

Society of Arts.

The Builder

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FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,

SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."——Sir Henry Wotton.

"Our English word To Build is the Anglo-Saxon Býlðan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."——Diversions of Purley.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is Goodness."

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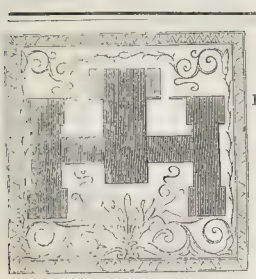
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Modern Athens.

THE monogram on our left contains the initial letters of the words "Theophilus Hansen"; it also represents with sufficient accuracy the block-plan of the Academy of Athens. Is it necessary to add that Mr. Hansen is the architect in whose name the Academy has been designed and built? Old John Thorpe *confessed*, in the three elegant lines,—

> "These 2 letters Π and Τ,
> Joyned together as you see,
> Is ment a dwelling-howse to bee,"—

to having constructed a plan on the automonogrammatic principle; but his present disciple pleads that he was not a voluntary agent in the bringing about of this happy coincidence.

Leaving, however, all speculation as to unconscious volition and the like, we must turn our attention to bricks and mortar, or rather to marble and cement; and in the first place it is necessary to state the uses for which the Academy of Athens is intended.

Its appellation cannot be termed distinctive. It raises in the mind a succession of dissimilar ideas, which may be divided into three classes, having for their types the Royal Academy of London, the Academy for Young Gentlemen, and the Academy of Paris, respectively; to either of which its application is ridiculous. But however absurd it may be for "Europeans" (as the Greeks call Western nations, as distinguished from themselves) to term a building situated in the centre of a crowded metropolis, "Far-from-the-people," it is more so to do it here, where the meaning and derivation of the name are contained in the Vulgate, and can never be overlooked. The Academy of Athens is to be such as those of Paris and Berlin, the head-quarters of the literary and scientific bodies of the nation, and as the statutes have not yet been drawn up, we may hope that, when the task is undertaken, the Greeks will find in their copious language a word more suited to express the purpose of the place, and so save themselves from the perpetration of a philological outrage, and give to Europe a word much needed.

We have said that the Academy was designed and built "in the name" of Mr. Hansen, and we think the phrase a good one to express the relationship in which some architects stand to the buildings which they are popularly said to "erect"; but we do not wish to impugn the ability and learning of the State-architect of Austria; his official position speaks for itself; his reputation is more than national; the Parliament-houses at Vienna will preserve his name to posterity as an eminent professor of our art. An outline history of the undertaking will explain our meaning.

Seventeen years ago Baron Simon von Sina, at that time ambassador to Austria, Prussia, and Bavaria, a patriotic Greek who has not once visited his native country, commissioned Mr. Hansen to prepare designs for an academy, which he proposed to present to his nation. Mr. Hansen, who had formerly studied in Athens, and had held the professorship of architecture, returned *con amore* to the fountain-head of art, and the drawings were soon in train at the office in Vienna. Mr. Ziller, the present professor of architecture under the Greek Government, was at that time in Mr. Hansen's office, and, without re-opening the wounds inflicted in the Barry and Pugin, and more recent Ross and Roper, controversies, we would suggest that the assistance of one who had already gained much distinction in the profession must have materially affected the nature of the design. In 1861 Mr. Ziller arrived in Athens, as the representative of Mr. Hansen, who had done little more than to lay the foundations of the structure, and since that date the former gentleman has conducted the operations. But over and above any facts in the history of the building which render it probable that the design, as executed, owes its character rather to the mind of Professor Ziller than to that of Professor Hansen, there is internal evidence sufficient to produce a moral certainty that it has been carried out under other influence than that of the architect who originally conceived the forms, and made the disposition of the masses. The University and the Academy stand side by side, and even to the casual observer there appears a greater difference of treatment than the more ample funds which have been applied to the construction of the latter will account for; while to the critic their individualities (for, happily, they each possess an individuality) stand out in strong contrast. The general effect of the University approaches the archaic; that of the Academy certainly does not.

With regard to the cost of the works, the fluctuations of professional opinion have been considerable. Mr. Hansen at first stated the probable expense at one million francs (40,000*l.* sterling); he subsequently saw reason to conclude that it would cost four times that amount; and now, in accordance with the wish of the donor, it will be completed for somewhat less than 2,500,000 francs (100,000*l.* sterling).

The University and the Academy stand side by side, and, when the Library is erected, the three buildings will form a group interesting as a study of modern Greek architecture, and even more, as a monument of Greek liberality. The site of the Academy is infelicitous, in that the building cannot be seen to advantage from any point beyond the road which passes before it, and is entirely hidden from the Acropolis.

We will now consider the architecture of the fabric with some minuteness.

If the reader refer to the monogram at the head of the first column, few words will suffice to explain the general arrangement of the building. The principal elevation is on that side of the plan which is nearer to the bottom of the page, and it presents a portico having on either side a wing projected before it, and connected with the central portion by a transverse block. The second elevation is arranged in a similar manner; but there the portico is projected before the wings, instead of being recessed as in the former case, and courts are formed between the lateral and central blocks by means of walls connecting them. The plan of the building is contained in a parallelogram 216 ft. long by 166 ft. deep.

Internally the structure consists of ground-floor and a basement. On the ground-floor, that part of the leg of the Τ which is crossed by the horizontal stroke of the Η is occupied by the entrance-hall; the rest of the leg of the Τ by the theatre, which is 66 ft. by 40 ft. Each

of the precinct [illegible] 11 ft. wide, offices, and a spiral staircase to the basement. [illegible] three-quarter columns, [illegible] and [illegible] the [illegible] Academy. In the basement, which [illegible] contain [illegible] kitchens, rooms for the servants, and [illegible] offices.

The whole pile is boldly raised upon a basement-story of [illegible], 17 ft. high from the ground level. The stone is of a brown colour, and of an uneven texture, well suited to its inferior position, and forming a good contrast with the [illegible] of the upper story. We think, however, that a rough material should receive a rough treatment; and we venture to suggest that, if, instead of being worked to an even surface, and [illegible] been rusticated with deep joints, it had been [illegible] negligence," it would have been even better than it is.

The basement-story has a square unmoulded plinth, which projects some 8 in., and on its uppermost course lie two marble steps, from which rise the wall and pilasters of the upper story, being set back about 2 ft. from the face of the basement. We consider this arrangement most excellent. If columns require a stylobate when they are [illegible], have we any reason to suppose that they do not when they rest upon a lower story? But more than this: the treatment which we find here entirely obviates the over-hanging effect, which, however it is to be explained, is so generally seen when an "order" is introduced in an upper story, or when "order" is used above "order." Even in Somerset House and Whitehall Palace, as one looks up, the small columns seem to be clinging to the walls for very life.

It would have rendered the cost of the building too enormous to have constructed it of the best quality of marble, and, consequently, we find the surface covered with veins. This would have been, in itself, a small evil, if an evil at all; but, unfortunately, it is not necessary, owing to the homogeneous texture of the material, and it is not customary, we know not why, to work the marble with any consideration of its bed. The result is that the face of the work is streaked with zigzag lines [illegible] to the feelings of one who has been accustomed to see stone laid as it was laid by nature. But time will mitigate this effect by giving to the surface that matchless hue of buff, which makes the buildings of Greece "beautiful for ever."

A glance at the block plan will tell any professional architect in what manner the building is roofed; but, lest there should be any doubt about this most explanatory feature, we will say that the central block has a pediment at each extremity, that each lateral block has four pediments, one on either side of each extremity, and that these together make up the number of ten pediments in all, each several pair of which are duly connected by ridge and eaves. The roofs of the transverse blocks intersect those of the lateral, and abut on the central block, which rises with monumental effect considerably above the other parts.

The Greek Ionic order is employed throughout the design with a most happy result. The central block is amphiprostyle. The principal portico, which is prostyle, hexastyle, tetrastyle in antis, has columns 30 ft. in height, of the kind which has those of the Temple of Minerva Polias for its prototype, that is to say once more, they have the astragal below the volute, and the honeysuckle ornament (palmates) round the neck. Indeed, the form of these columns is undisguisedly taken from that venerable example. The second portico, which is prostyle, hexastyle, has similar columns, and both have, at the inner corner of their angle ahaci, that horrible joining together, and mutual destruction of volutes, which is sanctioned by the precedent of antiquity.

We could not understand why, since the mouldings of the *antæ* resemble those on the Acropolis, the palmates, which there form a link between the columns and the *antæ*, should be omitted; nor why, since the astragal and mouldings of the *antæ* are carried along the walls, the base mouldings should not be also. The fact that they were not in the Minerva Polias can be accounted for by the circumstance that they would have appeared disadvantageously in relation to the Erechtheum, which stands upon a much lower level; but here in the Academy, without any apparent cause, we have in one part the base mouldings carried round and the mouldings of the capitals stopped, and, in another part, the base mouldings stopped and the mouldings of the capitals carried round. We have since learned that both these appearances are due to a collision which took place between [illegible] and architecture, in which the latter was borne down by its grim opponent; and we have also been informed that when the decorations are executed, polychromic "honeysuckle" will ameliorate the present effect of the *ante*.

Beneath each of the minor pediments is a large window, divided into three lights by Ionic columns, of the Temple-on-the-Ilissus form, with their attached semi-columns. We cannot appreciate the introduction of a flower into the band between the fillets of the volute, a practice which was resorted to by the ancient Greeks only, we believe, when the fillet became unusually broad, as in the temple at Bassæ; otherwise, as here, the plain surface is needed to refresh the eye.

The tympana of all the ten pediments are adorned with statuary; that of the two principal is executed in marble, that of the rest in a beautiful terra-cotta, in accordance with the usage of the ancients, as mentioned by Pausanias. The pure whiteness of the material is obtained by adding to the clay a small proportion of the chalk from which Cassie derived its name. The workmanship of the statues is considerably above the average, and their celestial majesties do not appear more than usually incumbered by the pitch of the roof. We confess that the principal group fills the mind with anxiety for the father of the gods, for Hephæstus appears to be on the point of "giving him one" with his hammer, while Hera, sublimely in accordance with nature, looks on with divine indifference.

The walls of the building consist of a series of pilasters, with windows or walling between them. Between the windows, which are grouped in two's, three, and five in's, and where windows might (not *should*) have been, the wall is recessed; so that at the angles of the different blocks only does it retain its full thickness. The whole is arranged in strict, but graceful symmetry.

The variety of capital which is made use of in this instance is well known, and a few words will recall it to mind. Each volute, instead of running horizontally from the centre of the capital and curling downwards, rises from the astragal, and passing up the *angle* of the square capital, curls outwards beneath the abacus. On each of the exposed, or partially exposed, faces are cauliculi, palmates, and tendrils.

Such is the capital of the pilasters, and against it we will commence, in forensic manner, our charges by investigating its reputation. Firstly, then, no such capital is found in the Acropolis of Athens, and of art; and we must go for our type of the class to which it belongs to the temple of Minerva at Priene and to that of Apollo at Miletus, two examples, we need not say, of the Asiatic division of the Ionic order. Now, seeing that every other part of the design is of the Attic division, we think that necessity alone should have been able to procure the introduction of this alien feature. Secondly, to our mind and eye the excellence of both the above-named temples is of a lower order than that of the Periclean works. And, thirdly, making allowance for the fact that the Asiatic architecture of the Greeks was both in its maturing and its decay in advance of the European, we consider that these buildings are by no means of the best period. But, after all, it is not so much the design of the capital which offends the sense, as the marring which it must necessarily undergo, when applied to a pilaster. In that case one of two courses is open to the architect, namely, either to stop the mouldings and foliage of the lateral faces against the wall, or to return them along the wall. The latter of these is the better, and such a mode of treatment would have been adopted in the Academy, had the sum at the disposal of the architect been sufficiently large; but it was not, and consequently we gaze with shuddering pity on a mutilated form.

We have it on Dryden's authority that "Pity moves the mind to love," but in the instance under consideration we own that it has failed to do so. We do not like that which raises in the mind ideas of incompleteness and obstruction. We must suppose either that a capital has been wrought and that the wall has been so built against it as to hide one side entirely, and half (!) of two more; or else that half a design has been wrought and attached to the wall. One volute of each lateral face is visible, and well may it cry, in the words of another great English poet, "Where is my brother gone?" while the severed palmate must pine indeed for its "other half." How much more worthy of the rest of the design it would have been if, consigning the "wood-hat" type "to its own place," the simple and most unexceptional moulded capital which is found elsewhere in this same structure had been employed, and had been returned along the walls in the same manner as the base mouldings are. The pilasters would then have become [illegible] parts of the wall, due to it by the mouldings; and surely there is no reason why the Classic style should not borrow from the Gothic principles that are good and true.

The roofs are covered with tiles of the shape most usually employed by the ancients. *Antefixæ* are placed before the eaves-tiles in alternate row, an arrangement scarcely in accordance even with that small amount of logic which usually bounds the flight of genius; for if an *antefixa* is necessary to one row of tiles, it must be necessary to every other, and, consequently, by employing it before only one-half of the eave-tiles, the voluntary deception of the senses produced by possible utility is entirely destroyed. The *antefixæ*, which are missing from the eaves, are seen on the ridge,—a less suitable position; yet the roofs look well enough.

On the present occasion, we will notice only one part of the internal construction, namely, the roofs or ceilings, which cover the apartments. A description of that of the theatre will render it unnecessary to describe any of the others. That which Mr. Ruskin calls the "true roof," or "roof proper," and what more ordinary people call the ceiling, does not exist; the form of the room following the pitch of the roof, which is framed in many small coffers, moulded in gypsum. The principal rafters and purlins are strongly marked, and if our description ended here, it might be supposed that it was a most constructional piece of work. But we are sorry to have to record that in the whole length of 60 ft., not a tie-beam, not an indication of any tie of any kind is seen; and as for the ridge-piece, it is literally cut away to allow a weak angle to form the internal apex of the roof. This may be a fine display of engineering skill, but, oh, ye Gods of Greece! is it architecture?

How often is the objector told that the peculiarity which offends his eye or his common-sense is a feature of the building. "Indeed," we once heard a venerable amateur reply, "it is a feature, and so is a nose ridiculously elongated, or an ear of abnormal development." We have now come to the feature, or features, of the Academy. Two huge columns rise one on either side of the main portico, within the line of the wings, some 40 ft. in height above the level of the upper floor, they overtop the highest apex of the pile, the lower parts of which stand around them like pigmies round the feet of a giant. Though intrinsically admirable, these pillars produce a pernicious effect upon the rest of the building, of which all who see them have ocular demonstration, for, as we have remarked twice already, the Academy and the University stand side by side. If a man who had passed before the two buildings were stopped in the Place de la Constitution and were asked to express his idea of the relative heights of the columns of the University and of the Academy, he would probably say roughly that the former are twice as high as the latter; now, the fact is that the difference is altogether insignificant.

On the summit of these lofty columns are to be stationed statues of heroic size, representing Minerva and Apollo, the tutelar saints who divide with the Madonna and St. George the reverence of the devotional Athenians. All have heard, and doubted, the story of the sailor, who, on arriving at Trafalgar-square, inquired why Nelson was sent to the mast-head; and with feelings similar to his, we asked why the divinities should occupy so giddy a height. "Is not," responded the learned professor, "the dwelling of the deities in the clouds?" "Yes, yes!" broke in a modest voice, "the gods of art walk no longer among men."

The building is to be finished with polychromic decorations, in which gold will predominate. As much as is done promises well, but as yet the work is too incomplete to allow us to pass a judgment upon it, although the bolster blows of amateur criticism already fall thick; but, then, every man in Athens, including women and children, is a universal critic. When the whole is finished, we hope that we may resume the description, and notice those points which we must for the present omit.

To Professor Ziller, the architect of the Academy, every civilised man is indebted for the excavations of the Panathenaic stadium, and his spirited defence of the principles propounded by Mr. Penrose give him an additional claim upon the English members of his profession. We are sorry not to find his name in the list of members of the R.I.B.A.

We have heard in Athens a lady begin by describing her friend as a most excellent person, and end by leaving her without a shred of character, a presentable feature, or an amiable quality. We will reverse this order. Having now encompassed the building seven times, and having tried every joint of the armour with which merit has protected it, we will, in the manner of Demetrius Poliorcetes, present to the place we have attacked the engines of the siege,—that is to say, our humble judgment, and the testimony of our experience. In conclusion, then, we pronounce the Academy of Athens a most excellent structure, honourable to all who have been connected with it.

SOME RESULTS OF THE PAST YEAR.

THE year 1875 has been, from the point of view most appropriate to our pages, a year of seed-time rather than of harvest. Not that, by any means, there has been so full a broadcast committed to the soil as was hoped for, and even promised, at the beginning of the year. Still, as to much of the good fruit of the future we, and those who come after us, may have to look back, with some gratitude, to the year that closed the third quarter of the nineteenth century.

Measures for facilitating the transfer of land, for improving the dwellings of the working-classes, for regulating some of the laws relating to labour, for consolidating the Acts of Parliament relative to the public health, for preventing the pollution of rivers, and for amending the law as to loans for public works, were proposed early in the session. As to the details and policy of these measures we have taken occasion to comment from time to time. The Act passed for facilitating the improvement of the dwellings of the working-classes in large towns, which is supplemented by a similar measure for Scotland, is now in course of operation; and the incoming year will probably enable us to form some just opinion of its practical efficacy. The great library of statutes affecting the question of public health has been reduced to the dimensions of a single Act, a necessary simplification with regard to further legislation. The Rivers Pollution Bill was unfortunately postponed. Measures were passed with a view of preventing danger to populous neighbourhoods by the careless carriage of explosive substances, as to which the accident in the Regent's Canal read us so serious a lesson, and as to which the close of 1875 has witnessed a terrible instance of the action of explosive materials abroad. Legislation also has been effected as to the adulteration of food, as to the law of conspiracy, as to the titles to land, and as to the inspection of unseaworthy ships,—a matter in which the energy of an individual member of Parliament has had an unusually effective influence on the proceedings of the Legislature.

The Act of Parliament for the erection of a Bishopric of St. Alban's has given to the largest ecclesiastical building in England, and, with the exception of St. Peter's, in Europe, the rank of a cathedral. The appeal which has been made to the public to facilitate the complete restoration of this noble abbey, named after the proto-martyr of England, will, we trust, be successful. The restorations already effected are of unusual interest.

In science, one of the most notable features of the year was the assembling of the British Association under the presidency of a civil engineer. The outcome of the meeting, however, was not of so memorable a nature as on some previous occasions. We hope that the propriety of giving, in the opening speech of the president for 1876, something by way of programme of the matters which have been found worthy to be brought before the several sections will not be lost sight of. The tendency of the time is towards the overlaying the scientific character of these and similar gatherings, by the social element,—of postponing work to amusement. The absence of a proper general programme tends to intensify this mischievous influence. Men who attend, not for the sake of fun, but for that of work, will be far more likely to be attracted by a business-like statement of the projected discussions, than by a list of excursions proposed, charming as these sometimes are. Thus, too, we should be more likely to avoid the misfortune of the occupation of the time of the visitors by the introduction of matters so irrelevant to science as were some of those brought before the sections at the last meeting.

The result of the perforation of the Wealden beds in Sussex has been such as to bear out the views we have so definitively expressed as to the slight grounds on which the optimist expectations of the Report of the Commission on Coal were based. The export of this precious mineral continues to increase, the tonnage of 1874 being 13,380,000 tons against 12,077,000 in 1873. The prices have ranged widely, but rule high, from 5s. for slack to 33s. for best. The export of iron has declined by 470,000 tons, or nearly one-sixth of the total of the previous year. The results of the disastrous struggle in South Wales at the commencement of the year will not be fully brought to light until the statistics of 1875 are made up.

The total receipts on the railways of the United Kingdom have reached a higher figure than in any previous year, amounting to 369 millions sterling. But the working expenses have advanced with more rapid strides, so that the net receipts of 1874 are less by 316,000*l.* than those of 1872. The working cost has consumed more than 57 per cent. of the entire income. In 1854, the earliest year for which we have the materials for comparison, the proportion of working expenses to gross income was 45½ per cent. The steady increase in the proportionate cost of working, which was chequered by a slight decline in 1871, when it fell from 49 to 48·4 per cent., has advanced with rapid strides since that date. The ratio for 1872 was 50 per cent.; for 1873, 54 per cent.; for 1874, 57 per cent. At the same time the cost per mile is also advancing, that for 1858 being 34,000*l.*, and that for 1873 being 36,500*l.* over the whole mileage. There is no doubt that the steady increase in the price of coal and labour increases working expenses. The increase of the capital account, however, is not thus accounted for. Again, it must be remembered that since 1858 the gross earning per open mile of railway has increased by 37 per cent., or from 2,516*l.* to 3,459*l.*; the rate of increase for 1874 being 3*l.* per mile less than that for 1873. There thus seems to be leakage at almost every joint, and it becomes highly expedient that railway proprietors should make some inquiry as to the true results of that mineral traffic which, carried on at such low rates, requires so large a portion of their plant, and so fully occupies their lines of way.

In face of such a movement in railway cost, we must regard the scientific, rather than the economical, results of the attempt to tunnel the Channel, as a matter likely to be of interest. Legislative sanction has been obtained for this scheme, as to the feasibility of which there is considerable difference of opinion among geologists; the possibility of its execution being admitted to depend on the continuity of the lower chalk-bed under the Channel. In the meantime, the success of the *Castalia* in producing freedom from sea-sickness, although the speed attained has not yet proved satisfactory, is enough to show that the sub-aqueous route, if ever made, will be far from monopolising the traffic across the Channel.

The bold step taken by Her Majesty's Ministers in the purchase of the Khedive's interest in the Suez Canal appears to have given general satisfaction. For the first time in modern history a great engineering operation has been regarded in its true light as a matter of European importance. That a considerable amount of engineering work will be entailed for the defence and improvement of our new property may be reasonably anticipated, and the real value of the purchase has yet to be seen.

The greatest mechanical triumph of the year has been the partial completion, and proof, of a piece of ordnance of the enormous weight of eighty-one tons, and throwing a projectile of 1,465 lb., or nearly two-thirds of a ton. The powder was formed in cubes, of from 1·5 in. to 2 in. on the side, and the charges varied from 220 lb. to 250 lb. The internal pressure on the breach of the gun amounted, in one case, to 28·1 tons per square inch. The highest muzzle velocity attained was 1,551 ft. per second. The cost of each discharge, in time of war, is estimated by his Royal Highness the Commander-in-Chief at 25*l.* Enormous as is the destructive energy thus produced, yet more powerful ordnance is contemplated. We think it does not need any prophetic instinct to arrive at the conclusion that armoured ships will be so definitively beaten by projectile power, that the development of our naval force must be sought under some very different type than that of the iron-clad, to say nothing of the iron muffin-plate of Admiral Popoff.

The architect has been furnished, during 1875, with samples of what is practically a new material, and one of which the introduction is likely to be attended with great structural, as well as domestic, utility. This is the annealed glass of M. de la Bastie, which, without loss of brilliancy or of transparency, or objectionable increase in weight, has the strength of cast iron. The use of this glass for illuminating, as distinguished from ventilating, purposes, will effect a great economy; as it may be safely built in a house or church without the costly preparation of the window-frame. The proofs which we have witnessed of the strength and beauty of this material, and the numerous purposes to which it may be applied, render the discovery of M. de la Bastie a most valuable one. In connexion with this invention we recall that of which we gave some account in February last, namely, the sand blast, as pointing towards a mode of obviating the difficulty of working in the annealed metal.

One of the most remarkable features of the year has been the extraordinary amount of rainfall during the summer, and again in the latter months. Greater quantities fell than have ever before been measured in England; and the damage from the floods has been serious and widely spread. Much, though not too much, has been said about storing the rain-water; but in the case of such abnormal supplies the question really is, how most easily to send the rainfall to the sea? Our river valleys, as we have not unfrequently pointed out, are neither left in their natural state for the discharge of flood water, nor improved by the art of the engineer for that purpose. The use of water as a motive power has been so long regarded in the country as of the utmost value, that obstructions in the form of mills are to be found on every river. The artificial arrangement of the water-courses to feed these mills is the main cause of the flooding of our valleys. Steam power is now so much more available than any other, that even old-established water-mills frequently have auxiliary steam-engines. In the interest of agriculture, as well as in that of public health and safety, we must look forward to a systematic engineering of our river valleys, in which the removal of all dams and mills, except such as may be required for hydraulic purposes, in connexion with irrigation and with well-designed outfalls, will be a main feature. At the same time, the regulation of river courses and protection of their banks demand attention. The suffering and loss occasioned by the want of proper wharf walling to the Thames during the latter part of the year will not readily be forgotten. It is to be hoped that it will lead to the reparation of a neglect so disgraceful to the metropolis. We think it far from improbable that the increasing cost of railway working will, sooner or later, send back a considerable amount of heavy traffic to lines of water-borne communication. The neglected state of most of our canals will otherwise force itself on the attention of the country. Unless intelligent care be directed to the state of our river-valleys and main lines of water communication and natural outfall, trouble and cost are in store for us in the not very distant future.

The local taxation of the country shows an increase that demands anxious care on the part of the ratepayers. The total receipts under this head amounted, for 1874, to nearly 41 millions sterling, or more than half the national revenue. This sum includes two millions transferred from the taxes, and nearly seven millions of loan. The local budget, moreover, is being weighted by a constant increase of loans; the sums now borrowed or required being estimated at upwards of eighty millions sterling, or one-ninth of the national debt. But the rate of interest is nearly half as much again as that of Consols. The check which the constitution expects the House of Commons to provide against undue public expenditure is thus removed with regard to one-third of the amount. When payments for which the national faith is pledged, such as the interest on debt, and the cost of permanent establishments of all kinds, are considered, as well as the large sum now raised by the local rates, it will be seen that the power of the House of Commons in controlling expenditure is tending to become almost imaginary. Local extravagance

is easy, when unchecked, and its result, if allowed to augment, would very speedily double the burden imposed by the Legislature at Westminster.

The year has witnessed a degree of uneasiness and contention on the subject of the supply of labour, of which the most disheartening feature is to be found in the fact that the working classes appear to have learned but little from the disasters which they have brought on themselves. To say that the whole nation must, sooner or later, suffer with them, is but Job's comfort. The year opened with a long struggle in Wales, in which it became evident that a great amount of terrorism was exerted to compel the quiet and industrious workman to throw aside his tools. With the close of the year the struggle has been directed against the best resource of the superior workman,—piecework. At the same time intelligence comes back from New Zealand of the destitute condition of the agricultural labourers who were induced to emigrate to that country, in order to diminish the supply of labour at home. From all parts of the world echo complaints as to the condition of emigrants; and proofs of the fact that no paradise has yet been discovered for the thriftless and idle. It would seem to be no hopeless work to make it plain to those who live by their labour, that the price of labour is not a matter to be fixed by the seller alone. That is, in point of fact, the mistake that often underlies a strike. Indeed, seller and buyer together cannot absolutely regulate that price. Work is not to be created by the workman. It can only be done by him when wanted, and the more difficulty he throws in the way of doing it, the less will be wanted. The great stimulus to demand is certitude of adequate supply. When reasonable terms, and, still more, reasonable certitude, are not to be had, work goes somewhere else. Iron, for example, is made in other countries besides England, and England has exported half a million tons less in 1874 than in 1873. It can hardly be supposed that this diminution represents the loss of trade due to the strike of the past winter. Employers must not be left without blame in the matter. Liberal views at certain moments save money.

The progress of exploration during 1875 has been active and wide spread. Egypt, Assyria, Palestine, and Asia Minor are each yielding stores of long buried information. The discoveries of Monsieur Mariette, of Mr. George Smith, of Lieutenant Conder, and of Mr. Wood, have more interest than that of so many archæological researches, each considered apart. The combination of the information thus gained is throwing a continually brighter light on the history of the past. The most ancient books of the Hebrew scriptures are receiving unexpected illustration. We are recovering the history of Assyria back to times antecedent to the days of Abraham. The chronology of Egyptian history receives absolute verification from the Apis monuments, to which we alluded in a recent number. The identifications made by Lieutenant Conder of extant Arabic names, which are the equivalents of the Hebrew names given in the Pentateuch and the Book of Joshua, are so numerous and mutually so explanatory, that the topographical system of the writers of those sacred books has become distinctly intelligible. We may hope that when the Palestine Survey party resume the operations which were interrupted by a fierce attack by fanatical Moslems in August, the next campaign will so far advance the examination of the country that few, if any, local names will be left, out of the entire mass of places mentioned by the sacred writers, by Josephus, by Jerome, by the historians of the Crusades, and by the Arabic writers, that will not be accurately determined as to locality, and existing equivalent. From all this wide field of exploration comes the concurrent testimony that very often an early civilisation, of a high order, as judged by artistic or literary remains, has been overthrown by a deluge of barbarism. The results of Dr. Schliemann's investigations in the Troad, which we were the first to announce to the English public, have been made better known in this country, during the past year, by the publication of the English translation of Dr. Schliemann's narrative by Mr. Philip Smith (*Builder*, No. 1685). Nor can we omit to mention the gain to architectural history, no less than to metrical science, by the determination of the Jewish cubit and shekel, and of the Babylonian talent (*Builder*, No. 1693). Actual measurements of ancient synagogues in Galilee, made since those determinations were published, show that these edifices were built to the 16-in. cubit, according to the outcome of literary research. The bearing of a discovery thus positively verified on disputed questions as to topography and architecture is too obvious to need pointing out.

The art and the engineering of India have been brought, during the past year, more fully under the notice of the English public than had previously been the case. The establishment of a permanent Indian museum at South Kensington has brought before the public an instructive display of the great objects of Indian industry, of the national products of the country, and of that remarkable transition state of art spoken of as Græco-Budhist, of which we have yet so much to learn. The visit of his Royal Highness the Prince of Wales to India, the unexampled splendour of the homage of the native princes, and the ready grace with which the Prince has turned his attention to the wants of these his future subjects, are matters of the happiest omen, as well to the mother country as to her more colossal daughter and dependency. Fresh attention will thus, it is hoped, be directed to that vast system of public works, of which we have barely indicated the principal divisions. Especially in the protection and formation of harbours, and in the works of irrigation, reclamation, and river protection, is there open a vast field for the lucrative investment of sums of money, compared to which all that has been laid out in the harbours, canals, and railways of our own country is a trifle. A well-constructed irrigation canal in India is worth far more than a gold, or even than a coal, mine.

If the year has not been marked by the completion of any national or public buildings of the first importance, the work of the ecclesiastical builder has been active and unchecked, and the domestic architecture of the country is everywhere in the course of renewal. Something like three churches are built per week, and the repairs and restorations average nearly a church per week. The prompt appeal to a call for more churches at Leeds, when 32,000*l.* were subscribed in the room before the meeting broke up, is a remarkable proof of the voluntary energy of the supporters of our ancient institutions. The tendency, rather concentrated than wide-spread, to overthrow the Protestant rite, whether in the caricature of the Romish ritual, or in the return to an exploded style of architectural ornamentation, has received a decided check by decisions against the legality of certain notorious examples. The operation of the new law on the subject has not yet been tested. That very fact seems to prove the utility of the measure, as the mere knowledge that a more ready way was open for the enforcement of the law has had the salutary effect of keeping all parties more carefully within the limits of its injunctions. The art-questions of the time, the position of architecture,—what architecture has done and should do,—the cultivation of the general taste, and other subjects more entirely our own, we shall have occasion to treat separately and with more minuteness.

From a Christmas bright with the associations of old English comfort and hospitality, we look forward to the coming year, ignorant, indeed, of what it bears on its wings, but yet with much cause for hopeful cheerfulness. At the same time, we must all feel that it depends very much on the exertions of her children what position Great Britain is to maintain in Europe. Never was there a keener competition,—never were carefully taught and trained men in Germany, Belgium, and other countries more ready to seize the opportunity of any neglect or shortcoming, in order to get our place. We must remember that coals have been, in actual truth, shipped to Newcastle, that Belgian iron and French engines have been supplied to English customers. We have yet to save our homes from pestilence; to speed the plough by the aid of science; to stamp out preventible disease. Everywhere we have work to do,—in but too many places is there great slackness in the attempt to perform it. All around are those who will profit by our mismanagement. To a degree that was formerly unknown, the future of the country depends on our vigilance, honesty, forethought, and unslumbering industry. The world moves fast,—we must do so, or be left behind.

Baths and Aquarium at Hastings.—The tender of Mr. Adcock, contractor, of Dover, for the construction of the baths and aquarium at Hastings, has been accepted. The amount is 28,000*l.* The buildings will be commenced early this year.

REBUILDING AT THE STANDARD THEATRE.

The National Standard Theatre in Shoreditch, although admitted to be the largest dramatic establishment in the metropolis—Covent Garden and Drury Lane not excepted—has hitherto had such an unpretending main frontage to High-street, opposite the Bishopsgate Railway Station, that a stranger would have some difficulty in finding its whereabouts. With the view of improving its external appearance, and at the same time giving increased facilities of approach to the auditorium of the theatre, the High-street elevation has just been entirely rebuilt, and the frontage to Bishopsgate increased in length from 12 *ft.* to 54 ft., and now presents an architectural exterior. In addition to the rebuilding of the frontage, the theatre has also been reconstructed to a depth of 110 ft. extending to the audience part of the house. The new Shoreditch elevation is 60 ft. in height, and the style of architecture adopted is Modern Italian. The ground-floor portion consists of ornamental pillars, from which spring three bold arches. The upper portion is built immediately over the arcade, above which is a balcony with balustrade. From the balcony to the cornice the elevation is continued with piers, between which are three arched windows, and in the centre the elevation is surmounted by a pediment. The elevation at the north angle is surmounted by a tower rising to a height of upwards of 80 ft., and at this portion of the frontage there is a separate entrance, with a stone staircase, leading to an intended skating-rink in the upper portion of the building, altogether distinct from the theatre. In the centre, under the arcade, there is an entrance and staircase, 12 ft. wide, leading to the dress circle, stalls, and boxes. The walls of this entrance are divided into handsomely decorated panels, in which are placed mirrors 5 ft. in width and 12 ft. in height. The floor of the entrance is laid with encaustic tiles. Immediately adjoining the central entrance is another of exactly the same dimensions, and similarly finished and decorated, leading to the pit-stalls and upper boxes. New entrances have also been made at the south side of the building, which will now face the new street from Oxford-street and Old-street to Shoreditch, at present in course of construction by the Metropolitan Board of Works. These entrances are four in number, one to the pit-stalls, two to the pit, and one to the gallery. The newly-erected building also contains a large additional saloon, 38 ft. by 24 ft., and 26 ft. in height, in immediate connexion with the several tiers of boxes. The skating-rink in the upper floor of the newly-erected portion of the building, which, as we have stated, is quite distinct from the theatre, is very spacious, having a floor covering an area of 4,000 superficial feet, and in connexion with it are a number of retiring-rooms. No timber is used in the floors, which are constructed with Dennett's fire-proof arches, filled in and covered with asphalte. The floor of the skating-rink rests upon the external and party walls of the building, from which spring concrete arches, the flooring being in asphalte.

The architect is Mr. C. Fowler, of Woburn-place, and Old-street, Shoreditch, and the buildings have been carried out under the immediate superintendence of Messrs. Douglas, the owners of the theatre, by their own workmen.

DRESS AND REDRESS.

For the approaching juvenile fancy-dress ball, to be given by the Lord Mayor, the order is that all the costumes are to be of Calico. In the domains where Cotton reigns, such a determination is very reasonable, and consequent. Moreover, it will make practically evident what we have often endeavoured to urge,—namely, that the effectiveness of a dress need not depend on the expensiveness of its materials. Should this ball at the Mansion House assist in leading to a return to a less costly style of dress than is now usual, husbands and fathers will have cause to remember with thankfulness the time when Cotton was King in the City.

New Vestry Hall at Attercliffe.—The new vestry-hall and offices, erected on Attercliffe Common, for the township of Attercliffe-cum-Darnall, have been opened. They have been erected at a cost of 2,500*l.*, from designs by Mr. Hall, architect.

THE GENIUS OF DAVID COX.

WE mentioned a few weeks since that the Liverpool Art Club had got together a large collection of the works of David Cox. The national interest in the works of so gifted and so peculiarly English an artist, as well as the importance and representative character of the exhibition referred to, render this a fitting opportunity for a little more extended comment than we are generally able to give to picture collections out of the metropolis.

The drawings and oil-paintings of David Cox brought together by the Liverpool Art Club number nearly 450, and include adequate representations of all the "three periods" through which it seems now almost proverbial that all original artists pass. The first period of Cox's style is curiously at variance with that of his latest and greatest manner, of which one may say that his early works do not contain the slightest hint. They are mostly on a smaller scale than his later ones, and really show little that can be called genius in conception and execution; they are timid in manner, and hard and somewhat conventional in colour and manipulation. In the middle period his method of translating nature assumed a broader and more comprehensive character, and some of his productions of this period remind one a good deal of Girtin in their calm repose of effect, their broad and rather flat washes of colour, and their representation of nature rather by carefully considered gradation and balance of tone than by any realistic brilliancy of local colour. What his third period is like every one who knows anything of water-colour art is well aware; it was in this that his genius and individuality reached their real development, and in their power and entirely distinct and original style these works afford a remarkable instance of the development of genius, after a long course of probation and feeling the way up to its ultimate goal. What is the more noteworthy is that the character of Cox's latest work is to all appearance so remarkably spontaneous. In contemplating it one would be inclined to say that to such an artist the proverb *nascitur non fit* must be peculiarly applicable; yet, as a matter of fact, the attainment of this powerful, free, dashing style was the result of half a lifetime of labour and practice commenced from a tradition the very reverse of this; and the broad and often almost "splashy" manner of working by which the artist contrived to realise his finest effects, arose not so much from an inborn artistic afflatus or inspiration, as from the power, acquired by long and patient practice with his materials, of estimating precisely the value and effect of every touch, and thus realising an *extempore* facility in work which had become a second nature to his hand. The artistic gulf which separates this last from even his second manner is strikingly marked in the juxtaposition of two such works as the "Tivoli" and "Pen-maen-Bach-Road (1850)", Nos. 101 and 102 in the Liverpool Collection; the former has no date, but may be taken probably as a typical and very fine specimen of his second or "Girtin-esque" manner, beautifully calm, rich, and lucid, though in a comparatively low key; while the second-named drawing represents in its fullest force that vigorous depiction of the wilder aspects and incidents of nature towards which the artist almost exclusively turned in the series of works which have given him his fame. It is in these that his peculiar individuality appears, and that he has given us what is most specially his own; for though his works of this period have been, somewhat inconsiderately, compared with Turner's, the fact is that the comparison between the genius of Turner and Cox is hardly more true in regard to quality than in regard to greatness and extent. His effects and his method of treatment were purely his own, and for the most part the spirit and feeling of his works also.

The chief characteristics of this last and fully-developed "David Cox" style may be said to be an effort to represent the movement and the feeling of Nature rather than the bare or detailed facts, and the restriction of the *technique* of water-colour to its most direct and at the same time most powerful and characteristic capabilities. In these works there is not an attempt at optical illusion, or at the polishing-up and manipulation of surface and texture until the idea of paper and paint is almost eliminated. For this species of excellence, now so much aimed at by artists in water-colour exhibitions, there are receipts to be had, and Cox, in spite of the modesty with which he is said to have deprecated any idea of his being able to compete with modern finish in water-colour, and expressed his contentment at working "in his own rough way," could no doubt have acquired this excellence of mechanical finish (which, in its way, we do not wish to underrate) had he aspired to it. But he spent his time far better. Practically, his reasoning, whether it were ever categorically expressed or not, even to himself, amounted to this. Water-colour is a means of representation by wet washings and blottings on paper. The minute facts of Nature cannot be represented in such a medium, except by losing sight of its primary characteristics, and transforming it into a system of washing down, and stippling, and finishing; and when all this is done, it remains a question whether the result was worth the labour, and whether we may not even have lost sight of the real poetry of Nature, as well as of the freshness and brilliancy of colour in the drawing, in this elaborate aim at detailed fulness and accuracy; an aim, too, which can at the best be only partially realised. But the broad facts of nature, which are what we most look to and which most deeply impress us, can be represented by this system of colour washing in its purity, accepting the fact that it is a system of washes on paper, and not a carefully-prepared illusion. Cox's finest works of this period seem to say openly to the spectator, "this represents the feeling, the tone, the harmony of such a scene, and indicates its movement, so far as water-colour and brush can translate it to you." There is not an attempt to hide or mask the *modus operandi*—the signs of the brush are visible all over the paper; often there is scarcely an attempt even to round off and give realistic effect to such objects as clouds, lest the characteristic aërial freshness and brightness of the pure tones of colour should thus be lost or impaired. The artist gives us all that his medium of expression can give most powerfully and most suitably to its character and capability; and there he stops short; "thus far shalt thou go and no further" seems to be his motto. In connexion with this reflection, the following remarks from the essay attached to the Art Club catalogue, by Mr. William Hall, of Birmingham, who appears to write from personal knowledge of Cox, may be interesting:—

"As respects the colours he used, his materials, and method of working, David Cox for many years used the old hard cake colours, which he ground into saucers, large or small, according to the dimensions of his drawing. Afterwards he adopted the moist colours of modern invention. His range of pigments was limited to those of a simple and what may be termed an old-fashioned kind. When he took his second sketching excursion into Wales, in 1806, his colours were only three or four,—such as lake, gamboge, indigo, and perhaps another. With these he imitated the varying hues and effects of nature as he best could. In course of time he increased the number of his colours. Cobalt, vermilion, light red, yellow ochre, sepia, burnt sienna, brown pink, and one or two others, were added to his box. Emerald green also was to be seen there; but of this he used little, merely for an occasional touch on the draperies of his figures, or the mossy coating of a stone or tree-trunk. He cared nothing for the pretty pigments of modern days. With large sable pencils, well filled with the required tints, he flooded and saturated his paper, so that it should be thoroughly stained, with a view to durability, securing his effects generally at the first trial. The writer has seen him, when in Wales, working on wet days at three or four drawings at the same time. To begin, he would mix a quantity of sky-colour, sufficient for all, if he intended them to resemble each other in tint, say varying shades of grey, and then he would take up one outlined sketch after another, *mopping away with a large brush as fast as he could, the colour running down his paper in floods*, cloud forms and other peculiarities being rapidly shaped and indicated. Whilst one was drying he was proceeding with another, taking them up again in proper turn, gradually progressing with his subject, introducing colour, in the lower parts and nearer objects, and securing light, shadow, and effect, until the work assumed a finished appearance. Many of his outlines were drawn in charcoal, sometimes in black and red chalk. He would put in the shadows with great spirit, and draw the forms characteristically and firmly, then go over the whole with plenty of colour, leaving the charcoal or chalk to show through. The effect sometimes was very happy. Cobalt was his colour for the azure of the sky; this mixed with light red or vermilion, or occasionally a little lake, with perhaps the addition of a small portion of yellow ochre, represented the shadows of clouds and extreme distances of his pictures. From the remote parts he worked down to the middle distances, breaking into warmer and more positive tints, marking forms more distinctly, and increasing in power by the introduction of quiet greens and other local colours of the right atmospheric quality for the distance,—his greens compounded of indigo, lake, yellow ochre (or gamboge). In his foregrounds he used the more transparent and powerful colours,—indigo and gamboge, indigo and brown-pink, indigo and sepia or Vandyke brown, sometimes enriched with burnt sienna or lake. Raw sienna (in water colour) he rarely or never employed. Body colour, so much used in the present day, he studiously avoided, except for a sharp touch here and there on his figures, or for bright lights on the details of his foregrounds, but always in the smallest quantity. He sometimes executed drawings entirely in body-colour, but merely as experiments or in freak; these are much inferior to his works of the usual kind. Many of the drawings of his latter time were executed on a coarse low-toned paper, manufactured in Scotland for wrapping up reams of paper of another kind. This paper, though full of specks and occasionally creased, he was very fond of, as it enabled him to get great power and richness of colour at once, and supported those solemn grand effects characteristic of many of his late productions."

In proportion as Cox developed his latest and freest style, it is noticeable that the local colour in his scenes becomes purer, brighter, and more strongly contrasted. His latter works exhibit, in regard to colour as well as execution, the perfection of what may be called the "natural" manner in water-colour; in which, while form is sometimes but roughly indicated, the colour is as nearly as possible that of nature herself, in her own real strong decided tones, not in the balanced opposition of half tints which Girtin brought to such excellence, and which, as we have observed, Cox practised during a portion of his artistic career. The art with which these strong open-air tones, and the broad forcible touching by which the characteristics of different objects are given, are nevertheless blended into a homogeneous whole without the slightest appearance of spottiness or over-strong contrast, is remarkably examplified in such scenes as "The Green Lane in Warwickshire" (171 in the Art Club collection), where we are equally struck by the brilliancy of separate portions and the entire unity of the whole. The aim at a direct and intense expression of the leading character of a scene—a momentary aspect caught and fixed in all its most striking and predominant characteristics, and emphasised to the utmost by the subordination of parts to the whole, is evident in most of Cox's later works. In the "Mountain Pass near Capel Curig" (82), the white clouds seen over the crags seem massed and piled in square forms as if to repeat the character of the scene, with that sort of "building up" of a landscape in which Cotman showed such power. "Peat Gatherers" (66) is another splendid example of combined simplicity and power, and subordination of everything to the one object, the expression of desolation and expanse. The drawing of the "green lane" just now referred to forms one of a remarkable row of five works hung together in a line, and which amongst them illustrate all Cox's most typical qualities. The first of these, "Lancaster Sands" (149), is one of the later of his middle period (it is dated 1839), and one of the few which really give ground for likening his manner to that of Turner; it might pass for an early Turner, in general manner, tone, and treatment, very naturally. The next one to this, "Caer Cannen Castle,—the Rain-cloud" (152), is a subject on a grand scale, and exhibits in one sense the very height of the artist's powers, though before he quite settled into his last manner. Here, again, there is possibility of comparison with Turner, more especially in regard to the splendid effect of both aërial and linear perspective and distance. In the next one, "The Stubble Field" (161), dated 1843, we have a much less ambitious subject, but the manner is David Cox pure and simple, no longer capable of comparison with Turner, or with any one but himself. The reality and the vividness of the aërial tints in this drawing, with its bright breezy sky, is such that one almost seems to feel the air and the sunshine. "The Vale of Dolwyddelan" (165) is one of the greater subjects again, but we should certainly surmise it to be later than Caer Cannen Castle (neither of them is dated), and the manner seems more individual and incapable of being ranged with that of other artists either greater or less than himself. The massive treatment and homogeneous spirit of the whole is as remarkable here, in this line of mountain stretching away into the deep dusky haze of the distance, as in that Capel Curig scene above mentioned; and the complete knowledge with which Cox made his materials serve him is very remarkable here, in the perfect discrimination of the character of the rocky and grassy surfaces in the foreground and middle distance, though a close inspection fails to detect any special attempt to give texture except by tone, and the disposal of light and shadow. Among the finest and most typical examples of his last manner here may be mentioned "On the Holyhead-road" (78); "The Flood" (74), in which, however, the artist has attempted a little more than quite explains itself in the drawing, grand and suggestive as it is; and "Asking the Way" (92). This last is a perfect thing of its kind; the skirts of a wood in twilight, with the last glimpse of light in the evening sky, most powerfully given, over the dip of the ground to the left; and the two figures in the foreground are most happily

conceived so as to give a touch of human interest to the scene, without impairing its wild and lonely expression.

More than fifty of the works at the Liverpool Art Club are oil-paintings, among which is included that remarkable one the "Welsh Funeral" (57), in which Cox showed such success and so much pathos in his mode of dealing with numerous figures as to make one wonder that he did not oftener make figures an important feature of his works; in general they are completely subordinate to, and subservient to the effect of, the landscape. This favourite subject is represented, it may be observed, in two or three different pictures, showing a varied treatment of the same scene. Cox's style in oil-painting is neither so powerful nor so individual as in water-colour; but it is a very admirable style in its full and broad use of the material; and those who are familiar with the works of the modern French school of landscape painters cannot fail to be struck with the similarity, in some important respects, of Cox's manner to theirs, in his full thick use of the pigments and his disdain of mere detail and touching up. It is recorded, indeed, that he was in the habit of using his palette-knife to "break up and blue those parts of his foliage-painting which he considered too *touchy*,"—his own highly characteristic expression. Of the oil-paintings at Liverpool the most remarkable, perhaps, is "Going to the Hayfield" (29).

Referring to the very overstrained comparison of Cox with Turner which is now being set up, we must say that there is no pretext for putting him for a moment on a level with the greatest and most varied poet in landscape who has ever painted; and the present exhibition in Liverpool, however brilliantly it displays Cox's power and genius within his own boundaries, also shows his limitations. There can be no question that the collection, as a whole, shows a certain sameness of character and feeling in each of the three periods it illustrates; and it is only in Cox's last, and in the later part of his middle, period, that he can claim the high standing he has gained. His earlier works are, on the whole, mediocre; at any rate they would not raise his name to anything like the highest rank in his art. It is necessary to point this out, because Mr. Hall's essay attached to the catalogue of the Art Club, from which we have more than once quoted above, indulges in an exaggerated estimate of its object, which can do no good, and is uncritical. It is remarked, for instance, that "Cox painted almost every conceivable subject within the range of art,—fish, flowers, still-life, portraits, figures, interiors," &c. This is quite a misleading statement, if taken to imply that he showed an equal and "all-round" power at all these things. He painted them all, no doubt, at different times, and "The Water Tower, Kenilworth" (61), and the sketch of the "Commercial Traveller at Lancaster Hotel" (295), show what he could do with architecture and figures respectively, in the way of spirit and character; but it would be absurd to pretend that his genius is shown in these as conspicuously as in his landscapes, or that his power even in landscape was unlimited, though it was of the very highest class within its own scope. Mr. Hall thinks that in rendering the every-day aspects of Nature Cox was "superior to Turner," from which remark we should surmise that he is less acquainted with Turner's water-colours of this class than with Cox's. The writer's enthusiasm, indeed, quite runs away with him, and in one paragraph of the essay we counted twenty-seven (!) marks. This kind of "gush" is bad literary taste, and tends, moreover, to defeat its own end, and editors of future catalogues of the Liverpool Art Club exhibitions should put a check on it.

The collection should, however, be visited by all lovers of art who may be going within convenient reach of Liverpool. It will be open, we believe, till the 15th of January.

Presentation.—Last week a number of the surveyors' clerks and foremen, in the employ of the well known firm of Messrs. William Cubitt & Co. met together at the Castle tavern, Farringdon-road, for the purpose of presenting Mr. Cornwell (who has been connected with the above firm for upwards of forty years) with a testimonial, consisting of a handsome timepiece and vases to match, as a mark of the respect and esteem in which he has been held by them for so long a time. About sixty of the subscribers afterwards dined together.

A REVISED THEORY OF LIGHT.

SOME of our readers may remember a somewhat lengthened and interesting correspondence which took place in our columns in the year 1868, set in motion by our notice of Mr. Benson's work on colour, in the *Builder* for July 25th of that year. It was in the course of that correspondence, in which Mr. Benson himself, Mr. Crace, Mr. J. K. Colling, and others took part, that Mr. Cave Thomas, in a letter published by us on September 19th of the same year, first briefly propounded that view of the relation of light and colour to vision which he has now published in a more detailed form in the small book entitled as above,* and which forms "Section I." in his proposed consideration of the subject, and deals with "the various sensations of light and the theory of the harmony of colour"; while "Section II." is intended to take up "the theory of vibratory or mechanical action, producing the sensation of light."

The original letter of Mr. Thomas, just referred to, was rather *apropos* of the discussion which occasioned it, than in direct continuance of it; but his theory must be considered as bearing upon, and to some extent connected with, the new theory of colour which has found more than one able exponent of late.† The point most easily laid hold of by general readers in the theory of Mr. Benson (founded mainly, we believe, on the views of Professor Maxwell and of Helmholz) is the degradation of *yellow* from its position as a primary colour, and the substitution of *green* in its place. It would be going out of our way to discuss the point in the present notice, further than to remark that the special theory referred to is the result of a special method of investigation, and is based upon experiments and combinations, not with pigments, but with light, that is to say, with refractions and reflections of coloured rays; and that such a process has the radical distinction from processes carried on with pigments, that whereas the addition of a primary colour to compound a secondary in pigments is accompanied by a withdrawal of light, the process of addition of two primaries in experiments with actual light is an addition of light,—an increase of brightness. This is illustrated by a diagram originally published in Mr. Benson's book, and reproduced by Mr. Church, in which Mr. Benson's three primaries, red, blue, and green, are shown in the form of circles of these colours, all intersecting in the centre of the diagram, which represents white, while the secondaries, yellow, pink, and sea-green, are the portions where only two colours intersect, and the outer segments of each circle, representing red, blue, and green, are the least luminous portions, having had a double proportion of illuminating rays withdrawn from them. This involves a serious reversal of all we have been long taught to think; and, moreover, it is at variance with the actual results of pigments, which do coincide with the "red-blue-and-yellow" theory,‡ as, in fact, the theory probably arose originally from the results obtained from pigments. At the same time, there can be no question that the researches and experiments of Mr. Benson and others have gone far enough to strike a serious blow at the old theory, regarded as a statement of the harmonic relations of colours, and that in such investigation experiments in light must needs take precedence of experiments with pigments, which are to actual coloured rays what moonlight is to sunlight.

It is in connexion with this view of the subject that Mr. Cave Thomas's speculations come in, as a main object of this first part of his book is to lead the minds of his readers to the consideration of light as a system of vibrations affecting the sense of vision, and of colour as a series of phenomena purely referable to the sense of vision, and having no objective or external existence whatsoever. That the sensation we call "light" is the offspring of vibratory motion,—that light does not as a substance travel, but that its pulsation movement alone travels, just as the pulsations of sound extend from the first impulse which sets them in motion, may be accepted now almost as a scientific truism; and we think it is a question whether some part of Mr. Thomas's elucidation is not superfluous, in the case of any readers possessed of ordinary education and reasoning power, and whether occasionally he does not treat what is really a mere question of verbal expression or definition as if it involved a scientific principle. "It is," he observes, "very difficult to accept the conclusion that pictures have no inherent colour,—that they are merely skilfully graduated surfaces reflecting the various colour-producing vibrations; that the coloured pictures exist only in our own and other person's eyes; and that possibly pictures do not produce precisely the same sensations of colour in any two people. What is called colour blindness is a defective organisation,—there is no colour to see. The vibrations in this case only fail to produce their ordinary concomitant sensations." Now, while fully admitting the great value of the extension of our mental and critical view of the subject afforded by a truer and fuller theory, and the suggestiveness which such a theory often has in its bearing on practice, may we not say that the foregoing sentence (the last remark especially) is merely an enunciation of a familiar fact in unfamiliar words? Practically, does it make much difference whether we say that a person "cannot see red" (the commonest form, probably, of colour blindness), or whether we say that certain vibrations fail, in his case, "to produce their ordinary concomitant sensations"? This is merely substituting the expression "vibration" for the more familiar expression "colour." Such an expression may be of use in teaching the unscientific reader to think in proper terms, but the phenomenon of red remains precisely the same to the same person, whether he regard it as paint on a board, or as vibrations exciting his retina. It is a misuse of language to say that the vibrations produce the sensation of colour, for the vibrations *are* the colour. A certain amount of verbal ambiguity of this kind appears to us to be a recurrent feature in Mr. Thomas's thoughtful and suggestive little book, and leads sometimes to unnecessary refutations, as where (p. 13) he formally urges that the *spectra* seen after looking at the sun, or at any strong light or colour, have no existence external to the eye,—a point on which one would imagine no intelligent schoolboy needed instruction. On the other hand, where the author remarks (p. 20) that "every sensation of either black, white, or colour, produced by external causes, is followed by its *compensating colour spectrum*, which balances and restores the even tenor of the optic nerves," he himself falls, verbally, into the same inaccuracy; for the sentence certainly infers the external existence of the colour spectra as an influence on the optic nerve. The truer expression would surely be that the effort of the optic nerves to recover their balance produces the counter excitement which gives rise to the spectrum.

Apart, however, from what we cannot but regard as a deficiency in its methods of statement, the considerations on the harmony of colour presented here are full of value and interest. And we must say, also, that there is something logically convincing in the author's way of putting the case for the deposition of the old dynasty of "blue-red-and-yellow" as "primaries." He denies the existence of any "primaries," unless the word be used only in regard to order of time or succession. Colours being sensations, are all alike indecomposable, and each is succeeded by a reaction or *libration* towards its contrary. In other words, there is a mean combination which satisfies the eye, and any deviation from this mean towards one extremity of the chromatic scale must be followed by a corresponding complementary deviation in the opposite direction. "What used to be called a *secondary* colour is succeeded by the ocular spectrum of a primary; and what used to be called a *primary* is succeeded by an ocular spectrum of a secondary. And not only is this the case with sensations of colour, but also with those of black and white; the impression of a black spot is succeeded by a spectrum of a white spot, and *vice versâ*."

. . . . "We cannot affirm more in respect to the harmony of colour than that there is a binary, mutually compensating series, or that every sensation of colour to satisfy our being should be either accompanied with, or succeeded by, one of a directly opposite kind. The terms primary and secondary could, therefore, only be appropriately applied to the order of succession for a spectrum of orange succeeds a sensation of blue, and a spectrum of blue the sensation of orange. Thus in the Polariscope a beam of waves may be divided, two and two, the combina-

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* The Revised Theory of Light. Section I. The Principles of the Harmony of Colour. By W. Cave Thomas. Smith, Elder, & Co. 1875.

† We may particularise Mr. Church's admirable little manual of "Colour," in which the author evidently leans towards the new theory, as in accordance with scientific experiment, though admitting the convenience of the old one as expressing the results with actual pigments.

‡ Of course, Mr. Benson's diagram of the primaries which we alluded to is an artificially prepared one; not the actual result of super-position of transparent colours on the paper, but an illustration in pigments of the effect of combinations of coloured rays.

tion of each pair of which will be equal to white light. And if the prism refracts an infinitely differentiated series of rays, we may be mathematically certain that there is a certain mid point from which every ray on one side will have its compensating ray on the other, which, two and two together, will be equivalent to white light. The experience to be gathered from an examination of the phenomena of *ocular spectra* points to the same conclusion, for the *ocular spectrum* to every colour sensation which can be produced by the prism, is one which compensates or neutralises that sensation. And the two waves of different periodicities which produce both these sensations, would in combined action produce the sensation of white light."

We must confess that this statement of the case appears to us to have the characteristics of a true theory, comprehensiveness and simplicity combined. For the detailed illustrations of it, chiefly by observations of the phenomena presented by the ocular spectra, we must refer the reader to the book, which, small and condensed as it is, is quite worth procuring by all who are theoretically or practically interested in the subject. The author has a tendency occasionally to push a statement farther in support of his view than it can fairly be made to go. For instance, we all know that "bright colours may be seen when the eyes are closed, particularly in the morning, when the eyes are sensitive after sleep; children frequently amuse themselves with these phenomena." But we can hardly accept this fact as a sufficient basis for the statement, to which special attention is drawn by the italics of the author, that "therefore we receive from external sources no impressions of light which may not also be produced from internal excitement of the nerves." But the recorded observations on optical spectra certainly tend to bear out the main theory advanced. The following is significant:—

"The most decided way to convince people of the existence of *ocular spectra* is to make them momentarily glance at the sun, after which a dark *spectrum* will appear on turning their eyes towards a (white)* surface, and will assume different colours, passing from dark to light in the following order,—black, blue, green, yellow, white; if, on the contrary, the eye be closed, after a similar act, against all external action of the sun's rays, the coloured *spectra* will succeed each other in an inverse order of white, yellow, orange, blue, violet, black. The preceding facts prove that the eye, and the eye alone, is the realm of light, and therefore it is that the perfectly organised sense is the true meter of chromatic harmony. Moreover, these experiments clearly demonstrate the fact that the eye itself has the power of decomposing a beam, of resolving the original force or forces producing the sensation of white light into different colours without the intervention of a prism. Or are these effects produced by the differentiation of the original force by *libratio*. All these facts will be found of the utmost importance when we come to the revision of the mechanical theory of light."

All persons, it is admitted, are not equally susceptible to these and similar phenomena. "Some see them without any trouble, others with difficulty. When once seen, the observation is repeated with extreme ease; when, however, they and their laws of production are known, their constant presence frequently becomes tormenting, so we counsel only an occasional, and not a too prolonged observation of them."

We shall, at all events, look with interest to the further statement of the author's revised theory. We trust, however, that it is not through the tormenting presence of these *spectra* which he has raised that Mr. Cave Thomas seems, as far as we have public evidence, to have rather neglected of late the practice of the art which he illustrates even better with the brush than with the pen. Despite the interest and thoughtfulness of his writings, we could not accept them as full compensation for the loss of, we must not say his "paintings," but of those special vibratory impressions on our retina which he was accustomed to produce through the exciting agency of canvas and pigments, which we should be glad to be oftener exposed to, and about which at least there is likely to be very little difference of opinion.

* This and the names of colours are placed by the author within brackets merely as a reminder that they are made use of in the popular sense, and not as implying any local existence of colour in a scientific sense.

DOINGS IN EDINBURGH.

A GLANCE at the architectural position at this the commencement of another year leads to the conclusion that there is a greater amount of work in prospect than has been accomplished during the past one; but then it must be kept in view that works of considerable importance are now in progress, some of which will not be completed even at the expiry of twelve months hence.

This has been called an irreligious age, but if we are to form our judgment upon materal results the opposite conclusion is the more tenable one. Everywhere new churches are arising, built by the voluntary contributions of the faithful, and in these edifices we find the desire to make them fit temples for the worship of the Most High a matter of graver consideration than it was wont to be. Amongst the completed churches here, we note the Palmerston-place United Presbyterian Church, designed in the Italian style by Messrs. Peddie & Kinnear at a cost of 15,000*l.*; the London-road United Presbyterian Church, designed by Mr. Starforth, a good example of modern Gothic as adapted to congregational worship; and the Abbey Parish Church, designed by Mr. R. Moreham, a large Gothic building, occupying a prominent position at Norton-place. These three churches are notable additions to the architectural features of the city; and besides these others of less importance have been erected in more obscure positions.

As to street architecture, the new Clarendon Hotel, in Princes-street, is completed as regards the elevation. In style it is Italian, and, although displaying neither freshness nor vigour of treatment, it is in good taste, unobtrusive, and sufficiently decorative for the important position it occupies. Combined with the hotel is an arcade, a new feature in Edinburgh. The entrance thereto is by an opening 21 ft. wide in the centre of the elevation. The treatment of this opening is the weakest point in the design; instead of being spanned by an arch, as would necessarily have been expected, there is a large lintel surmounted by a semicircular pediment, having a very heavy effect. Mr. Beattie, who designed the hotel and arcade, is also the architect of new premises in St. Andrew-street, for the Young Men's Christian Association. The narrowness of the frontage and the great height of the building cause it at present to appear at a disadvantage, but this defect will doubtless be remedied in course of time, as it is highly probable that ere long the valuable sites in this neighbourhood will not continue to be occupied by the comparatively low and poor buildings at present there. In this instance Mr. Beattie has adorned the *façade* with broken pediments, festoons, &c., and crowned the cornice with dormers having elliptical pediments.

In certain quarters a most unfortunate desire has sprung up to produce grand effects at a cheap rate, and some plain and substantial buildings have been recently taken down to be replaced by lofty brick erections, coated with cement, and this, too, in the leading throughfares at the west end. Such structures can never be to the credit of the architect, whatever profit they may otherwise bring him.

These productions, amongst other things, have led to the formation amongst men of taste of an association the object of which is to keep an eye upon the amenities of the city, and to use what influence they may possess with those who, as the late Lord Cockburn (from whom the association takes its name) said, were doing their best to destroy the beauties of the city.

Of works in progress, the most important is the Cathedral, which is progressing slowly but satisfactorily. The outer walls are built up as high as the window-cills, the doorways have been arched over, and the columns of the nave are in place. The Catholic Apostolic Church is now roofed in, and the interior disencumbered of scaffolding. This church has altogether the look of a Mediæval product, which has sprung up to life in these modern days, and yet it is strictly utilitarian. The nave is simply a large oblong, without any obstruction, but picturesqueness is produced by the windows being placed a great height from the floor, and by three arches at the east end forming openings to the church and side chapels. The exterior has at present a rather gaunt effect, but when the great west tower is added it will be solemnly impressive. At Hope Park a small but elegant Congregational church is approaching completion. It is Early Italian in style, having two tiers of circular-headed windows, the lower tier consisting of groups of three, and the upper of windows of larger proportions, divided into two lights by shafts having foliated caps and a circular pierced opening at the apex.

The medical wards of the new Infirmary are nearly completed, and the surgical and administrative departments are in active progress. The ultimate cost of the whole is now stated to be about 300,000*l.*

The remaining building stances in Chambers-street have now been taken up, and building operations are going on, but fitfully. This promises to be one of the most effective streets in the city, and point will be given to it by a slight departure from the original intention in consequence of a central stance having been secured for the erection of a church. The church has been designed by Mr. R. Thornton Shiells in the Lombardic style, and is intended to harmonise with, and yet be distinct from, the other elevations.

Considerable progress has been made with the new Episcopal Church at Merchiston, which promises fairly. It now turns out that the selected design will cost double the sum to which the competitors were restricted. This appears to be the abnormal result of competitions, but still they go on.

Two stories of the new premises for the Union Bank in George-street are in place. The detail is as bold and effective here as in other works by Mr. Bryce, but it hardly shows the same play of fancy as the premises he designed for the Western Bank, now occupied by the Scottish Widows' Fund Assurance Company, and which are similar in style.

Last season two theatres were destroyed by fire. These are replaced by others of a superior order, and an entirely new one upon a truly grand scale is in progress.

The "Southminster," in Nicholson-street, now called "The Queen's," being situated in a back court, no attempt at external decoration has been made. It is seated for 2,500, the auditorium being 80 ft. by 90 ft., and the stage, 75 ft. wide and 44 ft. deep.

The rebuilding of the Theatre Royal is expected to be accomplished next month. The principal elevation towards Broughton-street not having been affected by the fire is to be retained, but the interior is to be greatly improved by taking in two shops which formerly existed; the accesses, which were very cramped, will thus be enlarged and accommodation will be provided for an additional 300 sitters, bringing up the whole to 2,000.

Under the energetic superintendence of Mr. Gowans, great progress has been made with the new West-end Theatre, the site of which has for some months been a scene of remarkable liveliness. It has not been found practicable to complete the façade, but, still, what has been done in the time is surprising. The first story has, however, been erected, and from the great size of the openings (the central doorway is 30 ft. in height), the depth of the reveal, and the massiveness of the materials employed, the ultimate effect can hardly fail to be impressive. In the mean time a temporary brick wall screens off the interior from the street, which is so far completed as to be in use, and it may be safely pronounced as one of the most elegant and complete in the kingdom. The auditorium is 70 ft. square and 58 ft. high; the proscenium, 32 ft. in height and breadth; the stage, 74 ft. broad, expanding to 114 ft. Accommodation is provided for an audience of 3,000, comprising 1,000 in the pit and stalls, 400 in the private boxes and dress circle, 600 in the amphitheatre, and 1,000 in the gallery, and from every point a good view of the stage is obtained. The entrances, staircases, and retiring-rooms are unusually spacious, comprising an ample crush-room and refreshment-rooms. The style of decoration is of the modern French type, boldly modelled and picked out in white, blue, and gold. Over the proscenium are three figures symbolic of music. The ceiling represents the sky flecked with fleecy clouds, and in the centre is a sunlight, which is supplemented by other lights distributed around. Every endeavour has been made to secure ventilation and a comfortable temperature by means of steam pipes in winter and a large punkah in summer. It can now be said that no city is better provided with theatre accommodation than Edinburgh, and we may now look for the entertainment bearing a greater resemblance to what was provided fifty years ago than what has been given of late.

The first of the new School Board schools has been opened. Like all the others in progress here, it is Gothic in style, artistically treated, but with little enrichment.

Operations are in progress for the covering in of the fruit and vegetable markets, and a new fish-market is contemplated.

Nothing has as yet been done towards the formation of the new medical class-rooms for the university. The buildings in Park-place and Teviot-row, the site of which they are to occupy, have been acquired, are vacated, and will shortly be demolished.

The designs for the new buildings, by Mr. R. Anderson, are in the Early Italian style, and display considerable elegance and picturesque-

ness. A marked feature of the group will be a campanile rising from the midst, which bears rather too great a resemblance to that at St. Mark's at Venice. This building will be a great improvement to the neighbourhood, and a noteworthy addition to the architecture of the city.

Little has been done towards the completion of Jeffrey-street. Negotiations have been pending between the North British Railway Company and the Improvement Trust for the purchase by the company of the ground upon which the north side of the street was intended to be built, but the parties are not at one as to the value of the ground. The Cockburn Association have taken up the matter, representing that by leaving the ground unbuilt upon, the appearance of the neighbourhood would be greatly improved, and the view from the North Bridge be left more open. The addition to the breadth of the North Bridge has added greatly to the convenience of traffic, but the iron balconies, with useless heavy parapets made to resemble stone, are excessively ugly. It is to be regretted that an architect was not conjoined with the engineer in carrying out this work.

Three new statues are to be erected in East Princes-street Gardens: one to Dr. Livingstone, to the east of the Scott monument, the other two to Professor Simpson and the late Adam Black, M.P., respectively, to the west thereof. The pedestal of the Albert Memorial still waits for the sculpture, and the statue of Dr. Chalmers we look for in vain. We must not forget also to mention that a memorial cross is to be erected in memory of the late worthy Dean Ramsay in a prominent position in the ground attached to St. John's Church in West Princes-street.

Upon a retrospect of the past year, we come to the conclusion that there is more calling for congratulation than for regret, and that the balance is greatly in favour of the amenity of the city.

THE PALATINATE BUILDINGS, NEW KENT-ROAD.

WITHIN the last few months several large blocks of buildings, intended as residences in flats for the middle classes, have been in progress of erection on a plot of land in the New Kent-road, near to the Elephant and Castle railway station. The name given to the new buildings is the "Palatinate," and when entirely completed they will cover a ground area of nearly two acres in extent, with a main frontage to the New Kent-road of more than 200 ft. in length. One of the principal blocks facing the last-named road, is already finished and occupied, whilst two other blocks immediately in the rear, with frontages to two newly-formed streets, running out of the New Kent-road from north to south, to a depth of upwards of 300 ft, are almost ready for covering in. The buildings are very lofty, being carried to a height of nearly 80 ft. The elevations fronting the New Kent-road form the principal architectural feature. The ground-floor portions of this part of the structure consist of large shops, with a spacious entrance and staircase in the centre to the private dwellings in the upper part of the buildings. The materials used are stock brick, with artificial stone dressings and facings, and at the foot of the second and fifth floors there are ornamental projecting iron balconies. All the several blocks have flat roofs, open and clear to their full length, and there is access to them from all parts of the buildings, the roofs themselves being available for both drying purposes and recreation. The side blocks running from north to south, although of the same height as those facing the New Kent-road, are somewhat different in their external architectural character. They are intended to consist entirely of private dwellings, and from the ground-floor to the third story there are continuous bay windows. The internal arrangements of the buildings, and the general plan of the several dwellings, are being carried out with the view of accommodating both large and small families belonging to the trading and middle classes, and whilst some of the tenements contain only four apartments, others have as many as eight. Each dwelling is entirely complete within itself, including, as regards apartments, convenience for every domestic and social requirement. There are parlours or day-rooms, and bedrooms, together with kitchens, completely fitted with modern ranges, and other requisites for general culinary purposes, and the windows of all the dwellings are fitted throughout with Venetian blinds. As the several blocks and tenements are completed, tenants appear to be ready to occupy them, those already finished being all taken at rents varying from 10s. to 20s. per week, including all rates and taxes. Gas is also laid on so as to admit of every tenant availing himself of it, and burning it by meter, as in the case of an ordinary dwelling. It is stated that when the whole of the blocks now building are finished the total number of tenements will be upwards of 300.

The buildings are being erected by the owners, Messrs. Sutton & Dudley, contractors.

MOVEMENT IN INDIA.

THE Government of India has determined to spend about ten lakhs of rupees in purifying Simla, and in introducing a new water supply from a source about eight miles distant. This is a small sum, but the editor of the local paper says he should like "to see the face of the British Chancellor of the Exchequer if any one were bold or insane enough to propose to expend out of the public revenues 100,000*l.* for the cleanliness of Eastbourne or Hastings."

Proposals are on foot for the establishment of an institution, to be called the Albert Hall, for the promotion of social intercourse between natives and Europeans. The Maharajah Holkar has given 8,000 rupees towards the expenses. The Maharajah is also pushing on the completion of his new palace at Jummoo, and large quantities of material for its furnishing and decoration are daily arriving from Calcutta.

It is proposed to erect a "Noble Boarding College" at Hyderabad, similar to the Mayo College at Ajmere.

An old project has been revived of working the abundant slate beds which are said to exist in the Khassi and Jaintea hills.

About 10,000 of the ratepayers of Calcutta have signed a memorial, which has been presented to the Bengal Council, praying for an elective municipality, hoping thereby to solve many difficult problems in municipal administration in India.

Although two months have passed since the fine equestrian statue of Lord Mayo arrived in Calcutta, no site has as yet been allotted for it, and the local journals are expressing a hope that the Prince of Wales will either ask where it is, or stumble over the packing-cases which contain it, when it would be erected in two or three days, instead of remaining concealed, perhaps for years.

During his recent visit to Bombay, the Prince visited the European Hospital there, and his inspection only served to confirm the statements of the Sanitary Report respecting the condition of Indian hospitals in general. In the obstetric ward H.R.H. called for a thermometer, but finding that none was provided, accepted the assurance of one of his staff that the apartment was much hotter than it ought to be. Before leaving, he complimented the officials, but at the same time said he thought a new hospital ought to be erected, as it was quite evident that the present one was totally unsuitable for European invalids.

UNHEALTHY OCCUPATIONS.

The first of a course of lectures by Dr. B. W. Richardson, F.R.S., entitled "Industrial Pathology; or, the Influence of certain Injurious Occupations on Health and Life," was given under the auspices of the Society of Arts, at their Hall in John-street, Adelphi, in December last. The lecturer, after touching upon the action of a committee of the Society in reference to the subject of his lecture, referred to what the Government had done in the way of collecting information, which, though not so comprehensive as could be wished, was still very valuable. Among other inquiries he instanced those of the Factory Acts Commission, the Commission on Children's Work, and the Sanitary Commission. The figures he should put before the meeting were taken from the returns of Dr. Farr, the Registrar-General, to which he had been permitted to have access while they were in the press. It was while waiting for the grander inquiry that the work of such a society as the Society of Arts became useful. The calculation was based on the census of 1871, and was composed of six classes, the first of which was the professional class, which numbered 684,102 persons. Following that was the industrial class, in which there were numbers of women, and which included 5,137,725. The third class was called the commercial, and contained 815,420 persons. The agricultural class included 1,657,138, and the domestic class, which included many women, was 7,399,582. The industrial class was that which they had especially to consider in the lecture, and this class numbered 5,137,725, of whom 1,521,938 were women. The last class was an indefinite class, which numbered 8,512,706. The method of research adopted with the industrial classes was to obtain the causes of illness or injury apart from the causes arising from their trade or calling. He had found that a large number of working men were very fond of attributing their maladies to what they called their work, but there were five causes of degeneration apart from their calling, of which the principal was intemperance; and the tables of statistics showed that the per-centage of death amongst the class of persons who were engaged in the traffic of intoxicating liquors was the largest. Among other disturbing influences among the working classes, the lecturer instanced and described the food supply, the hereditary proclivity to disease, poverty, and inattention to cleanliness.

In the second lecture Dr. Richardson said that during the previous week he had been enabled to peruse the facts regarding the whole of the sixty-nine occupations recognised by the Registrar-General. Twenty-five of them were of a vitality above the average, while forty-four were below. The chief sources of injury to the human system by industrial labour might be classified into eight divisions, viz.:—I. Inhalation by the lungs of (*a*) fine particles of solid matter, *i.e.* dust, (*b*) noxious gases, and vapours; II. exposure to soluble chemical substances; III. mechanical impact of foreign bodies; IV. physical injuries from (*a*) unnatural postures, (*b*) sustaining and bearing loads, (*c*) undue atmospheric pressure, (*d*) mechanical concussion; V. exposure to damp and to impure air; VI. contact with organic parasitic forms; VII. excess of muscular work; and VIII. variation of temperature. In enumerating these various sources of injury, the lecturer incidentally mentioned, under the fourth head, section *a*, the postures assumed by miners and others, and in reference to section *c* of the same heading, he remarked that the triumphs of modern engineering were not without drawbacks, one of which was the creation of a new form of disease, which had been called by Dr. Smith, of New York, "caisson disease," inasmuch as it was very prevalent amongst men who worked in caissons under a pressure of three or four atmospheres. Under section *d* of the same heading was to be classed a peculiar disease to which carpenters were subject, owing to the concussion caused by the use of the plane to the minute blood-vessels of the neck and chest. A similar disease was also common to the boys who had to go inside boilers to hold the rivets while they were being secured by the hammermen. Butchers were subject to the causes of ill-health mentioned under the fifth and sixth heads, exposure to impure air, and contact with parasitic forms existing in the bodies of animals slaughtered for food. Under the last heading, variation of temperature, engine-drivers were, perhaps, the greatest sufferers. Proceeding to discuss in detail the sources of disease from the causes enumerated under the first section of the first heading, viz., inhalation by the lungs of fine particles of solid matter, he said the trades in which the most suffering from this cause was felt were twenty-five in number, and included file and saw-making, knife-grinding, needle-making, stone-cutting, lime-burning, wood-turning, wood-sawing, ivory-turning, woollen, cotton, and flax manufactures, paper-staining, artificial flower-making, tobacco and snuff manufacture, and flour-grinding. In every one of these occupations the lungs of the work-people were subject to the inhalation of fine particles of matter, more or less unhealthy, according to the nature of the occupation followed. By means of the *cilia* attached to the upper surfaces of the air-vesicles of the lungs, Nature had made an efficient provision for the expulsion, by means of the bronchial secretion, of particles of dust and foreign matter inhaled in the ordinary course of life; but so delicate were these *cilia*, that they were unable to perform their duty efficiently when they had to cope with the abnormal quantity of foreign particles which was inhaled by workmen engaged in such trades as those mentioned. Consequently, the particles settled on the lungs, and disease, more or less remote, according to the nature of the particles inhaled, was engendered. The greatest danger occurred

when the particles inhaled were of steel, stone, sand, or glass; for these, besides being insoluble, were finely edged or pointed, and their settlement on the lungs produced an irritation, or inflammation, which speedily developed into pulmonary consumption, which was an especial scourge of the knife-grinder, stone-cutter, and glass-paper maker. The Sheffield grinders were great sufferers from the injurious effects of fine particles of steel on the lungs. It had been questioned whether pulmonary consumption induced in this manner could become hereditary, and although he (Dr. Richardson) was not prepared to say, the indications seemed to favour an affirmative. This, however, was a refined question of pathology, which had yet to be authoritatively decided; but it was a most important one, for it would be sad indeed if large classes of men, in the ordinary course of their daily vocations, were inducing disease which they would transmit to their offspring. First, then, the inhalation of small particles of solid matter produced pulmonary consumption, perhaps hereditary. Secondly, wood-carving and turning, especially mahogany turning, caused the workmen to inhale a very fine kind of sawdust, which was productive of chronic bronchitis. Ivory-turning induced the same complaint, but in a lesser degree. The dusts arising from textile fabrics varied greatly in their effects upon the lungs of the workers. The fluffy particles of wool appeared to cause no evil effect upon the lungs,—a circumstance attributable to the oil contained in the wool. The fluff of silk was almost equally harmless, although, in silk-trimming manufactories, Dr. Richardson said he had found the workers suffering from the same kind of bronchial irritation as that induced by the dust of wood; this was solely due, however, to the dyes with which the material had been coloured, especially when the red and other bright aniline dyes had been used. The fine particles which were given off by flax and hemp in the course of manufacture were very different in their effect, being much more injurious than those arising from wool and silk. The dust of hemp (which lost greatly in weight in the process of manufacture, for ont of every 112 lb. weight, 4 lb. were lost in the shape of dust) was particularly injurious, causing great bronchial irritation. The dust of both Russian and Polish hemp had this effect, but the Neapolitan hemp was worse than either, for, combined with it was a plant the dust of which produced shortness of breath and the symptoms generally accompanying what was commonly known as hay-fever. The collection of rags,—a business largely carried on in London and all large centres of industry,—engendered the same kind of disease, but, contrary to what would be the natural and general expectation, seeing that rags were very frequently derived from infected clothing and the bedding of sick-rooms, it was not found that epidemic diseases were specially rife among those engaged in the rag trade, although the odour emitted from a rag-store was generally very offensive. Careful inquiries had been made on this point in Edinburgh and elsewhere, but the only disease to which rag pickers and sorters appeared to be subject was chronic bronchial affection, caused by inhaling the dust from the rags. The dust from corn, consisting principally of residue in the shape of dried husks, was rarely present in sufficient quantity to produce much irritation, but the dust of flour, though not injurious when inhaled in small quantities, was very detrimental when much of it was inhaled, causing great difficulty of breathing, and producing the third disease he had to name, —asthma and emphysema. The dust arising in earthenware manufactories from clay or silicious material gave rise to a disease known as "potters' asthma." In the burnishing of metal much bronchial irritation was produced by the finely-powdered rouge which was employed to give a polish. In some stages of paper-staining, and in artificial flower-making, the arsenical powders largely employed resulted in gastric irritation and dyspepsia among the workers. Fur-dyers were subject to caries of the teeth, but this was much more the case fifteen years ago, improved mechanical appliances having greatly ameliorated the condition of the workmen in this respect of late years. The dust arising from tobacco-leaves during their manufacture into cigars was particularly irritating, charged as it was with the volatile properties of the weed. Even more injurious was the dust produced by the various processes of snuff-making, for the tobacco dust was mixed with ground lime, sawdust, salt and water, and made hot. Workers in the tobacco trade were particularly subject to nervous depression. The inhalation of particles of fine carbon was very injurious to the lungs of coal-miners, their lungs having sometimes appeared to be carbonised, although carbon was less destructive of the tissue of the lung than particles of glass, &c. Walking-stick makers suffered greatly from the inhalation of powdered carbon in the process of preparing and polishing their sticks after they had been charred. Passing to section *b* of the first heading of his subject, Dr. Richardson remarked that the inhalation of noxious gases and vapours was even more injurious than the inhalation of solid particles of matter, for the *cilia* attached to the entrances to the air-vesicles of the lungs were at all times utterly powerless to arrest the passage of gases to the lungs. The inhalation of noxious gases and vapours had a twofold action: firstly, a direct local action on the bronchial tracts; and, secondly, a general or constitutional action through the blood. The vapours of nitric acid, turpentine, bisulphide of carbon, and copper smoke were particularly injurious; indeed, any noxious gas or vapour, if inhaled for long periods, would soon prove fatal. Carbonic oxide gas, the product of the imperfect combustion of carbon, was most injurious in its effects, producing diabetes, which was very prevalent amongst those who were in the habit of burning coke in close rooms or workshops, tinkers and braziers being especial sufferers. Frame-lace makers also suffered in the same way when, as they sometimes did in cold weather, they placed dishes of burning coke under their frames to keep their hands warm; their heads being directly over the pans of incandescent fuel, they inhaled the fumes, which produced vertigo. The fumes of sulphuric acid, as used in the bleaching of straw for bonnets, &c., were very injurious, producing undue thinning of the blood, which resulted in anæmia. In conclusion, Dr. Richardson said that the late Professor Graham, who had given much attention to the laws of the diffusion of gases, was of opinion (and that opinion was generally shared by scientific men) that in the probably not-distant future the condition of various classes of workmen whose vocations compelled them to inhale noxious gases and vapours, would be materially ameliorated by the discovery of some simple means of separating gases one from another with the greatest facility.

In the third lecture, Dr. Richardson, in resuming his discourse on the detrimental influence of foreign particles when introduced to the throat and chest, by the process of inhalation, said that pearl dust, as produced in the manufacture of ornaments, was injurious to the worker, as the particles given off were of a peculiarly sharp and cutting character. Speaking of sulphur and sulphurous acid, he mentioned the disease of ophthalmia sustained by those engaged in getting rid of parasitic insects on the leaves of vine and other plants by the use of sulphur. In the process of hat-making a solution of ammonia was used, and in this work, as well as in other occupations in which ammoniacal vapours were encountered, a thin and fluid condition of the blood was produced in the veins of those engaged. The vapour of turpentine, as used in the trades of painting and varnishing, produced very marked symptoms of disease by its effect upon the blood, the most complaints induced being constipation and dyspepsia. In the process of waterproofing by means of indiarubber, the volatile vapours given off by the bi-sulphide of carbon employed had a severe effect upon the nervous system, and the worker was sometimes reduced to a state of mental and bodily depression which was almost indescribable. The fumes of resin also, as breathed by workers in brushmaking, produced much throat irritation. Passing to the fumes given off by acids, he first spoke of nitric acid, and the vapour produced by this acid and inhaled by workers at fur-cleaning and other trades produced a coagulation of blood which had most injurious effects and led to many diseases. Many other gaseous bodies were most detrimental to those who were compelled to inhale them at their ordinary employment. The workers in the aniline dye manufactories suffered much from the vapour given off the aniline, and were often attacked with insensibility and a peculiarly violent form of neuralgia, which ended in ulceration. Aniline and other substances used in the modern processes of dyeing were strong poisons. The vapours from metals evolved in the processes of smelting and subliming were in reality very fine particles of metal itself, and produced a destructive corrosive effect when inhaled. The vapours from copper, mercury, zinc, and lead, were the principal ones met with in manufactories, and, strangely enough, the smoke or vapour from copper has been proved to be of service in arresting the progress of an epidemic disease. Excessive salivation and ulceration of month were the principal diseases brought on by the inhalation of mercury, although very frequently neuralgia and decay of the teeth were induced among the workers in that metal. Rheumatism, and a complaint known as mercurial tremors, were other forms of disease to which they were liable. The fumes of oxide of zinc were often productive of nausea and a choleraic disease. He also referred to the diseases so common ten or twelve years ago among the workers in phosphorus match factories, namely, the peculiar decay of the jaw-bone. This was now happily almost extinct in this country, owing to the improved processes of match-making. Passing to the diseases induced by the exposure to chemical substances, he proceeded to speak of lead, the particles of which were usually encountered by painters and earthenware makers, lead being used for glazing in the latter occupation. Lead-poisoning was too often brought on by the want of cleanliness in the artisans, who frequently took their meals without first washing their hands, and from this cause received the particles of lead directly into the system. The poison usually first took effect upon the kidneys, and induced an inflammation there which was an early stage of the disease. Paralysis in the more severe cases then set in, and this usually attacked the hands and arms, the extensor muscles being paralysed, and producing enfeeblement, and often total loss of power, upon the worker. In the case of poisoning by this agent the lead spread itself all over the body, and produced various organic changes. The tissues and muscles gradually contracted, and this at length affected the action of the heart, and death then ensued. Since the days when firearms had been first invented a nodule of lead had been the messenger of death to many a man, but few persons would credit the number of working people who had been killed by the insidious and stealthy diseases brought on by lead poisoning. The fact that those engaged in occupations in which lead was used died at the rate of 38 per cent. above the average rate of mortality showed the dangers to which such persons were exposed. The diseases incurred were, too, of an hereditary nature, for it was noted that the children of lead-workers in many cases died at an early age, or were of a weak and sickly nature.

The next lecture will be delivered on the 21st inst.

NEW BATHS AND WASH-HOUSES FOR GLASGOW.

ADEQUATE public accommodation for placing within reach of the masses of this large city the means for personal and domestic cleanliness unfortunately exists but on a very limited scale, and the tardiness of the Police Board (which is the local authority in such matters) in recognising the need for such elements in social amelioration may well occasion surprise. True, that in most of the better-class houses baths are fitted up, and that private enterprise has otherwise provided for the wants of the well-to-do section of the community, but the working classes have hitherto had to content themselves with such accommodation as is afforded by the existing baths in London-road, or with those portions of the river Clyde above the bridges which are set apart for bathing purposes. Chiefly owing, however, to the labours of Councillor William Wilson, who has recently been returned as a member of the Police Board, a committee has been appointed with a view to remedy this anomalous state of things, and the first result of their labours is the preparation of plans, which will secure for the populous east end conveniences for cleanliness exceeding those which they have hitherto enjoyed. The first part of the scheme includes the reconstruction and enlargement of the present baths in London-road, and the erection of new baths and wash-houses on the Green in lieu of the existing dilapidated and unsuitable washing-house at the corner of William, Calton, and Greenhead streets. The old structure will shortly be demolished, and new buildings erected with a view to meet the requirements of this portion of the city. The new premises, the plans of which have been prepared by the master of works, will have a high elevation east and south, the style being Classic in design, with a frontage of 148 ft. to the Green, and 118 ft. to William

and Greenhead streets. The eastern division of the building will be set apart for bathers, the western portion being intended for clothes-washing purposes. There will be an entrance to each department from the south frontage to the Green, both being commanded from the superintendent's office. The large swimming-bath will be 84 ft. long by 45 ft. broad. The dressing-boxes, to the number of about 100, are to be carried round the pond, the lighting, as is usual in such cases, being obtained entirely from the roof. Enamelled and other tiles will be used in the construction of the large swimming-pond, and of the internal lining of the main walls. Occupying a site at the northern end of the large bathing-hall will be lavatory and other conveniences, with several private bath-rooms, and it has been suggested that the introduction of suitable gymnastic apparatus would add to the usefulness of the new establishment.

But the clothes-washing section of the new premises will probably be its most important feature, especially when it is remembered that in connexion with a large number of the poorer class of houses in the city, the accommodation for carrying out this necessary portion of household economy is very imperfect. Provision has been made for thirty washing-stands, divided into separate compartments. The arrangements in connexion with each will consist of three tubs for steeping, "graithing," and wringing; hot and cold water-taps, and also a drying-stove; the moisture and steam being carried off by means of a flue passing along the top of the boxes. By this means also a proper system of ventilation will be secured; while the system of drainage has been devised on the most approved principle, and a room is to be provided and furnished where the women may dine or rest themselves during the day. The superintendent's house will occupy a position at the south-west corner of the main building. A part of the scheme which will be appreciated by numbers of persons who ramble on the Green will be the proposition to erect an iron verandah along the eastern half of the south front and the entire length of the east front to Greenhead-street, underneath which is to be placed a number of seats.

The alterations in the London-road Baths include the extension of the swimming-bath, so that its dimensions shall be—length, 65 ft., and breadth, 30 ft.; and, as in the case of the new bath at the Green, the depth will be from 4 ft. at the most shallow to 7 ft. 6 in. at the deeper end. The dressing-boxes will be re-arranged, and by utilising the space in the upper story of the building, the number of private baths will be increased from about a dozen to twenty-six, while there will be corresponding improvements not only in the fitting up of these, but throughout the whole building. On a piece of ground on the western boundary of existing buildings it is proposed to erect a washing-house capable of division into thirteen or fourteen compartments, after the style indicated above. The alterations at London-road are to be proceeded with immediately, while the larger and more important undertaking on the Green will be commenced when all the preliminaries have been arranged.

ST. AUSTEN'S COLLEGE, NEW KENT ROAD.

A BUILDING bearing the above title, situated on the south side of the New Kent-road, near the Elephant and Castle, has just been completed, and formally opened. It is intended for the training, and also as a residence, of students and lay preachers in the Church of England, of whom it will accommodate upwards of forty. The Rev. George Nugée, M.A., formerly vicar of Wymering and rector of Widley, Hants, is the provost and principal of the college. For the purposes of the institution three large houses were purchased, together with upwards of an acre of land adjoining. The buildings have all been thrown into one, and converted into an edifice of a decidedly ecclesiastical appearance. They have been partially reconstructed externally and internally, so as to adapt them to their intended purpose. The elevation to New Kent-road is Gothic, and at the east side an entirely new structure, called the College or Priory Chapel, has been erected. The New Kent-road frontage has two lofty double traceried windows, and it is surmounted by gables. A square tower and turret rises upwards of 30 ft. above the roof of the chapel. The interior has a decorated vaulted ceiling, and at the west end is an organ-gallery, with a carved front. At the rear of the chapel, overlooking the recreation-ground attached to the establishment, a large dining-room has been erected. The building is enclosed by a lofty boundary-wall, facing the New Kent-Road, in the centre of which is a spacious Gothic doorway and entrance, surmounted by a gable 20 ft. in height, all being in carved and moulded stone. Enclosed within the gable over the entrance, in a sitting position, is the sculptured figure of a bishop, holding in his hand the episcopal pastoral staff, with the inscription underneath "*Domus servorum Christi.*"

Mr. Norton is the architect, and Mr. Ransom, of Walworth, the builder.

PROPOSED CHANGES, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—The meeting to be held by the Institute on Monday, the 10th of January, for the consideration of the recommendations of the committee on the reconstruction of the Institute, is the most important one since its foundation. The report of the committee involves not only an entire remodelling of the whole framework of the Society, but the admission of a class of membership that will destroy its present distinctive professional character. It will mix up the tradesman with the body, and instead of continuing to be a purely artistic, scientific association, it will have a commercial element, which it was *the purpose of the first charter* to avoid. By dissociating the architect from the builder it was sought to remove the corrupting influences, which, however they may profit the individual, imperil his character, sacrifice the interest of the employer, and degrade the profession. Hereafter, if the recommendations of the committee are accepted, the great object of the honourable man who respects his own personal character and the prestige of the profession must be to keep aloof from such a mongrel combination. Greater activity in the Institute and further judicious aids to students are very desirable; but they may be realised without sacrificing the great charter of the profession, as it now exists, and which maintains, as much as possible for any human composition, the moral, artistic, and intellectual position of the architect.

There are many other objectionable propositions, which, however embarrassing in carrying out to such a body, are not discreditable to the profession, but must be modified. But the great contaminating trade element is the first important blot. The principles of the present great charter of the profession must not be trifled with in order to create a new "Architectural Building Union" (unlimited).

Let us stand by the charter!

THOS. L. DONALDSON.

THE INSTITUTION OF CIVIL ENGINEERS.

ACCORDING to the report read at the annual meeting held on the 21st of December, the council have, during the past year, devoted much attention to the subject of the classification in the institution of the younger members of the profession, and arrived at the conclusion that it was desirable to create a new class, in order to distinguish between those who were engaged in the active pursuit of civil engineering, and those who were not so engaged; but as the mode in which this alteration should be carried out was found to involve some technical questions, it had not yet been possible to prepare a definite recommendation. The students attached to the institution, of whom there were now 328, being an increase of 46 since the last annual meeting, had been assembled at twelve supplemental meetings, exclusively for the reading and discussion of papers furnished by members of their class. The council expressed regret that these meetings were not better attended, and that the discussions were not equal to those of previous sessions. With respect to the financial position, it was stated that the income proper had amounted to 8,053*l.* 8*s.* 11*d.*; the receipts from admission fees, &c. (required by the bye-laws to be added to capital), were 2,111*l.* 3*s.* 6*d.*, and from trust funds 136*l.* 6*s.* The general expenditure had reached 4,917*l.* 3*s.* 10*d.*, while the disbursements for publications were 3,101*l.* 17*s.* 4*d.* The trust funds were of the nominal or par value of 14,171*l.* 0*s.* 6*d.*, the Institution investments of 20,876*l.* 1*s.* 8*d.*, together, 35,047*l.* 2*s.* 2*d.*

CHURCH OF ST. AUGUSTINE, BERMONDSEY.

THIS church is now in course of erection in the Lynton-road, South Bermondsey. The Mission district in which it is situated was originated by the late Bishop of Winchester in the year 1872, when the Rev. Malcolm Mac Coll was appointed curate in charge.

The first stone was laid by Mr. Philip Cazenove on the 27th of July last. The site was given by Mr. J. Allen Rolls, of Monmouth, who is a large landholder at Bermondsey. Owing to the ground on which the church is built being considerably below the level of the road along the north side, and the soil being peat for some depth, it was thought desirable to form a crypt under the whole of the building.

A groined ceiling has been constructed of cement concrete at a height of 14 ft. above the floor of the crypt, and this forms the floor for the church.

The chancel, which is now nearly completed, is 40 ft. deep and 27 ft. wide; it will be vaulted with red brick to a height of 46 ft. Chancel aisles, 5 ft. wide, extend round three sides; the portions adjoining the western bays of the chancel on the north and south sides are 13 ft. wide, in which seats will be placed.

The organ gallery is on the north side, under the tower. The vestries will be on the north side of the chancel; that for the clergy will adjoin the chancel aisle, that for the choir will be in the crypt below, reached by the turret stair.

The nave will be 77 ft. long, in five bays, 35 ft. high to the wall-plate, with a narthex 17 ft. wide, and a large porch facing the road. The font will stand in an octagonal baptistery at the south side of the narthex.

The walls are faced with red brick, with masonry of Bath stone and red Dumfries stone piers. The nave will be the same height and width as the chancel, with aisles 13 ft. wide and 13 ft. high to the wall-plate.

The church will seat about 900 adults, and will probably cost about 12,800*l.*, exclusive of the steeple; the whole of the seats will be free and open.

The chancel is now being built by Mr. Shepherd, of Bermondsey New-road, under the superintendence of Messrs. Henry Jarvis & Son, of Trinity-square, Southwark.

THE HALL OF THE UNIVERSITY OF BOMBAY.

WITH the permission of Government, we illustrate the Sir Cowasjee Jehangier Hall of the University of Bombay, which has been built on the esplanade, facing Back Bay. It was designed by Sir Gilbert Scott, R.A. The architecture is French Geometrical of the fifteenth century. The hall is 104 ft. in length by 44 ft. in breadth, with a height of 63 ft. to the apex of the groined ceiling, with a semicircular apse of 38 ft. diameter, separated from the hall by an imposing arch, occupying a space of 7 ft. in the length of the building. The front corridor is 11 ft., and the side corridor 8 ft. broad in the clear. There is a gallery round three sides of the hall, 8 ft. in breadth, supported on ornamental iron brackets, and reached by staircases in octagonal towers at either side of the entrance-porch. The facing is of Coorla hammer-dressed rubble, in courses of 5 in. in depth. The plinth is chisel-dressed Coorla; bases, capitals, cornices, and all other dressings of Porebunder stone; shafts of blue basalt, except in the main entrance, where they are marble. The graining is of Porebunder stone, a calcareous sandstone in shallow courses; the floors are paved with Minton tiles; and the roof is covered with the Broomhall Tile and Brick Company's patent red roofing-tiles.

The work was under the immediate superintendence of Rao Saheb Muckoord Ramchundra, assistant engineer. The estimate amounted to rs. 415,804 (of which Sir Cowasjee Jehanghier, K.C.S.I., contributed one lac).

The actual cost has been 688,022 cubic feet (cubical contents above ground being alone taken) at 8·8 annas = 1*s.* 1*d.* per cubic foot, = 37,268*l.*

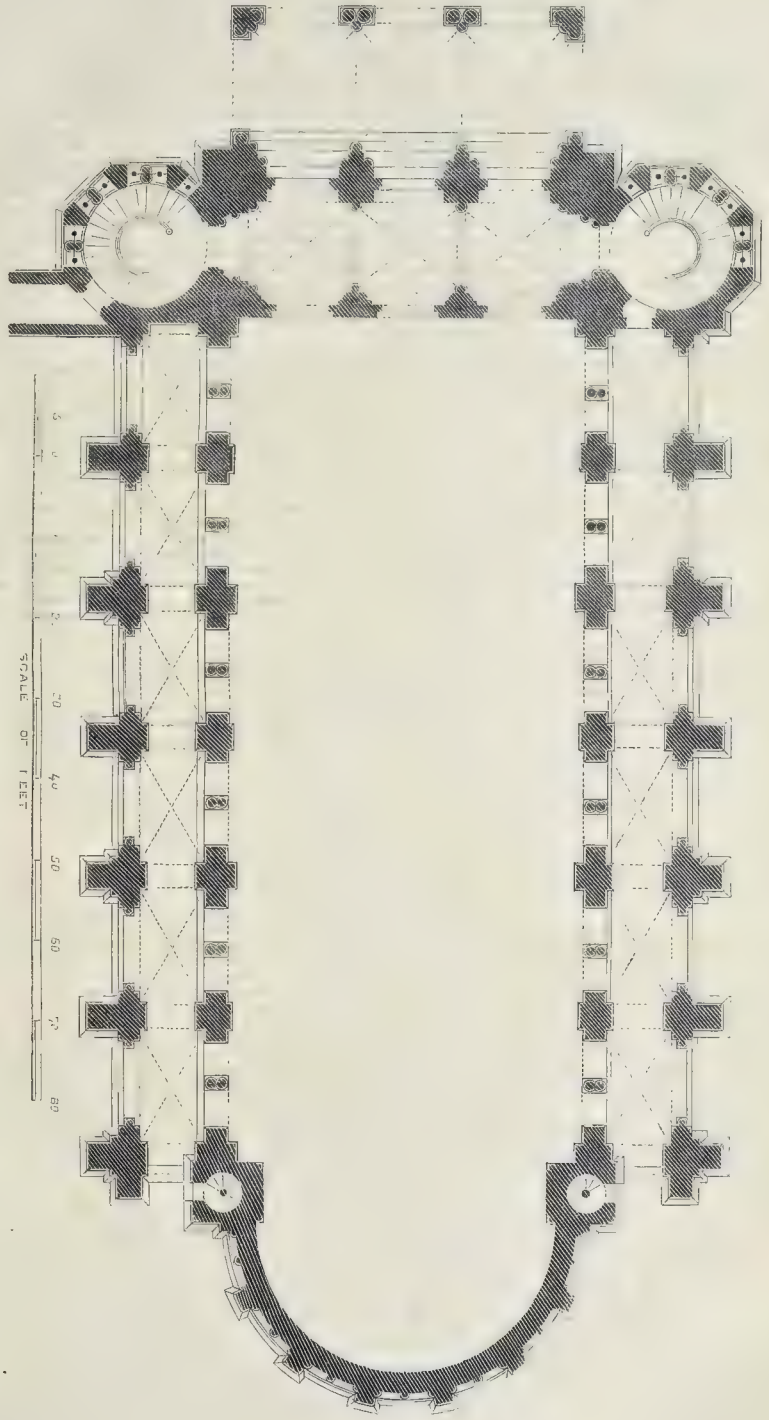
The Works of the Late Frederick Walker, A.R.A.—An exhibition of the works of the late Frederick Walker, A.R.A., will be opened on the 11th inst., in the rooms of the Society of French Artists, in Old Bond-street. The possessors of works by the artist are invited to contribute.



CHURCH OF ST. AUGUSTINE, BERMONDSEY.—Messrs. Henry Jarvis & Son, Architects



THE SIR COWASJEE JEHANGHIER HALL OF THE UNIVERSITY OF BOMBAY.—SIR G. G. SCOTT, R.A., ARCHITECT.



THE HALL OF THE UNIVERSITY OF BOMBAY.—*Plan.*

AN ARCHITECTURAL ADDRESS IN MANCHESTER.

THE president of the Manchester Society of Architects, Mr. Thomas Worthington, in the course of an address at the last general meeting said,—Perhaps, having now completed the tenth year of our existence as a society, it may not be altogether uninteresting to take a backward glance at our architectural history during that period. Probably a term of greater activity in building has rarely occurred, and Manchester has, during the ten years, taken her share in the work of progress, to which the members of our society have not been unimportant contributors.

Our new Royal Exchange,—the centre of mercantile life,—on the one hand, and the Town-hall on the other,—the centre of municipal life,—have risen up in our midst, towering above the roofs of the city; while the Conservative Club and the Reform Club, the police-courts, innumerable warehouses and public offices, and works of minor importance, occupy the sites of old and decayed buildings; and on every hand great street improvements, such as those in Deansgate and St. Mary's-gate and Albert-square, have so changed the character of our city that strangers find it difficult to recognise the former Manchester.

At the present moment great changes are in contemplation in the Infirmary area, and public interest is heartily awakened in the discussions on this subject. I have felt an especial interest in this discussion, as personally I took a very active part in the proceedings of several committees, which resulted in the formation of the esplanade; and any one old enough to remember the Infirmary pond, with its floating scum of soot and dead cats and dogs combined, will know how great a public benefit to Manchester that alteration effected. We as a Society of Architects cannot but share in the discussion now raised as to the Infirmary square, and doubtless many of us desire to see the present inartistic structure replaced by a building more in accordance with the times, and more worthy of one of the very finest sites in England. Surely Manchester will never suffer this noble open space, which in the eyes of all strangers constitutes the chief feature of the city, to be built upon. Its importance to the citizens as an air-reservoir, apart from its value as a site for a noble building, cannot be over-estimated, in spite of all attempts to prove the contrary; and every inhabitant should be willing and glad of the opportunity of contributing towards a great town's improvement. No citizen of Manchester would for one moment desire to deprive the sick poor of one farthing of value in the Infirmary property, nor would the trustees be justified in accepting less than its actual value, but there are many legal and complicated points involved before the discussion can finally be set at rest.

Meanwhile, Manchester is acquiring a reputation as a town of some architectural character; it is the inland metropolis of the North,—the Florence, if I may so describe it, of the nineteenth century; it has developed a school of architecture which we may largely call our own, and in which we may take a not unnatural pride; and let us hope that advantage may be taken of so rare an opportunity of contributing to the beauty of our town in a situation which, from its commanding and elevated position, may really be regarded as the heart and lungs of the city, as well as its finest site.

Before leaving this interesting topic of the town improvements, let me observe that it has always seemed to me a matter of regret that in all our large towns—and not least in our own city, where it is hardly possible to turn in any direction without finding some important building operations in progress—the street improvements and the changes in the thoroughfares demanded by the approaches to our railway stations should not have been conducted on some general, well-considered plan, so that in the course of each decade we might see developed at least some portions of a wide and comprehensive scheme of architectural lines, all tending to an ultimate complete result. This is not the first time this subject has been touched upon in addresses from this chair; and although such a project would, doubtless, involve patient and unremitting attention on the part of the authorities for a long course of years, yet with so excellent an aim in view, and a good plan to work upon, our municipality might, I feel certain, accomplish results which at first sight might seem Utopian.

During frequent visits to Continental towns, this idea has often forced itself on my mind; and in 1865, the year of the foundation of our Society, when the then contemplated new Royal Exchange and Town-hall were already under discussion, but before the actual building lines had been defined, I endeavoured to set forth my views in a communication to the local press, urging that with two such important buildings in immediate prospect, and the Deansgate Improvement looming in the distance, some general plan of the town's improvement might be determined on which would have admitted of a grand architectural group, giving us at the same time a straight, broad, central thoroughfare across the town from Corporation-street to Peter-street,—the Royal Exchange at one end, the Free Trade Hall and Theatre Royal at the other; with the Town-hall facing Albert-square, in the centre of which and on the axis of the street would stand the Albert Memorial. No doubt there exists a serious practical objection in the way of any such plan in the temptation to jobbers and land speculators, but I have faith in our authorities, and a corporation which can accomplish such an improvement as that in Deansgate, and build such a Town-hall as we shall shortly possess, can accomplish anything.

Turning from subjects of local interest to more general topics, I trust I shall not be thought egotistical if I advert to the proceedings of a committee of which I happen to be a member, and in which I have taken a not inactive part, as I regard them as of the first importance to our profession generally, and believe they will mark a crisis in the history of our various societies. I refer to the Special Committee on the affairs of the Royal Institute of British Architects, appointed at the close of the session of 1874, and which has held twenty-one sittings at the Conduit-street rooms, — the result of their labours being now presented to the Council of the Institute in the form of a somewhat exhaustive report. Although that report has, I believe, not yet been made public, I shall not be guilty of any breach of confidence in saying that the broad principle I have advocated, with all the force I have been able to command during our prolonged sitting, has been a policy of wide comprehension in the organisation of the Institute, and an abandonment of some of the exclusiveness which in its past history has had the effect of preventing some of our men of eminence and talent in the provinces from joining its ranks.

I hold myself a very strong conviction that common action on the part of the Institute with other architectural and cognate societies throughout the country would be attended with the greatest possible advantage to all. I think, in fact, that there should be a relation of the most intimate kind established between the Institute, as the parent Society, and all other architectural and kindred associations, and that we ought in our own Society to do everything in our power to promote a common action of this kind. Although there exist, both in London and in most of our large provincial towns, societies which are prosecuting their efforts with great zeal and energy, their efforts are practically of little effect on the general public, because there is no common bond of action. Such a combination of the strength of the various associated bodies would, in my opinion, be most beneficial to the provinces, while the Institute would lose none of its prestige by such an amalgamation as I have suggested.

The absence of this kind of *esprit de corps* has injuriously affected the interests of the architectural profession generally, on various occasions, when a more determined and decided resistance might have been greatly for the advantage of all. For example, at the time of the great discussion on *the ownership of drawings*, some time back, when a very eminent member of our profession was forced to submit to the dictation of an arrogant member of her Majesty's Government, had all our societies been in relationship the Institute would have felt its hands greatly strengthened in taking up the question and contesting it. It is my own conviction that on that occasion all custom, precedent, and equity were in favour of the architect, and that there existed great misapprehension on the part of the public; and that had we been a strong and united body, itstead of allowing judgment to go by default, to the injury of the whole profession, we might have settled a difficult and most important point which has long been and continues to be in dispute. I think that we, the Manchester Society of Architects, ought not to be behind-hand on such an occasion, but rather that we should be in the van, when a step may be taken for the general welfare of our profession; and though we are not a numerous body, I believe a hearty co-operation on our part might materially strengthen the hands of those who desire to widen the basis of the Institute, and at the same time to improve the status of the architects of the country generally.

During the forthcoming spring the Conference of Architects, which took place last in 1873, will be renewed, when the discussions which have already taken place at the previous conferences on many topics of general interest to our profession,—and among others that most difficult and important one of "Quantities,"—will be again taken up. On few subjects are there more widely divergent opinions among us than on this question of quantities, and it deserves the fullest and most impartial consideration of all architects, whether practising in London or in the provinces. For my own part, a strong preference for architectural work has induced me, as a rule, to decline the taking of quantities; but although I have no wish to alter my practice in this respect, I am bound to admit that it is not altogether without its inconveniences, to say nothing of the large pecuniary sacrifice. The architect who does not take out his own quantities is undoubtedly involved in much increased labour, in preparing more elaborate specifications and detailed drawings, than would otherwise be required to explain his views fully to the quantity surveyor and to the contractor previously to obtaining estimates; and should it happen, as it sometimes does happen, that after plans so prepared have been completed they are set aside, it is difficult to obtain any sort of reasonable remuneration for the great expenditure of time and thought bestowed on their preparation. It appears to me, however, that there can be no impropriety, and certainly some convenience, in an architect adopting the practice of taking quantities for his own works, if it be his wish to do so, and provided it be done with the knowledge and concurrence of his employer.

There has been, however, so much divergence of opinion at the conferences on this much-vexed question of quantities, that I think the time has arrived when some recognised system might with great advantage be adopted throughout the country, and that it would be most desirable that as many of our members as can make it convenient should attend the forthcoming conference, and represent their views in the discussions on this or any other topic. The Institute has taken the initiative, and invited the fullest expression of opinion from all, and is, I have no doubt, quite disposed to entertain some modification of the original charter, should it be shown that it would be in the interest of the profession generally. * * * *

A very serious evil sometimes accompanying the competitive system, and which is, I fear, a growing one, is a disposition on the part of building committees and public boards to bargain with architects with a view to inducing them to accept less than the recognised scale of charges, a practice so unfair and discreditable that it ought to be resisted by all, and especially by those who can afford to be independent. I confess such unhandsome attempts to diminish the fair earnings of a not too well paid profession excite in my own mind a strong feeling of indignation. Every opportunity should be taken of protesting against it, especially by the elder and more established men; and all of us must, I am sure, be well aware in how many ways the true interests of the public would be certain to suffer from the false economy of insufficient remuneration.

"ON THINGS IN GENERAL."

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association, held on Friday, the 17th ult., Mr. John S. Quilter, president, in the chair, the following new members were elected, viz., Messrs. E. W. J. Dodd, Clapton Rolfe, A. Flowers, F. de Jersey Clere, G. W. Browne, W. B. Reynolds, and S. J. R. Smith. There was a very large attendance.

Mr. W. Burges then read a paper "On Things in General," which we printed *in extenso* in our last number.

In the discussion which followed,

The Chairman said Mr. Burges had treated a very comprehensive subject under three very pointed heads. The first topic he discussed had received very ample attention at the hands of the Association during the past session. The second had come before the meeting rather prematurely, perhaps, although it was a topic which had been

freely discussed, and on which a report had just been presented to the Institute by a special committee appointed to consider the subject. The third part of the paper, which dealt with the future progress of architecture, was one of vital interest to the profession.

Mr. J. P. Seddon said it had been a dream of his, especially during the time he was acting as secretary to the Institute, to see all the professional societies under one roof. With reference to the future of the Institute, he thought that if the report of the special committee which had been alluded to led the Institute to put forth a tangible programme of operations, on a sufficiently bold scale, it would command the support of the profession; any scheme of a vague and undecided character would fall to the ground in embryo. Mr. Burges's remarks as to the future of architecture, dealt more particularly with the education of the architect,—always an interesting subject. Undoubtedly the younger members of the profession were mainly indebted to the Association for the greater part of their education. The systematic manner in which the classes for the study of artistic and scientific subjects were conducted was admirably calculated to further the educational status of the profession.

Mr. T. Roger Smith said he agreed so fully with the views which had been so ably put forward by Mr. Burges that it was difficult to add anything, except to express the hope that it would not be eight years before Mr. Burges would again read a paper before the Association; indeed, it was possible, as things were moving so fast, what with railroads and new styles, that Mr. Burges would find it absolutely necessary to address the Association before another eight years had elapsed. It was impossible to look around the present large assemblage of gentlemen engaged in the study and practice of architecture, without feeling that the Association was really a great centre of architectural education,—a centre from which influences for good would eventually be conducted all over England, and through the greater part of the practice of the last quarter of the nineteenth century. If he might emphasise any particular portion of Mr. Burges's paper, it would be that in which he had shown that the art which he had studied so thoroughly and practised so well was not a mere trick of drawing, but the result of great labour, study, and thought. Young architects were too apt to consider that in drawing, their hand and eye were doing enough, and that they were released from the necessity of thinking and observation. This was not the case with painters or sculptors, and far less ought it to be so with architects, for architecture was a logical art, depending upon building, the nature of materials, situation, climate, the wants of man, and an infinite number of practical considerations, and it was only when a man had grasped all these, when he knew what were the capabilities of materials and workmen, that he was properly equipped for the carrying out of the artistic part of his profession. This was the reason why much of the best art of the world was done by men who had little or no notion that they were artists at all.

Mr. Phené Spiers said, that with reference to the "Queen Anne" style, which had been treated of in the first portion of Mr. Burges's paper, the Association had fully discussed it last session, and had fairly well "sat down on it." What must be looked upon as its chief source of danger was its adoption as a complete style which might be studied by young students. There were a great many young men beginning architectural work at the present time who had not had, and would not have, an opportunity of going through those serious labours which the pupil of twenty or fewer years ago went through in working up the principles of the Gothic style by measuring the old churches throughout the country. Neither would they have the opportunities offered thirty or forty years ago of learning carefully the proportions of the orders. Therefore they had no ground to stand upon. He thought the introduction of the "Queen Anne" style was to be looked upon as a very great misfortune, considered with reference to its effects upon the education of the young architect. He did not feel disposed to agree with Mr. Burges that the Gothic style was the best suited to this climate, for he considered that Classic architecture adapted itself to our requirements with far greater facility than Gothic. At all events, it possessed certain sound principles, the acquirement of a knowledge of which would be of lasting benefit to the student. As to the position of the Institute, there was no doubt that the Association had done very wisely in refusing to allow itself to become absorbed by, or even affiliated with, the senior body. The best way for the Institute to increase its influence and usefulness would be for it to take up the work which had been done, and was still being done, by the Association. The Association owed its success to the fact that it was an educational body, and until the Institute pursued the same course it would never assume its proper position. The committee which had recently presented their report on the affairs of the Institute hoped that the charter would be very materially altered, so as to bring the Institute more in consonance with modern requirements. At the time the charter was granted, there were only thirty or forty Fellows, while now there were about 400 Fellows, and perhaps 600 or 700 who might become Fellows under altered conditions. As to the excursions under the guidance of Mr. Edmund Sharpe, he thought that had Mr. Burges accompanied the Angoulême excursion he would have found that an incalculable amount of good was done, even though the stay in one place might be of very brief duration. The route was always so well chosen that the places visited were seen to the best advantage. While it was desired to see as much as possible during each excursion, it was hoped that the flying visits paid to many of the places would act as a whet or incentive to individual members to visit them at greater leisure in the future. In conclusion Mr. Spiers proposed a vote of thanks to Mr. Burges for his able paper.

Mr. Boyes, in seconding the proposition, said it would be matter for great regret if in the Association any sentiments in the least degree disloyal to the Institute were supposed to find favour. He was quite sure that whatever might be the management of the Institute, and however capable of improvement it might be,—and everybody knew that it *was* capable of improvements, and hoped that it would be improved,—the main body of the Institute was of the same view as the Association with regard to the advancement of the profession. It would certainly not be for the good of the profession if the two societies were to "fall out." He thought the Association could not do better than to in every way support the Institute, and by continually drafting the senior members of the Association into the Institute, and by the gradual development of a progressive spirit, the needful reforms would be effected, without even an apparent disruption between the two bodies. He thought that the proposal for amalgamation was somewhat prematurely brought before the Association. The Association's strong point was that it was perfectly capable of managing its own affairs, and although it had, perhaps, somewhat peremptorily refused to coalesce with, or be merged in, the Institute, yet the refusal was not due to any feeling of disloyalty towards the Institute. There should be no want of union between the two bodies, which should go forward side by side.

Mr. H. H. Statham said he agreed so very much with all that Mr. Burges had said that there was little to add. He had always been led to regard Mr. Burges as a kind of architectural Ishmael, whose hand was against every man's, and therefore he had been somewhat agreeably surprised at the moderate tone of the paper. With regard to the Institute, he could not but express his satisfaction with the remarks which had been made by Mr. Burges. There was some applause during the course of the remarks by the last speaker in favour of the Institute, but whenever "a cut" was made at the Institute the applause, he noticed, was much more lively. As to the kind reception of the Mediævalists by the Institute, it was greatly to be regretted that more of them did not attend the meetings of that body and take part in the discussions, for at every meeting the same gentlemen did all the speaking,—some of them spoke very well, and probably that was the reason why they were called upon to speak. He was much pleased with Mr. Burges's remarks about the importance of thought rather than mere drawing in building, for he thought the profession would be a much more real thing if less dependence were placed on the drawing-board and T-square, and if details were drawn on the spot, with the view of the better judging of their effect. In the present day there was far too much time spent in making elaborate drawings, which did not further the building in the least. He differed from Mr. Burges's opinion as to medals, for a medal was a testimony that its possessor had surpassed some one else in the race.

Mr. E. B. Ferrey said he was very glad to hear Mr. Burges's remarks as to the value of a knowledge of Greek art. It was too much the fashion to pooh-pooh anything that was not Gothic, but Greek, Italian, and even Indian architecture might be studied with profit. The value of foreign travel to the architect was very great, for the more he travelled the broader and more enlightened became his views.

Mr. Riddett thought the Association was somewhat in danger of being a little too much "patted on the back." During the past two or three years the general opinion had been that the Institute had not been as "good" as it ought to have been, while the Association had been held up as being a great deal better than the Institute. A great deal was said about the "enthusiasm" and "deep study" which were to be found in the Association; well, he only hoped that at the end of the session the enthusiasm in question would be found to have taken a tangible shape in the form of work accomplished in the classes. The classes had not grown with the growth of the Association; and he was afraid that the praise which was lavished upon the Association generally was not due to the classes in particular. Before "pitching into" the Institute,—which no doubt deserved a certain amount of "pitchment,"—the Association should first see that it had no beam in its own eye.

Mr. G. Elkington, jun., said that directly a new style or fashion set in, the mass of illustrations of it which were published, almost imperceptibly, whether for good or evil, led to a certain amount of eclecticism. Was this eclecticism to be sought after or avoided? Was there a possibility of excelling in two styles contemporaneously? Was it not possible for a "Queen Anne" house to exist side by side with a Gothic town-hall without any violation of artistic feeling?

Mr. S. Flint Clarkson said that all revolutionaries, no matter whether in art, politics, or religion, necessarily, in order to secure themselves a hearing, overstrained what, if they were moderate and temperate, would probably be their own inmost feelings as to the importance of the subject which they wished to put before the world. At any rate, they temporarily obscured any view of any other than the particular object which they wished to thrust forward. He ventured to think that the advocacy of Gothic architecture had been submitted to something very much like the same process. The advocates of the Gothic revival, after long fighting in what appeared to be a losing battle, maligned their opponents, and eventually conquered. When they had succeeded they became reflective, and began to think whether they had not crushed their opponents too hard. Gradually they became more liberal, and a great deal of enlightenment began to dawn on the Gothic school. Perhaps, therefore, Mr. Burges would be inclined to assent to the last speaker's suggestion that buildings in different styles might be allowed to exist side by side?

Mr. Burges: Certainly not.

Mr. Stannus said he understood Mr. Burges to say that one of the benefits resulting to the profession from the accession of the Mediævalists to the Institute was the adoption of the 5 per cent. rate of remuneration. He thought that the Institute was to be commended, if not on account of its medals, at any rate on account of the valuable book prizes which it distributed. As to the architectural examination, he believed it was about to be placed on a better footing. As to the subject of "things in general," it was to be regretted that Mr. Burges and other "fathers" of the profession were not more often heard thereon at the Institute and elsewhere.

Mr. R. P. Pullan agreed with Mr. Burges in thinking the "Queen Anne" style a retrogression. He also agreed in thinking that architecture should be more fully represented amongst the ranks of the Royal Academicians. He coincided with the views put forth by Mr. Burges and Mr. Ferrey as to the great advantage of a knowledge of Greek architecture, because the principles of Greek architecture were the principles of common-sense, and the principles of common-sense were the principles of all good architecture. In the first place, its proportions were exquisite. What was good architecture but good proportion? It was true that the disciples of the extreme Gothic school delighted in the irregular and the purposely "picturesque," but the great buildings of all ages were all designed in proper proportions, even to the detail, and not only was this the case with the Parthenon, but also with the Sainte Chapelle and Westminster Abbey. Another

great merit of Greek architecture was its construction. The temples were the best buildings of the Greeks, because they were devoted to religious purposes, for religion had always been the great moving power in all good art, whether in ancient Egypt, Greece, or during the middle ages. The Greeks built their religious edifices of the best materials, and in the best manner. On the contrary, our churches and other ecclesiastical buildings were constructed of a sort of coarse rubble work, as if in imitation of the construction of some Cyclopean wall, whereas they should only be constructed of squared stones, with fine joints in lieu of mortar joints ¼ in. thick. He noticed that Mr. Burges shook his head.

Mr. Burges: Very much so.

Mr. Tarver said that if the Greek work was guided by common sense, he supposed that if a Greek of the best period were to come to life in the present day, the kind of window which would appeal most to his common-sense would be the double-hung sash?

Mr. W. W. Robertson, with reference to Mr. Burges's inquiry why, if large sheets of plate-glass were used, they should not be confined to the bottoms of the windows, said that the portion of the room furthest removed from the window derived all its light from the upper part of the sash, which should, therefore, not be in any way obscured.

Mr. J. Sulman said he had found no difficulty arise from the division of the upper part of the sash into small panes. He thought it was possible to draw still further instruction from Mr. Burges. As to future progress, what course of procedure would he advise young architects to keep in view? Were they to confine themselves mainly to the practice of one style, whatever buildings they had to design? Or, considering the varied wants of the present day, would it not be best to work in various styles, or to become slightly eclectic, and, keeping one style as the general basis, endeavour to incorporate with it whatever might seem good in other styles? No one style seemed to suit equally well all wants. By "eclecticism" he did not mean the haphazard jumbling of incongruous fragments, but a judicious combination and modification of forms.

The Chairman put the vote of thanks to the meeting, and it was carried by hearty acclamation.

Mr. Burges, in reply, said he had engaged to give the Association one lecture, but they asked for two. He had never been asked so many questions before, and felt very much like Martin Chuzzlewit on the eve of his departure for America. As to the question of Gothic *v.* Classic, if by "Classic" were meant Greek, or even if Roman were meant, he would take off his hat to it,—although even the best Roman was bad enough. But what was ordinarily meant by "Classic" was the vilest Renaissance of George III.'s time. No; he (Mr. Burges) had been brought up in the thirteenth-century belief, and in that belief he intended to die. As to working in two styles, a man could never work in two styles equally well. Eclecticism, whether in architecture or language, would only result in a farrago. Indeed, "Queen Anne" might almost be called "negro-language." As to the affiliation of the Association with the Institute, his only object in suggesting its advisability was that affiliation would secure the advantages he had enumerated, although possibly there might be some attendant disadvantages. One speaker had objected to elaborate drawings, and had suggested the drawing of detail on the spot, but even by drawing detail on the spot it was very difficult to say what would be the effect of certain mouldings,—indeed, it was impossible to tell unless you had a piece worked up. Drawing things out on the spot was all very well when you had no contract, but for contract drawings almost everything ought to be put in. As to Mr. Sharpe's excursions, he adhered to the opinion he had expressed in the paper. He did not think such "scrambles" could result in much good; no doubt they were very pleasant affairs, but he should not like to take part in one,—it would be too fatiguing. He certainly had not meant to say that the "five-per-cent." scale was due solely to the Mediævalists; it was brought about by the combined efforts of both Pagan men and Gothic men. As to the Institute policy generally, it had been a great deal too vacillating, and a great deal too fearful of "putting its foot down." Had it been otherwise it would have been a great deal more respected.

The meeting then terminated. The next meeting will be held on Friday next, the 7th inst., when Mr. J. P. Seddon will read a paper on "Consistency and Refinement in Architectural Detail."

THE EDUCATION FOR AN ENGINEER.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE inaugural meeting of this Society for Session 1875-76 took place on Thursday evening, the 9th ult., when the president, Mr. W. F. Butler, A.I.C.E., read an inaugural address. The Society has now entered upon its seventeenth year, having been established in May, 1859, for the discussion of engineering and scientific subjects, since which date about 190 papers have been read, mostly followed by free and liberal discussion. Another important part of the Society's operations is the arrangement of visits to various works in progress and to manufactories, foundries, &c., in operation, by which means the younger members obtain an insight into practical knowledge. After stating that the Society had made arrangements for the publication, in the form of "Transactions," of the papers read and the discussions thereon, Mr. Butler proceeded to consider what was required of the young man about to enter the engineering profession, and by what means he might rise in his vocation. On these points he said,—As an engineer should be a man of no mean scientific attainments, so also he should have large practical experience. The first is evidently a question of education; the second, one of well-used opportunities during pupilage and practice. I think it may be said, without fear of contradiction, that the average English engineer, while excelling in the latter part of professional perfection, is as conspicuously deficient in the former; at any rate, this would be true of most during the earlier years of their career, for we all know by experience that as necessities arise we make ourselves more or less perfectly masters of the requisite theoretical knowledge wherein we may have been deficient. In most foreign countries special schools are established for the instruction of youths intended for the profession, and very admirable the course of study appears to be generally; nor can we doubt that the young man who passes successfully through one of these schools starts with many advantages, as far as theoretic knowledge goes, over the ordinary English pupil. Indeed, in some countries, the road to success is well nigh closed against the aspirant for engineering honours unless he bears in his hand the magic diploma of the Government school. We have most of us, I think, observed with pleasure what beautiful draughtsmen French and German assistants usually are, and how well-proportioned their work often is; but of the two systems, I believe our own, properly carried out, will be found superior. For while the foreign student in the school is learning to make drawings of canals, railways, harbours, &c., and the necessary works connected therewith, he has never, until in practice, either by himself or as assistant engineer, the opportunity of seeing his own or any other designs carried into execution, and while the drawings for a canal may be perfect, we cannot be sure that the work will be sound when filled with water. So also with railways and other works. In point of fact, the foreign student does at the schools pretty much what the English pupil does in his master's office,—the latter, however, while his theoretic training is less perfect, having generally the advantage of seeing a good deal of practical work as well. Now under the English system, as most people are aware, a youth goes into an engineer's office, not always because he has been specially educated or intended for the profession, but perhaps because his parents think he has a taste for mechanics, or for drawing, or because it is a "respectable" profession; and as they perhaps hardly know what to do with their "young hopeful," they imagine he may as well be an engineer as anything else. At any rate, his three years' pupilage "will keep him out of mischief." Now it is not of such as these that great engineers are made. I feel convinced that the best education a youth can have before he enters the office is such as that afforded by our public schools,—a good, sound, liberal education; while, if the student exhibits special aptitude for the study of science, and if his parents wish to make an engineer of him, his particular bent may be cultivated, and attention paid to his progress in mathematics, chemistry, geology, natural philosophy, and the application of science generally to engineering; and where, also, he may have the opportunity of forming friendships and acquaintanceships which will be of the greatest use to him in after life, for it is at public schools such as Eton, Harrow, Rugby, and others, that the intending engineer will meet with a number of young men whom, during his practice, he may again encounter as landlords, members of Parliament, magistrates, &c.; and only those who have had experience in the organization of new schemes in England can tell what an advantage this is. A youth thus educated comes to the office with great advantage, and should he find that his knowledge in any given direction requires farther development, he will have no difficulty in improving it, either by attending lectures such as those given at King's College, or by other means which may be readily found if sought after. Unfortunately, however, a number of pupils in engineers' offices are not men of this stamp, and in many instances are less distinguished for their education and industry than for their liking for theatres and music-halls, where too many spend the evenings which should be devoted to reading and study. The foreign system seems to me to be rather calculated to produce a uniform level, it may be of talent or mediocrity, while under the English method a process of weeding-out goes on, the fittest alone being able to hold their own in the race of life. This part of the subject naturally leads to the consideration of what an engineer should be. As I have before observed, he should have good, sound, scientific knowldge, and should be so far a master of theory as to be able to apply it when requisite to the various works he may be called upon to design. And here let me observe that I believe true theory and practice always go hand in-hand, the one enlightening the other, and practice exemplifying the truth of theory. The engineer should be able to design and prepare drawings, specifications, and estimates for all works which are usually considered to be within the limits of engineering, and should, moreover, be thoroughly competent to superintend the execution of works entrusted to his care. For this purpose an intimate knowledge of the numerous materials used in construction should be possessed by him; with the nature and uses of earths, the many kinds of stone, timber, iron, mortar and cements, bricks, &c., he should be thoroughly acquainted; nor must he be backward in his knowledge of the value of the several materials, both in the rough, and when worked and fixed in the structure; for if he knows not good work, and good workmanship, too, from bad, he cannot effectually superintend them. The engineer must also have sufficient knowledge of mensuration to enable him to measure up accurately the various kinds of work done by contractors. In the field, the engineer must be able to survey, level, and set out work with accuracy and despatch; while for Parliamentary work an intimate acquaintance with the "Standing Orders" is indispensable. To all this must be added strict business habits and sound common sense; for otherwise the engineer will never be a safe adviser for companies, and others his clients, in the expenditure of the great sums of money so often laid out upon his recommendation. I hardly know how to define the meaning of the term "business habits" any more than the words "common sense,—a quality which, although considered indeed common (for every one believes that he has it), is often conspicuous only by its absence. Business habits seem to me to be hardly habits at all, but rather a special quality in the mind of the individual leading him on all occasions to be prompt and ready, to be always to his time, to keep faithfully his appointments, to have all his belongings and works in perfect order, and generally, before he enters upon a subject or undertaking, to have made himself master of it. Above all, I would insist that an engineer must be a gentleman. I do not mean by this that he should be possessed merely of that surface-polish which too often passes current in the world, and which is, when taken by itself, but a miserable varnish, frequently covering the basest feelings and inclinations of mankind; but what I mean by the term is this: that he will be courteous and considerate in all intercourse, whether with his equals or with those below him; that he will be thoroughly honourable and upright in all his dealings; as much above taking a bribe as he would be above picking any one's pocket; fair and just to both employer and contractors; and

that he will do nothing in the least degree unfair or unhandsome towards his professional brethren. It is only by setting before ourselves a high standard, and endeavouring to act up to it, that we can successfully maintain the honour of the profession, and cause it to occupy even a higher place in the estimation of mankind than that which it now holds, and therefore I have dwelt with some emphasis upon this essential element in the character of an engineer.

The remainder of Mr. Butler's address was devoted to a *resumé* of the progress of engineering since the commencement of the railway era, and to a review of future prospects. It was incidentally mentioned that Mr. G. J. Morrison had lately resigned his position as one of the vice-presidents of the Society, and gone to China as the engineer of the first Chinese railway.

CASES UNDER THE BUILDING ACT.

WOODEN BUILDINGS.

AT the Clerkenwell Police Court, Mr. John Goodman, builder, of Bentley-place, Dalston, was summoned before Mr. Chance by Mr. Rowland Plumbe, the district surveyor of South Islington, to show cause why he did, in the rear of No. 75, Balfour-road, Highbury New Park, "enclose a building with wood, contrary to the first schedule, clause 1," and omit to do certain things required by the Act, to wit, "enclose the building with walls constructed of brick, stone, or other hard and incombustible substances, as required by the 1st schedule, clause 1." Mr. Richard Jones, solicitor, attended on behalf of the defendant.

It appeared that the building is erected on a platform formed of earth, and banked up with clinker work, so formed at the end of the garden standing against the side wall of No. 17, Highbury Grange. The platform is raised above the surface of the garden, level with the wall, there being a space of about 13 ft. 6 in. between it and a pair of carriage-gates formed in the front fence wall, 8 ft. wide. The building complained of is 11 ft. by 7 ft. outside, about 6 ft. 4 in. wide, and 10 ft. 10 in. long inside, and about 7 ft. high at the lower slops of the roof, rising to 9 ft. high at the ridge. The building is inclosed on all sides, having in the front a pair of folding doors, 6 ft. wide by 6 ft. 9 in. high, and there is a window at the side. The sides and back are covered with boarding outside, and lined with match boarding inside, the total thickness of the inclosures being about 2½ in. The building is roofed with a span roof covered with zinc, on boarding carried by rafters, having a wooden gable in the side facing Balfour House. The floor is of wood, on wooden bearers wedged up on the platform. There are three discs of wood on each side of the building, to represent wheels bolted to the floor bearings. At present the wheels do not run, there being no joint between the point of the wheels and the side, and the surveyor said he did not believe they would carry the building as at present fixed. The building projects 6 ft. 9 in. beyond the general line of frontage of Grange-road, and it is placed about 2 in. from the wall of the house. The defendant in his notice called this building "a summer-house." Mr. Plumbe stated that he had evidence that it was intended for the purpose of keeping a patent steam bicycle or other similar conveyance. Even if it was a summer-house it was not exempt, and the building was irregular, and not in accordance with the first clause of the first schedule of the Building Act. It is claimed, said Mr. Plumbe, that the building is a temporary one, or one to which the rules of the Act do not apply, then by section 16, the sanction of the Metropolitan Board of Works should be asked, of which he should have received notice, but such notice had not been received by him from the Board. On these grounds he had to ask the magistrate to exercise his power, under section 46, to make an order commanding the defendant to comply with the requirements of the notice served upon him as the builder under section 45 of the Act. Evidence having been given at some length, Mr. Jones contended that this was not such a building as was contemplated by the Act, and asked the magistrate to dismiss the summons, and that with costs. The building was never intended for a dwelling-house, for in the winter it was used solely for the purpose of keeping plants in, and in the summer it was wheeled into the middle of the garden, and was then used as a summer-house and smoking saloon.

Mr. Chance said he did not think that the building in question came under the category of "other buildings" mentioned in the section, and dismissed the summons, but without costs. A hard-and-fast line could not be drawn, but he was firmly of opinion that the building did not come within the intention of the framers of the Building Act. In dismissing the summons the magistrate said he was quite willing to grant a case for the consideration of the court above if one was required.

Mr. Plumbe said he would consult the Metropolitan Board as to whether he should take a case or not.

This most extraordinary decision, in the face of scores of decisions the other way, given in this and other police-courts of London, would, if allowed to remain unchallenged, greatly interfere with district surveyors in the discharge of their duty, and if acted on would bring about a perilous state of things. Steps should be taken at once, by appeal to a superior court, to obtain the revision of Mr. Chance's judgment.

Architectural Design. — Lord Francis Hervey, M.P., has offered a prize of 5*l.* for architectural design to the members of the Birkbeck Literary and Scientific Institution, Southampton Buildings, Chancery-lane.

ARBRITRATION CASES.

A LANDSCAPE GARDENER'S "EXTRAS."

MR. EDWARD WORTHINGTON, registrar of the Manchester district registry of the High Court of Justice, has recently made his award in the case of Shaw *v.* Jones, which was referred to him as arbitrator. The action was brought on July 23rd last, in the Court of Common Pleas at Lancaster, Manchester district, by Mr. John Shaw, of the Stamford Nurseries, Bowdon, landscape gardener, against Mr. Thomas Jones (Messrs. Barlow & Jones, merchants, Manchester), who resides at Erlesdene, Green-walk, Bowdon. It appears that Mr. Jones employed Mr. Shaw to lay out and plant the extensive grounds attached to his newly-erected mansion adjoining the Green-walk, and that a written contract was entered into between the parties on October 12th, 1872, by which Mr. Shaw agreed to find the whole of the labour and material required on Mr. Jones's land for laying the same out in conformity with plan and specification for the sum of 780*l.* The real dispute in the action, however, related to extras, since after the action was brought the defendant paid into court a sum exceeding the balance of the contract. The action was brought to recover the sum of 441*l.* 19s. 9d., the amount being arrived at as follows:—Amount of contract for laying out grounds, 780*l.*; extras, 284*l.* 3s. 9d.; total, 1,064*l.* 3s. 9d.; less credit given for cash, &c., 622*l.* 4s.; leaving a balance of 441*l.* 19s. 9d. The defendant pleaded that he was not indebted except as to 228*l.* 14s. 3d., which he paid into court with his pleas. Mr. Mills, of the firm of Messrs. Mills & Murgatroyd, of Manchester, was the defendant's architect, and under a clause in the contract the defendant's solicitors endeavoured to obtain an order to refer the matters in dispute to Mr. Mills. This was resisted by plaintiff's solicitors, and by order of Mr. Baron Cleasby the matters in dispute were referred to Mr. Worthington, the district registrar. The arbitrator sat at the Mitre Hotel, Manchester, on the 7th, 8th, and 9th of October last.

The arbitrator's award, which was made on the 19th Nov., after reciting the order of reference, &c., proceeds,—"I do award that the plaintiff had good cause of action against the defendant, and that the plaintiff is entitled to recover against the defendant in respect of the said action, and all matters in dispute between the said parties brought before me, in addition to the sum of 228*l.* 14s. 3d. paid into Court, the sum of 116*l.* 8s., which additional sum I award and direct shall be forthwith paid by the defendant to the plaintiff. And I do further award that the defendant shall bear and pay his own costs of the said reference, and that he shall also pay the costs of the plaintiff of the said reference. And I do further award that my costs of the said reference and of this my award shall be borne and paid by the defendant."

THE IMPROVED APPROACH TO THE THAMES EMBANKMENT FROM BLACKFRIARS.

THE widening of the roadway at New Bridge-street, Blackfriars, leading on to the Thames Embankment, being a continuation of the line of frontage of the new Royal Hotel to the corner of William-street, has just been completed, and is intended to be thrown open for traffic next week. By the improvement the extreme width of the roadway between the south-west side of the hotel frontage and the entrance to the Metropolitan District Railway Station has been increased to 90 ft., with a similar width on the side between the hotel and the approach to Blackfriars Bridge, and an addition has likewise been made to the width of the thoroughfare between the Embankment and Queen Victoria-street. The additional space thrown into the roadway at its widest part is about 40 ft. The new footpath between the hotel and the corner of William-street, New Bridge-street, at the north-east boundary of the widened thoroughfare, is carried on seventeen strong brick arches. Mr. Webster has executed the contract. It is stated that additional crossing refuges are to be erected, in consequence of the great width and area of the enlarged thoroughfare. The triangular piece of land adjoining the hotel, and extending to William-street, has been for some time announced as for sale on building leases, but within the last few days this announcement has been removed, and it is said that the site has been secured for the erection of insurance-office buildings.

A Picture for Bradford Town-hall.—Mr. Angus Holden has presented to the Corporation of Bradford Mr. E. T. Parris's painting of the Coronation of Queen Victoria.

ST. JOHN'S, NEWFOUNDLAND, AND THE CATHEDRAL.

WE had been steaming all day along a rugged barren shore in the teeth of a piercing wind, but night fell before the light from the hill-top showed us we were nearing St. John's.

A massive front of black shadow towering to the sky stretched before us, the waves dashing angrily up the furrowed cavities of the cliffs, and we wondered where the gate could be through this gloomy barrier. A narrow defile, however, soon appeared to view, through which we carefully threaded our way; for even this was studded with sunken rocks, and the lights of a city resting on a hill-side burst upon us.

The hills surrounding St. John's are so high, and the harbour is so small, that although it was almost blowing a gale outside, the water inside was as calm as a mill-pond, and the beams reflected from a thousand lights serpentined sluggishly in the watery mirror.

By day the appearance of St. John's is not so theatrical. Its natural beauties, indeed, are equalled by few cities, but, like many colonial towns, man has not done much to assist nature. Art is almost unknown, and, like many another place in British North America, it is considered only as a depôt for making money, not for spending it; for, as soon as a man becomes wealthy, and has travelled sufficiently to give him good taste, he leaves for a more civilised home.

As may be expected, then, the ordinary buildings of St. John are commonplace structures in the extreme, of stone, brick, or wood, and with a lamentable absence in the latter of that most essential element with them,—paint; while their public buildings, with few exceptions, are distinguished by glaring evidences of bad taste, and an apparent waste of money without any return for it.

The most notable exception is the cathedral, by Sir G. G. Scott, which, with its old weather-beaten and stained appearance, its unfinished condition, its damaged transept footings, its decayed stones and defaced mouldings, rendered almost undecipherable by frost and snow and salt-sea fog, seemed almost like an old friend of the fourteenth century, built by mast er-hands of a country that knew not America, and left here friendless and forgotten, with no tie of relationship or of kin to the dwellings and churches around it.

We have no hesitation in saying that from an inspection of most of the religious structures in North America, both in the United States and in Canada, there is not one which so nearly approaches the time-honoured Mediæval cathedrals in its noble proportions, its massive simplicity, its gloomy grandeur, its correctness of detail, and its splendid workmanship as this fragment of a cathedral in St. John's, Newfoundland.

The cathedral, as it stands, is scarcely more than half built, for the transepts, central tower, and chancel, exist only on paper. There is a talk now among the moneyed men of finishing the transepts and tower, and leave the chancel. We hope, however, that enough funds will be raised to finish the whole, so that the design of its eminent author may be seen in its entirety,—a design so noble in its grand proportions, its massive majesty, its simple yet effective ornamentation, its varied yet harmonious detail, and so free from the garishness and meretricious ornamentation of so many of our modern ecclesiastical edifices, that we are of opinion, from an examination of Sir G. G. Scott's late designs, that even he would do well to study it anew, and commence therefrom afresh.

Halifax, Nova Scotia. AND. DEWAR.

PURE WATER.

You have in your pages often recurred to the subject of the polluted water-supply of towns,—but I think hardly sufficient attention has been drawn to the universality of the evil; for instance, I believe hardly a town or a village could be shown in which, on examination, cases of water-pollution to a dangerous extent would not be found to exist.

I will give two examples:—

1. The large school (now I believe discontinued) at which I was educated was situated just below a large grave-yard, the pump being about thirty yards from its lower boundary.

2. At a frequented bathing-place is a row of four small lodging-houses, the four court-yards of which altogether occupy less than 400 square yards, into which space are crowded all the

cesspools into which the whole of the drainage of the four houses is discharged, and the pump is placed in the midst. The soil is remarkably porous. P. P. C.

THE WORD "RINK."

SIR,—In reply to your correspondent "B. W.," the word "rink" is of Scottish derivation, and instead of signifying "ring," is a near approach to "ground." In fact, it is a special term to denote a place where people may skate on some other substance than ice. Hence, it is *not* wrong, nor is the use of it a vulgar habit.

If "B. W." had exercised his individual "common sense" he would have recognised that the primary use of this word would be to signify sound as the "ring" or "rink" of the skates; its secondary use referring to place.

PROPRIETOR.

SIR,—Isn't a *ring* supposed to be *round*,
Or in other sense isn't it a quality of *sound*!
Neither being a *sine qua non* for skating,—I think
We shall not be wrong if we stick [illegible]

J. M. K.

SIR,—The term "rink" is peculiarly Scottish, and properly denotes the portion of ice occupied by a party engaged in the roaring northern play of "curling." In modern times the term has come to be employed to denote any frozen surface on which a game is played and exercise indulged in. C. B.

SIR,—Pray allow me to record my agreement with your correspondent "B. W." in his condemnation of the word "rink." If it has any meaning in any country it has none in England.

There is another word which has been frequently misapplied. Why should a cattle-market be called a Smithfield? If once upon a time a cattle market was held upon Smithfield, in London, should a new cattle-market in the country be called a "Smithfield"? C. S.

TADCASTER CHURCH.

SIR,—I would not willingly increase the indignation and horror of your correspondent, "J. G.," but the melancholy fact is the church has been taken down, and is partly built up again; and we hope that, under the skilful and energetic management of our contractors, Messrs. Pearson, of Leeds, we shall have a renewed and comfortable church to worship in, by Christmas next year. "J. G.'s" agonised appeal, therefore, is now useless; and, what is more, it would have been equally unavailing if, like similar appeals, it had reached us months ago.

Sir Gilbert Scott was no doubt perfectly right in pronouncing the church capable of restoration. Others had the same opinion, but the parishioners generally, who had experienced the discomfort attaching to the lowness of its situation, in the bottom of an almost basin shaped churchyard, close to the river Wharfe, were surely better able to judge of what was most desirable, than any professional gentleman, after a mere few hours' acquaintance with the spot. Nearly all who had examined the church proved to be wrong as to the state of the roof. I do not know who the local builder may be to whom "J. G." refers, neither does it matter. The fact was that the timbers were terribly decayed, and no sooner did the workmen begin to touch the chancel-roof than it fell down bodily with a crash, though happily without accident to any person.

The north walls, though out of line both horizontally and perpendicularly, were found to be extremely strong, but the eastern and southern walls required to be taken down, under any circumstances; and, in short, nearly as much new work must have been introduced had the church been merely repaired, as will now be the case in the actual mode of dealing with it. Even now it will be as much as possible the old church, but raised 5 ft. higher out of the hollow, admitting of ventilation beneath the floor and a system of hot-air warming besides, two things from the absence of which the congregation have suffered sadly.

This thorough restoration and improvement would have been carried out sixteen years ago, costing a third less than it will now do, had it not been for two opposers, whose consent was indispensable, and we might have had, all this time, the enjoyment of a commodious and comfortable church. Since then the subject has been broached again and again. Why did not the archæologists, whose minds were so tortured by the probable fate of our ancient and beautiful church, rush in at once, and at their own expense take the matter out of our barbarous hands? Why wait till the sacrilegious deed was begun, and then content themselves with "brawn words" of remonstrance, protest, and appeal? But I believe that, when they see the new-old church lifted out of the mire, and proudly defying the waters at its feet, they will forgive us the crime we have committed as freely as we forgive them their well-meant efforts to prevent it.

A PARISHIONER.

STAMPS ON CONTRACT PLANS AND SPECIFICATIONS.

SIR,—I for one beg to thank you for your inquiry and information upon the above subject, having heard many different *legal* arguments upon it.

There is yet another point that so frequently springs up in connexion with small contracts that I shall be glad of an opinion upon, namely:—When a contractor sends in a tender for works according to plans and specifications, and receives a reply stating that his tender is accepted, whose duty is it to see that a proper agreement is drawn up, and that, together with other papers, stamped? Is it on the part of the proprietor or contractor, or both? And if the proprietor or his architect omit to have it done, is the contractor precluded from suing for any balance due according to the amount for which he tendered because no stamped agreement has been drawn up, neither have any other papers including the tender been stamped? Such is the opinion of a solicitor in this locality (unless the *contractor* is prepared to pay the penalties). Would not the proprietor be the responsible party for the penalties, being the custodian of the papers, should he wish to produce them as evidence in court? I am aware the papers could not be put in as evidence unless stamped. That being the case, would not an offer made by a contractor to do certain works at a price stated, but which proprietor did not care to have made an agreement, be looked upon as an arrangement upon good faith, and in the event of any dispute arising the only and proper course then left would be to have the works measured and valued? I may mention that the particular case referred to was, in consequence of the danger of penalties, referred to an architect. I would also ask should not all papers be stamped that are submitted for reference, the same as required by County Courts?

AN ARCHITECT AND SURVEYOR.

THE EAST WINDOW OF CARLISLE CATHEDRAL.

AT the winter meeting of the Cumberland and Westmoreland Archæological Society, held at Carlisle on the 9th ult., Mr. R. S. Ferguson read a paper on the old glass in the east window of the cathedral. After pointing out how inadequately the east window has been treated by the numerous writers of tractates dealing with the cathedral, who have, with one exception, so far overlooked the ancient glass in the upper part of the window as to conclude that Scriptural subjects were represented, he stated that, in fact, the whole of the old glass represents one connected subject. It is what is technically called "A Doom," depicting our Lord sitting in judgment, the procession of the blessed to the palace of Heaven, and the place of punishment of the wicked. The tracery of the window is generally considered one of the most perfect designs of window tracery in existence, and is composed of portions of no fewer than 263 circles, and contains thirteen quatrefoils,—namely, four just above the alternate mullions, and nine others. The great east window of York Minster contains only four quatrefoils, the rest of the tracery being composed entirely of trefoils. The cathedral window has eight mullions, after describing the peculiarities of which, Mr. Ferguson noted the curious fact that the stonework of the window remained unfinished for nearly 400 years from the time of its erection. After the burning of the cathedral in 1292 funds to rebuild it were difficult of acquirement; thus the work progressed slowly, and stopped when the money failed.

CHURCH-BUILDING NEWS.

Nottingham.—St. Mark's Church, Nottingham, was reopened on the 8th ult., after restoration and enlargement. A new chancel has been added, with organ-chamber and vestry, the organ being removed from its former position in the west gallery. The new chancel is floored with Minton's tiles, and some simple stained glass has been promised for the east window. The church is heated by hot water, the seats throughout have been made more convenient, the gallery front lowered, and the method of lighting entirely altered. The cost will be about 1,600*l.* The work has been carried out by Messrs. Marriott, Wartnaby, & Scott, builders, under the direction of Mr. W. Arthur Heazell, architect.

Slough.—It is proposed to add to Slough parish church a chancel, aisles, and large transepts, with vestry-room. The present buildings will be reseated and serve as a nave, until such time as it may be possible to build a new nave to harmonise with the portion that is now to be added. By these means seats will be provided for 1,000 people. The plans have been prepared by Mr. John Oldrid Scott, who estimates the cost of the whole at about 8,000*l.*

Nettleswell.—Netteswell Church, which had fallen into a very dilapidated condition, has been substantially restored, and a new vestry added. The plastering has been removed from the outside walls, and the flint work repointed. The old stonework to the windows and doorways has been carefully preserved, and only restored where absolutely necessary. The roofs have been all stripped and repaired, but that over the chancel is entirely new. The bell-turret is new, and is covered with oak shingles. The south porch has been rebuilt, some of the old timbers being replaced in their original positions. A new floor has been laid in the chancel with Godwin's encaustic tiles; and Peake's Staffordshire quarries are used for the pavements in the nave, vestry, and porch. The windows have been reglazed with cathedral glass, and fragments of the old stained glass have been re-leaded and refixed. New oak benches are provided for the nave; the chancel fittings are also new, and of the same material. The pulpit is of stone. Porritt's air-warming stove is adopted for heating. Throughout the work care has been taken to preserve the existing features of the building. The architect was Mr. F. Chancellor, and the works have been carried out by Mr. Gibbons, of Buntingford, at a cost of about 900*l.*

Newcastle-on-Tyne.—For the first time since the work of restoring the church of St. Nicholas was commenced, divine service was held in the nave and transepts on the 28th Nov. The chancel and aisles remain yet to be finished, but these will not occupy more than another year. The work of renovation commenced under Sir Gilbert Scott, R.A., in June, 1873, and two-thirds of the labour have now been got through. When fully completed, the architect himself avers that it will rank among the largest and noblest of our parish churches, amply repaying all the expenditure lavished upon it. The church when wholly restored will not be divided into two parts; it is intended that it shall be thrown open from end to end. In addition to sitting accommodation in the nave and transepts, there will be sittings in the chancel as heretofore. The floor is covered with Stettin oak benches (supplied by Messrs. Farmer & Brindley), carved at the ends, and adequate to seat 600 persons; and in the transepts temporary sittings have been fixed for another 600, so that, upon the completion of the chancel, 2,000 persons will be able to be accommodated with seats. With regard to the cost it may be stated that 11,000*l.* have been already laid out, and at least another 6,000*l.* are wanted to complete the work. Indeed, it is not unlikely that the gross expenditure will reach 20,000*l.*, as a new organ and other additions will probably be necessary. Mr. Walter Scott, of Newcastle, has had charge of the workmanship, while the clerk of the works has been Mr. James Yeoman.

Poplar.—The new chancel of St. Matthias's Church, Poplar, was consecrated on the 21st ult. In 1866 a new district, with a population of 4,500, was formed in Poplar, and the old East India Chapel (built in 1654) was repaired, altered, and enlarged, so as to serve as the district church. On account of the continued growth of the congregation it was last year found necessary to enlarge the church by the addition of a chancel, by which means 150 extra seats are obtained, making the total number of sittings 970. The new chancel has been erected by Mr. J. Kemp Coleman, builder, of High-street, Poplar, from plans by Mr. E. Evans Cronk, architect, Cockspur-street.

Corringham.—Corringham Church, near Romford, has been re-opened, after repairs. The roof of the north aisle has been entirely renewed, and the ceiling of the nave is of match-boarding. The work has been carried out by Mr. Thomas Gregory, builder, of Clapham Junction, in accordance with designs by Mr. W. White, F.S.A.

Twickenham.—The new church of St. Stephen, Twickenham, was consecrated on December 1st. The first stone was laid on September 28th, 1874, by the Princess Mary Adelaide (Duchess of Teck). The work was delayed until the spring, when Mr. Shepherd, the contractor, under the superintendence of Messrs. Lockwood & Mawson, of Lincoln's-inn-fields, the architects, commenced operations. That part of the church which is erected consists of a nave and two aisles, with a temporary east-end wall. The building is of white brick, with an external face of Kentish rag stone, lined with Suffolk bricks, and with Bath stone dressings. Sittings are provided for 500 people.

A Fine Pollard Oak.—One of the finest specimens of pollard oak ever grown in England was sold the other day in Liverpool. Its trunk was 14 ft. in length and 21 ft. in circumference; its actual weight, inclusive of the root, being thirteen tons. This tree, which was grown near Chipping Norton, in Oxfordshire, is to be used for furniture. It was opened at the Brunswick Saw Mills, Liverpool, and presented a rich brown appearance, resembling in every respect tortoise-shell, and being perfectly free from shake. The tree is calculated to produce 70,000 ft. of veneers, their value being estimated at 500 guineas.

INUNDATIONS, AND THE MEANS OF PREVENTION.*

CAUSES.

AT the least ten different causes, direct or indirect, and acting individually or collectively according to the locality, have to be provided against as regards their results.

1. *Heavy and continued Rains in the River Basin, generally the upper Portions.*—This is a common and obvious cause of inundation. All the great inundations on record have been preceded by three or four days' continuous rain. This fact shows how large is the area over which atmospheric condensation takes place, supplying clouds, following each other in rapid succession, and sufficient in extent to cover the menaced basin uninterruptedly for several days.

2. *Falls of Snow.*—A common and immediate cause of freshets in the neighbourhood of mountain ranges or snow-clad peaks.

3. *Simultaneous Concurrence of Freshets from several Affluents.*—This is a source of great danger, more so than the other two causes just specified, as these are of more common occurrence, and consequently the bed of the stream is better prepared for them.

4. *Impermeability of the Stream's Bed.*—A not unimportant cause.

5. *Declivity of Surface about the upper Portion of the Stream.*—Rain, however continuous, falling on a plain, works its way slowly to the lines of water-course, distributing its power, so to speak, over the whole surface. Falling upon steep slopes, like the watersheds of the Pyrenees, the Haute-Loire, &c., it produces an immediate torrent-like rush of the water to the lower levels, resulting in a more or less instantaneous inundation of the plain.

6. *Encroachment of Riverine Constructions and of the Banks upon the Streams.*—This is one of the principal causes, and requires most consideration. In nearly all towns and cities the confinement of the stream resulting from the erection of wharfs and quays is a source of danger, which can only be averted by the construction outside the town of channels for diverting some of the water.

7. *Insufficient Water-way, and inadequate Height of Bridges.*—Some bridges, old-fashioned stone bridges more especially, are veritable dams. Their powers of resistance are oftentimes very remarkable, as in the case of the old bridge at Toulouse. But the sudden arrest of the current so produced is a palpable source of danger. Stone bridges *with small arches* should be proscribed in such situations. The most suitable erections are wrought or cast-iron bridges of the largest span practicable.

8. *Sharp Bends in the Stream.*—These often produce dangerous rises of the water. The comparatively still water above the elbow acts as a sort of dam to a rush of descending water, causing it frequently to rise many feet above the surface level of the stream.

9. *Friction of the Water against the Bed and Sides.*—Some streams have smooth beds offering no impediments to the transit of the water; others are encumbered with rocks, stones, water-plants, &c., which reduce the sectional area of the stream, leaving only a narrow tortuous channel for the water. This retardation of the water may cause certain portions of the stream to overflow the banks; on the other hand, it may prevent the water accumulating with dangerous rapidity further down stream.

10. *Destruction of Timber.*—This has often been regarded as the prominent cause of modern inundations. No doubt, trees and herbage prevent the rain-water finding its way to the water-courses as rapidly and directly as it would over bare ground. But history shows us, too, that in the days of the Romans, many parts of the country then clothed with forests, notably Gaul and the Maritime Alps, were visited with inundations as formidable as those of recent date. It is not meant here to deny the utility of re-wooding, but simply to point out that it is not the unique and unfailing specific that it sometimes has been represented.

MEANS OF PREVENTION.

Having enumerated the principal causes, it now remains to pass in review the several means of preventing inundations hitherto adopted or proposed.

1. *Longitudinal Embankments.*—This method, the simplest of all, has been in use from time immemorial as a preventive of inundations. Unfortunately, as a rule each proprietor has thought but of his own safety, irrespective of that of his neighbours; riverine proprietors, too, are loth to spare the smallest scrap of their ground for the general weal, or to renounce any of their rights over such portions of the foreshore as may be cultivated or built upon in the interval between the recurrence of two *great* inundations. The result is that almost everywhere the embankments and wharfages are too close together, and trench far too much upon the *lesser bed* of the stream. Hence it follows that embankments, in place of being a remedy against, are actually a source of danger, which explains the virulence of the opponents of the system of embanking, who have not troubled themselves to inquire whether the principle has been rightly or wrongly applied in each case. It is therefore necessary to raise the height of the embankments from year to year, so that in old towns, the present level of the quays and roadways is 15 ft. to 20 ft. above that of the Roman remains or even of the twelfth and thirteenth century constructions, owing to the successive increments of height rendered necessary by the continual rise in the bed and level of the stream. And not only does this narrowing of the stream by embanking raise the level of the water, but by checking the current in parts it encourages the deposit of silt and gravel, which, in their turn, get carried down to the narrowest parts. The further we get down stream the more surely these deposits are found. These natural consequences of misplaced and encroaching embankments have led to the superficial conclusion that in the long run the water always surmounts the embankment, and that the latter is, at the best, but a costly palliative. This is going too far. Embankments should be used; but they should be sufficiently far apart to leave a *major bed* for the river between them, of dimensions sufficient to admit of the flow of a determinate volume of water moving with greater or less velocity. For ages Lombardy has been saved from inundations by longitudinal embankments. In every case, a sufficient width has been left between the opposing embankments, and they have never failed of their object.

The Po, a much less dangerous stream than the Loire, has a *major bed* of 1½ to 3 English miles wide, and some of its Alpine affluents have widths of 600 yards to 900 yards between their embankments; the Sesia, 540 yards; the Trebbia, 550 yards; and the Taro and Enza, 900 yards.

2. *Transverse Embankments.*—These should be combined with the foregoing, so as to form reservoirs of suitable capacity along the course of the stream in which the flood waters may be received and slowly discharged. The positions of these basins must, of course, depend upon the configuration of the ground. The land so enclosed need not lie idle. The silt left by the water is a good fertiliser, and the ground will only be submerged at intervals more or less distant.

3. *Self-acting Dams.*—But besides longitudinal and transverse embankments to keep the waters within certain bounds and to moderate the rate of flow, it is also necessary in dealing with large volumes of water to have means of controlling the level at will. For this purpose it will be necessary to establish an economical system of self-acting dams by which the level of the water may be raised or lowered as required.

4. *Organisation of a System of Telegraphic Warnings along the Valleys of the principal Streams in Times of Flood.*

5. *Widening of Bridges; Setting back of Wharfages.*

6. *Formation of Supplementary Channels.*

7. *Preservation of Bends and Hollows.*—One of the commonest faults in what is called the "improvement" of streams is the wish to shorten the distance from point to point by substituting straight cuts for the sinuosities produced in the course of ages by the geological and topographical features of the ground. A fundamental rule of hydrology is that in works of this kind the proper equilibrium must always be maintained between the weight of water, its velocity, and the friction it exerts against the wet surface of its bed.

8. *Building in Piles or Arches.*—This natural method of protection may be employed for erections of all kinds on land subject to occasional or periodical inundations.

9. *Dredging* is generally carried out upon too limited a scale to be of much utility. It may prove useful in removing local obstacles, and so preventing partial inundations.

10. *Planting.*—Although, as before remarked, it is not a radical and direct remedy for inundations and the evils thence resulting, it is nevertheless of great utility both in a hydrological and an agricultural point of view. Turfing the sides of the mountains with terraced slopes, on the plan described by Polonceau, is always to be recommended.

* By M. Oppermann: translated from the *Technologiste*, October, 1875.

PROTECTION FROM FIRE.

THE Metropolitan Water Act of 1871 authorised the Metropolitan Board of Works to provide hydrants in connexion with the Water Companies' pipes for the supply of water in case of fire.

The Honourable Society of the Inner Temple have taken the first step in this direction, and, acting on the advice of their surveyor, Mr. Arthur Cates, they have laid down throughout their extensive property a new series of water mains, with a complete system of hydrants, from which every portion of their buildings can be effectually commanded,—the object to be attained being to secure the power of effectually attacking any fire immediately on its outbreak, without waiting for the attendance of the fire brigade. Of course, a constant supply of water with a sufficient pressure is essential, and in this instance the mains are connected with those of the New River Company in Fleet-street and Whitefriars, and the arrangements have been made in concert with that company, who now give a constant supply under pressure.

On the 21st ult. the works were tested with highly satisfactory results, the hose being fixed to the hydrants or stand-posts by the Society's own servants, powerful jets of water, which were thrown over the highest buildings, being at once obtained, the result showing that in case of outbreak of fire it could be at once attacked by the officials resident upon the spot, and with such force of water as probably to ensure success.

The mains and hydrants were fixed by Messrs. Beard, Dent, & Hellyer, of Newcastle-street, Strand, and the Benchers of the Inn may be congratulated on having been the first to apply the wise provision of the Legislature, and thus furnishing means of protection from fire which should exist in every street of the metropolis.

WHO'S IN FAULT, BUILDER OR PARISH SURVEYOR?

SIR,—Knowing your willingness to expose or remove all inconvenience to the travelling public, I beg to call your attention to certain buildings in Chapel-street, Edgware-road, where the builder has occupied three-parts of the pathway with his hoarding, and only left 3 ft. for the thousands of passengers passing to and from the railway, as well as the general public. Here, without any rail or footboard, hundreds of passengers are compelled to walk in the muddy road, exposing themselves to the danger of being run over by the numerous cabs and carts passing all day long. This has been the case for many weeks, and are we to suffer from this gross neglect until some of us are run over and killed? As I believe it is against the law, I trust you will be pleased to expose this.

A WORKING MAN.

APPOINTMENT OF ARCHITECTS TO SCHOOL BOARDS.

MR. J. B. PEARCE, of Norwich, has been appointed architect to the Birmingham United District School Board, and also to Bramerton and Kirby Bedon School Board.

Mr. W. H. Powell, of Mecklenburgh-square, has been appointed architect to the Dartford School Board.

At a meeting of the Newchurch School Board, held on the 16th ult., at Bacup, the secretary read applications from the following for the appointment of architect to the School Board:—Mr. J. H. Hargreaves, of Rawtenstall; Messrs. Maxwell & Tuke, Bury; Mr. Clifton H. Whittenburg, King-street, Manchester; Mr. Harry Percival, Newchurch; Messrs. Hitchon & Bell, Burnley; Messrs. Andrew Wilson, Son, & Aldwinckle, London; and Mr. John Sutcliffe, Bacup. Mr. Nichols remarked that the applicants had said nothing about the terms.—The chairman said that the usual charge was 5 per cent.—Mr. Nicholls did not think it was so. He believed that some *architects made it a rule to charge less for schools than for other buildings.*—Mr. Howarth asked if it were advisable to limit the appointment to local applicants, as had been suggested?—The Chairman thought that London was out of the question on account of the distance.—Mr. Howarth thought that Manchester was too far.—

Mr. Perkins thought their local men were likely to give most attention to the work, as they would be on the spot constantly. On the motion of Mr. Howarth, seconded by Mr. Aitken, it was resolved that the candidates be reduced to the four local gentlemen.—The candidates were then balloted for, and Messrs. Hitchon & Bell were declared to have been duly elected, the voting being as follows:—Messrs. Hitchon & Bell, 5; Mr. Percival, 4.

GREENSTED CHURCH.

SIR,—This ancient wooden edifice, as seen from the south, and, as restored, is engraved in the *Builder*, No. 318, where it is stated, upon the authority of Bede, that, formerly, all churches in England were wooden, and that at York and Salisbury the earliest churches were wooden. Now, I believe that the only British specimen is at Greensted, near Ongar, in Essex, interesting by reason "of the material of which it is constructed, from its undoubted antiquity, and from the strong evidence that exists of its having been originally built as a place for the reception of the corpse of St. Edmund, which, on its return from London to Bury St. Edmunds, A.D. 1013, was, as Lydgate, a monk of that monastery (St. Edmund's), informs us, conveyed in a chest or feretory." This king began to reign in East Anglia, A.D. 855. He was crowned the following year at Bury, and is believed to have been killed in battle, A.D. 870. Camden states (1602), Greensted Church is "a very uncommon ancient buiding,"—and,—"the tradition of the place is that a dead king rested in it." The ancient road from Bury to London passed through Greensted, so this fabric might have been erected as a temporary shrine for the reception of the royal corpse, and then used as a parish church, which "derived light from three dormer windows of most domestic appearance; and an open wooden porch, without style or beauty, gave access to the church on the south side by means of a very low door." Camden stated the size of the wooden church was 29 ft. 9 in. by 14 ft.; the height, 5 ft. The walls were constructed of oak split in two, let into a sill and plate; smooth, and the interior, flat. The upright planks,—twenty-five on the north and twenty-one on the south side,—"were tongued together at the junction with oak strips," so as to keep out rain effectually. This author, Camden, also described "a wooden porch, the roof of a later date, and tiled," on the south side. This old edifice is engraved in the Journal of the British Archæological Association, vol. v., p. 1, as the Shrine of St. Edmund, from a drawing by Mr. A. H. Burkitt, as it appeared in June, A.D. 1848, and whose remarks, pp. 1–6, merit perusal. He states that the woodwork was damaged by the insect, *ptinus pectinicornis*, which works during a brief period of the year laboriously. The north side, shown in this view, is stated to be "the only fair specimen of the old building." The entire length of the shrine was 29 ft. 9 in. broad; 14 ft. and 5 ft. 6 in. high at the sides. A.D. 1748, Mr. S. Letheuillier, F.S.A., published an engraving of this church, and a description of it is in "Vetusta Monumenta," when it was nearly complete. In Grose's "Antiquities of England" this church is mentioned as an interesting object. The *Saturday Magazine*, vol. i., p. 37, contains a view of this church as it appeared from the south, A.D. 1829, and which was taken from "Vetusta Monumenta" above mentioned, being the veritable "wooden chapel near Aungre." A ground-plan is appended to this view, which differs from that in the *Builder*, No. 318, as is apparent if the two views are compared with one another. The tourist desirous to see this relic should know that it is near Ongar, in Essex, accessible by railway, the church of which town is stated to be composed of Roman bricks. Four miles northward are the two churches of Willinghoe Doo and Spain,—in one churchyard, — engraved in the *Gentleman's Magazine* for June, 1822. See *Notes and Queries*, S. V., vol. ii. A pedestrian adopting my plan of viewing these buildings may return from Loughton to London by Chigwell and Woodford, viewing the churches of these places, and the site, &c., of Loughton Hall, burnt, &c., in 1836, through the ignition of a beam in a chimney, overlooked in restoring the mansion. The King's Head, Chigwell, is an ancient building, described in Mr. Forster's "Memoir of Mr. C. Dickens." The May-pole Inn is at Chigwell-row, one mile distant, and from this spot Knockholt Beeches, in Kent, may be discerned on a fine day. It is mentioned in the tale of "Barnaby Rudge." CHR. COOKE.

SCHOOL BOARD SCHOOLS.

Newcastle (Staffordshire).—The new Board schools which have been erected in the Ryecroft-road were formally handed over to the Board on the 22nd ult. The building (according to the *Staffordshire Advertiser*) has been erected at a less sum than any other Board school in England in proportion to the amount of accommodation afforded, its cost having been about 3,500*l*. The accommodation provided is for 840 children, in three departments—320 boys, 320 girls, and 200 infants. The boys' and girls' departments each consist of one large room, 57 ft. 6 in. by 22 ft., each having two double class-rooms, 14 ft. 6 in. by 22 ft. 6 in. The infants' school is 45 ft. by 22 ft., with a babies' room, 18 ft. by 18 ft., lighted by a south light, and a senior infants' class-room of the same size, lighted from the north. The roofs are open-timbered and varnished. The lighting is by square-headed windows, supplemented by lantern lights in the roof. The centre part of the roof forms a foul-air chamber, with trap-doors opening therein, to regulate the emission of foul air. The schools have cloak-rooms and lavatories, and large play-sheds, forming covered ways to the closets. The building is of white brick, with bands of various colours introduced. In the centre there is a bell and clock turret, about 60 ft. high. The design for the schools was by Messrs. Hay & Oliver, of London and Bath, architects, and was selected in open competition a year and a half ago.

Daresbury.—The School Board for the United District of Daresbury has accepted the tender of Mr. John Holland, of Northwich, for a new school to be erected at Preston-on-the-Hill, from the design of Mr. William Owen, of Warrington, architect. The works will be commenced in March next.

DISSENTING CHURCH-BUILDING NEWS.

Nantwich.—The Wesleyan chapel at Nantwich is about to be considerably enlarged, by bringing the façade some 11 ft. in advance of the old front. The architect, Mr. G. B. Ford, of Burslem, has adopted the Italian style for the new elevation, the windows having semicircular heads. The centre of the new front projects beyond the side portions. The entrance is by two bold twin doorways, with rounded lights over them, while above them, and lighting the new gallery, will be a three-light window of large dimensions. The whole front is to be built of pressed red brick, with a heavy plinth and facings of cream-coloured Hollington stone. The builder is Mr. Matthews, whose contract will amount to about 1,000*l*.

Painswick.—A Congregational church is about to be erected at the Uplands, Painswick. Mr. Tait, of Leicester, has received instructions to prepare the plans. The edifice will be in the Early English style, and is to cost about 2,000*l*.

West Thurrock.—The foundation-stone of a new Primitive Methodist chapel has been laid at West Thurrock, Essex. Mr. Gostling, of Gravesend, is the architect, and Mr. Pavitt, of Aveley, the builder. The amount of the contract is 300*l*.

Wellingborough.—A new Congregational Church was opened at Wellingborough on the 9th ult. The site of the new building, containing 2,437 square yards, is on the east side of High-street, bounded on the north by Salem-lane and on the south by a new street 30 ft. wide, the whole site having been obtained at a cost of about 1,200*l*. The plan of the building is egg-shaped, struck from four centres, the extreme length internally being 87 ft., and the width 70 ft., providing accommodation for about 800 persons on the ground floor and 400 in a gallery at the longer end. The ground-floor slopes 18 in. towards a semi-circular platform, which is 20 ft. in diameter and 21 in. high, and is placed at the smaller end of the chapel. On this platform is erected an oak pulpit 8 ft. in diameter. The walls of the building are 35 ft. high, with a flat panelled ceiling coved at the walls, terminating in an enriched moulding. The front porch is carried up with a steep gable, in which is placed a three-light traceried window. The porches, lobbies, corridors, and aisles are paved with Maw's encaustic tiles. The style of the building is Gothic, the walls being faced externally with rock-faced brown Duston stone, with hewn Duston stone buttresses, quoins, and machicolations; also Bath stone dressings and red Mansfield shafts to the columns. The stone carving is by Mr. Harry Hems, of Exeter. The entance-gates, five in number, are of wrought iron, by Mr. Reynolds, of Little Harrowden. The work has been carried out by Mr. John Boddington, from the designs and under the superintendence of Mr. Edward Sharman, architect, Wellingborough, at a cost of about 8,500*l*. Mr. Payne has acted as clerk of the works. The organ has cost 705*l*.

Lisburn.—A new Wesleyan Chapel for Lisburn has just been erected on a site (given by Sir Richard Wallace) at the end of Seymour-street, at the junction of the Belfast and Hilden roads, Lisburn. The main front is approached by a gradual incline, and a flight of steps leading to a large open vestibule, having bold, massive columns of County Down granite, the carved caps and other enrichments being of Dungannon stone. The vestibule is surmounted by an enriched cornice, over which there is a large circular stone window in the principal gable. The front is flanked by wings, which form gables at the sides. The church is 51 ft. long, 36 ft. wide, and 30 ft. high; and, with the end gallery, will accommodate over 400 persons. Advantage was taken of the slope of the ground to provide a large schoolroom below the church. The edifice was designed and built under the direction of Mr. William Gray, architect, Belfast. Messrs. Thompson, of Ballymacarrett, were the contractors. Messrs. Musgrave & Co. carried out the heating, and Mr. Carlile the gasfitting, the total cost being under 2,700*l*.

Thurso.—A new Congregational Chapel was opened at Thurso on the 9th ult. Mr. Matthews, of Aberdeen, was the architect, and the masonwork was executed by Mr. George Manson, builder, and the joiner-work by Mr. George Durran, house-carpenter. The total cost will be about 1,100*l*.

STAINED GLASS.

Edlesborough.—During the recent restoration of the chancel of St. Mary's Church, Edlesborough, on clearing down the north wall discovery was made of a two-light window, filled in with some beautiful thirteenth-century tracery; this window was entirely bedded in the wall, and it has now been opened out and thoroughly restored by the especial wish of Lord Brownlow, and filled in with stained glass by Mr. Bell, of London, the figure of St. John being represented in one light and that of St. Peter in the other. The three south windows have also been filled in with glass of a subdued tint, executed by Mr. Pepper.

Aldford.—At the Chester Consistory Court, on the 1st ult., the Chancellor of the Diocese decreed a faculty for the purpose of placing five stained-glass windows in the church of St. John the Baptist, and decorating the chancel ceiling. The cost of the work, upwards of 600*l*., will be borne by the Duke of Westminster, K.G. The architect is Mr. Douglas, of Chester, and the window artists Messrs. Heaton, Butler, & Bayne.

Oswestry.—Mr. J. R. Ormsby-Gore, M.P., has just placed in one of the windows at the east end of St. Oswald's Church a stained glass memorial window to his father and mother, the late Major William Ormsby-Gore, M.P., and Mrs. Ormsby-Gore. The subject is that of "The Four Evangelists," and the window is by Messrs. Ballantyne & Son, Edinburgh.

Weaverham (Cheshire).—In memory of the late Vicar of Weaverham, the Rev. C. Spencer Stanhope, a stained-glass window has been placed in the parish church, at the cost of the parishioners and friends, by Messrs. Edmundson & Son, of Manchester.

St. Leonard's Priory, Stamford.—The *Northampton Mercury* states that "the remains of the priory church of St. Leonard, on the Uffington-road, are becoming more and more dilapidated. During the last few weeks the outer facing of the wall immediately over the westernmost arch of the massive north arcade,—a work which has stood for more than 700 years,—has dropped away, leaving an ugly hollow several square yards in extent. What is left of the pile, where once the censer swung, and where dirges were chanted for the dead who lie buried about, forms so capacious a store-room for grain, that one would think it would be worth while to bestow upon the fabric a little timely attention, even should its claims as the oldest specimen of church architecture in Stamford be regarded as unworthy of respect."

Books Received.

Carpentry and Joinery for Amateurs: containing a full Description of the various Tools required; with practical Instruction for their Use. By the Author of "Turning for Amateurs," &c. London: The "Bazar" Office.

THIS book contains more, in one sense, than its unpretending title-page claims for it; as it gives very extended and full information not only as to the use of tools, but as to the principles and methods to be followed in the principal classes of operations included in joiners' work; perhaps in some instances going beyond what amateur workers are likely to undertake, though this does not make the book the less useful. The illustrations of tools and of the various ways of putting wood together are very well and clearly executed; and the writing generally is marked by clearness and terseness, without omitting anything essential. The writer looks at his subject from more than a merely practical point of view, as his remarks in regard to veneering show. In giving directions for this process, he comments on the difficulties in regard to fitting veneer to curved surfaces, for which special holdfasts or "cauls" have to be made, for keeping the veneer in its place until it binds properly; "and hence it is, among other causes, that we see so many repetitions of the same pattern issued from any particular shop, and such unwillingness to depart from them. There is far more freedom in this respect when veneer is not intended to be used." Outsiders, as he says, are not acquainted with the complication of the process of veneering in the case of articles that present any but the simplest forms; and any common-sense person reading for the first time even the brief instructions and description of the process given here for the use of amateurs, would probably feel a degree of wonder at the trouble that is taken to get over the difficulties which oppose the practice of a sham method, half the care and labour bestowed upon which would suffice to produce some really good and honest work of a high class, in perfectly good though less costly material than that generally used for veneering. In general, throughout the book, the best way of doing everything, in regard to the use of the material, is well brought out; the exception, as usual, being in the case where some form supposed by force of habit and fashion to be ornamental or artistic is to be illustrated, and then we have such things as the claw leg for a pillar-table (p. 121), or the spiral or scroll leg (p. 123); forms not only wretched in themselves as regards appearance, but such as no sensible workman in wood, if not under the influence of the demon "taste," would ever think of adopting. This is always the case, we find, in these practical books, whenever the writers travel out of the line of the practical into what they regard as the ornamental, in which they are governed, generally, by mere habit and bad precedent, without any consideration as to whether the forms portrayed really are consonant with the best way of working the material, or with the purpose for which the object is designed.

In every other respect this is an excellent and (for its object) remarkably full little treatise, which we have pleasure in recommending. Lapses of English are, we suppose, inevitable in books of this kind. We have not been looking for them; but our eye was caught (p. 60) by the heresy apparently universal among practical workmen of every grade, that "stand" is a transitive verb. "*Stand* up one of the ends in the vice," in preparation for glueing a box, and then "this end must be removed from the vice and *stood* on the bench," &c. Such vulgarisms should at least be avoided in print.

The Amateur House Carpenter: a Guide in Building, Making, and Repairing. By ELLIS A. DAVIDSON. With numerous Illustrations, drawn on Wood by the Author. Chapman & Hall. 1875.

THIS, in spite of the similarity of title, is not quite similar in scope to the above-mentioned book. It leans more towards the carpentry side of woodwork, as the other leans more towards that of joinery and cabinet-making. The usefulness of Mr. Davidson's book is chiefly as a guide, to enable boys and young men who want some healthful and useful recreation, or persons of any age thrown into a position in which they have to depend on their own resources a good deal (colonists, for instance, in only partially inhabited countries) to put together fixtures and small erections which may be wanted, and do repairs about the house, without necessarily calling in the aid of a professed joiner, if he be at hand, or feeling utterly lost without him, if he be not at hand. Books of this tendency deserve all encouragement, not only for their real usefulness in the latter case, but for their valuable tendency in the former case, in suggesting useful and sensible work "for idle hands to do," instead of the "mischief" which a certain personage is believed to be always ready to suggest for them. Regarded in this light, all the practical part of Mr. Davidson's book is well put, and, for practical purposes, sufficiently illustrated. Perhaps the volume would have served its purpose better if it had been a little smaller and more compact in form, and more condensed in matter. The author is a little too fond of making "pretty writing" out of his subjects, not always to the purpose, as people do not take up a book of this kind for light reading or recreation. When he diverges into ornamental work he is not much better than his fellows: "Baby's crib," for example (p. 162), is simply a piece of "gim-crack." Bad ornamental work is a great deal worse than none at all. With this reservation, which we cannot reconcile it to our conscience to omit, Mr. Davidson's book will be useful, more especially as he adds a chapter on "general principles of building" and one on "plans and working drawings," which extend the scope of the work to the general building operations with which all carpentry is connected.

VARIORUM.

"SPRAGUE'S Pocket Diary and Architects' and Surveyors' Memorandum Book for 1876" may be recommended. It gives room for daily engagements, and includes many useful tables and memoranda.——"The City Diary" is published as usual by Messrs. Collingridge. Each page is divided for a week.——Blackwood's 1876 Shilling Scribbling Diary is foolscap in size.

Miscellanea.

The Destruction of St. Antholin's Tower. The *Daily News*, of Dec. 25, in a leading article on the parochial charities of the City of London, says:—"The taking down of the stone tower which was the only remaining relic of the parish church of St. Antholin has raised some very justifiable protests against removing the architectural monuments of London. The church itself has been swept away, but the spire was left, and its prominent position in the new street to the Mansion House made it one of the ornaments of the City. It broke the heavy line of modern offices of which the new street consists, and, without occupying much valuable space, asserted for old London a place in the renovated City. The tower was one of Wren's best works, and its destruction not merely sweeps away a landmark, but obliterates a monument of genius. The process of removal is, however, rapidly going forward, and the corner will soon be occupied with a new shop or warehouse, which will yield a ground-rent to the Commissioners. The impossibility of doing without this rent in the notoriously impoverished condition of the Church in the most richly-endowed square mile in her whole territory is the only excuse for this act of barbarism. The City is full of ecclesiastical charities as useless as St. Antholin's tower, but not ornamental, and almost any one of them, reformed and redeemed from waste or abuse, would probably have compensated for the ground-rent lost by letting Wren's handiwork alone."

Chatham Dockyard Extension.—The excavations in progress at St. Mary's Island for the large fitting-out basin in connexion with the Chatham Dockyard Extension are well advanced, some 1,500 convicts being at work upon them daily, the work being carried on under the direction of Mr. E. A. Bernays, C.E. The basin now under construction will be the largest of the three that were ordered to be constructed, and it will cover about forty acres; the other two basins have been completed and in use some considerable time. Several new workshops and factories are to be constructed near these basins, and at the present time a party of convicts are putting up a large iron building, which will be used as a boiler shop; other buildings have already been constructed, and are filled with machinery.

A Churchwarden Imprisoned for effecting a Public Improvement.—Whatever may have been the deserts of those churchwardens of the past who, in their zeal for "repairing and beautifying," committed such irreparable havoc in the buildings of which they were the custodians, it will hardly be thought just to imprison a churchwarden of the present day simply because he has sought to improve the appearance of his churchyard. But, according to the *Norfolk News*, this has actually been done. It appears that some time ago the churchyard of St. Augustine's, Norwich, was in a disgracefully-neglected and dilapidated state, and funds were raised for its improvement, the Corporation subscribing 120*l*. While the works were in progress no objection was made on the part of the ecclesiastical authorities, but proceedings were subsequently taken against the churchwardens in the Episcopal Consistorial Court of Norwich, although the promoter of the proceedings (the Archdeacon of Norwich) admitted that a great public improvement had been effected. The case was decided adversely to the churchwardens, who were condemned to pay the costs, amounting to 21*l*. 2s. 6d. This they refused to do, and one of them (Mr. Gilbert) has been lodged in Norwich Gaol for "contumaciousness." The other warden appears to have evaded arrest by keeping "out of the way."

Dock Extension at Liverpool.—At a recent meeting of the Mersey Docks and Harbour Board, the Committee of Works recommended that the Board should proceed with the construction of a further section of the new works at the north end, authorised by the Mersey Dock (Liverpool Dock Extension Act, 1873). Mr. Hubback, in moving the confirmation of the recommendation, said as regards the hydraulic-lift dock, which is included in this section, the committee have paid special attention to this matter, and have concluded that such an appliance will greatly add to the convenience of the docks in this locality. It is designed with a view to lifting (upon a platform) clear out of the water, and within a few minutes, with perfect ease and safety, the largest class of vessels that enter the port. Messrs. Clarke & Stansfield, of Victoria-street, Westminster, are the designers of the lift-dock, which, though similar in principle to those already erected, is improved in detail by reason of suggestions and alterations submitted by the Board's own engineer, in consequence of the special features of Liverpool docks.

Proposed Stephenson Memorial Hall, Chesterfield.—About four years ago, the Chesterfield and Derbyshire Institute of Mining, Mechanical, and Civil Engineers (acting in concert with the local Mechanics' Institute) set on foot a movement for the erection of a building which should serve as a scientific and literary institute, and at the same time be an appropriate memorial of George Stephenson, to whom the town owes much of its present position and prosperity, and whose remains lie in its churchyard. Although cordially received, the proposal has for some reason or other lain in abeyance, but it has now been revived with a fair prospect of success. The estimated cost of the building is 10,000*l*., and of this sum about 5,000*l*. have already been subscribed. A site was offered for the building by the Corporation of Chesterfield, but the offer was declined, as the site was not thought to be in the best position that could be obtained; and consequently, of the 5,000*l*. subscribed, the sum of 1,500*l*. will have to be paid for the site which has been chosen.

Cottage Hospital at Forgue, Banffshire. There has just been erected in the parish of Forgue, in pursuance of the wishes of the late Mr. Morison, of Bognie, a neat cottage hospital for the benefit of patients resident in the parishes of Forgue, Ythanwells, Auchterless, and Inverkeithny. The building, which has a southerly exposure, consists of two cottages apart, connected together by a verandah 45 ft. in length, and the front elevation from cottage to cottage extends to 120 ft. The architect is Mr. Duncan, Turriff, and the contractors are Charles Ingram, mason, Huntly; James Copland, carpenter, Cobairdy; Alexander Walker, slater, Banff; John Gibson, plasterer, Turriff; and Messrs. W. & C. Duthie, plumbers, Turriff.

St. Thomas's Hospital, Northampton.—At the annual meeting of the Architectural Society for the Archdeaconries of Northampton and Oakham, held at Northampton, on the 13th ult., Sir Henry Dryden read a paper on St. Thomas's Hospital, Northampton.

The New Docks at Barrow.—Great damage has been done to the new docks now in course of construction at Barrow-in-Furness, by a slip of wall caused by the action of the recent heavy rains. The works were commenced two years ago. The entrance basin, 900 ft. long, and the lock, 600 ft. long, were first proceeded with, and were fast approaching completion. The quay wall, where the accident has happened, had a foundation of concrete, and the wall for 15 ft. above this was of the same material, the superstructure being of red sandstone and granite. The wall, 12 ft. thick, was nearly completed, only the top stones being required. The concrete as well as the superstructure has given way, and for about 400 ft. the summit of the wall has fallen back, while the base has bulged inwards, and in one place a complete breach of the wall has been made for about 40 ft. The result is that the whole of the damaged wall will have to be removed and rebuilt. The damage cannot be estimated at less than 20,000*l.* or 30,000*l.*

The Dolgelley Parliament House.—A movement has just been commenced at Dolgelley for the purchase and preservation of the ancient building known as the Parliament House of Owen Glen Dawer, although it has been questioned whether the existing building is in truth the building where the Welsh prince convened his national assembly. It appears that of late years the inhabitants of the quaint little town have made strenuous efforts in the direction of public "improvements," though much remains to be done in the way of sanitary reform. In the course of the alterations it became evident that if the rebuilding of the houses were to progress near the central thoroughfare the structure in question must be razed to the ground. The possibility of such destruction gave rise to considerable local excitement; and protests against the contemplated demolition resulted eventually in an influential public meeting.

Alexandra Palace.—The directors' report states that a profit of 23,624*l.* 18s. 4d. has been realised on the workings of the past six months, and it is expected that this will be greatly augmented as the Palace and its attractions become more widely known, and increased railway facilities are provided. It is hoped that ere long three more railway companies will open direct communication with the Palace, thus bringing visitors from far-outlying districts. The company also expects to increase the number of season-ticket holders, which already shows a steady advance, by selling the 260 acres of building-land adjoining the palace and park, thus creating a resident population, many of whom would doubtless avail themselves of the advantages of a season-ticket. The sale of this land, which, it is expected, will realise over 300,000*l.*, would also materially decrease the capital of the company.

St. Margaret's Church, Westminster.—A committee, consisting of the Duke of Buccleuch, Lord Hatherley, the Speaker of the House of Commons, the Dean of Westminster, Canon Conway, and several of the principal parishioners, has been formed for promoting the restoration of this church. The original church was founded by Edward the Confessor, contemporaneously with the Abbey, for the benefit of the inhabitants residing outside the monastic buildings. The present building was erected in the reign of Edward I., and was considerably altered in that of Edward IV. The sum required for the restoration is very considerable, and it is stated that the general arrangements will be under the direction of Sir Gilbert Scott.

Presentation to a Builder's Manager.—Mr. Thomas Bakewell, who has until recently managed the business of the late Mr. E. Dusautoy, builder and contractor, of Derby, has been presented with a clock by the *employés* of the firm. The clock is of black marble relieved by bronze ornaments, and surmounted with a bronze eagle with expanded wings, and bears the following inscription:—"Presented to Mr. Thomas Bakewell, as a mark of respect, by the *employés* of the late E. Dusautoy, Esq., upon the occasion of his leaving.—Derby, Nov., 1875."

The Spire of the Manchester New Town-hall.—On the 4th ult. the top-stone was placed upon the spire of the new Town-hall, Manchester, by Mr. Alderman Heywood, the chairman of the New Town-hall Sub-committee. The spire is 288 ft. high.

Greek Architects.—The epitaph by Dean Swift upon Sir John Vanbrugh is well known, namely:—

"Lie heavy on him, earth, for he
Laid many a heavy load on thee."

Lord Neaves, in his recent edition of "The Greek Anthology," observes, "This is nearly the counterpart of the following Greek epigram," viz.:—

"Hail, Mother Earth! lie light on him
Who rear'd no tomb on thee, nor gave
Œ igones his form was slim,
And light his weight on thee."

In an epigram by Ammianus, the following translation has been made by Merivale, viz.:—

"Light lie the earth,
Nor rear no tomb on thy clay,
That so the dogs may easier
Find their prey."

St. Mary's Mission Hall, Bury St. Edmunds.—The newly-erected mission-hall in Raingate-street, Bury, has been opened. The building has a front of red brick, with white dressings, and consists, on the ground-floor, of a hall, 60 ft. by 30 ft., with entrance-lobby, kitchen, and offices, and at one end there is a platform, 11 ft. by 4 ft. Above the hall is a school-room, with class-room attached, of corresponding dimensions; this is reached by two flights of stairs, one for boys, and one for girls. The roofs are of open wood-work. The clerk of the works was Mr. L. Jackaman; and the builder, Mr. Firman, both of Bury St. Edmunds.

The Swiss Gardens, New Shoreham.—A new entrance-lodge in the Swiss style has just been completed at these gardens. It is built wholly of wood, and at the north and south ends are lofty towers. The lodge has been built by Mr. Reid, of Brighton, from the designs and under the superintendence of Mr. Arthur Loader, architect. A series of improvements within the gardens is about to be commenced, the first undertaken being the extension of the ball-room, and the erection of a new front to it (of similar character to the new entrance-lodge), also designed by Mr. Arthur Loader.

New Chapel at Greenwich Union Workhouse.—The memorial stone of a new chapel, in the grounds of Greenwich workhouse, has been laid. The building is intended to seat 400 persons, according to the plans of Mr. Wallen, the Board's architect, the builder being Mr. Hart, of Dover-street, Borough, who is also the contractor for the new infirmary, which was commenced about three months ago, and is expected to be completed in March. The style of architecture is Gothic, with yellow brick, red bands, and Bath stone facings. The contract was taken for 2,250*l.*

The Royal Aquarium.—We are glad to hear that Mr. W. W. Robertson has purchased the Cruikshank Art Collection on the part of the Royal Aquarium and Summer and Winter Garden Society. The collection will be arranged under the personal superintendence of Mr. Cruikshank himself, and will be exhibited in the Art Galleries of the Society at the close of the first annual fine-art exhibition. About 1,500 paintings have been accepted for exhibition. Mr. Redgrave, R.A., Mr. Millais, R.A., Mr. Weekes, R.A., and Mr. Marks, A.R.A., are the "Hanging Committee."

Archæological Discovery in Wigtownshire.—New outhouses have recently been erected at the farmstead of Ervie, Kirkcolm, and the farmer and his men were engaged carting clay away from the vicinity of them, when one of the men came on what appeared to be a small trap-door under some flat stones. It was found to be the lid or cover of a "cist" or sepulchre, hewn out of the solid rock. The oaken cover was fitted neatly into a sort of groove cut out of the rock.

The Rating of Timber Ponds.—At the Jarrow Petty Sessions, on the 14th ult., Mr. John Carr, of the St. Lawrence Saw Mills, Newcastle, was summoned for non-payment of 4*l.* 16s. 3d., being the general district rate. The defendant had refused to pay rates, as he contended that the place where his timber lay was covered with water. For the plaintiffs it was pointed out that the timber-yard was only occasionally filled with water, according as the tide rose and went back. The Bench made an order for the amount claimed.

Society of Engineers.—On the 21st ult. the annual dinner in connexion with this society was held at the City Terminus Hotel, Cannon-street, under the presidency of Mr. J. H. Adams, C.E., of the North London Railway Company. About seventy gentlemen sat down to dinner.

"The Unmistakable True North Compass."—Most people know that the compasses usually sold do not point to the true North or South Pole of the earth, or agree with the positions represented upon maps, but are apt to disregard it, though the difference between the two is considerable, and may often be the cause of tourists losing their way. Symons's Patent True North Compass (sold by Mr. Casella) shows the true North, and so unmistakably as to render any description unnecessary. It is corrected for use in the United Kingdom, but can be adapted to any specified locality in any part of the world.

Charing Cross Railway Station.—At a meeting of the Metropolitan Board of Works on the 22nd ult., it was resolved to petition against the South Eastern Railway Company's Bill for taking some of the land in the new street from Charing-cross to the Victoria Embankment. It was stated that the plan of the railway company for the enlargement of their Charing-cross station would materially interfere with the new approach to the Embankment.

International Compstition at Antwerp. Baron Solvyns, the Belgian Minister resident in England, has forwarded to the Institute of British Architects particulars of a competition for two orphan asylums and an almshouse to be erected at Antwerp. Designs are to be sent in before the 1st of February, 1876. A few plans of the site and copies of the conditions have been received at the Institute.

Proposed New Baths for Rochester.—At their last meeting, the trustees of Watts's Charity arranged for the purchase, subject to the approval of the Charity Commissioners, of a vacant piece of land in Eastgate, on which to erect the proposed swimming-baths and washhouses in the city. The proposed site is one of the most central which could be chosen for the purpose.

New Masonic Hall at Morpeth.—On the 13th ult. a new public hall was opened at Morpeth. The building contains two public halls, each 66 ft. by 29 ft., that on the first floor having a gallery. There are also two dwelling-houses of two rooms each, and a lodge-room, 32 ft. by 18 ft., with an ante-room attached. The building has been erected by the Masonic Hall Company (Limited).

A Cottage Hospital for Andover.—Arrangements are in progress for the erection of a cottage hospital at Andover, the greater portion of the required funds having been subscribed. At a public meeting recently held in furtherance of the project, the plans of the proposed hospital were explained by Mr. White, the architect, and were approved, subject to some slight alteration.

A Pig's Bedroom.—At the petty sessions of Nenagh, on the 4th ult., in the course of the evidence given in an abusive language case, it appeared that both litigants, with their families, occupied the same house, and the quarrel between them had arisen from the disturbance of the sleep of one of the families by the snorting of a pig which slept under the bed occupied by the other!

The Excavations at Olympia.—A telegram has been received at Berlin, from Pyrgos, conveying the intelligence that the excavations at Olympia have been rewarded by the discovery of a valuable relic of Grecian art, the first object found on the spot consisting of a marble statue of Nike, a product, as appears from the well-preserved inscription, of the chisel of Pæonius, and presented as an offering from the Messenians of Naupactus.

New Baths for Attercliffe.—New baths are about to be erected at Attercliffe, Sheffield, at an estimated cost of 8,500*l.*, from plans prepared by Mr. Stovin, the assistant borough surveyor. The style of architecture will be Italian, and the accommodation to be provided comprises a first-class swimming-bath, 36 ft. long by 20 ft. wide; a second-class bath, 63 ft. by 34 ft.; and a large number of private baths of various kinds.

Proposed Public Hall at Dunfermline.—A company has been formed at Dunfermline for the erection of a new public hall. It is proposed to have two halls,—one to accommodate 1,500, the other to hold 400,—in all 1,900. The estimated cost of the building is 6,000*l.* The hall is proposed to be erected in St. Margaret-street, on a site which will give three frontages.

The Builder.

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Houses in Flats for London.

NOT improbably the question of the arrangement of London habitations in separate stories under the same roof, on somewhat the same principle as that so largely exemplified in Paris and, on a somewhat different method, in Edinburgh, will presently come to be seriously entertained as a means of better meeting the wants of an increasing metropolitan population. There is the old theory, no doubt, that the Englishman's house is his castle, still stopping the way to the adoption of this principle of building; and it may be at once conceded that the sentiment of independence and of personal responsibility, which is so marked a feature in the character of the Englishman at home, is better met, and better expressed architecturally, by the separate residence than by the "flat" system; and this same characteristic is far too valuable, especially at a time when individual character is more and more in danger of being merged and lost in the complicated social machinery of modern life, for us to afford to accept inconsiderately any mode of living which may seem to tend towards its further effacement. There is the fact, however, that the system of "flats" is being talked of, and when a thing gets talked of in England that is the most decisive step towards the adoption of it as a fashion, or at least towards the removal of the prejudice against it as "unusual," which is always with us one of the greatest drawbacks to the realisation of whatever schemes are proposed from time to time for our individual or social benefit. A word therefore as to the advantages of the system, and the manner in which it can best be adapted to English habits and requirements, may be in season just now, more especially as the attention of our readers has been called to it recently by Mr. W. H. White's able and very complete papers on the system as carried out in Paris, where he had opportunities of becoming thoroughly acquainted with it.*

A word, we say, on the "advantages" of the system; because its disadvantages, from an English point of view, are too obvious to need comment. We may assume at once that in this country no one who could afford a good house of his own in a good quarter would ever wish to occupy a story of a large building including several other families similarly occupying other stories under the same roof, and with a common entrance. No doubt prejudice has a good deal to do with this. The only experiments on a large scale for housing separate families under one roof in this way have been those made in the shape of "model dwellings" for the "working-classes"; for the large blocks of chambers which exist in the neighbourhood of Westminster and Victoria-street are only partly intended or used as family residences. Independently of this, there is, as Mr. White observed, a tacit feeling that a division by vertical walls affords a much more independent and separate dwelling than a division by horizontal floors, and thus many people who have no objection to live in a mere strip of building disposed vertically, with similar strips on each side of it, would have an innate repugnance to inhabit a strip of precisely similar cubic dimension placed horizontally, and with similar strips above and below it, though the latter would in most cases be by far the more convenient residence to move about in. In the one case there are walls between them and their neighbours, in the other case only floors; the usual arrangement secures to each inhabitant his separate entrance-door and staircase; in the flat system the street entrance and main staircase are necessarily common to the occupants of different flats. This latter consideration is probably the most decisive with the average English tenant, who cannot bear the idea of exchanging his home life for anything approaching to what may be called hotel life; but the first consideration has also its weight, and however disagreeable it is to hear your neighbour's family festivities or family dissensions through an upright wall, it is considered much worse to hear them through a horizontal floor.

This latter *désagrément*, however, is partly, of course, to be attributed to the comparatively slight and sound-conducting construction of floors in English houses, which makes the ordinary lodging-house floor such a weak defence against the neighbours over-head. This may be readily obviated, at no very material increase of expenditure, by making the floors of as solid construction as the walls; and thus the fireproof construction of iron and concrete which was forced on the architect of the Paris *maison à loyer* by a unanimous and suicidal strike of the carpenters, would be forced on the London architect of a similar house by the equally unanimous demand of the tenant for the most complete isolation that could be obtained. Indeed, this condition may be at once accepted as a *sine quâ non* in the construction of houses in flats. Supposing the isolation of each tenement thus realised, so far as the effectual shutting out of alien sounds is concerned, the other drawbacks to the system in English eyes are rather sentimental and social than practical, and may be passed over for the moment, while we endeavour to specify some advantages of the flat system to tenant, landlord, and the public at large.

The flat system recommends itself especially to a very large, and we may add in the main a very meritorious, section of society,—those, namely, who, with incomes rather below the average of their class, are desirous nevertheless honestly to live in that neighbourhood, and with that degree of elegance or dignity in their abode and its surroundings to which their inherited social tastes entitle them. This kind of feeling is quite distinct from that desire for show and pretence of "style" which has been so often and justly satirised. On the contrary, the desire for as good and attractive a home as can be attained, the wish "to have things nice about one," is one of the evidences of a refined and cultivated nature, and one of the principal feelings which tend to keep up and to raise higher the standard of civilisation in every-day life. Now the family of small means, but with this kind of (as we hold it to be) healthy aspiration in regard to its mode and place of living, is at present ordinarily compelled to inhabit a slice in one of those rows of small suburban street houses, with bay-windows repeated in "damnable iteration" as far as the eye can conveniently see. These, it is needless to add, are all the work of speculating builders, flimsily and cheaply built, of bad materials, and too often almost criminally deficient in sanitary arrangements. No order of human habitation, except, perhaps, the Irish hovel or shieling, is more utterly at variance with any desire for dignity, comfort, and interest in their daily lives on the part of its occupiers. A country cottage by the roadside is a far more interesting and desirable abode from an æsthetic point of view, though it may not so readily afford the compensating relief of shortening the lives of its inhabitants, in which the Town abode of the class named is perhaps pre-eminent. But the provision of houses built in flats,—and by this we do not imply immense hotel-looking blocks of buildings, with innumerable stories, but houses of an average size, so built and arranged as to accommodate a separate family conveniently and privately on each separate floor,—would afford to those whose tastes in regard to neighbourhood and style of living are, in the present order of things, above their means, the opportunity of living in a better neighbourhood, and in a much better-built house, at the same rate of living required to taste the blessings of a life in No. 201½, or whatever it may be, of the row of bay-windowed "desirable residences." A separate house, of the right size to accommodate a small family with a small income, cannot be built in what are considered either the best or the second best streets, except at a dead loss to the owner, the cost or ground-rent of land being proportionately higher, without taking into account the fact that the laws both of social custom and architectural effect, as well as (in many cases) the hardly more stringent law of "building conditions," forbid the erection of houses greatly at variance, in size and scale, from those prevalent in a given street or district. But the house in flats, on somewhat the same model as the Paris *maison à loyer*, and the Edinburgh house of a similar description, can form, in its outer aspect, a perfectly harmonious and suitable addition to the street architecture of the neighbourhood (without, of course, disguising its real character), while in its internal plan and arrangement it provides for the wants of families who find the neighbourhood in every way suitable to them in regard to

* See vol. xxxiii., pp. 1100, 1131, 1147.

social and æsthetic taste; but who either do not require or do not find it convenient to take possession of a whole house of the scale of those around. So far as the tenant is concerned, therefore, the house in flats may be taken to supply a social and æsthetic demand. The class of tenants we refer to can get a house of the size and accommodation he requires in the speculating builders' districts; but he will have to put up with living where he does not wish to live, and with inhabiting a badly built, ill-drained, rickety dwelling, in a neighbourhood of the most depressing dulness of aspect and character that is conceivable. But if we look at the system from the opposite or landlord's point of view, there is something to be said for it on that side on the score of economy in outlay, and adequate or (which is the same thing) speedy return. A house capable of being let to three or four families at a small rent from each, would often, we can hardly doubt, if once the English prejudice against such an arrangement is overcome, be speedily let at remunerative rents, where a single house of the same size might remain long untenanted. On the other hand, the owner or occupier of building-land in the districts where the row of bay-windows usually predominates, would of course get a better return for his outlay if he could build three or four houses, one over another, on the ground now occupied by, say two of the ordinary tenements, with a good prospect of letting them. Such a prospect, again, depends of course on the view with which the public from among whom the tenants come would regard the system. We should think it, for some time to come at any rate, a much more problematical venture in regard to a third class than to first and second class neighbourhoods, because here the houses in flats are supposed to be erected on the same site as the single houses which they supplant; that is to say, they do not offer any inducement in the way of a better neighbourhood to the tenants, nor do the tenants look for anything of the kind. Their wants, as far as they understand them, are supplied by the ordinary 40*l.* or 50*l.* builder's street-house; and to prove that they would have better chances of comfort and health in a story of a well-built house in flats at the same rent, would be a very long business indeed; though it is almost certain this would be the case, because the house in flats, being an erection of a larger and better kind, almost necessitates better building and more careful planning and sanitary arrangements, while the proportion between the ordinary cost of land and materials and the rent returns would probably be such as to leave a larger margin for expenditure on good workmanship than is the case with the ordinary separate house of this class.

Still, there is not the same inducement for tenants of this class to look with favour on houses in flats. The application of the system to a third-class* neighbourhood, in fact, merely means arranging residences of the ordinary size and rental required by that neighbourhood in groups instead of in separate houses; and those who have to inhabit them are probably just the people to stick by the notion of an Englishman's house (even a jerry-built one) being his castle, and to think that they are being insulted and levelled with the "working classes" by being asked to live in "flats." At the same time, we do definitely think that they could be supplied with better built and healthier houses at the same rent by this system than by the present one; and if that can be proved, the common-sense of English people would probably in the end be found on the side of such a system. The application of the flat system to a first and second-class neighbourhood, on the contrary, means the division of the ordinary size of residence of the neighbourhood into several separate residences, to suit those whose proper place socially is in such a neighbourhood, but whose means or requirements are below the prevalent size of dwelling. These classes are much more likely to consider sensibly, and without prejudice, the advantage of such an arrangement, which to them would moreover be much more of a real advantage, and would, as it appears to us, afford opportunities of getting into their natural and suitable geographical place of abode, without ruinous expenditure, to those whose inherited birthright or intellectually-acquired pre-eminence gives them claim to a status to which their means are but ill-proportioned, and who (the former class especially, but the latter also to a considerable extent) form, as every one knows, no unimportant contingent of even the "best" London society.

And now a few words as to the possible application of the flat system in London, considered from its social, constructional, and architectural points of view respectively. In regard to the first and certainly the most serious and important point, we have already stated what we believe to be the main advantage which the system would offer to dwellers in London. In considering this we have been careful to point out that what we contemplate is not the erection of vast hotel-like edifices in which all character of "home" is destroyed,—at least, not mainly this, though such buildings may possibly have their value in certain places,—but simply the arrangement of buildings in harmony architecturally with the ordinary class of houses in the best streets, but with stories contrived as separate dwellings. We the rather draw attention to this, because the *Saturday Review*, in an article on "Houses *in* Flats," in the number for October 23 last year (on which we have a word to say just now), made the mistake of considering the subject (in reference to a special specimen) almost entirely in this light, and quite overlooked the perfectly different class of building, corresponding to the Paris *maison à loyer*, which it is the aim of some of those who have considered the subject to see introduced among us, and which would be far more homelike and attractive, and of far more use to society in this country, than the establishment of great blocks of building, only differing from hotels in the more permanent occupation of their suites of rooms; and which, however well they may do as "chambers" for single gentlemen or ladies, or men of business, would, we say it without fear of contradiction, never be accepted as a fortunate or suitable way of providing for English family life, unless all our social instincts and feelings are to be altered in a direction which would lead us towards the American hotel system,—from which Heaven preserve us! What we are contemplating is the same kind of provision for families which already exists in London for unmarried people, under the name of "chambers." This latter species of accommodation is probably better provided for and better carried out in London than almost anywhere else. The application of a similar system for the housing of families has, on the contrary, scarcely been tried at all, though it has been long a habitual and recognised system in Paris and Edinburgh. Neither an Edinburgh nor a Paris house, however, would altogether do for transplantation to London. In regard to the Paris house, by far the best planned and most systematically contrived abode of the kind for the requirements of its particular society, not only would the well-known differences in the usual domestic arrangement of a French and English family house necessitate a great difference in planning, but there are objections to the working of the flat system on the Paris plan which would certainly be considered very serious with us. The most important of these is perhaps the manner in which the servants of all the families inhabiting the same house are lodged together in the upper or mansard story, with a separate entrance from the street, and thus entirely apart from all supervision from their employers except when actually on duty. The immorality admitted to be notorious among this class in Paris it is not surprising to hear of under such an arrangement; but an almost equally serious objection to English minds would be the scandal and tittle-tattle which go on continually between servants of different families as to the doings of their several employers, for which the opportunities would thus be multiplied fifty-fold, and which would render all real privacy as to its own concerns an absolute impossibility for any family inhabiting such a house. We may take it for granted that no scheme will be adopted by the English public which does not provide for including "the servants" as part of their own household inhabiting each flat; and that not only for the reasons above hinted at, but for the more honourable motive arising from the principle, which is we believe slowly beginning to permeate English society, that domestic servants ought not to be regarded as mere machines hired to do certain work, but as a portion of the household to which they belong,—as fellow creatures whose interests, mental and material, should be cared for by those with whom they are domiciled. The provision of a separate servants' staircase with a servants' entrance on each flat would of course somewhat complicate the planning, but in houses on a tolerably large scale it could very well be managed; only it should be so placed as to be in the way of being a good deal overlooked by the residents, and not in a too removed and out-of-the-way corner, otherwise the facility for gossip, &c., would be almost as great as in the Parisian system.

In smaller buildings, perhaps a separate servants' entrance from the main staircase would meet the case, and the staircase would then be practically in the position of a part of the common street, extended into the building. This is what the staircase,—the "scale-stair," as it is or used to be called,—in a large proportion of the Edinburgh houses really is; the street-door standing open during the day, or being capable of being opened from the landing on any floor, when the corresponding street-bell is rung. And it has also, as some one remarked in the discussion which followed the reading of Mr. White's paper at the Association, a common property with the street, of being always dirty,—an old charge, referred to more than once in the Waverley novels. A building of this description, in fact, can hardly be kept properly in order without a resident keeper,—the *concierge* of the French houses, who is supposed to be another and very serious stumbling-block to the acceptance of the system in England. The Paris *concierge* is said to be a thorn in the side of society; a domestic spy, a collector and retailer of scandal, a man ready to speak or to hold his tongue only at the instance of bribes from the various residents. But if this is so, does it follow that the porter or doorkeeper in England should be so objectionable as the *concierge* in France? Does not the evil rather rise from social and political tendencies in French society than from anything inherent in the nature of the position? We can see little reason why the doorkeeper in a "flat" house should be any worse, or more objectionable a person, than the "porter" at a club. And if these two objections,—the housing of the servants and the espionage of the *concierge*,—are obviated, there remains only the objection of having a broad, spacious, and well-arranged staircase (and that is a *sine quâ non*) in common between yourselves and your neighbours, in having to meet the next-door neighbour on stone steps as well as on the flags outside. And that surely is not an insurmountable obstacle even to English prejudices (if we are to call them so) about "home."

The influence of any extensive adoption of the flat system on the construction of houses is almost certain to be for good. In the first place the fireproof and soundproof construction of the horizontal as well as of the vertical divisions of the interior is a *sine quâ non*, and must lead to a more solid and durable style of construction than is prevalent in the modern London house at present. The necessity of a superior and solidly built principal staircase would be another influence in the same direction. Then the greater difficulty of the problem of planning and arrangement in such houses, both as to convenience and architectural treatment, will almost necessitate the employment of a mind superior to that of the speculating builder, and might even go far towards getting ordinary town house-building out of the hands of the speculator, and into those of the architect. This, however, is not the view taken by our instructor in the *Saturday Review* aforesaid, who indulges in the sort of charge against the profession with which we are all familiar, and which we must expect to find repeated as long as the editors of literary journals are so ignorant and indifferent on architectural subjects that they are content to give *carte blanche* to any contributor with a "lively pen" to lay down the law and to make whatever statements he may please upon a subject on which he has probably no knowledge or experience whatever. This is a slice of the *Saturday Review* wisdom on the topic:—

> "No two sets of apartments (in a block of 'flat' houses) should be exactly alike, and the architect should not be allowed to settle where the windows are to go till he has designed the inside of the rooms. Uniformity ought to be a matter of no account, and it should not be deemed indispensable for a room to have four corners, each a right angle. . . . . But we may venture to say that the British architect, should a demand arise for flats, with his usual disregard as to who is to live in the places he designs, will make them all exactly alike," &c.

A writer who has no clearer notion of the architectural process of designing a house than is implied by the silly remark about the windows not being settled till the inside of the rooms is designed (as if any architect worth the name ever designed the interior and exterior of his building separately), is probably out of the reach

* We use this general term, the meaning of which will be well understood by most of our readers, rather than adopt the invidious alternative of naming specific districts as examples.

of argument or explanation; and when we find the whole article is *apropos* of an experiment in "flat" building carried out by an amateur architect, and marked by all the irregularities mentioned in the quotation, and which has become, we fear, a permanent blot on the architectural character of the neighbourhood in which it has been erected, it is easy to estimate the real meaning (and value) of the sneer at the professional architect. We may just remind the writer of what he has found it convenient to forget, that scarcely any of the street habitations of modern London are the work of architects at all; and that of the Paris houses in flats, which, except in regard to certain social unsuitabilities of arrangement, are admitted to be almost models in plan and architectural treatment, we know that they are *all built under the supervision of architects.*

As to the influence of the flat system on the architectural character and capabilities of the average-sized house, we can have little doubt, again, that it would be for good, and would present opportunities for improvement on the regulation type of street house, though it probably would be (and, most suitably, ought to be) inferior in architectural pretension and effect to the private house. In regard to the architectural treatment of the house in flats, we may take occasion here to reproduce (in translation) and call attention to the sensible and just remarks of M. Daly, in the introductory chapter to the subject of *maisons à loyer*, to which the second volume of his important work on "*L'Architecture Privée du XIXme Siècle*," is entirely devoted:—

"While the buildings for private residences demand an individual character, and express, within reasonable limits, the life and habits of the family or group of families for whom they are specially constructed, and who intend to take up their permanent residence there, the *maison à loyer*, intended for the many,—that is to say, for a number of tenants succeeding each other from time to time, according to the varying exigencies of their occupation, their several positions, or their means,—inhabited from basement to roof by tenants of different social grades" [this, however, is not a necessary, nor, as we have been looking at the matter, altogether a probable condition in London], "strangers to one another,—cannot admit of any too marked originality of physiognomy. The exterior aspect, as well as the interior distribution of a *maison à loyer* ought to remain, so to speak, *d'une caractère effacé*, and correspond only, in the attempt to satisfy them as fully as possible, to the common tastes and needs of the great mass of the population. . . . . The *maison à loyer* ought not to express its nature by any too exceptional trait. . . . . It is a form of building which gives little suitable scope for the play of fancy. That which it demands above all is the expression of calm practical consideration and reserve. It is not the habitation of an individual or of a family, but of society at large (*de tout le monde*). . . . In fine, we may say, the *maison à loyer* is the commonwealth of architecture, a commonwealth which ought to be distinguished by a commonsense treatment. It must be the property of the many; not as the expression of a passing fashion in architecture, but in virtue of an invariably comfortable and respectable *installation*. Little or nothing, then, can be permitted to the indulgence of fancy, since the fancy of one person is the aversion of another."

These sensible and considerate remarks are perhaps a little on the side of allowing too little to architectural treatment, though we quite concur with M. Daly that the house in flats is not the place for the indulgence of anything exceptional or strongly marked in architectural character. On the other hand, we may point out that the necessarily greater importance given to the entrance, in comparison with a single house of the same size,—more especially if this be, according to the excellent and effective Parisian plan, under cover and in an archway with a carriage passage,—affords a great deal of opportunity for picturesque and pleasing architectural treatment, in a most natural manner, and without going into any "fantasies." The opportunities of effect afforded by the Parisian treatment of the entrance we adverted to in a recent article on the æsthetics of house-building, and the principal staircase affords a means of giving more architectural character to the interior of the building than is realised in average houses of the usual type.

Valuable suggestions on this subject, as well as on practical points, may be obtained from Mr. Daly's second volume, before mentioned, which is worth the special study of all who may have to deal with this architectural problem, which seems not unlikely to be brought presently, more or less, under our immediate experience; and if the "House in Flats" offer the architect less scope for the refinements of his profession than the private house, no class of building, we venture to say, is calculated to bring out better the radical distinction, which the French well know, but which the English public and their literary oracles seem unable to perceive, between the architect and the speculating builder.

THE PROGRESS OF SANITARY ARRANGEMENTS.

THE Fourth Annual Report of the Local Government Board comprises the three distinct subjects of the administration of the laws for the relief of the poor, local government, and the public health. The administration of the Sanitary Acts, instead of coming under the third of these heads, is grouped under the second, together with the administration of local government for all other objects. By this arrangement the Report fails to bring the sanitary movement of the year into that full relief which the importance of the subject demands. We append a few notes on some of the principal items of the Report.

The total expenditure of the past year that is included under the title "Local Taxation" amounts to 32⅞ millions sterling. Of this sum only 23 millions have been raised by direct imposts; the remainder, amounting to 9,872,145*l.*, having been derived from "other sources of revenue, including loans."

Out of this sum, it appears from the tables included in the Report, rather less than 3½ millions has been devoted to sanitary purposes. The exact figures are,—"Total expenditure, urban sanitary rates, 6,416,822*l.*; and rural sanitary rates, 23,540*l.*"

Of the total amount of 6,440,362*l.* thus expended, however, only 3,117,791*l.* have been levied by local taxation. The difference, together with the unexpended sum of 172,831*l.* (which appears to be in the hands of the urban sanitary authorities) presumably represents loan, or at least indebtedness. Thus the sanitary expenditure forms only about one-tenth part of that expenditure of local taxation of which the Local Government Board takes cognisance. The figures tabulated in the appendix (p. 462) do not exactly tally with those which we have here taken from the body of the Report (p. liv.). They give the sum of 5,355,724*l.* as expended by urban sanitary authorities, and that of 23,540*l.* as "contributions to rural sanitary authorities." The numbers of the population in behalf of whom these expenditures have been made are not given in the tabular return.

It will be remembered that the expenditure thus incurred has to cover the two distinct items of outlay on public works, and annual charges. We do not find these payments distinguished in the Report. Thus while it may appear at first sight as if the sanitary expenditure of 5,379,264*l.* bore a high ratio to the sum of 8,480,819*l.* expended in the relief of the poor, the case is altered when we remember that the latter includes only the current charges of the year. The Report, therefore, does not allow us to distinguish between the capital sunk in sanitary works, and the sum spent in the current expenditure of the year.

If we turn to the latest official authority that can throw light on the subject, namely, the return to the order of the House of Commons, No. 134, for the year 1873, we find that 109 sanitary authorities had expended in permanent works, including land, just twenty-five times as much as their annual outlay. If this proportion should hold good (which can only be matter of guess until returns are completed to a later date), the annual outlay incurred by sanitary authorities in the past year will have been about 214,000*l.*, and the sum invested in works about 5,165,000*l.*

The purposes to which the receipts of the local authorities have been applied are ranged by the Report under seven general heads. They are as follow:—

1.	Protection of life and property	£3,903,241
2.	Public health and convenience	10,741,470
3.	Land and sea communications	8,663,572
4.	Preservation of lands	247,552
5.	Relief of the poor	8,480,819
6.	Education and religion	235,166
7.	Miscellaneous	393,135

The minor details that are comprised under these heads, and which amount to a total sum of 32,664,955*l.*, are given in the appendix to the Report.

The indebtedness of the local authorities is a subject of no little importance. The rapidity with which this burden is increasing is matter for watchful anxiety. In 1873-74 seven distinct groups of local authorities had borrowed the aggregate sum of 54,548,625*l.* Mr. Purdy, the principal of the Statistical Department, estimates that "the total indebtedness of the local authorities in England in respect of loans in 1873-74-75, or thereabouts," will be 83,062,000*l.* The smaller sum is made up as follows:—

1.	Poor-law authorities	£4,829,100
2.	Urban sanitary ditto	6,030,297
3.	Metropolitan local management ditto	16,230,128
4.	Drainage and Embankment ditto	1,562,672
5.	Burial Board	2,304,551
6.	Harbour authorities	20,440,593
7.	School Board	3,548,625
		£54,548,625

Of this sum 6,739,302*l.* have been advanced by the Public Works Loan Commissioners; 16,001,084*l.* by insurance and trading companies; and 31,808,239*l.* have been obtained from other sources, chiefly private persons. The rates of interest vary from 3 to 5 per cent.; the bulk of the sum paying from 4 to 4½ per cent. It thus appears that the local taxation is already weighted with upwards of two millions and a quarter per annum by way of interest on loans contracted by the local authorities. Thus, while the local budget is rapidly advancing to a magnitude of nearly half the national budget, the local debt is as yet far from bearing the same proportion to the national funded debts. But it bids fair to increase with rapidity.

It is thus clear that the operation of the sanitary authorities throughout the country is regarded, not as a distinct head of the duties of the Local Government Board, but as one of seven distinct branches of local administration, over which only a very general supervision is exercised by that branch of the Government. This, no doubt, is in accordance with the actual condition of the law on the subject; but none the less is it a result anything but re-assuring. We have already called attention to the Reports of the Local Government Board inspectors printed on the 7th of April last. These papers hardly bear out the satisfaction expressed in the present Report as to the "general activity shown by the several urban and rural sanitary authorities in discharging the important duties devolving upon them." We are willing to hope that the Local Government Board have a sounder basis for this satisfaction than they have as yet made public. But when we see that they have actually descended to the summation of the number of nuisances reported and abated during the last year, as well as of the structural works undertaken by the various authorities during that period, we certainly find something that may be called gratitude for small mercies.

The Local Government Board appear to have done excellent service during the past year in calling the attention of Parliament to undesirable provisions or omissions in thirty private Bills deposited by local sanitary authorities. Nevertheless, it is very obvious that much time, trouble, and cost would have been spared if the advice of the Local Government Board had been sought in the first instance as to the drafting of these Bills. This is another example of the great loss of administrative power occasioned by the absence of organisation in the sanitary machinery; and this is the more striking when we find that the Report draws attention to the "number of local Acts already in force, the provisions of which have required to be carefully regarded in considering the effect of the proposed new enactments."

A select Committee of the House of Commons having recommended the repeal of the Acts relating to the adulteration of food, and the substitution of an amended Act, the Board have suspended any compulsory action as to the appointment of analysts. One hundred and twelve local authorities have now complied with the existing provisions of the law in this matter.

A review of the entire report of the Local Government Board appears to show the exercise of a vigilant care for the welfare of the country, fettered and hampered to a great extent by the influence of the Act of 1872. The provisions of this measure have directly interposed to prevent a definite and systematic appreciation of the sanitary engineering required for the well-being of the country. Thus the outcome of local action is reduced to such a degree as to allow of the enumeration of reports of individual nuisances, by way of measure of activity.

A New Roman Catholic Church for Kilburn. — A new Roman Catholic Church will shortly be begun at Kilburn by the Oblates of Mary Immaculate. The architects are Messrs. Pugin.

FRENCH AND AUSTRIAN BRICKS.

IN conjunction with M. Trévenet's criticism on French and Austrian joiners, which we have already noticed in these columns, Messrs. A. Morel & Co., of Paris, published a similar pamphlet on brick-making and building by M. Alexis Fannier. The style of this little work is more refined than usual in pamphlets of this description; and, though the author, as a simple working man, complains bitterly that his education has been so neglected that he is scarcely able to accomplish his task, he nevertheless gives a very graphic and interesting description of his journey to Austria. The sight in that country of women working with masons naturally created the greatest surprise in the Frenchman's mind. Though the work is undoubtedly dangerous and rough, young women and girls may be seen at Vienna ascending and descending high scaffolding to carry bricks, mortar, &c., to the masons who are at work on the summit. These men and women are not Germans, however, but come, for the most part, from Hungary or Bohemia. M. Fannier, of course, protests in energetic terms against the employment of female labour in the craft. The sight of women, bare-footed and with short skirts, struggling up ladders with burdens of bricks on their shoulders does not suggest an advanced state of civilisation, nor is it conducive to that sentiment of delicacy and modesty which is the special attribute of woman. Their feet also, constantly chapped by the action of lime on which they are frequently treading, soon become covered with sores, and the exposure to all weathers aggravates the suffering to such an extent that paralysis sometimes ensues. For the larger buildings, however, the bricks, &c., are hoisted up by a chain affixed to a winch or capstan. The scaffoldings,—and this is a point worthy of note,—are pronounced preferable to the constructions on which the Parisian mason is compelled to work. This is an important admission, coming from the mouth of a Frenchman, for our neighbours have often been stated to excel in this special phase of building. The accidents, however, which nevertheless frequently occur in France in consequence of the faulty organisation of scaffolds, are very rare in Austria. Before a building is commenced, a large number of pine-poles are planted very close to each other; in fact, the total number required for the scaffolding is put down at once. The cross-pieces are then carefully bolted, and the planks are not merely laid between, but they are nailed down so as to render them quite secure. On the outside, from pole to pole, a piece of wood is also nailed, which acts as a sort of balustrade, so that it would be difficult for a workman to fall off, even if he tried to do so.

Vienna is now undergoing a series of improvements destined to maintain its renown as one of the most splendid capitals of Europe; and new streets are consequently pierced through old quarters, trees planted to shade boulevards, and magnificent mansions reared under the direction of architects well versed in all phases of modern improvements. A great number of these constructions are made with bricks and lime-mortar. This mortar is very clear, so that buckets are used instead of the ordinary hoss, and these are filled with large round spoons holding three or four pints. The masons employ a smaller but similar spoon, with which they pour the mortar over each row of bricks, and the substance being limpid runs down the joints, or spaces left open between each brick, of its own accord. The mortar, however, does not merely fill the spaces left open for its reception, but spreads itself all over the bricks, giving them an untidy and unfinished appearance. When, therefore, the work is completed, this has to be scraped off; then the walls are coated with a light yellow cement, which answers as an imitation of stone.

The bricks used for baking-ovens, factory-chimneys, and constructions destined to hold boilers and machinery, are the subject of special study. We have the description of numerous baking-ovens, and are assured that Vienna bread is irreproachable both as to its colour and the regularity with which it is baked. The Vienna ovens bake bread at a smaller outlay of fuel, but the large loaves sold in France could not be cooked in them. On the other hand, it is scarcely expedient to make such large loaves, for they require an intense heat, and this generally dries the outer crust while it leaves the interior in too moist a condition. If less heat is used, the bread would have to remain too long in the oven, and the crust would be pale and dry, and devoid of proper moisture. The French ovens are generally made of bricks. They are not covered over, as in Vienna, with sheet-iron, and it is urged that the bricks retain humidity even when the driest wood is used. The steam from the wood and the dough ascends and enters the pores of the bricks, and then, as the heat gradually subsides, and the baking progresses, this vapour falls again on the bread. Thus the large loaves obtain the colour and retain the moisture and weight they would have lost in an iron-plated oven, as the metal burns instead of preserving the humidity. Red bricks, measuring 32 centimetres in length, are generally used for the external covering of Austrian ovens. Those used for boilers and chimneys are of the same length. In width they measure 12 to 14 centimètres, and 6 to 8 centimètres in thickness; their colour is of a pale red. They are badly made, the clay is not properly sorted, and consequently contains numerous foreign bodies, and notably limestones. The kneading is done by hand, the work being performed very irregularly, and the stones that remain in the clay often break when submitted to heat, while the subsequent effect of damp causes the bricks to crack, thus destroying the appearance of the building in which they have been employed. Their shape also is awkward, so that, altogether, chimneys and ovens constructed at Vienna cannot be taken as examples of good brickwork. The French bricks, which invariably measure 22 centimètres in length, 10 centimètres in width, and 5½ centimètres in thickness, can be held in one hand, and are therefore easily manipulated by the mason; whereas the Austrian brick must be held by both hands, and this occasions a serious loss of time. The quality of the Vienna brick might be greatly improved if the red clay with which they are made was mixed with a small quantity of the green clay found in the neighbourhood of the Palace of Schoenbrunn, and which is now used only for pottery, statuettes, and terra-cotta ornaments.

Formerly the bricks used in France were manufactured in the Northern departments or in Belgium, but this industry has now extended to many other districts; for the economy realised by the use of bricks is more universally appreciated. Thus a great number are now made in the neighbourhood of Paris, though the Paris clay does not blend easily, but it is, nevertheless, sufficiently good not to require mixing with other clays. Various methods prevail for the manufacture of these bricks, though the use of a pressing-machine is most effective and most popular. The clay is reduced to small pieces with a pickaxe and then placed in the moulds by means of a shovel. Each press contains two metal moulds, so close to each other that they may be filled at once from the same shovel of clay. This done, a workman presses on the lever, and, as he releases his hold, a rod, placed in opposition to the lever, forces the clay up and out of the mould. The workmen may then seize the clay which has thus assumed the shape of a brick, and place it on a wheel-barrow ready to be conveyed to the drying-room. Other manufacturers prefer to wet the clay, so that it can be manipulated and kneaded by treading. The workmen, however, thus employed find it most difficult to make a sufficient number of bricks to earn a good day's wages. In some other brick-fields the clay is kneaded by machines which a horse sets in motion, while there are not a few workers who content themselves by simply using a spade. The moulding-machines of Belgium and the North of France produce two bricks at a time, and from 5,000 to 6,000 per day. A young man and a young woman together suffice to work and feed them. With regard to baking, every system has its partisans; but it may be said that the wood fires are more easily managed and produce the best bricks.

There is a great quantity of green clay in the neighbourhood of Paris; but it has to be treated in a peculiar manner in consequence of its greasy and tough nature. It is dried in the sun, then broken into pieces about the size of nuts and mixed with sand and coke-dust. This latter substance not only thins the clay, but facilitates the baking. Formerly the clay was exposed to the action of the frost as well as the sun before it was broken up; but now, apart from these two rival and natural processes, an artificial cutting-machine has been introduced which can be moved by steam or by a horse. When the clay has been duly cut or broken, it is thrown into a kneading-pit made of bricks, which are previously covered with cement so that water may not escape. In the potteries the clay is spread out in layers about 12 to 15 centimètres thick, and kneaded with the feet, a process which is termed in France *marcher la terre aux pieds*. For whatever purpose the clay is required, it is generally rolled into pieces weighing from 40 lb. to 50 lb. after it has been withdrawn from the kneading-trough, and left standing for several days, so that the humidity, if not evenly distributed, may have time to spread itself over the whole in equal proportions.

The ovens for baking the bricks are constructed after various models, but the ordinary Paris oven contains an open space of 70 cubic mètres, in which 35,000 bricks can be placed. It is, therefore, estimated that 500 bricks can be packed for baking in a cubic mètre. The fire is in some cases situated by the front wall, and in others it goes right through the oven. The latter is more easily managed, but also more expensive. The greatest experience and tact are necessary to know exactly when the bricks have been baked long enough to attain a sufficient degree of heat, and then it is no easy matter to extinguish the fire without letting the smallest volume of cold air enter the oven. Should such an accident occur, the transition from extreme heat to cold would probably cause a great number of bricks to crack. Apart from the ordinary green clay, there are near Paris the celebrated clays of Vaugirard and Vannes, which are very useful for household pottery and for cooking utensils.

The best fireproof clay of France is found in the neighbourhood of Arras. It is rather dark, soft, and very compact. At Antragne, near Quiévrain, on the road to Valenciennes, there is also some clay of this description, but not of so good a quality. The clays of Forges and neighbourhood are much superior, and are extensively used for reflecting heat, for stoves, &c., but they are very dear, and must be dug up from a depth of 50 ft. to 60 ft. To obtain the purest clay for the purpose of resisting heat, it would be well to dissolve the clay in water. As the tub in which this mixture is made becomes too full, the surplus clay and water should be allowed to run off by means of a pipe to another tub situated a little lower; and so on from tub to tub, till five or six tubs are full of clay water. As the ferruginous and other foreign bodies, which cause bricks to split, weigh heavier than the clay, they would sink to the bottom, and only the lightest and best clay could float down with the water to the tubs situated on the lower level; the last tub thus containing the best clay. With time it would settle at the bottom, and the water can then be removed by tapping the tub just above the level of the clay.

In conclusion, we may gather from the remarks of an artisan, whose practical knowledge and experience have won the high consideration of his fellow workmen, that the French produce superior bricks, while the Austrians are more careful in the construction of scaffolds. These at least are two facts worthy of record, and our only regret is that English artisans seldom find the means to travel, and publish their practical criticisms and experience.

PRIMITIVE HOUSE-BUILDING AND ARCHITECTURE.

IN the war of styles, and in the eagerness for new and improved methods of construction, and it must needs be added, in days essentially of cheap house building, it may be of interest to glance for a moment at the habitations of less civilised and less fortunate communities than our own. House-building necessarily differs in different climates, in different countries, involving different materials and modes of putting materials together. It would be difficult to overrate the importance of such a subject as this, for the modern proclivity to uniformity in all things, both material and mental, and the perpetual spread of a uniform "civilisation," as it is termed, tend, as a matter of course, to equalise and render uniform in all ways possible the houses and dwellings everywhere under its influence. Hence it is that we see the same type of house and villa building in all our colonies. The outskirts of Australian towns, such as Melbourne, might be taken, at a first glance, for those of suburban London. A New Zealand town differs but little, if at all, from one in the United States or Canada. Special opportunities are abundant of noting this. It is the same all the world over where "Western" influences have made any progress or headway at all. Calcutta and Bombay have streets of modernised houses, and even palaces, which

might be brought by art of magic to London without fear of their place of birth being found out, so like are they to all things about us here. Improved Constantinople, too, is coming to this, though, as it would seem, somewhat slowly. It must needs be of interest, therefore, to glance occasionally at the *old* ways of house-building, now so fast disappearing all the world over.

For the first *primitive* example of house building, and sufficiently primitive and original it certainly is, we need to travel to the extreme north, where things are yet to be found in a state of primeval barbarism, or naturalism, as it may more correctly be termed. The Siberian "*yourt*," or tent, in which the natives, the wandering Koraks, live, and move (as far as is possible), and have their being, is indeed a curiosity in the way of house-building. We have little original information about it. Contrivance, according to circumstances and conditions of life, is not confined to the civilised man. The climate in which these human beings, for they are human, live, is so keen and fierce that no ordinary house-building would be possible, even if materials were at hand for it, the thermometer in winter, as often as not, going down to 50° below zero. House-building there must therefore be a speciality and a curiosity, and it certainly is both the one and the other. A "yourt" is a rude construction of drift wood, as thrown up by the sea. It is about 20 ft. high. It has, strange to tell, neither door nor window of any sort. It is to be entered only by aid of a notched pole which takes the owner to the roof, and to the circular hole in the top of it out of which the smoke from the fire inside comes. Another notched pole is here fixed into the ground inside the hut, or house, and reaching to the roof: this constitutes the "stairs" by which entrance is effected—a right primitive staircase, a traditional record, we may suppose, of our remote ancestor, the "stone-age" man, about whom the geologists are so anxious and curious, and not a little puzzled, just now. For most part of the year this primeval house is covered thickly with snow. But if the exterior of it is a singularity, most surely not less so is its interior. This interior receives its light only from the round hole which serves alike for entrance-door and chimney. In colour it might have satisfied even Rembrandt himself, for the beams, rafters, and "drift" of which it is built up, are all of a glossy blackness from the smoke in which they are always enveloped. Round the floor or ground of this dwelling there is a wooden platform, raised about 1 ft. from the ground, reaching from the walls and about 6 ft. wide, thus leaving a space in the middle of the yourt of about 10 ft. in diameter. In this open spot is the fire, and over it always a huge copper kettle of melting snow. This platform takes up about three-quarters of the room. On this raised platform, which serves also as a settle round the perpetually burning fire, are the bedrooms, called "pologs." These are formed of the heaviest furs that can be procured; they are sewn carefully together to exclude the air. These "rooms" are lighted, and at the same time warmed, by a fragment of ignited moss floating in a wooden bowl of oil. They are about 4 ft. in height, and 6 ft. or 8 ft. in width and length. The temperature of these primitive dwellings but seldom ranges above 20° or 25°, consequent on the intensity of the outer cold, though the fire raised on its circle of rough stones is always burning. It needs but a dull imagination to picture the effect of the constant smoke. The lower part of the yourt is comparatively clear, but the upper part is filled by the dense moving cloud of dull vaporous mist. Our informant lived in a "yourt" for some time, and gradually got used to it, and boasted, as a proof of vigorous health, that he could "eat anything." May it not be that the healthiness of a Korak yourt, in spite of all, is owing to the fact of the keenness and purity of the outer air, which must needs find its way in at all times? And such purity of air, be it noted, is before all else needed, and makes up for nearly all other shortcomings and deficiencies. All things at first glance seem to be out of proper order here, but they are fitted for the place and climate, and circumstances of those who live in the country where they obtain. And be it observed, in passing, that bad as they may look from our point of view, they are not a whit worse than some of the "huts" that we have seen, in which our hardworking and industrious coalminers live and rest themselves. There are many other matters in this cold north, well worth the noting, and some good might come of their being attended to and well thought over. One of them we may mention as especially noteworthy. It is that the keen cold of an extreme northern climate, though so keen and fierce, many degrees below zero, does not strike, when the air is still, so cold, as the raw, damp atmosphere does here. "There are mysteries in cold, and air, and vapour, not yet come at by the scientific," says one of our Arctic voyagers,—and who can doubt it?

If the huts or dwellings in the wild wastes of the north are thus curious and strange, and unlike anything here in our civilised surroundings to be seen, not less so are the villages or towns where the houses are congregated together and are more permanently built; indeed, we may here find the incipient beginnings of streets and towns. Streets, in one sense of the word, there are none, not even roads, or pathways. The houses or huts are built all about, at random, just where the fancy of the builder and owner may happen to place them. They front all ways, if, indeed, they can be said to have a street front at all. A house of some sort is even a primitive necessity, but a street would seem to be a matter for an advanced state of society. It is a point worth noting. Their better sort of dwellings, thus congregated together, and in as cold a climate, are quite habitable and comfortable abodes. They are not of "drift" wood, like the primitive "yourt," but are constructed of rough logs of timber, with the bark left, wisely and artistically, on it, on the outside, the inner side being scraped and brightly polished. The low doorway rough enough, and the window not of glass, but of transparent skin. The fireplace with universal "settle," in place of movable chairs, is well fitted for its purpose, and the house thus built stands where a modern-built house, fresh from a new town here, would not endure for a week. The primitive yourt, be it noticed, is a movable structure,—this is not, and it may serve to instance how the fixed habitation grows out of the earlier and movable one. There is no "style" of architecture here, but the picturesque, if not the "architecturesque," finds a place of necessity in houses and dwellings like these.

We may pass from these snow-covered abodes to the far North to Eastern dwellings, where the hot sun has well-nigh all his own way. The houses of the native races in the less-frequented parts of India are quite as remarkable as those we have named, though in a different way. They are simple enough, and consist, for the most part, but of a single room. There is no window, all the light coming in from the doorway, a little of so intense a sunshine as here suffices. The walls are for the most part of mud, a reddish clay, mixed with small fragments of quartz and granite to bind it together and harden it. It lasts many years, and is found to resist the heaviest rains. So good is it, we are told, that in many of the towns and villages these houses have flat roofs terraced with this substance, and it is found to be water-tight. These walls are painted on the outside in alternate vertical stripes. If, says an observant traveller, these huts had but windows, they would be comfortable enough. There is here no "furniture," in our sense of the word. The floor is covered with rushes, and a rug with pillow for reclining, after the Eastern man's fashion. There may be a shelf or two, and a painted chest. In some places—for these primitive dwellings differ in different parts of India—there is a second hut for sleeping in, and perhaps another for a storehouse. Nothing can be more quaint and out of the way than the aspect of some of these Hindoo "villages," or groupings of huts or cottages. They seem to creep up the sides of hills, and to vie with the trees themselves in irregularity and thickness of clustering. In the hunt after "ruins," and the remains of the great temple architecture, it is a pity that so little has been done in the making record of this simple poor house building. It is surely a mistake, for very much of the temple work itself comes originally from the common hut and domestic house building. We are not here speaking of city house-building, but of the work to be found in the more primitive villages, wherein the materials at hand, and the necessities of the case, and the ingenuity of the untutored inhabitants, form the items of the problem. It is in rude structures like these that house, if not temple and palace, architecture begins. We may, in passing, notice a curious instance of this in a walled town. A house of this character is built on the top of the wide earthen wall, and immediately over the entrance-gateway to the town, and it makes of the simple round arch opening quite an architectural feature. It is a fortified gate, and a most ingenious one, showing how, indeed, architecture may grow out of necessity and bare "construction."

All over the vast continent of India the village house or hut building is in principle of this kind, and the contrast between it and that of the dwellings of the cold North is sufficiently noteworthy. Of architecture, as that word is commonly understood, there is none; but the "picturesque" is most surely common to both orders of building. May not our Polar Expedition explorers meet with something new in this way? And most surely if India were but slightly searched, very much would be found that would amply repay that search. Architecture as it now is, over Europe, is in a sufficiently artificial state, and the time must come when a peep into its origin may be useful and necessary. There are many things but little known to be yet met with, besides those we have here glanced at.

GLASGOW NEW STOCK EXCHANGE.

THE handsome building now in course of erection in Buchanan-street by the members of the Glasgow Stock Exchange, is gradually approaching completion, and it is expected that it will be ready for partial occupation by the coming spring. The new erection is in the Gothic style, and large figures, symbolic of trade and commerce, and which are placed in niches on the front, contribute much to the general effect. The area occupied at the corner of West George-street and Buchanan-street is 85 ft. in length by 74 ft. in breadth, and the new building will be three stories in height. The principal entrance will be in Buchanan-street, next door to the Western Club, and over this is a tower rising to a height of 112 ft. The chief apartments are located on the first floor, to which access is gained by a flight of stairs leading from a spacious vestibule about 15 ft. square. Fronting Buchanan-street is the Exchange-room proper, where the members will assemble for the transactions of their ordinary business, and the dimensions of which are 60 ft. long by 50 ft. in breadth, with a height of 32 ft., thus affording almost double the accommodation at the existing Exchange. The new room will be furnished and appointed in convenient and suitable style. At the rear of this, on the same floor, will be the reading-room, an apartment 41 ft. by 19 ft., while to the south of this, and nearest the Western Club, will be retiring-rooms and accommodation for holding committee meetings. At the front of the building, but on the second floor, will be the telegraph-office, 50 ft. long by 16 ft. broad, with the requisite message-rooms attached; while the clearing-house department will consist of a large room in the rear, the dimensions of which are 63 ft. by 50 ft., lighted from the roof by means of a large glass dome. On the same story will be the secretary's offices, clerks' rooms, and retiring apartments. The estimated cost of the building is 20,000*l.*, in addition to 25,000*l.*, the cost of the site, the expense of which may be readily accounted for by its commanding position in the most fashionable street in Glasgow, and its close proximity to the Royal Exchange and other centres of the more important commercial operations.

Mr. Jas. Thomson (Baird & Thomson) is the architect.

STIR AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following resolutions, we are requested to say, will be proposed at the meeting of the Institute to be held on Monday next, on behalf of certain Fellows and Associates connected with the Architectural Association:—

"I. That the proposal to introduce among the students of the R.I.B.A. powers similar to those suggested in Appendix 7, as a scheme of amalgamation to the Architectural Association, could hardly fail, if put into practical operation, to disturb the good understanding and satisfactory relationship which has for many years subsisted between the two bodies.

II. That the introduction into the class of Associates of persons not being members of the profession be not approved.

III. That the proposed alterations in the conditions of membership do not commend themselves to this meeting.

IV. That opportunity should be given at each general meeting to the members to ask questions concerning the direction and management of the Institute, to offer suggestions, and to propose resolutions thereon. At meetings at which papers are to be read, questions found to involve lengthened discussion to be deferred to opportunities arranged for their discussion by the Council. That the first part of by-law No. 43 be repealed, it being practically at variance with the provisions of the Charter.

V. That members desirous of associating themselves together for the promotion of any object calculated 'to advance civil architecture, to promote or facilitate the

acquirement of the knowledge of any art or science connected therewith,' or to advance the interests of the profession, shall be empowered so to do; and to frame their own regulations, which shall set forth the objects of such association. These regulations shall be submitted to the Council, and on their being sanctioned by it, rooms for meetings, publication of notices, and such other facilities as may be practicable, shall be afforded to the said associations, who shall be bound, at a general meeting of the Institute in each year, to present a report of their proceedings.'

*** As already stated, we do not find ourselves in a position to discuss the report of the committee. We are forced, however, to say that we dissent entirely from its main recommendations, and trust that the meeting will come to an unmistakable vote in that direction on Monday, always remembering the thankfulness due to a committee who have given much time to the consideration of a difficult subject.

SIR,—Having been called upon in the absence of Professor Donaldson to take the chair at some meetings of the committee on the affairs of the Institute, I have been requested by several of my colleagues on that committee to allude to a letter from that gentleman which appeared in the professional papers on Saturday last, and to request the Fellows of the Institute to suspend their judgment upon the report issued by that committee until it can be calmly discussed on all its bearings in the meeting-room of the Institute. We think it much to be regretted that the Professor had not contented himself with the protest he had already thought it necessary to make, and which has been printed and issued with the report to every Fellow of the Institute.

I need now only remind those members of our profession who are really interested in the consideration of this report, that the committee consists of twelve members of the Institute (eight being Fellows and four Associates), who were, in virtue of a resolution passed at a general meeting of the body, nominated by the Council, and may, I think, be fairly considered as representative men of their various grades; of this number *eleven* are unanimous in signing the report and endorsing its recommendations; one dissents and protests under thirteen heads. Can it be believed that these eleven architects are so indifferent to the honour and status of that profession by which they are living as deliberately to urge the adoption of rules and regulations likely to dishonour their position, or which, as Professor Donaldson considers, would "degrade the profession and drive every honourable man who respects his own personal character and the prestige of his profession to keep aloof from such a mongrel combination"?

The committee may have erred in judgment, but can hardly be supposed deliberately to have committed the suicidal act attributed to them by Professor Donaldson.

THOMAS HENRY WYATT,
Past Pr., R.I.B.A.

THE LATE MR. JOHN TARRING, ARCHITECT.

THE career of the late Mr. Tarring, who died at St. Andires, Torquay, on the 27th ult., aged 70, affords an interesting and useful example of what may be done, even under disadvantages, by industry and perseverance. Mr. Tarring was born at Holbeton, near Plymouth, Devon, and until he came to London worked as a carpenter or plasterer, or probably employed himself in the kindred manual occupations that a capable young man finds opportunity to turn himself to in a country village. He came up to London in May, 1828, and almost immediately put himself under the instructions of Mr. Brown, architect and surveyor, of Wells-street, Oxford-street, at the same time, we believe, attending a large builder's yard in Paddington. He afterwards bought of Mr. Brown a drawing academy that he had kept; and records of his studies and successes may be found at the Royal Institute of British Architects, of which he in 1845 became a Fellow. In earlier days he had obtained the Royal Academy's silver medal for measured drawings. We are told by one of his oldest friends that his practice increased steadily from the time that he established himself in his profession. He was employed by the late Earl of Combermere to restore Combermere Abbey; and he carried out extensive alterations and restorations at Thornton Hall, Bucks, the seat of the Hon. Richard Cavendish.

Mr. Tarring made suggestions, and submitted plans to the Government for concentrating the Government offices in one block of buildings on the site, or nearly so, occupied by the new buildings fronting Parliament-street, particulars of which were given in the *Builder*. In the competition that ensued he sent fresh designs, which were well spoken of by the press.

For some years his youngest son has been in partnership with him.

The following is a list of his works, though probably not a complete one:—Akeley Church, Bucks; Bethnal-green Chapel,—the first Dissenting place of worship built in London with a spire; Bedford New-town Chapel; Portland New-town Chapel; Old Westminster Chapel; Peckham-rye Chapel; Falcon-square Chapel; Horbury Chapel; Vine's Church, Rochester; Clapham Congregational Church; Presbyterian Church, Cork, Ireland; Tolmers-square, Congregational Church; Huntingdon Union Church; St. Ives, Hunts, Union Church; Baptist Church, Victoria-road, Leicester; Luton Congregational Church, Bedfordshire; Wesleyan Chapel, St. John's-hill, Wandsworth; Wesleyan Church, Mostyn-road, Brixton; Wesleyan Church, Malvern; Wesleyan Church, Clapton; Congregational Church, Lewisham; Presbyterian Church, Lewisham; Congregational Church, Southernhay, Exeter; Stamford-hill Congregational Church; Congregational Church, Chapel-street, Blackburn; Tavistock Congregational Church and Schools; Presbyterian Church, Upper George-street, Edgeware-road (Dr. Donald Fraser); Christ Church, Chase Side, Enfield; residences of the late Mr. J. Chubb, Mr. G. K. Chubb; Mr. J. E. Vunner, Mr. Owen Edwards, Mr. J. Webster, and others, at Chislehurst, Kent; Tingewick Rectory, Bucks; Tromer Lodge, Down, Kent; houses at Queen's Gate, Kensington; restorations and alterations at Coedgwgen Hall, Glamorganshire; Combermere Abbey; Thornton Hall, Bucks; Wykham Park, Banbury; Springfield, Banbury; also altering and remodelling Whitfield Chapel, Tottenham-court-road; the Congregational Memorial Hall, Farringdon-street; Messrs. Filmer & Son's shops and warehouses, Berners-street, Oxford-street; Messrs. Parkinson's Gas-meter Manufactory, Cottage-lane, City-road; and the City Bank, Ludgate-hill Branch. The last was recently illustrated in our pages, as was also, on a former occasion, the Memorial Hall.

REPAIRS OF CHIMNEY-SHAFTS DAMAGED DURING THE SIEGE OF PARIS.

A RECENT number of the *Annales du Génie Civil* states that during the war of 1870-71, a large number of chimney-shafts in Paris and the neighbourhood were injured by the fire of the German artillery. Some were razed to the earth; others were battered down more or less completely; whilst others, again, remained standing, but were pierced with shot-holes. Nearly all have now been repaired. Indeed, the work of restoration may be said to be completed. New shafts have been built on the plans of those demolished. Here nothing more was requisite than to clear away the ruins before rebuilding. But the pierced shafts were much more troublesome to deal with. The breaches in them varied from 18 in. to 7 ft. in height, and averaged 18 in. across. In such cases it was unsafe to meddle with the shaft until it had been strengthened. Timber shores were, therefore, placed vertically in the holes, and the openings then were built up with bricks set in plaster, which has the property of setting very quickly. This done, the shafts were taken down from the top, in the usual manner, and entirely rebuilt.

LONDON BRIDGE IMPROVEMENT.

OF the numerous schemes proposed for affording additional traffic accommodation over London Bridge, only one, as yet, is to be brought before Parliament in a petition for the conversion of a private Bill into an Act. A Bill has been deposited, wherein it is proposed to incorporate the London and Southwark Arcade Bridges Company, to authorise them to make two new bridges, from the foot of London Bridge at the south end thereof, to the north end of the same bridge, and for other purposes. The preamble sets forth that it would be of great public utility if two bridges, one on the east and the other on the west side of London Bridge were made, for the diversion of the passenger traffic at present passing over London Bridge; and that certain persons are willing, if incorporated into a company, at their own expense to undertake the erection and maintenance of the said bridges. The proposed capital is 160,000*l*., divided into 16,000 shares of 10*l*. each, with the usual borrowing powers. The works proposed to be executed are two bridges, one on each side of London Bridge, each commencing in the parish of St. Magnus, in the City of London, at the top of the steps leading down to the river Thames, and, crossing the river, terminating in the parish of St. Saviour on the Surrey side at the top of the steps leading down to the river. The company may dedicate to the public as a footway a space not less than 15 ft. in width on the inner sides of each bridge, and may erect upon the remaining portion of the two bridges, to abut upon the footways, buildings and shops, which the company may lease, sell, or dispose of at or for such considerations and upon such terms as they think fit. The Bill provides that the company "may levy tolls, rates, rents, and duties, in respect of the use of the bridges," &c. The promoters seem to be unconscious of the fact that a characteristic of the present time is the abolition, not the imposition, of metropolitan bridge tolls, and their proposal, if it applies to foot passengers using the footways formerly mentioned, is made quite too late in the day. The estimated cost of the works is 150,000*l*. Mr. George W. Usill is the engineer.

PROPOSED SEPARATION OF BATTERSEA FROM THE WANDSWORTH DISTRICT BOARD OF WORKS.

THE inhabitants of Battersea are taking steps for the separation of their district from the Wandsworth District Board of Works, and forming it into an independent vestry, and at a special meeting of the vestry, held last week, at which the Rev. J. Erskine Clarke, vicar of Battersea, presided, a memorial to the Metropolitan Board of Works was adopted, asking the Board to promote a Bill for the amendment of the Metropolis Local Management Act, by which the separation could be carried out. The memorial states that since the passing of the Act the parish of Battersea has greatly increased in rateable value, population, and inhabited houses, and that a great increase is still taking place. In 1851 the population was 10,500, and the rateable value 57,472*l*. In 1861 the population had increased to 19,600, and the rateable value to 92,090*l*. In 1871 the population was found to have nearly trebled itself during the preceding ten years, being at the last census 54,000, with a rateable value of 226,121*l*.; whilst at the present time the population is estimated to be between 70,000 and 80,000, and the rateable value has increased to 333,935*l*.

THE LANTERN OF ELY CATHEDRAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT an ordinary general meeting of the Institute, held on Monday evening last at Conduit-street the President (Sir G. G. Scott) in the chair, the following gentlemen were elected members:—As Fellows.—Mr. F. E. H. Fowler, of Serjeants' Inn, Fleet-street; Mr. J. Douglass Mathews, of Cloak-lane, E.C.; Mr. John Middleton, of Cheltenham; and Mr. John Noyes, of Clarges-street, Mayfair. As Associates.—Mr. James Jerman, of Exeter; Mr. J. H. Oswald Brown, of Piccadilly; and Mr. Frederic Hammond, Lilford-road, Stoke Newington.

The Secretary announced the decease of the following members:—Mr. John Tarring, Fellow, and Mr. Albert Bridgman, Associate.

Mr. R. Reynolds Rowe, Fellow, then read a paper "On the Lantern of Ely Cathedral." After giving a brief historical sketch of the building, beginning with the monastery founded by Queen Etheldreda in the seventh century, Mr. Rowe proceeded to describe the Octagon at Ely. It was in 1322 that the central tower fell, the accident being attributable to weakness of construction and defective foundation. Alan de Walsingham having cleared away the *débris*, raised his octagonal tower upon eight pillars, which had their foundation on the solid rock below. The masonry of this octagon having been constructed with great care, is at this day perfectly free from settlement. The stone used was oolitic, obtained from quarries in Northamptonshire. The octagon is regular, but unequal-sided. Each of the four cardinal sides, next the nave, choir, and transepts, measures 40 ft., and each of the diagonal sides 27 ft. Each diagonal side is pierced by an arch, 11 ft. 4 in. in span, and higher up by a four-light window. On each diagonal side between the point of the arch and the window-sill are three shallow niches, with

bold corbels, upon which are placed seated figures of the Twelve Apostles, the hood-mould terminations of the niches representing the heads of the sixteen major and minor prophets of the Old Testament. Attached to each pillar of the octagon is a shafted empty canopied niche, of great beauty, resting upon a corbel sculptured in illustration of the life of St. Etheldreda. Externally, Alan de Walsingham finished the octagon with a pierced parapet of Flamboyant tracery, at a height of 114 ft. above the nave pavement. The parapet on each cardinal side has part of a pinnacle set diagonally in its centre. Each pier of the octagon is crowned with an irregular panelled octangular turret. The existing capitular body, being imbued with an intense reverence for the wonderful building entrusted to their care (as shown by an expenditure thereon of 57,000*l.* during the last thirty years), instructed Sir Gilbert Scott to prepare a design for completing Alan de Walsingham's stonework. A perspective view of this design was published in the *Builder*. During the past year (1875) the Dean made an appeal to the public for funds, which was so amply responded to that the Dean and Chapter are about entering into a contract for finishing, in Clipsham stone, this important work, after it has remained in abeyance for 545 years. Alan de Walsingham also constructed upon the solid rock, in the outer lines of the aisle walls, four piers or buttresses, each capped with a stone pinnacle and, receiving a pair of radial flying buttresses, forming two angles of the octagon. There were two beautifully-sculptured Norman doorways opening into the cloister at the south-west outer angle, just at the point where an abutting pier to a flying-buttress was needed. He treated the Norman work in the most conservative manner by incorporating the doorways there most skilfully with his own new pier, which sheer constructive necessity demanded. The stonework of the octagon being so far completed, Alan de Walsingham determined to roof the structure, which is 74 ft. in diameter, with oak. The first step which he took towards solving this difficult problem was to raise upon a stone corbel in each of the eight piers, and on the same level as the springing of the four great cardinal arches, a series of vaulting ribs terminating at a curb 93 ft. above the pavement. This oak curb forms a regular octagon, 13 ft. on each outer face, but the octangular sides of the curb are set obliquely to the faces of the stone octagon. This arrangement, though it gives an infinite variety of curved lines to the vaulting ribs seen from below, causes a certain distortion in the ribs themselves. Though each rib was no doubt originally set out by "ordinates," it is impossible now to test their accuracy, seeing that the summer heat of five centuries has twisted many of them into fantastic curves similar to those which may be noticed in the spire of Chesterfield Church. It is recorded that Alan's greatest anxiety was caused by the difficulty he experienced in finding, in an accessible spot, eight sound trees of sufficient size to make the eight angular posts of his lantern. After great labour, he succeeded in obtaining them. They were 50 ft. long, and give a sapless scantling of 2 ft. 9 in. by 1 ft. 9 in. These being moulded and framed into the curb formed the first portion of the wooden construction. At a level of 18 ft. 3 in. above the curb, a second curb is framed between the posts, forming the sills of four-light traceried windows, each being 15 ft. 5 in. between the sill and springing of the arch; at this same springing level, 130 ft. above the pavement, rises fan-vaulting to a point 152 ft. 6 in. above the pavement. The vault-ribs radiate into a magnificent central oak boss, sculptured so as to form a practical exposition of the great central doctrine of the Incarnation. The space in each bay of the lantern between the two curbs is filled in with a traceried parapet of quatrefoils, breast-high, for safety. Above that are four panels, terminating with rich tracery. The upper stage of the lantern formerly contained a peal of bells, as proved by the gooves worked in the vault-ribs by the friction of the bell-ropes, which reached to the pavement. The interior of the lantern was decorated with painting. Great doubt existed as to the design and colours. After referring to the work done by James Essex, in the last century, the lecturer mentioned that in 1845 Dean Peacock appointed Sir Gilbert Scott as architect for the restoration of the cathedral. The lantern, as now seen from the exterior, is Sir Gilbert Scott's work, based on the authority of early prints, and traces of the ancient structure. In 1873 the bissexcentenary of St. Etheldreda drew much attention to the cathedral restoration. Mr. Gambier Parry, who had already painted half of the nave roof, volunteered to decorate the interior of the lantern. His generous offer was accepted, and Mr. Rowe was directed to prepare a scaffold for the purpose, as well as to make certain repairs. After giving a detailed description of the scaffold, the lecturer passed to the subject of the decoration itself, quoting, in Mr. Parry's own words, the scheme of iconography which he had devised and executed. An account of the ancient painting of the woodwork was found among the archives of the cathedral, and shows that the decoration must have been very rich and elaborate, the colours enumerated being vermilion, orpiment azure, verdigris, cynoper or dragon-blood, red lead, white lead, gold and silver leaf. This work was executed between the years 1335 and 1346. The wages of the chief workman, Walter (*pictor*), were 8*d.* per week, *præter mensam et robam*. Oil is mentioned as specially purchased *pro colore tempera*, and solution of parchment was used as size. Mr. Rowe's paper was illustrated by a number of large diagrams and a model of the timbers of the lantern. A series of photographs from Mr. Parry's decoration was also exhibited.

In the discussion which followed,

Canon Lowe, as representing the Dean and Chapter of Ely, expressed his regret at the unavoidable absence of the Dean, and went on to observe that in view of the works now contemplated at Ely, the reading of Mr. Rowe's paper was extremely opportune. He should not presume to offer any opinion on the points discussed in the paper, seeing that he was in the presence of a body of professional architects, and because Mr. Stuart,—who had studied the whole of the cathedral, and whose book was still the text-book for all who wished to know anything of the cathedral, —was also present. Personally, he thanked Mr. Rowe for his able paper, and would desire to say that in Mr. Rowe the Dean and Chapter had a most worthy coadjutor in all that appertained to the preservation of the cathedral. The excellent series of measured drawings which Mr. Rowe had made of the octagon had been presented by him to the Dean and Chapter, with the view that, should any mishap unfortunately cause the destruction of the octagon, it might be reconstructed line for line, and detail by detail. He trusted, however, that the drawings would never be required for that purpose, but that they would continue to remain as a record of Mr. Rowe's zeal and ability. Under the guidance of Sir Gilbert Scott, the Dean and Chapter were about to continue the work of restoration, and to take in hand the rebuilding or completion of the stonework of the lantern. There were some debatable points upon which the Dean and Chapter would be glad of the opinion of the members of the Institute, although they placed themselves with the fullest confidence in the hands of Sir Gilbert Scott. When appeals were made for funds, intending subscribers made various suggestions and inquiries, and some of them only consented to subscribe conditionally upon certain things being done or left undone. These objectors had to be pacified, their apprehensions allayed, and their suggestions courteously received and carefully considered. Among the points upon which the Dean and Chapter would be glad to hear the opinion of the Institute or of its President, there was first of all the question whether the angular turrets rising upon the leaden part of the lantern should be crowned with wooden pinnacles? This was a point on which there was great variety of opinion expressed. Secondly, how far (taking into consideration the somewhat heavy and gloomy appearance which the lead-covered lantern presents to the eye externally), would it be desirable to relieve it with lines of gilding or some similar ornamentation? Another more important question remained for the future, for even were all doubts upon the matter resolved, the necessary funds were not yet available; he referred to the question whether the great lantern was intended by Alan de Walsingham to carry some lofty *flèche*, as a landmark for the surrounding country, or whether the lantern without a spire completely realised Walsingham's intentions. In considering this question there would arise the practical questions as to how far the addition of a *flèche* placed upon the lead-covered lantern would affect the structure below, and as to how far a lofty *flèche* rising in the open and exposed country, subject to violent gales, would affect the main principals of the lantern and even the stability of the entire fabric?

The Chairman remarked that the lantern at Ely was the work of an architect (Alan de Walsingham), who was also the third in rank as an officer of the cathedral,—viz., the sacristan. Mr. Stuart, who was present, was a not unworthy successor of Walsingham, having been sacristan for many years, during which time he had devoted a great deal of study to the cathedral, to what purpose was to be seen in his book referred to by Canon Lowe,—a book which probably no one (with the exception of Professor Willis) could have written; it was a most admirable architectural history of the cathedral. Mr. Burges knew as much about Ely Cathedral as any man, and he recollected that he first made Mr. Burges's acquaintance there about seven-and-twenty years ago. Perhaps he had something to say on the present occasion?

Mr. Burges said he need not say that he took a very great interest in Ely Cathedral. He spent three months there of very hard work in sketching and measuring. Mr. Rowe spoke about going down to the rock. Where was the rock, how far down was it, and what was it like?

Mr. Rowe.—It is a very hard sandstone rock; so hard that it cannot be worked by tools with anything like economy. It is to be found at a depth, close to the cathedral, of only 6 ft. The first builders did not go down to the rock. Walsingham did go down to it.

The Chairman said he might perhaps be allowed to interpolate a word or two on this point, for he had seen the rock. In view of some drainage works at Ely some years ago he had to inspect the foundations of the cathedral, and he found that the Norman work went down to a rock, which no doubt was thought to be *the* rock, but it was only a thin bed of rock lying above the solid rock. Alan de Walsingham had found out that the rock first met with was only a thin stratum, and had gone down to the solid.

Mr. Burges.—How thick are the joints in Alan de Walsingham's work?

Mr. Rowe.—I am afraid to upset all your theories, but the joints are as fine as those of modern masonry; and that, I believe, is the reason that the work has stood so well.

Mr. Burges asked whether he was correctly informed that Mr. Gambier Parry's decorative work was a gift to the cathedral?

Canon Lowe said that in the first instance Mr. Gambier Parry painted the half of the nave entirely at his own cost, all materials, of course, being found for him. He gave his labour, and took upon himself all the expenses of his prolonged residence from home. Upon his undertaking the decoration of the lantern, he expressed his intention of giving his labour as before, but added that he should be glad to have the expenses attendant on a long stay from home considered by the Dean and Chapter, who were, of course, only too glad to assent; but when Mr. Gambier Parry had completed the work, he said he had no bill whatever to send in.

Mr. Burges said he was not quite clear on that point, and he was glad to have elicited it. With regard to Mr. Parry's work, it certainly looked very beautiful, but he was greatly surprised that Mr. Parry, an ecclesiologist and iconographer, should have violated the very first law of iconography by putting shoes on his angels' feet! Angels were the winged messengers of God, and were never properly represented unless without shoes. As to the questions submitted by Canon Lowe, he was inclined to think that while perhaps the external lead work of the octagon might be advantageously relieved, the effect of gilding would be too garish and toy-like. Gilt work always looked crude until it had been exposed for many years, or until it was so worn that there was little else but the mordant and a few specks of gold. In France, as at Amiens and Chalons-sur-Marne amongst other places, lead surfaces were very agreeably relieved with tin in combination with gilding, and the effect was very good without being glaring.

The Chairman said that traces of similar work in gold and tin were to be seen at Cologne Cathedral.

Mr. Burges said that as to Canon Lowe's question about the pinnacles or spirelets to the turrets, there were no records to enable a positive decision to be arrived at as to what was originally intended. As to the question of a crowning *flèche*, no doubt, as Pugin said, before the Perpendicular period every lantern was meant to be capped with a spire. But these were purely questions of archæology, and in their solution the Dean and Chapter must trust to their architect, Sir Gilbert Scott, to dictate to whom

would be an impertinence. If a lot of holes were found in the top beams of the lantern there would be no doubt about the matter. He would suggest that a large model of the cathedral be made, and the effect tried with a spire and without it; drawings would not enable a correct judgment to be arrived at. Mr. Rowe had spoken of some figures for the niches which were to cost 20*l.* each; he (Mr. Burges) would suggest very great caution in that direction. He wished to ask another question, which was one for the members of the Institute and the profession generally. Suppose we had to build the lantern at Ely in the present day: should we do it in fir or in oak? Would it not be better done in fir? and if not, why not? Would it last longer in oak, which had a tendency to twist, from which fir was free? In the construction of such work, would not deal, bound with iron straps and bolts, last as long, and be as strong as oak-beams tenoned and trenailed together? Incidentally, Mr. Burges mentioned an expedient resorted to in France to prevent the decay which was inevitable when iron and oak were in contact; this consisted in placing a piece of painted paper between the iron and the oak. In conclusion, he said he should like to know when deal first came into general use for large roofs. Which was the oldest fir roof, and how had it stood? Many architects in the present day advocated the use of oak for roofs; but if the lantern at Ely had to be reconstructed in the present day oak could not be used, for it was too expensive, and had other disadvantages.

Mr. Wyatt Papworth moved a vote of thanks to Mr. Rowe for his admirable paper with especial pleasure, for he had the good fortune to be one of a small party of architects who spent some hours in Ely Cathedral last autumn, under the guidance of Mr. Rowe. As to the relative advantages and disadvantages of fir and oak, he could only refer inquirers to his (Mr. Papworth's) paper, read before the Institute twenty years ago.

Mr. C. Fowler seconded the proposition with equal pleasure, as he happened to be one of the party referred to by Mr. Papworth.

Mr. C. F. Hayward, as another of the same party, cordially supported the motion, and recommended all who wanted a holiday, combined with proper instruction, to go down to Ely and spend a few days, or even a few hours, in studying the cathedral.

The Chairman, in putting the motion, said he could only add his heartfelt testimony to Mr. Rowe for the excellent manner in which he had described the cathedral, and also to express his great gratification, although not without some personal humiliation, at seeing that Mr. Rowe had performed so nobly what all church restorers ought to do, but which, unfortunately, was generally neglected, i.e., to prepare a set of perfectly correct and accurate measured drawings of works upon which they were engaged while they had the opportunity. All architects engaged on restorations ought to do this, and if they did, it would form a most valuable record, which would be of incalculable value in the future. He thought that Ely Cathedral furnished a distinct proof, if any were needed, that the term "workman" did not in the Middle Ages convey the idea of an inferior or comparatively uneducated person, for Alan de Walsingham, although described on his tomb as a "workman" (*operatorum*), was certainly far more than what was now implied by the word. There was no doubt, however, that Walsingham was the architect of a great deal more of the building than was comprised in the octagon, for he was evidently the general architect of the fabric for a very long period. As to the questions *re* fir and oak, the oldest fir structure he (Sir Gilbert) had seen was built in 1520, being the roof of Old Aberdeen Cathedral. It was, however, very much decayed when he saw it, besides having been greatly mutilated. He was not in a position to say with certainty whether Walsingham had intended the lantern to be crowned with a spire. Possibly it might have been intended to have had an open-work spire.

The vote of thanks to Mr. Rowe having been carried by acclamation,

Mr. Rowe, in acknowledgment, said that, as had already been alluded to, he had had the privilege of conducting a few of the members of the Institute (who were well known, he believed, among the members of the Institute as "F.A.B.S.") over the cathedral last year, and if a small party was again made up, he should have pleasure in conducting it over the cathedral, provided he had timely notice.

The meeting then terminated. A special general meeting (of members only) will be held on Monday evening next, the 10th inst., to discuss the report of the special committee as to the financial condition of the Institute, and the best mode of increasing its efficiency.

THE ART-UNION OF LONDON PRINT.

WE have received an impression of the plate prepared by the Council of this Art-Union for the subscribers of the current year, "The Death of Nelson," engraved in pure line by Mr. C. W. Sharpe, from the original wall-painting in the palace of Westminster, by the late Daniel Maclise. It is a companion to the "Meeting of Wellington and Blucher after Waterloo," produced for the same association for the past year.

By the report which accompanied the proof, we learn that the amount of subscriptions for the latter plate reached the sum of 18,926*l.* (being more than 1,000*l.* beyond the largest amount ever previously subscribed), from which we may conclude that nearly that number of persons took the print of Wellington and Blucher, an issue of a *large plate* which we take to be probably unequalled in the history of line-engraving. Of course, some years have been required to produce so large a number of impressions, and, we were assured, and took an opportunity of personally verifying the statement, that the last impression taken from the plate is in every respect equal to the first; every delicate nuance of light and shade, the half-tints, in which we have been accustomed to look for wear in plates having a long run, are preserved with perfect fidelity. This result could only have been attained through Mr. Joubert's valuable discovery of steel-facing, by which the copper-plate is covered with an infinitesimally-thin skin of steel; this, on showing the slightest symptom of wear, is removed, and a new facing put on, leaving the copper-plate quite untouched and ready to go on supplying any number of impressions. We are told that there is a great demand for the Wellington plate still, by new subscribers, with a view to pairing with the new plate of Nelson. The mention of these large prints recalls a statement we met with in one of the Art-Union reports, some years since, to the effect that an impression had arisen in some quarters that the issue of *large* plates to the subscribers was a mistake, on account of the expense of framing, and the difficulty of stowing them in moderate-sized houses, and that, to test the truth of the assertion, the Council had a return made of the relative numbers taken by the public of the several plates produced for them, and it was found, that of the three largest plates in the list, upwards of 50,000 had been taken, the aggregate number of subscribers in the three years being 39,855, showing that in *other years* more than 10,000 of these plates had been chosen in preference to the smaller subjects forming the regular issue of those years. It is a healthy symptom of public taste that the print-shops now teem with engravings, two or three new ones appearing every week, instead of the photographs and chromolithographs so much in vogue a year or two ago; but the fact still remains that the Art-Union alone gives commissions for large plates in *pure line*.

The plate of the death of Nelson is a worthy pendent to that of last year; the interest in the subject with a sea-loving people like the English is sure to be even greater than that in a military theme, and the treatment is perhaps even more successful,—the grouping is less crowded, and the interest, by the skilful treatment of the artist, is intensely centred in the principal figure, the dying hero,—all the accessories, guns and gun-carriages, shot and shell,—the rigging of the *Victory* and of the *Redoutable* entangled with it, are depicted with that mastery of detail which was Maclise's great characteristic; the expression of the little powder-monkey running across with a cartridge; the slate with the memorable words of the day, "England expects that every man will do his duty"; the men whispering to each other of the fall of their beloved commander, though not, for a moment, offering to leave their posts,—all are given with the most life-like and touching pathos.

We have no doubt that the number of subscribers for this truly national work will be, at least, equal to that of the past year.

The Society's almanack, also sent to us, contains some useful information as to the art-societies of London, and the arrangements of scientific and literary meetings.

SOME OLD HOUSES AND THEIR STORIES.

THE ROYAL SOCIETY'S FIRST HOUSE.

WE go back to about the middle of the seventeenth century, or a few years earlier, and amidst the horrors, miseries, and turbulent excitement of civil war, the contending of furious cavaliers and Parliamentarians, Puritans and Episcopalians, we enter the house of a London apothecary, and look in upon a strangely quiet little group of men, earnestly thoughtful, and absorbed in the discussion of some mysterious chemical question. Mr., afterwards Sir, William Petty is their host the landlord of the house in which he lodges has supplied them with drugs, and they have resolved themselves into a club, from which those elements of the outer strife and bloodshed, politics and religion, are to be rigorously excluded.

They are men who were not content that philosophy should continue to stagnate within the narrow bounds of very ancient knowledge and experience, and their purpose, as a club, is to free its beneficent waters, and set them flowing through the land, by their natural courses, onward to join the vast inexhaustible and mysterious ocean of life which surrounds them. They are tired of thinking no thoughts of their own; of continually putting into and pulling out of their minds the same antiquated ideas; and they have resolved by original research and investigation to plough, plant, and reap for themselves, with a view to the improvement and extension of their intellectual produce; to make wisdom more fruitful, and learning no longer barren.

Here, amongst them, is Thomas Willis, a young man destined to achieve great fame as a physician, and Dr. Wilkins, who will be Bishop of Chester, and is now a daring theorist, proof against ridicule, who believes a new world is to be discovered in the moon, and that it is quite possible by the aid of flying-machines to reach it. You may remember the story told of him when a certain wildly ambitious dame of lofty rank mockingly asked how, while on his way to the moon, he would contrive to bait; and he replied by expressing surprise that a lady who built great castles in the air should ask such a question. Here, too, is Seth Ward, a clergyman who will rather sacrifice his Cambridge fellowship than subscribe to the "solemn league and covenant," and who will become the Savilian Professor of Astronomy at Oxford; and there is Laurence Rooke, a young man whose knowledge of astronomy is already great. He will be the Gresham Professor of Geometry at Oxford. Waller, the famous mathematical scholar, is here; and Mr. Haak, a German, who had the honour of originating the memorable little club; together with Samuel Foster, the Professor of Astronomy at Gresham College, Bishopsgate, a great master of ancient languages; Dr. Wallis, who is writing a new book on Mechanics; Dr. Goddard, the Roundhead, who is said to have constructed the first English telescope,—he who afterwards rose so high in the favour of Oliver Cromwell; and Dr. Ent, another well-known physician of the day.

The little club, as time progresses, grows apace, meeting sometimes as the guests of Mr. Petty, sometimes in the house of Mr. Haak, and sometimes at Dr. Goddard's lodgings in Wood-street, Cheapside, occasionally at the great mansion of the late Sir Thomas Gresham, in Bishopsgate-street, called by courtesy, and in accordance with the will and purpose of its late benevolent owner,—to the annoyance of Oxford and Cambridge,—Gresham College; and sometimes at Oxford, where, in 1648-9, some of the members become residents; but most frequently in Dr. Wilkins' great room over the gateway of Wadham College. These, as John Evelyn says, "were the persons to whom the world stands obliged for the promoting of that generous and real knowledge which gave the ferment that has ever since obtained."

Growing in numbers and importance, we find the Club holding its meetings weekly as the Philosophical College, in the Bishopsgate-street mansion, where it was very comfortably housed and provided for, with a great room for its meetings, and smaller rooms for varied uses, amongst the open courts, covered walks, gardens, stables, offices, and almshouses generously bequeathed to the nation for the increase of learning, and extending from Bishopsgate-street westwards to Broad-street.

On the death of the great Protector, when turbulent demonstrations, ominous signs, fears, terrors, threatenings, and the warfare of all kinds

of conflicting interests and purposes arose, Gresham College was occupied by the military as a garrison, and all the professors, save one, perforce, abandoned it. This was in September, 1658, and the one who did not abandon the college was a member of the Philosophical College. In a letter of Bishop Sprat to Professor Wren, afterwards Sir Christopher, and the architect of St. Paul's, dated 1658, we read:—"This day I went to visit Gresham College, but found the place in such a nasty condition, so defiled, and the smells so infernal, that if you should now come to make use of your tube, it would be like Dives looking out of hell into heaven. Dr. Goddard, of all your colleagues, keeps possession, which he never could be able to do, had he not before prepared his nose for camp perfumes by his voyages into Scotland, and had he not such excellent restoratives in his cellars."* The tube referred to here is of course the great reflecting telescope which Sir Chistopher Wren, who was then quite a young man, afterwards perfected, to the delight of, and probably with the assistance of, the Royal Society's eminent astronomers, although Wren was then Professor of Astronomy at Gresham College, a post which he had held but a year.

Richard Cromwell contrived to make himself master of the army in the January of that year, but in this month of September the rude soldiers were mutinous, and the overbearing arrogant officers discontented, while Charles Stuart in Brussels was anxiously hopeful of a restoration, for which General Monk in Scotland was rapidly paving the way. In October, ten days of complete anarchy were succeeded by a military government called a "Committee of Public Safety," by the raising and marching of armed bodies of men in every direction, and then by the commencement of General Monk's famous march towards England. Dreadfully ominous as all these signs were, and unsettled as the country then was, it could hardly be expected that the Philosophical College would continue its work. With the Restoration, however, things fell back into their usual grooves, and the weekly meetings of the Philosophers' Society at Gresham College were duly resumed.

On April 22nd, 1662, happily influenced, perhaps, by what he had seen abroad, or wisely alive to the vast importance of scientific investigations, King Charles II. formally constituted the Philosophic College a body politic and corporate, by the appellation of "The President, Council, and Fellows of the Royal Society of London for the Improvement of Natural Knowledge." The members who had so laboriously won their way to so honourable a recognition of their just importance felt, doubtless, no little pride and exultation as they for the first time used that stately privilege, the Royal Society's seal.† But no accession of personal dignity and honour could slacken their zeal for the objects which had been their bond of unity in the past, or make them forget the noble spirit of their self-created mission. The month of their charter was that in which popular religious bigotry, of all bigotry the worst,—rising blind, deaf, and without reason to its most savage state of cruelty and hate,—had so clamoured against Papists and Dissenters that the Government had felt constrained, as a matter of policy, to issue a proclamation against Popish priests, and to address to his Majesty a protest against his admitted inclination to be merciful to Dissenters from the creed of the State. In the face of this it was agreed by one of the Royal Society's resolutions, in which the noble principles it had adopted were newly declared, to admit as sharers in its work and privileges men of all religions, professions, and nations, "in order that the knowledge of nature might be freed from the prejudices of sect, and from a bias in favour of any particular branch of learning" (which is another common source of bigotry and consequent dogmatism), "and that all mankind might as much as possible be engaged in the pursuit of philosophy," which it was proposed "to reform not by laws and ceremonies, but by practice and example." In the same resolutions it was agreed "That records should be made of all works of nature and art of which any account could be obtained, so that the present age and posterity might be able to mark the errors which had been strengthened by long prescription, to restore truths which have long been neglected, and to extend the uses of those already known, thus making the way easier to truths as yet unknown." With such ends in view nine distinct committees were at once formed, each with its sphere of active employment in experiment and inquiry clearly defined, and in one or another of these were to be found nearly all the eminent thinkers and writers of the time,—Wren, Waller, Cowley, Denham, Dryden, Ashmole, Aubrey, Barrow, Boyle, Lord Brouncker, and Sir Robert Moray, their first president.

We visited the Society in the room over the apothecary's shop; let us take another peep at it in Gresham College in company with one who has chronicled what he saw there,—Sorbiere, the historiographer of Louis XIII. We reach the extensive range of buildings forming the college, noting the reading-hall in front by its gable-end. We pass into a quadrangle, about 100 ft. square, under arcades over which are long galleries, and on one side of which are the professors' houses. Into a large wainscoted room we go, noting a great table before the wide chimney and carved chimney-piece, and seven or eight tall-backed green-seated chairs about it. Arranged one above another in amphitheatre fashion are rows of wooden benches, the seats of which are covered with matting, on one of which we pose ourselves, where the members of the Society are in rows and groups all pleasantly chatting and talking amongst themselves. Then to us comes the president, Sir Robert Moray, who is ushered in by the beadle bearing a mace, and takes his seat amidst a sudden silence in an arm-chair, with the table before and the chimney behind him. As the beadle retires take notice of his mace. It was thought to be that which was referred to by Cromwell in the House of Commons, when he bade the armed men "Take away that bauble." The president, with his little wooden mallet, strikes the table, and in an instant every voice is hushed, and one of the most zealous and industrious members, Mr. John Evelyn, stepping forward, removes his hat as a mark of respect to the president, who, by a sign, commands him to be covered, on which he resumes it and proceeds to describe some experiments he has been performing on "the sensitive plant and *humilis*, which," he said, "contracted with the least touch of the sun through a burning-glass, though it rises and opens only when it shines on it."* A murmur of voices follows the close of this singular communication. Then a discussion arises, but, as Sorbiere says,—"There is nobody eager to speak that makes a long harangue, or (is) intent upon saying all he knows; he is never interrupted that speaks; and difference of opinion causes no manner of excitement, nor as much as a disobliging way of speech," a sure sign that none but gentlemen are present.

The same authority, who probably visited the Gresham College meetings more than once, says:—"There is nothing that seemed to me to be more civil, respectful, and better managed than this meeting; and if there is any private discourse held between any while a member is speaking, they only whisper, and the least sign from the president causes a sudden stop, though they have not told their mind out. I took special notice of this conduct in a body consisting of so many persons and of such different nations."

No rule is, however, without its exceptions, nor was the good rule thus lauded. We come out from the meeting under an open archway leading to the stables, over which are two figures, one standing over another on his knees, with a drawn sword. We are told that they represent two members of the Society, viz., Drs. Mead and Woodward, who had quarrelled, and, meeting here, fought. The standing figure, Mead, asked the kneeling figure, Woodward, if he would beg his life, and the latter, who in 1710 was expelled the Society for insulting Sir Hans Sloane while he was reading a paper, replied:—"No, Doctor, that I will not, till I am your patient," but, nevertheless, consented to confess his defeat, and surrender his weapon. He was a quarrelsome fellow, it appears, and must have bitterly resented this permanent chronicle of his humiliation. The incident was made the subject of a variety of jokes at the time, and, indeed, the Society was most plentifully bespattered with ridicule, both then and afterwards. You may remember "Hudibras" satirises these gallant and wise old philosophers most mercilessly, and was especially severe with a bitter production in rhyme called "The Elephant in the Moon." The wise man whose wonderful discovery is due to the presence of a mouse in his telescope was probably intended for Dr. Wilkins. The merry monarch had his joke with them also, it is said, by setting the philosophers to account for some effect which never had been, and never could be. They continued, too, to be ridiculed and sneered at, as they sometimes are even nowadays by philosophers, who, seeing so much clearer than they did by the light they had lighted for them, laugh at their awkward gropings about in the dark for the matches wherewith the little candle, which throws its light so far at last, was fairly lighted to burn brighter and brighter with its ever-growing flame.

But really it does appear funny to see these grave, sober, stately philosophers desperately puzzled by Prince Rupert's drops, sent to them for investigation by their royal patron, the King, having been purchased, as it seems, in Rosemary-lane, and appointing a special committee of investigation to visit the glass-house at Woolwich, and there experimentalise with them. It certainly is amusing to see them with a little kitten in their midst breathlessly anxious as they pricked it with a poisoned East Indian dagger, also sent by the king, which had previously been carefully warmed, and was expected to produce immediate death. But the victim's death was vainly watched for, and when the meeting broke up the poor little animal was still alive, and so remained.

It is amusing, too, when we note the patient care and earnestness with which, at great trouble and expense, they pursued their credulous inquiries concerning the wood that attracted fishes and the fish that always turned to the quarter whence the wind was coming when suspended by a thread; as to whether snow flakes were, as reported, larger in some countries than they are in others, and whether young vipers could be produced from the liver and lungs of old vipers, ground into a powder; as to whether the corn rained down from Heaven at Norwich would, if planted, grow, and as to the nature of the white powder which at once made cold water hot. Nor is it, with the light we have from the candle they lighted, remember, less curious to see them full of child-like wonder performing their experiments with the horn they believed to be that of the unicorn, setting a spider in the middle of a circle of powder made therefrom, anxiously watching it, and very much puzzled by its contemptuous disregard of their efforts to confine it within that supposed mysteriously wonderful circle. Again and again was the spider caught and put back within the magic powder. Again and again did the long-legged insect straddle indifferently over it and hurry away. But once—the eagerly bent-forward heads of the philosophers noted it with a sudden start—once the spider while in the midst of the powder actually paused! Imagine how they held their breath amidst profound stillness while every distended eye was full of startled expectation. But nothing wonderful came of it. The spider, having made up its mind which way to go, pursued its scrambling way as before. It was only a little uncertainty on its part—nothing more. They write to one of their foreign correspondents—one Sir Philberto Vernelli, "resident in Batavia in Java and Major"—requesting him to ascertain "whether diamonds and other precious stones grow again after three or four years in the same places where they have been digged out;" and "What river is that in Java that turns wood to stone?" and again, "Whether in the island of Sumbero, which lieth northward of Sumatra about eight degrees northern latitude, there be found such a vegetable as Mr. James Lancaster relates to have seen, which grows up to a tree, shrinks down, when one offers to pluck it up, into the ground, and would quite shrink (down) unless held very hard? And whether the same, being forcibly plucked up, hath a worm for its root, diminishing more and more according as the tree groweth in greatness; and, as soon as the worm is wholly turned into the tree, rooting in the ground, and so growing great? And whether the same, plucked up young, turns up by the time it is dry into a hard stone much like to white coral?" Things quite as extraordinary crop up in old minutes of the Society wherein we read of "Burning-*glasses* made of ice," of "snake-stones and other antidotes," of frozen swallows taken from under the ice of rivers and restored to life, of birds in shells adhering to trees in multitudes.

The spirit of simple earnestness and humility so clearly visible in these early inquiries into things most incredible and strange crops up also in the first Catalogue of the Society's Museum, which was first established in Gresham College,

* Published in the "Parentalia."

† Pepys says,—"I saw the Royal Society bring in their new book, wherein is nobly writ their charter and laws, and comes to be signed by the Duke as a Fellow, and all the Fellows are to be entered there, and lie as a monument; and the king hath put his with the word 'Founder.'"

* The Diary of John Evelyn, p. 277.

Bishopsgate, wherein we are told how, on certain occasions, the porcupine shoots out its quills at pursuing enemies; how certain squirrels cross rivers by the aid of bark from a tree, and erect their tails to serve as sails; how elephants go mad in winter when it begins to rain, "and so continue from April to September chained to some tree, and then become tame again"; how unfortunate "tortoises, when turned on their backs, will sometimes fetch deep sighs, and shed abundance of tears"; how the feathers of the humming-bird are "set in gold, and sell at a great rate," and of "a mountain-cabbage one reported 300 ft. high." And for the collection itself the same credulity accepted everything, the absurdity of which had not been fairly demonstrated. Thus we find, amongst other similar wonders, it contained "a bone, said to be taken out of a mermaid's head"; "a stag-beetle, whose horns, worn in a ring, are good against the cramp"; "a siphalter, said, with its sucker, to fasten on a ship, and stop it under sail"; and "the white shark, which sometimes swallows men whole."

The Great Fire of London in 1666 once more drove the Royal Society from Gresham College, which, escaping the flames, was for several years "employed for carrying on the trade and transacting the public affairs of the City. To it went the Lord Mayors and the Mercers' Company, and in it were established temporarily the City courts and offices. In the south and west galleries, and in the piazza underneath them, shops were constructed for the sale of necessaries. In the quadrangle the merchants met on 'Change, for the Royal Exchange had been destroyed, and in the gardens and under the almshouses of the professors sheds clustered for the accommodation of burnt-out citizens.

Then Henry Howard, of Norfolk, gave the Society house-room in Arundel House, in the Strand, and at the same time presented to them the whole of his grandfather's famous library, which Samuel Pepys, in his Diary, informs us was then valued at a thousand pounds.

But we are filling our space much too rapidly, seeing that we have not yet got to the house of which we have to tell our story. We must here turn off from the Strand, and hurry away into Fleet-street.

Fleet-street and its tributary thoroughfares seem the most wonderful places in the world to those who love the interesting memories of which they are so curiously prolific; memories which powerfully affect the feelings or awaken recollections of the deepest interest; which are tragic and sad, gloomy and cheerful; which range from the greatest topics to the smallest, and are by turns social, religious, political, criminal, regal, legal, warlike, commercial, poetical, literary, artistic, and scientific. Trace back almost any phase of society, or any of our progressive social improvements, and you are sure to find Fleet-street cropping up here or there in connexion therewith. Take up the lives of persons most eminent in the past for their achievements in almost any of the multifarious ways wherein fame, in varying kinds and degrees, has been attained, and the chances are greatly in favour of your finding something or other which carries you straight to Fleet-street. What a host of woful memories cling about the heads on Temple Bar! What stories of political turbulence and stern rude popular protests against tyranny and injustice belong to the poor old much-abused Bar itself! The old printers, the old poet players, with Shakspeare at their head, and famous shop-keepers; the old newspapers, old publishers, old taverns, not forgetting "The Devil" nor "The Mitre," and the great wits, poets, philosophers, artists, lawyers, journalists, statesmen, soldiers, and noblemen who wrote for the one or frequented the other, are all brought to mind with Fleet-street. The Kit-cat Club, with Addison, Garth, Sir Richard Steele, and many another of its celebrities, belongs to Fleet-street. The changeful bygone customs, fashions, and amusements of the town are almost all historically connected with Fleet-street. There was perhaps something of this in Boswell's reply to Johnson's question one day when they were walking in Greenwich Park, and the latter having asked the former, "Is not this very fine?" Boswell replied, "Yes, sir, but not equal to Fleet-street"; when Johnson responded, "You are right, sir."

But our subject is running away with us again, for our business is not with Fleet-street, but with one of its tributary courts. As you pass along the famous old thoroughfare towards Temple Bar, you will find on your right hand Crane-court, a little, quiet, dull, paved place, at the end of which facing the entry stands the old-fashioned brick house shown in our sketch. This house was built by Sir Christopher Wren, for the Royal Society, in the year 1710, on the site of an old dilapidated building which the Society had purchased of its owner, Dr. Nicholas Barebone, who was a son of that Praise-God-Barebone who gave his name to a Parliament of which he was the most prominent member. The Royal Society had left Arundel House, and returned to Gresham College after the fire in 1673, where it continued to meet until, to accommodate the Mercers' Company, it removed into Fleet-street, in 1710, to this new house in Crane-court, the first and only house it ever called its own. Here in Fleet-street it remained located seventy-two years before it removed to Somerset House, in 1782, doing an amount of national service, to chronicle which would require a large and portly volume. The promotion of inoculation received its attention from 1714 to 1722; electrical experiments were the chief features of its efforts of 1745; ventilation and the suppression of fevers absorbed the efforts of 1750. In 1757 thermometers and the laws of light were the topics of investigation; astronomy came to the fore in the year following, and the Greenwich Observatory followed; and in the succeeding years were directly and indirectly productive of an amount of real substantial good, by which the whole world has benefited, and which should be amply sufficient to make the story of this old house a deeply interesting one, and the house itself a relic in every way worthy of the most careful preservation.



The Royal Society's First House.

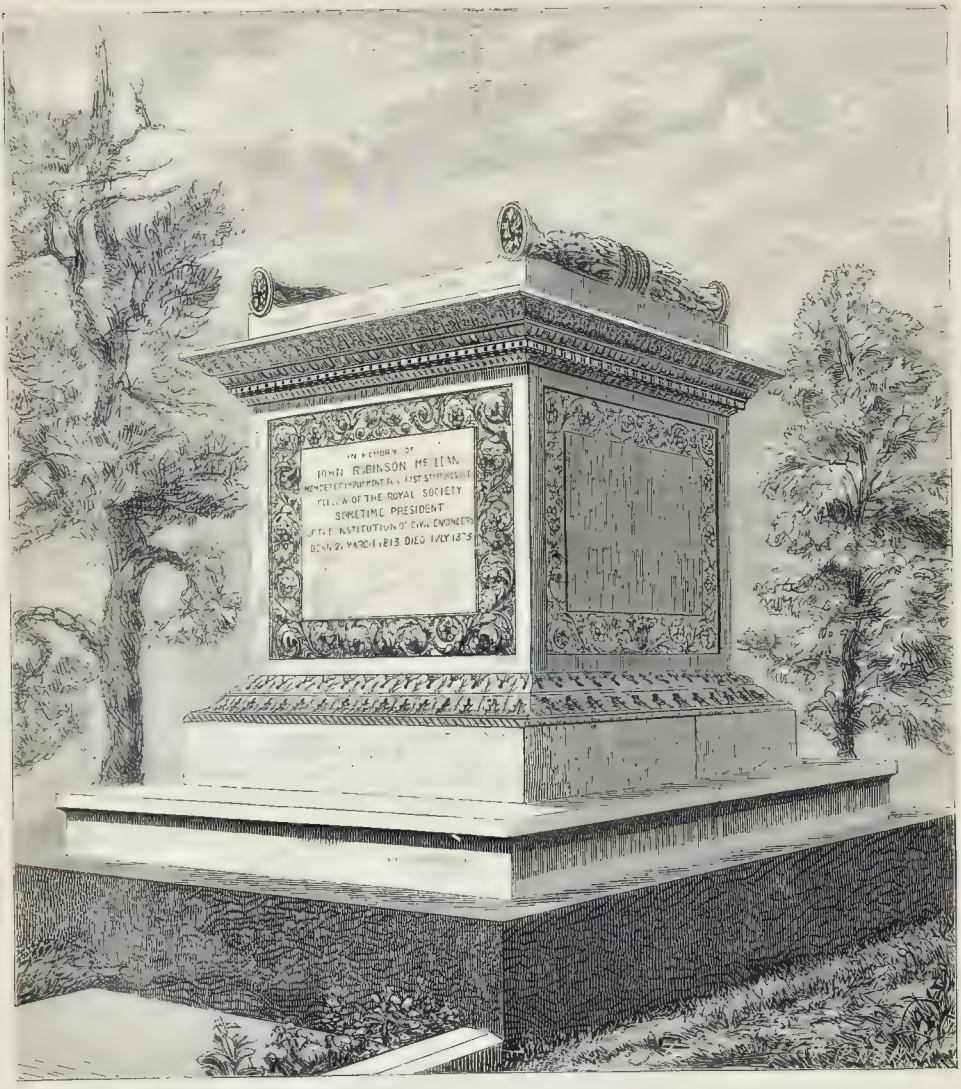
The new house had an extensive garden,—you must not, of course, look for it now,—wherein the Society erected a place for its museum, and the house was in other respects advantageous, but many of the members objected to it. A pamphlet on the subject, published in 1710 or 1711, says,—"The approach to it, I confess, is very fair and handsome, through a long court; but, then, they (the members) have no other property in this than in the street before it, and in a heavy rain a man may hardly escape being thoroughly wet before he can pass through it. The front of the house towards the garden is nearly half as long again as that towards Crane-court. Upon the ground-floor there is a little hall, and a direct passage down the stairs into the gardens, and on each side of it a little room. The stairs are easy which carry you up to the next floor. Here there is a room fronting the court, directly over the hall; and towards the garden is the meeting-room, and at the end another, also fronting the garden. There are three rooms upon the next floor. These are all that are as yet provided for the reception of the Society, except you will have the garrets, a platform of lead over them, and the usual cellars, &c., below, of which they have more and better at Gresham College."

It was our intention to look in upon the Society in Crane-court, as we have done elsewhere, some evening, when the lamp over the entrance to the court, being lighted, announced its meeting-night, and we also meant to dwell more fully upon its numerous and most important doings in Fleet-street. Again, it was our intention to trace from it those benefits and blessings in which millions of people have shared; to show how, rising from the little spring over the apothecary's shop, it widened into a magnificent river, and gave birth to a thousand fertilising streams in the shape of kindred societies, each occupied with some one special branch of that knowledge of which it was the noble parent and the first promoter. But although we have left so much out that it makes us sigh, we have put so much in that we fear it will be thought the space we occupy is much too large, and therefore we now put aside our pen.

DECEASED MASTERS, BURLINGTON HOUSE.

The Exhibition of works by the Old Masters and by deceased Masters of the British School, now open in Burlington House, consists of 285 pictures, and is very interesting. The collection includes 30 works by Sir Joshua Reynolds, and 19 by Gainsborough; 6 by Rubens, 7 by Titian, and 9 by Vandyck.

We shall take an early opportunity to speak of them.



TOMB OF THE LATE MR. J. R. McCLEAN, C.E., F.R.S., KENSAL GREEN CEMETERY.

AN ENGINEER'S TOMB.

MR. JOHN ROBINSON MCCLEAN was born in Belfast in the year 1813, and having received a good general education, he studied two years at the University of Glasgow, at the same time pursuing practical studies in engineering and surveying. On leaving Glasgow he entered the office of Messrs. Walker & Burges, civil engineers, and remained with them until 1844, during which time he was employed on several important works. In 1844 he commenced practice in London as a civil engineer; and from this period he became a man of superior rank in his profession, and in every way qualified to take a very prominent part.

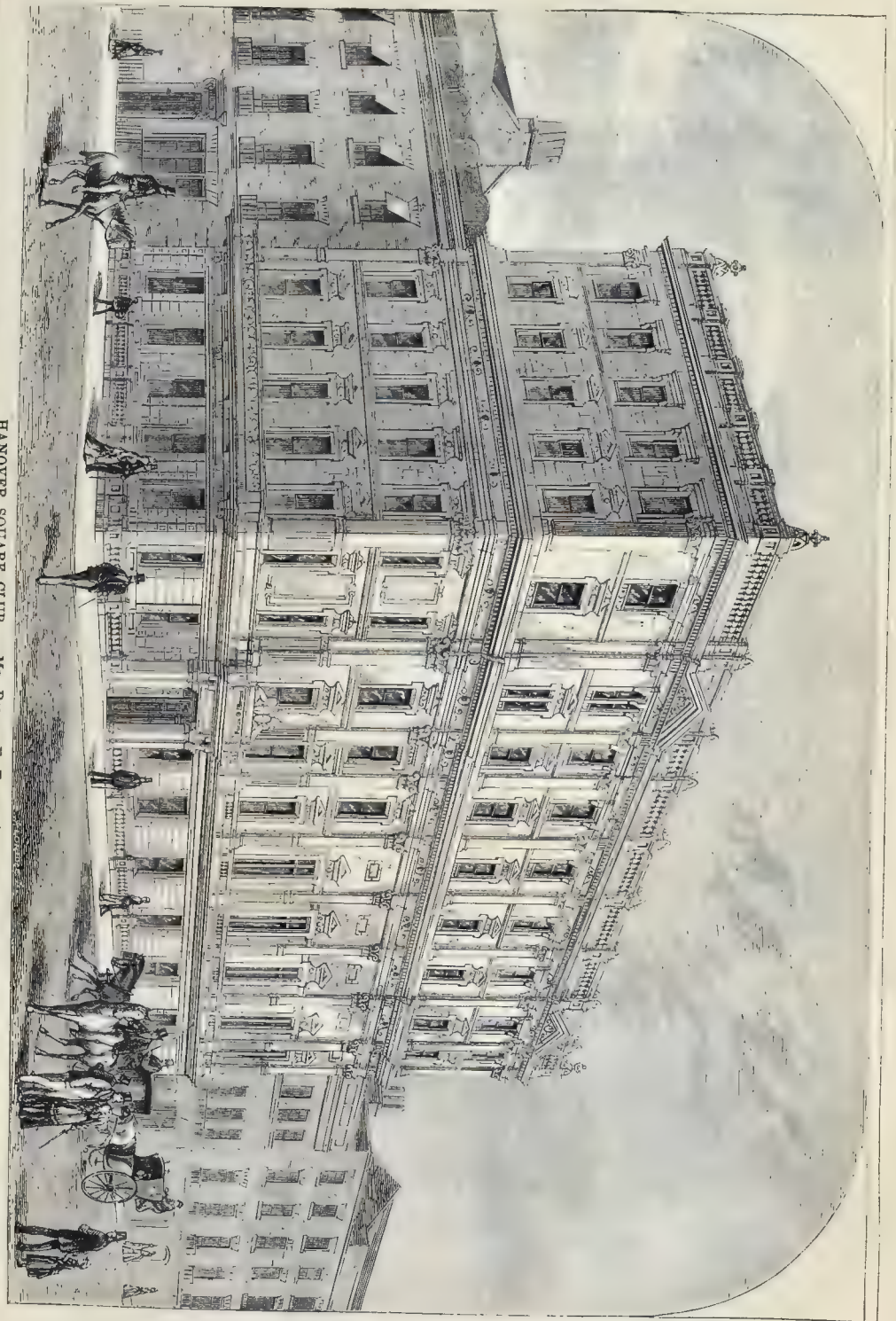
Amongst his chief works may be named Furness Railway, Barrow Docks, South Staffordshire Railway, Birmingham, Wolverhampton, and Dudley Railways, and South Staffordshire Waterworks.

In 1862, upon the death of Mr. James Walker, whose pupil and assistant, as we have mentioned, Mr. McClean had formerly been, viz., from 1837 to 1844, he was appointed Government engineer to the harbours of Dover, Alderney, St. Catherine's, Jersey; also for the Plymouth Breakwater, and the Shovel Rock Fort at Plymouth.

Mr. McClean was also appointed at different times on the following Royal Commissions, viz., that for the Thames Embankment, for the Cattle Plague, for Railways, on the Sanitary Commission, &c. He was president of the Institution of Civil Engineers during the years 1864 and 1865. He took a warm interest as president to secure the creation of the benevolent fund of that Institution. In 1868 Mr. McClean retired from the active exercise of his profession, and at the same time entered Parliament as member for the eastern division of the county of Staffordshire. He was consistently through life a Liberal in his politics. In 1869 he was elected fellow of the Royal Society, also a Lieut.-Col. of the Railway Volunteer Staff Corps.

In the latter part of his life he suffered from ill-health, and died on the 13th of July, 1873, at Stonehouse, near Broadstairs, Kent, at the comparatively early age of sixty years, his career having been at once active, useful, and honourable. He lies interred at Kensal-green Cemetery, where a monument has been erected to his memory by his family. The accompanying engraving will serve to illustrate it.

The monument is from the designs of the late Mr. Edward Adams, who has taken his *motif* from a tomb at Pompeii, viz., that to Nævoleia Tyché, which he studied on the spot. The work has been executed in solid Carrara marble, by Mr. George Sinclair, statuary, at his works, in Marshall-street, Golden-square, and reflects much credit upon him and his assistants for the goodness of the workmanship. The steps forming the base are of granite.



HANOVER SQUARE CLUB.—MR. ROBERT E. TYLER, ARCHITECT.

HANOVER SQUARE CLUB.

THE alterations to the Queen's Concert Rooms, Hanover-square, with the view to forming the present house, known as the Hanover-square Club, were commenced in May last year. One of the objects in the formation of this club was the introduction of foreigners, and most of the ambassadors (according to the public prospectus) have become members, and take a great interest in its success.

Another object was to provide bedrooms for the accommodation of country and foreign members; forty of these, besides rooms for domestics, are formed above the level of the ceiling of the old concert-hall, which, to the extent of 70 ft., has been retained as the present dining-hall. To accomplish this, the tie-beams of the old roof, which held up the ceiling, had to be preserved, and truss girders, 11 ft. high, were fixed at certain distances with other girders laid across, to which the tie-beams were fastened. After this had been carried out, the queen-posts, principals, &c., were removed. The truss girders are filled in with brickwork, and form the partitions to the first tier of bedrooms. The following is a description of the building, which has been constructed under the superintendence of Mr. Robert E. Tyler, architect.

Ground-floor: to the left of the entrance-hall, which is in Hanover-street, is the newspaper-room, 36 ft. by 18 ft.; to the right, occupying the position of the old supper-room, is a lobby for hats and coats, and a corridor, 6 ft. wide, leading from which are four private dining-rooms or card-rooms, about 20 ft. by 16 ft. each.

The secretary's offices and a writing-room are 26 ft. by 25 ft. A pass door from this corridor leads to the working part of the establishment, the servants' staircase, with tradesmen's entrance, and men's water-closet, store-rooms, wine, beer, and coal cellars, and serving-room, with lift from kitchen for private dining-rooms. Opposite the tradesmen's entrance is a general lift, which delivers goods, coals, luggage, &c., to each floor, meat, and so on, direct to the larder and kitchen. The principal lavatories are in the basement, leading out from the entrance-hall. The grand staircase, which is entirely of stone, is ornamented with statues (provided by Brucciani) on each quarter-space, holding jets of gas, and at the top is a large skylight, with a handsome inner light of stained and coloured glass.

First-floor: immediately off the staircase is the smoking-room, 36 ft. long, fronting Hanover-square, and leading on to a balcony, 4 ft. wide, the length in Hanover-street being 48 ft. To the left of the staircase is a corridor 7 ft. wide, on the right of which is a card-room, 20 ft. by 16 ft., and on the left the wine bar, with a lobby for waiters at either end, that adjoining the dining-hall, which is at the end of this corridor, having a jib door. The dining-hall, which is 70 ft. by 36 ft., and 34 ft. high, has been restored and re-decorated; the east end where the Royal box formerly stood (which has been removed) is new, as also the west end, a trussed partition having been erected the whole height of the room. The well-known pictures in the ceiling, where practicable, have been restored, and new ones inserted where necessary.

On the north side of the dining-hall (formerly occupied by the tea-room) are the serving-rooms, still-room, servants' hall, housekeeper's room, and male attendants' lavatory. The kitchen and scullery, 60 ft. by 20 ft., are over these rooms, the floor being fireproof, with an open-timbered roof, and ventilators carried to the top of the main building, so as to prevent any effluvia.

The larders are also situated in the immediate vicinity of the kitchen. The boiler and kitchen fittings have been supplied by Mr. Jones, of Castle-street, Leicester-square.

On the second floor is a billiard-room for three tables, 52 ft. by 36 ft., with lavatory attached; and the drawing-room, 36 ft. by 18 ft., over-looking Hanover-square.

The third floor: leading from the grand staircase to the east end of the building, is a corridor 6 ft. wide, on either side of which are bedrooms, bath-rooms, and water-closets; separated by a lobby, housemaids' closet, lift-room, which will be used by the bedroom attendants, and to which the electric bells from the various rooms will ring. At the north-east corner is the servants' staircase from the ground-floor, with female servants' water-closets and pass-door shutting off communication from the kitchen department. A servants' staircase is continued to the upper floors, and occupies the end of the corridor. This corridor is ventilated by gratings in the floor of the corridor over, and lighted by fanlights over the bedroom doors.

The fourth floor has a corridor similar to the one beneath, with bedrooms on either side, bath-room, and water-closet. This corridor is lighted from skylights in the roof, with inner lights, the panels round which are filled in with perforated zinc.

The servants' bedrooms are in the roof, also the tanks for the hot and cold water supply.

The bells throughout are electric, by Mr. Sax. All the principal rooms are ventilated by means of the "Potts Ventilating Cornices." The cement work to the exterior of the building (which was a separate contract) is executed in Portland cement and silver sand, the work having been carried out by Messrs. Bonden & Darrell. The contract (with the exception of the external cement work) has been carried out by Messrs. McLachlan & Son; and the ironwork by Messrs. R. Moreland & Sons. The total amount expended has been upwards of 30,000*l*.

The carpets throughout the building have been specially designed and executed by Messrs. Tyler & Son, Government contractors.

PROPOSED CHANGES, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—If, as it is said, the completion of the Suez Canal was largely aided by the unconcealed enmity of England to the scheme, the Report of the Special Committee upon the "Affairs of the Institute" has possibly acquired a revolutionary taint from the strenuous opposition of one deeply interested in the welfare of the Society. Professor Donaldson, with unusual pertinacity of argument and assertion, has protested against, not one, but every proposal now offered by the Committee—for modification or amendment—to the general body, whose charter, according to him, "maintains as much as possible, for any human composition, the moral, artistic, and intellectual position of the architect." But if it take only the traditional nine tailors to make a man, probably the seven well-known practitioners who cut and dried this report may be considered equal to one professor, however eminent. Their collective opinion is, at least, worth that of an individual superior. The latter's appeal, published in the professional journals last week, to the suffrages of architects who seldom attend a meeting in Conduit-street except to oppose all change, will, doubtless, be followed on Monday by a motion to maintain the present charter,—a course which will tend to consign the conscientious labour of months to the huge waste-paper basket of the Institute secretary. But such an easy triumph cannot save moribund regulations. At the same time, any attempt to obtain a new charter, in the face of such opposition as could be brought against the proposal, would lead to scandal and expense, neither of which can be safely incurred. Nor can the report be shelved without equal risk of moral and pecuniary loss. Unless the subject is carefully handled by both the promoters and opponents of reform, a schism is inevitable; and the Associates at least are not bound to accept a share in a catastrophe they did not precipitate and cannot avert. A majority of Fellows will remain; and eventually another financial crisis will occur, and another committee will be appointed, unless, indeed, the Institute elects to die gloriously "game" upon its funded capital,—an admirable mode of existence while it lasts, and one which enabled some of the predecessors of the present Council to declare officially that the immediate urgency of the cause for which the Special Committee was appointed had disappeared.

By the existing charter, Associates have not, and never can have, a vote,—which means that they are deprived of all practical participation in the management and business of the Institute. If the Fellows may be said to represent "householders," the Associates have not even the privilege of "lodgers,"—they are like waifs and strays, lost sheep, nullities! Yet between many of the younger Fellows and the elder Associates there is but slight difference; and the latter might undoubtedly become Fellows. But there is much to be said in explanation of the reluctance shown by many of them to accept the easy alternative. The course of early professional life does not always run smoothly; and the highest talent and most assiduous application are sometimes beaten down by adverse circumstances. Though work generally leads to work, the successful construction of one building does not always lead to that of another, and it is not unnatural that Associates in practice should be modestly anxious regarding their future. When times are hard, some rely on the lucrative employment of "taking off quantities." Some give their services honourably to builders, upholsterers, and other tradesmen. Others design for glass-painters, decorators, and sculptors, or draw on wood, or stone, or for photo-lithography. Week after week advertisements are inserted in the public journals by architects known to have been long in practice, who offer themselves as assistants. Misfortune would be sorely aggravated if such men were compelled to descend from the grade of Fellow. But there is also a sentimental side of the argument. To explain it I must invoke the shade of the late Arthur Ashpitel, who sometimes fished up Truth from the bottom of her well, and brought the young lady to Conduit-street, where, since his death, she has been less often seen. Half the buildings in England are nominally the works of Fellows; but, really, many are designed and the execution of them superintended by Associates, or men who, if they belonged to the Institute, would fill that grade. In this country, the first thing asked, when the scaffolding of a new building is removed, and the name of the nominal architect is mentioned, is, "Who did it for him?" It is a perfectly natural question; for no individual mortal could design and superintend simultaneously all the buildings which pluralist practitioners from time to time unblushingly call their own. The man who buys and sells land and houses, who values and surveys, who collects rents, and adds a general building agency to his professional practice, may become a Fellow of the Institute. There is no possible objection to such things when carried on by honourable men; but the members of a profession which thus touches upon, if it do not exceed, the confines of commerce, are unwise to ride tall horses, for they sit but loosely in the saddle. In England the modern architect is not a master-of-the-work, as he was in the Middle Ages, and as he still is, to a certain extent, in France. His functions are divided amongst several specialists, and one of these specialists is the "quantity" surveyor, who, were he not too often paid in an underhand fashion, has as much right to the Fellowship of the Institute as the valuer and the estate agent, the furniture designer, and the writer for the press. Indeed, for a long time the rights of Fellowship have been enjoyed by men known to be both regularly and casually employed by paper-stainers, upholsterers, and even builders; but to sit side by side with their employers, although upon a different social footing, has been, and is still, deemed intolerable by themselves and the majority of their colleagues.

However unanimous may be the opinion of the meeting next Monday regarding the maintenance of the present charter, the "Affairs of the Institute" cannot possibly be discussed in one evening. The advisability of altering the existing mode of administration to one more suited to a country in which from time to time Tory Governments carry sweeping measures of reform through both Houses of the Legislature, should at least be considered. As it is, the Royal Institute of British Architects does not represent the profession, because it is not managed upon native representative principles. On the contrary, its principles resemble those of a neighbouring country, which, until very lately, had an Emperor who elected a Senate, and who subsidised lieutenants to elect a Parliament. The Council of the Institute, unless surprised by a cabal, elects itself; maintains one secretary to preserve the illusion of a name; pays another to oppose honorary individual exertion; and completes the parallel by treating the reporters it invites to the meetings, not as Englishmen, trustful of a free press, usually do, but as an imperial *préfet* treated the journalists at his command. I am told that recent members of the Council already turn round upon half-empty benches and ask helplessly who shall succeed them! As their triumphs are so must be their disasters; and the "pooh-pooh" which has too long greeted an Associate who attempts to address a Special Meeting will be consistently answered when in the time of danger the man at the helm is washed overboard, and there is no one ready to take his place.

Many of the younger members entertain strange notions about the present management of the Institute. Some actually believe that the choice of a new president, of new members of

Council, and the award of the Royal gold medal, depend a great deal upon the secret nomination of the secretary, Mr. Eastlake, and such absurd rumours cause bad blood to ferment to his prejudice. But that he has too much power I am enabled to affirm. A short time ago the secretary was asked to convene a meeting of one of the few committees which sit. He replied that the Council had forbidden any committee to meet without its special leave. Three gentlemen then wrote separately to the Council declining under such circumstances to serve the Institute in any honorary capacity. No reply was vouchsafed; but one of them was privately informed that the secretary had made a mistake; and a day or two afterwards the said committee was summoned. That which is wanting in the chartered society is the force lent to the Association by its numerous committees and sub-committees. A spur to exertion is thus given to a large number of men. If the majority of those who will be present on Monday evening would honour the ordinary meetings with an occasional visit; if some would attend the committees to which their names are attached; if all would remember that paid service is necessarily limited, and that honorary labour might be boundless, then surely there would be no need of special committees to report on crises, because such calamities could not then occur. But the existence of one almost autocratic secretary is an excuse for shirking honorary work. Nor when such work is offered is it accepted by the present administration. The secretary is ordered to attend all committees, both ordinary and special; and it is certain that his presence serves to check the expression of individual opinion, since the servant of the Council is bound in honour to give a faithful report to his masters. All the committees should be periodically convened. There should be a general chairman; and each committee should appoint its own honorary secretary, who should draw up a report of proceedings to be presented to the Council through the medium of its salaried officer,—and to pay court to this gentleman should not be the only recommendation required to fill the honourable post of committee-man. At the same time, no one could do the legitimate work better than the present secretary does his; but indispensable "red tape" is not sufficient to carry out all that is required to be done in his department. To obtain the promise of sessional papers, to induce men whose opinions are worth having to attend a particular meeting, a lithographed form of letter is not enough. An honorary officer must wait upon those whose favours the Institute solicits; for upon the courtesies of life, more than upon the conventionalities of business, depend the welfare and progress of a professional guild.

While there is no living member of the Institute more worthy of general esteem than Professor Donaldson, there is a dead architect whose memory is at any rate honoured as much. On the 23rd of April, 1860, the late Mr. Cockerell, in one of those "imaginative or artistic disquisitions," as Mr. T. H. Wyatt has termed similar addresses, said:—"We hope to form schools of our own and to offer collegiate grades which will reward eminence and recommend by certificates to the public patronage. These last, already established in the shape of diplomas in the colleges of Law and Physic, prove the advantage of their being no less adopted in the Institute of British Architects." A few years before these words were spoken, Professor Donaldson attended a meeting of the Architectural Association at Lyon's Inn Hall, and offered the then members terms of amalgamation with the Institute. He was half laughed at, and his offer wholly rejected. I remember, then little better than a boy, that I thought we treated the Professor with scant courtesy. But the sequel has proved that we were right. The gauntlet of education which President Cockerell afterwards threw down was taken up by the Architectural Association. From all parts of the United Kingdom come praises of the art and science classes formed and carried on by the younger members of the profession, coupled with regrets that the provinces are not equally favoured. One of the greatest of modern Frenchmen has strengthened them with his mature approbation. On the opening night of this session I held up my hand fifty times to welcome a new member! The Association has energy and expectation on its side; and, however much may be averred to the contrary, a natural sentiment of rivalry with the chartered society stirs the heart and influences the spirit of the younger one. Backed by the press, ardent, and ambitious, the Architectural Association is aided by nearly all the Associates and some of the Fellows of the Institute. To read a paper, or attend the reading of one, to its members is equally a pleasure; and a roomful of eager and attentive listeners, with an unfettered press, is better payment to a competent lecturer than whole volumes of Transactions which, to parody a line of Pope,

"Are so corrected that they're ne'er correct."

Now a word in conclusion. However unfortunate was the tone of the Annual Report issued by the Council of last session, there was one sentence in it which deserves serious attention at the present moment. It was written:—"Only those conversant with the executive functions of a society can be aware of the marked divergence of opinions which exists on many questions respecting its policy and management." It is just this division, more apparent however than real, which forms the strength of the lukewarm office-holder, who holds the ready battledore to successive disputants and watches the good of the community tossed about like a shuttlecock—to fall eventually at his feet. Without a general acceptation of the very old policy of compromise, all discussion must inevitably be futile. Only by giving and taking in turn, can the Institute be pushed to do what, according to many of the younger members, it has not yet done,—"promote the advancement of a special art and maintain the integrity and protect the interests of those who practise it."

WILLIAM H. WHITE.

GREAT EXPANSION OF THE METROPOLIS.

THE new assessment of the metropolis which has just been made, and which comes into operation in April next, reveals some interesting facts and statistics as to the great increase in population and building which is going forward in every district within the metropolitan area, with the single exception of the City, where the number of inhabited houses is constantly decreasing, and their former occupants are migrating to suburban neighbourhoods. The figures show that the population in several of the great parishes on the northern, eastern, and western sides of the metropolis,—Marylebone, St. Pancras, Islington, and other places,—continues to increase, but it may, perhaps, be stated with confidence that it is south of the Thames where the greatest amount of building is going forward, and that what were within a very recent period purely suburban, or even agricultural districts, are now covered with miles of streets and houses, with a population only numbered by tens of thousands.

As regards the City of London, the returns show that the City proper contains 112 parishes and precincts, and that under the Valuation Act of 1869 its gross estimated value for assessment was 3,200,343*l.*, and its rateable value 2,681,235*l.*; but that in consequence of the removal of old houses for public improvements in large new buildings and new thoroughfares, the number of houses, and also the population, are continually decreasing, and that whilst at the census of 1861 the number of houses was 13,218, at the census of 1871 they had decreased to 9,248, and that at the latter date the population stood at 74,944, but is now considerably less. St. Pancras, although not covering so large an area as some of the other parishes within the metropolitan district, is, nevertheless, the most populous, its inhabitants reaching 230,000. Its area is 2,600 acres, and it is twenty-one miles and a half in circumference. The amount of its assessment is next to that of the City of London. Islington is also one of the largest parishes on the northern side of the metropolis, and one of those which is the most rapidly increasing in the number of its houses. At the last census it had 27,083 inhabited houses, and a population of 213,749, but since that date there have been a very large number of new dwellings erected, whilst others are still in progress, and it is now almost as large as St. Pancras.

Turning to the east, we find that Whitechapel, which comprises nine parishes, with the comparatively limited area of 406 acres, has, nevertheless, a closely-packed population of 76,332, contained in 8,313 houses, giving the large average of nine inhabitants to each house. The neighbouring parish of Bethnal-green is known to be one of the very poorest parishes in the metropolis. The census of 1871 showed the number of its inhabited houses to be 15,981, with a population of 120,200, or an average of eight inhabitants to each house, being thus almost as dense as White chapel.

Among the parishes at the West End it may be noticed that Paddington, covering an area of 1,235 acres, has a population of upwards of 100,000; and that the parish of St. Mary Abbotts, Kensington, at the last census, had a population of 120,234, but has since that time largely increased. The progress of Kensington has, indeed, been marvellous.

Crossing over to the Surrey side of the river, it is in the parishes of Camberwell and Lambeth respectively where the population is, perhaps, more rapidly increasing than in any other parts of the metropolis. With the exception of Lambeth, Camberwell is the largest single parish on the Surrey side of the metropolis. Its area is 3,420 acres, and its population, which, at the last census in 1871, was 111,302, had at the beginning of last year become increased by new buildings, to 130,000, and that number is known to have again very considerably increased by the large number of new houses erected in different parts of the parish during the year which has just closed. Within that period upwards of 300 houses have been erected on the plot of land known as the Rosemary Branch at Peckham, which was only recently laid out for building purposes, whilst from Loughborough Junction to Peckham, on both sides of the railway, which only about a year ago was nothing but green fields and meadow and park land, the whole of the area is being rapidly covered with dwellings. In the neighbourhood of Goose-green building is also rapidly going forward, the extensive old market-gardens between the Green and Champion Park having been purchased by the British Land Company, who have laid out the ground in streets, and on which some hundreds of houses have already been erected. Large numbers of houses of a high-class character are likewise in course of erection in the neighbourhood of Lordship-lane, Dulwich-grove, and other parts of Dulwich, whilst in the localities of Peckham-rye and Nunhead new blocks of buildings are rapidly springing up.

The same activity in building also applies to the large parish of Lambeth, one of the most extensive in the metropolis, and stretching from Westminster Bridge to the Crystal Palace. The area of this parish is nearly 4,000 acres, portions of which, near the river, as is well known, very densely populated, whilst a considerable area, extending in the direction of South Brixton, Streatham, and Norwood, is of a rural character. Its population at the census of 1871 was 208,342, but since that period it has enormously increased, and from the large number of new houses which have been erected in the parish since the census returns were made up, its present population is confidently believed to be upwards of 240,000. In proof of this it may be stated that during the last five years, the district surveyor for South Lambeth has passed upwards of 6,000 houses, which have been built, and the number erected during last year alone was 1,500. These new dwellings have been erected principally in the neighbourhoods of Brixton, Stockwell, Norwood, Clapham, and Wandsworth. In the last-named neighbourhood, Lavender-hill, at the upper end of Wandsworth-road, from the railway station to Clapham Junction, was a continuation of open fields only three years ago, and is now entirely covered with houses. The Bolingbroke Estate, between Wandsworth-common and Clapham Junction, and the vacant ground on the Battersea side of the Junction, as well as the district beyond, in the direction of Wandsworth, have all been covered with houses within the last three years.

WARRINGTON.

THE *New Post Office* has just been commenced. The building, which is to have a frontage of 47½ ft. towards Sankey-street, and 100 ft. towards Winmarleigh-street, will be of brick, with stone base mouldings, string-courses, and enrichments, the block at the Sankey-street end being two stories high, but about half the Winmarleigh-street portion only one story. The basement will be apportioned into a battery-room, clerks' and letter-carriers' retiring-rooms, with porters' kitchen and bedroom. The ground-floor will contain the public office looking both into Sankey and Winmarleigh streets, with entrance to the west corner. The postmaster's room will open out of the public office, and the sorters' room, which is 30 ft. by 38 ft., again out of it. On the first floor, with an entrance out of Sankey-street at the eastern corner of the building, and over the

public office and postmaster's room will be the telegraph offices, the stairs to which run at the back of the public office. The sorters' room, being one story high, is lighted both from the ridge and from windows looking into Winmarleigh-street, and has an entrance at the extreme end down this street. Mr. Williams, of Her Majesty's Office of Works, is the architect, and Mr. Collin has obtained the contract at the sum of 6,086*l.*

The *Conservative Club* in Academy-street has recently undergone considerable extension by the addition of two billiard-rooms and other premises. The principal billiard-room is 32 ft. by 29 ft., and has a raised platform, 5 ft. wide, running down one side, which will accommodate one or two sets of card-players, as well as those who take an interest in watching the progress of billiards. The roof is of open pitch-pine, stained and varnished. The room is lighted from the roof, and the heating is provided for by Haden's hot-air apparatus. The room is approached by an ante-room, part of which is partitioned off and fitted up as a lavatory. The adjoining room will have a larger superficial area than the room just described, inasmuch as it is an extension of a previously existing room. Its dimensions are 45 ft. by 23 ft. Mr. Wm. Owen is the architect; Mr. J. E. Wright, contractor; and the gasfittings and plumbing have been carried out by Mr. Hedgecock. The new building has cost 600*l.*

VALUE OF LAND, STOCKTON-ON-TEES.

IN June last, the Spring-gardens Estate, situate in Farm-lane, about half a mile from the market-place of the town, and belonging to the Ecclesiastical Commissioners, and used as a market garden, containing in the whole about four acres and a half, was put up for sale by public auction. Four years since the sum of 3,000*l.* would have been considered a large sum for this property, but the sale was opened by a bid of this amount from Mr. Adams, which rapidly ran up to 5,400*l.*, when the auctioneer, Mr. Thomas Hornby, declared the sale an open one. The biddings again commenced, and the property was ultimately knocked down to the bid of 6,825*l.*, made by Mr. Charles J. Adams, architect, on behalf of himself, Mr. J. W. Watson, and Mr. W. Adams, who were declared the purchasers. The property was purchased for possession in April, 1876, to be paid for in full in August last. Some delay having been occasioned in the completion of the deeds by the Commissioners, the payment was not completed until November last, when the tenant, having been compensated by the purchasers to give up possession at an earlier date, the purchasers have now taken possession, and a large staff of men are engaged felling the trees and constructing the sewers. The road-making will be started early in the present year. The proprietors have decided to engage their own workmen in order to find employment for a number of men who are out of work, and in the hope of alleviating some of the distress which is so great in the district. Three roads will be driven through the property, which has a frontage of about 500 ft., the plans for which have been submitted to the corporation and approved of by them. A portion of the ground has already been sold as laid out in sites, and it is contemplated to erect a church on a portion of the ground for a new district which has lately been formed.

THE ANCIENT WALLS AND FORTS OF SOUTHAMPTON.

THIS fine southern town possesses some of the finest examples of stone fortifications on the coast, and the Corporation have, with laudable zeal, from time to time taken steps to prevent their falling to decay. Not many years since they restored the Bar Gate, the ancient northern entrance to the town, and subsequently the old walls on the western shore and adjoining the west gate received at their hands the attention which all lovers of antiquity would desire. At the southern end of the town, near the Platform, stands a very ancient stone structure, for many years used as the jail; it adjoins the east gate. In fact, the latter is a portion of the building, which is about 60 ft. long and 20 ft. broad, and was originally flanked with two towers, one at the eastern and the other at the western end; the former one still remains in a tolerably good state of preservation, but the latter has for many years been dismantled. The Pier and Harbour Commissioners, who have possession of this building, are now restoring it and converting it into purposes of utility as well. The contract has been taken by Mr. Crook, of Southampton, and in the course of the restorations some old windows which had been filled up with rubble masonry had to be opened, disclosing the ancient traceried heads, the mullions being gone, the whole of which, with the other dressings, are in Tisbury stone.

The surveyor to the Board, Mr. Geddes, reported this to the Board, and we are pleased to hear that they ordered the complete restoration of these examples of Early English architecture, and we trust they will not be satisfied until the whole, including the western tower, have been completely restored.

THE THEORY OF LIGHT.

SIR,—It affords me a considerable degree of satisfaction to find that you speak approvingly on some of the important points of my "Revised Theory of Light." The first section, relating to the arts, whilst it contains some suggestions for the consideration of the scientific, is also addressed to the artist and the general reader; and in all works which attempt revision there must necessarily be much that is admitted in combination with what professes to be new.

Although I intended my title to be a modest one, it may not be sufficiently explicit as to the position I have ventured to assume in reference to the received theory of light: I therefore beg to state that I accept the undulatory theory as the true one, and the differentiation of vibration as the external cause of all the various *sensations* of light in us; and I push this accepted theory to its legitimate issues, in order to still further test its adequacy; or, in case the undulatory theory should prove vulnerable to new tests, to gain, perchance, some clue to the right solution of the problem.

That light in all its differentiations of colour has no existence whatever beyond the sentient, is not my assumption; it is a fundamental position assumed by the great thinkers. Neither Newton nor Huyghens supposed that light was in the one case inherent in the corpuscules which the former supposed were projected from the sun, nor in the other that light was a property of the undulating elastic medium itself. Each of these philosophers assumed only that his hypothetical mode of motion was the external cause of the various *sensations* of light in us. The believer in the undulatory theory cannot, indeed, for one moment, consistently attribute light to either the undulations themselves or to external things; for then the selfsame vibratory medium would possess the wonderful property of being of all colours at one and the same time; and if we find the vibration is the colour, the vibration is also the sound, and a simple mode of motion would be all kinds of things at once. Why a simple vibration should produce in one case sound, and in another light, will probably never be solved. The vibration, then, is not the colour itself, but is a sensation resulting from the contact of vibration and sentient.

Besides pushing the undulatory theory to its extreme consequences, I claim to have contributed an entirely new hypothesis, the libration of sensation, to account for the phenomena of the *ocular spectra*, an hypothesis which, while it appears most satisfactorily to account for these phenomena, links the human system with the solar, and shows that one simple law of compensation or restoration of balance reigns in both. That contribution to the theory of light will be of more value to the future than any picture, should I, sir, be either wise or conscientious to leave darkness, which I believe myself capable of making light, even to paint pictures as well as you are good enough to fancy I could. If the office of teacher and public benefactor be thankless, that is not my fault.

W. CAVE THOMAS.

THE THEORY OF COLOUR.

MR. BENSON would fain have had us believe that "green" was a "primary colour," and now Mr. W. Cave Thomas, in his "Revised Theory of Light," asserts that there are no such colours as "primaries" at all, except in point of time or succession. I suppose next we shall be asked to believe that *colour* does not exist at all, that it is simply a "sensation" of our own imagination. But with all due respect for Mr. Thomas's very subtle and profound reasoning, I am convinced, from continual observation, of one fact—and that is, that green is a *compound* colour. That it is always formed, whether in nature or in the mixing of pigments, of two or more colours, or "sensations," or whatever else they may be termed. That all nature, throughout which we see such a beautiful and wonderful variety of "greens," would unquestionably present to our eyes the "sensation" of yellow—from a sickly whitish one to a deep orange yellow—if it were not for the blue, the actinic, or chemical ray in the atmosphere—the ray of moisture, if I may so call it, which acts upon and enters chemically into combination with the yellow sap of plants and trees, and alters it to ever-varying shades of green. On the contrary, if it were not for the inherent colour of the sap of plants all nature would be blue instead of green.

Green is thus formed by the mixing, or amalgamation, or the action of one colour upon another; and this combined process conveys to our eyes the "sensation," which we all know and recognise as the colour of green. No matter how you describe it, or what you may call it, it is formed by a double process, and by two or more distinct colours. Like everything in nature, when clearly understood, the combination is of the most simple character. What is true of a little gamboge added to a little indigo, is true throughout nature, even to the refraction of light at sunrise or sunset, when we often see the blue sky near the horizon, changed to the most lovely green, formed simply by the yellow light from the sun amalgamating with or shooting through the blue sky. This compound character of green is a simple fact in nature, and cannot possibly be got rid of by any amount of reasoning.

JAMES K. COLLING.

NEW PUBLIC HALL AT HUNTLY, N.B.

THE new public hall and municipal buildings for the bargh of Huntly have just been completed and opened. The new building is in the Scottish Baronial style, the principal architectural feature being the tower, which rises over the front elevation to a height of 80 ft. The frontage of the building to Gordon-street is 64 ft. 6 in. The front of the building to the height of the first floor is in polished freestone, and above that the walls have freestone dressings, filled in with granite ashlar. The freestone is from Rhynie quarries, and the granite from Syllavithy quarries on the Castle Forbes estate, near Bridge of Alford, the colours of the stones presenting a pleasing contrast. The tower rises as a continuation of the front wall to the height of about 58 ft.; and above the parapet of the façade of the building is in three divisions, the two lower having windows, and the upper circular spaces for clock dials. The roof of the tower gradually contracts till it terminates in a platform about 5 ft. square, inclosed with ornamental iron-railing with corner vanes. A flagstaff rises from the centre of the platform to a height of 22 ft. The tower at the base is 15 ft. square, is fitted up inside into three floors, having also a gallery for bell and clock with four dials. The two shops in the front of the building are 22 ft. wide by 24 ft. deep. The main entrance to the building is from Gordon-street. It opens into an outer lobby, 10½ ft. square, beyond which there is a doorway admitting into an entrance-hall or corridor. The corridor measures 26 ft. by 13 ft., the ceiling is at a height of about 12 ft. From the entrance-hall or corridor there is a broad staircase leading to the apartments in the first floor above the shops. The principal of these apartments is a public meeting-room, 23 ft. by 24 ft., and having a height from floor to ceiling of 14 ft. Adjoining this apartment there is a dressing or cloak-room, about 10 ft. square, with ante-room about 13 ft. by 11 ft.; and closet with lavatory, &c. There are also upon the first floor three apartments for residence to the keepers of the building. These portions of the building are contained in the block fronting the street, measuring 64 ft. by 42 ft. The public hall stretches backward from this block, and occupies an external space of 80 ft. in length and 45 ft. in breadth. Externally, the side walls of the hall are 25 ft. high, while the apex of the roof is at a height of 40 ft. The public hall will seat 600 people. The floor is on the ground level, and has an area of 65 ft. by 41 ft. The hall is entered from the corridor, from which there is one opening into Gordon-street, and another into the passage by the side of the building. At the back end of the hall there is a circular recess, which is filled by a permanent platform, standing 3½ ft. above the level of the hall floor, and having a

width of about 20 ft. The height from the floor to the ceiling is 25 ft.; and the roof is broken up into nine panels by massive mouldings, the angles of the ceiling and side walls being coved, the circles springing from a bold cornice. The side walls are lined with pitch pine varnished, to a height of 5 ft., and above that they are lathed and plastered. The hall is lighted by five windows in each side wall. Doors open from each side of the platform, and also from the body of the hall in the vicinity of the platform, into retiring-rooms. The erection has occupied over eighteen months, work having been commenced in May, 1874. Local workmen were mostly employed, and the contractors for the different branches were:—Messrs. Ingram & Gordon, masons, Huntly; Mr. Milne, carpenter, Invernrie; Barclay & Duncan, slaters, Huntly; Logie, plasterer, Huntly; Bowman, plumber, Huntly; and Robertson, painter and glazier, Huntly. The cost of the building and furnishings will be slightly over 3,000*l.* The architect is Mr. James Anderson, of Huntly, whose plans were selected in a limited competition by the trustees of the late Mr. Alexander Stewart, jun., who by will directed the realisation of his estate, the proceeds to be devoted to the erection and maintenance of a public hall for the burgh.

TREATMENT OF AN ARCHITECT IN THE ISLE OF MAN.

SIR,—Permit me through your columns to place before professional men generally a matter most injuriously affecting all our rights; and in order that it may be properly understood, I will, with your permission, briefly give a few facts of the case, and then allow the correspondence to speak for itself.

In the years 1869-70, from an intimate acquaintance with Douglas, and without the slightest aid from any one else, I first prepared the plans for the embankment now carried out, and gave it the name "Loch Parade," the production of which caused the general question of town improvements to be taken up for the first time. Within a few months after my plans had been made public, several others were produced by local men, and an extraordinary amount of public excitement attended the matter. A referee was called in, as it was thought, to decide as to the best of the plans submitted; but it resulted only in the gentleman alluded to re-using one in his own name, so like, as practically to be the same as one of those on which he was called to report (the work of an amateur). This result not being satisfactory to the public, the latter plan, bearing the referee's name, took the place of that belonging to the amateur alluded to, was placed in competition with the others, and three professional referees chosen to decide between them; the House of Keys afterwards appointing a committee of its own members also to report thereon. The result was that my plan was accepted by referees and committee both, and adopted unanimously by the Insular Legislature, "The Douglas Streets Improvement Act, 1874," being passed for the purpose of carrying it out. Success attended my efforts after a four years' struggle, at an expenditure of time and money I scarcely care to recall, and after an opposition the bitterness of which I shall never forget, but, bitter as it was, not one whisper arose as to my authorship of the plan.

I now innocently thought my troubles were over, and I should have nothing to do but carry out my pet scheme, which had at last secured that success so dear to professional men; but found myself, without reason assigned, or to my knowledge existing, superseded by the appointment of Mr. Powell to carry out the distinguishing feature of my plan (although requiring nothing beyond the experience of a practice such as my own), and the prestige thereof, as well as the commission on works worth 20,0 0 *l.*, sought to be taken from me. Mr. Powell's only connexion with the matter previously being that of a witness, for an hour or so, before the Court, during the inquiries above referred to.

My plans being proceeded with, and no arrangements whatever made with me, I wrote the Improvement Board, most respectfully, as to my position being defined, receiving a reply, which, although signed by the secretary, I learned had been written by the Board's legal adviser. This led to correspondence between the solicitors on both sides, extending over some months, and resulting in my appointment of architect and surveyor to the Board, with arrangements only as to future work, all the past being left in abeyance by mutual understanding. My duties, however, up to the act of which I complain, were almost *nil*, surveying of building land, laying out of lots, opening up of streets, reports on various matters, evidence as to value of property taken before referees appointed under the Act, all being done by local men, regardless of my official position.

The climax of the treatment to which I, as the author of the scheme, have been subjected, was reserved for the completion of that part of my plan placed in the hands of Mr. Powell, the resident engineer to the harbour works, when, although the vice-president of the Board publicly speaking of the "Loch Parade," said,—"The result is, that if the land sell—and, judging by the inquiries there are already, there can be no doubt about that—then we shall have accomplished this great work, than which there is no finer in the kingdom, without a single penny cost to the town,"—my name was entirely omitted from a public document officially said to contain "the name of the engineer and others connected with this important work," regardless alike of the facts before stated, and my now holding the position of architect and surveyor to the Board, and on that account only entitled to equal recognition with the engineer (supposing him even to have done more than carry out the works of another).

Although the Board (in writing) put upon Mr. Powell the responsibility of an act so mean, I still thought it but courteous to give him an opportunity of clearing himself; but as, instead of doing so, he simply tries to evade the question by declining to do what he was not asked, he leaves himself committed to an act which to characterise truthfully would be offensive.

This being the act of a public body in connexion with a public work, would, if allowed to become a precedent, seriously affect the rights of all professional men; I have, therefore, felt it to be my duty to protest, and now bring the matter to the knowledge of my professional brethren, feeling confident I shall have their sympathy in this struggle for our common rights.

C. O. ELLISON, F.R.I.B.A.,
Vice-President of the Liverpool Architectural Society.

CONVEYANCE OF BUILDING LAND.

HUNTON *v.* GREY AND OTHERS.

THIS case in the High Court of Justice, Chancery Division, before the Master of the Rolls, is one of considerable importance to builders and others contracting for the sale of land. The plaintiff sought to obtain specific performance of an agreement by the defendants to sell him some copyhold land for building purposes.

On the 24th July, 1873, the defendants, through their agent, Mr. Dodds, M.P., and with the consent of the person beneficially in possession of the rents, agreed to sell the land in question. A covenant was contained in the agreement to the effect that the purchaser should erect a dwelling-house, with a lodge and suitable outbuilding on the purchased property. That he should expend no less than 1,000*l.* in the erection of the dwelling-house, and should have the plans and elevations of the same previously submitted to, and approved of, by the vendors or their agent. The purchase-money was to be 910*l.* 3s., and the contract was to be completed on or before October, 1873. Prior to the date of the contract the defendants agreed to sell to a Mr. Smith a plot adjoining the plaintiff's purchase. It was complained by the plaintiff that Mr. Smith had placed a waterspout so as to be a trespass on his land. In September, 1873, the plaintiff agreed to the defendant's offer to enfranchise the land, and about the same time the plaintiff commenced the erection of his house, and had laid out about 3,000*l.* on it. He alleged, in his Chancery bill, that his plans had then been submitted to, and approved of by, Mr. Dodds, the defendant's agent. This statement was, however, denied by the defendants. The plaintiff had sent the draft conveyance to Mr. Dodd's office, but the defendants had declined to execute it until the question at issue between Mr. Smith and the plaintiff as to the boundaries had been settled, and the plans approved. The plaintiff now filed this bill asking for specific performance and the costs of the suit.

For the defendants it was urged that they were justified in refusing to convey the property to the plaintiff, inasmuch as he asked them to assure to him land already contracted to be sold to another party. The alleged approval of plans, they said, did not take place. The day after the plans were left at Mr. Dodd's office plaintiff met the defendants' architect in the street, who said he thought they were very "nice." This "nice," it was contended, did not amount to the approval required by the contract.

The Master of the Rolls observed there was no dispute about the contract, and the defendants were bound to execute a conveyance, according to the covenant in the agreement. They refused, however, to execute until the squabble as to the boundaries was settled. Anything more absurd he, the Master of the Rolls, had seldom seen. The defendants had nothing to do but to take the purchase-money and convey, according to the provisions of the contract. With reference to the other point, the learned judge thought the defendants were right in insisting that no approval of the plans had ever taken place. Both sides had been wrong and "wrong-headed," and he should, therefore, give costs to neither side. A conveyance would be executed, and there would be interest on the purchase-money at 5 per cent.

An array of counsel were engaged, and the litigation will have cost a considerable sum.

"GRINDING-MONEY" AGAIN.

SYMES *v.* MORELAND.

IN this case, heard at the Clerkenwell County Court on the 17th ult., before Mr. Gordon Whitbread, the judge, a claim was made by the plaintiff, a carpenter and joiner, against Messrs. Moreland & Nixon, builders, of Old-street, St. Luke's, for the sum of 9d., being an hour's pay in lieu of notice, for time to grind his tools. Mr. Wakeling appeared for the plaintiff, and Mr. Nixon for the defendants.

Mr. Wakeling stated that the claim was for 9d., but it was a large question whether the plaintiff was entitled to what was called in the trade "grinding-money." Previous to July, 1859, it was the custom to allow grinding-money, in order that when workmen went to their next place their tools might be in proper order, and for that purpose two hours and a half were allowed. The masters and the representatives of the workmen, in July, 1875, had a meeting, at which it was agreed that not exceeding two hours should be allowed for grinding-money.

The Judge remarked that the meeting would be in the teeth of any customer, but if it was the custom, there would be no occasion for the meeting.

Joseph Symes, the plaintiff, said he was a carpenter and joiner, and had been in the trade for forty years, ever since he was a boy. It was formerly the custom of the trade to allow two hours and a half for grinding tools, or a quarter of a day; it was now the custom to allow two hours, not in some cases, but generally. He was discharged on account of the slackness of the work; he had notice at eleven o'clock, and should have had the noticeat ten o'clock to leave at twelve. Was not aware that some of the largest firms only allowed one hour to the men for putting their tools in proper order.

Joseph Coles, carpenter, gave evidence of the custom being to allow two hours to put the tools in order.

Mr. Nixon, one of the defendants, said he had been in business for fourteen years, and had worked for twenty years. The joiner had never been allowed more than an hour for putting the tools in order. He was not consulted as to the meeting of the trade, nor did he belong to any association. He had notice put up in the shop of one hour being allowed for grinding-money, but it had been torn down. The men had a number of tools, but they could grind them in one hour, for it was supposed they would always be in working order to do the work, and they would not, therefore, all be required to be ground. At Messrs. Cubitt's, Gray's-inn-road, and some other shops, two hours were allowed for grinding tools. He had between 200 and 300 men in his employ, and about twenty or thirty had been discharged, but he had had only two disputes, one of them being the present case.

George Shapley, foreman to the defendants, said he engaged the men. The plaintiff came and asked if they had a job, and he engaged him. Nothing was said about grinding-money being paid. Two of the men were discharged at the same time, eleven o'clock, and another came in at twelve o'clock, and then received notice. The rule of the shop was to allow one hour for grinding-money.

The Judge considered the evidence as to the custom to be very slight. The meeting of the trade showed that there was a difference, and the two associations came to a resolution that not exceeding two hours should be allowed for grinding-money, but that did not establish the custom that two hours should be allowed in every case. It only said that not more than two hours should be allowed.

Judgment for defendants.

ASSESSMENT OF A SAW MILL.

NORTON & SONS, APPELLANTS: THE ASSESSMENT COMMITTEE OF ISLINGTON, RESPONDENTS.

THE appellants (at the Islington Special Assessment Sessions) are timber merchants and proprietors of a saw-mill, occupying wharf property on the Regent's Canal, in the parish of Islington. The assessors and overseers of the parish had originally fixed the value of the property in the new assessment list, which is to come into force next Lady-day, at 700*l.* gross value. This figure upon appeal before the Assessment Committee was reduced to 600*l.* gross value, and it was against this reduced amount that Messrs. Norton & Sons appealed to the Special Assessment Sessions.

Mr. Robert Walker and Mr. Wagstaff, surveyors, called by the appellants, valued the premises at 400*l.* per annum gross value, deducting another 100*l.* for repairs, leaving the rateable value at 300*l.*

On the part of the Assessment Committee, Mr. Higgins and Mr. Clark, surveyors of the Vestry, were called, who placed the value at 1,000*l.* per annum gross; whilst Mr. Worthington, surveyor, placed it somewhat higher. Mr. Arthur Harston, of the firm of A. & C. Harston, surveyors, placed the gross value at 800*l.*, exclusive of the fixed machinery, and placing the property in class eleven, deducting 60*l.* for repairs, &c., leaving a rateable value of 740*l.* The machinery did not appear to have been generally rated in the parish; but if the fixed machinery in this case were to be taken into consideration, then, in his opinion, the gross value should be 1,060*l.*, and the rateable value 878*l.*

The Court, after retiring to consult, confirmed the rating, but made no order as to costs.

HEATING WITH HOT WATER.

SIR,—I HAVE somewhat foolishly attached a coil, for warming a hall, to the hot-water apparatus for warming water for bath, taps, &c., over the house. The water of the whole system was spoiled by the rust of the inside of the coil and iron pipes thereof (lead pipes being used for all the rest), but is now apparently clearing, after a week or so of use. The coil warms moderately well, but what I much wish to know is,—1st, Will the inside of the coil and its pipes gather fresh rust when left full of water, but cut off from the general circulation, when the coil is not being worked (as it will be)? And, 2nd, The best method of treating such a combination so as best to escape rusty water everywhere?

C. H. F.

"RINK."

SIR,—I append a cutting from the *World* newspaper, which may be of interest in connexion with the controversy now going on in your columns as to the word "rink." The writer in the *World* says:

"The following 'Poem picked up at Prince's,' though in truth it has but little poetry in it, shows how quickly a just retribution will sometimes overtake rash young gentlemen who attempt to take liberties with the English language during a 'cruise upon wheels':—

'There is rank on the rink,' said young Brown, with a wink;
People stared, and they thought he was drunk;
On the rink, then, he rank, and came down with a spank,
Sincerely repenting he'd runk."

D.

The Ordnance Survey.—It is said that the Government has ordered that the annual cost of the Ordnance Survey of the United Kingdom shall be reduced, and that on Saturday and Monday last a large number of civil assistants at the head-quarters in Southampton received their discharge.

THE PUBLIC RECORDS.

A VAST amount of valuable work is going on quietly in the Public Record Office, where the historical documents of the kingdom are being systematically arranged, and the more important among them reproduced in a modern form accessible to everybody. The principal works, to the production of which the energies of the department are now devoted, are the Chronicles and Memorials of Great Britain and Ireland during the Middle Ages. The first three volumes have been completed and published, including the "Memorials of Saint Dunstan, archbishop of Canterbury"; while seventeen further volumes are in the press—if not by this time published—and three others in progress. The varied interest and value of these works will be indicated by the following selections from the list:—"Life of Thomas à Becket, from an Icelandic Saga, with an English Translation"; "Register of Malmesbury Abbey"; "The Metrical Chronicle of Robert of Gloucester"; "The Historical Works of Ralph de Diceto, dean of St. Paul's, 1181–1210," &c.

The popularity of the work is evidenced by the fact that the sales had, up to the beginning of the year, amounted to 28,907 volumes.

M. Armand Baschet has, at the request of Lord Romilly, prepared a list of documents relating to English affairs preserved among the French archives; and, according to his report on the subject, some very valuable additions will be made to our historical papers if copies of the French originals can be accurately obtained.

But the existing records relating to the history of our country are already of immense value, and the references which are made to them in the Annual Reports of the Public Record Office, though, of course, not touching on a tithe of the actual documents, are most interesting. From the list of the Welsh Records of the Palatinate of Chester, for instance, we can gather many facts which throw great light on the customs of the period to which they refer. In 1407, for instance, we have the appointment of John de Acton and others, as admiral and governors of the fleet fitted out by the mayor and citizens of Chester, and about to proceed to sea on the king's service. The value of land is shown in the Indenture, dated 1366, by which Edward, Prince of Wales, grants to the dean and chapter of St. Asaph a piece of land called Gronantesmore, for the yearly rent of twenty marks, and promises to allow them 12d. yearly for every acre destroyed, should the sea burst over the land.

In 1391 we have an indenture between the bishop, dean, and chapter of St. Asaph's Cathedral and Robert Fagan, the said Fagan to build and complete the belfry of the cathedral in stone, to the height of 5 rods, and 1½ rod of battlement, the said chapter to pay to the said Robert 100 marks, "*sc'd'm quantitatem facture d'ci campanilis*," and to find carriage for the stone and lime; the work to be completed by the Feast of All Saints, 1392.

The principle of arbitration, recently paraded as a modern idea, was not unknown to the Welshmen of 500 years ago; for among various similar documents we find a recognisance for 1,000 marks on the part of Richard de Aston, Kt., and others that the said Richard de Aston abide the award of John de Burghes, and three other arbitrators, touching all dissensions between him and John de Mascy of Podyington, Kt.; and there is a counter recognisance on the part of John de Mascy of Podgington. These worthy people had a more business-like way of insuring the acceptance by both parties of the arbitrators' award than is adopted nowadays, when, in disputes between colliers and colliery owners, there is no assurance that the former will abide by any decision that is adverse to their claims.

Lead mines in Flint, and elsewhere in North Wales, are recorded as having been let in 1389 at a yearly rental of 40*l*.

Considering the frequent allusions we have made to the paltry salaries offered to surveyors at the present day, the following announcement, notwithstanding the difference in the value of money, would seem as applicable to the end of the nineteenth as to the beginning of the fifteenth century. "Robert de Baildon, appointed Sept. 22, 1402, keeper and surveyor of stores in the castles of Conway and Carnarvon, and surveyor of the works of the town and castle of Conway, with 6d. a day wages." Immediately prior to this Thomas Bagylegh, who had been with the king's father at the siege of Calais, and at the battle of Poitiers, and elsewhere abroad, and had never received any reward, as was well known to the people of Chester, had been allowed a similar sum—6d. a day "during pleasure." Certainly Thomas Horlebot, of the principality of Chester, thought it worth while to petition the king for 1d. a day, he being feeble and poor, and a grant was accordingly made to him of this magnificent sum. But this surveyor was not so well treated as William de Hampton, who in 1399 was appointed plumber to the castles of "Chester, Beston, Flint, Rothelan, Conway, Beaumarres, Caernarvon, Crukyth, and Hardelagh," for life, with 8d. a day for himself, and 4d. for his man.

We find the germ of modern "paving rates" in the grant of "murage" for the repair of the walls and pavements of the city of Chester, which in 1395 were, according to the mayor and commonalty, in a very ruinous state, and had from the earliest times been supported and repaired by a murage. This "murage" had, in 1387, been diverted from its legitimate use to the "rebuilding of the bridge there, the destruction of which caused the inhabitants and those resorting to the said city much danger and inconvenience, and was a source of great loss."

To the riots and rebellions of the times there are ample references, which resulted in such grants as the following, dated 1364:—Licence to John de Delves, Kt., to fortify and kernellate his mansion at Dodynton, with stone, chalk, and wood, and to hold the same so fortified to himself and his heirs.

The ancient forestal rights of the Crown gave rise to writs, such as that calling upon the forester to "expel all dogs, *canes molosorum*, and pigs from the forest (Delamere), the game in which was much injured by the coursing of the former, and the grubbing up of the latter"; and "to build *quandam cameram* in the said forest, 40 ft. long and 20 ft. broad, and two stories high, for the convenience of the foresters, the Prince having been informed that great damage had accrued to the vert and venison of the forest, owing to the distance from it of the foresters' dwellings."

Here is a curious entry:—"Oct. 26, 1352.—Pardon to Thomas de Beeston and Katherine his wife, for the trespass which Elizabeth, who was the wife of Robert de Calvilegh, committed in marrying herself." In these days of "women's rights," a woman hardly requires a Royal pardon when she commits the "trespass" of getting married; much less do her parents and guardians, even though, as in this case, the marriage transfers to the husband the right to landed property.

Fac-similes of the most valuable national manuscripts are being made by means of the photo-zincographic process. Irish history is being first dealt with, and the second volume of the series, containing seventy-nine *fac-similes*, has been produced. As one of the most characteristic of these documents, we quote the following description of one of the later papers, dated June, 1542. The original of this is in English; but Gaelic, French, and Latin originals all figure in the book. The document referred to is a petition from the gentlemen, inheritors, and freeholders, of the county of Tipperary to the king, giving an account of the prosperous state of the county, formerly under the governance of the Earls of Ormonde, until the delegation of his authority by James, the White Earl of Ormonde, to some of his kinsmen during his absence in England at the court of Henry VI.

It particularly complains of the action of one Sir Edmund Butler, and his brother, Sir James, who kept continually charging the county with coin and livery, coddies, coyssers, hounds, hunts, stud-keepers, masons, carpenters, and other workmen, to its utter impoverishment. His son and heir, Sir Thomas, followed in the evil steps of his father, and "swearing that he will forego nothing of what his father and grandfather extorted from the complainants, makes such intolerable exactions from them, plundering them of their goods and money, and making them keep his studs of horses, and his hounds of many kinds, obliging them to maintain horses and horsemen for his service and garrisons for his castles, and to keep them and all his mills, gardens, orchards, etc., in proper repair. Every Christmas he makes them pay him 7*l*. 13*s*. 4*d*. for wines which he orders for that feast, and he also makes them pay for the carriage of all the corn, wine, pails of butter, and anything else he chooses to order. On the marriage of each of his daughters, he takes a sheep from every flock, and one cow out of every sixty, besides assessing them in many other unlawful ways, whereby they are so impoverished as to be unable to pay his Majesty's subsidy." They therefore humbly pray redress.

This document, says Mr. Sanders, in his report on the subject, "furnishes a very graphic picture of the wretched state to which Ireland had by that time been reduced, not so much by her original Celtic inhabitants, the *puri Hibernici*, the 'wild Irish,' as by the mixed race that had sprung from inter-marriage of the native princes with the descendants of the Anglo-Norman nobles that had followed De Clare,—a race that, after the manner of most half-castes, often inherited the worst qualities of each parent stock. It also sets out some of the many modes by which the inhabitants were oppressed, and the country impoverished by the vagaries of these Anglo-Norman-Irish robber chiefs,—'coin and livery,' which meant the forced provision for three or four nights at a time for the chief's soldiery, and a presentation to them of a sum of money into the bargain,—'foy and pay and mertyeght,' or forced contributions of cash and kind towards the entertainment of all his guests, whenever he had any (and he was generally of a very hospitable turn),—'musteroons,' for the keep of all his workmen, from the mason who repaired his castle to the tailor who made his clothes; and 'cody and coshry,' an arrangement by which he contrived to get rid of another considerable item of personal and household expense by periodical visits, with as many of his respectable retainers as he chose to take with him, to his tenants, who were not only obliged to keep the whole party in meat and drink, light and lodging, but fee them with money at their departure. If a tenant was at all disagreeable, his lord repeated his visit till he was ruined. As will be seen in this petition, the petitioners were sessed in every shape and way, and the assessors in such cases were often so insolent and rapacious that unless bribed they would pay themselves by seizing more than they had to account for."

HOW TO RAISE THE STANDARD OF INTELLIGENCE AND EDUCATION IN THE BUILDING TRADE.

SIR,—The grave importance of the scheme, so opportunely advocated in your columns by Mr. Morris, demands the prompt attention and earnest co-operation of all connected with the building trade. The general purport of the scheme I heartily applaud, but beg to differ in the mode of procedure. I should certainly recommend a far more liberal programme, a much broader footing, or, it is greatly to be feared that the superstructure proposed to be raised thereon would be far from imposing,—would speedily collapse and crumble into insignificance. I can scarcely concur that it is the thoughtful workman that is surprised at this wide-spread ignorance of bricklayers, for he must certainly be cognisant of the fact that the majority are self-made men. The smart labourer is not slow to observe how very few tools, and what a slender stock of knowledge, is required to perform the ordinary kind of work; he aspires (and why should he not?), speculates in a trowel and pair of lines, and after sundry tactics, tips, &c., he speedily attains the highest pinnacle of his ambition, and emerges from the menial obscurity of the mortar-bank a full-blown bricklayer. Here, unfortunately, he comes to a dead stand, sinks into a kind of hopeless, helpless metamorphic state, being perfectly satisfied with the return of Saturday night and its demoralising accompaniment,—an unlimited supply of beer. Raise, then, the standard of intelligence of skilled workmen, and these men with these habits cannot hope for success. The schoolmaster must be visited as the preliminary step to advancement. I do not wish to infer that bricklayers are the only class of men that require the aid of the schoolmaster and their more enlightened brethren; multitudes are to be found in the joiners' shop and at the mason's banker. I may go much further without exceeding the truth one iota; there are many foremen, and even clerks of works, who are so sadly deficient even in primary knowledge such as that possessed by the ordinary schoolboy of ten years old, that their thoughts or ideas when transmitted to paper bear a striking resemblance to some of the most ancient systems of hieroglyphics. Even the intelligent and skilful workman is not such as he should be, inclined to pamper ease, persuading himself that this or that problem may never fall to his lot to solve in a practical manner. He rests in ease and fails in the time of trial.

Seeing, then, that all need improvement, a

united and Herculean effort must be made; reform and self-denial are an absolute necessity; lodges must not be held at public-houses,—malt and hops will not assimilate with geometry and geometrical projection; the business and trivial matters connected with the different lodges, hitherto crawled through in three or four dreary and profitless hours, should be handled in a business-like manner, and accomplished in at least one quarter that time, and the grand product of these fragments of a man's existence should be utilised in the mental development of those who are sufficiently wise to see their own ignorance.

The course of study should embrace a fair knowledge of the ordinary rules of arithmetic, including, of course, vulgar and decimal fractions familiarity with the rules of proportion, some of the most useful of the problems in the mensuration of superficies and solids, geometrical and isometrical projection, divested of those multitudinous laws, rules, theorems, and axioms, which so damp the ardour of any ordinary man.

In due course examinations should be held and certificates should be granted, and that ultimately the holders of the higher class of these certificates should be formed into a society that might be termed "The Institute of British Mechanics (Building)," similar in design and purpose to the Institution of Civil Engineers, and plans should be laid down, papers should be read (not necessarily by the senior members), alternately by the different trades at their respective lodges and all trades should be free to attend upon the production of a member's pass.

Probably I may be regarded as sanguine, and aiming at a Utopian state of felicity. It is certainly within the bounds of possibility that I may be so: time and a proper ventilation of the subject alone can prove. I should therefore propose that the matter be discussed at the different lodges, a general meeting convened, a committee selected, who should have power to lay down a plan of action. I should be most happy to co-operate for the advancement of technical education.

T. MARCUS HOUGHTON, Foreman.

WESTMINSTER AQUARIUM.

CAN you inform me, sir, if any accommodation is to be offered to the Fellows at the opening ceremony on the 22nd? Having paid a heavy entrance-fee for the privileges of fellowship, I expect something more than is at present known. At least, a place to sit down on during the above ceremony ought to be one of the privileges, but which, I hear a whisper, will not be the case; and, according to present arrangement, very little chance of even standing. A disturbance ought to be provided against. A FELLOW.

THE ALBERT STARCH WORKS, PAISLEY.

PAISLEY is noted for its starch works, and boasts some of the largest manufactories of this kind in the kingdom. The Albert works, erected by Messrs. Foulds, Gilmour, & Co., in Murray-street, and which have been in progress for about two years, are now nearly completed, and will add another to the list already existing. The designs for the new buildings have been prepared by Messrs. Rennison & Scott, architects, and the estimated cost is about 20,000*l*. The Albert works have a frontage of about 145 ft., and run a considerable distance northwards from Murray-street. On the ground flat is the "tun-room," 275 ft. long by 43 ft. wide, on each side of which are arranged a large number of "tuns" or vessels for depositing the manufactured article, and each of which is capable of containing between four and five tuns of starch. In addition there are departments for the manufacture of feeding-meal for cattle; the packing-rooms and grinding-houses, all 67 ft. long, with stoves specially fitted up for the manufacture and preparation of corn-flour, and crisp and crystal starches, each of these stoves being 100 ft. long. The store-room is situate on the top or fourth story of the building, and the grain and other articles used in the various processes of manufacture are received on the ground flat, and hoisted upwards by steam-cranes. In undergoing the requisite transformation these various elements descend by a sort of filtering process from flat to flat, the result of which is a considerable saving of manual labour. The necessary machinery has been fitted in the boiler and engine rooms by Messrs. Wm. M'Ghee & Sons, engineers, and by Messrs. Fullerton, Hodgart, & Barclay; and, as the result of tests, has been found admirably adapted to the purpose intended.

PROPOSED NEW PUBLIC BUILDINGS IN EDINBURGH.

AT a meeting of the Lord Provost's Committee, held on the 22nd ult., the subject of a new town-hall and public buildings, as remitted from a previous meeting of the Council, was under consideration. Several sites in the New Town were mentioned and discussed, and ultimately a sub-committee was appointed to obtain information in regard to the whole matter, and report. The Lord Provost, it is stated, was of opinion that the cost of erecting suitable public buildings, including a large city-hall, in a style worthy of Edinburgh, would amount to about 250,000*l*.

THE PROPOSED CHANNEL TUNNEL.

THE whole of the correspondence which has passed between our Foreign Office, the Board of Trade, and the French Government, respecting the proposed Channel Tunnel and Railway to France, has just been published in the form of a Blue Book, and forms a very interesting contribution to the early history of this project. The letters range in date between the 16th of October, 1874, and the 6th of August, 1875, and the publication of them is greatly enhanced in value by the addition of lithographed plans and maps, illustrating the soundings and other preliminary surveys necessary for a proper comprehension of such a gigantic scheme.

THE STRENGTH OF STRUCTURES.

AT the last meeting of the Glasgow Institution of Engineers and Shipbuilders, Professor James Thomson, C.E., read a paper bearing the title "Comparisons of similar Structures as to Strength, Elasticity, and Stability." In the course of his paper the Professor furnished certain easily-comprehended but exhaustive data for estimating a comparison of similar structures of different sizes as to strength, elasticity, and stability. He explained how, in structures of similar forms, but varying in size, though subjected to similar strains, the margin of superabundant strength decreases as the dimensions increase, till the enlarging of already large structures must cease, by a stage being reached at which they must fail under the load of their own weight. Large tubular bridges and ships furnished cases in point. In certain other structures, on the other hand, such as obelisks, pinnacles, and chimney-stalks, which depended for their resistance to the overturning tendency of the wind on the action of gravity, the increase of the force of wind per square foot which they would bear was in proportion to the increase of their linear dimensions.

ENLARGEMENT OF THE ROYAL INFIRMARY, WATERLOO ROAD.

THE Royal Infirmary for Women and Children, Waterloo-road, founded by the Duke of Kent in the year 1810, has for some time past been undergoing a considerable enlargement, and the works which are now completed will admit of greatly increased accommodation both for indoor and outdoor patients. The external features of the building have been materially changed and much improved by the erection of an additional story, in which there is space for twenty-two beds beyond those which the capacity of the building was equal to before the enlargement. The added story is 20 ft. in height, making the present extreme height of the Waterloo frontage 52 ft. The general architectural features of the old building have been adhered to, and the windows of the new portion have arched heads uniform with the other parts of the structure. The elevation is surmounted by a parapet-wall 4 ft. 6 in. in height on each side, and 5 ft. 6 in. in the centre, on which are inscribed the names of the Queen and the Prince of Wales as patrons of the institution. The materials used are Malm brick, with gauged arches, the cornice being in Portland cement, and the strings and copings in Portland stone. The open casements of the central portico entrance have also been filled in, for the purpose of giving greater protection in unfavourable weather to patients and others who may be in waiting. Several important structural alterations have likewise been made in the interior of the building. These include the basement, which has been entirely reconstructed, with the view of giving increased accommodation for the out-patient department, and lifts have also been constructed from the kitchen to the new upper story, for the purpose of carrying up the patients' food.

Mr. E. M. Barry, R.A., designed the alterations and additions, which have been carried out by Mr. W. Brass, the contractor, at an outlay of nearly 5,000*l*.

SCHOOL BOARD SCHOOLS.

Rillington (E.R. Yorkshire).—The new Board School in this village was opened on December 22nd; it consists of school-room, class-room, with ample entrances, separate offices, and large play-grounds, and affords accommodation for 140 scholars. The style is Gothic, and the materials used are common gray clamp bricks for the walling, with red pressed stocks for the bands, arches, and diapers, walled in black mortar. Specially moulded bricks have been used in plinths, strings, and labels. The sills, copings, roof, corbels, &c., are of cleansed moorstone. The roofs are covered with blue and green slates arranged in bands, and the ridges and finials are of red terra-cotta. Internally the principal roof timbers are dressed and varnished, and the walls are lined to a height of 4 ft. with red stock bricks walled with fine joint. The work has been substantially and satisfactorily carried out by local contractors at a cost, including boundary walls, palisading, gates and pillars, and architects' charges of 800*l*. Messrs. John Gibson & Son, Malton, were the architects.

Cottenham.—New Board Schools for the parish of Cottenham were opened last month. The new schools adjoin the old British Schoolroom, and consist of a building with one story 62 ft. long and 22 ft. wide. The infants occupy the ground-floor and the girls the room above. Both schools are provided with class-rooms. There are two playgrounds—one for the girls and infants, the other for the boys. The buildings have been constructed by Messrs. E. Leach, J. Smith, and D. Ingle, of Cottenham, under the superintendence of Mr. Charles Wilson, of Histon, the total cost being about 2,500*l*. Accommodation is provided for 550 children.

Easter Ross.—The Portmahomack new Board School, Easter Ross, Inverness, has been opened. The school, which is said to be the largest yet opened in the north of Scotland, has five class-rooms of the following dimensions:—Infant school 68 ft. long, one class-room 45 ft., and the other three 25 ft. square. The building has a *pièche* 15 ft. high. The schoolmaster's house contains nine apartments. The architects are Messrs. Maitland, Tain; and the contractors were:—Mason work, Mr. Fraser, Portmahomack, carpenter, Mr. Murray, Inverness; slater, Mr. Ross, Alness; plasterer, Mr. Gallie, Inverness; plumber, Mr. Meikle, Tain; and painters, Messrs. Urquhart & Mackay, Tain.

CHURCH-BUILDING NEWS.

Rodmersham.—Towards defraying the cost of the proposed restoration of Rodmersham Church, Kent, 750*l*. have been raised, but 250*l*. more are required to commence. Sufficient money has been raised to build a vicarage-house for the parish. Mr. Seager, of Borden, has the contract, and it is hoped that the building will be completed by Michaelmas next.

Drayton Bassett.—St. Peter's Church, Drayton Basset, Tamworth, was re-opened on December 26th, after restoration and renovation. The church was built in 1793, on the site of an old church erected in the fourteenth century. About twenty years ago it was restored, at a cost of 2,000*l*., by Sir Robert Peel, M.P., of Drayton Manor, at whose expense the present repairs have also been carried out. The former ordinary pulpit, reading-desk, and fittings, have been replaced by others made of English oak, elaborately carved. The chancel-floor has been relaid with encaustic tile-paving, and the stone paving in the passages has been replaced by plain tile paving. The six two-light tracery-headed windows have been filled with ornamental and stained glass, bearing Scriptural quotations. The whole work of renovation has been carried out under the supervision of the architect, Mr Edward Holmes, Birmingham, by the several tradesmen employed, viz.: Messrs. Clarson & Son, Tamworth (builder's work); Messrs. Jones

& Willis, Birmingham (new pulpit, &c.); Messrs. Minton, Hollins, & Co., Stoke-upon-Trent (tile paving); Mr. Higginson, Birmingham (the decorations); Mr. Bourne, Birmingham (stained glass); Messrs. Haden & Son, Trowbridge (heating apparatus). The total cost is about 800*l.*

Liverpool.—St. Aidan's Church, Liverpool, was consecrated on the 22nd ult. by the Bishop of Chester. The church is situate in Latham-street, Stanley-road, Kirkdale. St. Aidan's Church was originally built twenty years ago; but it was, a short time since, razed to make way for dock extensions, and the Mersey Docks and Harbour Board had to re-erect it upon another site. Messrs. Culshaw & Sons were the architects, and Mr. Urmson, of Soho-street, was the builder.

Old Malden.—About six months ago the foundation-stone of a new church at Old Malden was laid by the Bishop of Guildford. The consecration of the building took place last month. The building is of red brick, with Bath stone dressings, from the design of Mr. T. G. Jackson, architect, London. The cost is about 2,700*l.*, and the work has been carried out by Messrs. Goddard & Sons, contractors, Farnham and Dorking.

Miscellanea.

Charcoal Steel direct from the Ore.—At the meeting of the Society of Arts on the 22nd ult., Mr. Henry Larkin communicated a paper on "A Method of Producing Pure Charcoal Steel direct from the Ore." Abstracts of patents for hard-steel manufacture, taken out in the course of the last forty years by Mr. W. N. Clay, M. Chenot, M. Bellford, Mr. T. S. Blair, Mr. Joel Wilson, and others, were read, Mr. Larkin thence proceeding to demonstrate wherein consisted the improvements which he claimed for his own method. Any rich and pure ore, he states, is capable of satisfactory treatment, though it is more particularly to the reduction of magnetic iron ores that his attention has been directed. In these latter substances, after pulverisation the finely divided ore is separated out by means of magnetism, leaving the greater part of the impurities as a residual heap. The extraneous matter having been thus removed, the magnetic oxide is intimately mixed with any suitable carbonaceous material, such as charcoal or powdered resin, the mixture thus formed being compressed into bricks. These are introduced into horizontal retorts, heated on the principle of the Siemens' furnace, and, after exposure to a full red heat for nearly twenty-four hours, the charcoal becomes oxydised at the expense of the ore, leaving behind a powder of practically pure iron. This is removed in such a way as to avoid contact with air while the metal is in the heated state, and when cool the powder is mixed with the amount of carbon (in the form of resin) and of flux that may be deemed requisite, and having been again compressed into bricks is fused in crucibles into steel in the usual way.

Curious Painting discovered at Reading. A curious old painting was lately discovered on the plastering behind some panelling in the lower front room of a house lately demolished in Friar-street, Reading. The building was probably erected about the beginning of the sixteenth century, and the painting appeared to have been done about the same time, as it was on a plastic ground of lime putty and a great quantity of hair, on the face of the original clay (or wattle and daub) plastering, and formed a frieze to the room, the upper edge being close to the ceiling. The subjects are a part of apparently a number, illustrating the "History of Susanna," one compartment and the half of another being found in one piece, the half one representing three soldiers wearing helmets, one with an axe-headed spear, and an old man, the inscription over (written in Old English letters) being:—"Ye too Elders of their owne mouths." This compartment is divided by a pilaster from another which represents two naked men bound to a stake, and being stoned by three others. The size of this compartment is 36 in. by 32 in., and the inscription over it (also in Old English) as follows,—"The too Elders are stoned to death for bearing false witness against Susannah." On Mr. Albury, the secretary of the Archæological Society, hearing of the discovery, he proceeded to the spot, and successfully removed the whole entire. He is of opinion that the building was originally occupied by some society or guild.

The Artisans' Dwellings Act.—At the last meeting of the Leeds Guardians of the Poor, Mr. T. Winn brought under notice the misery inflicted on many families in Leeds by the recent destruction of many dilapidated hovels in order to make room for a new market and other public improvements. He especially dwelt on the condition of the occupants of 507 cellar dwellings in the North-east, East, and North wards, which are still permitted to be inhabited, but which it is intended by the authorities to close shortly. One of Mr. Winn's principal objects in bringing this subject forward was to confer with his colleagues as to what should be done when all cellar dwellings were abolished. Mr. G. Smith asked what the local philanthropists were doing amid all this desolation and general wretchedness. Let a flood or a fire come in America, and Englishmen's charity knew no bounds; but here it seemed was a want which up to now had remained without any responsive effort. Mr. Winn said, being himself engaged in the building trade, he could assure the guardians that if he had a thousand houses at low rentals in Leeds to let, he could find tenants for them at once. A resolution was passed by the Board, calling the attention of the Town Council to the advantage of exercising the powers given them by the Artisans' Dwellings Act, 1875, in order to remedy the great deficiency that exists in the number of suitable dwellings for the poorer classes of the inhabitants.

Masonic Window, Plymouth Guildhall. The design for the window which is to be placed in the Plymouth Guildhall, in memory of the combined meeting of the Freemasons of the Provincial Grand Lodges of Devon and Cornwall, to welcome the Prince of Wales, Grand Master of England, on the occasion of his opening the building in August, 1874, is ascribed to the Earl of Mount Edgcumbe, the Grand Master of the Province of Cornwall. To correspond with the other windows in the hall, the circle in the middle of the tracery is devoted to a portrait of the Prince of Wales. In the cinquefoils are the All-seeing eye, the Bible, the Crown, the badge of his Royal Highness, and emblems of Faith, Hope, and Charity. In the quatrefoils are the arms of the Prince, with a five-pointed star, and the arms of the Grand Lodge of England, with a six-pointed star. The tracery has appropriate Masonic borders. The design is so arranged that at the first glance it has the appearance of a subject picture; but closer examination shows that it has four distinct subjects, namely, Brotherly Love, a figure supporting another in distress; Relief, a female with child, receiving relief from a second figure, who consents to take charge of the child; Truth, a figure representing the Master Mason; Obedience, representing the fellow-craft and the entered apprentice. The window is to be executed by Messrs. J. Fouracre & Son, of East Stonehouse, Devon.

Manchester Tidal Navigation.—Some few years ago this subject was mooted in Manchester, and at the time excited considerable interest, but owing to the then unfavourable state of the money market and other circumstances, it was thought expedient to postpone its consideration. It is now understood that some gentlemen in London interested in the progress of the trade at Manchester have the matter under deliberation with a view of forming a company to carry out the undertaking. The proposal is to straighten, deepen, and widen the river Irwell from below Manchester downwards to its junction with the river Mersey. From this latter point it is intended to straighten, deepen, and widen the present channel of the Mersey to the sea below Liverpool. By this means it is proposed to provide a tidal channel from below Manchester to the sea, of sufficient depth to accommodate vessels of a like character to those which now navigate the Suez Canal, by which the embarkation and landing of goods and passengers at Manchester and the surrounding districts would be economised and accelerated. The total cost of the undertaking, including the construction of wharfs, railway bridges, and other matters, taking the present prices of labour and materials, is estimated by Mr. Hamilton Fulton, the engineer who has had this project in hand, at 3,500,000*l.*

New Font at Wath-upon-Dearne Parish Church.—A new font of Caen stone, with an oak top in the form of a pyramid, has been placed in Wath-upon-Dearne Church. It was designed by Mr. Hadfield, of Sheffield, architect.

Tewkesbury Abbey Church.—At the last meeting of the Tewkesbury Abbey Restoration Committee, Mr. Wood, from the office of Sir Gilbert Scott, attended to give some information as to the manner of decorating the roof. At the same meeting, a letter was read from the Rev. R. C. and Mr. T. J. Nightingale, offering to give, jointly, 500*l.* towards the restoration of the abbey, on condition that 500*l.* are subscribed by one or two other persons. The 500*l.* they propose giving they wish to be devoted to the recolouring of the roof, and the 500*l.* given to meet it they would like divided into two equal portions; one to be devoted to the cost of a reredos, and the other towards the restoration of the apsidal chapels. Mr. Wood explained that the gilding and colouring, parts of which were plainly distinguishable now the outer colouring had been removed, were in some instances peculiar to the building, and would give quite enough guidance to enable the workmen to paint and gild the bosses and other prominent parts exactly as they were before they were covered with wash. He also produced some estimates for certain parts of the work, and said that judging from these, he should think Messrs. Nightingale's offer would about cover the whole cost.

A Monster Tree.—The *Omaha Bee* gives a full description of a section of a big tree of California arrived in that town on its way to the Philadelphia Centennial Exhibition. The *Bee* says:—"The tree grew on the west slope of the Sierra Nevada, at an elevation of 6,500 ft. above sea level. The age of the tree as indicated by the yearly rings was about 2,250 years, the rings being so close on the outer edge that it was almost impossible to count them. The height was 276 ft. The diameter at the surface of the ground was 26 ft.; 100 ft. above the ground, where the first limbs project, 14 ft.; and 200 ft. above the ground the diameter was 9 ft. The bark averaged 1 ft. in thickness, and in some places it was 1 ft. 4 in. thick. The bark of some of this species of tree is 3 ft. thick. The estimated number of lumber feet that it would make was 375,000, and the number of cubic feet about 31,000,—enough to make lumber and posts for sixteen miles of ordinary fence. The weight of the wood when first cut was 72 lb. per cubic foot, making the weight of the lumber-producing portion 2,232,000 lb. It took two men ten days' hard work to fell the tree, and when it fell it broke in several pieces."

Smothered.—An inquest has been held on Sarah Ann Walker, a domestic servant, in the employ of Mr. Manners, at 21, Newcastle-street, Strand. The deceased was found dead in her bedroom, and it was stated that, having partly fallen out of bed in an epileptic fit, she had been unable to free herself, and was suffocated with the clothes which covered her. Mr. Dunn, the surgeon who was called to her, said the place in which he found her was wretchedly small, without any ventilation. The air was very impure, and it was a wonder she could have slept there at all. The father of the deceased said he had seen the room. It was the shape of a grand pianoforte, not longer than the table the jury sat at. There was no fireplace in it, and no window. It was only lighted from above. The verdict was,—"That deceased died from suffocation, produced by falling from bed while in a fit, and the said death was accelerated by want of proper sleeping accommodation and pure air and space." The unhealthy holes in which thousands of domestic servants sleep would astonish those who have not inquired. We have before now given sketches of such places, which are found in the basements, the roofs, and under the stairs.

Fall of a Warehouse in Manchester.—Shortly after three o'clock on the morning of the 28th ult., a large warehouse in course of erection in Marsden-street, Manchester, fell in. The warehouse was nearly finished, and occupied a large space of ground, with a frontage of about 27 yards in Marsden-street, extending a depth of 25 yards to Back Marsden-street. The building is called the Marsden Chambers, and is the property of Mr. Cotterill, manufacturer, Southport. Messrs. Winder & Metcalfe, Back-square, St. Ann's-square, were the architects, the contractors being Messrs. R. Neill & Sons, Strangeways. The premises were four stories in height, and the back portion was so far completed that the principals had already been placed. There had been no indication of weakness, the workmen, numbering forty, having left the premises the previous evening. The building was erected on the fireproof principle. Fortunately, no one was within the building when it fell.

Proposed New Assize Courts and Town-hall, Newcastle-on-Tyne.—A special meeting of the Newcastle Town Council was held on the 15th ult., for the purpose of receiving and considering a report from the Assize Courts Committee, relative to the proposed erection of new assize courts and other buildings adjacent thereto. The report premised that, after fully considering the matter, the committee were satisfied that by converting the corn-market into shops, removing the corn-market into the town-hall, letting the present council-chamber and corporation offices for commercial purposes, and disposing of the Guildhall, Moot-hall, and Mansion House in Ellison-place, they would be enabled to erect more eligible buildings in lieu thereof in Northumberland-street, without entailing either upon the county or the town the risk of much additional burden. The motion for the adoption of the report was negatived by twenty-one to twenty.

A Big Bridge.—The *Montreal Daily Witness* of the 9th ult. gives particulars of the plans prepared by Mr. Legge, C.E., for the Royal Albert Bridge, which is to span the St. Lawrence at Montreal a little lower down than the Victoria Bridge. It is to accommodate a railway track, carriage and cart traffic, and a tramway line, and provision is also to be made for pedestrians. Its total length will be 15,500 linear feet, or very nearly three miles. It will have one arch of between 500 ft. and 600 ft. clear span over the navigable channel of the St. Lawrence, with a height of 130 ft. above the water at high tide; five of 300 ft. each at the same height, four of 240 ft. each, and fifty-one of 200 ft. each. The estimated cost of the bridge is $1,000,000 (800,000*l.*), and its erection, which will commence next spring, is expected to occupy three years. The Victoria Bridge, which has hitherto passed for being the largest in the world, is only 7,000 ft. long, with one arch of 330 ft. span and twenty-four of 242 ft. span. Its construction occupied six years, and the total cost was 1,260,000*l.*

The Mineral Wealth of England.—From the report about to be issued by Mr. Hunt, Keeper of Mining Records, it appears that the total value of minerals and metals, coals, &c., obtained in the United Kingdom in 1874 was:—Of metals, 19,539,070*l.*; of coal, 45,849,194*l.*; and of minerals, earths, &c., 2,446,049*l.*; making a total of 67,834,313*l.* This shows a decrease in the value of the metals and minerals, produced from the mines of the United Kingdom in 1874, as compared with values given in the returns of 1873, of 2,888,679*l.* This falling off is in the coal and iron, the falling off in the value of coal being 1,782,086*l.*; ditto of pig iron, 1,581,367*l.*; ditto on other metals, 288,981*l.*; total decrease in the value of coal and metals, 3,652,434*l.*; while there has been an increase on the value of the earthy minerals of about 764,500*l.*

Old Malton, Yorkshire.—Alterations and additions to this school are completed. The work executed consists of rebuilding a large portion of schoolroom, new yards, and offices, and the erection of a turret on the roof, this acts as a ventilator to the schoolroom, and contains a clock with bell and two dials, made by Messrs. T. Cooke & Sons, of York, the gift to the village of Mr. Henry Hartley, of Old Malton. The turret is constructed of timber with glass louvres round the portion containing the bell. The spire is covered with lead and slates, and surmounted with wrought iron vane and weather-cock. The works have been carried out by Mr. John Wood, builder, Malton; Messrs. John Gibson & Son, Malton, being the architects.

The New Free Library for Wigan.—On the 21st ult. the Mayor of Wigan received from the trustees under the will of the late Mr. J. T. Winnward, surgeon, of Wigan, the sum of 11,300*l.*, which was bequeathed for the purpose of purchasing books for the new free library at Wigan, which Mr. Thomas Taylor, cotton spinner, of Wigan, had, at the time of Mr. Winnward's death, promised to build at an expense of 5,000*l.* Plans have been prepared by Mr. Waterhouse, and the building is being erected on the site of the old Wigan Free Grammar School. It is stated that the cost to Mr. Taylor will be fully double the amount named.

Employment of Children in Brickworks.—At the Stourbridge Police Court, Mr. T. Rhodes, brick manufacturer, has been fined 2*s.* 6*d.* and costs in four cases, for employing young persons under the prescribed age in his brickworks. He said he would see in future that no one was employed till he had seen the register himself.

A Mediæval Bell.—Efforts are being made to collect sufficient funds for the restoration of the parish church of Brailes, Warwickshire. The tower of this ancient church contains one of the heaviest peals of six bells to be met with in this country. Unfortunately, they are so badly hung and out of repair that twenty men and boys find it a toilsome and difficult task to bring out their melody, and the tenor and third bells are badly cracked. The former is a Mediæval bell, weighing about 34 cwt., and much admired by archæologists. It bears the arms of the Underhill family, with the following legend, probably a stanza of some ancient Ascension hymn:—

"Gaude quod post ipsum scandis,
Et est honor tibi grandis
In cœli palacio."

It is proposed to recast this bell, exactly reproducing its interesting features, and also the other cracked bell.

V-Shaped Groynes.—Mr. Holt, of Hastings, has proposed a new kind of groyne or breakwater. He proposes to form the groyne of a V-shape, entirely of iron screw piles. For familiarity of illustration it may be stated that each pile would be somewhat the shape of an extinguisher. The apex, or point, would be the screw portion. The broad end would be made hollow, with a circular outlet in the side, 2 ft. or 3 ft. below. In a south-west gale the sea would strike on the western arm of the groyne; and the water would rush between each pile and also into the hollow top part (as into so many gully-gratings in the street). Inside the V the raging water would become partly quieted, and would escape through the openings at the side of the eastern arm, where the waves would be running with much less force.

The Colosseum, Rome.—Mr. J. H. Parker, in a letter to the *Times*, states that the interesting substructures of the arena recently discovered are now 10 ft. under water,—not from any flood, but from the blundering of the Roman workmen, who made a hole in an aqueduct and sent all the water into these substructures. He adds,—"Nothing can be done until the water is pumped out, and this can only be done by the steam-engine, which has been stopped for the last four months 'for want of funds.' Can no one be found who has money enough and liberality enough to give 100*l.* to pump this water out, and allow these interesting substructures to be seen, and a drain made to carry off the water in future?"

Chimney Construction.—At the Haslingden Petty Sessions, four builders, one of them a member of the Haslingden Local Board, were recently summoned for a breach of the 3rd and 4th Vict., chap. 85, which relates to the construction of chimneys. Three were summoned for two offences under the Act, viz., for building the partition "withs" 1 in. instead of 4½ in. thick, and for not rounding the angles of the chimney, the latter defect making it necessary for the chimney-sweeper to go on the roofs of houses to sweep the chimney. The lowest penalty was 10*l.* for each offence, but it was arranged for defendants to pay 5*l.* and costs in both cases, except in one, where the person summoned was not the master builder.

Alnwick Working Men's Club.—A public meeting was held in the town-hall, Alnwick, last week, under the presidency of the Duke of Northumberland, for the purpose of opening a working-men's clubroom. A building has been erected at the cost of his Grace in connexion with the baths and washhouses. The Duke, in delivering the opening address, expressed himself willing, if necessary, to be responsible for the taxes and rates until the club got thoroughly under way. Several interesting speeches were delivered. An address was presented to the Duke in acknowledgment of his kindness in providing the inhabitants of Alnwick with such a building, which was subsequently declared to be duly opened.

The Liverpool Borough Engineer's Salary.—A proposal is being considered by the Health Committee of the Liverpool Town Council to increase the salary of Mr. Deacon, the borough and water engineer, from 1,000*l.* to 1,300*l.* a year. At the present time Mr. Deacon's salary is chargeable to the Health and Water Committees in the sum of 600*l.* and 400*l.* respectively, and the Water Committee will be asked, with the consent of the Town Council, to contribute 650*l.*, instead of 400*l.*, whilst the Health Committee will raise their contribution to the same amount, which will make 1,300*l.* a year.

Proposed Embankment of the Thames at Windsor.—A meeting was held in the town-hall, Windsor, on the 23rd ult., for the purpose of considering the question of erecting a bank along the south shore of the Thames between Bier-lane and Clewer church. The mayor, having referred to the discomfort and privation caused by the late floods, Mr. Thomas Buckland explained a scheme for the erection of a bank about 6 ft. high between Bier-lane and Clewer Church, which might be formed of ordinary mould, and would keep the water from flooding the suburbs of the town. A committee was appointed to take steps to effect the proposed improvement.

New Mansion at Kingsclere Woodlands.—The erection of the mansion which has just been built at Kingsclere Woodlands, by Mr. W. Holding, from plans furnished by Mr. W. Drake, was celebrated by the workmen on the 21st ult., when, through Mr. Holding's liberality, they were entertained at supper. The mansion has been built mainly of brick, at a cost of upwards of 7,000*l.*, by Mr. Samuel Elliott, of Newbury. The health of the founder of the feast was drunk with great enthusiasm, as also the healths of the architect, builder, clerk of works (Mr. West), and the foreman (Mr. Stringer).

Waste of Water.—A remarkable report, prepared by Mr. Gale, the engineer, was read at the last meeting of the Glasgow Water Committee. It detailed the results of experiments which had been made in five districts of the city for discovering and reducing waste of water, setting forth that the defective fittings found consisted of three classes,—burst service-pipes, fittings out of repair, and fittings both not in conformity with the rules and out of repair. The waste had been reduced twenty-five gallons a head, or 127,375 gallons a day, over the population operated upon. The committee authorised further experiments over a larger area.

The Sewerage of Ipswich.—At a meeting of the Ipswich Town Council, on the 22nd ult., it was resolved, on a motion by Mr. E. R. Turner, that Mr. Bruff, C.E., should be instructed to prepare plans and specifications for the sewerage of the town on the north side of the Orwell, in accordance with his report of September 18th, 1875, the plans to include the provision of means for arresting suspended matter at the outfall, and dealing with the storm water, to be so arranged as to admit at any time of additional works for the more elaborate treatment of the sewerage, if found necessary.

Restoration of an Irish Mansion.—Downhill, the Irish residence of Sir H. Hervey Bruce, bart., has just been altered, partially rebuilt, and enlarged, the works having been in progress for over two years. Until the works just completed were commenced, the building had been, since it was burnt down in 1851, little more than a ruin. All the works have been carried out by Mr. James Henry, of Belfast, under the superintendence and direction of Mr. John Lanyon, architect, Belfast.

The Aylesbury Sewerage.—At a recent meeting of the Aylesbury Local Board of Health, a committee was appointed to consider the question of the disposal of the sewage of the district. The committee was authorised to consult Mr. Hawksley, and requested to report fully to the Board on the system of dealing with the sewage which Mr. Hawksley might recommend to be adopted.

Illustrations of St. Alban's Abbey.—Mr. Jas. Neale, architect, is about to publish a volume illustrating the "Ancient Abbey of St. Alban." The drawings have been worked to scale, and checked on the spot, all jointing, &c., measured, and the mouldings taken real size. They obtained for the author, from the Institute of British Architects, the "Pugin Travelling Studentship."

The Fairbairn Memorial, Manchester.—Some squabbling is going on concerning the manner in which the sculptor for this work has been appointed. The question rested between Mr. Woolner and Mr. Geflowski; the former naming 1,500*l.* as the price, the latter 750*l.* The appointment of Mr. Geflowski was ultimately carried.

The Artisans' Dwellings Company.—Lord Shaftesbury has resigned the office of president of this association, the directors having failed to circulate amongst the shareholders a series of reports which it is thought necessary the shareholders should see. We wait further information.

Fog Signals for Scottish Lighthouses.—Messrs. Stevenson, civil engineers, Edinburgh, have advised the Clyde Lighthouse Trustees in the matter of fog-signal distinctions for the Cloch Lighthouse. The principle consists in a musical whistle combination, connected with a high-pressure boiler, which gives a marked and distinct sound. The whistle first sounded produces the higher note for two seconds and a half, and the lower pitched note for a similar period. Another signal at Fort Matilda will be produced by bells of different tones.

Termination of the Dundee Masons' Strike.—The strike of the masons in the employ of one or two masters, consequent on a threatened reduction in the rate of pay, has now terminated, after lasting over a month. The men have resumed work at the old rate of 7½d. per hour, and on the further stipulation that, from the 1st March next, the pay, where no sheds are provided, shall be 8d. per hour.

Edinburgh.—The United Presbyterian Church at the Haymarket, which has been in course of erection for the past twelve months, has been opened. Externally, the building is not yet complete, as a spire has to be carried up from the square tower on the north side of the front, which faces Dalry-road. The style chosen by the architect, Mr. John Paterson, is Romanesque.

TENDERS

For East Markham Board schools. Messrs. Robt. Clarke & Son, architects :—

Slight	£2,111	0	0
Vickers	1,964	0	0
Hopkinson	1,883	0	0
Young	1,839	0	0
Duke	1,828	0	0
Hodson & Facon	1,762	0	0
Wallis	1,720	0	0
Shm	1,695	0	0
Clarke	1,634	0	0
J. Wilson	1,580	0	0
T. Wilson (accepted)	1,577	0	0

For Board schools, teacher's residence, &c., at Ferry bridge, for the Ferrybryston School Board. Mr. William Watson, architect :—

Johnson	£2,600	0	0
Barstow	2,420	0	0
Sykes	2,278	9	3
Houston	2,213	7	9
Thompson	2,207	0	0
Denison	2,200	0	0
Whitlock	2,143	0	0
Adams	2,113	0	0
Hassell, Bros. (accepted)	2,035	0	0

For Board schools for the United District of Carisbrooke, Isle of Wight. Mr. T. Dashwood, architect. Quantities supplied :—

Ward	£3,330	0	0
Barton	3,100	0	0
Sibley	2,780	0	0
Dyer	2,670	0	0
Ball	2,617	0	0
Jenkins	2,595	0	0
Young	2,530	0	0

For new offices for the Greenwich District Board of Works. Mr. W. Wallen, architect :—

Hammer	£8,564	0	0
Little	8,492	0	0
Lord	7,922	0	0
Slade	7,861	0	0
Wood, Bros.	7,810	0	0
Thomas	7,800	0	0
Kent	7,740	0	0
Stevens	7,642	0	0
Stephenson	7,370	0	0
Staines & Son	7,223	0	0
Downs & Co.	7,034	0	0
Falkner	6,997	0	0
Hunt	6,992	0	0
Braid & Co.	6,919	0	0
Shepherd	6,890	0	0
Prout	6,781	0	0
Hart	6,670	0	0
Tarrant & Sons	6,541	0	0
Tongue	6,342	0	0

For the erection of cemetery buildings, drainage works, &c., for the Wimbledon Local Board. Mr. W. F. Rowell, architect. Quantities by Mr. J. Waghorn :—

Contract No. 1.—Chapels, Lodge, &c.

Neave & Son	£11,077	0	0
Bracher & Son	10,422	0	0
Ackerman	10,091	0	0
Simpson & Son	10,000	0	0
Hook & Oldrey	9,870	0	0
Cullum	9,720	0	0
Nightingale	9,480	0	0
Waters	9,456	0	0
Aviss & Son	9,400	0	0
Adamson & Sons	9,289	0	0
Niblett	9,250	0	0
Nye	8,725	0	0
Crockett	8,700	0	0
Harmer	8,671	0	0

Contract No. 2.—Drainage Works.

Aviss & Son	£3,350	0	0
Neave & Son	3,170	0	0
J. Jackson	3,099	0	0
G. Jackson	3,888	0	0
Crockett	3,859	0	0
Fortescue	2,811	0	0

For the erection of public offices, &c., for the Wimbledon Local Board. Mr. W. F. Rowell, architect. Quantities by Messrs. Arding, Bond, & Buzzard :—

Beale	£10,444	0	0
Roberts	8,250	0	0
Harmer	8,210	0	0
Burford	7,870	0	0
Adamson & Sons	7,324	0	0
Kirk & Randall	7,280	0	0
Cullum	7,200	0	0
Nightingale	7,164	0	0
Aviss & Sons	7,060	0	0
Nye	7,048	0	0
Crockett	7,000	0	0

For making up Griffiths-road, South Wimbledon. Mr. W. F. Rowell, architect :—

J. Jackson	£485	0	0
Crockett	480	0	0
G. Jackson	450	0	0
Pizzey	450	0	0
Hills	448	0	0
Fortescue	391	0	0

For the erection of a warehouse, Old Bethnal-green-road, for Messrs. J. Cook & Sons. Messrs. J. Tarring & Son, architects :—

Wire	£1,200	0	0
Sargeant	1,109	10	0
Manley & Rogers	1,180	0	0
Little	1,074	0	0
Shurmur	985	0	0
Boden	936	0	0

For the erection of schools and teacher's residence for the United District of Bassingbourn and Kneesworth, Royston. Quantities by Mr. T. Thornton Green :—

Twelvetrees	£1,980	0	0
Redhouse	1,950	0	0
Willmot	1,798	0	0
Worboys (accepted)	1,696	0	0

TO CORRESPONDENTS.

Messrs H L—J. W J K C—C. H F.—F H. G—Dr A H. St. J.—J J C—Mrs P W. W.—R. M Y—W B—L S—C H —E. C. L—L. W. R.—C J. T—H. B. -S. W. N.—T. T A.—F. W.—J T—T D C O E—A M—H W. (we cannot give addresses)

Constant Subscriber for fifteen years (can close the window himself by an erection of boards, for example, on his own roof. He might take a shilling a year from adjoining owner in token of right to close it when desired).—J. S. (next week).—C. & Son (next week).—W. M T. (next week).—T. M. H. (in type)

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course with the authors.

With the next Number will be given, as a Supplement, an INDEX and Title-page to the Volume of last year. A COLOURED TITLE-PAGE can be had, Gratis, on personal application.

The THIRTY-THIRD VOLUME of "THE BUILDER" (bound), for the year 1875, will shortly be published, price One Guinea.

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Advertisements cannot be received for the current week's issue later than **THREE** o'clock p.m. *on THURSDAY.*

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SECOND ,,	15		£50
			£300

The following Gentlemen, at the request of THE LINOLEUM MANUFACTURING COMPANY, LIMITED, have kindly consented to make the awards :—

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For Conditions and Particulars apply, by letter only, to the Secretary, at the Company's Offices, 4, Fell-street, Wood-street, E.C.; or the Manufactory, Staines, Middlesex.

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Address, X. Y. Z. 332, Old Kent-road, S.E.

North Walsham,

December 31st, 1875.

ROBINSON CORNISH, Builder and Contractor, begs to inform the Nobility, Gentry, Clergy, Architectural Profession, and Public generally, that in consequence of taking Mr. JOHN CAYMER into Partnership, on and after January 1st, 1876, the Business will be conducted under the head of CORNISH & CAYMER.

R. CORNISH takes this opportunity of thanking his friends for their liberal support during the last twenty years, a continuance of which both for himself and partner he respectfully solicits.

TO PARENTS AND GUARDIANS.

ARTICLED PUPIL Required in the Office of an ARCHITECT and SURVEYOR.—Address, BURGESS J. REEVE, Architect and Surveyor, 12, Guildhall street, Folkestone

MARKET HARBOROUGH HIGHWAY BOARD.—APPOINTMENT OF SURVEYOR. The Wardens will, at their meeting, to be held at the Rose and Crown Inn, Kibworth Harcourt, on MONDAY, the 24th day of JANUARY next, at ELEVEN a.m. proceed to the APPOINTMENT of a well-qualified person to fill the office of SURVEYOR of the HIGHWAYS for the entire District. The District embraces 23 parishes, and contains about 130 miles of roads. The Surveyor to be appointed will be required to devote the whole of his time to the duties of his office, to reside within the District, and to enter into a bond, with two sufficient sureties, in the sum of £300. The salary will commence with 150l. per annum, with a contemplated increase if the duties are fulfilled to the satisfaction of the Waywardens. Further particulars may be had from, and applications, with testimonials, are to be sent to the clerk before SATURDAY, the 22nd day of JANUARY next. By order of the Board,

JAS. H. DOUGLASS, Clerk.

Market Harborough December 29, 1875.

TOTTENHAM LOCAL BOARD of HEALTH.—Notice is hereby given that the Board require a fit person to execute the OFFICE of SURVEYOR and ENGINEER. He must possess a thorough and practical acquaintance with works of sewerage and drainage, water-works, road making, and paving, and must be competent to superintend the execution of all such works, and to perform all such other duties as are more particularly set forth in a printed form, to be obtained on application to me. The salary will be 400l. per annum. Written applications, stating age, qualifications, and previous occupation, accompanied by testimonials, and endorsed "Application for Office of Surveyor," must be sent to me on or before MONDAY, the 24th of JANUARY, 1876.—By order,

EDWARD CROWNE, Clerk to the Board.

Offices, Coombes Croft House, High Road, Tottenham, 30th December, 1875.

ARCHITECT'S ASSISTANT WANTED immediately by a Firm of Architects in the Country. A good draughtsman.—Address, No. 116, Office of "The Builder."

A JUNIOR ASSISTANT, or IMPROVER, REQUIRED, as a Measuring Surveyor's Office. One who writes a good hand, and can square dimensions and check abstracts. Address, stating terms and particulars, 41, Office of "The Builder."

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CLERK of WORKS WANTED, for a Suburban Job. Application, stating experience, references, and salary, to Messrs TOLLEY & DALE, 13, Angel-court, Bank.

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January 5th, 1876. THOS ELLIOT, Architect.

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WANTED, by a London Builder, a thoroughly competent SHOP FOREMAN of JOINERS, and to take General Management of yard and machinery. Highest references as to trustworthiness, capacity and respectability will be required. Residence in the premises. Address, stating age, wages required, where last employed, and full particulars, to No. 105, Office of "The Builder."

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AN ASSISTANT desires a RE-ENGAGEMENT. Is an Improver in the Art and Craft of working details, setting out, &c. P. BYRNE, 20, Royal Avenue, King's-road, Chelsea, S.W.

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AS MANAGING ASSISTANT.—A Gentleman, aged 30 quick draughtsman, of business habits, and general experience, desires an ENGAGEMENT.—Address, ARCHITECT, Gresham Library, 388, Coldharbour-lane, Brixton.

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The Builder.

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Ivory, and Works in Ivory.

R. MASKELL'S Handbook of Ivories, Ancient and Mediæval,* is chiefly valuable as a *précis* and index of the literature of the subject, illustrated by reference to the most striking examples known to the author, whether in the British Museum, the South Kensington Museum, or elsewhere. With regard to the critical character of the book, the writer has, perhaps, allowed himself to be too much seduced by the fascinating nature of his special study. The woodcut at page 36 is very far from justifying such a remark as, "looking at it, can we hesitate to claim for the earliest Christian art, after Christianity was recognised by Constantine, a place by the side of the best works of pagan times?" The remark, of course, applies not to the woodcut itself, but to its subject, the leaf of a diptych in the British Museum. Those who are familiar with Greek art, and even with Classic work of much later date than the time of Alexander the Great, would feel disposed to read no further than such a sentence. In this, however, they would be wrong. The work is one of much interest, and deserves to be read.

As to that portion of the lore of the ivory-carver which relates to the method of his toil, the peculiar excellences and defects of his material, and the distinct methods of handling which are proper to the different purposes to which ivory sculpture is applicable, the Handbook is silent. Nor is this, perhaps, to be regretted; for we find (p. 3), a statement between turned commas as to African and Asiatic ivory, which, if not absolutely incorrect, is yet very far from giving an adequate view of the subject. Mr. Maskell says that African ivory, "when recently cut, is of a mellow, warm, transparent tint, with scarcely any appearance of grain, in which state it is called *transparent* or *green* ivory; but, as the oil dries up by exposure to the air, it becomes lighter in colour." Three or four very distinct matters are here confused. All ivory, so far as our experience extends, when fresh and young, whether coming from the tusk of a young animal, or from the finer portions of an older tusk, is more or less gelatinous in its appearance, and yields with comparative freedom to the tool. It is the exposure, not to the air, but to heat, whether climatic or artificial, that dries, hardens, and whitens this fresh ivory. The mere conveyance of objects carved in a cool to a warmer climate, without any exposure to air or light, is sufficient to cover them with a coating of exuded gum, insoluble, or, at least, not readily soluble, in water, but readily soluble in spirit. This gum exudes from the action of the summer heat of the south of Europe. We speak, of course, from definite experience. Owing to the great heat of India, most ivory objects arriving in England from that country have had this gum driven out by the heat, and thus, while differing much in grain, are generally characterised by a hard and comparatively brittle texture. Their whiteness depends chiefly on the exposure to light. Without exposure to both light and heat, such as we only obtain from the sun in this country in a few weeks of the summer, ivory will never assume its proper creamy or marble white hue. If young ivory, however, be exposed to a heat proper to blanch it, without proper precaution, it cracks. It is very rare to find ivory carvings without black, unseemly lines. These are either formed by shakes in the material, or by sun-cracks. Shakes are of two kinds: those which were produced during the lifetime of the elephant, and those which have been produced since the tusk was severed from the skull of the animal. The former have been produced either by fighting, or by blows against trees or stones while the animal was living. They render the part of the tusk where they occur valueless, or nearly so, as they are liable to part asunder when the ivory is sawn into portions. The latter kind of shakes appear frequently to have been produced by the use of the hammer and chisel. Ivory lends itself freely to this, the true sculptural, treatment. But the chisel, which ought to be sharp and of good temper, rapidly blunts; and a little misdirected energy will then inflict mischievous shakes on the ivory. A fall, a blow, or, as before said, unguarded exposure to undue heat, even by being left in a window looking to the south on a midsummer day, or on the fender of a fire-place, may produce the same result. These shakes and sun-marks are at first almost invisible. But very shortly a black substance forms in the fissure, which, we apprehend, is of fungoid origin. In this case, as well as in that of injury to the living tusk, black lines form; and indelibly seam the pure surface of the ivory. We apprehend that the application of a silicious varnish as soon as the damage occurs may arrest the progress of the disfigurement.

What the dealers now call green ivory was almost unknown, to the best of our experience, in this country, thirty years ago. Certainly the ivory-turners and handle-makers of Birmingham, Liverpool, and London, had no such special supply of this peculiar ivory as is now the case. It is, we understand, of African origin. It is more gelatinous and transparent in its first appearance than any other fresh ivory, unless it be the very finest specimens of the white tusks we shall presently mention, and by gradual exposure, extending over at least two summers, to properly regulated light and heat, it assumes a pure milky whiteness which is more beautiful than any other tint to be found in the material. We use the word milky rather than creamy, as the first appearance of the tusk when cut is like that of milk when thrown in a jet from the animal, and the yellow tint of rich cream is not attained by this kind of ivory. To the chisel or burin it yields with a sharp clear cut, which rather resembles that of fine stone than of any animal substance. It is susceptible of the most exquisite finish. The distinctive mark of this ivory, in the tusk, is a corrugated surface, somewhat resembling that of the tooth of the hippopotamus. It must be the product of a special race of elephants, if it has not even a claim to a specific designation; and we shall be very glad if any African travellers or hunters will complete the sketch thus drawn from our own experience. The price of this ivory is high, reaching as much at times as 20s. per pound for large and well-shaped pieces. We have not bought it in the tusk.

There is another kind of African ivory which has been sold to us as Egyptian. It is, when blanched, of a much softer texture than the green ivory, and has a creamy colour. The tusks are perfectly smooth, and very white, giving the idea of coming from a white species of elephant. Its behaviour under the tool to some degree resembles that of clay; as with a sharp graver it can be cut almost as clay is modelled by the tool. But the special peculiarity of this kind of ivory is its liability to bruise. If put in a vice, or subjected to a blow or violent pressure on a small spot, it behaves almost like the human skin. A slight discolouration ensues, which penetrates into the ivory in proportion to the violence of the pressure, and leaves a positive bruise, or lesion of the texture, which is irremovable by any means known to us. Even a fall on a stone floor will produce a bruise of this kind. This ivory, however, is less liable to crack than other species, although small cracks are not uncommon in the tusks.

In all kinds of ivory, with the exception of the green, or corrugated sort, the great indication of excellence is the whiteness and freedom from cracks of the outside of the tusk. No coating of true dentine, or hard matter, occurs in any tusk of the elephant. But the corrugated ivory has a sort of skin of rougher and harder texture than the interior; and in all tusks a slight discoloration and hardening occurs, varying from the sixteenth of an inch to greater depths. In the tusks of the hippopotamus the exterior is much harder than in the tusk of the elephant, and the structure of a true tooth is more closely resembled. Hippopotamus ivory is neither so hard nor so white, when blanched, as true ivory. And it is incomparably more subject to suffer from sun-cracks, even under a comparatively feeble exposure to the rays of the sun. Some of the white tusks have an extreme delicacy of tissue, which, although the artist can at once distinguish it, by the burin, from the

* South Kensington Museum Hand-books: Ivories, Ancient and Mediæval. By William Maskell. Chapman & Hall.

corrugated ivory, yields to the other neither in closeness nor in ultimate whiteness.

On the subject of the production of large plates of ivory from moderate-sized tusks, we are unable to speak with absolute certitude. But we have some reason for the opinion that the continued application of pressure under boiling water may unroll a hollow section of tusk, so as to allow of the sawing out of flat plates. Certainly the effect of heat on the texture of ivory is very powerful; that of dry heat is, sooner or later, destructive; and, not only so, but light itself appears to have a direct chemical action on ivory. French carvings exposed under glass to direct sunlight, even without any considerable heat, gradually lose their fibrous texture, and have a tendency to disintegration. A small degree of pressure will then crush the material, and make it crumble like alabaster. The gradual elimination of the glutinous matter is probably the cause of this change of structure. Lapse of time, in the case of Assyrian and Egyptian ivories, appears to have had a similiar effect. But then it must be remembered that it is lapse of time in a very hot climate, and that the frequent recurrence of the summer temperature may by degrees evaporate all traces of gluten from the ivory. We have little doubt that a fuller study of the subject, with the aid of a microscope, would enable us to distinguish the race of elephants from which any ivory, ancient or modern, was obtained.

Mr. Maskell very properly observes that what is called the fossil ivory of Russia "has not undergone the change usually understood in connexion with the term fossil." These tusks are those of the mammoth, or *Elephas primigenius*, a fellow inhabitant of Europe with extinct forms of the human family. The absence of change during so long a period is due, we can have little doubt, to low temperature and concealment from light. It will be in the recollection of many of our readers that an undecayed mammoth, tusks and all, embedded in the ice of the Lena, had been so preserved by congelation that the flesh was eaten by wolves when the creature was thawed on exposure to the air.

A word or two should be added to the very interesting historic sketch of Mr. Maskell, as to the purposes to which ivory is most properly applicable in art, and the special mode of art treatment proper to each case.

The lowest, and one of the earliest, methods of application is that of what we usually call veneer,—that is to say, of a thin plate of material applied to portions of a wooden or metal fabric. The pure colour, and smooth and glossy surface, obtainable from ivory, led to its use in this way, in the same way that the precious metals, precious woods, and shell of the tortoise have been applied from remote antiquity. In our own day this use of ivory is chiefly adopted for the covers of books, especially prayer-books, and no binding is more durably brilliant. A somewhat similar application is found in the palace at Copenhagen (if we recollect aright), at the present day, where the pendents of a highly-ornamented ceiling are made of ivory. To this method of inlay of plaques, or heightening the effect of wood-carving by the introduction of ivory, reference is probably made in Psalm xlv., as well as by the Prophet Amos. The phrase, "Bethi hashen,"—houses of tooth,—used by the latter writer, is, in our opinion, far better rendered "palaces of ivory," that is to say, adorned with ivory, than "wardrobe," or "vestry," according to Mr. Maskell's translation of the equivalent phrase in the former passage. Again, in the passage in Ezekiel, where the Authorised Version has "benches of ivory," and St. Jerome has *transtra*, the Septuagint has "temples"; and Gesenius translates the word by "boards." Benches or beams of ivory would be out of the question. The use of this material for inlay seems to be indicated in each passage. The throne of ivory of Solomon was not altogether unlike the curule chairs of the Roman dignitaries, and the mixture of ivory with gold in this throne recalls the chryselephantine work of the Greeks.

This leads to the consideration of the second application of ivory, namely, to furniture. Thrones or chairs are among the earliest examples of this use; but caskets, no doubt, are at least of equal antiquity. Ivory caskets are often boldly carved; and the inlay of carvings, in high relief, in wood, or even in metal, is akin to this use of the material. Under this head, also, we rank the diptyches and triptyches; for a good account of which we refer to Mr. Maskell's volume. These carved slabs were the lineal ancestors of the bindings of our actual books. The natural form of writings on parchment is that of a roll; and highly ornamental rollers were common for the purpose of supporting a valuable manuscript. Fine specimens of these are to be seen at South Kensington. The introduction of paper, however, was in lieu not of the parchment roll, but of the waxen tablet. In China, paper is printed only on one side, and then, though not rolled, is folded in a long strip. For maps and sections that mode is excellent. But the paged book is the improvement of the waxed tablet; and thus the boards of the book so clearly keep the form of the leaves of the Roman diptych, that ancient classic specimens, of pagan character have been utilised for binding missals. The use of the material for cups and vases, which allow of great splendour and beauty, although they are not so durably useful as silver, also ranks under this head. The style of handling in these instances is usually bold, heavy, and in deep relief,—little, if at all, differing from work in fine wood.

Of the third kind of ivory work we have to speak with much reserve; not only from the fact of its entire disappearance, but also from the circumstance that it is difficult to reconcile the high terms in which the chryselephantine work of the Greeks is commemorated, with the most generally received canons as to sculptural purity and excellence. But when we find that Phidias thus wrought, and wrought in his most famous work, we must admit that criticism may well be modest. What we have seen in modern times of the combination of ivory with other materials, or of the similar combination of white and black marble, or of alabaster, or coloured marble, with bronze, does not recommend itself to a taste of any severity. It is possible, however, that the cause of this may lie rather in the manner of the artist than in the exigencies of the material. The modern French works of this class may not unjustly be called meretricious. But, unfortunately, many French sculptors of the day contrive to deserve that adjective even when they work in *terra cotta*. Still there can be but little doubt that all such admixtures are rather sumptuous, splendid, and costly, than artistic in the highest sense of the term. Nor is it impossible that the exceeding splendour of the colossal statue, formed from the most costly, as well as the purest, materials, was one main cause of the powerful impression produced by the great figure of Pallas. We cannot doubt that the abstracted, motionless, passionless, countenance which Phidias gave to the immortals,—and, to a certain extent, to his heroes,—was reproduced in the great chryselephantine goddess. A colossal statue, priceless in its materials, imposing from its position and illumination, sanctified by a halo of religious awe, and solemn in the passionless majesty of the great Greek style, may well have been a masterpiece of one of the first artists of all time.

From religious art of this nature the transition is easy to those smaller objects, statuettes of sacred or of domestic character, to which the beautiful material furnished by the elephant so readily lends itself.

With regard to ivory statuettes, it is to be regretted that neither Mr. Maskell's book nor, so far as we are aware, the Museum at South Kensington, is enriched by any account or specimens of the exquisite figures which were produced some thirty years ago by Mr. Cheverton. They were mechanical reductions from famous originals, and were produced by a drill. The surface thus formed was entirely free from the facets which are the great defect of inferior work in ivory, and no less free from the vulgar polish which it is so easy to obtain by the use of whiting and water. It closely resembled the texture of the human skin, and was perfectly adapted to the exquisite delicacy of the material.

Sculpture in the round, however, is not the true treatment of ivory. The statuette must be so small, that only the most masterly hand can redeem it from the character of a toy. The same amount of artistic toil applied to silver or to bronze will produce work that is at once more effective, and more durable. The true function of ivory is to yield material for cameo, or work in relief. For this, within its natural limits as to size, it is unapproachable. Relief carving in ivory allows to the artist a wider range in style and mode of handling than any other material whatever. It allows of the breadth of touch proper to the wood-carver; and of the microscopic delicacy of the gem-sculptor. There is, indeed, as we have before intimated, a great difference in the texture or grain of different kinds of ivory; a difference quite corresponding to the different degrees of delicacy of workmanship of which we speak. Coarse-grained ivory is not inappropriate to such bold plaques as are filled by the *amorini* of Il Fiorentino; works well known to the frequenters of South Kensington. On the other hand, a fine young piece of green ivory admits of the execution of a cameo of delicacy and boldness equal to anything that can be wrought in onyx, carnelian, or any other hard and precious stone. The perishability of the material is the only drawback to its value. But, on the other hand, it can be worked with far greater rapidity than any *pietra dura*.

The chief interest in Mr. Maskell's book lies in the mode in which it illustrates the relation of this special and rare branch of art work, not only to all other branches, but to history, to religious opinion, and to ethnology. Periods that are otherwise very blank as to their relics, are illustrated by ancient carvings. The dawn of human art is pushed back, by the carving figured on p. 11, to a period more remote than our ancestors could have dreamed of. Making all such reserve as is unfortunately now too necessary as to authenticity, the sketch of a mammoth, engraved on a piece of the ivory furnished by that extinct proboscidean, denotes a high order of artistic feeling amongst tribes of an antiquity so remote that they might almost have been the inhabitants of another planet, so far as regarded the probability of our discovering any relics of their work. Again, the spirit and force of the outline of a ruminant, on p. 9, is something very unlike the work of a savage. It is impossible to examine these products of recent excavations in caves in the Dordogne without a feeling of awe. They repeat, in still more impressive tones, the lesson taught by the discoveries of Dr. Schlieman in the Troad. They show that race has succeeded race, not in order of development, or according to any process of natural selection, but according to some more subtle and far-reaching law. It is, no doubt, in some cases the civilised, who has conquered the savage, man. But in other instances the sequence has been reversed. Wilder and ruder tribes have stamped out the light of nobler races, as the Tartar hordes have done within the limits of modern history. There is ample room for a work of the utmost interest, which should be limited to the illustration of the ethnological, artistical, and religious history of man by the relics of the work of the carver in ivory. At the same time, visitors to South Kensington should provide themselves with Mr. Maskell's Handbook.

PORTRAITS AT BURLINGTON HOUSE.

THE seventh winter loan exhibition at the rooms of the Royal Academy is strong in portraits, which, those of the British school especially, form even numerically a very large proportion of the works exhibited, and on the whole constitute the chief interest of this year's collection, which, in comparison with some of its predecessors, is somewhat deficient in the highest class of pictures of a more imaginative and ideal type. The portraits, too, have been well selected and arranged so as to give a certain degree of speciality to the exhibition, and the double interest of portraiture, in regard to the power of the artist and to the character and personality of the sitter, has full illustration in this exhibition.

The two great English portrait-painters of the past, Reynolds and Gainsborough, are of course largely represented; but in one respect they do not stand so entirely unrivalled among their compeers as formerly. There can be no doubt that one effect of this admirable and delightful institution of the annual loan exhibition has been to raise very much, in modern estimation, the name of a third English portrait-painter, who, during his life and for long after his death, did not receive the honour that was justly his due; and now instead of speaking of Reynolds and Gainsborough only, we are tempted to make a *trio* of it, and speak of Reynolds, Gainsborough, and Romney. We do not mean to say that Romney had either the same power or the same versatility as his two great contemporaries, and it must be admitted that Reynolds is not, taking the average of his works exhibited, quite seen at his best in this year's exhibition; but there is enough in the six works by Romney which find place here to confirm the opinion which the last exhibition suggested, that as a portrait-painter and within perhaps certain limits, he may claim a place considerably nearer to Reynolds than has been commonly assigned to him.

Romney heads the catalogue with his half-length of "Elizabeth, Duchess Countess of Sutherland" (1), a side-face portrait of a young lady of a delicate and refined type of beauty, and illustrating in a high degree that union of dignity with sweetness which is so conspicuous in the feminine portraits by the great painters of that period. How is it, one is tempted to ask, that we so rarely see anything approaching to this type in the modern portraits which are sent to the Academy Exhibition? Portraits of "pretty girls," as the phrase is, are not unfrequent, but what has become of the sort of feminine portrait which the trio among whom we have classed Romney used to turn out? Is it that our modern painters, unquestionable as is the genius which some of them possess, are less able to appreciate and express the "ladyism" of a lady? or is it that a different class of persons get their portraits painted? or, finally, must we think that the lady of Reynolds and Romney no longer exists,—that the wider range of modern education and the influence of the show and bustle of modern life have deteriorated this crowning growth of civilised society? If so, we have paid a heavy price for "culture." Whichever be the explanation, the fact remains that we rarely if ever see a modern portrait of a lady recalling that peculiar grace and dignity which are of every-day recurrence in the portraits by Reynolds and his two compeers. Leaving that, however, as a passing reflection, we remark that Romney's real triumph in this collection rests on his family group of the children of the "Second Earl Gower" (70), lent by the Duke of Sutherland; where one daughter, a grown-up young lady, in flowing white robes, beats a tambourine, while the four others, all children, dance round in a ring. Never was a happier effort in child-portraiture than this joyous group, more especially the elder of the four looking up at her sister, and the sunshiny face of the little boy in the full glee of the dance. The face of the player is painted with great finish and delicacy, and her attitude is charming, but perhaps a little too quiescent for her occupation. The picture is an evident "bid" against Reynolds, being quite according to his ideal; there is a difference, distinct enough though not easy to define, between the excellence of Romney and that of the "P. R. A."; perhaps to be distinguished mainly in a comparative want of fulness and richness of texture in Romney's manipulation, and of that peculiar ease and *abandon* which seems a kind of inspiration in Reynolds's portraits of this class. Romney's portrait of "Lady Hamilton" as a peasant at her spinning-wheel (216) hangs next to Boucher's "Madame de Pompadour"; an instance of the effective groupings which have been made in hanging a good many of the portraits. These two are almost startling in artistic and social contrast of character: the French lady, with her small pretty head and characterless face, reclining in elegant indolence on a sofa, in a beflowered and beribboned dress, and amid all those showy knick-knacks which Boucher and his school delighted to paint; the other figure in plain white dress, without an ornament on or around her, painted in a broad, comparatively sketchy style, and just turning up her face as if in act to speak—and such a face! It is not often that the painter has such a model as that before him, so far, at least, as outward beauty and perfection are concerned.

Of the numerous Reynolds's, some are finer in execution, but none superior in interest to, the portrait of Miss Morris as "Hope nursing Love" (18), which does not need her melancholy and half-romantic story to win the attention of the spectator. Reynolds seldom painted a more charming figure than this young girl, with the full contour of face and rich masses of hair above it; she is of a peculiar and very fine type of beauty; her green and crimson drapery makes a full rich harmony with the dark foliage behind. The same room contains "Mrs. Nisbett as Circe" (34), with a cat and a leopard, the latter of doubtful construction. The execution of this picture is superb, but the figure is a little stiff and formal, and the face certainly not interesting. Some interest attaches to Angelica Kauffmann's portrait of Reynolds himself (45), which has a more bold and broad character and manner than is generally attributed either to the style of the fair artist or to the personality of her distinguished sitter. Among other portraits in the first room, the "Sir Francis Bassett" (8) is a model Gainsborough: a youngish man in blue coat (half-length), whose figure and attitude show in perfection that ease and grace of pose which Gainsborough, in his portraits of men, carried further than any other painter, without sacrificing dignity. The distinguishing character of Gainsborough's portraits of men, as compared with Reynolds's, is perhaps in this apparently easy and unstudied attitude, as if the movement of the sitter were arrested and caught at one single moment. A portrait of the same sitter, by Jackson, finds place in this room on the opposite wall, one instance out of several in which various portraits of the same person have been secured, and afford interesting opportunities of comparison. Jackson's likeness looks older than the other, and is stiffer in manner, but is a very capital and manly-looking portrait. Reynolds's "John Paterson, Chairman of the Blackfriars Bridge Committee, 1776," is in this room,—a specimen of the artist's best style.

Gallery II. is remarkable, besides the Romney group before mentioned, for no fewer than four David Garricks, by Reynolds, Gainsborough, Dance, and Hogarth respectively. The first shows him in the character of *Kitely*, and seems to be intended as a metamorphosis of David's natural expression. Gainsborough's full length, in which the actor leans against a pedestal, on which stands Shakspeare's bust (in commemoration of the celebrated piece of "high jinks" at Stratford), might be, in Mrs. Garrick's eyes, "the best portrait ever painted of her Davie"; but it is not so natural and pleasant a one as that by Reynolds (not in this exhibition), where the actor sits with the points of his fingers pressed together, and his countenance truly answering to Goldsmith's line,—

"An abridgment of all that is pleasant in man."

Hogarth's well-known portrait, where Mrs. Garrick leans over her husband's shoulder to pull the pen out of his hand, shows the painter's proclivities in an amusing manner in the slight exaggeration of the points of the countenance as compared with the other portraits. There is a very after-dinner look about David in this picture, as he sits "inditing a good matter" for his prologue; but the whole thing is a brilliant performance.

What a contrast to step through the doorway into Gallery III., and stand before certain Vandycks. The very force of aristocratic stiffness is in the figure and attitude of "Prince Maurice" (104). Granting Vandyck's splendid power in his familiar stamp of portrait, where, in the case of the ladies, the picture often seems to consist of a richly-painted satin dress, with an insipid face at the top of it (see the "Countess of Monmouth," for instance,—110), we may safely stand on our Reynolds and Gainsborough as greater than he in real spontaneity and freshness of genius. Contrast the graceful and natural attitude in Reynolds's "Mrs. Bouverie" (108), for instance, and the delicate tones of her drapery, and the effective and yet unforced composition of the whole, with these stiff satined and brocaded pillars of aristocracy. Vandyck, of course, had to paint what came before him, but his portaits, supereminent as they are in some qualities, certainly do not attract us like those of the English artist; there is too little humanity in them. Velasquez is most characteristically represented in the equestrian portrait of the statesman Olivarez (116), seated almost on the shoulders of his horse in the way which the Spanish horsemanship of the period seems to have approved, and with the complete unity of action between horse and man which Velasquez realises in his equestrian figures, who always sit their horses in a sort of cool, collected, easy-chair manner, as if to be on a rearing horse were their normal position. If physiognomy is any guide to character, we may say that a greater rascal than "Don Gaspar de Guzman, Count Olivarez" never drew bridle. "The Head of a Spanish Gentleman" (121), by the same artist, is a capital specimen of strong, bold, direct painting, without a suspicion of humbug in it; and there is a great deal of interest in his melancholy-looking portrait of a lady (117), who seems as if she had a history of some kind. Over this is one of the two Giorgione portraits (118), a most interesting head, a thin, nervous, eager countenance, with a long straight nose and very refined mouth; a picture as intensely Italian as the "gentleman" of Velasquez is intensely Spanish. The other Giorgione portrait (128) is a half-length of a figure, of delicate features and hands, in a dark velvet dress; it is noticeable that both the cut of the dress and the attitude of the figure are remarkably similar (but reversed) to those in a portrait of Borgia by Raffaelle, we forget where at this moment. Titian's "Ariosto," in which the great artist remarkably combines romance with realism of expression, and Reynolds's Lord Thurlow, are among other portraits in this room, characteristic respectively of Italy and England alike in their artistic qualities and in the personality of the subjects. We cannot omit reference to the remarkably individual portrait of "Contessina Mattei" by Andrea del Sarto (135); a remarkable face, painted with great care and finish, though a little too "smoothed down" in execution.

This latter description might perhaps be held to apply to the portrait called a "Leonardo da Vinci" (185), in Gallery IV.: a head and bust of a lady of not very interesting countenance, who with the right hand lifts the lid of a small vase she carries in the left. It no doubt is in the style of Leonardo; but is it proved to be his; or, if so, is it untouched? We should incline to feel doubtful on either point, in the absence of conclusive evidence. The work is effectively contrasted with the portrait of Doña Maria Padilla, by El Mudo (176), a dark, gipsy-looking face, cloaked up to the chin,—a very characteristic work. We may just mention the presence, in Gallery V., of Phillips's portrait of Byron, so well known from engravings, and in Gallery X. Vandyck's much-less known and very remarkable portrait of "Robert Boyle, first Earl of Burlington." In glancing at the Reynoldses in the first room, we omitted one too characteristic to be passed over,—Mrs. Abington, as "Miss Prue," the hoyden in Congreve's surpassingly brilliant though licentious comedy, "Love for Love"; she is the very ideal of the character, as she sits leaning over the back of her chair, and sulkily biting her thumb. The tone of the painting is peculiar and not agreeable to the eye, though the humour of it is admirable.

Of the works other than portraits, the principal ones are mostly too well known to require comment. Some of the more out-of-the-way specimens we may take opportunity briefly to "specify, when time and place shall serve."

THE ERITH STRIKE.

WE look with fear and trembling for the next step that will be taken by the Iron Trades Employers' Association in respect of the strike against Messrs. Easton & Anderson, the engineers, of Erith, brought about by the orders of the Amalgamated Society of Engineers and the Engine Makers' Society. The strike is in opposition to the asserted extension of the principle of piece-work, and although only 200 men have gone out (some 500 others remaining at the same establishment), the masters view the step as the commencement of an organised assault under which, if they stand quietly by while each of their fellows is attacked in detail, they must fall. The Employers' Association have accordingly fixed to meet on, this, Friday, the 14th inst., to consider the advisability of a general lock-out of the workmen in their employ as against the interference of the Unions. The men on strike have no complaint, as we understand, against the prices offered or the treatment they receive from their employers; they were ordered to go out, and they obeyed.

Our opinion on the subject of piece-work,—the right of either master or man so to work,—has been too often expressed to need repetition. Piece-work and sub-contracting are the only doors through which the workman can hope to pass to the class above him. The number of those who have passed through these doors is considerable. In some trades the men would strike if piece-work were not given by the masters; in others, as we see, a determined war is waged against it by order of the Unions. The question, however, just now, is not the desirability or otherwise of permitting piece-work. The question is, shall not employers be permitted to offer work in such shape as seems to them best? shall not men be allowed to use their own discretion as to whether or not they will accept the work so offered? The masters have the outside world with them on this occasion. If they should determine on a lock-out they would be generally excused; few, however, who might have said "quite right," reflecting on the amount of suffering and misery which such a step would involve, notwithstanding the considerable sums which the Amalgamated Society of Engineers have at their disposal. We earnestly trust that matters may take such a turn as will avert the terrible misfortune which at present looms large in the distance.

ARCHÆOLOGY OF ROME.

THE most recent instalment of Mr. Parker's indefatigably pursued illustration of the archæology of Rome,* forming the fourth "Part" of his publications on the subject up to the present time, is, so far as regards the bulk of the volume, a supplement to the three first parts (which together form Vol. I.), giving fuller information and illustration as to various remains less fully illustrated in the previous portions of the work, or which have been further investigated since those earlier portions were published. The "Part IV.," describing the Egyptian obelisks, is therefore in fact but a very small proportion of the volume to which it gives the title. It contains a concise account of the Egyptian obeliska in Rome, drawn up entirely from the inscriptions on these interesting monuments, which are thus made to tell their own story to the northern barbarians. The inscriptions are of three classes, each conveying its own species of record. "Those of the Popes record when each was placed in its present situation. Those of the Emperors state on what occasion each was brought to Rome. The hieroglyphics give the original history of each in Egypt. One of them only was made for the Romans, or is of their time; the others are much older, and belong to the history of Egypt." The hieroglyphics have been translated for the author by an eminent Egyptian scholar, residing for a time in Rome, who declines to have his name published; but the reader has the guarantee of the authority of Dr. Birch and Mr. Bonomi for the accuracy of the translations.

Of the nine obelisks described in this chapter, illustrations by photo-engraving are given of four; those in the Piazza del Laterano, in Monte Citorio, in the Piazza della Minerva, and in the Piazza Navona. Of these and the other five a full account is given in the chapter which forms the bulk of the text; but we cannot help saying that Mr. Parker's method (if it can be so called) both in this part of the volume and in the more extensive supplement, is deplorably confused and devoid of method. The information about the dates and original founders of the nine obelisks is given twice over, and in the case of the four which are illustrated, four times over: first in the table of contents, then in the succeeding chapter, then in a schedule at the close of the chapter, and once more in the descriptive note appended to each engraving. This repetition is not only useless in itself, but embarrassing to the reader, who as he turns the page, is continually discovering that he has "heard this learning before." On the other hand, information that ought to be given is omitted. The architectural reader of course can readily distinguish between the original portion of the Egyptian obelisk and the Roman terminal added to it, or (as in the case of the Lateran obelisk) the Roman surbase and plinth upon which it stands; and in the case of three of the obelisks the addition of the cross on the top is sufficient to show any reader that the monument is not in its original form. But in the case of the Monte Citorio obelisk, for instance, where there is no cross, there is not a hint for the uninstructed reader, taking up the subject for the first time, as to what is original and what is not. The ridiculous elephant base upon which the obelisk of Pharaoh-Hophra was placed by Bernini in the Piazza della Minerva (which gained Bernini the nickname of "the elephant"), is too prominent a peculiarity to be passed over; but otherwise the reader is left to find out what he can for himself as to the architectural substructure of the obelisks. The concise statement of the history of these remarkable monuments is well put into a short space, and the author draws attention by a pointed sentence occasionally to the remarkable nature of the historic vicissitudes which some of them have passed through. Of the Lateran obelisk he observes that "it was originally set up in Egypt by Thothmes III., the great oppressor of the Hebrews, B.C. 1555. It was brought to Rome by Constantine, about A.D. 311, and it now stands as a trophy before the earliest, and in some respects the chief, basilica or cathedral church in Christendom." A short but certainly suggestive record. What will be the next destination of this ancient monolith, which has looked upon such changes in human life and thought, and in architectural style and development too? Perhaps "twere to consider too curiously, to consider so." Mr. Parker is fully alive to the significance of some of the inscriptions of the obelisks in regard to religious history, and repeats, at each mention of the obelisk of Domitian (Piazza Navona), the denunciatory epithet of "blasphemous" in regard to the titles of deification of the emperor inscribed thereon. After the lapse of so many centuries we should have thought such follies might be allowed to pass without any more hard words.

In regard to the supplement, which, as we observed, forms the bulk of the present volume, we may state its object in the author's own words,—"To explain more fully and clearly some points where this seems to be required, especially by means of plans and diagrams, because they are new to most people, being the results obtained by the great excavations and explorations that have been going on in Rome during the last few years, more especially the last two years. The great excavations made for the drains of the new city have brought to light many things quite unknown previously." Mr. Parker describes his own position in regard to these records and illustrations, carried out only by the combined efforts of many friends, as that of "general editor," a post for which he was qualified "by long experience in the architectural branch of the subject, and the habit of closely observing the construction and details of a building as a guide to the date of it." Without questioning Mr. Parker's capability, in this respect, to edit the labours of his friends, we cannot but think his publication would have derived increased value from the presence of a further co-operator to edit the work of the editor. There is a mass of information and a large amount of theory and suggestion presented to us, but all poured forth in such an unmethodical manner, and written in a style so deficient in point and perspicacity, that it is a kind of thirteenth labour of Hercules to find out, in most places, what the author is really driving at, or what is the relation between one fact and another and between the isolated facts and the general theories in support of which they are adduced. Considering that the information intended to be given is very full and very interesting in itself, it is difficult to imagine a volume more perplexing and bewildering to the reader. Mr. Parker may say, and perhaps with some truth, that those who are well acquainted with the sites alluded to will have no difficulty in understanding all he wishes to convey; but the very object of such a publication is to afford information and convey lucid ideas to those who are without such detailed knowledge; and the information amassed by even so untiring an archæological student as Mr. Parker loses a great deal of its value if the archæologist does not possess, or has not taken the trouble to acquire, the power of systematically grouping his facts, and stating them in a clear and lucid manner.

The supplement, which may be divided into two portions, the first consisting of continuous text, the second of illustrations, with comments descriptive or otherwise in connexion with them, is chiefly directed to the further elucidation of the author's theory in regard to the lines of the walls of the city at various periods, and the recent discoveries that bear upon or support it. These, however, not only refer back to the former volumes, but forward to volumes yet unpublished, and the date of the appearance of which is "uncertain." It would be scarcely possible, therefore, fully and fairly to examine at present the position taken by Mr. Parker in regard to this part of Roman archæology, in which he admits that he is in opposition to a good many other archæologists. Among the points of interest of which drawings are given, is the great foss of *Roma Quadrata*,—the ditch, in fact, of what Mr. Parker regards as the first wall of Rome. This, he says,—

"Is of so much importance for the early history of the city of Rome, and is in general so little understood that some further account of it is called for. It is so much concealed also by having been filled up for such a length of time, that considerable study is required to understand it, and realise the fact that it was an enormous foss, which remained open and had various buildings erected in it, on the bottom of it, during the time of the later kings and the Republic. It was not filled up to the level of the rest of the surface of the hill until late in the first century of the empire, under Domitian. At that time the plan of the great public buildings called the Palaces of the Cæsars required a large level platform, and this great foss was filled up to the level of the earth on each side of it, not with earth, but by building walls across it at intervals of 15 ft., and throwing vaults from one wall to the other. This was done to make the whole surface one large level space, of greater extent than was practicable in any other manner.

In consequence of the great excavations made for Napoleon III., and more recently for the Italian Government, by Signor Rosa, these cross walls can now be distinctly seen in several places. One of the most obvious of them is near the west end of the foss towards the Circus Maximus, and close to the cliff on the south side of the foss, on the top of the bank of which stands the Villa Mills. In this part a deep pit is left open, in which can be seen the walls of some great building, of the large squared stones in the style of the later kings or early in the Republic, respecting which nothing has been ascertained. On the east side of this pit, on the present level of the ground, stand the bases and parts of the columns of a portico of the time of Domitian, apparently a small temple, just outside the tribune of the great hall or triclinium. About a hundred yards further to the east a modern flight of steps descends into a series of three chambers, now subterranean, called the "Bath-chambers of Livia," probably because there is a fine picture of her time on the vault of one of the chambers. . . . These chambers have been cut through in the most reckless manner by some of the transverse walls before mentioned. Still further to the east, and getting towards the Arch of Titus, these walls may be seen again passing under the *Aula Regia* or state hall of the empire, which is also of the time of Domitian."

This description, borne out and explained by the section given through the foss and the buildings in it and over it, affords a remarkable instance of that blending of the remains of various epochs in almost inextricable confusion, which has rendered Rome such a practically inexhaustible field for the interest and ingenuity (some perhaps would add the imagination) of the archæologist, and is an example of the nature of the information and archæological illustration given in the supplement. The references to this very plate, however, give an instance of the confusion in the arrangement of the book. The editor can do nothing like other editors, so he calls the first of the series of plates illustrating the supplement the "frontispiece," though it does not occupy the position indicated by the word frontispiece, and then adds "or Plate I."; but refers in the text to the next illustration as "Plate I.," though it is numbered "II." The said "frontispiece" is a photograph of the primitive fortifications of Gabii, with a modern village which stood, up to 1870, within the old walls, and which, if taken as a remnant of the aboriginal style of dwellings in the country, does illustrate, as is remarked in the notes, why it was so easy in early times to transfer all the inhabitants of a conquered city to Rome; "the Italians in those days lived in similar huts; they were shepherds and herdsmen, their wealth consisted in flocks and herds; if they could have pasture found for them, and a safe place for their huts, the removal from one place to another was little hardship to them, and the increasing power of the Romans gave them better protection against neighbouring tribes." The fortifications referred to, and of which the photograph gives a view, stand on the edge of a high cliff, which was formerly the bank of a lake. "This lake," says Mr. Parker with charming *naïveté*, "*has unfortunately been drained* under the direction of Canina, the Roman architect and engineer." The lake was no doubt drained for sanitary reasons, as there are still a few people living among and about the ruins of Rome; but to an archæologist of course that is nothing; and as picture-cleaners think pictures are only painted to be "restored," Mr. Parker regards Rome as only existing for the archæologist.

The general chapters on the walls, and on some special buildings recently excavated, of which we have not space to give an abstract, are followed by a chapter on "brick-stamps," and their use as indications of the date of the work in which the bricks are used. Of the illustrative plates following, one of the best and most interesting is No. 10, showing the excavations on the site of the Porta Capena (Juvenal's "madidamque Capenam"), in which the extraordinary mingling of the road and wall of one Roman epoch with aqueducts of a later epoch and domestic buildings of Mediæval date, all tumbled together and intermixed in the sublime confusion of new and old which distinguishes Rome from all other ancient cities, is remarkably shown. Another extremely interesting building, or rather apartment, excavated in 1874–5, is shown in plates xiii., xiv., and is the only apartment in preservation among the remains of what is called and believed to be the "house of Mæcenas."

"The house of Mæcenas is recorded to have been on the Esquiline, and on high ground, as it was from the tower of this house that Nero witnessed the great fire. The exact site has hitherto been unknown, and has been supposed to be on the site of the church of St. Pietro in Vincoli, which is also on the Esquiline, from whence there is a fine view over a great part of Rome. But in the great excavations made by the municipality of Rome in 1874 for the new city, in removing part of the great *agger* of Servius Tullius, near its southern end, and its junction with the cliff of the Esquiline Hill (which is only a great promon-

* The Archæology of Rome. By John Henry Parker, C.B., &c. Chapter or Part IV.,—the Egyptian Obelisks: to which is added a Supplement to the First Three Parts, which form the First Volume. Oxford, James Parker & Co.; London, John Murray. 1876.

tory from the high table-land on which the *agger* was erected), remains of this celebrated house were found, at a short distance to the south of the church of S. Maria Maggiore, on the eastern side of Via Merulana, the street that leads from that church to the Lateran. The house has evidently been of considerable extent, part of it within the city and part without, as the great *agger* on which it was built was here the boundary of the city; or perhaps, strictly speaking, the great fosse outside of it was the municipal boundary in this part, and a street was made on each side of the *agger*, the two fosses being paved, and the houses built on the sloping banks, and in part dug out of them. So that this great house must have had one door in the inner street and the other in the outer one.

The only part at all perfect has been called the *auditorium*, or lecture-room, being like a small theatre. This is a very remarkable building; it seems to have been lighted from above, and has sham-windows in the walls of the apse or round end of the hall, which are beautifully painted on the plaster, with views of a garden as if seen through them, probably intended to represent the garden of Mæcenas himself, as he wished it to be before it was actually made."

How this could have been considered an auditorium or lecture-room it is difficult to understand; the plan is like that of a rather short basilica, an oblong apartment with a semicircular apse at one end, with stages running round it. If these stages were regarded as seats for an audience, what need of the extension of the oblong apartment in front of them? The opinion subsequently put forward by Herr Mohr, that the apartment was a conservatory, and the stages for flowers, seems much more probable, and, Mr. Parker infers, is now the generally accepted one. A string-course divides the wall about half the height between the plinth-line and the cornice-line; below this occur the recesses in the form of windows, alluded to in the quotation, painted with floral ornament on the soffit and jambs, and at the back painted realistically, in scenic fashion, with part of a garden, with balustrade, fountain, and trees, seen in perspective, and evidently intended as an illusion. One bay, below the string, is given on a larger scale in plate 14. The plinth is painted with small figures and other subjects, light on a dark ground. Mr. Parker tells us nothing about the colours, or whether they are still distinguishable. The representation of the trees and shrubs in these window-pictures seems, as far as one can judge from the engraving, very free and natural; and it seems probable enough that such a mode of decoration, extending in appearance the domain of the flowers beyond the walls of their apartment, would have been thought a suitable style of decoration for what we should now call a conservatory. The apartment is barrel-vaulted, with ceiling lights, and, to judge from the plan and section, must be a very elegant and pleasing interior.

Almost the whole of the information in regard to this relic of the house of Mæcenas is of course repeated twice over, in almost the same words, in the general chapter, and in the long comments prefixed to the plates, according to what seems to be Mr. Parker's notion of the way to make up a book. It would surely have been a more simple matter to have inserted the plate at the point where the illustration is required in the general chapter. Among other highly interesting illustrations are those on plate xvi. of the piers and masonry on each side of the Via Triumphalis, and a portion of a foot-bridge near the bridge of Caligula, with a piece of delicate trellis parapet, the appearance of which suggests woodwork rather than the actual material, marble. Plate xviii. lets us a little into the building operations of the first century, in a carving from a tomb, where stones are shown being raised to the roof of a temple in progress by a patent crane with a hoisting action worked by a tread-wheel on which three or four men are operating.

Part II. of the chronological table, in which the dates of buildings are given in one column, and those of contemporary events in the other, is continued from 337 A.D. to 1691; this is a most useful table, and assists the archæological student materially to bear in mind the relation between architecture and history. This table is indeed the most methodical thing by far in the volume, which in the main is about as curious an example of the collection of numerous interesting facts from original research, without the slightest perception of the value of condensation and arrangement, as could well be imagined. We hope Mr. Parker will long have health and strength to continue his valuable and interesting researches in Roman archæology, and that when he has completed all that it is allotted to him to do, a competent editor will be found to condense and arrange into readable form the chaos of facts which will have been amassed by his energy and perseverance.

DWELLINGS OF THE SWISS WORKPEOPLE.

THERE are but few countries where the dwellings of the working classes are better built and planned, and where they offer greater advantages in a sanitary point of view, than in Switzerland. In the architecture of the Swiss châlet, for instance, there is, socially and artistically speaking, much that is attractive. These wooden houses are more frequently to be met with in the German cantons than in the French and Italian, where they are rapidly disappearing, being replaced by more economical, if less picturesque, constructions of stone or brick.

Although there is great variety in the plans of châlets, they, in one respect at least, bear an affinity to the older style of German peasants' houses, namely in the arrangement of the family-room. As a rule this room holds such a position in the southern corner of the house that the sun shines through it diagonally. It is nearly square, and the wall on both sides of the southern corner is pierced by numerous contiguous windows, which throw light upon the large working and eating table placed in this corner. This is the gathering-place of the family, where the light and warmth of the sun may be enjoyed from morning to evening. Benches are fixed to both of the sunny walls, under the windows, which have small compartments, which can readily be opened by the hand of any one sitting on the benches. These windows generally command a beautiful view; whilst a mere turn of the head enables the person enjoying it from the benches to keep a watchful eye upon the proceedings of the other inmates of the room. The windows are mostly lattiged, and a projecting roof shelters the interior of the room from the mid-day rays of the summer sun. By this arrangement of the windows the symmetry of the frontage is sacrificed, a matter which, however, appears of little consequence where the great object is to obtain a clear and full view of what is passing in the neighbourhood. The lowness of the rooms, the panelling of the walls and ceiling, and the stout boards of the floor combine to retain in winter the heat radiating from the large tiled stove which fills the corner opposite the windows. Close to it are high steps, which serve for seats in cold weather, and which lead through a trap-door to an upper room, which derives its warmth from the same stove. In the third corner stands the immense dresser or sideboard, provided with open and locked compartments, and a flap which serves as a wash-table. A clock, with hanging weights and some neatly-carved wooden chains, complete the furniture of the family-room, which only differs in the poorer and richer dwellings in the lesser or greater amount of carving which adorns the panels and furniture.

From the square shape of the family-chamber is evolved the grand plan of the whole building. Next to that room is the sleeping apartment, which fills the adjacent space in the frontage, and stretches back the same distance. Behind both these apartments, and completing the ground-floor is the kitchen. The kitchen-range is situated behind the stove, which is the only one in the house. Either one chimney is made to serve for both fires, or the kitchen-smoke is left to find its way out of holes in the roof, to which the walls of a portion of the kitchen extend in height. On the south-west and north-east sides of the house are steps leading up to two opposite entrances to the kitchen, which are protected by the projecting roof. The spaces under the landings of these staircases are sometimes enclosed and utilised as pig-styes, &c. Flights of stairs lead from the kitchen downwards to the cellars and upwards to the two front rooms under the gables, and to the covered-in balconies on the sides. The front of the house is by far the most important portion, and for it are reserved the chief efforts of the wood-carver. The back wall is generally left perfectly unornamented.

Some of the châlets have only a ground-floor, divided in the manner described into a family-room, sleeping-room, and kitchen. In rare instances there are also more than two floors; but the general plan is that which we have endeavoured to explain. Occasionally châlets are to be met with constructed on a totally different system, as, for instance, with the kitchen in the centre of the house, lighted from above; or, as in the Bernese Oberland, where two families live in one house, which is often the case, the châlet is divided down the middle, the partition-wall subtending the point of meeting of the sloping sides of the roof. It is in such double châlets that the finest specimens of huge gabled fronts twice the length of the sides are to be met with, richly and fantastically decorated. The barns and stabling are sometimes attached to the house where the resident is of the better class, and sometimes separate. In the interior of Switzerland, and in the mountain districts, the former is usually the case.

With respect to the outer walls of the Swiss châlets, they belong to three styles. The first belongs to the so-called blockhouse châlet, which is generally raised considerably above the ground on stone foundations. The walls projecting one beyond the other, are constructed of stout planks of fir or larch, fastened together by means of wooden pins.

The second is the frame-house style, in which the walls are built of strong oaken posts, grooved to receive planking which is secured by cross-pieces and bolts.

The third style, which is called the panelled or trellis-work mode of building, was introduced into north-east Switzerland about the beginning of the last century in consequence of the increased price of wood. It is related to the frame-work house above described. It is built on high stone foundations, from which a series of light beams, interlaced so as to form a species of trellis-work, rise upwards vertically and diagonally, to support a projecting roof of varying character; the spaces between the beams are filled up with rubble and plaster.

Employers, being themselves directly interested in finding lodgings for their operatives, have, in many instances, constructed dwellings for them close to their factories. In the western districts there are, indeed, but few such lodging-houses; but they are frequently met with as one approaches the north-east from the west towards the Lake of Constance. A number are found in Soleure, Argovie, Zurich, Schaffhausen, and Thurgovie. The thirty-six houses built by M. Wyss, of Zurich, for the families employed by his firm, may be cited as a fair sample of the kind of buildings constructed for operatives by their employers. These houses, which have a small garden attached to them, consist of a ground floor and upper floor of two or three rooms, a kitchen, cellar, and loft. The rent varies from 13s. 4d. to 18s. 4d. a month. They are always occupied. Many such lodging-houses have been built by philanthropic societies, and even by the joint efforts of workmen themselves. At Neuchâtel a society has erected a considerable number of lodging-houses, and proposes to build others for the working classes. The apartments are grouped in fours, with a common entrance, two apartments being on the ground floor, and two on the first floor. Each lodger has his own garden, and the rent paid is very moderate. But the town of Locle in the Jura, one of the principal districts where clock and watch-making is carried on, offers, perhaps, the most remarkable instance of the scale on which such buildings are constructed in Switzerland. Each block of houses built by the "Association Immobilière" consists of five divisions. These are again subdivided into buildings detached from each other, and surrounded by little gardens. There are from 300 to 400 such holdings, their rent ranging from 6*l.* to 16*l.* per annum. They leave little to be desired as regards position, distribution of rooms, and ventilation.

There is no establishment in Switzerland where workmen can obtain cheap clothing, at least at all commensurate with the small price of other necessaries. But in nearly every town and village are to be found public fountains and washing apparatus, protected by roofing, where linen can be washed with ease, and at little or no cost. A vast number of boats are, moreover, moored in the various lakes, rivers, and canals for this purpose; and both the Cantonal authorities and private individuals readily allow of the free use of those countless limpid streams which flow through the country. Public enterprise has also introduced machinery for bleaching, drying, and ironing linen by steam, the charges being on an average 1½d. for washing, 1d. for ironing, and ½d. for drying, per hour. This system has an excellent effect in one sense, namely, that of keeping the domiciles of the lower classes, where it is in force, entirely free from the damp and consequent unhealthiness produced by washing.

The average rate of wages of men, women, and children, taken altogether, is estimated at between 1s. and 1s. 3d. per working day of thirteen hours; taking the men only, the estimate is between 1s. 5d. and 1s. 7d. In the

Canton of Berne, which represents one-fifth of the whole country, masons, stone-cutters, and joiners earn about 2s. a day, and carpenters 2s. 2d. There are no general statistics on the subject, but these figures are allowed to be near the mark.

The food of the working classes consists principally of bread of very fair quality, of cheese, potatoes, vegetables, and fruit. They seldom eat meat above twice a week, and even then in very small quantities. All classes alike live very frugally, and confine themselves principally to a vegetable diet,—the fare of the middle classes being frequently very much the same as the lower. Breakfast generally consists of coffee with milk, but without sugar, and a large piece of bread. Those who are highly paid add cheese, butter, and fried potatoes. The whole population, from the highest to the lowest, dine between eleven a.m. and one p.m. Then the working classes take soup, potatoes, vegetables, and bread, and a bowl of coffee. The last meal is in all respects the same as the first. Wine is drunk in French Switzerland, and beer and cider in the German-speaking cantons. In Berne board for a man is from 5s. 7d. to 6s. per week, without wine or beer. Lodgings for single men cost 1s. 2d. to 4s. 9d. per week, according to the accommodation. Families pay from 2s. 3½d. up to 6s. 2d. per week. For the former sum they have but one room and the use of a kitchen in common with other lodgers.

As a rule the Swiss workmen are competent in their several trades, and take an interest in their work; for, thanks to their superior education, they fully appreciate the pecuniary advantages to their masters, and indirectly to themselves, by adhering strictly to this course. Their wages are very small, but relatively larger than in other countries, if judged by the standard of their wants. The thriftiness of their habits, the smallness of their wants, and the variety of the resources at their disposal, enable them in the majority of cases to save money whilst living in comparative ease.

THREATENED DESTRUCTION OF CHURCHES.

ACCORDING to a report passed at a meeting of the Fellows of Sion College, the commissioners acting under the Union of Benefices Act, are to be recommended to leave as many as twenty of the City churches; fifteen it was thought would be enough, but out of consideration for historical associations, architectural merit, the configuration of the City, and ecclesiastical traditions, they will go as far as twenty! Not long ago there were eighty churches within the City walls; there are now, we believe, fifty-one standing, so that thirty-one more of these monuments are to come down. Those who are interested in such matters should at once consider what steps could wisely be taken to prevent such wholesale destruction. A Protection Committee should be appointed.

THE INSTITUTE.

AT the special meeting on Monday last, to discuss the recommendations of the committee in regard to proposed alterations of the constitution of the Institute, we may just say, though (as we before observed) we do not feel at liberty to report the proceedings, that there was a large attendance, and that the discussions were carried on, considering the amount of strong feeling existing in regard to some of the subjects, in a very moderate and temperate tone, and that, while the majority of the meeting appeared to be like ourselves, opposed to much of the proposed change, there seemed every disposition to take full time,—even two or three more meetings, if necessary,—to discuss both sides of the question fully, and to come to no hurried decision. We hope, whatever the ultimate conclusion arrived at, that good will result from the thorough consideration of some of the subjects brought forward. The meeting was adjourned before attempting the passing of any resolution, there being no prospect of closing the discussion at a reasonable hour with fairness to all who had a claim to be heard.

We may just add that, while we are desirous studiously to respect the privacy of the proceedings as long as they are officially declared to be private, and abstain from anything like reporting, we cannot help thinking that entire publicity would be a much better policy, and would lead to a much fuller and more satisfactory discussion of the proposals under consideration than can be possible as long as a formal privacy is maintained, which, after all, is, in regard to any one who really chooses to get information, little more than a fiction.*

PUBLIC STANDARDS OF MEASURES AND WEIGHTS.

THE Standards Commission, some little time ago, recommended the construction and laying down of public standards of length, and a site in New Palace-yard was proposed for the object, but was abandoned in consequence of objections raised by the Office of Works. It was next proposed to lay down these public standards on the terrace of the Thames Embankment, immediately above the landing-place at Westminster Bridge; and after some communications between the Board of Trade and the Metropolitan Board of Works, a grant of 200*l.* for the necessary expenses of laying down the public standards on this site was sanctioned by the Treasury, and included in the Parliamentary grant for 1875–6. We now learn from the Annual Report of the Warden of the Standards, just issued, that in consequence of the restrictions imposed by the engineer of the Metropolitan Board, it has been found impracticable to carry out this arrangement; but that, thanks to the intervention of the Astronomer Royal, it has been settled that these public standards of length, consisting of the chain of 66 ft. and the chain of 100 ft., shall be fixed on the north side of Trafalgar-square, the mural standards being also placed at the same site.

We also learn from this Report that amongst such of the ancient standards of weights and measures that have been discovered and authenticated as genuine standards, the most complete set of weights are those of Babylon and Assyria, found by Mr. Layard in the ruins of Nineveh, and now deposited in the British Museum. There are two distinct series of weights, one of bronze, in the form of a crouching lion on a pedestal; the other of stone or hardened clay, in the form of a duck, with the head turned flat on its back. Some doubt, however, existed as to their true weight, and as a matter of general interest the Warden of the Standards thought it desirable that their weight should be authoritatively determined, by accurately comparing them with our own standard weights. This has been done by an officer of the Standards Department, by permission of Dr. Birch, in whose immediate charge these curious relics of antiquity are placed. A very full and interesting description of them is printed in an Appendix to this Report, together with some remarks upon the standard units of these countries, and of other countries, supposed to have been derived from Babylon and Assyria. Reference is also made to the earliest ancient coins of these countries, and the relation which their weight bears to the shekel, the lesser unit of weight.

In addition to a handsome Sèvres vase, inscribed with the name of the delegate from each country, which was presented to every member of the International Metric Commission in 1873, the French Government has recently presented to each member of the same Commission a bronze medal, in commemoration of the work entrusted to them of constructing new primary standards of the metric system. On the obverse of this medal, which has been struck at the Paris Mint, is an allegorical group of four female figures, representing the four quarters of the civilised globe, Europe being in the attitude of presenting the standard mètre, and having a balance and kilogram beside her. Above and below are the following inscriptions:—"Populorum. Concordiæ. Sacrum. Paris, 1872." On the reverse is an address in Latin to the members of the Commission, which may be thus rendered:—"To each and all of the men of science, delegates for constructing a standard mètre, in commemoration of the skilful and successful accomplishment of the work, given publicly by grateful France, 1874."

The Building Trade in the Potteries.—The builders of the Staffordshire Potteries and Newcastle have received notice from the carpenters and joiners for an advance in the rate of wages, a reduction in the hours of labour, and increased advantages with regard to overtime.

* We have received from several hands copies of various amendments intended to be brought forward at the next meeting: but they reached us too late for consideration.

THE LATE MR. S. T. DAVENPORT.

WITH very great regret we have to announce the death of Mr. S. T. Davenport, well known as an active and energetic officer of the Society of Arts. Mr. Davenport's connexion with the Society had lasted for thirty-three years, and it was in great part to his unceasing and zealous efforts that the present prosperity of the Institution is due. To very many of the members he was well known, and all who take an active interest in the Society of Arts will feel his loss severely. Mr. Davenport's death was very sudden. It took place on Friday, January 7th, after an illness of only four days.

MR. ALBERT BRIDGMAN, ARCHITECT.

WE have to record the death, on the 30th ult., of Mr. Albert Bridgman, architect, of 42, Poultry, E.C., at the early age of thirty-five. He had already executed a number of works, amongst which may be named the club at the south-east corner of Ludgate-circus, the Imperial Arcade annexed to it, and extensive buildings in Ludgate-hill; a range of warehouses in St. Bride-street, in the same neighbourhood; a block of buildings at the north-west corner of Queen Victoria-street and Queen-street; the second block of buildings from the Mansion House, on the north side of Queen Victoria-street, City; a range of shops and offices in Railway-place, Fenchurch-street; warehouses and offices in Chancery-lane, near the New Law Courts; the rebuilding of "Canterbury Palace," Westminster Bridge-road, with considerable additions of aquarium and skating-rink, some of which latter works are still in progress, and which will be completed under the direction of Mr. H. H. Bridgman, his brother. Mr. A. Bridgman, who was an Associate of the Institute, was awarded the second premium in open competition for the Paddington Baths and Washhouses, and it is stated that in 1873 he was the first to conceive and advocate the idea of an aquarium for the metropolis, and for that purpose prepared a design for a group of buildings on the Embankment, near Waterloo Bridge, and submitted the same to the Metropolitan Board of Works, which also comprised an art club, museum, and library; but in consequence of some difficulty in procuring the site his scheme was delayed, and the Royal Aquarium grew into being, to his great disappointment.

Like Mr. Tarring, whose death we announced recently, Mr. Bridgman died at Torquay.

THE STORAGE OF WATER.

AT more than one place in England there fell during the late rains 2½ in. depth of water in twenty-four hours. A single mile is not a very great space of ground, and yet there fell upon each square mile in twenty-four hours at these places 36 million gallons of water; and, allowing that even a large quantity may have been absorbed into the ground and evaporated into the atmosphere, there would still have been a very large amount which might have been collected on the surface which would have been, after filtration through sand and gravel, much superior in quality to ordinary well-water. We place this one day's rainfall on one square mile of ground (which was as much—if it could all have been stored—as 4,000 people require during a whole year) in contrast with the great damage recently done by floods in the low-lying grounds, and as a prelude to some further remarks upon the general case. The case is one in which two parties may be benefited by one and the same operation.

By making reservoirs to store the flood waters, the population of towns and villages might be from them supplied with water for all purposes, and at the same time, and by the same work, the lands now subject to floods might be proportionately relieved; and, of course, the owners and occupiers of such lands should pay their share of the cost of the work. The tenant's payment would merge in that of the owner, and would take the form of an increase in the rent, which would be the way by which the owner would recoup himself for payment of the tenant's share of benefit along with his own. In what proportion the share should be subdivided between owner and occupier can be ascertained by proper valuations. There are several forms of loss by floods; there is the loss of profitable occupation of land during the continuance of the

flood, and injury to the herbage already upon the ground; then, where houses are flooded, there is the loss or depreciation of value of furniture, and security against these is the benefit for which the tenant must pay. On the part of the owner, where buildings are flooded, there is structural injury to them, not only in breakages, but, what is perhaps more permanently injurious, the site is rendered damp for a long time afterwards, giving rise to rheumatism and other ailments of the inhabitants, and, although they are the first sufferers in this respect, the owner suffers a loss consequent on a real and permanent depreciation of the property-value. The owners and occupiers of land at present subject to floods would then be one chief party to the expenses of construction of remedial works; the other chief party would be the populations to be supplied with water from the storage reservoirs, whose representatives are the several sanitary authorities of the country. To these, under present arrangements, Government lends money for the construction of such works as storage reservoirs, at the low rate of interest of 3½ per cent., the principal sum being repayable in a stated number of years; the sanction to the loan, however, depending upon the issue of a local inquiry into the merits of the proposal, at which all parties interested may be heard.

The reservoirs to be made in the interests of the populations would mostly be at high levels, and would deal with the flow of water from the upper portions only of the water-shed areas, but in so far as they impound the flood waters of those areas they are, *pro tanto*, of full efficiency in the interests of the other party, who might very reasonably be called upon by the Government to pay a portion of the 3½ per cent. otherwise payable solely by the sanitary authorities, based upon the number of acres of each separate owner which lie below certain given levels which have reference to the levels of the rivers in their normal condition, the amount of such payment being based upon and being proportional to the outlay of the sanitary authorities under the sanction above mentioned. The portion contributed by the owners of these lands would be upon the cost of the reservoirs only (which would be easily ascertainable) and not upon the conduits or town piping in any case.

There are other persons who would be benefited, but who would not be asked to contribute anything more than their good will, viz., the millers and other users of water-power on the streams. The water-wheels, with the small mill-dams for storing the night water, are mostly constructed so that they can use nearly one third of the whole quantity of water which comes down the stream in a year of average weather; but in dry weather the quantity they can use is often not more than one eighth of the average flow, excepting on some chalk streams.

The proportion of the minimum to the average flow varies with the character of the ground within the watershed area, for where it is of an absorbent nature the wheels are proportionately of greater capacity, for the flow is more regular, the water issuing in copious springs even in dry weather, having been stored in the ground from previous heavy rains, whereas upon clay or other non-absorbent ground the flow is very irregular, and the reason of the water-wheels being constructed in such manner as to use about one third of the average quantity would seem to be that it is in the long run a loss instead of a gain to make a wheel so large and therefore heavy as to be capable of using a much larger proportion of the water, which would seldom come down the stream, whereas at all other times too much of the smaller proportion of water would be expended in moving the useless weight and inertia of the larger wheel, instead of being applied through a lighter wheel with useful effect.

In times of flood, the wheels are at a disadvantage, because the available fall is reduced, and the wheels run in backwater. It is, therefore, much to the advantage of mill-owners to receive regularly throughout the year one-third, or even less, of the whole annual quantity stored, than to be subject to droughts at one time and floods at another. It is probable that one-fourth would be an ample compensation, all things considered; but we shall assume one-third to be due to the streams, and two-thirds to the populations requiring a water supply, which we take at 25 gallons per head per day, or 4 cubic feet. If one-third of the whole be apportioned to the mills or streams, it would be 2 cubic feet per day per head of the population supplied, making the whole quantity required 6 cubic feet per head per day, or 2,190 cubic feet per head per annum. How, then, to procure this quantity?

In the case of reservoirs for the supply of towns (without any reference to the question of floods in low-lying lands), the quantity of water falling during three successive dry years is regarded, and the third part of that quantity is set down as the average of three consecutive dry years, which is all that is attempted to be dealt with in calculating the requisite size of the reservoir, and it allows about one-sixth of the whole quantity to pass over the waste weirs of the reservoirs. For town purposes, it is thought not worth while to make the reservoirs so much larger as they would have to be to store this sixth part, coming, as it always does, when the reservoirs are full; but if storage reservoirs are to be made with the object of preventing the lower lands being flooded, as well as of supplying towns with water, the capacity should be calculated so as to store also this other sixth part of the quantity.

In the earlier days of town water-supplies the average rainfall was relied upon as available after deducting a certain fixed quantity, or a certain proportion (one or the other, according to the practice of different engineers) for loss by absorption and evaporation, but the supplies calculated on that basis failed during long droughts, because the reservoirs were not of sufficient capacity. Further experience, or, rather, further trouble in examining extended tables of rainfall, combined with the knowledge of failures which had occurred, proved that a portion of this average (*i.e.* about one-sixth part) could not be stored unless the reservoirs were made larger than economy dictated, and so engineers became content to deal with five-sixths only of the average annual quantity, confessing that the capacities of the several reservoirs constructed for town supplies would not be sufficient to store the other sixth part, which must therefore, pass the reservoirs; and if, upon a complete examination of the facts bearing upon the question, it should appear to be true (as has been said) that it would be impossible to store this other portion in reservoirs of any practicable dimensions, then that portion must go as heretofore to flood the lands; but it ought to be remembered that this saying had reference to the economical outlay of money by waterworks companies and by corporations who make their own waterworks, and who, of course, have no interest other than their own, or that of the people whom they represent,—have, in short, no interest in preventing floods in the lower lands; and in this light it may well have appeared to be impracticable. But this is a question which must be dealt with on grounds of general interest rather than on those of persons, and deserves the attention of the Legislature, with the view of bringing into harmony the requirements of the several parties interested. There is a precedent in the South Staffordshire Mines Drainage Commission, although that case is not quite analogous to this one. There the water running over the surface of one property sinks into the ground and floods the mines of another, which thus become unduly charged with water, and so far there is some analogy between the two cases; but the Mines Drainage Act was passed to regulate conflicting interests of a strictly personal character, whereas this other question must be dealt with on another and a wider basis, and one which shall be more national. No greater calamity could happen to the country than that this question of a water supply to towns and villages, combined with the relief of low-lying lands from floods, should be dealt with on the principles which govern trading concerns. Let us have economy of construction, and do not let us bury good money by wasting good materials, but never let one section of society sell water to another.

It may be said that such reservoirs as would be made for the supply of water to towns and villages would mostly be placed in the higher parts of river courses, and would cut off but a comparatively small part of the whole watershed area of a great river, and that is so, no doubt; and whatever we do in the upper sections of rivers, a very large drainage area will remain below any reservoirs that could be made. This is one of the many points to be considered. But whether reservoirs be or be not made with any regard to land-flooding, the river-courses claim attention. For a long time the solid refuse matter of towns and villages on the banks of rivers has been ruthlessly thrown into them. Where is the hydraulician who will say that English rivers, taking them in general, have a transporting power sufficient to carry out to sea house ashes, brick-rubbish, and the waste products of manufactures? Those who put these things into rivers are deceived by false appearances. They see the flood carry out of their sight the ashes and other refuse they have put upon its banks, but they do not see that the bed of the river in their own neighbourhood is gradually rising, being silted up with the refuse of the people who reside upon the banks of the river higher up, nor will they believe that their own refuse raises the bed of the river lower down; but it does so, nevertheless. If we would discontinue the practice the power of the stream would, in course of time, carry the accumulations out to sea, and the river bed would return to its normal condition; but so long as the practice is continued, no better, but a worse, state of things than we have now may be expected.

THE PROPOSED PARIS OPERA HOUSE FOR THE PEOPLE.

THE *Revue Nouvelle de l'Architecture* gives a full description of the proposed scheme for a great opera-house for "the people" in Paris, and our readers may be glad to hear something about it. We confine ourselves to a statement of the object aimed at, and the general features of the proposed scheme.

For fifteen years past the idea has been entertained of constructing an immense theatre, at the junction of the Boulevard St. Martin and the Boulevard Magenta, and thus to complete the ornamentation of the Place du Château d'Eau, in Paris.

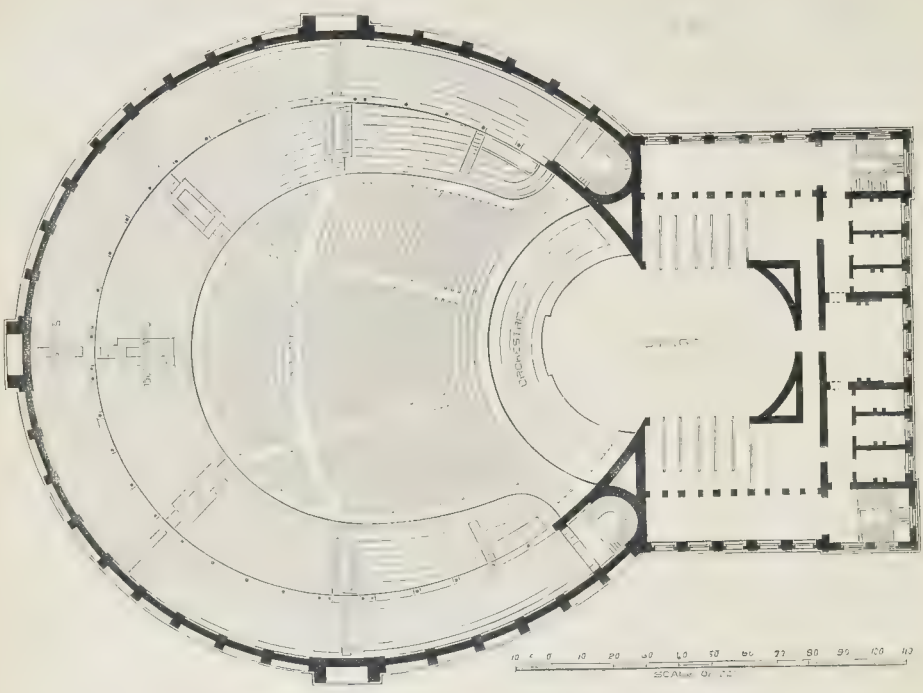
Different projects have been brought forward, but all concur in recommending the erection of a theatre for *popular opera*. The situation is a fortunate one for such a purpose, for a popular theatre could only be erected with success in one of the labour quarters of the city; and though the execution of the plan was put off in consequence of the events of 1870-1, it has never been abandoned, and the unoccupied land which adjoins the buildings now on the site (among which are the *Grand Café Parisien*, and the new circus recently illustrated in the *Builder*) has always remained vacant.

This project, which has slept for some time, has now been revived by a group of notabilities in the artistic, literary, and financial world, among whom we may remark the well-known names of MM. Emile de Girardin, Bardoux (Sous-Secrétaire de l'État au Ministère de la Justice); the Marquis de Saint-Georges; Halanzier and his lieutenant, Carvalho, the eminent comedian Régnier, Ambroise Thomas, Dennery, Sardou, Émile Angier, Jules Bartier, Félicien David, Camille Doucet, the Baron de Reinach, the *financier* Rostand, the tenors Roger and Duprez, Victorin Joncières, Saint-Saëns, Guy de Charnacé; Gall, editor of the *Liberté*; Raoul Duval and Count d'Osmory et Tirard, deputies; Charles Blanc, Alexandre Dumas, Léon de Maleville, Gounod,* Victor Massé, Massonet, Prince Troubetzkoï, Watel, Bisschoffsheim, Auguste Maquet, Sapia, Erlanger, Segouvé, Faure, Bamberger, and lastly the promoters, M. Détroyat, who has convened all these personages, and M. Adolphe Sax, who has laid before them a project which he has for a long time studied for a theatre able to contain 16,000 persons, which he would erect in the Place Château d'Eau, at the angle indicated above, where it would be completely isolated by a street which will unite Rue de Bondy with Rue Château d'Eau, skirting one side of the Théâtre des Folies-Dramatiques.

The principle of M. Sax's project was warmly discussed, and finally a sub-committee was appointed to consider the scheme more fully, and the possibility of carrying it into execution; the sub-committee consisting of MM. Émile de Girardin, Bardoux, Ambroise Thomas, Halanzier, Carvalho, Joncières, Baron Reinach, Dennery, Détroyat, and Camille Doucet (as president of the committee of dramatic authors and composers).

The idea caused considerable excitement in artistic circles, and M. Davioud, the Inspector of Public Works in Paris, and architect of two theatres in the Place du Châtelet, recalled having given special thought to the subject ten years ago; his plans had even been drawn out and received a medal at the Vienna Exhibition. He reviewed his former conception, and secured the valuable co-operation of M. Jules Bourdais, who is an engineer distinguished also as an artist.

* It appears, however, from other sources of information, that the leading French composer has expressed his disapproval of the idea of a monster theatre.



PROPOSED OPERA HOUSE FOR THE PEOPLE, PARIS.—*Plan.*

These gentlemen materially modified the forms of the auditorium on new scientific data, preserving at the same time the monumental aspect of the building, and submitted their project, thus perfected, to the committee meeting under the presidency of M. de Girardin. M. Bourdais gave at some length a very lucid exposition of the principle and details of the plan, which appears to have impressed the committee with a strong opinion in its favour.

This scheme, then, of which we give sketch-plan and section, provides for the erection of a building capable of seating 9,000 spectators, divided thus :—

1,600 places de loges,
2,000 places de deuxièmes,
2,800 places de troisièmes *

The plan of the auditorium is semicircular at the part opposite the stage.

The front portion of the plan is traced on a curve which is neither circle nor parabola, but is determined by points in such a way that, if divided into twenty equal parts, each part will serve as a reflector of sound to so many different parts of the *salle*.

This front portion of the house forms the frame of the proscenium, and presents an area of 500 square mètres, which forms an immense speaking-trumpet for the orchestra, the actors, and the chorus. At the back of the scene is a surface defined by the revolution of a curve of the same nature as that before described, and disposed in such a manner as to reflect forward all the sound that is ordinarily lost directly towards the house.

In addition to this, seventy-two vases for reinforcing sound (*vases renforçants*), tuned beforehand in accordance with the successive notes of a chromatic scale of six octaves, and rendered mute or resounding by a special mechanism, are placed near the orchestra, in order to augment to a great degree the sonority already developed by the other contrivances of the construction.

The conditions on which the placing of fauteuils and orchestra stalls is arranged in almost all modern buildings are very defective. In this building the floor is designed in such a way that each range of seats overlooks the one before it, not only by the height of the 10 centimètres between the eyes and the crown of a head of ordinary dimensions, but of 10 centimètres in addition, to allow for the more or less prominent coiffures of the ladies.* The line which satisfies these conditions is not a straight one, as one would suppose *à priori*, but a curve in which, at each equal and regular augmentation of the horizontal extent, there occurs an irregular augmentation of the vertical height. By this arrangement it is not necessary to look between the heads of the rank next below, the view of the whole width of the stage being clear.†

For a theatre containing 9,000 spectators, one may calculate that those in the last row of seats will in this case be placed at a level of about 20 mètres above that of the stage. It may readily be supposed, therefore, that one would not think of placing above this first range of the audience one or more of those rows of drawers (*tiroirs*) called *loges*, which throw the seats beneath them into obscurity, and occupy on each story height which would be much better utilised in successive additional ranges of sloping grades of seats. The effects of the stage *ensemble* will therefore be seen from all parts,‡ without any of those movements of the head which commonly transform a whole parterre into a kind of agitated sea of spectators who follow the movements of the actor not only with the eyes, but with the whole body.

Ventilation, when systematically attempted in theatres (which it seldom is), is provided for by a principle of exhaustion which leaves the whole interior in a state of low pressure (*un effet d'appel d'air qui met la salle entière en dépression*) and admits, at every opening of the box doors, a rush of cold air of which we know the disastrous effect. Is it not more logical, on the contrary, and not less easy, to place the internal air in a state of pressure, and thus give the draughts an inverse direction to that which they usually take?

In the plan under notice something beyond manual power is required for much of the working, even for mere economy of labour, and a steam engine of 10 or 15 horse-power will therefore form a necessary part of the scheme. This engine may easily be contrived to lend its force also to a ventilator, which, as the underground passages of the building communicate directly with the external air (*sont ventilés comme en plein air*), can easily be placed so as to draw in a continual supply of fresh air. This will be forced into the theatre behind the sound-reflector at the back of the stage, and will find its escape beneath the feet of the spectators. It is of course understood that the air will be warmed in winter, but in the summer it will be cooled, and means of easily regulating its temperature will be provided.

The theatre will be lighted not by one central lustre, but by a series, and just as the gas will be laid on in tubes on the ordinary principle, so a system of tubes will be provided, in like manner, to carry off the products of combustion, without their being permitted in any way to mingle with the main body of air in the interior.

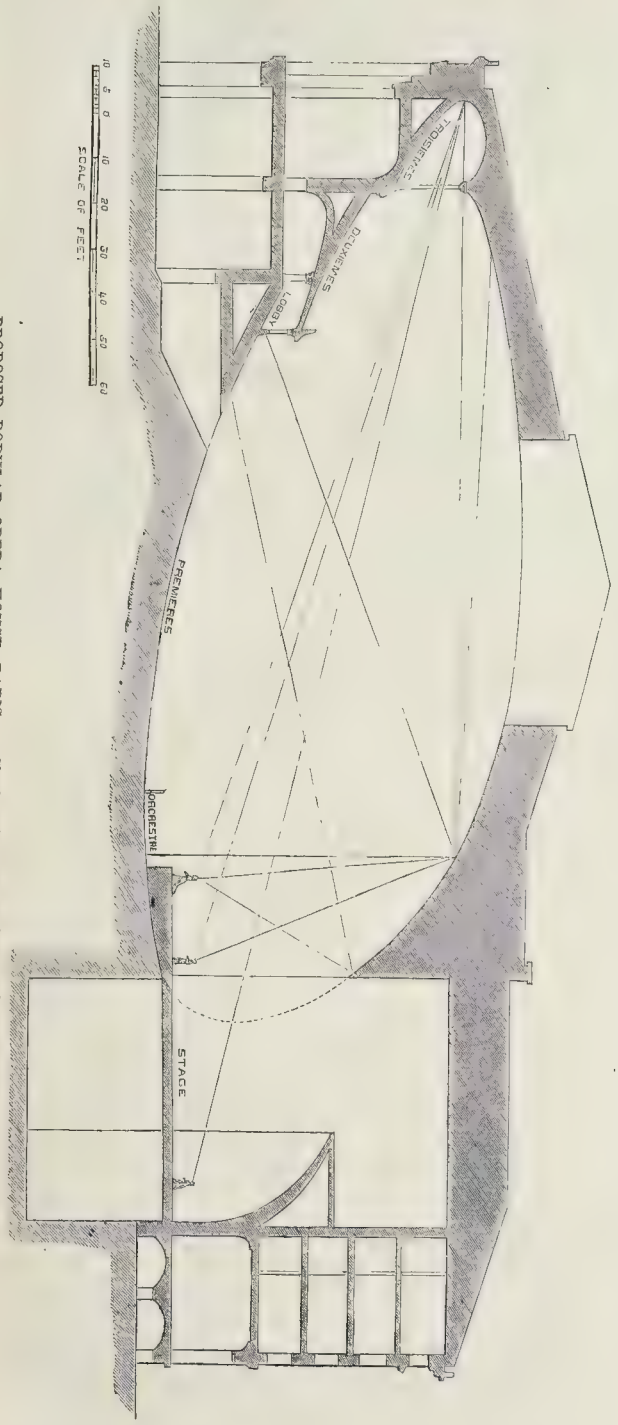
The centre of the ceiling will be occupied by a movable canopy, of a material rigid and light at the same time, and this will be arranged to open or fall back, and leave a large open skylight for daylight performances.

* Our contemporary's figures and plans are not got up with the accuracy desirable in such cases. There is evidently a mistake or an omission here, and probably we must supply the item, "2,600 places de premières," which will make up the total, and accord with the proportion of areas on the plan. The plan and section also are not everywhere in accordance, though the differences are not of any importance in regard to the general illustration of the scheme. We have, therefore, reproduced them.

* The height mentioned can only be intended to allow for the *less* prominent ones.

† It is scarcely necessary to remind our readers that this is no new idea, but merely the application of a system first worked out by Mr. Scott Russell a good many years ago, and styled by him the isacoustic curve. The principle has been adopted by two or three writers on the subject in works since published.

‡ The spectators in the two segments of the *troisièmes*, nearest the proscenium, will not, we should say, see much of the "*ensemble*."



PROPOSED POPULAR OPERA HOUSE, PARIS.—*Sketch-section through Stage and Auditorium.*

So far the practical statement of the scheme after which our contemporary comes to "*aperçus théoriques*," of which we waive the consideration for the present. We may add that two methods of architectural treatment are suggested; the one the erection of a completely new and independent building, internally and externally, the whole forming a complete architectural design on a grand scale; the other, which the *Revue Nouvelle* calls "mesquine et inacceptable," by which it is proposed to retain most of the buildings on the exterior line of the site, and enclose the theatre within them, thus making it a specimen of internal architecture only.

THE NEW IMPERIAL MUSEUMS OF VIENNA.

THE competition for the two new Imperial Museums, in the Ringstrasse, opposite the Hofburg, or Imperial Castle—of one of which we give a view—was a severe artistic contest. The designs submitted were many, and the final choice lay between two rival plans, those by the architects Herr Hansen and Herr Hasenauer. Hansen's design is in the Greek style, of imposing exterior, with fronts facing the Ringstrasse, and with flights of steps, rows of columns, &c., the two museums being surrounded by ornamental grounds, and connected by an open portico. Hasenauer's project is much more sober, in the style of Italian Renaissance, retaining, however, the ornamental grounds. He separates the two museums, but places the main fronts at a right angle with the Ringstrasse, with their lesser fronts facing the latter, continuing them in a series of archways, in the style of the whole, across the Ringstrasse, and forming open terraces over it, past the two narrow fronts of the present Burgthor (which remains free), over the Heldenplatz, to the Kaiserburg, the rebuilding of which at no distant date is taken account of. Hansen's design represented Greece, the purely artistic; that of Hasenauer the realistic, practical. The contest of the partisans of the two designs waxed to such a pitch that the artists even petitioned for Hansen's plan. Listening to both parties, and recognising the merits of both designs, the Court had the happy idea of submitting the rival claims to the arbitration of the most celebrated of living German architects, Semper, and he chose Hasenauer's project, making, however, a few improvements.

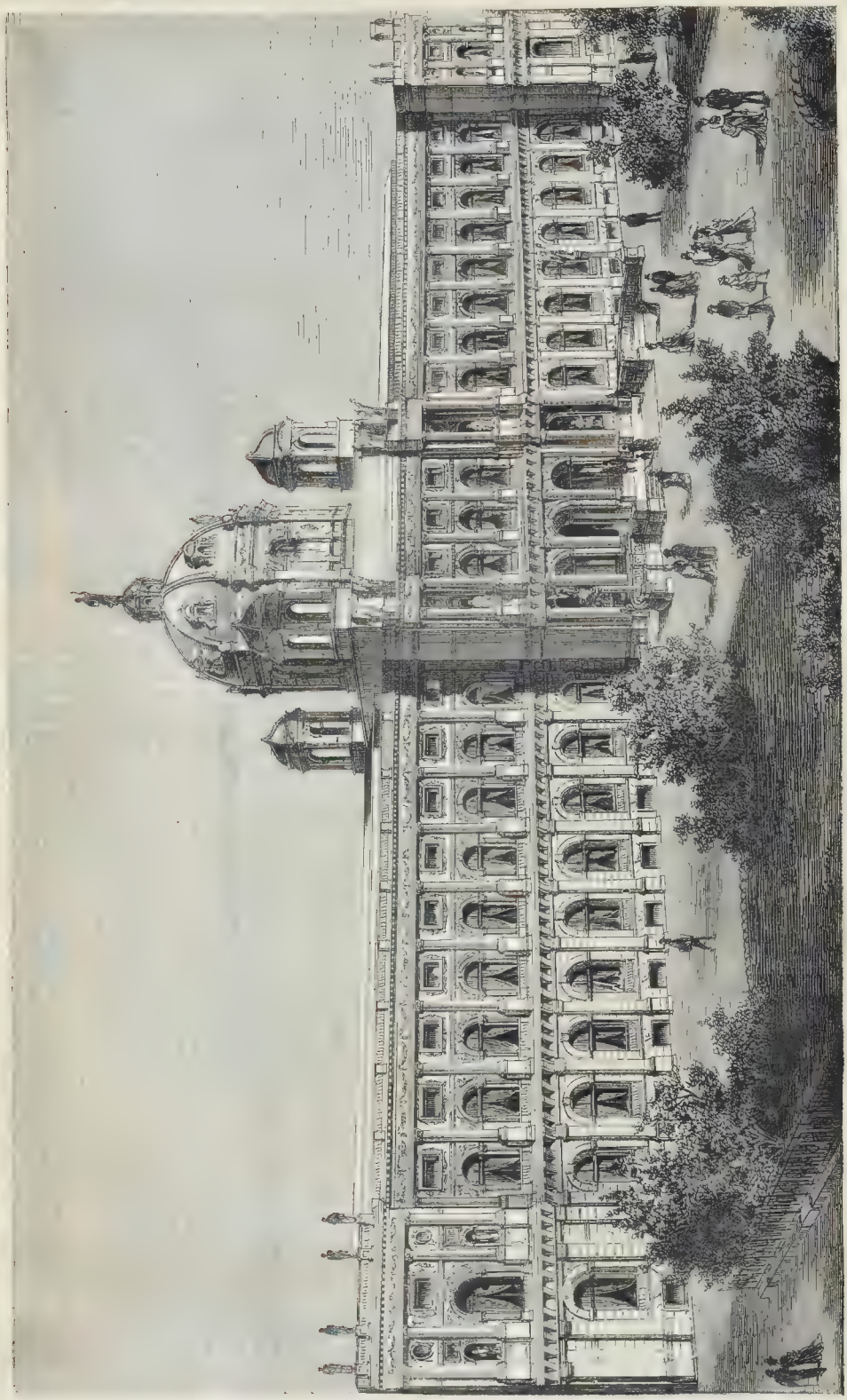
The works were actively taken in hand, and will soon be completed, while the annexe leading to and across the Ringstrasse, as well as the new Kaiserburg, which is to extend in oval form to the flanks of the Volks-Garten and Kaiser-Garten (People's Gardens and Imperial Gardens) will be left for the future,—truly a colossal undertaking, and one which, when carried out, will be of the most imposing grandeur.

The illustration, as already remarked, represents one of the museums, with its lesser front to the Ringstrasse. It will face with its principal front that of the other, placed at the proper distance; the intervening space being laid out in ornamental grounds, in the centre of which will be placed the colossal Maria Theresa monument. Uninterrupted light and rooms of the required dimensions form features of Hasenauer's design, while Semper has added statues and improvements; the former to be of representative men and periods of art.

In the construction of the buildings, proper care is taken to preserve in the interior the required side and high light. Larger rooms, supported by marble columns, will alternate with smaller ones, some of the rooms to be decorated with frescoes.

When completed, the two museums are to receive the various collections, some of them of very great value, now scattered in unknown or unsuitable buildings, not accessible to students and the general public. Such are, among others, the Imperial Picture-gallery of the Belvedere, containing unknown treasures; a valuable ethnographical collection of specimens of the first periods of art history, among them treasures from Egypt, hitherto known to only few. Natural history collections, a museum of the history of weapons, and many others, will also find a more suitable home in the new edifices.

The placing of the museums athwart the Ringstrasse alone will prevent for the present their full display, but they will exert an imposing effect when the whole of the contemplated improvements are carried out.



NEW MUSEUM OF ARTS AND SCIENCES, VIENNA.—*One of the Two Blocks.*—HERR HASENAUER, ARCHITECT.



WAREHOUSE, MILK STREET. OFFICES, LEADENHALL STREET.

LONDON STREET ARCHITECTURE.—MR. HERBERT FORD, ARCHITECT.

LONDON STREET ARCHITECTURE.

NEW OFFICES, LEADENHALL-STREET.

THE premises, 89 and 90, Leadenhall-street, have recently been rebuilt for Mr. F. N. Lloyd, and comprise, on the basement, ground-floor, and three floors above, two offices on each floor (ten in all), well lighted in front and rear. On the top floor are one small office, and sitting and bed rooms for housekeeper. Lavatory, and "closet" are provided on the second-floor, and a group of "closets," lavatory, and coal-cellar on the basement, under the pavement.

The front, which is of Portland stone, with polished granite pilasters, is Gothic in style, with carving freely introduced.

The architect is Mr. Herbert Ford, and the builders are Messrs. Scrivener & White. The carving was done by Mr. Seale, of Walworth. The cost has been about 3,500*l.*

ADDITIONS TO WAREHOUSE, MILK-STREET.

This building has been added to, and now communicates with, Messrs. David Evans & Co.'s extensive premises in Wood-street and Milk-street, and consists of basement, ground-floor, and four floors above, all appropriated to warehouse purposes, with lift and fireproof floor, and is well lighted in the rear by large wells and areas. The front, which is opposite the City of London School, is of Portland stone. Mr. Herbert Ford is the architect, and Mr. William Brass is the builder. The carving was executed by Mr. Seale, and the cost has been about 3,500*l.*

CONSISTENCY AND REFINEMENT IN ARCHITECTURAL DETAIL.

ARCHITECTURAL ASSOCIATION.

AT the ordinary general meeting of this Association on Friday evening, the 7th inst., the president, Mr. John S. Quilter, in the chair, the following new members were elected, viz., Messrs. E. W. Poley, J. H. Churchyard, W. J. Ashdown, C. J. L. Sandilands, H. M. Wardrop, R. J. Lovell, G. H. Coldwell, and S. Hill. Five nominations for membership were read. The death was announced of Mr. F. P. Johnson, a well-known member of the Association, who took a very active part in the management of the classes and internal work. It may here be stated that the first visit of the session to works in progress will be made this day (Saturday) at three p.m., to the new Natural History Museum, South Kensington, when Mr. Waterhouse, the architect, has kindly promised to conduct the members over the building.

Mr. J. P. Seddon then read the following paper "On Consistency and Refinement in Architectural Detail":—Whether or not, at this festive season of the year, the claims of architecture to an audience can compare with numerous other counter-attractions, the title I have chosen for my lecture will have occupied a place upon your programme throughout the session, and cannot have failed altogether in conveying thereby a portion of the lesson I proposed to draw from it for the benefit of your members. Indeed, I almost fear to darken that counsel by many words in dilating upon a theme whose purport is more or less self-evident, but in discoursing upon which one might be tempted to drift to the wide area of "things in general" whereto my friend, Mr. Burges, drew your attention at your last ordinary meeting. Consistency and refinement are the qualities in relation to building which constitute it architecture, with which, therefore, they may be almost taken as synonymous. Consistency, at any rate, is the characteristic of all true architecture of the past, and refinement of that of its best periods. The want of both distinguishes most of the buildings of the present. I could not help being struck by the tone of the discussion that followed the reading of Mr. Burges's paper,—nearly all of the speakers seeming to seek a solution of the great problem of the day: how they were to ally æsthetic architecture to the practical building which alone the world imperatively demands; whether they might or should be eclectic; whether buildings copied from the works of the Greeks, Romans, Goths, or Italians, ought or ought not to stand cheek-by-jowl; whether sash-windows were to knock all artistic fenestration to the winds, or mullions and transoms to be crammed down the throats of our employers, whether they would or no; or whether a compromise could, by any possibility, be effected by leaving the lower sash to the tender mercies of plate glass (described in a letter to myself by one enthusiastic reformer as an "emanation from the jaws of hell"), so long as the upper one might be subdivided by those bars to which Gothic mullions had dwindled in the days of Queen Anne, and which are now counted by some as a direct emanation from Heaven. One despairing appeal, however, at the close of the discussion, touched my heart with infinite pity; it sounded so like that of the Thessalonians to St. Paul, "Come over and help us." What were they to do? was the pertinent but pathetic question put on behalf of himself and fellow-students by the evidently earnest-minded inquirer. Well might Mr. Burges, aghast at such a culmination to the host of questions that had been put to him, exclaim that he had but agreed to give one lecture, and then found himself asked for two. But I could not bear that no attempt should be made to satisfy so natural a craving, and so turned to the speaker, and said that my lecture, then as yet unwritten, should be a reply to his query, and so I have made it, so far as I have been able to do so. "Eclectic," to continue the use of that euphonious adjective to describe a jumble, we are and must remain, simply because nine-tenths, or rather ninety-nine one-hundredths among us, are not really architects at all, but simply highly-respectable gentlemen who have mistaken their profession, or, at the best, building-surveyors, among whom, however, the public, Gallio-like, caring for none of these artistic things, scramble their commissions for buildings. They (*i.e.* the public) would nevertheless gladly, if they saw their way, follow Sir Henry Cole's advice, and give them, if they could, to men who make no pretence at all of adhesion to art. Sir Henry, however, is not the originator of this idea, for the Romans forestalled his notion of getting their plans and construction settled first virtually by engineers, and then getting Greek architects to dress up their elevations for them. I could not but regard the crowd that honoured Mr. Burges with their attendance. I cannot think of the numbers of students enrolled on your list of members but with vague wonder as to how many, or rather how few, possible germs of true architects there may be among them. I am a sad sceptic as to there being any great amount of good, if any, to be done to architecture if the most Utopian schemes for education now clamoured for were realised, or as to whether any moral pumping will discover wells of genius now undreamt of, but which, somehow, were reached with ruder appliances in many a bygone, nay, even uncivilised, age. Educate, however, by all means, for the truth is we do not want genius so much as common sense, and it is better that the surveyors who have to look after speculating builders, and to whom the public give their commissions, should be educated. It will be better, if they will be "eclectic," and cannot be anything else, that they should know one of what they term "styles" from another. They might learn to be ashamed of the murderous mixtures of such which some of them now concoct under cover of their favourite euphonious adjective. But that one real architect will be discovered or elaborated by the process who would not have come as well to the front under Mr. Smiles's system of "Self-Help," I, for one, do not believe. To the querists who ask whether they may build in this style or that, or first in one and then in another, I reply you do not know,—you have not a conception,—of what architecture is. It is not a thing of shreds and patches; it is simply building with consistency and refinement. It is a universal language, although there may have been many dialects and many *patois* of it. When men had something to say with it, they recked little how they said it. You vex yourselves only with the manner, and forget that there is any matter concerned. You compose with it nonsense-verses, like boys at school, and forget that such were invented only for exercise, and that now you are men you should lay aside childish things. You run to all the ends of the earth to find out some uncouth style of talk, different from that of your fellows, in the hope that it may distinguish you and impose upon the public an idea that you are original; and the last dodge has been to imitate the gibberish of the time of Queen Anne! However, having heard me so far with more or less patience, you will perhaps allow that it is at least probable that the number of those architects who could work out successfully for themselves the problem for which so many seek to know the solution is likely to be but limited. Let me ask each of you individually to consider himself the "coming man" for the purpose, that I may not appear to be shirking the task I undertook of showing you the road. I have no manner of doubt in my own mind as to this, though I may have considerable doubt as to my own power to make good use of it. I may say, however, to you, for your consolation, as I have often said to myself for my own, that it really matters comparatively little whether Nature has endowed you with genius or not, for if you will keep in the right road, and obey the dictates of common sense, your work will be right, if not brilliant, and in time is sure to bring its reward. I must, however, put the problem and my method of its solution before you in my own way, and to do so I shall endeavour to show you first what, in my opinion, architecture is not, and then, not to leave you in the lurch, I will go on to show you what, according to my creed, architecture is.

What Architecture is not.—The president of the Royal Institute of British Architects, in his opening address of this session, took occasion to lament the lack of architecture in the miles of speculative building of the day. I am going to ask you to join me in a wail of woe ever works supposed to be architectural in comparison with those; in fact, over the rampant iniquity of sins of actual commission as still more to be deplored than those of simple omission. Architecture parodied is, I cannot but think, more offensive than the mere ignoring of architecture. I do not, however, wish you to think that I desire in any way to defend the doings of those arch-offenders against both science and taste, the speculating builders, to whom the astute English public has delivered itself over a willing victim, body and soul. Stupidly housed in ugly, inconvenient, and monotonous brick boxes, with holes cut symmetrically in them, the public stays contentedly until a fever breaks out or a frost sets in. Then, however, it immediately raises an insensate howl against the profession (which was never consulted), because sewer-gas was laid on to, and fresh air carefully kept out of, its dwellings, and because all the pipes were left exposed to the elements. It was not, however, such prosaic evils as these that constituted the grievance alluded to by the president. His was one that the public cares far less about, rightly or wrongly,—rightly I am disposed to think. His sorrow was rather because our suburban terraces are not, to borrow again the word which Professor Kerr so kindly invented, "architecturesque"; for whatever his own treatment of them might be, that is what they would become in the hands of those members of our profession to whom our street architecture usually falls. Now, seriously, would it be of the slightest benefit to any living soul that they should so be? The august architectural profession has, no doubt, missed the commission which it would have well earned had it only acted in its respectable, though lower, capacity, of surveyor, and simply stopped the scamping of the drains and attended to the proper disposition of the pipes. In other respects, if architecture be what the majority of the architects to whom our principal street-buildings are relegated seem to consider it to be, I declare I think the speculative builders have the best of it; for since refinement is generally conspicuous by its absence from the works of both alike, there is a consistency, even if it be but of ugliness, about the erections of the humbler class of builders which in my opinion might bear away the palm. The backs of the houses erected by the latter correspond better with the fronts, whereas a glance from the windows in the rear of the "architecturesque" structures of the former shows that their idea of architectural beauty and fitness is but skin-deep. This question of the comparative disadvantage of building without architecture at all, and of the mock architecturesque, is being daily forced upon me most unpleasantly in the neighbourhood of Westminster, wherein I happen to live. There vast buildings, public as well as private, have risen and are rising like mushrooms. In some of these architecture is altogether set at nought, and in others its name is, as it were, taken in vain; and I am quite at a loss to decide which of these classes may be considered the worse or the more vulgar of the two. It is certainly a saddening reflection, which must sooner or later compel the consideration of public authorities, who at present seem to trouble themselves little about this aspect of their business, that men may be allowed to rear up in the sight of their fellow-men,—I had almost said of angels,—Babel-like towers of naked brickwork, such as those with which Mr. Hankey has lately disfigured this part of the metropolis. [An illustration was here shown of Mr. Hankey's

building, labelled "Building Barbarous."] One shudders to think of what our city would become if the example this gentleman has set in this building were to be followed extensively,—and I am informed that he has actually in hand a still larger block of similar character, intended to be carried up several stories higher! Whether such monstrosities could be made tolerable by a veneer of the fashionable sham architecture or otherwise is the question I would now propose for your consideration. May we turn to the neighbouring great work [the new Government Offices, Whitehall] by the President himself to see how it is likely he would have treated it? Should that ten-storied structure be covered with an "architecturesque" mask representing some five or six? If so, how would the tenants of the floors (not being Government clerks), whose windows had to be crammed in under archivolts, like it? [Here a drawing was exhibited of Mr. Hankey's house dressed in the Italian fashion,—many of the details being copied, we ought to say exaggerated, from the new Home and Colonial Offices,—and labelled "Architecturesque - Barbaric; Nonsense Verses."] And must the mighty semblance of a temple with acrobatic orders thus piled up, be similarly represented on all four of the ungainly and equally visible sides of the structure, and if so, how is the cost to be borne when no Imperial treasury defrays it? Or would the usual architects' dodge suffice in this instance, of confining the mask to the front, in the hope that a like idiotic fit would in time seize the neighbours on either side, so that hideous erections of theirs should shut out the hideousness of it? [Here another sketch was shown of the same building in the garb of the revived "Queen Anne" style of the present day, and labelled "Queen Anne of 1876, compiled from the latest and best authorities." Much as Mr. Seddon is opposed to "eclecticism," he appeared to have been so far eclectic in the "compilation" of this sketch as to include in it some of the most notable features of Mr. Norman Shaw's "New Zealand Chambers," Leadenhall-street; Mr. Bodley's Office for the London School Board; and of other of the principal buildings of the "Queen Anne" revival, some of them greatly differing in design and treatment.] Mr. Hankey has, I must say, wisely for his own pocket, abjured all such architecturesque treatment, and perhaps done some good by letting the problem he has not tried to solve proclaim itself so horribly to the world. But was no solution possible? Go to Nuremburg or Cologne and see, as you may, in many even of the back streets, how our Mediæval ancestors would have gloried in the opportunity such a scale of building would have given them. They would have needed no expensive false mask to have hidden the simplicity of their structure; and while we glance at their bold treatment, we should see how consistent they would have been in this as in all their works, and how a little refined detail here and there would have redeemed even their plainest buildings from becoming monotonous. [Here two drawings were exhibited of the same building, with suggestive treatment by the author.] Think, again, what they would have done with a *façade* like that of the new Aquarium at Westminster, which is some hundred yards in length, without the necessity to make it like a barrack with a multitude of windows, as most modern buildings are almost compelled to be, especially if they had the means to expend in decoration somewhat more to the purpose than the regiment of mer-men and mer-maidens and mer-babies, which disport their conventional floriated tails there for the amusement rather than for the edification of the populace. Shall we pass on in our search for modern consistency and refinement to the buildings rising, not from the designs of speculating builders, on our splendid new thoroughfare, the Embankment, where sweet if flimsy things in gables are rendered in French Renaissance and nondescript "Queen Anne"? Or shall we fare better if we continue our route towards the City, amidst *façades* overloaded with mere architecturesque details, with here and there a pleasing because more modest exception, such as Mr. I'Anson's Bible Society's Office, in which refinement is to be found? Too-generally, incongruous blocks, as if parts of imported palaces, come to an untimely end, and are jostled side by side in ludicrous oversight of their perspective combination. The *tout ensemble* is simply shocking to any person of taste. One at least escapes such horrors if one confines one's work to the suburbs, where the sins, not seldom to be found, are but mild imitations of the vagaries of what is assumed to be higher art. Such, gentlemen, are examples of what architecture is not. My present purpose were, however, scantily fulfilled by my merely giving you a moral indigestion and distaste, perhaps, of the more seasonable Christmas fare awaiting you at home. I want to show you that consistency and refinement are both practicable and desirable. Let me ask you, then, to glance with me at the past history of architecture, from a point of view in which it may be seen in its unity, and not in its diversity,—as a development of principles, and not as a mere statement of isolated facts. Here it is that we shall find

What Architecture is.—I would ask you, then, to follow me while I travel very rapidly over, not new ground, but with perhaps a somewhat new light thrown upon it, if one can judge from the remarks I have referred to, and constantly heard, as to the ordinary light in which it is viewed. This ground is the history of the architecture of the past, and the light in which I would have you regard it is that which displays it as one sequence, and not a succession of separate styles. Architecture, so long as it was a living art, ran an even progressive course, and its sequence was only once broken, or rather, it may be said, suspended, when its ancient, or what we now call Classic, development went astray. But the clue was taken up again when the dictates of common sense re-asserted themselves, and it was never after lost until the course of art was altogether run out, and its life destroyed. The seeds of the art were sown in the East in the early ages of the world, fostered by the love of pomp and display, which has ever been essentially Oriental, and for which the *Times* has recently been unduly censured for terming "barbaric." The wondrous works still extant in India thoroughly deserve the admiration which the attention now fortuitously directed towards them by the occasion of the Prince of Wales's visit to India has aroused. Rich in fancy and elaborate ornamentation, often charming in outline, grouping, and proportion, and far indeed from being in any sense barbarous, they are, as the buildings of these Eastern countries always have been, essentially "barbaric," and to avoid repetition in this short sketch we may class under the same general term all the Saracenic works of later ages which have been derived from them. They are the storehouse whence the purer, if less original, Western architects have drawn their ideas, and whence, doubtless, many others yet might glean with advantage. But in themselves the Oriental buildings do not deserve the name of architecture, and their grandest triumphs have been gained, as it were, by brute size and mass, and their richest and most elaborate temples are but gigantic trifles, that if executed on their more legitimate scale would more fitly adorn the workbox or the mantel-shelf, devoid alike of consistency and refinement in a true sense. The Greeks brought this chaos of luxuriance into order; they culled, tended, pruned, and developed its choicest germs. They made architecture a science and art, and brought it within the domain of common sense. Their creation, out of the discordant elements that lay around them, was the Doric order. That was their ideal of architecture for all purposes of seriousness and dignity. We hardly sufficiently realise this simplicity, this unity of their conception, for we talk of the Greek orders when we should only speak of their order,—for the Ionic and Corinthian were but later extravagances, occasional relaxations, playthings upon a small scale. The perfection of the Doric order for its purpose has been often, but never can be too often, descanted upon. Its supposed derivation from wooden hut construction M. Viollet-le-Duc has disposed of, and shown that it was nothing more nor less than the most common-sense development of the stone column and entablature, wrought out in perfect taste, combining contrast and harmony in due proportion, and being the embodiment of consistency and refinement in trabeate architecture. But the purpose for which it was invented, though simple, was special, and that purpose is gone. It was for what may be termed external architecture for a sunny climate,—for a one-storied covering to surround a temple, the temple itself having but a plain wall within. The Doric order has given us a standard of architectural proportions, but is useless for more complicated conditions of building, its application to which at once destroys the very merits which are our admiration and instruction. Greek architecture is, therefore, to us a dead language, —one we should learn as the foundation of our own, but to revert to mere copying of which would be its desecration, and our utter confusion. The restless activity and love of pomp of the Romans soon led that nation to need buildings of far different character. Though able constructors, they had no art of their own to make their buildings architectural; so when they had piled story on story, and vaulted vast spaces, they, instead of following methods commonsense would have dictated to them, of ornamenting naturally their own construction, they sent to the Greeks to come and put a veneer of sham architecture to conceal their construction. Thus were sown the tares in the field which had hitherto grown only good grain, and hence all architectural evils spread. No more "barbaric" nor civilised, but barbarous and false art flourished with a growth so rank that it soon spread through all known lands. First, the column and its entablature were ruined, the proportions spoiled, the enrichments overloaded and degraded, consistency outraged, and vulgarity substituted for refinement. At last, when the cup of Roman iniquity, artistic as well as moral, had overflowed, it was dashed to pieces, and it was not till then that any hope of the resuscitation of architecture upon a true and healthy basis could exist. Then when men came to their senses, and the Christian religion had taught them to act simply and wisely, they found scattered everywhere around them the fragments of the Pagan architecture. The columns and entablatures that encumbered the ground they set up to do duty for their wants, not to pretend only to do so. Soon they found the entablatures *de trop*, and did without them, spanning from column to column with arches, whose edges they learned by the light of their own common sense to mould and chamfer, to carve and decorate, as the feature required, instead of bending the mouldings of an architrave round it, as the Romans had done. To support their vaulting they used shafts no longer in classic proportions, but as their nature needed, and step by step they developed an appropriate mode of building their many-storied or lofty single-storied and vaulted structures, which it had been the business of the Romans to have done, but which they had left undone. No longer vapid and monotonous parodies on a monstrous scale of the delicate and pretty, if not too consistent Ionic volutes, or the charming acanthus-leaves of the capitals of the monument of Lysicrates, but bold and vigorous ever-varying carvings, into which the carvers threw their whole soul, and cut out, for the very pleasure of doing it, the men, the scenes, and the things around them. There was plain common-sense and admirable consistency in what they so did, and as to refinement, that was to come in good time, but for the nonce could be dispensed with. At the time of the partition of the Empire, the nascent stream of Christian art became subdivided, one branch remaining with Rome as head-quarters, and more or less influenced for the worse by the vices of the works forced upon it as models; the other at Byzantium, drawing healthier inspiration from the purer old Greek work left in that locality. Of this latter, much of that sculptured in Venice and Ravenna leave little to be desired on the score of refinement, together with plenty of vigour, while the treatment of Sta. Sophia at Constantinople shows the consistency maintained between the construction and decoration, which remained an unsolved or mis-solved problem in the hands of the Romans; as, for instance, in the not dissimilar class of building, the Pantheon at Rome. Under Charlemagne the Western Empire was again united, and the progress of Christian art, which had become sluggish, was wonderfully quickened. Thenceforward it flowed in a rapid and mighty torrent along the banks of the Rhine, and in every direction westward through Europe, in the phase of the round-arched Romanesque, which combined all that had been developing slowly in the Byzantine and Early Christian Roman. In this, stupendous problems of construction and of consistently making the decoration explain and emphasise the construction, were well wrought out. But of refinement, as the Greeks would have understood it, there could not be much as yet. Thus we miss it, or look not for it, in the great Rhenish churches, which awe us by their grandeur; yet, when the rush of the fierce tide had passed, and men had leisure to devote to their work, it is astonishing what an amount of refinement they were capable of. Our own Norman version of the Romanesque is worth far more study than is often devoted to it. A noble and vigorous example of it, brimful of suggestion, is Kilpeck Church, in Herefordshire,

the chancel-arch of which is strikingly fine, and its study would be a good corrective for those whose work savours too much of refinement without its equivalent of consistency and vigour. On the other hand, there is a doorway at Patrixbourne, in Kent, to name one among many such examples, the delicacy and refinement in the details of which are absolutely remarkable. Then I may halt again at the next stage in our insular career (mind you, I do not talk of styles), which followed so hard on the former one that the actors in this work could recognise no such line of demarcation between that of themselves and their fathers, as we are pleased to discern. The Transition epoch, with which Mr. Edmund Sharpe has so identified himself, seems to me almost to balance consistency and refinement in equal scales. I need not trench upon his peculiar province more than to name, in passing, Fountains, Kirkstall, Rievaulx, and Byland as a few noble specimens among the host of glorious works raised by the Cistercian order, the consistency throughout which is remarkable, and the refinement not less so, and just of the right kind, well balanced with simplicity and moderation. I may, perhaps, point to a humbler and less-known example, a few fragments of which remain attached to a farmhouse on the north coast of Norfolk,—Bromholme Abbey. Last autumn I reached it with no small difficulty through a wilderness of nettles, and found a part of the north transept and chapter-house perfect *bijoux* of art internally, the refinement of their detail, considering the isolated position and evidently small and unimportant character of the institution, being quite astonishing. Then, when the Gothic style was fully established, think of the wondrous succession of works of the Lancet, Geometrical, and Curvilinear periods. Our noble cathedrals are too well known to need mention; but, to my mind, the inexhaustive mine of consistent and refined art which we have in our parish churches is even more noticeable. When I look at such a one as West Walton, in Norfolk,—I name but a single example of the crowd of which that county alone can boast,—or Stone Church, Kent, or a score of others that come to my mind, I am fairly aghast at the fertility of invention shown in so many separate types, each so nearly reaching, and at least aiming at, perfection. Nor even in the very last, the Rectilinear period, is the scientific progress of architecture arrested; and though we may think its artistic excellence less, it is only because we architects rightly prefer the more modest work that preceded it. We cannot, however, deny that the aim of the last efforts of Mediæval architects was a grand one, nor say that they were not consistent in following that aim, or that their details lack refinement. At times they were almost over-refined, as may be seen in the screen in the out-of-the-way village church of Llangwm, in Monmouthshire, a representation of which I have just had the pleasure of presenting to your Association, and of which Mr. Gladstone remarked, in his recent address at Greenwich, that it resembled jewelry rather than architectural ornament. I cannot but think that the principles of this Mediæval art lingered longer in England than elsewhere, and that our domestic architecture realised its spirit best of all. It struggled long against the flood of the spurious revival of the old Roman which had paralysed it on the Continent. The fading merits of Elizabethan and Jacobean are due to it, and its flickerings before it died entirely out were the salvation of those of the time of Queen Anne from oblivion. Thenceforward architecture as a living art was not. The *savants* and *dilettanti* of Italy exhumed the fragments, not of Greek art, but of the always-false-from-the-first Roman. Consistency could not be when the structure and the *façade* had no necessary connexion, and though refinement could be pedantically imitated, it was only as the lesson conned by copyists, who had nothing of their own to refine. Such as I have described it to you was the architecture of the past, a universal and intelligible language for all the nations of the earth: progressive, simple at first, and complex at last; consistent always; and refined when it reached sufficiently settled conditions. It knew nothing of "styles," but of style, in the sense M. Viollet-le-Duc has so ably treated of in his "Dictionnaire," it took the utmost account. Now, you ask what is to be the architecture of the future, and I say will you go back to the prattle of its childhood because you lik baby-talk? Will you ignore all that science has done for it, and deny yourself the arch, or the pointed arch, because you like the work of those that knew not of such things? No; you are the heirs of all the ages, and every detail man has devised is your heritage, which it were folly in you to set aside. But if this universal language is for your use, are you going to make only nonsense-verses with it, as it was in the days of your schooling? Are you going to stick pediments on the tops of gables and chop them in two for the diversion of the ignorant? Are you going to set up as crowning ornaments to your buildings piles of obelisks and pots with balls on them in ludicrous guise of cruet-stands? Are you going to turn curled brackets upside down, and torture their outlines, in the vain hope that your crotchets will be thought original? For goodness sake, if you will be eclectic, out of the vast repertory I have shown that you possess, choose the best, or what is at least consistent with common sense when applied to the purpose you propose to put it to; and strive, by refinement, to be gained by study of the best works of the past, to be in your own less barbarous or barbaric than is most of the architecture of the present.

A discussion followed, a report of which we will give in our next.

STONES AND MARBLES OF IRELAND.

BELFAST ARCHITECTURAL ASSOCIATION.

At the last general meeting of this Association, Mr. R. Young in the chair, Mr. F. W. Lockwood read a paper on "The Arrangement of Materials in Construction to Produce Satisfactory Effects." In the course of it he said,—Stone plays an important part in our buildings, and deserves a large share of our attention. Its chief natural characteristics are breadth and strength, and these we must seek to retain in our work. Foremost on our list come the granites, and no stones retain their natural colour so well as these. Our grey native granite is much in demand—that from Bessbrook is lighter, from Goraghwood darker in tone. The grey Dalbeattie, from Scotland, is lighter than either. There is a beautiful silver grey granite from Donegal, very fine in texture, but not in the market, I believe. There is also the red Peterhead. The flesh-coloured granite from Westmoreland I have not heard of as being used here. The use of granite may be either in mass for a whole building or story, or in such portions as polished shafts. Nothing gives such an idea of strength as polished granite, doubtless from the suggestion of hardness which it conveys. A further consideration of the application of granite may be taken with the other building stones. For these we are fairly well off here. Nearest to us is the Scrabo sandstone, of which the greyish-white quarry, known as "Cargo's," is no longer worked. The colours may be described as pink, grey, greenish-grey, and the mottled beds of hardened chocolate-coloured mud, which are only to be avoided. The pale-red Dundonald is only an offshoot of the Scrabo. The imported Dumfries and Runcorn stones are better reds and are harder, though perhaps not more durable. Most of the Scotch stones are of an unpleasant tone of colour, an ochreish yellow predominating, and they have the further defect of rapidly decaying. Glasgow, however, has recently sent us a good cold light grey stone from Messrs. Baird & Stevenson's Tunnel Quarry. A building is now being erected in Lombard-street entirely of this stone, but I question whether a mixture of some brighter varieties would not turn out an improvement. To go back to our native stones, the Dungannon is of a pleasing warm colour, though sometimes inclining to a rusty colour; the Cookstown is a beautiful light grey, nearly white. These constitute our principal freestones; and, before taking up other stones, we will make a few general remarks on the application of the foregoing. In the first place, no stone, however carefully selected, will be perfectly uniform in colour, and to insist on such is a sure sign of a depraved, or at least imperfectly developed, taste, consequently there will turn out a pleasing variety of colour in a stone wall, even without any conscious intention on the part of the builder. It is strange that this result does not more often suggest a little selecting care, when the hint is thus given daily before our eyes. For instance, the grey and greenish stones of the Scrabo will work up for the body with pink bands and dressings. The Scrabo again makes a good body with whitish grey Glasgow, or still whiter Cookstown. There have been several buildings erected recently of Dumfries or other red stone, with white quoins and other portions, the Armagh limestone working in for this purpose with a more sparkling effect than any other. By itself it is grey, seen beside red stone it appears white, yet still a toned white. I do not remember a happier instance than in the late Mr. Pugin's Catholic Church, in Thomas-street, Dublin. I think that some light stone,—Cookstown, for instance,—would work in with pretty good effect with red stone dressings. A light grey or yellow stone does very well with bands of darker stone, such as some of the bluish limestones from Benburb, near Armagh, for instance. As a general rule the whiter and brighter stones should be sparingly introduced, and in the higher portions of the building. The glittering white stone, brought from somewhere in the South, which forms the spire of the Seamen's Church, in Corporation-street, for instance, is an example, but in this design, in some respects a really good one for a town church, there is a lamentable crudeness of treatment; the spire has no connexion with the tower, nor the tower with the body of the church, nor yet, again, with the pipe-stems which do duty for attached shafts round its sides. Some of the granite spires near Dublin also have a very bright effect. There are several local stones used in building to which I must now call your attention. Many of the slaty Silurian rocks, which spread over the length and breadth of the County Down, are largely used for common walling, and where the architect makes use of them they might claim more attention from him than they generally receive. Perhaps a purplish grey is their prevailing tone, but frequently the same or an adjacent quarry will yield red, brown, and greenish grey. A little thought and a trifle more per perch will make all the difference between a suite of stable or farm offices, or a demesne wall, being in harmony with the landscape or an eyesore to it. In the same way the basaltic rocks of Antrim and Derry are really of a variety of colours—grey, purple, black, and greenish grey, and vary greatly in the same quarry: selected and arranged in bands, many a common wall would show a much happier effect, only where is the British workman to see this and take the trouble? The white limestone, or, more correctly, hardened chalk, of the North of Ireland will never be much of a building stone, but it might be sometimes worth the architect's while to make a moderate use of it; perhaps many will consider it too pure a white, but skilfully used the effect I conceive would be brilliant and sparkling. Its application in a well-known house under Cavehill, though scarcely successful, is yet, at any rate, suggestive. Other hints may be derived from the walls along the limestone railway between the Antrim-road and North Queen-street. A main story of black stone, which, as I have shown, is, in reality, anything but black, with a small, well-managed upper story of white limestone, would have a very pretty effect on a hill-side, or in many a country or sea-coast district. In the same manner, where carriage was not too expensive, Dumfries or Dundonald stone, with an upper story of limestone, would not have a bad effect, care being taken in all these cases that the junction of the two materials be not too abrupt. That one colour should always be carried into another is a well-known law of colour composition. An upper story of brick on one of stone is also a very legitimate mode of obtaining effect, which might be much more often practised than it is. In judging of the effect to be produced by these different materials, we must bear in mind that no inconsiderable portion of the result is due to their texture, the stone being left rough or finely chiselled, the granite sometimes being polished, and the brickwork divided up into a number of small joints. There is another class of stones, too costly to be largely used, and more adapted for interior than exterior work, especially in this dripping climate, where the rough-hewn seems more appropriate than the highly-finished, yet of considerable value, nevertheless, as accessories to the general effect,—namely, the various coloured marbles. Of these I prefer to confine myself to the native specimens, some of which, through the courtesy of the Messrs. Robinson, of York-street, I have now before me. There are, first, the red, or red-and-white, from Cork, and two specimens of dark-green from Galway. From the same county also comes this black specimen. Then there are these greys,—the purplish grey, or Irish St. Ann's, and the fossil marble, which is also in general a pure grey. The Armagh marble is a

mottled pink and sienna colour. I have also seen several specimens of a white marble from Galway from a quarry recently opened,—some almost pure statuary, and others more or less of a greyish tinge, but for architectural purposes white. Now I do not, so far as my own tastes go, recommend the facing of our buildings with marbles after the old Venetian fashion, but I think we can find some uses for them. For instance, in the tympana or spandrels of windows, and especially of doorways, in panelling under windows, between the cantilevers or consoles of cornices, and in medallions, at moderate expense, polished marbles could be introduced with great value to our street and other architecture. The field for their employment inside is, of course, unlimited, but into that it is not my purpose at present to enter. One of the buildings of which Belfast, a city of merchants and manufacturers, has just reason to be proud, is the pile erected several years ago as a warehouse for Messrs. Richardson, Sons, & Owden. It is built entirely of Dumfries stone, and it is obvious that the architect has deliberately and intentionally avoided anything like a variety of colour, and aimed solely at a simple dignity of effect, as being most in consonance with so large a building devoted to purposes of commerce. Without saying anything in derogation of these intentions of the designer, and the result which he has achieved, it may, nevertheless, be instructive to consider for a moment how the same design could have been treated otherwise with respect to colour. The basement and principal story might have remained of red stone, as at present, the upper stories having a good deal of Cookstown stone or Armagh limestone introduced. Leaving the cornice, however, of Dumfries, the polished window and door shafts might have been either of the lightest grey granite, or, if obtainable, of dark-green marble. The beautiful carved medallions just above the basement could have polished green marble fitted round the carving, with a fine ring of white, to separate it from the red stone, and accentuate both of them. The introduction of green slates in the roof and turret roofs, and bands of the same in the main dormer, with a red clay ridge, would then further assist the colour effect. The medallions of the piers of the front railing would in harmony be filled either with green or light grey fossil marble, or a contrast be produced by a circle of white. I do not say that this would be a better treatment than the one adopted, it is at any rate a possible one. In smoky and large towns like this we need not fear the use of bright materials, they will tone down soon enough. Out in the country we may sometimes have to be a little more moderate, perhaps. In these northern climes the roof forms a more conspicuous object, and is architecturally of more importance to the design than in sunny regions of almost perpetual summer, and ought not, therefore, to be left, ornamentally speaking, to shift for itself.

At the close of the paper, a discussion ensued, in which Dr. MacCormac, Messrs. Lanyon, Watt, B. E. M'Allister, Marsh, and the Chairman, took part.

THE ARCHITECTURE OF THE FUTURE.

IT is seldom that architecture attaining its ideal has founded itself strictly on constructive necessities, using such ornament as could consistently be added, and no other. The human mind moves so slowly, and sticks to old habits so long, that for centuries after a nation has given up wood construction we find it copying wooden forms in stone buildings. It the gateways of Hindoo topes* enormous trouble and expense have been taken to procure posts and cross-bars of stones like long logs of wood; and, of course, the nail-heads, which in wooden construction fastened the logs, are carefully carved in the stone. Even in Greek architecture the triglyphs which divide the frieze into spaces are said to be the reminiscence of the notched ends of the wooden beams of the roof. As to Roman architecture, its decoration has nothing to do with its construction, but is the artistic expression of a wholly different one. In fact, the history of all arts and ornament consists very much in tracing ornamental forms back to some long-forgotten use which gave rise to them. Illustrations without end might be given of this, but the following, though slight, are as good as any. The holes arranged in waves and zigzags on the toe-caps of shooting-boots are the reminiscence of the old Highland brogues of untanned leather, which allowed the water to soak through them, and consequently had to be provided with little holes at the toes, where it squirted out again with the pressure of each step. Again, the bands on the backs of books have similarly now no constructive use, except in some of the best-bound books, in which they still cover the cords to which the pages are sewed. Such features in an art are not unnatural; on the contrary, they are analogous to the imperfectly-developed organs of animals which in the ancestors of the species had performed functions now superseded from change of habit and development of the organism.

To the old Gothic architecture belongs the almost singular merit of perfect truthfulness. When a form ceased to have meaning, it was frankly given up. People did not, as in most other styles, weakly cling to the dead carcass. This evidences, instead of the ignorance and darkness usually attributed to the Middle Ages, a freshness and independence of thought rare in the history of humanity, and of a wealth of artistic conception employed in making every new necessity beautiful which few races have possessed. If we could but do likewise, the result of working on the principles of Gothic architecture would be something very different from Pointed Gothic. We should have no pointed windows and quatrefoils, and buttresses which receive no thrust. We should not have in stonework chamfer-stops at the angles of windows, simulating wooden framed work, and all sorts of ugly and unmeaning notches, and roofs so steep that they endanger men's lives.* We should ruthlessly abandon forms that are unsuitable, which are not developed by our modern necessities, even though we love and admire them for their beauty. Can it be said that the Gothic revival has exhibited these signs of the true Gothic spirit? On the whole, certainly not; and we fear that such vices as appear in it are almost inseparable from the attempt to apply a thirteenth-century style to nineteenth-century use; that the Gothic style is, in fact, *the artistic expression of an obsolete mode of construction.*

Must we, then, give up hope of having a style of architecture suitable for our dwelling-houses, fitted for our use, and true and beautiful in point of art? Gothic does not answer our requirements, while the common builders' style, which is that of the houses most of us must live in, though the growth of our wants, and therefore in the main suited to them, becomes yearly more degraded and ugly.

"Why do not architects invent a new style?" say some. We might almost as reasonably ask grammarians to invent a new language. The time needed for the development of the great old styles of architecture is measured in centuries not in years, and though in the present day our thoughts move faster, this but makes us liable to see-saw from one style to another without any real progress, instead of sticking to a single style and steadily improving it.

"But what style should we adopt?" As well ask what language must we adopt. We cannot alter our history and our birth. As there is a common language which every one more or less understands, so there is a common architecture which arose with the growth of modern thought, and has been the architectural style of the country for the last three centuries, which every builder naturally follows, which every workman has been apprenticed to, and more or less understands. But while our language has been kept up to a reasonable mark of artistic excellence by a high standard of criticism and the constant efforts of educated minds, our vernacular architecture is characterised by the vulgarity and commonplaceness of the men in whose hands it has been left. The interest of refined and educated minds for the last thirty years has been directed not to improving the vernacular style, but to the hopeless attempt of supplanting it by another, which appeared at first to flourish, but has not taken root in the soil of the country.†

The Grattan Memorial.—The statue of Henry Grattan, one of the latest and finest works of Foley, erected in College-green, Dublin, has been unveiled.

* See photographs in Fergusson's "Tree and Serpent Worship."

* In old buildings these steep roofs had usually a parapet at the cornice, which saved any workman, slipping on them, from falling over the wall.

† From an interesting paper on Gothic Architecture, in *Good Words*, by Mr. J. J. Stevenson. Readers of our earlier volumes will recognise advice given by us, again and again, long ago.

THE NEW BATHS AND WASHHOUSES IN SOUTHWARK.

THE ratepayers of the parish of St. George-the-Martyr, Southwark, have declined to follow the example of several other neighbouring parishes, which have recently refused to adopt the Baths and Washhouses Act. At a meeting held last week, specially for the purpose of considering the desirability of adopting the Act, a resolution in favour of establishing baths and washhouses in the parish was unanimously carried. The statements made by several of the speakers at the meeting were both important and interesting, and conclusively showed that the introduction of baths and washhouses in the parish was absolutely necessary in the interests of the health and general sanitary condition of the inhabitants. Amongst other facts laid before the meeting, Mr. Bailey stated, on the authority of their medical officer, that they had 340 families amongst them in the parish, living in houses that were condemned as unfit for human habitation. In addition to this sad state of things they had from 1,500 to 2,000 families living in rooms where there was no proper convenience for washing, the consequence being that the water had to be boiled in a kettle or saucepan on the fire.

CASES UNDER METROPOLITAN BUILDING ACT.

WOODEN BUILDINGS.

AT Hammersmith Police-court, Mr. Moseley, district surveyor for Fulham, attended before Mr. Ingham to support adjourned summonses against Mr. F. W. Serff, a builder of Star-lane, North-end, for erecting wooden buildings. The summonses were adjourned to give the defendant an opportunity to apply to the Metropolitan Board of Works for their sanction to allow the buildings to stand. The defendant was called, but did not answer. The district surveyor said the defendant applied, and obtained the Board's sanction under certain conditions, but he had not complied with them. Mr. Moseley now applied to have the buildings removed. One of the cases was then gone into. The surveyor said that on discovering the building he gave the defendant notice to enclose the posts with incombustible materials. He had not complied with the notice, and said the buildings were only for a temporary occupation. There was danger to be apprehended from fire, as defendant had a great quantity of timber about the building. Mr. Ingham required the building to be pulled down in fourteen days, and the defendant to pay 12s. costs. In the other case a similar order was made.

RELIEF OF LONDON BRIDGE.

AMONGST various schemes submitted to the Corporation is one from Mr. J. Keith, who recognises the necessity of providing accommodation for the eastern traffic rather than meddling with London Bridge. He proposes a subway, with a lift not greater than that of a low-level bridge, and this is his plan:—If the shell of an iron ship were inverted, it would form a gigantic diving-bell, the space under which might be excavated, and the shell sunk to any required depth. Acting on this principle, he proposes a subway similar in form and construction, sunk in sections between guides, and connected at joints. Caissons on a larger scale, and at greater depth, have already been sunk, but in this case the work will be simplified, and the excessive pressure and friction on straight-sided caissons will be avoided by the form of section, which will only touch the sides of cutting at the base. The chief difficulty, the joint, by the method he proposes, will, he believes, be satisfactorily overcome.

The advantages of this scheme are, he thinks, not only that size, form, and depth are at discretion, but the work may be carried out with rapidity, and at a comparatively low cost.

DECORATIONS IN ELY CATHEDRAL.

SIR,—As Mr. Burges has accused Mr. Gambier Parry of violating "the very first law of iconography by putting shoes on his angels' feet," I wish to remark that Mr. Parry has sinned in very good company. Raffaelle, in his picture of the Archangel Michael, in the Louvre collection, has been guilty of the same offence.

R. G.

WAS IT FAIR?

SIR,—For the purpose of illustrating Mr. Seddon's paper at the Architectural Association the other evening, he first of all exhibited a drawing of Mr. Hankey's tall building in the Broadway, Westminster. This was followed by drawings showing the manner in which Mr. Seddon assumed that the same building would have been treated by Sir Gilbert Scott and by the "Queen Anne" revivalists. The whole of the drawings so far exhibited were pointed to by the lecturer as illustrations of "how not to do it." The meeting was then shown two drawings by the author, or prepared from his instructions, exhibiting alternate modes of treating the same building. Now, allowing a certain margin for burlesque, the exhibition of this series of drawings might have been fair enough if they had all been equally well got-up. The drawing of Mr. Hankey's building as it is, and of Sir Gilbert Scott's assumed treatment of it, were rough sepia drawings; the "Queen Anne" drawing was a still rougher pencil production; *but*, the lecturer's designs for the same building were artistically coloured perspectives! Was this fair? In ordinary competitions similar procedure would doubtless be strongly deprecated by Mr. Seddon. X.

THE ROOMS OF THE INSTITUTE OF ARCHITECTS.

SIR,—The present structural arrangement of the premises in which the Royal Institute of British Architects is lodged is about as faulty in every particular as can well be imagined.

In place of the library above all things, and the offices and the meeting-room, being on the ground floor level, you are called upon either to ascend flights of stairs, or tumble down a few,—it is needless to multiply objections to any such arrangement.

The *locale* is good, but if insuperable difficulties exist as to the getting all the required accommodations at this ground level, with committee and refreshment rooms above, then other premises should be sought, and probably the Government would give all the aid in its power in furtherance of this view, as it has in the case of kindred societies, having less direct claims on its support. Let our legislators reflect how important the influences, and its sphere of action,—

"Uni civium, decori urbium,"

will perhaps one day be more studied by statesmen. L.

FOREIGN BRICKS.

SIR,—I have read the article in your last issue upon "French and Austrian Bricks," and would like to hear further thereon from some of our own countrymen who may have had opportunities of seeing what "Mr. Alexis Fannier" has seen. To me it appears they are very far behind this country in their mode of manufacture; and to reduce clay "to small pieces with a pickaxe and shovel," and then put them into a kind of press, seems antiquated; but if they can produce 5,000 to 6,000 a day without steam-power, and by the aid of a man and young woman only, they must indeed be very far superior to the bulk of machines in use in England; and further information thereon would be highly desirable.

J. M. GIBSON.

THE CHURCH OF ST. MATTHIAS, POPLAR.

SIR,—In your "Church-Building News" Mr. E. Evans Cronk is named as the architect of the new chancel of the church of St. Matthias, Poplar, formerly the chapel of the East India Company,—and it would appear to those not better informed on the matter, that the renovation of the whole fabric was his work.

I venture to ask you to correct this statement, as I myself planned and completed the works, with the exception of the chancel and a little exterior work, before Mr. Cronk became my junior partner, and they were nearly finished before I even knew him. Circumstances having occurred which led me to discontinue all further intercourse with the Incumbent of that time, I handed over the building of the new chancel to Mr. Cronk, with whom I was just then dissolving partnership, but having previously worked out all the drawings myself in order to insure harmony with the former work. Whether or not my exact design has been carried out in this latter work I am not aware.

W. MILFORD TEULON.

*** The architect's name, in this instance, was forwarded by one of the building committee.

Royal Institution.—The first of the Friday evening meetings will take place on the 21st, when Professor Tyndall will lecture on the Optical Department of the Atmosphere in Relation to Putrefaction. On the 28th Professor Huxley will treat of the Border Territory between the Animal and the Vegetable Kingdom.

THE EXCAVATIONS AT IONA.

At the last monthly meeting of the Society of Antiquaries of Scotland, Mr. W. F. Skene, LL.D., read a paper on Iona. After referring to the restoration recently carried out by the Duke of Argyll, under the superintendence of Mr. Robert Anderson, architect, and done, he said, in the most thorough manner, he said it had often been assumed that the Monastery of Columba was on the same site as the later monastery. The indications given by Adamnan pointed, however, to a different situation. Examining these indications, he found that it must have been situated on the highest point of the road passing to the north of the present ruins, and between this road and the Cladh an Disert. He traced the history of the wooden monastery of St. Columba through its various vicissitudes, noticing its destruction by the Danes, and the contemplated removal of the establishment to Kells, in consequence of the insecurity of the times. As the annals recorded in A.D. 807 the building of the new Columban House at Kells, and the Monastery of Iona appeared likewise to have been reconstructed in A.D. 818, it was probable that it was at this time built of stone like that of Kells, and not of wood, as it had previously been. The stone monastery, therefore, which succeeded that of wood appeared to have been always in the same place down to the time of its reconstruction by Queen Margaret of Scotland in 1064. The little chapel on the north side of the Abbey Church, and at a little distance from it, had an entirely different orientation, and on the west of the ruins there was a small building, which went by the name of St. Columba's House, which was similar in its orientation. It was probable, therefore, that these buildings formed part of the earlier establishment which preceded the Benedictine monastery.

INSTITUTION OF CIVIL ENGINEERS.

THE LABOUR MARKET.

At the meeting of the Institution of Civil Engineers last Tuesday evening, Mr. George Robert Stephenson delivered an address on taking the chair for the first time after his election as president. In the course of it Mr. Stephenson referred to the mutual relations of capital and labour, and to the disturbed condition of what was called "The Labour Market." Speaking from his own experience in the direction of mining and mechanical works, he said that mutual confidence, which was essential to success in manufacturing enterprises, seemed to be further and further from realisation, for some of the rules laid down by Trade Unions were incompatible with justice, either to the masters or to the men. Thus the Union rate of wages was fixed without regard to the ability of the worker to produce, either in quantity or in quality, labour of higher value to the employer—a result which was unsatisfactory to the ingenious skilled mechanic, and which had a tendency to deteriorate the work itself. In this way foreign competition was fostered, and engineering and ship-building works were greatly on the increase in places which formerly depended on this country for their supplies. Again, the reduction of the hours of labour had led to "idle time"—a rise in wages not being followed by increased earnings, so that neither the men nor their families were benefited—while machinery and floating capital were frequently lying unproductive. Mr. Stephenson thought these great evils could only be mitigated, so far as the present generation was concerned, by the strong determination on the part of the men themselves to stamp out the cause of so much unhappiness.—the abuse of a luxury to which, in moderation, every working man was entitled.

WORKS OF THE SCHOOL BOARD FOR LONDON.

THREE new schools have been publicly opened during the last fortnight in the suburbs of London. One in Poole's Park, Holloway, leading from the Seven Sisters-road (by the Lord Mayor), on the 4th inst. This school is a two-storied building, the ground-floor being devoted to infants, and the upper to boys and girls. There is good accommodation for masters, mistresses, and caretaker, with extensive playgrounds. The heating is effected by a system of hot-water pipes and air-flues, worked from a central boiler and furnace. The school will contain 716 children, and the amount of the contract was 7,296*l*. Mr. G. S. Pritchard, of Finsbury, was the builder, and Mr. Ayres clerk of works.

The second school is situated in the Blackheath-road, not far from High-street, Deptford. The infants' school forms a basement, the principal entrance being for the boys, by a handsome flight of steps and portico, and the elevation is further enriched with some carving, in red brick, by Mr. McCulloch. There are three stories, the girls being on the first, and the boys on the second. The playgrounds are ample, and the situation very open. The accommodation is for 767 children, and the amount of the contract is 7,283*l*., the contractor being Mr. S. J. Jerrard, of Lewisham, and the clerk of works, Mr. Jackson.

The third school is at Peckham, close to the High-street, and consists of an extensive two-storied building, somewhat in the form of the letter E, having the main frontage to the Sumner-road. There is a spacious school and three class-rooms to each division, and the boys have also a covered playground. The site is very open and airy, and the play space ample for the 913 children intended to be received. The builder was Mr. W. Brass, the amount of whose contract was 8,097*l*., and the clerk of works, Mr. A. Higgs. All these schools are from the designs of the Board architect, Mr. E. R. Robson, and in each of them, as in all the buildings erected by the Board, special attention has been paid to ventilation and sanitary arrangements.

SCHOOL-BUILDING NEWS.

Brechin.—The erection of the new High School at Brechin has been commenced. The school is being built from the plans of Messrs. Aitkenhead & Mason, architects, Arbroath and Montrose. The estimated cost is 2,500*l*. The following are the contractors:—Mason, Mr. A. Crabb, Brechin; joiners, Messrs. Milne Brothers, Montrose; slater, Mr. John Davidson, Brechin; plumbers, Messrs. C. Middleton & Sons, Brechin and Montrose; plasterer, Mr. Robert Mason, Brechin.

Weston.—The new parochial schools, which have been built near the Midland railway station at Locksbrook, for the parish of Weston, Bath, were opened on the 21st ult. Messrs. Wilson, Willcox, & Wilson, of Belmont, are the architects, and Mr. Birch, of Belvedere, is the builder. The schools, which are intended for girls and infants, and will accommodate about 160 children, are built of blue lias, with Bath stone dressings. The roof is laid with Shortwood tiles.

Shaw-cum-Donnington.—Through the liberality of the landowners and others at Shaw-cum-Donnington, new parochial schools, intended to accommodate about 150 children, have just been erected at a cost of 1,300*l*. The schools, which comprise one large room and two class-rooms (the former having desk accommodation for 100 children, and the room for infants being capable of holding fifty), have been built by Mr. Franklin, of Deddington, from design by Mr. Butterfield, on a site presented by Mr. H. R. Eyre.

Bishops Stortford.—Extensive additional works and alterations which have been in progress at the Nonconformist Grammar School in this town during the past six months are now nearly completed. The old kitchens and out-offices, which were totally inadequate to the increasing requirements of the establishment, have been pulled down, and new kitchens, sculleries, &c., with dormitories and private apartments for the matron over, have been erected in their place; while an additional block of buildings, containing three class-rooms, library, lavatory, and cloak-room, with separate studies for the masters and elder boys on the first floor, has been erected and connected with the present building by a covered way. The new buildings are of red brick, to match the old work, and have been nearly all carried up in cement, as the kitchen block had to be completed during the summer vacation. The kitchens, sculleries, &c., have been paved with Victoria stone, and the class-rooms and library floors are of wood blocks on concrete. A fives court has also been built, and a laboratory and large covered playroom are now being rapidly pushed forward, and it is expected the works will be completed during the present vacation. Accommodation is now provided in the school for 150 boarders. The cost of the additions will be about 2,800*l*. Mr. John Slater, B.A., of Southampton Buildings, London, is the architect, and the contractor is Mr. J. L. Glassock, of Bishops Stortford.

Lincoln.—Schools have just been completed

for the parish of St. Mary le Wigford. They accommodate 210 children. Infant school, 40 ft. by 20 ft.; mixed school, 43 ft. by 20 ft., with porches for each department. The style is Gothic; walls built of brick, with stone dressings; barge-boards to gables; and overhanging eaves. The cost, including out-offices and boundary-walls, is 1,036*l*. The above were built from the designs and under the superintendence of Messrs. Robert Clarke & Son, architects, Nottingham.

Halford (*Salop*).—A school for sixty children has been erected in this parish by the Hon. Lady Mary Windsor Clive, as guardian for her son, Lord Windsor. The work has been carried out by Messrs. Treasure, of Shrewsbury. The architect is Mr. Wm. Penstone, of London.

VARIORUM.

THE fourth volume of *L'Art* begins with the new year. Its success is fully deserved, great improvement being observable in both the literary and pictorial department.——Those who are interested in the elevation of the poor will find in the *Contemporary Review* a paper worth reading, entitled "The Pauper Abroad."——The new issue of Cassell's Family Bible is very profusely illustrated, and with Part I. is given a very good engraving of "Christ and St. John," from the painting by Ary Scheffer.——Cassell's "Illustrated History of India" promises to be a valuable work. With the first part of this is given a very good portait of the Prince of Wales.——*Evening Hours*, edited by Lady Barker, begins the year with a strong list of names. It is an undeniably good sixpen'orth.——The *Peep Show* is a picture-magazine for the youngest readers.——The *Sunday at Home* and the *Leisure Hour* maintain their good character.

Miscellanea.

The French Working Classes.—The committee (says a Paris correspondent) appointed to inquire into the condition of the French working classes has concluded its labours, and drawn up a bulky report embodying the result of its researches. "Out of 36 million Frenchmen," says the report, "only two million live exclusively upon their revenue. Thirty-four million, of whom 19 million belong to agriculture, depend solely for bread and cheese upon the sweat of their brow." Only 3,000,000 persons can really be classified under the head of "workmen" or "mechanics," and this number includes both employers and employed in the surprisingly small proportion of three workmen to one employer. Ever since the introduction of modern machinery, the working classes have constantly improved their position,—so much so, in fact, that their salaries have risen to the extent of 40 per cent. within the last twenty years. The average wages of a Parisian workman are now from 45 to 50 centimes an hour, or from 4*f*. 50c. to 5*f*. per day of ten hours, and in the provinces from 2*f*. 50c. to 3*f*. a day, the cheapness of living accounting for the difference in salaries. In Paris female work is paid at the rate of 2*f*. 75c.; and in the provinces 1*f*. 50c. per day. After taking all these facts into consideration the commissioners agree in the opinion that working men's services are more handsomely remunerated in France than in Great Britain, Germany, Italy, Switzerland, or any other European community.

Street Improvements at Bradford.—One of the greatest works which the Street Improvement Committee of the Corporation of Bradford has at present on hand is the new thoroughfare, to be known as Sun Bridge-street, leading from Sun Bridge to City Road. A few months since 488 yards of land were purchased for the construction of the street from Mr. James Dixon, who reserved a portion of the property facing the new street for his own use. On this plot of land, which forms the south-western side of the new street, Mr. Dixon is about to erect a pile of shops and offices. Messrs. Knowles & Wilcock, architects, have been entrusted with the designing of the building, which will have three frontages,—a short one of about 38 ft. to Tyrrel-street; one, the principal one, to Sun Bridge-street, of 90 ft.; and a third, of equal length, to Aldermanbury. The elevation will be of the Italian character, and the building will be 64 ft. from the ground floor to the top of the balustrade at the Tyrrel-street end.

New Hydropathic Establishment for Ilkley.—Among the many schemes for the extension of Ilkley is the project for the erection of the Grove Public Hall Hydropathic Establishment. An establishment for the reception of invalids and visitors has been in existence for some years under the name of the Grove Hydropathic Institution. Mr. Edward Smith, the proprietor, proposes to combine with his establishment a commodious public hall, suitable for lectures, public meetings, concerts, theatricals, &c. Plans for the projected building have been designed by Mr. Thomas Clarke. In the portion of the premises devoted to an hotel and hydropathic institution, the plans show a dining-saloon to accommodate 150 guests, a coffee and news room little inferior to those of the saloon, two billiard-rooms, six drawing and private sitting-rooms, a consulting-room, private bar, and upwards of ninety bedrooms. A portion of the basement is intended for a restaurant. The projected bath accommodation will provide, in addition to the ordinary hydropathic baths at present in use, large Turkish, Russian, and electrical baths, all on the ground floor. Another feature in the internal arrangements is the provision of a suite of bedrooms on the ground floor for the special use and convenience of patients and invalids. In the hall it is intended to provide accommodation in area, gallery, and stalls for 700 persons. It is stated that Mr. Smith purposes to carry out the works by means of a company (limited), at a cost of some 16,000*l*.

Reduction in Masons' and Labourers' Wages in Edinburgh.—Many of the master builders of Edinburgh and Leith have given notice to their *employés* of a further reduction in the rate of wages, which is to come into force on Monday, January 31st, 1876. In the spring of the present year an agreement was come to between the Masters' Association and the Operative Masons' Association, by which the parties bound themselves to a maximum rate of wages, viz., 8½d. per hour, the agreement to hold for a year, and in the event of any of the parties desiring a change on the expiry of that period, some weeks' notice to be given. Trade, however, becoming very brisk, and scarcity of labour being much felt, the operatives by giving in their warnings in squads to various employers, indirectly forced up the wages to 10d. and in some cases 10½d. per hour. About six weeks ago the masters felt themselves in a position to reduce the wages to 9d. and 9½d., and they did so without meeting opposition from the operatives. At another meeting of the Master Builders' Association held recently, it was resolved that the time had arrived at which they could reduce the rate to the maximum fixed by the agreement with the operatives, the reduction to take place at the beginning of the ensuing year. It was also agreed, as there is an abundant supply of labourers in the town, that the rate paid to this class of workmen should not exceed 5½d. for first-rate hands, their present rate being 6d. and 6½d. per hour.

New Fire Alarm Apparatus in Bradford. A new fire alarm apparatus has been fixed to one of the bells of the Town-hall. The apparatus has been fixed by Messrs. Gillett & Bland, of Croydon, and operates in the following manner:—A hammer has been fixed to a lever close to the second bell above the hour-bell. This lever is worked by a cam-wheel revolved by a weight attached to a chain which winds round a drum in a manner similar to an ordinary clock-weight. The weight is released by means of a stout wire, which is worked by a lever in the police-office, and on being released the weight slowly descends, turning round the drum, which, acting on the hammer-shaft, causes the bell to be struck a series of blows at intervals of two or three seconds. The striking continues until the weight has run to the full length of the chain, which occupies about twenty minutes, and the weight has then to be wound to the top; but it has been so fixed that the period of time can be divided into two intervals of ten minutes each, so that if a second alarm has to be rung before the weight has been wound up, there will not be any difficulty arising from the weight being at the bottom. The sound caused by the striking of the bell is so different from the ringing of any other bell in the town that no confusion can well arise, and is so loud and distinct that it can be heard at a great distance.

Alterations at the Standard Theatre.—Mr. Charles Fowler wishes it understood that he merely acted as district surveyor here, and not as architect of the works.

The Philips Hall and Trevelyan Club, Bury.—These buildings, lately opened, are situate in Garden-street, Bury. The Philips Hall is 90 ft. by 60 ft. The club adjoins the hall, and is intended to be used in conjunction therewith. The club is cellared throughout, and has on the ground-floor a club-room 26 ft. by 20 ft., library 20 ft. by 15 ft., private room 20 ft. by 15 ft., still-room 18 ft. by 18 ft., with living-room, &c. On the first-floor there is a reading-room 31 ft. by 20 ft., and a billiard-room 48 ft. by 36 ft., with private room, &c. The whole of the rooms in this club are furnished in pitch pine. The reading-room and billiard-room have open timbered roofs of pitch pine. The whole of the buildings have been designed and erected for Mr. R. N. Philips, M.P., by Messrs. Maxwell & Tuke, architects, Bury. The contractors are:—brickwork, Mr. George Rawson and Mr. Frank Dawson; masonry, Messrs. E. Hill & Bros.; woodwork, Mr. John Atkinson; plumbing and gasfitting, Mr. Robert Caton; plastering and painting, Mr. J. Hargreaves; slating, Mr. John Kay; ironwork, Mr. Robert Hall. The place is heated by superheated water, by Mr. Hoyle, of Accrington; and all the closets are Taylor's patent earth closets. The whole of the works have been superintended by Mr. John Taylor, as clerk of works.

New Skating Rink, Tunbridge Wells.—On the 21st ult. a new skating rink at Tunbridge Wells, was completed by Messrs. Howell & Son, of Hastings, from the design of Mr. Cronk, architect, of Tunbridge Wells. The building, which is of ornamental brickwork, is situated in Grove-hill-road. It is approached by a covered way. The visitor enters first the covered rink, which is 113 ft. long, 55 ft. wide, and 45 ft. high. The gallery stretches along the entire length of the building on the south side, and has a width of 14 ft. Beneath the gallery, and on a level with the floor of the rink, there is a spacious ante-room fitted up as the refreshment department, and also a skate-room, a saloon, ladies' and gentlemen's cloak-rooms, &c. The interior woodwork is of pitch-pine. On the side opposite the gallery there are seven folding doors at regular intervals apart, and surmounted by circular-headed windows and ornamental arches. These doors are thrown open, and the skaters at once have access to the outer rink. Here the floor is also 113 ft. long and 60 ft. wide.

Railways in China. — The *London and China Telegraph* states that a company has been formed in London for the purpose of introducing railways into "the Flowery Land," and that the first experimental line will be made between Shanghai and Wosung, a distance of 9¼ miles. A contract has been entered into between the Shanghai and Wosung Road Company (Limited) and a well-known English contractor, and that the materials for the permanent way have already left for the Middle Kingdom. The engineer of the company went out to China some time since, and would be on the spot to commence operations as soon as these shipments arrive. It is expected that the railway will be completed, and in full working order, by next July. The line, being avowedly tentative, will be constructed on the narrow gauge of 2 ft. 6 in., the funds at present in command not admitting of a greater width.

Architect to the Hornsey School Board. At the last meeting of the Hornsey School Board, the Works and General Purposes Committee reported that forty-three applications had been received in answer to advertisements for the office of architect to the Board. These had all been considered, and bearing in mind the particular work required of the architect, they recommended the following gentlemen as the most eligible candidates, viz., Mr. T. Chatfeild Clarke, Messrs. Davis & Emmanuel, and Messrs. Lander & Bedells. The remuneration to be the usual fee of (according to published reports) 1 per cent. on all buildings erected, this to include the preparation of all plans, which are to be the property of the Board. The report was adopted, and Mr. T. C. Clarke, who is a member of the London School Board, received the appointment of architect. We conclude there is some mistake as to the rate of commission.

Houses in Flats. — A reader urges that attention should be given to the Berlin, and particularly the St. Petersburg, flat system, a superior to that of Paris, and better adapted to English domestic habits. Hamburg also is well worthy of study in this respect.

Memorial of the late Mr. Gutch.—A new stained-glass window was set up last week in Holy Trinity Church, Paddington. It consists of three transomed lights, forming six compartments, in each of which there is a large Scriptural subject, and several smaller panels of tracery are occupied by angelic figures, with musical instruments. The three lower groups represent the corporal acts of charity,—Feeding the Hungry, Clothing the Naked, and Visiting the Prisoner, &c., while the three upper are drawn from our Lord's life,—first, the Entombment; second, the Resurrection proclaimed by the Angel to the Women; third, the Ascension. The inscription at the base is "To the honour and glory of God and to the memory of her beloved husband, by Mary Gutch." The window has been executed by Messrs. Wailes, Son, & Strang, of Newcastle-upon-Tyne.

"Pure Gas" from Sewage.—If all that the inventors of this process claim be substantiated, we may look out for changes. "The saving in coal effected by the new invention is enormous, viz., one ton of best coal is used to produce 9,000 cubic feet of coal gas, and a very large quantity of furnace coal consumed to produce the extreme heat required; in producing 9,000 cubic feet of 'pure gas,' *not any* best coal is used, and only 135 lb. of furnace coal consumed; therefore the whole of the best coal and a large portion of the furnace coal is *saved*, equal to 90 per cent. of all coal used in making gas." It is estimated that after allowing a liberal margin for expenses, peculiar to some places, the cost of manufacturing "pure gas" from sewage will never exceed one shilling per 1,000 cubic feet, whilst in the majority of places it would not cost more than sixpence per 1,000 ft.

St. Andrew's Roman Catholic Chapel, Dundee.—The sanctuary of this chapel has just been redecorated. The roof, which is groined, is pale blue, studded with gold stars and white *fleurs-de-lis*, while the mullions are of crimson and buff, with gold and coloured ornaments. The cornice below the ceiling is in crimson and gold, with rich stencilled ornaments on the mouldings. Underneath this there is a painted frieze in lavender and green, with large and small gold crosses terminating in a band richly stencilled in gold. Gothic arches with pillars between are represented on the walls, the upper portion of which is of a rich blue, while the form of the arches and pillars is in gold. The new gas standards were supplied by Mr. Johnston, Small's-wynd.

The Hythe Drainage.—At a meeting of the Hythe Town Council on the 17th ult., the contract was signed for the construction of the new main drain. The contractors are Messrs. Lucas & Aird, of Lambeth, and the amount of contract is 7,000*l.* A difficulty has since arisen with regard to the contract; the plans and specifications only provide for a depth of 7 ft. over a section extending from Market-street Bridge to Twit's Bridge, whereas the Council, under the advice of the engineer, had decided upon a depth of 9 ft., in order to provide for the future requirements of the building land east of the town. It has been decided to ask the contractors to accept an additional contract for the extra depth.

Harbour Works in Jersey.—An offer has been made by Government to cede to the Legislature of Jersey the extensive harbour of St. Catherine's, situate on the east side of the island, conditionally on the States undertaking the repair and lighting of the breakwater. This breakwater was constructed twenty-five years ago at a cost of 32,000*l.*, the intention being to form a harbour for vessels of the Royal Navy, but the idea was abandoned. Since then the works have remained useless. The Jersey States have submitted to Government certain conditions upon which they will accept the harbour.

Price of Land, South Kensington.—According to the *Rock* the remaining portion of the well-known garden at Kensington-gore, in which Wilberforce and his sons were wont to disport themselves, was sold last week by Her Majesty's Commissioners for the sum of 103,000*l.* The plot has a frontage of about 50 yards to the Knightsbridge-road, and a depth of about 80 facing the east side of the Albert Hall. It has been bought with a view to the erection of a few first-class houses; the price per yard being very nearly 26*l.*, whereas, in Wilberforce's time, it might have been difficult to get as many pence.

Middlesbrough Main Drainage.—At a recent meeting of the Sanitary Committee of the Middlesbrough Corporation, tenders were submitted for the completion of the main drainage scheme, lately relinquished by Messrs. Prior, of Darlington. The following were the tenders received:—

Hannan & Co.	£21,282 10 5
Hodgson & Ridley	20,162 4 6
Jonas Franz	16,485 16 0
Jonas Franz & Son	16,073 17 0
Sharpe	13,956 0 0

It was agreed that Mr. Sharpe's tender be accepted, the figures, exclusive of extras, being 10,991*l.* 12s. 6d. Messrs. Prior's tender was 10,992*l.* 12s.

Llandudno Improvements.—At a recent meeting of the directors of the Llandudno Pier Company, it was announced that 18,000*l.* worth of shares had been taken, out of a total capital of 30,000*l.* The engineers, Messrs. Brunlees & M'Kerrow, stated that the whole of the pier, except the landing stage at the end, would be completed and open for a public promenade by July next. The sewerage works are also progressing rapidly, and it is confidently stated that the whole system will be completed early in spring.

An Appeal to the British Museum.—At the late conference of the head masters of public schools the following resolution was passed:—"That it be an instruction to the committee to communicate with the authorities of the British Museum and ask them to take into consideration the possibility of placing their vast treasures more readily at the disposal of the country for educational purposes." It is to be hoped that the trustees of the British Museum will give attention to this request.

The Wellington Hotel, Tunbridge Wells. This block of buildings, just completed, is in the Italian style. The front and almost the whole of the exterior is of brick and compo, with bay windows. The architects were Messrs. Weeks & Hughes; the general contractor, Mr. G. Weeks; the stone mason, Mr. H. Card; the plasterer, Mr. John Mason; the smith and bell-hanger, Mr. W. Catt; the hot water, baths, plumber, and decorator, Mr. G. Winnifrith. Messrs. Gilbert & Co. did the gas-fitting.

New Workhouse Chapel at Poole.—The chapel which has recently been built for the use of the inmates of the Poole Union Workhouse, was, on the 23rd ult., dedicated in due form by the Rev. J. L. Williams, vicar of St. Mary's, Longfleet. The building is capable of containing 120 worshippers, and the cost was about 450*l.* Mr. E. Pearce was the architect, and Mr. J. Dunford, the builder.

Association of Municipal and Sanitary Engineers and Surveyors.—The meeting proposed to be held at Oxford in November last (and postponed in consequence of the heavy rainfall), will be held on Friday, the 18th of February next. As the Oxford main drainage works are objects of special interest, it has been thought advisable to effect a fusion of the Home counties and Midland districts to view them.

Society of Antiquaries of London.—On the 5th inst., the council of this Society elected Mr. Frederick Ouvry, president of the society, as a temporary successor to Earl Stanhope, deceased. At the time of Earl Stanhope's decease Mr. Ouvry was senior vice-president, and for twenty years he was treasurer to the Society. Another and a more permanent successor will be elected on St. George's Day.

The Duke of Norfolk's Markets at Sheffield.—The Duke of Norfolk has consented to sell to the Corporation of Sheffield his markets in the borough for 267,000*l.*, the payment to extend over fifty-one years, at three per cent. This committee to whom the matter was referred has reported in favour of the purchase on the terms named.

Purbeck House, Swanage.—The old Purbeck House, Swanage, has been removed to make room for a larger building intended as a residence for Mr. G. Burt, of the well-known firm of John Mowlem & Co., Millbank, London. Mr. G. R. Crickmay, of Weymouth, is the architect of the new building, the foundation-stone of which was laid on the 27th ult.

The Sheffield Plumbers and their Wages. The Operative Plumbers' Association of Sheffield have passed a resolution asking 8½d. per hour, and 9d. for overtime.

Liverpool College for Girls.—The Building Committee, at their meeting held January 6th, the Dean of Chester in the chair, accepted the design sent in by Mr. John Johnson, architect, of London, for the new building to be erected in Grove-street. The whole of the designs, twenty in number, which entered into the competition, are on view in Liverpool College, Shaw-street.

Grantham Hospital.—The new hospital recently erected at Grantham from designs by Mr. R. Adolphus Came, architect, was formally opened on Wednesday, the 5th inst., by the Countess Brownlow, in the presence of the Lord Lieutenant and the Bishop of Lincoln, Lady Alford, and others. The buildings include twenty-one beds.

Royal Architectural Museum.—The Grocers' Company have given a donation of 25*l.* in aid of the Drawing and Modelling Classes for Art-Workmen at the Royal Architectural Museum, Westminster.

A New Organ for Salisbury Cathedral.—The *Hampshire Chronicle* states that a lady of Salisbury, whose name is withheld, has offered to supply the cathedral with a new organ, to cost 6,000*l.*

Dorchester.—Mr. W. Norman has been appointed engineer and surveyor to the borough of Dorchester.

TENDERS

For enlargement of the schools at Langford, Beds, for the Langford School Board. Mr. Thomas Handley, architect:—

Twelvetrees	£966 0 0
Redhouse	874 0 0
Langmead & Way (accepted)	819 0 0

For a pair of semi-detached houses, in the Bulmershe-road, Reading, for Mr. C. F. Willson. Mr. W. Ravenscroft, architect:—

Filewood	£1,264 0 0
Lewis	1,120 0 0
Grover (accepted)	1,097 0 0

For works at Ruthven, the Boltons, for Col. Tod Brown. Mr. John G. Hall, architect:—

Stephenson	£224 0 0
St. Pancras Iron Work Company	216 0 0
Wilson	182 0 0
Smith & Alder	174 0 0
Fisher	172 0 0
Thompson & Smith	169 0 0
Stimpson (accepted)	144 18 0

For erecting house and stables at Norwood, for Mr. Henry Brown:—

Johnson	£4,620 0 0
Johns	4,610 0 0
Wills	4,585 0 0
Timewell (accepted)	4,570 0 0

For the rebuilding of No. 2, Artillery-lane. Mr. William Barnet, architect. Quantities supplied by Mr. Wm. Birdseye:—

		If brickwork in cement, extra.
Saywell	£1,310 0 0	£60 0 0
Hayworth	965 0 0	60 0 0
Ellis	897 0 0	53 0 0
Stoner	887 0 0	23 0 0
Waldram & Company	869 0 0	45 0 0
Sewell & Son	787 0 0	60 0 0

For stables, cooper's shop, and cellarage, to be erected at Messrs. Threlfall's brewery, Cook-street, Manchester. Mr. George Scamell, architect. Quantities supplied by Messrs. Curtis & Son.

	Buildings.	Ironwork.
Foggett	£7,772 0 0	£1,200 0 0
Clay & Son	6,695 0 0	1,241 0 0
Neill & Son	6,085 0 0	1,050 0 0
Southern & Son*	6,000 0 0	1,148 0 0
Twibill & Co.	—	1,341 0 0
Cochrane & Co.	—	1,317 0 0
Bennett & Co.	—	1,282 8 3
Smith & Wood	—	1,267 18 2
Horsley Iron Company	—	1,192 15 0
Handyside & Co.	—	1,142 0 0
Head, Williams, & Co. (accepted)	—	1,037 10 0

* Accepted for buildings.

For restoring the Parish Church, Great Waldingfield. Mr. A. Hakewell, architect:—

Grimwood & Sons	£1,343 0 0
Hawkins (accepted)	1,238 0 0

For London School Board schools, Bellenden-road, Peckham. Mr. E. R. Robson, architect. Mr. W. H. Barber, surveyor:—

Oliver	£8,950 0 0
Wall	8,933 0 0
Nightingale	8,873 0 0
Ennor	8,870 0 0
Perry	8,857 0 0
Macey	8,628 0 0
Hill, Higgs, & Hill	8,610 0 0
Tyerman	8,447 0 0
Downes	8,389 0 0
Jerrard	8,283 0 0
Pritchard	7,878 0 0

For alterations and additions to the School for the Indigent Blind, Southwark. Mr. R. Drew, architect. Messrs. Fuller & Deacon, surveyors:—

Colls & Sons	£1,360	0	0
Jarrett	1,367	0	0
Hill, Higgs, & Hill	1,320	0	0
Adamson	1,287	0	0
Candler	1,200	0	0

For alterations and additions to 15, Upper Grosvenor-street. Mr. F. Todd, architect:—

Brass	£3,677	0	0
Hill, Higgs, & Hill	3,490	0	0
Aldin & son	3,260	0	0
Macey	2,748	0	0
Allen	2,720	0	0

For the erection of a further block of four warehouses, in Great Guildford-street, Southwark, for Mr. Joseph Kitchin. Mr. Alex. Fraser, architect:—
Downs & Co. (accepted).

For rebuilding three shops in the Edgware-road, for Mr. Tooley. Mr. J. Wilkinson, architect:—

Baker	£7,500	0	0
Man	7,490	0	0
Sharp & Maxwell	7,440	0	0
Ward	7,100	0	0

TO CORRESPONDENTS.

Errata.—In notice of Hanover-square Club, for "Boulton & Darnell" read Lowder. And Darnell
W., Son, & S.—J. K.—C. F.—M. L. M. W.—H. S.—H. B. H.—R. A. C.—W. P.—J. J.—L. & W.—F. C.—Major H.—W. C. F.—E. S.—W. F.—W. & Co.—A. C.—J. M. G.—W.—T. S.—Col. S.—R. A. L.—B. L.—W. H. W.—M. L. C.—J. N. & Sons.—W. N.—H. H. & H.—G. & Sons.—H. M.—F. M.—S. & D.—J. McD.—D. & Co.—J. F. S.—W. L. B. (too late. Next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the writer, not necessarily for publication.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

We give with this Number, as a Supplement, an INDEX and Title-page to the Volume of last year. A COLOURED TITLE-PAGE can be had, Gratis, on personal application.

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The Builder.

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The New River.

AMONG all the institutions of "still increasing" London, there is not one which has caused greater interest than that "antient foundacon," the New River, which was inaugurated two centuries and a half ago, or, more correctly speaking, on the 29th of September, 1613. The old chronicler briefly sums up this great event in these words:—"On the Michaelmasse-day in Anno 1613, being the day when Sir Thomas Myddleton, brother to the said Hugh Myddleton, was elected Lord Maior of London for the yeere ensuing, in the afternoone of the same daye, Sir John Swinerton, knt., and Lord Maior of London, accompanied with the said Sir Thomas, Sir Henry Montague, knt., Recorder of London, and many of the worthy aldermen, rode to see the cisterne, and first issuing of the water thereinto. A troope of labourers to the number of sixty or more, well apparelled, and wearing green Monmouth caps, all alike, carryed spades, shovels, pickaxes, and such like instruments of laborious employment, marching after drummes twice or thrice about the cisterne, presented themselves before the mount where the Lord Mair, aldermen, and worthy company beside stood to beholde them, and one man (in behalfe of all the rest) delivered a speech:—

> 'Long have we labor'd, long desir'd and pray'd
> For this great work's perfection; and by th'ayd
> Of Heaven, and good men's wishes, 'tis at length
> Happily conquer'd, by cost, art, and strength,
> And after five yeeres deare expence in dayes,
> Travaile and payne, besyde the infinite wayes
> Of malice, envy, false suggestions,
> Able to daunt the spirits of mighty ones
> In wealth and courage. This, a work so rare,
> Onely by one man's industry, cost, and care,
> Is brought to blest effect, so much withstood;
> His only ayme the citie's generall good.'"

At which and further words the floodgates flew open, and the new stream flowed into the New Reservoir erected upon the site of "an open idle pool,"—a ducking pond,—and now more familiarly known as the New River Head at Clerkenwell.

Such, then, was the inauguration of the company's works, which, after a lapse of 262 years, still continues to supply the City and North London with water. Thanks to the preservation of the Records of the time of Charles I., we are now enabled to give a complete summary of the History of the New River, in a document which has recently been discovered among the State papers. It is not only interesting, but very valuable, being an official description of the undertaking, as given before the judges, and a curious review of one of the earliest troubles the company had to endure. While quoting the document in its original phraseology as far as we can, we shall refrain from giving those numerous repetitions with which, in all legal writings, we are so familiar:—

"Whereas, by vertue of two severall Acts of Parliament, the one made in the third yeare of the raigne of the late King James of famous memorie (the first), and the other in the 14th yeare of the saide late king's raigne of this realme of England, the Mayor, Comonaltie, and Citezens of London, and their successors, had free libertie given unto them, and were enabled to bring a sfresh streame of running water to the north parts of the said Citty of London from the springs of Chadwell and Amwell and other springs in the Countie of Hertford, not far distant from the said springs. And the said Maior, Comonaltie, and Citezens, considering the great charge and expense of the saide worke, and *doubtinge much losse might befall upon the chamber of the said cittie in case the saide worke should not succeede well and prove beneficiall*, did thereupon forbeare at their comon charge to undertake the saide worke, soe as the same lay long neglected and unlike by them to be p'formed. And that Sir Hugh Middleton, Baronet, deceased, late Citezen and Gouldsmith of London, beinge willing of his owne private charge to undertake the said worke to that purpose, did make offer to the then Lord Maior, Aldermen, and Comons of the said Citty assembled at a Comon Councell holden within the said Citty on the XXVIIIth day of March, in the seaventh yeare of the raigne of the said King James, to undertake the said worke, and to performe (at his owne charges) whatsoever was or should be necessarie and convenient to be doone and performed on the parte and behalfe of the said Citiezens, which saide offer was willinglie accepted and imbraced by the then Lord Maior, Aldermen, and Comon Councell assembled. And that thereupon they, by their indenture under their Comon Seale bearinge date the XXVIIIth day of March, in the nineth yeare of the raigne of the said King James, made betweene the said Mayor, Aldermen, and Citezens, of the one part, and the said Sr Hugh Middleton of the other parte, did make and appoint the said Sr Hugh Middleton, his heirs and assignes, their true and lawful attorneys, deputies, and agents," to carry out the said work, confirming to him "the whole profitt, comoditie, and advantage that should be raysed and gained by the said River New Cutt and Streame, and the water and benefitt of the water that might come or be conveyed thereby, and free libertie of laying and conveying the pipes for the currency and passage of water," through the districts authorised.

"And the said Sir Hugh Middleton did begin to convey the said springs in a new channel or river towards the said Citty of London, and proceeded soe farre therein as that he brought the said water divers miles towards the saide Citty. But finding the charge of the saide worke to be greater, and the difficulties thereabouts to be more than he expected, the said Sr Hugh Middleton thought fitt to ioyne unto himselfe for helpe therein some other persons of qualitie which were willinge to adventure and ioyne with him in contribucon towarde the charge of the said worke, whereupon divers persons of qualitie became adventurers with the said Sr Hugh Middleton in the said worke, and made soverall agreements to pay and contribute. And it was agreed that they should have and receive severallie to them and their heires ratable shares or parts of the proffitts to growe or arise out of the said worke, according to the proporcon of their severall disbursement. And after they had proceeded soe farre that it was founde to be feasible, the said late King James, considering that the said worke would be of greate use and benefitt unto the said Citty, and being willing to vouchsafe his ayd, by indenture under the Greate Seale of England, bearing date the second day of May, in the tenth yeare of his rayne over England, did agree to beare and paie the one-halfe and moietie of the charges disbursed and to be expended in perfecting the said worke:"

And the king in return to have half the profits, &c.

We now come to the very interesting details of the purchase of the site of the present New River Head:—"And the said Adventurers, for the better effecting and continuing of the said water-course and to make the same usefull for the said Citty, it was necessary to make and have a greate store Pond or Poole, whereunto the said new Cutt or Poole might emptie itselfe and thence be derived in pipes unto the said Citty in some convenient place neere the said Citty, and takeinge knowledge that Samuell Backhouse, Esquier, now deceased (who was one of the Adventurers in the work) was seised in his demeasne as of ffee of certaine land in or neare Islington, in the county of Middlesex, which was very fitt for that purpose, did thereupon treat with him touching the purchase of soe much of the saide lande as would serve to make such store ponde or poole and alsoe some other waste ponde to receive and hold the said water," with powers of ingress or egress, for the purpose of repairing or viewing the same when necessary, "and for layinge and repayringe of pipes whereby to convey the said water from the store ponde or poole unto the said Citty," the Adventurers paying "a greate some of money to the said Samuel Backhouse and Sir John Backhouse, or one of them," and contracted for the privileges to pay 6*l.* per annum to him or them "for the same waste pondes." "And after the said agreement made the Adventurers at their greate costs and expenses did digg and make one great and large store ponde or poole in the saide ground to receive and keepe the water running in and comeinge from the said New River, and walled the same roundabout with a faire brick wall, and at the entry thereof erected and built a fitt and convenient dwelling-house of brick" as a residence for the custodian of the same ponds. And they also made "two other wast pondes close adjoyninge to the said store ponde to receive and keepe the surplusage of the water of the said New River when the store pond was full," and laid main pipes from the grounds to the City, &c.

By letters patent dated the 21st day of June, in the seventeenth year of his reign, 1619, Myddelton and the other Adventurers were incorporated by the name of the Governor and Company of the New River, brought from Chadwell and Amwell to London, and the usual grants and privileges granted them. "After which letters patent at a Court holden by the said Governor and Companie at Sergeants' Inne in fleete-streete, London, on the second daie of November, Anno Dni 1619, all or the greatest part of the said Adventurers did seale and deliver certaine indentures unto the said Governor and Companie, whereby they did severally and respectively grant and assigne all their estate, and interest in the saide water worke to the said Governor and Companie for ever," and the company by another agreement granted to Sir Robert Naunton and others on

behalf of the king," the one moyetie or halfe of the cleere yeerly profitts of the said water workes." And at subsequent Courts the shares belonging to the Company's moiety were severally let, and orders made for the carrying on the business. The whole being entered in "a faire legier booke prepared for that purpose," and the accounts audited half-yearly, and other matters were contained in other books, "all which were suffered to be and trusted in the custodie of the Governour and Clarke of the said Companie for the tyme beinge; and that the said Sr Hugh Middleton being for divers yeares together after the said corporacon chosen and continuinge Governor of the said Companie until his death, and William Lewen from the tyme of the granting of the said patent of incorporacon until about Midsomer last (1636-7) continuall Clarke of the said Companie."

Subsequently, Sir Hugh Myddelton "obteyned the other moyetie in fee farme from his Majestie at and under the rent of 500 li. [500*l.*] per ann.," executing an indenture accordingly. Sir Hugh, by his will, dated November 20, 1631, and proved a month later, leaves all his parts or shares in the New River to his "loveinge wife Dame Elizabeth," and after her death a part or share each to his three sons and two daughters, and the sixth share to the Goldsmiths' Company, of which he was a member, in trust for their poor brethren. And he declared that the one half of the waterworks was divided into thirty-six parts or shares, thirteen of which belonged to himself, six of which he had thus disposed of, and the remainder passed into his general estate. After his death, his widow and William Lewen retained possession of the company's books and deeds, "whereby they are disabled to knowe the rents and revenues of the said New River," while Sir John Backhouse, although he had annually received the 6*l.* rent for the Islington land, "doth now make title [so says the Bill of Complaint made before the king in 1637] unto the said house and pondes pretending that the grounde whereon the said house is built and wherein the said pondes are made," were not granted to Sir Hugh Middleton or the adventurers, "and goeth aboute to take the same from the said complainants, their officers, or servants, whereby the said workes is like to be overthrowne and the said Citty deprived of the benefitt and use of the said water." The case being tried before the King in Council an order was made that if the widow of Middleton had two copies of a deed, one should be handed to the company, and if one then she deliver a true copy; that Lewin should hand them all the letters which Mr. Attorney-General Noy had written respecting the shares. "And as touchinge the said defendant Sir John Backhouse the Court then propounded that for an enlargement of recompense to him that his rent of six pounds per ann. should be increased to tenn poundes by the yeare." But to this arrangement Sir John would not agree, and coming again before the Court on the 18th of November, 1637, the King in Council made decree "that the said complainants and their successors shall from henceforth have, hold, and enjoy the quiett and peaceable possession of the land and premises in question, as well of that part thereof as is incompassed with a brick wall within which the store ponde or poole for the water worke is conteyned, together with the grounde or soyle on which the said brick wall is erected and the said house is built, together with the same house and yard thereunto adjoyninge, as alsoe of the other parcell of land and soile where the waste pondes belonging to the said waterworkes are made," paying to the said Sir John Backhouse and his heirs 10*l.* per annum, and permitting him, his heirs, and assigns "to have libertie for watering of the cattel going and depasturing in his, the said defendant's, grounds, next adjoyning to the premises, in the said wast pondes, and from tyme to tyme to put in and take out fish in the said wast pondes. And it was likewise ordered, according to Sir John Backhouse his desire, that the said complaynants shall not permitt any alehouse or taverne to be kept in the said cisterne house." And it was also ordered that the company should pay arrears of rent since the 20th of May last at the rate of 10*l.* per annum, and previous to that date 6*l.* per annum that Dame Elizabeth deliver one of two original copies, or a transcript of the original if she has only one deed; and that William Lewin deliver over to the company Attorney-General Noy's letters and the books belonging to them in his hands.

Such then is the substance of the interesting document just discovered, but to enable the reader to understand the importance of this decree it is only necessary to add that the New River Company hold the property mentioned therein to this day.

As regards the history of the undertaking, a few notes may not be out of place in order to explain the above narrative; but a most complete account may be found in Pinks & Wood's "History of Clerkenwell," published in 1865, pp. 441–471, or in Mr. Smiles's "Lives of the Engineers."

Hugh Myddelton was a native of Denbigh, whose castle had for governor during three reigns the father of our worthy. While working some Welsh mines he had acquired a good knowledge of levelling, embanking, &c.; hence, after he came to London, the proposal of the City to bring up the New River from Chadwell did not appear so visionary a scheme to him as it did to them. After undertaking the work, he soon found out that he had no easy task to construct this aqueduct some thirty-eight miles, not to mention the remarkable opposition he met with on the route by landowners and others. He had expended nearly 5,000*l.*, when want of funds compelled him to seek out King James, who had previously declared that, sooner than see the country abandoned to the will of the waters or lie waste and unprofitable, he would undertake the remedy. Accordingly, among the Exchequer documents we find the King advancing to Middleton, between the years 1612 and 1616, the sum of 9,430*l.* 4s. 2d., being one half the cost of the construction of the work. It occupied five years, although seven years had been allowed him, and the progression made for some time is evidenced by 600 men being employed. In return for the kingly help, James had half of the seventy-two shares in the undertaking, twenty-eight were possessed by others, and eight by Myddleton, but these eight were increased subsequently (by purchase from other adventurers) to thirteen, as we have shown by the extract from his will. The New River, which passed through King James's park at Theobalds, flowed into the Clerkenwell reservoir, described in the document above given, in 1613, and the company were incorporated six years later. The government was vested in twenty-nine adventurers, who held thirty-six shares, the King being precluded from personally taking any part in the management, although a representative was allowed him. No dividend was paid for twenty years, the cost of laying mains, &c., being very great; the first amounted to 15*l.* 3s. 3d. a share; the second, 3*l.* 4s. 2d., three years later; and in 1636, the year before the law case was decided, Charles I. was so "hard up" that he parted with his thirty-six shares to the company for the remarkably speculative sum of 500*l.* a year. Under the name of "King's Clogg" this payment is still annually made to the Royal Exchequer.

From this time the prospects of the New River Company became brighter, and before the end of the seventeenth century a good dividend was paid. In 1711, Lord Chancellor Cowper decreed that the possessors of two or more fractional parts of an adventurer's share,—for a share began to be divided when the property improved,—and equal to one whole might have a representative in the government of the company. The value of a king's share sixteen years later was stated to be 5,000 guineas; in 1766, worth 15*4l.* per annum. In 1805 one sold for 4,400*l.*, and in 1813 an adventurer's share fetched 8,000*l.* In 1838 an original share sold for 18,000 guineas, and in 1852 three-sevenths of a quarter of a king's share realised 1,600*l.*, upon which a dividend was paid of 90*l.* per annum. In 1864 one-seventh part of thirty-sixth share (63*l.* 11s. 4d., half-year's dividend) sold for 2,490*l.*; one-fourth part (dividend, 117*l.* 13s. 2d. half-year), 4,670*l.*; and one-eighth and one thirty-second part (equal to five thirty-seconds), with a dividend of 68*l.* 9s. 8d. the half-year, 2,670*l.* At the great sale in 1870 of Miss Horton's property, comprising four-fifths of one king's share, five-twelfths of one adventurer's share, seventeen new 100*l.* shares, each fully paid up, and sixty-eight with 20*l.* paid up, the whole realising a dividend in 1869 of 2,105*l.* 6s. 11d., and a bonus of 1,726*l.* 13s. 4d., sold at auction for 62,429*l.*! Thus the seventeen realised about 195*l.* each; the sixty-eight from 50*l.* to 55*l.*; six twentieth parts of an undivided thirty-sixth share or king's moiety brought 11,720*l.*; eight sixteenth parts, 20,240*l.*; and seven twentieths, with two thirtieths of another, 17,650*l.* The dividend on the new 100*l.* fully paid up was 7*l.* 5s.; on the king's, 1,516*l.* 13s. 4d. or 75*l.* 16s. 8d. for each twentieth part, and conferring votes for Middlesex and Herts; 1,565*l.* 10s. 6d., or 97*l.* 16s. 10d. for one sixteenth part; 1,578*l.* 17s. 3d. for one adventurer's share, or 78*l.* 18s. 11d. or one twentieth of an undivided thirty-sixth (or adventurer's moiety). In 1872 two 100*l.* shares were sold for 200*l.* each; in 1873 one quarter of a king's share fetched 12,240*l.*, showing the whole share to be worth 48,860*l.*! Last year 27¼ London Bridge Waterworks annuities of 50s. each for 260 years from October 1, 1822, were sold for 16,020*l.* When the old waterworks were removed from under the arches of London Bridge, the New River Company undertook to supply the old customers, securing to the old waterworks proprietors their then dividend of 50s. per share as an annuity for 260 years, the unexpired term of the original lease for 500 years granted to one Peter Morrys by the Corporation of London in 1580. These shares have priority, as regards dividends, to all other New River shares for 207 years to come. At some trouble we have collected these curious details, feeling sure all our shareholder readers may derive some information worth having from them.

The New River, as originally formed, was 18 ft. wide and 5 ft. deep, with an average fall of 5 in. per mile. It is now 25 ft. wide, 38¾ miles long, and the water is allowed to subside in reservoirs at Cheshunt, Stoke Newington, and Clerkenwell,—a total area of 43½ acres. Twenty millions of gallons of water are pumped up to the reservoirs at Pentonville, Maiden-lane, Highgate, and Hampstead, by engines of 1,700 horse-power, and the total length of mains is about 620 miles. In 1869 the Parliamentary return exhibited the capital of the company as 2,609,418*l.*, and the daily average supply to 113,462 houses, having 800,000 inhabitants, is 23,790,667 gallons of water! And while the water-rents amounted to 150,943*l.* 14s. 8d. in 1855, they had increased to 250,010*l.* 4s. 9d. in 1869; ground-rents and rents on land, 10,952*l.* 3s. 5d.; and other items brought up the income to 285,529*l.* 2s. 1d. The expenditure, including for repairs, &c., 111,598*l.* 9s. 4d.; interest on loans, 39,721*l.* 4s. 11d.; dividends, 116,629*l.* 2s. 7d.; purchase of land, new pipes, and laying, 17,319*l.* 14s.; leaving a balance of 260*l.* 11s. 3d.

Aubrey, in 1682, complained that the growth of London only enabled the New River Company to supply water twice a week. This want of water caused them to borrow, in seasons of drought, the overplus water of the mill-stream of the River Lea near Ware, which was measured to them by a balance engine and gauge. The first supply not proving sufficient, Mr. Smiles tells us that their surveyor proved a valuable servant to his company by offering to pay double the price then paid for a pipe of double the diameter. The Lea River agent assented, not knowing that two orifices are to each other as the squares of their diameters, and the result was the New River received four times the original quantity of water at the cost of only double the original payment! In 1738 the Company purchased the Ware Mills, and other lands in Ware and Amwell, and by Act of Parliament 11 Geo. II., a perpetual rent-charge of 100*l.* per annum (now less land-tax of 40*l.* 8s.) was secured by them on this property. A family who had held it for a century sold it this present year for 8,640*l.*, thus further evidencing the value of property in connexion with this prosperous Company.

As for the founder, Myddelton, all he received was a Baronetcy in 1622, and dying Dec. 10, 1631, was buried in the churchyard of St. Matthew, Friday-street, London, in the registers of which parish are recorded members of the family between 1557 and 1730. It was left to later times to pay some little mark of respect to his energy and true citizenship, although two baronetcies in the family have been allowed to drop through the poverty of his descendants. The Corporation for a long series of years granted pensions to the family. But as long as the New River exists, so long will the name of Myddelton be honoured, not only by Londoners, but by all those who admire true enterprise, especially when carried out in the remote days, two centuries and a half ago.

The Institution of Civil Engineers.—We are asked to state that supplemental meetings for the reading and discussion of papers by Students of the Institution have been appointed for the following Friday evenings:—January the 21st and 28th; February the 4th, 11th, and 18th.

PRINCIPLES OF ORNAMENTAL ART.

BOOKS in illustration of the history and principles of ornament are numerous enough, and some of the existing publications of this class are so complete and admirable, so thoroughly established as standard works, that a book which manifestly does not aim at superseding or surpassing these must be expected to show some speciality to make good its claim to be added to the list. On looking at the preface of the volume before us,* we see at once that its author is aware of this, and we think he makes out a good *locus standi* for his book, while he assures the reader that he makes no pretence to do more than contribute a few scattered ideas for consideration. Taking as his motto Pope's couplet,—

"Content if hence th'unlearn'd their wants may view,
The learn'd reflect on what before they knew,"—

he selects certain points for special consideration,—"as, for instance, the influence of symbolism and religious belief on particular styles of ornamental art; the greater or less use of animal or vegetable forms, with its attendant question of the due amount of healthy naturalism or necessary conventionalism to be observed in their representation as elements of decorative design; the history and modification of various forms, such as the fret, the anthemion, the paters, the guilloche, which, though especially characteristic of classic art, crop up more or less recognisably at almost all periods." The influence of symmetry and subordination on the designer's work, and the ornamental use of caligraphy and the adornment of written character, are also subjects specially considered. Besides this, however, Mr. Hulme's book has the advantage of including a large number of illustrations of types of ornament (over 400) in a volume much more convenient and portable in form than well-illustrated works on decoration generally are. The element of colour is wanting, but the principles of ornament may in most cases be well illustrated in black and white; and the consideration of the subjects elucidated, and the style and calibre of Mr. Hulme's critical writing throughout, deserve the highest praise; in fact, we rarely meet with a work of this kind in which the subjects treated are so logically and fairly discussed, in a manner so entirely free from undue prejudice for or against any particular style or school.

To the subject of symbolism in ornament, Mr. Hulme devotes two long chapters, and treats the subject in an appreciative and, at the same time, a common-sense manner. The interest of symbolism, in connexion with the study of ornamental art historically, the absolute necessity of understanding it in order to appreciate the full meaning and sentiment of a large proportion of ornamental work of past ages, can hardly be over-rated; but the author avoids the error of supposing that therefore symbolism is a necessity of ornament generally, or of modern ornament at all. As he observes, "symbolic forms can never, in the future, attain to the importance they have done in the past, since, living as we do in a time when the opportunities both for imparting and acquiring knowledge are so great and widely spread, there does not exist the same necessity for this picture-language." The origin and meaning of most of the principal symbolic forms which have influenced decorative art are briefly described, without the disproportionate place being given to Mediæval symbolism which we are accustomed to find in recent works. Indeed, Mr. Hulme specially condemns the over-strained and extravagant use of symbolism in the Mediæval period, of which the following example, cited from Durandus, is curious enough to be worth recalling to our readers' memory. It is in reference to that unobtrusive piece of church furniture, the bell-rope. To the old monk sitting in the twilight of the abbey belfry,—

"The hanging rope by which the bell is pulled is humility, or the life of the preacher; the same rope also showeth us the measure of our own life. Besides this, since the rope hath its beginning from the wood upon which the bell haugeth, by which is to be understood the cross" [a point which, to his own satisfaction at least, he had proved in a preceding chapter], "it doth thus rightly typify Holy Scripture, which doth flow down from the word of the Holy Cross. As also the rope is composed of three strands, so doth the Holy Scripture consist of a trinity,—namely, of history, allegory, and morality. Again, the rope reacheth unto the hands by which it is grasped, because Scripture ought to proceed unto good works. Also the raising and lowering of the rope in ringing doth denote that Holy Scripture speaketh sometimes of high matters, sometimes of low; or that the preacher speaketh sometimes lofty things for the sake of some, and sometimes condescendeth for the sake of others. Again, the priest draweth the rope downwards when he, from contemplation, descendeth into active life; but is himself drawn upwards when under the teaching of Scripture he is raised in contemplation."

This is not a bad sample of a literary abuse of symbolism, similar to what was not infrequently made in the artistic use of it in the same period A symbolic treatment should be direct, comprehensive, and to the point, not involved and far-fetched. Under these limitations, it may be of use in giving an additional interest or motive to ornament in modern work, though in a rather different spirit from that in which it was used in ancient work. It is worth remark that an ornamental feature may in a sense be symbolic, and even gain much in interest from the fact, though the symbolism is not precise enough to be connected necessarily with one definite idea. For instance, the ancient Egyptian symbol of the winged globe, though we may have lost the definite signification probably attached to it originally, cannot be regarded as a mere material decorative feature; it has a meaning and a suggestion to us, too vague, perhaps, to be expressed in words, but which quickens and stirs the fancy whenever the image meets us. Good examples of modern symbolic decoration of this half indefinite nature are to be found among M. Garnier's decorative detail in the interior of the Paris opera-house; and we have noticed some very fanciful and suggestive specimens used as head and tail pieces in some recent books: the pretty series of volumes, for instance, published under the title of "Moxon's Miniature Poets," contains some very poetical page-ornaments of this kind; little bits of design which are midway between pictorial and ornamental work, and just hint to the fancy something in harmony with the spirit of the poem on the same page, without being in any way "illustrations" in the ordinary sense. Dr. Dresser, in his work on Decoration, gives some valuable hints as to the path to be followed in thus lending an inner meaning to decoration. It is a line of decorative study which might, we think, be followed out a good deal further than it has been. Symbolism, however, it must always be borne in mind, has its right place only in decorative art; any attempt to combine it with the higher forms of art, in the shape of sculpture or painting, always tends to lead to a mannered and unprogressive art, in which the arbitrary signification confers a fictitious interest on the figure, irrespective of its artistic and expressive power. This is the main cause of that mannered immobility of Egyptian sculpture referred to by the author, in which one fixed and restricted type was rigidly adhered to, century after century. The interest of the work consisted in its religious significance as the symbolic representation of one or other divinity: hence the necessity for progress, for increased human interest and artistic power in the sculptor's productions, was entirely abrogated.

The use of inscriptions as an element in ornamental art, to which Mr. Hulme gives rather more than usual attention, acquires also a kind of symbolic interest, as distinguished from mere matter-of-fact information. The author exemplifies this rather well. "If, for example, we see 'Dent, London,' legibly inscribed on a clock-face, we realise at once that the matter-of-fact statement has no other object than to afford knowledge of certain business details; but if surrounding the dial we have a band inscribed 'Time tryeth, time flyeth,' we comprehend that the designer, desiring to beautify his work, has chosen an inscription full of thought and suggestiveness, as well calculated to attain the end in view." He quotes, as a very good actual example, the legend on a clock in the north tower of Exeter Cathedral (but we think it has been used in other instances also), surrounding the hour circle,—*Pereunt et imputantur*,—but Mr. Hulme's translation, "They perish and are reckoned," is inadequate; "are placed to our account," is the full signification; and the contrast between the brevity of the Latin and the round-about sentence necessary to render it adequately in English, is worth noticing in connexion with our subject, because it is this terseness and significance of Latin which justifies its use in modern inscriptions of the kind; a use which is sometimes complained of as an affectation of learning or of Mediævalism (according as the Latin is Ciceronic or "ecclesiastical"), but which is perfectly defensible, both on common-sense and æsthetic grounds, as the employment of a language better fitted for such expression than most others. In regard to inscriptions of this kind, there is also a reason in favour of the use of a dead or a foreign language which we do not see that Mr. Hulme has noticed; it brings the inscription out of the region of everyday-forms of thought, and throws a little "glamour" about it, more especially when, as in the case of Greek or Latin, the language used is one superior in construction and form to our everyday-speech, and of older and more venerable associations. In this respect Latin may be considered, as it practically has been to a great extent, as the language for modern decorative inscription, enjoying pre-eminence over Greek through its being more generally understood; but French also (a language of the Latin school) possesses qualities of terse and at the same time picturesque expression which render it often much fitter for ornamental inscriptions than English. German, on the other hand, is perhaps less fitted for this kind of use even than English. In the consideration of decorative writing we of course come upon the subject of illumination, recently become so fashionable a recreation. Some remarks of the author on the *rationale* of the subject are worth the attention of amateur illuminators:—

"The decorative effect will be very greatly dependent on the character employed; thus the Roman characters at present in use,—though, from their clearness and simplicity of form, of eminent work-day utility,—present but little scope to the designer; while the various Mediæval alphabets, from their picturesque character and quaintness, are especially adapted to art purposes. It follows, therefore, that where a decorative effect is desired, as in texts for church dressing, the Gothic character is, even to the present day, employed. This practice, though at times presenting some evident anomalies, does not seriously, we think, violate any law of artistic propriety, more especially as it is ordinarily in harmony with the architectural features of the buildings, so long as the text or other matter is clearly legible; though it at once fails of its primary object when, owing to overcrowding of accessory ornamental features, or the use of a character unknown to all but a few antiquaries, it appeals merely to the eye, and leaves the mind unsatisfied. There is great need, in the present day, when the practice of so-called illumination is so general with amateurs, who bring but little previous study to bear on their work, to emphasise the fact that the decoration,—the outer clothing,—is subordinate to the thought they thus seek to clothe. True illumination should aim at the clear and legible setting forth of some thought noble in itself. Any amount of good decorative work may be added in enhancement of honour to this; but as soon as the decoration, instead of being the accessory, becomes the principal feature, the whole aim is perverted,—the last becomes first and the first last, and the text or other passage that should at once strike the eye is lost in a labyrinth of forms that, possibly beautiful enough if kept in due subordination, become an eyesore and an impertinence when they usurp the attention, and thrust from its throne what should really be the centre on which the eye should without difficulty rest."

A good many architects, we may add, set a bad example of this kind of misuse of decorative effect in the manner in which they delight to disguise and torture into strange shapes the lettering on their drawings, not only when elaborate "letter-painting" is used, but even in the process of mere pen-writing, so that the extraction of the practical information which the writing is intended to convey becomes as great a difficulty as if it were purposely written, from diplomatic motives, in "cipher."

The use of inscriptions in such a way as to form actually a mode of surface ornament, as in the Assyrian sculptures, where sometimes a broad band is formed, crossing a figure or a group, by the incised writing carried right over the sculpture, belongs of course to quite a different class of decorative treatment by inscription from that which we have been considering. It belongs chiefly to Assyrian art, though we may regard the Egyptian hieroglyphics on columns, &c., as a kind of use of decorative writing on a similar principle. This method of employing writing is almost entirely unknown in modern ornamental design. It is possible, however, that it might be found a source of effect, where something in the way of a surface diaper was required. One way in which some modern designers do use writing in what is, we suppose, intended for a decorative manner, is to our thinking very silly; we mean the fashion, when such a thing as the name of a portrait or the subject of a head in a medallion is to be stated, of scattering the letters of the word irregularly about the vacant part of the space. This is neither one thing nor the other—neither writing nor ornament.

In regard to the subject of heraldry, we may call attention to Mr. Hulme's judicious and impartial way of considering it from a modern point of view; regarding it as a subject rather belonging to the past than the present and future of decorative art, but at the same time pointing out that if used at all, it is to be used with due reference to its own rules and traditions, apart from which, in fact, it loses most if not all of its meaning. "It is not a sufficient

* Principles of Ornamental Art. By F. Edward Hulme, F.L.S., F.S.A., author of "Plants, their Natural Growth and Ornamental Treatment," &c. London, Paris, and New York: Cassell, Petter, & Galpin.

reason for the violation of the special rules of the subject to deride it as obsolete, arbitrary, or absurd. It may be all this, and yet, if the thing be introduced at all, it should be rightly done, according to those rules. If the verdict on heraldry be an unfavourable one, it should at least spring from knowledge, not from want of knowledge." In this view we entirely concur; though thinking that, except with a few mediævalising enthusiasts, heraldry is likely to occupy a less and less place in what may be called illustrative decoration. It belonged to a state of society utterly distinct from the present, in regard to which its significance and utility have nearly disappeared.

Mr. Hulme's two last chapters on symmetry in ornament, and on the use and misuse of natural forms, are among the best parts of his book; and we have seldom seen more just and discriminating criticism on the opposite faults of over-naturalism and over-conventionalism than that contained in the first two pages of Chapter VII. What is said here is not new, but it is very well and pointedly said. In speaking of Egyptian art, the author holds it up as an example of an ornamental art founded entirely on forms indigenous to the country, and contrasts this with what he considers the unthinking copyism with which the acanthus is reproduced by "classic" architects,—"the modern English principle of manufacturing the ornamentation of capitals and string courses, *ad nauseam*, with a plant of Southern Europe, the acanthus, a plant unknown in England,—a plant that the Greeks introduced into their work, too rigidly to the exclusion of other beautiful forms, but with a delicate sense of its beauty; a plant that the Romans used in clumsy imitation, equally readily adopted, and that, therefore, from its classic associations, has obtained a firm foothold amongst us with all those who look not to the living spirit of Greek or other art, but to the mere letter; those who can copy being always a much larger body than those who can create." While we are thus repeating a single idea or form, once beautiful, now hackneyed, in architectural ornament, we find that in smaller and more personal adornments a continual demand seems to be made for something new and startling, without any consideration of its fitness or refinement. Mr. Hulme instances among these vulgarities of modern taste "one of the most selling things" of recent date, the horse-shoe, in a variety of forms. We can cap his examples with something worse than this: not many days ago we observed among the attractions set forth on the counter of one of the best-known jewellers in Bond-street a pair of (apparently) solid gold ear-rings in the shape of ladies' boots or *bottines*, about an inch in length along the sole, contrived to hang by the loop by which the real boot would be drawn on. We never remember really to have seen a lady wear anything so outrageously vulgar as this, but the fact of its presence in a shop of the first class shows that it is thought a "selling thing." Looking at such specimens of the taste of the day, as within the mark, no philippics that have been made on the subject would seem to us too extravagant.

It is *apropos* of this misuse of forms that the author draws an important distinction between *designing* and *decorating*; observing that to be a designer is to occupy a position higher than we associate with the word decorator; though, as he says, the two terms are often used as if synonymous. "Decoration is the clothing with beautiful form or colour some object we desire thus to adorn, while design refers to the construction of any work both for use and beauty." We are not quite sure that the meaning of the word "design" can thus be limited, or rather, perhaps, the fact is that the word is in reality made to do double duty, and we really want a third word. But the principle inferred is quite correct, and it is worth while to emphasise it, because there is a notion rather too prevalent now with some people, that the architect's business is entirely decorating, and that the rest of it is all easy work; forgetting that there must be something worth decorating first, or, as Mr. Hulme in another place phrases it, that decoration "is an adjective and not a substantive."

The "Principles of Ornamental Art" is a companion volume to that on the use of plants in decoration, which we noticed at some length previously; and though it has not such a special value as that very excellent and suggestive treatise, the one is the complement of the other, and the two together would form an excellent general introduction to the study of ornamental art, before investigating separate branches of it more in detail. And while Mr. Hulme very ably puts before the student that which a book of a limited size can convey, he is equally careful to remind him how much there is which books cannot adequately convey, and to guard him against regarding the whole history of ornament as grouped and divided in the manner in which an author is obliged to group it for convenience of definition. With the observation on this point, under the heading "Styles," we will conclude our remarks:—"In using the term 'style' we must be careful not to fall into the error of considering the various epochs of ornamental art as so many distinct periods having no connexion with those which preceded or followed them; allowing nothing for the continuous change, the old giving place to the new, and the external influence brought about by contact with other men and other ideas. We may rather, perhaps, compare ornamental art, as a whole, to some great river ever advancing on its course, receiving on each side tributary streams, and incorporating them into its own volume of waters, influenced by various circumstances, here expanding into broad quiet pools, there confined by rocks and sand-banks, causing tortuous deviations. The view that many gather from mere book-reading, unaccompanied by personal study, is rather, if we may be allowed to continue our figure, that of a series of lakes, some large, others small and insignificant, some abounding in features of beauty, others having but little charm, dotted about in no perceptible order or plan, and having no connexion with one another."

WORKS OF THE LATE FREDERICK WALKER.

THE collection of the principal works of this gifted and early-lost artist, opened at Mr. Deschamp's Gallery, in Bond-street, more than bears out the estimate of his genius which thoughtful critics have some time since arrived at. His powers had, so far as he lived to develop them, certain limitations, rather in regard to idea and feeling than execution, which this exhibition no doubt exemplifies. There is a certain prevalent tone and bias in his conceptions, and a tendency to a special manner in the treatment and action of his figures, in his largest and most important works at least, which can less than ever escape notice when they are brought into close juxtaposition. It may be difficult to define in what this manner consists; its characteristics may be said to be a somewhat exaggerated action of the lower limbs of his figures, and a tendency to overstep probability a little in giving such curves and contours to the figures as might serve to intensify their expression and their part in the whole composition, without considering quite sufficiently their compatibility with natural action. We see this manner in the figure of the man mowing in the "Harbour of Refuge," in that of the woman in "Right of Way," and that of the boy in "Wayfarers," and in the figure in the finished study of "Mushroom Gatherers" (65 in the present collection). Yet this peculiarity was perhaps only characteristic of one phase of his artistic career,—the highest phase he lived to attain, but which might, had he been spared, have given place ultimately to a style in which his peculiar genius would have been further developed without this drawback of a mannerism of action. There is none of this in his earlier small works during his book-illustrating period. A good many of the sketches and drawings for these are hung, and serve to show, even more than the engravings from them which are familiar to us, how thoroughly spontaneous his genius was from its commencement.

The works which form Walker's principal claim to posthumous fame may be defined as idylls with a serious aim; works in which a deep sympathy with the nobler aspects of rustic life is combined with a perception of their intimate relation to and harmony with surrounding nature. In a previous notice, on the occasion of the artist's decease, we alluded to his picture at the 1870 Academy, "The Plough" (56 in the Bond-street collection), as the one in which his greatest qualities had been most thoroughly exemplified with it the admixture of any defect of mannerism; and from this opinion we see no reason to dissent on again considering the picture in its connexion with his other works. It is a painting of the future of which (if only it has been *durably* painted as regards execution) there can be no doubt. It is one of those inspirations of genius which at once strike the eye and the mind as one connected whole—the feeling of the figures and the landscape completely in harmony, nothing out of place, nothing interfering with the expression of the leading idea; and in this case the tendency to an exaggerated action in the figure is not felt as a defect, but is natural to the situation, and, simple as the subject is, has really an element of the sublime in it. The "Harbour of Refuge," which hangs in the place of honour at Bond-street, is, we know, looked upon by many as the artist's greatest work; but when a calmer criticism is substituted for the excitement which the novelty and intensity of its feeling occasioned, it must be recognised that the picture has technical defects: the attitude of the mower is exceedingly strained, and the painter has somehow got into confusion in his aërial and angular perspective, between the foreground figures and the buildings and distant figures. The girl in the foreground could never enter the door seen at the end of the paved walk; if the perspective proportions between the nearest and furthest part of the wall be compared with that between the girl and the figure entering the door, this will be at once evident. This confusion seems to have become inextricable in the design; for, in the small repetition of part of it in water-colour (32) the proportion between the foreground figures and the group around the statue is again quite different from that of the large picture, the distant figures being in this case absurdly small; the point of view of the scene is slightly different, but not sufficiently to account for such a discrepancy. The work hung to balance "The Plough" is "The Old Gate," which is remarkable, among other fine points, for the noble character of the figure of the labouring man on the right, and the spirit and contrast in that of the lad accompanying him. There is much sweetness, too, in the figure of the lady issuing from the gate; the best lady, perhaps, painted by Walker, whose artistic sympathies with the humbler class seem to have been in general much closer and more genuine; while in his painting of characters of vagrant life he sometimes recalls the feeling of Wordsworth, to whom a "tramp" or a beggar was never without their common interest of humanity and brotherhood. This kind of feeling is certainly embodied in "Wayfarers" (of the two editions of which the water-colour one is, we think, the finest) and in "The Vagrants," in which again the powerful figure of the woman on the right, with arms crossed, and the smoke from the fire drifting past her, has a great deal of what goes to make the "sublime" in painting, in its own way.

We need not remind our readers of the talent displayed in the now well-known "Bathers" (64), but may just observe that, humble as the subject is, a great deal of what really constituted the excellence of Greek art is shown here in a modern form, viz., the direct study and reproduction of fine free natural action. The figures of the three lads who form the centre group, particularly the two who are just finishing their "unrobing," one kneeling and the other standing, are really noble figures in energy and freedom of action. Among the smaller works which illustrate different phases of the artist's power and conscientious execution, we may mention "The Fishmonger's Shop" (62), a piece of realistic finish and harmony, and brilliancy of colour, worthy of "the Dutch school"; the large study for "Mushroom Gatherers" (34), a dim, cold landscape of much poetic power; the scene from "Philip" (60); "The Ferry" (68) an exquisitely-painted village scene, and to be noted for the character and individuality of all the figures, and the grace and natural attitude of the girl in the stern of the boat; and the "Spring of Life" (71), a little out-door subject literally glittering with sunlight, the more noticeable as Walker's landscapes are in many cases a little deficient in true open-air effect, delicacy and refinement of tone being carried to the extent of rather losing force and reality of light and shadow. There are numbers of small domestic scenes, all full of character and point; we regret, however, to miss one of the most beautiful and refined of all the artist's works of this kind, the small interior, with two girls at a window, which was at one of the Water Colour Society's exhibitions, under the title of "The Rainbow"; this should certainly have been here.

There is no need to say that every one should go and see the collection before it is dispersed, for every one seems to be going.

THE NATIONAL SAFE DEPOSIT COMPANY'S PREMISES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT an ordinary general meeting of this Institute, on Monday evening, the 17th inst., Mr. Henry Currey, Vice-president, in the chair, Mr. Banister Fletcher was elected a Fellow, and Mr. Baldwin Pyke an Associate.

Mr. Lewis Solomons, Associate, called attention to an important law case reported in the *Times* of the 15th inst., in which a decision materially affecting the relationship between architect and client was given. It was held by the judges that there was no evidence to prove the custom of an architect being at liberty to order "extras" without the knowledge or sanction of the client.

Mr. T. Chatfeild Clarke said the judgment went even further than that, and it was a matter of such serious importance to the profession that the case ought to be taken into consideration by the Professional Practice Committee of the Institute.

It was announced that the adjourned special general meeting of members only, for the consideration of the report on the affairs of the Institute, would be held on Monday next, the 24th inst., at seven p.m., instead of eight p.m. as previously announced.

Mr. J. Whichcord, F.S.A., then read a paper (of which the following is an abstract) "On the National Safe Deposit Company's Premises." Mr. Whichcord commenced by stating that the novel purpose of the building which he was about to describe, as well as the great interest of the ancient relics which had been disinterred in preparing for its foundations, would be a sufficient apology for his dealing with the subject of his paper. The problem which the Company undertook to solve was to provide a receptacle in the heart of the city of London, which should be proof against fire, burglary, and riot, and in which property small in compass, but of great value, might be safely deposited. In carrying out this instruction, he wished to acknowledge the advantage which he had derived from the advice of several eminent scientific men, who were consulted by the Company on technical matters. The establishment of public safes had originated in America in consequence of losses which had been incurred by fire and robbery, and safe deposits were now established in New York, Boston, Philadelphia, Chicago, and other commercial Transatlantic cities. After pointing out that ordinary bank cellars could not be regarded as proof against the chance of fire or skilled burglary, the lecturer proceeded to give a detailed description of an ingenious and almost scientific attack which was made last year on the National Bank at Pittson, Pennsylvania. In this case the thieves were alarmed, and made good their escape, but left behind them implements of their craft and all their paraphernalia, and abundant evidence of the extraordinary skill with which their attack had been planned. Mr. Whichcord also mentioned other instances of bank vaults having been penetrated in America, showing the skill and resources of the burglars. The Company in London, having regard to the extended sphere of operation which presented itself, determined to construct a very much larger establishment than any which existed in America. It was found necessary to design a perfectly undrillable armour plating in place of laminated iron plates, as well as to invent a simple contrivance for the numerous doors into which the *sanctum sanctorum* of the larger conception had necessarily to be divided. The first difficulty to be encountered was that of obtaining a suitable site, for while it was essential that it should be in the centre of the City, it was also a condition that it should be detached from other buildings on all sides, so as to prevent the possibility of access from adjoining property. The excavation for the vault in which the safe proper is constructed involved the necessity of going to the very unusual depth of 46 ft. below the street level, and owing to the nature of the soil, and the great lateral pressure of surrounding earth, this had to be executed with very great caution. During the excavations, a very interesting collection of Roman antiquities was discovered, not only curious in themselves, but, owing to the level at which they were found, illustrating the topography of ancient London. The date of the Roman remains was fixed by the coins found with them. They all belonged to the best period of Roman history, ranging from the time of Claudius to that of Antoninus Pius, no coin of later date having turned up, while between these periods the chronological sequence is unbroken. This abrupt cessation suggests that the site formed part of the first Roman settlement in London. Mr. Whichcord exhibited some of the more prominent relics, and said that their wonderful preservation was due to their being found immediately above the clay. He had also brought specimens of Roman piling existing below the remains. He suggested that most of the relics found at the extreme depth of the excavations were as early as the second century A.D. After describing some of the remains and relics thus discovered, Mr. Whichcord went on to describe the erection of the building which he was entrusted to design. The great depth at which the foundations had to be laid, and the treacherous nature of the soil, dictated the necessity of great caution in getting in the foundations, which was done by building the walls in trenches and at short lengths with strutting, of which a drawing was exhibited to the meeting. The external walls were built in very hard brickwork with cement, with a backing of hydraulic concrete of an average thickness of 6 ft. After the enclosing walls were thus laboriously raised to the level of the ground, the earth, within the enclosure, was taken out by means of steam hoists, and a cross wall was built to prevent the possibility of bulging from the great lateral pressure. Having thus secured a chamber, 80 ft. long, 46 ft. wide, and 45 ft. high, within which to construct the actual safe, the latter was made a distinct and isolated structure, with space which enabled the Company's officers to patrol it externally on all sides. The walls of the great safe are 3 ft. in thickness, built of extremely hard blue bricks, and an outer skin of fire-bricks. The brickwork, being intended mainly for protection against fire, was not considered sufficient defence from burglary or riot. A distinct lining of undrillable armour was therefore provided within the walls. A very important item of consideration was the doors, of which there are thirty-two, one to each of the compartments into which the structure is divided. On the principle that the strength of a fortress is only equal to that of its weakest part, it was essential that the doors should be as strong as the walls, and of a different kind from those used in ordinary bank-safes. They are made 12 in. thick, in solid metal, of various qualities, so as to resist either drilling or fracture. They weigh about four tons each, and are absolutely imperforate. They are opened, closed, and locked by hydraulic power, the precise application of which, for obvious reasons, was not described. The vault, as well as the several floors of offices below the ground level, are of necessity lighted and ventilated by artificial means, which Mr. Whichcord explained, together with the nature of the fireproof floors, and other practical details.

In the discussion which followed,

Mr. Paleston, the chairman of the National Safe Deposit Company, said that although he thought he was tolerably conversant with the construction of the unique building upon which Mr. Whichcord had expended so much talent, he had, by coming to hear the paper read, learnt a great deal more about the building, and what he had heard before was now rendered additionally clear to him. The architect's reputation, however great before he carried out the novel building under discussion, could not fail to be materially enhanced by his successful accomplishment of so unique a problem. He (Mr. Puleston) happened to be in America when these "safe deposit" structures were first devised, and he knew that all the conditions of commercial success present in America were present in this country.

Mr. Alfred White, F.S.A., read a brief supplemental paper, treating of the antiquities discovered during the progress of the excavations, and of the additional light which had been thrown upon the Roman occupation of London thereby. There had always been a tradition that the Walbrook was formerly navigable for boats and barges as far as Bucklersbury, although, taking into account the great difference between the level of high water and the present level of the street, it was difficult to realise that such was the case. However, the excavations for the Safe Deposit Company's building, which went to a depth of upwards of 40 ft. below the surface, had completely set the matter at rest. But how surprisingly great was the difference of level now and in Roman times! Perhaps the most interesting discovery made during the progress of the works was that of an *arca finalis*, or Roman boundary mark. These boundary-marks when found could rarely be mistaken for anything else, and might be looked for where two or three or more parishes or hundreds met. They were generally formed by excavating a small shaft, sometimes to the depth of 40 ft., the sides being generally brattised or lined with wood, and the interior filled up with common pottery, metal, &c. Many of these *arcæ* had been found in various parts of the country, but no doubt many of them had been destroyed and all trace of them obliterated, frequently because they were not distinguishable from ordinary *débris* except to a practised eye. Had Wren been alive to the opportunity which was afforded him by having to lay out the city after the Great Fire of London, he would have searched for these boundary-marks, and probably might have been enabled to determine the plan of the whole of Roman London. The metal and other objects found were most interesting. The preservation of the metal was exceedingly good, and was no doubt due to the fact that it was found embedded in the clay, where, in fact, it would have remained for ever without injury. The ironwork was as sharp and as perfect as when it had left the smith's forge. Among the many objects of interest found, Mr. White particularised, among other tools, some mortise-chisels. In conclusion, he urged architects who had to carry out works on historic sites, to keep a sharp look-out for any antiquities that might turn up, especially Roman boundaries, which, although perhaps of no use now, might throw a great deal of light on the Roman occupation of Britain.

Mr. Lewis Solomons said that he had had occasion to give some attention to the subject, and he thought that, prior to the erection of the National Safe Deposit Company's building, the strongest safe of any kind was that which was erected for Mr. Streeter, the jeweller, when in business in Conduit-street. It was of iron in two layers, an outer and inner one, the intermediate space being filled with water. Even though a burglar might succeed in drilling a hole through the outer layer or coat, the water would escape, and in doing so would set ringing a number of electric bells placed all over the house.

Mr. J. E. Saunders, in moving a vote of thanks to Mr. Whichcord for his paper, said that until the advent of Mr. Whichcord's building, he (Mr. Saunders) thought he had built the strongest safe that could be built. Mr. Whichcord had, however, surpassed everybody in that particular line, and had, moreover, constructed a building which the Institute might be proud to acknowledge as the work of one of its members. Mr. Whichcord had given some very interesting details as to the testing of the girders; were any means taken to test the behaviour of the columns while bearing a load and at the same time subject to a great heat?

Mr. Edmeston seconded the motion, and asked what cement was used for the joints of the fireclay casing round the iron columns? Again, he should like to know whether, when the girders were tested by fire in the manner described by Mr. Whichcord, the ends were open at each end or not. Had Mr. Whichcord any special reason for using iron in the columns,—for it appeared to including their surrounding coating of fireclay, him that the sectional area of the columns, would be sufficient or nearly so, to allow for the construction of the support entirely of terra-cotta. There were many other questions of detail which might be asked, although perhaps it would be unreasonable to seek to elicit too much information with regard to a building of this unique character.

Professor T. Hayter Lewis thought that the reading of such papers as Mr. Whichcord's, describing the construction of important and unique buildings, was of great practical service. The reason why such papers were not more frequently read was, that the architect of a building naturally felt some amount of diffidence in describing his own work. He hoped, however, that such a consideration as that would not weigh in the future, for who could so well describe the construction of a building as its architect? He, too, had been concerned in the construction of safes and strong-rooms for banks and companies, but, of course, had never produced a structure which could rival Mr. Whichcord's in invulnerability. He could not imagine how it would be possible either to break into or to burn down that structure. The building was certainly fireproof in construction; but not only so, there was nothing in it to burn, for it should be remembered that what would very often prove to be, under

similar conditions, practically fire-proof construction, was found to fail when made the depository for enormous quantities of combustible materials. Mr. Whichcord was deserving of great credit for the ingenuity he had displayed in a thousand and one little points, but he wished he could find a better term for the innermost part of his safe than "holy of holies."

The vote of thanks having been carried by acclamation, and Mr. Puleston having imparted some additional information as to the precautions taken to prevent the admission to the vault of any persons but those entitled,

Mr. Whichcord, in reply to Mr. Edmeston's first question, said that the joints between the blocks of fireclay casing to the columns were likewise of fireclay. As to the girder which was tested in the manner described, it was not a box-girder, but an ordinary T-shaped one, and the ends were made perfectly air-tight. It was not thought necessary to subject the columns to heat, because the horizontal girder behaved so satisfactorily under a crucial test, the like of which could not possibly be brought to bear upon the vertical column covered with its 4 in. of fireclay. The reason why fire-brick was not employed for the entire construction of the columns was that the weight to be borne was so enormous that nothing but iron could carry the weight within anything like a reasonable compass. As to the substitution of another name for the *sanctum sanctorum*, he had thought of calling it "the bottomless pit," but that name might be equally objectionable.

The meeting terminated with the announcement that the next ordinary general meeting will take place on Monday, the 31st of January, when a paper on "Old Cleeve Abbey" will be read by the Rev. Mackenzie E. C. Walcott.

THE KNIGHTSBRIDGE BARRACKS.

WE believe we may state positively that the War Office has determined on pulling down the unsightly nuisance at Knightsbridge, which has so long stopped the way, and prevented those improvements in the main road to London which are imperatively demanded, and would have been made long before this but for the pile of building in question. The department has been led to this, probably, by the fact that parts of the building are ready to fall and remove themselves if left untended much longer. Whatever the cause, this would seem to be, at first hearing, good news,—a satisfactory result of the loud public outcry which has been raised against the building for years,—if we had not the astounding further intelligence that it is proposed to rebuild the barracks precisely on the old lines. We can scarcely believe the statement, but the position of our informant forbids us to doubt it. A stir should at once be made on the subject. Such of the neighbouring residents as have heard of the threatened rebuilding are, of course, alarmed, and will, we suppose, take means to make themselves heard.

It has been proposed, in view of the statement that the barracks must be kept in the park, that they should be erected nearly opposite their present site, on the *north* side of the drive instead of the south, so that the high road might be improved, both as to width and having open park land next it, and the building take a better shape and aspect architecturally. This would certainly be better than the re-erection of the present most injurious obstruction, but we cannot admit the existence of a necessity for placing the barracks in the park at all, and trust that earnest endeavours will be made to obtain their removal to another and more fitting site.

New Gasworks for Birmingham.—At a special meeting of the Birmingham Town Council on the 11th inst., the Mayor read the report of the Gas Committee, and moved that they be authorised to enter into contracts for the erection of two new gas-holders and an extension of the retort-house and purifying apparatus, at the works at Saltley, at an estimated cost of 10,000*l*. In moving the resolution the Mayor said that the amount they now asked for was only a part of a larger sum that would be required in the course of the next few years. His Worship explained the various additions, alterations, and improvements which it was proposed to make, which would altogether necessitate an outlay of 28,000*l*., and for that they would get an extended supply of gas that would last for six years. The resolution was carried.

THE WESTMINSTER AQUARIUM.

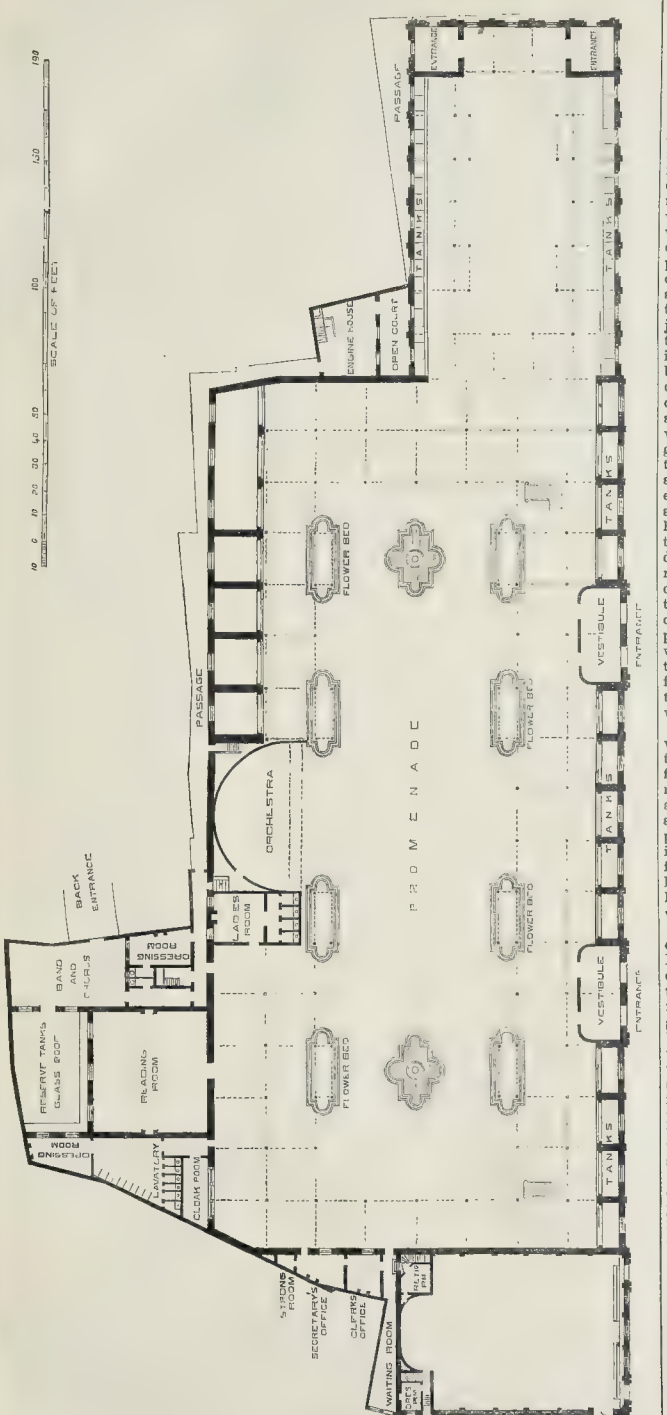
A FEW hours after these pages come into the hands of our readers, the ceremony will have taken place of formally opening to the public a building which, for the rapidity with which it has sprung up and been completed, deserves at least to be regarded as a phenomenon in modern building operations. Only eight or nine months since the north side of Tothill-street, Westminster, was an expanse of waste land of a most uninviting appearance. To-day it is the site of a place of public amusement on almost the largest scale in London and its neighbourhood, including a promenade and winter garden, an extensive range of aquarium tanks, a large orchestra, a collection of sculpture and paintings, billiard-rooms, dining and refreshment rooms, and a new organ and a new theatre "to follow,"—the former being still in the hands of the maker, the latter still in a "shell" condition.* With these exceptions, everything in the institution has been brought to a fair state of completion within the short period named. Certainly the modern contractor is, in his way, a great power.

We gave in our volume for last year† a view of the exterior of the new Aquarium, and in the present number we add a plan, which will show the general form and disposition of the building. As will be seen, there are only two street fronts, architecturally speaking; the *façade* of what is called the "front building," abutting on Princes-street, and nearly facing the west front of the Abbey, and the long elevation extending nearly the whole length of Tothill-street; the return along the narrow street at the west extremity of the site (Dartmouth-street) being little more than a blind wall. The remainder of the enclosing lines of the building accommodate themselves more or less to the boundaries of the surrounding property, and play no part in the architectural design. The public entrances are four, two in the east front to Princes-street (which perhaps might rather be regarded as one entrance with two porches), and two into the main block of building from the Tothill-street side. Entering from the Princes-street end, we find ourselves first in the front building, a parallelogram of about 120 ft. by 80 ft., with a semicircular iron and glass roof, and a gallery supported by a single range of iron columns running round it. Around the walls of this portion of the ground floor are ranged the smaller tanks, with other isolated tanks and a fountain in the centre of the room, and in front of the wall tanks, along the line of the gallery columns, are formed beds of earth planted with large exotic shrubs, while the lower parts of the pillars, with wire trellis arranged round them, are intended to form centres for climbing plants. At the west end the apartment opens out into the main building. It was at first intended to divide the two portions of the building by a solid wall, with only a 6 ft. doorway in the centre leading from one to the other; but this has been reconsidered, and, on second thoughts, wisely abandoned. The whole space is now thrown open, the upper portion of the wall of the main building being carried by a large wrought-iron girder spanning the whole width of the opening. Thus a view of the entire length of the building can be obtained, and a much greater effect of space is secured than if the one portion had been shut out from the other: at the same time we may say that an open colonnade or arcade would have had a better effect than the mere opening, with the uninteresting box-girder over it. However, through this opening we walk into the main building, which is a parallelogram of 340 ft. by 130 ft., the width being taken between the fronts of the tanks, which for the most part form the actual boundary of the floor area. Here the gallery, which runs right round, is more than twice the width of that in the front building, and is carried on a double range of iron columns. The whole of the central portion, between the side galleries, is roofed by one great "barrel vault" of iron and glass from end to end, the ends also forming large semicircular windows, so that there is no deficiency of light in this part, at least, of the interior. The length is divided into five principal bays, each of the width of two interspaces of the iron columns, by the projection at equal distances of two additional columns advanced beyond the main line of the gallery front, and which assist in carrying the main girders of the roof, which are grouped in pairs and connected by transverse ties. Thus we have four main arches or "principals," each the width of one intercolumination, separated by bays of double that width. From an architect's point of view this is the best feature of the building, as a union of effect with constructive arrangement; and it is rather curious to trace in this construction the form and principle of the old Romanesque barrel-vault of masonry, with its main transverse arches over the piers and thinner vaulting surface between, thus translated into the glass and iron language of modern aquarium architecture. The beds for shrubs, &c., we may observe, are formed at the feet of the projecting columns, so as further to emphasise their main divisions. Looking from the east end, where we enter from the front building, the wall to our right in the first two bays is occupied by the largest tanks, seven in number, each about 18 ft. square; the third bay on the same side is occupied by the orchestra; and the area of the "pier" beyond is occupied by ladies' retiring-rooms. In the last two bays on the right the floor area is clear back to the main wall, and through this a door leads to the reading-room, a large apartment, about 48 ft. by 45 ft., and farther on in the north-west angle are the gentlemen's lavatories. To the east of the reading-room is space for the band and chorus, and dressing-rooms for principals, connected by a passage with the orchestra, and reached also from the main area by a door which is too near that of the general ladies' room, which latter does not appear to us, in fact, to be very well placed. The west end, opposite to our supposed standpoint, is closed by the blank wall dividing off the theatre, which is a separate building with a separate street entrance. The south wall, on our left, is occupied in the second and fourth bays with the entrances and vestibule from Tothill-street, and the whole of the intermediate portion is lined with tanks of the same width, and having the same outer finish as the large tanks opposite, but only 7 ft. in depth from back to front. Of the galleries, we need only observe that they are continued right round the building, except at the one point on the north side, where they are stopped by the upper portion of the orchestra. The western half of the galleries is occupied as picture galleries, which are already filled; in the centre of the south gallery, opposite the orchestra, is formed a kind of "grand stand," or inclined platform, for "reserved seats" for hearing the music; and the wide area at the east end is to form the principal dinner or refreshment room. This we think a mistake in point of effect. Dining "in the open" is neither comfortable to the feeders nor to the lookers on; a room divided off is much better. The roof over the galleries is ceiled with plaster (Part's "Martin's cement"), in what we heard called a "coffer" form, but which we should rather describe as a "hopper" form. The light, which is admitted through the side-glass in a raised skylight, with an opaque soffit at the top of each hopper, is lamentably insufficient for the pictures, and some alteration will have to be made here. The additional space in the roofs behind the raised pediments towards Tothill-street is utilised for billiard-rooms, reached by stairs from the south gallery. This is the only second floor in the building, or at least the only one with which the public have anything to do. Of the theatre we say nothing at present, as it is only as yet in a very early stage in regard to interior construction and fitting up.

So much for what is seen, or to be seen, of the building; but what is not seen is equally important. The visitor who parades the wide boarded floor of the main building is, unawares to himself, walking over "a waste of waters." The whole of this portion, beneath the floor level, is divided off into nine large brick tanks, separated by thick walls, and with invert and culvert arches. These are all laid, in the first instance, on a thick bed of concrete, extending over the whole centre area of the site, and when in addition to this it is remembered that each of the main walls stands on concrete footing 9 ft. in width, some idea may be formed of the amount of value in labour and material which has disappeared beneath the ground level, before the architectural portion of the structure arose to view. Of these nine tanks two contain fresh water, all the rest sea-water, and these latter are connected so that the water admitted at the west end of the building has a continuous flow through all the tanks, is pumped up and used in the glass tanks, and then re-collected

* In the original plan this apartment is designed as a concert-room, but is now to be fitted up as a theatre: a far better use to make of the space, as musical performances are already provided for in the main building, and a good theatre in the neighbourhood of Westminster is much wanted.

† Vol. xxxiii., pp. 392, 393.



ROYAL AQUARIUM AND WINTER GARDEN, WESTMINSTER.—*Ground Plan.*

and taken round to a head, whence it circulates again through the tank system. The engine-room is in the north-east angle of the walls of the main building and front building, and near this point are two wells, into which the sea-water and fresh-water respectively flow, and from which they are pumped by four pumps to each well. One engine does the work; but two, as usual in such cases, are provided to prevent any catastrophe in the event of a breakdown; as a stoppage of two or three hours in the flow and aëration of the sea-water in the tanks would be fatal to a large proportion of their occupants. Arrangement is made for disconnecting and emptying any tank for repairs, without interrupting the flow of the water, which is continued through a pipe from one wall of the tank to the other.* These pipes, and all pipes through which the water is conveyed to the aquarium tanks, are of vulcanite; a point insisted on by Mr. Lloyd, the naturalist to the Aquarium Company, as iron acts injuriously on the health of the animals which are to live in the water supplied through it. At the instance of the same able adviser the lining of both the supply-tanks and the living-tanks is done with asphalte; cement having a deleterious chemical effect on the water. The laying of the asphalte was attended with some difficulty, as when placed, at a heat of 300°, on the bricks, it generated steam where the bricks were more than ordinarily wet, raising the surface of the asphalte, which had to be perforated for its escape and then made good again. From this, as well as other causes, a good deal of trouble has arisen from temporary leakage in the supply tanks, the position of the leak being often difficult to find, and the only test of the tightness of the tank being to fill it with water and observe any alteration in the level. However, this has all, we believe, been successfully got over. The large living-tanks are built so as to provide a due foundation for the considerable weight of water which they will have to carry; the pressure on the walls being distributed on the foundation by inverted arches below, discharging the weight on to a bed of concrete, and filled up with concrete to the level of the tank floor.

The building is warmed by hot-water pipes, which obtain their heat by the water passing through chambers filled with the waste steam from the engines, and are continued in a flow and return along a continuous chamber, covered with an iron grid on the floor level. The gas-pipes are laid in the same channel, so that all these pipes are together, and within easy reach; and into this channel also the necessary drainage from the flower or shrub beds is carried. The kitchen is over the engine department, with a hoist down to the level of the gallery floor, where, as we observed, dinners will be served.

The roof, which, as far as its construction is concerned, has been carried out by the Thames Ironwork Company, appears an admirable piece of work, and we are assured, by those who ought to know, that the accuracy of the casting and fitting could not be surpassed. Indeed, the generally excellent workmanship throughout the building is remarkable, considering the rate at which it has been got up. The glazing is on a principle which has never yet been applied on so large a scale, and the result of which, in this instance, we shall be interested to observe. The principle is that patented by Mr. W. E. Rendle, to which we devoted a commendatory note in the *Builder* of January 30th, last year. Its speciality, as our readers may remember, consists in dispensing with putty, and all other extraneous compositions for ensuring watertight joints, and simply inserting the glass in grooves formed by zinc fixed on wooden cross battens secured to the iron ribs, into which grooves the water runs at the foot of each pane of glass, and from a cut in the centre of the zinc drains on to the centre of the pane next below; the panes are laid side by side with a vertical lap of about ⅜ in., over and under alternately, and it is asserted that any water which may be blown through the joining would simply run down the inner surface of the glass, where again it will find a drain groove to carry it harmlessly away. The behaviour of so large an area of roof as this in a strong wind, accompanied by rain, will be about the most severe test it could be put to. We hope it will prove entirely successful, for every constructive invention which tends to do away with artificial and perishable cementing of

* We presume the division of the water into various tanks is mainly with the object of facilitating repairs of this kind, and of dealing more safely, and in the end more economically, with so large a body of water.

any kind, and make the construction depend for its success on the method of putting the materials together, is a step in the right direction, both architecturally, and, in the long run, economically.

The floor of the main building is, as we observed, of wood on joists laid on the top of the tank brickwork; the floor of the front building is, however, of Minton's tiles, in a simple but, on a large scale, effective arrangement; and the east porches are laid with random mosaic (Burke's) in the same manner which has been used in the corridors of the Manchester Town-hall, where we last drew attention to it. Some mosaic of more artistic pretension, containing figures of fish and marine plants (a sort of section of the sea, in fact), which we saw being arranged on the floor of the main room, we presumed was intended for a similar position in the Tothill-street entrances.

The orchestra appears to be well constructed for sound; it is enclosed in a large alcove or apse the full height of the gallery roofs, entirely of timber construction, and finished with canvas-covered boarding. The organ, which has been superintended by Dr. Stainer, is being built by Mr. Jones, of Fulham. It cannot, from the space, be a very large one, though there will be more of it than appears externally, the large pedal pipes being relegated to the back of the orchestra. As the main floor is continued under the orchestra, which is merely, in fact, a fixture built upon it, the sound of these pipes will travel well enough.

Ventilation does not form part of the regular scheme of the building. There are louvres in the roof for carrying off foul air; for the admission of fresh air the general opening of the entrances, &c., is trusted to. In a building where there will be such constant ingress and egress this may very probably be sufficient; there is no doubt it will create considerable draughts in cold weather. The regular admission of air through the hot-water chamber would have been more to the purpose. In the reading-room, where we are told also that no special provision for the introduction of fresh air is made, the deficiency will unquestionably be felt, and felt seriously, when the room is full, more especially as it is rather low for its size; and alterations must be made if the room is to be healthy for occupation. It is astonishing how often it is necessary to repeat the truism, that regulated supply as well as escape is a necessary condition of proper ventilation.

Before concluding with a few general remarks on the new edifice, we may just mention that the whole arrangement of the living-tanks and everything connected with the naturalist department has been done under the direction of Mr. Lloyd; that the florist is Mr. Wills, fellow of the Royal Horticultural Society; the carving has been done by Mr. Bromfield; the glazing of the east window and the decorative painting on the walls of the east galleries by M. Durand, of Paris, for whom Mr. Weigner is the English agent; the ornamental tiling is Minton & Co.'s; the engineers are Messrs. Leete, Norman, & Edwards; and the heating apparatus is supplied by Mr. Phipson; the gasfitting by Messrs. Forrest & Sons; and the lavatory fittings by Mr. Jennings. The general contractors were Messrs. Lucas, whose contract for the main building was nearly 90,000*l.*; but, of course, there have been many additional smaller contracts for special branches. Their foreman at the building throughout has been Mr. Robertson. The work has been done under the superintendence and from the designs of Mr. Bedborough, architect, and under the immediate supervision of Mr. Greenman as clerk of works.

As to the general aspect and finish of the interior, it may be at once conceded that it would be unreasonable to look for anything very noteworthy in the way of artistic detail or effect in a building got up against time to secure a speedy return for the outlay. Many things might have been worse, some might certainly have been better. The general effect of colour in the iron work, a warm bluish tint lined out with strong red, and with gilding in the capitals, does well enough. The fronts of the principal tanks, finished in black enamelled slate with polished granite sills, and marine tile-pictures in the spandrels and pilasters, are very satisfactory in effect. The small tanks in the front building are of the same black slate, with a bordering of white tiles with a green leaf pattern along the lower edge; and the principal centre tanks, in the middle of the apartment, formed of the same material, are relieved by pillars and angle shafts of red marble. These are, however, in the form of balusters: we never saw the baluster form used so before, and do not like it; shafts would surely have looked better. There have been some special designs furnished for gas chandeliers, those in the galleries taking the form of a large starfish, with the burners at the points; those down below, which seem to be thought a good deal of, are a combination of sea-horses (the natural fish, not the conventional sea-horse), swans, and water-reeds. The small fish which has got the name of "sea-horse" from the shape of its head forms, from its characteristic and spiney outline, a very good subject for metal work; but while it is introduced here about twice the natural size, the intermediate swans are models about 4 in. long: of course the contrast of scale is absurd. If the swans had been omitted, it would have been a rather good bit of suitable novelty in design. Did the designer possibly think of the "sea-horse" as an animal of the same scale as the land quadruped,—as a mount for the "horse-marines," in fact? The worst thing by far in the interior is the tawdry coloured glass put by the French firm aforesaid, into the east window, with the object of hiding the roofs of the other buildings outside; it does not effect this, and looks hideous in itself. The wall-decorations adjoining, by the same firm, are much more delicate in effect, and rather pretty, though in a taste that few English decorative artists would approve. They are produced by a special process, said to combine rapidity with economy. The manner, by the way, in which the ends of the two semicircular roofs of the main and front buildings are seen from each interior, with their lines cutting across each other, is very unfortunate, and should have been foreseen. The lighting of the interior is well arranged, and there is an arrangement for lighting the rows of burners at the cornice above the galleries; a small lamp is slung up in chains, and then with a pull of the chains travels along a sliding bar just below the row of gas-burners, lighting them as it moves. The reading-room is being specially decorated, apart from the rest of the building, by the Tinfoil Company, whose process quickly and economically realises an effect, but can hardly be very durable. The general furnishing of the interior includes stall-stands, or *boutiques*, for the sale or display of goods, and also numerous refreshment buffets, the contracts for all which are taken by Messrs. Bertram & Roberts, who furnish the whole of the commissariat department. Of the general effect of the whole when filled, and the objects of statuary, fountains, &c., completely arranged in the centre of the hall, we cannot, of course, speak at the time of writing these remarks. We may just observe, however, that those who, from the statements in the newspapers, may have been led to believe that there was anything like a fine collection of pictures, in the artist's sense of the words, to be seen here, will find themselves disappointed. There is a very good shilling's worth of square feet of pictures for the interest of the general public; but, in spite of the presence of a good name here and there, little to attract from an art point of view, at least as far as the oil paintings are concerned. The sculpture seemed to promise more: we noticed some good works awaiting their final placement; and, considering the great disadvantage sculptors are under in any of the recognised exhibition-rooms, we should not be surprised if some able artists were glad to avail themselves, as they did in the recent annual "International" exhibitions, of the opportunity of exhibiting sculpture in a good light and with plenty of space round it, and with the adjuncts of foliage as a background.

Of the exterior of the building, architecturally considered, if we decline to say much, it is on the ground that much cannot be said. The materials are Fareham brick, and Portland and Bath stone; the latter, to use the happy generalisation of the *Times* reporter, "freely introduced and elaborately carved." This elaboration of carving is chiefly in the direction of dolphins; and Neptune appears in the pediment, and other emblems convey sufficiently to the bystander the aquatic objects of the building. It is only fair to add that the system of building against time renders anything like well-considered architectural style next to an impossibility, and when everything is wanted all at once an architect must be reduced to a great extent to working up the stock materials ready to his hand. We must be permitted to hope, however, that the style of the New Aquarium will not be taken as a *point de départ* for other new buildings in the neighbourhood.

THE PRESENT STATE OF THE LAW RELATING TO LIGHTS.

THE INSTITUTION OF SURVEYORS.

At the meeting of this Institution, held on Monday, the 10th inst., a paper "On the Present State of the Law relating to Lights," previously read by Mr. W. Dundas Gardiner, was discussed; Mr. Squarey in the chair.

Mr. Chatfeild Clarke and Professor Kerr, who were unable to be present, on account of the special meeting of the Institute of Architects, sent their remarks in manuscript, which were read by the secretary, Mr. Rogers.

Mr. Clarke commented on the completeness with which Mr. Gardiner had dealt with every portion of the subject. He wished to present to the meeting some practical thoughts on the means by which the constantly-recurring troubles and difficulties about "lights" could be met and dealt with at once inexpensively, quickly, and yet equitably. It could not be denied that many of the cases now brought before the courts were not genuine, but were promoted by persons who hoped, by delaying the course of a building, and thereby jeopardising important interests, to extort a sum of money from the parties to settle the matter. He by no means denied that there were cases of great practical hardship which arose, and the great point for the consideration of surveyors as a practical body was in what way could these be dealt with speedily, economically, and efficiently? His view was that two or three courses should be followed. Firstly, that the court should arrange, at an early stage of the proceedings, to appoint a professional architect or surveyor to advise on the whole of the facts, after a careful inspection of the premises, and that this should be done prior to the court receiving any opinions of professional men in the form of "expert" evidence or by way of affidavit. Secondly, that in all cases where such an adviser is called in, he should be at liberty to require the parties claiming to raise any buildings by which it was alleged the light would be excluded to put up temporary screens in such a mode and form as would enable a professional man to judge of the effect of the alleged obstruction, this trial to be made on more than one occasion. Thirdly, another of the most difficult elements in these cases was to determine how far the alleged diminution of light was "sensible and material," and it was upon this point that great conflict of opinion arose. It was clear that the light to select diamonds by was in no sense on a par with the case of the light of an ordinary warehouse, and what was material in one case was immaterial in the other. Such instances might be greatly multiplied, especially in the metropolis, where such multifarious trades were carried on. His view was that the courts should have power in each of such cases to call in an independent man, cognisant of the special trade, to advise, without any bias or presumed bias on either side. The evidence of such witnesses would greatly shorten the proceedings and expedite a settlement of such cases. Then, again, the mode of conducting these cases by affidavits and counter-affidavits, and replies on such, led to much delay and expense, though this point would probably be met by the powers of the new Judicature Act, which enabled the Chancery Courts to take *viva voce* evidence. There were one or two grounds of settlement in these instances which were often resorted to in amicable arrangement, and which might be extended in use with great practical advantage, one being that where a building is raised opposite another, each retaining rights of light, the party first raising shall absolutely contract with the other to give a right to raise to a similar height at another time hereafter, each party having the power to attach this right to the property. There was another plan, adopted, he had been told, on the Continent, of requiring a certain well-hole or area to be left in proportion to the height to which it was proposed to go. In many cases this suggestion would seem to meet the equity of the case, but only to a limited extent. It was manifest that the oft-quoted angle of 45 degrees from the wall of the opposing lights was no true ground of deciding as to the material loss of light, and it would be much to be regretted if such should become, under all circumstances, an accepted rule. In a recent case, cited in Mr. Gardiner's paper, he (Mr. Clarke) felt certain that the most accurate test by applying an obstruction above the 45 degrees line to a moderate height would have made no sensible or material diminution of light to the dominant tenement. The

subject was full of interest, and of points for discussion and elucidation.

Professor Kerr said he had read Mr. Gardiner's paper with extreme interest, and he thought that gentleman was entitled to gratitude for the clearness and conclusiveness of his explanations. But he wished he could more readily confirm Mr. Gardiner's opinion that the result of the development of the law of ancient lights during the last few years had been to reduce it "to principles easy of comprehension and enunciation." His (the speaker's) experience as what was called a "scientific witness" led him, he regretted to say, to an opposite conclusion. The uncertainty of the law with regard to disputes connected with building operations generally was notorious; but he was obliged to confess that in cases concerning ancient lights, the bewilderment of all alike who were engaged in the controversy seemed to be more astonishing than in any other kind of business he knew. It was no doubt true that by means of the series of judicial decisions which Mr. Gardiner had so lucidly set forth, with others touching collateral points, the Chancery Courts had, to all appearance, determined the general bearings of the law, and left scarcely anything open for controversy in the form of leading principles. But when Mr. Gardiner added to the proposition that such principles were now "easy of comprehension and enunciation" the suggestion that they might nevertheless be "difficult of application to the varying circumstance of the different cases," it seemed to the speaker to account for all the confusion of law which the surveyor saw where the lawyer saw none. In other words, the lawyer had to do with abstractions, which might be more or less readily reduced to a system of principles sufficiently "easy of comprehension and enunciation"; but the surveyor or architect had to take up a multifarious variety of circumstances, and here he found the "difficulty of application" of those principles to be such that the very principles themselves too frequently vanished into mere suppositions. To take, as an example, the question of adding to the area of ancient lights, as set forth by Mr. Gardiner in his paper. The lawyer supposed a typical case, and one that should narrow the issue to the utmost. His (the speaker's) neighbour had an old window in a wall which stood against his open land. Through his neglect that window had remained unobstructed for twenty years. It might have been obstructed by him at any time by the usual and simple means of setting up a board so as to cover it. If he had not so obstructed it, the fault was his own, for he was supposed to know how to protect the interests of his property. When he continued to neglect the protection of such interests, the time must come when it would be unfair to assert his old unprotected rights against the conditions which he had allowed his neighbour to rely upon so long. Accordingly, having thus permitted his neighbour to use the window for twenty years, the law said,—and perhaps reasonably enough,—that the time had come when his neglect should be conclusive against himself; therefore he was now prohibited for ever from putting up a board against his neighbour's window. But his neighbour increased the size of the window; thereupon he put up a board against the increase, scrupulously leaving uncovered the exact area of the ancient light, but definitely obstructing all the rest. Nothing could be simpler, and out of this simplicity of imaginary circumstances the logic of legal argument arrived readily enough at a theoretical principle. Thus far the surveyor, as the practical man, concurred absolutely; but how long did such concurrence last? Not for a moment when the theoretical principle had to be practically applied, for the lawyer assumed that, because the case narrowed the issue to the utmost, the principle was, therefore, comprehensive to the utmost. That window should represent all windows; that enlargement all enlargements; that obstruction all obstructions; but the surveyor was constrained to declare that, as matter of fact, so multifarious were the peculiarities of building operations, that the narrow issue supposed never really occurred at all. All other kinds of windows, all other kinds of enlargement, and all other kinds of obstruction except those named in the suppositions case, were what had to be dealt with in actual practice. Let any surveyor who had had much experience in cases of actual litigation about ancient lights call to mind how many other abstract questions there were, and much more complicated, even, than the one mentioned; how many ingenious contrivances there were for the assertion of convenient rights, how many desperate schemes for the evasion of inconvenient wrongs; and he would agree with the speaker in asking the learned lecturer to pause before he attributed too much importance, as regarded the public enlightenment, to the mere assertion, by a succession of able logicians, of a succession of abstract principles, the difficulty of applying which in unforeseen circumstances rendered each new case in reality a new question. This was all he would venture to say about the law; as a practical man, he found it in utter confusion. But the chief concern of surveyors was not with the application of dogmas of law, but with the preliminary appreciation of materiality of damage. If there was no material injury occasioned by any given obstruction, there was no case for further inquiry; and upon this very delicate point the skill of the surveyor came in to determine the matter of fact. Here it was no doubt essentially necessary that the surveyor thus intervening should understand the maxims of the law, such as those which were so ably expounded in Mr. Gardiner's paper, otherwise he would be prone to direct his attention to points of no real moment. With respect to the conflicting testimony sometimes given by professional witnesses in ancient light cases, Professor Kerr said it ought to become an earnest endeavour amongst architects and surveyors to come to some distinct understanding as regarded the principles upon which they should estimate the materiality of damage. It would be known to many that he had attempted to establish, by a geometrical admeasurement of sky area, a preliminary test, if no more, of proportional obscuration; but he was obliged to acknowledge that Mr. Gardiner was right in stating that such efforts had met with little favour in the courts,—the reason, he (the Professor) was accustomed to think, lying chiefly in the fact that the learning of the bench and the bar alike, however profound, did not turn, and could not be expected to turn, very much upon spherical trigonometry. Vertical measurements of obstructions, however, were not uncommon, and he had not found them to be distrusted by the courts, although they were not worth much. A concluding word as to what was termed "direct evidence." A court of law always preferred that kind of testimony, upon whatever subject. The plain story of people who described what they had seen with their eyes and heard with their ears, was naturally esteemed to be infinitely better than the mere opinions of those who arrived at their conclusions by speculation. In cases of damage to lighting, what was this direct evidence? It took the form of various kinds of assertions by such persons as inmates of the plaintiff's premises, to the effect that they had actually by their eyesight perceived the lighting to be materially diminished by the obstruction complained of. He felt bound to say that throughout his experience he had scarcely ever known such evidence to be worth anything at all. The conditions of the atmosphere in this country were so changeable, day by day, and even hour by hour, and the effect of this upon the lighting of a room was so very considerable, that he did not believe any one could trust his mere eyesight as a test in this way, unless in very exceptional cases. He had known gas bills referred to, and the alleged hour of lighting the gas in the afternoon or evening was continually being quoted. To give a single instance of the real value of such evidence. At a certain window in the rear of an eating-house, an old servant had cut ham and beef for some thirty years. A row of houses outside this window was pulled down, and a new building erected in their place. When the new building had reached a certain stage, the operator upon the ham and beef laid down his carvers and declared that he could no longer see to cut. All over the eating-house the gas was lighted early in the day. All this was sworn to; but a shrewd Vice-Chancellor sent some one to measure the walls. It was found that the new building was not yet so high as the old one had been! His (the speaker's) opinion of the whole question of ancient lights, if he were asked to express it in a few words, would be this; that legal acumen was wasted upon it, and that an intelligent and honest surveyor's judgment, taking every case on its own merits, was better than all the litigation in England. He was very much mistaken, moreover, if that was not the opinion of the majority of the Judges themselves.

Mr. E. I'Anson said he had read Mr. Gardiner's paper with great interest, but he was afraid he should not be able to add much to the general stock of knowledge. As to the remarks of Professor Kerr, they were characterised by a great deal of most sound and excellent argument, but did not appear to point to any solution of the difficulties of the question. He (Mr. I'Anson) had now, for the past thirty years, been professionally concerned in a great many cases involving questions of ancient lights, and was more than ever impressed with the difficulties of the subject. He agreed with Mr. Chatfeild Clarke in characterising the subject treated of in the paper as one of extreme professional interest. There was no doubt, as Professor Kerr had said, that frequently, when questions of this sort were litigated, they were promoted in the most grasping, selfish spirit, for the sake of making some paltry profit, to the immense loss of some adjoining owner. As to the conflicting evidence sometimes given by professional witnesses, it was, no doubt, partially to be explained by reason of the natural leaning which the surveyor had to serve his client, partially by the manner in which the surveyor was engaged by his client, and partially by the manner in which his client's solicitor "improved" his affidavits. The real difficulty in all such cases was to say how much light was light enough. The question in all cases was as to the material damage. There could be no doubt, as Professor Kerr showed in his diagrams, that if you obstructed a certain proportion of the arc of a circle you obstructed a certain proportion of light, but it was not true to say that if ten degrees of the horizon or zenith were obstructed, that quantity of light would be obstructed, as the light coming from the horizon and the zenith was not so valuable as that coming at an angle of 45 degrees. It was very difficult to lay down any certain rule by which it could be shown what was the diminution in value of property caused by interference to a greater or less extent with the uninterrupted enjoyment of its ancient lights. He recollected the case of a gunmaker in Whitechapel, who used to prove his gun-barrels by looking down them while they were at such an inclination as enabled the light to shine down them. This was a case where a certain angle of light was absolutely necessary. He thought that the twenty years' occupation worked very hardly indeed in respect of lights acquired by prescription. Twenty years in the life of a building was a very short period, especially as many buildings were put up which would last for two centuries easily. Some modification was therefore necessary. Mr. Chatfeild Clarke had suggested that before a building was erected there should be some competent surveyor appointed to determine what were the facts. That was very well, so far as it went; but he (Mr. I'Anson) thought it would be well if some competent person,—perhaps more than one,—were appointed to say what would be the damage, in their opinion, in the event of certain obstructions, or assumed obstructions, taking place to ancient lights, and informing the person wishing to obstruct of the amount of damage, giving him the option either to pay the amount or to forego his building. The settlement of such cases was beset with great anxiety to professional men, who all endeavoured to arrive at the truth, though the complexity of the subject was so great that it was a matter of extreme difficulty to determine the amount of damage. It very frequently happened that the surveyor did not get the whole of the facts before him.

Mr. Edward C. Robins, in a written communication to the Hon. Secretary, Mr. J. W. Penfold, said he was anxious to press one point, and to hear all the arguments *pro et con.*, viz., Was it not desirable that it should be an established and well-recognised custom that (in towns, at all events) no damage to existing lights should be deemed to have arisen where the building owner kept the front wall, roofs, and all (except chimney-stacks) under a line drawn from the lowest window-sill of his opposite neighbour's premises at an angle of 45° with the horizon? He (Mr. Robins) was surveyor to the Dyers' Company, and conducted the experts' evidence in a case between that company and King, referred to in the paper, and in which that angle was enforced. He had settled out of court many cases upon the same basis, and in a recent case before Sir George Jessel, both parties consented to this mode of decision. Let this once be recognised, and the question of compensation had a basis from which to work, all attempting any rise above that line to be either a subject for compensation or injunction, as the case might be.

A cordial vote of thanks having been given to Mr. Gardiner for his paper, the meeting ter-

minated. The next meeting will be held on Monday, the 24th inst., when a paper on the subject of "Fences in Agriculture" will be read by Mr. Gray, of Dilstone.

ARCHITECTURAL PRECAUTIONS AGAINST EARTHQUAKES.

IN a report addressed to the Minister of Public Instruction in France, M. Lescasse, a French architect and engineer resident in Japan, observes that earthquake-action, and its consequences, have attracted much attention wherever such phenomena are of frequent occurrence, but nowhere more so than in Japan, since the use of masonry for building purposes has been encouraged by the Government of the Mikado.

It would seem that solid walls of masonry, with massive timber roofs and floors, are less secure, and far less durable, than either of the buildings heretofore in use in Japan, or ordinary wooden structures. But the rapid decay of timber in Japan renders it unsuited for large edifices or public buildings.

M. Lescasse's first idea was to use wood, but to replace the portions most liable to decay, such as the wall-plates (Japanese *dodaï*), and the larger stanchions (*hashvia*) with ironwork. The additional expense thus involved proved very heavy.

Some experiments undertaken by him, at the instance of Dr. Murray, before preparing the plans for a large college (*Kaï-sui-gakko*), suggested a method that he ventures to think may prove of service, not in Japan alone, but wherever earthquake-action is prevalent. Whether it is a novelty, pure and simple, is of no great consequence, although he feels bound to state that neither he nor any of his friends to whom he has described it have seen it in use before. What is more to the purpose is that it should be widely known.

Suppose a wall of dry bricks (without mortar) to be built upon a table. If the table is violently shaken the edifice will topple down in all directions, like a house of cards. But let the pile of bricks be bound together in a block with twine, or wire, or hoop-iron, and it will only fall over bodily, backward or forward. The idea thereby suggested was to build in bays, so bonded together that breaches of continuity would be impossible.

To build the walls in bays, formed of stout wooden frames, firmly secured one to another, and to prevent the structures so raised from falling over outward or inward, by using strong transverse frames, firmly united to the former, appears a method at once simple and feasible, and in several cases M. Lescasse has employed it for wooden structures with complete success, notably in the college of the Rev. Father Nicolai, at Suragee Daï, Yedo.

The application of the same principle to masonry, by employing a surface arrangement of iron cramp-rods, appears equally simple and effective, the more so, as the iron rods are applied in directions where their power of resisting a strain is greatest. The dimensions of the cramp-rods will, of course, depend upon the structure. In Japan, the increased cost thus entailed may be reckoned as 10 per cent. on the prime cost of the wall.

CONSISTENCY AND REFINEMENT IN ARCHITECTURAL DETAIL.

ARCHITECTURAL ASSOCIATION.

IN the discussion which followed Mr. Seddon's paper (see p. 59, *ante*),

Mr. John Salman said that he was the questioner who at the previous meeting had asked Mr. Burges whether the architect of the present day should aim to be eclectic, and he thanked Mr. Seddon for his reply, which appeared to be "Yes, with certain limitations." If he remembered rightly, he put his question with somewhat the same limitations, believing that eclecticism should not be a jumbling together of odd scraps of different styles, but that, as "heirs of all the ages," modern architects should use the best points of all styles in their work, especially in the best of their work. Mr. Seddon had insisted upon the necessity of common-sense as a basis of all good architecture, but what was common-sense? Were they to take up the vernacular, the ordinary form of speculative building, and endeavour so to refine and beautify it with consistency as to form an architecture of the present? Or were they to go upon the system they had already been pursuing, *i. e.*, taking an old style as a starting-point, and almost torturing their buildings to make them fit the style? It seemed to him that the time had come when the whole matter must be looked at in the face. Probably most of the members present had been working in the Mediæval styles, but it seemed to him to be rather a tendency of Mediævalists to put common-sense on one side if it happened to clash with what they called good architecture. It appeared to him that such was not a proper course to pursue, and that it would be advisable to revert to simple forms which would meet the bare wants of construction, and refine them and make them beautiful with consistency. Of course it was a tremendous task to endeavour to take up hints from various styles and so to fuse them as that they should be consistent; but nevertheless that seemed to him to be the right method. It struck him that it would be advisable in future to take the vernacular or common-sense forms of building, taking one style as a general key-note with which all the architectural details should harmonise. Success seemed to be more easy of attainment by taking one style and modifying it to suit present-day wants, than by seeking to evolve an altogether new style.

Mr. Stannus remarked that, excellent as was Mr. Seddon's paper, it had not gone farther than the enunciation of general principles, in the laying down of which probably all would agree, although differences of opinion would arise in the application of those principles. Roman art, it was true, became utterly degraded, but it had a germ of good in it. He did not think Mr. Seddon had been quite just in speaking of the manner in which the Italians in the Renaissance period revived Roman architecture. The buildings of the quattro-cento period, by such architects as Bramante, were possessed of common sense in a marked degree, and for soundness and honesty of construction might have been designed by Mr. Seddon himself. He thought Mr. Seddon had not been sufficiently explicit in pointing out that the characteristics of a style of architecture must to a great extent be the outcome of the kind of materials available. The Greeks had large stones, which enabled them to build in a trabeate or lintel style. The Romans had no large stones, and consequently they were compelled to use semicircular arches in the architectural coverings of masonry to their brick buildings. But in consequence of their great thrust, semicircular arches could only be used when strong abutments were readily available, and this was the reason why in the Middle Ages the monks and religious corporations adopted the pointed arch, which had little or no outward thrust, and therefore allowed of the building of two or three bays at a time, which would have been impossible if semicircular arches had been used. Coming down to the present time, in London we were situated on a bed of clay, and therefore we built principally in brick, and it was certainly not impossible to get good architecture by the use of so homely a material. Indeed, he believed that there was much more good architecture produced when the architect had small means at his disposal; for in lieu of the meretricious carving with which unlimited money enabled him to cover his building, he was obliged to rely upon good proportion and breadth of effect.

Mr. H. L. Florence said that the architecture of the present day corresponded very much with the thoughts and habits of the people of the age. The modern mind was exceedingly complex, and consequently there was a great diversity in our buildings. What we most needed was simplicity, which was, indeed, generally, if not always, synonymous with the refinement Mr. Seddon desiderated. Many buildings were spoiled because their design originally was not sufficiently simple. They were generally overdone, and the paring and pruning down on account of financial exigencies invariably resulted far more unsatisfactorily than would have been the case had a simpler design been kept in view from the first. If the proportions of buildings were more carefully studied, a great many of the defects of which Mr. Seddon complained would be got rid of.

Mr. W. W. Robertson said he was particularly interested and instructed by Mr. Seddon's short and clear analysis of the different periods of architecture with respect to the two qualities of consistency and refinement. Certain periods were characterised both by consistency and refinement. At other periods, consistency was present, though not refinement; while in other periods, refinement was present though unaccompanied by consistency. Much had been said against Roman art; it was undoubtedly lacking in consistency, but did it lack refinement? There would be no difference of opinion as to the fact that, with regard to the architecture of the present day, the qualities of consistency and refinement were in the majority of cases conspicuous by their absence. In considering the matter it occurred to him whether this was not the result of certain disadvantageous circumstances under which the architectural profession laboured in the present day? The present was a period of immense pressure. Every one was anxious to make a name, and there was a temptation to leave the beaten track of excellence and try to do something "striking." The architect newly engaged in practice was too often absorbed in thinking how he was to "strike" the public,—how he was to force himself upon public notice; he felt that he must do something "acrobatic,"—something that would "stun" the public. This was the result of competitions. In a competition, the architect who would obtain the commission must do something "striking"; and even when he might subsequently desire to prune his extravagances he found that he had already spent so much time on the design that he had no time to alter it, at any rate, with any satisfactory results, even if his client were willing to allow any pruning, which he generally was not, thinking that the architect wanted to escape from his bargain if he sought to remove some of the excrescences of the design.

Mr. Elkington, jun., put in a plea for some of the buildings erected in the City as satisfactory adaptations of the vernacular. In some of the large warehouses and buildings of a like unpretentious character, the qualities of consistency and refinement were frequently very well expressed. Of course, such buildings afforded no scope for anything like high art, but they were extremely interesting as showing what could be done with simple materials when the architect had a definite aim before him. In such buildings the question constantly arose as to the best manner of treating constructive ironwork. Could Mr. Seddon give his ideas on the point?

Mr. Lacy W. Ridge said he agreed with Mr. Robertson's remarks as to the demoralising and vitiating tendencies of competitions, which elucidated the very peculiar paradox he had put before the meeting. He said that the architect must do something "striking" to make a name, and that that would prevent him from going in for common sense and refinement. On the other hand, it was constantly being declared that the public did not care a bit about architecture; all they wanted was common sense. This was the reason why, for their ordinary dwelling-houses, they were not only content with, but actually revelled in, the work of the speculating builder; but when they wanted anything extraordinary, or what they were pleased to think must be extraordinary, they invited any number of architects, and unfortunately they got them, to send in designs. These competition designs, as a rule, positively luxuriated in extravagances and excrescences, such as, indeed, an architect would never think of suggesting to a private client. The advice had been given that it would be best to begin with the vernacular; he (Mr. Ridge) thought that was bad advice, because the vernacular was "nasty." If "the vernacular" meant anything, it meant the ordinary run of speculating builders' houses. He advised the student not to begin from the "vernacular," but to go back one stage farther, and begin *de novo* from common sense. They had to deal with doors, windows, walls, roofs, chimneys; let them think what each of these should be, and start from that basis. Notwithstanding the numerous revivals of styles which the last few centuries had witnessed, we were not one iota nearer a new style. While he did not think the buildings of the present generation of architects were worse than those of their immediate predecessors, he could not say that they were very much better. He thought each man ought to work out his designs from one to another, adopting (if in a modified form) what was successful in one design in his succeeding designs, instead of seeking to design something entirely different. If this course were pursued, greater individuality would be expressed in our buildings, and the chances of the evolution of a new style would be far greater. Not that the architect was not to study the works of his contemporaries, for from them much was to be learnt. It had often been complained of that there was no copyright in architecture, but this was not a real grievance, for every architect knew that his subsequent buildings would be better than those he was just putting up. He

believed that if architects were to work more together, and to be more consistent with themselves and with one another, they would make their works more acceptable to the public. Above all, the young architect should never attempt anything "striking," except for a competition. There had been a very unfortunate departure from that principle. There was a style of Gothic really almost free from any defects. It was founded on a sort of domestic Gothic, with, however, hardly any distinctive Gothic elements in it. It was being worked out with great success by men of very great talents; all of a sudden these men rushed off to Queen Anne, and outraged all common-sense and decency, so far as architecture was concerned. But a most fearful Nemesis had befallen them. Could any one imagine a more frightful nightmare than that experienced by a leader of the Queen Anne style when he woke up to the fact that some of his less-gifted brethren were imitating some of his choicest *morceaux?*

Mr. Robertson said he did not mean to say that the public objected to consistency and refinement, but that it required an architect of great genius to make such qualities attractive to the public.

After some remarks from Mr. S. F. Clarkson,

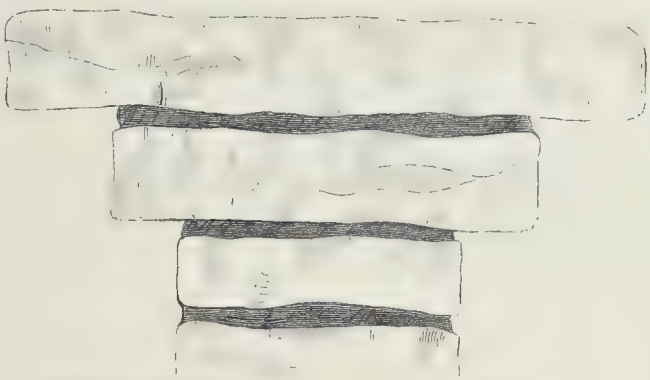
Mr. Seddon, replying on the discussion, said Mr. Sulman had put the matter more admirably and clearly, and perhaps in more courteous terms, than it was stated in the paper. In considering the subject, it was necessary to dissociate it from particular styles. Architecture must be considered as a whole in discussing its consistency or refinement. Although he considered himself a Gothic architect, he was a great admirer of Greek art. As to the trabeate construction of Greek architecture being due to the largeness of the stones available by the Greeks, he thought M. Viollet le Duc had distinctly proved that, on the contrary, it arose from the fact that the Greeks had no large stones except the frustra of the columns, which were rolled to the spot where required. He believed, however, that the Greeks were competent to work in any material which might have come to their hands. They showed the utmost refinement in working out their peculiar needs. The question as to what style should be chosen for working in at the present day was of comparative unimportance. They might, if they chose, take architecture at its height and with its best details, and apply it in a common sense way to the vernacular; or they might begin with the vernacular and treat it as fancy dictated, but care should always be taken to decorate the construction, and not to construct the decoration. With regard to Italian or Roman examples, it was quite true that some had fewer faults than others; but how many details were there, and were they good? He was far from saying that there was no merit in Roman or Italian. No great man could work in any style without showing some good result. Even "Queen Anne" had its merits, which would be worth dilating on. He thought with Mr. Sulman that the best thing to do was to begin with the vernacular and work upwards, avoiding all ornament that was not needed. Ornament should be concentrated, and good of its kind. As to the use of iron for constructive purposes, he (Mr. Seddon) must come to the Association for lessons, for he never used it. He had never used an iron girder in his life, and did not intend to if he could help it, although he believed that if necessary it was capable of some amount of artistic treatment. He decidedly agreed with Mr. Elkington that many City warehouses were often very satisfactorily treated. In conclusion, he acknowledged the vote of thanks which had been tendered to him for his paper.*

* With reference to a note from a correspondent headed "Was it Fair?" in our last issue, Mr. Seddon writes to deny any intended unfairness in the preparation of his illustrative drawings.

ROMAN HYPOCAUST AT BINCHESTER, NEAR TO BISHOP AUCKLAND, DURHAM.

THE Roman work here illustrated requires a little timely attention to preserve it from falling into ruin.

I believe this interesting monument of a mighty people was accidently discovered about thirty years ago, by a laden cart bursting a little of the top in in passing over, and when I visited the place last summer, I found many of the tile pillars missing,—indicated on the plan by B and X; two of these deficient pillars were substituted by recent 9-in. brick piers, which helped greatly to support the floor above. Unfortunately, at this place many of the large tiles forming the caps to pillars had, of course, fallen in, owing to their supports being removed, thus exposing the layer of mortar or concrete floor above,—this floor, happily, retaining its position. When I again visited the place, I found that nothing more had been done to support the roof since my previous visit, and the dilapidation had become slightly worse. A local gentleman who takes an interest in these matters, and who rents the land in which the hypocaust is situated, had previously to my visits creditably put in those brick pillars before alluded to, and marked B on plan, thus doing something towards preserving this interesting memento. There yet, however, remains more to be done before the top is out of danger.



ELEVATION OF PILLARS. ¾ FULL SIZE.

Cannot the Northumberland and Durham Antiquarian Society give a watchful eye and helping hand to this precious legacy of a far-away past?

Perhaps I may be permitted, further, to mention a somewhat interesting fact connected with the estate in which the hypocaust is situated,—namely, that it was once owned by a family of the name of Wren,—of the same stock, I believe, as the illustrious architect of that name,—they having occupied a country-seat close to this Roman structure. The estate, after some vicissitudes, was purchased by one of the Bishops of Durham, whose castle was close to it, and who levelled this country-seat with the ground, having, it is said, first quarrelled with the occupants.

THOMAS WEATHERLEY.

THE SOUTH-EASTERN AND LONDON, CHATHAM, AND DOVER JUNCTION AT BLACKFRIARS.

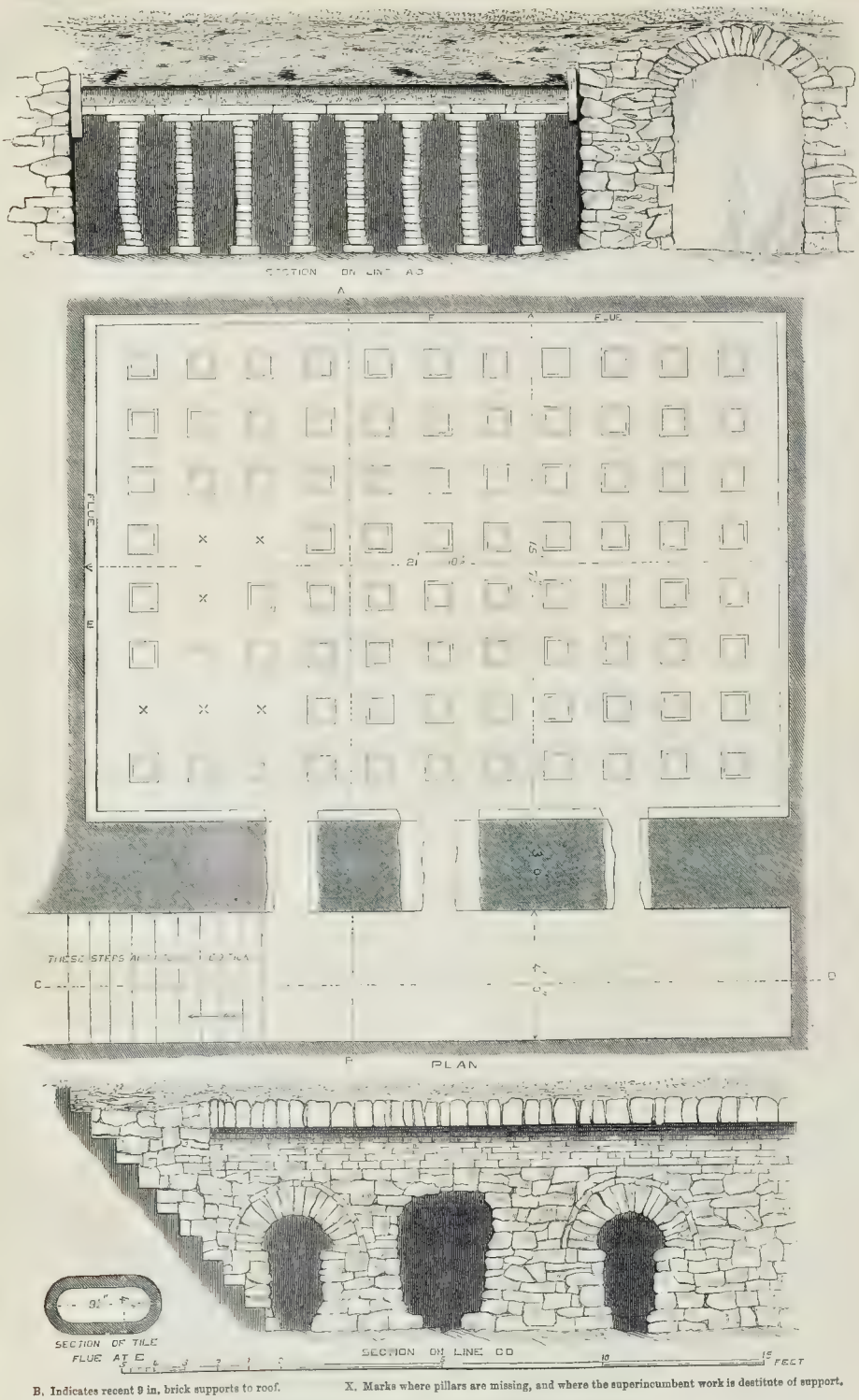
THE new junction line which has been in progress during the year just ended, by the South-Eastern Company, for the purpose of connecting their railway with that of the London, Chatham, and Dover Company at Blackfriars, is now almost completed, and is expected to be opened for traffic early in the spring, when the South-Eastern line will be placed in direct communication for through traffic to the north and north-east with the Midland, Great Northern, and Great Eastern railways, and likewise with the Metropolitan and District lines.

Although the new junction line is under a mile in length, the outlay has been very heavy, not only owing to the amount of property which has had to be purchased, but also to the heavy engineering obstacles which have had to be encountered at some points on the line, more especially at Gravel-lane. The line commences between Southwark Bridge-road and Guildford-street, on the north side of the Cannon-street and Charing-cross section of the South-Eastern Company, running parallel with that line until its arrival at Gravel-lane, and absorbing altogether the south side of Ewer-street, the whole of the houses in which have been purchased by the company, and those on the south side,—upwards of 100 in number,—demolished to clear the site for the new junction. From the point of junction near Southwark Bridge-road, to within a short distance of Gravel-lane, the line is carried forward on thirty arches, built with an ascending gradient of one in ninety from the low level of the South-Eastern line, the Chatham and Dover line at Blackfriars where the junction takes place being much higher than that of the South-Eastern. The whole of these arches are already completed, and ready for the ballasting and the laying down of the permanent way. About twenty yards on the east side of Gravel-lane the new line diverges in a north-westerly direction towards Blackfriars from the Cannon-street and Charing-cross line, being carried from this point to the east side of Gravel-lane by a brick tunnel about thirty yards in length. It is thence carried across Gravel-lane partly by a massive skew bridge, 35 ft. above the street level, spanning the entire width of Gravel-lane, including the footpath, and partly by a girder bridge immediately adjoining the skew bridge on the south side, the abutments on the east side of Gravel-lane supporting both the skew and iron girder portions of the bridge being upwards of 20 ft. in thickness. The foundations for the abutments on either side of Gravel-lane are 24 ft. in depth, filled in with concrete. It was at this point that unusual engineering difficulties were met with. In excavating for the foundations the gravel stratum below the Thames was arrived at, and it was necessary to have an engine at work day and night to pump out the water. The large brick skew bridge over Gravel-lane is finished, and the iron girder portion far advanced. From Gravel-lane the line is continued on a curve, in a north-westerly direction, to its junction with the Chatham and Dover line at Blackfriars, by twelve arches, intersecting Price-street, Union-place, Dyer's-court, and George-street, by lofty arches, several of which are already turned. The height of the several arches at the point of junction, a short distance from the Blackfriars Station, is 44 ft. above the ground level. The joint contractors for the new junction line are Messrs. Lucas and Messrs. Aird, and the works are being carried out under the superintendence of Mr. Brady, the South-Eastern Company's engineer.

It is stated that the Company contemplate the erection of a goods station on the north-eastern side of Gravel-lane, immediately alongside the new line now in course of formation, and that the whole of the houses on the north side of Ewer-street, now the Company's property, together with other dilapidated property in the neighbourhood, will be demolished for the site.*

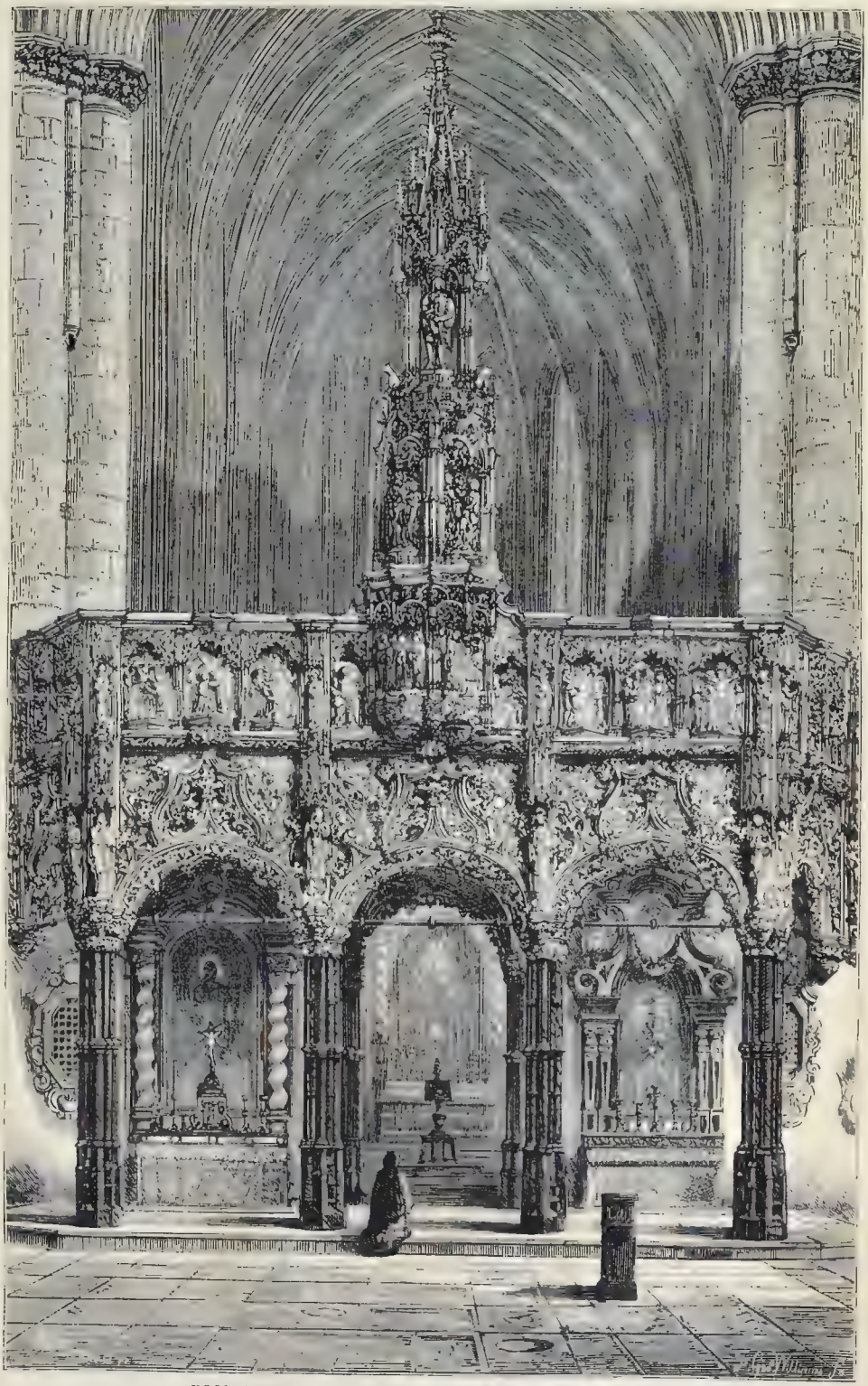
Breakages by Workmen at Ironworks.—Mr. Kettle, the County Court judge, has decided at Dudley that where breakages at ironworks occur from the negligence of a workman he may not only be dismissed without notice, but be amerced in damages. Hitherto, ironmasters have patiently borne the consequences of such neglect, and the case in which this decision was given is the first of its kind, and therefore noteworthy both for masters and men in the iron trade.

* The miserable condition of this part of Southwark long continued, has been described and illustrated in our pages. See, also, "London Shadows," by Geo. Godwin 1854; pp. 74 to 79.



B. Indicates recent 9 in. brick supports to roof. X. Marks where pillars are missing, and where the superincumbent work is destitute of support.

ROMAN HYPOCAUST AT BINCHESTER, DURHAM.



ROOD SCREEN AT LIERRE, IN BELGIUM.—*Circa* A.D. 1520.

ROOD SCREEN AT LIERRE, BELGIUM.

THE pretty little town of Lierre is situated about twelve miles from Antwerp, on the road to Mechlin. Although a place of no great importance, yet it is tolerably prosperous and fairly populated. It contains a town-hall of the last century, attached to which is a plain but very picturesque *beffroi*, dating from the fourteenth century.

There are eight or nine churches, several of which are interesting to the antiquary and architect, but one of which is really a most splendid structure: we refer to the Church of St. Gomaire. A picturesque old Béguinage and a curiously-vaulted hall on the market-place complete the archæological attractions of Lierre.

The Church of St. Gomaire, or Gommaire, is a magnificent cruciform building, consisting of a nave and aisles of seven bays, two of which form the lower portion of the great western tower; very deep transepts, each of four bays; and a noble choir, surrounded by aisles, with a *chevet* and seven radiating polygonal chapels. There are vestries on both the north and south sides, and one chapel, of two bays, opening out of the north aisle of the nave.

Externally the Church of St. Gomaire is very plain, but dignified and striking, from its great height, the massive flying buttresses which support its clearstories, and the number of radiating chapels which surround the apse. Unfortunately the great western tower, which was commenced in the year 1436, and completed in 1453, by the erection of a lofty spire of wood, covered with lead, was struck by lightning in the year 1702, and the upper story or octagonal lantern had to be rebuilt. This was done in the most hideous manner, and an ill-formed and most unpicturesque capping now replaces the ancient spire. There is a western portal below this tower, but the sculpture which originally adorned it now no longer exists; probably it was so injured by the destruction of the ancient spire that its removal was rendered necessary.

Few churches in Belgium present a more beautiful interior than the church of St. Gomaire. Its proportions are wonderfully good; the aisles are divided from the nave by well-moulded arches supported upon circular columns with polygonal abaci and bases. Above is a very wide triforium of open tracery, and a lofty clear-story containing windows of six lights, except in the apse, where they are reduced to two lights. Between the nave and choir is the magnificent rood-loft shown in our engraving. All the other fittings in this church are in the Renaissance style of architecture, of which they are good examples, and show how well fittings of this style harmonise with Gothic buildings, and if any one will compare the interior of this church, where the Renaissance fittings have been retained, with the interior of the great church at Courtrai, where they have been removed and replaced by Modern Gothic ones, he will at once see that *old* Renaissance work harmonizes better with ancient Gothic than *modern* Gothic does, although the latter is supposed to be a careful imitation. Perhaps the fact that it is an *imitation* makes it look so incongruous when placed in juxtaposition with ancient work; whereas the boldly distinctive character of these Renaissance fittings rather delights us by its contrast, and certainly adds greatly to the picturesque effect of the buildings which it adorns. Thus one is often tempted to sketch a bit of a Belgian church with its fourteenth-century arches and vaulting, and a Renaissance altar stuck against one of the columns; but who would care to make a sketch from the same point of view if the Renaissance altar were to be replaced by a modern Gothic one, however good it might be in design?

It is probably the fact that all the Renaissance fittings have been preserved in the church of St. Gomaire that makes its restoration the most successful one which we have seen in Belgium; and, we are sorry to have to say so, this restoration was carried out, not only without the aid of an architect, but *in direct opposition to the advice of the architect consulted.* We cannot give our readers a better idea of this curious state of things than by quoting the words addressed to us by the venerable dean of the church. His account was as follows:—"I had an architect sent to me by the Government, but before placing this fine church in his hands, I determined to ascertain what he intended to do. To my astonishment he told me that 'as the church was in the Gothic style it was necessary to remove every feature which was not in that style.' 'What,' said I, astonished, 'you would remove these fine altars of marble, these beautiful statues against the columns, these costly and splendidly carved screens? No; I will not have one of them touched. My church is a museum of sacred art, and you have no more right to destroy features in it which are of a later date than the rest than you would have to turn all the coins out of a collection because they happen to be of a later date than the time of Augustus. No; if I am to leave my mark upon this church it shall be by adding something to it, not by destroying the works of my predecessors.' And so my architect left me in disgust, and I called in an intelligent mason, and I said to him, 'Scrape all the whitewash off the walls of this church. These windows have been robbed of their tracery, copy the existing ones on the other side,'" &c.

Now we do not mean to recommend this plan, but as Sir Gilbert Scott pointed out at the opening of the present session of the Institute, and as we ourselves have often done, it is terrible to think what harm can be effected by an architect who regards destruction as an essential part of restoration.

The dates of the various portions of the church of St. Gomaire are fortunately well known, and have been carefully ascertained and recorded by Professor Schayes. They are as follow:—

First stone laid in	1425
Nave completed (except the vaulting)	1443
Transepts commenced	1490
" completed (except the vaulting)	1475
Chancel commenced	1473
" completed	1515
Vaulting of nave and transepts completed	1557
Western tower commenced	1436
" " completed	1453

The remarkable rood-screen bears the arms and motto of the Emperor Charles V., and was evidently erected in his time, probably very shortly after his election to the Empire [A.D. 1519]. It is composed of a very fine white stone, except the columns, which are of black marble. The tall shrine upon it is a remarable feature, and serves as a kind of monument to the patron saint, whose works are represented in the alto-reliefs which adorn it, and whose statue fills the large niche forming its upper story. There is some fine old stained glass in the windows of the choir and transepts, dating from the earlier part of the sixteenth century; and there are remains of decorative painting on the vaulting of several of the chapels. This was brought to light by the removal of the whitewash. Many of the altars have fine pictures enclosed in the reredoses, one of which is ascribed to H. Memling.

CRYSTAL PALACE RAILWAY STATION.

THE rapidity with which the railway system has increased since the rail and the locomotive—man and wife, as George Stephenson pronounced them—were married fifty years ago, is a trite topic. There are some kindred subjects to which less attention, perhaps, than is their due has been given, such as the expanded and elevated ideas that have led to the developments and improvements in the railway system in connexion with permanent way, rolling-stock, stations, and, indeed, in all departments.

In permanent way, iron rails of 20 lb. to the yard have been superseded by rails of from 70 lb. to 90 lb. per yard, and by steel rails of, in some cases, 90 lb. to 100 lb. per yard. The locomotive engines first run on the Liverpool and Manchester Railway weighed, with their charged tenders, 7½ tons. Nowadays engines are built as 60 tons. In the early days, when but few locomotives and railway-carriages were in existence, each engine and carriage had its distinctive name, such as the "Rocket," the "Locomotion," and the like, for the one class, with the "Experiment," the "Good Intent," &c., for the other. The catalogue of heathen deities was speedily exhausted in locomotives named after Jupiter, Mercury, Mars, &c.; and even the names of countries, capitals, counties, and less-imposing localities "gave out"; and the names of qualities and objects, animate and inanimate, failed to supply titles to the engines and carriages of companies that have numbers that run into four figures in several classes. Simple progressive numbers were hence resorted to, and now every company has its engines, tenders, carriages of each class and wagons, trucks, &c., registered under its simple progressive number. This, however, is a matter of much less importance than the character of the accommodation provided for the public. In the beginning railway carriages were, for the greater part, most uncouth and comfortless vehicles, the third or fourth class carriages were "stand-up" boxes on wheels, little or no better than cattle-trucks. From these there has been a *crescendo* improvement from third-class carriages that may be seen on the Crystal Palace trains of the Brighton Company, with stuffed seats and backs, and parcel nets overhead, to the luxurious and superb Pullman's drawing-room and sleeping-cars. Several of the companies that run trains out of London have now third-class carriages that are little inferior to the first-class carriages of forty years ago. So it has been also with railway stations that were a few years ago, in many places, mere wooden shanties. Stations have developed wonderfully of late in the magnitude and grandeur of principal termini, and also in the style and amplitude of accommodation of subordinate stations. The works recently completed and in progress in connexion with the Crystal Palace stations of the Brighton Company are notable illustrations of this.

At the Crystal Palace low level station the platform accommodation and the spacious flights of steps to the high level have left nothing to be desired, excepting, perhaps, in so far as that part of the station is concerned, more light after sundown, and shelter from piercing winds, that it would be difficult, it may be, to provide. The accommodation between the landing from the platforms and the entrance-turnstiles has always been of the most inadequate character, as many thousands of visitors have experienced who have gone through the horrors of egress on an extra night. Now that the company have put their hands to the work, they are doing so in a liberal spirit. The station is being entirely rebuilt, at a cost, we believe, of about 13,000*l.* The bridge over the railway, upon which the station is built, is widened by 10 ft. to the rear. The substructure consists of strong piers and ranges of flanged wrought and cast iron girders, with jack arches of 9-in. brickwork thrown between, and levelled up with concrete. The accommodation to be provided consists of a general waiting-room in the centre, 69 ft. long and 35 ft. wide. At each end of this room is a large block of building with two floors. The approach to the Palace is by two corridors, each 41 ft. long and 11 ft. wide. The first and second class ladies' waiting-rooms, each provided with lavatory, &c., are 23 ft. by 15 ft., and 18 ft. by 17 ft. respectively. On nearly the site of the present buffet a spacious dining-room will be provided, and, near it, a much-enlarged refreshment-bar. A cloak-room, 20 ft. by 15 ft., adjoins one of the entrance corridors. The first floor over the corridors, cloak-room, &c., will contain a second dining-room, 28 ft. long and 17 ft. wide, with kitchen and other conveniences. In the opposite block are the booking-offices, a telegraph-office, and the ladies' waiting-rooms. The first floor over these has the station-master's rooms, which embrace a living-room, four bed-rooms, kitchen, &c. In front of the station the carriage approach terminates under a covered space of 70 ft. by 40 ft., divided into five bays, the roofs supported on ranges of ornamental columns. The roof of this spacious portico is glazed from ridges to gutters. The general waiting-room has a very handsome domed roof, with cast-iron principals and ornamental spandrels. It is crowned by a lantern, 4 ft. high by 12 ft. wide, glazed all round. Both of the two-story buildings have mansard roofs, the one nearest the Palace grounds, which is of very high pitch, will be covered with zinc; the other is slated, and each is finished at the top with an ornamental iron railing at the base of the crowning square. The side lights to the new buildings are by coupled windows, with arched heads.

Mr. F. Dale Banister is engineer-in-chief, and Mr. Mannering his principal assistant. Mr. White, of Croydon, is contractor.

Startling Statistics.—The *Sheffield Telegraph* publishes a series of statistics, obtained from the official records of the Sheffield Consulate, showing that one leading branch of the local trade with the United States,—the Bessemer steel rails,—has entirely collapsed. Not a single ton of steel rails has been sent from Sheffield to the States for nine months! In the first three-quarters of 1874 the total declared value of steel rails exported from Sheffield to the States was 356,180*l.* In the last quarter of 1874 the value fell to 1,156*l.*! In the first quarter of 1875 the value was 2,301*l.*, and since that date the trade has been a thing of the past.

THE GREAT NORTHERN COMPANY'S KING'S CROSS STATION.

AMONGST other improvements and extensions which the Great Northern Railway Company have for some time been carrying out at their King's Cross Station, is the formation of a large dining and refreshment room, which has just been completed, and which has necessitated the absorption of several of the company's offices. The spacious area, 60 ft. square, now forming the principal dining and refreshment room, has been entirely reconstructed and finished. The walls are in panels, painted and gilt, between which are ornamental pilasters, and a dado, 4 ft. in height, is carried round the apartment. The ceiling, which is coved, is also in panels, which are uniform with the mural decorations, and the coved portion is supported by consoles representing the figures of griffins, between which are gilt enrichments, picked out in varied colours. Near the centre of the apartment an ornamental screen separates the refreshment department from the dining-room, the latter occupying about two-thirds of the entire area. There are also retiring-rooms and lavatories in immediate connexion. The whole were designed by the company's architects, and have been executed by Messrs. Cubitt & Co. The station has also been enlarged on the west side in order to give increased accommodation for the local and metropolitan traffic. This enlargement consists of an additional double line of rails running parallel with the main line platforms to their entire length. On either side, and also at the south end, there are spacious platforms, and the new or added station area is approached from the main line platforms by two spacious passages, 17 ft. in width. The walls of these passages have an ornamental appearance, being faced with red, white, and blue brick. New booking-offices at the south-west side of the station have been erected specially for this section of the company's traffic, whilst an entirely new block of buildings has also been erected on a site between the main line platforms and the new station, containing the offices in connexion with the general manager's department, and new offices of other servants of the company, who were displaced by the construction of the new dining and refreshment room above described. Further westward a large engine-shed has been erected, and on the land adjoining, which the company some time ago acquired, and cleared of upwards of 200 dwellings, a number of sidings are about to be laid down for shunting purposes, and to relieve the present crowded state of the station. When all the intended works are completed the area of the station will be increased to the extent of more than four acres.

It may be added that in addition to the enlargement of the station other works of an important character between King's-cross and Finsbury Park are in progress. In order to facilitate the traffic between these points an additional double line of rails is being laid down, involving the doubling of the Maiden-lane tunnel near the station, and the Copenhagen tunnel at Holloway. This portion of the work amounts, in fact, to the construction of two new tunnels, with heavy excavations and engineering work.

A LARGE NEW SKATING-RINK AT CAMBERWELL.

ANOTHER new skating-rink, said to be the largest in the metropolis, is about to be added to the numerous establishments of this character which are in such rapid succession being opened for the recreation of the public. The site upon which the new rink is being constructed is in Camberwell-new-road, near the Green, immediately to the east of the railway, and conveniently situated within a few minutes' walk from the station. The building in connexion with it has a frontage to Camberwell-new-road, 60 ft. in length, and consists of the ground floor and story above, surmounted in the centre by a pediment enclosing a tablet in Portland stone, on which will be the following inscription: "The London Skating Rink." The central entrance leads to the hall and staircase to the upper floor, from which is approached a spacious balcony or gallery overlooking the skating-rink area, for spectators. The gallery will also be approached by a flight of stairs at the west side of the rink, and is the only part of the establishment where smoking will be permitted. On the right and left of the entrance are the ladies' and gentlemen's retiring-rooms. On the west side is the refreshment-room, and on the east side the repository for skates. The upper story contains the manager's residence.

The rink, which is approached from the rear of the building, is 260 ft. in length, and 92 ft. in width, and contains the large area of about 24,000 superficial feet, surrounded by a wall 10 ft. in height. In forming the foundation for the floor of the rink earthwork has been excavated to a depth of several feet, and the excavated space afterwards filled in with gravel. Over this there is a thick layer of concrete, the face of the floor being in asphalte, which will be laid down by the Val de Travers Company. The rink on each side, and at the north end, will be covered in to the extent of 15 ft. in width, by an ornamental roof, supported upon iron columns, about 12 yards apart, leaving an open area in the centre about 240 ft. in length, and 62 ft. in width. The covered portion is intended to be used in wet weather, and also in summer when the heat of the sun is oppressive. At the north-east angle there will be an orchestral platform for a band, which is intended daily to enliven the skating exercises.

The architects are Messrs. Bailey & Young, and the contractors for the building, enclosure walls, and foundations, Messrs. Kirk & Randall, of Woolwich, and Mr. Male, respectively. The ironwork and roof of the rink are furnished by Messrs. Brady & Son. Mr. H. Plowman is acting as clerk of works. The rink is expected to be finished and opened to the public about the beginning of March next.

HOMES FOR THE MIDDLE CLASSES.

THE *Morning Advertiser* says:—We are glad to notice that the *Builder* advocates the erection in London of houses in flats for the middle classes. Houses of this description have already been built for the rich and the poor, but no effort has yet been made to supply similar accommodation for the large number of persons belonging to the middle class who cannot find house accommodation at a moderate rental in London, and are now forced to live in apartments, if they wish to remain a short distance only from their places of business, or to take a house in a suburb which they can only reach after a long and tiresome railway journey. . . . . How much better in a sanitary point of view such flats would be for the inmates, than many of the suburban dwellings, the *Builder* has clearly pointed out. How much better would such a flat be for a family of small means than one of those dwellings which our admirable contemporary speaks of as "a slice in one of those rows of small suburban street houses, with bay-windows repeated in 'damnable iteration,'" which "are the work of speculating builders," and are "flimsily and cheaply built of bad materials, and are too often almost criminally deficient in sanitary arrangements!" The new class of town houses to be built in flats which the *Builder* suggests "do not imply immense hotel-looking blocks of buildings, with innumerable stories, but houses of a moderate size, so built and arranged as to accommodate a separate family conveniently and privately on each separate floor"; and there is no doubt that these houses could be built without much difficulty, and that they would let very readily. There is, indeed, at the present time a demand for houses in flats for middle-class persons, and building societies and investors will do well to direct their attention seriously to the plan the *Builder* has so sagaciously recommended. Some persons may object to the project, under the idea that flats would be more noisy than separate residences; but this objection need not be heeded, as sounds cannot be transmitted from one floor to another if a layer of concrete or some similar material is placed between them. There is a great advantage to a family in having all the rooms it occupies on one floor. Less fatigue is incurred in passing from room to room than in running up and down stairs; and as a large amount of labour is thus saved, a smaller number of servants is required to attend to the wants of the family. Where three servants are now required to attend in a house, two only would be necessary for the same family in a "flat"; and where two are now required in a suburban residence one would be found to be sufficient, if a middle-class "flat" residence were occupied. The wife would therefore be more like the mistress of her home than many a wife is at present; she would be able to watch and to protect her children more effectually against such accidents as arise from the ignorance or neglect of nurses; and the great domestic puzzle of the day, the difficulty in procuring good servants, would become less perplexing, as fewer servants would be employed. There would be gain both as regards economy and comfort, if the middle classes were to live in the flats of such houses as the *Builder* has suggested; and amongst the gainers by the new system would be many members of the journalistic and other professions. The practice of living in flats exists to a large extent in Edinburgh and some other Scotch cities and towns, and it answers admirably. The flats in Victoria-street and other fashionable parts of Westminster are eagerly sought after as town residences by members of Parliament and wealthy citizens; and we are certain that houses in flats in less expensive neighbourhoods, and designed for persons of moderate means, would be as quickly tenanted. There are few men who have lived in good suites of chambers who do not contrast unfavourably with them the houses they are compelled to occupy when they get married and settled; and when we compare the simplicity and convenience of the arrangements of good chambers with the complexity and inconvenient arrangements of many small suburban houses, we must own that the latter lose by the contrast. We have no hesitation in saying that if houses were built in London on the plan the *Builder* has suggested, a great many professional men with limited incomes, who do not marry at present because they believe their incomes are insufficient to keep up suburban houses, which must either be very costly or very uncomfortable and undesirable, and of a class which would horrify marriageable girls who had been reared in comfortable middle-class homes, would be lured from their cosy little "dens" or chambers in the Inns of Court and elsewhere, and speedily converted into happy and comfortable Benedicts. Many of these young professional men do not attempt to marry, simply because they are not in a position to provide comfortable homes in London for the ladies they would desire to make their wives; and they feel that they are not justified in devoting a large portion of their earnings to the payment of rent for a rickety suburban house, which is heavily rated, is often out of repair, and is anything but what its landlord describes it to be, "a desirable residence for a small family."

THAMES FLOODS PREVENTION.

IT would appear, happily, that the recent disastrous floods are not to be without permanently beneficial results, judging as evidence of this from the important provisions of the "Thames Floods Prevention" Bill that is to be brought before Parliament in the approaching session. The objects of the Bill are the appointment of Commissioners, who shall have powers to construct and make such embankments, channels, sluices, flood-gates, and other works, in and about certain areas, as shall fit them for the temporary reception of the extraordinary flood-waters and high tides of the River Thames; and as may be required for freeing such areas from such flood-waters on the subsidence of the tide. The limits of the Act are from Hammersmith to Plumstead, including both sides of the river, but it seems to be intended that the Commissioners shall have powers to execute works for the purposes of the Act lower down the river than Plumstead. The areas on which it is proposed to form these temporary receptacles—they are not designed to serve the purpose of reservoirs—are portions of Rainham, Wennington, Aveley, and West Thurrock marshes, in Essex; and portions of Plumstead, Erith, Dartford, and Stone marshes, in Kent. It may seem, on a superficial glance, that the construction of receiving-basins in these localities is not likely to prove of advantage to the inhabitants of Lambeth and other low-lying, thickly-populated districts higher up the river. It should be borne in mind, however, that the flooding of houses and lands is caused by the conjunction of the flood land-water and the tide, and that just so much water as will be taken in by these receptacles will be arrested in its destructive progress up-stream with the rising tide. Of the Commissioners, one-half are to be appointed, and the other half elected. Each of the following bodies shall be entitled to appoint two Commissioners:—The Metropolitan Board of Works; the Mayor, Aldermen, and citizens of the City of London; and the Conservators of the River Thames. Each of the local authorities within the limits of the Act shall be entitled to appoint one Commissioner. The qualifications for being electors of Commissioners are owner-

ship or occupation of a wharf or other property within the limits of the Act, having a frontage to, or water communication with, the Thames, and being liable to be rated for the relief of the poor in respect of such property. Persons qualified to vote for Commissioners shall be qualified to be elected Commissioners. No Commissioner shall receive any remuneration, or hold any office of profit under the Act. The Commissioners may make yearly assessments for the moneys required for the purposes of the Act. The estimate of expense for the works indicated in the Bill is 150,000*l.*, and the estimated revenue 15,000*l.* per annum.

THE COMPANY OF GLASS SELLERS' EXHIBITION, ALEXANDRA PALACE.

SIR,—May I take the liberty of directing attention to the above exhibition (which closes, I believe, on the 31st), with especial reference to the stained glass department. It would be as well, perhaps, here to explain that the writer is himself an exhibitor, and therefore his statements will be accepted with what reserve may be considered prudent. Next you will, doubtless, grant my sincerity when I confess that, though an exhibitor, I am not proud either of the quality or extent of the exhibition. On the contrary, I am rather ashamed of it. The company or guild in question very kindly undertook the responsibility, trouble, and expense of the whole affair, for the laudable purpose of encouraging the artisan to display his individual ability in his craft, and by originality of conception or skill in execution to throw some definite light on the question of the English workman's alleged deficiencies in art-knowledge, æsthetic feeling, and technical skill. I sincerely trust no art patron, or even "intelligent foreigner," will take this exhibition as in any sense a reply to that question, much less a solution of it, as he would thereby do a gross injustice, not only to the artisans whose exhibits have been either *skied* or *floored;* but to the greater number of art-workmen who, from various reasons, have not exhibited at all. In fact, the Glass-sellers' Company have been very ill-rewarded for their good intentions. Their first invitation, by accident or design, or both, was so little known throughout the craft that, in order to get exhibitors at all, they extended their time another three months, and the result then, or rather now, is a miserably meagre collection. This, however, is much more the workman's misfortune than fault. The time of year chosen is most unpropitious, and inconvenient, and if that was not generally known, at least one would have supposed that any one at all connected with stained glass would have chosen in preference any other period of the year than its shortest and darkest days for such an exhibition, wherein the exhibitor himself, in addition to the desertion of the *buying* public, has but a couple of hours of dubious light on four Saturday afternoons to enjoy the company's munificent gift of a *free pass* for a month. Be this as it may, one cannot well blame the Glass-sellers' Company for acting like the indignant host in the parable, and, failing the invited artisan, on whose behalf the feast was originally or ostensibly provided, calling in the halt, the lame, and the blind,—in this case most effectively represented by an incongruous collection of small masters, who, like most make-shift guests, have coolly elbowed all the little people into the dark corners, and have quietly and comfortably settled themselves down in the best lights, for the display of a wondrous and a motley show,—from the emblazonment of a big trade advertisement done in the prettiest pinks and violets imaginable, to an indescribable something like a menagerie after an explosion, with the bits cleverly stuck together again. The treatment I refer to is amusingly illustrated in the very first compartment on entering. The light is not good at the best; but here the centre light and on the line the space is filled with several specimens of geometrical lead work, filled in with plain glass, by a firm who call it, as plain as the glass itself, specimens of ANTIGUL work, meaning, doubtless, antique, but not stooping to common legibility of writing; this is interspersed with some common public-house embossed panels. These unique works of art, which would have borrowed enchantment, with advantage, from distance, displace some of the best specimens of workmen's work in the whole exhibition, including, I think, the only examples of *originality* of design. This kind of treatment is carefully carried out in the other window compartments till it culminates appropriately in a series of meretricious panels of flowers, a large portrait being placed just where two smaller portraits should be (the latter by a workman), which two are as far above the one in merit as in actual altitude,—at least, in my opinion. All this is, of course, entirely apart from the question as to whether employers are fairly eligible to compete, on equal terms, for prizes in an artisans' exhibition. Finally, I would be understood to respectfully beg your impartial attention to the merits and demerits of this small exhibition. I consider it painfully evident that nothing is more urgently needed than that some high and indisputable authority, like your influential paper, should, with kind judiciousness, but withal with justice, point out to most of us, including my audacious self, the right direction in which we should aim for the cultivation of style and the education of a purer taste. And whether we have the manifold advantages of a master, or the more inadequate opportunities of a workman, I fear this exhibition is a too clear indication that most of us have yet to learn how, consistently and artistically, to design and paint stained glass.

AN EXHIBITOR.

SAXON MEMORIALS.

AT a recent meeting of the British Archæological Association, Mr. J. T. Burgess, of Leamington, exhibited a large and valuable collection of Saxon remains recently exhumed from gravel diggings at Longridge, near Warwick. These consisted of a gold *bractea*, 2¼ in. diameter, stamped with rude conventional animals, several pairs of disc-shaped fibulæ with interlaced patterns, portions of a silver *bractea*, unique, two very large cruciform fibulæ, gilded and enamelled knives, long straight swords, a number of umbones, of the usual types, some with inside grips, portions of wooden buckets, with a textile fabric adhering to the wood in one instance, a string of rudely-shaped claret-coloured amber beads, pins, and portions of rough pottery with stamped ornamentation in rectangular panels. Mr. Burgess's description of the finding of these objects was listened to with great attention, and his mention of a quantity of human lower jaw-bones, all with unusual elongation of the chin, deserves to be investigated by comparative palæontologists.

ILL-TREATMENT OF AN ARCHITECT.

LIVERPOOL ARCHITECTURAL SOCIETY.

AT the meeting of the Liverpool Architectural and Archæological Society, on the 12th inst., Mr. Joseph Boult, the president, in the chair, Mr. C. O. Ellison, architect, exhibited a large coloured drawing of Douglas, Isle of Man, showing the Loch Parade improvement. Mr. Ellison stated that he merely exhibited it in accordance with the usual invitation given to members to exhibit anything of interest, and he thought the members might like to see the drawing. He had no intention to make any remarks respecting it, but perhaps at some future time the whole subject might be brought before the Society.

The President said this was the first time that he had seen the drawing. He had read the correspondence with regard to the exclusion of the name of Mr. Ellison from the scroll on which the names of those who took part in the construction of the work were recorded, and it certainly was very remarkable that the name of the gentleman whose design had been adopted, and which was made the rallying cry in a very long and tedious dispute as to which line of improvement should be adopted, that his name and his claims to recognition should be ignored in public documents by the body having charge of the work. The Board in the Isle of Man had endeavoured systematically, as far as he could understand the correspondence, to ignore Mr. Ellison's claim to recognition in every possible way. It was true they formally appointed him their architect and surveyor, but in the correspondence laid before the Society they had endeavoured to reduce his remuneration to the lowest possible amount, and in that correspondence the utmost ignorance was shown of an architect's employment, and of the courtesy and consideration to which he was entitled. Except as regarded the correspondence which he had seen, and the information which he had received from people who had been to the island, and what he had seen in the papers personally, he (Mr. Boult) had no knowledge on the subject; but one of the referees to whom the various competing plans were submitted a few years ago, had told him after his return from the island that there was not the slightest doubt Mr. Ellison had been very badly used by the Manx people. With regard to Mr. Powell, the engineer, the less he (Mr. Boult) said on the subject the better. If a professional man could so far forget what was due to his own position he was not likely to contribute to what was due to the position of other professional men; and he (Mr. Boult) was extremely sorry that any person calling himself an engineer, and occupying the position Mr. Powell had occupied in the harbour works of Douglas, should condescend to act the part he had taken on the occasion referred to.

Mr. J. A. Forrest said he regretted exceedingly that the Manx people had put themselves in this position, and more especially as he understood that Mr. Ellison had not been paid a single shilling for his work.

ADDITIONAL WORKS AT THE BROOKWOOD LUNATIC ASYLUM.

VARIOUS structural alterations and additions have lately been made at the Surrey County Lunatic Asylum, Brookwood. The works comprise enlargement of the laundry and chapel, so as to double their accommodation, and the addition of new workshops, a cottage hospital, a ward for 100 male patients, and a detached block for 300 females. The cottage hospital will afford room for sixteen patients. The new female block contains four distinct wards, two on the ground-floor and two on the first-floor. Passing into the block from one of the main passages, the visitor enters a corridor, 12 ft. wide and nearly 70 ft. in length, having single sleeping attendant's room, scullery, and stores in one niche, and in the other a projecting bay, with windows looking out in the front. This terminates in a large day-room, situated at the angle of the building, 45 ft. by 30 ft., with three bays. From this runs a short corridor, with small patients' and attendants' rooms, terminating in a bay, containing a door leading to an enclosed airing-court. At the extreme ends of the ward are staircases, along-side which, and situated in a small projecting tower, are the water-closets, constructed by Herring & Son, of Chertsey. Within the same area are slop-sinks and lavatories, for day purposes. All the wards are plastered, and the day-wards are 14 ft. high from floor to floor. They are heated by open fireplaces, constructed by Herring & Son. The back of the grate forms part of a narrow chamber, which, communicating at its lower part with the external air by means of a conduit-pipe, terminates below the mantelpiece in openings, through which heated fresh air is constantly being passed into the ward. Flanking the central portion of the building are two towers, at the base of which are the principal entrances to the entire structure, and they contain small rooms, high-level water-cistern, and act as ventilating-shafts. One of them, terminating in a spire and vane, is extended to a height of about 130 ft., and contains a clock, with four dials, striking the hours and quarters. The central portion of the ground-floor contains the dining-hall, 80 ft. by 50 ft. (with large projecting bays), in which the whole of the patients will take their meals. Centrally placed is a large serving-counter, behind which is the opening into the scullery. In the rear of this is the kitchen, fitted up with a large Benham's apparatus.

The plans were furnished by the county surveyor, Mr. C. H. Howell, in concert with the medical superintendent, and have been carried out by Mr. Chappell, of Steyning, Sussex.

LONDON POPULATION STATISTICS.

THE Registrar-General, in his recently-published "Abstracts of 1873," estimates the increase of London population in the ten years 1861—1871, at the rate of 16·1 per cent. It was 23 per cent. in the west districts, but all the increase occurred in Chelsea and Kensington, as the population declined in Westminster, and was stationary in the great district of St. George, Hanover-square. The north districts increased by 22 per cent.; but among them Marylebone declined, St. Pancras increased only 11, while Islington increased 38, Hackney, 50, and Hampstead, 69 per cent. The population of all the

central districts, extending from the Strand to the City, decreased 13 per cent. The law-courts, railway-stations, and offices, have displaced dwelling-houses. The east districts, with the exception of Bethnal-green, Mile-end Old-town, and Poplar, were stationary or decreasing. The increase of London was greatest in South London, which, low and flat, has benefited so much by the new system of drainage, and, lying near the Thames, is convenient for many manufacturing processes. Lewisham, Camberwell, and Wandsworth, still thinly inhabited, increased 61, 56, and 78 per cent. in the ten years preceding the census. The density of population in London was such, that there were 25 persons to an acre in 1841, and 42 in 1871. The density in the thirty years doubled in the west, north, and south districts. In the central districts it declined from 172 to 140. It is a general law that the mortality increases with the density, and this would no doubt have been observed in London had it not been for the increased purity of the water supply, the new system of drainage in operation, and some improvement in the method of lodging people.

The violent deaths show no diminution; they have progressively increased from 2,247 in 1861, to 2,843 in 1873. There is little increase of homicide or suicide, and a decrease of executions. The Registrar-General remarks that while one execution excites great feeling, and a murder finds ample report in the journals, it is left for weekly tables to tell that on an average 45 people of both sexes, and of all ages, are killed by negligence or accident in London every week.

SIR CHRISTOPHER WREN AND HAMPTON COURT.

PRESERVED among the old Treasury documents, which are now open to public inspection at the Record Office, is a curious paper drawn up by Sir Christopher Wren, and endorsed by him,—"Estimat for finishing Part of Hampton Court." It is dated the 28th of April, 1699, and addressed to William III. The portions of the Palace for which Wren's estimate was asked seem to have been the Great Stairs, the Guard-chamber, the Presence-chamber, Privy-chamber, Drawing-room, &c., Lobby and Gallery for the pictures. Sir Christopher writes,—"That although a perfect estimate of Finishing the Inside of any house is as uncertain as the charge of Furnishing, and is more or less according to the intention of the Owner; yet upon supposition that Your Majesty would finish as decently as the greatness of the Rooms seems to require," he considers it proper that the Great Stairs be made with steps of the Irish stone, such as are at Kensington, but longer and easier, with iron rails of good work; the floor and hearth-places to be well paved with marble; the walls to be wainscoted 20 ft. high, with fine doorcases; that the Guard-chamber be fitted for arms, as at Windsor and other houses; the Presence-chamber be fitted for hangings, with marbles in the chimney and the stools of the windows, and proper ornaments; the Drawing-room in like manner, though with some variety, as having the best furniture; that the Gallery be fitted for the cartoons with wainscot on the window-side and below the pictures, and between them, and with wainscot behind them to preserve them from the walls, and with a marble chimney and marble "soyies" in the windows, &c. It is also stipulated that the boards of all these rooms ("being already provided very good and dry,") are to be laid after the best manner, without nails, and with battens under the joints. The cost of the work, "thus performed by good artists," is estimated at 6,800*l*. Wren concludes with an opinion that many other things must be done before the Palace is in proper habitable order, the Courts must be paved, more sewers made, and water brought to more places. It may be interesting to add, that in a volume of "Civil List Expenses," preserved in the British Museum, is an entry, under date 1716, of a payment of 487*l*. 10*s*., to "James Thornhill for Painting the Ceiling of a Room in His Majesty's Palace at Hampton Court."

Hornsey School Board.—We were correct in supposing that the statement in some of the newspapers that the commission to be paid to the architect was "one per cent," was an error. The chairman of the Works Committee, Mr. H. R. Williams, writes to say that the commission fixed by the Board is the usual 5 per cent.

WORKMEN'S COTTAGES IN THE NORTH.

THE proposed improvements in the city of Durham having ended in "smoke," the working men themselves have come to the front through the Durham Co-operative Society, who have resolved to utilise a surplus fund in the bank by purchasing freehold land in the city and erecting thereon a number of model working-men's cottages, of which there is a great want; each cottage to contain four rooms substantially built, and that decency and rarity in the north, a water-closet to each, as well as water.

Owing, however, to the tenure under which a large portion of the land around Durham suitable for building purposes is held, most of the land being held by the Ecclesiastical Commissioners, some difficulty has been found, but the Commissioners appear desirous to give their aid to so laudable an object; and, to prevent any misunderstanding, they will enfranchise the land, and thus secure it untrammelled to the purchasers.

A similar movement has taken place successfully at Leeds.

OUR DRAINS.

(FOR USE OF SCHOOL BOARD SCHOOLS.)

Our drains! our drains! our foul, leaking drains!
They poison the air of our streets and our lanes,
In city and suburb, in hamlet and town,
'Neath dwellings and workshops wherever laid down.
Can reason tell, fail young and old to convince
That sewer-gas slaughters both peasant and prince?
How can we have health if the blood in our veins
Is poison'd by breathing foul air from the drains?

Our drains! our drains! our badly-made drains!
That give out their smells ere and after it rains,
Sickening the robust man walking the flags,
Prostrating the half-nourish'd worker in rags;
Swift-stealing through panels where fashion and rank
Sit proudly on cushions, in drives from the Bank.
But headache and faintness, and death-boding pains,
Go home in the carriage to tell of the drains.

Our drains! our drains! our death-dealing drains!
Choked up, with no outlet for rotten remains;
Chronic hotbeds of typhoid, full of foul silt,
Reflecting our ignorance, proving our guilt,
And showing that we have been riding rough-shod
O'er Nature, and morals, and maxims of God.
For pure air and water, in cities and plains,
Spell health, if we keep right our dwellings and drains.

THE VENTILATION OF DRAINS AND SEWERS.

AT the last meeting of the Royal Scottish Society of Arts, Edinburgh, Dr. Stevenson Macadam read a paper "On the Ventilation of Drains and Sewers and the Cleansing of House Cisterns." The water-carriage system of disposing of sewage was, he said, a pernicious system. It poisoned our streams and the air above them, and promoted disease in our households. While, however, he was no friend to that system, he was not prepared to go back to old methods nor adopt any of the new systems proposed in its place. He wished to direct attention to a mode by which the evils attending the present system could be to some extent lessened or modified. As a preventive of the evils resulting from the return of gases from the main sewer, he suggested that besides the syphon trap at the water-closet, there should be a U-shaped trap between the main sewer and the house, from which trap a fireclay pipe should lead to the air, with a charcoal absorbent cage at the top. Town drains should be ventilated, and the air passed if possible through furnaces in constant operation, or through shafts filled with charcoal. He dwelt on the necessity of periodically cleansing cisterns with a soft brush. Mr. E. Sang (secretary) then opened the discussion on the general subject of sanitary arrangements. He pointed out that the present system of carrying away sewage had infiltrated the whole subsoil of the city with offensive matter, while it wasted good wholesome water at great expense. Good manure was also being by the water system carried away in the most reckless manner to the sea. He was therefore in favour of Captain Liernur's system, which could collect and utilise the sewage without mixing it with water. Mr. William Marshall approved of the Liernur system if it could be shown to work safely. Dr. Alexander Wood said that the present system of drainage ran counter at every point to nature, and the palliatives offered by Dr. Macadam and others were pitiable when the evils of the system were regarded. He pointed to the advantages of the immediate removal of effete matter in a solid state.

COLOUR IN THEORY.

SIR,—There is a passage in my recent letter which is so involved that I must beg to be permitted to set it right. It should have run as follows:—

"The believer in the undulatory theory cannot, indeed, consistently assume colour to be the inherent property of the vibrations themselves, for then the selfsame elastic medium would possess the wonderful property of being of all colours at one and the same time. Vibrations, it is true, produce in us the very different sensations of heat, light, colour, and sound, and in our too frequently unreflecting way we accredit the vibrations themselves with the properties of the sentient, with the sensations which they excite in us. A sensation of colour is the result of mechanical action on the optic nervous system, of the contact of either a vibration or an impulse, with the sentient. But why a simple mechanical action should produce, in one case, the sensation of heat, in another case the sensation of sound, and in a third case that of light, will probably never be solved."

Our senses deceive us in many things, and in none perhaps more completely than the subject of light. We cannot, offhand, be confident that our first notions upon any portion of that subject are right. Mr. Colling is positive that Nature produces *green* by a compound process; that the sensation of green is always,—speaking by the card,—the united, the compounded, activity of the yellow and blue waves. I will not give my own views of the matter at present, if I can help it, but the science of it as the science now stands. It is this, that the mechanical admixture of two sufficiently finely-powdered pigments,—reflecting, the one, let us say, the blue producing wave, the other the yellow,—will produce in us the sensation of green. Two different waves of the prismatic spectrum may also be combined to produce a colour sensation differing from that produced by either separately. But it is said that the waves of these mechanical compounds may again be resolved, separated, into their original elements, but that the prismatic wave producing the sensation of green, or of any other colour, cannot be decomposed. I say this is what we have been taught, and if this teaching be correct, we are enabled to make a very useful generalisation, viz., that certain sensations of colour can be produced either by a combination of waves, or by a single undecomposable wave.

W. C. T.

"THE PALATINATE."

SIR,—Will you kindly allow us to add a few remarks to your recent lucid account of these buildings?

The extent of ground we are covering is rather more than four acres, embracing, when completed, five streets in addition to the frontage in the New Kent-road,—viz., Gurney-street, Pollock-road, Rodney-road, Chatteris-road, and Trafalgar-place, all included in the term "Palatinate," and offering accommodation for nearly 600 families.

In erecting these buildings to meet the requirements of the middle classes residing in the metropolis, we have aimed to form an entirely new locality, embracing dwellings as distinct as ordinary houses, with more ample appliances and conveniences than have hitherto been obtained, at the same time obviating many sanitary and other defects so usually complained of in the dwellings available for the classes in question.

The height of the buildings facing the New Kent-road, near the Elephant and Castle, is 60 ft.; that in the other streets, 50 ft.

We are not, nor ever have been, contractors; but are carrying out this experiment as an investment pure and simple.

SUTTON & DUDLEY.

The Cabmen's Shelter Movement.—The success resulting from the establishment of the Calverley-street Cabmen's Shelter, Leeds, has been such as to encourage the promoters of the movement to place two more shelters, viz., at the New and Central Railway Stations, which are expected to be ready for use during this month. Both shelters are comfortable, with sufficiently commodious rooms, each being 15 ft. long and 9 ft. wide. They are constructed of wood, the upper part of the sides glazed. The builder is Mr. John H. Thorp, of Leeds, and the cost will be 75*l*. each. Amongst the subscribers to the shelters were upwards of eighty cabmen. In the neighbourhood of Leeds, Huddersfield has opened a shelter, and Halifax is starting a movement for providing them under the auspices of the Mayor (Mr. Edward Crossley). In other places also shelters are being erected, and everywhere they are successful, meeting a real want.

THE LATE MR. JAMES GODWIN.

FELLOW-STUDENTS and friends will hear with much regret of the death of this gentleman, which took place, at a comparatively early age, very suddenly, at his residence in West Brompton, on the 18th inst. Mr. James Godwin studied as a painter, was a student of the Royal Academy, and early gave promise of great excellence in his art. He illustrated very successfully a number of books for Messrs. Blackie and other publishers, and, for several years, the Christmas number of the *Illustrated London News* contained evidence of his versatile fancy and skilful draughtsmanship. One of his pictures, "Hamlet and Ophelia," exhibited, on the line, at the Royal Academy a few years ago, obtained remarkable encomiums from men able to judge. He also wrote with ability, and in fact a bright career seemed in store for him; but it was stopped by what proved an overwhelming calamity,—the simultaneous death of a much-loved wife, a child, and his wife's mother, to whom he was equally attached. His mind never recovered from the shock, and although he occasionally drew or painted, his energy never returned, he was unable to satisfy himself, and the work was destroyed as soon as done. But for the affliction to which we have alluded, James Godwin might have been a great artist.

THE STRIKE AT ERITH.

AT the special general meeting of the Iron Trades Employers' Association, held at Derby, the following resolutions were carried unanimously:—

"That since, as a rule, employers are compelled by the law of freedom of contract to work by the piece at prices fixed beforehand, the Employers' Association see no reason why workmen should seek to be exempted from the same law, one which the men usually avail themselves of when they are purchasers.

That this Association, recognising this law, will resist any attempt on the part of the men or of their societies to curtail or restrict the application of piece-work in the workshops of the members of the Association."

The report and recommendation of the committee of management as to the Erith strike having been brought up and fully discussed, it was resolved unanimously,—

"That this meeting, having regard to the many innocent persons who would suffer by the general lock-out recommended by the committee of management, hereby authorise the committee, before putting such an extreme measure into force, to employ the officers and funds of the Association in filling the shops of Messrs. Eastons & Anderson, and to suspend the order for a lock-out at their discretion."

The poll of the 44,174 members of the Amalgamated Society of Engineers to take the votes for and against a levy of 6d. per member in aid of the men on strike is being prosecuted. To carry this out, specially convened meetings of the 384 branch societies in different parts of the country are being held, and the result returned to the general office in London. A return has also to be made of the number of members working short time,—that is to say, three or less days a week. According to this month's return of the state of the engineering and machine-making trades throughout Great Britain, Ireland, &c. (as stated in the *Times*), it appears that, in the various places where branch societies exist the state of the trade is described as very bad in twenty-two towns, bad in 129 towns, working short time in thirteen, reducing wages in three; declining, seven; unsettled, one; discharging hands, four; moderate, 147; good, four; improving, one; no reports, fifty-nine. Disputes are reported to be pending at Battersea, Bury, Hyde, Ashton, Stalybridge, Duckinfield, Dundee, and the London and North-Western Railway's running sheds, Edge Hill, Liverpool.

Messrs. Easton & Anderson have given to the men lately in their employ and now on strike, the following—

"NOTICE.

Those of the men now out who are willing to work by the piece when called upon, and to sign a declaration to that effect, will be re-admitted on application at the office on and before Saturday next, January 22.

The firm desire that it should be clearly understood that after that date none of the men now out can be re-admitted on any terms whatever. Arrangements for the engagement of workmen will be deferred till after Saturday next, except in the case of workmen who may make personal and voluntary application for employment.

EASTONS & ANDERSON.

Head Offices, 65, Southwark-street, S.E., Jan. 17."

Mr. Easton writes:—"By this you will see the strike will be terminated in one way or the other at the end of the present week. Such of the men as like to readopt our mode of carrying on business will no doubt return to their work, and those who do not must seek employment elsewhere. In either case there will be no pretence for them to continue to state that they are our workmen on strike. We have such overwhelming evidence before us that we can obtain the requisite number of men willing to work upon our terms that the danger of a lock-out will also be at an end."

LIGHT AND AIR CASE AT MANCHESTER.

LEA *v.* GRUNDY.

ON the 11th inst. Vice-Chancellor Little gave judgment in this case, in which an application was made by the plaintiff for an injunction to restrain the defendant, who is a building owner, from erecting new buildings on the site of old premises at a greater height than the former buildings. The plaintiff's case was that the defendant's new premises obstructed the access of light to his buildings. His Honour had granted an injunction on the 27th of December last restraining the defendant from further heightening the buildings until the October following, with leave to the plaintiffs to move in the terms of his bill upon giving notice to the defendant. Arrangements were made between the parties by which the defendant's undertaking as to damages was to continue in operation until the hearing of the cause. The property of the defendant had a frontage which reached backwards from Kennedy-street to Booth-street, Manchester. The defendant's old buildings had existed for some sixty years previously to the time when he commenced his present alterations. Originally they had been private residences, but long since had been converted into warehouses or offices for the accommodation of merchants and others. The question at issue was whether the defendant was entitled, in a street 27 ft. wide, to raise his buildings from 45 ft. to 60 ft. above the level of the street. The maximum sky area visible from the plaintiff's present windows did not exceed 36°, and the new buildings would very greatly obscure that amount of sky area. The plaintiff contended that this was naturally a great injury to his property on the opposite side of the street, and, further, that the Court was bound to draw that inference, whatever might be the opinions and views expressed on the subject by the evidence of witnesses who had been examined in the case. The judge decided that there must be an injunction in the terms of the bill. The decree must carry with it the right to the general costs of the suit.

IMPORTANT TO ARCHITECTS AND LOCAL BOARDS.

IN the Queen's Bench division of the High Court of Justice, on the 12th inst., Mr. Wills, Q.C., on behalf of Mr. Phillips, moved for a rule for a *mandamus* calling upon the Local Board of Litchurch, a suburb of Derby, to show cause why they should not approve certain plans for the construction of some china-works which had been submitted to them for approval. Mr. Phillips was the owner of large china-works at Worcester, and he and other persons had bought lands, and were under heavy contracts to the extent of 50,000*l*. With the view of putting up these works, the applicants had plans prepared which were in strict accordance with all the bye-laws of the Local Board, and these were duly submitted to the Local Board; and no objection had been taken that they did not comply with the bye-laws in all matters of construction. The Public Health Act of last year required the sanction of the Local Board, and if this was not given, then the Local Board had power to pull down the buildings if they were proceeded with. The Local Board passed a resolution to the effect that they could not allow Mr. Phillips to erect china-works, because its working would establish "a noxious trade or manufacture, according to the 112th section of the Act." The Local Board had entirely misconstrued the 112th section. It did not give them power to say that the works when completed would prove a nuisance to the neighbourhood. They were simply to decide whether the plans complied with the bye-laws; and if afterwards they were proved to be a nuisance in working, the owners would be liable to a penalty of 50*l*. per day. Mr. Phillips had carried on similar works in Worcester without causing any nuisance. It could never have been intended that the Local Board were to be judges as to whether a business would be a noxious trade.

The Lord Chief Justice.—Take a rule.

THE ASSOCIATED CARPENTERS AND JOINERS OF SCOTLAND.

THE fourteenth annual report of this Association has been submitted by the general secretary (Mr. Wm. Paterson). The members are congratulated on the continued prosperity and usefulness of the Association, the membership and branches showing a considerable increase, and the reserve fund steadily accumulating. Referring to the reduction of wages in the Clyde district which had been accepted after a strike of a few weeks, the report points out that although wages were advanced to the old rate a few months after, yet the men working in the shipyards had no corresponding advance to that obtained by those in the house shops. "There is," says the report, "no apparent reason why this state of matters should continue, if the shipjoiners can be roused to a proper sense of the cause that has kept and still keeps them in the rear. The remedy is in the hands of the shipjoiners, and the fault is their own if the grievance is continued. In all the other disputes success attended our efforts, so that, generally speaking, wages are on an average about 2s. more per week at the close than they were at the beginning of the year. A considerable number of the branches have also obtained the 51-hours week. The day is not far distant when the 57-hours week will entirely disappear from our report and the trade. Parliament last session removed almost entirely the restrictions that operated so much against us as workmen and trade-unionists. It is not for us to inquire whether this action was stimulated by a sense of justice or by a desire to please. In the labour laws of last session we have got what we were often told we would never get, and although exception might be taken to some clauses, the measures are good and give a freedom we did not expect for many years." The receipts for the year amount to 8,165*l*. 5s. 3½d., being 1,349*l*. 13s. 10½d. of an increase as compared with last year. There has been paid as sick aliment 2,612*l*.; as funeral allowance, 545*l*.; as tools' compensation, 409*l*.; as strike allowance, 614*l*.; as victimised allowance, 7*l*.; as bonuses to two disabled members, 100*l*. There is a balance placed to the credit of the Association of 1,367*l*. 13s. 11½d., which brings the funds in hand to the sum of 10,439*l*. 2s. 7½d.; of this sum 8,162*l*. 16s. 5½d. is the property of the trade section; and 2,276*l*. 6s. 2d. belongs to the sick section. There are 861 more members than last year.

WALLS OF ROME.

AT the *conversazione* of the British and American Archæological Society of Rome, held on Monday, January 3rd, Mr. Parker exhibited a drawing, by Signor Cicconetti, of the arch or doorway at the south-west corner of the Quirinal-hill, in a cellar under the villa of Cardinal Antonelli, in a line with the Via Nazionale, which is being partly rebuilt from below. This arch has been called the Porta Fontinalis, and is probably near to the site of that gate in the wall of the kings, but Mr. Parker showed that it cannot be a gate in the wall of Servius Tullius or of any of the earlier kings, for these reasons:—the walls of the fortifications of the time of the kings were 12 ft. thick., the wall of this arch is only 3 ft. thick. It has been rebuilt of old materials; the jambs are not of the same stone as the arch; it is built upon a wall of concrete and not upon the solid tufa rock, as all the walls of the kings are. The builders have been afraid to trust the soft tufa to carry the weight of the wall of the house above, and for that reason there is a brick arch of the time of Constantine over the arch of tufa to support the weight. Part of the original wall of the fortification of the Quirinal-hill remains near to it, but not on the same line, and on a much higher level; on the other side of that wall is part of the pavement of the street made in the inner fosse with a drain on the other side of it. There were originally two arches about 10 ft. apart, one of which was destroyed by the workmen, but the large blocks of stone of which it was built were lying about when this drawing was made; the old wall on the cliff above forms an angle near this point, and in the wall which is at an angle with these two arches is the jamb of another doorway of the time of the kings, only one jamb remains, but that appears not to have been moved, possibly the stones taken from it were used for the arches below, and this may be one jamb of the Porta Fontinalis. The two arches may possibly have been entrances into

the thermæ of Constantine, of which there are remains in the Colonna gardens not very distant from this spot, in the same direction, and on the same side of the road. The brick walls of these thermæ are built upon a stone wall of the time of the kings, which is used as a foundation. These solid old walls of the time of the kings have been found very frequently used in the same manner.

REMOVAL OF LEAD FROM WATER.

SIR,—A "Medical Officer of Health," in your issue of December 18th, questions our assertion that the Silicated Carbon Filter has the power of removing lead from drinking-water, and he calls in the aid of our old acquaintance the "merest tyro in science" to bear out his own gratuitous statement, that "a filter can only remove what is mechanically suspended in a liquid." With all due deference to a "Medical Officer of Health" and the "merest tyro," we must refer them to any of the modern analytical chemists, who will inform them that certain forms of carbon are capable of removing the salts of lead from solution in water, and we again unhesitatingly assert that our filters will do so.

We now invite your correspondent to make a solution of lead, containing the largest proportion of the metal that drinking-water is likely to absorb from contact with leaden cisterns or pipes,—say half a grain to a gallon,—and bring it with him to these works, where our chemist will have much pleasure in affording him every facility for performing the experiment himself.

THE SILICATED CARBON FILTER COMPANY.

COMPENSATION CASE.

EXTENSION OF THE LIVERPOOL FREE LIBRARY.

MR. J. J. ASTON, Q.C., assessor, and a jury, sat on the 5th inst. in the Sheriff's Jury Court, St. George's Hall, to assess the compensation to be awarded to the owner of a public-house at the corner of William Brown-street and Mill-lane, required by the Corporation for improvement purposes in connexion wit the Free Library and Art Gallery. The house is at present occupied on a lease of which three years are unexpired. The present rental is 110*l.* a year, and Mr. Peter Ellis was called and valued the property, including 10 per cent. for compulsory sale, at 3,618*l.*

Mr. Wylie's valuation on an increased rental of 200*l.* at the end of the present lease was 3,740*l.*

Alderman Rigby, the present lessee, said that about two years ago he made a *bond fide* offer of 3,100*l.* for the property, but withdrew on learning that the Corporation intended acquiring it.

For the Corporation, Mr. Cawley, C.E., Manchester, was called, and gave it as his opinion that the increased rental which the property would bring at the expiry of Alderman Rigby's lease would only be 120*l.*, and he estimated the compensation at 2,320*l.*, including the customary 10 per cent.

Mr. W. H. Picton said that 110*l.* would be the full rental, and that, allowing 5 per cent. for leakages, he considered 2,299*l.* to be a fair compensation.

The jury fixed the compensation at 2,900*l.*

FAIRBAIRN MEMORIAL.

SIR,—I notice in your impression of January 8, that my price for the above statue "is 750*l.*" I wish to say that the price by one of the contesting sculptors was 750*l.*, but the price I gave, and received the commission at, is 840*l.*

E. EDWD. GEFLOWSKI.

BUILDING PROVISIONS IN AMERICA.

THE New York Board of Health requests the Department of Buildings to require, in accepting specifications for buildings in future,—

1. That the iron soil-pipe and the waste-pipe be extended through the roof for 2 ft., at their maximum calibers, and that the waste-pipe be independent of the soil-pipe.

2. That every basin, sink, and bath-tube be properly trapped.

3. That the pipe connexions be lead, caulked or otherwise securely sealed.

4. That the location and direction of the house-drain be accurately indicated by a diagram with measurements, or by measurements from walls or other permanent landmarks, so that it may be readily reached when necessary.

5. That the department forbid the use of brick drains or wooden as substitutes for pipe-drains, and that separate sewer connexions be required when practicable; and

6. That the house-drain be trapped under the area or near the cellar-wall, in addition to all other traps whatsoever.

Society for the Encouragement of the Fine Arts.—The first of the four *conversazioni* given during the season by this Society took place on the 13th inst., at the gallery of British Artists, Suffolk-street, Pall-mall, and was numerously attended, the company numbering about 500. It was a music night, and the programme was carried out under the direction of Mr. Alfred Gilbert.

CHURCH-BUILDING NEWS.

Gloucester.—St. Michael's Church, Gloucester, was re-opened on the 21st ult. The church, with the exception of the tower, was rebuilt twenty-five years ago, from designs by Mr. F. S. Waller and the late Mr. T. Fulljames, and was consecrated in 1851. But some of the carving, and other parts of the design, were left unfinished from want of funds. Soon after the appointment of the Rev. G. James as rector, it was determined to alter and greatly improve the building; plans were furnished by Messrs. Waller, the contract was taken by Mr. A. Estcourt, and the work is now completed. The old vestry and organ-loft have been removed, and a new vestry erected on a part of the site of the ancient burial-ground. The space thus obtained has been made available for the fitting up of the organ on the floor, and also for some additional seats at the east end of the aisle. The old seats in the nave as far as the second pier from the east have been removed, and in this space have been placed new choir-stalls, the whole of the floor having been raised 6 in., and the chancel thus enlarged has been separated from the nave and aisle by means of low stone screens, that between the piers of the arcade being surmounted by ornamental iron-work. The unfinished carving has been completed by Mr. Henry Frith. The groining of the tower has yet to be done. The present work will cost between 600*l.* and 700*l.*

Midsomer Norton.—Application has been made by the vicar and churchwardens at the Diocesan Court, Wells, and a faculty has been granted, to permit the execution of extensive alterations in the fabric of Midsomer Norton parish church. Through the liberality of one of the parishioners, Mrs. Savage, a handsome stone and marble pulpit will be substituted for the present "two-decker." It is proposed to build an extension of the chancel, and to remove the organ from the west gallery into a chamber formed out of the south-east vestibule. The galleries will be approached by a new entrance under the tower; and the high pews will be replaced by more commodious open seats. Plans have been prepared by Mr. Gane, architect, of London. The church was rebuilt forty years ago.

Arbroath.—During the ensuing summer some extensive alterations are to be made in the fabric of Abbey Church, Arbroath. A portion of the front wall is to be taken down, and a new one erected at some distance out on the open space in front of the building. This will contain a vestibule and also new stairs leading to the gallery, so that the space at present occupied by the stairs may be utilised for additional pews. The gallery itself is to be cleared out, and a new one erected. These alterations will cost 2,000*l.* Mr. James Maclaren, architect, Dundee, will superintend the work.

Boroughbridge.—Christ Church, adjoining the villages of Marton & Grafton, near Boroughbridge, was consecrated on the 11th inst. The church is built to accommodate 122 persons, and has been erected by Mr. Joshua Naden, builder, of Knaresbro', from plans prepared by Mr. John Ladds, architect, of London. It consists of a nave, 41 ft. long, 21 ft. 6 in. wide, 17 ft. high to the wall plate, and 35 ft. high to the ridge. The chancel is 22 ft. long by 18 ft. wide, 14 ft. 6 in. high to the wall-plate, and 29 ft. high to the ridge. The style is Early Decorated, and the cost has been about 1,700*l.* In removing the old church which formerly occupied the site there were found a number of worked arch stones, also jambs, shafts, caps, bases, and stone crosses, built into the walls in all directions, evidencing that there had been one or two earlier churches on the site. After the stones had been thoroughly fitted, it was found that many of them originally belonged to a fine Norman arch, with richly-moulded arch and jambs, which the vicar has been instrumental in having carefully restored and used as a doorway from the church to the vestry. Mr. W. Lewis, of York, was clerk of the works.

Donhead St. Andrew.—After having undergone restoration and refitting of its interior, the parish church of Donhead St. Andrew, Wilts, was re-opened on the 12th inst. The edifice is in the Perpendicular style, and consists of a nave and side aisles, with a spacious chancel, and an embattled and pinnacled tower at the west end. The aisles are separated from the nave by an arcade of three bays, and the ancient windows of the clearstory and of the aisles of the north and south are square-headed. Previously to the reparation, the interior was in a most dilapidated and uncomfortable state. The unsightly high pews have been removed, and have been replaced by sittings of stained deal. The gangways are laid with Godwin's tiles. Under the floor are hot-water pipes for heating the church, the apparatus having been supplied by Mr. Richardson, of Wincanton. The chancel is paved with enamelled tiles, and the new steps are of Portland stone. The columns of the arcade have been renewed. A gallery at the west end of the church has been removed, and the lower part of the tower has been fitted as a baptistery, a new stone base having been added to the ancient font. A new oak pulpit, of good design, rests on a stone base. The contract for the work was executed by Mr. T. B. Miles, of Shaftesbury, from designs by Mr. Kemp, of London. It is intended to place an organ in the church, and a chamber for it will be formed on the north side of the east end of the church.

SCHOOL-BUILDING NEWS.

Etchester (*Co. Durham*).—A new school-room has recently been erected in this village, from the designs of Messrs. John Smith & Son, architects, of Shotley Bridge, and was formally opened in December by the Rev. Archdeacon Prest. The school is Gothic in style, and of a strong, substantial character, and provides accommodation for 100 children.

Sherborne.—Newland Infant Schools, Sherborne, were re-opened on the 6th inst., after undergoing alteration and improvement, from plans prepared by Mr. T. Farrell, architect. The unsightly dead wall next the street has been replaced by a wall of faced stone, and pointed, and the windows of the mistress's house have been renovated, and made to correspond with those in the old school-house, which formerly received its light from the back, but is now lighted by four stone pointed twin windows with iron casements inserted therein. The gallery in the old schoolroom has been repaired and enlarged, and the room has been fitted with polished desks and seats. An entirely new schoolroom, 30 ft. by 20 ft., has been added to and approached from the old apartment. This room is also lighted by two twin pointed windows on the west, and one on the east side, and by a triple window on the north side, and is also fitted with desks and seats on iron standards. The whole of the improvements have been effected at a cost of about 450*l.*

Miscellanea.

Fatal Scaffold Accident. — Last week Dr. Hardwicke held an inquest on the body of Jeremiah Lovett, a labourer, killed by the falling of an immense stack of timber and a scaffold, at buildings in course of erection on the premises of Mr. Sage, builder and shop-front fitter, of Gray's-inn-lane. Mr. Driscoll, a labourer, said that he was working with deceased on Tuesday afternoon on a scaffold at new buildings, adjoining their premises in Verulam-lane. Witness was engaged in stacking timber on this scaffold, and deceased was below, serving mortar to a bricklayer. All at once the scaffold gave way, and the whole of the timber, in weight about six tons, was shot off, and the large bulk of it fell upon deceased, who was so deeply buried under the timber that it took a quarter of an hour before he could be got out. The only support to the scaffold on which all this timber was stacked was two uprights and two transverse poles, resting in sockets made in the brickwork of an old wall, which, on account of its rottenness, had collapsed and bulged out with the weight of the timber on the scaffold. The scaffold had been erected under the direction of Mr. Sage's brother, the foreman of the works. Ultimately the jury returned a verdict of "Accidental death, but at the same time the jury further believe that the accident occurred through neglect or the want of proper precautions in the construction of the scaffold on which such a mass of timber had been placed." Mr. Sage, the foreman, was called in, and informed that, although the jury had abstained from returning a verdict of Manslaughter, the firm were liable, upon their verdict, under Lord Campbell's Act, for compensation to the widow and family of deceased for the loss they had sustained by his death.

Rheims Cathedral.—It is stated that M. Wallon has ordered the restoration of Rheims Cathedral, at a cost of 2,000,000 francs.

Fires in London.—From the report of the chief officer of the Metropolitan Fire Brigade (Captain Shaw) on the state of the brigade and the fires in London, during the year 1875, made to the Metropolitan Board of Works, we learn that the number of calls for fires or supposed fires received during the year has been 1,668. Of these 90 were false alarms, 49 proved to be only chimney alarms, and 1,529 were calls for fires, of which 163 resulted in serious damage, and 1,366 in slight damage. These figures refer only to the regular calls for fires, or supposed fires, involving the turning out of firemen, fire-engines, horses, and coachmen; they do not include trifling damages by fires which were not sufficiently important to require the attendance of firemen; neither do they include the ordinary calls for chimneys on fire, which are separately accounted for. The fires of 1875, compared with those of 1874, show a decrease of 44; and compared with the average of the last ten years, there is a decrease of 59. The proportion of serious to slight losses in 1875—163 to 1,366—is about as favourable as the Brigade has hitherto succeeded in making it.

Navy Oak.—The Secretary of the United States' Navy, in his recent report, calls attention to the importance of securing, before it passes entirely away, as great a quantity as possible of the sea-shore live oak of the country, which he describes as the best timber of the world. He says:—"The rapid deterioration of all our vessels built of other wood constantly warns us how invaluable is this timber, now so rapidly passing away. It is the growth of centuries, and when once gone will never be replaced. The supply, which was never large, is being rapidly exhausted, and it becomes yearly more difficult to procure, as what is left is being largely bought up for shipment abroad. All of it that was laid up by old Navy Commissioners was consumed during the war, and the Department has been endeavouring for the past few years, whenever it had the opportunity and the means, to secure what could be had for the present use, or to be laid up to season for the future use of the navy. In the opinion of the Department, measures should be taken, if possible, to prevent the exportation of such of this timber as is left on our southern coast, and to secure it for the use of the Government."

The New Law on Land Transfer.—On the 1st inst. the statute to simplify the title and to facilitate the transfer of land in England took effect. This Act will supersede the Land Registry Act of 1862, and the registrar and other officers will be attached to the new law. It points out certain persons who "may" register property under the same. For instance, any person who has contracted to buy for his own benefit an estate in fee simple in land, any person entitled for his own benefit, at law or in equity, to an estate in fee simple, and any person capable of disposing for his own benefit, by way of sale, of an estate in fee simple in land, whether in either case subject or not to incumbrance, "may" apply to the registrar to be registered under the new Act, with a proviso that in the case of land contracted to be bought the vendor consents to the application. The statute contains 129 sections, divided into five parts, and repeals a part of the Vendor and Purchaser Act, 1874. No application can now be entertained for registration under the Land Registry Act of 1862, which was brought forward by Lord Westbury, and it remains to be seen whether the present measure, introduced by the Lord Chancellor, will be generally adopted.

Decoration of Gainsborough Parish Church.—Workmen are now employed in decorating the interior of the parish church, Gainsborough. A short time ago a copy of Leonardo da Vinci's picture of "The Last Supper" was given by an anonymous parishioner, and placed in the centre compartment of the reredos, immediately above the Communion Table. Soon after this gift was presented, it was decided to make an effort to decorate the whole of the apse in a permanent and worthy manner. After mature consideration the plans of Mr. Knowles, of York, were accepted, and the work is entrusted to him. The cost of these adornments is estimated at 125*l*.

Chester Cathedral.—The *Chester Chronicle* states that it is the intention of the Dean and Chapter to place a spire upon the tower of the cathedral, in accordance with the model which has been exhibited for some time past in the Chapter-house.

New County Buildings, Dumfries.—An important addition to the architecture of English-street, Dumfries, has recently been completed. Formerly the head-quarters of the Dumfriesshire Constabulary and the department of Weights and Measures were accommodated in small, dingy, and ill-arranged premises in the street just named, which the Police Committee of the county three years ago resolved to replace with a building suitable and commodious for the purpose required, and externally in keeping with their character. Accordingly they employed Mr. Barbour, now of the firm of Barbour & Halliday, architects, to prepare plans, and these having been submitted to and approved by the Government, were proceeded with and carried out, at an estimated cost of 3,300*l*. The building is three stories in height, and is Scottish Baronial in style. There is a central portal arch, flanked on one side by a massive loop-hooled tower, 65 ft. high, and on the other by a square "keep," which attains the highest elevation of the building. The contractors were:—Mason work, Crackstone & Son; joiner work, Mr. Mein; slater work, Mr. Bridges; plumber work, Mr. Ramsay; plaster work, Mr. Dickson; glazing and painting, Mr. Costin.

Reredos at Stoke Church, Ipswich.—The stone panels of the reredos in Stoke Church, Ipswich, have been filled with full-length figures in oil painting on a gold background, in the style of the early Italian school. This painting is the work and gift of Miss Lacon, and has been executed at the Ipswich School of Art, under the superintendence of Mr. T. W. Griffiths. The eight panels, 9 ft. in length, contain the figures of the four major prophets, and the four Evangelists. Isaiah, Daniel, St. Matthew, and St. Mark occupy the north side; St. Luke, St. John, Jeremiah, and Ezekiel the south side. Each of the prophets bears a scroll on which is written his chief Messianic prophecy. The space beneath the figures is occupied by floral decorations. Each of the Evangelists bears a golden book of his Gospel. Beneath appear their distinctive symbols. The central portion contains four angels, in the early Florentine style, with wings worked on gold, and mantles alternately red and blue. They hold inscribed scrolls. The central cross of white marble now stands out from a gold back-ground having a broad border of red, gold, and black, and the Eucharistic emblems.

Noxious Gases.—At the last quarterly meeting of the North-Western Association of Medical Officers of Health, held in Manchester, a report on the effects of chemical gases on human life and health was read. The medical officers of districts in which chemical or allied works are carried on had replied to a series of questions submitted by the Association. Their suggestions for the amendment of the evils resulting from the chemical-works nuisance were summed up thus:—"First, the removal of the works from the vicinity of inhabited houses; second, the reduction of the legal maximum of noxious vapours allowed to be discharged; third, emitting the vapours for the most part when the wind will carry them in a safe direction; fourth, the more stringent application by sanitary authorities of the legislative provisions already existing; fifth, the adoption by manufacturers of the most approved scientific processes; and sixth, requiring the removal of all sulphur from alkali waste before deposit."

Rhyl Winter Gardens and Aquarium.—The ceremony of cutting the first sod of the Rhyl Winter Gardens and Aquarium took place on the 4th inst. The proposed establishment will be situate on the west side of the town, in close proximity to the sea, some thirty-six acres of land having been purchased on which to erect summer and winter gardens, the latter of which will be enclosed, and will be on a somewhat similar plan to those at Southport. A marine and fresh water aquarium will be formed, and a large lecture and concert hall is to be erected capable of seating 2,000 persons, together with a dining-hall for 1,000 diners. A large proportion of the land will be laid out as a park, natural and artificial terraces being erected to add to its appearance; another portion will be leased for building villas upon.

The Aberdeen Painters.—The Aberdeen house and ship painters, at a large meeting held on the 12th inst., in Glennie's Hall, Queen-street, unanimously resolved to ask for a rise of 1½d. per hour, to take effect on the 1st of March.

A Powerful Organ.—Says the London correspondent of the *Liverpool Journal*:—"Private organs become more popular in London every year, and threaten soon to compete with the piano. But I suppose that no such private organ has yet been erected as that which was opened at Primrose-hill on Saturday. It belongs to Mr. N. G. Holmes, the well-known engineer. The designs were by Mr. Best, of Liverpool; the builders were Messrs. Bryceson. It is an immense instrument to be placed in a private house. It has four key-boards, sixty-five speaking stops, and 4,209 pipes. In connexion with the great organ is an "echo organ," built away from it, and worked by the electric action. Then there is a carillon, or peal of bells. Altogether, Mr. Holmes has power enough in his house to please his neighbours for a quarter of mile round, or, if he pleases, to make life unbearable to them."

Defences of the Metropolis.—The newly-built powerful forts on the banks of the Thames between London and Sheerness have had their armaments completed. These consist, in some cases of 38-ton, and in others of 9-inch or 12-ton guns, which in all cases are mounted upon the patent carriages, by the machinery of which the gun can be elevated or depressed, or its position changed with the utmost facility. As bearing indirectly upon the defence of the metropolis, it is stated that the first of the forts that are to be erected on the heights above the Medway at Borstal, Rochester, intended to form a chain of land defence for Chatham, will be shortly commenced. At this work, which will be one of great magnitude, the convicts now occupying the new convict establishment at Borstal will be employed.

"Harrison of Chester."—At the meeting of the Chester town council, on the 12th inst., the town clerk read the following letter, dated dated January 11th, 1876, and signed "Ann Boseley."—"9, Whitefriars. Sir,—My relative, the late Miss Ann Harrison, who died the 6th of October last, having bequeathed to me a portrait of her father, Thomas Harrison, the eminent architect, formerly of this city, and also two medals presented to him by Pope Clement, I beg to ask your acceptance of the same on behalf of the corporation. I inclose a copy of an article from the *Gentleman's Magazine*, May, 1829, containing a short biography of Mr. Harrison, and an account of the medals." The portrait and medals were accepted.

New Vicarage, Clee St. Margaret.—The new vicarage-house for the parish of Clee St. Margaret, Worcestershire, has just been completed, and was inspected a few days ago by the architect to the Ecclesiastical Commissioners. It has been built of local stone, with Grinshill stone dressings, and lining of local brick, by Mr. Thomas Pugh, of Hangerford, near Much Wenlock, from the designs of Mr. W. M. Fawcett, architect, Cambridge. The total cost has been about 1,700*l*., a considerable portion of which was contributed by the Ecclesiastical Commissioners. The porch and entrance-hall floors are laid with tesselated tiles manufactured by Thoms, of Broseley, under the superintendence of Mr. Bathurst.

Important Federation of Trade Societies. At the Trades Congress held in Liverpool about a year ago, a scheme was submitted for the federation of organised trade societies, with a view to raise an immense fund to enable them to meet the great associations of capital on equal terms, especially in cases of dispute. The matter was again considered at Glasgow in October, when the scheme was approved of, and the rules for the guidance of members have just been issued. They set forth that, in the interests of labour, it is imperatively necessary that united action should be taken by the powerful trade organisations of the country for mutual protection under exceptional circumstances.

Enlargement of the Salop and Montgomeryshire Lunatic Asylum.—The visitors of the Shropshire and Montgomery Lunatic Asylum at Bicton, near Shrewsbury, have just reported to the magistrates that, in their opinion, it will be necessary to enlarge the asylum by building new wings on the male and female side. Four acres of land have already been purchased on the west of the present building. The amount of the additional accommodation to be provided is for no fewer than 200 patients, being an increase of about one-third of the present number. Plans are about to be ordered from the County Surveyor.

Coroners' Courts.—The principle of establishing Coroners' courts in the various metropolitan parishes, which originated in St. Pancras, in the central district of Middlesex, has been further carried out by the establishment of a court at 15, South Wharf-road, Paddington, adjacent to St. Mary's Hospital. The room contains an elevated platform for the coroner, with suitable accommodation for the press, and plenty of seats for the jury, witnesses, and the public. These courts will supersede the use of public-houses for the holding of inquests, and not one hour too soon.

Iron Waste.—Efforts have recently been made in America, it is said with success, to introduce the process long since turned to good account at Sechshaus, near Vienna. Iron and tin-plate scraps are reconverted into valuable merchantable products. From all tin-plate and soldered articles the tin is first separated, and the iron is subsequently melted into a very high quality of metal. In the course of the process various by-products are obtained, which are said to pay all working expenses, so that the value of the tin and iron is all clear profit.

Chester Archæological Society.—The second meeting for the present session was held in the Society's apartments, Albion Rooms, Lower Bridge-street, on the 17th inst., when Mr. John Brown read a paper on "The Ancient City of Ephesus, including a short description of the celebrated Temple of Diana,—being notes and recollections of a recent personal visit to that historic site." The lecture was illustrated by a series of large photographs and drawings of the ruined city and temple of Ephesus, as well as of the chief palaces and mosques of Constantinople, Smyrna, &c.

Tramway Cars for Working Men at Edinburgh.—At a meeting of the Lord Provost's Committee on the 12th inst., it was resolved by a majority of ten to six to recommend that the Town Council, as local authority, request the Edinburgh Tramway Company, in terms of their Act of 1871, to run cars upon all their routes before seven o'clock in the morning, for the convenience of working men. The hour at which it is proposed the cars should leave the different termini is half-past six a.m. The fare is not to exceed one halfpenny per mile.

The Black Memorial, Edinburgh.—Since the commission for this monument was entrusted to Mr. John Hutchison, R.S.A., the artist would seem to have lost no time in proceeding with the work. His design has been completed in the form of a small model, and he is now engaged upon the full-sized figure, from which the bronze casting will be made. Mr. Black is represented in standing posture, in the fur-trimmed robe of the Lord Provost of the city. With the full-sized model, which is 12 ft. high, considerable progress has been made.

The Edinburgh Plasterers.—It is stated that most of the master plasterers of Edinburgh have received notice, through the secretary of the Operative Plasterers' Trade Union, to the effect that each must disperse with a certain number of apprentices. The general result, it is said, will be a reduction of about twenty in the number of lads learning the trade. If this system were pursued throughout all the trades and professions, what would become of the "residuum"?

The Threatened Wholesale Demolition of City Churches.—The Archdeacon of London has addressed a letter to the President of Sion College, in which he says: "I do not like to leave you and my rev. brethren of Sion College in ignorance of my sentiments on a matter so vitally affecting the Archdeaconry as the movement about the City churches. I am very sorry I cannot approve of the scheme which seems to be recommending itself to the majority. I look upon it as too closely bordering upon confiscation."

Extensive Improvements proposed for Birmingham.—An inquiry by Mr. J. T. Harrison, C.E., Local Government Board Inspector, was held on the 13th inst, at the Council-chamber, Moor-street, respecting the borrowing of a million of money by the Corporation for the purposes of street improvements and sewerage in this town.

The Liverpool Borough Engineer.—The salary of Mr. Deacon, borough engineer of Liverpool, has been increased from 1,000*l.* to 1,200*l.* per annum.

"Flitting" at the Zoological Gardens.—The lions at the Zoological Gardens, Regent's Park, have this week been removed to their new quarters in the building lately erected from the plans of Mr. Anthony Salvin, and which we described some months ago, in an article entitled "The Lions at Home." At the back of the new lions' house there is now being constructed an open cage, 50 ft. long by 40 ft. wide, in which it is intended the lions and tigers shall, from time to time, take the air.

The Glasgow Painters.—At a meeting of the Glasgow United Trades Council, on the 12th inst., the painters' representative stated that the trade with which he was connected was moving for an advance of wages to the extent of ½d. per hour, and fifty-one hours per week. The employers, however, were opposed to such an alteration, and in several shops had asked the men to engage to work for twelve months on the present arrangements, intimating that those who did not do so would immediately be discharged.

Foreign Cattle Sanatorium, Newcastle. At the meeting of the Newcastle Town Council, on the 12th inst., it was resolved that an additional story be erected to the Foreign Cattle Sanatorium at the Ouseburn, at a cost of 2,365*l.*, and that the tender of Mr. John Dickson, contractor for the works at present in hand, be accepted. The total estimate for the sanatorium was 15,000*l.* The first contract was 6,094*l.*, to which had to be added the present contract of 2,365*l.*, making a total of 8,459*l.*, exclusive, of course, of the land.

Belsize Park Skating Rink.—On the 12th inst., a new skating-rink was opened for this quarter of London. The rink is the property of Messrs. S. G. & W. Bird, and is situated in the Lancaster-road, three minutes' walk from the Swiss Cottage Railway Station. It is 200 ft. by 100 ft., and about one-third of it is covered in by a substantial roof. The surface is laid with Clarke's patent asphalte. On entering, on the right-hand side, are an office, skate-room, &c.; on the left, a refreshment-room.

Incombustible Wood.—A recent invention by Mr. A. F. Richard, of Dax, France, relates to the preservation and incombustibility of wood by the aid of crystallised chloride of sodium in solution in water at between 6° and 24° by Beaumé's aëcometer, and of a solution of chloride of sodium and alum at between 4° and 27°, either mixed in variable proportions or employed separately.

Fire at Bosbury Church, near Ledbury. On the afternoon of Sunday, the 9th inst., a fire broke out in the roof of Bosbury Church, near Ledbury. The fire occurred at a point where a stove-pipe passed through the roof, and it is supposed that a spark must have fallen upon the timbers beneath the roof. A plentiful supply of water being at hand the damage was not very great.

To Clean Paint and Marble.—It may be useful to some of your readers to know that the "New Californian Ground Borax" is admirably adapted for cleaning paint, marble, and glass; one penny packet (containing about 2 oz.) boiled in two gallons of water would clean the paint of several rooms; a little soap should be used with it.—T. M.

Rateable Value of the City of London.—The valuation lists for the City of London, which come into force on the 6th of April next, show a gross value of 3,577,752*l.*, and a rateable value of 2,932,227*l.* The same values in 1871 were respectively 3,052,086*l.* and 2,556,403*l.*, the new assessments showing an increase of 525,666*l.* gross, and 425,824*l.* rateable value.

New Court-house, Usk, Monmouthshire. The contract for building the new Court-house at Usk has been let, and the work will be speedily commenced. Messrs. Hill, Higgs, & Co., Crown Works, Lambeth, are the contractors, and the amount of the contract is 9,349*l.*

Death of a Milanese Painter.—On the 7th instant, at Milan, the artist, Signor Cavaliere Luigi Zuccoli, departed this life, after a short illness. This painter gained some of the highest distinctions by his talent, and was honorary member of the Academy of Fine Arts of Milan.

Bricks.—We are informed that the stock bricks used at the Royal Aquarium, Westminster, were supplied by Mr. W. T. Wiseman, of the Hop Exchange, Borough, and Brixton. We also understand that Mr. Wiseman is supplying the Yarmouth Aquarium, and the New National Opera-house, Victoria Embankment.

Tramways for Sheffield.—The Sheffield Corporation have resolved to complete the system of tramways in the town, at a cost of 20,000*l.*

Glasgow Stock Exchange.—The architect is Mr. John Burnet, not Mr. Thomson, as stated.

TENDERS

For rebuilding 21, Leadenhall-street. Mr. R. N. Clifton, architect:—

Simpson	£12,390	0	0
Patrick & Son	12,291	0	0
Lawrance	12,284	0	0
Brass	11,983	0	0
Peto, Brothers	11,630	0	0
Conder	11,240	0	0

For schools, Hanover-street, Islington, for the School Board of London. Mr. E. Robson, architect:—

Roberts, Brothers	£11,165	0	0
Hobson	11,089	0	0
Newman & Mann	11,051	0	0
Williams & Son	10,995	0	0
Downs & Co.	10,653	0	0
Enoch	10,565	0	0
Wall, Brothers	10,501	0	0
Hook & Oldrey	10,470	0	0
Kirk & Randall	10,370	0	0
Lawrance	10,336	0	0
Shellield	10,259	0	0
Bryce	10,233	0	0
Grover	9,974	0	0

For alterations at 9, Rose-street, Newgate-street. Mr. Wm. C. Banks, architect:—

Eaton	£620	0	0
Larke	620	0	0
Marriage	585	0	0
Sharpe & Everard	549	0	0
Parnacott	525	0	0

For additions to public hall, Walthamstow. Mr. John H. Swan, architect. Quantities by Mr. E. Morfee:—

Lipscombe	£3,408	0	0
Tubby	3,380	0	0
Lawrance	3,284	0	0
Perry & Co. (too late)	3,125	0	0
Sabey & Son	3,120	0	0
Deards	3,084	0	0
Morter	3,075	0	0
Tarrant & Sons	2,995	0	0
Reed (accepted)	2,950	0	0

For the erection of a warehouse, Cowcross-street, Smithfield. Mr. H. S. Benson, architect:—

Rudkin	£2,000	0	0

For building retort-house, coal-stores, &c., at the Plymouth Gasworks. Mr. J. T. Browning, engineer:—

Shaddock	£7,250	0	0
Finch	3,246	0	0
Verren	3,100	0	0
Willcocks, Brothers (accepted)	2,889	0	0

For forming a new road and building coal vaults, &c., Upper Norwood, for Mr. J. Selwin Tait. Messrs. Edward Power & Wheeler, architects.—

Aitchison & Walker	£3,730	0	0
Keeble	3,469	0	0
Anon	3,386	0	0
Carter	3,329	0	0
Brown	3,005	0	0
Crick	2,957	0	0

For alterations and additions to mansion at Silwood Park, near Sunningdale, Berks. Mr. Alfred Waterhouse, architect:—

Smith & Taylor	£27,379	0	0
Parnell	25,800	0	0
Hearn	23,360	0	0
Browne & Robinson	23,500	0	0
Holland & Hannen	22,950	0	0
Perry	22,800	0	0

For the vicarage house, Acton, for the Rev. A. H. Dunn. Mr. E. Monson, architect:—

Baker	£3,947	0	0
Jackson & Shaw	3,582	0	0
Temple & Foster	3,474	0	0
Seale	3,393	0	0
Baker	3,330	0	0
Gibson, Brothers	3,325	0	0
Roots	3,228	0	0
Beale	3,198	0	0
Gregory	3,193	0	0
Hunt	3,190	0	0
Nye	3,124	0	0
Hunt	3,102	0	0
Bartlett	3,100	0	0

TO CORRESPONDENTS.

C. B.—H. W.—A. S.—H. de M.—G.—J. C. K.—E. L.—M. Brothers & Co.—E. H.—C. R.—W. H.—W. W. & Co.—W. C. B.—F. P.—H. B. H.—M. H. R. W.—E. W. P. S.—A. G. C.—J. P.—F.—P. & W.—S. McS.—G. H. S.—J. B. W. C.—J. B. T. B. S.—An Old Subscriber try a circular curtain at the bottom of the cupola. There appears at present to be no certainty as to the result of wreck. J. C. (we cannot undertake the examination requested). Landowner (we decline to advise in private disputes).—J. J. M. (next week).—J. P. P. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, but necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

VOL. XXXIV. No. 1721. SATURDAY, JANUARY 29, 1876.

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The Proposed "Popular" Opera House, Paris.



RECENTLY we gave a description, with plan and section, of the great opera-house "for the million" which a company of gentlemen interested in art are proposing to found in Paris.* The success or failure of such a scheme would be matter of interest beyond its own locality. The attempt to popularise lyric drama, so long (from its costliness) an entertainment for a privileged few, is likely to be made in one way or another on both sides of the Channel before long, and we hope in the end with success. But the project of effecting this by a vast increase of the auditorium, so as to distribute the cost among a greatly-increased number of spectators, appears to us one of dubious success, and likely to lead to a heavy expenditure, without satisfactory result, either in a pecuniary or an artistic point of view.

The promoters and architects of the proposed "Opéra populaire" persuade themselves that by properly considered and specialised construction they can provide that an audience of 9,000 persons (from four to five times the ordinary extent of a theatrical audience) should be able to hear satisfactorily and with pleasure, without any disproportionate increase in the numerical strength of the executants. This is a species of ambition which is continually exciting the mind of the modern architect. Mr. Fergusson, in the appendix to his "History of Modern Architecture," has suggested the provision of a concert-room for 20,000 as a desideratum which ought to be supplied. The Albert Hall (to which reference is made by the French projectors) is a scheme of the same kind. It might be urged with some reason, that if people could really hear and enjoy a performance of this kind at a much greater distance, and in much larger buildings than the average of those built for the purpose, it would have been found out before now. The projectors of the "Opéra populaire" assert that it has been found out long ago, and that we have timidly dropped the model of the antique Greek and Roman amphitheatres, which were a greatly larger sort of building than even what they propose to raise. The Coliseum would contain 110,000 spectators; but it is admitted that spectacle only was in question there. But the Athenian theatres were much larger even than the "Opéra populaire" is intended to be, and "it is incontestable," says our French contemporary, "that there were musicians employed in them"; and the antique theatre, too, was open to the sky, or merely covered in with a curtain, though this latter seems only to have been a later Roman refinement of luxury. The argument, therefore, is that if musical drama of some kind or other could be heard in so large an open theatre by an Athenian audience, *à fortiori* it can be heard in a closed building of less extent by a modern audience, whose powers of hearing are not supposed to be inferior to those of the Greeks. It is admitted that echo in a large closed building creates a difficulty; but that, it is urged, may be obviated by using absorbent instead of reflective materials everywhere except near the origin of the sound; "in place of the surfaces being hard and polished, they must be soft, and garnished with cloth fabrics; or, in a word, instead of mirrors, we must have curtains.

"But, it will be objected, if the sound is absorbed everywhere, the vocal power of the singer would be insufficient to completely satisfy the hearing of so large an audience. This is specious reasoning; but experiment has proved that sound can be conveyed in tubes 5,000 or 6,000 mètres. This has resulted in the establishment, in large administrative institutions, of acoustic communication by tubes, which are not resonant, seeing that they are made of gutta percha. The sound-conveying power of the longest of such tubes is due simply to the manner in which the sound-rays are confined and forced forward in a parallel direction; and we find it is only necessary to speak in a low voice at one end of these tubes to be distinctly heard at the other end. If then our object is to reach distinctly the hearing of a very large audience, it would-suffice to arrange that audience along the sides of a tube, and the orator might make himself heard by an almost unlimited number of people."*

It follows from these considerations that in building a theatre for a very large audience, we should have all materials near the origin of sound as reflective and sonorous as possible, and all materials in other parts of the house as indifferent to sound, as un-resounding, as possible; and that the general cubic contents of the auditorium should be reduced to a minimum, in comparison with the space occupied by the audience, so as to approach as nearly as possible to the theoretically favourable conditions of a tube.

So far the *Revue Nouvelle*, speaking in the name of the architects of the new opera-house. The process of reasoning is theoretically logical, but the facts we take to be wrong at both ends of it. In the first place, the comparison with the conditions of the Greek theatre is fallacious and misleading. We know little or nothing positively as to the sort of manner in which the "chorus" of the Greek play was sung or declaimed, or of the nature of the instrumental accompaniment, if any, with which it was enlivened; but, negatively, we may feel absolutely certain that it had nothing in common with modern operatic music. There is no evidence whatever to render probable the existence of an art of music, anything like what we now understand by the term, till long after the Christian era. The Greek drama was a performance of a stately, severe, slow-moving type, restricted to three principal actors and the "chorus," and in all probability, as far as we have grounds for conjecture, the "musical" element in it consisted only of some kind of recitation or intoning on a fixed pitch, which would have the effect of conveying the words further than the ordinary tones of speech. But modern lyric drama is utterly distinct from this; it is a highly involved art, employing a great number and variety of performers, vocal and instrumental, dealing with the most delicate shades of effect and expression, and making use of elaborately interwoven successions of sounds following each other often with great rapidity, and which are liable to interfere with and overlap each other, so to speak, in any interior large enough to give space for a perceptible echo. However the auditorium be enlarged, the velocity of sound is a "constant," which cannot be modified in accordance with the dimensions of the building; and which, with an increased area, becomes increasingly disproportionate to what is expected of it. We do not believe that any contrivance for neutralising one echo or reflection of sound by another (which seems to be the kind of idea which governed the setting out of the curves of the *loges* fronts in the proposed Paris house) could be in the least depended upon. There is the expedient of destroying the resonance, mentioned in our first quotation, by using materials that will absorb sound; but these make a very "dead" house for music, a point of importance in so large an interior. This is to be met, however, by the principle of the tube; that is, by confining the air-space of the auditorium as much as possible so as to concentrate the sound. Now this application of the tube-principle in extending the size of music-rooms was suggested in a paper on the subject of buildings for music read at the Institute of British Architects three years ago,* in the course of which it was observed that in all probability a rectangular concert-room, of comparatively narrow area, and where the sound was confined in one direction, might probably be prolonged to a much greater length than such a room generally is, with success, proper provision being made against a return echo from the back of the room. But the amphitheatre form of the "Opéra populaire" can in no respect be likened to the "tube" of the French architect's theory. It is true the roof is kept low; but there is a vast space of air in the centre of the interior in which the sounds would spread and disperse quite uncontrolled or reinforced in any one direction.

The architects are right to keep the roof

* See page 53, *ante*, and illustrations.

* Revue Nouvelle de l'Architecture, December 8, 1875.

* Architecture practically considered in Reference to Music. By H. H. Statham. January 20, 1873. Printed in the *Builder*, vol. xxxi., p. 73.

low; but in so large an area this will not do all that is required. The difficulty will probably be just the same as in the Albert Hall, where the sounds of the band, in rapid passages especially, wander about in the most vague and uncertain manner, so that sometimes one-half of a phrase strikes clearly on the ear, and the other half is nearly lost.

The Albert Hall, it is true, wants the trumpet-shaped and sound-reflecting proscenium opening, which would certainly be a point in favour of the French theatre. But, besides the velocity of sound, there is another "constant" to be taken into account in these cases, and that is the power of the human voice; and, to a great extent, we may say, also, of the instruments, most of which have a fixed average power which cannot be much varied. A single voice may be very well heard in a large place such as the Albert Hall, in slow passages, where the sound has time to spread and develop itself. But in rapid passages the case is different; they are confused and blurred, and the effort to render them clear to the audience is a great, and in the end a deleterious strain on the singer's physical powers. And when we come from solo-singing to *ensemble*, both of voices and instruments, the disproportion between the limited powers of the singers and players and the increased size of the area is still more apparent. A mere proportional augmentation of numbers will not meet the requirements of the case. Even were it so, this would not meet the case of the "Opéra populaire," the object of which is to bring opera within reach of the masses by opening performances to a greatly increased auditory at low prices, but with the same expenses as usual. But even putting that out of the question, it is an utter mistake to suppose that mere adding to the number of performers in proportion to the size of the building will result in a proportionate effect. If 100 singers produce a certain effect in a theatre that will seat 2,000, it by no means follows that 400 will produce the same effect in a theatre that will seat 8,000.

At the Handel Festivals a chorus of 4,000 sing to an auditory of 20,000; and very grand the result is in some cases, and very confused and unequal in others. But the 4,000 do not produce anything like the same proportionate effect in power and incisiveness that 400 singers would in a room seating only 2,000. If, instead of increasing the number, we could proportionally reinforce the *timbre* and the travelling power of each individual voice and instrument, then the result would be very different. But as each separate voice and instrument can only be adequately heard at a certain distance, the mere combination of an increased number does not give each greater travelling power. The combined sounds will be heard further, no doubt, than single ones could be, but the many at a distance have not the same distinctness as the few at closer quarters: on the contrary, they mutually blur and interfere with each other, and lose edge and distinctiveness of articulation.

In London we are in a position to form a practical opinion upon the results of so large an area, on modern musical performances, as that which the projectors of the "Opéra populaire" contemplate. They refer to our Albert Hall as an example of what may be done in a place of the size they propose. We are sorry to be compelled to inform them that whatever valuable public use that in many respects remarkable building may ultimately be put to, as a place for music it is a warning, and not an example; and that, too, in spite of a very favourable acoustical construction as far as selection of materials goes. The Albert Hall has in England practically demonstrated the truth of the opinion which M. Gounod has already expressed to the committee of the proposed French opera-house, that real "music" is not possible in such great spaces. The idea which is becoming prevalent of having monster concert-rooms and monster theatres we believe to be an utter mistake, though we are very sorry it is so. If the French committee wish to popularise opera, they had much better make a double theatre on the site proposed, and divide audience and performers between them. They will have a much better result, and quite as good a chance of making it pay. If they, in opposition to the advice of their first musician, and to our experience with the Albert Hall, sink their money in a monster theatre, however scientifically contrived, we much fear that they are preparing loss for themselves, and dissatisfaction and disappointment for their public.

THE GLASS EXHIBITION AT ALEXANDRA PALACE.

THE Exhibition of Stained Glass and other work in glass at the Alexandra Palace, promoted by the Company of Glass-Sellers, and which was referred to by a correspondent in our last, is assuredly a very poor show to be regarded as a representative exhibition of the doings of the art and trade in this country. We took note some time since of an advertised intention to promote such an exhibition, as a matter worthy of attention when the time should come; but the thing appears to have been done in such a hole-and-corner way, and so little effort made to attract any interest in it either, that we imagined the project had fallen through or been postponed. There is nothing, as it is, to make a talk about, or to attract public attention in the collection, which consists of four screens containing specimens of stained and embossed glass, fixed before four of the windows on the west side of the great Hall, and a few tables bearing specimens of glass vessels, ornamental and scientific, and of glass-cutting and painting on glass, &c. There can be no doubt that had an appeal been made, on a wider basis, to the artists and manufacturers in glass throughout the kingdom, a very large, interesting, and (to the public) instructive collection might have been got together, such as might have been something like a rival to the Londesborough collection of arms, at present the only thing worth seeing in the building. As it is, the collection is so small and so entirely destitute of representative character, that it has little value. We may offer a few remarks on the objects exhibited, in part by way of indicating what has been done and what may be done on some other occasion; for there is plenty of room for repeating the attempt on a larger scale and under better management.

The designs exhibited are classed under five heads:—A, church-windows; B, domestic glass in the "modern style," showing flowers, figures, and fruit, &c.; C, glass for public buildings, embossed or etched; D, glass cutting; E, leaded window-glazing. The first screen, commencing from the south end, contains two small mediævalised designs of sacred subjects, showing a somewhat refined treatment, though rather common-place in colour, and with too much blue in them; two designs of similar character occupy the same position on the second screen; they are all too high up to be seen properly or for the designer's or manufacturer's name to be discerned. Four squares of designs for cathedral and antique glass (which latter is, as our correspondent last week correctly reported, written as "*antigul* glass"), and for arrangements of "sheet" and "crown" in leaded patterns, are exhibited by Mr. Cox, and show very good style of work, especially in the white glass arrangements; the others are flat treatment of colour designs in a conventional style. The specialty of what Mr. Cox calls "antique" glass seems to be the artificial roughening of the surface so as to break up the flatness of the colour; this of course tends to greater richness of effect; but why call it by so misleading a name as "antique"? It is not like old glass,—no new glass ever can really be so, because the staining of time cannot really be imitated, even if the precise process and material of the old glass were recovered; and there is no need to excuse it by the precedent of what is old, because a treatment which produces this prismatic roughness of surface is only in accordance with the common sense of the art, which dictates that richness and depth of effect should be aimed at rather than raw and glittering colour through smooth surfaces. The same exhibitor shows a piece of "church glass," which is rich and full in colour. The specimens of "domestic" glass in this screen are not happy; the best in style is a window-blind with an etched profile-portrait of the Laureate in the centre, and the rest of the glass in small square quarries containing devices said to be emblematical of the poet's works, but not distinguished by any happiness of invention; the general treatment, however, is in keeping with the principles of stained glass, as a material for decorative rather than pictorial effect. In this respect the etched panels in black and white by Mr. Connell, who works for Messrs. Heaton, Butler, & Bayne, though showing very good drawing, are out of place on glass. You cannot consistently look through a breaking wave, nor can its freedom of movement and variation of tone and lights be represented by any work that is possible on glass. It is a great pity, as we have repeatedly urged, that designers on glass cannot, once for all, be got to see the futility, on both artistic and practical grounds, of attempting *pictorial* effect. Artistically it is a mistake, because that which is obviously, to the eye, a flat transparent or semi-transparent surface in one plane, cannot be consistently made to appear rounded and solid, and the reflected lights and dark shadows of nature cannot be represented by transmitted light; and, practically, there is the objection, that no methods of working on such a ground as glass are sufficiently tractable in manipulation to give realistic softness and refinement. The result must always be hard and artificial.

On the next screen we noticed a rather good specimen of ecclesiastical design by Messrs. Shrigley & Hunt, of Lancaster; a figure of "The Good Shepherd," with too much of the conventional stiffness supposed to be proper to ecclesiastical stained glass, but good and harmonious in colour (mostly in secondary tones), and with the detail treated in a manner suitable to the material. On the same screen Mr. Snell exhibits a design of the "domestic" class consisting entirely of a medley of animals grouped over the surface, each surrounded by its own leading. The design, which is labelled "one week's work," is probably sent as a test of executive ability rather than as a design; considered in that light, we must compliment Mr. Snell on his ability and spirit as a draughtsman. A study from a lithograph of "A Greek Girl" on the same screen has more refinement than any other of the realistic transparencies, and also shows good drawing. At the top of the third screen are what appear to be the best specimens exhibited; especially a domestic window, with a circular design emblematical of Night in the centre, and the spandrel panels filled with flower and fruit subjects. This is in every respect a good and artistic design, both in style and colour. Next to this are two or three specimens of embossed glass, one of which is a reproduction of Flaxman's beautiful design of "Apollo and Lampetia" (from the *Odyssey*), in a severe and simple style which suits the manner of the drawing, and exhibits also a specimen of the kind of effect in which this mode of execution can be legitimately employed. A portrait head of the Princess of Wales, with a border or margin in rather pronounced Renaissance style, shows, nevertheless, some powerful and effective treatment. All these are placed too high for proper examination or for the names to be read; and application for the authors' names only elicited from the official in charge the curt statement that he "had no orders" to supply this simple piece of information. Below these, and "on the line," are a set of productions bearing the name of Geo. Wilson, and comprising a lake and mountain scene, a big portrait of some moustached civic dignitary, with a gold chain, surrounded by a Renaissance border with pink interspaces, and the whole on a blue ground; there are two or three other things of the same kind, among all of which it is difficult to say which is the most tawdry and vulgar in taste. These, however, seem to occupy the post of honour, and strolling visitors came up, and in our hearing admired and marvelled at them: so much for the education of popular taste promoted by the exhibition. Mr. Peter Fussel exhibits on this screen a long panel of "heraldic" glass, which is very good, and so entirely right and in good taste that we can only wonder to find the same exhibitor's name on some of the very commonplace figure transparencies on the first screen. The fourth screen contains a large head of a semicircular window, with some good points in colour and design, but the semicircular border is very crude and raw in effect. One of the best bits in the collection is a small design by Mr. Cox for ornamental leadwork; conventional foliage arising from a vase, and in which the lead lines form the stem and stalk, and the leaves and flowers are of coloured glass. This opens the question how far the lead lines in glass can be made to form part of the design, in combination with colour. As a general rule, in completely stained windows, the leading is supposed to be, and practically is, lost to the eye, which is entirely directed to the coloured glass in the interspaces. But where colour is only introduced here and there, the leading may, we think, be combined with it, and made to form part of the design, with successful effect; but the colour should be very sparingly introduced, otherwise a confusion between the two must result. In the panel mentioned, the effect would be much better if the colour were confined entirely to the leaves

and blossoms, and the ground of the design left colourless; the patches of colour introduced into it only confuse the eye.

Among the miscellaneous objects forming part of the exhibition is a table of service glass, by Messrs. Barnes, of Birmingham, which shows excellent taste. Some of the decanters and wine-glasses are as artistic in form and in the correct treatment of the material as could be wished. They are, though without colour, a good deal founded on the style of Venetian glass design, the spirit of which is well reproduced by the English manufacturer.

We should be very glad to see on some future occasion a really good and representative exhibition of English glasswork. The present one has evidently been quite mismanaged, or not managed at all, and the result is a collection containing a few good bits (put mostly in bad places) amid a motley assemblage of rubbish.*

FRENCH ARTISANS ON THE CERAMIC ARTS.

Two pamphlets now before us, written by M. Meyer and M. Baylac, respectively represent the opinions prevalent among the working men of Paris and Limoges on the ceramic manufactures of Europe. At least, we may presume that the views expressed by these two intelligent artisans, who were selected as the most able representatives of their craft, will be endorsed by the majority of their working-men readers. As judges of the ceramic arts their experience is limited, when compared to the character of the subject, but they enjoyed the advantage of visiting not merely the International Exhibitions held in France, but also the recent concourse at Vienna. More than this is, of course, necessary before an emphatic verdict can be pronounced; for, in judging the respective merits of national industries, the special advantages or disadvantages of the various localities should be taken into account. The nature of the clays and other materials employed may compel the artist to restrict his imagination within bounds which he need not observe in some other and more propitious district. On the other hand, a neighbourhood gifted by nature with excellent raw materials may not perhaps afford good sources of inspiration to the designers and artists. Thus M. Baylac, who represents the ceramic workers of Limoges, complains bitterly that the industrial centres for the manufacture of French stoneware, porcelain, &c., are situated in the provinces instead of Paris. The artistic excellence of French bronzes, furniture, and jewelry is due, M. Baylac insists, to centralisation of these art-industries in a town which affords so many conveniences for acquiring knowledge and for the cultivation of associations admirably calculated to develop genius. At Limoges the position of the workers is more isolated, and the delegate of this town thus accounts for the fact that the artistic excellence of French bronzes and furniture is more universally recognised than the produce of his own craft.

M. Meyer, the Parisian delegate, does not, however, enter into these considerations; and, being himself more fortunately situated, does not probably realise the disadvantageous position of his provincial fellow workers. Nevertheless he also admits that French ceramic produce has failed to excel in every particular detail, in obtaining that undisputed sway in the markets of the world which other art-industries of France have acquired. Since the Exhibition of 1867 painting on china has made no progress in France; but in what relates more especially to the building trades, considerable improvements have been realised. The manufacture of stoneware, hardware, and glassware has made rapid progress during the last few years; and the facility with which these wares may be used for decorative purposes is better understood. They can be coloured easily with metallic oxides, but it is necessary to mix them with the bulk of the material employed, and they cannot be laid on the surface as with porcelain. The long and painful process employed with the latter material is dispensed with in the manufacture of hardware; and, as really marvellous results are obtained by the most simple means, it is not surprising if this branch of industry has been actively encouraged. There is nevertheless much room still open for improvement in the ceramic arts of France, and notably in the question of apprenticeship. A pupil is placed in a workshop when he is twelve years old. He runs errands and learns merely the manual part of his craft. Drawing, which is the very basis of industrial art, is not taught in any workshop; and, as a rule, children are made to work four or five years without being instructed in the craft to which they are destined. If the pupil chooses, he may add to the fatigue of his day's work by spending the few leisure moments allowed him in the evening at some drawing-school; but these establishments are not sufficiently numerous, nor is he particularly encouraged to frequent them. M. Meyer suggests that the Syndical Chamber, or union of this trade, might undertake to watch over the studies of these children; for they are often articled by incompetent and ignorant parents, and have no means of enforcing the strict observance of the various stipulations inserted in the act of apprenticeship. Of course, students who live near the manufacture of Sèvres may visit the richest of ceramic museums, where they will learn all the more rapidly as the objects are exhibited in a most systematic manner, being assorted according to the locality and manufactory from which they are derived. The library also contains the most varied designs on every style of decoration; and the value of these precious documents is enhanced by the kind advice and assistance so freely bestowed by the chief librarian.

M. Meyer seizes this opportunity of contradicting the assertion contained in the *Gazette des Beaux-Arts* of October, 1871, that a number of these drawings had disappeared during the siege and the Commune. Official documents are quoted which explain how the whole collection was removed to Paris before the arrival of the Prussians. They remained in Paris during the Commune. Two members of the insurrectionary Government and the representatives of the "Federation of French Artists" visited the cellars containing the objects saved from the Sèvres Museum, and, finding that no mischief had been done, caused the doors to be sealed, and they remained untouched and uninjured till the day they were removed back to Sèvres. By technical study which such collections so materially facilitate, real progress will alone be secured, and hence the importance of preserving them. Formerly, when an artisan acquired some reputation he was able to start at least a small business on his own account, and even to found a little museum, in which he infused the artistic spirit that had won him his laurels. Now, however, the character of the industry has entirely changed. Great capitalists are alone able to start manufactures of ceramic ware, and they are consequently worked with a view to financial results, while artistic considerations hold but a secondary place. The proprietor is often but a mere administrator; and, as for the workmen, they are expected to produce a certain amount in exchange for their daily wages, so that they have no time left for studying themselves or teaching the pupils. These facts involve a problem of the utmost importance,—the difficulty of combining business with art. According to the pamphlets before us, more attention seems to have been given to the development of art in England than in France. The French manufacturers, we are told, are entirely absorbed in their efforts to compete with their rivals,—not, however, by endeavouring to improve the quality of their produce, but by reducing the rate of wages. The very opposite policy is adopted in England, where the lucrative wages offered by our great firms entice French workmen to abandon their own country. Thus, at the Exhibitions of Paris and Vienna some of the finest specimens displayed by English manufacturers were due to the skill and taste of the French workmen in their employ. Nor is this all, the presence of French workmen in England has contributed to develop the latent taste of the English artisan, and it is admitted we are able to equal in many points the manufacture of Sèvres.

The Italians on their side are also praised for their hardware and glassware, though it cannot be said that they have made any remarkable progress since the Exhibition of 1867. The Italians monopolise ancient traditions and persist in manufacturing imitations of the antique which would thoroughly deceive even a connoisseur. For work of a more modern style, the Italians have also been glad to enlist the services of French workmen. MM. Rhiel and Alary, two able ceramic artists, for instance, are now working in the factories belonging to Signor Ginori. This firm is more distinguished for its hardware than its porcelain, and it has contracted the bad habit of dissimulating the nature of its products by covering them with a thick layer of colour.

In Austria, the firm of Bernand, which possesses the material formerly belonging to the ancient Imperial Manufactory, produces objects used almost exclusively for architectural decoration. The enamels are well glazed and free from cracks, and are frequently used for the stoves so extensively sold throughout Germany, and also for chimneys communicating from the stove to the wall. Some of these are elaborately decorated, but the colouring is decidedly loud. This firm imitates in its hardware decorations the ordinary French models.

The two chief firms of Denmark seem to be Messrs. Bing & Grandahs, and Messrs. Konigliche, both of Copenhagen. They have distinguished themselves chiefly by the manufacture of immense vases. Many of these works are signed by Judelck Ferensen, a Danish ceramic artist, who possesses undoubted talent. The imperial manufacture of St. Petersburg also prides itself on the dimensions of its vases, &c., but bad taste and unskilled workmanship are clearly discernible. Attempts have been made to apply enamel on glass, and though these efforts have not proved very successful, this is a *début* which promises well for the future. The Russians seem also to be skilled in glass imitations of precious stones, which might prove a useful addition to elaborate fresco-work.

The Imperial manufacture of Berlin is subject to the same criticism which applies to all similar institutions. Its successes are attributed to the subsidy it receives from Government, and the lavish expenditure which such assistance renders possible. Under these circumstances, the production of a few *chefs d'œuvre* hardly exemplifies the prosperity of national industry. For a State as for a private factory, the production of various and good articles extensively consumed by the general public is the true test. When these have been successfully manufactured, then it will be time enough to attempt some more pretentious work. A small object, of trivial value on the market, may demonstrate more conclusively the innate skill and art of the workmen and artists engaged in any particular factory, than some majestic, costly, and elaborate production, only fit to grace the palace of a sovereign. For the welfare of a nation it is better to have art diffused by the cheap articles which all can afford to buy, than confined to the decorations of the mansions of the wealthy. If an object is to be judged by the amount of work expended in its make, it would be difficult to compete with the celebrated "point d'Alençon" robe sent to the Exhibition of 1867. Ten thousand and five hundred days' work were devoted to the making of this marvellous piece of lace, but we are unaware that the country derived any particular benefit from this robe when it was completed, though we do know that the agriculture of France suffered considerably at the time for want of hands. Notwithstanding these various objections, the French critics willingly recognise the virtues and beauty of Prussian ceramic work, though, of course, they do not consider themselves in any danger of serious competition. Indeed, to all French critics at least, France stands first in the ceramic arts, but the second place is unhesitatingly given to England. M. Baylac places Prussia third in the order of merit, Austria fourth, Russia fifth, Denmark sixth, Italy seventh, and Portugal at the end of the list.

In the pamphlets before us there is a lengthy description of the porcelain exhibited at Vienna, and the clays and chemicals usually employed in France, especially at Sèvres; but we have contented ourselves by reviewing the general observations made by these working-men authors. Our readers are mainly interested in the manufactory of porcelain in so far as it helps to spread the general artistic taste of a nation; and we have shown some of the impediments which exist in this respect. With regard to hardware and glass-ware, the case is very different, hence we have dwelt on that section of ceramic work, and reproduced the various opinions expressed by the artisans' delegates, who seem to take so earnest an interest in the more abstract advantages which may accrue from refining and educating the artist workmen engaged in the ceramic manufactures of Europe. The policy they would advocate for art-industries in general is the manufacture of good, handsome, and cheap objects. They rightly maintain that art is not necessarily expensive, and should be

* We have received four letters in reply to our correspondent "An Exhibitor," but the writers were mostly too angry to do their best.

found in the labourer's cottage as in the amateur's gallery. The materials used need not be costly, and the decoration may be as simple as possible, but the original design can always be artistic. To find workmen preaching to their fellow workmen such a moral is a symptom that betokens a prosperous future for art among the artisans of France.

LEAD IN ITS RELATIONS TO ARCHITECTURE.

THAT well-known and highly useful metal which the alchemists, in their fanciful phraseology identified with the planet Saturn, which the Latin races denominate *Plumbum*, and which we plain Anglo-Saxons call *Lead*, bears such important relations to the sciences and arts involved in the theory and practice of architecture, that a repeated study of its properties can never, we hope, come wrong to our readers. Although the subject has been frequently enough treated of in our pages, yet a further discussion, although discursive, may not be undesirable as far as it goes.

One of the earliest metals applied to the arts, we will not say to the purposes of building, lead still retains its well-defined position as the most *ductile* of metals; and even with respect to its formidable rivals, zinc and galvanised iron, it also continues to hold its place in several essential respects. For roofing purposes, indeed, lead is simply invaluable. The stately cathedral roof, the beautiful dome, the minaret, the spire, the finial, are all of them more or less indebted for their effect, as well as preservation, to sheet or cast lead. It may as well be stated, in passing, that the repairs of those leaden roofs have, on several noteworthy occasions, been the unfortunate cause of the destruction of the noble and time-honoured buildings to which they were primarily intended to afford protection. But then we hold this was not so much the fault of the metal, which does not readily catch fire!—as the fault of the metal-workers themselves, who are apt to neglect their red-hot chaffers during a high wind at the dinner-hour. *Festine lente*, we must say to these skilful artisans—hasten slowly when you are about to burn down our cathedrals and crystal palaces!

When we come to the interior fittings connected with a building we shall find that there is not a single principle of water supply or drainage, or even gasfitting and bellhanging, which is not more or less dependent on the applications of this most useful metal. The lining of the cistern,—unwise as this may be,—the supply-pipe, the soil-pipe, the trap, the safe, the waste-pipe, and the overflow-pipe, are all constructed of lead in one form or another; and although it has been recently demonstrated (only too well) that leaden soil-pipes, under certain conditions, become carious and rotten from the long-continued action of sewer gases, yet it must be said again that this is not the fault of the metal, but of the method of fitting it up, as we shall try to explain.

In the arts of interior decoration, too, the presence of lead (although chemically transformed) is still indispensable; for the basis of almost every form of oil paint which decorates our halls and lobbies consists of its carbonates or its oxides,—that is to say, of white lead, red lead, and litharge. Used as a pigment *per se*, in inordinate quantity, and with a menstruum of the oil of turpentine, white lead is certainly one of the most dangerous and deleterious forms of its application. As to the oxides, these are quite innocuous when properly treated, which is a fact that house-painters should take home to themselves.

We have not much to say about the history of the metal. The Chinese have, of course, been familiar with its use and application from time immemorial. But it is remarkable that neither the Egyptians nor the Greeks made much use of it,—unless, indeed, in the form of weights, or, perhaps, as a sort of glaze on their earthenware,—of which we cannot be certain; although the researches of some of the best German analytical chemists would seem to establish this curious circumstance. Nor can we say that the Hebrews dealt much with lead, except in the way of metaphor and poetical trope. For example, Moses makes a simple reference to its ponderousness; Job says that his words should be written "with an iron pen and lead in the rock for ever," which is obviously meant for durability; and so on. Even although lead is incidentally mentioned in that glowing account of the Tyrian commerce which is given by the prophet Ezekiel as being imported, along with silver, iron, and tin, from Tarshish,—that is to say, from Africa,—it never seems to have been a well-known metal among the ancient Hebrews. Rapp, Rosenmüller, Mr. Napier, and other authorities being against us, we still hold the opinion that the ancient Jews preferred gold and silver,—or even iron and brass,—to lead and tin; even as their descendants are supposed to do at the present day! Seriously speaking, the Jews never were, in the best periods of their history,—nor can we say they are at this moment,—in any way distinguished in the arts of metal-working.

The Romans undoubtedly made the most extensive use of the metal. But it is very remarkable that the Romans seem to have been quite unacquainted with the well-known method of soldering the joints of a leaden pipe. At all events, the slender remains of Roman lead-work that have reached the present century show no indications of this beautiful mechanical process. For instance, in bending a leaden pipe to any required angle, an elbow was bored in a solid stone, into which the ends of the adjacent pieces of pipe were securely cemented. The process of soldering, indeed, seems to have originated among the Arabian alchemists in those old weird days when they pottered over their fluxes and amalgams. Be that as it may, there can be no question about the enormous consumption of lead by the ancient Romans, and the readers of Pliny and Vitruvius will find in their pages almost all that we moderns know of its technical applications. We can also ascertain from other sources that lead-mines were wrought by the Romans in several quarters of Great Britain,—chiefly in Wales and Anglesea,—and lead pigs with undecipherable Latin inscriptions have often been found near the ancient and abandoned works.

Vitruvius, in his eighth book, which is devoted to water-supply, gives quite a scientific account of the mode of finding it, together with its different uses and applications. He treats of hot springs, mineral waters, fountains, river and lake water, together with the various modes of conveying it for the supply of a city. The pipes were of lead or terra-cotte, and sometimes, for the sake of economy, of leather. But it is very remarkable, in connexion with the sanitary aspect of this question, that Vitruvius gives the preference to earthenware pipes, on the ground that the water passing through them was the most wholesome.

It was during the Middle Ages, however, that lead first began to assume that important character with regard to architecture that it still maintains. There can be no doubt but leaden roofs were known, although certainly not widely known, as far back as the gardens of Nebuchadnezzar, and the porches of the Latin basilicæ; but it is to the magnificent roofs of our French and English cathedrals that we must look for the best possible type and highest explication of the architectural value and importance of lead. To enter into the details of castings and laying that good old sheet lead on our Mediæval roofs,—to describe how it has stood the storms of centuries, and the havoc of fires and revolutions, will we hope soon afford a proper theme to some of our able archæologists. But we must not attempt to linger upon it in the present connexion: all we need say here further is that the powerful rolling-machine has long superseded the more curious and antique process of casting by hand, in which, by the way, pure metal was of greater consequence than it seems to be nowadays.

The physical properties of lead, which come first in order, need very little description. As everybody knows, it is a bluish-white metal of considerable brilliancy, which soon disappears on exposure to the air, owing to the formation of a thin film of oxide. It is so soft that it may be easily cut with a knife, or may be made to take impressions from a coin or medal; and it leaves a streak upon paper. It may be cast or beaten, or rolled into thin sheets, but in ductility and tenacity it is low in the scale of metals. It is readily fusible at a temperature of about 625°, and at a higher temperature it absorbs oxygen rapidly from the air, and the oxide thus formed volatilises in the form of white fumes. Its specific gravity is 11·4. In process of time it becomes perfectly dark in colour, and hence Pliny designates the metal *Plumbum nigrum* (or dark) in contradistinction to tin, which he termed *Plumbum candidum* (or white).* It is hardly necessary to explain that lead has of course no mineral or chemical relations to the substance vulgarly known as black lead, the proper name of which is *graphite*,* or plumbago.

It is beyond the scope of this paper to enter upon the pure metallurgy of the subject, although that is highly interesting, involving, as it does, one of the most interesting and beautiful processes of the useful arts. We mean the extraction, or rather separation, of silver from lead. Referring the reader who wishes to pursue this subject to Dr. Percy's exhaustive treatise, we may just mention, in passing, that silver to the value of 30,000*l.* or 40,000*l.* sterling, is annually extracted from lead ores in this country alone! The Russian,—that is to say the Lithuanian,—and the Hungarian mines produce more silver roubles than we care at this moment to compute. The reason why the ores of lead invariably contain silver is one of those singular questions which should be treated alongside of the origin of species. You never find tin in lead ores, which is a more probable nexus to all appearance, and you never find silver in tin ores. The mere colour or specific gravity cannot determine the matter, for gold is never found associated with copper, or even with titanium. The proper explanation will doubtless be found in connexion with the laws of chemical attraction, or electrical affinity, or of both; but this subject, as we have hinted, properly belongs to the domain of the scientific naturalist.

To revert to roofing. There can be no doubt whatever but this is the most important purpose to which lead can be applied in relation to architecture. We will not enter upon the question of weight. Scarcely any other material, from felt to balachulish slate, can be mentioned that is not lighter than lead; none of them can in any degree compare with it in the quality of endurance. We remember to have seen a piece of sheet-lead dug from the ruins of Waltham Abbey, but which had obviously belonged to the roof in some form in its original state. Its preservation was very nearly complete, if we excepted a thin film of oxide on both sides, and it seemed to have weighed about 12 lb. to the superficial foot,—a lesson to be taught to some of our modern builders who profess that 4 lb. is a sufficient weight for any roofing purpose whatsoever. In addition to the element of weight there are certain conditions which cannot be overlooked, nor too widely known, which circumscribe the structural necessities of the metal. We refer, in the first instance, to the physical property of its expansion by heat, and contraction by cold. This quality is, of course, common to all the metals, but to none more so than to sheet-lead, which may be exposed to the scorching rays of the sun on a roof during the day, and to a cold equally intense during the night. It is, therefore, a primary necessity that lead should be laid on a roof in such a manner that it can expand and contract freely during changes of temperature; and consequently, without suffering from that well-known phenomenon which goes under the name of "blistering," the invariable end of which is either a crack of the soldered joints, or a rupture of the sheet itself. Indeed, as a rule, soldered lead should never be used on a roof at all, and need not be used if proper care be taken to overlap the seams properly, or to make that well-known connexion which plumbers term a "roll joint," which admits, under necessary limits, of expansion and contraction. This form of joint, we may mention, is equally applicable to the Italian or Pointed style of architecture.

Lead is the most expensive form of roof—indeed, we may say is a co-efficient to that extent of the whole structure—for the roof in this case governs the buttresses, and even the very foundation of the building. Endurance is therefore its principle recommendation—how it compares with zinc or galvanized iron in this respect is too soon to tell. A hundred years hence people will be able to tell something about the distinction and the difference. All we can say in the present day is that zinc is subject to certain electrical influences from which lead is exempt; and that galvanised iron—with which the roofs of our Houses of Parliament are covered—being a sort of hybrid material like vulcanised india-rubber—it is quite impossible to estimate its future and probable value. On the whole, with regard to roofing, we confess an *attachment* to good stout sheet lead. Next to this form of roof the best is of course the ordinary

* Nat. Hist., lib. 34.

* See for some account of this substance an article on the Keswick Pencil Mills, published in our volume for 1867.

slate roof—constructed at the proper angle—where the whole ridges, gutters, valleys, sheets, and aprons are of lead properly laid. In many respects it is less costly, it is more convenient, and it may be made the most picturesque.

Let us now say a few words with regard to lead pipes in relation to buildings. The most ancient, that is to say, the Roman, method of making lead pipes was to turn a sheet of the metal cast to the requisite thickness on a stout timber or iron mandril; and then to fuse or "burn" the edges together by means of a stream of red-hot lead, poured on the joint through a level channel of clay,—which melted and thus combined the separate edges. This process,—cumbersome, indeed, and sometimes ineffectual,—had long given place to a soldered joint, until in our day it has been resuscitated, as it were, by the use of the oxyhydrogen blow-pipe. But we need hardly tell our readers that both of these old-fashioned methods have been superseded,—first, by the ordinary drawbench; and, secondly, by the hydraulic press,—the last of which is an uncommonly beautiful process, and renders the use of solder altogether unnecessary. This mechanical innovation,—however it may affect the business of the artisan skilled in the use of the copper bolt,—is not altogether a matter for regret. For the objection we made to solder in any form upon roofs applies with still greater force to solder especially in soil-pipes. There is, in that case, a physical action, properly so called; a chemical action and an electrical action. Solder, which is an alloy of lead and tin is, singular enough, more fusible than either, but then it is *harder* than both. Again tin is a very much better conductor of electricity than lead: hence a case of action and re-action, which we need not stay to explain. Once more the solid, liquid, and gaseous matters which separately or in combination go to compose the sewage of our domestic soil-pipes tell differently on the separate metals; and in point of fact we find that soil-pipes invariably give way at the soldered joints. Besides, it must be told that soldering is frequently executed in such a slovenly fashion as to render the interior surface of the joint a sort of serrated ridge of projecting spikes, to the great obstruction of the thoroughfare. For this reason alone the cast-lead syphon trap is preferable to a soldered one. Supply-pipes are of course never soldered excepting at the points of junction in the lengths, and this, the well-known form of plumber's joint, is, when carefully performed, one of the most useful and scientific operations in the whole range of the mechanical arts.

The use of lead in water-cisterns, although in many respects a very convenient application of the metal, is not by any means without danger in a sanitary point of view, and is, therefore, more or less objectionable. Of course, no other material, even slate or cast-iron, can be made so absolutely water-tight. The lead for a cistern is usually cut in three pieces from the sheet,—the bottom and two sides in one,—the two ends separately, soldered together at the vertical corners by the technical process termed "wiping," which is effected by a cloth saturated with grease and a rednot iron. Those who have tried to do this little job, and burnt their fingers at it, as we have done in our hot youth, will better understand than we can describe it. The waste pipes, water-closet valves, hot-water pipes, and so forth, are all attached to the cistern in the same manner; and yet, as we have said, although probably the safest in one respect, it is not the best means of storing water for domestic use, and we will try to explain in a few sentences the reason. Lead pipes, lead cisterns, lead vessels,—in short, lead in any form, used in connexion with water-supply, contains a possible and a very potent element of poison!

Lead is a metal which, as we have pointed out, is peculiarly prone to oxidation; and therefore a study of the combined action of air and water on lead is of great importance, in consequence of the metal being so frequently employed in the construction of cisterns and water-pipes. The true chemical reaction is simply this,—the lead becomes oxidised at the surface, and the water dissolves the oxide; this solution absorbs the carbonic acid of the atmosphere, a film of hydrated oxycarbonate of lead is deposited in silky scales, and a fresh portion of oxide of lead is formed and dissolved, and in this way a rapid corrosion of the metal ensues. This action is materially increased by the presence of some salts, and diminished by the presence of other salts in the water. It is much increased, for example, by the occurrence of chlorides (which, as chloride of sodium, is often present in spring water), and of nitrates and nitrites (which are often present in spring and river waters, from the decomposition of organic matter); while it is diminished, on the other hand, by the sulphates, phosphates, and carbonates, and especially by carbonate of lime, which is an extremely common impurity in spring water. In the latter case, a film of insoluble carbonate of lead is rapidly formed on the surface, and the metal beneath is thus protected from the action of the water. If, however, the water contain much carbonic acid, the carbonate of lead may be dissolved in its turn; and on the whole, considering the dangers which constantly arise from the use of water impregnated with lead, cisterns constructed of slate, or even of cast iron, are far preferable to leaden ones.* This poisonous tendency of the metal is accordingly one of the great problems of water supply, since the purity of the water is the greatest factor of the oxidation, and consequently of the solution, of the metal. It is impossible to interpose, as has been often suggested, any obstacle to this chemical action, such as plates of zinc or layers of sand or lime, for the obvious reason that these preventives need more attention than a hot-air furnace or a gas-meter. Lead pipes, or even composition pipes the basis of which is lead, are decidedly inferior to tin or iron, or even lead which is lined with tin. But we may return to this subject (which is of the gravest importance) on another occasion. We need not dilate on the symptoms of lead-poisoning which, in its worst form, invariably takes the shape of paralysis; but, strange to say, this well-known poison, like arsenic and hydrocyanic acid, has its uses as a curative agent. Taken with proper precaution, the acetate of lead has been, we believe, found beneficial in cases of phthisis and bronchitis.

The gradual deterioration of lead, not as a metal, of course, but as a merchantable commodity, is another subject of very great importance in these days. The fact, we are afraid, is unquestionable. We have two or three specimens of sheet lead before us at this moment, the properties of which, easily ascertained by the facility of cutting with a penknife, are exceedingly diverse. The quality of softness is the highest test of the purity of the metal; and, simple as it may appear, a good architect should never neglect to use this test. Pure lead may be adulterated in various ways, either in the original pigs, or, which is more frequently the case, by being remelted along with zinc parings and other *débris* of the plumber's shop.

If we had to wander beyond the regions of architecture we could easily discourse on the value and importance of lead in the arts. Even in the fine arts, not to speak of its well-known pigments, it has often been used as a substitute for bronze in the casting of statuary, and for the external decoration of Mediæval buildings. Its value as a material for shot is indisputable. Enormous quantities are consumed in Birmingham and Sheffield in the manufacture of pewter, Britannia metal, and similar alloys. We do not know whether we should make much of the subject of leaden coffins any more than the hot cauldrons in which it was the fashion to boil sorcerers and wizards during the Middle Ages. These are subjects which are foreign to our present purpose, and our space is exhausted. One other application, however, we may just allude to. Lead is the basis of the typefounder's materials, hence of our modern methods of printing; and also of the stereotype founder,—therefore, an indispensable accessory to the wonderful Walter printing-machine, which is now astonishing the latter quarter of the nineteenth century.

We must not omit to mention, in a sketch like this, that lead has always been regarded as the most *prosaic* of metals. It has no poetry in its composition like silver and gold, no mythology like iron, nor archæology like copper. This may possibly be due to its physical want of tenacity and elasticity, as well as its colour. But whatever be the reason, this unfortunate metal has been universally used by the poets, from Horace to Sir Walter Scott, as the proper metaphor for dulness and stupidity. Let us take as a single illustration of this curious fact the well-known triplet from "Marmion":—

> "Oh! be thy soul as lead to lead
> Upon its dull destroyer's head!
> A minstrel's malison is said."

Wherefore, although we confess ourselves that to our taste the subject is by no means dull, we had better conclude, in case our readers should suppose that we are getting infected with the Saturnine atmosphere!

* See on this subject Dr. Christison's valuable "Treatise on Poisons," pp. 551, *et seq.*

TRADE UNIONS.

MR. C. H. REW read a paper on this subject at the last meeting of the Civil and Mechanical Engineers' Society. He commenced by giving some statistical information concerning a few of the principal unions. The largest and richest organisation of the kind was the Amalgamated Engineers (including the trades of engineers, machinists, millwrights, smiths, and pattern-makers), which had upwards of 43,000 members, and a fund of over 200,000*l*. It had more than 350 branches in various parts of the world. In the year 1873 eight new lodges were opened, 1,300 members joined its ranks, and 42,000*l*. were added to the funds. Since 1869 there had been a steady increase in numbers and wealth, upwards of 9,000 members having joined, and no less than 125,000*l*. accumulated for the society's objects. The Amalgamated Carpenters and Joiners came next, with 12,800 members, and 30,450*l*. in the fund. The income of this society for the year 1873 was 31,085*l*., of which 566*l*. were spent in replacing tools, 5,865*l*. for the sick, and 3,000 for "trade privileges," including strike-pay, arbitration and conciliation expenses, &c. The Ironfounders' report for the same year showed the number of members to be nearly 12,000, and the funds in hand 49,000*l*. The annual income of the society was upwards of 32,000, and in the first twenty-five years of its existence it paid to its members little less than 500,000*l*. The Boiler-makers' and Iron Ship Builders' Society numbered more than 13,000 members, and had 39,000*l*. From the year 1870 to 1873 the number of members doubled, and its funds increased four-fold. The Miners' National Association had 130,000 members, and funds in hand to the extent of 143,000*l*.; but this was rather a political organisation than a trade-union. Institutions such as these, which had made their mark and stood the test of time, must have at least some good points about them; but there could be no doubt that the recent aggressive action of the trade-unions was altogether a perversion of the proper aims and objects of such societies. A trade-union was, in theory at least, a friendly and mutual benefit society. The chief function of a trade-union should be that of a mutual insurance society for the assistance of any of its members who might happen to be temporarily out of work. Another object of an ideal trade-union should be the provision of relief and pensions to aged and infirm members. Thirdly, it should form a means of intercommunication throughout the trade, and so enable the workmen to know where work was to be had. It should collect information as to the rates of wages and the demand that exists for labour in different parts of the country. The system of payment to a common insurance fund, in order to ensure "out-of-work" pay, and pensions in old age or infirmity, afforded the true remedy against sudden depression in trade and consequent falling-off of wages, and was one of the happiest connecting-links between the trade-union of to-day and the trade guild of the middle ages. It would also have the result, if carried out in its integrity, of raising the quality of work, inasmuch as the old and infirm members would be able to live on the pensions the unions would be able to grant them, instead of having to do cheap and "slop" work for such wages as they could get when they were unable to keep pace with younger men who could demand the highest pay. The rule should be to make each apprentice and young tradesman pay this insurance money in the prime of life, for the benefit of the old and infirm members, feeling sure that when his time came he would have his claim allowed by the next generation of his craft. Mr. Rew then went on to review the official reports of the inquiries of the Royal Commission on Trade Unions in 1867-8-9. The Commissioners remarked on the methods used by the unions to attain their trade objects, one of which was "to limit the number of workmen to be employed, and to repress competition among the workmen themselves," so as to create a monopoly of labour, with its attendant power to command a higher rate of wages, as well as shorter working-hours. The officers of the unions professed to seek to enforce the rules so as to ensure the setting-up of such a standard of work as could be conformed to by the weaker as well as the stronger men, so that all might earn the same wages. The limitation of the number of apprentices was, it was argued, necessary to prevent any overplus of labour, and to keep wages up; but one witness examined before the Commissioners owned that the real reason

was that workmen sought to keep strangers out of their trade, as they could not, if strangers were admitted, introduce their own sons in such numbers and on such terms as they could wish. The unions dictated the proportion of apprentices each master might have at one time; sometimes the rule was one apprentice to five journeymen; sometimes the master must have no more than seven apprentices whatever number of men he might have in the shop. It was further argued that a master ought to pay the journeyman, over and above his regular wage, for teaching an apprentice; although how a journeyman could be earning one wage by working, and another by teaching an apprentice, was a thing that probably only a union man could explain. Another set of rules bore upon the question of piece-work, the existence of rules against which was admitted by all the witnesses. Fines were imposed on members who took it, and, in short, open war had been declared against the practice; for, said the union leaders, "it leads to scamping of work, and tends to break down wages." It was also said that it encouraged men to work long and irregular hours, and to fall into bad habits. But one witness had the fairness to say that this deterioration of work might be guarded against in the selection of the men to whom piece-work was given. On the other hand, it was shown that in the case of some firms, where piece-work was the rule, higher prices were obtained than would otherwise have been the case. There was a practice, chiefly among stonemasons, called "chasing." It was said that employers put the best men at the head of the lines, so as to keep up the speed at which the work was carried on. This was held to be against the good of the trade, as the good workman was doing more work, and helping to get more out of the less expert workman, than was a fair average. So strong had been the power of the unions, that this practice had almost ceased to exist. The number of bricks to be carried at once by a labourer had been fixed at eight, so that a man must not carry ten, even if it would be easily within his strength for him to do so. This regulation was justified by one witness, who said,—"The society considers that it knows the amount of work a man ought to do: a man should not be free to overexert himself." Another form of repressive action was quite common: a mason might not lay a brick, nor a bricklayer bed a stone, nor could one branch of a trade trespass even a hair's breadth on the domains of the other. These were some of the ways in which the unions exerted an indirect repressive influence, the great means of direct action being the strike. Among the larger unions the decision as to the demand, and, failing their concession, as to the strike, was given by the branch committee in whose district the employer to be struck against carried on business. It then had to be confirmed by the central committee, and by a poll of the whole society. No member or body of members was allowed to strike on his or their own responsibility; if they did so strike, the council had power to refuse "strike-pay." All the leading union witnesses examined before the Royal Commission were careful to point out the deliberation given to each proposed strike before it was ordered; but one of them admitted that in certain cases, such as an attempt to lower wages, introduce piece-work, or employ non-union men, a branch might at once strike on its own responsibility, without obtaining the confirmation of the general body. The rule practically amounted to this: that strikes for objects which could be called defensive might be entered upon by branches on their own action, but for offensive and aggressive purposes the formal sanction of the society as a whole was necessary. Mr. Rew then proceeded to detail the arrangements ordinarily made to ensure the success of a strike, such as "picketing." With regard to the Sheffield and Manchester outrages, he said it would no doubt be unfair to regard them as the ordinary acceptation by the trade-union mind of the meaning of "moral suasion"; still, the fact remained that such outrages were one result of trade-union teaching. All trade-unions made more or less profession of having for their main object the insurance of certain benefits in return for regular subscriptions. But this was too often a mere stalking-horse to get money for carrying out trade objects. The carpenters and joiners, for a weekly payment of 1s., promised 12s. per week in case of sickness, a superannuation allowance of 6s. 6d. per week on the average (8s. to 5s.), and a payment at death of 12*l*. It was not too much to say, however, that until money could be spent twice over, these benefits were not and could not be ensured, for out of a total income of 10,487*l*., no less than 6,733*l*. had been spent in management and for non-benefit purposes, as against 1,634*l*. paid for sickness, funeral benefits, and superannuations. These sums were quite irrespective of the further promised benefits in cases of accident, loss of tools, grants for emigration, or in relief of exceptional distress, for which no provision was made in the practical distribution of the funds. It was the "donations to members out of work from causes other than sickness," or, in plain English, "strike-money," that swallowed up the subscriptions nominally paid for purely friendly objects. As a matter of fact, actuaries appointed by the Commissioners found that one of the professedly richest unions required, to meet its total liabilities, and fulfil all its insurance promises, a sum of over a million sterling, equal to a levy of upwards of 33*l*. per member! The question as to whether the action of the unions had had any pronounced effect in raising the rate of wages was one on which the Commissioners were unable to arrive at a decision, or, at any rate, one upon which they did not put forth any formal expression of opinion. Evidence was given to show that wages had risen in trades which had powerful unions, but evidence was also given of trades in which wages had increased 10 or 15 per cent. within a few years without the intervention of unionism. It would appear to be a mere truism that a steady rate of wages, and an ascending scale of increase bearing some proportion to the national increase of wealth, must be of more benefit to the workman than a series of abrupt rises wrung from the masters at the cost of much suffering and loss to all parties. In conclusion, Mr. Rew briefly considered the legal status of trade-unions, and summarised the conclusions arrived at on the whole subject by the Royal Commissioners, laying especial stress on the advisability and practicability of establishing Boards of Conciliation.

THE INSTITUTE OF ARCHITECTS.

THE special general meeting to continue the discussion of the report of the committee on the affairs of the Institute, adjourned from the 10th ult., was resumed on Monday evening last, at the Institute rooms, the attendance being nearly as large, and the proceedings quite as animated, as on the occasion of the former meeting, of which we gave a note (page 52, *ante*). Without transgressing the wishes of the Council by reporting any of the proceedings in detail, we feel ourselves at liberty to say that the important amendment proposed by the oldest member of the special committee, Professor Donaldson, by which all questions of reform were to be limited to the conditions of the existing charter, was eventually carried by a sufficient majority to mark the sense of the meeting; and that Mr. Horace Jones's amendment, of which notice had been given, to refer the Report to the Council to consider and report upon it further to a general meeting, was carried almost unanimously, with a slight alteration in form in order to incorporate in it the sense of Professor Donaldson's amendment. The meeting now stands adjourned for the 7th of February, another Fellow having requested opportunity for the discussion of a further amendment on that of Mr. Horace Jones (which now stands as a substantive motion), with the object of giving the Council some definite expression of opinion to work upon.

Notice has been given of other amendments and resolutions, which may be considered, but the first turning-point of the discussion is past, and we must congratulate the meeting on its result. Whilst fully alive to and fully sympathising with the conviction, in which nearly all the speakers concurred, that the present position of the Institute necessitates some movement for giving renewed vigour and usefulness to its action, we are distinctly of opinion (in spite of the rather blustering tone assumed by one or two young and ardent "reformers") that the Institute could not have done a more suicidal act that to have taken any step involving or presupposing the abrogation of its present charter. It would have been simply cutting away part of its own standing-ground with the certainty of not being able to replace it except at a considerable cost, and the possibility (or probability) of not being able to replace it at all. And we hope that those members of the special committee who appear to feel chagrined and even aggrieved at what they regard as a shelving of their report, will perceive, on consideration, that this is not the case at all, and that, as was pointed out by more than one experienced speaker at the last meeting, the existing charter is by no means, practically, the unelastic and obstructive document which they have considered it to be; and that they will see the desirability of combining cordially for the general good of the Institute and the profession which it represents, with those who fully recognise the value of their labour in preparing the report, and are desirous of turning it to the best possible account.

So far, we think, we may fairly go in commenting on the proceedings of these formally private meetings. And it will be no "breach of privilege," we hope, to add a word in recognition of the admirable manner in which the vice-president, Mr. Whichcord, has presided over discussions, to the successful conduct of which a combination of firmness and good temper on the part of the chairman is essential.

A NEW PUBLIC MARKET AT BRIXTON.

BRIXTON will shortly possess a public market, one of the largest in the metropolis, and of an unusually varied character. A body of capitalists have purchased the vacant land facing Brixton-road, situated between the London, Chatham, and Dover Company's Metropolitan Extension Railway and Shepherd's-lane, their intention being to erect on the site a large and commodious market for the sale of meat, fish, poultry, vegetables, and every description of provisions, and also for the sale of clothing for men and women, whilst one portion of the market space will be specially set apart for the display and sale of articles of furniture. The land upon which the market is to be erected is little short of an acre in extent, and is the site which the School Board a short time ago fixed upon for new Board schools, but which were abandoned in consequence of the strong opposition which was raised as to the suitability of the site.

The architect of the building is Mr. Henry Parsons, of Devonshire-road. The Brixton-road frontage will be 125 ft. in length, and 52 ft. in height. The elevation from the street level to the upper floor windows, will consist altogether of polished granite and plate glass, bold and massive piers, pilasters, and columns supporting the several plate-glass windows. The upper portion of the frontage will be in red Fareham brick, with carved stone dressings, portions of the elevation being relieved and ornamented by brick bands of varied colours. The building will be carried alongside the railway and Shepherd's-lane, to a depth of 250 ft. westward from Brixton-road, the return frontage in Shepherd's-lane to the extent of 60 ft. in depth being uniform with the main Brixton-road elevation, the remaining portion of this side frontage being brick, and plain in character, with long ranges of lofty windows to admit of light to the interior. An ample supply of light will also be obtained from the roof, which will consist to a great extent of glass. The two principal entrances to the market from the Brixton-road frontage, will each be 12 ft. in width, and in addition there will also be entrances from the Shepherd's-lane frontage, and likewise at the rear of the market, which will be more immediately for the accommodation of the vegetable department.

The front portion of the ground-floor, to a depth of 80 ft. from the main entrances, covering an area of about 10,000 superficial feet, will be fitted up as stalls and "shops" as the meat and general provision section of the market, for the sale of butchers' meat, fish, poultry, butter, cheese, bacon, and every other description of provisions, including grocery and what are known as Italian warehouse stores, whilst the principal portion of the remaining part in the rear will form the fruit and vegetable market, and will be approached from the meat market from which it will be divided, through a spacious entrance near the centre.

It will thus be seen that the market is intended to be carried out on a novel and unusually comprehensive scale, embracing the sale not only of food and wearing apparel, but miscellaneous articles in connexion with general domestic requirements. The building, which will involve a large outlay, estimated at between 30,000*l*. and 40,000*l*., is expected to be completed and opened to the public about autumn in the present year.

THE EXCAVATIONS IN OLYMPIA.

THE commission appointed by the German Government for the excavations to be carried on at its expense in Olympia, and to which attention has already been drawn in these columns, intends publishing reports on the progress of those works at certain intervals, according as the extent of the discoveries made may make it desirable. A strictly scientific treatment of the materials already brought to light will naturally follow, the present periodical publications serving merely the purpose of satisfying the great interest manifested in wider circles in the progress of the undertaking. The *Reichs- und Staats-Anzeiger* publishes now the first of these reports, drawn up by Professor Curtius and Baurath (Government surveyor) Adler, including the time from the beginning of the works on October 4 of last year to its close, and containing particulars on the remarkable finds made during that short period. The report says in substance as follows:—

"The gentlemen entrusted by the commission for the excavations in Olympia with the supervision of the works, Herr Dr. Gustav Hirschfeld and Herr Adolf Böttticher (surveyor), arrived on September 12th at Druva, the village nearest the place of excavation, where a house had been erected and furnished for them by the good offices of the German consul at Patras, Herr Hamburger. After the measurement of an area of 115 stremmata, the works were begun on October 4th by the opening of two trenches east and west of the temple fronts towards the bed of the Alpheios, to keep dry the centre of the excavations, the temple district especially, during the rainy season. Besides a few smaller excavations on the shores of the Kladeos, resulting in the discovery of graves and the western boundary wall of the temple district, it was intended to approach by degrees the temple of Jove by deepening and widening the trenches. During those works the Doric entablature of a still unknown building, and tambours of columns, as well as capitals of the temple itself, were met with. The two principal trenches were then connected by a cross trench dug along the north side, and the clearing of the entire ground before the two fronts was next taken in hand with an increased staff of 125 workmen. In the middle of December the important finds were made of which full particulars are now given.

On the 15th of December a male torso of marble, of more than life-size, was found at the south-east corner of the temple, nearly 10 ft. below the surface, which had been inserted in a later dry wall, a work of considerable artistic value, and in all probability a fragment of the statue of Jove, who had been represented in the middle of the eastern gable in a sitting posture. Five days later, near the same place, the workmen came upon a triangular pedestal of marble, with the perfectly preserved dedicatory inscription of the Messenians and Naupactians to Jupiter Olympus, to whom they offer a tithe of their booty. In the third line of the inscription the name occurs of the artist, Paionios, of Mende in Thracia, who adds in the fourth line that in the competition for decorating the pediments of the temple he was declared victor. The next morning a female figure of Pentelican marble, of more than life-size, in two parts, was found, which by the remnants of wings was proved to be Nice (the Roman Victoria, Goddess of Victory), which had stood on the pedestal. The figure measures from the neck to the tip of the foot 5·55 ft.; the drapery, which leaves the left breast exposed, falls over the girdle in short folds. It lies close to the lower part of the body, exhibiting the beautiful forms in full distinctness. The garment swells out behind in a large sweep. Although head and arms are not yet found, the expressive gracefulness and the swelling drapery of the goddess, descending to the earth, excite great admiration. It was at once recognised as the work mentioned by Pausanias in his description of the monuments of Olympia. It is the first piece of sculpture of a Greek master of the fifth century before Christ which has been corroborated by documents.

At the same place several trilateral blocks of marble came to light, belonging evidently to the same pedestal. They bore inscriptions referring to the history of the Messenians; especially one, the subject of which is the award of a disputed frontier district by the Milesians to the Messenians. It is the process known to us by Tacitus' *Annals*, iv., 43.

From that time the discoveries were continuous, and it was not so much a question of looking for treasures, as of raising and preserving them. A colossal male torso was found lying under that of Nice, almost uncut at the back, consequently also from the gable; the elbow of the left arm is wrapped in the drapery which surrounded the lower body. Beneath the latter, again, another colossus is waiting for deliverance.

On the 22nd, the lower part of a recumbent figure was found before the east front, which must have been placed in the left corner of the gable, probably one of the two river gods of which Pausanias speaks. The fragment is hardly above life size, and of excellent workmanship. By the side of it, the same evening, a male torso, and next, at the south-west corner, a female torso, the first sample of the still preserved statues of the western gable, came to light."

Thus far the most important parts of the report, which further speaks of lucky finds (especially a beautiful head of a Satyr, of terra-cotta, life-size) at the foot of Kronos Hill. Later advices announce the discovery of one of the charioteers, and of a male torso; finally, also, the completion of the river god, the upper part of the body and the perfectly-preserved head having been brought to light. In consequence of the rich yield of the excavations, which has exceeded all expectation, the time and power of the two gentlemen superintending the works in Olympia have been so much occupied that they have been unable to describe and value at its proper merit each find. Photographs and casts of the sculpture are to be sent in to the commission as soon as possible.

ON CERTAIN MATHEMATICAL INSTRUMENTS, AND SOME SUGGESTIONS FOR NEW COMBINATIONS.

THE ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of the Architectural Association on Friday evening, the 21st inst., Mr. John S. Quilter, president, in the chair, the following new members were elected, viz., Messrs. Alfred Burr, J. E. Parr, A. Gillespie, R. L. L. Poynter, and R. O. Ellis. It was announced that the visit to the Natural History Museum, South Kensington, deferred owing to inclement weather, would probably be made to-day (Jan. 29). It also was announced that application had been made by the Birmingham Architectural Association to be constituted a branch of, or to become affiliated with, the London Association; and in order to comply with the application notice was given of the proposed new rule, which will be discussed at a special meeting preceding the next ordinary general meeting on February 4, viz.:—

To be Rule XX, inserted between present Rules XIX. and XX.

"Local societies whose rules are in accordance with those of the Association may be admitted as branches thereof, by a resolution of the committee, confirmed by a vote of the Association at an ordinary or special business meeting. Such societies to contribute to the funds of the Association a sum or sums to be agreed upon before the vote sanctioning their admission. Such societies shall elect local officers, who shall have the management of their affairs, subject to the general control of the committee of the Association; and they shall present an annual balance-sheet and report of their proceedings at the first ordinary meeting of each session. Members of such branch societies shall have the same privileges as members of the Association in respect of the prizes, classes, and library connected therewith, and shall have the right to take part in the business of the general meetings by delegates elected by them in the proportion of one delegate for every five (or part of five) members of the branch society. The chairman of a branch society shall, *ex officio*, be a member of the committe of the Association. The representatives of a branch society may vote either personally or by means of voting-papers delivered to the honorary secretaries of the Association not later than twenty-four hours before the meeting at which the votes are to be recorded. The arrangement with any branch society to be terminable at the close of any session by written notice from either association sent not later than the 1st of June."

Mr. F. C. Penrose then lectured "On Certain Mathematical Instruments, and some Suggestions for new Combinations." The lecture was illustrated by a large number of diagrams and instruments, and all present were agreed as to its value. Unfortunately for those not present, and, indeed, for those who had the advantage of hearing it, the lecture, with the exception of a few notes, was not in MS.; in fact, Mr. Penrose said it would have been impossible for him to have put it in MS. The lecture consisted entirely of an involved technical explanation of the diagrams and instruments exhibited, and was, therefore, almost totally unreportable, especially without diagrams in elucidation of the lecturer's remarks. We are, therefore, only able to briefly show the general scope of the lecture. Mr. Penrose said it was not his intention to trouble the meeting with descriptions of any of the ordinary instruments, T-squares and compasses, and drawing-pens, which were so well understood, but his main object would be to endeavour to explain some of the more unusual forms for drawing; for instance, the conic sections, and a few other curves which had interesting properties or great beauty of line. Before mentioning the curve instruments, he called attention to a very useful and ingenious level, by Mr. Bow, of Edinburgh; and the slide-rule, which was not, he thought, used nearly so much as it ought to be. Messrs. Elliott had sent some modern forms of it, but he preferred the old-fashioned 2-ft. slide rule. It might be used for a great variety of purposes. For instance, with it could be obtained at once the proportion of two scales for reducing or enlarging a drawing, and this operation could be performed with one scale only. It was of great use in checking more elaborate calculations. Cube and square roots, and the values of the sines and tangents of angles, might be obtained from it with tolerable accuracy. The amount of error which might be expected in a simple multiplication of two factors was about as 1 in 300, which was near enough for almost any purpose connected with drawing. One could not, in general, reckon on so much accuracy from geometrical methods depending upon the straightness and squareness of the work. Proceeding to the curve-drawing instruments, the lecturer began with the centrolinead, an instrument invented, he believed, by the ingenious Peter Nicholson, whose dictionary was the first which gave any technical information as to building artificers' work, although it had now been superseded by Gwilt's "Encyclopædia." The centrolinead was used for drawing the converging lines in perspective. The blade, when properly bisecting the angle formed by the two arms, pointed invariably to the extremity of the diameter of a circle passing through the two fixed points and the point of intersection of the two arms when the instrument was placed centrally between the two fixed points. It was very easy to adjust the instrument. Supposing it to be requisite that the lines should converge to a point 20 ft. distant, bisect the angle formed by the converging lines, and draw a straight line to the bisecting line, on the margin of the board towards the vanishing point required. On this line, and equidistant from the bisecting line before mentioned, and at convenient distances, fix two points or pegs. Let the distance from the centre to one of the pegs be (say) 5 in. Then obtain this proportion: Let x be the amount of deflection to be given to the arms. Thus, $x = 5 \times 5$ divided by $5 \times 4 \times 12 = \frac{5}{48} =$ about 1-9th of an inch. If the adjustment had been accurately made, the blade of the centrolinead would fall upon the required converging lines exactly. But perhaps it might not prove sufficiently exact, as it was difficult to deal with such small dimensions as 1-9th of an inch. In that case, move the instrument to the upper line, and regulate it by the lower screw-clamp, and then transfer it to the lower converging line and regulate by the upper screw-clamp. Two or three trials of this kind would be sufficient. So much for the centrolinead as used for drawing converging lines. But what was any point upon it doing? The investigation of this was due to the late Mr. Jopling. It was not difficult to see that the point of the blade formed a loop, but the general action would be much better seen by a different form of the same instrument. In this modification of the centrolinead the blade was omitted, and the arms made with each other a right angle. They were also continued both ways, and a pencil was put on the line bisecting the angle formed by the arms. A heart-shaped figure of great beauty, called the cardivide, was the result. Varieties of the same curve were obtained by placing the pencil elsewhere. The conic-sections, however, took the leading place among curves. They might be described by two characteristics. They were the only curves that could be formed by intersecting a cone by planes in any direction. It was immaterial whether the cone be sharp or flat, or what was called a right cone or an oblique cone; no other than ellipse, parabola, or hyperbola, could be got out of it. He did not especially name the circle because it was included amongst the ellipses. The other peculiarity was that if these curves were measured by octangular co-ordinates from two fixed lines, the relation between these co-ordinates will be expressed by the second power or square of the lines in question. From this peculiarity,

the conic sections were called lines of the second order, straight lines being lines of the first order; and there were no simple equations which might not in some way be represented by straight lines, and there were no quadratic equations which might not in some way be represented by a conic section. The conic sections had various properties, much too numerous to be enumerated, and it was by following out one or the other that they might be drawn by instruments. Again, in the ellipse, the ordinates had always a constant ratio to the ordinates of a circle constructed on the axis major. This gave the method of the trammel.

Among the instruments described and exhibited was Peaucellier's parallel, the invention of a French artillery officer, which was first introduced into this country by Professor Silvester. Mr. Penrose said that the celebrated parallel motion invented by Watt was only approximately accurate, although it answered very well for steam-engine work. Peaucellier's parallel motion had two forms, the positive and negative. Mr. Penrose then explained to the meeting how he had himself adapted the mechanism of this instrument to the purpose of the gear of a pump in his own house, and so succeeded in obtaining a pump which worked uniformly at all parts of its stroke. Mr. Penrose also exhibited an instrument of his own invention for drawing the Ionic volute.

In the brief discussion which followed,

Mr. Elphinstone described methods of constructing Peaucellier's cells with cardboard or sheet brass, remarking that he would recommend all who intended to use the instrument to construct it themselves, as they would then understand it more thoroughly.

Mr. Stannus moved a vote of thanks to Mr. Penrose for his description and explanation of the instruments exhibited, some of which were marvellously ingenious inventions. Particularly noteworthy was Mr. Penrose's instrument for drawing the Ionic volute. By those who had been apprenticed to the "Five Orders," the drawing of this volute might be remembered as a species of torture. He agreed with Mr. Penrose in advocating the study of conic sections.

Mr. Aston Webb, in seconding the motion, asked Mr. Penrose whether he had tried his volute-drawing instrument on the line of an actual volute, and, if so, did his instrument describe a line exactly coinciding with the line of the volute. Furthermore, did he think that the Greeks drew their volutes with instruments?

Mr. Penrose, in reply, said he had not yet satisfied himself as to the exactitude of the instrument, but if not quite exact, it gave a very close approximation. As to the latter part of the question, the Greeks drew so many things with instruments, that no doubt they used an instrument for drawing the volute.

There was no further discussion, but at the close of the meeting many of the members availed themselves of Mr. Penrose's additional explanations of the instruments exhibited.

The next meeting will be held on the 4th of February, when Mr. H. H. Statham is announced to read a paper on "Plan as the Basis of Design."

SALE OF LAND AND BUILDINGS IN LINCOLN'S INN.

A SALE took place at the Auction Mart last week of a house and outbuildings on the west side of Lincoln's Inn-fields, together with a large quantity of vacant land adjoining, containing altogether an area of 10,000 superficial feet. The competition was spirited, but before the biddings commenced, the auctioneer was requested by several gentlemen present to explain the nature of certain restrictions, which it subsequently appeared were of a somewhat peculiar nature as regards building on the premises. The sale took place by the direction of the trustees under the will of the late Alderman Copeland, and it transpired that, under the restrictions in question, the purchaser would not be allowed to build on any portion of the land at present not built upon, which compromises 6,000 superficial feet out of the 10,000 feet, the entire area of the property, leaving only 4,000 ft. at present built upon, which can be applied to building purposes. A farther restriction prevents the owner from taking down the existing house and premises, and rebuilding them, without the consent of the owner of the adjoining property. The property was described as freehold, and the present annual rental 500*l*. In submitting the property the auctioneer dwelt upon its prospective increased value owing to its proximity to the new law courts now in course of erection, and stating that a property in Lincoln's Inn, close adjoining, containing a little more than 1,300 ft. was recently sold for 6,000*l*. The first offer made was 5,000*l*., which immediately advanced to 7,000*l*., and the biddings rapidly continued until the property stood at 12,000*l*., and it was ultimately sold for 12,800*l*.

THE ARTISANS' DWELLINGS ACT AND THE GRAY'S INN ROAD COURTS.

SIR SYDNEY WATERLOW, speaking at Maidstone, on the 19th inst., referred in deprecatory terms to the action now being taken by the Metropolitan Board of Works under the Artisans' Dwellings Act. He said: The first scheme of improvement propounded in the metropolis was a scheme for pulling down 300 or 400 houses lying between Leather-lane and Gray's-inn-lane, in Holborn, an unhealthy area, consisting of between ten and eleven acres, three-fourths of which the Board propose to pull down. As some evidence of the necessity for this, it is stated that in this small area there are more than 1,000 families living in *single rooms*, and paying for these single rooms from 1s. 6d. to 4s. per week. The houses are very old, approached in too many instances by narrow courts, only from 3 ft. to 6 ft. wide; and in the majority of cases eight or ten families may be found living in each house, built originally to accommodate only one family, and therefore utterly unfitted for the accommodation of so many persons. These houses contain a most mixed population, respectable working people being, not next door, but too frequently in the next room to persons of vicious morals, and frequently criminal character. There is no doubt as to the desirability of this quarter being rebuilt if the health and morality of the inhabitants are to be at all cared for. Those who are watching the operation of this Act of Parliament are therefore not only surprised, but extremely disappointed, to find by the suggested plans for rebuilding, that this degraded condition of occupation is to remain to a great extent unaltered, and that all the evils which arise from families living in single rooms, with conveniences in common, are to be perpetuated in the new buildings. In spite of all that has been said and written upon this subject, the Metropolitan Board propose, by the plans suggested by their engineer and architect, to construct 1,000 single-roomed tenements, on flats, with open balconies, on which are placed the closets and urinals. Sir Sydney then proceeded to urge that in the interests of decency and morality nothing like the present system should be perpetuated, and contended that the working classes, and especially the wives, would gladly pay an increased rent for increased and improved accommodation.

Reference was made to the subject at the meeting of the Metropolitan Board of Works on the 21st inst., when it was resolved that the question be referred to the architect and engineer, and that they be requested at the next meeting of the Board to show how many single-room, double-room, three-room, and four-room tenements there are projected, to supply accommodation for the surplus population.

COTTAGE BUILDING ON THE DULWICH ESTATE.

THERE is a probability of a large number of dwellings for the industrial classes being shortly erected on the Dulwich College estate, in addition to the mansions and other residences for the wealthy, which are springing up so rapidly on various portions of the estate. A company has just been formed, promoted by a number of City merchants and others residing at Dulwich, with the object of purchasing land on different portions of the estate, and erecting cottages of an ornamental character, which it is stated are now much required in the neighbourhood. The capital of the company in the outset is 6,000*l*., in 10*l*. shares. The company has been registered within the last week or two, and we understand that negotiations will immediately be entered into with the governors of the College for acquiring the necessary land for the first block of cottages to be erected. We also learn that the promoters of the undertaking are desirous that the cottages to be built shall harmonise, as far as possible, with the general character of the locality and the houses on the estate, and that they will in all probability be erected under the superintendence of Mr. Barry, the architect and surveyor to the governors of the College.

VENICE.

AT midsummer last year Venice, by holding high holiday on the occasion of the opening of a new dry dock, reminded the world that if she has long been deposed from her proud position as Queen of the Adriatic, and has lost all her political importance, she still retains a fair place as a port and commercial *entrepôt*. But, while she was thus congratulating herself upon her present advantages, her very existence was being threatened. The Venetian lagoons are rapidly being filled by mud; and, if some prompt measures be not taken, she will be left mistress only of a desolate and unhealthy swamp. More than five-and-twenty streams bear their tribute of sand and slime to the canals of the city, of which the Brenta and Novissimo are the most destructive to the lagoon of Chioggia, and the Boudante and Osselin to that of Venice. The port of Chioggia, since 1812, has lost 75 centimètres in depth. Within sixty years the fen has risen to such an extent that where there used to be 1·14 mètre of water, there is now only 0·79 mètre, and before long the marsh will have reduced the depth of water to about 0·30 mètre. Attention has of late been called to the subject, and it is now hoped that the State will provide for the urgent work of keeping back the Brenta to protect the port of Venice. The estimates of the cost of this undertaking amount to 280,000*l*., or about 7,000,000 lire. It is proposed to extend the work over ten years, and to defray it by an annual contribution of 150,000 lire from Venice itself, and 100,000 from the provinces. Italy is still justifiably proud of the fine old city on the sea, as is evidenced by the fact that last year the chamber of deputies voted over a million sterling for deepening and widening the canals, and establishing warehousing docks at the port. The municipal authorities are now engaged in considering the important question of the water supply with greater earnestness than ever. Drinkable water is only obtained by being brought to Venice in large barges from the Continent. For thirty years successive mayors have sought to immortalise themselves by introducing an adequate water supply during their own reign and under their own auspices. Senator Fiorroni, the present holder of the office, has been more than usually active in the matter, and is likely to solve the problem, unless deterred by interested councillors. Several projects have been advanced, chief among them being that of Mr. Ritterbandt, of London, who proposes to sink an artesian well to the depth of 400 yards, and also to lead the waters of the Brenta to Venice by a conduit in masonry under the lagoons, parallel with the railway, and of the length of 4,250 mètres. This would supply the municipality with 300 cubic mètres of water per diem. The result would be a water supply at 60c. per cubic mètre. Mr. Gaerth, of London, is also a competitor.

SOME OLD HOUSES AND THEIR STORIES.

THE ROYAL ACADEMY OF ARTS' FIRST HOUSE.

A WONDERFUL locality to men who cherish memories of dead far-away celebrities, is that otherwise commonplace, uninteresting London thoroughfare, St. Martin's-lane. It is particularly rich in anecdotes connected with celebrated professors of the fine arts, and, is specially interesting from the fact that most of the stories associated with its old houses are of artists to whose efforts we owe the rise and ultimate establishment of our Royal Academy of the Fine Arts.

In their days the British fine arts were enduring the contumely and neglect of their miserably-neglected childhood. Painters were for the most part held in a sort of vassalage by mercenary tricksters and dealers, on whose professed judgment the wealthy and noble patrons of art in their ignorance implicitly relied. Their chief fields of employment were in portraiture—then "the only really lucrative branch of art"; in copying old paintings by foreign masters for the decoration of ceilings and staircases in fashionable houses; in designing for the then newly-introduced book illustrations; and commonly in engraving such designs, but most largely in painting those sign-boards which marked the residences of traders and professional people depending upon the general public for support, before the present plan of putting up the names of streets and numbering the houses was commonly adopted. Many of these signs displayed

no little artistic skill and knowledge both in their design and execution. Hogarth painted several. Samuel Wale, one of these founders of the Royal Academy, who was afterwards R.A., and its Professor of Perspective, was a famous sign-painter, and one of his best-known productions of this kind was a whole-length figure of Shakespeare displayed in a gilt frame, supported by ornamental ironwork, outside a public-house at the corner of Little Russell-street, Drury-lane. They led hard, precarious lives, did these old artists; were the favourite butts of all kinds of heartless witlings; were contemned of every class; and were miserably ill-paid for their labours. Dr. Tucker, dean of Gloucester, once said, and that, too, in the presence of Sir Joshua Reynolds, "A pin-maker is a more useful and valuable member of society than Raffaelle"; and the public held the same opinion. Lowndes, the publisher, agreed to give Wale, when he was eminent and could command high prices, no less a sum than eight guineas for his eight page designs to illustrate "Clarissa Harlowe," and being greatly pleased with them, with notable liberality, added an additional guinea to the price. Wilson disposed of "Ceyx and Alcyone" for a pot of beer and the remains of a Stilton cheese. Hogarth, as we described in another of our papers, sold his copper-plate engravings for half-a-crown per poundweight; and Angelo informs us that Joshua, afterwards Sir Joshua Reynolds, painted heads for half-a-guinea each.

A letter published in the *St. James's Chronicle*, of April 25, 1761, says,—"It is a well-known melancholy truth that the tribe of auctioneers, connoisseurs, picture-dealers, brokers, menders, &c., for their divisions of practice are endless, have monopolised the trade of pictures, and, by their authority, interest, and artifices with the great, have made it a matter of ridicule to purchase any modern production, or encourage an English artist. By this craft the leaders of taste of these kingdoms acquire fortunes and credit, whilst many of our painters, men of genius and industry, are absolutely starving." In the *Adventurer*, again, under the date December 5, 1752, we read in a real or supposed artist's letter,—"I am at present but a humble journeyman sign-painter in Harp-alley; for though the ambition of my parent designed that I should emulate the immortal touches of a Raffaelle or a Titian, yet the want of taste amongst my countrymen, and their prejudice against every artist who is a native, have degraded me into the miserable necessity, as Shaftesbury says, 'of illustrating prodigies in fairs, and adorning heroic sign-posts.' However, as I have studied to improve even this meanest exercise of the pencil, I intend to set up for myself, and to reduce the vague practice of sign-painting to some standard of elegance and propriety." Alas! for the excellent intent. Not many years after the appearance of this letter the sign-painter's art received a crushing blow. In the second year of George III.'s reign, sign-boards having so largely increased in size and number that they darkened the narrow streets where they most abounded, and prevented a proper circulation of air, an Act was passed for their removal as public nuisances, which was followed some few years after by another Act to the same effect but more stringently severe, which insured their final departure, and the consequent disappearance of an occupation from which hundreds of unfortunate painters, with their wives and families, had long obtained a mean and precarious but welcome subsistence. About that time advertisements appeared in the daily papers announcing a forthcoming exhibition of curious signs by the brokers and sign-painters of Knaves-acre, Harp-alley, a comical catalogue of which is still extant. The following extract from the *St. James's Chronicle*, of July 20, 1764, is of interest in connexion with the disappearance of London street-signs:—

"My master yesterday sent me to take a place in the Canterbury stage. He said when I came to Charing-cross I should see which was the proper inn by the words on the sign. I rambled about, but could see no sign at all. At last I was told that there used to be such a sign under a little golden cross which I saw at a two pair of stairs window. I entered the yard and found the waiter swearing about innovations. He said that the members of Parliament were unaccountable enemies to signs, which used to show trades; that for his master's part he might put on sack-cloth, for nobody came to buy sack. 'If,' said he, 'any of the signs were too large, could they not have limited the size without pulling down the sign-posts and destroying the painted ornaments of the Strand?' On my return I saw some men pulling with ropes at a curious sign-iron, which seemed to have cost some pounds; along with the iron came down the leaden cover to the pent-house, which will cost at least, also, some pounds to repair." *

It was at this time that Foote, the celebrated comedian, in that most interesting of elder play-houses, the little theatre in the Haymarket, introduced in his tea-table entertainment a species of farce which, under the head of "Taste," was intended, he says, "to brand those Goths in science who had prostituted the useful study of antiquity to trifling superficial purposes, and who had blasted the progress of the elegant arts among us by unpardonable frauds and false prejudices." This satirical sketch is so forcibly characteristic of the position, painting, and sculpture were in at the period we write of, that we venture, without apology, to introduce a few extracts from it:—

"Act 1.—Scene 1.—*A Painting Room.*
Enter BOY *with* Mr. PUFF.

Carmine.—Let us be private. (*Exit* Boy.) What have you there?

Puff.—Two of Rembrandt's etchings, by Scrape, in May's buildings,—a paltry affair,—a poor ten guinea job; however, a small game—you know the proverb. What became of you yesterday?

Carm.—I was detained by Sir Positive Bubble. How went the pictures? The Guido, what did that fetch?

Puff.—One hundred and thirty.

Carm.—Hum! Four guineas the frame,—three the painting; then we divide just one hundred and twenty-three!"

In the next act the scene is an auction-room, where sham foreign collectors for sham royal personages run up the prices and extol the merits of sham old masters. "Lord Dupe" is the great purchaser here, and at last a picture is put up which is not a sham, and which his lordship is quite willing to purchase on hearing its merits described, until one of the dealers' agents, "Brush," in the interests of the sham works, informs him that, "Lack-a-day, 'tis but a modern performance, and by an Englishman," whereupon the great aristocratic art-patron at once exclaims, "Oh! then, I would not give it house-room."

The British sculptors fared no better than their countrymen, the painters, and Foote showed the victimised "Novice" of the auction enraptured with the fragments of sham antique sculpture, exclaiming, in an outburst of artificial enthusiasm,—"Great! Amazing! Divine! Oh, let me embrace the dear dismembered bust!—a little further off! I'm ravished! I am transported! What an attitude! But then the locks! How I adore the simplicity of the ancients! How unlike the present priggish, prick-eared puppets! How gracefully they fall all adown the cheek!—so decent and so grave, and,—who the devil do you think it is, Brush? Is it a man or a woman?"

John Pye, in his historical sketch called "Patronage of British Art" (1845), says, in illustration of such scenes as Foote so amusingly satirised:—

"The immense wealth that continued to flow in the current of fashion for the acquisition of pictures and other objects of *vertu*, called into action the faculties of a number of ingenious men, adepts in the art of growing rich by flattering the prejudices of the wealthy who sought them; and it is recorded that portrait-painters were sometimes induced by these temptations to dabble in the dealer's art. The spirit of trade was aided by auction-rooms, built in different parts of the town to exhibit and sell by auction *recherché* objects of all kinds. It must be borne in mind that, at that time, sources of rational pleasure and mental improvement, such as in the nineteenth century are afforded to the million by the National Gallery, British Museum, Royal Institution, exhibitions of various kinds, and scientific institutions in all parts of the town, were then only within the reach of the few whose means enabled them to travel": consequently, "sales by auction were the only opportunities within common reach of seeing works of art." And they were consequently crowded with fashionable company, as we may learn from numerous old prints of such places and magazine sketches of the period. At these sales, continues Mr. Pye, "persons who attended to buy and sell again, to commend or decry, as might be, knew well the vast importance attached by the amateur to whatever they said or did, and did not fail to turn their knowledge to good account. Works, unsanctioned by such authority, though they had been the most perfect works of Raffaelle, would not at an auction have produced five shillings; whilst a damaged and repaired old canvas, sanctioned by their praise, found a purchaser and a place in a noble's collection at almost any price."

Under all these circumstances who can wonder that a belief prevailed, both at home and abroad, that Englishmen were by nature unfitted for the study and practice of the fine arts; that the Abbé du Bos, President Montesquieu, and the Abbé Winckelman and others, complacently denied us, as a race, the mental qualities requisite to excel in painting and sculpture? And remembering the absence of all real taste and knowledge of art in the public generally, which was natural enough under such circumstances, who can wonder that English artists, degraded and contemned in exact proportion to their honesty and ambition, grew bitter in their indignation, and often were morbidly savage in the fierce attacks they made upon a system of art-patronage so cruelly unjust, ludicrously false, degrading, and mischievous? "In a country where poverty is infamous," they were amongst the poorest. Many a wretchedly pathetic, and sometimes romantically picturesque, story could be told of the lives they led, and of the natural outgrowth of such lives, in strange and eccentric doings, in recklessly defiant violations of respectable society's ordinary decencies and common customs, in misanthropy, a morbid sensitiveness to praise or blame, and in wild, strange outbreaks of madness or frantic dissipation. Scattered amongst out-of-the-way nooks of neglected literature we have glimpses of their wild doings; but as a class they were too insignificant and contemptible in the eyes of the public to call for any special notice. Walpole took no trouble to ascertain who Hogarth's father was, even when Hogarth's fame employed Walpole's pen. He was described simply and conveniently as the son of some "low tradesman," which, as our readers know, he was not. The "dainty and delicate" Lord Orford scorned to soil the golden buckles of his aristocratic shoes by following the same great painter into scenes of low sensuality; for, as Allan Cunningham says, "Hogarth was no picker of paths," the fact being that, at the period of Hogarth's career alluded to, he had little or no choice of paths, but, like the rest of his unhappy fraternity, took that low walk of life which belonged, as a matter of course, to men of his contemned and discreditable profession. It is true there were some exceptions to this rule amongst a few fashionable portrait-painters who had grown famous and respectable, and comparatively rich, by the practice of their art; but many a fourth and fifth rate portrait-painter would now look down with scorn upon the prices they obtained for even their best works. Hogarth said he received more for his portrait of Garrick as Richard III., executed when his fame was at its highest point, than any English artist had ever before received for a single portrait. The sum of which he was so proud and boastful was 200*l*. For his other and grander paintings he was much worse paid. "Hogarth," says Allan Cunningham, "supported himself by the sale of his prints: the prices of his paintings kept pace neither with his fame nor with his expectations. It is true, also, that we had in those days at least one "great history painter" in Hogarth's father-in-law, Sir James Thornhill, the patronised of royalty, who was appointed "serjeant-painter to the king," and had the privilege of painting "all the royal palaces, coaches, barges, and the royal navy."

Turning for a moment from the painters and sculptors to architects, we find them in no better plight than their brethren of the brush and chisel. Blenheim, erected by Vanbrugh at the order of the Government, as a monument of national gratitude and glory to the Wellington of his day, was ruinous to the architect's peace and purse. The poor starving masons and carpenters clamoured indignantly, and in vain, for their unpaid wages, and the architect at last finished the work with his own money, thereby reducing himself to poverty, although so little was he respected for thus doing that he records how he and his amiable young wife were not permitted by "Old Sarah,"—Marlborough's proud, parsimonious, illnatured, implacable widow,—to go over the castle and park with some titled friends, whom he had brought to see the place; and had to "sit all day long," waiting their return at

* These signs were sometimes enormously heavy. In 1718, the weight of one caused the whole front of a house to fall into Fleet-street, killing the king's jeweller, two young ladies, and a cobbler. The house stood opposite Bride-lane.

the inn. It is true that the cheap, small honour of knighthood was afterwards awarded him, but that was a miserable return for all he had spent and suffered in erecting Blenheim, the last of his buildings. It is easy to conceive what degrading and obscure struggles Gibbs, who designed the portico of St. Martin's Church, would have gone through in England without the Earl of Mar's friendship. You remember the lines of Savage:—

"O Gibbs! whose art the solemn fane can raise,
Where God delights to dwell and man to praise!"

Without Walpole, the great pretender, Kent, who was everything but a great or real artist in either painting, sculpture, architecture, or decorative designing, for he worked in all these, and in many other sections of art, would have found a fate more in keeping with his merits. Again, if a tutor in architecture had not been wanted for a prince who was afterwards George III., it is probable that we should have heard little enough of another of the R.A. founders, the builder of Somerset House, Sir William Chambers, and to this extent only we may agree with the satirical lines in which he was described as,—

"Knight of the polar star, by fortune placed,
To shine the cynosure of British taste:"

which said taste we look for in vain amongst the public it was Sir William's fate to be judged by. Allan Cunningham says of this period,—"We had no fixed laws nor settled rules by which excellence in architecture could be judged: a palace or a church was tried by precedent and by comparison, and unless it happened to resemble something which time had sanctioned, it was pronounced unclassic and barbarous."

The position of engraving as an art may be gleaned from the fact that in all London there were but two print-shops, and these dealt chiefly in foreign prints and portraits.

It can readily enough be seen how a class of men occupying the social position we have roughly indicated, would naturally seek in each other's society the sympathy and fellowship denied them elsewhere. Hence we find the artists congregating regularly at certain coffee-houses and taverns, higher or lower in grade, according to their position and means. The more famous and popular artists had their favourite resort at the Turk's Head, in Gerard-street, Soho, where also amateur and professional actors and literary men most did congregate. They were a wild, drunken, dissipated set, after the fashion of their day, but there are stories of them extant which show how their fellowship went beyond the mere talking and drinking, and had its place in warm hearts amidst kindly feelings. Angelo, for instance, depicts them here on one evening when the news came that a poor journeyman artist of Long-acre who had been living by painting coach-panels had died suddenly, leaving his widow and children destitute. An honest, and perhaps therefore none too rich, lawyer, who was well known as an amateur artist, Theophilus Forrest, put up a petition for the unhappy mother in the public parlour over the chimney-piece, heading it with a subscription of five shillings, and said to the guests:—"I shall open a book here and be widow's clerk, till twelve, when, gentlemen, by your leave, we will close the account."

Straightway the list grew, and the names of future R.A.s figured in it opposite shillings, half-crowns, and crowns. Amongst these were Mortimer, a great *bon vivant*, the friend of Garrick, Sterne, Churchill, Goldsmith, Quin, Malone, and other celebrities of the day, whose studio over the shop of Jemmy Moran, a bookseller, was a popular morning lounge for fashionable people He sat under a brass sconce, reading the *St. James's Chronicle*, and on the appearance of the petition he called for pen and ink, and "began to sketch, with extreme rapidity, groups of monsters, caricature figures, and grotesques upon the margin." He had the reputation of drawing "with greater spirit and grace than any one, not excepting, perhaps, Guercino himself." He continued thus employed, despite the chaffing and joking of his professional brethren, refusing to allow any of the miscellaneous company to see his productions until eleven o'clock, when, rising with the paper in his hand, he began, in clever imitation of a famous auctioneer of his day named Cock:—

"This lot, gentlemen,—this matchless lot,—this unique effort of art, the property of a great amateur (*aside*, of wine and venison), and a renowned connoisseur (in tobacco and punch) is offered to the notice of the *cognos*. It is to be disposed of without reserve. Come, gentlemen, shall I say ten pounds—five—one pound, gentlemen,—yea, even five shillings,—anything for a beginning?"

The company knew their man, and his intention was at once seen and applauded. Another of the future R.A.s, whose picture of the first Royal Academy and Academicians was not very long since republished in the *Graphic*,—



The First House of the Royal Academy, St. Peter's-court, St. Martin's-lane.

Mortimer figures in it,—cries out from the next box,—

"I offare von guinea, mine friend Mortimare."

"Thank you, Zoffany," returns Mortimer; "charity covereth a multitude of sins."

Amidst the laughter that ensues, another voice cries out, "Guinea and a half!" and Zoffany retorts with "Two guineas,"—seriously adding, "'Pon my soul, 'tis peaudiful!" Whereupon comes another bid from Caleb Whiteford of two guineas and a half, and the bidding continues to rise until it stops at five guineas "from," says Angelo, "some good soul whose name, I regret to say, I cannot record." Mortimer, like Reynolds, was one of Hudson's pupils. We can imagine the future R.A.s as they went home through the dark, ill-paved streets, sooner or later, probably later, after midnight, when the auction was over, more jolly and, perhaps, less steady on their feet than usual. Most of them occupied houses or apartments in St. Martin's-lane and Covent-garden, where, over the Piazza, lived Zoffany, who, although born in Germany, called himself an Englishman, because he so truly loved our country. Richard Wilson was Zoffany's near neighbour, and there, too, not long before, had resided Sir James Thornhill, where he opened his academy for young painters in a building adjoining Covent-garden Theatre.

Still lingering amongst the old founders of the R. A., we note what manner of men were some famous artists whose works, despite all modern aids, appliances, and the accumulating experience and knowledge of generations of art students, still so nobly hold their own. We see portly Dick Wilson, as he was familiarly called, sitting gloomy and melancholy in the snug arm-chair by Jack Hamilton Mortimer's comfortable fire-side, full of cynical bitterness, shabby in dress, cruelly neglected, and scarcely able to earn a meal. Mortimer, a tall, handsome, gentlemanly-attired fellow, full of fun and gaiety, stands before him, and a favourite tabby cat, blissfully contented with the warmth, purrs and basks in the rosy glow between. "Come, my old Trojan," says Mortimer, affectionately bending and stroking his hand gently down Wilson's sleeve,—"Come, old boy, I wish I could set you purring like puss there." But poor Dick was metaphorically out in the cold, and purring was hardly to be expected; there was none of pussy's content in him. His heart was full of grief and bitterness. Again, we see Wilson, who was a great lover of books, entering the bookseller's shop in Church-passage, near Covent-garden, on his way to join a snug little dinner party above to which Mortimer has invited him at a time when the two men, although they had little in common beyond their art and its always kindly fellowship, were great cronies. Mortimer, by the bye, painted the figures in that picture of Ceyx and Alcyone, to which we have already alluded.

The dinner-hour comes and goes, the guests are getting impatient, the host is annoyed. No Wilson turns up. The carefully-prepared dinner is spoiling, and a servant is despatched to what afterwards became the Tavistock Hotel, where Wilson's apartments were, who, returning, informs them that the absent guest has locked up his studio, and gone out with the key in his pocket. So the dinner is placed on the table, and the viands duly disappear. Some little time after, the conversation turns on a certain new publication of the day, and the servant, being sent down into the shop below to fetch it, returns saying:—

"Mr. Wilson is reading it, sir; when he has done with it Mr. Moran says it is at your service."

"Mr. Wilson!"

"Yes, sir."

Imagine the surprise and laughter, the rising up of the dinner party, and their hurrying down to the shop in a body, headed by Mortimer and his amiable engaging spouse, for whom Wilson had the deepest respect and affection. Imagine Wilson as much surprised as any there until reminded of the purpose of his visit, which the reading had quite driven from his mind. See them carry his portly figure up the stairs perforce, laughing and chaffing with merciless merriment, vowing that no dinner should he have until he had drunk a goblet of port, and made an apologetical speech. And then the fun of that merry speech, and the jolly social evening which followed. Ah! those bad old days were not all gall and wormwood, and we have few such genial, jovial, boon companions of rich and poor, recognised and neglected, amongst the mildly respectable or stately dignified clubs, studios, and homes of our modern "Sons of St. Luke."

Here, however, we must break off for the present.

THE PUGIN STUDENTSHIP.

THE drawings made by Mr. James Neale, during his tour as the Pugin Travelling Student in 1875, have given general satisfaction, and the Council have awarded to Mr. Neale the 40*l.* to which he became entitled on completion of them. We fully coincide. The drawings are about eighty in number, various in character, and very good indeed. Mr. Neale has won his spurs.

New Hospital at Stroud.—The new general hospital at Stroud has been completed and opened. It has been erected, at a cost of about 7,000*l.*, from plans by Messrs. Medland & Son, architects, Gloucester.



BRONZE DOORS, FOR THE HYPOTHECARY BANK OF BUENOS AYRES.—PRODUCED BY MESSRS. BUNNETT & CO.



THE GERMAN LUTHERAN CHURCH, DALSTON.—MESSRS. E. HABERSHON & BROCK, ARCHITECTS.

BRONZE DOORS, BUENOS AYRES.

IN our last volume we mentioned some bronze-metal doors which had been completed by Messrs. Bunnett & Co. (Limited), New Cross Works, for the Hypothecary Bank of Buenos Ayres. They are all double-leafed, the upper portion being fixed. The size of the largest is 18 ft. 8 in. by 8 ft. 7 in., and the weight of each five tons.

We now give a view of the most important pair, and repeat the particulars before printed.

The design is rich and massive; the thickness of the meeting stile is 10½ in. The method adopted was to cast each leaf in one plate, only $\frac{3}{16}$ in. thick, the ornamental panels being afterwards secured to it in such a manner that neither screw nor rivet head can be seen from the front, and having the appearance of one casting, enabling the various mouldings to be undercut, and giving to each a clear and sharp outline. The casting of these bronze-metal plates, each about 14 ft. 6 in. long, 4 ft. 6 in. wide, and $\frac{3}{16}$ in. thick, was accomplished in the new foundry each time successfully,—an operation, considering the large size and extreme thinness, necessitating great care and ability.

The doors are hung to the frames by six pairs of hinges to each leaf, with steel washers and pins; and, to prevent any deflection, a gun-metal roller, with steel axle, is fixed under the bottom of the meeting stile, working on a fixed quadrant, and, notwithstanding the immense weight, they can be opened and shut easily by a boy. There are six bolts to each door, which are secured thereto by means of a combination lock from the inside only; the end of each bolt is fitted internally with a steel roller, so that any attempt to cut the bolt would be defeated.

The whole of the enrichment is highly chased, relieved, and burnished, giving a rich appearance. The cost of patterns, models, and enrichment was, of course, considerable, the whole being made from brass patterns.

THE GERMAN LUTHERAN CHURCH, DALSTON.

THIS building, now nearly completed, stands close to the German Hospital at Dalston. Its erection is consequent upon the removal of the Temple founded shortly after the Great Fire of London on the site of the ancient parish church of the Holy Trinity, in Little Trinity-lane. This structure never having been rebuilt after that calamity, the site was purchased, and by the king's letters-patent license was granted on September 13, 24 Car. II., to Theodore Jacobson and five others, to build a Temple on the site for the free exercise of the Augustan Confession in the German tongue. The licence is also to their heirs and assigns, and with the consent of the then Archbishop of Canterbury, the Bishop of London, and the Lord Mayor. The building at that time erected on the site was a plain brick structure with a small cupola over the entrance. It had galleries, and the end of the building was adorned with a handsome altar-piece, an organ-case, and other fittings carved in oak in very elaborate style, having, it is said, all the appearance of Grinling Gibbons's workmanship. The site being required for the purposes of the Metropolitan Railway, it was purchased by the company, and the building was shortly after entirely removed.

The new church has been built mainly through the exertions of Mr. R. Brandt, with Baron Schroeder and the other trustees. It is of brick, in the old Germanic Gothic style, and consists of a nave, chancel, and transepts, and has a tower and spire between the transept and nave on the south side, while a corridor on the north side will enable the convalescent patients from the adjacent hospital to obtain ready access. The principal entrance is from the Alma-road, and beneath a rose-window, which is the most prominent feature of the front. The seats are of oak, and provision is made for about 300 worshippers. The roof of the nave and transepts is of open timber, and that of the chancel is arched and boarded. The church is 79 ft. 6 in. long internally, the nave is 28 ft. 3 in. wide, the length of the transepts being 49 ft. across. The tower and spire are 136 ft. 3 in. high to the top of the metal cross.

The whole of the works, and also those of a commodious house for the minister, the Rev. Dr. Walbaum, at some distance from the church, have been executed by Messrs. Newman & Mann, of Upper Thames-street, from the designs of Messrs. E. Habershon & Brock, of Bedford-place, Russell-square, architects. The cost has been about 10,000*l*. Mr. Weekes is clerk of works.

The ancient reredos, the organ-case, pulpit, &c., are restored by Mr. Jacoby, and will be re-fixed, the architects desiring to retain these memorials of the old building, which are of considerable beauty, but of totally different style from that of the new church.

PIECE-WORK AND DAY-WORK, *i.e.* HOUR-WORK.

THE disputes at Erith give rise to many reflections which it is not our intention to ventilate at length. On the threshold of our remarks let us be plainly understood to say that the employer has a perfect right to adopt the system of piece-work in carrying out his contracts, and that the workman has an equal right to refuse working by that system if he considers it an unfair one. So long as no coercion is used on either side the system of piece-work may be allowed to stand or fall upon its merits. The present writer has had ample experience of both sides of the question, and has witnessed the benefits and drawbacks of both methods. Piece-work is undoubtedly a system of competition, and the more extensive the system the more fierce becomes the competition. Where quantity instead of quality is expected in ordinary or mere routine work, the younger and stronger man will reap the advantage, and will often if not always draw more wages than the older and more experienced. In work where quality is desirable the better and safer workman is generally the elder craftsman; but even in his case a lump price for the whole piece of work in contradistinction to piece-work prices for parts of the whole, would not be an injustice.

In the building trade the piece-work system is of old date, although not general. Probably long before the era of the introduction of wood-working machinery into the building trade, the piece-work system was more extensive than what it is to-day. The making of doors and sashes, and the trimming of doors and windows, have been done long years ago by piece-work or by the foot. Working by measurement is nothing short of piece-work, and there is at present a large amount of carpentry, joinery, bricklaying, and other building work executed by measurement, both on the part of builders and workmen in different parts of the three kingdoms. If employers and workmen (we are constrained to use the word "if") were, as a rule, conscientious in the matter of turning out good work very little could be urged against the piece-work system. Like all systems, it is liable to abuse; indeed, abuses are inseparable from its adoption as well as abuses are inseparable from payment by the day or hour. It is an undeniable fact that many operatives do not do a fair day's work for a fair day's wages; but it would be unfair to stigmatise a whole class for the unprincipled conduct of a minority. In a well-regulated workshop, with efficient, fairly-paid, and independent foremen, no difficulty need be experienced on the head of exacting a fair day's work for a fair day's wages. Whether the workmen are paid by the hour or piece, if they are not efficient their services can be dispensed with. Employers are not obliged to keep hands who do not answer, though it must be allowed, at the same time, when hands are scarce and contractors are bound to time, they are compelled, through necessity, to make the best use of the workmen they are able to obtain. Apart from mere routine-work, there are few branches which need more careful and conscientious work than that of the engineering branch. The sad disasters that startle the nation now and then by sea or land, suggest, certainly, sorrowful thoughts perhaps, that "scamped" workmanship and bad materials have been contributors to the disasters. We are fully conscious of the large amount of scamped work that takes place in the building trade, and which we have often exposed in these pages. Some speculative building work is performed by day-work, but at a lower rate of wages than what is paid by respectable builders. A large number of the "Jerry" buildings are put up by inferior workmen, and youths, in many instances who have but little knowledge of their trade, but who work under a leader, and who also work by the piece or job. This kind of scamped, or "slush," or "slop," work would not of course, pass current with a respectable London firm. In the metropolis and throughout the provinces staircase work is often done by the piece, or by measurement, or so much per step or stair, and excellent work is often done in this way by men who make stair-building their peculiar work. In the building and cognate branches there is a class of work well suited to be done by piecework, while there is a large amount of other work of a miscellaneous character which could not be brought under any system of piecework. To the young and strong piecework could be held out as an inducement to greater exertion on the part of workmen; but care should be taken that the work should not be accepted by the employer if "scamped." The unprincipled employer might profit by the transaction, the operative might profit, but the public would be grievously wronged or deceived. In fact no hard and fast line can be laid down in any one trade for regulating the exact limits of the piecework system, neither should a number of men, willing to avail themselves of the system, be coerced by their fellow-men. If piecework leads to an overstraining of the energies so does the system of overtime by the hour system. Both systems entail long hours, though they bring more wages. If men unduly deprive themselves for several days or weeks of their natural amount of sleep by a prolonged system of overtime by the hour system, even with double payment, they are in the end losers instead of gainers. We are aware that overtime is cried out against by trade societies latterly in several trades; yet we know it as a fact that many societies who have cried out against it publicly have allowed their members to work overtime month after month. We are averse to both "lock-outs" and "strikes," for we believe both to be evils, and though either might be used righteously under certain circumstances, they are too often resorted to as offensive weapons, and they often entail injury and hardship on the users. The piece-work dispute between employers and workmen will never be settled by the medium of a "strike" or "lock-out." Piece-work has existed for centuries and will probably exist until the end of time. It will be adopted more or less according as appliances favour its adoption and self-interest prompts the individual workman or the many to make the most of their time. Before the hour system was adopted, many workmen thought that a greater evil could not be introduced, but it has proved the reverse. Piece-work, under limitations, and in some trades, must prove an advantage, but in the hands of unprincipled employers and manufacturers there is a tendency under the system to lead to the execution and production of much inferior work. Great production leads to the overstocking of the market, and it is not advisable, even if more work is done and more goods are produced, that the surplus shall be of an inferior description. Viewed in this light, of course, a reduction in the price of goods and a reduction in the price of labour is inevitable.

In what we have above written it will be seen that we recognise the right of the employer and the employed to adopt or reject a form of labour that is pleasing or objectionable to them. Freedom of contract, and time will bring about better relationships.

COLOUR IN REALITY.

SIR,—My friend, Mr. W. C. Thomas, in his letter last week, seems to assume that I am too positive in what I assert; that "we cannot, off-hand, be confident that our first notions upon any portion of that subject are right." But without going into the question whether my assertions are first notions or not, I must confess that I do not clearly understand his theory as applied to colour. He describes pictures as having no inherent colour. I, however, look upon colour as a fact; that everything in nature, without a single exception, possesses its own inherent colour. That colour exists as much as form does, and that we cannot have form without it. That we cannot see form or colour without light and the use of our eyes, but that both exist, nevertheless, whether there be light or not, or whether we can see them or not. I take a brick—a red one. I break it—it is red all through. Can "W. C. T.'s" reasoning make me believe that that brick has no inherent colour? So it is with every substance on the face of the globe, or for miles above or below it. Everything has its own colour.

How the sensation of colour arrives at my eye, or whether by the corpuscular or the undulatory theory, I am unable to explain. I only know that I am able to distinguish between different colours in a perfectly simple and natural way,

and in the same manner that every one else is able to do. There may be some exceptions as to the particular tone of colour which some people see,—as in the case of those who are afflicted with what is called colour-blindness. But they see *colour* all the same, although it may not exactly agree with what we see; and, perhaps, further, no two people ever do see colours exactly alike; but as we cannot detect the difference between each other's eyes, colours become the same to all of us who see in the ordinary way. I have, however, long held the opinion that colours alter in different countries; that they become brighter and more beautiful in countries where the atmosphere is clearer and brighter; that pictures and architecture look more beautiful in Italy or Greece than they would do in our Northern climate. Even in our own works, that they look more beautiful in summer than in winter—better at one time of the day than another. I saw this fact last autumn, when I beheld the west front of Lichfield Cathedral, which as every one knows is plastered over with a wretched coloured cement, lighted up by the setting sun, with the most lovely and glorious colour, that gave the whole front a beauty that I never saw before!

I shall be told perhaps, that this was only a sensation—momentary. Well, agreed it was so, and I acknowledge that it was not the inherent colour of the cement; but it was a fact for all that, and my mind still retains a vivid recollection of its beauty. All colours look different under different circumstances. Grass in sun-light and grass in shadow are two different and distinct shades of green. Grass when seen lighted up by the rising sun is of a golden green, while the long stretched-out shadows look to be of a pure ultramarine. Grass, however, is still green to all of us, and of that particular kind of green that we all know and do not recognise again in any other form of vegetation. So it is again with every tree and plant throughout nature—all have their own peculiar shades of green. As it is in the forms of leaves, no two ever being precisely alike, so it is with colours. No two plants, of different species, have ever the same shade of green.

JAMES K. COLLING.

WORKING DRAWINGS.*

IF we remember for a moment what is meant by "working drawings," and what is the duty they have to perform in our art, we shall, I think, come to the conclusion that the matter is deserving of our best attention. Working drawings, then, generally speaking, are the means by which our ideas can be realised in actual materials; they give our clients an idea of what we intend, and they convey to the contractor an explanation of the works to be done under the contract.

To acquire the knowledge to prepare in a creditable manner the necessary working drawings, there are many opportunities; first, you have the opportunity of seeing such in your principal's office, then you can visit the works in progress, access to which is very readily granted, and this if properly carried out, I consider to be one of the best forms of education in this direction. You can see in the art and scientific journals the latest information to be had on these subjects. There is photography in all its branches, as well as all the other different forms of illustration, putting before you the choicest examples of ancient and modern work; and, though last not least, you have the sketching tour. This I consider a most important feature of your education. Take up a door or window or any other portion, and thoroughly measure it, and carefully sketch in the mouldings, marking the construction and jointing of the masonry. Then carefully study, and sketch the figure and sculpture, and never leave the object till you feel that you have made accurate drawings of the whole. This will, I believe give you a better idea of what is necessary for a working drawing than almost any other form of study; it is also calculated to give you great confidence in your own efforts, as you need be at no loss for information on similar points while you have those studies by you. You must, however, avoid making the preparation of the drawings your whole care, remembering the end of all drawings should be simply to help to realise the actual construction. It should be your anxiety in your general drawings to represent on paper, as simply and faithfully as possible, the appearance and effect which the work, when realised, will present.

To explain your ideas to the workman and artist who may be assisting you to carry out your design, it is absolutely necessary that your geometrical drawings should be clear and distinct, bold and truthful. A little extra time spent in this way at the beginning, and you need then have little fear that the work will be otherwise than as you had designed it. It will also, to a great extent, prevent the possibility of any difference arising between you and the contractor in the carrying out of the work; it is surely only simple justice that you give the contractor a full idea of what you intend before you ask him to send his estimate of the cost. This will, I believe, be productive of the greatest good feeling amongst all parties, clients, architects, and contractors, and you will then probably hear less of that most annoying subject,—"extras."

Working drawings should include every information that is necessary, taken with a full clear specification for explaining to the contractor and to the workman the work to be done, and the proper way of carrying out such work in the best manner. It is not necessary, in my opinion, that they should be prepared in any regular or uniform manner,—they may include the rough sketches given, perhaps, on the scaffolding to explain away some difficult point to the foreman, the ordinary detail drawings given with the general contract plans, the full-size details or the marginal sketches given in your specifications, these are all working drawings. In fact, everything that is necessary to explain your views as to the proper carrying out of the work is a working drawing. Sketches are oftentimes very useful for this purpose, for you will occasionally find that where an ordinary drawing fails to make itself understood, a perspective sketch seldom or never fails. It will be well, however, to prepare, in the first instance, in connexion with the specification, a full set of plans, and I would recommend that for buildings for domestic purposes, it consists of general plans, sections, and elevations, most carefully figured. . . . .

In preparing the details it will be well to make plans of every portion, and carefully figure all the widths and heights; the plans of the window should include — plan, exterior and interior elevations, and section, as well as full-size sections of the mouldings; the plan should show carefully the different materials used, the bonding being distinctly marked; the elevation should show the general features, the construction being distinctly marked, the sizes of the stones and other materials being clearly indicated, and the centres of all arches shown. The showing of the sizes and jointing of the material is most important, as this has oftentimes a great deal to do with the appearance of the work; it may also have an influence on the value of the work, and therefore it should not be left in doubt. The interior elevations should clearly indicate the kind of sashes, shutters, skirtings, and trimmings; lintels should be shown, their thickness and bearings, and the discharging arches turned clear of them; then large details, say full-size, should be given of the different parts requiring such. In the cills or strings you should be careful to show the raised seats for the jambs, rebates, and weatherings for the frame; the moulds of your architraves and panels should be shown. The same general principles will apply to the windows of a church or other public building.

The details for the door should show the construction, sizes of stones or other material, the bonding steps, arches, and centres, as well as manner of securing the frame and other woodwork. It will be important to make plans or sketches of the different portions, and see that they realise your wishes; do not content yourself with the general elevations and sections. It very often happens that when we have depended on these, the result is quite different from what we had intended. Take a door or window (as on the accompanying sketches) with an attached or detached shaft: the geometrical elevation may look quite satisfactory, the cap appear to have legitimate work to do, to do it effectually; but yet, owing to the distribution of the work over it, or the kind of mouldings on the arch-mould, the result may be most unsatisfactory; the shaft, in fact, from different points of view appearing to have less to carry than it should, the line of the shaft oftentimes being outside the line of the archivolt at the springing. This great evil will be avoided if you thoroughly study your work. . . . .

To conclude, you should have a thorough knowledge of construction and the uses of materials; you should also have a general knowledge of all the trades. This is absolutely necessary for the proper preparing of your working drawings. How can you possibly expect that workmen will understand your ideas, that are, perhaps, somewhat new and strange to them, unless you put these before them in a perfectly clear and intelligible form? Without this your client will not have that confidence in you which is necessary; while the builder, who is really anxious to have the benefit of your assistance and to follow your plans, too often finds that, in matters within his own province, you are at fault, and thus your influence is weakened. Let this not exist, and the aid of the architect will be more generally sought: the public will feel that their interests are safe in his hands; that technical knowledge and artistic taste are employed in their behalf, and will place themselves unreservedly in his hands; and thus the cause of art and the interests of his client will be served in the end.

* By Mr. J. J. O'Callaghan. From a paper read at ordinary general meeting of the Architectural Association of Ireland, on the 30th of December, 1875.

PARISH SCAVENGING AND WATERING.

THE Vestry of Chelsea, finding they were called on to pay more and more for the scavenging, watering, and removal of dust, without, as it seemed, sufficient reason, or with satisfactory efficiency, referred the subject to their surveyor, Mr. G. H. Stayton, who has submitted an elaborate report to show that a saving would be effected by the Vestry doing their own work. From the report it appears that the estimated cost for the coming year, under the present system, would be 6,935*l.*; but by the Vestry providing their own men, horses, and plant it would be 5,445*l.*; showing a saving of 1,490*l.*, which in four years would more than repay the 4,636*l.* which it is estimated would be the original outlay for horses and plant.

From Mr. Stayton's report we learn that Newington performs the whole of the parish work without contracting for it. The refuse is conveyed away by railway, and sold to farmers for a price varying from the actual cost of carriage to a profit of sixpence per ton. Great satisfaction is expressed with the system. Islington does a portion of the parish work itself, and contracts for the remainder. The refuse is carried away by means of the canal. Entire satisfaction is given by the non-contracting plan, and it is contemplated to extend it to the whole of the parish. St. Luke's, Old-street, has for some years adopted the same plan as Islington, and finds it pay. Bermondsey, also, does without contracting. The refuse is conveyed away by barges from a wharf alongside the river. The Vestry derives considerable advantages from the system. St. George's, Hanover-square, does its own work for two-thirds of the parish as regards cleansing and watering the roads, but contracts for the remaining third and for the whole of the dust removal. The refuse is carried away by canal, and costs for its disposal about three shillings and two pence per load. The system gives satisfaction. Lewisham partly does its own work, and partly contracts, and the surveyor is of opinion that the system works well. We are bound to say that, looking at the figures alone, we should not be sanguine as to the saving that would be effected in Chelsea by the change proposed, but we are quite ready to believe that the work would be done more completely than it is at present.

The Vestry have adopted for the present a modified scheme, by which it is believed a saving of several hundreds per annum will be effected.

PROPOSED INVERNESS AND GLASGOW RAILWAY.

IT is proposed by Mr. S. M'Bean, C.E., to construct a single line of railway from Inverness through the great Glen and Glencoe to Garelochhead, the present terminus of the Glasgow, Dumbarton, and Helensburgh Railway, and a branch line to Kyle Rhea, through Invergarry, in connexion with it. Preliminary estimates have been prepared for the main line, which amount to 1,542,000*l.* for about 145 miles of railway and rolling-stock, including also extensive workshops at both termini of the new railway. A suitable site for the Inverness station has been selected on the west side of the river, and a convenient junction will be formed with

the Highland Railway opposite the Thornbush Brewery without destroying any house property. The proposition is receiving some attention, and appears to us to deserve more. There are hundreds of thousands of acres of land in Inverness-shire and Argyllshire that the railway would be instrumental in developing and bringing into a high state of cultivation within a few years.

There is an immense deal of money being squandered annually on foreign loans through the criminal action of our financial agents, some at least of which we should gladly see diverted into channels where its honest disposal and expenditure can be watched without difficulty. The tract of country through which the route has been projected is capable of immense development, and the mails north and south will be accelerated three hours. Fish fresh from the whole west of Scotland and the Hebrides will be poured into the midland towns and London, in great quantities, on the opening out of this railway.

THE WORKING OF RAILWAY TUNNELS.

INSTITUTION OF CIVIL ENGINEERS.

IN the course of a paper on "The Ventilation and Working of Railway Tunnels," by Mr. G. J. Morrison, C.E., the author, after a slight allusion to the possibility of destroying the evils arising from the products of combustion, alluded to the hot-water locomotive, on which principle engines had been working on tramway-cars for some years; to a description of locomotive the boiler of which had a receptacle for a mass of red-hot iron, or of heated fire-bricks, something on the plan of the tea-urn; to the compressed air-engine; to the pneumatic system; and eventually to the atmospheric system, one of the few which held its own for a time against the locomotive engine, and the mechanical difficulties of which were all worked out years ago, with one exception, namely, that of dealing with a single tube of great length. There was yet another method of working long tunnels, and that was by means of ropes. This plan was minutely discussed; and, in conclusion, the author recapitulated his views as to the mode of dealing with tunnels exceeding seven miles in length in the following terms:—First, when long tunnels without shafts had to be ventilated, a current of air should be caused to pass through by means of a fan placed near one end, that end being closed by doors. Secondly, for a given amount of traffic, the power required to ventilate long tunnels varied as the fourth power of the length. Thirdly, when a long tunnel had to be ventilated, it was more advantageous to have a double-line tunnel than two single-line tunnels; and fourthly, for a tunnel of given length there was a limit to the traffic that could be carried on by locomotives, beyond which ventilation became impossible, and when that limit had been reached, some other tractive power must be employed.

WORKING MEN IN ENGLAND AND AMERICA.

IN pursuance of instructions, United States consuls in Europe have been supplying to their Government some information relating to the labouring classes, and the chief of the Bureau of Statistics has published the results of the inquiry. The *New York Times* says:—"The general conclusion to be drawn from the answers is unfavourable to the efficiency of English labour as compared with American. The explanation given is probably the true one—that it lies in its greater 'adaptability' owing to the superior education and intelligence of the American factory workman, and in the more temperate American social habits. The English workman requires a day or two to get over his Saturday night and Sunday drinking sprees. The extent to which the English labouring class drink up their wages appears in a melancholy form in this report. The consul at Sheffield reports that great numbers of working men stop work on Saturday noon, and do not commence again till the following Wednesday. This is, in part, because they need Monday and Tuesday to enable them to recover from the effects of Sunday's drinking. 'Increase of pay,' says the consul at Birmingham, 'means increase of drink.' In Manchester, our consul reports that many sober working women complained that increased wages and shortened hours of labour were a curse to families, as the men were only the more tempted to drink. In Liverpool there seems a wide-spread and fearful demoralisation of the labouring class from their intemperate habits. And thus from all the manufacturing centres our officials report a wretched condition of working men's families, and reduced efficiency of labour from the habits of intemperance prevalent. A curious fact also appears in these researches—namely, that a rise of wages does not always produce more work. Thus in the collieries of Leeds the product for each person in 1864 was 327½ tons for 313 working days, or 21½ cwt. for each person per diem. In 1868 it fell to 317 tons, or 20 cwt. per diem. In 1873 to 17½ cwt. for each person per diem. This is a reduction of production in ten years of 19 per cent., while wages have risen 30 per cent. and upwards. In Manchester, the average earnings of a certain mine were 4s. 7d. per day in 1871; in 1872 the wages had more than doubled, and yet the earnings were 2d. less per week for each man. The workmen averaged less than four working days per week, while many only worked three days. The statistical proof presented by the United States Bureau of Statistics of the terrible loss and degradation to the English labouring classes produced by their drinking habits will not be one of the least of the good results accomplished by this able report."

NEW BANK AT DERBY.

THE structure recently erected in the Market-place of this town, from the designs of Mr. Isborn, architect, as a new bank for Messrs. S. Smith & Co., has been completed. The banking-room is 40 ft. by 50 ft., lofty, well lighted, and appropriate. The pavement is mosaic. The walls of this room, upon the business or counter-side of the room, are ornamented at the foot by a dado panelling of wainscot oak, with bold plinth and surbase mould of admirable finish. Above this the walls are morone, decorated with free-hand ornament, Grecian in its design, whilst further up, a mid-cornice divides the height, and adds to the appearance of the room. The plaster ceiling, which is heavily panelled and richly moulded, is supported by four columns, having Corinthian capitals. The ceiling is further ornamented, in the centre, by three large sunlights, supplied by Messrs. Strode & Co., of London. To both sets of windows are fitted Bunnett & Co.'s patent iron revolving shutters, the merits of which, for convenience and security, are too well established to need any comment at our hands. The whole of the fittings in and about the banking-room are of wainscot oak, except one portion of the panelling on the off-side, where the grain has been so skilfully imitated that none but the most practised eye would know that the original had not been employed. This is the work of Mr. Felton, a skilled artist employed by Messrs. Arrowsmith, of London, who have supplied the most important part of the furniture and decorations in this and other parts of the bank. The locks here (and, indeed, throughout the bank) have been supplied by Chubb, of London; and the two safes, which are of unusually great size and strength, are by Milner, the manufacturer of this *spécialité*. From the outer strong-room one of Bunnett & Co.'s raising-machines lifts the books, &c., into the banking-room above, and the trolly which contains them can there be pushed with ease into any part of the establishment. The gas arrangements were fitted by Mr. Brassington, of Derby.

The works have been carried out from the designs of the architect by Messrs. J. & E. Wood, contractors, of Derby, under the immediate supervision of Mr. Albert Barratt, as clerk of the works.

ON HYDRAULIC RAMS FOR COTTAGE WATER SUPPLY.

MR. J. A. DAVENPORT, surveyor to the Nantwich Rural Sanitary Authority, says there is at Lea Hall, near Nantwich, an arrangement which, in many instances, might be copied with advantage. There is a similar means of water supply in Bartherton township, and although there is nothing new in raising water by means of hydraulic rams, still he thinks there is a novelty in the general application of the little rams erected at these places.

The water supply at Lea Hall is lifted from a stream which has been dammed, so as to obtain a head or fall of water of 8 ft. 6 in. to the ram below, the supply of water to the ram being about 25 gallons per minute; the water is lifted to a tank holding about 2,400 gallons at a distance of about 100 yards, and at a vertical height of about 50 ft., the ram supplying water at the rate of 180 gallons in the hour, or say 4,300 gallons per twenty-four hours. From the tank mentioned the house and farm buildings are supplied. There are taps at all required points in the farm-yard for the 75 head of stock, taps to the stables, watering troughs, and for the engine. To each boiler in the cleaning-shed there is a tap; the kitchen boiler and range are also supplied with water, and it might be thrown into the bed-rooms or the highest point in the house. The ram has now been working night and day continuously for eighteen months, and its entire cost during that time has been only one shilling for a new washer, and there is no sign of depreciation or wear and tear.

Taking the present as an instance, there would be a sufficient supply in the Lea Hall tank to give twenty gallons per twenty-four hours to 200 cottages, and cottagers at present seldom use more than six gallons in twenty-four hours, and the cost per annum (terminable say in thirty years) to each house would, irrespective of rights of way or water rights, hardly reach a shilling, making some allowance for additional mains.

These rams are supplied by Messrs. W. & B. Douglas, an American firm, and range in price from 50s. upwards.

COUNTY OF DURHAM LUNATIC ASYLUM.

AT the Epiphany Quarter Sessions, holden at Durham on the 6th inst., it was resolved that the county engineer and architect do prepare plans for an "anxiliary building," on the present Asylum estate, at Sedgefield, to accommodate 400 chronic patients. This was adopted in lieu of building a second asylum, as it was considered the buildings for this class of patients would be much less expensive than the usual asylum buildings, and that the cost of maintenance would be less than in the asylum. The structure will be a detached building, at some distance from the present asylum, but yet under the management of the present superintendent, medical officer, and assistants. The grounds of the present asylum are 200 acres in extent, in a rich, loamy soil, over a great depth of gravel and sand.

ST. BUDEAUX CHURCH, DEVON.

Now that the mother church of St. Andrew, Plymouth, has been beautifully completed (under Sir Gilbert Scott), the restoration of her daughter, the sadly-neglected church of St. Budeaux, is to be proceeded with. For a Post-Reformation structure the church is of considerable interest. It was built about 1560, and consists of nave, north and south aisles, with a well-proportioned tower at the west end. There is only a quasi-chancel at the east end. The Perpendicular details are nearly as good as those of Devonshire churches generally, a century earlier, but the edifice has been as much desecrated by successive churchwardens, and has in various ways suffered as great barbarisms as it is possible to imagine. An influential committee has been appointed, and under the direction of Mr. James Hine, architect, Plymouth, the church will be restored this year. Here was married the famous Sir Francis Drake, and here his wife was buried. There are several monuments to members of the Fortesque and Stukely families.

Improvements in Mortar Mills.—According to the *Birmingham Gazette*, Messrs. W. M. Ward & Co., of the Limerick Foundry, Great Bridge, have recently patented some important improvements in mortar-mills. "The Patent Dwarf Mortar Mill," which is adapted for crushing and grinding mortar, and for mixing sand and cement, is very light and simple in construction; it can be worked with small motive power, and it is so arranged that the mortar can be passed up a discharging trough by the revolution of the pan, thus dispensing with the labour of emptying the mill with a shovel. These improvements are effected by the upright standards being little more than half the usual height, and the awkward top-cross heading being done away with, oscillation and vibration are reduced to a minimum. The invention emanates from Mr. Ward, and the new mills already are rapidly superseding the old ones in many large manufactories.

THE STATUE TO LORD PALMERSTON AT WESTMINSTER.

PREPARATIONS are being made for the erection of the colossal bronze statue to the late Lord Palmerston, at Westminster, in the inclosure opposite Palace-yard, at the angle of Great George-street and Parliament-street. The excavations for the foundations on which the pedestal of the statue will rest have already been dug out, and the brickwork basement for the pedestal is being put in. The pedestal consists of several massive blocks of polished Aberdeen granite, the basement part of which is 6 ft. in width and 4 ft. in height, the extreme height of the pedestal being upwards of 14 ft. The statue itself is about 9 ft. high. It is expected to be completed and ready for inauguration shortly before Easter, and it is stated that the Queen, or some other member of the Royal Family, will be asked to unveil it. It will form a prominent companion work of art to the statue of the late Earl of Derby on the opposite side of the inclosure.

BUILDING ON RUBBISH SHOOTS.

WE have done our best to convince authorities of the evil of this practice and the extent to which it is carried on, and, we may hope, not wholly without success.

Hackney is thoroughly awakened, and has sent a deputation to the Home Secretary (Mr. Cross) to learn if Government will assist in carrying through some measure to enable authorities to put a stop to the nuisance and danger in question.

Dr. Tripe made a strong statement, and

The Home Secretary, in reply, said,—This is a matter which was brought under my notice incidentally last year, when I was discussing the question of buildings, and I had to go into it to a certain extent, quite enough to make me aware of the great danger which does arise—though people do not know it—from the circumstances you have just mentioned. As Mr. Booth has said, in the country he believes there is power, if it is put in force, which would give a remedy, and no doubt that will be attended to, and I will take care to see whether some provision can be made affecting London. You must give me a little time to think it over, and consider what can be done to remedy what is undoubtedly a very serious evil.

IMPORTANT PROCEEDINGS UNDER THE PUBLIC HEALTH ACT.

AT the Saffron Walden Borough Petty Session, on the 18th inst., Mr. R. Perry, of Debden, Essex, was summoned at the instance of the Mayor and Corporation of Saffron Walden, to show cause why an order should not be made upon him for the payment of 66*l.* 10*s.* 8*d.*, being the expenses incurred by the Corporation acting as the Urban Sanitary Authority in doing certain necessary works which the defendant had neglected, after notice, to do himself.

It appeared from the statement of the counsel for the complainants, and the evidence adduced in support thereof, that the defendant is the owner of a number of small houses in the borough of Saffron Walden, called Upper-square. In the early part of last year repeated complaints were made by the inspector of nuisances, the surveyor, and the medical officer of health, of the bad and insufficient privy accommodation and defective drainage of these premises, and ultimately on the 13th of July last, the Urban Sanitary Authority directed the inspector of nuisances to serve Mr. Perry with a notice in writing requiring him to do the necessary works within twenty-eight days, and giving him notice that in case of his making default in doing so, the Urban Sanitary Authority would themselves proceed to the work, and to recover the costs of doing so from the owner in a summary manner, by proceedings before the Justices. Mr. Perry took no notice whatever of the matter, and after some further delay, the Sanitary Authority in November last ordered a builder in Saffron Waldon to execute the works, which he did, and his charges, amounting to 66*l.* 10*s.* 8*d.*, were now sought to be recovered from the defendant.

The defendants' counsel took a number of technical objections to the various notices and proceedings, but admitted that he could not ask the Justices to open the question of the reasonableness of the builder's charges, as it had been decided by a superior court, but the duty of the Justices, in such a proceeding as the present, was purely ministerial.

The Mayor, after consulting with the other Justices present, announced that the order applied for would be made for payment by the defendant of the 66*l.* 10*s.* 8*d.*, but, at the request of his solicitor, they consented to state a case for the High Court of Justice upon the technical objections taken by him.

Registration of Trade Marks. — The Registry of Trade Marks is now open in Quality-court, Chancery-lane.

MISTAKES AS TO EMIGRATION.

NEW countries want strong arms and energetic minds.

The Brisbane correspondent of the *Grafton Argus*, speaking of a cargo of emigrants which had arrived in Queensland, says their presumption was boundless. They expected 2*l.* and 3*l.* a week, and were prepared to fill any position, whether they knew anything about it or not. They looked admirably adapted for washing their masters' spoons, preparatory to putting them in their pockets. One little chap, who looked as if he had been engaged in the exploration of pockets, said he would take a billet as ploughman if he could get nothing else, and the following original dialogue took place:—

Q. Have you been accustomed to ploughing?
A. Never saw a plough in my life.
Q. What were you doing at home?
A. Engaged in a machine-shop in London.
Q. In what department?
A. Turning the grindstone.
Q. Then you think a man whose genius comprehends the mysteries of a revolving grindstone could hardly fail to guide a plough?
A. It is just as difficult to turn with one hand and grind a chisel with the other, as steering the handles of a plough.
Q. What wages do you expect?
A. 2*l.* a week and found.
Q. Don't you seriously wish you may get it?
A. I intend to go home and write to the papers about the way we are allured out here and then get nothing to do.
Q. Have you ever filled any other dignified position than that of grindstone revolver? Did you ever learn anything else?
A. Can't say I ever did.
Q. Then you came out here entirely ignorant of any kind of work, and no idea of doing anything at all, and feel disgusted because some one won't rush up and offer you double the wages of an experienced hand?
A. We were deceived by the agent, and intend to go back.
Q. If you can by any possible means persuade all your friends to go home with you, it will constitute a very great favour to the new country, and if you get drowned on the way back so much the better for the old country.

A BUILDER'S CLAIM FOR "EXTRAS."

GROVES *v.* HOLT.

AT the Wolverhampton County Court last week, before Mr. A. Martineau, judge, Mr. Andrew Groves, builder, Wolverhampton, sought to recover from Mr. George Holt, fruiterer, the sum of 17*l.* 18*s.* for extras incurred in the erection of a house in Stafford-street for the defendant.

It appeared that defendant engaged with Mr. Groves to erect a house in Stafford-street at a cost of 200*l.* There was no written agreement, but after the work specified had been completed defendant's wife gave orders for a cooking-range to be erected, and other additions were ordered which cost 17*l.* 18*s.*, the sum claimed. Plaintiff gave evidence in support of the above facts, and stated that the specifications detailing the work to be done had been returned to Mr Holt On behalf of the defendant it was stated that the whole of the work was to be done for the sum of 200*l.*, and nothing was said about the extras until some time after the completion of the work. The 200*l.* were paid in instalments, and the last 50*l.* were handed over to the plaintiff soon after the work was finished. Mrs. Holt denied ever giving orders about the cooking-range to be put in at an extra cost, and both she and her husband denied ever having seen any specifications. Defendant wanted a specification, but plaintiff said it was not necessary in a small job like that. His Honour said the burden of proof as to the amount claimed, being for extras, rested upon the plaintiff. It was a loose contract. He thought the defendant and his wife were under the impression that the 200*l.* were to include all the work. Under the circumstances he should give a verdict for the defendants, with costs.

EDUCATION FOR WORKMEN.

SIR,—I am glad to see this question of technical education once more about to be discussed in your columns; and I hope it will cause many artisans in the various branches of the building trade to arouse themselves and seek to raise the standard of working men in this country; for, as your correspondent says, there is a lamentable deficiency of technical education in the building trades, and consequently of mechanical skill also. It cannot be denied that a man who possesses a knowledge of the principles on which his craft is founded must be a better workman than he who is ignorant of them. Let a man possess a good knowledge of geometry and drawing, and he will find that it greatly facilitates his work; for he will see a way of doing scientifically and correctly what he before did blindly and by the rule of thumb. But I fear it will be a long time before we shall be able to arouse the workmen from that lethargy into which they have fallen. I hope I may be disappointed in this, but I speak from my own experience.

About three years ago, when I came to Banbury, I started classes with the above object, and have continued them for three successive winters, but with very poor results; for out of about 100 carpenters and joiners, besides other trades which are employed in Banbury, the average attendance at these classes has been about twelve. At first the attendances were a little better, but they gradually dropped off. I had two bricklayers for a short time, but they probably learned enough in a few weeks, for they never came after. It may be that it is too cheap, for I give my services gratuitously, and have frequently paid money out of my own pocket to help to support these classes; and since I commenced they have been a direct pecuniary loss to me. We meet three nights in the week, and the subjects taught are plane and solid geometry, building construction, drawing and isometrical projection, arithmetic and mensuration. I have to be continually urging upon the men the necessity and importance of technical education. I simply state these facts to show how lethargic working men are in respect to technical education.

I would most willingly give my assistance and support to any practical scheme which would tend to obviate these evils; and I consider your correspondent's idea of starting an institution of working men, for the purpose of extending technical education, a good one, likely to be productive of good results, and much practical information would be derived from the papers which would be read.

FRANK CHESSELL, Builders' Foreman.

THE PAYMENT OF WAGES.

SIR,—Statistics have lately been published which show that the greatest amount of drunkenness takes place at the end and beginning of the week.

Now that Saturday is a half-holiday, and Monday a recognised "spree" day, the almost invariable custom of paying workmen on Fridays or Saturdays exposes them to irresistible temptation, and I believe that if employers could be induced to pay wages in the middle of the week, it would prove a practical step in the right direction.

Moral weakness is the working-man's weakness, as it is that of all classes, and many a workman would only be too glad to be assisted to avoid the temptations which now beset him on and after pay-day.

I am confident that if employers would give my proposal a trial, they would be gratified with the result, and be the means of saving many a family from improvidence and consequent misery. ONE WHO PAYS ON WEDNESDAYS.

STAINED GLASS.

Tuxford.—Mr. Charles Story, of Worksop, has presented a three-light window in stained glass, in memory of his sister, Mary Story, to the Parish church. The centre light represents our Saviour blessing little children, with ribbon scroll, and the inscription, "Suffer little children to come unto me." The right-hand side-light contains two figures representing Faith and Hope with their accustomed emblems, and the left-hand light Charity. The window is by Cox & Sons, London.

Wolverhampton.—A stained-glass window has just been placed in the north aisle of St. Peter's Church, Wolverhampton, to the memory of the late Mr. Langman, by Messrs. Heaton, Butler, & Bayne, who executed the wall-paintings in the chancel. The centre compartment represents our Lord calling and blessing little children. On the left hand there is a picture of Jonathan trying to make peace between his father Saul and David. On the right hand is a scene from the parable of the Good Samaritan. On either side in the upper tracery of the window are crowns representing the reward of the peace-makers and the merciful. The tree of life forms the background of the whole window, with "its twelve manner of fruits," and "its leaves for the healing of the nations."

Liverpool Art Club.—At the annual meeting of the committee of the Liverpool Art Club, held on the 20th inst., Mr. Holbrook Gaskell was appointed president for the year, and Mr. T. Mathison and Mr. J. F. Collier, County Court judge, were elected vice-presidents; Mr. James L. Bowes and Mr. P. H. Rathbone were elected honorary secretaries.

BLACKPOOL WINTER GARDEN AND PAVILION COMPETITION.

THE three premiums offered for the above,—50*l.*, 30*l.*, and 20*l.*,—have been awarded as follows:—1st, Messrs. Mitchell & MacLeod, St. Ann's-square, Manchester, and Oldham; 2nd, Messrs. Cobbet & Sons, Manchester; 3rd, Messrs. E. & E. B. Ellis, London. The first-named firm have been appointed by the directors to carry out the works.

PROGRESS OF BELFAST.

BELFAST has continued to make great progress during the year 1875. The number of houses built in the year was 980. The annual increase of population is about 6,000, and the total population is now above 200,000. About 17,000 houses have been built during the last fourteen years.

It appears from a report of the borough surveyor, Mr. Montgomery, C.E., that during the year 1875, 22,000*l.* have been expended on main drainage, making in all 40,000*l.* recently laid out in main drainage; 13,500*l.* have been expended in paving three of the chief streets; seventy-nine private streets have been sewered and paved; many footways have been flagged; several streets have been widened, some under "provisional order" obtained through the Local Government Board. The market buildings and slaughter-houses have been considerably extended; a chapel has been built in the cemetery; and improvements have been made in both the public parks; also in the quays, borough courts, and new municipal buildings. Seats have been placed along the chief roads, and the chief streets have been better lighted since the Corporation acquired the gas-works. Coffee-stands, drinking-fountains, and cabmen's shelters are being erected by private persons, under the direction of the borough surveyor.

The Harbour Board are widening and improving the harbour, quays, and docks, at a great cost, in addition to three docks recently completed.

ART AND SCIENCE CLASSES AT OLDHAM.

THE annual distribution of prizes in connexion with the Oldham School of Science and Art has just taken place. The report, read by Mr. T. Bailey, the secretary, stated that the session ending May, 1875, closed with 237 students, which was an increase of fifty-eight on the previous year; while even a greater advance is shown in the present term, as the number on the books already reaches 250. This large number of students necessitates an increased accommodation in the building, as all available space has long been appropriated to the use of the machine drawing, building construction, and geometry subjects, these classes now requiring three times the number of seats for the average attendance. Large time-tables, with lists of the prizes offered, were sent to the firms of machinists, builders, and cotton-spinners in the town and district. The result was very satisfactory, as by this means the attention of many young men was drawn to the science and art classes as a profitable way of spending some of their winter evenings. Special Queen's prizes were awarded to F. A. Caussidiere for machine drawing; F. W. Jackson, J. R. Sugden, and G. T. Wood for art drawings. Franklin Garside gained the fifth Whitworth Scholarship gained by the students of this school. Mrs. Platt endowed the school with 1,000*l.*, the interest of which will next year realise 50*l.*, which will be used according to the regulations of the Department of Science and Art in the form of two exhibitions. The art-masters are Messrs. Hague, Heywood, and Bottomley; and the science-masters, Messrs. Phythian, C.E.; Philip, M.A.; and Robertson. From a long report of the proceeding in connexion with the distribution of prizes the school appears to be somewhat exceptionally successful.

The Benefit of Two Staircases.— On the 17th inst. the cotton-mill of Ramwell & Lumley, Astley Bridge, near Bolton, was destroyed by fire. It was almost new, and contained from 20,000 to 30,000 spindles, employing about 130 people. Most of the workpeople succeeded in escaping by the staircase at the opposite end of the building, but eight had to be lowered by a rope of partly-prepared cotton.

Books Received.

Ancient Domestic Edifices of Bruges. Specimens from Drawings taken on the spot, by CHARLES VERSCHELDE, Architect. English Edition: B. T. BATSFORD.

THIS collection of drawings, showing specimens of a highly interesting and picturesque school of Mediæval domestic architecture, would have been more practically useful and *apropos*, in this country at least, had it been presented to us fifteen years ago. It represents a phase of Mediæval building which, though more practically suited to modern everyday necessities than any other of the period, was almost neglected by our Mediæval revivalists, who were anxious to apply the style of the cathedral to the street house, ignoring the fact that there existed precedents and examples for the application of Gothic treatment to street architecture in a perfectly natural and suitable manner, and without the introduction of features and methods of treatment only suitable to buildings on a great scale. And now that the practice of Gothic is on the wane again, and there is a new move in favour of the quasi-Classic style of the last century, which is defended as being the vernacular of modern building, we have such a collection as this of M. Verschelde's brought before us, representing equally the vernacular of Mediæval building, just when it seems too late in the day to make converts, or to persuade English architects to adopt the style of building which it illustrates as a model.

So at least the new or newest school among us would say; but, whether it be so or not, there is that in this book which is full of suggestion for the treatment of modern street architecture, if we could once get that at all into the hands of the architect, instead of the builder. Mr. Verschelde remarks that on the Continent also the study of the remains of domestic Mediæval architecture "has remained in the background." It was in the hope of preserving and making better known those examples that still exist, that he undertook some time back a collection of drawings of the old edifices in the town of Bruges, made on the spot, and accompanied by details of the construction and of any special feature in the architectural detail. Some of these the author regards specially as a means of preserving the record of peculiarities of detail and construction for which we cannot at present account, but which may be capable of explanation when this class of architectural remains has been more completely investigated.

The book contains forty plates, exceedingly well and accurately executed, and representing a series of house-fronts not unknown to a good many of our readers, but of which any architect engaged in domestic work may well be glad to have a record. The value and suggestiveness of these for the modern house architect consists partly in the fact that their varied and highly picturesque effect depends little, in many cases not at all, upon what is called "ornament," but upon skyline and grouping and arrangement of windows and piers, methods of finishing gables, &c. Some of the types of "fenestration" would be inapplicable to most modern street buildings certainly, but they serve to suggest something in the same spirit, with modifications; and they illustrate curiously the perpetual variety and play of fancy which seems to have been permitted free scope in the street architecture of this period, as contrasted with the eternal monotony of modern English architecture (?) of the same class. Independently of this, the book is highly interesting to the archæologist as a specimen of extinct forms of building, and to the lover of the picturesque in building its pages are delightful to turn over. The volume is attractive alike for artist and architect.

Emile Gilbert: Sa Vie, ses Œuvres; Notice Biographique. Par M. L. CERNESSON. Paris: Ducher & Cie.

THIS is a reprint of the memoir of his deceased brother architect, read by M. Cernesson at the Congress of French Architects, at Paris, in 1873, taken from the "Annales" of the Société Centrale des Architectes. It is a short and sympathetic summing up of the life and career of the late M. Gilbert, with a brief description of his principal works. M. Gilbert was associated a good deal with large works of an eminently practical character, but not the less calculated to call forth and test the experience and ingenuity of the architect. The principal of these were the "Maison des Aliénés," at Charenton, and the prison at Mazas.

The Fine Arts and their Uses: Essays on the Essential Principles and Limits of Expression of the various Arts, &c. By WILLIAM BELLARS. Smith, Elder, & Co.

THIS is a very neat volume, containing a series of rather verbose essays on the capabilities and boundaries of the various arts. Mr. Bellars appears to have correct ideas on this subject, and displays refinement of feeling in his mode of writing and in the tastes and preferences implied thereby; but we cannot see that there is anything in the book beyond what is matter of everyday perception to all persons of ordinarily cultivated minds, and who are conversant with contemporary art. A book containing nearly 400 pages of print on the subject of art-principles should either possess original ideas, or a forcible method of putting received ideas, to justify its publication; but Mr. Bellars is neither forcible nor original. His chapter on architecture, for instance, is little more than Ruskin-and-water. Still, it is what may be termed a "pretty book," and, as artistic light reading, may prove attractive.

Time and Time-Tellers. By JAMES W. BENSON. London: Robert Hardwicke, Piccadilly.

MR. BENSON has made his little volume both instructive and entertaining. After a pleasant and somewhat minute history of clocks and watches, as well as of the earlier time-tellers, he treats of modern watches, escapement to watches, balances, clock-escapements, and, at more length, of turret clocks, with which a considerable section of our readers are more particularly concerned.

It is estimated, many will be surprised to hear, that the manufacture of and trade in watches annually in England, France, Switzerland, and America, amount to over 5,000,000*l.* per annum; and that in Switzerland alone there are 38,000 persons, one-third of whom are women, engaged in the manufacture. It is probable, Mr. Benson thinks, that even the immense number of new watches thus annually produced barely exceeds the growing requirements of the people, who, as they increase in intelligence and receive higher wages, soon learn the advantage of personally possessing a pocket time-keeper, and make it accordingly their first ambition to purchase one. The Watch clubs which are formed in the various towns and rural districts throughout the kingdom enable this desire to be gratified at but small pecuniary inconvenience, inasmuch as payment is thus made in small instalments at fixed intervals, and the watch is bought with sums which might have been spent thoughtlessly and to no permanent benefit. This first lesson in thrift having been well learnt, and the result being so palpably beneficial to those who exercise it, has often laid the basis of a regular habit of economy.

The remarkable position which Mr. Benson has attained in his trade has made his name so well known that few will be able to believe that the author of "Time and Time-tellers" had not a personal object in its publication, and doubtless they are right. This object, however, is so entirely kept out of sight that it can only be guessed at, and will in no way interfere with the pleasure and profit with which the book may be read.

VARIORUM.

IN a pamphlet entitled "The Piece-work Question in Engineers and Ironfounders' Shops," the Iron Trades Employers' Association have published the correspondence on the strike against Messrs. Easton & Anderson, and some of the articles bearing on it, which have appeared in newspapers.——"The British Almanac and Companion" for 1876 includes a chapter, as usual with its predecessors, on Architecture and Public Improvements, and one on the Picture Exhibitions of the past year. The writer of the first perpetuates the mistake which attributes the New Town-hall at Leeds to Mr. Waterhouse.—— The *Engineer* is giving full accounts, illustrated, of "Blackfriars Bridges, Past and Present."—— The *World* says:—"Our principal art-collectors are, I hear, very chary of parting with the treasures of their galleries for the Philadelphia Exhibition. Two or three smaller Landseers and Mr. Frith's 'Railway Station' are the only modern works of any celebrity which have been promised." A considerable number of pictures, not quite so modern, will nevertheless be sent, we are told.

Miscellanea.

New Bank at Worcester.—New premises for the Stourbridge and Kidderminster Banking Company are approaching completion, in Broad-street, Worcester. The building is French Renaissance in style, and is a symmetrical composition of a centre and two slightly-projecting wings, one containing the principal entrance to the bank, and the other leading through a passage lined with white glazed bricks to the private entrance for the manager, and communicating with Angel-street in the rear. The pavement to the public portion of the bank is of marble mosaic, executed by Italian workmen; and the chimney-piece, 15 in. in height, is composed of Italian griotte, dove, veined, and other rich marbles. It was specially designed for the purpose by the architect, and has been executed by Messrs. Burke & Co., of London. The strong-rooms are solidly built upon a thick bed of concrete, lined with fire-clay, and fitted with Messrs. Milner's fire-resisting iron doors and ventilating gates. The whole of the basement and ground-floors are of fireproof construction. The principal front is built entirely in selected Bath stone, the carving being executed by Messrs. Farmer & Brindley, of London; Messrs. Richardson & Ellson, and Messrs. Skidmore, supplying the ornamental ironwork. Owing to the ruinous condition of the adjoining property, it became necessary to rebuild the house adjacent to the bank, which has been carried out in a similar style. The cost of the entire block will amount to about 8,000*l.*, Messrs. Wood & Sons, Worcester, being the contractors; Mr. Jeffreys, the clerk of the works; and Mr. H. L. Florence, of London, the architect.

Repairing Cracked Bells.—A correspondent of the *Scientific American* proposes that cracked bells should be repaired as locomotive cylinders are sometimes repaired in the United States. A piece is slotted out by a machine, and the surface is scraped perfectly true; then a pattern is made, and a casting in bell-metal is made from it. This piece is planed and scraped to fit perfectly into the slot. This is done with the same nicety as making a patch for the broken locomotive cylinder. To fasten it in its place an oven is constructed with a door large enough to admit the bell. The bell will stand upside down on an iron truck, with a wheel under it, so that it can be put in and taken out of the oven conveniently. The oven must be heated by a clear fire, free from smoke, and the flames are not to touch the bell. The bell and the piece are to be put into the oven, and the door closed, till they become hot enough to melt silver solder. Then remove the bell and piece from the oven, and treat the sides of the crack and piece with muriatic acid, prepared as silversmiths' acid for soldering. Then coat the sides of the crack and piece with silver solder. Do this part expeditiously, and free the surface from dross; then, while the bell is hot, and the solder is in a soft adhesive state, insert the piece in its place. Have at hand two large pieces of iron, shaped like the inside and outside of the bell, red hot, with suitable tongs for holding them. These are to be used to keep up the heat if necessity requires it. When the soldering is completed, allow the bell to cool off.

Restorations and Improvements at Eton College.—During the recess considerable progress has been made in the works at the new mathematical schools, which are being built on the north side of the college, near the Slough-road. The new building is in the Mediæval style, and is being constructed of red brick with Bath and Portland stone dressings, so as to match the earlier portions of the college buildings. The erection is 152 ft. long, 43 ft. high, and 44 ft. in breadth, and consists of an arcade, and upper and lower stories. Altogether there are sixteen class-rooms, eight on each floor. All will have oak moulded and panelled ceilings, with an oak panelled dado, 7 ft. high, along the lower part of the walls. The rostra, benches, and desks are likewise of oak. When finished, the new mathematical schools will be capable of seating upwards of 500 pupils. The total cost will be about 15,000*l.* Mr. Woodyer is the architect, the contractors being Messrs. Wheeler, Brothers, of Reading.

The Defence of London.—The Royal Engineers have for some time past been engaged in making surveys of the country around London with a view of some more definite steps being taken for the defence of the metropolis.

Proposed New Cemetery for Wimbledon. At a meeting of the Wimbledon Local Board on the 19th inst. the clerk read a report from the drainage committee, recommending that the plans for the cemetery, chapels, and grounds be so modified as to allow of the buildings being constructed at a cost not exceeding 4,000*l.*, and the forming and laying out of the grounds, &c., for 2,000*l.* A report was also read from the cemetery committee, recommending important alterations in the plans, including the curtailment of the length of the chapels by 5 ft., with the view of largely reducing the cost of the work. A third report was presented by the surveyor (Mr. Rowell), showing how a reduction of 3,686*l.* in the estimates before them might be effected. In the course of the discussion it was stated that the lowest tender received for the buildings alone amounted to about 8,700*l.*, while the total amount available for the whole work was only about 6,500*l.* A member of the Board suggested that a number (!) of architects be invited to furnish plans for the two chapels, mortuary, and lodge, independently of the enclosure and laying out of the ground. If such were done he had not the least doubt that some clever architect would be found to prepare plans which would ensure the erection of the buildings for 4,000*l.* It was resolved to adopt the suggestion.

New Cemetery for Canterbury.—A meeting of the Canterbury Burial Board was held on the 19th inst. to consider the plans prepared by the surveyor for the new cemetery. The surveyor produced his estimate, which was as follows:—Chapel complete, 2,324*l.*; cottage complete, 565*l.* 5s.; mortuary and hearse-house, 216*l.*; roads and paths in cemetery, 732*l.* 4s.; fencing from point abutting on new road with wire fencing on the north, east, and west sides, 1,022*l.*; new road leading to cemetery, planting ditto with trees, and asphalting paths on each side, 1,038*l.* 9s.; cost of land, 2,400*l.*; planting, 150*l.*; excavating on north-east and west side, 50*l.*; incidental compensation, architects' and other charges, 300*l.*; total, 8,797*l.* 18s.; deduct sum given by commissioners for road, 300*l.*; 8,497*l.* 18s. In reply to Alderman Austin, Mr. Wright said his estimate amounted to about 8,000*l.* After some discussion the plans were adopted.

Worcester Guildhall.—The committee of the Worcester Town Council (consisting of the Survey, Buildings, and Property Committee, with the addition of the chairmen of the other committees), to which the question of the rebuilding of the Guildhall was referred, had a meeting on the 19th inst., and a long sitting terminated without their coming, so far as the Worcester papers are aware, to any definite conclusion. It is said to have been proposed that Mr. Waterhouse's design should be adopted, but this found no seconder. It was also proposed and seconded, that the Council be recommended to abandon Mr. Waterhouse's plan on the ground of expense, but this was lost by a majority of one. All that was decided was about tantamount to this,—that the edifice should be rebuilt when the Council can be brought to appropriate sufficient funds for the purpose.

Fall of Buildings in Newcastle. — An alarming accident has occurred in Newcastle. An apparently substantial building situate in Westgate-road, one of the leading thoroughfares in the town, together with the adjoining works of Messrs. H. Angus & Co., coach-builders, suddenly gave way and fell to the ground. It appears that for some time past the first has been undergoing extensive alterations, the front of the building having been almost entirely removed to be rebuilt. Signs of shrinking had been noticed, but no idea was entertained that the fabric was so unsafe as it has proved to be. Messrs. Angus's workmen had not long been at work after the dinner-hour when the building next door went down with a crash, and the front premises of the coach-works, from the first-floor upwards, also collapsed.

Local Taxation.—The total sum raised in England during the year 1873–4 by local taxation properly so called was 24,295,133*l.* The sum levied by rates falling on rateable property amounted to 19,821,203*l.*; levied by tolls, dues, and rents falling on traffic, 4,118,890*l.*, and levied by duties falling on consumable articles, 355,034*l.* The gross estimated rental of the whole of the rateable property in England was 136,230,863*l.*, and the rateable value 115,492,013*l.*; so that the total amount charged on rates, viz., 56,065,062*l.*, was less than one-half of the annual rateable value of property in the country.

The Ordnance Survey.—We have already given currency to the announcement that the Government have ordered a reduction in the expenditure upon the Ordnance Survey. Writing to a daily contemporary, Mr. Thomas Sebastian Bazley says that the Government "might have selected a fitter object for a little cheeseparing. But an efficient survey of the country with the promised new 'Doomsday Book' (whose appearance is singularly delayed) will be essential to any improvement in land transfer or land registration. . . . . So far from diminishing the cost and extent of the survey, it should be largely increased. And, as it is of immense benefit to all proprietors to possess plans of indisputable accuracy, a proportion of the cost might fairly be recovered *pro rata* from the owners of the lands surveyed."

Brighton.—The value of stable property in Brighton is rapidly increasing. The Norfolk Hotel livery stables,—lately noticed in the *Builder* as having been rebuilt from designs and under the supervision of Mr. Edward H. Hudson, architect, of that town,—are to be transferred to a limited liability company, with a capital of 50,000*l.* In addition to the increasing livery and hunting stable business, there are to be periodical sales of horses, carriages, and harness, as at Tattersall's and Aldridge's in London. The premises provide accommodation for 200 horses, 100 carriages, and forty rooms for the grooms. The property is valued at 15,000*l.*, exclusive of stock and goodwill. Sir Cordy Burrows and Mr. Alderman Mayall are trustees.

Proposed Conference of Ironmasters.—An important national conference of ironmasters is convened to be held in London, during the latter part of February or beginning of March, for the purpose of considering various questions which are now looked upon as demanding the careful consideration of the trade. Wages in relation to foreign competition is one of these subjects, and will doubtless be seriously dealt with. It is expected that Mr. Clark, of Dowlais, will preside, and that every district will be very influentially represented. At Sheffield, large numbers of steel-workers and other workmen are being discharged, owing to the unparalleled stagnation of trade.

Crabs and Winches.—According to a recent invention by Messrs. Crossley, of Manchester, a sliding bar, by which the driving band of a winch is shifted from the fast to the loose pulley, is formed with an incline, which at the same time that the band is shifted on to the loose pulley is made to act on the break so as to stop the machine. On the side of the loose pulley is formed a rim, which can be made to bear upon the face of a disc, which is also in frictional contact with the periphery of the break wheel, and so arranged that when the band is on the loose pulley the break wheel, and with it the chain barrel, will be run in the direction for unwinding the chain.

Deck Loads of Timber Ships.—At a meeting of underwriters and shipowners in Newcastle-on-Tyne, on the 13th inst., to consider the practicability of abolishing the custom of deck-loading in timber-laden ships, the following resolution was passed:—"That the secretary be authorised to correspond with the Government, through the local members or otherwise, recommending that ships of British and foreign register carrying deck-loads of timber be prohibited from entering into ports of the United Kingdom at all seasons of the year, and to make such representations to other Governments as will enable them to carry out this resolution."

The late Mr. Gastineau, Artist.—On the 17th inst. died Mr. Henry Gastineau, aged 86, the well-known water-colour artist. He was the oldest member of the Society of Painters in Water Colours, and contributed a number of pictures to their last exhibition. A good many years have passed since the Conductor of this Journal, then a boy walking the Rhine and the Moselle with sketch-book and note-book, seeking in his small way to pick up what he could find, first met Mr. Gastineau labouring assiduously to transfer to paper picturesque scenes then less known than now. Mr. Gastineau loved his art, and has done good work.

Museum for Nottingham.—The plans of Messrs. Hine & Son for the adaptation of the Castle, Nottingham, to the purposes of a public Museum and Gallery of Art, have been unanimously adopted by the council. Tenders for the execution of the works are to be obtained forthwith.

Hawick Archæological Society.—On the 18th inst. the twentieth anniversary of this Society was celebrated by a supper and business meeting in the Museum. Mr. D. Watson, president, occupied the chair. Reports were given by the secretary (Mr. J. J. Vernon), and the treasurer (Mr. F. Hogg), showing that the Society is in a prosperous condition, and had done a considerable amount of work during the past year. The Rev. J. R. Dakers was chosen president; Sir W. Elliot, of Wolflee, and Bailie Michie, vice-presidents; Mr. F. Hogg, treasurer; and Mr. D. Watson, secretary.

Fire-blocks of Tan.—A firm in Treves, Germany, manufactures fire-bricks of refuse tan just as it is taken from the pits. They are made in a very simple manner, without special apparatus, and without being baked, and are said to almost equal the best stone-coal in flame, duration, and heating power. They appear to be nothing more nor less than dry tan saturated with gas-tar. They are very heavy, and when broken the fracture is a brilliant black. They burn at first with a bright flame, which gradually slackens, and at last they burn dead like coke.

A New Masonic Hall for Sheffield.—A meeting of the Sheffield Masonic Hall Company (Limited) was held at the Masonic Hall on the 21st inst., under the presidency of the chairman, Mr. Alexander Hay. The purpose for which the meeting was called was to consider the question of building a new hall. It was decided to pull down the present building, and erect another on its site. The new hall is to be brought up to the street boundary both in Surrey-street and Eyre-street. The estimated cost of the new building and site is 6,000*l.*

The Valuation of the Metropolis.—A great number of appeals arising from the operation of the Valuation (Metropolis) Act, 1869, are to be heard at the sittings of the Court of General Assessment at the Guildhall, Westminster, before Mr. P. H. Edlin, Q.C., assistant judge, and other members of the court, viz, Messrs. Pownall and Kemshead (Middlesex), Messrs. Penrhyn and Hardman (Surrey), Aldermen Finnis and Besley (city of London), and Admiral Robertson and Mr. Riley (Kent), on February 7 and subsequent days.

Costliness of Trees for Street Planting.—A committee of the Hackney District Board of Works having been instructed to consider and report on the question of planting trees at suitable places in the district, have presented a report to the Board, stating that as each tree would cost 5*l.*, independently of maintenance, they were reluctantly compelled to recommend the Board not to go on with the matter. Some discussion took place at the last meeting of the Board, and ultimately the subject was referred back to the committee.

Royal Birmingham Society of Artists. The season of the Royal Birmingham Society of Artists, just closed, is stated to have been a very successful one, 47,127 persons have visited the exhibition once, of which number 27,934 came during the second season, and at that time also 6,024 were admitted free by holding Art Union tickets. The sales are:—General sales, 4,931*l.* 18s.; Art Union sales, 922*l.* 12s.; total, 5,854*l.* 10s., being an increase of 735*l.* 12s. over the season of 1874.

Yafforth, Northallerton.—Four panels carved in bas-relief in Caen stone have been placed in the reredos behind the communion-table in this church. The subjects are the Nativity, the Baptism, the Transfiguration, and the Resurrection of our Lord. The figures are carved with much skill. The panels are the gift of the Misses Masterman, of Little Danby; and the work, which has given entire satisfaction to the donors, has been executed by Messrs. J. Throp & Sons, sculptors, of Leeds.

Krupp's Non-Conducting Silicate Cotton. The value of this material as a cheap and effective non conductor to all users of steam-power, safe-manufacturers, and others, must be considerable if it at all answers the purpose as well as the small portion which has been submitted to us. As the process seems to include the mechanical admixture of fine sand with the cotton, it may be as well to remember that a certain sort of motion would have the effect of liberating the sand.

Royal Academy of Arts.—At a general assembly of the academicians and associates, held on Wednesday evening, Messrs. E. Long and L. Alma-Tadema were elected associates.

Competition for Admission to the National Training School for Cookery.—The Society of Arts has established five scholarships, entitling the holders to free instruction in this school. These will be competed for on Saturday, the 12th of February, at ten a.m., at the school at South Kensington. Qualified teachers are now urgently wanted for schools, and when they have obtained their diploma, they may earn from 1*l.* to 2*l.* weekly. Every member of the Society of Arts is privileged to nominate one candidate.

Switzerland.—The Swiss Society of Engineers and Architects, and that of the past scholars of the Polytechnic School, having made *Die Eisenbahn*, otherwise *Le Chemin de Fer*, their organ of publication, the managers are enlarging their programme, and intend devoting more space to architecture and the science of construction than they have done. Some of the articles are in French, others in German. It is published in Zurich.

A New Railway in India.—The construction of the railway between Agra and Gwalior is to be begun without delay. The Government of India have advertised for tenders for the construction of the whole line, a distance of seventy-five miles, including the bridge over the river Chumbal. This line will be another link in the chain of railways that in course of time will run through Central India and Rajpootana to Bombay.

Salaries at the Metropolitan Board of Works.—At the meeting of the Metropolitan Board of Works, on the 21st inst., the following increases of salary were made:—Mr. Wakefield, the clerk of the Board, from 700*l.* to 800*l.*; Mr. W. W. Smith, the solicitor, from 1,400*l.* to 1,500*l.*; Mr. Valliamy, the superintending architect, from 1,400*l.* to 1,500*l.*; and Mr. Gunn, the accountant, from 700*l.* to 800*l.*

The Water of Leith Bridge, Edinburgh. At a meeting of the Edinburgh Road Trust on the 17th inst., there were submitted plans of a scheme which has been mooted for raising the Water of Leith Bridge at Bell's Mills by 20 ft., so as to improve the gradient of the roadways. It was stated that the proposed improvement would cost some 5,600*l.* The matter was remitted to a committee for consideration.

Masons' Wages at Dysart.—For some time past considerable excitement has existed at Dysart, in connexion with the threatened strike of operative masons, the master builders having signified their intention of making a reduction of ½d. per hour on wages. On the 15th inst., however, the master builders agreed to let the matter drop, and allow the same rate of wages as formerly,—8½d. per hour.

Cement for Iron.—The following is an iron cement which is stated to be unaffected by red heat. Four parts by weight iron filings, two parts clay, one part fragments of a Hessian crucible; reduce to the size of rape seed and mix together, working the whole into a stiff paste with a saturated solution of salt. A piece of firebrick can be used instead of the Hessian crucible.

Clapham Common.—On the 18th inst. many of the additional improvements on Clapham-common were completed, and the Metropolitan Board of Works, who rescued this suburban manor land from speculative builders by purchasing the manorial rights at a cost of 17,000*l.*, will not enclose any portion of the common, but preserve it as an open park for the public.

Strike of Painters at Durham.—On the 17th inst. the Durham house-painters struck work, on account of an intimation from some of the employers of an intended reduction in the rate of wages. The intention is to reduce the men a penny per hour, which would cause an abatement in the wages from 31s. 10d. to 25s. per week. The men refuse to accept this.

Slow Combustion Grates.—Amongst such may be mentioned those by Messrs. Clark, Hunt, & Co., of Shoreditch. The grate is so constructed that when placed in the brick recess it forms a chamber at back for warming and circulating air in the room; and as the fire burns on a solid fire-brick, the consumption of fuel is doubtless less than in register stoves of the ordinary construction.

Sir George Harvey, late president of the Royal Scottish Academy, died on the 22nd inst. at Edinburgh.

The Royal Academy Medal.—The Council of the Academy have determined, we believe, not to reverse their decision as to the recent award of the medal for architecture. It is not disguised that a mistake was committed, and arrangements have, we understand, been made with a view to prevent on any future occasion the adoption of drawings not in accordance with the published conditions.

Proposed Winter Garden, Bradford.—A meeting was held at Bradford, on the 18th inst., in furtherance of a projected scheme for establishing a winter garden, aquarium, skating-rink, and assembly-room, with the object of providing rational entertainment for the inhabitants of the town. It is proposed to purchase about 5,200 yards of land fronting Manningham-lane. Mr. Mawson is the architect.

Hogg's Patent Sanitary Ventilating Company.—This company is formed for the purpose of purchasing and working a patent taken out by Mr. Hogg, through which pure air is secured by efflux, or the riddance of vitiated air, by process of vacuity or exhaustion; and influx, or the induction of the outer air, delivered in vertical air columns.

Mexican Onyx Marble.—This is a very beautiful material for internal decoration, and its price is sufficiently reasonable to give hope that it may be largely introduced. Mr. B. La' Mert, who acts as agent for Great Britain, has shown us some very charming specimens. It includes a considerable variety of colours, and ought to considerably used.

The Langham Rink Club.—"The cry is still, they come." Our advertising columns show that it is proposed to transform the Portland Bazaar, Regent-street, and some adjoining property, into a skating-rink and clubhouse. The area will be large, and will afford good accommodation. A long list of names is given as forming the council of the club.

St. James's Park.—A correspondent asks us to call the attention of the First Commissioner of Works to the disgraceful state of the asphalte footway, in St. James's Park, that runs between the triangular enclosed grass-plot and the houses in Spring-gardens. The footway is full of holes, and therefore most dangerous to pedestrians by night.

Resignation of the Weymouth Borough Surveyor.—Mr. George Seaman has resigned his position as borough surveyor of Weymouth. From a letter read at the meeting of the town council on the 21st inst., it appears that Mr. Seaman feels that he has been unfairly blamed in reference to works carried out under the advice of other persons.

The Proposed Fever Hospital at Sheffield.—The Health Committee of the Sheffield Town Council, at their meeting on the 20th inst., discussed the question of providing a fever hospital for the town, as suggested at the previous meeting of the Council. A sub-committee was appointed to look out for a site.

Skating Rink for Bournemouth.—The skating rink in the Bournemouth Winter Garden Company's grounds has just been opened. The rink is 105 ft. by 50 ft., and has been constructed by Messrs. Fletcher, Lowndes, & Co., of Great George-street, Westminster, with cement floor.

The Removal of Snow.—At a meeting of the St. Olave's (Southwark) District Board of Works, on the 18th inst., a letter was read from the Conservators of the Thames giving the Board authority to throw clean snow into the Thames on the occasion of heavy falls.

The late Mr. Bridgman.—We are informed it was the third premium in the Paddington Baths competition that was awarded to Mr. Bridgman, not the second; the second went to Mr. H. H. Collins.

Wigan.—A new Presbyterian church is about to be erected in Wigan. The church will accommodate 600 persons, and cost 3,000*l.* The architect is Mr. G. F. Stalker, of London.

TENDERS

For drainage works, for the borough of Deal, at North End:

Prout	£5,260	0	0
Hobbs	4,000	0	0
Croxford	3,910	0	0
Homes	3,755	0	0
Ansell	3,534	0	0
Chamberlain	3,549	0	0
Bourne	3,490	0	0
Denne	3,475	0	0
Coleman	2,910	0	0
Ritson	2,887	0	0

For the erection of a block of model dwellings, in the London-road, Enfield. Mr. Thomas J. Hill, architect:—

Linzell	£2,793	0	0
Rist & Brown	2,763	0	0
Field & Sons	2,760	0	0
Patman Brothers	2,748	0	0
Bentley	2,370	0	0
Sabey & Son	2,320	0	0
Fairhead	2,250	0	0

For the erection of a warehouse, at 20, Old Change. Mr. Tabberer, architect:—

Crabb, accepted.

For new vicarage, stables, and boundary-walls, for St. Mary Abbotts, Kensington. Mr. W. White, architect. Quantities by Mr. John Young.—

Carter	£6,665	0	0
Downs & Co.	5,630	0	0
Gregory	5,435	0	0
Lathey, Brothers	5,343	0	0

For the erection of warehouse and offices, 51 and 53, Knightrider-street. Mr. J. W. Reid, architect:—

Hill, Higgs, & Hill	£8,100	0	0
Kirk & Randall	7,627	0	0
Nightingale	7,380	0	0
Downs & Co.	7,218	0	0
Ramage	7,200	0	0
Scrivener & White	7,142	0	0
Bayes, Bros., & Allen (accd.)	6,718	0	0

For the erection of two-story stabling, Church-street, Chelsea, for the London General Omnibus Company, Limited. Mr. P. Tosh, architect. Quantities by Mr. A. J. Bolton:—

		Allow for Old Material.
Young & Co.	£3,963	£56
Brass & Co.	3,911	100
Martin, Wells, & Co.	3,894	150
Garland & Perkins	3,784	147
Stephenson	3,725	110
Crabb	3,700	120
Gold & Brand	3,555	80
Read & Roberts	3,497	185
Cohen	3,478	53
Shorn & Co.	3,467	80
Perkins	3,383	133
Aitchison & Walker	3,333	66
Forkington	3,317	100
Niblett & Son	3,295	85
Braid & Co.	3,146	66
Beale	3,136	204
Hunt	3,130	137

For ironwork in patent fireproof flooring for the above. Mr. P. Tosh, engineer. Quantities by Mr. A. J. Bolton:—

Stephens & Co.	£1,912	0	0
Hall	1,790	0	0
Oswald, Gardner, & Co.	1,750	0	0
Horsely Iron Co.	1,665	0	0
Butterly Iron Co.	1,558	14	5
Bunnet & Co.	1,462	0	0
Godenough	1,420	0	0
Shaw & Co.	1,347	0	0
Head, Williams, & Co.	1,347	0	0
Jukes, Coulson, & Co.	1,316	0	0
Measures, Bros.	1,287	10	0
Witford & Co.	1,280	0	0
Brass & Co.	1,270	0	0
Young & Co	1,260	14	0
Bergheim	1,204	13	7

For new chancel, organ-chamber, vestry, &c., to the Church of St. James Norland, Notting-hill. Mr. R. J. Withers, architect. Quantities prepared by Mr. Charles Poland.

Booth	£2,476	0	0
Sharpington & Cole	2,363	0	0
Browne & Robinson	2,350	0	0
Dove, Bros.	2,275	0	0
Lawrence	2,247	0	0
Cowland	2,190	0	0
Newman & Mann	2,132	0	0

For rebuilding Gun-street Mills, Spitalfields, for Mr. T. B. Haslam. Mr. R. P. Notley, architect. Quantities prepared by Messrs. Frankland & Andrews:—

Oliver	£2,280	0	0
Newman & Mann	2,096	0	0
Scrivener & White	1,963	0	0
Hart	1,965	0	0
Greenwood & Sons	1,954	0	0
Marsland	1,950	0	0
Browne & Robinson	1,908	0	0
Morter	1,897	0	0
Shepherd	1,863	0	0
Killby	1,686	0	0

For proposed alterations, &c., at the Edinburgh Castle, Caledonian-road, for Mr. C. Howland. Messrs. Bird & Walters, architects. Quantities supplied by the architects:—

Eunor	£786	0	0
Newman & Mann	740	0	0
Kerry	728	0	0
Williams & Son	713	0	0
Brown	676	0	0
Anley	655	0	0

Vicarage, South Acton.—Mr. Nye's tender has been accepted.

TO CORRESPONDENTS.

J. L.—G. R. I.—E. R.—J. T.—T. C.—A Traveller.—J. W.—J. K. C.—S. H.—W. S.—J. C.—H. G.—J. F. M.—H. J. S.—T. J. H.—J. M. G.—S. & T.—J. H.—T. C. H.—T. O.—E. W. H.—G. F. S.—E. C.—H. R. W.—T. B.—G. C.—M. & M.—Mr. C.—E. M. [illegible] A. Z. (no).—P. P. C. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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HENRY BLAKE, Principal Clerk.
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For Conditions and Particulars apply, by letter only, to the Secretary, at the Company's Offices, 4, Fell-street, Wood-street, E.C.; or the Manufactory, Staines, Middlesex.

The Builder.

VOL. XXXIV. No. 1722. SATURDAY, FEBRUARY 5, 1876.

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International Exhibition, Philadelphia.



IN the 10th of May next the International Exhibition which has been organised in Philadelphia, at once to celebrate the one hundredth anniversary of American Independence, and to show the progress and resources of the country, will be opened. The great Park of Philadelphia, on which the buildings are located, comprises 3,000 acres of ground, lying along the western border of the city. This fine tract of land is watered by a broad river, navigable for pleasure and traffic, but entirely subordinate in its item of traffic to the pleasure of the visitor; the whole tract, land and river, being under the exclusive control of the Park and Centennial Commission. These grounds have been the resort of the most prominent men of the Revolution; they were the scene of one of the most skilful of Lafayette's actions in the Revolution, and had their share in the battle of Germantown. The mansions in which Baron Steuben, the organiser of the Revolutionary army, and Judge Peters, its Secretary of War, lived are still in perfect preservation.

The new buildings are situated on the south-western border of the river, a reservation exclusively for Exhibition purposes of 450 acres. The ground rises 100 ft. above the river level, and extends in a plain to its western border. The buildings lie mainly in a group, separated by sufficient distances, and present from the elevations of the Park a remarkable sight.

The main buildings, erected by the Building Committee of the Centennial Board of Finance, for the uses of the Exhibition, are five in number, located within easy distance of each other, and so arranged that parties wishing to visit any one department, can, by carriage or horse cars, arrive directly at the gate opening into that department. The buildings will be known as,—I. Main Exhibition Building. II. Art Gallery. III. Machinery Hall. IV. Horticultural Building. V. Agricultural Building. In addition there is a special edifice erected for the exhibition made by the Government of the United States, which forms the sixth of the Exhibition Buildings. In our last volume we gave a view of the Art Gallery.* We now add a view of the Main Building, a view of the Government Building, and one of a subsidiary structure termed the Women's Pavilion.†

The main Exhibition Building, of which Mr. Jos. M. Wilson was the architect, and Mr. Henry Pettit engineer, is in the form of a parallelogram, extending east and west 1,880 ft. in length, and north and south 464 ft. in width.

The larger portion of the structure is one story in height, and shows the main cornice upon the outside at 45 ft. above the ground, the interior height being 70 ft. At the centre of the longer sides are projections 416 ft. in length, and in the centre of the shorter sides or ends of the building are projections 216 ft. in length. In these projections, in the centre of the four sides, are the main entrances, which are provided with arcades upon the ground floor, and central façades extending to the height of 90 ft. The east entrance will form the principal approach for carriages, visitors being allowed to alight at the doors of the building under cover of the arcade. The south entrance will be the principal approach for street cars, the ticket-offices being located upon the line of Elm-avenue, with covered ways provided for entrance into the building itself. The main portal on the north side communicates directly with the art gallery, and the main portal on the west side gives the main passage-way to the machinery and agricultural halls.

At the corners of the building there are four towers, 75 ft. in height, and between the towers and the central projections or entrances there is a lower roof introduced, showing a cornice at 24 ft. above the ground.

In order to obtain a central feature for the building as a whole, the roof over the central part, for 184 ft. square, has been raised above the surrounding portion, and four towers, 48 ft. square, rising to 120 ft. in height, have been introduced at the corners of the elevated roof.

The areas covered are as follow:—

	Square Feet.	Acres.
Ground Floor	872,320 ...	20·02
Upper Floors in projections ...	37,344 ...	·85
Upper Floors in towers	26,344 ...	·60
	936,008	21·47

The general arrangement of the ground plan shows a central avenue or nave 120 ft. in width, and extending 1,832 ft. in length. This is the longest avenue of that width ever introduced into an Exhibition building. On either side of this nave there is an avenue 100 ft. by 1,832 ft. in length. Between the nave and side avenues are aisles 48 ft. wide, and on the outer sides of the building smaller aisles, 24 ft. in width.

In order to break the great length of the roof lines, three cross avenues or transepts have been introduced of the same widths and in the same relative positions to each other as the nave and avenues running lengthwise, viz.: a central transept, 120 ft. in width by 416 ft. in length, with one on either side of 100 ft. by 416 ft., and aisles between of 48 ft. The intersections of these avenues and transepts in the central portion of the building result in dividing the ground-floor into nine open spaces free from supporting columns, and covering in the aggregate an area of 416 ft. square. Four of these spaces are 100 ft. square, four 100 ft. by 120 ft., and the central space or pavilion 120 ft. square. The intersections of the 48 ft. aisles produce four interior courts, 48 ft. square, one at each corner of the central space.

The main promenades through the nave and central transept are each 30 ft. in width, and those through the centre of the side avenues and transepts 15 ft. each. All other walks are 10 ft. wide, and lead at either end to exit doors.

The foundations consist of piers of masonry. The superstructure is composed of wrought-iron columns, which support wrought-iron roof trusses. The columns are of rolled channel bars, with plates riveted to the flanges. Lengthwise of the building the columns are spaced at the uniform distance apart of 24 ft. In the entire structure there are 672 columns, the shortest being 23 ft., and the longest 125 ft. in length. Their aggregate weight is 2,200,000 lb.

The aggregate weight of iron in the roof trusses and girders is 5,000,000 lb. This building being a temporary construction, the columns and trusses are so designed that they may be easily taken down and erected again at another site.

The sides of the building for the height of 7 ft. from the ground are finished with brickwork in panels between the columns; above the 7 ft., with glazed sash. Portions of the sash are movable for ventilation. The roof-covering is of tin upon sheathing boards. The ground flooring is of plank, upon sills resting upon the ground, with no open space underneath.

All the corners and angles of the building upon the exterior are accentuated by galvanised iron octagonal turrets, which extend the full height of the building from the ground level to above the roof. These turrets at the corners of the towers are surmounted with flagstaffs, at other places with the national eagle.

The national standard is placed over the centre of each of the four main entrances. Over each of the side entrances is placed a trophy showing the national colours of the country occupying that part of the building. At the vestibules forming part of the four main entrances variegated brick and tile have been introduced.

The building stands nearly due east and west, and is lighted almost entirely by side light from the north and south sides. Louvre ventilators are introduced over the central nave and each of the avenues. Skylights are introduced over the central aisles.

A system of water supply, with provision of fire-cocks, &c., is provided for protection against fire, and for sanitary purposes; and offices for foreign commissions and for the administration are placed in the ends of the building and on the second floor.

The departments of the classification will be placed in parallel sections running lengthwise of the building, from east to west, and will be wider or narrower in proportion to the bulk of the articles exhibited. The countries exhibiting will be located geographically, in sections running crosswise of the building, from north to south.

The building will cost $1,600,000, and Mr. Richard J. Dobbins, of Philadelphia, is the contractor.

* Vol. xxxiii., pp. 118, 119.
† See p. 121.

Mr. Dobbins, we may add, secured the contract at a sum far below that of any other bidder, although there was a great competition. He has had a wide experience, with a practical education in the service of the United States Government, under General Meigs.

The wrought-iron is rolled by Messrs. A. & P. Roberts, of the Pencoyd Works, near Manayunk, Philadelphia, and is manufactured by Messrs. William Sellers & Co., at Edgemoor Works, near Wilmington, Delaware. The cast-iron work is made by Morris, Tasker, & Co., of Philadelphia. The erection of the iron frame-work is done by the Watson Manufacturing Co., of Patterson, N. J., and was carried on at the rate of fifty tons per day. The galvanised iron-work is manufactured by the Kittredge Cornice and Ornament Co., of Salem, Columbiana County, Ohio.

It will be understood by our readers that the Main Exhibition Building will be the principal object of attraction; in it will be displayed, under the flag of each country, all the manufactures, inventions, and products of each, so arranged that the visitor can pass from one country to another geographically, or follow, if he chooses, any one product in its course through the several nations. How this will work has to be seen.

The Government Building grew out of a belief that it is desirable the Executive Departments of the Government of the United States, in which there may be articles suitable for the purpose intended, should send such articles and materials as will, when presented in a collective exhibition, illustrate the functions and administrative faculties of the Government in time of peace, and its resources as a war power, and thereby serve to demonstrate the nature of American institutions, and their adaptation to the wants of the people. For the purpose of securing a complete and harmonious arrangement of the articles and materials thus designed to be exhibited from the Executive Department of the Government, a Board was charged with the preparation, arrangement, and safe-keeping of such articles and materials. By an Act of Congress, an appropriation of $50,000 was placed at the disposal of the Board for the arrangement of this exhibition, $150,000 of which are to be expended in the erection of the special building for its accommodation. The dimensions of it are 360 ft. by 300 ft. The architect is Mr. James H. Windrim.

As to the *Exhibition Section*, the latest advices state that the machinery building is quite finished, and that any fears which might have been entertained as to the possible completion of the industrial hall within the period fixed by the American executive, have been set at rest. The fine-art building, which is intended to serve as a memorial hall, was covered in before the approach of the winter, so no apprehensions as to damp need be entertained. This fine building will be presented in a completed form, and not, as has been too frequently the case with fine-art galleries at International Exhibitions, in an unfinished condition.

Owing to the liberality of the Anglo-American Telegraph Company, who send all messages of the executive without charge, the preliminary arrangements of the British Section have been much assisted. Three officials of the British staff are already in Philadelphia with instructions to aid exhibitors in the reception of their goods.

The Executive Commissioners will enter on their duties at Philadelphia at early dates, Professor Archer leaving England this week, and his colleague, Colonel Sandford, R.A., will follow.

Messrs. Appleby Bros. and Messrs. Aveling & Porter despatched one steam crane and two traction-engines at the end of last month, and four other engines from the same firms (the whole for the use of the British and American executives), to assist in the unloading of goods, will be speedily forwarded. We understand, also, that Messrs. Galloway & Sons, of Manchester, have contributed three boilers to the British Section, for the reception of which the best boiler-house yet erected at any exhibition has been prepared.

The offices, barracks, and workmen's quarters of the British Commission, three in number, surrounded by trees, and situated in one of the most picturesque portions of Fairmount Park, form a very striking group, and have already attracted much attention in the States as reproductions of Old English architecture, recalling to the minds of travelled Americans many quaint buildings in the old country. A number of our principal manufacturers have, in the most handsome manner, combined in the furnishing and decoration of the offices, which, when completed, will, it is asserted, whilst retaining the old-world air to be expected from their exterior, convey an excellent idea of the English decorative art of the present day.

We may name amongst these firms Messrs. Barnard, Bishop, & Barnards, who will contribute some of their artistic works; Messrs. Cooper & Holt, who are furnishing the offices in the Mediæval style; Messrs. Daniell & Son and Doulton & Co., who will supply choice specimens of porcelain and Lambeth faïence; Messrs. Elkington, who have placed at the disposal of the executive an unlimited collection from their choicest art-treasures; Messrs. Eastwood & Co., the roofing tiles, finials, and terra-cotta chimneys; Mr. John Lewis, the carpets needed throughout the offices; Messrs. Minton, Hollins, & Co., encaustic paving tiles for the hall and verandah; and Messrs. Gardner the various lamps required.

In the Machinery Hall a considerable space has been allotted to British exhibitors, and a full representative display of the various classes of machinery is confidently looked for. The collection of stone-dressing machines will be large, containing some novel features.

Armour-plates may be looked upon as an English speciality, and in that section our display will be simply unrivalled.

The collection of models, both miscellaneous and railway engineering, is very complete, and last, though not least, we may state we shall present a large collection of fuel economisers.

The Indian Court will occupy one of the most prominent positions in the main avenue of the industrial hall, and it is proposed, in place of making the Indian Section, as in all previous exhibitions, rather a museum of curios than an industrial display, to practically exemplify her great resources by an exposition of raw and mineral productions, and a complete representation of the various industries for which she is renowned.

Canada, from its proximity to the States, will naturally be a large exhibitor, and a numerous and influential Commission, comprising the Governor-General, Lord Dufferin, and other notables of the Dominion, are using every effort to secure a thorough representation.

A word or two now as to our artistic representation. Her Majesty's Treasury having placed a sum of money at the disposal of the British Executive for the purposes of the Fine Art Section, the Duke of Richmond requested a number of artists and collectors to form a committee to secure an adequate and representative display of the works of deceased and living artists of the British School at Philadelphia.

This committee, having for its president Sir Francis Grant, numbers amongst its members Mr. Millais, Mr. Calderon, Mr. Leighton, and Mr. Redgrave, Royal Academicians; Mr. Clict, president of the Society of British Artists; Sir John Gilbert, president of the elder branch of Painters in Water Colours, the Society, and Mr. Louis Haghe, president of the junior, the Institute. Mr. Holman Hunt, Mr. Val Prinsep, and Mr. Frederick W. Burton, director of the National Gallery, are also on the committee; whilst Mr. Calder Marshall is the representative sculptor.

Amongst the collectors and others who consented to serve are Mr. Bolckow, M.P., Mr. Eaton, M.P., Mr. Fox, Mr. Albert Grant, Mr. Thomas Lucas, Mr. W. Smith, F.S.A. The secretary to the committee, Mr. Samuel Redgrave, having resigned through ill-health, Mr. Joseph M. Jopling has been appointed his successor and superintendent of the Fine Art Section.

Her Majesty the Queen has been most graciously pleased to place five pictures at the disposal of the British Executive, "The Marriage of the Young Princess," by Northcote, R.A., and "The Marriage of H.R.H. the Prince of Wales," by Mr. Frith, R.A., both from Buckingham Palace. From Windsor Castle will be sent "The Meeting of the Members of the Royal Academy," a work well known through engravings, by Zoffany, R.A., and "The Portrait of Her Majesty in Coronation Robes," by Sir George Hayter, late painter in ordinary to Her Majesty; while Hampton Court Palace will contribute a work of much interest to Americans, both from its subject and artist, "The Death of Wolfe," by Benjamin West, P.R.A.

The Royal Academy has consented to send, paying the costs of freight and insurance, diploma paintings and busts by the following deceased members of the body:—Etty, Clarkson Stanfield, Constable, Newton, Mulready, Owen, Turner, Hilton, Richard Wilson, Sir David Wilkie, Benjamin West, John Francis Rigand, Sir Augustus Calcott, Fuseli, Sir Joshua Reynolds (two works), Creswick, Maclise, and Sir Edwin Landseer. The busts are two in number, that of Flaxman, by Baily, and of Benjamin West, by Sir Francis Chantrey.

The Executive Commissioners have reserved, in the section of the Fine Art Gallery allotted to Great Britain, space for the exhibition of architectural designs. Further information on this point will be found in a letter read at the last meeting of the Institute of Architects, and reproduced on p. 120 of the present number of the *Builder*.

South Kensington will contribute a highly interesting and instructive collection, instructive in its records of the rise of art industry in England, and interesting from the admirable drawings of the various courts, and the specimens of the terra-cotta, majolics, and tesseræ used in the construction of the buildings.

It will be obvious to our readers, from what we have previously said, that the Centennial Commissioners have provided ample and handsome accommodation for the proposed exhibition, and we sincerely hope that the result will be a very glorious assemblage of the world's produce with large numbers of visitors to see and profit by it.

THE PRESENT AND FUTURE OF THE INSTITUTE.

Now that, as we noted last week, the first turning-point of the present discussion as to the affairs of the Institute is passed, and it has been determined that any proposals for improvement in its working are to be narrowed to the scope and intent of the original charter, it seems a favourable moment to offer one or two considerations as to the why and wherefore of this rather sudden and ardent impulse for reform; what it means, what has made it necessary (if it be necessary), and what is the best way of turning it to account for the advantage of the Institute, and of the profession which that body represents.

In the first place, we cannot help thinking that rather too much of what we should call "fuss" has been made about the simple and by no means unheard-of incident of a society of this kind setting its house in order a little,—a sort of fuss, too, which, to say truth, contrasts rather ludicrously with the almost entire apathy of outsiders on the subject. Almost every such society does come to a point in its history at which there is a want of relation between old forms and new notions, and a want, perhaps, of complete cordiality and understanding between an older and a younger generation of members. It is just the same sort of thing that we see frequently in the case of old and respected periodicals, which have fallen into a groove a little behind the age, and lose some of their original influence, until a little fresh start is made, and our old friend the *Monthly Inquisitor*, or whatever its name may be, appears with the words "New Series" in the margin of the title-page, as a delicate indication that some new blood has been introduced. Now this is really all that is happening, or that need happen, to the Institute. To judge from the tragic wailings which reach us from some quarters, it might be supposed that the "Royal Institute of British Architects" was on its last legs; that it was hopelessly insolvent in funds and intellect; and that all that remained was to provide for a decent interment. Surely a society which can show a constant increase in numbers and in revenue for years back, which is more than paying its way, which owes the rather too narrow margin between expenses and revenue almost entirely to increased business and increased activity, which is presenting to its members, during the present month only, an essay on a most important class of Mediæval buildings by one of our most learned archæologists, and another on the elucidation of one of the most beautiful ancient Greek temples by an architectural critic and student of European reputation, surely such an Institution is in no such very bad way; its form

> "Has yet not lost
> *All* her original brightness."

The Institute is going into a "New Series," that is all.

At the same time, we do not deny that a fresh start is desirable, and, in fact, called for. But let us, if possible, clearly understand why it is called for, and what is the real origin and meaning of the present movement. The whole

matter arose, if we understand it aright, out of a wholesome anxiety in the minds of the governing body of the Institute as to the too near encroachment of the annual expenditure on the margin of the annual revenue. The committee, whose report has been the occasion of the special meetings now being held, came in the main to the conclusion that the too tardy increase of revenue was due to, and indicated a want of general interest in the proceedings of the Institute, and, therefore, that the question suggested a general scheme of reform with the object of in every way enlarging its borders and giving it a wider influence in the profession and a more nationally representative character than it could at present lay claim to. In making out their scheme the committee found, or believed that they found, the existing charter entirely in their way, and obstructing them at every turn, and proposed, as a first step, the application for a new charter. Believing this to be, as we have already said, a mistake, we must admit, nevertheless, that the raising of this question has been indirectly beneficial; for it is probably almost entirely owing to that proposal, and to the opposition which it provoked, that what one speaker called a "stirring among the dry bones" was induced, which led to two of the most crowded and animated meetings that have taken place for a long time in the Conduit-street Rooms. This result at least seems to have given a great deal of satisfaction; there was a general kind of congratulatory tone; members who had not met for years expressed their cordial pleasure and surprise at the fortunate *rencontre;* and so on. It is odd that no one seems to have perceived that all this has a double significance; but we venture to say that if all who thus met and joined eagerly in the debates at these two special meetings had attended the ordinary meetings of the Institute with the same zeal, and shown the same interest in its proceedings and its welfare which they suddenly and unexpectedly evinced on this occasion, these said meetings need never have taken place at all, and there would have been no pretext for any committee to draw up a report on the affairs of the Institute, unless in the form of a congratulatory address upon its brilliant and increasing success.

As it is, there is no doubt that the attendance at the ordinary meetings of the Institute has very much fallen off of late years, and (though some may have had their good reasons for stopping away) has certainly become far too much limited to a certain set of members who show a praiseworthy perseverance and loyalty in their regular attendance, but who, of course, cannot of themselves keep the ball rolling as it should be. This fact of non-attendance is in itself at once a cause and a consequence of that lack of "vigour" in the proceedings of the Institute which seems to be pretty generally admitted; and it arises in the first instance mainly, we believe, from two defects,—one in the administrative department, the other in the general body of members of the Institute. To take the second first, we have to complain of a gradual, but of late increasing, development of a party or "clique" spirit, which has been the ruin of similar associations before now. How this works all who are familiar with the ins and outs of architectural politics in London know very well. A certain set of professional men, for example, of very pronounced opinions, think they ought to have the upper hand in regulating the concerns and influencing the spirit and policy of the Institute; and because they have not this, they will have nothing to do with it. Another set profess a dislike to set No. 1; or their "consciences" will not allow them to support Mr. So-and-so as a president; or some equally public-spirited feeling is in the way. All the while the absurd thing is that those, the "pronounced" gentlemen especially, who thus stand aloof from all active participation in affairs, are the loudest in raising the cry of "want of vigour,"—the Institute should do this, that, and the other, which they blame it for not doing,—while at the same time they do not raise a finger to assist in the good work, and are never seen at a meeting except when they have some particular grievance of their own to complain of. Now, without for a moment flattering these gentlemen by inferring that they have the prosperity of the Institute in their own hands (though there are some very clever men among them), we cannot but recognise the truth that *l'union fait la force,* and that it is hopeless to look for any real or permanent improvement in the prosperity of the representative body of architects so long as this absurd and narrow spirit of partisanship prevents it from really being a representative body at all. If these complainants, instead of standing aloof and declaring that this or that ought to be done, had frankly joined their brethren, and put their own shoulders to the wheel, much of what they wanted, or of that part of it which was desirable and reasonable, would have been accomplished. Some people, however, as we all know, prefer to have a "grievance," and are never happy without one. The other defect, which we touch upon with more reluctance, is that since the abrogation of the honorary system of work, the administration of the Institute is thought to have become too personal in character. We have no desire, on our own part, to make any unkind reflections, and we are told on good authority that in the minor but still very important details of the conduct of business, the Institute has never been so well served as it is at present; a statement which we have certainly no reason to discredit. But that the complaint referred to remains we have received evidence too often to be justified in ignoring it, if we are to deal with the subject at all. Without inquiring too closely under what influences the present position of things has been brought about, it must be obvious to every one that if an official acting under any public society is allowed to become practically the regulator of its affairs, though that may not in every case be bad policy, the prosperity of the society must be very dependent, not only on the personal energy and ability, but on the personal popularity, of its official representative; and that in such a case it is not to be wondered at if all parties find themselves sooner or later in somewhat of a false position, not particularly agreeable to any one. Enough on that head; but the remark will be found to have a bearing on one of the propositions that have been made for giving increased vitality to the working of the Institute.

So much for the present not entirely satisfactory position, and some of the causes that have led to it. The schemes for amending the position seem in the main to resolve themselves into four principal heads; the admission or invitation of the Associate class of members to a larger share in the government of the Institute; the extension of the educational machinery of the Institute; the establishment of a direct and formulated relationship between the Institute and the various provincial societies; and the enlargement and improvement of its premises. The first-named part of the reform scheme seems to have been the one most on the mind of the special committee, and for which in particular they declared a new charter to be necessary. The more we consider the matter, the more surprise we feel that such a body of sensible, and for the most part practical, men, as the Fellows and Associates who constituted the committee, should have proposed such a step as the throwing over of the charter for the sake of a scheme which, in its essential result upon the constitution of the Institute, would really amount to very little more than giving different names to the existing classes of members. All who are directly interested in the matter have the scheme of the committee before them, and can judge whether we are not correct in saying that it would in its practical working result in making the Fellowship the same kind of honorary distinction that the gold medal now is; taking from the Fellows their distinctive title, and merging them with the elder Associates in a large class with a very undistinctive title, and mixing the younger Associates with the Contributing Visitor class. This last is the only part of the whole affair which would really amount to an important constitutional alteration, and it is one in the wrong direction. Now, we think the Associate class at present does comprehend a considerable number of clever and energetic men, whom it would be well to have more actively connected with the work of the Institute. This is partly, however, a matter of accident; it happens at the present time that there are a good many men not quite old enough in practice to comply with the conditions of Fellowship, but of whom a large proportion probably will become Fellows in two or three years, when their stipulated seven years are made up. There are others (a considerable number, we suspect) who are qualified to stand as Fellows, and who ought to do so, and if they do not cannot complain of not having their privileges. But, as to the younger Associates, their place in the Institute might be made a most valuable one, if they were given the opportunity and the option of taking part more largely and systematically in voluntary work in connexion with the conduct of the general and special business of the Institute, on sub-committees, and in other ways. There is plenty of valuable work that may be done in this way, and many who would be glad to assist in it; and this idea is what appears to us the best course towards breaking through that purely personal administration to which we referred above, and which has become a subject of dislike and complaint to many. As to the present class of Associates, those who are not yet eligible as Fellows, considering themselves aggrieved because by the charter they can have no actual vote in the affairs of the Institute, we have a better opinion of the understandings of the Associates generally than to suppose that they are swayed by any such nonsense. They would at all events be very short-sighted to complain of a rule which is intended to secure the status of the class to which they themselves will ultimately belong.

The extension of the student-class, and the increase of educational power, is another part of the proposed reform. Now, in regard to this question, it must be remembered that the Institute was never founded or intended as an educating body. In the original charter there was not even any mention of student-members at all; they were constituted by a by-law in 1838, the object of which was simply to admit articled pupils of architects to the use of the library and the advantage of attending the meetings. To attempt to make the Institute a college of instruction in architecture would be to attempt an impossibility. It was never constituted for such an object, and has not and cannot, consistently with fulfilling its prior objects, provide the machinery for such an undertaking. All it can do is to offer prizes specially for that class of members, and to admit them to the use of the library, and any other opportunities for the interchange of knowledge and ideas which the Institute furnishes to its members generally. This is provided by the by-law of 1838, at a subscription of a guinea; and the proposed lowering of the student's fee to half that amount, with the idea, we suppose, of competing for students with the Association, would be distinctly a step in the wrong direction. However little one may think of money as a gauge of respectability in one sense, there is no doubt that in architecture, as in the matter of the franchise, it is no bad working test of eligibility in the long run. The Architectural Association, on the other hand, has by degrees founded an extensive machinery for instruction and self-education, by which it is, in fact, doing great part of the work of instruction which private practitioners in the profession ought by rights to be themselves imparting to their pupils. The question arises upon this,—and it is one of the points that has been most discussed,—should the Association, which has all this educating machinery ready and at work, be incorporated with the Institute, thus receiving the advantage of its status and position, and continuing its educational work? There are, of course, two voices to such a proposal, and the junior Society appears to express itself decidedly against it. We cannot help saying that we think the Association is in the wrong in the part it takes in reference to the Institute, and the feeling of narrowness of which it has at times given indications in connexion with the subject. There can be no question that the chief advantage of such a union would, in the end, lie with the Association, whose members do not seem the least to realise the importance of the historical position and recognised status of the Institute,—an advantage independent of mere temporary deficiencies,—nor to understand the important difference in some other points between their body and the Institute. A certain degree of formal connexion between the two might, however, be carried out on such a basis as making the Institute final arbiter of the prizes and recipient of an annual report of the Association, and thus, without interfering with the independent action of the latter, giving it the share of weight and influence derivable from association with the society chartered by the Queen.

This leads us naturally to the next proposition on our list, the closer connexion of provincial societies with the Institute. It seems to us that both the committee and some of those who have joined in discussing their report have made the mistake of putting the cart before the horse, in treating the matter as if it were a policy on the part of the Institute, and for its own good, to persuade the provincial societies to join it. This is only one curious specimen of the amount of "humble pie" which has been consumed already by supporters of the Institute in connexion with

the present movement, and one of the things for which we are greatly indebted to Professor Donaldson is that in the recent discussions he has consistently and firmly upheld the dignity of the society for which he has already done so much. We should scarcely say that to tell the provincial societies, as some members seem practically inclined to tell them, "we are in a bad way, come over and help us," was the most likely way to bring about that result. But there is not the remotest pretext for taking up any such false position. The union of all the provincial societies as sub-sections of the central society, and bound by the same laws, would (as we have frequently urged) be one of the best possible things for conducing to the unity and strength of the profession in England, and, if properly carried out, for advancing the interests of architecture. But the advantage, even in the present rather slack time of the Institute, would certainly be at least as much for the said provincial societies and the profession at large, as for the Institute locally, upon which the arrangement would impose a large increase of business and of responsibility. That this view is correct we have evidence in the fact, which is within our knowledge, that able provincial architects in large practice have declined to join their local societies because those societies were not connected with the Institute; and a still more pointed indication is that the Institute of Ireland, by far the most active and able of all the extra-metropolitan societies, and whose excellent papers we have often the pleasure of printing at large in our columns,* have themselves taken the initiative in this matter, and wrote more than a year ago to the secretary of the Royal Institute proposing the consideration of a scheme for union. This at least we hope will be carried out. As to the rest, the object is not so much to induce the country societies, as such, to join the Institute, as to induce the profession of British Architects at large to join it more generally; not with the narrow view of merely giving position and *éclat* to the central society, but for the great object of realising the union of the profession under one banner. With this object, the provincial societies would be valuable as a means of working the local business of the profession, if they will conform to the status of professional principles and practice of the Institute. If they will not (and it is said that some of them will not), they, and all members of the profession who think that status too high and too exclusive for them, are better out of the way; for we cannot for a moment contemplate the idea of the Institute lowering even its terms of admission, much less its standard of professional principles, to satisfy those who find these terms too high for their pockets or their consciences (synonymous expressions in some instances). If the Institute is not prepared to keep the standard of the architectural profession as high as it possibly can be kept socially, morally, and intellectually, it will have fallen from its high estate, and had better cease to exist altogether.

This reminds us that an objection which has been raised to the maintenance of the original charter is that it does not furnish a sufficient bar to the admittance of members who might lower the status of the Institute, since by the terms of the charter a meeting is bound to elect any candidate who has a majority of votes, however small. Now in regard to the charter generally, we cannot but endorse the opinion of an able and experienced member, who at one of the special meetings observed that the charter seemed to be in fact about "as elastic a document" as could well be framed; its defect, in reality, consists in its being somewhat too vaguely worded, and it is owing to this that a misapprehension has arisen in regard to this very subject of voting. The passage which is supposed to interfere with the healthful exercise, when necessary, of the privilege of "blackballing," is as follows:—"At all general meetings and meetings of the Council, the majority of members present, and having a right to vote thereat respectively, shall decide upon the matters propounded at such meetings, the person presiding therein having, in case of equality of numbers, a second or casting vote." Now, though no doubt the expression, "matters propounded at such meetings," might be read as including the voting for new members, a consideration of the whole document will render it evident that it is not so intended, for not only is there no reference whatever to balloting, here or in any other sentence of the charter (and the provision for a casting vote seems to show that no such reference was intended), but there is actually a distinct proviso on the next page (Section VII.),—"That the general meetings shall make and establish such bye-laws as they shall deem to be useful and necessary for the regulation of the said body politic and corporate, *for the admission of members*, for the management of the estates," &c. It is perfectly obvious from this (at least one would have thought so) that the Institute would be completely within the "general scope, true intent, and meaning" of the charter in making any reasonable bye-law they think fit in regard to conditions of balloting for membership; there is no bye-law at all referring to the balloting at present; it has been overlooked; but they can pass one at any general meeting. If the sentence quoted from the charter really compelled the adherence to a majority of votes in all possible cases, it has been transgressed already, for the 16th Bye-law provides (page 6) that no member shall be expelled "unless twelve of the Council concur in the vote of expulsion," which, of course, is directly at variance with the "majority" theory. The whole difficulty raised is, in fact, nothing but a "mare's nest."

A consideration which bears upon the question of increasing the country membership, and which in other respects is of more importance than has been quite recognised, is the proposal for new premises. It seems admitted that the enlargement of the present premises, to any good purpose, is impossible. Now, without endorsing, in its full dimensions, a certain rather Utopian scheme which a very enthusiastic Fellow intends, we believe, to bring forward at one of the special meetings, and the heads of which are before the members of the Institute, we cannot but feel that a worthy outward and visible sign of the existence of the central professional body in London, a new house for the architects, commensurate in dignity and artistic character with the aims of the profession, and within the walls of which everything connected with those aims could be collected, would be one of the best moves that could possibly be made. The architectural profession is, in regard to the general public, in far too hole-and-corner a condition; and external circumstances have their effect in this respect. Who would ever suppose that the meagre-looking cemented front in Conduit-street, with the ill-ventilated and ill-arranged meeting-room, was the home of a body which received a Royal Charter on the ground that it represented "an art esteemed and encouraged in all enlightened nations as tending greatly to promote the domestic convenience of citizens and the public improvement and embellishment of towns and cities"? The building of an adequate house would of course have to come chiefly out of private subscription, the Institute having no funds adequate to such a purpose; but the Institute itself arose in the first instance out of private subscriptions.* And if the architects would join together to show their pride and interest in their "guild" by erecting a building which would be itself a good specimen of their art, which could include the Architectural Museum, and whatever addition to these collections may be made from time to time, and which would furnish also a desirable and comfortable house of call, in the nature of a club, to all country members coming to town, they would perhaps do more to establish their position both in the metropolis and in the country generally than by any other of the propositions which have been made with that object: and we do not see that such a scheme is by any means an impossibility.

To carry out such a scheme would, in fact, only need what is, as we have already half hinted, the leading desideratum, the want of which has given rise to the present state of inquiry and stirring up of everything in the Institute,—a more thorough unity and *esprit de corps* among members of the profession, and more particularly among those within the walls of the Institute. If the Society which was established to represent the united action and interests of the architectural profession is itself disunited by parties and jealousies, how can it adequately fill the *rôle* assigned to it? And this would be our reply if it were urged that in the foregoing remarks we had, while admitting a good deal that is not satisfactory in the present condition of the Institute, nevertheless rather discountenanced most of the propositions for reform put forward by the special committee. We have done so, because we believe they involve needless disturbance of the constitution of the Institute, which will break the continuity of its history, and which will not attain the end proposed, because the real defect is not of a nature to be cured by mere constitutional changes. What we want to see put an end to is the want of cordiality and confidence between different parties in the profession; the abolition of all "parties" in fact. If each individual member will do his best to promote the real objects with which the central society was founded, and put aside partisanship, there will be no difficulty about its taking the place in the country which theoretically it is entitled to take. The whole philosophy of the matter in regard to the present position of the Institute, is (to alter Shakspeare a little),—

> "To your own selves be true,
> And it will follow, as the night the day,
> You cannot then be false to any one." *

* The managing body, like wise people, seek to obtain for their papers the widest publicity possible.

* "And have subscribed and paid considerable sums of money for these purposes."—Charter, page 1.

THE DECORATIONS AT THE HOUSES OF PARLIAMENT.

Decorations of a varied character have for some time past been in progress at the Houses of Parliament and their approaches, in anticipation of the opening of the session on Tuesday next, and externally the neighbourhood of St. Stephen's now presents a much more cheerful aspect than it has hitherto done. One of the most prominent features of the decorations, as the house is approached, is the regilding and ornamental work at the iron palisading enclosing Palace-yard, which has been in progress during the last three months, and finished this week. It is now several years since this portion of the boundaries was renovated, and the work has materially added to the ornamental appearance of the approaches. The cresting of the palisading, with the crowns and large globular lamps by which it is surmounted, have all been regilt, the operation necessitating the enclosure of the palisading by the erection of a movable wooden structure. Several portions of the interior of the house itself have likewise undergone renovation and decoration, notably St. Stephen's Hall, which has been to a large extent transformed in its mural aspect, besides other improvements which have been effected. The walls have been covered with a flock paper having raised embellishments, whilst the mullions of the windows and other stone work have been repainted, and covered with a painted solution, in order to render them impervious to the action of the damp atmosphere arising from the proximity of the river. The "lobby" of the house has likewise been improved in appearance, by the laying down of tesselated pavement at one of the entrances, whilst the walls of the lobby itself have been thoroughly cleaned; and finally, in consequence of her Majesty having decided to open Parliament in person, the throne has been regilt and the upper chamber re-embellished, and all the apartments which will be used by her Majesty and the great officers of state have been freshly fitted up. The apartment known as the Minute Room, close to the Prince's Chamber, has likewise been fitted up as a retiring-room for her Majesty.

Her Majesty's Theatre.—Having been appealed to to set at rest contradictory assertions published, we have enabled ourselves to state that the Government has *not* purchased the opera-house in the Haymarket, either for a post-office or any other purpose.

* It has been suggested by Mr Arthur Cates (with the concurrence of Mr. Horace Jones and Mr. F. C. Penrose) that in the event of Mr Horace Jones's amendment being carried as a substantive resolution, the reference to the Council should take the following form, viz:—

"That the subject of the steps which should be taken to improve the efficiency and ensure the prosperity of the Institute, together with the report of the Committee;—the minutes of the proceedings at the special general meetings at which such report has been considered,—the several amendments and proposals submitted;—and such further suggestions as may be submitted;—be referred to the Council for consideration, and to report thereon to a special general meeting:

And that the Council be requested to act on the authority of Bye-law 30a, and invite the past vice-presidents to attend their meetings on this subject, and to take part in their deliberations, and also to appoint sub-committees (not necessarily exclusively members of the Council) to consider the several heads into which the inquiry would divide itself, and to report thereon to the Council. Each sub-committee to appoint a chairman, who *shall* be a member of the Council, and a secretary who *may* be an Associate, and to be subject to such regulations as the Council may lay down."

PEPYS'S LONDON.*

SAMUEL PEPYS, Secretary to the Admiralty in the reigns of Charles II. and James II., and some time President of the Royal Society, has taken rank as a general favourite ever since the first publication of his remarkable diary, and few of us are tired of reading those characteristic touches that reveal the diarist's inmost thoughts and feelings. It has long been known that we did not possess the whole of the diary, but now, thanks to Mr. Mynors Bright, we for the first time learn something of what was rejected by Lord Braybrooke, and Pepys-lovers will be able to revel in new matter that is equal to a third of the whole book.

Pepys was a thorough Londoner, who seldom left the town, and as he was also a minute reporter of every occurrence that came under his notice, his diary must always be esteemed an important help to our knowledge of the state of London in the seventeenth century. We therefore propose to gather together a few of the London notices that are now printed for the first time, and to place them before our readers with some explanatory notes.

When Pepys began to keep a diary in January, 1659–60, he was living in Axe-yard, King-street, Westminster, a place long since swept away, and upon the site of which Fludyer-street was built in 1766. He appears to have been employed as a clerk under Mr. (afterwards Sir) George Downing, in some office connected with the pay of the army. A few months later, when the king was restored to the throne, Pepys was appointed Clerk of the Acts of the Navy, and obtained an official residence in Seething-lane, Great Tower-street, a place famous as having once had Sir Francis Walsingham as a resident. He also held an office as a deputy for his patron the Earl of Sandwich, who was Clerk of the Privy Seal, and the constant communication that was necessary between the Navy Office and the Admiralty took him often to Whitehall, to which place he usually went by water, and when going in his boat to Westminster he frequently stopped at Blackfriars in order to visit Lord Sandwich at the "Wardrobe," where the royal clothes were kept. This almost constant use of the river as a highway is a marked feature of the habits of the time, which is illustrated by the fact that Pepys makes a point of, mentioning that he went to a place "by land" (as "March 8, 1659–60, Home about two o'clock and took my wife *by land* to Paternoster-row to buy some Paragon for a petticoat, and so home again"), when from some cause or other he did not take a boat. On April 6th, 1662, we read, "After I was tired I went and took boat to Milford-stairs, and so to Gray's-inn walks, the first time I have been there this year, and it is very pleasant, and full of good company." These stairs were at the foot of Milford-lane, Strand, which is described in Gay's "Trivia," in the following unflattering lines:—

> "Behold that narrow street, which steep descends,
> Whose buildings to the slimy shore extends."

One Sunday night (April 20, 1662) our diarist passed through the "rapids" under London Bridge, and did not like the sensation he experienced. "And so to Whitehall to Sir G. Carteret, and so to the Chappell, where I challenged my pew as Clerke of the Privy Seale and had it, and then walked home with Mr. Blagrave to his old house in the Fishyard, and there he had a pretty kinswoman that sings, and we did sing some holy things, and afterwards others came in and so I left them, and by water through the bridge (which did trouble me) home, and so to bed."

On February 8, 1659–60, we find a reference to one of the *désagrémens* of walking the streets of London. "My father and I went down to the kitchen and there we ate and drank, and about nine o'clock I went away homewards, and in Fleete-street, received a great jostle from a man that had a mind to take the wall, which I could not help."

Pepys was very fond of his wife, but the two often had little "tiffs." Here is a notice of one on April 14, 1661:—"Then to my father's, and after supper seemed willing to go home, and my wife not seeming to be so too I went away in a discontent; but she, poor wretch, followed me as far in the rain and dark as Fleet Bridge to fetch me back again, and so I did."

On May 19, 1662, he has a supper at Moorfields, which does not agree with him. "After dinner Sir W. Pen and his daughter and I and my wife by coach to the theatre, and there in a box saw "The Little Thiefe" well done. Thence to Moorefields, and walked and eat some cheesecake and gammon of bacon, but when I was come home I was sick."

Our forefathers enjoyed advantages that we do not possess, and not the least of these was the nearness of the fields and country lanes to their offices and shops. Pepys often indulged himself in a walk or romp over the grass that is now covered with bricks. On July 29, 1660, "I dined, and in the afternoon, with Dick Vines and his brother Payton, we walked to Lisson-greene and Marybone and back again." On October 9, 1660, "I met with Sir W. Pen again, and so with him to Redriffe by water, and from thence walked over the fields to Deptford, the first pleasant walk I have had a great while, and in our way had a great deal of merry discourse, and I find him to be a merry fellow and pretty good natured, and sings very loose songs." On June 4, 1661, "I went over the water and walked over the fields to Southwarke, and so home and to my lute."

A walk to the Half-way House, on the Surrey side of the river, was a favourite one with Pepys. On May 20, 1662, we read:—"Thence to Tower-wharfe, and there took boat, and we all walked to Halfeway House, and there eat and drank, and were pleasant, and so finally home again in the evening, and so good night, this being a very pleasant life that we now lead, and have long done; the Lord be blessed, and make us thankful. But though I am much against too much spending, yet I do think it best to enjoy some degree of pleasure now that we have health, money, and opportunity, rather than to leave pleasures to old age or poverty, when we cannot have them so properly." On June 13th, and again on the 20th, he has "a most pleasant walk" to the same place.

When we read the account of frequently recurring convivialities, we are apt to misjudge Mr. Secretary Pepys and his companions, and to think that work was neglected. We must, however, remember how much habits have changed, and take into consideration the fact that our ancestors often did a day's work before the hour at which we now turn out of bed. Pepys sometimes went to his business at four o'clock in the morning, and his usual round of occupations may be summed up as follows:—About six to the office, about eight or nine to a tavern for a morning draught, at noon to dinner, after dinner sometimes back to the office, but more frequently drinking at a tavern or to the theatre, then a walk, and home to bed, sometimes as early as nine o'clock. On June 12, 1662, we read:—"Thence to dinner, by Mr. Gauden's invitation, to the Dolphin, where a good dinner; but what is to myself a great wonder, that with ease I past the whole dinner without drinking a drop of wine. After dinner to the office, my head full of business, and so home, and it being the longest day [old style] in the year, I made all my people go to bed by daylight."

When the days grew shorter walkers in the streets after dark had to make use of torchlight, as we find by an entry on September 11, 1661: "At the office all the morn, dined at home, and so to the Wardrobe to see my lady, and after supper with the young ladies, bought a linke and carried it myself till I met one that would light me home for the linke. So he light me home with his own, and then I did give him mine."

None of our diarist's days passed without a visit to some tavern, for a morning draught, or a pint of wine after dinner. The notice of these little jovialities has preserved to us the names of several old inns, such as the Star, Half Moon, Harp and Ball, Swan, Bull Head, Plough, Lion, Cock, Greyhound, Globe, Mitre, Cardinal's Cap, King's Head, Hercules Pillars, Trumpet, &c. Here is an account of a friendly meeting at one of these places. "While we were drinking, in comes Mr. Day, a carpenter in Westminster, to tell me that it was Shrove Tuesday, and that I must go with him to their yearly clubb upon this day, which, I confess, I had quite forgot. So I went to the Bell, where were Mr. Eglin, Veezy, Vincent a butcher, one more, and Mr. Tanner, with whom I played upon a viall and he a viallin, after dinner, and were very merry, with a special good dinner, a leg of veal and bacon, two capons and fritters, with abundance of wine."

On January 10th, 1659–60, Pepys "drank a pint of wine at the Star in Cheapside," and on May 24th, 1662, he took his "morning draft" at the same house. Here is an amusing account of the events of a day:—"Jan. 12., 1659–60, I drink my morning at Harper's with Mr. Shepley and a seaman, and so to my office, where Captain Holland came to see me. After that I went home, and thence to the Half Moon, where I found the Captain and Mr. Billingsby, and Newman, a barber, where we were very merry, and the young man that plays so well on the Welsh harp. Billingsby paid for all. Thence home, and finding my letters this day not gone by the carrier, I new sealed them; but my brother Tom coming, we fell into discourse about my intention to feast the Joyces. I sent for a bit of meat for him from the cook's, and forgot to send my letters this night. So I went to bed."

The following entry contains a notice of two inns, and the record of a curious custom:—

"Jan. 20, 1659–60. I met with Mr. Woodfine, and drank with him at the Sun in Chancery-lane, and so to Westminster Hall, where at the lobby I spoke with the rest of my guests, and so to my office. At noon went by water with Mr. Mayd. and Hales to the Swan, in Fish-streete, at our Coal Feast, where we were very merry at our jole of ling, and from thence, after a great and good dinner, Mr. Falconberge would go and drink a cup of ale. Thence calling on Mr. Stephens and Wootton, with whom I drank, about business of my Lord's, I went to the Coffee Club, where there was nothing done but choosing of a commitee for orders. Thence to Westminster Hall, where Mrs. Lane and the rest of the mayds had their white scarfs, all having been at the burial of a young bookseller."

The Swan in Old Fish-street is mentioned in an inquisition held before the mayor and aldermen in 1413 as "The Swan on the Hoop." The house was destroyed in the Great Fire, but was rebuilt and advertised to be let in the *Spectator* of April 25, 1712. On February 16, Pepys again goes to the Sun and exhibits his frugal mind. "We went to the Sun Taverne in expectation of a dinner, where we had sent us only two trencherfulls of meat, at which we were very merry, and here we staid till seven at night, I winning a quart of sack of Shaw that one trencherfull that was sent us was all lamb and he that it was veal. I by having but 3d. in my pocket made shift to spend no more, whereas if I had had more I had spent more as the rest did, so that I see it is an advantage to a man to carry little in his pocket. Home and after supper, and a little at my flute, I went to bed."

He went once or twice to the Bull-head in Cheapside, which was a famous house.

"Sept. 1, 1660.—Dined at the Bull-head upon the best venison pasty that ever I ate of in my life, and with one dish more it was the best dinner I ever was at. Here rose in discourse at table a dispute between Mr. Moore and Dr. Clerke, the former affirming that it was essential to a tragedy to have the argument of it true, which the Doctor denied, and left it to me to be judge, and the cause to be determined next Tuesday morning at the same place, upon the eating of the remains of the pasty, and the loser to pay 10s.

Sept. 4.—To the Bull-head, where we had the remains of our pasty, where I did give my verdict against Mr. Moore upon last Saturday's wager, where Dr. Fuller coming in do confirm me in my verdict. So home by water and sat up late setting my papers in order, and teaching my wife her musique lesson, in which I take great pleasure."

King-street, Westminster, was full of inns. Pepys's favourite haunt was the Leg, where an ordinary was held. On Dec. 6, 1660, he and Mr. Moore went there and "dined together on a neat's tongue and udder." Again on April 6, 1661, "with Mr. Creed and More to the Leg in the Palace to dinner which I gave them, and after dinner I saw the girle of the house, being very pretty, go into a chamber, and I went in after her and kissed her."

Two other King-street taverns were visited by Pepys in July and August, 1660.

"July 4.—To Westminster Hall, where meeting with Mons. l'Impertinent and W. Bowyer, I took them to the Sun Tavern, and gave them a lobster and some wine, and sat talking like a fool till 4 o'clock."

"Aug. 23.—To Westminster Hall, where I met with W. Symons, &c., and with them to the Dogg, where we ate a musk lemon."

The two last-mentioned houses of entertainment are both noted as haunts of Ben Jonson

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* Diary and Correspondence of Samuel Pepys, esq., F.R.S., from his MS. Cypher in the Pepysian Library, with a Life and Notes by Richard Lord Braybrooke; deciphered, with additional Notes, by the Rev. Mynors Bright. Vol. I. London: Bickers & Son. 1875.

in Herrick's Address to the Shade of "glorious Ben,"—

"Ah, Ben!
Say how or when
Shall we, thy guests,
Meet at those lyric feasts
Made at the Sun,
The Dog, the Triple Tun;
Where we such clusters ha'd
As made us nobly wild, not mad!
And yet such verse of thine
Outdid the meat, outdid the frolic wine."

Another Sun, that behind the Exchange, was a famous house; it was rebuilt after the fire by John Wadlow, the host of the Devil Tavern, and son of the more famous Simon Wadlow, whom Ben Jonson dubbed "Old Sym, the King of Skinkers." Pepys was there on March 1, 1659-60. He often went with his colleagues to the Dolphin, and drank "a great quantity of sack" there. On August 15, 1661, we read, "So home, and was overtaken by Sir W. Pen in his coach. So I followed him to the Dolphin, where Sir W. Batten was, and there we sat a while, and so home after we had made shift to fuddle Mr. Falconer, of Woolwich. On April 25, 1661, he "went to an ordinary at the King's Head, in Towre-street, and there had a dirty dinner." On June 21 of the same year,—"This morning, going to my father's, I met him, and so he and I went and drank our morning draft at the Samson, in Paul's Churchyard, and ate some gammon of bacon, &c., and then parted, having bought some green say for curtains in my parler."

On October 9, 1661, he went after the theatre "to the Fleece Taverne, in Covent Garden, where Luellin and Blarton, and my old friend Frank Bigge, was to meet me, and there staid till late very merry." This was the chief tavern in Covent Garden, but being the resort of bullies it obtained a very unenviable notoriety. The Green Dragon on Lambeth Hill, the Golden Lion near Charing Cross, the Old three Tuns at the same place, and the Pope's Head in Chancery-lane are among the other taverns mentioned by Pepys. The Rhenish Wine-house, in the Steel-yard, Upper Thames-street, was a favourite resort, and is frequently mentioned by the old dramatists. Pepys went there sometimes, but the house referred to in the following extract was in Cannon-row:—"Sept. 3, 1661,—To Westminster Hall with Captain Ferrers, where we met with Mr. Pickering, and so all of us to the Rhenish Wine-house, where the master of the house is laying out some money in making a cellar with an arch in his yard, which is very convenient for him." On May 28, 1662, we read,—"Up and down in several places about business with Mr. Creed, home about noon, and by and by comes my father by appointment to dine with me, which we did very merrily, I desiring to make him as merry as I can while the poor man is in towne. After dinner comes my uncle Wight, and sat awhile, and thence we three to the Mum House at Leadenhall." Mum was ale brewed from wheat, a strong beer, said to have been introduced from Brunswick. There were several mum houses about the town, and the *Complaisant Companion*, 1674, contains the following joke relating to this drink:—"One seeing written on a coffee-house sign, 'Here's mum to be sold,' said it was a good rhyme. 'How can that be?' said the other. 'Why thus,' replied the former,—

'Here's mum to be
S, o, l, d.'"

From these extracts it will be seen how much wine was drunk at all hours of the day, and there is quite enough in the Diary to show that the heads of the clerks could not have been very clear after dinner, so that it was of little use for them to return to their offices for business. One day Pepys, being a little more sober than Sir W. Pen, has to lead the worthy knight home through the streets, and on another occasion he resolves not to drink any more wine,—a rash vow which he forthwith breaks. On March 3rd, 1659-60, he writes, "Tom Harper took me into a place in Drury-lane, where we drank a good deal of strong water, more than ever I did in my life at one time before." And on September 9th, 1661, "To the Privy Seale in the morning, but my Lord did not come, so I went with Captain Morrice at his desire, into the King's Privy Kitchen to Mr. Sayres, the master cooke, and there we had a good slice of beef or two to our breakfast, and from thence he took us into the wine-cellar, where, by my troth, we were very merry, and I drank so much wine that I was not fit for business, and therefore at noon I went and walked in Westminster Hall a while."

With one more quotation we must close this article:—

"June 28th, 1660, after my Lord was awake, I went up to him to the Nursery, where he do lie, and having talked with him a little I took leave, and carried my wife and Mrs. Pierce to Cloth-workers' Hall, to dinner, where Mr. Pierce, the Purser, met us. We were invited by Mr. Chaplin, the victualler. Our entertainment very good, a brave hall, good company, and very good musique. Where among other things I was pleased that I could find out a man by his voice whom I had never seen before, to be one that sang behind the curtain formerly at Sir W. Davenant's opera."

We have seen Pepys dividing his time pretty equally between the City and Westminster, and doing official work in both places. In Westminster Hall he was on friendly terms with all the shopkeepers who formerly kept their little stalls in that place, and most of the watermen at the different stairs, who recognised his genial face, were emulous of the honour of carrying him as a fare. The Diary relates to the doings of ten years of his early life, two and a half of which are given in the volume under notice. Much of his time was spent in gossip and pleasure-seeking, but Mr. Mynors Bright tells us that "it is impossible for any one who has not read the *entire* Diary fully to appreciate Pepys's industry and diligence in his office." We may therefore believe that as he grew older he became more staid and worthier of the esteem of his distinguished friend, John Evelyn.

THE NEW CASTELLANI COLLECTION.

Those of our readers who are interested in such a subject are probably already aware that Signor Castellani, from whom an extensive collection of specimens of antique ornamental art was purchased for the British Museum some few years since, has offered for purchase a second collection of somewhat similar kind, of equal value with the former collection, and even more varied in character. These are now on view in the severally appropriate rooms of the Museum; and those who have not had time or opportunity to inspect them personally may be glad to have a brief characterisation of the nature and value of the relics thus offered to the nation (which, however, are well worth a special visit); and the question as to their acquirement for this country is one of public importance.

The articles included in this second Castellani collection come under three divisions: works in sculpture; bronze utensils; and gold work and personal ornaments of various descriptions. The sculpture comprises three heads, one said to be that of Euripides, the other two evidently of Bacchus and Apollo, which are at present in the small ante-room where the statue of Demeter from Cnidus stands; and two nearly complete statues, placed in the room further on to the right, where the Æginetan sculptures are arranged. Of the heads, that of the Bacchus, which has considerable resemblance in type to that shown in a well-known torso of Bacchus, an adult but very youthful and half-feminine-looking head, is the best artistically; the Apollo, however, though considerably damaged, is of great interest as a specimen of a very marked though not very elevated ideal of the god, of which other examples of a similar type are known; it is, in fact, too sensuous in contour and (as far as we can judge in its present state) in expression to stand as a representation of the highest ideal of Apollo, but is remarkable nevertheless for the fulness and boldness of its contours, and the complete unity of expression and style in the whole workmanship, even the hair seeming to repeat and carry out the peculiar and somewhat exuberant character of the physiognomy. The two statues are of greater interest and value than any of the busts, and are as remarkable for their utter distinction—opposition we might say—in spirit and style as for the individuality of each. The one which is really, perhaps, the most valuable, partly because the most unique of the two, is believed to be of original Greek workmanship, and is a figure of a naked boy, rather under life-size, seated with the left foot held up, and partly resting on the right knee, apparently examining or removing something that has wounded the foot. The lower part of this foot has gone, the hands are imperfect, and the right leg below the knee is wanting; in nearly every other respect the work is in very good preservation. When we speak of it as a work of Greek sculpture, however, it must be understood that it is not of the severe, ideal, partly conventionalised type which we commonly associate with Greek art. It is a work of probably a much later date than the great style of Greek sculpture, and is as completely and markedly realistic as any work of modern sculpture could be. This, so far from detracting from its value, in one sense adds to it; for it is rarely that we have an example of such absolutely realistic study of form and action in antique sculpture; and, indeed, such a specimen as this may be said to have an important bearing on art-criticism and art-history, as proving that the excessive realism towards which modern sculpture has too much tended is, at any rate, not wholly a weakness of modern date. The important distinction is, however, that the modern realistic sculptor throws away his labour on detail not worth either the skill or the material,—on "the coats, the hosen, and the hats," the flounces and lace trimmings, of his figures. In the case of the work before us the sculptor's aim has been to realise in its minutest details the muscular action and contours of the human figure; and a minute examination of the statue shows its remarkable fidelity to nature, in the treatment of the bent body especially, the contours of the muscles of the back and the folds of the skin in front. The whole action and posture are frankly transcribed from nature; no attempt is made to carry off the somewhat awkward and, from some points of view, ungainly position: it is, in fact, we may say, the realistic portrait of a Greek *gamin* of 1,900 or 2,000 years ago.

Utterly opposed in every way is the statue,—Roman in execution almost certainly, whether Greek or not in conception,—to which we now turn. It is a large heavily-draped figure, with a head of considerable dignity, but comparatively formal, conventional, and expressionless; the features regular and somewhat mechanically executed, so far as they are seen; for the lower part of the face is concealed by a long and ample beard of half-conventional wavy locks; the hair of the head, also, executed in a similar style, descends on the shoulders on each side. The right arm and hand, which have been outstretched, are wanting, otherwise the figure is perfect, and the upper part, the face and head especially, is in extraordinary preservation, and seems almost as fresh and sharp as if but recently executed. From what we have said as to the head it will be seen that from the purely artist's point of view this work is not of so much value as the other; but it is a production of a higher and indeed of an imposing stamp, and we can pardon a somewhat stiffly-modelled and typical cast of head for the sake of the majestic presence of the whole figure, and the really grand line and arrangement of the draperies. The main lines of the drapery depend from the left shoulder and cross the body obliquely, the lower portion falling on the right leg in bold, simple, and massive folds; and an effective contrast is secured by the more vertical folds on the left side, and by the closer and more regular lines, cut into sharp lights and deep shadows, of the lower robe beneath. To appreciate the fine pose and composition of the figure, and the manner in which the drapery is folded over the right limbs, so as to express while concealing their action, the spectator should view it from a point rather on the left hand of the figure, so as to get about a quarter-face; from this point the pose and balance of the whole are remarkably fine. We hope we may pretty confidently predict that neither of these statues will be permitted to leave the building in which they are now placed.

Upstairs in the Bronze room, on a shelf in one of the cases on the left-hand (coming from the Mummy-room) is placed the second group of objects of the new collection.* The most prominent of these are round and oval boxes, averaging 10 in. to 12 in. in height, and rather less in width, and evidently connected with the toilet, inasmuch as mirrors, combs, &c., have been found in them. Some of these mirrors are also to be seen; oval metal plates with handles, very much the shape and size of a battledore, and ornamented on the back in a similar style with the sides and lids of the boxes. This ornament consists entirely of outline, including figure subjects, and borders and friezes of a con-

* We cannot but think that a collection offered for purchase as a whole and by the same owner, had better have been placed, collectively, in one room, so that its extent could be taken in at a glance. We observed, also, that there was no indication of any kind for visitors who had not previously acquired information, either as to the subjects of these relics of art, or the circumstances under which they are temporarily placed in the Museum.

ventional ornament, chiefly of the Greek honeysuckle type, but of somewhat unrefined and debased character. The articles are all of bronze, and the mode of executing the ornament might be described as resembling that called *niello* in silverwork, though producing the reverse effect; the metal being evidently incised, and the lines filled in with some material which shows a white line on the bronze ground. The execution of the figure subjects on these boxes is unequal; all of them show spirit and freedom of design, but in many the heads seem as if sketched in a somewhat mechanical manner by art-workmen who had got the trick of a certain type of face, founded on the style of the best Greek type, but exaggerated and debased; and in some of the female figures especially the curves of the limbs are much exaggerated, and give one the idea of being the work of an uneducated draughtsman; in others there is considerable beauty and refinement, and the resemblance of some of the best of these outline designs to the out-lined figures of Flaxman is curious; one or two of the figures on the lid of the long oval box might have come out of his illustrations to Homer or Hesiod.

Of the further portion of the new collection, in the Gold Ornament room, we cannot just now undertake to speak in detail; we must content ourselves for the present with observing that it is of great variety and beauty, comprising ancient Etruscan and Greek gold ornaments of the most artistic type in design and execution, in that refined and reticent style of ancient goldwork in which the very most was made of the precious material, artistically, in proportion to its bulk, in happy contradiction to the modern "bullion" style, which values gold ornament more by its mass than its design, if we may judge from the style of many articles that find a ready sale. Besides the gold ornaments, there is a large collection of rings, and a number of cameos and intaglios, many of the highest interest and beauty both in regard to design, material, and execution. Between the former and the present collection, in fact, whole days might be spent in this room without exhausting its wealth of beauty in design and detail, not to speak of the interest attaching to many of these in every sense precious relics, as records of a taste and feeling so far removed from our modern associations, and in some senses so entirely inimitable in the present day. Even the ancient literature that we possess does not bring us so directly face to face with the antique spirit as do some of these specimens of jewelry and ornament. Take one specimen alone—the pair of earrings twisted into a serpentine form, and ending in a small and delicate female head at each extremity, which every visitor to the room will be sure to remark: the whole library of Alexandria could hardly have given us more vivid evidence of the existence and character of "the antique" spirit in æsthetics than this little production; a thing which is absolutely of the ancient world, and which could under no circumstances have been originated by a modern workman; though this and many of the articles here might be invaluable in suggesting new ideas to modern art workmanship. When, as we hope, this new collection has been bought and arranged and classified along with the rest of the contents of the room, we may take an opportunity of dwelling on it more in detail. There can be no doubt the collection generally is well worth purchase for the nation on any tolerably reasonable terms, and we recommend those who would feel interest in its acquisition to go and judge for themselves.

A BALLOON WITH POWER.

ON the 2nd of February, 1872, M. Dupuy de Lôme made a satisfactory ascent from Paris in a balloon constructed by him, and provided with a screw for propelling and steering it. The screw was then worked by manual power, and the rate of progress was comparatively slow. M. Dupuy de Lôme expressed at that time his belief that its speed might be increased if, instead of the weight of the eight men working the screw, an eight-horse-power engine were taken into the car. The only drawback to such a plan was the liability of the engine to set the balloon on fire. According to a communication in the *Jahresbericht des Physikalischen Vereins zu Frankfurt*, 1875, an important step in advance in this direction has now been taken. Herr Hänlein, civil engineer, of Mayence, has invented and constructed a balloon driven by a gas-engine. He has proved by his invention that, by increasing the size of the balloon and by other improvements, an increased rate of speed may be attained.

If we suppose a screw-steamer cut off just above the water-line, so that it moves only in one element, viz., water, that it finds its resistance in water, that the point of attack for its driving apparatus lies in it, and that its helm likewise acts there, this case is perfectly analogous to the movement of a balloon which may be driven and guided in the air. Of course, the driving apparatus of a balloon has to overcome a very much smaller amount of resistance than a vessel moving in water; but, in the same proportion, the resistance which a body propelled in the air meets with is less than when it is moved in water.

The impetus in boundless water or boundless air is calculated according to the formula:—

$$P = \varsigma \cdot \frac{v^2}{2g} \cdot F \cdot \gamma,$$

in which ς is a co-efficient depending upon the form of the body; v, the speed of the body; F, its greatest cross-section; γ, the density of the medium; g, the weight of the earth.

It will be seen from this formula that the impetus for congruent bodies, with equal velocity, depends solely upon the density of the medium in which they are immersed. The density of air being $\frac{1}{816}$ of that of water, the resistance a vessel propelled in air meets with, compared with that of another vessel propelled in water, is in the same proportion. In like manner, the pressure of the screw against air amounting to only $\frac{1}{816}$ of its pressure against water, and the resistance of the propelled body and the pressure of the screw being less, at the same rate, in air than in water, the final result, velocity, is the same.

Without (for the sake of simplicity of theoretical examination) taking account here of the coefficients modifying those relations, it may be said that the force necessary for moving a body in air is only $\frac{1}{816}$ of the force which must be applied to move a similar body with the same velocity in water.

A like relation exists also between the bearing capacity of the balloon and that of the ship. A ship, for instance, the volume of which under water amounts to 1,000 cubic mètres, has a bearing capacity of 1,000,000 kilomètres, while a balloon of the same dimensions, filled with hydrogen, is capable of carrying only 1,250 kilomètres, or $\frac{1}{816}$ of the capacity of a ship. The balloon motor absorbs in weight about the same percentage of the balloon's carrying capacity as the ship's engine does of the carrying power of the ships. Supposing a screw steamer and a balloon to have the same dimensions, the latter will require only $\frac{1}{816}$ of the power of the ship's engine in order to attain a speed equal to that of the ship. In this case, it is supposed that the effect of the air-screw is equal to that of a water-screw. But as it is not possible to make the sides of a balloon as smooth as the sides of a ship, the meshes of the netting causing small bulgings, though only on the upper surface of the balloon, and thus increasing resistance to its movement, its speed will be proportionately less.

Hitherto there has been a want of motor in the use of which the weight of the necessary mechanism stands in the same proportion to the carrying power of a balloon as, for instance, the weight of the boiler with contents and fuel to the carrying capacity of a steamship. Hänlein, in the first instance, obtained a patent (in 1865) for the combination of an air-screw and gas-engine for the locomotion of balloons, and included in this patent the application of a smaller balloon, filled with air, which, in the interior of the balloon proper, served the purpose of preserving the form as well as the volume of the latter. The smaller balloon acts in two ways. As soon as the balloon reaches the higher strata of the atmosphere, the gas with which it is filled expands, expelling a corresponding quantity of air from the inner, smaller balloon. In the case of the consumption of gas for the supply of the gas-engine, the inner balloon expands by taking in atmospheric air by the action of an air-pump.

In 1870, Hänlein constructed his first model, with a length of balloon of 38·94 ft. He was enabled to carry out his plans by the generosity of a few rich Frankfurters, who provided the necessary funds in the interest of science. The first experiments with the model were made in the following year at Mainz, and Hänlein's principle was found in practice not only perfectly sound, but it led to the conclusion that, with a balloon constructed on a larger scale, it would be possible, by means of a gas-engine of corresponding size, to attain a speed which would permit of overcoming, throughout the year, with few exceptions, the velocity of the wind. In 1872, Hänlein constructed a second, larger, balloon, capable of carrying, besides the necessary apparatus and outfit, two persons.

This balloon, of the form of a rotatory body, with a longitudinal section like the water-line of a ship, has a length of 166·32 ft., and a diameter of 30·36 ft. The covering of the balloon consists of closely-woven silk, having a thick layer of caoutchouc inside and a thinner one outside. The ten strips forming the balloon are joined perfectly gas-proof by means of strips 1·18 in. wide of a similar nature. The balloon is surrounded by a net, the meshes of which are 3·94 ft. square. Each mesh is connected from the terminal meshes of the sides with a cord 6·6 ft. long. Each twelve of such cords are united in a loop, and from each of these loops a stronger rope leads to the car. The back cords do not lead direct to the car, but unite at a strong cross-beam 15·84 ft. long, forming the space required for the play of the screw. All the ropes leading from the car to the net meet the balloon tangentially. To prevent the horizontal strain exerted by the front and back ropes upon the car, they are, running under the car, connected by other ropes diagonally with each other. Thus the whole weight of the car rests in a perfect network of ropes, the car being farther suspended at a number of other points, thus reducing the strain upon the apparatus to a minimum. Between car and balloon, 18·15 ft. under the balloon axis, is a frame, of such a form that the ropes connecting the car with the balloon cross the frame tangentially, and thus may be fastened on to it. This frame carries the side-posts and stays supporting the steering-apparatus and cross-pieces for the transmission of the steering, and serves as a resting-point for four stays connected at their lower ends with the car. Two buffers, fastened underneath the car, protect the screw in case of the balloon touching the ground. All the supports, stays, &c., are made of very light soft wood, and are of the shape of fish-bellied bearers. They consist of four rods, which are held together by cross-pieces (crosses or rings) at intervals of 11·8 in.

Besides the usual inlet and escape valves for gas, the balloon is provided with two safety-valves, which open at a pressure sufficient to keep the balloon perfectly tight and extended. In the interior of the balloon is the smaller one, already mentioned, filled with air.

The gas-engine consists of two pairs of horizontal cylinders, acting upon a common crank-axle, by means of four cranks. Each two of them are opposite to each other, and form with the two others right angles. By this arrangement the pitching which would otherwise be caused by the forward and backward movements of the pistons is neutralised to a great extent. The screw is secured to the extremity of the crank-axle. The explosions are effected by the electrical spark of an induction apparatus. The engine is a Lenoir engine, its parts being made hollow, to reduce the weight of the whole. It makes ninety revolutions per minute. The diameter of the cylinders is 6·3 in.; that of the screw, 15 ft.; the pitch of the latter, 20 ft. The screw has four blades, and is in form like Griffiths' screw. The sides and ends of the cylinders are surrounded by cold water, to prevent them from being too highly heated. As but little water can, however, be carried, it is conducted from the cylinders in so-called coolers along the car. In these coolers the heated water comes into contact with the air passing through them. An aliquot part of it evaporates as the rising power of the balloon diminishes in consequence of the consumption of gas. The cooled water is brought back to the cylinders by two pumps, driven by the engine. The cooling surface is large enough to ensure an ample supply of cooling water, about 150 lb. being a sufficient store. The engine takes the gas it consumes direct from the larger balloon. In proportion as the consumption of gas goes on, the inner, smaller balloon must be extended by air.

The cubic space of the balloon, as measured by a meter, is 25,922 cubic feet. From this, the carrying power may be calculated as follows:—

	Lb.
If the balloon is filled with gas of 0·50 sp. gr., it is	3,128
If the balloon is filled with gas of 0·45 sp. gr., it is	3,440
If the balloon is filled with gas of 0·40 sp. gr., it is	3,756
If the balloon is filled with hydrogen gas, it is	5,828

The weights to be carried are:—

	Lb.
Gas engine	406
Screw	138
Frames, cross-bearers, steering apparatus, buffers, &c.	498
Cooling apparatus	220
Car	218
Covering of balloon	700
Net, with ropes	232
Battery, with inductor	80
Water	150
	2,812

Supposing the specific gravity of the gas to be 0·45, there would remain 628 lb. for two persons and their equipment.

At the experiments carried on at Brünn, the gas used was so heavy that the car had to be considerably lightened before it would carry two persons. On that account a regular ascent could not be made, and the balloon was secured by ropes, and propelled by the engine a distance of nearly 2,000 ft. It was found that the engine acted perfectly satisfactory; the balloon moved with the wind and against the wind, was propelled in a circle by means of the steering apparatus, and was perfectly manageable. In being propelled against the wind, a good rate of speed was attained. The engine consumed per hour from 70 to 75 cubic feet of gas, and from 20 to 25 lb. of cooling water.

It will thus be seen that, if all the parts are made still lighter, and lighter gas,—for instance, hydrogen gas,—is used, and the balloon is made of larger dimensions, a high rate of speed seems possible.

GENERAL EXHIBITION OF WATER-COLOURS.—DUDLEY GALLERY.

The collection does not show much work of the highest class; but there is a pretty large proportion of suggestive and interesting drawings. Mr. Poynter sends two works,—one a very finely executed study for a figure of Michelangelo, for the wall of the lecture-theatre at South Kensington, representing the great master, with rather a sad and worn expression on his rugged countenance, seated in a niche surrounded by an architectural framework in marble, the draperies, though in low tones of colour, assuming a decidedly warm tinge as a harmonising contrast with the cool tints of the marble. Opposite to this hangs the artist's other contribution, a landscape (465), very broadly washed in, and showing a fine power of broad delineation of the contours and perspective of a hilly scene. In general the works which occupy central places on the walls are hardly the best; we must look for these among scattered smaller contributions. Mr. J. C. Moore's portraits of children are good, and he has been at considerable trouble in securing striking and harmonious combinations of colour in the dress, &c., most successfully in "Maud" (296); in the triple portrait at the top of the room (202) the management of effect of this kind is overdone and too obtrusive, and the result is too much like a decorative painting. Among other figure subjects, Mr. Napier Henry's "Nautical Argument" (240) is carried on in the interior of a cabin with considerable spirit and character; and there is capital humour and broad powerful execution in Mr. A. Stocks' study of "Mural Decoration" (280) carried out by an urchin with a blacking-bottle: the drawing has somehow got unfortunately "cockled" in stretching. Mr. Luxmoore's "I will and bequeath" (271) is an excellent piece of manipulation, but wants point and subject; and Mr. Macallum's "Burning Kelp" (356), with the materials for an excellent picture, seems somehow not to realise the artist's aim; his "Carting Sea-weed" (93) has fine qualities, and more interest in the figures. Architectural subjects are pretty numerous; among them we notice Mr. F. Dillon's "Courtyard of an Arab House" (161), a most picturesque piece of external architecture, and the same artist's interior of the "House of Radnan Bey, Cairo (195), in which the jewelled effect of the stained glass is rather forcibly produced in opaque colour; Mr. Spiers's "Laon Cathedral" (388); Miss Wratislaw's careful and effective drawing of the "Gate of Paradise" at Sta. Prassede (130); and Signor Carelli's large and highly finished drawing of the interior of the Medici Chapel at Florence.

Among landscapes may be noted "A Homestead" (263), by Mr. Ernest Waterlow,—an orchard scene, with an evening sky behind, poetic in feeling, and far from commonplace in manner. Mr. Waterlow seems to be steadily progressing in artistic power. Mr. Ditchfield's "Summer Afternoon" (272), a delicately toned work, reminding us of the French landscape-painter, Sebillot; Mr. T. B. Hardy's "Waterloo Bridge" (178), with a heavily-laden hay-boat swinging in the tideway,—a capital little thing; "Driving Rain" (19), a clever work by Mr. Pocock; Mr. Glennie's fresh and broadly-treated sketch on "Keston Common" (181); Mr. E. Redgrave's "Felday Brick-kilns" (78), an unusual subject well treated; Mr. Wade's "Old Houses at Bassenthwaite" (231); Mr. F. Walton's "A Day of Sunshine" (295), a sketch with some individuality in idea and treatment; Mr. Jennings's "Old Place near Maidenhead" (431), and Mr. A. B. Donaldson's "The Moselle at Treves" (456), showing the characteristics of his very marked and original style, though not equal to some works of his we have seen. Mr. Heywood Hardy is zoological as usual, this time in the way of "Fishers of the Nile" (126), which in the vulgar tongue are called pelicans; and in our mention of architectural subjects we should have included the ruined "Hospitium at Waverley Abbey" (432), by Mr. J. H. Leonard, and Mr. C. Earle's "Under the Umbrellas, Verona" (69); the latter a rather brilliant and unusual study.

Some of the best things in the room are among the smaller drawings on the two screens. We may mention the "Fisherman's Cottage, Zuyder Zee" (561) by Mr. G. Clausen, who also sends a good little work illustrating the same part of the world, "Coming out of Church" (328); Mr. A. Goodwin's study of a green and weedy "Mill-stream" (562); Mr. Skill's little sketch of Rotten-row, under the title of "London—West" (572); Mr. F. G. Cotman's "Little Primrose Gatherer" (500), a charming bit of colour, though the aërial perspective of the landscape is somewhat puzzling; and Mr. Walter Crane's two drawings, "Whitby," and "Whitby Abbey" (468, 498), of which the latter, with the Abbey standing solemnly up in the middle of the scene, crown and massy, against an evening sky, is a very fine little drawing indeed, wherein the artist has perfectly realised his intention.

Without presenting much that is remarkable, the present exhibition strikes us as exhibiting a good many examples of originality in the choice and treatment of subjects, which renders it not an uninteresting one.

THE FIRST HOUSE OF THE ROYAL ACADEMY OF ARTS.

Taking up our gossip from where we broke off,* two other of the original R.A.s come to our fancy—John Baptist Cipriani and his dear friend and fellow countryman, Bartolozzi, the engraver. We see them always together, sharing the same thoughts and feelings, and pursuing their beloved studies with kindred perceptions, aspirations, and capacities. Angelo describes them as twin-like, and speaks of the delightful evenings of several years when his own family with these famous artists and the two distinguished musical composers, Bach and Abel, "formed a little friendly party, and amused themselves with drawing, music, and conversation, until long after midnight. Cipriani used to make sketches of heads, and groups of figures, to which Bartolozzi would with red, black, and white chalks add the effect."

Thus recalled to being in our fancy these old pictures come and fade as they came and went in life on the screen of Time.

Another slide in the magic lantern of dead men's memories shows us a great popular hero of his day, whose head still figures on public-house signs, the Marquis of Granby, sitting to Francis Hayman—familiarly known as Frank—the Royal Academy's first librarian, for a still existing portrait. The Marquis had in his younger days been a skilful boxer, and so too had Hayman, who was moreover an athletic man.

"So, friend Hayman," says the Marquis, "I understand you are an adept with the gloves."

"Once, my Lord, but the day has gone by."

"I' faith," replies his lordship, "so it was with me. Come, I see your gloves there in the corner, let us have a set to."

"I am gouty," says Frank. (By-the-bye, he died of gout in 1776.)

"So am I. We are about the same age and a fair match."

"But I shall not be in a condition to paint."

"Pho! pho! You will paint quite as well, and I shall look all the better for the exercise."

Mrs. Hayman, sitting in another room, was startled by suddenly hearing a succession of strange sounds, noises of rapid beating and heavy thumping, sudden jars with every now and then a terrible shaking of the entire house. These mysterious and alarming noises becoming more violent, and the thumpings louder and quicker, she started up and burst into the studio, where, to her astonishment, she saw her gouty husband and his illustrious gouty sitter, "knocking each other's heads about like two coal-heavers."

"Hayman," says Walpole, "was a rough man with good natural parts, and we still stumble over prints of his designing in old collections. His paintings at Vauxhall—very often falsely described as Hogarth's—were, in his day, much admired. He was chairman of the committee appointed for preparing the R.A.s' charter and organising its general plan."

But chief and foremost amongst the artists to whom we owe the R.A. stands George Michael Moser, the chaser, affectionately known in his latter days as "Old Moser," who dwelt in Craven-buildings, Drury-lane, near where Sir Peter Lely had dwelt before him, and close by the former lodgings of Mistress Nellie Gwynn when she resided in a house which is still standing, and which she knew as "The Cock and Pye." He became keeper at the Royal Academy in its first house (that of our little sketch*), where Roubiliac's first studio had previously been.† In Zoffany's famous picture,—that already alluded to as republished in the *Graphic*,—we see Moser giving the nude male model of the evening the handle of a rope suspended from the ceiling of the painting-room to sustain his arm in the right position. The artists of this academy were at first their own models, and took it in turns to pose upon the raised platform, remaining motionless for the space of one hour on each occasion. His daughter, Mary Moser, afterwards Mrs. Lloyd—her portrait hangs to the right over her father's head in Zoffany's painting of the year 1764—was also one of the original R.A.s. Moser, shortly after the death of Sir James Thornhill, in 1734, opened a private academy in the house of a painter named Peter Hyde, in Greyhound-court, Arundel-street, Strand, for a little coterie of artist friends, chiefly foreigners. They met regularly to study from the life on certain evenings of the week, and at these meetings the project of a Royal Academy of the Fine Arts, according to Angelo and others, was first conceived, and some years after, when they met in St. Martin's-lane, and were more numerous, matured. The preliminary business was, however, transacted at their favourite evening place of resort, the Turk's Head, in Soho.

Sir James Thornhill had, however, suggested a similar design in the reign of George I., and strove to give effect to it through Lord Halifax, but this attempt was a failure. He not only conceived its plan, but estimated the cost of its execution. Afterwards, other efforts were made, and there are in the British Museum copies of pamphlets issued from time to time by artists advocating the same idea. In October, 1753, a printed circular appeared from the St. Martin's-lane Academy, detailing a project "for erecting a public academy for the improvement of the arts of painting, sculpture, and architecture," and inviting all interested therein to meet at the Turk's Head aforesaid on the thirteenth of the next month, "at five in the evening precisely, to proceed to the election of thirteen painters, three sculptors, one chaser, two engravers, and two architects,—in all twenty-four." This was signed by Francis Milner Newton, as secretary; by Francis Hayman, as chairman; by George Michael Moser, the chaser (a Swiss); Roubiliac, the sculptor; Hudson, the portrait-painter; George Lambert, the scene-painter,—he who founded that famous Beef-steak Club which lived so long, and is on the point of being revived; by Samuel Scott, famous as a marine-painter, and for his views of Old London; by Robert Strange, the engraver, who was afterwards knighted, despite the known fact

* See p. 98, *ante*.

† Hogarth strongly objected to this establishment, although he presented to it several casts and other useful articles which had belonged to the Academy of his late father-in-law, in Covent-garden. He declared that it was the surest way of bringing artists to beggary by rendering their education so easy as one guinea and a half and two guineas per quarter, since it would induce hundreds of foolish parents to send their boys to keep them out of the streets, whether they had talent or not. And there was some reason in this, for at that time ordinary schools were very scarce.

* See p. 98, *ante*.

of his having fought for the Pretender. By-the-bye, there is an interesting story told of this well-known old artist, and we may here digress to briefly relate it.

When the rebels of 1745 were put to flight by Duke William, he was a soldier in the ranks of the defeated, and flying for his life, rushed through a door which chanced to be open, closed it, and, breathing heavily, made his way into a room where a young lady was seated, wearing one of those immense hoops then in fashion, singing and working. Hearing his pursuers approaching he implored her to conceal him, and, touched with pity, she bade him get under her hoop. Strange had been seen to enter the house. Scarcely was he covered when his pursuers, bursting into the room, saw only his protectress quietly singing and working as before, and, apologising, they retired. When the search was over, the lady,—a most amiable woman, who was afterwards the fugitive's wife,—helped him to retire in safety.

To continue our list of the committee. Next comes John Shackleton, one of the three names to which esquire is appended; William Hoare, Charles Grignion, John Ellys, esq., and Isaac Ware, the architect, of whom Mr. J. T. Smith tells so interesting a story that we venture to digress once more in telling it.

A thin, sickly, little boy, a chimney-sweeper, was amusing himself one morning by drawing, with a piece of chalk, the street front of Whitehall upon the basement stones of the building itself, carrying his delineations as high as his little arms could possibly reach. It happened that his operations caught the eye of a gentleman of considerable taste and fortune as he was riding by. He checked the carriage to watch the boy's doings, and after a few minutes called the boy to him, asking where he lived. A look of terror sprang into the eyes gleaming out of that little black face, and with tears streaming from them he begged that he would not tell his master of what he had been doing, and he would soon rub it all out. "Don't be alarmed," said the gentleman, as he threw him a shilling. The carriage was at once driven to the boy's master, who lived in Charles-court, in the Strand. He gave the poor little boy a good character, but complained of his propensity for "chalking," pointing out where his own walls were disfigured by the lad's chalk drawings of the famous porch of St. Martin's Church, a subject which figured thereon repeatedly. This gentleman purchased the boy's indentures, took him away, gave him an excellent education, and sent him to study at Rome. Smith says his father heard Ware tell this story of himself as he was sitting to Roubiliac for his bust, when he had grown prosperous by the practice of his art, and had not only a town residence in Bloomsbury-square, where the father of our present Prime Minister afterwards resided, but a country-house in Bayswater. We could, if it were not out of place here, point to a gentleman now living in Leeds, a famous dealer in and lover of pictures, who is accumulating a collection of which the world will some day gladly hear, and who some months since gave us touching glimpses of his early life as a chimney-sweeper in that most ancient and flourishing of English manufacturing towns.

Next on our list aforesaid comes Richard Dalton,—familiarly "Old Richard,"—he who was commissioned to bring Luccarelli, the king's favourite landscape-painter, to this country. He was a kindly-hearted, good sort of man, who has been evil treated since his death in connexion with the rise of the Royal Academy. He was one of "Gruff Dick's" (Richard Wilson's) best friends, and strove in vain to make King George believe in his friend's now famous pictures. He was the keeper of the king's gallery, and on one occasion said:—

"May it please your Majesty, might not a picture of Mr. Wilson's fill that space?" The king was, it may be remembered, induced to assent, and when the picture was finished, the king, hearing its price,—100 guineas,—denounced it as a daub, and expressed intense astonishment at such an exorbitant price being demanded for it. When a few days after Wilson called on Dalton,—being as usual most sorely in need of money,—the following conversation ensued:—

"*Dalton.*—Why—a—with regard to the picture;—as for my own opinion,—you know,—Mr. Wilson,—that—indeed.

Wilson.—Damme,—his Majesty doesn't approve. Speak out, man; I know your friendly zeal.

Dalton.—Why,—in truth, my dear friend, I venture to think the finishing—is—is—well—not altogether—altogether answerable to his Majesty's anticipations.

Wilson.—Humph! Not every leaf made out, hey? Not every blade of grass! What else?—out with it man.

Dalton.—Why, then, his Majesty thinks—that the price—is—is a—is a great deal of money.

Wilson (seizing Dalton by the button-hole, bending forward, and whispering).—Tell his Majesty I don't want to distress him. I will take it out in instalments of a guinea a week."

Peter Pindar, Dr. Wolcott, who received lessons in painting from Wilson, is the authority for this story. Again resuming our list, we pass on to James Payne; Joshua Reynolds, who, if we are not mistaken, was then living in St. Martin's-lane, where Sir James Thornhill had previously lived, and where Van Nost, the sculptor, cast from the life his famous mask of Garrick's face, and where, at another time, Hayman lived; Samuel Wale,—several of his views figure in Cassell's "Old and New London"; John Gwyn, the architect; John Pine, the portrait-painter; Gavin Hamilton; Thomas Sandby, architect; Richard Yeo; Thomas Carter, and John Astley. An amusing volume might be filled with the stories and anecdotes extant of these old artists and others associated with them; but we must glean no more from the sources where they abound, but hurry to a close.

In the year 1734 a society of art-lovers, called "the Dilettanti," was established. It consisted, not of artists, but of men of wealth and position, who had travelled in Italy, and its assumed purpose was a mere pretext for social enjoyment and the gratification of a desire of ranking high in the fashionable world as men of taste. To this Society, as one having funds at its command, the artists' appeal was specially directed, and most unfortunately, as they soon found out. The Dilettanti Society responded to the appeal. Its members came to the Duke's Head meeting, and we have reason to infer that an air of condescending patronage proved as offensive on the one side, as the air of sturdy independence and the pride of professional superiority were on the other, although Strange tells us that the artists formed the majority of those who were most to blame for the division which ensued. He says of them, "I was sorry to remark motives apparently limited to their own views and ambition to govern." The Society withdrew. The public only sneered at or ignored the appeal, and the project was perforce abandoned. In 1760 the first fine-art exhibition was held by this Society, in the room of the Society of Arts, where its great success* had much to do with the fact that in 1765 the same body of artists were more successful. They then obtained a charter, and formed a body corporate as "The Society of Artists of Great Britain," its crest and arms were chosen, and St. Luke's Day was appointed for the annual election of officers. F. M. Newton was secretary; Richard Dalton, treasurer; Lambert, the scene-painter, of whom we have already spoken, was the first president; Francis Hayman, the second; and the father of the once celebrated Mrs. Trimmer, Joshua Kirby, was the third. The latter had been long employed as a coach and house painter at Ipswich, and made his reputation by a work called "The Perspective of Architecture," &c., which was dedicated by permission to the king, to whom he had given lessons in architectural drawing, and by whom he was appointed keeper of the Kew Gardens. He won the personal esteem of the artists of his day, as well as his monarch's. Gainsborough was his most intimate friend, and had been from boyhood, when they studied together from nature, near Sudbury: he believed him to be the greatest genius of the age, and in return Gainsborough called him "Old pudging Josh,"—saying of his selection and execution in landscape paintings, "His lines are all straight, and his ideas all crooked, by Jove!" His treatise on perspective will long be memorable in connexion with the singularly eccentric and extraordinary frontispiece which was drawn for it by Hogarth.

While Kirby was president, the Society's fund having grown by successful exhibitions to a considerable sum, another powerful effort was made by a large number of the fellows to establish a Public Royal Academy therewith, but the twenty-four artists who had been elected directors or officers in that year opposing their desire, the effort was abortive. After many struggles, however, on the 3rd of March, 1767, a considerable majority of the members resolved "That it be referred to the directors to consider of a proper form for instituting a Public Academy, and to lay the same before the meeting in September next." But the directors were obstinate. Chambers and Paine, the architects, had resolved that the funds should be appropriated to the erection of a building for the Society. A petition was drawn up, and in March, 1768, presented to his Majesty, beseeching him to grant them a piece of ground adjacent to the Royal Mews, whereon the Society might build. This was signed by seventy officers and more than eighty fellows. Dalton had a scheme of his own to serve. Some premises which he had taken for a "print warehouse" were on his hands, useless; he thought the Academy could occupy the same, and lessen his loss from the somewhat heavy failure in business. In 1767 Mr. Moser announced the intention of the king to take the arts under his protection. Loud cheers followed, and unity seemed to be once more restored. Mr. Moser also announced that the first step consequent upon this would be the removal of the Society from Peter's-court, St. Martin's-lane (see sketch) to Dalton's premises in Pall Mall. The words "Print Warehouse" were erased from over the door, and "Royal Academy" put in their place, when it was discovered that instead of a free school all students would have to pay one guinea per year for its support. Fresh dissensions and new strife arose, and the party struggle grew so fierce that the Society's destruction was looked for. Law was appealed to, but the officers defied both the legal opinion and that of the fellows they represented, declining to adopt any modification of the Society's method of electing officers which might exclude them from power. But the Society at the next election, on the 18th of October—St. Luke's Day—left sixteen of the officers non-elected, and so broke up the obnoxious party in its government. On the 10th of November the eight old directors who had been elected resigned. Amongst these were West, William Chambers, Moser, Sandby, and Newton. The story of how these seceders re-established the Society under its new name of the Royal Academy has been a fruitful source of misrepresentation and controversy from that time until the present. Sir Robert Strange, in a pamphlet on the subject, says,—"The dissensions in the Society of Artists having reached its height, and the remnant of the old directors, whose attempts to obtain an arbitrary and responsible power had occasioned the dissension, having, by a vigorous effort on the part of the general body of members, become a minority, now with the help of Mr. Dalton" (between whom and Strange, it must be remembered, there was private enmity), "betook themselves to the king, and proposed an enlargement of the plan of the Royal Academy, so that it might only serve their views of triumph over the society from which they had seceded." Chambers, West (to whom the king first intimated his willingness to support the seceders), Cotes, and Moser, were the real authors of the new project to which Strange alludes, as Northcote tells us in his "Life of Reynolds." Reynolds joined them with reluctance after they had completed their plan, and only after much earnest and persevering solicitation, and after he consulted his friends Dr. Johnson and Sir Edmund Burke, whose advice he followed. Both parties felt certain of the royal support; Kirby had assured the members from his chair of office that his Majesty George III. would patronise them and their exhibition. The bulk of those who supported Sir William Chambers's party were foreigners, and on the 10th of December, 1768, their plan received the royal assent, and was duly signed by those who formed the thirty-six original Royal Academicians, to whom, making forty, were afterwards added Edward Burch, Richard Cosway, Joseph Nollekins, and James Barry. Their first meeting was held on the 14th of December. In Galt's "Life of West," we are told how Kirby, anxious that West should exhibit his picture of "Regulus," the latter promised to do so with the king's permission, when the king, to whom the picture belonged, and who was present, said "Assuredly I shall be happy to let the work be shown to the public." "Then, Mr. West," said Kirby, "you will send it to my exhibition," meaning that of the Incorporated Society.

* We have not the requisite space at command, or it would be interesting to show how important was the influence of this exhibition, and those which succeeded it in Spring-gardens, in creating a feeling of interest in art amongst the general public, and raising the funds which were needed. In 1763 the sum raised was 680*l*. At first the money was applied to charitable purposes, afterwards to the establishment and support of the Society in connexion with the projected Royal Academy.

"No," interrupted the king firmly, "it must go to my exhibition—to the Royal Academy."

The affair had been kept secret, at the king's request, on political grounds. This was the first intimation Kirby received of the Chambers party's triumph, and Galt says "his colour forsook him, his countenance became yellow with mortification, he bowed with profound humility, and instantly retired, nor did he long survive the shock."

The old Society was at an end, and the new one reigned in their place in St. Martin's-lane. Many of the old members lost even the valuable statues and busts, &c., which they had placed in the painting hall. Strange headed the so suddenly and unexpectedly defeated party, and they petitioned the king for redress, and the king promised to give no more encouragement to one than he did to the other side, but did not keep his word. The old society lived apart in new premises, dwindling and fading for want of royal favour and fashionable support until 1807, when the Incorporated Society of British Artists was no more. In 1836, when Martin Archer Shee was P.R.A., the last living member of the old body, Mr. Polard, aged eighty-one, being poor and in great difficulties, was induced to surrender the old Society's charter, &c, to the new one, and in 1838 he died.

These were some of the men and their chief doings, with which the old walls of the Royal Academy's first house were familiar. Were our paper not already much too long, there are other stories to be told of those who studied there as boys whose names are now brightest on the scroll of England's most famous artists. On the site of the house was afterwards erected a Quakers' meeting-house, and a Quaker's son, West, had here reigned as president of those arts which our old-fashioned Quakers held in contempt as frivolous, or in detestation as vicious. Thus time worked and still works curious and pregnant changes.

THE NEW NATURAL HISTORY MUSEUM, SOUTH KENSINGTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

The first of the Saturday afternoon visits of the Architectural Association for the present session to buildings in progress was made on the 29th ult., when the new Natural History Museum at South Kensington was inspected, so far as the dense fog prevailing at the time would permit. The visit was originally arranged for a fortnight earlier, but was postponed on account of the inclemency of the weather; and could the fog of Saturday last have been foreseen, another postponement would certainly have been made. Notwithstanding the inauspicious state of the atmosphere, the members of the Association mustered from eighty to one hundred strong, and Mr. Waterhouse, the architect, having kindly arranged to be present and conduct the members over the works, the most was made of the occasion. The building, as will be known to many of our readers, will exemplify the use of terra-cotta as an architectural and constructive material to an extent not yet carried out in any other modern English building, the whole of the *façade* and of the walls and architectural members of the interior being entirely of terra-cotta, with the exception that some if not all of the columns of the interior will carry the weight they are destined to bear by means of iron stanchions, which will be surrounded by terra-cotta. The style adopted is Romanesque, which Mr. Waterhouse explained is better adapted to the exigencies of the material than Italian or any other style. The Museum, of which a view has already been given in the *Builder*, will present one very notable feature of arrangement, viz., the "Index Museum," which will be the largest apartment in the building, and approached directly from the principal entrance in the centre. This "Index Museum" will, as its name imports, serve as a general key or guide to the whole contents of the Museum, and will form, together with the British Natural History Museum in its rear, the really popular part of the collections. The building will be unique as to its ornamentation, which will be entirely based on the extinct and living species of birds, beasts, fishes, reptiles, and insects, of which examples will be exhibited in the museum. Of course these present an endless variety, and the manner in which the different specimens have been modelled by Mr. Dujardin (of Messrs. Farmer & Brindley's) has met with the unqualified approval of the architect. The extinct specimens have been modelled from fossils now in the British Museum. The floors will be of fire-proof construction, but boarded over instead of tiled, as curators find it exceedingly unpleasant to be constantly on a tile floor. The whole of the ironwork used in the building comes from Belgium,—a fact well worth pondering over by British workmen. The stairs will be of stone; Mr. Waterhouse would have liked them in terra-cotta, but did not think it was possible to get the requisite truth of line in that material. It is not intended to light the whole of the building with gas, on account of the extreme danger which would arise, owing to the fact that the fish are preserved in spirit. In case of fire the stoppers of the jars would fly out, and the burning spirit would be all over the place, carrying destruction wherever it went. It is contemplated, however, to close all portions of the Museum in the evening except the "Index Museum" and the British Natural History Museum, which will be, as before stated, the really popular portions of the building, and these it is proposed to light with gas. The heating of the building will be effected by boilers placed below the British Natural History Museum. The foul air was originally intended to be carried off by the two towers, which were cut down by Mr. Ayrton, and which, though not included in the present contract, the architect hopes will be built in their integrity. If the towers are not built, some modification in the scheme of ventilation will have to be devised. The whole of the basement fronting the Cromwell-road will be occupied by workshops, the rear portions of the basement being devoted to store and lumber rooms. In concluding his remarks in elucidation of the plans, Mr. Waterhouse, quoting the motto "Honour to whom honour is due," said he had been most ably assisted by his old pupils, Messrs. Cooper and Isaac Steane, by Mr. Farquharson (clerk of works), and by Mr. Dujardin, who, as before stated, has modelled all the ornament. A word or two on what, though a trifling incident of Saturday afternoon's visit, might have been a very serious matter. It is always a sufficiently dangerous task to conduct a large party of visitors along the scaffolding of a building in course of construction, and it is therefore desirable that all extraneous sources of danger should be stopped while such a visit is in progress. While the party was proceeding along one of the scaffolds at the Museum on Saturday last, some men who were at work on a scaffold above dropped two or three bricks, which fell within 18 in. or 2 ft. of several of the visitors, shattering one of the terra-cotta blocks. The men were of course ordered to stop working, but not until what might have been a fatal accident had occurred. In future visits it will be well if somebody in authority will think of the old adage anent the futility of locking the stable-door after the steed has been stolen.

MEETING OF THE INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, January 31, the president, Sir G. G. Scott, R.A., in the chair, the following members were elected, viz., Mr. J. B. Badock, of Staple Inn, as Fellow; and Mr. C. R. Pink, of Winchester, and Mr. J. B. D. Wall, of Stamford-hill, as Associates. Several donations to the library were announced.

Mr. C. L. Eastlake, secretary, then read a letter with reference to architectural drawings for

THE PHILADELPHIA INTERNATIONAL EXHIBITION,

which said,—

"The Executive Commissioners for the Philadelphia Exhibition have reserved, in the section of the Fine Art Gallery allotted to Great Britain, appropriate space for the exhibition of architectural designs, and they indulge the hope that the Council of the Royal Institute of British Architects will co-operate with them, in this direction, in order to secure a worthy representation of the architectural art of this country at the approaching Exhibition.

So many important buildings have been erected in London of late years, distinct in character from anything which exists in America, that it seems specially desirable that the space allotted to British architectural designs should be well and adequately filled.

It is desired that such office drawings and elevations as those ordinarily sent to the Royal Academy may be contributed on this occasion, and I am directed by the Lord President of the Council to state that the designs confided to the Executive Commissioners by any members of the Institute will be sent to and from Philadelphia at the cost of the Commission.

His Grace trusts that the Council of your Institute will take such steps as may seem to them expedient, to make the proposals contained in this letter known to architects, and that the Council will generally advise the Executive Commissioners in what manner an adequate representation of architectural designs may be best attained.

F. R. Sandford, Executive Commissioner."

All architectural drawings intended for the Exhibition should be addressed to Mr. Thompson, at the South Kensington Museum, during the first week in March. The drawings will be conveyed to Philadelphia under the care of Mr. Joseph Jopling, the fine-art superintendent (British Section), who will see that they are carefully returned to their owners at the close of the Exhibition.

An Insult Resented.

Mr. C. F. Hayward said he had just seen on the library table of the Institute several advertising pamphlets or circulars with reference to an invention which he particularised (but which shall here be nameless). Between the pages of each of the pamphlets was a little slip of paper, stating that "25 per cent. commission" was "allowed to architects." He asked for some explanation as to how the circulars got upon the table.

Mr. Eastlake said they were sent to him by the tradesman or patentee "for distribution." Of course he never thought of distributing them, but, instead, placed them on the table, which was the course customarily pursued. He was quite unaware that they contained the insulting offer referred to by Mr. Hayward, or they would have been consigned to his waste-paper basket.

The President thought the best thing to do was to transfer the papers to the fire, and inform the sender that it had been done, and wherefore.

Mr. C. Fowler hoped the matter would not be allowed to drop in that way. The offer made on the circulars in question was a most gross imputation on the honour of the profession,—so gross that it ought to be formally repudiated by the Council on behalf of the Institute. He suggested that the Council should pass a formal resolution on the subject, and should give the utmost publicity to the views of the Institute on the matter.

Mr. B. Ferrey fully concurred with what had fallen from Mr. Fowler, and thought it was high time that some notice should be taken of such insulting offers as that referred to by Mr. Hayward. The profession had, as a body, remained uncontaminated by such offers, but its members were continually being taunted with receiving commission from tradesmen.

The President thought that it was perhaps hardly necessary to take any special steps for the repudiation of such offers, as it would be investing them with too much importance.

Mr. Arthur Cates thought that if any notice were taken of the matter, it should be definitely stated and given forth that one of the principal conditions of membership in the Institute was that each member was bound in honour not to receive commission on account of goods supplied by tradesmen, and that any member receiving such commission would be expelled the ranks of the Institute. If such offers were allowed to be sown broadcast without protest, it would naturally enough be thought that they met with the wished-for response.

The President thought it would be best to burn the papers, as he had suggested, and for the members to strike the offending tradesman or patentee off their lists, and not employ a man who offered such a gratuitous insult to the profession.

The matter then dropped, and the Rev. Mackenzie E. C. Walcott, B.D., read an extremely long but interesting archæological paper on "Old Cleeve Abbey." An abstract of the paper, with a brief report of the discussion which ensued, will be found on another page.

The next ordinary general meeting will be held on Monday evening, February 14th, when a paper, "On the Erechtheum at Athens," is announced to be read by Mr. J. Fergusson, D.C.L., F.R.S.*

The Ordnance Survey of Scotland.—At the last meeting of the Highland and Agricultural Society, the secretary read a report on this subject, stating that a deputation from the Society waited on the First Commissioner of Works to ask a grant to complete the unfinished survey of Scotland, and that a communication had since been received to the effect that in face of pressing demands from all parts of the kingdom, the First Commissioner deemed it impracticable to comply with the request.

* An adjourned special general meeting to consider the report of the special committee on the affairs of the Institute will be held on Monday evening next, the 7th inst., at *seven* o'clock, "for the purpose of considering the amendments and motions already before the meeting, and such others as may be brought forward for consideration."



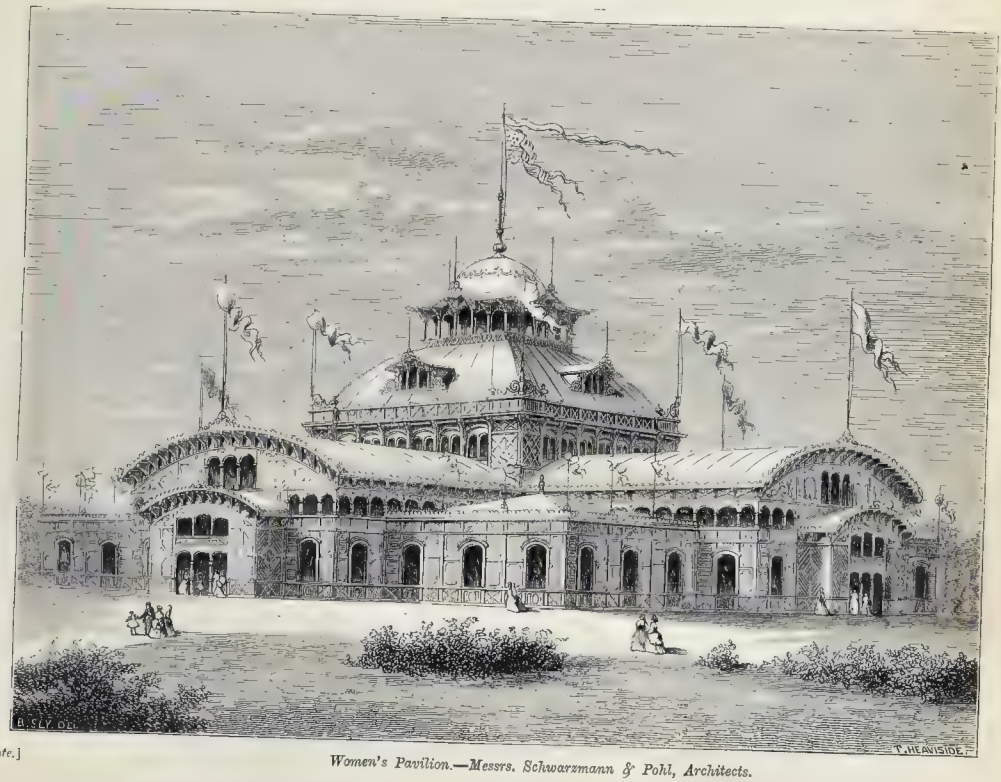
INTERNATIONAL EXHIBITION, PHILADELPHIA, 1876.—THE MAIN E



United States Government Building.—Mr. James H. Windrim, Architect.



TION BUILDING. —MR. H. PETTIT, ENGINEER; MR. JOS. M. WILSON, ARCHITECT.



111, *ante*.]

Women's Pavilion.—Messrs. Schwarzmann & Pohl, Architects.

OLD CLEEVE ABBEY.

THE Rev. Mackenzie E. C. Walcott, B.D., read a paper "On Old Cleeve Abbey" at the meeting of the Royal Institute of British Architects on Monday evening last, as already mentioned. The paper, which was exceedingly long (occupying twenty-five pages of the Institute "Transactions," whereas the average length of a paper read before the Institute is only about eight pages), was illustrated by a number of tracings of pavements and tiles from the abbeys of Cleeve, Muchelney, and Athelney, and by ground-plans of some representative English and Continental abbeys. Having spoken of the choice of site and general arrangement of a Cistercian abbey, with reference to exceptional treatment in the ground-plan, the author gave an account of the exhumation of Old Cleeve Abbey Church, made at the cost of Mr. Luttrell, of Dunster Castle, of which he gave the first intelligence in a letter to the *Times* of August 25, 1875. He proceeded to offer a succinct account of the daily life and ritual of the Cistercian order, and the purposes to which their buildings were allotted, with their furniture and arrangement. Attention was drawn to the apparent peculiarities of the abbey, such as the aisleless chapter-house, the position of the day-stairs to the dormitory, and the refectory lying east and west (of which other instances were adduced), and approached by a high flight of stairs. The true position of the retro-choir and cemetery was ascertained, whilst several erroneous theories were combated: for instance, the alleged invariable ground-plan, which is disproved by existing remains; the choice of a site on picturesque grounds, whereas it was designedly selected from its unhealthiness; and the misuse of the terms fratry (meaning, in fact, a confraternity) applied to the chamber properly called, from its fire-place, the calefactory; and of *Domus Conversorum* (the special name for a house of Jewish converts, now the Rolls Court), as the designation of the chambers of the lay brothers. These points were confirmed on the authority of the Ritual and Statutes of the General Chapter, compared with the chronicles and inventories of the English abbeys. The lecturer exhibited tracings of a beautiful pavement found during the excavations, composed of tiles of a heraldic character, and of the most graceful design, which he further illustrated by those found by Mr. Shelmerdine at Muchelney, one of which contained a representation of an elephant nearly of the same date as one carved by Bishop Bruère, an Oriental traveller, on the miseriœrds in Exeter Cathedral, and earlier than the famous portrait in the Cottonian MS. of the first elephant brought to England in 1255, according to Matthew Paris. The conventual buildings round the Cloister-square retain roofs and floors, and form the most perfect series not in ruins existing in this country. The south wall of the nave, and a large portion of the south transept, are also standing. The foundations of pillars and other portions of the fabric are now exposed, and the whole site has been fenced in. In conclusion, Mr. Walcott referred to the purity and refinement of the Cistercian buildings, which attained the highest architectural effect, without the slightest use of meretricious ornament. He commended the study of Cistercian architecture to the younger members of the profession, and in that study they could have no abler guide than Mr. Edmund Sharpe. It was a study, moreover, which could be pursued without going, like the troubadour of old to find his lady-love, to Italy, France, and Spain. Finally, all would be the better for more fully bearing in mind the old motto of the Cistercian builders,—"*Laborare est orare.*"

In the discussion which followed,

Mr. B. Ferrey said that while in Somersetshire last summer he came across Mr. Walcott when he was pursuing his investigations at Cleeve Abbey, and from what he (Mr. Ferrey) then saw, together with what was stated in the paper, he (speaking as an architect) was disposed to agree with the conclusions arrived at by Mr. Walcott. It would well repay any member of the Institute who happened to be in that part of the country to go from Taunton down to Watchet and visit the interesting remains brought to light by Mr. Walcott.

The Rev. T. W. Baker briefly described the discoveries which he had made at Beaulieu Abbey some years ago.

The Rev. Thomas Hugo referred to the discovery made by him many years ago of the common-seal of Cleeve Abbey, which represented an abbot with his crozier kneeling before the Madonna and Child, under a beautiful canopy of Early English work. He believed that a careful study of these monastic seals would be the means of throwing a great deal of light on monastic architecture, and he asked the Institute to accept an engraving of the Cleeve Abbey seal.

The Rev. Mr. Denton thought that Mr. Walcott had not quite apprehended the reason why the Cistercian monks chose the sites they did for their monasteries. It should be remembered that they had the exclusive sale of wool for a long time, and they were also the great leather-sellers of their times. The sites were presumably chosen rather with reference to the facilities for carrying on these branches of trade than with regard to the beauty or otherwise of the site.

Mr. Loftus Brock said that Mr. Mackenzie Walcott's drawings and tracings exhibited on the walls were the result of true archæological work; in other words, they were obtained, not by taking books and copying a little piece out of one, and a little piece out of another, but by going to work with mattock and spade. He thought that Cleeve was the most perfect example of a Cistercian house in the whole kingdom, and he hoped that Mr. Walcott would take steps to put on record in some tangible form the valuable information which he had gleaned respecting it. He thought archæologists might take encouragement from what had been discovered at Cleeve, for the site appeared to be one of the most unpromising that could possibly be explored. There were 500 sites of abbeys in England yet to be investigated, and he trusted that the success met with at Cleeve would prompt the investigation of some of these sites.

Mr. Edmund Sharpe then, with the aid of plans which he exhibited, proceeded to enter minutely into some of the points of difference between the conclusions arrived at by Mr. Walcott and those arrived at by himself. He (Mr. Sharpe) contended that the primitive type of Cistercian abbey to which he had referred in his works, was only to be met with in the twelfth and thirteenth centuries. Cleeve was, it should be remembered, only a small abbey, and the rules which were observed in the first two centuries of the order were utterly neglected in later times. The monks fell off, not only in diet and in morals, but in architecture. He was willing to admit that there were examples in which the Cistercians did not follow the universal rule of putting the refectory transversely, but longitudinally; but the exception proved the rule. In twenty-one examples of which he had drawn the plans to scale, the refectory was at right angles to the church,—*i. e.*, due north and south. He defied Mr. Walcott to show him a fireplace in a *fraterium* so early as the twelfth century. As to the cause which had determined the sites of Cistercian abbeys, he thought that seclusion was the only object; for there was no trade in wool until long after the abbeys were founded. In conclusion, Mr. Sharpe said he accounted for the different views taken by him and Mr. Walcott by the fact that the architect illustrated his reading by his plans, whilst the archæologist illustrated his plans by his reading.

Mr. William White, F.S.A., in proposing a vote of thanks to Mr. Walcott for his paper, said he believed it would be universally found that in the early ages the monks made a special point of placing every building which was essentially secular at right angles to the church, the church being always east and west; therefore he thought there was good ground for supposing that the refectory at Cleeve ran north and south.

Mr. B. Ferrey, in seconding the motion, said that the thanks of the Institute were also due to Mr. Sharpe and the other gentlemen who had taken part in the discussion.

The Chairman (Sir Gilbert Scott), in putting the motion to the meeting, said "Who shall decide when doctors disagree"? Mr. Walcott and Mr. Sharpe had both given a great amount of study to the subject of Cistercian abbeys, and both were well entitled to speak on the subject. As to the position of the refectory, one gentleman brought twenty examples to show that it invariably ran north and south, while the other brought a dozen examples in which it ran east and west. He (the Chairman) differed from Mr. White in saying that the Cistercians took pains to place their buildings for secular purposes north and south; there were no special reasons, religious or otherwise, why they should do so. He thought that as architects the members of the Institute would feel deeply indebted to Mr. Walcott and Mr. Sharpe for having brought under special notice, now and on former occasions, the grand simplicity and purity of the early Cistercian architecture. Every architect might take useful lessons from it. However much it might be the fashion to use carving and other enrichments, it should never be forgotten that fine and noble architecture was possible without any of those added "spices." The early Cistercians build without any carving, absolutely forbidding all sculpture, all stained glass, and all wall painting; yet they erected buildings which were not excelled in grandeur,—stern grandeur, it might be,—by any architecture which could be found. Kirkstall Abbey, one of the earliest Cistercian buildings, was a grand lesson to those architects who, like himself (the Chairman), were somewhat given to luxuriating, and it served to call to mind Solomon's advice,—"Put a knife to thy throat if thou be a man given to appetite."

The vote of thanks having been carried,

Mr. Walcott, in replying to some of the points raised in the discussion, said that archæologists proved their theories by their facts and by documentary evidence. He was unable to find the equivalent of the term "day-room," as used by Mr. Sharpe in connexion with Cistercian buildings; indeed, he believed the term was first introduced at the Penitentiary at Westminster.

The meeting concluded with an announcement by Mr. Sharpe that the thorough exploration of Bylands Abbey was about to be undertaken by the Yorkshire Archæological Society.*

A PIONEER ENGRAVER.

THE reputation of Dr. Alexander Anderson rests on the fact that he was the pioneer engraver on wood in America, and the virtual inventor of the art on that side of the Atlantic. The story of the career of this remarkable man, who may be styled the Bewick of America, is far less known than it deserves to be. Indeed, he may be said to be altogether unknown in this country. He was of Scottish descent. His father was, we believe, a printer in Edinburgh, and emigrated to New York about the year 1770, in which city Anderson was born, on April 21st, 1775. The old War of Independence had just broken out, and it may be noted as a somewhat curious circumstance that not only did Anderson, senior, differ in politics from most of his countrymen in America at that time, who were generally distinguished for their loyalty to King George, but we find him among the very first to espouse the republican notion, and one of its most energetic and uncompromising advocates. He started a Republican newspaper, under the title of the *Constitutional Gazette*, and when, in the autumn of 1776, the British took possession of New York, the rebel printer was obliged to fly, with his goods and chattels, nearly all of which were lost before he reached a place of safety in Connecticut.

As early as his twelfth year young Anderson would seem to have begun to handle the graver as an amusement. He had no guide or instructor; but, as the poet tells us, "Genius finds its own road, and carries its own lamp." He gained his knowledge by silent observation and experiment. Many self-taught men of whom we read have found the means to gratify their early thirst for knowledge by poring over the open pages in the booksellers' windows. In like manner, Alexander Anderson, by peeping into the shop-windows of silversmiths, saw the shape and the method of manipulating the graver in the lettering of spoons. Rolled-out copper cents gave him his plates for first efforts. Notwithstanding the many difficulties that lay in his way, he made rapid progress in the art, and by his seventeenth year his proficiency was so great that he was commissioned by a bookseller to copy the illustrations of that once popular little book, "The Looking-glass for the Mind." These illustrations were by Thomas Bewick, the father of modern wood-engraving. Anderson had completed nearly half of the illustrations before he was aware that Bewick's were made on boxwood. His own engravings up to this time were all on type-metal, and it appears he had no idea that wood was used for the purpose. Here was a most important discovery, which must be turned to account. The young pioneer engraver immediately procured pieces of boxwood from a rule-maker's shop, invented proper tools, experimented, and, to his great joy, he found the material much more agreeable to work upon and more easily managed than his type-metal.

* Some further particulars of the discoveries at Cleeve Abbey will be found in the volume of the *Builder* for last year, p. 801.

Several of these blocks are still in existence. They are considerably worn by use, to be sure, but they are treasured as the very earliest specimens of wood-engraving in America, executed eighty-two years ago.

About this period of his life Anderson began to take a deep interest in the study of medical science, and this proclivity was fostered and encouraged by his father, who rather deprecated the notion that his son should be an engraver. The profession of a physician was much more to the parental taste. Accordingly, out of deference to his father's wishes, Alexander prosecuted his medical studies. In May, 1796, he received the degree of Doctor of Medicine from the faculty of Columbia College. The subject of his diploma address was "Chronic Mania," and it is no small compliment which has been paid to the youthful M.D.,—for he was only twenty years of age,—that the theories which he then advanced concerning lunacy have since become well-established facts in medical science. But he had not lost his passion for art. In the first year of his practice Dr. Anderson drew and engraved on wood a full-length human skeleton from Albinus's "Anatomy," which he enlarged to the length of 3 ft. This, it is believed, is one of the largest and most carefully elaborated engravings on wood ever attempted, and is said to be admirable, both in drawing and execution, even when compared with the art at the present day. Shortly after this, Dr. Anderson had the misfortune to lose the whole of his family by yellow fever. He himself was attacked, but recovered, and with a view to recruit his strength he took a voyage to the West Indies, where he had a maternal uncle, Alexander Anderson, who was "the king's botanist" at St. Vincent. On his return to New York,—that is, in his twenty-fifth year,—Dr. Anderson resolved to abandon the medical profession and devote himself entirely to engraving. He could not forget his first love. Anderson preferred wood-engraving, but the demand for it being small he practised on copper, receiving instruction from an eccentric Scotsman, one John Roberts, a friend of Anderson's deceased father, who painted miniatures, etched and engraved on copper, was a clever musician and mathematician, and a competent draughtsman,—in a word, a sort of universal genius. Unfortunately Roberts was as dissipated as he was clever, and though Anderson gained great proficiency under his instruction, Roberts's habits of intemperance were such as to compel Anderson to give up the advantages which he might have derived from that artist's practical suggestions.

During his long and busy life, Dr. Anderson engraved many thousands of subjects. Among his principal works were illustrations on copper for Josephus's "History of the Jews," executed so long ago as the year 1799. In 1808 he executed on wood about seventy illustrations for an American edition of Bell's "Anatomy," copied from the originals, etched by Bell himself. He also furnished engravings for a quarto Bible. Between 1850 and 1855, he executed nearly 100 illustrations of Shakspeare's plays from original designs. But his most popular work is the illustrated edition of "Webster's Spelling book," which, for over seventy years, has been a leading elementary class-book in the schools of the United States. Its sale has been enormous, and at one time amounted to about a million copies a year. In 1857 a new and more fully embellished edition of that work was published, the engravings being again executed by Anderson from drawings by Morgan, one of his pupils. Indeed, he found continual employment for his remarkable abilities, until called upon to lay aside every implement of labour for ever. He was eighty-seven years of age before his hand had lost its cunning. Only two years previously, when he had completed his eighty-fifth year, Dr. Anderson issued a new business card, drawn and engraved by himself, bearing the appropriate motto, "*Flexus non Fractus*," and also executed his own portrait. Dr. Anderson's reminiscences extended back to the closing scenes of the revolution, and his fund of anecdote and geniality of conversation made him a favourite with all who came in contact with him. With most of the literary and professional men of New York, in the early part of this century, he was familiar, and was universally beloved for his sterling virtues. Washington Irving, who was one of the earliest friends of his youth, used to relate how he learned from Anderson to play the flageolet. At the time of his death, which took place in 1870, Dr. Anderson had reached the patriarchal age of ninety-five. He discovered the art of long life by observing two things,—regularity and temperance. "I would not," he was wont to say, "sit up after ten o'clock at night to see an angel." And so passed away an American Scotsman of the good old stock, whose name has been familiar to booksellers and readers in America for more than half a century, and whose mysterious little monogram, "A. A.," in the corners of woodcuts in educational books, has attracted the attention of millions of children in the schools and at the firesides of the United States.

THE GOLDSMITHS' ART IN SOUTHERN INDIA.

The native gold and silver smiths of Madura have long been celebrated, and consequently it was resolved that when the Prince of Wales visited the ancient city it should take the opportunity of displaying its loyalty by presenting to him such a specimen of workmanship as would give him reason to be pleased to remember the dusky donors and to entertain some pride in counting them among his future subjects. The needful funds were soon forthcoming, and after much consideration designs were selected for a casket, to contain the usual loyal address, and also for a sort of throne, which it was resolved to offer to the future emperor as a sort of memorial of his visit. Such works are not completed in a day, and for many months the native artists were busy with their task, and were just finishing it when the startling intelligence arrived that the royal tour through the South would not take place. The local consternation was great; for Madura was one of the places specially tabooed. Orders were given to destroy the arches which had been erected, and intending visitors warned that they need not come. But the Madura folks were full of faith, and at the eleventh hour it was rewarded. His Royal Highness has been slightly wilful throughout his trip, and insisted on seeing the Madura temples, notwithstanding the advice of his counsellors; and the consequence is, that both the casket and the throne are now included among his belongings. The former is of pure beaten gold, the length being 10 in., the breadth 6 in., and the depth 7 in., and contains 200*l.* worth of gold. The elaborate figuring illustrates the mythological stories of the goddess of the great temple. The corners are cut away to make room for Tarlis—mythical animals frequently represented in the buildings of the town. The back panel of the box contains a representation of the coronation of Menachi, the last of the Pandiyan line, she being the daughter of the last king, Malayadwajan. The Pandiyan power having passed into the hands of a female, the secular power was weakened, till, after a lengthened period, the priests defied her, and ruled in her name. Hence the honour rendered to her was but a mere political trick to confirm their own power. The panel at one end of the casket represents the Thikuvijayam,—a ceremony in which the new sovereign shoots arrows to the eight points of the heavens, thus asserting supremacy. Menachi was encountered by Sundereswaran, who disputed her authority and also claimed to be her lord. She recognised him by predicted secret signs, and owned him as her future husband. The third group on the front portrays the marriage of Menachi with Sundereswaran; and the fourth group, on the other end, represents the bestowal of the sceptre, and the transfer of the temporal power to the dynasty of the Naicks, but really indicates the support accorded by the priesthood, which was purchased by the endowments given to the temple. The top has in the centre an oblong dome, richly chased with a raised ridge, bearing the inscription "Madura, 1875." Two panels, each containing ten niches separated by columns, from which spring graceful arches, represent respectively the ten incarnations of Vishnu, and the ten forms of Eswaran. Each of the two side panels contains five separate niches, the centre ones with figures of Subramaniya, the god of war, and Pilleyar, the belly god. The other niches are filled with their supporters. The four corners of the lid are filled with intertwining serpents. Round the panels runs a double margin, half an inch wide, of richly-chased scroll-work. The throne is made of pure silver, lined with crimson damask, spangled with silver stars. The four legs are formed by mythical animals rampant, having the body and head of a lion, and the trunk of an elephant. The arms are formed by two silver lions passant. The back is a Hindu arch, supported by miniature columns, in the centre of which are the Royal Arms of England, surmounted by the Prince of Wales's crown. Springing from twin columns rise two spiral supports for the canopy. Round this canopy runs a fringe of silver band network, with silver beads and crimson tassels. The Prince of Wales's feathers, chased in silver, appear supported apparently by two mythical birds. In the centre of the lower surface of the canopy is a large silver boss. This throne is accompanied by a silver footstool, formed by four lions couchant.

OUR SOURCES OF SUPPLY.

MEMEL AND ITS TIMBER TRADE.

Memel, with the name of which most of our readers are familiar, is a little German port on the Baltic. It used to be a very picturesque place, from the number of windmills which it contained, and by which it was surrounded, but it is rapidly losing its quaint old-world look before the progress of steam. There are still about a score of the long-armed aërial motors which may be counted from the sea, and all are employed in sawing timber; but there are quite as many more establishments of the same kind which depend solely on engine and boiler. The population numbers about 25,000, and all are dependent on the traffic in wood. The trade is conducted as follows:—Timber cut down during the winter in the large forests of Poland and Galizien is floated down the river Memel and its tributaries to the Prussian village of Russ, situated about thirty English miles from Memel, into the Kurische Haff. Here it remains until sold, and then is formed into more secure rafts and sent to Memel at the risk of the Prussian purchaser, either by way of the Kurische Haff or the King William Canal. The latter is the more expensive if the more secure route. This canal was dug in expectation that all the timber-rafts would pass through it, but thus far it has proved almost a complete failure. In order to get into the canal the rafts have to go about three miles up the Menge, a small river, which is sometimes too shallow, and sometimes too strong in the current to force the rafts against it. If the canal is therefore to be of any use it will be necessary to extend it for these three or four miles to Memel itself, when it may be made a paying concern. The port itself, although difficult to approach in stormy weather, possesses many advantages over the other Baltic ports. The harbour is excellent, and is rarely closed by ice, and then only for a few days, so that almost at any time ships can enter far enough to be in safety. Its progress, however, has been greatly checked by the want of railway communication with the interior of Russia. All the more valuable goods are forwarded to ports possessing this facility, the time gained, and the speedy exchange of merchandise into money, fully counterbalancing any additional expense. It is expected that the early opening of the Memel-Tilsit line will, in great measure, remedy this defect, and will also bring back many branches of commerce which formerly flourished in the town. The protective duties levied by Russia also have a most pernicious effect, and as yet all the exertions of the Prussian Government to get greater facilities have been unsuccessful, and the sole chance of amendment in this direction lies in the hope that Russia will soon discover that lower duties and less protective measures would be of equal benefit to herself and her neighbours. At Memel the round timber which is brought from Russia, as above described, is sawn into planks, and made ready for shipment by sea-going vessels. Close upon a million pounds worth is exported in the year, and England is the chief customer. The Government indulges in the hope that all present disadvantages may be soon overcome, and last year expended nearly 50,000*l.* in the improvement of the port.

Will of the late Mr. Foley, R.A.—The late J. H. Foley says in his will, "I desire that my two assistants, Mr. Brock and Mr. Dewick, and Charles Bell Birch, finish all my works now in progress according to the models." We have seen a correspondence, in the course of which the executor of Mr. Foley and his solicitors give various reasons why Mr. Birch has not been employed, and is not being employed, as desired by Mr. Foley. The clearness of the instruction makes us very much disposed to think that the law, if appealed to, would give Mr. Birch compensation for the loss sustained.

PROPOSED SANITARY CONFERENCE.

AT a meeting of the Joint Committee of the Council of the Social Science Association and of the British Medical Association on State Medicine, held on the 12th of January, it was resolved to hold "a thoroughly efficient representative Sanitary Conference, to discuss the organisation and administration of the sanitary laws." It is proposed to hold the Conference in April next, and the secretaries have been requested to draw up a paper stating their views as to points specially demanding attention in the present law, and with special reference to the Public Health Act, 1875, and of a general scheme for transaction of the business of the Conference.

BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY IN ROME.

THE meetings of this Society are going on vigorously. According to Forbes's *Tourist's Directory*, the promenade on Tuesday, January 18th, was over the Esquiline. The Society traced the remains of the agger from the remains of the tower, with the masons' marks, to the arch of Gallienus. The auditorium or green-house was then visited and its frescoes examined, also the remains of the agger near by. The Nymphæum of Alexander Severus was examined, and the ruined aqueduct that supplied it with water. Next, the round building called a Castellum Aquæ, a tomb, a Mediæval castle, though its actual use is difficult to demonstrate. It consists of four oval towers, formed with the outer circular wall, having a small court in the centre; it is built of concrete, which was probably faced with marble or stone. Beneath each tower is a chamber which may well have been for sarcophagi. In the court was a *Cippus*, with the following votive inscription to the fortunes of the baths of Verulanus:—"FORTVNABVS BALNEI VERVLIANI Q HOSTILIVS AGATHOPVS. *Donum Dedit.*" It is not known if this was its original site, or merely placed here temporarily; it has now disappeared. The road Via in Merulana is thought to be a corruption of Verulana. Mr. Parker first thought it a Mediæval castle, but now considers it a Castellum Aquæ or reservoir. Mr. Forbes calls it the tomb of Mecænas, who was buried on the skirts of the Esquiline. Tradition likewise calls it a tomb. Mr. Hemans considers that it may well be one of the numerous pleasure-houses of Gallienus, who had large gardens in this neighbourhood. The Society then bent their footsteps to the New Museum, near the Minerva Medica, formed by the *Compagnia Fondiaria Italiana* out of the objects found in the recently discovered columbaria. These objects are highly interesting, consisting of inscriptions, lamps, glass, vases, ornaments, and large water-colour drawings of the frescoes described above; also, a small fresco of a man driving a biga, the horses of which are very spirited and well executed. The Minerva Medica and the reservoir of the Marcian aqueduct were then visited, also the highly interesting and in many respects unique group of columbaria recently exposed to view by the above Society.

On Thursday, January 20th, the Society took a promenade over the southern part of the Celian hill, first visiting the church of St. Stefano Rotondo, considered by Mr. Parker and Mr. Hemans to be of the fifth century; some authorities consider it as the temple of Claudius erected by Vespasian, though begun by Agrippina and almost demolished by Nero; others call it the Macellum Grande, or meat market, of Nero, and it certainly corresponds with that building as shown on a coin of Nero by Mr. Tighe. There is a similar building at Perugia, which is there considered as an ancient temple. A visit was then made to the remains of the houses built against the cliff of the hill below, where there was an ancient road; one of these houses has been dignified by being called that of Seneca, who mentions that he dwelt on the Celian, but there is no authority for calling these remains the house of Seneca, and the construction is much earlier than his time,—in fact, of the republic. The nymphæum near by was then visited; though called by the name of Alexander Severus there is evidence in its construction of an earlier date. The aqueduct at the back was full of water, and goes to the reservoir in the grounds of Baron Hoffman. A piece of black and white mosaic floor excavated in the vineyard above was next examined; it is of the third century, and represents a boy and flowers. The tomb in the Villa Campagna, of the first century, was then visited, also the Church of Santi Quattro Incoronati, Carponferus, Severus, Severianus, and Victorianus. Mr. Hemans explained the frescoes in the Chapel of St Silvester, of the thirteenth century, representing events in the fabulous account of the life of Constantine the Great.

On Friday evening, January 21st, Mr. Hemans gave an interesting lecture upon the sculptures in the Capitoline Museum.

THE NEW THEATRE ROYAL, EDINBURGH.

THE new Theatre Royal, Edinburgh, was opened on the 27th ult., having been constructed within three months from the commencement of operations, from plans by Mr. Phipps, architect. Sitting accommodation is provided for 2,300 persons, or about 300 more than could be comfortably seated in the old Theatre Royal. Ventilation is provided for partly by openings into the corridors, and special apertures above the gallery, but mainly, so far as the body of the house is concerned, by an iron-cased shaft passing from the ceiling through the outer roof, and in which an upward current will be maintained by the sunlight in the centre of the ceiling. Care, it is said, has been taken to obviate draughts by placing double doors, opening outwards, in the various entrance passages: if successful, it is more than can be said of most theatres. As to decoration, that of the proscenium is simple in design; and the salient mouldings are picked out with gilding on a general ground of dark-cream colour. A flat ceiling, defined by mouldings into a circular form, the outer edge of which ranges with the gallery-front, is painted with Romanesque ornament on a ground of turquoise blue. In the front of the gallery the colours of the ceiling are repeated on a cream-coloured ground; the front of the second circle repeats the latter tint, and is relieved with gilding in the shape of foliated ornament; while the dress circle shows a front of open metal work gilt throughout. The circle boxes have their frontage covered with crimson cloth, which harmonises with the dark-green paper, picked out with gilding, that covers the back walls. With a proscenium opening 27 ft. wide by 39 ft. high, the space available for scenic purposes is 61 ft. wide between walls, and in the centre 59 ft., but at the sides, where the back corners are cut off, only 36 ft. deep. The stage is provided with seven traps (including that required for the operatic prompter), ten cuts, and four bridges, the whole structure being so contrived as to be capable of immediate adaptation to all probable requirements. For the orchestra a space 6 ft. 9 in. wide is reserved between the footlights and the front of the pit. The area in the basement, below the pit, has been floored with concrete, and is to be appropriated as ballet-room and supers' room; while the back part of the space below the stage, not required for scene-shifting machinery, is set apart as a room for making properties. The corner spaces partitioned off at the back of the stage afford on the stage level, and on two floors above, a series of dressing-rooms, with offices for the manager and stage manager; and on the gallery level there extends over these rooms, as well as the intervening scene-dock, a workshop with a private room attached for the scene-painter. The curtain is of morone-coloured baize, to harmonise with the general tone of the decorations. The act-drop, painted by Messrs. Gordon & Harford, shows a Florentine scene between draperies, on which are displayed medallions of Shakespeare, Scott, and Burns. From the same artists has come a considerable portion of the general scenery, the remainder being produced by the resident painters, Messrs. Galt and Morgan.

The construction of the theatre has been carried out under the superintendence of Mr. Frank Stripling, clerk of works. Exclusive of scenery, the cost is stated to be about 11,000*l.*

A Free Aquarium for Ipswich.—Mr. Edward Packard, of Birkfield Lodge, has offered to present the inhabitants of Ipswich with an aquarium in connexion with the museum. The offer has been accepted. The aquarium will, of course, add greatly to the usefulness of the museum, and will constitute one of the public attractions of Ipswich. It will, we believe, be the only instance of an aquarium open to the public without charge.

AUSTRIAN EXPENDITURE.

FROM official documents just published, it appears that, during the year 1875, the Austro-Hungarian Government expended 1,221,000 florins on State buildings; 195,000 fl. on new works; 12,000 fl. on telegraphs; 81,000 fl. on the Academy of Sciences; 70,000 fl. on the Museum of Industrial Art; 9,000 fl. on the maintenance of old monuments; 954,000 fl. on technical high schools, and 1,432,000 fl. on technical middle-class schools; 361,000 fl. on fine-art high schools; 22,000 fl. on students' libraries; 92,000 fl. on funds for students; 50,000 fl. on the Oriental Museum; 2,562,434 fl. on the sea and harbour sanitary service; 197,000 fl. on land and forest schools; 70,700 fl. on land and forest improvements; 199,500 fl. on mining offices; 78,500 fl. on mining schools; 1,464,000 fl. on the State forests and lands; and 4,800,000 fl. on the State mining establishments.

ROOF PAINTINGS AT SALISBURY CATHEDRAL.

AT a meeting of the Society of Antiquaries, on the 27th ult., a letter was read from Mr. Disraeli, in reply to a suggestion of the Society that the obelisk which had been given to the English nation might be brought from Alexandria. The Premier called attention to the fact that much correspondence had taken place on the subject in 1867. The authorities of the British Museum had been consulted, and had given their opinion that the removal of the obelisk would not be worth the cost, as the hieroglyphics had been much defaced.

Mr. Armfield then read a paper on the paintings on the roof of Salisbury Cathedral. These had been covered over with a buff wash when the cathedral was restored by Wyatt, in the last century. Many of these paintings were distinguishable through this wash, and when the present restoration under Sir Gilbert Scott commenced, it was hoped that the wash might be cleared away, leaving the paintings beneath. Unhappily, however, it was found that the pigments beneath the wash had been reduced to powder, and any attempt to remove the wash removed the pictures also. These pictures were on medallions between the groining ribs of the roof, and tracings of a great number of them had been taken, which were exhibited on the walls by the kindness of Messrs. Clayton & Bell. These paintings were of a very early date, being of the latter end of the thirteenth century, and were now being replaced by more modern ones. They were all of about the same period as the consecration of the cathedral, and extended from the beginning of the choir to the place where the altar at present stood, near the wall dividing the Lady Chapel. Some of those in the large medallions were pictures of some pretension; the others were of a very varied description. The prophets, apostles, and evangelists were represented in the medallions extending over the choir and the small transept, over the further end of which was the representation of the "Majesty." The other pictures were smaller, and represented, as far as could be made out, the months of the year, only seven of which, however, had been identified. Mr. Armfield then argued that from the character of the pictures the present high altar must originally have been under the representation of the "Majesty," and not under the meaner representations of the months. He knew that Sir Gilbert Scott differed from him in this view, but there was a passage in Leland describing the position of the tomb of a bishop just outside the wall, near the high altar, proving that the high altar must have been where it now stands. Mr. Armfield referred at great length to numerous authorities in support of his argument.

Sir Gilbert Scott said that he thought Mr. Armfield was perfectly right about the period of the pictures, which undoubtedly belonged to the latter part of the thirteenth century; the other ornamentation on the roof was precisely the same as that in the lady chapel, showing that Mr. Armfield was quite right upon that point. He differed from Mr. Armfield in regard to his conclusions. In the first place, the distance between the stalls and the present position of the high altar tallied very closely with that which he had found was the distance in ten other cathedrals. Sir Gilbert Scott concluded by reading a paper from Mr. Beresford Hope, M.P., agreeing with the views expressed by Sir Gilbert.

Mr. Scott contended that it would have been impossible to have performed the ritual within the space which would be left if Mr. Armfield's theory were right.

The Rev. Mackenzie Walcott argued in support of Mr. Scott's view of the matter, as did also Mr. Micklethwaite.

UNHEALTHY OCCUPATIONS.

In giving the fourth of his special series of lectures, on "Industrial Pathology; or, the Influence of certain Injurious Occupations on Health and Life," at the Society of Arts, on the 21st inst., Dr. B. W. Richardson, F.R.S., dwelt specially on the injuries produced upon the artisan classes of the community by the agency of dust and lead. The class of persons particularly exposed to the effects of these sources of malady were workers in earthenware, commonly called "potters." The followers of this industry were amongst the most ancient artisans on the face of the earth, and their art had now been brought to a state of perfection never approached in any earlier age. Yet it was sad to reflect that the potters constituted one of the three classes of the population which exhibited the lowest vitality. At the last census there were in England and Wales 45,122 persons engaged in the potteries. Of these, 29,169 were males, and 16,953 females. Amongst the males the mortality was no less than 38 per cent higher than the average death-rate for the males of the whole community above the age of fifteen years, and this increase chiefly showed itself in carrying off persons in the prime of life,—say at thirty-five years of age. Notwithstanding this, the social position of potters was far superior to that of many classes of far longer vitality. They were a temperate, steady, and essentially a rural people, being, in the greatest number of cases, natives of the district in which they worked, and seldom caring to move far away. This characteristic, together with their physiognomy, proclaimed them of genuine Saxon blood. Their wages were good, and poverty was a name practically unknown among them, since there was plenty of work for all, and no lack of skill for its performance. A general description of the Staffordshire district and its physical features was given, and the lecturer then went on to treat in detail of the general health of its population. The inhabitants were, he said, generally poor in physique. They were weakly, wan, and pale, notably so in the case of the women. They were subject generally to most of the diseases common to other members of the population; but the special maladies which caused the enormous excess in their mortality over that of other classes of the population were three in number,—bronchitis, pulmonary consumption, and lead-paralysis. Many interesting statistics were given in support of these facts, and it now remained to inquire into the causes of the prevalence of these diseases among them. In the first place, no doubt the persistent monotony of the potter's occupation led to a nervous deterioration which would strongly predispose his system to the ravages of consumption. Cleanliness in the homes of the workers was religiously observed; but unfortunately this remark was not applicable to their hands,—hence the frequent slow poisoning among those of them who constantly manipulated lead. The climate was not on the whole an unhealthy one, but the atmosphere of the pottery districts was greatly clouded and contaminated with smoke, dust, and furnace and oven fumes of various kinds, and the part played by the inhalation of dust, and particularly of fine sand, in the production of pulmonary consumption, must now be regarded as established almost beyond doubt. Repeated chemical analyses of the human lungs had shown silica to be absent as a normal constituent of those organs. Nevertheless in the ash left on incinerating the lungs of a potter, Professor Church had detected in round numbers 48 per cent. of silica, 18 per cent. of alumina, and 5 per cent. of oxide of iron. This showed to what an enormous extent finely-divided clay was being constantly breathed, with the fatal effect, too, of completely hardening the portion of the lungs in which it accumulated. The inhalation of dust, therefore, must be regarded as one of the chief causes of increased mortality among the potters, the other being that which had been already alluded to,—lead paralysis. This was a most painful and protracted disease, slow but sure in its effects, and it was sad to reflect that it was in such an eminent degree due to the careless indifference above referred to on the part of the men. Whether any suggestions could be put forward to revolutionise the melancholy state of things existing among these people was a matter for most serious consideration, and any practical steps tending to improve them must be hailed with welcome, if merely on the ground of common humanity. In commencing his lecture, Dr. Richardson referred, in terms of deep regret, to the recent death of Mr. Davenport, the financial secretary of the society, who had rendered him material help in the preparation of this course of lectures.

THEATRES AND SOUND.

Sir,—With reference to the Baltimore Opera-house, mentioned in your last volume, I may say that observations made on sound, both in open and confined spaces, during a number of years, led me to the conviction that the movement of the atmosphere towards the audience, under circumstances analogous to those which in large open spaces seemed to govern the transmission of sounds, unimpaired in character, to great distances, would be the proper principle to adopt for large halls. In planning the Academy of Music in Baltimore, I was restricted by the size of the ground only. Adopting such lines and forms in building as were evidently favourable for seeing and hearing, I then built the house to secure a strong steady movement of the whole air, which is supplied warmed in winter from the rear of the stage, towards the entire audience, whence it is withdrawn by a powerful exhaust in the ventilating shaft over the great chandelier. Any one who has observed the manner in which a large volume of smoke, rising towards a ventilator in say a station shed, curls over and depresses the succeeding volume, will understand why I expected to secure an air movement almost horizontal at first. This has been perfectly secured, and there is no part of this large theatre into which sound from the stage does not pass with all the tone that accompanied its emission. That the air should be homogeneous, and moved without pulsation or cross-currents, is of course required, and is effected by the mode of supply and egress, and by guards against disturbing draughts. If there is a complaint now to make, it is that we hear too well; the words of the prompter, trial notes from the piano of the green-room, and orders from the stage-operators, are all delivered to the audience; and as the house is not in the hands of a company trained to its peculiarities, but is rented from night to night for almost every possible purpose, a good deal of explanation is required, and some little experience, before persons accustomed to other houses learn to conduct themselves in this one. Towards the stage the house is very quiet; the little bustle of movements and the subdued conversation of the audience do not reach the performers. Mdlle. Titiens has told me that she never sang where she was so little disturbed by such causes. About one year before the construction of our Academy, I explained in one of our art papers the principle on which it was planned, and confidently predicted its success.

J. Crawford Neilson, Architect.

Baltimore, Maryland, U.S.

COLOUR.

Sir,—That colours are sensations excited in us by a certain mode of motion, and that, externally to the sentient, there can be but an infinite number of differentiations of this mode of motion, is an accepted fact. This is no new doctrine of mine: I only keep the fact steadfastly in view, in order to prevent the otherwise inevitable misleading of the senses, in questions relating to the subject of colour.

Perhaps it may help all who are still possessed by the conviction that colour is inherent in the things themselves, to divest themselves of this error, if we point out the fact that neither Mr. Colling nor any other mortal has ever seen the things themselves. Let us keep, for instance, to his "*inherently green grass.*" Now let us ask him if he has ever seen that grass by any other means than through the medium, the intervention, of those rays of force which, impinging on it, are reflected to his eyes? Never! His eyes are, therefore, not sufficiently in the confidence of the grass to have had any special revelation that it is inherently green. The impression of colour received from the same piece of grass will vary as the periodicity of the vibrations impinging on it vary, and Mr. Colling, observant as he is of nature, has not failed to notice that his "inherently green grass" under different conditions of vibratory force gave him two very different sensations of colour, viz., a yellow green, and a blue green. Now, taking into consideration the fact that our friend has never seen the grass itself, can he, with any show of reason, affirm which of those two greens is its inherent colour? That same piece of grass would, however, under other conditions, reflect other rays, which would excite other quite different sensations; much less, therefore, is Mr. Colling in a position to affirm anything in respect to the *inherent* colour of the grass.

The sensations of colour produced by reflections from grass under the sun are very different from those which are produced by its reflections when exposed to the unclouded empyrean, as is often the case in shadows. This difference is very marked at sunset, the illuminated portions of objects under the direct action of the sun's rays appearing golden, whilst their shady sides, which receive their rays from the open sky, opposite to the sun, will appear coldly blue. There is a very interesting effect to be observed on architectural façades when the sun is low: the shadows underneath the cornices, &c., will appear very hot as compared with the general surface of the stonework, which is neutralised by the rays reflected from the open sky above. These rays are prevented from affecting the space immediately below the cornice, on account of the projection.

It has been said by the greatest of authorities that "the light is within you." This is equally true of both the moral and physical worlds.

W. Cave Thomas.

NEW CONCERT HALL, BUXTON.

The foundation-stone of a new concert-hall in connexion with the Pavilion and grounds belonging to the Buxton Improvements Company has been laid by the chairman of the company, Dr. Robertson. The additions to the grounds will be over three acres of land. The additional buildings consist of a reading-room (completed and in use), a music-hall, corridor entrance to it, and artistes' rooms for both ladies and gentlemen, a smoking-room, a skating-rink, and suitable offices to the same. The music-hall is octagonal on plan, and 102½ ft. external diameter; the heights are, to the eaves of the aisle 24 ft., to the junction of aisle with dome 39 ft., and to the top of dome cresting 71 ft.; the diameter of the dome is 50 ft. It will be supported with eight pairs of coupled cast-iron columns 35 ft. long, with ornamental caps and bases. The girders and ribs of the aisle and dome are of lattice work in cast-iron; these with the cast-iron ornamental spandrels, will be seen from the interior. Other large projections have been avoided so as to interfere as little as possible with the acoustic properties of the hall. The ceiling of the aisle and dome is to be lined with pitch pine boarding, stained and varnished; and the interior generally will be relieved by colour in artistic decoration. The hall will be lighted by a sun-light in the centre, of large power, and the large iron shaft in which it is to be fixed, together with the eight windows at the base of the dome, will provide ample ventilation. The corridor connecting the hall with the present pavilion is 45 ft. in length, by 25 ft. in breadth, being 3 ft. wider than the present corridors. The hall will accommodate about 2,000 persons, and the corridor, which may be used in conjunction with the hall, will accommodate about 250 persons, making together additional accommodation for 2,250 persons. The artistes' rooms behind the orchestra, for ladies and gentlemen, are each 20 ft. by 13½ ft. The smoking-room, with its appurtenances, which is entered from the outside only, is 25 ft. by 21½ ft. The whole will be warmed with hot-water pipes. The skating-rink, which is partly formed, is at the north-west corner of the new grounds, and will be 180 ft. in length by 40 ft. in breadth. There will be a terrace on three sides, averaging with the recesses nearly 20 ft. wide. These recesses are for single and grouped seats, and will give ample sitting-room, leaving the whole width of the promenade free. There will be a roof 100 ft. in length over the rink, leaving 80 ft. without a cover. The sides will be left open. At the entrance to the rink will be a ticket-office and suitable dressing-rooms for ladies and gentlemen. Both roofs will be covered with zinc, and the whole of the woodwork will be stained and varnished. The

terrace in front of the present pavilion, which is 400 ft. long, will be continued 600 ft. more, by 60 ft. in breadth, making a total length of 1,000 ft.

Messrs. Eyre & Rogers, of Buxton, were the contractors for the reading-room, which was furnished by Messrs. Kendal & Milne, of Manchester. For the erection of the music-hall, corridor, smoking-room, &c., Messrs. Rankin & Co., of Liverpool, have contracted for all the cast and wrought-iron work; Messrs. Ellis, of Sheffield, for the warming; and Mr. W. H. Brown, of Stockport takes all the other trades. Messrs. Eyre & Rogers are building the roof over the skating rink, and Mr. W. H. Brown the offices, &c. to the same. The new grounds will be laid out to harmonise with the old; and a children's playground will be provided on the sheltered and sunny bank between the skating-rink and the river. The total cost will be about 12,000*l.*

REGISTRATION OF TRADE UNIONS.

THE report of the Registrar of Friendly Societies contains the following passage as to the registration of trade unions:—

"In connexion with the subject of trade unions, the Registrar desires to call attention to a matter of great importance. By the Trade Unions Act, 1871, it is provided (s. 13) that the Registrar, upon being satisfied that a trade union has complied with the regulations respecting registry in force under the Act, shall register the trade union and its rules. The effect of this is that if a trade union provides in its rules for the matters prescribed in the first schedule to the Act, the Registrar is bound to register the rules, however contrary to law all their other provisions may be. The rules submitted to the Registrar by trade unions very frequently contain provisions contrary to law, self-contradictory, or not expressing the real intention of the framers. In these cases he has gone beyond the strict limits of his duty, and called the attention of the unions to the matter, but often without result. For example, trade unions are not exempted from the operation of the Life Assurance Companies Act, 1870, if they insure sums at death, yet the rules of many unions contain provisions for payment of sums at death without any reference to the requirements of the statute. Again, the rules of trade unions frequently provide for the payment of sums at death to persons nominated, which, though allowed with certain limits by the Friendly Societies Act, is not legal in a trade union. Rules of trade unions are frequently so framed also as to purport to apply to the union other provisions of the Friendly Societies Act,—as those for settlement of disputes, exemption from stamp duty, membership of minors, &c. Such rules, of course, although registered, would have no binding effect, and, in respect to any infraction of the provisions of the Life Assurance Companies Act, the trade union might become liable to penalties. The Registrar thinks it important that the attention of trade unions should be drawn to this. It cannot, again, be too clearly understood that section 5 of the Trade Unions Act, which enacts that the Friendly Societies Acts shall not apply to a trade union, and that the registration of a trade union under those Acts shall be void, has the effect of depriving of all legal sanction any rules of trade unions for benefits in sickness, old age, or at death."

BUILDING AT BELFAST.

THE *Belfast Newsletter* comments upon the rapid extension of the town limits, to which we have lately drawn attention. New streets and terraces of houses have sprung up, new avennes of trade have been opened. On patches of formerly waste land enormous factories now stand. The most remarkable feature in these transformations has been the suddenness with which they have been accomplished. An instance of this has been afforded in the restoration and enlargement, for Messrs. Gamble & Shillington, of the Broadway damask-mill on the Falls-road. Last summer the Broadway Mill, which had been built not very long previously by Messrs. M'Laughlin & Harvey, builders, of York-street, was destroyed by fire. The contract for its re-erection was again given to M'Laughlin & Harvey, and the work was commenced on the 6th August. The dimensions of the shed were to be 250 ft. long by 158 ft. wide, the front being three stories high. This was so far an enlargement of the old factory that, whereas the roof of the former structure consisted of eleven bays, the new one was to contain two additional, making thirteen bays in all; yet although little more than four months have elapsed since the work was entered upon, it is now nearly completed. A story [somewhat apocryphal, we should say] is told about the proprietor of an extensive brickyard near the Staffordshire Potteries, who, it is said, left his house one morning last summer after a domestic storm, informing his wife that he would not return that night. On going to his place of business he set men to work on a new house, and, having abundance of hands and an unlimited supply of material, before the shades of evening closed in there stood where that morning not one brick or stone rested upon another a very comfortable and commodious detached villa, so that when his better half, finding him rather later at business than usual, and remembering his threat of the morning, drove to the yard, determined on reconciliation, she found him in a well-furnished apartment of his new house enjoying a Havannah and something hot out of a tumbler. Smart as was this building feat, it has been fully equalled in Belfast within the past few months. Last summer Messrs. M'Laughlin & Harvey commenced to construct a large cooler or dam in connexion with the premises of the Northern Spinning Company, off Northumberland-street. The required excavation was made, having a capacity of about 15,000 cubic yards, and the work completed. The clay dug out was then burned into bricks, and in a few weeks a row of substantial houses was built therefrom, and every one of them occupied. Shops and offices are daily being added to the marts and business establishments of the town. Numerous churches and chapels have also been erected of late.

CHURCH BUILDING AND RESTORATION IN ENGLAND.

THE following table, which has appeared in the *Scotsman*, summarises the statistics in the return which was issued a few days ago showing the number of churches, including cathedrals, in every diocese in England (except those of Peterborough, and Gloucester and Bristol), that have been built or restored, at a cost exceeding 500*l.*, since 1840, with the expenditure. Among sources from which funds have been drawn other than private benefaction are Queen Anne's Bounty, the Ecclesiastical Commissioners, and various local and national church-building societies. The great bulk of the sum of over twenty-four millions sterling, which, according to the return, has been expended on church building and restoration by the Church of England since 1840 has, however, been derived from private subscriptions and benefactions—probably about 80 per cent. It must be remembered that in this amount are not included restorations which have cost less than 500*l.*; while the returns from most of the dioceses have appended notes to the effect that the figures are known to be incomplete, and that the actual expenditure has been larger than is shown. There are also two large and important dioceses—Peterborough and Gloucester and Bristol—which do not make a return at all. It will be seen that more than a million sterling has been expended on the cathedrals; and in many cases the restoration is still going on. The return from the diocese of Bath and Wells does not show the number of churches which have been built or restored, or afford any means by which the number can be ascertained. In the case of several of the other dioceses, the totals are not supplied, and have had to be calculated. The return from Lichfield does not show the expenditure on the cathedral of that diocese. Thus the statistics in the following table, while they are an accurate summary of the contents of the return, can only be said to give an approximate statement of the facts with which they deal:—

Diocese.	Total expenditure.	Expenditure on cathedral.	Churches built and restored.
Bangor	£161,312	£21,000	96
Bath and Wells	728,359	22,013	—
Canterbury	917,399	57,359	377
Chichester	745,266	63,482	236
Ely	884,941	57,053	361
Exeter	782,305	25,300	401
Hereford	443,641	48,591	217
Lichfield	1,177,584	—	414
Lincoln	1,909,056	36,555	458
Llandaff	145,111	30,000	169
London	2,706,613	62,203	402
Norwich	727,713	17,000	396
Oxford	1,305,367	20,000	561
Rochester	1,413,924	19,876	463
St. Asaph	408,371	9,968	143
St. David's	371,453	27,835	228
Salisbury	879,426	50,574	333
Winchester	2,042,873	4,500	688
Worcester	1,121,854	114,295	332
Carlisle	391,493	21,610	167
Chester	1,219,312	68,000	273
Durham	687,109	65,384	266
Manchester	1,513,446	59,407	350
Ripon	954,623	40,000	349
Sodor and Man	28,210	—	15
York	1,291,395	74,520	383
	£24,061,081	£1,006,526	7,892

"Petticoat-Lane."—It is stated that Petticoat-lane is to be reformed, and that considerable improvements are about to be made in that thoroughfare. Artisans' dwellings are to be erected, and in consequence of this several of the inhabitants will shortly receive notice to quit.

EXEMPTION FROM HOUSE DUTY.

JEPSON *v.* GRIBBLE, SURVEYOR.

THIS was a case (Exchequer Division) involving an important principle—namely, whether the house of a medical superintendent of a pauper asylum, required to reside on the premises, was liable to inhabited house duty. It came before the Court in the shape of an appeal from the decision of the Commissioners of Inland Revenue, by which a sum of 1*l.* 17s. 6d. was imposed as inhabited house duty upon the house in question, on an estimated annual value of 50*l.*

Mr. Poland stated the case on behalf of the appellant. It appeared that Mr. Octavius Jepson was a medical practitioner, and appointed as medical superintendent to the City of London Pauper Lunatic Asylum. He resided with his family in a house built for the reception of such an official. Though this house was not actually within the asylum it closely adjoined it, and was within the boundary-wall of the main building. Counsel contended that the house must be held to be part of the same edifice, and therefore that it came within the exemption from taxation enacted by the 48th Geo. III. in respect to establishments of a cognate character. Having quoted the provisions of the Acts bearing on the subject and referred to some authorities in point, the Attorney-General, in support of the impost, relied upon the terms of the 17th & 18th Vict., establishing the inhabited house duty as decisive upon the subject. He referred to a Monmouthshire case (which he regarded as being on all fours with the present) as a precedent which should solve any doubt upon the matter. That was a case in which a doctor (Mr. Cullagh) appealed against a somewhat similar assessment as the present, on the ground that he resided in a house close to the asylum to which he was the resident medical officer, that such house was built by the authorities of the asylum, though a little time after the main edifice had been constructed, and that it was standing upon the land of the asylum, although separated from it by a turnpike road. [The Lord Chief Baron—A very important distinction from the circumstances connected with the residence of the present appellant.] He also quoted some other cases which he deemed to be authorities.

Their Lordships were unanimous in their judgment in favour of the appellant, on the ground that his residence was substantially part of the asylum of which he was the resident medical superintendent, and that it was obviously the intention of the Legislature to exempt such institutions from the rates in question.

Mr. Poland said the Act gave the Court discretionary power of ordering costs.

The Lord Chief Baron: Oh, yes; the Crown must pay the costs of these proceedings.

DARLINGTON.

AN Industrial Exhibition was held in the Central Hall, in this town, on the 26th, 27th, and 28th ult., and financially was a success. The arrangement of the goods and patterns exhibited was very defective, owing to the unsuitableness and smallness of the building for the purpose. The light was bad, the things were crowded too close owing to want of space, and the passage-ways very narrow. In the minds of the committee it was, no doubt, thought to be the best place available for the purpose; but the covered market-house opposite is infinitely better suited for the purpose than the Central Hall. As it is only used on Saturdays and Mondays, there is no reason why it could not be used at the next industrial exhibition; for it is much larger, better lighted, has ample stall space besides plenty of standing-room, and has better access. In the day-time the place was crowded, but in the evenings the people were wedged in, such was the pressure.

T. B. W.

LOUGHBOROUGH.

ON Thursday, 27th ult., Lieut.-Col. Ponsonby Cox, R.E., one of the Engineering Inspectors of the Local Government Board, held an inquiry at the Town-hall, Loughborough, in reference to an application made by the Loughborough Local Board to borrow the sum of 1,300*l.*, to be expended for improvements in the Flood Channel, and the construction of safety weirs and sluices at the Loughborough Waterworks, in accordance with plans furnished by Mr. George Hodson, C.E.

Colonel Cox stated that he had examined the drawings and estimates submitted, and informed the Board that he should recommend the Local Government Board to sanction the loan. He afterwards, accompanied by Mr. Hodson, made an inspection of the works in progress at the reservoir, which include a new filter of large size, and a covered service tank, the plans for which were sanctioned in November last.

New Coal Exchange for Glasgow.—The *Glasgow News* states the Victoria-place property at the foot of West Regent-street, between West Nile-street and Renfield-street, has been purchased by the Committee of the new Coal Exchange. The price is 96,800*l.*, which is equal to 21*l.* 8s. per square yard.

ON THE EDUCATION OF BRICKLAYERS.

Sir,—Your correspondent, Mr. Morris, in his letter upon this all-important subject,—vide *Builder*, December 25th, 1875,—says he will not attempt to explain the causes of what he calls the widespread ignorance displayed by the majority of bricklayers. This omission on his part, I beg to suggest, is to be regretted, as, from his peculiar position as secretary of a trade-union lodge, he should be able to give a thorough explanation. I am of opinion that the more the causes of any particular evil or grievance are discussed the more likely are some practical ideas as to the remedy to be arrived at; therefore, before I venture any comment upon the remedies suggested by your correspondent, I will offer a few remarks upon the causes.

In attempting any explanation upon this subject, the first thing to be considered is, what class are the majority of bricklayers drawn from, and what amount of elementary education are they able to bring with them on their first introduction to the trade? Time has been, and not so many years ago, when the name of bricklayer was synonymous with drunkenness and blackguardism, and although, except in some few isolated cases, they are no longer deserving the opprobrium, it, unfortunately, still clings to them. The work is precarious, and being mostly out of doors, they are necessarily exposed to the weather, and subject to loss of time, and many other drawbacks, to which the other branches are not so liable. Consequently, for these very reasons, the trade is not generally courted by those having the advantages of a good elementary education. Again, access to the trade is so very anomalous. We will suppose a youth who is tolerably well educated, and has a mind to become a bricklayer. He finds it closed to him, without an apprenticeship, most likely accompanied by a premium, because he cannot submit to what would be to him the degradation involved in passing through a probationary period of hod-carrying. Moreover, the building trade is in the hands of general contractors, who, as a rule, do not care to take apprentices to the bricklaying branch; they share the prevailing mistaken notion that anything can be made into a bricklayer, and takes no time to do it; consequently they throw away the protection which apprenticeship in a measure would afford to keep out the ignorance that is swamping the intelligence which is as necessary in a bricklayer as in any other artisan.

Again, the later days of railway construction and other large works all over the country have given great facilities to the manufacture of these so-called bricklayers. I say later days advisedly, because in the earlier days of railway construction, none but the most skilled bricklayers were employed. This is evidenced by the quality of the work, with which the brickwork of the present day will bear no comparison. In those days bricklayers would resent any attempt by a labourer to steal an opportunity to lay a brick, by shoving him into his proper place and making him keep it. But as railways became more developed, and the demand for bricklayers increased, wages rose, strikes intervened, and the system of subletting was extended. By degrees labourers have been employed to fill in the body of the walls on all works of a massive nature, where every course of bricks covers the imperfections of the one beneath it, and in course of time these men obtain by those means just sufficient smattering of the craft to enable them to grope their way about, and don the name of bricklayer, and with the impudence, the sure companion of ignorance, they assume the position, and in contradiction to the statement of your correspondent, that intelligent bricklayers are surprised, it is only too well known—for are they not recognised by the Union, which measures its strength by numbers, not by a standard of ability and intelligence?

Now, sir, having described the class of men that are as a rule so freely imported into the trade, I will follow them to their work. A great many people connected with the building trade, especially those whose business it is to get a profit out of it, entertain the erroneous idea that simply to pile bricks one upon another is sufficient for brickwork; that there is any fundamental principle upon which it is based never enters their heads; into such hands, the majority of the men, such as I have described, almost invariably fall, and as it is plain a man cannot teach another that of which he knows nothing, these men go on in just the same groove as they started, and at the end of ten or twenty years in nine cases out of ten are as ignorant of the art as at the commencement. How can it be otherwise, seeing that no one teaches them, and, having no previous mental education, their minds are not sufficiently expanded to grasp it for themselves? Moreover, it is not so easy a task to attempt to teach them when once they have got a start upon their career, for if there is one thing more than another they dislike it is to be told of their failings, especially by one of their own trade. It is of frequent occurrence that such a one, in the exercise of his duty, finds it incumbent upon him to complain of a piece of faulty workmanship: he is met with an oath, and any show of authority or remonstrance is the signal for a volley of abuse, the usual termination of the dispute being, the workman indignantly demands his wages, and walks off with the air of an injured party, more than likely accompanied by the hearty approval of the rest of the gang.

Again, owing to the working of the union, the vicious system of a uniform rate of wages is in full swing, so that these illiterate, untrained, so-called bricklayers are levelled up to the same rate of pay as the thoroughly intelligent and proficient workman, who has worked his way up through a lengthened period of good training, probably initiated by an apprenticeship, receiving while serving it a mere nominal rate of wage, which afterwards has been advanced only as he has progressed in proficiency. This system destroys emulation, because under it a man has no inducement to apply himself to a close pursuit of proficiency so as to be able to compete with the skilful workman, when he knows he is already his equal at the pay-office, and as he has possibly never tasted knowledge either mentally or mechanically, and gets on very well without it, he cannot be made to feel he needs it, or that there is any pleasure to be derived from it. Again, the sudden possession of a high rate of wage too often tempts him to rush into dissipation, which in the evening deprives him of the opportunity of acquiring mental education, and in the morning makes him unfit for the study of his work, he being only too glad when it is time to get away from it.

Another cause, which is the natural outcome of the foregoing, is the great preponderance of carpenter-foremen placed in charge of brickwork, because with such the unskilful bricklayer can push his way with far greater ease than with a bricklayer-foreman, who is able to select his men with judgment, and, if untrammelled by the action of the union, rate them as to their pay according to their individual ability. Moreover, he has the theoretical and practical knowledge, which, coupled with the opportunities, enables him to improve the training and increase the proficiency of his men, that a carpenter has not. Now, sir, one more remark before I close. If those intelligent men with whom your correspondent, Mr. Morris, identifies himself, had used their powers,—which as representative bricklayers they undoubtedly possess,—in combating ignorance and incapacity, and encouraging intelligence and proficiency in their constituents, with the same energy and devotion as they have in leading labour to combat with capital, we should have been spared the humiliation attending the discussion of the necessity of teaching the majority of bricklayers the three R.s, in addition to the simple technical details of their trade.

A Bricklayer Clerk of Works.

NOVELTY IN BRICKWORK.

The church at Felixstowe, near Ipswich, having been just rebuilt, a method of laying the bricks has been adopted which, as far as I am aware, is entirely new; and as the effect is, in my opinion, far better than could be produced by any other method with such rough materials, it is, I think, well worthy of notice. It had been intended to construct the walls of flint, with stone coigns; but the architect suggested that the materials of a martello tower just demolished might be had very cheap, and might be substituted for flints; but instead of laying the old bricks in horizontal courses as usual, he proposed to lay them all at an angle to the horizon, so that there should not be a single vertical or horizontal joint in the whole building, except in the stonework. The idea is taken apparently from the herring-bone brick panels so common in old timber-framed houses, which idea he has carried out with as much regularity as the roughness of the broken bricks would allow.

The colour of the bricks is a good yellowish grey, and the effect altogether is decidedly good, and appears to me to be a remarkable instance of utilising a rough material which could not have been endured if laid in the usual horizontal courses.

It has often been a matter of surprise to me that no attempt appears ever to have been made to introduce the Roman reticulated brickwork, the ornamental appearance of which is still to be seen in many ancient ruins.

P. P. C.

IVORY.

Sir,—Allow me to thank you for the very courteous manner in which you have spoken (in your number for January 15th) of my handbook on "Ivories."

There is one "severe" remark at the beginning, referring to my judgment upon the leaf of a diptych in the British Museum. I would say that the reviewer has mistaken my meaning; which was not to suggest that the plaque equals, or even rivals, the works of Greek artists of the best pagan times, but that as a very early Christian work it may "claim a place" by the side of them.

As to my not having noticed the admirable ivory carvings of Mr. Cheverton, allow me to say that my subject ended with Mediæval ivories.

Let me add that your article contains a great deal of most interesting and valuable information about ivory, which scarcely fell within the limits of my little book, sufficiently to permit me to include it.

W. Maskell.

SCHOOL BOARD SCHOOLS.

Cholsey.—New schools for 213 children, with a detached master's residence, have been opened in the parish of Cholsey, near Wallingford, Berks. The cost, including boundaries, playgrounds, and fittings, is about 1,500*l.*, and the work has been executed by Mr. A. W. Dodd, of Caversham; Mr. W. Penstone, of London, being the architect.

Trelleck.—At the last meeting of the Trelleck School Board, Monmouth, eight designs were received from various architects. The one submitted by Messrs. Haddon, Brothers, of Hereford and Great Malvern, was unanimously selected, and they were duly appointed architects to the Board.

Pentlow (Essex).—New schools are being erected in this parish, in accordance with the requirements of the Board. Messrs. Geo. Grimwood & Sons, of Sudbury, are the architects and builders.

Inverness.—At the meeting of the Inverness Burgh School Board on the 12th ult., the plans and estimates for the new Merkinch school, submitted by Mr. Lawrie, were adopted, subject to the approval of the Education Department. The estimated cost of the buildings is 2,687*l.* 12s.

Tamworth.—At the monthly meeting of the Bolehall and Glascote School Board, held on the 14th ult., it was announced that in answer to advertisements issued, only one tender had been received for alterations to the present school and schoolhouse so as to meet the requirements of the Education Department. It was from Mr. H. Mottram, builder, Tamworth, as follows:—School, 1,198*l.*; schoolhouse, 215*l.*; total, 1,413*l.* This tender was accepted, subject to certain conditions to be decided upon by a committee.

Brynmawr.—New Board Schools at Brynmawr were opened on the 10th ult. The new school-room is situate on the north-western side of King-street. It was built by Messrs. Foster, Brothers, of Abergavenny, who commenced the work in November, 1874, according to plans and specifications prepared by Messrs. Alexander & Henman, architects, Stockton-on-Tees. The erection is in the modified Gothic style, with windows of Elizabethan character. The front elevation is of red sandstone rock work, with limestone dressings; and the slate roof, which slopes rather low, is surmounted by a bell-turret and bell. It is built to accommodate 750 children, and the contract price was 4,855*l.*

Yeovil.—The new public elementary schools at Yeovil were opened on the 10th ult. They have been erected from the designs of Mr. T. Mellard Reade, of Liverpool, architect, the plans being chosen from about sixteen sets submitted in public competition. They are divided into a mixed school for 160 scholars, and contain two class-rooms, which can be thrown together by sliding screens for collective teaching, and an infant-school for 150 children, containing a class-room for 44. Attached to the schools is a master's house, containing parlour, kitchen, scullery, and three bedrooms. The elevations are Gothic in style. The walling and dressings are of Ham stone; the roof is covered with ornamental tiles, and the carpenters' and joiners' work is of Baltic fir and pitch pine. The sole contractor was Mr. J. K. Chant, of Yeovil, and the fittings are by Mr. Hambridge, of Yeovil. Mr. George Hayter, of London, was clerk of the works; the contract for the whole, including playgrounds, is 2,185*l.*

THE LATE RICHARD ROLT BRASH, ARCHITECT.

RICHARD ROLT BRASH, architect, of Cork, whose able work on "The Ecclesiastical Architecture of Ireland to the Close of the Twelfth Century" we recently noticed, died at his residence, College View, Sunday's Well, in the above city, on the 18th ult. He had early imbibed antiquarian tastes through his association with the members of the South Munster Society of Antiquaries, the late John Windele, a zealous and laborious antiquary, and one of the most prominent members of that body, being his particular friend. To his study of archæological matters Mr. Brash throughout all his labours brought to bear his practical knowledge of architecture, and in none of his papers were his readers left in doubt about his meaning. He visited and examined with the eye of an architect, as well as with the love of an archæologist, most of the principal churches, abbeys, and round towers of note in the sister kingdom, supplementing the labour by a visit and examination of the only two round towers outside Ireland, those at Abernethy and Brechin, in Scotland. His papers on these last two towers were contributed to the proceedings of the Antiquarian Society of Scotland, of which he was a member, and afterwards published in 1861–2, in Edinburgh, under the title of "The Round Tower of Abernethy, with Drawings," and "Notices Historical and Architectural of the Round Tower of Brechin." Mr. Brash was member also of the Royal Irish Academy and of the Royal Historical and Archæological Association of Ireland, and to the proceedings of the latter Society he contributed a paper, "The Round Tower and Church of Dysert, county Limerick," printed afterwards at the University Press, Dublin, 1868. To the "Ulster Journal of Archæology," he contributed "Notes on the Round Tower Controversy," and subsequently on the same subject, "The Belfry Theory Examined." Both of these papers evidenced great research and a thorough acquaintance with all that was previously written on that perplexing and pregnant subject. Mr. Brash ranged himself on the Pagan side of the controversy, which has been as fruitful of various theories as that of the Christian side, but the particular theory which he upheld was of the monumental or sepulchral uses of these towers. The excavations of the South Munster Society of Antiquaries gave a certain strength to his opinions in this respect, although his friend, John Windele, in his "Historical and Descriptive Notices of Cork," was of opinion that the mystic structures were used in the system of fire-worship, — an opinion held by other Irish antiquaries. This aside. Mr. Brash brought to the study of the ancient architecture of Ireland, pre-historic and historic, considerable knowledge, and in his recently-published work, he purposely abstained from entering upon the question of the origin of the round towers, except incidentally, as he did not believe in their ecclesiastical character. Although Mr. Brash conceded to the late George Petrie the merit that none could deny him for his work on the round towers, and in illustration of the ancient architecture of Ireland, still he hesitated not to expose many of Mr. Petrie's fallacies, historical and architectural. Petrie, though a clever artist and laborious antiquary, was no architect, and he failed to detect architectural features that could not escape the eye of a professional architect. It was Mr. Brash's intention had he lived to have followed up his recent work by one in illustration of the Pointed styles as practised in Ireland, for he believed that there were several features in Irish structures peculiar to the country. One of the last literary essays,—we believe the very last,—of Mr. Brash's, was a letter in a Dublin paper in September last, "On the Restoration of Kildare Cathedral," which is to be "restored" on a plan prepared by Mr. Street in 1871, and now being carried out. Mr. Brash went point blank against the "restoration." After giving an exhaustive description of the existing remains of the so-called cathedral, Mr. Brash concluded thus:—

"To show the folly of the present proceeding, I would ask one question. Is it the intention of the restorers to construct the deficient parts in the same manner as the existing remains,—*i. e.*, will the wretched rubble masonry of the old, with its scanty meagre dressings, be imitated in the new? If not, it will be no restoration; if otherwise; it will be a standing jest for years to come. I am no foe to the restoration of our ancient buildings; far from it. Few men have taken a greater interest in their study and preservation than I have, as can be attested by my portfolio of measured drawings, collected from almost every ancient building in Ireland during the last thirty years; but I do object to the pseudo restorations that we have seen. The true principles of restoration have been frequently laid down as follows: that the building should possess merits of design or construction; that the principal portion of the fabric should be in existence and in a fairly sound condition; that no new features be introduced, the original plan being strictly followed; that the class of masonry visible in the old parts be strictly followed in the new. If the above obviously rational principles be observed in reference to the Cathedral of Kildare, its decaying relics will be allowed to moulder away in peace."

Mr. Brash's architectural practice was mostly confined to Cork and the south of Ireland. He has been ailing for some time; but the news of his death came unexpectedly on most of his friends and co-labourers. He was buried in the new cemetery, Cork, on the 22nd ult. The Cork corporation, of which he was a member, passed a vote of condolence to his widow, to whom, as his wife, his recently published volume was dedicated,—"the congenial companion of many a pleasant pilgrimage in search of the materials from which it had been compiled." Besides his widow we believe he leaves some daughters to mourn his loss. Respected and regretted, at the comparatively early age of fifty-eight passes away a practical antiquary and able architect.

THE WAPPING IMPROVEMENTS.

AN arbitration case, William Moodie *v.* Metropolitan Board of Works, was heard upon three days last week, at the Westminster Palace Hotel, before Mr. Harry Jones (Hunt, Stephenson, & Jones) as umpire; Mr. George Vulliamy being appointed arbitrator for the Board, and Mr. George Fuller (Fuller & Fuller) for the claimant. The claimant is a ship's carpenter, holding considerable property at 34½, Wapping High-street, and the Board had given him a notice to treat, in consequence of the same being required for the widening of that thoroughfare. The Board's witnesses valued the property under notice to treat as follows:—Mr. E. N. Clifton, 4,933*l.*; Mr. Horsey, 4,965*l.*; Mr. Harston, 5,011*l.*; and the Board's offer, under the seal, including compensation for loss of trade, amounted to 5,400*l.* On the other hand, witnesses were called on behalf of the claimant, and their figures varied from about 8,000*l.* to 8,418*l.* The umpire's award has since been made, and the same amounts to 8,018*l.*

THE NATIONAL CO-OPERATIVE BUILDERS' AND CONTRACTORS' SOCIETY, LIMITED.

THE inaugural meeting of the above Society was held at the offices, 36, New Broad-street, on Saturday last, when the report of the preliminary committee was presented, and the officers were elected for the first year.

This Society, which has emanated from a Club and Institute at Stoke Newington, aims to carry out upon co-operative principles the trade of builders and contractors, and the buying and selling of land and buildings.

Mr. J. C. Lake was elected chairman, and a vote of confidence was given to the manager, Mr. Thomas F. McCormick, who was able to state that nearly one thousand shares had been subscribed for among the committee and their friends, and that immediately 5,000 shares were issued the committee would commence work. The declared capital is 100,000*l.*

BACK DRAINAGE.

OUR readers know there is some diversity of opinion amongst the several metropolitan vestries and district boards of works on the question of what is termed back drainage as distinguished from drainage through the houses, which, as a rule, is recognised by the Metropolitan Board of Works. The Wandsworth District Board of Works has firmly resisted back drainage, in proof of which their differences with the Artisans', Labourers', and General Dwellings Company, in the case of the buildings on the Shaftesbury Park Estate, need only be cited. The Camberwell vestry, however, appear to take a more favourable view of the principle. The British Land Company have purchased an estate in East Dulwich which they are about to lay out for building purposes, and have applied to the vestry for permission to construct the sewers on the back drainage system. At the meeting of the vestry last week the sewers committee recommended that the application be complied with, subject to the consent of the Metropolitan Board of Works being first obtained, and on the condition that the sewers, when completed, be placed under the control of the vestry. The recommendation of the committee was unanimously confirmed.

HOUSES IN FLATS.

SIR,—In the "Miscellanea" at p. 64 of the current volume of the *Builder*, you say:—"A reader urges that attention should be given to the Berlin, and particularly the St. Petersburg, flat system, as superior to that of Paris, and better adapted to English domestic habits." The German and Russian capitals are comparatively so little known to ordinary Englishmen that a description of the system of town dwellings in vogue there would be highly interesting; and more particularly at the present moment, when several English architects are studying the best means of applying the Parisian mode of house-accommodation to London habits and wants. If, sir, your correspondent will enable your subscribers to learn something of Berlin and St. Petersburg houses, or say where information concerning them can be obtained, I for one shall be infinitely obliged to him.

WILLIAM H. WHITE.

"BOIS REPOUSSÉ."

THIS is the title given to ornamental woodwork produced by Mr. Ley's patent process now being brought into operation. It is executed by the pressure of steel dies, and we have seen a number of specimens of very good character. The "Bois Repoussé" ornament can be executed in the woods usually employed for internal joinery and cabinet work.

Friezes, pilasters, tracery, medallions, diapers, and so on, in the varied styles of art, can be executed with fidelity from special or existing designs or models.

To the cabinetmaker the facility and economy with which artistic enrichments can be adapted to the decoration of furniture would seem to commend it. The artistic goodness of the work will of course depend on the ability of the artists employed to prepare the models, and the mechanical excellence on the efficiency of the pressure used. There are obvious difficulties in the way, but these are said to have been overcome.

THE PARISH VESTRIES AND BAYLEY'S HYDROSTATIC VANS.

SEVERAL of the vestries at the West End and other parts of the metropolis have decided to adopt Bayley's hydrostatic vans in watering the streets during the present year. The Kensington vestry have resolved to purchase the whole of the vans they had on hire last year, one of the results of last year's trial showing a saving in horse-hire alone of about 1,000*l.* The Paddington vestry are also about to use them. At their meeting last week, they resolved to have the entire parish watered by these vans, in consequence of the success which attended their partial trial last year. Some of the northern parishes have likewise adopted them. For the purposes of giving them a full and effective trial, the Islington vestry had the entire parish watered with them last year, and the surveyor states that whilst the watering was efficient, the saving in horse-hire was between 2,000*l.* and 2,500*l.* This result has induced the vestry to decide upon their exclusive use during the present year.

New Mission Hall in Salisbury.—The St. Barnard's Mission Hall, Salisbury, was opened on the 20th ult. The hall is a plain substantial structure. It is 50 ft. long and 25 ft. wide, and is capable of accommodating about 300 persons. On each side there are several class-rooms, each capable of holding from twelve to fifteen persons. There are two larger class-rooms,—one for twenty and the other for forty boys or girls,—and there is likewise a room for the superintendent. The hall was built by Mr. Abel Harris, Mr. Hutchings acting as clerk of the works.

DISPUTED AWARD.

BLITH *v.* THE BOARD OF TRADE.

Mr. H. Matthews, Q.C. (in Common Pleas Division), said that this matter had been referred to arbitration, and his motion was for a rule calling upon Sir Charles Adderley, the President, and upon Mr. Trevor and Mr. Traill, assistant-secretary and chief surveyor of the Board of Trade, to show cause why an award made by Mr. Hoskin should not be set aside.

The plaintiff, in June, 1874, entered into a contract with the Board of Trade to supply new boilers to the Ramsgate steam-tug *Aid*. The designs for the boilers were approved of by the Board of Trade, and the work was approaching completion, when it was found that the sister ship, the *Castilia*, did not answer, her boilers priming a good deal, and thereupon the Board made some alterations in the designs, principally in connexion with the steam-chest. The plaintiff's charge for the work done was 5,619*l.*, whilst the Board thought that 4,000*l.* would have been sufficient, and it was arranged that the question of amount should be referred to the arbitration of Mr. Hoskin. This gentleman awarded about 1,600*l.* less than the amount claimed, and his award was now questioned upon the grounds that he had received statements from the officers of the Board behind the back of the plaintiff; that he had not heard evidence which the plaintiff had tendered to him; and that, instead of confining himself to questions of amount, he had taken upon himself to decide a question of liability as to whether the Board could be called on to pay for extras,—a matter which had really never been referred to him at all.

Mr. Justice Brett.—Both parties seemed to have sent in to the arbitrator *ex parte* statements behind the back of the other.

Mr. Matthews.—But two blacks do not make a white.

Rule granted.

Books Received.

A short History of Natural Science and of the Progress of Discovery, from the Time of the Greeks to the present Day. By Arabella B. Buckley. London: John Murray. 1876.

This is a delightful book, and one for which we confidently prognosticate a great circulation. It is intended for the use of schools and young persons; but thousands and hundreds of thousands of persons who have left school and are not young, will find advantage and pleasure in at once perusing it. The authoress acted as secretary to the late Sir Charles Lyell, and being thus brought into contact with many of the leading scientific men of the day, often felt very forcibly how many important facts and generalisations of science, which are of great value both in the formation of character and in arriving at a proper estimation of life, are wholly unknown to the majority of otherwise well-educated persons. From that feeling came this book. The precision and clearness with which Miss Buckley lays hold of and conveys the main result of an individual's teaching, or the chief characteristic of a period, is remarkable, as is the immense amount of information condensed. We do not set ourselves to discover omissions or errors: we are willing to recommend it just as it stands; but it will probably be noticed by its more minute critics that George Stephenson and the Railway are nowhere mentioned. In a history of natural science simply, this might be right enough; but it can scarcely be so in an account of "the progress of discovery."

We offer our acknowledgments to Miss Buckley for the singularly able manner in which she has executed a work of no small difficulty.

VARIORUM.

The "Architects' Almanac," 1876, published by Wyman & Sons, is on a card of moderate size for suspension. On the back are given a number of useful tables and memoranda.——Sir John Causton & Co. issue some "Calendars" on card, with trade views, smartly adorned with Greek forms.——"The Channel Railway: Tube or Tunnel?" by P. J. Bishop. The writer says tube, and gives very briefly his views as to how it may be laid,—ingenious, but not convincing. The cost is estimated at 22 millions, and the time at five years.—— Spon's "Architect's and Builder's Pocket Book," by W. Young, architect, has been further developed and improved for 1876, and will be found a useful pocket companion.——*Leisure Hour* says as to artists and musicians in London,—"Artists who practise in London number about 500, or one to 7,000 of the population, a number that seems but small when we recall the numerous exhibitors in the various galleries open to view every season; but, in fact, many London artists prefer, for obvious reasons, to reside a few miles out of town. Of sculptors, London boasts 140, or one to 25,000 inhabitants. Photographers are about 350 in number, or one to 10,000 inhabitants. Of wood-engravers there are about 170, or nearly one to 20,000 inhabitants; and this class of artists is constantly on the increase, owing to the large and continued demand for illustrated works. Turning to the subject of education, we find the number of schoolmasters and schoolmistresses, who are the proprietors of private schools, to be about 1,200, or one to 2,900 inhabitants,—a number absurdly inefficient at first view, but hardly so when we recollect that it does not include public schools, board schools, national schools, or ragged schools, and when we bear in mind the fact that a large proportion of the London youth of both sexes are educated at provincial schools. Of professors of foreign and dead languages the number is about 100, or one in 35,000 inhabitants. Of professors and teachers of music the number is 350, or one to 10,000 inhabitants. In carrying out their harmonious designs, the musical professors are aided by 280 pianoforte-makers, 50 organ-builders, 12 flute-makers, 10 fiddle-makers, 3 harp-makers, and some score of makers of various other instruments, amongst whom figures one guitar-maker."——The *Technical Educator* for February, remarks,—"The ordinary professional man's house built in the street of a busy town naturally abuts upon many an object that is not altogether pleasing to the eye. Light is required—the denser the population the more does it become a necessity, and the greater is the difficulty in acquiring it, but the outlooks are not agreeable; we must have windows, but we do not care to look through them; we must look into the streets, but we do not wish that every passer-by should return the stare and become familiar with all the doings of our little home; we must light our staircases with openings that front upon our neighbours' premises. In order to keep out the unpleasing sights and the unwelcome eyes, we resort to the dull, colourless, light-destroying blinds, or we insert the so-called ground-glass, either plain or else ornamented (save the mark!) with a pattern of stars or flowers. How much more pleasure might be derived from the contemplation of one of the many species of coloured windows than from either of these dull, lifeless, insipid transparencies! Blinds fully deserve their name, but a well-arranged window of slightly-coloured glass, with a pattern not too formal, rests the eye, leads it on from one portion to another, so that it is not fatigued, while at the same time it is employed."

Miscellanea.

Lead Colic in Devonport Dockyard.—In his report, for 1874, on Her Majesty's Dockyard at Devonport, Staff-Surgeon D. J. Duigan, M.D., says:—Thirty-six cases of lead colic were admitted during the year. This disease is an old one amongst painters, but somewhat modern amongst shipwrights. It may be dated amongst them from the time of the loss of the *Megæra*. Previously to the wreck of the vessel named, iron ships were more attended to outside than inside, as regards protective paintings of red lead. The result was the iron within suffered from corrosion from the bilge water. Hence ships are now more frequently overhauled. Before a fresh coat of red lead paint is applied, all the previous one is hammered and scaled off by a pointed or conical hammer, and during this tedious operation the men are working in a cloud of lead dust in confined places. As prophylactic measures, the usual old-established precautions inculcated in the lead factories are in force here, even to the sulphuric acid beverage. Regular lavatories and ablution-rooms, with hot and cold water pipes laid on, have been suggested; also a few warm and shower baths. The men are not employed more than two consecutive days at scaling off the lead. At the end of every hour they are sent on deck to breathe the fresh air for ten minutes, and during their absence from the compartment in which they have been working a supply of fresh air is pumped into it by Lloyd's blowing-hose. Everything is being done to mitigate the evil. It cannot be altogether prevented, for men must breathe, and so take in the impalpable lead dust. Respirators, good in theory, are impracticable and unendurable in a close atmosphere. Dr. Duigan concludes his report by stating:—In visiting the sick, we find their abodes generally miserable, and defective in sanitary arrangements. When the Bill for facilitating the improvements of the dwellings of the working classes becomes law, there will be a great field for its sphere of action in this neighbourhood.

New Wholesale Co-operative Warehouse, Newcastle-upon-Tyne.—On the 22nd ult. the new buildings erected for the Newcastle branch of the Wholesale Co-operative Society were formally opened. The buildings have been erected from the designs of Mr. Thomas Oliver, architect, and their total cost will be about 17,000*l.* In case an extension of the premises should be required the committee have secured additional ground for that purpose. The new building is an imposing structure, five stories in height, 120 ft. in length, and about 60 ft. wide. The materials used in the walls are red brick and substantial stone dressing. Mr. John Harrison was the contractor for the mason, bricklayer, carpenter, painter, glazier, and plasterer's work; Mr. David Donkin for the smith and ironfounder's work; Messrs. Walker & Emley for the plumbing and hot-water apparatus; Mr. Holden, of London, for the zinc work; and Messrs. Dawber & Sons for the slating. The lifts, boilers, and engines are from the Ouseburn Engine Works, and the carving has been artistically executed by Mr. Curry. Mr. Eadie has discharged the duties of clerk of works.

Birmingham Society of Arts and School of Design.—An anonymous friend has placed 10,000*l.* in the hands of Mr. Arthur Ryland, of Birmingham, "to improve and extend the operations of the school, and to aid in diffusing in Birmingham, both among producers and purchasers, a correct taste in art." The conditions of the gift, Mr. Ryland writes, are:—"That a plan tending to these results shall be placed in my hands before the 25th of March next; and that the plan adopted shall be approved by such gentlemen as my friend may desire to consult on the subject. In connexion with this, it may be well to mention that it is desired that the 10,000*l.* should be chiefly, if not altogether, applied to the improvement of the teaching department, and to the founding of scholarships or exhibitions. In order to develope thoroughly any scheme which may be adopted, more money will probably be required, but this will doubtless be supplied by the liberality of the town." The committee of the school have accepted the gift, and appointed a committee to prepare a draft plan.

Liverpool House-painters' Association.—The first annual tea-party and ball of the Liverpool House-painters' Association was held on the 24th ult. at St. George's Hall, the proceeds being devoted to the Liverpool Plimsoll Lifeboat Fund. Over 800 members and lady friends sat down to tea; and afterwards a meeting was held, Mr. Clarke Aspinall presiding. Mr. John Tatlock, the secretary, read a statement showing the work of the association. During the last three years there had been paid out of the funds 173*l.* 10*s.* to members who had met with accidents, 275*l.* 8*s.* 6*d.* for funeral expenses, and 103*l.* 7*s.* 5½*d.* to members seeking employment; and the association provided for members permanently disabled, affording also a reading-room for the benefit of members out of employment. In 1872 the number of members was 400, which had been increased to 1,400. The association had at present a credit balance of 1,565*l.*

"Half Sovereigns" for Paving Purposes. The *Camberwell and Peckham Times*, in its last report of the proceedings of "Our Local Parliament,"—*i.e.*, the Camberwell Vestry,—represents the following colloquy to have taken place during the discussion of a proposal to plant certain roads in the parish with trees, viz.:—"Mr. Grummant estimated the expenses of the trees as being about 100*l.* He said every tree would require a cradle, and then the ground round about would have to be paved with 'half sovereigns'" (laughter). The Surveyor explained that the term "half sovereigns" meant small "pitchers." Mr. Weller, amidst much confusion, protested against the term of "half sovereign" being applied to the stones when there was a proper name that might be used. Mr. Wesson:—"Sit down. You shall have the order." (Confusion.) Very dignified for a "parliament," certainly.

The Kirkcaldy Masons.—Circulars have been issued to the masons of the Kirkcaldy district stating that their employers had come to the conclusion to reduce their wages to the extent of ½*d.* per hour. The men at once had a meeting, at which they agreed to oppose the reduction. This determination was intimated to the masters, who agreed to withdraw the circular, and give the present rate, 8½*d.* per hour, as usual.

A Workmen's Hall and Club for Chelsea. Under the management of a body of directors associated under the title of the Chelsea Hall and Club Association, a working men's club has been established at 147, Fulham-road. It was first formed in 1872, to provide a place of resort for artisans, tradesmen, and the industrial classes generally, at the moderate subscription of 5s. annually. The intentions of the promoters were greatly encouraged by the generous liberality of Mr. C. J. Freake, who presented them with a piece of land 62 ft. in length by 32 ft. in width, on which to erect a club-house. Mr. Freake also gave the association 195*l.*; and other influential friends, including the two members for the borough of Chelsea, have given it their support. At the present time there are, including shareholders and non-shareholders, 500 members of the club. The third anniversary has just been celebrated.

St. Michael's Tower, Southampton.—Funds are being raised to place the tower and spire of St. Michael's Church, Southampton, in a satisfactory state of repair, its condition at present being such that the bells cannot be rung with safety. An inspection of the tower and spire has been made by Mr. J. Colson, architect, of Winchester, who reports that the stonework of the spire requires to be repaired in five places, where it has been damaged, apparently by lightning. The bell-frames and floor are also in a very bad state. The exterior stonework to the four windows of the belfry requires renewing, and the external facing of the four sides of the tower should be examined and pointed where found necessary. The cost of these and other repairs is estimated at from 175*l.* to 200*l.* In addition to this amount a further sum of 350*l.* is required to be expended on the bells.

Building Enterprise in Coleraine.—At no time, particularly during the wiqter months, have houses risen in larger numbers or with greater rapidity than now, chiefly in the northern and eastern quarters of the town. The most noticeable is the companion building to the dwelling-house finished last year on the Lodge-road, the property of Mr. David Baxter. North of Alexander-terrace a range of houses is rising, and closer to the Railway Station, Mr. Hugh Miller is engaged in running up [so the *Coleraine Chronicle* phrases it] a useful block, intended, from the size of the houses—two stories in height—for the better class of artisans; and in continuation of the south side of the west end of the Horse-road, there is a row of some eight houses of a similar class in course of erection by Mr. Thomas Caldwell.

Memorial Pulpit in Ecclesfield Church.—A carved oak pulpit has just been erected in the parish church, Ecclesfield, in memory of the late Mr. W. F. Dixon, of Page Hall, and Mrs. Dixon, by their daughters. The pulpit is from a design by Mr. W. White, F.S.A., of London, and has been supplied by Mr. Hayball, of Cavendish-street, Sheffield. The shape of the pulpit is octagonal, and the panels are filled with subjects from the life of St. Paul as follows:—"The Conversion of St. Paul;" "The Apostle Preaching on Mars Hill;" "His appearance before King Agrippa;" and "His Shipwreck when on his way to Rome." The carving of the panels has been executed by the firm of De Boeck & Van Wint, of Antwerp. A new lectern, by Mr. Hayball, uniform with the pulpit, has also been presented by an anonymous donor.

The Liverpool Skating-Rink.—A new skating-rink has been opened at Liverpool. It has been constructed by Messrs. Dixon & Co., contractors, and has a low galvanised iron roof. It comprises a ladies' dressing-room, pay-office, skate-room, and gentlemen's dressing-room, which offices stretch across the north end of the building. Beyond these is the covered rink, 145 ft. by 60 ft., with a raftered roof, from which hangs a long row of gas jets, with pendents; and this roofed portion covers 900 square yards. The left (or east) enclosure is composed of glass and iron, and opens by three broad apertures on to the uncovered rink, about twice the size of the first one. At the lower end of the roofed space are a refreshment-bar and a second gentlemen's dressing-room; while on both sides are forms. The entire skating space covers about 3,000 of the 4,000 yards.

Paint. — The Conservative and the East Indian Clubs, London, have just been painted and decorated with the Silicate and Enamel paint manufactured by the Silicate Paint Co., Liverpool.

New Public Hall at Tain, N.B.—A new public hall was opened at Tain on the 18th ult. The hall is 72 ft. long, 32 ft. wide, and 32 ft. 6 in. high. Including a gallery in the north end with accommodation for 100 persons, the hall is seated for between 500 and 600 persons. The building stands in a prominent position fronting Academy-street. The style of architecture is French Renaissance. The front is divided into a centre-piece, with two projecting towers, the centre being surmounted by a pointed gable. The height of the central frontage is 66 ft., and it is flanked by two blocks of buildings, in which are cloak-rooms, &c. The hall has been erected by a joint-stock company, the chief promoter of which is Mr. Murray, of Geanies. The cost has been upwards of 2,500*l.*

Apparatus for Recording Earthquakes.—At a meeting of the Edinburgh Geological Society, on the 20th ult., Dr. Bryce called attention to the arrangements at Comrie for recording earth-shocks. The *seismometer* in the parish church tower there having been the only means for many years of noting earthquakes, the committee of the British Association on this subject, of which he was convener, had lately fitted up in the grounds of Mr. Drummond, of Dunearn, other apparatus, which it was thought would give better indications. This consisted of upright cylinders of different diameters placed in such a position upon flat planks that they would fall among fine sand with even faint shocks, and would so indicate both direction and intensity.

"Notes on the Architecture of Three Italian Cities."—A paper on this subject was read on the 31st of January, at the Belfast Architectural Association, by Mr. Robert M. Young, honorary secretary. The chair was occupied by Mr. Joseph John Murphy. The essayist took for his subject the three Italian cities, Verona, Venice, and Padua, and he gathered his facts from a visit he paid to those cities in 1874. He spoke of the churches and public edifices in those places, and described them very minutely. The paper was illustrated by a number of drawings, and was criticised by the Rev. Dr. MacIlwaine, Mr. Lockwood, and Mr. W. H. Patterson.

The Philadelphia Exhibition.—By telegram received from America, the executive Commissioners are informed that the usual declaration on oath before a United States Consul is not necessary in the case of invoices of goods for the Exhibition. The American authorities will accept in lieu thereof, as on the occasion of the Vienna Exhibition, the formal certificate and seal of the Executive Commissioner. These certificates can now be obtained at the office of the Commission, 5, Craig's-court, Charing-cross, London, and as the various buildings are ready for the reception of goods, it is expedient that the consignments from this country should be despatched with the least possible delay.

Birmingham Architectural Association. Last week a paper on stone-carving was read at the rooms of the Association by Mr. J. Roddis, sculptor. The lecturer commenced by tracing the history of ecclesiastical carving in England, beginning with the Romanesque period, and carefully describing the several peculiarities and purposes of the succeeding styles as far as the Perpendicular period. The lecture was illustrated by a series of his sketches and casts from some of the best examples. Mr. Roddis also exhibited a set of working drawings by the elder Pugin. The meeting terminated with a hearty vote of thanks to the lecturer.

The Dundee Painters.—The Dundee Operative House and Ship Painters have unanimously agreed to memorialise the employers for an advance of wages at the rate of ½d. per hour, to take effect on and after 1st of April next, an answer to be received not later than March 17th. A committee has been appointed to draw up a code of bye-laws to regulate the working of the trade, which should be binding on employers and employed, the same to be submitted to the employers at an early date for their consideration.

Proposed New Harbour at Scrabster.—A proposal has been made by the Thurso Town Council to the Scrabster Harbour Trustees to erect a new harbour at the mouth of the River Thurso, suitable to the requirements of the growing trade of the place. It is stated that the works could be constructed for 7,000*l.*, and that the present trade would do much more than meet the interest.

Proposed Art-Exhibition at Wrexham.—The Lord-Lieutenant of Denbighshire has issued the prospectus of the Art-Treasures Exhibition, to be held in connexion with the Wrexham Eisteddfod. It is proposed to open it contemporaneously with the Eisteddfod, and to keep it open for two months. The exhibits are to include paintings by the old masters, representing the different schools, and also modern art, water-colours, and other drawings, sculpture, a gallery of Welsh worthies, ornamental art and antiquities, Oriental art, &c. It is proposed to hold popular lectures on the contributions. Mr. W. Chaffers has accepted the post of superintendent and hon. sec.

Society for the Encouragement of the Fine Arts.—The general meeting of this society took place on the 27th ult., Mr. James Edmeston in the chair. In opening the proceedings the chairman congratulated the members on the continued progress of the society. The honorary secretary, Mr. Augustus G. Babington, then read the report, which was unanimously adopted, as was also the financial statement put before the meeting by Mr. William Atkinson, the honorary treasurer.

Lighting Railway Stations by Electricity.—It is stated to have been decided to light all the waiting and luggage rooms of the principal railway-stations in Paris by means of electricity. By working the Graham machine with three-horse power, it is said that as much light is obtained as that given by a hundred gaslights. The electric lantern is placed at a height of 10 mètres from the ground, and sheds a soft, clear light over an area of 20,000 square feet.

Water Supply of Beyrout.—A letter from Beyrout says that a new water supply has been introduced into the town of Beyrout, from the Dog River, which is two or three hours to the north of the city, and near which are several well-known tablets with Assyrian, Egyptian, and other inscriptions. The works were executed by an English company, under the superintendence of Mr. Maxwell, an English engineer, assisted by Mr. Huxley and others.

Royal Historical and Archæological Association of Ireland.—The January meeting was held on the 19th ult., at the Association Apartments, Butler House, the Rev. Charles A. Vignoles in the chair. Various new members were elected. This being the annual meeting, the report of the committee for the past year was brought up and read by the Rev. James Graves, the indefatigable hon. sec.

Institution of Surveyors.—In compliance with special requests from many of the members, the council have arranged for a discussion of the provisions of the Agricultural Holdings Act coming into operation on the 14th proximo. The discussion will be opened by Mr. D. Watney at the next meeting (Monday, February 7th). The chair to be taken at eight o'clock.

Museums in Rome.—A new museum has been opened in the Palazzo Tenerani, Via Nazionale, consisting of upwards of 450 models and masterpieces of Pietro Tenerani, the celebrated sculptor. They are arranged in six halls, and the catalogue is by Professor Raggi. A new Mediæval museum was opened on January 16th. It is in the upper floor of the old Collegio Romano.

Mr. R. Tress.—According to the *City Press*, the will and codicil of Mr. Richard Tress, of Queen-street, Cheapside, architect, who died at his private residence, No. 4, Albert-road, Regent's Park, on the 29th of October last, were proved under 9,000*l.*, on the 23rd ult. by Mrs. Susan Headly Tress, the widow of the deceased, the sole executrix, to whom he leaves all his real and personal estate absolutely.

Colchester Museum.—In view of the visit of the British Archæological Institute to Colchester in the summer, great alterations and improvements are to be made in the Castle, the Museum, and the adjoining property, through the instrumentality of the owner, Mr. James Round, M.P., in conjunction with the Committee of the Essex Archæological Society.

A Butcher's Shop at Nottingham.—A butcher's shop-front would not appear to afford much scope for architectural talent; but from what we read, a new shop of the kind just erected in Angel-row, Nottingham, for Mr. C. Simkins, presents one or two points worthy of imitation. It has been erected from a design by Mr. W. A. Heazell, architect, Nottingham.

New Lecture Hall at Hawkhurst.—The new Lecture Hall at Highgate, Hawkhurst, erected at the cost of Mr. Henry Maynard, of Oakfield, was opened on the 25th ult. The building, which is in the "Old English" style, has been erected from a design by Mr. Alfred Williams, and will seat 400 persons.

Jubilee of the Menai Suspension Bridge. A public dinner was given at Menai Bridge on the 31st ult., in celebration of the fiftieth anniversary of the opening of Telford's suspension bridge. The first stone was laid in August, 1819, and the bridge was opened on the 13th January, 1826.

Cases for Philadelphia.—Mr. F. Sage known as a show-case manufacturer, has published an illustrated catalogue of designs for counters and cases suitable for the Philadelphia Exhibition. Some of them are repetitions of those he put up at Vienna. Practice gives facility.

The O'Connell Statue in Dublin.—At a meeting of the O'Connell Monument Committee in Dublin on the 28th ult. it was resolved to have a cloaked statue. The controversy is now stated to be finally settled. Quite right. The cloak was his distinctive feature.

A Use for Sadler's Wells Theatre.—Sadler's Wells, the oldest theatre in London, is said to be sold at last. Arrangements are in progress for its immediate conversion into,—a skating-rink of course.

Society of Engineers.—The first ordinary meeting of the society for the year 1876 will be held on Monday, the 7th of February next, when the president for 1876, Mr. Vaughan Pendred, will deliver his inaugural address.

Rinks.—The fact that the Société Française des Asphaltes are now completing four rinks, at Highbury, Putney, Kennington, and Surbiton, says something in favour of Seyssel asphalte as a material for the floors.

The Poole Surveyorship.—At a meeting of the Poole Town Council on the 21st ult., Mr. E. Pearce was appointed surveyor, at a salary of 100*l.* per annum.

The Abbey Church of St. Alban's, Herts. Her Majesty the Queen has consented to become a subscriber for one copy of Mr. Neale's work.

TENDERS

For the erection of a police station, petty sessions room, superintendent's and constables' residences and offices, Hughenden-road, High Wycombe, Bucks. Mr. Charles Carter, architect. Quantities supplied :—

Hook & Oldrey	£5,197	0	0
Woodbridge	4,933	0	0
Cooper	4,833	0	0
Silver & Son	4,680	0	0
Hunt	4,493	0	0
Spicer	4,450	0	0
Loosley (accepted)	4,346	0	0
Taylor & Grist*	4,300	0	0
Biggs*	3,761	0	0
Smith & Fletcher*	3,025	0	0

* Withdrawn.

For alterations to Blackfriars' Tavern, Queen Victoria-street :—

Langmead & Way, accepted.

For the erection of the East London Synagogue, Rectory-square and Stepney-green, E. Messrs. Davis & Emanuel, architects. Quantities by Mr. Frederick Downing :—

	Main Building.	House.
Merritt & Ashby	£6,420	£880
F. & F. J. Wood	6,337	847
Williams & Son	6,190	900
Dove, Brothers	6,150	845
Lathey, Brothers	5,892	831
Brown	5,760	840
Brass	5,740	784
Ennor	5,635	762

For new schools, Canonbury-road, Islington, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. W. H. Barber :

Bill, Higgs, & Hill	£7,414	0	0
Dove, Brothers	7,345	0	0
Roberts	6,844	0	0
Williams	6,833	0	0
Grover	6,683	0	0
Hobson	6,665	0	0
Kirk & Randall	6,659	0	0
Browne & Robinson	6,634	0	0
Brass	6,512	0	0
Perry	6,510	0	0
Jerrard	6,443	0	0
Pritchard	6,441	0	0
Downs	6,382	0	0
Wall, Brothers	6,361	0	0
Clarke & Bracey	6,346	0	0
Lawrence	6,279	0	0

For mansion and stables at Newton Court, for Mr. J. Totteridge :—

Timewell	£12,872	0	0

For additions and alterations to schools, Hornsey-road, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Mr. T. M. Rickman :—

Sheffield	£4,319	0	0
Kirk & Randall	4,227	0	0
Hook & Oldrey	4,158	0	0
Williams	4,119	0	0
Roberts	4,094	0	0
Goodman	4,064	0	0
Newman & Mann	4,062	0	0
Downs	4,052	0	0
Grover	4,048	0	0
Wall, Brothers	4,041	0	0
Ennor	3,941	0	0
Royce	3,934	0	0
Hobson	3,927	0	0

For taking down and rebuilding No. 9, Lilypot-lane, City. Messrs. Ford & Hesketh, architects. Quantities supplied :—

Merritt & Ashby	£1,966	0	0
Killby	1,847	0	0
Anley	1,770	0	0
Kirk & Randall	1,728	0	0
Scrivener & White	1,718	0	0
Hobson	1,669	0	0
Mark	1,663	0	0
Brass	1,646	0	0
Crabb	1,629	0	0
Lawrence	1,389	0	0
Boyce	1,184	0	0

For asphalting the footways in Brook-street, Hammersmith :

Brunswick Rock Asphalte Company	£150	0	0
Val de Travers	137	0	0
Société Française des Asphaltes (accepted)	122	10	0

Accepted for general contracts for works and supplies for the Vestry of the parish of Chelsea. Mr. G. H. Stayton, surveyor :—

General Works and Repairs for Three Years.

Neave & Son, 20 per cent. above schedule prices.

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Turner, at the schedule prices.

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A. & F. Manuelle, at 13s. 6d. per ton.

Enderby Granite for One Year.

Nowell & Robson, at 14s. per ton.

For a new Baptist Chapel, to be erected in the Finsbury-road, Wood-green. Mr. Banister Fletcher, architect. Quantities supplied by Mr. R. C. Gleed :—

Chesum	£3,376	0	0
Mattock	3,342	0	0
M'Cowan	3,325	0	0
Downs & Co.	2,815	0	0
Vincent	2,658	10	0

For additions and repairs to No. 14, Hill-street, Berkeley-square. Mr. A. Mosley, architect :—

Brempson & Co.	£2,488	0	0
Bywater	2,039	15	0
Pickersgill (accepted)	1,830	0	0

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Inquirer (we know of no plan, within reasonable limits, by means of which a building near a railway station, and close to the line, can be rendered sound proof and thereby made suitable for a Cottage Hospital. Send particulars. Result of the competition appeared in our last).—Architect (correspondents who do not write their names plainly must put up with being miscalled). We will correctly the error caused by the writer himself.—A. C. (ditto. We do not believe in a man who signs his name so that it cannot be read).—H. R.—T. F. M'C.—G. H.—O. T. C.—W. D. C.—C. S.—H.—S.—N. M.—D. W.—J. W. R.—A. C.—Capt. T.—C. & Co.—J. N.—M. E. H.—E. W. J.—C. M.—P. & B.—J. B.—L. A.—W. D.

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Vol. XXXIV. No. 1723. Saturday, February 12, 1876.

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Recent Collisions: their Causes, and the Proposed Mode of Prevention.

OPINIONS of an expert, especially if he be a man of intelligence outside his specialty, are always of value. In no case can this remark be more applicable than in that of railway collisions. The men who are best fitted, by the daily direction of their energies, to understand the conditions of safety on a railway, are unquestionably the engine-drivers; and, among them, those of their body who, from their superior skill and care, are selected as the drivers of express or fast trains. It is therefore well worth while to give very careful attention to the opinions which a man of this class has been allowed to express in the columns of a daily contemporary.

Few persons who have not themselves driven engines, or at all events travelled on the footboard of the locomotive, are aware of the great stress that is thrown on the faculties of the driver. He must be, to a certain extent, a mechanic; and often is a skilled mechanic, able, from education and practice, to repair or to construct any part of the wonderful artificial organism which is entrusted to his care. He must be a man of a certain amount of muscular strength, and of a robust constitution that will enable him not only to brave all inclemencies of the weather, but to keep his powers of observation, and his instant readiness to act, unaffected by heat or by cold, by fatigue or by hunger; by darkness, storm, or tempest. It is one thing to bear such things gallantly on foot, on the outside of a coach, or even on horseback; and another to do so when not only one's own life, but the lives of many other human beings, may directly depend on readiness of eye and hand. For though, on a well-ordered railway, by broad daylight, with signals visible from a distance, the post of an engine-driver may appear to be an easy one, such is far from being really the case. At all times and under all circumstances the demand made on the energy of his manhood is great. On occasions of hardship and of danger it is probably higher than under any other ordinary circumstances. A pilot or a helmsman in a storm, or a superior officer in an engagement, may be subjected to a severer strain than an engine-driver in a fog, a snow-storm, or the prospect of an imminent collision. It is not easy to pick out more pertinent comparisons.

When a man, whose daily life is spent in an occupation of this anxious nature, finds language to tell us his experience, it is not a thing to be neglected. It is not, of course, to be assumed that "an express-driver" is infallible. But it is certain that he ought to be heard with respectful attention; and that his advice, if it recommends itself to the reason, should have the added weight of the most apt experience. "I will give you a case I see every day," says the driver. We listen to his evidence, and we come to the conclusion that precautions which, if faithfully adhered to, would make collisions impossible, are only nominally adopted. The block system, if thoroughly carried out, ensures safety. If only half carried out, it is no better than any other system, or no system, that has been followed for the last quarter of a century.

We will not cite the actual words of the express driver. They are perfectly clear and conclusive to the engineer; they may be a little too technical for the ordinary reader. The gist of them is this. A railway is supposed, under the block system, to be divided into a given number of sections by semaphores, or plainly visible signal stations. The length of each section ought to be determined, as to its minimum, by the distance within which the heaviest and fastest train can be brought to a stand still from its highest speed, under the most unfavourable circumstances. No engine-driver should be allowed to pass any one of these stations unless it display the signal "Line clear." This signal should never be given while a train is on the section immediately in advance. Thus, if we take stations *a*, *b*, *c*, and so on, when a train passes *a* the semaphore at *a* should bar the line until the signalman at *a* is aware that the train has passed *b*; *b* is closed till the train has passed *c*, and so on. But this is not quite enough. If any obstruction is known to occur, or to be probable immediately beyond *b*, the engine ought not to be allowed to pass *a* at full speed. Thus when a coal-train has to shunt into a siding between *b* and *c*, a proceeding that occupies some time, and during the execution of which the section *b*–*c* is properly closed, if a following train is allowed to pass *a* at say sixty miles an hour, although the section *a*–*b* is clear, there is imminent danger of a collision. There is the possibility of stopping in time, but there is also the opposite possibility. It is this opposite possibility which has to be avoided. The block system supplies the means of so doing. But then it must be arranged with that view. It is entirely unsatisfactory to allow the train to run at full speed over a section known to be clear, if there exist a probable or a possible obstacle in the section immediately beyond, of which due notice cannot be given until it is too late. This argument is so plain and practical that it cannot be rationally contradicted. All that can be urged *per contra* is that the traffic of a line is so heavy, and the number of trains so frequent, that it is difficult and inconvenient to allow such intervals as are requisite for the assurance of absolute safety for the passengers. And this is, in fact, what very frequently occurs.

The question of the length from signal to signal is a detail of primary importance in this view of the case. At Abbot's Ripton the up-signal is only 950 yards from the siding. In other places the distance is not more than 700 yards. A heavy express train, running at the rate of sixty miles an hour, with say sixteen carriages and two break-vans, will often require, when the rails are greasy, a mile's distance before it can be brought to a stop. Thus arriving at the point which we have called *b*, and finding the signal "on," although the driver may instantly reverse his engine and whistle for the brakes to be put on, he will probably run into the coal-train before it has got clean into the siding. Without referring to any case which may be under judicial investigation, it is pretty clear that an accident would be likely to ensue in such circumstances as these. It is also clear that the collision would be justly attributable to the imperfect code given for the working of the line at that particular spot, and not to the signal-man, the engine-driver of the heavy train, or the engine-driver of the fast train.

The real cause of danger and of disaster in almost all cases is the attempt to conduct traffic over the same lines of rail at very different rates of speed. This can only be accomplished by allowing the slow trains to stop at certain points; to run into sidings; and to allow the fast trains to run by without interruption. But the very fact of having to run a train of some thirty wagons into a siding is in itself a serious matter. It consumes a definite period of time, under any circumstances; and many incidents such as the slippery state of the rails, may extend the ordinary time required. For the most part, the present practice is calculated to avoid what are called facing points, which effect the direct diversion of a train in motion by the agency of the pointsman; and the slow train is shunted backwards into the siding in consequence. Here is an additional cause of delay. Again, the plan of the sidings is often complicated, as the requirements of the traffic of a line augment. The up-line of rails crosses the down-line at various points; often at a station,—almost always at a junction. At all these points the risk of collision is multiplied in proportion to the traffic, and the more economically, that is to say the more slowly, the heavy traffic is conducted, the greater is the risk of collision.

Against the mechanical possibility of collision, notwithstanding these complications, it is possible to guard by the use of signals, and a proper code of arrangements. But then the signals must be so arranged, and so worked, as to leave nothing whatever to the chapter of contingencies. For instance, the connexion between the signal-box and the distant signal is still, for the most part, extremely rude. It usually consists of perhaps half a mile of wire, and the mere alteration of temperature between day and night, causes a change in the length of this wire quite sufficient to prevent the signal from answering to the lever. Unless a provision be applied for regulating the wire, the signal-man has to make

alterations in the connexion from time to time. In case of fog, he is unable to see whether his distant signal has actually obeyed his lever. What is called an electric repeater obviates this danger, and informs the signal-man that his movement of the lever-handle has produced the effect he intended. Such being the case, it would seem obvious that the introduction of this, or some equivalent safegnard, is an imperative necessity. If the signal-man, on whom the safety of the public depends, be responsible for the working of a signal at half a mile from his station, it is certain that he ought to be able to tell, absolutely, instantly, and under all circumstances, whether the signal which he has endeavoured to give is actually given. As means for giving him this information exist, we think an honest jury would be very likely to come to a verdict of manslaughter in the case of an accident arising from the non-working of a distant signal, when the signalman had fixed his lever aright, but had been prevented by fog or other cause from seeing that the corresponding signal had not been made at the distant station.

In all cases where safety depends on the observance of signals, a repeat of some kind is an absolute necessity. For a man to give a signal without the certainty whether it is or is not visible to the driver whom it is intended to warn, is worse than to be without signals at all. In the latter case the driver depends on his own observation of the freedom of the line before him. He knows where obstacles are likely to occur, and where, at certain times, they are certain to occur, and he regulates his conduct accordingly. But when signals are given, and especially those distant signals which are required by the velocity of our passenger traffic, the driver depends on them absolutely. It is natural that he should do so. They are expressly constructed for his information, guidance, and direction. If they mislead him, he is blameless, though he may pay the penalty of the error with his life. Whether, then, we look at the responsibility of the Board of Trade, as professing to supervise the working of our railways, or at the liability of the directors or managers of our great companies to be placed in an exceedingly unpleasant position by the honest verdict of a jury, it is pretty clear that some mode of ascertaining whether the signal, at any moment, has obeyed the signal-man, is an imperative necessity.

With the signals rendered mechanically perfect, the next requisite is, that the code should be equally satisfactory. The alterations on existing practices may seem slight; but they make all the difference between life and death. If "Line clear" is given at a station or signal-post as soon as a train has passed it, such a signal, in certain cases, is a cause of danger, and may at any time prove a cause of calamity. If the preceding train has to shunt, the signal, "Line clear" should in no case be given until such train was perfectly within its destined siding. If the train runs straight on, enough time ought to be given before "Line clear" is signalled, to allow it to be well on its way; so that in the case of any obstacle to its progress the succeeding train might have time and space within which to stop. To arrange such a code as this is a matter of perfect simplicity. It is only the desire to save time that complicates the matter. Apart from the very serious question of line crossing line on the same level, which is a matter demanding independent examination, there is no doubt that signals can be constructed, and worked under a rigid code, in such a manner as to make collision from one train running into another, while stopping or shunting on the same line of raile, a mechanical impossibility. Are the public of this country content to take the risk of the non-enforcement of these conditions?

There is no doubt that very serious attention has been recently directed to this matter. Indeed, the statement has been made, although we are not aware on what authority it is based, that her Majesty's Government contemplates a measure intended to constrain the railway companies to lay down separate lines for the merchandise traffic. The equivalent to be offered for this outlay is said to be the abandonment, on the part of the Government, of the Government duty which now exists in England and Scotland, although not in Ireland. As this duty, however, does not amount to much more than one per cent. of the gross revenue of the railways of the United Kingdom, the compensation would be altogether inadequate. The average receipt per train mile, in 1874, is stated in the Board of Trade return at 68·11d. The expense per train mile was 37·89d., of which the Government duty amounted to only ·72d., or less than three farthings. It is obvious that such a saving would go but a very small way towards paying interest on the laying down an additional pair of lines of railway.

In the case of the Abbot's Ripton collision, the jury have taken upon themselves to decide, as far as their verdict has any weight, a great mechanical and commercial question, which has yet to be fully elucidated and argued out. They have censured the directors of the Great Northern Railway for endeavouring to conduct so heavy a mineral traffic as that which they carry on, without providing a special line of rails for its transit. That the jury, if not outside their right, are outside their information, in giving such a verdict, we think few practical men will doubt. That a censure may be proposed by a jury is undeniable. But as the actual function of a jury is to ascertain whether there has or has not been a breach of the law, we confess that we look at what may be called amateur expressions of opinion with considerable disfavour. They seem to us extremely likely to bring the system of jury-verdicts into further disrepute. If the jury in the Abbot's Ripton case had before them sufficient grounds for expressing marked condemnation, either of the directors or of any of the officials of the Great Northern Railway, the constitutional mode of expressing that opinion would have been by a verdict of manslaughter. The case would then have been open to review; and if the verdict had been given upon insufficient evidence, it would have been reversed, with as much publicity, and with ten times the authority, as that with which it was originally promulgated. As it is, twelve men, selected to inquire judicially into a grave question, have taken the opportunity to declare what may be their unanimous opinion, but something which it forms no part of their judicial function to deliver. Right or wrong, it amounts to no more than twelve private opinions. It has not been shown, either to the jury or to the public, that general safety would be improved by the laying down of "a line for mineral traffic." It may well be questioned whether such an expedient would have any such effect. To lay down a pair of additional tracks, indeed, would be a suggestion more to the point. We conclude that a sort of compromise is indicated by the rather helpless suggestion actually published. But with regard to an additional pair of tracks, much more than such a simple operation, costly as it would be, is requisite to prevent, with any degree of certitude, collision and disaster. It is not on the running part of the railway that collisions occur. As we have before said, it is at the crossings, sidings, and junctions. At almost any great station the system of points and crossings would be rather complicated than simplified by laying down parallel lines of way. To attain the object we all have in view, safety, where two kinds of traffic, differing as widely in their conditions as do passenger and mineral traffic, are each of sufficient magnitude to demand tracks of their own, nothing short of the provision of two practically independent railways will be altogether adequate. Excepting in so far as the price of land is concerned, which of course is a considerable element in the case, it would probably generally cost less to make an entirely new railway than to double the width of an existing railway. That is, of course, considering that it be regarded as a *sine quâ non* for safety that railway shall not cross railway, nor traffic intersect traffic, on a level. Nothing short of a provision to that extent will render collision impossible. And it is only mischievous to lead the public to suppose that the laying down of a third line of rails would have such a result.

How much has already been done by way of laying parallel tracks we cannot at present ascertain. But no inconsiderable progress has been made in that direction. During the four years from 1870 to 1874 nearly 3,000*l.* have been added to the capital cost of every mile of railway, on the average of the net work of the United Kingdom. The fact is so startling that we give the figures, to show that there is no misstatement. The total capital invested in the railways of the United Kingdom at the end of 1870 is returned by Captain Tyler (in the Blue Book, c. 1,382, 1875) at 529,903,673*l.*, or 34,106*l.* per mile open. At the end of 1874 the capital amounted to 609,895,931*l.*, or 37,078*l.* per mile open. The length of railways open at the former date is not given, either in the report for 1874 or in that for 1873. Of course it can be calculated by dividing the capital by the cost per mile; but we are now citing Captain Tyler's figures. At the end of 1871 there were 15,376, and at the end of 1874, 16,449, miles of railway open in the United Kingdom. Thus, in addition to the construction of 1,073 miles of new railway in three years, the cost of every mile of line was raised from 34,106*l.* to 37,078*l.* between December, 1870, and December, 1874. That this great outlay has been mainly made for the accommodation of the heavy traffic we suppose there is little doubt. While the mineral train mileage of 1874 was about 4 per cent. more than the passenger train mileage, the number of vehicles used for the conveyance of passengers, and attached to passenger trains, was less than one in eleven of the total number of vehicles, excluding locomotives. If we take the speed of the passenger trains at only double that of the mineral and goods trains, we shall thus find that, at the present moment, the rails, including line, stations, and sidings, are occupied for twenty-two hours by the goods traffic for every hour that they are occupied by the passenger traffic. Out of a gross revenue of 56,899,498*l.*, thirty-two millions sterling, or 56 per cent., was earned by the goods traffic. The relative cost of running a goods train and a passenger train for a mile, or of the carriage for a mile of a ton of minerals or of a ton of passengers, is nowhere given. Those elements of working cost which would enable an engineer to arrive at the knowledge of this great elementary fact, are not given in the Returns of the Board of Trade. We are told that the receipts per train mile from passenger trains are 60·72 pence, from goods trains, 75·84 pence, and from all put together, 68·11 pence; but we are only furnished with a general cost of 37·89 pence per train mile. It is, however, certain that the goods train, which earns 75·84 pence, must be a much longer, heavier, and more costly convoy than the passenger train, which, at a very much higher rate of freight, earns only five shillings. The public are precluded, by the form of the accounts sanctioned by Act of Parliament, from receiving that information on this important subject to which the shareholders, at least, are fully entitled. But we hope that we have said enough to show that a very important, as well as a very obscure, question is involved in any attempt to estimate the value of the mineral traffic of our railways; and that the idea of enforcing a duplication of their tracks is neither so simple nor so satisfactory as many persons now imagine.

THE BRUSSELS EXHIBITION.

The programme of this forthcoming Exhibition is now complete, and we are enabled to describe its details. The greatest interest and the highest influence have been brought to bear in order to ensure success, and the result seems likely to reward the exertions that are being made. It will be borne in mind that this is not to be a miscellaneous display, in which cabinet work and carpets, jewelry and gold, sculpture and painting, gun-metal and ornamental woods are huddled together in company with a thousand knick-nacks, more or less useful or useless, of artisanship; but an emulative illustration of whatever modern humanity and science have accomplished or suggested in the cause of the public health and safety, and the relief of suffering, by land or sea, all over the world. The idea is comprehensive and expansive enough, and, as was inevitable, some eccentricities of ingenuity find their way in with the rest; but there can be no question as to the general value of the scheme. We are reminded that the present is an age which conducts its operations upon the grandest scale, and that, consequently, its disasters, when they occur, are equally prodigious. Thus, a conflagration may, as in the New World, destroy an entire city; the victims of collisions, burnings, or wrecks at sea are counted by hundreds; every maritime company, almost, owns a fleet; battles are fought by populations rather than armies; the gigantic forces employed in industry are surrounded by similarly colossal dangers; and the very rapidity and universality of action, and the multiplicity of swift and subtle agencies, add to the perils that environ human life. Such, in effect, is the ground upon which the promoters of the Brussels International Exhibition of 1876 have based their scheme. They admit that the principal Governments of Europe, assisted by inventors and constructors of various classes, have given the subject their anxious care; but their desire is to bring together, as it were, an array of comparative groups, the one tending to correct or extend the other, so

that the whole of our science and progress in these respects may be brought into a bird's eye view. If less fascinating than the great world bazaars of London, Paris, and Vienna, the Belgian show will thus be more concentrated and practical, though arranged in a strict series of sections and subdivisions. One distinct characteristic is that the originality or utility of every invention brought forward may be publicly debated upon the spot, and that supplementary experiments, on river and sea, will be carried out at Antwerp and Ostend. So much being said by way of preface, we may proceed to note the special features of the project.

The Exhibition Buildings are in course of erection in the park, at a point about midway between the Royal Palace and the Legislative Chambers, and have been designed less with decorative than with rigidly practical objects. This, indeed, is the principle which the administration has declared its resolve absolutely to enforce. It will admit nothing but what comes within the legitimate limits of the published classification, and nothing but what is plainly distinguished by merit, interest, or superiority of some kind. We may be slightly sceptical as to the fulfilment of this philosophic promise; but, at all events, it indicates a right appreciation of the purpose in view. Nor will dangerous substances of any kind be allowed, while, with regard to whatever is necessarily offensive, it is to be placed under particular restrictions. In the first class are specified apparatus and means for preservation against fire by land and by sea, and in this are included the construction of dwellings, powder-magazines, petroleum stores, and ships, together with preparations for rendering uninflammable timber, woodwork, clothing, furniture and decorations, and lightning-conductors. The second category embraces a number of subtle contrivances for the detection of fire, whether spontaneous in the hold of a vessel or on the floors of a warehouse, or the act of an incendiary. It is a strange circumstance that although many of these inventions have, from time to time, been exhibited and approved of, few are in common use, either through difficulties in their application, or a spirit of parsimony, or doubts of their effectual value. There can be no question, however, that a system of self-acting fire-alarms and telegraphs, at once simple and trustworthy, would be a discovery of incalculable importance, and the examples produced at Brussels will be looked forward to with considerable expectation. But one that failed in the working would, of course, be worse than useless as tending to relax precautions, without rendering them unnecessary. Next come the whole paraphernalia of humane societies everywhere—wall-ladders, roof-ladders, ice-ladders, sacks, escapes, cordage, parachutes, respiratory aids, and ventilators; and, in a fourth department, are water-engines—as they should, perhaps, be termed—with steam or manual power, for decks, for holds, for cabins, for masts and rigging, for kitchens, chimneys, staircases, and every conceivable variety of structure; and we may expect an astonishing competition in hose, joints, taps, pump-actions, reservoir connexions, tanks, and so forth, besides chemical and mechanical methods of extinguishing a conflagration. Here, again, while invention has been at work upon a large scale, no particular process has won wide-spread belief or favour. It appears as if such things are popularly regarded, like the fire-buckets at a bank, as being rather conventionalities than necessities. These, however, are but introductory departments of the Exhibition, which expands thence through all the hazards of swimming and skating; the lighting of shores on seas, rivers, and canals, and under water; signals for ships and railway-trains; sounding-leads; lifeboats, rafts, rockets, mattresses, belts, jackets, bells, and balloons, and models of coast-stations. Really, if the whole of these were practicable, and the whole of them taken into adoption by the world, we ought to hear of very few casualties on earth or ocean. Then, the securities suggested for every description of craft, from the ironclad that could not possibly heel over like the *Captain*, to the tiniest out-rigger that ever skimmed by Mortlake, are scarcely to be comprehended in a single summary, not to speak of hammocks, berths, and cuddies upon hygienic principles, impermeable hatches, safe gangways, railed tops, and comforts for the sick and wounded at sea. Much thought and care have been bestowed upon vessels abandoned or in distress, water-logged or in flames, and there will be an instructive collection—to judge from examples we have seen—of such matters as are generally left to chance,—jury-masts, temporary rudders, sails to fit on every variety of spar, and lockers for open boats in tempestuous weather. Some curious contrivances are prepared for visiting and repairing hulls of any burden which, for whatever reason, cannot be brought into port, but must be taken in hand while still afloat. With them are medicine-chests, wherein every square inch of space is so minutely turned to account that one might suppose a range of Oxford-street shops to have been reduced to sublimates and essences. Thus far with respect to water. Upon land, the road, whether travelled by steam or in horsed vehicles, is the conspicuous peril that presents itself, and it is sought to be mitigated, to begin with, by patent harness, bits, bridles, stirrups, curbs, and reins; but the railway, of course, is most prominent, though we have had many exhibitions in connexion with it, to very little purpose, Heaven knows. Here will be displayed any number of safety breaks, signals, lamps, means of communication between guards and drivers, helps to entering and alighting from carriages, steps, foot-boards, hand-rails, wheel-guards, and "machines and tools for immediate assistance in case of trains running off the rails, or other accidents." We are, moreover, to have snow-ploughs and cow-catchers from the laboratory of American inventiveness, with self-acting gates for level-crossings, and, better still, a way of dispensing with the use of level crossings altogether. From peace,—which has its holocausts, more frightful, often, than war, since women and children and unconscious age are among their victims,—to war itself; and, if ever it can be waged in velvet gloves, Brussels will show how. It is agreed by all humanity that from the moment an enemy is disabled, he becomes, if not a friend, at least no longer an adversary; therefore these litters, portable chairs, and cacolets, these carriages and wagons, specially constructed for the transport of the sick and wounded, and contrivances for adapting ordinary railway rolling stock to the same use, which are already being notified to the Executive Council. In suggestive and formidable proximity with them will be the ghastly cutlery of a campaign, infinitely more hideous of aspect than swords and bayonets,—instrument-cases threatening horrible tortures, boxes of medicaments and lint, stationary and flying ambulances, hospitals, lazarettes, and huts, and an interesting apparatus of "cookery for the wounded," of French invention, we believe. An essential accessory is a series of plans for the preservation, burying or burning of corpses, and the purification of battle-fields and camps. Thence, by a natural transition, we pass to the drainage of marshy soils, the purification of pestiferous land, the cleaning of river and canal beds, paving, Macadamising, public lighting, means of preventing the subsoil being infected with gas, the repair of roads, the construction of scaffolds, the strengthening of bridges under exceptional weights and strains; and, oddly enough in such a connexion, the reclamation of wandering dogs and diminution of hydrophobia. A corner, however, had to be found, we assume, for every order and degree of philanthropy, and as well here as anywhere else. Very practical and useful will be the collection,—though all its specimens may not come within that category,—of church models, plans for ventilating, heating, and illuminating them, hospitals, barracks, schools, prisons, and theatres, public baths, and workhouses. The subject of water supply is not neglected, and the latest suggestions are to be presented of reservoirs, main and subsidiary pipes, meters, fountains, taps, plugs, and filters, in most of which the French, Belgians, and Germans, whatever may be said to the contrary, are lamentably deficient, except in their principal cities. They are, for the most part, not less backward in their water than in their drainage arrangements. On the other hand, they will probably prove themselves deserving of praise with regard to their slaughter-houses, markets,—the latter especially,—and shops. We shall see, however, their newest proposals for the disinfecting of towns; the removal and appropriation of cinders, ashes, and waste; the meeting of certain wants disgracefully overlooked in England, and the general extirpation of nuisances like those which affront every sense in nearly all the smaller towns of the Continent. A question of the day is to be illustrated by projects of morgues and mortuaries,—improvements, it may be hoped, upon those of Paris and Munich, and upon the detestable dead-houses of London,—and of vaults, tombs, and graves, as little melancholy as such things can be made without being rendered frivolous or grotesque. We are also promised some hints, illustrated, however, only by models or on paper, about cremation and embalming. The Exhibition will next set forth a view of sanitary workshops and factories, safe mine and quarry interiors, lifts and cages for workmen and loads, the protection and improvement of machinery, with a view to the lessening of danger. There is a class to which the public will look with no slight curiosity,—substitutes for deleterious materials employed in manufactures and the arts, apparatus for reducing the inconvenience and evil caused by dust, noxious vapours, stoves, and excess of gas, and special dresses for special occupations. Model private habitations are to occupy one section, and gregarious habitations, if the term be permissible, another, with all the conveniences and appliances essential to both. Passing the clothing and cookery classes, we shall meet one of peculiar utility; that is, of suggestions as to the cleanly and wholesome preservation of food in the dwellings of the poor. Any dark and airless hole is usually considered good enough for a cupboard or a pantry, and the result is that provisions get prematurely tainted. The Dutch contrivances in this respect, are admirable, and perfectly easy to adopt. Little is to be said about children's toys and home gymnastics, though they illustrate a unique industry; but considerable interest attaches to the salubrious and economical construction and fitting-up of stables, cattle-sheds, and other rural buildings, of swine-houses and kennels, and, of course, above all, of abodes for the agricultural labourer. It will be confessed that the programme is large and elaborate, but our view is far from having comprehended the whole of it. The inventors assembled at Brussels will undertake the protection of houses from the effects of excessive frost, the teaching of the farmer with reference to the healthier disposition of manure in storage; the pointing out of means for finding water for fertilising purposes, where it is supposed to be scarce, and how to clear fields from mud after sudden inundations. No doubt, it is already evident from their own accounts of their several projects, that a good many of the intending exhibitors miscalculate the value of their inventions, but that in all such emulations is inevitable. The very object of them is to sift the suggestions of modern ingenuity, and separate the practical from the futile.

FURTHER NOTES AT BURLINGTON HOUSE.

As at the previous exhibitions, Gallery IV. is appropriated to works of early, or comparatively early, Italian art. Occupying (justly) a central position, is a work of that remarkable, and in this country little represented artist, Luca Signorelli, whose strong and almost defiant originality seems to be stamped upon everything he produced. The present work is a fresco successfully transferred to canvas and framed, representing the interview between Coriolanus and his wife and mother outside the walls of Rome. In spite of the peculiarities, we might say angularities, of the painter's style, this is a work in its intent and meaning full of a noble pathos, and illustrating also what has been remarked by able critics as to the part Signorelli played in initiating new and striking positions of the figure, in which to some extent he was the forerunner and anti-type of Michelangelo. The moment of reconciliation of the hero is evidently impending; the two Roman ladies stand before him, a mingled dignity and supplication in their figures, half bending forward; this combined air of earnestness and hesitation pervades the whole group; Coriolanus spreads his arms wide with a gesture which might be attributed either to affection or expostulation; the little boy moves forward to embrace his father, but looks back to the mother as if for permission to do so. The evidence of the thinking out of his subject by the painter is very clear and interesting. On either side of this fine work are two companion pictures by Sandro Botticelli, of the same subject, "The Virgin, Child, and St. John" (190, 197), both fine specimens of this painter in his quieter subjects, and in execution superb in their way, and if (as appears) they are really untouched, their preservation and brilliancy are astonishing. The combination of colour in the draperies in No. 197, the finest of the two, is very rich and harmonious. A "Virgin and Child" of Pietro

Alemanno, in the same neighbourhood (193), is a fine specimen of decorative painting, in the brilliant, hard finish of the elaborate design of the dress; and a curiosity, in quite an opposite way, is the small "Jupiter and Semele," of Schiavone, lent by Mr. Leighton, where the god comes tumbling through the air, with a general cut in his countenance and robes which suggest the idea of a high priest let loose. The "Triptych," by Giotto (187), containing a number of small subjects from the life of Christ, is disappointing; it is a mere curiosity, the designs for the most part being rough and crude to a degree. The two specimens of Mantegna's well-known monochrome style, "Judith and Dido" (179, 182), are also disappointing, not presenting the ideal grandeur of form and conception which marks others of his works in this style. Memling's "Virgin and Child," with the donors of the picture, the Donne family (172), is a well-known and exceptionally fine specimen of the painter; one may notice the care, and, as far as the painter could go, the realism, with which the extended landscape seen through the architectural background is painted. Filippino Lippi's "Adoration of the Magi" (170) is a work of precisely the same type as, but not equal to, the picture by him of the same subject shown at a previous loan exhibition; the Virgin enthroned on the steps of a nondescript architectural erection, with the pillars and roof half broken away to show the sky and the rest of the composition. The architect may note the section of the roof-framing left exposed, with the purlins suspended beneath, instead of resting on the principals.

It is interesting to contrast the two very fine specimens of ideal figure-subjects by Titian and Correggio, in Gallery III.—"Europa" and "Venus disarming Cupid" (123 and 131). In the latter we see in a marked degree the beauty and also the limits of Correggio's art; the delicately modelled figure and soft rounded relief of the limbs, in which the outline "loses itself" in what was at one time supposed by critics to be the *ne plus ultra* of painting, is so charming in its way that one half forgets the comparative weakness and conventionality of the style. The Titian is a wholesome corrective to these blandishments. It is true his treatment of the "Europa" legend in this case is anything but idealised as far as regards the principal figure, which is, in fact, simply a scantily-clad and somewhat coarsely formed woman in a very ungraceful attitude; but the power and vigour of the whole thing makes Correggio seem rather harmless by comparison; and in tone, in that rich deep lustre of surface which belongs to Titian at his best, the work is superb. The group of the little Cupid and his dolphin to the left might be taken by itself as a model specimen of Titianic workmanship. One of the most interesting works in this room is the Giorgione lent by the Earl of Derby, the "Head of Pompey brought to Cæsar" (138); a long picture, almost of what may be called a decorative type, wonderfully rich and harmonious in the combination of colour in the costumes, but curiously deficient in finish of detail in the faces and even the drawing of some of the figures, though the grouping is thoroughly connected and consistent, and every figure has its relation and varied expression of manner, if not of countenance, in regard to the central incident; it is a highly interesting specimen of the painter in a manner of subject and treatment differing from that by which he is best known.

Two or three specimens of Henry Fuseli in the collection may be taken as warnings to those who are tempted to desert nature, under the idea of going beyond her. His "Macbeth" (248) exhibits most fully his peculiar power and his perhaps equally peculiar faults. The witches are effective—here the painter was in his element; Macbeth, with the unnaturally glaring eye and the usual Fuselian length of leg, is a figure bordering on the absurd. To drop at once from very tragic tragedy to very comic comedy, Hogarth's small portrait picture representing the "First Performance of the 'Beggars' Opera'" (100), has interest of more than one kind. The actors are in the centre, and the "distinguished audience" to the right; *Captain Macheath* is just in the dilemma which leads him to exclaim:—

"Which way shall I turn me? How shall I decide?"

It is worth notice how much of the very highest quality of painting is illustrated in this small picture of a by-no-means "high-art" subject, as that used to be understood; humour as delicate as that of Fielding, admirable grouping, decisive yet harmonious colour, go to make up a remarkable work of its kind. The kneeling figure of *Polly Peachum* is most excellent; pathetic, yet with a touch of humour in its pathos. A perhaps still more remarkable picture of the life of a past period, and also a portrait work, is Gainsborough's "Ladies walking in the Mall" (278), one of the most charming and original things he ever painted. It is a comparatively small picture, showing us a broad walk under the shadow of masses of June foliage, beneath which, in groups of twos and threes, walk the Lady Bettys and Lady Kittys of the period; some rest on seats at the side; one remarkably graceful girl is conspicuous among the seated group on the left. What strikes one is the consentaneous waft and movement of the whole picture; even the trees seem painted with an unusual breadth and freedom, and, swaying in the breeze, combine, with the dresses of the ladies, to give a general idea of the rustling of soft plumage everywhere throughout the scene; and as we look at this group of youthful, buoyant figures, moving about with the light elastic step of high birth and breeding,—this wave of the tide of life, thus caught as it passed by the artist,—it is almost with a startled revulsion of feeling that we remember that all of them are gone, gone long ago, and that the great-great-grandchildren of some of them may come here, young girls like these, to look at this very picture.

Among the *genre* pictures of the Dutch school, not very numerous in this year's collection, two are worth special notice. "The Violoncello," by Metzu (163), is remarkable not only for its exceptionally fine execution, but for the interest and individuality of the group portrayed, and the life-like suggestion of the whole composition: the player is seated fronting the spectator, just in act to commence; another figure stands in the gallery just over him, an expectant listener, and a singularly plain woman in a very picturesque dress stands on the stair leading to the gallery, holding out a sheet of music to the player. The other work is a very fine specimen, the only one exhibited, of Nicholas Maas, "Woman seated at a Pianoforte" (240), unusual in composition; the pianiste is seated with her back to the spectator in the front room, and through the open door we look through a range of rooms receding in perspective, with another figure sweeping the floor, in the distance; the whole of the rooms are lighted through windows on the right by a strong sunlight, which throws its successive range of lights on the floor: what is remarkable is the combination of a strong effect of light and a very realistic and forcible painting of detail, without the slightest hardness or loss of atmospheric effect. A panel of studies of animals, by Paul Potter (168), is full of interest.

Among landscapes the largest and the smallest in the collection have each a specialty of interest in their way: the first, the so-called Rubens, a large bare barren-looking landscape of most uninviting tones, with the Escurial situated in the midst of it, is noticeable, in connexion with the long story attached to it in the catalogue, as one more example of what was a frequent practice of Rubens, of painting a certain proportion only of a work himself; as much, in fact, as he considered the money's worth of his commission; adding his sign-manual to it and letting it go to a certain extent under his name. The smallest is the landscape by Raffaelle (178), a little painting on panel, 6 in. by 4 in., looking more like an imaginary composition than a transcript of nature; a river and bridge and mill near the foreground, the middle distance a good deal lost in shadow, and the distance closed by a range of hills, behind which a white light as of early morning rises. Hard as it is in texture, there is a great and scarcely expliable charm in this little work. Turner's "Lowther Castle" (33) needs no comment; on either side of it are a small Crome and a small Constable (30, 38), of singular beauty of feeling and composition, and adjoining it Richard Wilson's exceptionally fine "Tivoli" (37), notable for the pellucid clearness of the atmosphere in which the famous group of buildings on the rock stand up on high in the composition. Gaspar Poussin, Both, and Rosa are well represented. More special interest attaches to the less popularly known works of De Koning (147, 165); the latter of the two is the finer work, and in composition, and a peculiar power in giving the perspective extent of the landscape, has the characteristics of a Turner of the first period, though differing greatly in tone. Attention should be given to the Earl of Radnor's large Wynants also (229), a work which at first sight looks somewhat hard and repellant, but which will be found to have very subtle beauty of light and composition on closer study; the distance, though actually hard in comparison with the average of good landscape-painting, is effectually kept in its place by the almost metallic sharpness of the foreground detail, where the foliage appears as if cut out in bronze. A small landscape by Wilkie (26) is a sufficiently out-of-the-way thing to be noted; and the architectural visitor must not forget to look at the Vander Heyden (217), with the buildings on the canal bank so lovingly and exactly finished; and at Guardi's "Church of La Salute" (72), a splendid piece of architectural painting.

In noticing the portraits a week or two since, we accidentally omitted mention of one far too individual and unusual to be passed over, that of Pococke, the African traveller, in an Eastern costume, by Zoffany (51), a very fine and striking work; had Zoffany always painted so forcibly as this his renown would be much higher than it is. And we direct attention also to a work of rare merit in feeling and sentiment, the "Reconciliation of Olivia Primrose with her Mother," by Newton (265), a painter who was represented by some such very weak productions in former loan exhibitions that his right to be there at all might well be questioned (as it was); but this work, with undeniable shortcomings of technique, is full of genuine pathos and delicacy of feeling; the sad figure of poor Olivia leaning her head on her father's shoulder, the rigid virtue of the mother's pursed-up mouth and vulgar features, the beseeching countenance of Sophia, who kneels at her side, the puzzled concern of the two little boys, are all in complete keeping with the story, and we do not know that the immortal family of the Primroses have ever been better represented on canvas. To the younger generation of critics and spectators Newton is nearly a forgotten reputation, but such a work as this shows that his place among the painters of his day rested on more solid merits than it has been lately the fashion to concede to him. It is curious to reflect that this painting, if sent to a modern Academy exhibition, would run the risk of refusal, on the ground of careless execution, and yet it may be doubted where, among English painters, we could look at present for the same kind of unpretending pathos and delicacy of sentiment in the treatment of such a subject: so much has execution of late years predominated over feeling.

THE INSTITUTE.

As we anticipated, the third special meeting last Monday evening, to consider the questions arising out of the recent report of the Special Committee, was smaller and much more unanimous than the first two. The question of the retention of the charter having been settled, the spirit of fight had lulled, and the meeting resulted in the unanimous acceptance of the amendment of Mr. Horace Jones, and the rider to it by Mr. Cates, which we printed in a note to our article of last week. Mr. Seddon and Mr. Douglass Mathews, both of whom had proposed a list of suggestions which had been printed in the circulars, agreed to waive all special recommendation of their views, and to take the shortest course of letting their suggestions go, with other matter, for the consideration of the Council. A well-deserved vote of thanks to the Special Committee, proposed by Professor Kerr, was passed "with effusion" (as the French put it); and we hope these gentlemen, who have worked so hard and with such excellent intentions, will get out of their heads the idea that their work has been either under-valued or wasted: it will form the basis, we hope, of some really desirable and workable scheme for the permanent advancement of the Institute. An equally well-merited vote of thanks to the chairman (Mr. Whichcord, vice-president, to whose excellent supervision of the meetings we before referred), proposed by Mr. Horace Jones, received equally prompt ratification, and terminated at a comparatively early hour a sitting which at least served to show that architects, like some other people, exhibit wonderful unanimity when they do agree.

It now rests with the Council, with whatever other advice and assistance they are empowered by Mr. Cates's resolution to call in, to reconsider and blend into a "harmonious whole" the manifold suggestions (many of them, however, tending quite in the same direction) which will be before them for manipulation. We will just add that the two lists of suggestions referred to above form a valuable contribution to the subject, and should receive due attention. Our

opinion as to the idea of a new house for the architects, which forms a leading point in Mr. Seddon's list of propositions, we expressed in our article last week; and some of the suggestions made by Mr. Mathews are eminently practical and sensible.

We may remark that Mr. W. White, at the commencement of the meeting, called the attention of those present to the very point in regard to the charter which we have already touched upon—the totally imaginary character of the obstacles to the regulation of the ballot for admission of members, which have been supposed to be involved in the terms of the charter. As some of the members seemed still to regard the charter as a bugbear in this matter, we beg permission to refer them to our remarks last week (p. 114, *ante*), and to ask them to compare the passages there mentioned, and to "put two and two together"—a simple operation which would often remove many imaginary difficulties, and which is quite easy, if people will only try it.

ARCHITECTS AND THEIR WORK: PAST AND PRESENT.

As there is now some "stir" in architectural circles, and as the movement includes so much that must necessarily be new, it may be of interest to give a passing glance at some one or two of the phases through which architecture as a fine art and a *practical* science has gone in its eventful career. The present always, as perhaps it should do, takes up so much of active men's attention that but few have the time, if the inclination, to go much out of it, either backwards into the past or forwards into the future. But both are worth the attempting every now and then; for much that is instructive may be got by it. If the present of architecture be somewhat of a puzzle, as most assuredly it is, then is the past of architecture a thing not a little strange, and hard to understand and to realise. No two phases of anything were, or can be, more diverse than the old ways of things architectural, and the modern and every-day mode of architectural work. A few thoughts on these contrasts may not be without a certain use just now, and of interest most certainly they must needs be, however looked at.

First, then, a word as to the present. By going up and down a few of the leading thoroughfares of great London city, it is possible to get sight of well-nigh a specimen of every "architecture" that has ever had existence all the world over, and of every date, from the earliest down to the very last, whatever that may be. We are speaking, of course, of examples of those styles of architecture which have had a distinct existence and a distinct individuality, such as the Gothic or the Renaissance, or the Greek. This is, of course, an obvious thought enough. No one denies the fact, or has ever attempted to disprove it in any way, or perhaps even to lament it; though this last has been done. But obvious and patent as it is, if we but cogitate it a little it is one of the most curious and momentous of artistic circumstances. It is altogether unique in the world's artistic history, and belongs exclusively to the *present* order of things human and mundane. How exactly it has all come to pass would be in detail a very curious subject of inquiry, and might here and there puzzle the most acute and philosophic to account for duly, and to fully explain. We are nowadays so used to a house, or a warehouse, or a palace even, springing up in a new style of art, suddenly imported, that no one sees anything very startling in it. It is looked at first for its novelty, and the eye wanders on naturally and instinctively to a something else. But the time was when an event of this kind would have been a simple impossibility, and could never have occurred except under circumstances little short of miraculous. Let us go back a little in time, and look at things as they at one time were.

It is difficult indeed to get at the very beginning, or primitive cause, of a style of art or architecture;—to get a glimpse of the very first building of solid and enduring form built up in a country, and by a powerfully individualised race of men. In old Egypt, for instance, we seem, when looking at its temple architecture, and even, in a dim sort of way, at its common "house-building," to be gazing at them in their fully-developed state, and in their maturity of settled forms. It is, however, all Egyptian work, and Egyptian only. There is no sign in either temple or house of *borrowed* or copied work. It is all of it indigenous, and of the country and people. No Egyptian architect would seem ever to have thought for a moment of going out of his own country to borrow an art thought or an architectural idea from anywhere else under the sun. He uttered his art thought and his architectural ideas, as he spoke his own language, without the most distant idea of using any other. It was for Egypt and for Egyptians that he designed and built, and he never gave a thought to any other. Was this a strength or a sort of weakness? Do the great temples suffer from this narrow exclusiveness of view? Would they have been better, or more expensive, if but the designers of them had travelled—say to Assyria—and picked up notions from the artist-minds there, and imported not only their mental ideas, but brought back bodily the very forms and very presences of Assyrian art thought?

It is impossible to think so. The very strength and might of the Egyptian work lies in the very essence of it, in its own inherent individuality, and the power of the Egyptian workman lay in his doing his own specialised work, in his own,—if we must say it,—narrow and exclusive way! And yet he was a real workman, and has left his "mark" on the world's surface, if ever man did anywhere. It would be difficult indeed to say where he failed, and where the work he did could have been improved by dint of any amount or kind of borrowing. We must need take his work as he did it, and as Egyptian work *per se*. It needs only to be looked at. Let us take another glance at another people, equally individualised, though in so different a way, and who certainly had no need to borrow,—the Greek. The old Egyptian was no traveller, that is pretty certain, but the antique Greek was, and he has been accused more than once of going into other lands, and amongst other peoples, and picking up ideas, and then bringing them home and utilising them, and,—as it has been said,—"making them his own," by passing them through his own mind before putting them into forms of his own. Now and then he may have done this, for well did he know how to do it, but never was the skill to borrow less needed. The antique Greek needed but to know what was wanted, and the material for it, and he could go to work without help from any, and could then fairly defy the world to do the like; or to, in any way, surpass or even to equal the work he produced. But what he did in either case was all purely Greek, and nothing but Greek. It was Greek in idea and thought, and feeling, and was always worked out in a way purely, and thoroughly, and entirely Greek. No one can possibly mistake it, or can hint at any external influence which could improve it. We are content with it as it is, and certainly do not need to regret that the great artists and architects of the "antique" had no foreign art or architecture to copy from; and to so far change in any way the direction and individuality of their own thoughts, either in architecture, or, indeed, in anything else. The whole strength of the matter lay in the Greek himself, and in his own special power of imagination and "individuality" of work.

We would but glance at but one more of the world's art and architectural thoughts,—the Gothic,—of the Middle Ages. Work not strange, like that of Egypt, or "pure" like the Greek; but to a certain extent familiar, and well worn, and as workable, nowadays, as ever it was, at least according to not a few. But though it be thus familiar as household words, and is as useful in its well-worn and current forms, in the modern office, as any other of its familiar things, it is not a little curious to go back in thought to the times of any one of its great national phases, as worked out in any special country wherein it obtained; as in this,—in the Early English days by way of example. And to narrow the view for a moment, consider how narrow things then were. No designer in the "Thirteenth Century," it is quite certain, with the Early Gothic forms as the art language of the time, ever for a moment thought of going back to the then worn out, though existing "Romanesque," either for one idea or for a quaint form even. Indeed, it is surprising to find,—as we may find if we look for it,—how totally indifferent the men of that particular age were to the labours of those who went before them, and who did their own special work, *i.e.*, the Romanesque, so well. The then older work seems to have been simply ignored. A building in its style was used as usual, and *added* to in the *new* style if need were, but if found too small or unfit, away went the old work, however good and true, and the very forms of it were without mercy sacrificed to the commonest exigencies of the new structure,—as in York Minster,—where the fine "Norman" work of the old cathedral forms the foundation and inner walling, and "rubble" work of the new cathedral!

But in these modern days of architecture, all these "ways of old" are changed indeed! The old world's architects could not, if they were in the flesh, conceive of our method of work, even for a moment. All our art education, multifarious as it is, and daily getting to be more and more so, would have utterly confounded them. The multitudinous styles of art, as seen all about us, and at every turn, would have more than puzzled them. In their simple way of going to work, and providing for the wants of the community, they doubtless every now and then found difficulties enough as it was; but our difficulties would have indeed confounded them. It is useful to look back a little sometimes, and see how things were once on a time done. Can it be said that the architecture of the present is a finer or more expressive thing than that of the Gothic of the thirteenth century? We have almost no end of "precedent" to go by; they, strange to say, had actually none. A stranger or a stronger "contrast" there cannot possibly be. If a multiplicity and diversity of knowledge, got from every age and country, be an artistic advantage, and a cause of good work, then ought the present, indeed, not only to equal the past, but almost infinitely to surpass it. Who will contend for this? It is really surprising to think of how little the old world's architects had of what we have come to consider so essential. The old builders knew of no art-language but their own; they even rejected that spoken by their immediate predecessors, and worked out their own thoughts in their own way, rejecting all else. If "education" is to be tested by results, then, indeed, must there be mysteries in and about it, which have escaped hitherto all the cogitations and speculations of the most erudite and advanced. We might say a good deal here perhaps to the purpose just now when so much is being thought of in the educational way, in art education more especially. But in forbearing, it may be useful, as we have hinted, to go back a little in time, and see how they fared who did all their work so well, and so truly, that *we* are but too well content to take it all as models to go by, and as an art language, or languages, to utter our thoughts in. What a Middle Age architect, or workman, would do now-a-days, or could do, if amongst us, with nought but his own acquirements to aid him, limited as they would be found to be, may be a curious question. It would seem a little singular that no one has yet speculated about it. And if the man of the Middle Ages, then still more he of the antique Greek time, with all things and surroundings so different from the present. He at least must have been to a certain extent "educated," and after a certain kind. But in what did it specially consist? And how far and in what way did it aid his natural and inherent faculties as an artist? How far can any "institution," whatever it may be, *help* the artist, and what would be the kind and power of an Institution now-a-days, and what would or ought it actively to do, to put the artist of to-day in the position to do, not only what they of the old days did, but more? More they ought to do, for how wonderfully in advance is the modern man, aided as he is on all hands, with new powers never dreamed of before, with new materials never before seen, and with well-nigh boundless wealth. What ought not the artist of to-day to do? And the question is—*how* is he to rival the work of the past, not in means and ways only, but in artistic results?

THE SOUTH METROPOLITAN GAS COMPANY AND THE PROPOSED AMALGAMATIONS.

THE amalgamation movement amongst certain of the metropolitan gas companies has evoked a strong opposition to the South Metropolitan Company being included in the proposed fusion, and a memorial on the subject has been forwarded to the Board of Trade by the Lambeth Vestry. The South Metropolitan Company is placed in an exceptional position when compared with the other companies on the important subject of charges. The memorial to the Board of Trade puts the case against amalgamation of the South Metropolitan with any other companies in a strong light, showing that whilst the price charged by the South Metropolitan Company at the present time is only 3s. per thousand, the

charge by some of the other adjoining companies who are desirous of amalgamation is 3s. 6d., 3s. 9d., and 4s. per thousand; and, moreover, that although the charges of the last-named companies are higher than those of the South Metropolitan, their illuminating power is actually less. Under these circumstances, the memorial states that an amalgamation would in all probability have the effect of raising the price of gas beyond that now charged by the South Metropolitan Company, in order to enable the amalgamated companies to pay a dividend at the rate of more than 10 per cent. The memorial presses upon the Board of Trade that neither the Amalgamation Bill nor the Bill of the South Metropolitan Company for powers to revise its price and dividend, should be permitted to receive Parliamentary sanction without a guarantee that the shareholders shall not be allowed to receive an increased dividend by the charges at present made by the South Metropolitan Company being raised to the consumers within its district.

LONDON BRIDGE.

A special meeting of the Court of Common Council was held on the 3rd inst. at the Mansion House, for the purpose of discussing an important resolution with regard to the proposed widening of London Bridge. Mr. H. A. Isaacs, pursuant to notice, moved:—

"That in order to meet the wants of, and to relieve generally, the continuously increasing traffic of this City, it be referred to the Bridge House Estates Committee to consider and report as to the desirability, and the approximate cost, of erecting a bridge over, or a subway under, the Thames, east of London Bridge, and that the said committee be authorised to confer with her Majesty's Government upon the subject."

In moving the resolution, Mr. Isaacs argued that no possible means of widening London Bridge could give the desired permanent relief to the congested arteries of traffic, even were the approaches to the bridge widened. Mr. W. S. Gover seconded the motion. Mr. Washington Lyon moved, and Mr. Bengough seconded, the following amendment:—

"That it be an instruction to the Bridge House Estates Committee to consider and report upon the approximate cost of erecting a bridge for general traffic over the Thames, east of London Bridge, but within the City limits; to ascertain the probable effect on the value of wharf property between London Bridge and the proposed new bridge, if erected; and also to obtain a return of the number and tonnage of vessels discharging and loading in the river within such limits."

This amendment was lost by a large majority. Another amendment was then moved by Mr. Hicks, and seconded by Mr. McGeorge, in these terms.—

"That the Bridge House Estates Committee be instructed to proceed forthwith with the widening of London Bridge in accordance with their report, and that it be further referred to them to examine and report as to the practicability of building a bridge or subway to the eastward of London Bridge, with the probable expenses in connexion therewith."

This was lost by 66 to 77. A division was then taken upon the original motion, which was carried by 78 to 67.

The discussion occupied the Court four hours.

THE ENGINEER'S PLACE IN NATURE.

SOCIETY OF ENGINEERS.

At the first ordinary meeting of the Society of Engineers for the present year, held on Monday evening last, at the conclusion of the ordinary routine business, Mr. Vaughan Pendred proceeded to deliver his inaugural address. They had all heard a great deal, he said, of a subject very interesting to biologists, namely man's place in nature. He hoped they would give him a patient hearing while he said something concerning the engineer's place in nature. Mr. Pendred then went on to define what an engineer was, and to explain that the engineer's place in nature was that of the great civiliser. He pointed out that nearly all the natural comforts of life were due to the engineer, and he urged that the engineer had great privileges and grave responsibilities. One of the great privileges was that he alone could supply the soundest investments for the great mass of capital now lying idle to the great injury of trade in this country. He then expressed his opinion that engineers in Great Britain had during the last year or two manifested less energy than was desirable in supporting new engineering works, a circumstance originating, no doubt, in false delicacy, and certain to operate injuriously on the best interests of the nation. The privilege of the engineer was to find employment for money in developing the revenues of his and other nations, and so advancing civilisation. The responsibilities of the engineer were defined by the fact that unless he exerted himself energetically, much suffering and disease and want of civilisation must continue to exist. The engineer alone could improve the mutual economy of the world, and if the world was to be happier and better, the engineer, and the engineer alone, could produce that result. He might be asked what the engineer was to do, but he would not attempt to lay down principles of action which would suggest troubles to thoughtful members of the profession. He might point out, however, that a great necessity of the day was the improvement of the water supply of our towns and cities, and that this work required the best attention of the profession, which would find plenty of work in supplying the want. The regulation of our rivers so as to prevent floods in winter, and to secure the storage of water in summer, was another great work. But the greatest of all was the cleansing of the country by an efficient method of dealing with sewage.

The address was well received by an appreciative audience, and at its close a cordial vote of thanks was accorded to the President.

"KNIGHTSBRIDGE BARRACKS."

A pamphlet under this title, on the Government proposal to rebuild the barracks on the present site, written by Mr. Elsworth, the hon. secretary to the Knightsbridge Improvement Committee, has been published by Ridgway. We are wholly with the writer in his opposition to the proposal in question, but we cannot praise him for the tone adopted towards those who happen to think differently. The chief result of the pamphlet, we fear, will be to confirm the *Times* and the Commander-in-Chief in their advocacy of the present site. Mr. Elsworth would have done better had he striven to persuade these powers to re-consider the matter. We have no hesitation in asserting that any Government which replaces the present block and nuisance in the high road will provide for itself a constantly increasing amount of obloquy and reproach.

SURVEYORS' CHARGES.

SHOPPEE *v.* ORME.

This was an action brought in the Westminster County Court on the 2nd inst. (before Mr. Francis Bayley, judge) to recover 20*l.* 6s. 6d., being professional charges for assisting in the survey and valuation of three houses which it was alleged had been damaged by the erection of new Board schools under the following circumstances.

It appeared that in July, 1874, the plaintiff, Mr. C. J. Shoppee, was requested by a Mr. Foster, the defendant's solicitor, to assist in estimating the damage done to three houses in Lombard-court, St. Giles's, belonging to the defendant, and which had been injuriously affected by the erection of the new Board schools in that locality. Nothing was said about the charge, but when the bill was sent in the claim was disputed. The sum ultimately obtained from the School Board was 750*l.*, but the plaintiff only charged commission on 700*l.*, and that at the rate authorised by the scale in general use amongst surveyors in estimating compensation cases.

In cross-examination, the plaintiff said he had charged three guineas a-day for his attendances on the arbitrator and solicitor in connexion with the business. Mr. Foster did not tell him to send in his evidence in writing instead of attending upon him.

Mr. Robert Collar Driver, surveyor, of No. 4, Whitehall, said he considered the account a fair and proper one, and according to the scale recognised by the City of London, the Metropolitan Board, and the School Board.

Mr. Virgo Buckland, surveyor, of 66, Cannon-street, considered the charge not only fair, but moderate.

This was the plaintiff's case.

For the defence it was contended that the defendant had employed Mr. Cook to estimate the damage done to the property for the purpose of basing a claim against the School Board for compensation. The plaintiff simply went over the premises with Mr. Cook to assist him in making the valuation. After proceedings had been commenced to enforce the claim they required the plaintiff's services as a witness, but the valuation had already been made by Mr. Cook, who sent in his report. Plaintiff was requested to put his evidence down in writing, and he was also occupied an hour or two in attending Mr. Foster and Mr. Cook to look over the premises, but he was never employed as surveyor for the purpose of valuing the damages, which was intrusted to Mr. Cook. It was also contended that the scale in question only applied to cases where the surveyor was employed to value and report, and not simply to give evidence as a witness; that a surveyor was not a scientific witness in the ordinary acceptation of the term; that a witness under ordinary circumstances could not claim compensation for loss of time in attending to give evidence, beyond the usual scale fees for allowances to witnesses; and that, therefore, plaintiff being a surveyor, could not charge more than 1*l.* 1s. per day for his attendance, whereas he had charged 3*l.* 3s. It was also contended that where an agreement to pay more than the scale fee was made, the extra amount could not be legally recovered.

Mr. Robert Orme, the defendant, said the plaintiff was not employed above three-quarters of an hour in going over the premises. He did not go into the lower part of the houses at all; it was merely a superficial look round. Mr. Cook was employed to value and report upon the property, and witness paid him 10*l.* for so doing. The case was settled by the property being purchased by the Board. Had tendered plaintiff 8*l.* 8s. for his services, which he refused to accept.

His Honour said he thought the plaintiff was entitled to a verdict. It was the same thing as a man going into a tailor's shop and ordering a coat without any agreement as to price. All that the plaintiff had to show was, not were his charges similar to those made by other surveyors, but were they such as he was in the habit of making? It was immaterial whether the plaintiff took an hour, or two or three days, in making his survey. He had done all he was required to do, and was therefore entitled to recover. Judgment for the plaintiff for the full amount, with costs.

THE WEYMOUTH SURVEYORSHIP.

The first business at the meeting of the Weymouth Local Board, on the 31st ult., was to consider the resignation of the surveyor, which was briefly announced in a paragraph in the *Builder* for the 29th ult., p. 109. From a long report of the proceedings, which appeared in the *Dorset County Express* of Monday, the 7th inst., we learn that some members of the Board were in doubt as to whether the surveyor was in earnest in tendering his resignation, or whether it was sent in in a "bit of a pet." Inquiry soon set the point at rest, and then commenced a discussion as to whether the surveyor had been quite fairly treated, some members taking the negative side, and apparently with justice; for Mr. Wallis, one of the members, is reported to have said that "he did not blame the surveyor for resigning, after being knocked and kicked about" [the expression, we take it, was used in a figurative sense]. In the course of the discussion, according to the *Dorset County Express*,

Mr. Snook said there was an article in the *Builder*, on the subject of the Weymouth surveyor, and somewhat, he thought, reflecting on the Board.

Dr. Drew said that must have emanated from some gentleman in the town.

Some Councillor thought it was likely to have been written by a gentleman at Dorchester.

If it is the eight-line paragraph we published a fortnight ago which is dignified by Mr. Snook with the title of an "article" (and no other paragraph or article on the subject has appeared in the *Builder*), any one who cares to turn back to it will see that it makes no reflection on the Board, but merely announces the resignation of Mr. Seaman, and states the purport of the letter giving his reason for so doing.

A motion to accept the resignation having been agreed to *nem. con.*, it was ultimately resolved to insert advertisements in the *Builder* and other newspapers, for a surveyor, at a salary not exceeding 250*l.*, to devote the whole of his time to the duties of the office. The Board had only been giving Mr. Seaman 100*l.* a year, but he was allowed to take private practice.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the meeting, Feb. 2nd, Mr. H. S. Cuming (in the chair) described the sword recently found on the site of the New Opera House, and which was exhibited; also a poniard from the Bailey collection. The Rev. S. M. Mayhew exhibited several Chinese objects made of rice. Mr. Thairlwall, Mr. Brent, Mr. Brock, Mr. Wentworth Huyshe, Mr. Cuming, and other members, exhibited a variety of Egyptian antiquities, consisting of sepulchral figures in blue glazed pottery, stone figures with inscriptions painted or incised, scarabæi, beads, ornamental emblems of the *bat* or nilometer, pillows, amulets, the two fingers of the right hand inscribed, base of a sepulchral cone, a rare specimen of a bronze *horus*, and other deities from the Egyptian pantheon, footboard of a mummy case *cartonnée*, a mummied leg of a child and head of a greyhound dog. The collection was described by Dr. Birch, whose instructive remarks were listened to with great interest. In the discussion which followed, M. Maville, of Geneva; Mr. Kerslake, Mr. Thairlwall, Mr. W. de Grey Birch, and Mr. Cuming took part.

MONUMENT TO GENERALS THOMAS AND LECOMTE.

THE last number of the *Revue Générale de l'Architecture* contains an illustration of the monumental tomb just erected in the Cimetière de l'Est, Paris, to the joint memory of General Clement Thomas and General Lecomte, who, it will be remembered, were murdered on the 18th of March, 1871, in a moment of popular fury excited by the interference of the regular troops, under orders, with the will and pleasure of the gentlemen of the Garde Nationale. A week after it was decreed in the Assemblée Nationale that the event was "*un deuil public*," and that the only reparation possible should be now made to the memory of the two unfortunate men, by the erection of a monument at the public expense. The commission was entrusted to M. Coquart, whose work has just been completed.

The consideration of the particular form which a monument under such circumstances should take, occupies a considerable portion of the critical description given by M. Daly, the editor of the *Revue* (who, as most of our readers are aware, has made the subject of "*architecture funéraire*" one of his special studies), and is of some general interest in the principles of treatment which it suggests. The problem appears, in M. Daly's view, to have this speciality, that it is a monument erected by the country at large to the memory of two men unconnected with each other except in the incidents and simultaneous manner of their death, and of whom, though they perished under the same catastrophe, one lost his life in the execution of military duty, while the other was simply "*un malheureux assassiné*"; General Lecomte having been actually in charge of the troops whose mission excited the popular fury, while General Thomas was found in disguise near the spot, with no object that any one could explain.

The problem for the artist who was charged to design the monument in commemoration of the deplorable event and its victims had, therefore, as M. Daly states it, three distinct elements to combine in his work; the expression of the character and position of each of the two individuals, and that of the national protestation against the deed of which the monument was the result, and the artist might have endeavoured either to combine into one *ensemble* two tombs illustrating severally the personality of the two subjects; or he might have made it a "*tombeau du groupe*," emphasising whatever was common to the personality and circumstances of the two; or, finally, he might have made the character of a national monument predominant, almost effacing any personal reminiscence or characteristic.

The first-named principle, thinks M. Daly, would have involved the objection that the two persons commemorated,—one exclusively a soldier, the other a political partisan,—were too diverse in character to be personally commemorated in a double monument forming one *ensemble*,—there would have been too little parallelism between the two subdivisions. On the other hand, the second idea, of commemorating what was common to the personality and circumstances of the two men would have reduced the monument to the level merely of a "*manifestation générale contre les violences de la rue*." Accordingly, the artist chose the third method, of giving to the monument a national character, and just sufficiently defining the personality of its subjects. The result is an architectural grouping, in which the surbase is formed by two broad heavy pilasters separated by a slight recess, each bearing the name of one of the two murdered generals; under that of Lecomte, who suffered in discharge of his duty, is sculptured a laurel crown, gilt. Above the pilasters a high conical block or *stele* rises, which unites the two and forms a single apex to the composition, and two palms, springing from the hollow between the pilasters, spread over the face of the *stele*, bending to either side over the two inscriptions.* Between and above the two pilasters rises a figure representing *France*, wounded herself, and stretching towards the tablet of Lecomte a sword, and towards that of Thomas a civic wreath, the emblems of military and civil eminence respectively.

We have given the heads of our friend M. Daly's criticism, as it is rather suggestive in regard to the treatment of monuments generally, and the subject is one which well deserves more careful are called on to design monuments. We may add that the monument, an engraving of which is given in the *Revue*, is a rather fine and unusual conception well carried out, though we agree with the editor in thinking the outstretched sword with its point to the name of Lecomte is a little ambiguous as an expression of the artist's intention. It is something, however, to see an important monument which represents a distinct thought consistently carried out; a characteristic rare enough in modern designs of this class.

THE DISCOVERIES AT OLYMPIA.

THE *Reichs- und Staats-Anzeiger* publishes the second report of the excavations, including communications of the 30th of December ult., and of the 6th and 13th of January, 1876. The works have been continued with the same staff of workmen on the east and west sides. The fact seems to be that the finds begin where the black humus appears under a stratum of sand. The thickness of the latter is not everywhere the same. While at the place of discovery of the river god and the charioteer, it is over 6 ft., near the spot where Nice (Victoria) was brought to light it is nearly 10 ft. The same proportion has been observed in the western trench, it being, at a distance of eighty to ninety paces from the southern border of the temple, 9 ft., and some forty paces more to the south, already nearly 14 ft. The old ground of the temple seems, therefore, to have slightly sloped towards the Alpheios.

To the finds already known, it may be added that the whole triangular pedestal of Nice, consisting of five blocks, has made its appearance. A drawing of the figure sent in shows that the girdle was laid in of bronze; near it several pieces of bronze have been found, one of which is a fragment with leaf ornament. The reclining body of the river god is in its lower part enveloped in thick drapery; the raised upper body rests upon the left arm, while the cheek of the head bent to the side rests on in the palm of the right hand. The arms are broken; but the bearded head, which shows a meditative, mild expression, is to the smallest detail as fresh and free from injury as if it just had left the artist's hand. Below the figure there were numerous pieces of bronze, among which considerable gilded fragments of a round object, perhaps of a shield, have been found. The third figure, the so-called charioteer, over life-size, of excellent execution, is complete, excepting the head; it is in a crouching attitude, the left knee drawn up, and resting upon the right arm. The mantle falling from the left shoulder serves as support. The neglected state of the side turned away shows that the figure was placed to the right of Zeus, to the left of the beholder, consequently close in front of the horses. The surface is entirely free from fault, which is the case with all the other remnants of the eastern pediment; the attitude is natural and animated. The only find near the western pediment, after cleaning, has turned out to be the fragment of a violently-agitated man with chlamys, consequently one of the Lapithæ, in accordance with which the former statement ought to be corrected. The work shows strong effects of exposure.

Amongst the new finds on the east front is a male torso, found on the 29th of December. It is turned towards the right, extending both arms in an exerting attitude, and consequently probably the charioteer on the left side of Zeus (to the right of the beholder). The formation of the neck is of the same excellence and truth as in the other works, and is very striking. Another piece, found at the beginning of January, is the lower portion of a reclining male figure of life-size, extended from right to left, covered with drapery, and intended for a front view and high position. The statue, further, which in the first report is described as lying under the male torso, is more fully described in the recent one. It is a colossal female figure, broken in two pieces, in long classic drapery, corresponding on the whole to the celebrated Vesta Giustiani, only much more full of life and finer in its execution. The base probably belonging to it, circular in front, square behind, has been also found. The statue was placed with its back to a wall, and is an excellent specimen of classic severity. Head and arms are still wanting. Further guesses with regard to this work, probably dedicatory, must for the present be suspended, until fresh discoveries throw more light on it.

In deepening the western trench, several remnants of the Doric building already mentioned, as well as nine square bronze plates of different thicknesses, with the symbol of lightning and the name of Zeus, have been found. They may probably be weights (of 15, 30, and 60 drachmæ Attic weight). In the same neighbourhood, graves have again been met with, from which bronze arms and implements, small bells, as well as Roman and Greek coins and fragments of pottery with black varnish, have been extracted.

These are in their essentials the results of the last three weeks' work, from which time, besides Sundays, three Greek festivals and a rainy day must be deducted.

NOTES ON PLAN AS THE BASIS OF DESIGN.

ARCHITECTURAL ASSOCIATION.

THE ordinary general meeting of this Association on Friday, the 4th inst., was preceded by a special meeting for the consideration of the proposed new rule with regard to the affiliation of branch societies with the Association. In the course of the discussion, which occupied an hour, several amendments were suggested, and the further consideration of the matter was ultimately postponed until seven p.m. on Friday next, the 18th inst. We gave the text of the proposed new rule in the *Builder* a fortnight ago.

The following new members were elected, viz., Messrs. G. J. Tarver Good, F. N. Palmer, N. Bent, L. Younghusband, C. S. Kirkby, J. Dell, and A. R. G. Fenning. Ten other gentlemen were nominated for membership.

It was announced that the Association would to-day (Saturday) visit a new church now in course of erection from plans by Mr. Dollman at Stoke Newington, and also a (completed) church by Mr. Burges in the same neighbourhood.

Mr. H. H. Statham then read a paper entitled "Notes on Plan as the Basis of Design." He said:—My subject is a very large one; my paper unfortunately (or fortunately) a small one; indeed, entirely incommensurate with the subject, to which I have not had time to do any justice; and though fully intending to go more thoroughly into it, one thing after another has occurred to put off the consideration of the matter, and I find myself coming before you with only a few rough notes and some still rougher sketches. I may add, however, that though my remarks have been hurriedly put down, they have not been so hurriedly thought of, as the subject is one that has been in my mind, more or less, for some time past. The connexion between plan and what is commonly understood as "design" in a building may be considered in two different relations. We may consider the plan as the basis of the construction; and in this connexion a plan always does present itself, to the properly-constituted architectural mind, in its relation to the ultimate construction and covering in of the building. It is a space of a certain dimension and proportion to be roofed in, and while the general shape of the plan may in some measure determine the method of roofing, the latter must, in any consistent constructive style, have a great influence on the detailed arrangement of the plan and the disposition of piers and openings. This connexion between plan and roofing has, as we are all aware, been made more and more manifest in regard to the greatest of architectural styles, as it has been more and more studied; and those who have given most study to the problems of Mediæval vaulting have lately gone so far as to say that the whole design of the substructure of a Mediæval cathedral is in fact determined, in all its essentials, by the intended disposition of the vaulting, and that to properly study a building of this class we should regard the plan of the vaulting as the factor of the whole. Without undertaking to offer a decided opinion as to whether the Mediæval builders really thought out their designs on this principle, it may be observed in passing that if we accept the theory, it at least entirely disposes of the idea that these buildings arose by a sort of consentaneous inspiration, without the aid of any preparatory drawing, or even, as some people seem to think, of any fixed method among the workmen; since on this supposition the laying down some kind of diagram of the plan of the vaulting in the first instance must have been a *sine quâ non*. At all events,

* The introduction of the palm, intended, as our contemporary says, as the symbol of martyrdom, is surely a misuse of the real meaning of the emblem; though not more so than the constant misapplication of the term "martyr," which is often used as if it were synonymous with "victim." The palm might be suitable to the case of Lecomte, who died in the execution of his military duty; but the other unfortunate man was simply and purely a *victim*.

the intimate connexion between the vaulting system of a bay of a Gothic interior, and its plan and architectural detail, in all the best work, is what every one admits, and this connexion and constructive independence between plan and roofing is a ruling characteristic of all honest and consistent building. It is not, however, this division of the subject that I am proposing to speak of. This belongs especially to the science of architecture, and I only touch upon it here in passing, that it may not be supposed I have forgotten how important a part of the relation between plan and design this constructive connexion is. The few suggestions I wish to make this evening refer rather to architectural effect, or to architecture considered as the art of building effectively, impressively, and truthfully, on the basis of practical requirements. And the view which I take of it bears an especial reference to modern architecture. We are quite accustomed now to the idea of a marked line of demarcation in architectural history and principles at the period of the Renaissance, though I believe the general acceptance of this idea is not older than Mr. Fergusson's "Handbook," and that it is to him we are indebted for first clearly and unmistakably defining that great distinction of principle between præ-Renaissance and post-Renaissance architecture; the former always showing (except in some of the architecture of the Romans) a natural development of style from the process of the arrangement and construction of the building, without regard to precedent; and the latter being, in almost all its developments, an architecture formed in the first instance on precedents, and fitted to, rather than arising out of the plan and construction of the building. The existence of this distinction is regarded now as a truism. But there is another very marked and very general distinction between the conditions of ancient and modern architecture which seems to have been rather overlooked, and which has some bearing on, perhaps offers some excuse for, the form which architecture assumed at the Renaissance and subsequently. The distinction I refer to is this; that ancient architecture (by "ancient" I mean everything before the Renaissance) in all its most important productions took the form of buildings with one great apartment, open from floor to roof; while in the modern period few such buildings are erected, and the architect has generally to deal with the problem of combining a number of apartments in a certain relation to each other and in several tiers or stories, within one building. This tendency of modern architecture is in accordance with that of society. Ancient architecture, in its most striking forms, was almost always the work of a *caste* (not using the word in any offensive sense), sometimes a regal, sometimes a religious caste, and the art of building was employed emphatically for splendour and effect, and its productions were marked by unity of design, as the expression of some one predominant motive. Modern architecture is much more that of society at large, and tends to become more and more so as society becomes less feudal and more federal; and as it has no longer one single predominating idea to fulfil, but has to provide for many and increasingly numerous and varying practical wants, it tends more and more to lose this unity of character and to become multifarious. The typical large Mediæval building is the cathedral; the typical large modern buildings are the Houses of Parliament or the Law Courts, or, to put it more generally, the class of edifice now so largely built under the name of "Town Hall" or "Municipal Buildings." The Mediæval Abbey was, it is true, an erection of the multifarious order, but it was simple in arrangement, and was in fact a collection of buildings nearly distinct both internally and externally. But the problem of combining a number of apartments and classes of apartments in what is externally treated as one edifice is almost peculiar to modern architecture. Of course, this important change in the requirements and nature of our largest buildings very much alters the nature of the architect's work, and renders his profession a great deal more utilitarian than it used to be, especially as regards internal effect. We cannot produce the same grand or impressive effect in a building cut up vertically into floors, and horizontally into passages and suites of rooms, that can be obtained with a great apartment open to the roof and in one area, like a basilica or a cathedral. But if the modern architect's problem is thus shorn of some of its artistic interest, it has a kind of compensation in the increased demand made upon his practical and logical sense in the arrangement of the building, and in the relation which that arrangement bears to its external treatment and expression. The first desideratum, of course, in planning a building is, that every part should be in the most convenient position and relation for carrying on the internal traffic of the building. It is further desirable not only that the arrangement should be found on trial convenient, but that it should appear so at a first entry on the scene; that the plan should not be needlessly involved in the effort to provide intercommunication wherever it is required; but that it should have a leading principle at once apparent to the visitor, and main centres or starting-points from which the leading lines of the plan can be perceived, and to which they are subordinate. To do this well, on the purely practical ground only, often requires no little trouble and study. Large buildings, public or private, where this is neglected, sometimes almost suggest the idea of a rabbit-warren in their tortuous sinuosities of thoroughfare. It is on this point in particular that amateur architects generally fail, while imagining that they are evincing a remarkable amount of common sense in putting walls and passages, as they say, "where they are necessary," and not, like those foolish people, the professional architects, the slaves of precedent, who place their walls by a rule, and quite independent of utility. The fact, of course, is that the architect, if he understands his business, keeps the details of his plan subordinate to a general scheme, both of plan and construction. So far we are, however, on purely practical ground. But what we have a right to expect further from the architect, as the master-mind of the whole building, is that he shall combine *effect* with convenience and clearness in his plan; that he shall be able, whilst arranging his building upon a good working system, also to contrive in it points of effect, of vista, or of surprise perhaps for the visitor,—points which, however, not only must not interfere with the main practical idea of the plan, but which must appear to arise naturally out of it; and, whatever study and contrivance have been necessary to attain this object, must not *appear* too much "contrived." In planning it may be said emphatically, *ars est celare artem*; and in general it will be found that those plans which appear so simple and natural in their arrangement that it scarcely seems as if the problem could have had any other treatment, are just those over which the most consideration has been expended. Scarcely any part of an architect's business can, as it seems to me, be more interesting than this; and I hope it will not be thought censorious to say that perhaps scarcely any among the important problems of designing buildings is more often neglected, or, at all events, is more seldom satisfactorily solved. We have certainly got beyond the practice of the architects of the Vanbrugh school, who simply put together an imposing exterior of perfect symmetry, and then let the plan take its chance. But still, if you look, for instance, through modern competition drawings for large buildings, you are sure to find a quantity of fine and effective drawing, a certain proportion of picturesque design and detail, but it is a comparative rarity to find a plan which combines convenience and fitness with architectural point and effect. Next to this, and as the completion of the whole thought of the architect, we should expect to find the external design of the building and its main architectural features coincident with those of the plan, and, in fact, expressing and growing out of them. And these conditions ought to be fulfilled in every work which claims to be in the highest sense architectural in its structure and design. This is particularly what I wished to urge in reference to this subject,—that a fine and effective, and at the same time practical, plan is in reality not only the necessary basis of a good design, but is itself an important element of design; that it has an intellectual and æsthetic interest beyond its mere practical importance; that if you have a fine plan it is a difficult thing to really spoil it even by bad detail (though, no doubt, a determined operator may accomplish a great deal in that way); and if, on the other hand, you have an ineffective and ill-arranged plan, good treatment of ornamental detail will not atone for this initial deficiency. And what is required is not merely that the design should agree with the plan, as if added or formed afterwards, but that the two elements should grow up together in the architect's mind, that they should interpenetrate, so to speak, and the whole arrangement and aspect of the building be part of one whole and distinct scheme; the architect, in place of arranging the plan first, and then considering how it could be treated, should see the design in his mind's eye as he forms the plan. When regarded in this way, design (in the ordinary sense of the word) and plan mutually act upon each other. A particular point, arising out of the arrangement of the plan, suggests a corresponding feature in the design; and conversely, the importance or prominence of one special angle of the site, perhaps, in connexion with the surrounding streets or buildings, stamps it as the key of the position, and leads to the concentration of the main point of the plan on that portion of the site. In this respect sites are often exceedingly suggestive in regard to the architectural treament of the building which is to occupy them; and nothing is more indicative of the true architectural spirit than a quickness to perceive and turn to account a salient point in the site of an intended building. It may be observed that this ground of suggestion in design seems also to be much overlooked, and that in competition sets, again (which are not bad barometers in this way), it will often appear that many of the competing architects have either not seen the site, or have quite failed to appreciate what a once eminent auctioneer would have called its "capabilities." The perfect result is when the plan and design of the building appear to have arisen naturally out of the circumstances of the site, and yet to accommodate themselves to each other and to the practical uses of the building, with both convenience and striking effect. This fortunate combination is hardly common, but we are not without some admirable examples of it. I have here some memoranda (for I can hardly dignify them by any higher title) of a few plans which serve to illustrate some of the points in connexion with the subject. The first I will refer to is a plan of a residence, or so-called "castle," in Mecklenburg, by a modern German architect, which illustrates a good point in a plan spoiled by not being thoroughly and consistently carried out. It may be observed here that as regards effective planning, especially in private residences (though the one referred to is not a fortunate example), German architects as a rule show a great deal of originality and ability, and that a book of plans of this kind by a German architect is generally worth attention, if only to "crib" from. They do not confine themselves nearly so much to stereotyped arrangements as we do; they seem to be frequently trying new combinations, and have a great eye to internal effects in planning. As far as I can judge, they seem, however, commonly to do their best to spoil the plan by its architectural clothing; and indeed, what the modern Teuton architect, *pur sang*, is capable of when he gets to his Gothic could hardly be adequately characterised in any language which it would be at all proper to use here. [Reference was here made to a plan and perspective view of a mansion (from a published work) in which the good point of the plan,—the arrangement of a series of reception-rooms and winter-garden *en suite*,—was spoiled in effect by the loss of the vista through the neglect of alignment and centralising of the openings, while the design contradicted any idea of this part of the building forming one suite. A re-adjustment of the plan was shown, and a sketch illustrating the manner in which the arrangement of the reception-rooms *en suite* might be expressed in the external design, and form a marked feature in it, by uniting all this portion of the building under one "ordinance." An effective plan for two semi-detached street houses, by the same architect, was exhibited.] I will now ask you to consider for a moment the merits of three of the finest examples that I know of in modern planning. Every one here is of course familiar with the plan of the Houses of Parliament. Sir Charles Barry's great work is a remarkably good example both of what may be called generalisation in planning, and of illustration of the main points of the plan in the external design. The great point of this building internally consists in the arrangement of the two main corridors crossing each other, and meeting in the centre octagon. It looks very simple, but in its simplicity is one of its great merits; and while the octagon with the corridors diverging from it is an exceedingly effective feature, it is also precisely in keeping with the requirements and business traffic of the building. The cross corridor furnishes the main connexion between the public entrance and the inner business portions of the building; the longitudinal corridor affords a special passage to each of the two

Houses; while the centre octagon furnishes a neutral meeting-ground for members of the two Houses and for members and the public. The emphasis thus given to the centre point gives a remarkable unity and directness of arrangement to the whole; you can always tell where you are, because everything in the lines of the thoroughfare refers to a central point. Externally, of course, the great feature is the tower which marks the royal entrance; but an equally good incident of the design, and equally arising out of the plan, is the light lantern of the octagon, which at once marks the central point of the plan, and furnishes a fortunate contrast, with its light and graceful outline, to the flanking masses of the two towers. These towers are placed at the extreme points of the building, and thus at once, and from a distance, indicates its extent; this is an important point, and no doubt intended with that object. As a specimen of fine and effective grouping of architectural design on a great scale, arising entirely and directly out of the features of the plan, it is my impression that there are very few things to surpass the Westminster Palace, and nothing could have been more irrational and absurd (if regarded even on critical grounds only) than the attempt which was made a few years ago to deprive its architect of the credit of being what was called the "art-architect" of the building. I refer to this unfortunate affair because it bears upon my point, which is, that the plan, and the illustration of it externally by the leading features of the design, are in themselves the highest art-feature of the building, and that the detail, whoever is to be credited with it, is a comparatively secondary matter. Externally the detail is not, I think, the best thing in the building, though its shortcomings are partly inherent in the style selected; but the leading idea, and that which stamps the architect of the building as a man of genius, is the arrangement of the plan and the proportion, position, and outline of the leading features in the external design. Mr. Fergusson, in his "History of Modern Architecture," makes what also seems to me a very strange criticism on the plan: after remarking (I think with truth) that the principle of symmetry was carried too far in making the Speaker's residence and the house of the Black Rod exact counterparts to one another, and of the same ordinance as the committee-rooms between, he observes,—"But having gone so far, this symmetry should have been carried out in all parts of the building, and it was unpardonable to adopt three towers of such different design as those which form the principal features of the structure, and to arrange them so unsymmetrically as he has done." Are we to understand that Mr. Fergusson would really have preferred that there should have been two Victoria Towers, one an exact counterpart of the other, instead of the two which form such a picturesque contrast now? And as to their unsymmetrical position, it is that very thing which varies the grouping and composition from different points of view so continually, and forms one of its great charms; and it is vexatious that a critic of Mr. Fergusson's calibre should have left on record such a depreciation of our greatest modern architectural work (for such Barry's building unquestionably is), founded on what most students of architectural effect would certainly consider to be among its chief claims to admiration. [Reference was made also to the admirable internal effect of the plan (sketched on the black-board) of the Manchester Royal Institution, an early building of Sir Charles Barry's, where the suites of rooms in each wing were connected with the gallery of the centre hall and staircase by low colonnaded sculpture-galleries, arranged so as to secure a vista right through. Mr. Statham then directed attention to the plan of the new Manchester Town-hall, by Mr. Waterhouse. Perhaps only those who had competed in the preliminary sketch competition, and endeavoured to realise the exacting demands of the "Instructions," in regard to the grouping and arrangement of all the departments in certain specified relations to one another, could fully appreciate the merits of this plan, in which the grouping of all these apartments on a most irregular site was reduced to perfect order and symmetry, and made subservient to remarkably picturesque interior effect, with a success that was really surprising. This was an illustration of the point that had been urged, that plan was an important element in architectural effect; for however the exterior of this building might be admired, probably every competent critic would agree that the incontestable triumph of its architect lay in the plan. The third of the leading illustrations referred to was the plan submitted in competition for the Birmingham Municipal Buildings by Mr. Lynn, an eminent architect of the sister isle. This was represented, when the competition drawings were publicly exhibited, by merely two or three hasty and half-finished drawings (the author of it having been interrupted, as he explained, by the intervention of other work), but the architectural power and grasp of the problem, as a whole, at once asserted itself, in spite of this disadvantage. Although the whole plan was disposed on the most symmetrical and what might be called stately method, yet it would be found that every room was in its right place, every thoroughfare had its proper relation to the business of the building; there really was hardly a weak point in it.* But the master-stroke in connexion with the design was that its author perceived that by a slight alteration of the lines of the site, it could be combined architecturally with the adjoining town-hall, the state suite of rooms being connected with the public hall by a bridge, and the architectural ordinance of the latter carried throughout the new building so as to make one great whole. This, which was a grand idea, resulted in putting the design out of court, on the technical ground of a transgression of the instructions; any other decision would have been unfair to the other competitors; but it was one delightful result of the competition system that an architect of genius might thus hit upon a great and perfectly practicable idea, only to find that the promoters of the building had tied their hands beforehand from accepting it.] In regard to the external treatment of a building in reference to the plan, it is sometimes a question of some difficulty how far one is to lay aside all demands of symmetry of external arrangement, when the internal arrangement is by necessity totally unsymmetrical. In such a case as when two wings of a building, for instance, are occupied, the one by show or state apartments, and the other by business rooms in much smaller and more numerous subdivisions, and probably occupying two stories to one of the other, I think there can be no question whatever that to treat two wings symmetrically and mask the smaller subdivisions behind an architectural screen, is simply an absurdity; I cannot see any use in architects or architecture at all if that kind of thing is to be encouraged; and although probably we all think pretty nearly alike on that point here, still this absurdity is carried out continually even now in buildings on which many thousands are spent. The difficulty in regard to this point is, of course, much less in architecture put together on Gothic principles, than in what is generally termed Classic. But it may, perhaps, be said that the principles of either class of design are sometimes pushed a little too far. On the side of Gothic the unsymmetrical taste is often carried to an extreme, as if the object were studiously to avoid any correspondence between any two portions of the building. When the competition for the new Law Courts was still pending, an able letter was written in some public paper,—I forget which,—arguing that the whole system of making one great building out of the courts was a mistake; that they ought simply to be so many small buildings, each representing a single court, grouped together; and that this would have been the true Mediæval way of carrying it out. I am not sure that that last remark is not correct, and that the Mediæval system would have been to group them as separate buildings; but I would not rashly say that it was therefore the best one. On the contrary, to follow out this scheme in such a case would, as it seems to me, be to throw aside an opportunity for producing a great and impressive building, and to shirk one of the most difficult and at the same time most interesting of architectural problems. On the other hand, there is really no reason why buildings in the manner we agree to call Classic should not have more play and variety in treatment than is often allowed them, without by any means losing their characteristic style and feeling. The most generally applicable method of combining external symmetry with the expression of variety in planning, is to make the masses of the building symmetrical, and vary the details, such as ornament and fenestration; and this principle will be found just as applicable to Gothic as to Classic building. There is one consideration in reference to the subject on which I have ventured to offer these very superficial and hasty remarks, which at least ought to encourage the young architect to give his time and attention to it. Some of us not infrequently feel quite uncertain and bewildered between the various succeeding fashions of architectural design which court our notice and that of the public as to which is worth attention and which is not, which will retain its hold on public taste or critical judgment, and which is a mere passing whim. Now among all these vagaries and changes of architectural fashion, *plan* is what engineers call a "constant." However the fashion may change, from Gothic to Queen Anne, from Queen Anne to Early Irish, or from Early Irish to Mexican, as the field of the sketcher and copyist gets extended, the requirements and principles which govern good planning are always the same, until the whole habits of society change. As things are now, we can rarely feel secure that a design which for the present satisfies us and our neighbours in its style and ornamentation will continue to give the same satisfaction in later years; and most architects advanced in practice will say that they have little admiration now for the architectural style of their earlier works. But a good plan is a safe investment of mental capital, and a production to which the author of it can always return with satisfaction.

In the discussion which followed,

Mr. H. L. Florence, in proposing a vote of thanks to Mr. Statham, agreed that not only was much to be learnt from German architects on the subject of planning, but from French and Italian architects also. In many houses in Italy the one architectural feature was the staircase, which was generally almost ignored in this country except in buildings of the first magnitude.

Mr. W. H. White seconded the motion, which was supported by Mr. Clarkson, Mr. Aston Webb, and Mr. Salman, the latter speaker remarking that the main purport of Mr. Statham's paper was to urge the importance of getting leading lines in plans, for without such leading lines good plans could not be produced. Good plans, indeed, would never be produced unless they were studied, so to speak, from an art point of view, just as the successful points in an elevation were studied.

The President, in putting the motion, urged the members to avail themselves of the opportunities offered by such buildings as the Houses of Parliament for the study of plan in design; and

Mr. Statham having said a few words in reply, the meeting terminated.

* This plan was given in the *Builder* for Sept. 2, 1871, along with the report upon it by Mr. Waterhouse, who acted as professional assessor on the occasion. It may be interesting, in connexion with the subject, to notice this report of one master of planning upon the work of another.

THE POPULATION, NUMBER OF INHABITED HOUSES, AND ACREAGE OF ENGLAND AND WALES.

An interesting Parliamentary return has just been published, showing, amongst other things, the number of inhabited houses and the population for each county in England and Wales in 1871, exclusive of the metropolis; also the number of owners of land below one acre, the number of owners of one acre and upwards, the extent of lands, and likewise the estimated extent of commons and waste lands. From this return it appears that the total population of England in 1871, exclusive of the metropolis, was 18,240,874, and the number of inhabited houses 3,592,020. The number of owners of land below an acre is returned as 671,667, and the number owning an acre and upwards 249,649, the total number of owners being 921,316, representing an ownership of 29,179,622 acres, whilst the waste lands and commons are estimated at 1,197,676 acres. Exclusive of the metropolitan area, the county of Middlesex stands low on the list, the number of inhabited houses being 44,383, with a population of 253,197. The number of owners of land below an acre is 9,006, and the number of owners of an acre and upwards 2,875; total number of owners, 11,881, owning 143,014 acres, whilst the waste lands and commons are estimated at 2,592 acres. Lancashire, in 1871, contained more inhabited houses than any other county in England, although Yorkshire is nearly four times its area, covering a little more than 4,000,000 acres, as compared with 1,011,770 acres the area of Lancashire, notwithstanding which the number of inhabited houses in the last-named county in 1871 was 530,490, and its population 2,819,495, whilst at the same period Yorkshire contained 507,040 inhabited houses

with a population of 2,436,355. The number of owners of land below an acre in Lancashire is 76,177; one acre and upwards, 12,558; total number of owners, 88,735. In Yorkshire, the owners of land are respectively 84,623 and 28,179; total number of owners, 115,802. Of the acreage of the two counties, the estimated waste lands and commons in Lancashire is 64,306 acres, and in Yorkshire 350,460 acres, of which no less than 247,409 acres are in the North Riding. The gross estimated rental of the 947,464 acres of land in Lancashire (excluding waste lands) is 13,878,277*l.*; whilst the estimated rental of the 3,256,505 acres in Yorkshire (also excluding waste lands) is 12,073,980, showing the average annual value of the lands in Lancashire to be about 15*l.* per acre, whilst the average annual value of those in Yorkshire does not reach 4*l.* per acre. The counties standing next in order to Lancashire and Yorkshire, as regards population and number of inhabited houses are respectively Staffordshire, Warwickshire, Durham, Cheshire, Devonshire, and Gloucestershire. The population of Staffordshire is returned at 858,326, and its number of inhabited houses 167,614; Warwickshire, population, 634,189,—inhabited houses, 131,412; Durham, population, 685,089,—inhabited houses, 114,705; Kent (exclusive of the metropolis), population, 630,127,—inhabited houses, 117,388; Devonshire, population, 601,374,—inhabited houses, 105,200; Cheshire, population, 561,201, —inhabited houses, 110,449; and Gloucestershire, population, 534,640,—inhabited houses, 101,474. The three English counties having the smallest population and number of inhabited houses are Westmoreland, Huntingdonshire, and Rutlandshire, Westmoreland, being returned as having a population of 65,010, and 12,671 inhabited houses; Huntingdon, population, 63,708,—inhabited houses, 14,032; and Rutlandshire, population, 22,073,—inhabited houses, 4,766. The returns in respect to some of the counties show a large extent of waste lands and commons in proportion to the acreage, Westmoreland, out of an area of 450,000 acres, having 114,282 acres of waste lands; Cumberland, with an aggregate of 894,000 acres, of which, 114,025 are waste lands; and Cornwall, 70,968 acres of waste lands out of an aggregate of 830,000 acres. Some of the other counties, on the contrary, show an almost entire absence of these waste lands, Northampton having only 255 acres, out of 593,000 acres; Leicester, 519,500 acres,—waste lands, 298 acres; and Huntingdon, 225,860 acres,—waste lands, 796 acres. The returns give Wales an aggregate population, in 1871, of 1,217,135, and 249,334 inhabited houses, with an area of 4,160,860 acres, 326,972 acres consisting of waste lands and commons. The population and inhabited houses in Glamorganshire amount to about one-fourth of the whole principality, being respectively 397,859 and 72,905. More than one-fourth of the acreage of Brecknockshire consists of waste lands and commons, the entire area being 417,000 acres, and the waste lands, 115,107 acres.

GUILDFORD AND THE RIVER.

One hour's ride from Waterloo will take the Metropolitan, as it took me, to Guildford. This is at the present moment one of the most flourishing towns in England; the scenery is charming and the atmosphere exhilarating. Built upon the declivities of a gorge in a range of chalk hills, locally termed the "Hog's Back," through which the arcadian river Wey meanders, the town has a picturesque appearance that can scarcely be excelled. The country hereabouts is of deep interest to the geologist. On the south-east side of the range two periods in the Wealden formation contribute to the beauty of the locality; high hills, formed of a brittle sandstone, extensively used for building purposes, succeed each other to the south, whilst many coloured sandy elevations trend towards the east. The whole country is covered with luxuriant vegetation, from the umbrageous elm to the odoriferous violet, and animal life, from the largest English mammalia to the lovely lepidoptera, abounds, and the lords of creation have appropriated some of the most gem-like spots for their habitation. To the north and west stretches the tertiary formation composed chiefly of Bagshot sand, but some extensive beds of clay exist, which make excellent bricks of a bright red colour, and there is no doubt lighter bricks might be made by mixing chalk with it. Bountiful crops are gathered from the farms that occupy the district, and hops flourish to the westward; in fine, a more delightful country to be located in does not exist in the same latitude.

The town itself is not devoid of interest; it is evidently ancient, for there are several Early English ruins about: that upon the summit of St. Catherine's Hill has a very weird appearance as it towers high above the silvery Wey. The High-street is a fine one, and is very wide and scrupulously clean. It is full of fine shops, and near the top is situated the Grammar School, erected in the reign of Edward VI., apparently of an oolite stone. The almshouses, of the seventeenth century, are built of brick; these surround a large quadrangle entered by a massive pair of oak gates, which are flanked by a pair of octagonal towers. There are also in this street a Georgian council-chamber and a Doric-fronted corn-exchange, and at the bottom of the street a church is in course of erection under the superintendence of Mr. Christian. There is nothing very elaborate in it except the groined apsidal chancel; the style is Early English, and the materials Bargate (local) stone, with Bath stone dressings, and the side aisle is roofed in a peculiar manner, the plates and ridges being at right angles with the nave, the whole being hidden by a high parapet.

In the minor streets may be found the modern public buildings. These are the public hall, the post-office, cattle-market, and a chapel. Several neat villas are rising up in the picturesque suburbs, and the Government are themselves erecting extensive barracks. Altogether there is an air of prosperity about the place which is refreshing; there is, however, one drawback, and a very serious one. The water of the river which winds through verdant meadows, such as we see on the canvas of Claude and Salvator, and read about in Goldsmith, is polluted by the whole sewerage of the town, and of course this ultimately finds its way into the Thames and the teapot of the unsuspecting Londoner, so that if the otherwise blessed Guildfordite does not speedily divert his foulness into some less objectionable channel, the aforesaid Londoner will know the reason why. The stream is very sluggish, so that the offender himself inhales the bulk of the noxious vapours generated by thus outraging the crystal stream, whose banks are much patronised by pensive maidens "all forlorn," mottled cows "with crumpled horns," patient anglers "all tattered and torn," and chanticleers which crow "in the morn." The next time I visit Guildford I hope to see all this altered; for, to say nothing about offended olfactory organs, there is the danger of being attacked by one of the zymotic diseases that have no doubt already sent many little corpses into the pretty cemetery on the Hog's Back. Gargoyle.

THE CLOSING OF PICCADILLY.

The St. George's, Hanover-square, Vestry having decided to lay down wood pavement in Piccadilly, have applied to the Metropolitan Board of Works to close it for the purpose of carrying out the works. The Board will not permit this important thoroughfare to be closed altogether, but have agreed, under certain conditions, to its being stopped up longitudinally. The Board object to its being stopped up during "the season" which they assume to commence about the 1st of May. The Vestry are to have power to close it until after September, which arrangement would admit of the work of laying down the pavement being commenced at the close of the summer season, but it appears that the Vestry are about to make an effort to have the work completed before May, and have commenced.

TRENT MANOR HOUSE, SOMERSET.

Alterations and additions are in progress to this very interesting old house,—interesting not only for its architecture, but for its historical associations; for in a space between the ceiling and the floor Charles II. was hidden by Lady Wyndham from the search of the Parliamentary troops. This place of concealment is of course left undisturbed, and a separate staircase is provided for the convenience of visitors by the owner, Mr. H. Danby Seymour.

Portions of the house are of the fifteenth century, and there are evidences that much work of this date has been pulled down. Here are also portions of Elizabethan and Jacobean dates. These are being repaired and re-fitted with new oak fittings. The new work follows the Elizabethan type, with square mullioned and transomed windows, and consists of entrance-hall, porch, picture-gallery, bedrooms, and completely new offices. The walls are of local stone, with Hamhill stone dressings. The works are being carried out by Mr. Bateman, of Sherborne, under Mr. R. Herbert Carpenter and Mr. Benjamin Ingelow (who has recently become Mr. Carpenter's partner). The village of Trent is full of ancient houses, some of great beauty and interest, and in one is an exquisitely ornamented plaster ceiling of Jacobean date. There is a chantry chapel belonging to the manor-house, attached to the church, in which are some very fine recumbent figures. This chapel was restored some years ago by Mr. Seymour to his father's memory, under the direction of Messrs. Slater & Carpenter.

LONDON STREET ARCHITECTURE: CHANDOS-STREET.

The warehouse erected for Messrs. Benham & Froud, coppersmiths and general metal-workers, and just completed, has a frontage to Chandos-street of 50 ft., and a depth of nearly 80 ft., and consists of a basement-floor, ground-floor, mezzanine, and four floors over. It stands upon the site of the premises which have been in the occupation of the firm and their predecessors, Messrs. Kepp, for nearly a century, and which were destroyed by fire in the year 1874. Amongst other large works executed in copper here may be mentioned the present ball and cross of St. Paul's Cathedral, 22 ft. in height, which were made upon the premises in the year 1822, under the direction of the late Professor Cockerell, to replace the original one put up by Sir Christopher Wren.

The style of the exterior of the new building is Italian, adapted to suit the requirements of a warehouse. The ground-story order is upwards of 20 ft. high, and has a finely-axed grey granite dado, polished red granite pilasters, with Sicilian marble caps and bases, and a Portland stone cornice; the entrance doorway is also of Portland stone, in which some carving has been introduced. The upper portion of the elevation is constructed in projecting piers of red brick, with horizontal bands of light grey tiles 3 in. deep every third course, and carved stone panels at each floor, some of which are of bold design. The recessed window-jambs are of white brick, with carved stone capitals, and have a double set-off, giving relief from the red brick piers. The panels under the windows are of white moulded bricks. The circular arches over the windows of the third floor are of purple brick, with double set-off, in which white bricks have been introduced. Above these arches is a cornice in Portland stone. In the piers to the top story Pether's bricks have been used, above which is a cornice in stone and moulded bricks. The roof is covered with purple brown plain tiles, and circular-headed dormers have been introduced.

Interiorly the floors are lighted from the centre by a well, with large sky-light above the mezzanine floor. The floors are supported by plate girders and rolled joists, and the four upper floors are carried upon iron girders and columns, thus leaving the three lower floors clear, with the exception of a few columns. The soffits of the floors and joists are wrought and varnished. There are a principal staircase, lift, and men's stairs. The basement floor is covered with Val de Travers asphalte. The modelling and carving were executed by Messrs. Mabey, of Westminster.

The building is connected, on two floors, with a factory in the rear, consisting of four floors about 130 ft. long by 30 ft. wide, occupying one side of Taylor's buildings, and erected for Messrs. Benham & Froud last year.

The architects are Messrs. Chadwick & Sons.

Liverpool Academy of Arts.—It is stated that an exhibition of the works of the past and present members of this academy will be shortly held at the rooms of the Art Club in Sugnall-street, which have been lent for the purpose. The exhibition is expected to be especially interesting, as showing the different phases through which art in Liverpool has passed from the founding of the academy in 1810. The academy, which was reconstituted some years ago, now numbers more members than at any former period of its career. Though it has held no exhibition for some years, the Free Art Schools are still maintained.



LONDON STREET ARCHITECTURE: WAREHOUSE, CHANDOS STREET.——Messrs. Chadwick & Sons, Architects



INTERIOR OF ROCHDALE TOWNHALL.—MR. CROSSLAND, ARCHITECT.

INTERIOR OF ROCHDALE TOWN HALL.

THE interior of Rochdale town-hall is very elaborately decorated, and we give a view of it. The extreme length, exclusive of the orchestra, is 90 ft., and the breadth 57 ft. 6 in.; the height from floor to apex is 68 ft. It is calculated to seat 1,200 people, and is used for public meetings, balls, concerts, and so on. There are seven different ways of egress from the hall that can be used in case of fire or other alarm.

The principal carving consists of sixteen large figures of angels, holding gas-pendants, forming the finish of the hammer-beam. The arcade at the west end of the hall is enriched by some delicate running foliage, consisting of vine, thorn, and oak leaves. The two circular windows in the gables are decorated with ball-flowers. The labels round the hall are terminated into heads of prominent male and female characters of the fourteenth century.

The roof timbers and panels are decorated in gold and colours. The several arms, badges, and legends of England, Ireland, and Scotland, are painted in black, red, and white, in the panels, and the seven principals are decorated with the red rose-tree of the House of Lancaster. The gold soffits of the principals give lightness and brilliance to the roof, and the livery colours of the Queen, blue and red, form an ornamental string-course of the wall-plate.

The walls, the mouldings, and the jambs of the windows are covered with a diaper painted in black and Indian red colours. The principal feature in the hall is the series of windows filled with figures, in stained glass, of the kings and queens of England. The figures are under canopies on quarry grounds, painted with the initials and badges of the sovereigns, excepting the parts underneath the canopies and above the screen, which are left perfectly plain. The series commences with William the Conqueror and ends with William IV. The figure of Cromwell, in subdued colours, stands between those of the first and second Charles.

The lights above the sovereigns are filled with their armorial bearings, commencing with the doubtful two-lion shield of William I. Henry II. has three lions on his shield,—the same shield of England that has continued up to this day. Henry II. at first bore the two lions, but on his marriage with Eleanor of Aquitaine, who had but one lion on her shield, the two shields merged into one of three lions. The badges of the sovereigns, or rather of the different Royal Houses, are shown in the tracery of the windows. The broom plant of the Plantagenets commences the series and is followed by the red rose, antelope, and chained swan of Lancaster; the white rose, falcon, and fetterlock of York; and the red and white rose and portcullis of the Tudors. The red and white rose, shamrock, and thistle come next. These have been the badges of Great Britain until the present day. The figure of our present sovereign is in the centre of the circular window over the organ-chamber. She, as the fountain of honour, is surrounded by the collars and badges of the different orders of knighthood, the Order of the Garter, the Bath, the Thistle, Star of India, &c. Facing this window at the other end of the hall is a similar window, in which the portrait of Prince Albert is introduced.

In the quatrefoils surrounding the Prince are figures emblematic of painting, sculpture, science, architecture, commerce, manufacture, and agriculture.

Underneath the Prince Albert window is a large subject painted by Mr. Holiday, representing the Council at Runnymede, at which were discussed the terms of the "Magna Charta." On the dexter side of this large painting is a panel to balance with the window and the door on the other side to prevent the subject presenting a one-sided appearance. A conventional chesnut-tree is painted in the panel, and from the branches hang the shields of the conservators of the Magna Charta, their names being written on scrolls adjoining the shields. On a conventional curtain are the arms of the Queen, whose portrait is in the window above, and at the sides are the badges of Ireland and Scotland united with the rose of England.

The walls are finished by a fine oak dado, with drapery panels, and fitted with seats and elbows all round. In the west end of the hall is a carved platform, the front of which is filled in with brass balustrading. The floor is laid with Dantzic oak in narrow widths, dowelled, glued, and skew-nailed.

The hall was erected from the designs of Mr. Crossland, architect, and a view of the exterior and plan of the ground-floor will be found in our volume for 1866.*

ARTISANS' DWELLINGS IN THE PROVINCES.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE annual meeting of the Northern Architectural Association was held on Tuesday evening, the 1st inst., in the Old Castle, Newcastle, Mr. John Johnstone presiding. The President, in the course of his address, said:—The Artisans' and Labourers' Dwellings Act having now become law, the subject of how this is to be carried into effect practically is one of absorbing interest at the present time. The future of the dwellings and lodgings of this country becomes a feature full of hope in contemplating the protection it will give to the public from speculators and not too scrupulous builders and avaricious landlords. From the building and sanitary control vested in corporate bodies and boards (if judiciously applied), great improvements must proceed, affecting more particularly that class of the community,—I mean the "working classes,"—who, in this respect, have not within themselves the means of self-assistance, or even protection. To thoroughly fulfil the purpose of the erection of the dwellings, it is of the utmost importance that the site should be selected with all the care possible, a knowledge of the neighbourhood, the people, their wants, and means, being indispensable to this end. In the majority of cases it is undoubtedly better to have the buildings contiguous to great centres of labour and manufacture, otherwise the inconvenience to the tenants which must ensue must be considerable. It must be admitted, however, that in these days of rapid and cheap transit the suburban system has, not without show of reason, many advocates; yet, even with every facility that can be given in the way of travelling, the working man must of necessity have greater chances of comfort when the workshop and dwelling are adjacent to each other. It would be quite out of place here to describe at length the several systems upon which industrial dwellings are generally designed. Three different systems at least have been adopted with varied success. They may be characterised as the "self-contained cottage system," the "isolated block system," and the "community system"; but there are exceptional buildings which cannot be classed under these heads. It is worthy of remark that, in many instances, a great deal has been effected at a moderate cost of old dilapidated structures being remodelled and converted into spacious and healthy dwellings. This is a means which should not be lost sight of where its adoption is possible. The industrial dwellings at the Garth Heads belong to what is termed the "isolated block system," and have been found to answer the purpose well. It has been said, out of doors, that in erecting buildings of this class, architects should be in the van. An opportunity has now occurred for the profession to show whether we can do so or not; it will be our own fault should it be found we are wanting in that respect. The Building Bye-laws Act of the town is, in some cases, an anomaly as it now stands. Capitalists are afraid to enter into building operations on account of the stringency of the Act, or rather the interpretation of it, as applied to not only open spaces behind buildings, but also at the front and wings of the same; there are other matters relative to the Act which press unequally, and which ought, under certain circumstances, to be relaxed. Suffice it, there will be no change or alleviation of these grievances until some decisive action is taken on the part of the public, and a case removed to a higher court in a friendly way, to be there thoroughly tested. It appears there are upwards of 200 corporations and local boards who have introduced various and conflicting regulations, involving great uncertainty and much trouble to architects practising in the country. It surely is not impracticable to frame one Building Act sufficiently broad and comprehensive to meet the various conditions of materials and local customs, and elastic enough to admit of the introduction of novel materials or of improved modes of construction.

Mr. Kyle stated that there was one point that he would ask the profession to consider, and that was the advisability of assisting the Town Improvement Committee to obtain a stringent bye-law which would have in view the providing of more healthy dwellings for the working classes. He did not see how they were to have healthy dwellings unless there were a bye-law to the effect that no buildings should be erected over ground that had been filled up by general refuse from the streets in the manner they were at present. He knew of several acres, in the aggregate, in Newcastle and surrounding neighbourhood where quarries and brickyards excavated to a great depth, had been filled up with refuse of a filthy character, and houses afterwards built thereon, and inhabited by thousands of working men. The Corporation were to a large extent powerless to prevent it. He hoped that they would let it go forth that in their opinion something ought to be done to stop building on such places until the deposits had become consolidated by the lapse of two or three years, and a layer of concrete or some similar material put over, so that there might be a healthy, solid basis.

Mr. Shotton endorsed Mr. Kyle's remarks. He knew of houses erected in Sunderland not upon mere slag or refuse of furnaces, but upon abominable refuse from ashpits, &c., which had been used to level up ravines or valleys. He thought it was very reasonable that they should protest against such a practice. If building was to be confined to our mother earth, they would be able to get better results than by levelling up a valley. They would be able to get better drainage and the dwellings would be much more healthy. The Corporation ought to have power to prevent persons building on places so filled in.

Mr. Kyle said that when places filled up were built upon there should be drains below the deposits.

The Chairman observed that the difficulty would be to draw together the water.

Mr. Oliver remarked that they were straying from the subject, which was how to get workmen's dwellings. He never expected that the Corporation would do as private individuals and public companies would do—viz., supply the accommodation required for dwellings. The question of what houses were built upon really was a matter for the Corporation. With regard to what Mr. Shotton had said, he thought that they never would be able to follow the ups and downs of natural ground, and he also thought that it would be almost impossible to drain so deeply as Mr. Kyle seemed to think they might. He thought rather that they should use asphalte to render the streets impervious to water. Water should not go through at all. In London, every crevice was sealed—every court, street, or area—with Val de Travers asphalte, and the water could not go through. That appeared to be a proper way of obviating the difficulty.

* Vol. xxiv., pp. 867, 868, 869.

AJACCIO, ILE DE CORSE.

A COMPANY WANTED.

A CORRESPONDENT writes:—As a well-wisher to humanity, and especially to those driven abroad in search of health, I am induced to ask the attention of friends and strangers to listen to the wants of Ajaccio, for the climate offers so many advantages, and may, I think without contradiction, be asserted as one of the best hibernal stations in the Mediterranean. This assertion is not made entirely on my own authority, but from the writings and knowledge of several highly-talented medical men. The salubrity ceded, the question naturally arises, what is the accommodation for strangers,—invalids? There is very little, indeed; abundance of room for a nice, comfortable, well-conducted hotel on English principles and comforts. The hotels, save one, in a splendid road, at which we stayed, and which is more expensive than the others, are *far* from suitable to the real invalid, either by position or arrangement, and that one is conducted upon the German plan, and is constantly filled with Germans, Russians, Danes, Americans, and *English*. I put these the last, as usually the smallest community there, for the climate appears far better known and estimated by our more northern brethren than ourselves. The want of a good, comfortable, nicely-appointed, and well-situated hotel, has been felt and continually increases. A few years since, 1870, a project was set on foot to try and remedy the defect, and help make this place what it deserves to be, a true health resort and winter station. A company, consisting I believe of three or four persons, was started, purposing to build an hotel nearly at the top of this fine road on the left-hand side, facing south, and over-

looking the gulf, &c., having 120 rooms (*chambres*). The Corporation ceded the ground almost gratuitously for this purpose, about 7,710 square mètres, or 7,680 square mètres, I am not certain which, say the larger of the two, for the sum of 25 centimes (say 2½d., twopence-halfpenny!! at 10d. the franc) per square mètre. The hotel to be an embellishment to the city, the plan to be approved by the Corporation, and to be finished within a certain period, or the whole to fall again to the Corporation. The hotel was virtually begun in 1870, and one-half of the basement built with granite and hydraulic cement, walls 20 in. to 22 in. thick, until on a level with this road, when, unfortunately, from one of those unforeseen causes "no fellah can understand," and the Franco-German war, it fell through, and is now in the hands of the city authorities, who would be delighted to have some veritable company take it up, as it stands, upon these terms, or at least as near as the present *acting* Mayor could take upon himself to say yes to, without an assembly being called. Cession of the ground upon the same terms, the present masonry to be paid for according to the ordinary cost of labour, but not of the granite stone,—*nothing* is asked for that! Quarries, if insufficient *on the spot*, permitted to be opened close at hand, so that there would only be the cost of labour, and a few yards carriage. The company to deposit one-third in the hands of the Corporation of the sum to be expended, with permission to withdraw it proportionally as the labour advanced. The Mayor undertakes labourers shall not be wanting so far as he can assist. At the present time there is not work enough and labour is now cheap. The entire cost, I should think, would not exceed 8,000*l.* to 10,000*l.*, according to decoration.

The site is a magnificent one, facing south and overlooking the gulf; the ground slopes towards the sea, and could be laid out in walks and gardens at a little cost. On the ground is an opened quarry of granite, which apparently contains enough to build a large part of the hotel, and the rest may, if huge blocks here and there, mean anything, be found on the spot. There is a large surface, but not deep, well on the west side of the present building. I am told it is never dry, but it is *not* potable; hence water would have to be taken from the river source, which is already brought to within 50 or 60 yards of the site; but it is doubtful if naturally it could be brought higher, as the building is about level with the surface of the large reservoir which supplies the town with really good water; so that to carry it over the building would require a force-pump. There is abundance of room on the ground for a villa or two, and there is a bit of ground adjoining, which possibly could be obtained for a garden if necessary. A road to join the sea road and this one, on each side of this plot, is in project. The ground, if largely planted with the *Eucalyptus globulus*, which grows most rapidly here, and is the tree planted to reclaim marsh land and render it healthy, would yield by its presence additional health-giving properties to the air, for it has abundant virtues in many ways, even competing with quinine medicinally; hence it would serve a double purpose. Vegetables can be had close by, and abundantly. Green peas were offered at the door yesterday (January 19th), and new potatoes we had from the garden a few days since. Flowers can be raised most easily, and by a little management the plot of ground may be made charming at a very small cost. Olive trees now flourish on it, and might be left.

As regards materials for building, hydraulic lime is used with granite *débris*, not sand, as sand and ordinary mortar do not stand well; the former sets quickly, and almost defies separation. This lime has to be brought from the Continent, in sacks. Cost, delivered at the quay of the town, 40 to 42 francs, the 1,000 kilo. or 1 ton. The *débris* is on the spot, or from sifted chippings of the granite stones. The stones are usually cut at the quarry, at a cost, according to softness, at 8, 9, or 10 francs the cube mètre (39 in.). The soft kind is used for the walls, and afterwards stuccoed or left rough, with edgings of hard-faced granite. The labour varies, according to demand, from 2 francs or less to 4 francs, according to the perfection of the workman. The haulage is best done by own horses and Corsican carts, paying the labour or driver. The marble for stairs can be had in Corsica, but cheaper in Italy, ready cut. Red granite, of a splendid quality, can be had in Corsica, for pillars, &c. The timber can be had here from the large forests in Corsica, consisting of splendid pine and most durable chestnut beams, 1 mètre thick and 18 m. long, at a very small cost. There is a large quantity now, already cut into planks, awaiting sale. The costly part of the building is the internal decoration. The ceilings here are mostly painted on the smooth plaster, with water or body colour. No obligation to take the original plan; but a new design must be submitted and approved by the Corporation. Such hotel ought to have its own hot, cold, and douche baths, as the baths of the town are at some distance. It should possess a verandah on three sides, and balconies to each story, also means of keeping the temperature of the hotel pretty uniform,—fireplaces in all the bedrooms; its own billiard and lounging room; an easy staircase, a washhouse and laundry, with drying-room, for washing is an important item, and would need some of the patent machines. As to stables, I question if these, from the noise, smell, &c. would be advisable. The frontage, north and south, is 84 mètres; the depth, 96; mètres each side; the cost, conditionally at 2½d. the mètre, about 80*l.* 6s. 3d., though really less, as the franc is nearer 9½d. than 10d. I fancy the ground is not 7,710 square mètres, but 6,880. This was the number given to me at the mayor's office.

The granites, red, grey, and orbicular, are very fine. There is a project on foot, I am told, for gas to the town. It is now lighted by petroleum. There is also talk of a railway, which would, doubtless, open up the riches of the country.

UNHEALTHY OCCUPATIONS.

Dr. Richardson delivered his fifth lecture on Friday evening, the 28th ult. Discussing the diseases engendered by exposure to soluble chemical substances, he referred to the deleterious action of salts of chrome (chiefly employed in the manufacture of pigments), the inhalation of the poisonous particles resulting in ulceration of the face. Ulceration also ensued from the contact of these chromates with slight wounds or scratches on the skin of the worker. Animals employed in chromate works were frequent sufferers from ulceration of the feet and legs by the subtle poison. Cyanide of potassium, much used by photographers, induced great physical suffering in the form of giddiness, dyspepsia, and nervous prostration, owing to the absorption of the poison through the pores of the skin. It would effectually and quickly cleanse the hands of nitrite of silver stains, but it was a dangerous because a poisonous detergent, for although it might perhaps be used with impunity when the skin of the hands was perfect, yet if there was the slightest abrasion or wound in the skin the results might be very serious. Within the last two years a new form of poisoning had manifested itself amongst the men employed in the refining of crude paraffine. It generally appeared, in its first stage, as an eruption of bright red pimples upon the exposed portions of the workmen's skin, and it was purely an affection of the hair follicles, caused by the inflammatory properties of the crude paraffine oil when it penetrated the skin. The disease, when not relieved, continued until the skin was covered with patches of dry, indurated skin, and was not only a source of great disfigurement, but was very painful. The action of soot upon the skin of chimney-sweepers, where cleanliness was not strictly observed, was very irritating, and in some cases had led to a disease known as "soot-cancer," which was, however, far less prevalent than formerly. Arsenite of copper, or Scheele's green, much used for colouring paper-hangings, dress fabrics, and artificial flowers, was a poison the absorption of which produced diseases of the skin and lungs, the latter closely resembling consumption. Artificial flower-makers were the chief sufferers from this cause. Cheap confectionery was formerly largely coloured with this poison, but recent legislation had greatly diminished its use for such purposes. Dr. Richardson then proceeded to give the following summary of diseases induced by industrial labour in thirty-six occupations, viz.,—Diseases affecting the chest—including phthisis pulmonalis or pulmonary consumption, bronchial phthisis, bronchitis, emphysema, asthma, spasmodic flax asthma, cheat spasm, and bronchial irritation — were prevalent amongst potters, millstone and stone cutters, pearl-cutters, sand-paper makers, needle and knife grinders, hemp and flax dressers and spinners, rag-workers, millers and flour-workers, wood and ivory turners and carvers, cigar and tobacco manufacturers, walking-stick makers, hair-dressers, brush-makers, fellowship-porters, burnishers, paper-stainers and artificial flower-makers, miners, and trimming-makers. Diseases affecting the heart and blood—including palpitation and irregular action of the heart, intermittent action of the heart, cyanosis, extreme fluidity of blood, and anæmia—were prevalent amongst cigar-makers, lace-frame workers, bleachers, hat-makers, fur-dyers, and aniline dye manufacturers. Diseases affecting the glands—including irritation of salivary glands and salivation, and nephrosis: chronic inflammation of the kidney—were common amongst workers in mercury and lead. Diseases affecting the stomach and digestive organs—including dyspepsia, gastro-enteric irritation, nausea and vomiting, pyrosis (water-brash), choleraic diarrhœa, colic, and constipation — were prevalent amongst cigar-makers, lace-frame workers, potters, painters and lead-workers, fur-dyers, bronze-founders, paper-stainers, tinmen, and braziers. Diseases affecting the skin—comprising ulceration and exfoliation, follicular inflammation, and soot ulcer—were prevalent amongst aniline dye-makers and workers in mercury, bichromate and potassa, arsenic, crude paraffine, and soot. Diseases affecting the bones and teeth—namely, osteitis (inflammation of surface of bone), necrosis, and caries of teeth — prevailed amongst pearl-workers, fur-dyers, and workers in mercury and phosphorus. Diseases affecting the brain and nervous system—including vertigo, cerebral exhaustion, and paralysis, cerebral congestion, apoplectic coma, neuralgia, mercurial rheumatism and neuralgia, and dementia—are found to prevail amongst potters, painters, and lead-workers, aniline dye-makers, chemical manufacturers, workers in bisulphide of carbon and mercury, braziers, and fur-packers. Diseases affecting the muscular system,—comprising paralysis, mercurial tremors, cramp, spasm, and atrophy,—prevailed amongst potters, painters and lead-workers, fur-packers, cigar-makers, workers in mercury and bisulphide of carbon, and bronze-founders. Diseases affecting the organs of sense,—including ophthalmia, double vision, impairment of vision (amaurosis), and deafness,—prevailed amongst cigar-makers, vine-dressers, workers in bisulphide of carbon, and workers in cyanide of potassium (photographers). Dr. Richardson then went on to say that of all the complaints of the chest, pulmonary consumption was the most dangerous and distressing; and after many years of practice and observation, he was unable to say that the medical profession could cure the malady. Nearly all the unhealthy trades engendered consumption to a greater or less degree, and it might be said to be the most fatal of all the diseases from which the artisan suffered, and, with the kindred diseases of asthma and bronchitis, it formed the most prevailing complaint amongst them. The diseases of the heart and blood were not by any means permanent in the system of the sufferer, although they were accountable for much of the enfeebled condition of the workers in many trades, especially in the case of women and young persons. The diseases affecting the glands were principally felt by the workers in mercury and lead, the latter metal being most dangerous to life. The complaints of the stomach and digestive organs were principally of a temporary nature. The diseases affecting the skin, the bones, and the teeth, were extremely painful, although seldom fatal. The diseases of the brain and nervous system, and those of the muscular system, were all of them most distressing and dangerous, especially in the case of the workers in metals and chemicals. The list of diseases concluded with those affecting the organs of sense. There were, said the lecturer, at least four new diseases in this catalogue of complaints to which the working classes are liable; and this fact afforded a fresh branch of study for all who were interested in the condition of those who formed so large a proportion of the population of this country. Dr. Richardson said that in his next and concluding lecture he intended to consider the means he would adopt for the prevention of many of the diseases he had referred to, especially those induced by the inhalation of dust.

Force of the Wind.—During a recent violent wind-storm along the Atlantic seaboard, the tower of the Metropolitan Methodist Church, New York, 230 ft. high, was blown several feet out of upright, and was rocked by the wind. At Colwes, New York, a church steeple, 225 ft. high, was blown down.

HOLYHEAD NEW HARBOUR.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting held on the 1st of February, Mr. Geo. Rob. Stephenson, president, in the chair, the paper read was on the "Holyhead New Harbour," by Mr. Harrison Hayter, C.E.

Of the several schemes proposed, the plan suggested by the late Mr. Rendel was ultimately accepted, and was sanctioned by Parliament on the 22nd of July, 1847. It comprised a north breakwater, 5,360 ft. in length, and an east breakwater, about 2,000 ft. in length (inclosing an area of 267 acres of available water space), and a packet pier, 1,500 ft. long, within the area. The east breakwater and the packet pier were subsequently abandoned. But it was found, as the works advanced, that the harbour was likely to prove too small, even for refuge purposes. The Lords of the Admiralty therefore decided to lengthen the breakwater to 7,860 ft. from the shore, to shelter a roadstead of 400 acres of deep water. The north breakwater consisted of rubble stone, or *pierre perdue*, from Holyhead Mountain, with a substantial stone superstructure, the end of the breakwater being terminated by a head, on which had been erected a lighthouse. The quarries were at the foot of the mountain nearest the breakwater, being rather less than one mile from the commencement of the work. To convey the stone, nearly two miles and a half of single line of railway were constructed, besides other preliminary works, the total cost of which had been 92,000*l*. The total cost of quarrying the rock had been 4½*d*. a ton, and the cost of filling into wagons, including blasting the large stones, had been about the same. The cost of driving the headings varied from 10*s*. to 25*s*. per lineal foot. The average length of heading driven was 5 ft. per week with four men.

The rubble mound was of great size—the average depth of water at low-water spring tides being 40 ft., and the greatest depth 55 ft.—The variation of the tide at ordinary spring tides being 17 ft., and at equinoctial spring tides 20 ft. It contained altogether about 7,000,000 tons of stone. The weight of the stone in mass was about 1 ton to 13 cubic feet, but in the breakwater 1 ton of stone occupied somewhat less than 20 cubic feet. The rubble mound having been formed, and consolidated by the action of the sea, the superstructure of massive masonry was erected. The cost of the north breakwater and works connected therewith, including land, had been about 1,285,000*l*., and per lineal foot about 163*l*. 10*s*. The cost of the stone deposited in the rubble mound had been 2*s*. 3*d*. a ton for the first portion of the breakwater, and 2*s*. 7*d*. a ton for the last 2,500 lineal feet. The cost of the superstructure alone, excluding the head, had been 36*l*. a lineal foot.

IMPROVED INDUSTRIAL DWELLINGS COMPANY, LIMITED.

ACCORDING to the report to be presented at the twenty-fifth half-yearly meeting of members, on Thursday, the 17th inst., the capital subscribed is 336,350*l*., of which 250,000*l*. have been fully paid, and 90,060*l*. in new shares of 10*l*. each have been recently subscribed by the members of the company. The total amount of capital paid to December 31st was 257,059*l*. The loans received from the Public Works Loan Commissioners amount to 99,000*l*., and a further sum of 9,000*l*. has been granted, and will be taken up when required.

The rents, &c., amount to 14,810*l*. 0*s*. 2*d*., and dividend on railway stock and other items, amounting to 295*l*. 1*s*. 10*d*., make the total income 15,105*l*. 2*s*. 1*d*. The total expenditure, including the contributions to the Leasehold Redemption Funds and repairs account, amounting respectively to 150*l*. 18*s*. 4*d*. and 1,876*l*. 10*s*., has been 7,915*l*. 11*s*. 6*d*., leaving a profit of 7,981*l*. 10*s*. 6*d*. Of this amount, 528*l*. 18*s*. 2*d*. repaid to the Commissioners during the half-year has been carried to the Public Works Loan Redemption Fund, and the balance, viz., 6,660*l*. 12*s*. 4*d*., added to the balance 257*l*. 4*s*. 8*d*. brought forward from last half-year, gives a total of 6,917*l*. 17*s*. available for dividend. Interest on the large sum expended on works in progress, as above referred to, has been paid out of revenue. But for this charge revenue would have been improved by about 1,200*l*. The cost (amounting to only 24*l*. 3*s*. 7*d*.) of raising 125,000*l*. capital, in 10*l*. shares, has been this half-year debited to revenue account. The directors recommend the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax, which will absorb 5,346*l*. 7*s*. 10*d*.; that 1,000*l*. be added to the reserve fund for the equalisation of dividends; and that 571*l*. 9*s*. 2*d*. remaining be carried forward to the next half-year's account.

The directors have secured on lease, from the Ecclesiastical Commissioners, a site in Artillery-row, Westminster, and another in Peerless-street, City-road. They have also taken on lease, from the Commissioners of Chelsea Hospital, an important site in Chelsea Bridge-road, and have agreed to purchase the freehold of a large site lying between the Liverpool-road and Upper-street, Islington, close to the Highbury Station of the North London Railway. These sites will enable the directors to erect about 538 additional dwellings, for the accommodation of 2,500 persons. Building operations have already been commenced in Artillery-row, and the plans and elevations for the other estates are being prepared. The new dwellings will be erected on a much improved plan, so as to give still greater comfort and convenience to the tenants, and to provide several further improvements in the arrangement of the domestic conveniences. The directors regret that nothing further has been done in respect of the sites set apart under the Metropolitan Streets Improvement Act, 1872, not one of the ten plots having been yet submitted to tender by the Metropolitan Board of Works. The number of persons resident in dwellings now under the control of the company is nearly 10,000.

BREEDING MONEY.

SURPRISE is sometimes expressed as to the largeness of the fortunes made by individuals, but the fact is that the moment the corner is turned, and a man's income becomes sufficiently large for him to re-invest the *interest* on his savings, year by year, the rate at which the accumulations then go on is past belief.

Many carelessly infer that the increase of money at 6 per cent is *just twice* as rapid as at 3 per cent.; but in reality the increase is vastly more rapid than this. In one hundred years, at 6 per cent., the increase on any given sum is about *eighteen* times as much as at 3 per cent. A lecturer quoted by the New York *Mercantile Journal* says:—If one dollar be invested and the interest added to the principal *annually*, at the rates named, we shall have the following result as the accumulation of one hundred years:—

One Dollar, 100 years, at	1	per cent.	$2⅝
,, ,,	2	,, ...	7⅓
,, ,,	2½	,, ...	11¼
,, ,,	3	,, ...	19½
,, ,,	3½	,, ...	31½
,, ,,	4	,, ...	50⅓
,, ,,	4½	,, ...	81½
,, ,,	5	,, ...	131⅛
,, ,,	6	,, ...	340
,, ,,	7	,, ...	868
,, ,,	8	,, ...	2,203
,, ,,	9	,, ...	5,543
,, ,,	10	,, ...	13,809
,, ,,	12	,, ...	84,675
,, ,,	15	,, ...	1,174,405
,, ,,	18	,, ...	15,145,007
,, ,,	24	,, ...	2,551,799,404

In Hildreth's "History of the United States," it is stated that Manhattan Island,—afterward called New Amsterdam, now the City of New York,—was bought by the Dutch from the Indians, for sixty guilders, or *twenty-four dollars* ($24), and this only about 250 years ago. And yet, if the purchasers could have securely placed those $24 where they would have added to the principal annually interest at the rate of 7 per cent., the accumulation would exceed the present market value of all the real estate of the city and county of New York.

LIGHT AND AIR CASES.

CARTWRIGHT *v.* LAST.

THE defendant in this case (Chancery division, before Sir R. Malins) became, in the early part of 1875, the owner by purchase, under an order of the Court, of a valuable property known as Cavendish Mansion, which extends from Burlington-gardens to Cork-street, and, intending to turn the building into an hotel, he proceeded to put upon it an additional story. The plaintiff is the well-known dentist in Old Burlington-street, and he sought to restrain the erection of the proposed new buildings on the ground that they would materially diminish the light on the western side of the house, and by diminishing the light of his consulting and operating rooms seriously interfere with his business.

The Vice-Chancellor, though of opinion that Mr. Cartwright had sustained some injury, was unable, upon the evidence before him, to determine its extent or the proper remedy. Since the writ was issued, the building had been carried to its full height, and the case was not one in which, upon interlocutory motion, he should grant a mandatory injunction for the buildings to be pulled down. His lordship had no doubt whatever, that he now had, whatever might have been the former practice of the court, perfect jurisdiction to grant such an injunction before the hearing. He should not, however, grant one in this case, and for these reasons:—There was no evidence whatever before him to show how much of the building should be taken down. In fact, the present structure was 50 ft. higher than the one which originally stood opposite the plaintiff's western windows. Was 10 ft., or 20 ft., or 30 ft., the proper quantity to be removed? It was, as the case now stood, quite impossible to determine. What, then, should the court do? Why, this,—he should refer the matter to an architect or surveyor, to be appointed by the parties. That was done in the case of Kelk *v.* Pearson (Law Reports, 6 Chancery Appeals, 809). Then the Lords Justices felt great difficulty in ascertaining from the evidence the amount of injury inflicted on the plaintiff. A surveyor was appointed and he made a report. The motion then came on for hearing, was treated as a motion for a decree, and the surveyor examined by the court and by counsel on both sides. His lordship should follow that course, and though sorry to put the parties to such an extra expense, it would enable him, when the surveyor's report was made, to hear, and finally to dispose of, all the matters really in dispute in the cause. The surveyor must (if the parties could not agree upon one) be appointed by the court, and he must, after a careful inspection of the premises, and due consideration of all the written evidence, report to the court what was the extent of the injury sustained by the plaintiff, and what, in the surveyor's opinion, should be done to remedy it now and hereafter. That would give the court some solid, substantial ground on which to decide the whole suit, and which was wanting now.

WHO PUTS THE DRAG ON AT THE INSTITUTE?

SIR,—Last Monday evening the formal consideration of the recent proposals for reform in the Institute of Architects terminated by the reference of the whole scheme, with all other suggestions that had been or might be made, to the consideration of the Council, to report thereupon to a special general meeting at some future time; in fact, to re-commit the whole thing, and evolve a fresh scheme out of the *disjecta membra* of the first one.

Let it not be inferred that those who voted for this way of terminating the first phase of the discussion did not take about the best course under the circumstances. A great many ideas have been thrown together into a sort of chaos, the constituent atoms of which require to be marshalled into order. But how long is this to take? The question was raised in a practical manner the other evening, by the very rational and sensible suggestion of one of the older Fellows, who has taken a leading part in the recent discussions, that the report of the Council should be ready for the general Conference of architects which is intended to be held this year, so that those portions of the scheme which affect provincial members could be then discussed. Some applause followed the suggestion, but a damper was immediately thrown upon it by the remark of the chairman, at a whispered suggestion of the secretary, that the latter gentleman reminded him that it would be "quite impossible" to have a report ready by that time.

Now this is just a specimen of one of the causes which has brought the Institute to such a dead-level state as it has lately been in. For some time past the Institute of Architects has been one of the most unbusiness-like and unpunctual of societies, in all matters of importance. Nothing can ever be done in time. It was only by dint of repeated attacks and letter-writing in the professional journals, that even the ordinary virtue of punctuality in taking the chair at the ordinary meetings was at last enforced, as it were, at the point of the sword. It is this dilatory, sleepy, procrastinating, slow-coach administration which is tiring every one out, and clogging the wheels of the machine. Here we have been all talking for the last two or three weeks of the great importance, among other points, of gaining the

look'erest of the architectural profession at large in the Institute, of connecting it more closely with the country societies and the country professional men generally; and then, when the very opportunity for enlisting their interest in the whole subject is forthcoming in the natural course of things—when we have the opportunity of making the Architectural Conference this year an occasion of arousing some general interest in regard to proposals which we hope will be for the benefit both of the Institute and of the profession at large—we are to be officially told that it is "impossible" that this opportunity can be taken advantage of. What does "impossible" mean? The Conference will not, at any rate, be held till May, and need not be held till June; and we are to understand therefore that the Council of the Institute cannot, in a space of three months at the least, or a good four months if they choose, arrive at any definite ideas to lay before the Conference, and thus make the discussion of the subject a national and not a merely metropolitan affair. As the meeting broke up, one gentleman present observed, "Well, now I suppose we shall hear nothing more of this for two years!" That, unfortunately, is pretty much what many of us feel; but one thing is quite certain, that if nothing is heard of it for two years (or even one year), it will be too late, for any interest aroused by the recent proceedings will have died away, and all the record of what has been done, talked, and suggested, might just as well be put into the fire.

If the Institute, after having attracted public attention by all this display of zeal for reforming itself and advancing the profession, is so swathed and entangled in red-tape administration that it has not the spirit and energy to take time by the forelock, and seize the first and most fitting opportunity of striking while the iron is hot, and of drawing the representatives of the provincial profession into practical co-operation in its schemes, it deserves to go to the wall, and to stop there. BIS DAT QUI CITO DAT.

THE PIECE-WORK QUESTION.

SIR,—Piece-work does not of necessity bring with it, as some would have us suppose, any decrease in the price of labour, for we have only to refer to the colliers, puddlers, and many other trades, to see that the price of labour actually rises with the price of material. Agitators may talk about what a man ought to get, but the hard fact remains still unalterable, that the value of a man to his master is always in proportion to the *result* of his labour: consequently if a man unskilful in his trade, can by application to one particular branch of it do more of the kind than an ordinary journeyman, he makes himself more valuable to his master, and so long as the master can find him work of that particular kind, the man is worth, and the master is willing to pay, a higher rate of wages than to an ordinary journeyman. The truth of this is evident in any large workshop, where it will be found that certain men receiving the same rate of wages will, if obliged to change their jobs each for the other, be neither able to do so much work as his fellow was doing, and consequently neither would be worth so much to his master as he was previously to the alteration.

In a trade where a man repeats the same kind of labour for weeks together, there should be no objection to pay him for the result of his labour. In every trade there are men who from their natural gifts are competent to do more work than their fellows, and are therefore entitled to a higher rate of pay from the fact that the result of their labour is of more value to their master than that of an ordinary man.

In arriving at the proper price for the manufacture of an article, the cost of its production by a man of ordinary strength and ability must be taken as a standard; men who can then earn more than their wages are entitled to what they may earn in excess, and those who cannot earn so much as their wages are certainly worth no more. The society requires all to be competent and able to earn an ordinary rate of wages. But from the number of inferior workmen who are society men we fear this rule is not in all cases enforced. Besides which, what is to be done with a man of twenty-one years of age who from neglect of his opportunities to learn during his apprenticeship has failed to make himself fairly master of his trade? Certainly he cannot earn an ordinary rate of wage.

A certain class of men complain that in slack times some men are discharged, instead of all taking a share in the work and all working less hours per week. But, as in such times it is not the most skilful hands that are dispensed with, it is only the inferior who have any cause to fear such calamities. The more a man applies himself to his trade, and the more proficient he makes himself, the more right has he for employment over others who have not taken so much trouble to perfect themselves.

When any two classes of men have interests in common they always work much better together. And this is the case where the piece system is adopted; for a master's interest is to turn out of his factory all the work he can in a given time, and the man has the same interest, for he knows that the more work he does the more pay he gets.

We only have to look at the three great industries in England, viz., cotton, coal, and iron, which are almost exclusively worked by the piece in all their branches, to see that the price paid per article advances or declines according as it is worth more or less in its finished state in the open market.

I have only to add, in conclusion, that where a proper system of supervision is in practice, it is equally difficult for a man working by day or piece to get his master to accept inferior or slop work, and there is no system so calculated to give to individuals what they are worth as payment by piece. For, as skill and speed are important qualities in the possession of a man, but either one without the other is of inferior value to the combination of the two, so the possessor of both is worthy of all the emolument he can obtain. MANUFACTURER.

VENICE.

SIR,—With reference to a notice in the *Builder* of 29th January, will you allow me to say that on the 27th of June, 1875, Signor Luigi Monga, acting as agent for Signor D. C. Dalgairns and his associates, presented a project for the bringing of the water from the Seriola direct into Venice in connexion with the formation of certain artesian wells, which latter, however, was a secondary rather than a primary part of the scheme, these wells being only required in case of war, as they would be within the fortified lines of the town. On the 26th of January, 1876, the concession was voted in favour of the said Signor D. C. Dalgairns and his associates by 47 votes out of 54, and the concession was granted and ordered to issue. There were six competitors for the concession. I am able to make these corrections with authority, and to add that the official documents have been placed before me.

WILLIAM SMITH, C.E.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

SIR,—We are now a sufficiently scientific people to immediately recognise the great importance of obtaining reliable standard measurements of the human figure. In ancient times several portions of the body were taken as units of measurement,—the foot, the hand, the thumb, the cubit. At first thought this would appear to afford very uncertain and unsatisfactory standards for commercial purposes, but if the averages of a sufficient number of actual measurements of these portions of the body were obtained, these averages would afford standards of measurements sufficient for all the general purposes of life. The human frame, like other fluctuating phenomena, oscillates about a certain mean type.

My attention has been freshly directed to this special object by a pamphlet by Mr. Joseph Bonomi, the respected curator of the Soane Museum, entitled, "A Project of an Instrument for the Identification of Persons,"* &c. The instrument is sufficiently simple and ingenious, but whether this, or any other mode of measurement which may be considered better, be adopted, it is of far more importance just now that we should have so earnest an advocate for instituting systematic measurements of the human frame.

Possibly photography might be pressed into the service of this kind of work. The figure to be photographed might be placed against a reticulated frame, so that we should, at once, be able to ascertain the proportions of the subject photographed. Of course, all proceedings would have to be carried out with scientific accuracy.

This plan might be useful for "identification," &c.; but in respect to art, a scientific determination of the present proportions of the human frame would be invaluable. All fanciful theories about the proportions of the human frame developed out of the moral conscience, as it is said the German set about working out his camel, are futile. If we desire to have anything trustworthy on this subject it must be ascertained from actual measurements.

To men used to such investigations it would at once be evident that we could obtain the measurements of the type of every regiment in the service; and it would be a matter worthy the consideration of the Government whether it would not be a useful public work, as well as a public record, to have sculptured types of some of our finest regiments executed by the most eminent sculptors. METER.

* Noticed some time ago in our pages.

QUEEN ANNE STYLE.

SIR,—"Queen Anne." These two words flow trippingly on the tongue by reason of the number of liquid letters. So does the expression "fal-lal-la." But in neither case is any very distinct definition obtained. If in defect of definitiveness, we allow imagination to run riot as to the origin of the present use of the expression "Queen Anne" with reference to architecture, it suggests that the users are oblivious of the existence of any such works as those of Palladio or Vignola, of Raffaelle or Michelangelo, of Blondel or Philibert de Lorme. Moreover, the expression is misleading, as tending to suggest to the ignorant mind that the misdeeds of dunces like John Thorpe, Inigo Jones, Wren, Gibbs, Sir William Chambers, and Sir Robert Taylor, instead of being diffused over a period of two centuries, were all concentrated within that short reign during which the Battle of Blenheim was fought, the character of Sir Roger de Coverley created, and the youthful Dr. Johnson "touched" for the king's evil by the last Stuart monarch. G. M.

WAPPING IMPROVEMENT ARBITRATION.

MOODIE *v.* METROPOLITAN BOARD OF WORKS.

SIR,—Half the truth may be sometimes more deceptive than a complete falsehood. In your report in this case last week you state that witnesses were called on behalf of the claimant, and their figures varied from 8,000*l.* to 8,418*l.*, and that the umpire's award has since been made at 8,018*l.*, the Board's offer being 5,400*l.*

Whoever supplied you with information might have made it fuller, yet somewhat nearer the truth. The claim sent in was 15,720*l.* 6*s.*—viz., leasehold, 9,331*l.* 6*s.*; fixtures, 453*l.* 18*s.*; and 5,935*l.* 2*s.*, for damage to business by forced removal,—viz., two years' net profits.

For reasons that need not be entered upon here, the officers of the Board are precluded dealing with Messrs. Fuller & Fuller, the surveyors who had the carriage of the claim; but their client, Mr. Moodie, called upon me, and after two interviews, expressed his unwillingness to accept less than 9,000*l.*

Hence there was no alternative but to proceed to trial. Practically, the sealed offer in this case had been exceeded; for, upon receiving further information as to trade profits, &c., I told Mr. Moodie that I was prepared to recommend a very considerable advance on the amount named prior to the arbitration being proceeded with.

F. W. GODDARD,
Surveyor to the Board.
Metropolitan Board of Works.

MASTERS AND MEN.

The Plymouth Masons and Piecework.—The Plymouth masons have given notice to their employers that piece-work must terminate.

The Oxford Carpenters and Joiners.—At a meeting of a large number of the carpenters and joiners of Oxford, on the 2nd inst., it was decided to memorialise the employers for an extra penny per hour, and also to adopt a new code of rules. March 1st was fixed upon as the day for the reply of the employers to the request of the men.

Bricklayers at Barnsley.—The bricklayers employed in the Barnsley district, who are connected with the Sheffield Association, have given three months' notice for an advance of 3*s.* per week. It is said the demand is made in consequence of the great request for houses in the district, and in the event of the masters not complying, it is the intention of the Central Association, which has about 17,000*l.* in hand, to purchase land in and near Barnsley, and build a number of superior houses.

The Birkenhead Painters and the Town Commissioners.—At a meeting of the Birkenhead Trades Council, on the 2nd inst., the following resolution was passed:—"That the Council is of opinion that the action of the Market Committee of the Birkenhead Commissioners in employing the market constables to paint the fountains in the market in December last was an act of gross injustice to the heavily-taxed master painters in the township, as it debarred duly qualified journeymen painters from doing the said work, a large number of them being out of employment at that time."

The Hereford Painters.—The working painters of Hereford have addressed the following letter to their employers:—"We, the undersigned, employed by you, should feel thankful if you would grant us the system of payment by the hour, the same as that paid by the other branches of the building trade in Hereford and the surrounding towns, viz., 6d. per hour, to be paid at one o'clock on Saturdays; feeling we are justified in this request by the high price of provisions, and to place us on the same equality as our fellow-men. We should feel obliged by an answer to the above request by the 4th of March."

The Wigan Bricksetters.—The Wigan bricksetters have applied for an advance in their wages of 6d. per day, to start from the 1st of April. The masters have not yet decided what action they will take in the matter.

VERDICT OF MANSLAUGHTER AGAINST OWNERS OF PROPERTY.

AN inquiry took place before Dr. Hardwicke into the circumstances connected with the death of Elizabeth Sergeant, aged 79, of Liverpool-road.

Mrs. Mary Whittington said deceased had resided with her six years. There was a raised pavement some 6 ft. above the roadway in front of Paradise-terrace, which was between 300 ft. and 400 ft. long, unprotected by railing, and at seven o'clock on Saturday evening deceased fell from the pavement, and sustained severe injuries.

Mr. James Beal, Regent-street, here said he was agent to some of this property. There had been railing put up to prevent people falling from the pavement, but it had been torn down by the boys and girls. There were other owners of property on the terrace, and a dispute arose as to who ought to pay for further railing. He, however, had determined to end the dispute by putting up a strong wooden railing throughout, and the work was to have been commenced on the previous day.

Several jurymen urged that the place was exceedingly dangerous, and that the owners were guilty of culpable neglect in allowing the place to be so long unprotected.

Ultimately the jury returned a verdict to the effect that "D. ceased died from shock and injury, the result of falling from a pavement in Liverpool-road, which was caused by the unprotected state of the said pavement, and that the owners of the property were thereby guilty of Manslaughter."

The verdict was recorded, and the Coroner made out his warrant against the several parties, who will have to appear in due course at the Old Bailey.

THE ROYAL AQUARIUM AND THE WANT OF SEA WATER.

THE folks at the Royal Aquarium, seem to be in a sad fix about obtaining sea-water. Well, an aquarium it is not, unless you call a few Chinese carp (gold fish) swimming over broken cockle-shells an aquarium.

I am told it will require miles in length of railway trucks, and I know not how many hundreds of tanks, to bring the sea water from Brighton. And no one can say how long this process will take.

The Company, I hear, flinch from the expense—four thousand pounds. Now, having had tanks of my own for fifteen years, perhaps I may be heard upon the point.

It is not possible to use a wine, a beer, or cider cask—no, not even a new cask, and hope to bring pure sea water to London.

Suppose you knock a hole in the two ends of a cask, make it fast to a buoy out at sea, and let it be there for a week: in two days the water is putrid and no fish can live in it—if you desire the cask to be sent 100 miles—afterwards.

It was only a few days ago I heard of what is called a fix about sea-water.

With this preface I will put my notions in a few words:—

1. Barges with batches to batten down (barges, you know, that will keep water out will keep water in); 2, and next,—In fair weather with a steam-tug three or four of such barges to be towed out beyond the Foreland; then having obtained (perhaps a novel cargo) water, let the barges be brought to the Millbank Landing next the iron bridge, and then utilise the water-carts that are useless at this time of year. TRUTH.

EXCAVATIONS IN ASIA MINOR.

MR. R. P. PULLAN, M.R.I.B.A., delivered his concluding lecture, "On the Excavations in Asia Minor for the Dilettanti Society," at the Royal Institution, Albemarle-street, on Saturday afternoon. Its subject was the excavations of the Temple of Minerva Polias. They were undertaken and carried out during his third expedition in the service of the Society, on which he started in August, 1868, returning to England in the summer of the following year. In his opening remarks Mr. Pullan slightly touched on the ancient history of Priene, a member of the league of twelve Ionian cities in Asia Minor. It was seated at the foot of Mount Mycale, and was formerly on the sea. The Mausoleum Room at the British Museum, since, besides the relics of the Carian king's world-famous tomb, it contained those from the noble temple at Priene, might fairly be styled the Pythios saloon. The lecturer contrasted the beauty of the sites which he had before excavated with the sad desolation of that of Priene. Here, too, he had to struggle against many other disagreeables, such as want of water, as well as dearth and badness of food. He found two noble Ionic columns of the temple still standing to the height of 12 ft., and the cella wall was preserved in its integrity as much as from one to two yards above the ground. Inscriptions of great value were brought to light, together with precious fragments of sculpture, all of which were safely housed in the British Museum. On the whole, in spite of many *contretemps*, this was the most fruitful of his three expeditions. He excavated with good results; the temple pavement was laid bare, and was, happily, found entire; the cella was cleared of rubbish, the steps of the parabolas were brought into the light of day. But at length fever seized his workmen, and brought further operations to a close for a time.

HOW THEY LIVE AT SPENNYMOOR.

AT a recent meeting of the Spennymoor Local Board of Health, the newly-elected inspector (Mr. E. Robson) presented his first report on the sanitary condition of the town. He said the place was in a very unsanitary condition, not only as regarded cleanliness and drainage, and in many places ventilation, but from the slothful, filthy, and debauched habits of many of the population in the back slums. In seven houses in George-street and Vinycomb-street there were eight tenants, the property consisting of sixteen rooms, and in these lived no less than twenty-three children and thirty-eight adults, making a total of sixty-one persons. In a block of property on the east side of Dundas-street there was not a single convenience for the whole lot of people. To add to the filthiness, one of the houses was occupied as a beerhouse. We are told that the chairman, amidst much laughter, said it was a fact that as soon as one lot got out of bed others took their places. The report was received. As a local journal remarks, such revelations are hardly fit subjects for laughter.

ACCIDENTS.

At the Royal Aquarium.—Mr. Bedford has held an inquest at the Sessions-house, Broad Sanctuary, on the body of Robert Corbett, aged 23, a florist, of Highgate New Town, who was mortally injured at the Royal Aquarium. The evidence of Mr. E. Pask, of 9, Walton-street, Chelsea, and other witnesses, showed that the deceased was standing on the ground-floor of the building when a heavy piece of wood was dropped or thrown from the gallery, and falling upon deceased, inflicted a compound fracture of the skull, which terminated fatally. Who it was who let fall the wood could not be ascertained, although it was known that several painters were at work in the galleries at the time of the occurrence. The jury returned an open verdict.

Fall from a Ladder.—Last week Dr. Hardwicke held an inquest at the Court-house, St. Pancras, on the body of Wm. Dovell, aged 78, a carpenter, who died in the workhouse on Thursday, from injuries sustained by falling from a ladder, which broke at the base. After a full inquiry, the jury concluded that deceased alone was responsible for the accident, as he ought to have examined the ladder before using it. A verdict of "Accidental death" was recorded.

Fall of a House in Dublin.—The other day a large three-storied house in Golden-lane, Dublin, fell out into the street. Two men who were passing by at the time of the occurrence were seriously injured by fragments of the *débris*, and had to be taken to the hospital.

Fall of an Iron Roof.—Last week the iron roof of a large building belonging to the North British Railway Company, at Cowlairs, near Glasgow, came down with a great crash, killing a boy on the spot, and seriously injuring three men, one of whom is not expected to recover.

Miscellanea.

Electricity and Railway Travelling.—At the weekly meeting of the Royal Institution on Friday night in last week, a paper "On the Applications of Electricity to the Protection of Life on Railways" was read by Mr. W. H. Preece, one of the Divisional Engineers of the Postal Telegraph system. Mr. Preece set out by proposing to establish three propositions,—viz., 1, that railway travelling is dangerous; 2, that railway travelling is safe; and 3, that the danger is potential, and the safety actual; and that the one has been converted into the other by the operation of scientific thought, and by the application of scientific skill. As regarded the second proposition, the lecturer adduced some very interesting statistics, showing that in proportion to the total number of persons who met with violent deaths, only a small number were killed on railways. Analysing the different causes of accident on railways, the lecturer showed that defective "human machinery" was responsible for 41 per cent. of these mishaps, defective signals for 28 per cent., defective permanent ways for 18 per cent., and defective rolling stock for 13 per cent. He then proceeded to show that telegraphy, or the art of conveying information by certain preconcerted signals to the ear and to the eye, is the chief aid of the railway engineer. These signals are interpreted to the outward observer by mechanical appliances familiar to all who travel by railway, and are exhibited in different forms to suit the requirements of day and night traffic. Speaking of the block system, the lecturer characterised it as the greatest element of safety on railways. By its means trains travelling on the same line of rails are kept apart by a certain and invariable interval of space, instead of by an uncertain and variable interval of time. Block systems are of two kinds—"absolute" and "permissive." The latter Mr. Preece characterised as no "block" system at all, but a system introduced, not to secure the safety of trains, but to increase the capacity of the line for the transmission of increasing traffic.

Theatre Royal, Covent Garden.—Mr. Charles Rice, having proved himself a very good manager, desires to show his London friends that he is also a good actor, so he is now playing *Shylock* in the "Merchant of Venice." If we were to say of his assumption "this is the Jew that Shakspeare drew," we should say what is not correct, but it is played with great spirit, and serves to show that there are parts in which Mr. Rice would doubtless prove effective. Mr. Millard, who plays *Antonio*, is the most satisfactory of his supporters. Mr. Rice promises the revival of a play of Shakspeare's, if encouraged, on "a scale of unexampled completeness." Should he be led to carry out this promise, as we hope he may be, he must get some competent person to advise him in architectural and archæological matters. And with reference to costume, let us suggest to him that *Shylock*, a Jew, never wore a staring maltese cross in his cap. The pantomime here is still running gaily. It is full of innocent fun, and includes charming scenery and some very good singing.

Mr. Ellison's Claim on the Douglas Street Board.—At the last meeting of the Douglas Street Board, the Government Commissioner, Mr. Dalrymple, made a speech and motion in reference to the charge of want of courtesy brought by Mr. Ellison against the Board in omitting his name from the scroll placed under the finishing block of the promenade enclosure works. He said that the placing of the scroll, although not the act of the Board, had been mentioned by Mr. Powell to two of the members and approved by them, and had been copied by the clerk to the Board. The Board had been advised by their advocates to keep neutral, inasmuch as any claim which Mr. Ellison might have would not be against them, but against the highway fund, and this course they adhered to, inasmuch as Mr. Ellison claimed to have his name on the scroll, not as a matter of courtesy, but as a recognition of his money claim. He, therefore, approved of Mr. Powell's action as being correct and proper, and moved that it should be adopted as the official act of the Board. For himself, he added that he would never consent to any reference or mode of settlement which would not end in obtaining the oath of Mr. Ellison, on the one hand, and the oath of two persons who state that before he brought out his plan in 1870 they furnished him with the prospectus and plan printed by Mr. Williams, of Liverpool. If Mr. Ellison applied to the Tynwald Court, he (Mr. Dalrymple) would get this part of the matter investigated; and he hoped the Board would always adhere to their determination not to meddle in the matter, but to leave it to the referees who were lawfully authorised to interfere, namely, the Tynwald Court. The motion was carried unanimously.

Municipal Buildings at Reading.—At the quarterly meeting of the Reading Town Council, held on the 3rd inst., a report was presented by the Municipal Buildings and Streets Improvement Committee, stating that a meeting of the committee was held on the 25th ult., when the mayor submitted several sketches which had been forwarded to him by Mr. Waterhouse, the architect, showing the arrangement of the fittings which he recommended to be provided for the new council-chamber. The committee having considered the sketches, instructed the borough surveyor to prepare a modified plan, showing the seats for the members of the Council at meetings of the Council, arranged in a circular form, and separate provision for the officers of the Corporation and the representatives of the press. The deputy town-clerk reported the steps which had been taken for raising by subscription the amount which would be required to defray the cost of providing the proposed clock, bells, and machinery for the tower, and it being estimated that the cost would be about 700*l.*, the mayor was requested to advertise the subscription-list, with a view to raising that amount. The mayor called the attention of the committee to the condition of the interior of the town-hall, and it was resolved to recommend the Council to take steps for its repair and redecoration, so that the work might be completed simultaneously with the completion of the new municipal buildings. The recommendation was agreed to.

The Howth Drainage Competition.—At a recent meeting of the North Dublin Union Sanitary Board, the principal business was to receive the report of a committee appointed to consider plans prepared by several engineers, for the drainage of Howth. The report from Mr. W. F. Cousins, C.E., having been read, it was agreed, that owing to the difficulty of constructing a sewer on the East Pier, any plans suggesting that outfall should be abandoned. It was resolved unanimously that the first premium (20*l.*) for plan and specification for Howth drainage be awarded to Mr. F. A. Doyle, C.E., Kingstown. The second premium (5*l.*) was awarded to Mr. Leonard, C.E. The competing engineers were:—Mr. Leonard, C.E., Messrs. Butt & Son, C.E., Mr. Palles, C.E., Mr. Maher, C.E., Messrs. Lyons & Ferguson, C.E., Mr. P. M'Cann, C.E., Mr. F. A. Doyle, C.E., and Mr. Adam Scott, who advocated Liernur's pneumatic system of drainage.

Ipswich Fine Art Club.— The second annual exhibition of the Ipswich Fine Art Club has just been opened. The object of the association is to encourage local art, in which it has been highly successful, and the present exhibition comprises numerous pictures by Suffolk artists. In addition there is a loan collection from South Kensington.

London and County Bank.—The report, as advertised, deals with large figures. It states with reference to the exceptional loss arising out of the failure of Collie & Co., that it has been decided to transfer 75,000*l.* from the balance carried forward in August last to the special account previously opened, which would in the judgment of the directors fully cover the whole of the deficiency. The available profits, after making the usual provision, amounted to 156,731*l.* The sum of 25,000*l.* was added to reserve, bringing it up to 699,522*l.*, and after providing 15,000*l.* for interest on new shares, a balance of 14,731*l.* remained to be carried forward. The present dividend of 8½ per cent. makes, with that before paid, 16½ per cent. on the year 1875. The balance-sheet gives the following particulars:—Assets: Cash at head offices and branches, &c., 2,735,258*l.*; ditto lent at call on securities, 3,375,271*l.*; investments on Government and other stocks, 2,417,560*l.*; discounts, advances, &c., 16,967,880*l.*; and freehold property, 441,138*l.* The liabilities consist of paid-up capital, 1,499,045*l.*; reserve fund, including amount added on the half-year's business, 699,522*l.*; customers' balances, deposits, &c., 21,399,784*l.*; and acceptances, 2,162,095*l.*

Society for the Encouragement of the Fine Arts.—On Thursday evening, February 3, Mr. Walter Hamilton delivered a lecture "On the Origin of English Dramatic Art," Mr. Hyde Clarke, D.C.L., in the chair. Having shown that the drama in England, as in almost every other country, was exclusively religious in its earliest stages, and that the old miracle plays were attended by the public as part of their religious duties, the lecturer traced minutely the gradual development of the legitimate drama, which became more secular in its subjects, and more original and poetical in its composition. He took occasion, finally, to point out that, true to its origin, nearly every drama of acknowledged merit inculcated the highest lessons of morality and propriety, and that almost every English writer of eminence had written something for the stage. A discussion ensued in which Mr. G. Browning, Mr. A. G. Babington, Mr. Meenacshaya, Mr. Thomas Gilks, and the chairman took part.

Humane Societies. — Humane societies spread rapidly throughout the civilised world, and new life-saving processes are everywhere being studied and perfected to attain more easily the noble end of saving human lives from the sea or fire. But to ensure a greater success and to obtain from this philanthropic work all the beneficial effects of which it is capable, it is desirable that efforts should be united, and that all the achievements of human industry should be made the patrimony of all mankind. With this aim the Humane Society of Genoa have resolved to keep during the first days of July, 1876, an international congress of all humane societies and those institutions which favour experiments in that praiseworthy direction, for the progress and improvement of the same institutions and the means of salvage. They seek the co-operation of all countries.

Land in Edinburgh.—At Heriot's Hospital offices, Edinburgh, on the 20th ult., there was put up to public roup certain feuing ground belonging to the hospital recently laid off in Leith-walk and adjoining cross streets. The *Metropolitan* says the frontage towards Leith-walk, extending to nearly 1,000 ft., was exposed in sixteen lots, all, excepting those at the corners of cross streets, having a uniform length of 60 ft. The upset price was in each case 12*s.* of annual feu-duty per foot of frontage. At the upset price the annual value of the ground would have been 576*l.* The value actually realised was 651*l.* of feu-duty, representing, at twenty-four years' purchase, a capital sum of 15,624*l.* The area of ground disposed of being barely three acres in extent, the annual return will be 213*l.* per acre, equal to a capitalised value, per acre, of over 5,000*l.*

The Iron Gates and Railings from St. Paul's Cathedral.—"Man About Town," a writer in a sporting contemporary, charges the Dean and Chapter of St. Paul's with irreverence for having resolved to dispose of the entrance-gates of St. Paul's. He states that a firm of iron and metal merchants are now offering for sale, to quote from their own advertisement, "the State entrance-gates of St. Paul's Cathedral, and about 150 ft. of fine railing belonging to the same, at a lump sum of 150*l.*, delivered to vans at our yard." These gates were erected in 1750, and are of Sussex iron.

The Victoria (Philosophical) Institute. At the meeting of this Institute, held on Monday, Mr. C. Brooke, F.R.S., in the chair, a paper on "Heathen Cosmogonies compared with the Hebrew" was read by the Rev. B. W. Savile, who stated that its object was to contrast what the late Sir Charles Lyell termed "the cosmological notions" entertained by the *savans* of the ancient world, who were without a revelation from on high, with the Mosaic record as laid down in the first chapter of Genesis. The paper contained a brief review of the cosmogony of the Egyptians, Phœnicians, Chaldeans, Persians, Hindoos, and Chinese; and an extended one of what the learned Greeks held and taught on the same subject; together with an examination of some points connected with the atomic philosophy as recently advocated by Professor Tyndall.

The Proposed Torquay Aquarium.—At a public meeting held at Torquay a short time since, it was decided to accept Mr. Bridgman's scheme for an aquarium, &c., provided that the Aquarium Committee were satisfied on examination that Mr. Bridgman would be able to carry it out in a satisfactory manner. It is now stated that Mr. Bridgman has developed his scheme, and is making arrangements for the land required; also that his financial friends are prepared with the whole of the capital, which will place him in a good position when he next goes before the committee. The aquarium is proposed to have a greater height from floor to ceiling than those of London or Brighton. A special feature in his plans will be an open air skating-rink facing the sea, 200 ft. long, and about 45ft. wide.

Memorial of the late Lady Wenlock.—A recumbent effigy of the late Lady Wenlock, sculptured by Count Gleichen, has just been placed in the parish church of Escrick, near York. The figure, of the purest Carrara marble, is of life-size, and placed on a pedestal of Huddlestone stone and Sienna marble, the appearance of the pedestal itself being much enhanced by the insertion of side panels of rosso antico and verd antique marble. Four carved columns support the Giallo di Sienna slab on which the figure reclines, and the pedestal is placed on a substantial block of black marble. The monument is placed near the chancel. The pedestal was designed by Mr. F. C. Penrose.

An Ice Rink.—A new and startling sensation awaits the pleasure-seekers of the ensuing London season. Roller-skates and the like are quite thrown into the shade by a perfect sheet of solid ice, maintained constantly at a low temperature, so as to bear skaters all day and all night long if necessary. For five or six years Professor John Gamgee has been working incessantly at the economical production of artificial cold as applicable to fresh meat preservation, and this has led to so remarkable a control over temperature as to provide a remedy for the evils of asphalte and roller-skates. On January 6th he completed a rink of modest dimensions, but which has since afforded pleasure to some scores of skaters.

Edinburgh Architectural Association Sketch Book.—It is proposed to publish a limited number of copies of this work. The work will consist of yearly volumes of six parts, issued at intervals throughout the year. Each part will consist of six plates, contributed by members of the Association. The volume for 1875–6 will contain of measured ecclesiastical work about ten plates, of measured and sketched domestic work about sixteen plates, four to six plates of wood-work, and the remainder of measured and sketched details, such as plaster-work, painted decoration, iron-work, &c.

Proposed New Schools at Oxford University.—The Oxford University correspondent of the *Morning Post* says that it is understood that five architects—namely, Messrs. Bodley, Champneys, Deane, Jackson, and Scott—have sent in designs for the new schools to the committee of selection appointed to consider the matter. The latter will have to submit the design they prefer to Convocation for either approval or rejection. It is much to be hoped that this long-pending matter will at length be settled, as the new buildings are urgently required, and much time, money, and convenience have already been sacrificed to no purpose.

"Building before Line of Front."—Mr. Arnold has given a judgment in a case of this kind—the Vestry Clerk of Chelsea against Messrs. Adamson,—but we must postpone notice of it until next week.

The "Positive" Ventilation of Coal Mines.—A paper on "The Positive Ventilation of Coal Mines" was read on the 25th ult., at Manchester, before the Society for the Promotion of Scientific Industry, by Mr. Alderman Taylor, of Rochdale. The system of ventilation he advocated was that of forcing air into the mine by the piston, and regulating its pressure and velocity at the exit. By the adoption of this plan he contended that the ventilation will be under complete control both as to quantity and certainty, and moreover will be perfectly independent of atmospheric changes.

Building Operations at Brechin.—Working men's houses have been very scarce in Brechin for several years, but it is now stated that a set of houses is about to be erected in Montrose-street, by private enterprise, which will supply in some degree the long-felt want of suitable accommodation for the working classes. Large granaries are being erected at the head of Southesk-street for the Brechin Distillery Company. Building operations are going rapidly forward at the High School, the west front being already well advanced.

Wood Carving, Sheffield School of Art.—At the last distribution of prizes at the Sheffield School of Art, a prize was offered with the view of inducing some of the students to direct their attention to carving in wood. We are glad to hear that there are at present eight competitors for the prize, and there may be some more. The works that are ready for exhibition will be shown at the annual meeting some time this month; but the prizes, we are told, will not be awarded till June or July.

A Presentation.—Mrs. Palmer, the wife of the late Mr. John Palmer, builder, of Old Gravel-lane, St. George's, was presented with a handsome electro-plated service, bearing the inscription, "Presented to Mrs. Palmer by the *employés* of her late husband as a token of their respect." The presentation was made on behalf of the workmen by Mr. R. Marchant, the foreman, who represented about fifty subscribers, all of whom had been for many years in the service of Mr. Palmer.

Portland Market.—The area of ground in the rear of Oxford-street, now the site of Portland Market, has been sold by public auction. The biddings were very spirited. Commencing at 10,000*l.*, they soon passed double that sum, Messrs. Hanraty, Rose, and Lemaitre being the principal bidders. Finally, the property fell to the bid of the latter gentleman, who purchased it at 27,500*l.* for Louise & Co. As soon as the present short leases have lapsed the ground will be cleared.

The Consett Waterworks.—The Consett Waterworks Company have just completed and successfully filled at Smiddy Shaw, Waskerley, the first and largest of the storage reservoirs, by which their storage capacity for use in summer months is increased to the extent of 300,000,000 gallons. The works just completed include an embankment 1,100 lineal yards in length, with a maximum height of 51 ft., and containing the large amount of 650,000 cubic yards of earthwork.

Piece-work.—A discussion on this subject took place at the Artisans' Institute, Castle-street, St. Martin's-lane, on Thursday evening, the 10th, and will be continued on the 17th inst. Admission free to members of London Working Men's Clubs and trade societies, and to employers of labour. We are informed that Professor Leoni Levi, the Earl of Rosebery, several leading workmen and large employers, have promised to attend if possible.

The Aberdeen Harbour Engineer.—The Finance Committee have agreed to recommend to the Harbour Board that Mr. Dyce Cay, the resident engineer, be allowed to undertake private work (being still fully responsible for the carrying out of the harbour work), and that his salary be reduced from 800*l.* to 500*l.* To enable this arrangement to be carried out, an assistant engineer will probably be appointed, at a salary of 250*l.*

New Bridge for Hythe.—The Corporation of Hythe have decided to build a bridge over the Royal Military Canal, which will shortly come into their possession. The bridge will replace the old Town Bridge, from Bank-street to the Stade, and will cost about 450*l.* It will be a girder bridge, 30 ft. wide. The designer is Mr. Goode, engineer and expenditor of Romney Marsh Level.

The Nineveh Exploration.—Mr. George Smith, of the British Museum, has just returned to London from Constantinople, whither he went three months ago to solicit the requisite authorisation for prosecuting his important exploration of the ruins of Nineveh. After contending with the Sultan's Ministers for more than two months, he gained his object and has returned home with his "pass," in order to organise an expedition which will shortly set out for Nineveh.

The Drainage of Bromley.—A large body of the ratepayers of Bromley, being of opinion that it is essential to proceed immediately with the drainage of the parish, and that the cost of joining the West Kent main sewerage scheme will be reasonable, and the advantage great, have petitioned the Local Board to take steps for entering into negotiations with the West Kent Main Sewerage Board as soon as possible.

Unhealthy Foundations in Southwark.—At a meeting of the Vestry of St. George the Martyr, Southwark, on the 25th ult., it was reported that in a new street in course of formation the contractor was digging deep down and taking away the gravel, filling up the hole with any kind of rubbish. The surveyor was directed to make a report upon the matter to the Roads Committee, and the subject was referred for the Committee to report upon to the Vestry.

An Iron Church destroyed by Snow.—The iron church built by the congregation of St. Luke's, Cheltenham, early in 1872, has been completely wrecked. A very heavy fall of snow, resting with unusual weight, on account of its moisture, upon the large roof of the building, forced out the sides; the whole building consequently gave way, and has become a complete wreck.

Liverpool and the Artisans' Dwellings Act.—It was decided, at a meeting of the Liverpool Town Council on the 2nd inst., to petition the Local Government Board for the granting of a provisional order under the Artisans' Dwellings Act for carrying into effect a scheme for improving a low part of the town, known as Nash-grove.

The Literary Fund.—The Earl of Derby will fill the office of President of the Literary Fund, vacant by the death of Earl Stanhope; and, in accordance with what has been the custom with a new president, will take the chair at the ensuing anniversary dinner, fixed on this occasion for the 3rd of May.

Ystradyfodwg Burial Board.—It having been decided to lay out a cemetery at Ferndale in the Rhonda Valley, near Pontypridd, Glamorganshire, designs for two chapels and a sexton's lodge were invited in competition, and one submitted by Mr. Henry Lovegrove, of Budge-row, London, was selected for execution. Tenders will be obtained forthwith.

The Slade Professorship of Fine Art at Oxford.—This professorship is vacant by the expiration of Mr. Ruskin's three years of office. Mr. Ruskin, who was appointed the first professor in 1869, and re-elected in 1872, is again eligible for re-election, and will, it is supposed, meet with no opposition.

Dismissal of a Government Clerk of Works.—It is announced from Plymouth that an acting clerk of works at Keyham-yard has been dismissed the service, through his own admission of having employed men privately while they were at the same time being paid from the public funds.

Society of Arts.—The Council of the Society of Arts have just appointed Mr. H. Trueman Wood as Assistant Secretary, under Mr. P. Le Neve Foster, secretary of the Society. Mr. Wood has been for the last three years the editor of the Society's *Journal*.

The Nottingham Mechanics' Institute.—The committee of the Nottingham Mechanics' Institute has approved of plans submitted by Mr. R. C. Sutton, architect, for some extensive additions proposed to be made to the building, including a two-story building fronting Milton-street.

Death of M. Thome de Gamond.—M. Thomé de Gamond, one of the original proposers of the Channel Tunnel, has just died, at the very time the International Commission has pronounced in favour of the scheme.

Burlington Fine Arts Club.—A collection of ancient glass and a series of Nielli have been arranged here for exhibition.

TENDERS

For receiving wards, &c., at the Industrial Schools, Plashet, Essex. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Taylor	£1,434	0	0
Menning & Dowdney	1,350	0	0
Cordozo	1,269	0	0
Hunt	1,255	0	0
Webb	1,249	0	0
Palmer (accepted)	1,185	0	0
Hearle	1,175	0	0
Cohen	1,080	0	0

For new boilers at the Industrial Schools, Plashet. Messrs. Wilson, Son, & Aldwinckle, architects:—

		Allow for Old Boilers.
Smith & Co.	£324	—
Wardell	720	£15
Ware	589	20
Fraser, Bros. (accepted)	560	20

For building warehouse in the Kingsland-road, for Mr. Job Darnell. Mr. W. B. Clarke, architect. Quantities by Messrs. King & Tomlinson:—

Porter	£3,397	0	0
Lewis	2,970	0	0
Pritchard	2,831	0	0
Lathey, Brothers	2,830	0	0
Channing	2,773	0	0
Staines & Son	2,682	0	0
Bayes & Co. (accepted)	2,645	0	0
Goodman	2,635	0	0
Hunt	2,506	0	0

For villa residence at Old Coats, near Worksop, Notts, for Mr. G. Simmons. Mr. G. A. Wild, architect. Quantities supplied:—

Carr	£1,300	0	0
White	1,100	0	0
Fishburn	1,064	12	4
Wright	1,062	15	8
Howard (accepted)	1,053	16	0
Wilson	1,045	0	0

For alterations at the Canonbury Tavern, St. Mary's-road, Islington, for Mr. Longhurst. Mr. Edward Brown, architect:—

Stamp & Bowtle	£521	10	0
Marr (accepted)	451	10	0

For vicarage at Seaford, Sussex. Mr. E. Christian, architect:—

Vidler	£2,245	10	0
Morling	2,245	0	4
Berry	2,232	4	0

For forming granite carbing, and making the Hole Farm-road, Hastings. Mr. H. Carpenter, surveyor:—

Howell & Son	£1,246	0	0
Hughes	1,125	0	0
Vidler	1,098	0	0

For the erection of a new covered skating-rink. Messrs. Bidlake & Fleeming, architects:—

Lovatt	£1,800	0	0

For new shop-front and fittings for Mr. Blunden, Clapham. Messrs. J. & A. E. Bull, architects:—

Wagner (accepted)	£229	0	0

For erection of villa, Tottenham-lane, Crouch End, Hornsey. Mr. J. W. Reed, architect:—

Crabb	£2,638	0	0
Morter	2,495	0	0
Cowley	2,400	0	0
Ramage	2,363	0	0
Arrowsmith & Drinkwater	2,300	0	0
Bayes, Bros., & Allen	2,300	0	0
Southcott	2,298	0	0
Hunt	2,193	0	0
Hawkes	2,070	0	0

For alterations and repairs to Castle Villa, Dalston-rise, E. Mr. J. W. Reed, architect:—

Ramage	£930	0	0
Bayes, Bros., & Allen	896	0	0
Smith	779	0	0
Norman (accepted)	745	0	0
Aldridge	650	0	0

For erecting stabling at No. 6 Wharf, Amberley-road, for Mr. R. A. Nash. Mr. E. Vigers, jun., architect. Quantities supplied by Messrs. Herring & Shayler:—

Temple & Foster	£946	0	0
Crockett	873	0	0
Butland & Thomas	863	0	0
Mark	856	0	0
Stimpson & Co.	820	0	0

For sundry alterations and additions at Nos. 65 and 67, Ludgate-hill, for Messrs. Samuel Brothers. Messrs. N. S. Joseph & Pearson, architects. Quantities not supplied:—

Pritchard & Son	£5,886	0	0
Newman & Mann	5,590	0	0
Browne & Robinson	5,304	0	0

For rebuilding front and back portion of No. 61, Cheapside, for Mr. Brotherton. Mr. John Wimble, architect. Quantities supplied by Mr. William Wimble:—

Greenwood	£9,714	0	0
Downs	9,612	0	0
Dove, Brothers	9,455	0	0
Scrivener & White	9,438	0	0
Lawrence	9,137	0	0
Croaker	8,896	0	0
Killby	8,881	0	0
Ashby & Horner	8,791	0	0
Newman & Mann	8,693	0	0
Brass	8,381	0	0

For reinstatements to East End Chapel, Finchley. Messrs. Chas. Searle & Sons, architects. Quantities supplied by Mr. Chas. Henry Searle:

Williams & Son	£1,790	0	0
Newman & Mann	1,761	0	0
Dove, Brothers	1,675	0	0
Roberts	1,334	0	0

For excavating and foundations and vaults, corner of Southampton-street and Henrietta-street, Covent-garden, for Mr. H. G. Clarke. Mr. John Wimble, architect. Quantities supplied:—

Hill, Higgs, & Hill	£3,145	0	0
Downs	2,265	0	0
Fish	2,957	0	0
Brass	2,743	0	0
Lawrence	2,739	0	0
Killby	2,729	0	0
Newman & Mann	2,710	0	0
Scrivener & White	2,425	0	0

For alterations at Devonshire-terrace, Paddington. Messrs. N. S. Joseph & Pearson, architects. Quantities supplied by Mr. Green:—

Hearn	£1,998	0	0
Brass	1,991	0	0
Lidstone	1,970	0	0
Adamson	1,955	0	0
Scrivener & White	1,955	0	0
Newman & Mann	1,926	0	0
Langmead & Way	1,875	0	0
Griffiths	1,859	0	0
Sabey & Sons	1,716	0	0

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The Venus of Milo; Arundel Castle, &c., unavoidably postponed.

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The Sanitary Movement at the Society of Arts.

IN spite of the blackest fog which has enveloped London during the present season, between thirty and forty gentlemen assembled at the rooms of the Society of Arts, on the 11th inst., in response to an invitation issued by the secretary on the 7th. From the various but not discordant accounts of the meeting which have reached us, we judge that it promises to issue in a movement of practical public utility. It is not the first time that the Council of the Society of Arts have usefully taken up some urgent question of the day. As a rule, we must say to their honour, that it has not been done in the spirit of giving publicity to private crotchets, or to making capital out of matters of general interest. The exact contrary is the case. There is probably no body or association which has attempted, and has accomplished, so much public good, with so little private trumpet-blowing, as the Society of Arts. Whether it is due to the wide area of society from which its members are selected, or to the good taste and good management of its officers and Council, we will not take upon ourselves to say. But the contrast which it presents to some other societies that we might name, in the mode in which it effaces its personality while doing good almost by stealth, is worthy of no mean degree of admiration.

In the present case it is gratifying to the friends of sanitary improvement to learn from what widely different parts of the country, and from what various walks and occupations in life, came the gentlemen who met one another for the first time in John-street on Friday last. Lord Alfred Churchill was in the chair. The task of introducing, or rather of suggesting, the resolutions, mainly fell to Sir Henry Cole. But the character of the proceedings was eminently consultative. The Scylla and Charybdis of new committee meetings were avoided with equal dexterity. There was neither the assemblage of a number of heterogeneous units, with no guidance, with no plan, and with no results except a vast amount of talk; nor the adroit manipulation of a cut and dry scheme as to which all that was sought from the meeting was the sanction of numeric authority. The business to be done was concisely stated on the circular convening the committee. It consisted, according to the document, in three points. They were,—(1), to fix a date for holding a sanitary conference some time after Easter; (2) to settle the steps to be taken for preparing papers and other information for discussion at the conference; and (3) to appoint an executive committee.

In addition to this programme, the meeting discharged the function of actually constituting the General Committee on the Health and Sewage of Towns. Each gentleman present signed the book; and three or four names of absentees were added by general accord. An amusing incident occurred at this part of the proceedings, illustrating the fact that no three dozen Englishmen can possibly meet without some little collision of opinion; but the good feeling and good taste of the majority kept all within very agreeable limits. A gentleman who spoke more than once, with evident knowledge of a multiplicity of details, and who frankly admitted that he was a patentee of a sewage utilisation process which had failed, was objected to by another gentleman, a medical officer, we believe, of an important union, on the ground of being an interested party, and thus disqualified as a committee man. On the other hand, it was pointed out that the perfect ingenuousness with which the patentee had admitted the failure of his process in the important town in which it had been tried supplied the committee with the first of that class of facts which it was their object to collect. Amid general hilarity the patentee was added to the list by a considerable majority.

The first point brought before the meeting to be affirmed by resolution was the limit of the function of the committee. This was, in fact, the very life-blood of the whole scheme. To assemble a body of partisans, each anxious to enforce his own views, is merely to represent the builders of Babel in the costume of the nineteenth century. The right tone was taken at the beginning,—suggested from the chair, and acquiesced in at once by the good sense of the majority of those present. It was resolved that the functions of the committee should be limited to the collection of facts, and that no communications of opinions or of theories should be received. The wisdom of this limit became at once apparent. More than one gentleman, either from innocence or from adroitness, endeavoured to glide in the point of the wedge of his particular hobby; but was promptly and quickly suppressed, in virtue of the fundamental resolution. But for that sagacious measure of police, precipitators and irrigators would have turned the room into an arena for free fight before the meeting broke up.

We have pointed out in these columns (p. 27, *ante*) that the expenditure of the local authorities for public health and convenience had attained, according to the last report, the respectable figure of 10,741,470*l*. The indebtedness of the Urban Sanitary Authorities is returned, for 1874, at 6,030,297*l*.; and if we adopt the estimates of Mr. Purdy, the principal of the Statistical Department, as to the total indebtedness of the local authorities, it must be as much as 9,600,000*l*. On many occasions we have pointed out the fact that this large expenditure of capital remained almost entirely useless, as far as any general experience to be drawn from its employment occurred. The horror of any useful centralisation which was the moving principle of the sanitary legislation of 1872, acted as a direct stopper on the concentration, and consequent diffusion, of information. Manchester derived no light from the expenditure of Norwich. Richmond has no light from the experience of Reading. We foretold that this would be the case, unless certain simple and obvious measures were taken to prevent it. From time to time we have lamented the continuance of this idle and puerile waste of power. From every side, on the 11th inst., echoed confirmations of these views. From one part of the country after another representatives arose to express regret at being unable to ascertain what had been done elsewhere. It was said that Manchester spent 80,000*l*. a year in scavenging, but the speaker had been unable in any way to ascertain how that large sum had been expended. The representative of Richmond deplored the unfortunate state of that town, attacked by sanitary authorities, on the one hand, for not getting rid of its sewage; by river authorities, on the other hand, for turning over its sewage to them, and by every surrounding landowner, if they attempted to drain any outlet through their property. In fact, it became very evident, from this and other statements, that the view which we have expressed of the Act of 1872, that it proposed to purify towns by stopping up the outfall of their sewers, and filling them chock full, was a pretty accurate representation of that consummate piece of legislation. Captain Galton, the inspector before whom the case of Richmond had been heard, was present, and was appealed to by his fellow committee-man to confirm his statement that the ratepayers had been mulcted in some 700*l*. or 800*l*. for "doing the best they could"; and that no one gave them the slightest aid in getting out of their *impasse*.

It was mentioned that the only official information accessible on the subject of the outlay by different districts, and the results of the same, was the slovenly and imperfect return of April, 1873, comprising, in part, the expenditure of 109 Sanitary Authorities. Out of date and imperfect as this paper is, it yet contains some very important facts; and an analysis of the same kind, exhaustively conducted, and brought down to the close of 1875, would give very valuable information. It is information of this kind that it will be the primary object of the committee to collect.

Another point which was not in the programme of the council, but which cropped up with great energy in the course of the discussion, was the impossibility of expecting any useful sanitary action from the medical officers of the various authorities, so long as they are deprived of the

shield of systematic organisation, and of the power of communicating their reports so as to reach a central authority, independently of the action of the local sanitary authorities. Medical officers and other practical men were present, who spoke on this subject with deep and scarcely suppressed feeling. One gentleman stated that to his inquiry of a medical officer, "Why do you not report so and so?" the reply was, "Because it would take the bread out of my children's mouths to do so." A hum of assent from the various country representatives attended this statement.

There is no single point on which we have so frequently and earnestly insisted as this. There was nothing that came before the meeting which appeared to excite such deep and unanimous feeling. We might say that it took the chairman and council by surprise,—were it not for the perfect urbanity and sympathy with which the statements were received. But it certainly formed no part of the programme of the meeting. It emanated spontaneously from the experience of those who were suffering under the mischief. The matter took the form of a resolution that it should be a part of the duty of the committee to inquire into the obstacles to sanitary improvement. This guarded manner of approaching a delicate, as well as a vital, question, met general approval. It was decided that the medical and other sanitary officers should be applied to for information, as well as the mayors or treasurers of towns, and the chairmen of Sanitary Boards. And the general opinion of those members of the committee who appeared to represent the officers of Sanitary Boards was, that their brethren would be ready to communicate facts, but would decline adding comment or opinions.

Mr. R. B. Grantham, as chairman of the sub-committee of the British Association on sanitary matters, offered, subject to the sanction of that committee, to lend to the Health and Sewage Committee the volume containing the result of investigations extending over several years,—the collection of which had cost as much as 3,000*l*. Printed questions had been issued by this committee. The replies had been, Mr. Grantham said, extremely unsatisfactory and unreliable. It appeared that some attempts had been made to verify or correct such information as was received, but that from want of funds the inquiry had as yet but very partial and doubtful results. It rather looked as if the experience of this delegation of the British Association was unpromising, as far as the consequences to be expected from the action of the Society of Arts Committee was concerned. On the other hand, the strong rival interest throughout the country that was evinced by the presence of so many unpaid representatives augurs a more satisfactory result. Indeed, but for the wise barrier erected by the first resolution it is more than probable that the offer of Mr. Grantham would have opened the doors to a speech in behalf of one special mode of disposing of sewage.

Another point which emanated rather from the country than from the council seemed to meet universal assent. It was the statement that what was now needful to do was to get rid of the sewage. The idea of making a profit out of it was admitted, on all hands, to have been the main stop to real progress. It was not asserted by any one that there was no value in sewage. It was not asserted that it must cost more to get at the valuable elements than they were worth. Points of opinion such as these were not even mooted. But it was unanimously felt that as yet there was no information before the public to justify the expectation of profit. It was stated that in many cases where profit had formerly been confidently expected, it had never been realised. On the other hand persons had everywhere been waiting to see whether their neighbours did, or did not, derive adequate returns from expenditure on various theories. Meantime infection was not idle. So the general outcome of opinion was this. No more time is to be lost. We must get rid of the sewage at once. Our first duty is to render it innocuous. If any one can make it pay, so much the better. But we cannot wait for that. We have waited for a great many years, and do not seem any nearer the result. The outside theoretic value, on paper, of a given quantity of sewage is shown. It is not very high per individual. To extract that value, at a less cost than the return, is a problem which may, or may not, be insoluble. It is a problem which, as far as we know, is at all events unsolved. While therefore we will receive any definite tabulated facts that throw light on the subject, we will listen to no more theories, plans, or suggestions. We will go to work to get rid of our nuisances, without waiting any longer in the hope of turning them into gold.

Another point, proposed and unanimously agreed on, was that the subject of water-borne sewage, or the results of the water-closet system, should be considered separately from the details of any other systems for the disposal of *excrementa*, or from what is called dry sewage. This of course includes the earth system, of which, however, no mention was made at the meeting; the pneumatic system, of which we have lately heard so much; the venerable abominations of the cesspool and the midden heap; the absorbent pail system, which found a representative at the meeting; and many others. It seemed to be rather the hope of the committee that some member would draw up for the Conference a systematic account of all the various systems now known or proposed. Some such abstract, indeed, is necessary as the backbone or index of any tabulations of the information to be collected. It is probable that the most valuable result of the inquirers of the committee will be the light it throws on the financial value of different plans. It was admitted, all round, that no hard-and-fast rule was to be laid down in the first instance. It was possible that a certain method might be applicable, in one instance, and inapplicable in others. What was wanted was to know the outcome of each individual experience. What plans had been tried? How had each succeeded? If it had failed, what was the cause of the failure? A systematic catalogue of the different methods would form the best skeleton for a report of this nature.

The names proposed for an executive committee of five, to arrange for the meeting of the conference, were received with unanimous approval. They were—Lord Alfred Churchill, the chairman of the meeting; Sir Henry Cole; Col. Du Cane, R.E.; Capt. D. Galton, R.E., C.B.; and Professor F. A. Abel, F.R.S.

It was finally resolved that the conference should assemble, at the rooms of the Society of Arts, on Tuesday, the 9th of May. It was hoped that by that time the executive committee would have organised engineers throughout the country, would have received much valuable information, and would have arranged a programme for the proceedings of the conference. The selection of a time most convenient to the country delegates was discussed, and the expressed intention of these gentlemen to come up to London to be present at the conference, gives promise that the matter is not likely to end in smoke. It was thought that the conference would probably occupy the remainder of the week in question—the hours of meeting being from eleven to four—with a break for luncheon.

We must not disguise from ourselves the fact that it is one thing to ask for information and another to obtain it. We very strongly suspect that, in order to bring to a good conclusion what has been begun under very good auspices, it will be necessary to have travelling inspectors as agents of the committee. A day spent at each place where works have been executed, by an engineer authorised by the conference, would have more practical and valuable results than a twelvemonth of correspondence with local authorities. At least, such would be the case in most places. We do not at all mention this as reflecting on the sagacity of the plan adopted. No doubt, correspondence should, in the first instance, be attempted. But we see that, even in the case of returns ordered by Parliament, there is often extreme difficulty in obtaining proper replies. The Englishman, as a rule, dislikes to be questioned. If he is an ignorant Englishman, we may go further. We may say he will not be questioned; or, at all events, will not reply, and suspects and dislikes his questioners. Pretty certainly those various local authorities whose inaction is the cause of the present movement will do very little to aid it. We even question how far the local medical or other officers may render themselves obnoxious to their boards if they reply to the questions which may reach them. At all events, personal investigation may do much. To that, sooner or later, we shall probably find that it is necessary to have recourse. Nor is the necessary expense so very overwhelming.

It may be said by those who are anxious to do all in their power to maintain the vested rights of filth, that the Council of the Society of Arts, in this matter, are invading the province of the Local Government Board. We may at once admit that they are now attempting to do what we have again and again urged that the Local Government Board ought to have done. But such action is in conformity with the most time-honoured traditions of the British constitution. The very idea and scheme of Parliament is that of an assembly in which the representatives of property and of educated opinion meet to counsel the servants of the sovereign. It is open to any peer, or to any commoner, to submit a resolution to the House of which he is a member, or to ask for leave to bring in a Bill; which, if passed, forms thereafter an integral part of the statute law. Not only is this our principle, but it is our constant and invariable practice. It sometimes happens that, when a matter has been long neglected, a private member will introduce a Bill for its regulation; and that, when he has fairly brought the subject before the House, the Minister in whose department it falls will express his own readiness to take up the matter on behalf of the Government, if the mover will leave it in his hands. We should not feel greatly surprised if something of the same kind were to result in the present instance. If so, the Society of Arts, without relaxing their watchful attention to the great subject which they now have taken in hand, might well be willing to see the details, which they can only obtain by courtesy, or at their own expense, collected under the authority of the Local Government Board. No further legislation, we should conceive, would be necessary to enable that to be done. In that case the Society would enjoy almost a more satisfactory triumph than if they had executed every detail of their task, as well as brought the matter fully before the public.

THE ERECHTHEUM AT ATHENS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday, the 14th inst., Sir G. G. Scott, R.A., president, in the chair, the following new members were elected, viz.:—Mr. Richard Armstrong, of Westbourne-park, as a Fellow; and Messrs. John Dunn, of Wellington-road, and E. H. Harbottle, of Exeter, as Associates.

The President announced that the Council had unanimously resolved to recommend to the general body that the name of M. L. J. Duc, architect, of Paris, should be submitted for her Majesty's approval as the recipient of this year's Royal Gold Medal.

In reference to the objectionable circulars to which exception was taken at the last meeting of the Institute, Mr. Burges asked whether the secretary had communicated with the person who sent them to the Institute rooms, expressing the indignation of the Institute at the insulting offer which they contained; and, if so, whether any reply had been received?

The President said that the inventor of the appliance referred to in the circulars had been written to, and had replied, excusing himself as well as he could by saying in effect that he had no intention of offering the members of the Institute a percentage upon orders obtained from their clients; but that if they wished to use the invention for themselves, they might strike the percentage off the cost. This explanation was received with laughter.

The secretary called attention to a number of drawings on the walls, exhibited by Mr. W. G. Davie, Soane Medallist for 1871, and explained that Mr. Davie had been prevented by illness from fulfilling the usual condition as to Continental travel and study at an earlier period.

The President said it was the intention of Mr. Davie to publish these drawings, and some of the members might feel disposed to subscribe to the work, which was to be entitled "Architectural Studies in France."

The President also announced that, in reference to the affairs of the Institute, the Council were taking steps to carry into effect a resolution passed at a special general meeting, on the 7th inst., requesting them to act on the authority of bye-law 30a, "and invite the past Vice-Presidents to attend their meetings on this subject, and take part in their deliberations; and also to appoint sub-committees (not necessarily exclusively members of the Council) to consider the several heads into which the inquiry would divide itself, and to report thereon to the Council, each sub-committee to appoint a chairman, who *shall* be a member of the Council, and a secretary,

who *may* be an Associate, and to be subject to such regulations as the Council may lay down."

Mr. James Fergusson, F.R.S., then read a paper "On the Plan and Architectural Arrangements of the Temple of Erechtheus on the Acropolis at Athens." He commenced by referring to the numerous attempts which had been made, not only in this country, but in Germany, France, and elsewhere, to explain the peculiarities of this very exceptional building. All had failed, as he said, because the problem as hitherto stated was practically insoluble. Besides two tombs, there were three temples in this group. Firstly, that of Minerva Polias, the largest and most important; next, that of Erechtheus; and lastly, that of the nymph Pandrosos. On the other hand, we knew, not only from Pausanias, but from the existing remains, that the building now standing was only double, and contained only two apartments. The puzzle was, how to get these buildings into two. The solution proposed by Mr. Fergusson was that the Temple of Pandrosos was not in the building as it now stands, but over a separate enclosure, attached to it on the west side. He then proceeded to read the various passages in Pausanias, and in the inscription brought home by Dr. Chandler, and now in the British Museum, which described the repairs and additions required to complete the building in the year 409 B.C. These, with other passages from different authors, he contended were all in favour of his views. He then pointed out the various indications which showed that buildings, certainly forming parts of the original design, once existed on the spot. This explained the existence of the two doorways under the northern portico, and the anomalous position of the central doorway in the western wall of the temple under one of the attached columns. Reverting to the interior, the lecturer explained, from existing indications, that the Temple of Minerva was divided into a pronaos and adytum by a screen of columns which were an exact repetition of the western façade of the Temple, omitting only the solid parts, but retaining the pillars and piers. Mr. Fergusson then explained the position of the Tomb of Erechtheus in a chamber under the floor of the Temple bearing his name, and that of the Tomb of Cecrops, as opposite the Portico of the Virgins, but separate from the temple itself. The position of the tree in the Pandroseum and of the well of salt water in the Temple of Minerva were also pointed out and illustrated by diagrams on the walls. In conclusion, Mr. Fergusson said he had looked up every passage which occurred in the writings of ancient authors in reference to the subject of his paper, but he did not find one which in the smallest degree militated against the theory he had advanced, or which was not equally inexplicable with the theory of the Pandroseum being in the centre. Similarly, he had examined every stone of the remains, and did not find one whose use could not be clearly accounted for on his theory. To sum up, the author pointed out the relative positions, in plan, of the three temples which were included in the group known as the Erechtheum, viz., that of Minerva Polias in the centre, that of Erechtheus to the eastward, and that of Pandrosos attached externally to the present building on the westward.

In the discussion which followed,

Professor Donaldson said it was half a century since he studied the Erechtheum on the spot, with the exception of a flying visit made a few years ago, when he was only able to cursorily glance at it. On his first visit he had particularly studied the doorway, with its magnificent tetrastyle portico, and had published drawings of it. At the time of his visit the ground was much encumbered with rubbish, and it was extremely difficult to tell where the transverse walls came across. But, *ex pede Herculem*, Mr. Fergusson, from a small plan had advanced a theory which was very ingenious, and his imagination had lent a great deal of reality to what did not exist at all. Mr. Fergusson was greatly to be thanked for his effort to explain what had always appeared to be an enigma. It was certainly a very remarkable thing that the ancients should have chosen such a difficult and awkward site. He (the speaker) thought the building itself was in a debased style of art, but very elaborately worked out. It appeared to be of a later period than the date assigned by Mr. Fergusson, although the inscription left no doubt on that point. Mr. Fergusson's theory was a most ingenious mode of describing the temple, and he (Professor Donaldson) begged to propose a hearty vote of thanks to the author of the paper.

Mr. F. C. Penrose said he was unable to contribute much to the discussion, for when he visited the buildings on the Acropolis at Athens, thirty years since, he had very little time to study the Erechtheum, as he principally devoted his attention to the Parthenon and the Doric temples. He had always recognised the difficulty of explaining the disposition of the buildings of the Erechtheum on the theories hitherto advanced, and had often longed to take up the subject, a course from which he had been deterred owing to inability to devote sufficient time to it, for it was a subject which required deep research and long and patient investigation. The limited amount of attention he had been able to give to the matter, however, inclined him to accept Mr. Fergusson's theory. He begged to second the vote of thanks.

Professor T. Hayter Lewis said that, like the previous speakers, he had to look back a great many years to the period when he visited the Erechtheum. At that time he made very careful notes and drawings, which he found of great use even in the present day. The importance of taking careful notes and measurements was evidenced by the fact that he found the drawings of Inwood and Stuart, which he had with him, to be very incorrect in several essential particulars. Mr. Fergusson's restoration was extremely ingenious, but exception might be taken to one or two points. In the Temple of Minerva Polias Mr. Fergusson had shown a level floor; but anybody with a critical eye would see that he must be wrong, because he took no account of the gaps shown on the plan, which, however, were not intended to be seen, being probably covered with slabs of marble. He thought that the large and, on plan, ungainly and unpicturesque portico would never have been constructed unless with the express object pointed out by Mr. Fergusson, of whose theory it was a strong corroboration.

Mr. Watkiss Lloyd thought that Mr. Fergusson's paper furnished an excellent illustration of the manner in which a good interpreter of a monument might sometimes correct a very good Greek scholar. Before coming to the meeting, he (the speaker) had the curiosity to turn to the account of the Erechtheum given by Ottfried Müller, the learned German archæologist, who, however, propounded a theory about the building which was entirely demolished by Mr. Fergusson. Ottfried Müller placed the Pandroseum in the portico, but Pausanias distinctly spoke of the naos of the Pandrosos. The naos was in reality a house, not a portico; in the inscription it was not called a naos at all. Had Müller paid a little more attention to his text he might possibly have anticipated Mr. Fergusson. It was now perfectly clear that the Pandroseum was another building, and scholars and architects alike were deeply indebted to Mr. Fergusson for the almost more than ingenuity of his solution of the problem. The Erechtheum was a building exceptional and anomalous in character, with its different levels and peculiarities of building, and afforded, moreover, some faint indication of how much of Greek architecture had been unhappily lost; for when it was seen how much variety could be introduced into such a building, it might be taken as a proof that the Greeks showed equal variety and power in adjusting their architecture to utility and circumstances.

Mr. Edward Hall remarked that there were some peculiarities in the plan of the temple as restored by Mr. Fergusson which were decidedly of late date. For example, the pilasters on the internal face of the western wall were Roman in character rather than Greek. The apsis was also a Roman feature, and might probably be omitted with advantage when the plan was published.

Mr. Leighton observed that he had seen the Erechtheum, and, speaking as a sculptor, had been much struck with Mr. Fergusson's elucidation of the building. The first point which impressed him (the speaker) when he saw the temple on the exterior was its columnar dignity, which completely effaced any unpleasant feeling which would be engendered by seeing female figures performing an architectural function by supporting an entablature or other heavy architectural member. On closer approach, the beholder was struck with the great variety seen in the figures themselves, not merely in the arrangement of the hair and in the folds of the drapery, but in the general pose of the figures, which evidenced the skill of the sculptor. Than these figures nothing could be more Greek, and nothing so little English, in character.

Mr. Burges said Mr. Fergusson's theory was a very bold one, and almost took away one's breath so that it could not be adequately discussed then and there. He suggested that the paper should be printed, and further discussed in a month or six weeks' time. Mr. Fergusson had confined himself almost entirely to the plan of the temple; he had told the meeting little or nothing as to its architecture, although it was the most beautiful building on the Acropolis. He therefore hoped Mr. Fergusson would favour the Institute with a paper on the architecture of the temple, which would be infinitely more interesting to architects than to know exactly whereabouts the Pandroseum stood. Architects wanted art, and needed to improve their art by means of Greek art. Architects needed to take up thirteenth-century architecture,—which was Greek architecture with the pointed arch,—and study it in conjunction with the best Greek examples. It was impossible to have good architecture until all architects were artists, which they were not at present.

After a few words from Mr. Wood and Mr. Arthur Cates,

Mr. Phené Spiers suggested that the subject might be taken up by the Conference of Architects, which is to meet in June next. Mr. Fergusson's paper was one of the most important that had been read before the Institute, and was deserving of more than passing notice. On the occasion of the last Conference, two years ago, the committee of the section devoted to architectural art was rather at a loss for subject-matter, and had to take up "Queen Anne" as the only topic which offered itself. Possibly Mr. Fergusson would, by the time the Conference met, be able to say a great deal as to the architecture and decoration of the Erechtheum.

Mr. Fergusson said he had very little to say in reply to the discussion, as there had been tolerable unanimity in favour of the views he had advanced. His object had been to show the position of the Pandroseum,—to settle the plan first. The architecture could not be explained so long as it was necessary to put the three buildings into two. This initial difficulty settled, it was possible to proceed to consider the architecture. He should be very glad to read a supplemental paper on this part of the subject; but there was the difficulty that it would require a large number of drawings in illustration of it.

The vote of thanks was then put to the meeting, and carried by acclamation.

The President said he thought the evidence brought by Mr. Fergusson to show that the Pandroseum was to the west of the better known temple was conclusive. Presuming that the discussion would go on, as he hoped it would, he thought that the difficulty as to drawings might be got over in this way: all members who had sketches or means of obtaining sketches of details of the Erechtheum could place them at Mr. Fergusson's disposal, and the result would be not only an additional and valuable contribution to the Institute's transactions by Mr. Fergusson, but a collection of drawings such as was seldom brought together in illustration of a paper. It was a very curious thing that a building so elaborated in detail as the Erechtheum should be of the same date, within twenty or thirty years, as the Parthenon.

The proceedings then terminated. The next ordinary general meeting of the Institute will be held on Monday, the 28th inst., when Mr. R. F. Chisholm will read a paper "On the Palace of Tirooma Naik, Madras."

"ARTISTIC PAINTED GLASS" AT THE BURLINGTON CLUB.

THE title we have placed between commas is adopted by the Marquis d'Azeglio, the proprietor of the small but very curious collection of works so described now arranged in the house of the Burlington Art Club, as a distinctive description of a class of objects which differ essentially from what is generally known as "stained glass." Of the nature of the work, and the origin of the present collection, we may let the owner of it speak in his own words, quoted from the descriptive catalogue supplied by him at the request of the committee:—

"In 1865, in a small curiosity-shop in Milan, I came across the first of these glasses. It forms part of the tray No. 9; a large circular rock crystal lens, with a 'Descent from the Cross' in a grand style, and, underneath, the arms of the Venier family of Venice. I thought it very beautiful; but after carefully examining it, I could not make out what it was. It looked like a sort of enamel. At all events, I secured it for a moderate price. Singularly enough, this my first *trouvaille* I still consider as one of the gems of my collection. Soon after my return to

London, young Mr. Farrer, of Bond-street, wrote to say that he wanted to show me an exquisite object of art. It was the companion to the one above mentioned, 'Christ in the Garden of Olives.' . . . . . Subsequently, having met with a few more, it struck me that perhaps here was a forgotten branch of art worth illustrating, and thus I gathered this collection all over Europe."

Of the specimens thus collected, by far the larger proportion are Italian, dating from 1350 up to a modern period, the most beautiful and interesting being those dating from 1500 to 1600. The specimens earlier than that period are mostly *sgraffiti* done in gold laid on glass, and shaded in line after the manner of engraving, the gold being removed for the lines and shadows. It is during the sixteenth century that there are found the small paintings having very much the appearance of enamel work, and mostly set beneath crystals, to which the two specimens already alluded to belong, and of which other examples are shown in the same tray. The two sacred subjects mentioned quite bear out the opinion of their artistic merit and interest expressed in the above quotation; the figures and countenances are fine in drawing and conception; the nude portions of the figures are of a greyish tint; the background or landscape is partly formed in gold *sgraffito*, and partly filled in with other tints. The mode of execution it is certainly not easy to understand, and perhaps this could hardly be very well ascertained without risk of spoiling the work in the process of investigation. Two small portrait lockets in this tray, beneath crystals which take the form of a heart-shaped leaf (or what would be a heart but that the point is carved to one side), are very charming specimens of fanciful ornament. An "Adoration of the Magi," in the centre of the same tray, appears to belong to the same set as the two other scenes from the New Testament history, and perhaps to be the work of the same hand. It is very delicately executed. Tray 7 contains a very fine little composition of the Crucifixion, labelled by the exhibitor, "School of Mantegna," in which the treatment is more decidedly conventional and ornamental, the figures having gold hair, &c.; but the design is of a very grand type, though on so minute a scale. The same tray contains a figure of the Madonna, executed in gold *sgraffito* on a ground of dark and unevenly tinted crimson glass. In the case at the end of the room are to be seen some large specimens of this etching in gold, as it may be called, in one or two of which the gold etching is used only for the drapery, and the limbs are coloured (in enamel?); but these, we fancy, belong to a later date. One specimen, a kind of flat dish, entirely in gold sgraffito, and evidently belonging to the period prior to the sixteenth century, is curious enough as a specimen of the refined grotesque, as one may call it, of Italian revived Paganism. It represents a collection of river deities apparently,—one with the head and body of a swan, on human legs, comes out of the water; other almost equally strange biformed figures recline on the bank; trees sprout from the top of shrivelled-looking female forms, &c. The thing is a curiosity, as a specimen of the artistic fancy of the time.

Subsequently in order of time to the paintings under crystal, which form the centre point, historically and artistically, of the collection, comes a third and very inferior form of painting on glass, consisting of coloured copies from engravings mechanically transferred; the original engravings from which one or two of the specimens are copied hang on the walls. These are coarse in execution, and, moreover, have perished very much in some cases; their artistic value is *nil*; but they serve as specimens to complete the historic illustration of the particular art in its decline. This, however, is followed again by another style, in which copies of this kind are carried out with a richer and more conventionalised ornamental effect, as illustrated by some very elaborate specimens in trays 12 and 13; but these have not the artistic feeling of the sixteenth-century and earlier work.

Among curiosities in the collection a figure of "Fame" (tray No. 7) may be mentioned, engraved with a diamond on the under side of the glass; a fault in the surface of the glass has been made to do duty as the sun, "rays" being made to diverge from it. An early specimen of German painted glass, "The Death of the Virgin," which belonged to Baron Marochetti, is most interesting, both in regard to richness of colour and (in its way) intensity of expression. A curiosity of another kind is a glass painting, labelled "*Copia Cinese di pittura Europea*," a Chinese copy or imitation of European painting. The subject is Europa taking her seat on the back of the kneeling bull, Europa being a pretty Chinese maiden, assisted by others, all in the costume of the country. The anomaly and confusion of associations are odd enough.

Some fine engravings hang round the room; some well known, by Marc Antonio and Dürer; others less known; and some interesting and very delicately-executed *nielli*, or designs left in white on a black ground. The collection of glass will quite repay a visit from its unusual, indeed, we may say unique, character. Admission is readily to be obtained through members.

We may mention that the club intend to make a collection next month of drawings and designs by Blake. Those who appreciate the peculiar power of that remarkable genius ought to look forward with interest to such an opportunity.

CAPTAIN LIERNUR'S SYSTEM OF SEWERAGE.

In accordance with instructions from the City Commissioners of Sewage, Mr. William Haywood, their engineer, has investigated Capt. Liernur's pneumatic system of sewerage, has conferred with that gentleman personally, visited Amsterdam and Leyden, where the system has been partially applied, and presented a careful and valuable report on the subject. Mr. Haywood sees the objections which may be taken to the system, as well as the advantages it possesses, and in conclusion says:—

"That the pneumatic system is not perfect on all points is certain, but its value must be considered by the side of the results of the existing system, with which it seems to me there is a growing dissatisfaction, and, as to its sanitary value, many doubts; and for that reason it seems to me important that the pneumatic system should have a full and fair trial in England."

He thinks it would be best tried in a poor district, where, the population being usually more dense, more excreta is produced from a given area, and where the consumption of water being less, and the condition of the ordinary syphon-pans more resembling that of the pans under the Liernur's system, water supply might be omitted or withdrawn from the closets without objection from the inhabitants. In the metropolis, and in most of our great towns, under the Artisans' Dwellings Improvement Act, large numbers of dwellings for the working classes are likely to be built, and there the system could be tried under favourable conditions; in the suburbs of London whole districts are also being laid out for the residences of those in very moderate circumstances, and there a similar opportunity offers itself.

LINE OF FRONT.

At the Westminster Police Court, Mr. Arnold, as already mentioned, has given judgment in a case in which Mr. Charles Lahee, the Vestry Clerk of St. Luke, Chelsea, was the complainant, against Messrs. Adamson & Sons, the builders, of Putney, for an infringement of the Building Acts at Sloane-street, Chelsea.

Mr. Arnold said: This is a summons taken out by the Vestry Clerk of Chelsea, alleging that the defendants "were the builders of a certain erection, to wit, certain bay windows of the house No. 142, Sloane-street, erected beyond the general line of building in such street, without the consent in writing of the Metropolitan Board of Works, the distance of such line of buildings from the highway not exceeding 50 ft." The proceeding is instituted under the 75th section of the Metropolis Local Management Act of 1862 (25 and 26 Vic., cap 1 2).

The facts of the case which are not in dispute are as follow: At the beginning of last year the defendants pulled down an old house, the shop frontage of which extended 9 ft. 6 in. beyond the general line of buildings "as decided by the superintending architect to the Metropolitan Board of Works." At the end of July or the beginning of August they began to build a new house as a dwelling-house on the site of the old one, putting back the general frontage of the house to the general line, but erecting bay windows in the centre of the house to the ground and first stories, which windows project 3 ft. beyond the general line.

It was contended on behalf of the defendants that the building comes within the provisions of the seventy-fourth section, "in case any building situated within any of the parishes, districts, or places comprised in the schedule of the firstly-recited Act, which shall in any part thereof project beyond the general line of the street in which the same may be situate, or beyond the front of the building, wall, or railing on either side thereof, shall at any time be taken down to an extent exceeding one-half of such building, such half to be measured in cubic feet, or shall be destroyed by fire or other casualty, or demolished, pulled down, or removed from any other cause to the extent afore-said, it shall be lawful for the Metropolitan Board of Works to require the same to be set back to such a line, and in such a manner, for the improvement of any street as the said Board shall direct; provided that the said Board shall make compensation to the owner of such building for any damages and expenses he may sustain and incur thereby."

The Metropolitan Board of Works had not required the building to be set back under the last-mentioned section, nor had they consented to the erection of the bay windows beyond the general line of buildings under the 75th section.

On behalf of the complainant, however, it was contended that Sections 74, 75, and 76 should be read together, and that as the defendants had not obtained the consent of the Board of Works, the Vestry were entitled to an order for the demolition of the projection in question.

It was not stated in what way Sections 74 and 75 were to be read together (for Section 76 has really no bearing on the present question), but I suppose it was intended to be argued that when an old building projecting beyond the general line had been taken down, and the builder proposed to erect a new structure on the old foundations, &c., also projecting beyond the general line, he was in the first instance to apply, under the 75th section, for the consent in writing of the Metropolitan Board of Works to such projection, and that if the Board did not consent, they were, under the 74th section, to require the building to be set back to the general line, and to make compensation to the owner, and then if the building was continued beyond the general line, the Vestry or the District Board of Works would revert to the 75th section, and be entitled to a justice's order to demolish the projection.

But I am clearly of opinion that this is not the meaning of the statute, and that it would be a confusion and jumbling together of enactments that are applicable to different sets of circumstances.

The 75th section applies to the case either of a new building, or of the removal of an old one where the builder wishes to have a projection beyond the general line which had not existed before; in either of these cases the builder, having no previously-acquired rights, is to take the initative and obtain the consent of the Metropolitan Board of Works before he can lawfully erect the proposed projection.

The 74th section, on the other hand, applies expressly to a case like the present, where an old building which did project beyond the general line is taken down and a new building is erected in a projection to the same or a less extent than the old one (for it can make no difference in principle if—as in the present case—the projection does not extend so far as the old one had done). In such a case the owner is exercising his existing rights, and if, on grounds of public convenience, or for any other reason, the Metropolitan Board of Works should be of opinion that the frontage should not extend beyond the general line, it is for them to take the initiative, and to require the owner to set back the frontage to the general line, and to pay him compensation for any damage and expenses he may sustain.

I need not refer to the seemingly unnecessary delay that has taken place between the original commencement of the works and the issuing of the summons, as that fact does not touch the merits of the case; but I am of opinion that the owner of the house in question had a right to rebuild the house upon or within the old foundations, unless required by the Metropolitan Board of Works to set it back; and that neither he nor the defendant (the builder) was called upon to obtain the previous consent of the Board for that purpose. The summons, therefore, will be dismissed.

Mr. Corsellis, for the defendant, asked for costs, and 2*l.* 2*s.* was allowed.

Upon the application of Mr. Wallace, barrister, for the Vestry, a case was granted for a superior court.

It is to be hoped the Board of Works will not waste any more money in endeavouring to sustain an obviously erroneous opinion.

RUINOUS BUILDINGS AND THE BUILDING ACT.

On the 10th inst., an adjourned summons, of a protracted nature was heard at the Guildhall, before Sir Andrew Lusk, M.P., with regard to the dangerous state of the back walls of Nos. 69 & 71, Coleman-street, City. Mr. A. J. Baylis appeared on behalf of the Commissioners of Sewers; and Messrs. Lumley and Dowling for the owners and occupiers.

Mr. Edmund Woodthorpe, District Surveyor of the Northern Division of the City of London, was called, and stated his opinion as to the walls in question; and his views were supported by Mr. Tabberer, District Surveyor for Greenwich, Mr. Hammond (a qualified District Surveyor), and by a highly respectable builder.

For the defence it was contended that although the walls were old and bulged, and the floors settled, yet there was no danger, in support of which contention Mr Chatfeild Clarke, Mr. Reed, Mr. Joy, and another surveyor, were called.

Sir Andrew Lusk considered the weight of evidence was against the Commissioners of Sewers, and declined to make an order for the demolition of the walls.

The solicitors for the defence made an urgent appeal for costs, but Mr. Martin, the chief clerk, stated that the magistrate had no power to allow them.

The City Architect's Salary.—At a meeting of the Court of Common Council, on the 10th inst., the Lord Mayor laid before the Court a letter of Mr. Horace Jones, the City Architect, soliciting a reconsideration of his salary. The communication gave rise to much argument, in the course of which it was stated that the architect had a salary of 1,500*l.* a year, and that only two years ago, in consideration of his eminent services, he received a bonus of 5,000*l.* Mr. L. H. Phillips moved that the letter should lie upon the table. On the other hand, Mr. Deputy Lowman Taylor and other members paid a high tribute to the ability and eminence of the City Architect. In the result the letter was referred for consideration to the Officers and Clerks Committee.

ARUNDEL CASTLE.

ARUNDEL, in its position, magnitude, and history, is one of the foremost of the Mediæval military structures of England. English probably in its origin, Norman certainly by adoption, it is not only among the rare castles recorded in Domesday, but is the only one therein specifically mentioned as in existence before the coming in of Duke William. It was held by Alfred and by Harold, and was granted with its surrounding and dependent lordships by William to the head of the great house of Montgomery as an acknowledgment of kinship, and a fitting reward for his distinguished services at Hastings. Three members and two generations of that family held the castle for about thirty-two years. They were followed by Henry I. and his Queen, who held it for half a century, and it has since descended in blood through the lines of D'Albini, Fitz-Alan, and Howard, through seven centuries of inheritance, to its present lord. Though less extensive in area, it is equal to Windsor in antiquity and position, and resembles it closely in type, having an upper and lower ward, and a lofty mound partially interposed between the two, girdled by a deep fosse and crowned by a circular keep. Within its precinct is the Chapel of St. George, and far beyond the walls, but in one direction only, extends its broad demesne. It has also its own peculiarities. Just beyond the wall of the Norman castle, but probably within the earlier English outwork, stands the fine parish church, a Fitz-Alan gift, and attached to its east end is the chapel of the college founded by Richard, Earl of Arundel, in 1386, and now, by a grant or purchase in the reign of Edward VI., vested in the descendants of its founder, and the private property of the lord of the castle. The buildings of the college are mostly removed, and the chapel, though still standing, is in a dilapidated state, and closed against visitors. This is much to be regretted, as it contains many tombs of great magnificence and considerable historic interest, beneath which rest the remains of many members of the great house of Fitz-Alan, who loved full well and gave full largely to that church to which their Howard descendant has shown himself a not less liberal benefactor.

The Arun, a principal river of the south, has its sources in Surrey. It traverses the whole breadth, here about twenty miles, of the county of Sussex, and in its passage to the sea cleaves the southern ridge of the chalk by a very striking ravine or dell, which, with the river, gives name to the castle and the town, as well as to the Rape of Arundel, within which they stand. The castle is placed upon a bold bluff of chalk, which rises on the right or western bank of the river, here flowing in easy curves across a broad tract of low and level land, which intervenes between the downs and the sea, from which the castle is distant about four miles. Upon and at the foot of the slope has sprung up the town, which for centuries paid allegiance to the castle and received from it protection and support. Six miles westward of the Arun is Bognor, rich in Roman remains, and as far to the east is the mouth of the Adur, where Shoreham contests with Portsmouth the representation of the ancient Portus Adurni. A few miles north of the castle Stanemay marks the line of the old Roman road between Chichester and London. Various villages, the names of which show their English origin, are thickly posted along the lower course of the Arun; but the name of the river and of its tributary the Rother, may be British, as are no doubt the hill camps here and there scattered over the downs. The Rape is supposed to be a Jutish division. It includes five Hundreds, and was formerly nearly all forest. The courts were held beneath an oak-tree at Madehurst.

The bluff occupied by the castle is the end of a ridge of high ground, which is specially steep towards the east and south, and ascends to still higher land towards the north and west. In this direction lies the park, which covers about 1,100 acres, and includes, between two ridges of the chalk, a deep combe or valley, in the lower part of which, just below the castle, is the lake called Swanbourne, the pool from a very remote period for the use of the mill.

The history of Arundel has been written by Dallaway in his Western Sussex, and by Tierney in a specific work. Whatever may be the value of either production for the history and descent of the lordship, neither gives a full plan of the earthworks of the castle, nor enters at all scientifically into its details from either the military or architectural point of view. Unfortunately, the proximity of the castle to Brighton and some lesser watering-places has caused the exclusion of visitors, save under restrictions so very narrow that it is impracticable to examine the works at all in detail. It appears from Tierney's history that the castle is protected towards the north or open country by a double line of defence, composed of a bank and ditch, of which the outer includes the present as well as the older park, and is, in places, at least two miles from the castle. The inner is of much smaller extent, but the two seem intended to protect the town and the port, as well as the site of the castle, and to be rather lines of defence than the remains of a camp, whether British or English. Within both these, and probably of later date, are the earthworks upon a part of which the Norman castle was founded. These resemble the works common to England with Normandy, and may probably be attributed to the Northern invaders in the eighth or ninth centuries. The high ground is occupied by an oblong inclosure, of which more or less of the original earth-bank remains, and outside of which to the south and east was the natural steep, and to the west a natural hollow, deepened and extended round the north front by art. The inclosure is in length 317 yards, and in breadth 83 yards, and includes about 5¼ acres. Near the centre of the western side, and forming a part of the *enceinte*, is a large circular mound, almost wholly artificial, having its proper ditch, which on the outer face is also the ditch of the general *enceinte*. The mound is about 90 ft. diameter at its table summit, and about 230 ft. at its base. As the ground rises towards the north, the height is on that side about 50 ft., and on the opposite side about 70 ft., from the bottom of the ditch. The Windsor mound is about the same height, but rather larger, being 125 ft. across at its summit. By its projection this work materially narrows the main area, and with the addition of a short cross ditch, bank, and wall, now gone, divided it into an upper or northern and lower or southern ward, in the latter of which are the domestic buildings. These two wards were the parts of the earlier fortification taken possession of by the builder of the Norman castle, but there is also an inclosure opposite to the mound, and outside the ditch, which runs up to a narrow end towards the north-west. Whether this was fortified with masonry is uncertain, but it certainly was a part of the earlier fortress, and shows its extent and importance. The ditches everywhere being in the chalk, and at a high level, were no doubt always dry. Earl Roger, probably, found along the crest of these earthbanks the same sort of defences that he left behind him, on similar banks and mounds, at his paternal castle in Normandy, but whether these were of timber or of masonry is uncertain. They might very well have been of either. It is, however, certain that the earl, or his immediate successors, inclosed the main area within a curtain of masonry, which ran up the mound and placed half of it, as at Lincoln and Tonbridge, outside the inclosure. Upon this curtain, a little south of the mound, was placed the gate-house, and along it at various points were mural towers, probably square, of which one, on the curtain north of the mound, and known as Bevis Tower, still remains, though more or less altered. The domestic buildings were then, as now, along the sides of the lower ward, and upon the mound was placed a shell keep.

As the public are only permitted to inspect the lower part of the gate-house, the adjacent curtain, and the interior of the keep, it is impossible to form a correct opinion as to the extent of the original earthworks, or as to the age of the general curtain, or the basement of the domestic buildings, parts of which are said to be of Norman date. That the earthworks were extensive, and in part remain, may be seen from the summit of the keep, and from the upper gate of the park. Dallaway gives a large, but not quite correct, plan of the keep and its mound, the gate-house and Bevis Tower, and the lower ward; but his plan does not include the higher ward nor the earthworks, nor is it accompanied by any sections. Neither he nor Tierney were strong in architectural details.

The *Gate-house* stands on the line of the curtain, projecting inwards from it, and upon the southern edge or counterscarp of the ditch of the mound. It opens into the lower ward. It is of the early Norman type, resembling that at Tickhill. It is a square of 32 ft., having in the outer and inner faces a large round-headed doorway, quite plain, without even a chamfer, and with a plain sloped abacus. The chamber is, of course, square, and but little broader than the doorways. That towards the ward seems to have been closed by a pair of doors only. The other or outer doorway has a broad portcullis groove, which may or may not be original; more probably not. The covering—the floor of the upper room—was no doubt of timber, and flat. The present vaulting is an insertion. There was always an upper floor, but this has been much altered, chiefly in the Decorated period. The old loops, now blocked, may be traced. Some of the inserted windows are very late. In the south part of the inner doorway was a door opening into a mural stair leading to the upper floor and to the rampart-walk of the curtain, which seems to have been continued through the gate-house, over the outer portal. The present staircase is exterior, and modern. This is the whole of the original gate-house, which, with the adjacent and very thick curtain, is probably the work of Earl Roger.

The gate-house has been produced outwardly in the Decorated period. There is appended to it a crooked passage about 10 ft. broad and 40 ft. long, between thick lateral walls. In its sides are shoulder-headed doorways, which led into lodges and cells, and on the south side is a well-staircase, ascending to the roof. The passage is covered by a very flat-pointed vault. It ends in an outer doorway having a drop arch, and opening between a pair of flanking towers, 20 ft. square, rising out of the ditch. These have sub-basement chambers in the ditch, basements at the ground level, and two upper floors. In the doorway is a very broad portcullis groove for a timber frame, and in front was a drawbridge, now replaced by an arch of masonry. This addition to the Norman gatehouse, making with it a very long covered entrance-passage, is attributed to Earl Richard Fitz-Alan, on his return from the wars of Edward I. In very modern times the floor of the passage has been lowered about 3 ft., and the walls underpinned by a plinth. The doors, which are not in use, have been left unaltered, and show the original level of the sill. Probably the approach to this entrance lay through an outer gate to the north-west, at the upper part of the town, and across the large outwork, now a garden and a carpenter's yard.

The *Keep* is a rounded shell of masonry, about 67 ft. by 59 ft. in the internal cross diameter, and with walls, 8 ft. to 10 ft. thick, and 20 ft. high to the rampart walk. It is built of rubble masonry, the material chiefly Sussex stone and chalk, but faced outside with small ashlar blocks of Caen stone, close jointed, and with flat pilasters which die into the wall below the base of the parapet. The entrance was by a rather large full-centred doorway to the south-east, probably reached, as at Tickhill, by a flight of steps up the mound, with a timber bridge at their base, as at York. This doorway is not shown to visitors, but Tierney's drawing represents it as having a bold chevron moulding alternating with rolls or rounds, common to the head and the jambs, and unbroken by imposts. Within, it opened into a recess, also full-centred, and having its angle replaced by a bold roll. This, as at Lincoln, was the original entrance, and it seems, though walled up, not to have been otherwise altered. Near this doorway a well-stair has been formed in the wall, ascending from the ground to the ramparts. It is evidently a Decorated insertion, of the same date, with a steep flight of steps and a vaulted subterraneous chamber near the centre of the area, and which seems to have been a cellar belonging to the lodgings which, as at Windsor, were at one time built against the wall all round, leaving a small open court, as at Tamworth and Ledes, in the centre. That there were here such lodgings is evident from the roof corbels in the wall, and that they, as at York, had an upper floor, is shown by a late fireplace, which marks the upper level, and the back of which is formed of tiles set on edge. The parapet was about 8 ft. high, and crenellated, and in each merlon was a loop, set in an arched recess. In one merlon is a small full-centred recess, evidently a garderobe. The present parapet seems a Decorated addition. The keep stands, as does the mound, on the line of the main curtain, which crosses the ditch from the gatehouse, and ascends the mound, and has a similar continuation northwards. Where the south curtain abuts upon the keep, there stands a broad irregular tower, of about 20 ft. in projection by 50 ft. in breadth. This contains the well and its chamber, the entrance from the curtain rampart, and an oratory. The entrance is by a vaulted passage, with a portcullis groove

at the ground level of the keep. The curtain has a parapet on either face, forming a close way, and is commanded by a sort of balcony connected with the keep. The well is of unusually large diameter, but not in use. The chamber was at the ground level of the keep, into which it opened by a full-centred doorway. There was also an upper chamber, now ruined. This position of the well, on the outside of the keep, is found elsewhere. At Wallingford it is on the slope, and at Cardiff nearly at the foot of it. The oratory, or chapel of St. Martin, is a small chamber of irregular plan at the first-floor level, and is placed over the entrance passage. It has a large east window, altered at two periods, and two smaller lateral windows, all now closed up. The roof was of timber, and is gone. This oratory had a special endowment, afterwards shifted and expanded in favour of the large chapel in the lower ward. The details of this appendage show that, as at York and Cardiff, it was an addition to the original shell, the ashlar face of which is seen within one of the lower chambers. At Cardiff the added tower was Perpendicular; at York, where it included a small chapel, Early English. Here the addition seems Early Decorated. The chapel is probably the St. Martin's mentioned in Domesday, and in the Patent Rolls of 1275, and was, of course, dismantled when the endowment was shifted in 1375. The keep is mentioned at different periods as Beaumont, Hautmont, and Grosmont, all names preserving its chief characteristic.

As the English "Aula" was probably on this mound, while the ashlar exterior of its present wall is unquestionably later than the Conquest, it has been supposed that the heart of the wall is original, and that it was cased by the Norman architect. Of such casing there is, however, no appearance. The entrance from the curtain is cited to show early masonry, it having probably been cut through the wall, some of the stones of which are laid in horizontal courses, rather than as regular voussoirs. This irregularity, however, does not warrant the interpretation placed upon it. The wall appears all of one date, and that probably late Norman, as is usual with shell keeps.

Bevis Tower stands upon the curtain, and projects from its outer face only. It stands on the north counterscarp of the ditch of the mound, about 42 yards from the keep. It is square, and said to be, in substance, of the age of the gate-house, but it is not allowed to be seen close. It is called a Barbican, but its position scarcely justifies its having been so intended. It looks more like an ordinary mural tower. There is no communication from the keep with the curtain on this side. North of this tower the earthworks of the upper ward seem tolerably perfect, but a proposition to be allowed to visit them was evidently regarded as a sort of sacrilege.

Besides the well attached to the keep was a second, now covered up, in the middle of the lower ward. The habitable part of the castle is mostly or entirely Howard work. Edward, the ninth duke, was a great builder. He rebuilt Worksop, which was burned soon afterwards, in 1761, and he founded Norfolk House in St. James's-square. What he did here does not appear. The present domestic buildings which line the lower ward to the east, south, and west sides are, in substance, the work of Duke Charles towards the close of the last century, or 1791—1806, and have since been added to. They are what might be expected from the period, and better than the rather earlier work at Alnwick, lately removed. It is said that in the cellars, and built into the outer walls, are parts of the earlier structure, some of Norman date. The hall stood on the east curtain. It had a good Early English door, destroyed in the present century. The hall itself was ruined during the siege of 1643. The present grand entrance to the ward, to the south of the original one, is entirely modern, as are the approach to it and the outer gateway. So also is the Chapel of St. George, which stands along the west wall. The chapel which preceded it, and was taken down in 1796, was 40 ft. long by 22 ft. broad, and was endowed by Richard, Earl of Arundel, in 1375, with spoils derived from Crecy. The domestic buildings are said to have been augmented at the same time by wealth from the same source. The ecclesiastical endowment, shifted from the oratory of St. Martin to the Chapel of St. George in 1375, was, after about a century, again shifted to the Fitz-Alan Collegiate Church, without the walls.

Arundel is a castle where, if anywhere, traces of English masonry earlier than the Norman Conquest might be expected to be preserved, and no doubt it is possible that such may be found about the foundations of the Norman walls. What is mainly remarkable about it is the resemblance to Windsor in its general plan; the oblong enclosure encroached upon from one side by the mound and its ditch, so as to divide it into two wards in one of which are domestic buildings. The older part of the gatehouse, and parts of the curtain near it, may be regarded as Early Norman, the work probably of Earl Roger. The keep seems later, though also Norman. The additions to the gate-house, the well tower, and the oratory are probably Decorated. What is wanted is a correct ground-plan, which should include the outworks and the more distant earthworks. The older walls should be critically examined, and especially the basement of the domestic buildings.

HISTORY.

The Manor of Arundel, with others in this immediate neighbourhood, was given by Alfred, by will (885) to his brother's son. It was held by Harold, and afterwards by William, who about or before 1070 granted to Roger de Montgomery the castle and honour of Arundel, with 84½ knights' fees. Roger, who was of kin to the Conqueror, and commanded the Norman centre at Hastings, became Earl of Arundel and Shrewsbury, and held the Castle about twenty-three years, till his death. Domesday describes the Castle of Harundel as having, in the time of King Edward, paid annually for the mill, 40s.; for three "conuvii," or entertainments, 20s.; and "pro uno pasticio," or pasty, 20s. There was also the church of St. Nicholas, or parish church, and St. Martin's, probably the chapel of the castle. There was also another mill which paid ten bushels of corn. The burgh, port, and shipping paid 12l. or more.

It is curious that Arundel, Chichester, Shrewsbury, and the Norman Manor, whence Roger derived his territorial designation, each possessed a mound, as also did the chief seat of the Welsh county, to which his son gave the family name. On William's death in 1088 Earl Roger gave his support to Robert Curthose, whom he invited to land at Arundel. The Prince's sluggishness alienated his English followers, and the Earl tendered his aid to Rufus. At Earl Roger's death, in 1094, he bequeathed his Sussex earldom, called also "of Chichester," to his younger son Hugh, the Hugh Goch of the Welsh, who held both Arundel and Shrewsbury, stood in opposition to William Rufus, and was slain while repelling pirates from the north Welsh coast in 1098. His successor in the English earldom was his elder brother, who already held the family lordships in Normandy. This was Robert, Earl of Belesme in la Perche, who received at Arundel William Rufus on his arrival from Normandy in 1097.

Earl Robert, the wicked son of a wicked mother, was a bold soldier, and an able, though a very cruel man. He built with great rapidity the strong castle of Brugge or Bridgenorth, and that of Montgomery, called by the Welsh Tre-faldwin, from Baldwin, its early seneschal. His career in England was violent and short. Bridgenorth was besieged and taken by Henry I., who brought the wooden turret known as a malvoisin to bear upon its walls. He went into exile in 1102, and died in 1118.

King Henry held Arundel till his death, when it passed in settlement to his widow, Adeliza, daughter of Godfrey of Louvaine, Duke of Brabant. The Queen Dowager married William d'Albini, a Norfolk noble, known to chroniclers as "William with the strong hand," the royal butler. They received the Empress Maud at Arundel on her landing in 1139, with her brother, the Earl of Gloucester, and in consequence had to stand an attack from Stephen, to whom, it is said, Adeliza pleaded with success the duties of hospitality, and Maud was allowed to retire to Bristol. D'Albini, however, was, on the whole, a supporter of Stephen, though with great judgment. He advised the accord between Stephen and Henry in 1153, and signed the compact as "Earl of Chichester." Henry, on his accession, acknowledged the service by a grant of the earldom of Arundel in fee with the third penny of the county of Sussex. Earl William died in 1176. By Adeliza, who died in 1151, he left a son, also William, the first of four generations of d'Albinis, and of five persons who held the earldom of Arundel, or as they called it, of Sussex. They were buried at Wymondham, their own foundation. Earl Hugh, the eighth from the Conquest, died childless in 1243. Isabel, his sister, carried on the succession, and married John Fitz-Alan, whose son, on his uncle's death, succeeded.

This John, head of the great house of Fitz-Alan, Lords of Clun and Oswaldestre, became the ninth earl, and died 1240. He was the first of fourteen earls of the name who held the castle for twelve generations. Of these the elder line died out in the person of Thomas, fifteenth earl, who died childless in 1415; but the succession was continued by his cousin, Henry Fitz-Alan, Lord Maltravers, who died 1580, leaving an heiress, Mary, who married Thomas Howard Duke of Norfolk. The later Fitz-Alans lived much at Arundel, with which place they became closely identified.

Duchess Mary died 1557, and her husband in 1572. Their son, Philip, became twenty-second earl, since when there have been in all ten generations of Howards who have held the title of Arundel, the present Duke of Norfolk being the thirty-fifth Norman earl, and the thirty-second by descent from Queen Adeliza and William d'Albini.

The castle of Arundel has not played any very important part in English history. Its most famous event is the siege of 1643, when it was besieged by Sir William Waller, who first attacked and took the town, then defended by walls, and finally battered the castle from the tower of the church, where he posted his guns. The siege lasted from the 20th December, 1643, to the 6th of January following, when the place surrendered, and with it the celebrated Chillingworth, who died shortly after. The domestic buildings were then ruined, and seem so to have remained until the last century.

The town was walled round by Richard Fitz-Alan, who had a licence for that work in 1295. There were two gates, one below and on the river, the other called St. Mary's, at the top of the town. The town wall seems to have abutted upon the castle, which thus formed a part of its defence.

The present duke has built just outside the castle, and not far from the parish church, a large church dedicated to San Filippo Neri, a very noble structure, and fitted up with great simplicity and excellent taste. Unfortunately it is so placed as to detract materially from the general aspect of the castle from the plain below. Placed a little lower down it would have left the castle as the predominant figure, permitted the fine old parish church to hold its due place, and have supported and elevated instead of somewhat oppressing the whole group.

1876. G. T. C.

DOINGS IN SCOTLAND.

The Safety of Glasgow Bridge.—As the chief of several connecting-links between the north and south sides of the city, it is obviously of the greatest importance to maintain the Jamaica-street bridge, Glasgow, in a state of security, and especially as a vast and increasing traffic daily passes over at that point. It has long been feared by some persons that the gradual and natural deepening of the channel of the river underneath had rendered the bridge insecure, and that measures would have to be adopted for strengthening the structure. It is satisfactory to learn, however, that a report was presented at a recent meeting of the Glasgow Bridges Trust, by Messrs. D. & T. Stevenson and Messrs. Bell & Miller, the effect of which should serve to allay any feeling of grave anxiety on the score mentioned. The report says,—"We have examined the superstructure of the bridge, which presents no indication of settlement or dislocation; and having carefully considered the information afforded by the sections which have been made by our instructions, we have the satisfaction of reporting that, in our opinion, the foundations of the bridge are in no immediate danger, and that, unless considerable additional scouring or deepening were to take place, we think there need be no apprehension of damage to the superstructure. Although the channel of the river under the centre of the arches has been scoured to a greater depth than the masonry of the foundations of the piers, still the piers themselves are in all cases surrounded by material of a much harder character than the natural bed of the river, and these harder materials have not been affected to the same extent by the scouring action of the currents. This harder covering or protection round the several piers is probably due to the remains of the coffer-dams used in constructing the work having been left in the river's bed, and

to some extent also to the deposit of heavy materials as a further protection to the foundations. We are not prepared to say that it may not be found desirable to apply at certain places some means to insure the permanence of this coating of harder material by which the piers are surrounded; but there is, as already said, at present no scouring action to occasion any immediate apprehension for the safety of the bridge." The minutes of the committee, containing the report, were adopted. At the same meeting, while on the subject of bridge accommodation, Mr. Laing gave notice of the following motion,—"That having in view the increasing traffic of the city, especially in the vicinity of Argyle, Buchanan, and Jamaica streets, and the near completion of the City Union Railway-station at St. Enoch's square, the trustees should take into consideration the propriety of providing additional bridge accommodation between the north and south banks of the river, so as to prevent the dangerous overcrowding of the streets leading to the Glasgow Bridge, and that it be remitted to a special committee to consider and report."

Operations of the Glasgow Improvement Trust. The minutes of the general committee, read at a late meeting of the Glasgow Improvement Trust, embraced a lengthy report by Dr. Russell, medical officer of health, giving some interesting information on the immediate results of the operations of the Improvement Trust as regards the inhabitants of the lower quarters of the city displaced about May, 1875. Up to that time 818 families had been displaced, as against 351 displaced in May, 1874. Of these, 655 families, representing a population of 2,720, had been traced to their new homes. The area of demolition between May, 1874, and May, 1875, was chiefly the Gorbals and High-street. On inquiry by the medical officer as to the size of houses inhabited by the families displaced, it was found that there were, before the operations of the Improvement Trust, 55 per cent. of those families living in houses of one apartment, and after, 42 per cent.; before, 36 per cent. living in houses of two apartments, and after, 41 per cent.; before, 6 per cent. living in houses of three apartments, and after, 7 per cent.; before, 3 per cent. living in houses larger than three apartments, and after, 2 per cent.,—leaving a balance of 8 per cent. who betook themselves to lodgings, to the suburbs, and to the country. The report afterwards dealt with the rental of the old and new houses, the question of overcrowding, and the method of the disposal of the excreta. Bailie Morrison, in moving the approval of the minutes, gave an elaborate account of the work in progress, and the alterations contemplated by the Trust during the course of the summer. What was known as the Bell of the Brae Improvement was being rapidly carried forward, for it was intended to reduce the level of the High-street at that point by something like 16 ft. The alterations had caused them to encroach upon the prison, and they had been obliged to excavate a portion of the ground, and had undertaken the responsibility of rebuilding the prison wall, abutting on the Bell of the Brae. The ground at this point was very valuable, and they considered it due to the tastes of the inhabitants, as well as for their own interests as owners, to erect the wall of the prison in the Gothic style, somewhat like the entrance to a baronial residence or castle. Alluding to the large square in front of the infirmary and the cathedral, he said it was proposed that it should shortly be laid off, and describing the Barony Church of the late Rev. Norman Macleod as an "abortion," suggested its removal, when he was certain they would have a spot which, architecturally, would be the best in the city to which visitors could be taken. Alluding to a report by Dr. Russell on the lodging-houses, Bailie Morrison said remits had been made to various members of the committee to secure suitable sites for the erection of such houses. At the Cross and Greendyke-street very extensive premises of this kind would be ready for occupation at Whitsuntide. At Bridgeton Cross they had secured a large site, and plans were in course of preparation for a lodging-house there which would give ample accommodation to the poorer residents of the district. As to Gorbals, a very suitable site had been fixed upon in Portugal-street, and plans were in course of preparation. In Anderston an excellent association existed, having a model lodging-house, and the trustees had not done anything in that district. The basis upon which the trustees desired to have these lodging-houses was, that they should be self-supporting. The accommodation would be good, and after they were erected any man would be able to get, at a cheap rate, a clean bed, and have the benefit of proper cooking utensils, &c., so that the low class of lodging-houses would find it impossible to compete with the new ones. Alluding to another important subject, the most probable site for a free library, the bailie said a little consideration would enable them to come to a fair conclusion. If they bore in mind the intended widening of Bell-street and High-street each to 60 ft., the widening of Salt-market to 70 ft., the improvement of Gallowgate in its levels, the widening of Trongate to 100 ft., they would have an idea of the City Improvement Trustees' work. Instead of being what it now seemed, a chaotic system of demolition, they would find it a harmonious and grand whole, which would hand the name of their city architect down to posterity. There would be one splendid thoroughfare extending from Partick on the west to Camlachie on the east, the transition from Trongate to Gallowgate being almost imperceptible. All the glories of the past Cross of Glasgow would be revived, and there he held was the proper site for their central free library. That building would be part of the large architectural scheme of Mr. Carrick, which embraced the reconstruction of the site lying between Salt-market, King-street, Trongate, and Prince's-street. Entrance would be given to the library from each of the four streets, and it was proposed to line the corridors with pictures and statuary, and to make it ornamental to the eye. Having entered into further details of the scheme, the Bailie concluded by expressing his belief that this was the true problem of where the Mitchell bequest for the free library was to find its resting-place. The minutes of the trust, after some discussion, were approved.

The Warming of Public Buildings.—At a meeting of the Royal Scottish Society of Arts held in Edinburgh, Mr. T. B. McFadzen, architect, communicated a paper by Mr. Chas. J. Henderson, Royal-terrace, the subject being "On Warming Churches and other Public Buildings." Mr. Henderson suggests that the heated air be admitted near the roof, while, at the same time, the cold air be drawn from below by a door opening into the stove-room on the level of the floor. From the stove-room the heated air is carried up an undulating pipe to the ceiling, where an opening is made into the building, and thus the heated air escapes into it. The plan, it was stated, was now in operation in a church at Grahamstown, and it was found in this way that a circulation was established resulting in a very short time in the whole air in the church being raised to a uniform temperature, while affording complete means of control so as to discontinue the process when necessary. In the course of the discussion which followed, Dr. Stevenson Macadam objected that this method did not allow any means of escape for the vitiated air which would remain in the upper part of the building. Ultimately the matter was remitted to a committee to report. The principle involved has been often discussed.

THE TESTING AND STRENGTH OF MATERIALS.*

Wrought Iron.—The tensile strength of good wrought iron is nearly four times greater than that of cast, viz., twenty-four tons per sectional inch. Mr. Mallet gives twenty-three to twenty-four tons, and Mr. Kirkaldy twenty-five tons for bars, and twenty-two tons for plates. Mr. G. Berkeley gives as his experience of breaking-strength:—

	Average. Tons.	Minimum. Tons.	Average Stretch. In. In.
Plates	20 ...	19 ...	1 in 12 lineal = 8·33 p. c.
L and T...	22		1½ in 12 lineal = 10·5 p. c.
Rivet Iron.	18		

The Admiralty would seem to have a good opinion of Low Moor and Bowling iron, for in a late specification for boilers, they mention that all plates, with the exception of these, will be tested, and must be capable of standing the following tests:—Tensile strains per square inch, lengthways, 21 tons; crossways, 18 tons. Forge test (hot), plates to admit of being bent hot without fracture to the following angles: lengthways of the grain, 125°; across, 100°. Forge test (cold), plates to admit of being bent cold without fracture to the following strains:—

	⅜ in.	½ in.	⅝ in.	¾ in.
With the grain	20° ...	25° ...	35° ...	35°
Across the grain ...	5° ...	10° ...	15° ...	15°

Bridge Tests.—A piece of iron 2 in. wide and ⅜ in. thick, and of sufficient length to have 7 in. under actual tension, to be cut from any plate intended to be used on the work, and the following tensile strains applied, the plates of similar manufacture to be rejected if the extension of the piece tested is greater than ¼ in. under 18 tons, ⅓ in. under 21 tons, ½ in. under 23 tons, ⅝ in. under 24 tons; all bars and L irons being required to bear a tensile strain of 25 tons before fracture. Messrs. Clarke, Reeves, & Co., American bridge-builders, specify in their work that all bars subject to tensile strains shall be tested to 20,000 lb., or nearly 9 tons per square inch, and struck a smart blow with a hammer while under tension, and if any show signs of imperfection they shall be rejected. I mention this foreign test because in a competition this firm secured a contract against English firms. For bridges of large spans some engineers specify different tests for the larger spans: for a 100 ft. span, average breaking-strain of plates per square inch to = 45,000 lb., or 20$\frac{1}{10}$ tons; for the same span, average breaking-strain of channel irons and bars per square inch, to = 50,000 lb., or 22½ tons; for a 200 ft. span, all parts to be exposed to a tensile strain of 60,000 lb. per square inch, = to 26·78 tons. In building Blackfriars Bridge, experiments were made from time to time, as mentioned by Mr. Carr in a paper read before the Institute of British Architects, and the extension of 1·625th part of the length was given by strains varying from 13 tons to 15 tons (instead of 16 tons, as specified); but even with this, the elastic limit is just about four times the working load, which is ample allowance for safety, taking into account a very large deterioration for time and corrosion. The limit of elasticity of wrought iron under tension is that point at which the elongation ceases to be in uniform proportion to equal additions of load, and commences very nearly with the point at which visible set takes place. A bar 1 ft. long, and 1 in. sectional area, should elongate at least 15 per cent. before breaking. The crushing weight is from 12 to 15 tons per inch section, or about half that of tensile resistance. It is sometimes specified that it must be equal to 16 tons per inch, and that it must not show any signs of failure at 8 tons per inch. In specifying or ordering wrought iron, size as well as quality must be borne in mind. L iron, without extra price, runs from 3 ft. to 25 ft.; T iron, without extra price, runs from 3 ft. to 21 ft. Some L and T irons are rolled from 30 ft. to 40 ft.; as a rule, it is of the middle size that long lengths are rolled. L iron can be got rolled up to 40 ft. without any extra charge when the specification is a good one, and does not include more than a fair share of such lengths; and they may even be rolled to 50 ft. and 60 ft., but the difficulty of carriage enhances the cost. Plate iron must be of a regular shape, and should not exceed 15 ft. by 4 ft., otherwise an extra charge will be claimed for rolling. Mr. David Kirkaldy has just completed a valuable set of experiments upon wrought-iron plates manufactured by Mr. Fred. Krupp, of Essen, Rhenish Prussia, and six Yorkshire firms. The experiments were made from plates, 4 ft. by 3 ft. by ⅜ in., ½ in., and ⅝ in. thick,—those most generally used for boiler-making. 324 specimen tests were made from pieces of these plates, and are carefully preserved in Mr. Kirkaldy's museum. The experiments have been made (1) to ascertain the elastic and ultimate strength, softness, and ductility under pulling stress; (2) to ascertain the effects produced by drilled holes and by punched holes under pulling stress; (3) to ascertain the resistance to, and effects under, bulging stress; (4) to ascertain the resistance to, and effect under, bending stress. The facts elicited in these experiments, which are very voluminous, will convince the Admiralty that they should at least give Krupp's plates an equal position with the Yorkshire ones.

Cast Iron.—In round numbers, the strength of cast iron in *compression* equals the square of the tensile force, or, in other words, the resistance that cast iron of good quality gives to a crushing or compressive strain is variously stated by authorities on the subject at from 40 to 43 tons per square inch of section, and from 6 to 8 tons per

* By Mr. R. M. Bancroft. Read at the Civil and Mechanical Engineers' Society, and embodying the particulars of a number of experimental tests not yet published elsewhere.

sectional inch for a tensile or stretching strain. Tabulated it stands :-

	Breaking Strain.	Safe Working Strain.
In compression	40 to 48	7 tons
In tension	6 to 8	1½ ,,

It is clear from this that cast iron of good quality may in compression be strained to one-sixth of its greatest strength, and in tension to about one-fourth. Cast iron of good quality will, when first broken, have a crystalline texture, and a slight indentation will be made if struck smartly with a heavy hammer. Sometimes this metal is specified to bear a tensile strain of 2½ tons before loss of elasticity, and 6½ tons per square inch before fracture. Test-bars should be run each day as the castings are being made, and a good plan is to specify that the test-bars must be cast on to the ends of the castings. One test is, that a bar, 2 in. deep × 1 in. wide, placed on bearings 3 ft. apart, with a load of 25 cwt. placed on the centre, should give ¼ in. deflection and carry 27 cwt. without breaking. A second test is that of a bar, 1 inch square, placed at 4 ft. 6 in. bearing. In this test the bar should not break with a less load than 600 lb. placed on the centre. The above tests are for iron to be used in compression. When required to be used in tension, even higher standards are advisable. Some engineers insist that these shall be *dead weights*, and that no strain shall be applied in any way by levers; and in important contracts test-bars must be cast in duplicate, one to test, and the other marked with the date when run, and kept for future reference by the engineer. The area of the flanges of cast-iron girders should be in the proportion of 6 or 7 to 1; but the upper flange, where the girder is isolated, and not held in position by the structure itself, should be proportionally wider, according to each particular case, as it has to resist flexure, which would possibly deform it before compression of the flange could occur; but where the web and the upper flange are supported by the structure itself, as in the cases of arches and flooring, the above proportion may be taken. As a general rule, we may, in designing cast-iron girders, make the depth from one-twelfth to one-sixteenth of span; bottom flange, two-thirds to three-fourths the depth in centre; top flange, one-third to one-half the width of bottom; maximum span, 25 ft. With greater spans than this wrought iron becomes as economical, and safer. I believe some of our members are of opinion that strengthening webs or ribs should not be cast in girders, as the metal is drawn away from the flanges in cooling; others say that at the junction of web and flange, the rib, if broken away, will frequently be found honey-combed.

Rail Tests.—When we consider that there are 125 tons of rails and 64 tons of chairs used in each mile of single-line railway, the importance of rail-tests will be apparent. The usual modes of testing rails are :—1. Dead central weight, or static test; 2. Dynamic, or test by impact; 3. A combination of first and second,—first by the central and afterwards by the falling load; 4. Chemical or acid test. 5. By rolling weight. To these might be added that of torsion, or twisting. It should be borne in mind that tests ought to be such as can at all times be easily applied, and not to cause unnecessary inconvenience to the contractor in carrying out his contract. Climate has great influence upon rails, for in tropical countries a comparatively hard rail might be employed, and a greater amount of duty might probably be obtained than from a softer rail. In practice, any sleeper may be badly packed, or decayed, so as to offer little resistance; therefore it follows that a rail to be safe should not break or take a permanent set under the weight of an engine. If every other sleeper were taken away, this would always give a bearing at which to test rails for different lines or ganges. A good steel rail, as used on the English railways, will deflect about $\frac{3}{16}$ of an inch in a span of 6 ft., when a locomotive engine is passing over it. Taking the tests *seriatim*, it seems to me that the test by a falling weight is more to detect brittleness than a test of deflection, and being a destructive one, only 1 or 2 per cent. of the quantities are tested, and the rest of the turn is supposed to be like them. For the test of brittleness, it has been suggested that a good method would be to drop rails from a given height on to a hard platform, which would certainly detect any *cold short* ones. To detect brittle rails is certainly most important; yet it is difficult to imagine how the loads passing over rails come with the suddenness of a blow from a test monkey. Some engineers say the endeavour to ascertain whether a rail has sufficient toughness by submitting it to the action of a falling weight is most deceptive; the test goes as far beyond the mark as that by a dead weight falls short of it, because it requires an amount of toughness which is quite unnecessary, and inconsistent with a proper degree of hardness. Dead central weight tests determine the strength of a rail as a girder, and are adopted by some engineers, who consider nothing so good as the simple application of gradually increasing bending stress to the centre, the deflection and set being noted after each successive increment of stress. These tests being usually made upon bearings varying from 2 ft 8 in. up to 5 ft. and 6 ft., it is a question whether the amount of deflection shown by so short a length of rail without being damaged by a permanent set is not too small to be accurately measured; and the difference of the deflection which would be exhibited by a short piece of very good iron and a similar piece of very bad iron would at any rate be too small to afford any certain gauge of its qualities. It would seem that a double test of dead weight, and afterwards by impact, is a severe and, one would think, a satisfactory one, and, unlike a chemical test, is simple, quick, and inexpensive; it severely tests the qualities of material and workmanship. Some engineers adopt this method, and though these tests are not designed to represent the wear the rail would have to undergo, yet they are, combined, the safest and simplest that we are at present able to apply. The acid test is made by cutting off a slice from the end of a rail, and, after polishing, immersing it in dilute acid, which eats away all impurities, leaving a lot of cavities and furrows, thus showing up the fibre or grain of the metal very plainly. With most metals chemical analysis is in itself a complete and sufficient test of quality, but not in steel. The toughness of steel may be altered by sudden cooling, and although the effect of this operation, and generally the effects of tempering, are greater when the quantity of carbon is considerable, yet it acts more or less in the mild qualities of steel, so that we cannot rely entirely on the aid of the chemist, but must fall back on mechanical tests, which prove not only the material, but the workmanship. The rolling-weight test is made by heavy rollers fixed in a frame-work and radial bars connected to a central boss after the form of a turntable; motion is imparted to a central vertical shaft by means of shafting and wheels underneath, which is driven by steam-power. It can be made with or without springs; without springs the test is more severe, but by using springs the rollers may be lightened and greater weight thrown into the frame. The rails to be tested are formed into a circle or polygon, supported on sleepers packed with ballast in the usual manner. If the rails are bent into a circular form, Mr. Price, the patentee, says in his experience the texture of the iron is of no moment, provided the rails are bent at a dull red heat, but they may be arranged as a polygon, which plan possesses the collateral advantage that the rollers wear more evenly over their entire surface. Rails weighing 86 lb. per yard are tested by a dead weight produced by hydraulic pressure. A piece of the rail is placed upon 5 ft. bearings, and a slightly curved iron surface 3¾ in. in width is made to press upon the centre of the rail. The test is that under these conditions a pressure of 40,000 lb. shall not deflect the centre of the rail more than 1 in.; also that 60,000 lb. shall deflect it 9 in. without breaking it. The following are tests for iron rails 75 lb. per yard :—1. Each of these rails placed on two supports, 3 ft. 8 in. apart, must carry for five minutes in the centre between points of support a hanging weight of 12 tons, deflection 0·15 in. as a maximum, and when the weight has been taken off the permanent set must not be more than 0·04 in., or 1 millimètre, and on condition that at the second placing of the same weight the deflection does not increase more than 1-150th of an inch or 1-5th of a millimètre. 2. Each rail in the same position must carry also for five minutes without breaking a weight of 30 tons; then, having nicked the surface of the head, it shall be tested to breaking by the blows of a tup 648 lb. weight falling 18 ft., and the fracture must show a combination of iron conforming to the aforesaid condition. 3. Each of the two halves of broken rail placed on two supports, 3 ft. 8 in. apart, shall be tested by the blows from a tup 648 lb., falling 7 ft. on the centre between the point of support. Under this test the rail may bend, but must not show any trace of destruction. The Vignoles section of rail would seem to have some advantage over the double-headed, as the bottom flange is placed at a greater distance from the neutral axis, besides resisting side strains and torsions, and, as a matter of practice, none but ductile tough iron can be rolled into a wide flange.

Test for Bessemer Steel Rails, 80 lb. per Yard. — Rails to be taken from each day's rolling, and placed upon bearings 3 ft. apart, when a ball weighing 10 cwt. is to be raised 10 ft., and dropped three times, when the deflection must not exceed 3 in.

Testing of Fish-plates for Rails.—1. Six fish-plates to be taken at random from one day's rolling, and bent to an angle of sixty degrees, without any sign of fracture. 2. Holes to be punched at a distance from the edge equal to the diameter of hole without bulging the metal at the sides.

Weakening Rails by Drilling and Punching.—An experiment is also mentioned by Hackney, in his "Manufacture of Steel." 1. A piece of rail with no holes in it stood a blow of one ton, falling 20 ft. 2. A piece of the same rail, with a punched hole through the web, broke under the first blow at a 3 ft. fall. 3. A piece with a drilled hole the same size, while it stood the first blow at a 2 ft. fall, broke with the second blow at a 4 ft. fall.*

A LOSS TO ITALY.

To a young country like Italy, just battling with the incongruous elements from which its unity is to be consolidated, nothing more to be regretted can occur than the loss of any one of her great and good men, the representatives of her past traditions,—grand examples of noble energy and patient working for the accomplishment of the regeneration and unity of their country. Italy now mourns one who, honoured as patriot, *savant*, and perfect Christian gentleman, has just passed away.

The Marchese Gino Capponi was born in 1792, in Florence, of one of her most ancient families. At the age of seven years his family, following the Fortunes of Ferdinand III., driven from Tuscany by the French, were exiled from Florence for four years, after which his life was devoted to study until the age of twenty-one, when he formed one of a deputation sent to Paris to offer assistance to Napoleon I., after the fatal battle of Leipzig. On the restoration of the House of Lorraine, he was made Chamberlain to the Grand Duke Ferdinand III. He afterwards travelled in France, England, and Germany, to gain knowledge and experience. When his country had need of his services, he left his studies to serve her as statesman, and from love of his country in 1847 he consented to form a Ministry. In 1848 the Capponi Ministry fell, to the great regret of all well-thinking men. He then retired into quiet life, giving his time to the study of history, to the publication of works of interest, and attempting to raise the intellectual tone of the minds of his countrymen. In 1859 he endeavoured to give friendly counsel to the Grand Duke when his wretched administration was threatening to stir up the people to revolt. On the accession of Victor Emmanuel, Capponi took his seat in the National Assembly, and voted with his colleagues for the abolition of the Lorraine rule, and the union of the small grand duchy to the subalpine kingdom, in the conviction that it was in the way of accomplishing the desired national unity. After the institution of the kingdom of Italy he was named senator. He had begun authorship in his twentieth year, publishing "Observations on the Critical Examination of the First Voyage of Americus Vespucius to the New World." From that time he never ceased writing and publishing important historical essays. His latest work, published last year, and of which a second edition appeared a few weeks ago, was the "History of the Republic of Florence."

From over-study, and reading sixteen hours a day, he became blind in his last years. In April next he would have completed his fiftieth year of membership of the Academy of La Crusca. Nothing of interest in arts, science, or literature but claimed his attention. He had been in his life the friend of Napoleon I. and the Count of Paris, Chateaubriand, Lord John Russell, Gortschakoff, and Thiers; had had relations with all the diplomatists and ministers of Europe during the last fifty years; had been the friend and intimate acquaintance of all the greatest men of talent

* To be continued.

in Italy and of his age. History was his principal study,—Italy the first in his thoughts and affections,—and he was one of the greatest promoters of her regeneration, by his words, his writings,—every act of his life.

His wealth enabled him to do good in his generation. He presided over many of the different artisans' clubs and societies. His funeral, which took place on the 5th, was attended by the representatives of every class in Italy,—from the King (by the Duke of Genoa), the army, navy, every college in Italy, academies of fine arts, the ministry, artisans, and every Florentine noble family, professors, and others.

His body was, after being embalmed, exposed in a *chapelle ardente*, to which were permitted to pass his friends and relatives,—a few hours before the long procession was formed to bear him to his last resting-place.

The loss of this man, of such distinguished intellect, and high, pure patriotism,—a man so good, so courteous, so loving to rich and poor, so grand an example to the rising generation of his country,—cannot be overrated. It might be considered less serious could Italy produce among her young nobles many who knew how to live and work, and give their lives for the good of their country, as he has done.

MOVEMENT IN INDIA.

THE Indian journals state that Maharajah Holkar imported a large Durbar room, made of iron, at a cost of 4,000*l.*, for the reception of the Prince of Wales at Indore.

The Behar people are determined to signalise the visit in a really worthy manner, and have already subscribed the handsome sum of 40,000*l.* for the establishment of an industrial school by which they intend to commemorate it.

Rai Dhunput Sing and Luchimput Sing, bankers of Calcutta, and Baboo Hurish Chunder, of their combined intelligence and loyalty, have offered to contribute, the former 40,000 rupees, and the latter 45,000 rupees, for the advancement of science.

When the Duke of Buckingham went to Madras it was supposed that it was merely as a stepping-stone to the Viceroyalty; but this error has been exploded, and his Grace already shows a disposition to become a really hard-working Presidential Governor. He has just made his first official visit to the Godavery Irrigation Works. This project was first sanctioned in 1844, and has only very recently been completed. At the head of the delta, at Dowlaiswaram, the deep bed of the Godavery river is 22 ft. above high-water mark, and the highest part of the delta requiring irrigation is 30 ft. above the same level. From Dowlaiswaram the river flows to the sea, on the crest of what may be termed a great natural embankment, which is from 6 ft. to 24 ft. above the level of the surrounding country. The bed of the river, therefore, only needed to be raised 10 ft. or 12 ft. to give the requisite head of water. This was effected by an anicut, or dam, at Dowlaiswaram, where the river is about three miles and a half wide. Advantage was taken of the existence of four islands, which saved 1,000 yards of building; but still it was necessary to construct a stone dam 130 ft. broad at the base, 12 ft. high, and two miles and a half long. The land is very rich, being composed chiefly of alluvial soil. There can be supplied from the anicut 12,000 cubic feet of water per second, during the high period of the river's volume, and 3,000 ft. at its lowest ebb. The former quantity may be depended on from July to October, when the paddy grounds are at their thirstiest, and consume a cubic foot for every forty acres per second. The delta, which contains about 2,000 square miles, is divided into three natural sections,—the first between Samalkota and the Eastern Godavery. Here the main line of the canal passes along the bank of the river, while two branches proceed to Samalkota and Cocanada. In the second section between the two branches of the river, which is of surpassing richness, a main channel passes down the left bank of the river, and at the eighth mile branches into two. The right-hand branch is again subdivided six miles farther on, and one line crosses a minor branch of the Godavery, by the Gunnaram brick aqueduct, constructed by Lieut. Haig, 2,248 ft. long, on forty-nine arches. The third section has a main channel, carried out for eight miles, when it breaks off into several branches, having a united length of 220 miles. Altogether there are 480 miles of main channels to irrigate 780,000 acres. In 1864, an extension of the Godavery line, completing the water communication between the Godavery and Krishna works, was sanctioned, and since then improvements have been executed from loan funds. The traffic on these canals, which are used for navigation as well as irrigation, is carried on by upwards of 50,000 boats. There is still room for much profitable extension of these great works; and it is to them that the new Governor of the Madras Presidency has first directed his attention.

While writing of Eastern affairs, we may note that the European residents of Shanghai intend to erect a memorial of the late Mr. Margary.

AN ART TRUST IN ABEYANCE.

AN application was made in the Rolls Court, Dublin, on the 9th of this month, that a scheme settled by the Court of Chancery in 1860 for the management of the charitable fund bequeathed by a Mr. George Archibald Taylor, might be varied. The abeyance of this trust is suggestive of some remarks, which are perhaps better unsaid at present. Mr. Taylor died upwards of twenty years ago, in 1854, leaving a sum of 2,000*l.* to be applied for the encouragement of art in the city of Dublin. His executors filed a petition for the settlement of a scheme which was carried out by the execution of a deed in 1863. This provided that prizes should be annually given to the most deserving art students in Dublin, who competed for them by painting pictures. Messrs. Charles Leech, Q.C., and John Chambers, the two trustees of the will, with two other trustees appointed by the Royal Dublin Society, aided by a person appointed by the Royal Hibernian Academy, were to act as judges. Now comes the strange part of the matter and management. It is stated that, from want of merit of the candidates and other causes, the fund has now accumulated to the sum of 3,044*l.* 15*s.* Government New Three per Cent. Stock. The amended scheme proposes that the annual proceeds of the fund should be applied to sending deserving students abroad to study under the best foreign masters, the Royal Hibernian Academy to retain a voice in the management of the charity, having the power to appoint a trustee. This scheme is opposed by the Royal Dublin Society, but only so far as it gives power to the Royal Hibernian Academy to appoint a trustee. At the conclusion of the hearing his Honour directed the matter to stand over, in order that further particulars might be obtained as to the working of the existing scheme for each year since 1863. He intimated at the same time that he thought there would be some difficulty in giving effect to the proposed new scheme. Here we have the case of a trust for art purposes lying waste and unapplied for the space of nearly a dozen years, while during that time the Government have been repeatedly solicited for grants, large or small, for the encouragement and extension of art and science in Ireland. It is a question if this trust will not come in for some attention on the part of the advisers of the Government in Ireland, pending the maturing of the State plans for the consolidation and enlargement of Dublin Metropolitan institutions devoted to science and art.

REPORT OF THE BOARD OF TRADE ON THE PRIVATE BILLS IN PARLIAMENT.

ON Monday last the Board of Trade presented its annual report to Parliament on the Railway, Canal, Tramway, Gas, and Water Bills to be investigated before the Committees during the present session. From this document it appears that the number of railway Bills promoted by existing companies is 90, to make 155 miles of new railways, with an aggregate capital of 21,487,365*l.*, and of this sum 16,335,075*l.* are proposed to be raised in shares, and 5,152,290*l.* by loan. Of these Bills 69 are in respect of English lines, 132 miles in length; 11 for Scotch lines, 18 miles long; and 10 for Irish lines, 5 miles; the capital for the English lines being 18,246,515*l.*; Scotch lines, 2,799,300*l.*; and Irish lines, 441,550*l.* The number of Bills promoted by new companies is 42, for the construction of 550 miles of railway, for which the capital proposed to be raised is 15,167,329*l.*, of which 11,343,000*l.* is in shares and 3,824,329 by loan. The Bills promoted by new companies for English lines is 35, to make 417 miles of railway, at a cost of 13,569,079; 3 Bills for Scotch lines, 35 miles long, cost 466,600*l.*; and 4 Bills for Irish lines, 98 miles in length, cost 1,131,650*l.*; the total aggregate capital proposed to be raised by existing and new companies being 36,654,694*l.* There are 5 tramway Bills, for constructing 25 miles, with a capital of 166,600*l.* Four of the Bills are in respect of tramways in England and 1 in Ireland. There are 40 gas Bills, capital 4,932,972*l.*, of which 37 are English, and 3 Scotch Bills. The water Bills are 29 in number, 25 being English, 3 Scotch, and 1 Irish Bill, with a proposed capital of 4,552,000*l.*, the general total being 206 Bills, for making 705 miles of railway and 25 miles of tramway, and the gross proposed capital for the several undertakings, 46,306,266*l.*

The applications to the Board of Trade for provisional orders to construct new works are 7 for tramways in England, 12 miles in length, capital 36,393*l.*; 12 gas supply, England, capital 238,916*l.*; 8 water supply, England, capital 138,500*l.*; and 3 gas and water supply, England, capital 37,500*l.*

Of the bills promoted by existing railway companies, the most comprehensive are those of the Midland Company, the proposed capital being 4,033,333*l.* for the construction of 16 miles of new railways, and other works and buildings on the company's existing lines. As regards capital proposed to be expended under the bills promoted by existing companies, the London and North-Western Company stands next in order, with a proposed expenditure of 2,066,800*l.*, for the construction of five miles of new railway, and various other works. The Lancashire and Yorkshire Company's Bill, capital 2,000,000*l.*, is for powers, amongst other things, to make seven miles of new railway, to enlarge their Exchange Station at Liverpool, and for other works. The Manchester, Sheffield, and Lincolnshire Company propose, under their Bill, to raise 1,333,300*l.* for new works; the North-Eastern, 1,332,000*l.*; the Metropolitan, 1,283,333*l.* (chiefly for the construction of the proposed line from Aldgate to Whitechapel, the Hammersmith and Walham-green line, and the Kingsbury and Harrow line); the South-Eastern, 666,666*l.*; Great Eastern, 640,000*l.*; Great Western, 600,000*l.*; London and South-Western, 501,858*l.*; London, Chatham, and Dover, 500,000*l.*; and the London, Brighton, and South Coast, 266,666*l.*

The Imperial Gas Company, by their Bill, propose to raise an additional capital of 1,408,000*l.*, 1,300,000*l.* in shares, and 108,000*l.* on loan; whilst the Bill of the South Metropolitan Company provides for raising 250,000*l.* in shares, and the same amount on loan.

THE MAINTENANCE OF PUBLIC BUILDINGS AND PARKS IN LIVERPOOL.

THE annual statement showing the income and expenditure of the Corporation of Liverpool during the year just ended has been published, and contains some interesting statistics as to the outlay on the several public buildings and places of recreation within the borough. From this statement it appears that the ordinary receipts during the year amounted to 225,609*l.*, and the extraordinary receipts were 61,268*l.* Of the ordinary income 114,754*l.* were derived from rates, 98,196*l.* from real and personal estate belonging to the corporation, and 11,966*l.* from the markets. The figures also show that there was a large profit on the markets, the receipts being almost double the expenditure. The baths and washhouses were also a source of profit, the receipts being much in excess of the expenditure. Some years ago the corporation erected a number of houses in flats for the industrial classes, at the north end of the town. These several blocks are situated in that part of the borough known as St. Martin's-in-the-Fields, and are called St. Martin's Cottages. The rents which they produced during the year just ended amounted to 1,606*l.*, out of which 725*l.* were expended, leaving a balance of 880*l.* Amongst other items the payments included 178*l.* for rates and taxes, 85*l.* for the superintendent's salary and clothes, 329*l.* for gas and fittings, and 108*l.* for general repairs. These figures may enable builders who know the premises, and their original cost, to calculate how far such property can be considered a profitable investment. We farther learn from the document that the expense of maintaining the town-hall, the municipal offices, and St. George's Hall and the Law Courts, was 9,823*l.*, after deducting 2,852*l.* received, and that the borough prison at Walton cost 24,432*l.* last year. The maintenance of parks and places of recreation and instruction



Steele's Cottage, Haverstock Hill.

involved an expenditure of 43,392*l.*, and in addition to that sum 3,443*l.* were spent on Sefton Park in the year, 1,147*l.* on Newsham Park, 1,578*l.* on the Botanic Gardens, 1,045*l.* on Stanley Park, 496*l.* on Wavertree Park, and 244*l.* on Sheil Park. The payments on "improvement" account amounted to 33,357*l.*

SOME OLD HOUSES AND THEIR STORIES.

SIR RICHARD STEELE'S COTTAGE NEAR HAMPSTEAD.

There is nothing very interesting in the appearance of that extremely modern row of shops, Steele's-terrace, which stands on the left as you ascend Haverstock-hill, on the way to Hampstead, and there is nothing even remotely suggestive of wildness and solitude in Steele's-road, at the corner of that terrace. Yet before that road was made, or those shops built,—that is to say, about ten years ago, when the low old-fashioned cottage which gave them their respective names was still standing,—rustic and picturesque elements were not altogether wanting, and visiting it one might still imagine what a wild, solitary, out-of-the-way place it was when Sir Charles Sedley came to it to die, and a few years afterwards when Sir Richard Steele sought it as a safe biding-place from importunate creditors.

In those days, that ancient little house must have seemed one of the most lonely and isolated of outcast buildings. Hidden by wild patches of woodland, lingering relics of the primæval forest of Middlesex, with great stretches of waste land surrounding it, and with large fields, meadows, gardens, parks, and several little villages between it and London, and with a road to it of the rudest and loneliest description, such as no horsemen dare venture upon in bad weather, and few would care to venture upon in any weather, the place must have been just such as a distrustful, gloomy, world-weary man might choose to die in,—just such as must have seemed most safe for any poor hunted wretch flying from the terrors of a debtors' prison when such terrors wore their ugliest and most cruel expression.

In one of the low-browed, wainscoted, quiet little rooms of this lonely house, on the 20th of August, in the year 1701, Sir Charles Sedley, the famous wit, was breathing his last. Shrinking from the future, and having no satisfaction in the present, he may have looked back, as dying men commonly do, upon his past; but neither comfort nor hope could he have found therein. It had been one long scene of folly, dissipation, debauchery, drunkenness, and crime, ending in political conspiracies and turbulent excitement.

He had been the most intimate friend and constant companion of one described in Chambers's *Encyclopædia of Literature* as "hospitable, generous, and *refined*," namely, Lord Backhurst, afterwards Earl of Middlesex and Duke of Dorset,—

> "Dorset, the grace of Courts, the muse's pride," *

a famous nobleman and wit, whose favourite joke had been the very refined one of displaying himself naked at a window, or, sword in hand, in the streets. And they twain had been the sworn friends and companions of brave, licentious, blasphemous, but, when worn-out and dying, at last penitent John Wilmot, Earl of Rochester, who died aged 33, who once admitted that he had been drunk every day for five years, and who wrote such elegant verses, and such excellent letters to his son on the duty all human beings owe to God, themselves, and their parents. With these great noblemen, upon whom the lord-loving writers of the last century heaped disgusting and fulsome flattery, which has been echoed and re-echoed ever since, and with Sir George Etheridge, Sir Thomas Ogle, and other "mad wags" of Charles II.'s "merrie" mad court, he had been guilty of almost every conceivable offence against society.

These mad wags were never so jolly as they were when in some tavern or brothel they met to boast in lewd songs and speeches their conquests over simple-minded, unsuspicious women, who had been good enough to think them truth-speaking, honourable men; and Sir Charles Sedley on such occasions outshone them all. Rochester wrote some lines which have been popular ever since, in which he admitted even his inferiority to Sedley in what he called the "prevailing gentle art,"—that is to say, in those gentle arts of refinement, lying, false-swearing, deceit, and treachery, whereby disgrace and misery are brought into honourable and happy homes, and loving, confiding girls are suddenly overwhelmed with horror and despair by finding—if we may speak it waggishly—"too late that men betray." Did the wasted forms and white faces, and mournfully reproachful eyes, of ruined women visit Sir Charles Sedley on his awful death-bed in this old cottage? Did he see them wringing their thin hands, and piteously wailing over God's tender-loving, blessed, heart-winning gift of beauty as one which he, Sir Charles, had impiously converted into a life-long curse? Men have seen and heard such things in the dark valley of death's shadow, and grown wild with fear and horror of future punishment. But we have no record of Sir Charles Sedley's last thoughts, or description of his passing away. We can only look upon the old house and think of probabilities.

It is also probable that through that awful silence of departed years the stern voice of Lord Chief Justice Foster may have come back to him as he once heard it when he stood a prisoner in the dock of the King's Bench Prison with my Lord Buckhurst scowling beside him, they being charged with a crime too gross for print. It was then a year of great national disasters and troubles—1663—and the Lord Chief Justice indignantly calling him "Sirrah," said, "It was for him, and for such wicked wretches as he, that God's anger and judgments hung over" them. This was bold speaking for even a Lord Chief Justice when he was addressing a "merrie" monarch's favourites, and it may have misled meaner men into supposing that in the cause of right against wrong they might do the like, which was a very serious mistake.

Pepys, alluding to a similar "frolic" in 1668, wrote,—"Pierce do tell me, among other news, the late frolic and debauchery of Sir Charles Sedley and Buckhurst running up and down all the night, almost naked, through the streets, and at last fighting, and being beat by the watch and clapped up all night; and how the king takes their parts; and my Lord Chief Justice Keeling hath laid the constable by the heels to answer it next sessions, which is a horrid shame"; and shows us how vast was the difference between a justice-loving Foster and a time-serving Keeling.

But other things more pleasant may have come back to the dying man in that lonely cottage on the steep, wild hill-side near London. He may have smiled faintly to hear the echo of his monarch's praise, for Charles II., with whom he was a special favourite, said he had obtained a patent to be Apollo's viceroy at the English Court. And a faint glow of pride may have quickened for a moment his congealing blood as he recalled the praises lavished upon his wit and courtliness by one who intrigued with heartless Lady Shrewsbury, and killed her husband in a duel, a spirit of kindred nobility and virtue, the Duke of Buckingham, who playfully called Sedley's power over female hearts witchcraft, which name, seeing the wickedness of it and the evil it wrought, seriously meant, would be not altogether a bad name for such a power, unless one preferred devil's-craft.

But it was perhaps neither the wickedness of his life nor the pleasures of it which occupied the old beau's dying thoughts. He had been proud of and had loved his daughter, and one of his friends, the king's brother, James Duke of York, High Admiral of that English fleet which the Dutchmen laughed to scorn, combined to do for his daughter what he—Sir Charles—had so often done for other men's daughters, and so brought home to him certain uncomfortable sensations and bitter feelings. Be sure thy sins shall find thee out. From that hour Sir Charles became a changed man, and when James Duke of Buckingham became James King of England, although Sedley's dishonoured and degraded daughter was elevated in rank and had become

* Pope, Prior, Congreve, Addison, Dryden, and others, wrote of him in a similar strain.

Countess of Dorchester, the one feeling dominant in the heart, and the one idea dominant in the brain of Sir Charles Sedley, was revenge. The poet and dramatist—for Sir Charles was both—abandoned everything for politics, attended Parliament regularly, was foremost in opposing the king's arbitrary proceedings, and when a conspiracy was secretly formed to dethrone his daughter's seducer, he was first amongst the noblemen and gentlemen who on various false pretences went over to Holland, and in conference with the Prince of Orange arranged the proposed invasion of England by the Dutch. He risked his life and devoted all his energies to the cause of political and religious freedom for his country, but with no higher motive, we fear, than the gratification of personal revenge,—a feeling which peeped out when grimly and wittily he replied to one who was curious to ascertain why he was so bitter and determined an enemy to King James,—"I hate ingratitude. The king made my daughter a countess; I will make his daughter a queen."

Curiously enough the very year of Sir Charles Sedley's death was that in which William of Orange—our William III.—being dead, the only surviving daughter of the exiled king, James II., was crowned Queen of England.

In that year, a merry, talented young Irishman, of English descent, was in the army, leading a life of riotous dissipation and licentious pleasure, when, determining to mend his ways, he published a little treatise called "The Christian Hero," with a design,—as he affirmed,—of making it the guide of his future conduct. This was Captain Richard Steele.

But Steele's life continued in its old evil course, and grew from bad to worse, and his "Christian Hero" only brought upon him the railery and mockery of his companions. So he published a comedy to do away with the impression that he wished to reform, and this, which was acted for the first time a few months after Sedley's death, he called "The Funeral; or, Grief *à la Mode*." It was represented successfully at Drury-lane, Cibber, Mr. Oldfield, Pinkelhman, and some other famous performers of the day, appearing in it.

"Steele," says Macaulay, who regarded him with no favour, "had left college without taking a degree, had been disinherited by a rich relation, had led a vagrant life, had served in the army, had tried to find out the philosopher's stone..... was one of those people whom it is impossible either to hate or respect. His temper was sweet, his affections warm, his spirits lively, his passions strong, and his principles weak. His life was spent in sinning and repenting; in inculcating what was right and doing what was wrong."

In 1709, on the 12th of April, when Captain Steele was in his thirty-eighth year, he began to publish the *Tatler* in concert with Swift, who some little time before had published some humorous pieces under the name of Isaac Bickerstaff. It was a very small sheet, and appeared three times a week. In 1709, when, as usual, he was in "difficulties," and was a Commissioner of the Stamp Duties, and held the post of Gazetter, fresh troubles arose. In August, 1710, he was for some little time locked up at a house called the Bull-head, in Vere-street. In 1711, Steele, although still in difficulties, was living luxuriously in a house he had built and richly furnished at Hampton-wick, adjoining the palace, which he called "The Hovel," on which, together with its furniture, he had borrowed of his friend, Addison, who could ill-spare the money, a thousand pounds to get him out of one of his constantly arising difficulties. Macaulay says, "Steele's negligence or dishonesty provoked Addison to repay himself by the help of a bailiff," and he adds, "we cannot join with Miss Aikin in rejecting this story. Johnson heard it from Savage, who heard it from Steele. Few private transactions which took place a hundred and twenty years ago are proved by stronger evidence than this. But we can by no means agree with those who condemn Addison's severity." Macaulay then goes on to excuse Addison by conjecturing, very picturesquely, what the real story may have been.*

But the curious thing here is that about the actual truth there never was any mystery. It appears in the original letters of Victor (1776), in John Nichol's collection (1787), in George Cunningham's life of Steele, and, in short, it has been given in print scores of times. Steele's extravagances were largely due to his possession of this house, and had, it seems, produced the usual result. About the time when the bond was forfeited, "Addison," says Victor, "dealt at this time with his friend, as he did afterwards with his favourite Sir Roger de Coverley, whom he deliberately killed, through fear that somebody might murder him." After the sale Addison explained his motive to Steele, in a letter sent with the surplus money, which Steele would otherwise never have received, and hoped that the inevitable ruin he was fast nearing might now be happily avoided. The story was told Garrick in a letter from Dr. Johnson, who heard it not only from Savage, but from Mr. Wilks the actor. Steele afterwards told the story to Garrick himself, and to several others, always recognising Addison's conduct as that of a true friend. It is rather an odd but not uncommon way this of ignoring or denying a fairly demonstrated fact, because some one has forgotten, or never read, or been too careless to give, its actual explanation. The *Tatler*, which had enjoyed immense popularity, ceased to appear after Thursday, January 2, 1710. Swift says, "Steele's last *Tatler* came out to-day. You will see it before this comes to you, and how he takes leave of the world. He never told so much as Addison of it, who was surprised as much as I; but, to say the truth, it was time, for he grew cruel, dull, and dry. To my knowledge he had several good hints to go upon; but he was so lazy, and weary of the work, that he would not improve them." In the taking leave referred to, Steele for the first time appears as himself instead of the Isaac Bickerstaff he borrowed from Swift. Everybody now knew who the real writer was, and disguise was useless. He said of the volumes already published (four),—"The general purpose of the whole has been to recommend truth, innocence, honour, and virtue, as the chief ornaments of life; but I considered severity of manners was absolutely necessary to him that would censure others, and for *that reason* and *that only* chose to talk in a mask. . . . I confess my life is at best but pardonable." Thus began and ended the first periodical work published in England.

In the same year and the following March Steele was again associated with Addison in the starting of a new literary venture, and once more in a mask. This was the famous *Spectator*. The year 1712 appears to have found poor Steele again pursued by duns. There was a difficulty at its commencement in paying even the domestic servants, and Gibbs, his butcher, had made himself so obnoxious that it was imperatively necessary that he "and two or three others" should be settled with immediately. Matters growing worse and worse, a hiding-place became necessary, and Steele suddenly disappears. The first clue to his place of seclusion, so far as we are concerned, crops up in a letter he addressed to Pope, which runs as follows:—

"*To Mr. Pope.* June 1, 1712.

Sir,—I am at a solitude, an house between Hampstead and London, wherein Sir Charles Sedley died. This circumstance set me a-thinking and ruminating upon the employments in which men of wit exercise themselves. It was said of Sir Charles, who breathed his last in this room,—

'Sedley has that prevailing gentle art
Which can with a resistless charm impart
The loosest wishes to the chastest heart,
Rouse such a conflict, kindle such a fire
Between declining virtue and desire,
Till the poor vanquish'd maid dissolves away,
In dreams all night, in sighs and tears all day.'

This was an happy talent to a man of the town; but, I dare say, without presuming to make uncharitable conjectures on the author's present condition, he would rather have it said of him,—

'Oh thou my voice inspire
Who touch'd Isaiah's hallow'd lips with fire.'"

The letter concludes by some critical comments upon the poem from which the above last quotation came. Pope replied in a pedantic solemnly commonplace epistle.

We have no clue to the length of time Steele continued in this solitary cottage, but it was long enough to cause it to be traditionally associated with his name from that time to that at which it was removed, and to ensure the memory of its site in the name it gave to the road it stood in and the neighbouring terrace. It is probable that his discovery of the house and residence in it may have been in some way connected with the Hampstead rambles of the famous Kit-Cat Club, which was established in 1703; for there are some traditions of its more famous members calling at this house in "a solitude" to bring Steele away with them to join merry meetings at the Upper Flask on Hampstead Heath, another old house of which stories are told, and one which is still, we believe, in existence.

* Macaulay's Essays, July, 1843, on "The Life of Joseph Addison," by Lucy Aikin.

THE NEW THEATRE OF DÜSSELDORF.

Among the many new constructions either completed or still in course of progress at Düsseldorf, the new theatre, of which we give a view, is, perhaps, the most important erection, and one exciting the greatest interest. The old theatre, on the Market-place, having been found entirely insufficient for the requirements of the town, the plan of building a new and larger one was conceived nearly fifty years ago; but various causes have delayed its execution till now, the old theatre being meanwhile several times altered and enlarged. The new house is situated in one of the best parts of the town, close to the entrance of the beautiful Anlagen (ornamental grounds), and has been built after the plans and under the direction of the architect, Professor Ernst Giese, of Dresden, while several Düsseldorf architects were entrusted with the supervision of the works. The building is in the Italian Renaissance of the Dresden school, the originator of which was Professor Nicolai. The works were commenced in September, 1873, under great difficulties, caused by the influx of water and the remains of the old fortifications of the town. The latter, as far as they were not used for the foundations, had to be removed by blasting, to make room for the substructures of the 144 piers upon which the building rests, and which are connected by strong arches. Notwithstanding these obstacles, the superstructure was commenced in April, 1874, and by September, 1875, the building was covered in. The work of finishing the inside having been rapidly pushed forward, as well as that of decorating the inside and outside—which latter, however, is not expected to be completed for some time—the formal opening performance took place on the 29th of November last.

On entering the theatre, a handsome vestibule, designed in a sober style, makes a pleasant impression. Here are the cashiers' places for boxes and stalls, pit and gallery; flights of broad stairs at both sides leading to the pit; and decorated caryatides, executed by the sculptor, Karl Hilgers, a young Düsseldorf artist. The *foyer*, enriched by mural paintings, is over the vestibule. Two refreshment-bars are to be placed here. Stalls and pit are on the usual plan of a gradual rise towards the back, offering a full view to all the spectators. There are three tiers of boxes, each tier with a separate staircase and exit, and provided with cloak-rooms.

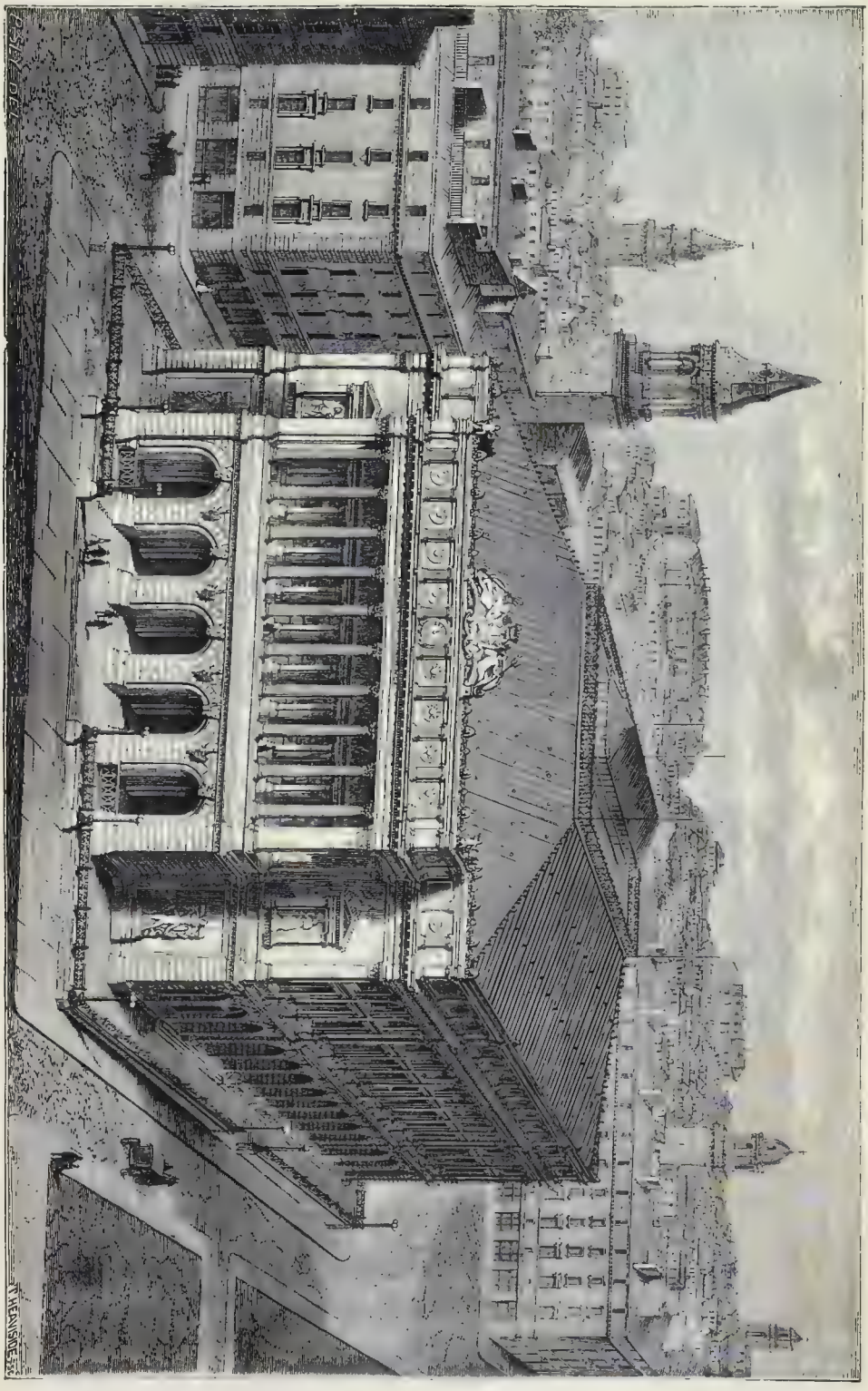
The house is constructed to accommodate 1,500 spectators, the old building holding only 800 persons. In the orchestra, ample room is provided for fifty performers, and—a novel feature—a tuning-room at each side. The acoustic properties of the theatre are said to be excellent, and the same is affirmed of the warming and ventilation. The theatre is warmed by Reinhardt's hot-water apparatus (*coliferes*). The foul air is drawn in by conduits, and escapes through them over the roof. Ventilation in summer is to be secured by a plentiful supply of fresh air being conveyed to all parts of the house. In short, all modern appliances of the most approved pattern are made use of; but we do not pledge ourselves that they are successful.

The stage is just over 50 ft. deep and 72 ft. wide, the width of the proscenium being 33 ft. 6 in. It has been constructed under the direction of Herr Brand, of Darmstadt, and is provided with machinery of the latest construction, amongst which are two sets of flying apparatus. The curtain is being executed by the historical painter, Ernst Hartmann, but it will not be completed until the opening of next season. Thus the seat of art on the Rhine has been provided with a theatre worthy of its importance.

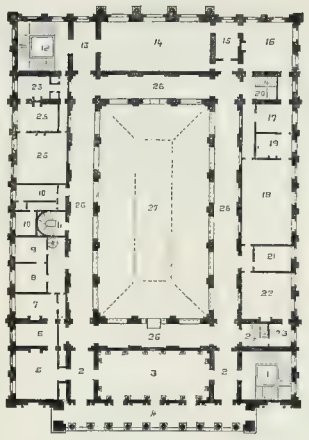
Ventilation at the Royal Institution.—Sitting among the audience when Professor Huxley was lecturing at the Royal Institution a fortnight ago, we were much impressed with the very defective state of ventilation of the lecture theatre, and somewhat surprised to find that those who undertake to instruct the public in the matters of science and hygiene should be so careless of the health and comfort of their members and friends. The draughts were frightful. There is another Royal Institute whose meeting-room is, to say the least, very inadequately ventilated.



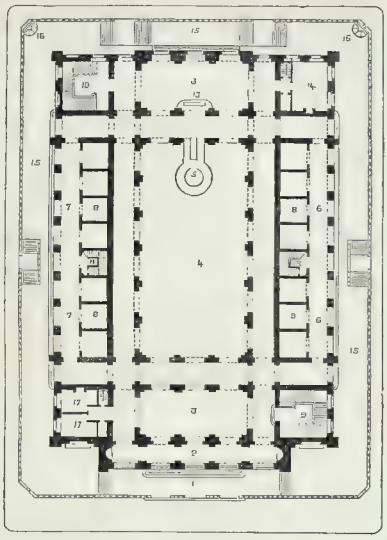
THE NEW THEATRE IN DUSSELDORF.—Professor Ernst Giese, Architect.



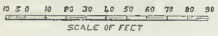
THE "PALAIS DE LA BOURSE," MARSEILLES.—M. PASCAL COSTE, ARCHITECT.



FIRST FLOOR



GROUND FLOOR



THE BOURSE, MARSEILLES.——*Plans.*

Ground Floor.

1. Principal entrance.
2. Porch.
3. Waiting-hall.
4. Grand hall.
5. Brokers' rostrum.
6. East portico.
7. West portico.
8. Brokers' offices.
9. Stairs of the Room of Commerce.
10. Stairs of the Tribunal of Commerce.
11. Stairs of the entresol supper floors.
12. Stairs of the entresol only.
13. Auction rostrum.
14. Brokers' settling-room.
15. Terrace.
16. Latrines.
17. Naval and commercial intelligence.

First Floor.

1. Stairs of the Chamber of Commerce.
2. Ante-room.
3. Grand assembly-hall.
4. Colonnade and balcony.
5. Ordinary meeting-room.
6. Library.
7. Principal secretary's room.
8. Assistant secretary's room.
9. Keeper of records.
10. Treasurer.
11. Housekeeper's stairs.
12. Stairs of the Tribunal of Commerce.
13. Vestibule.
14. Tribunal of Commerce.
15. President.
16. Hall of deliberations.
17. Judge's dressing-room.
18. Second room of the Tribunal of Commerce.
19. Hall of deliberations.
20. Record office or clerks' stairs.
21. Barristers' library.
22. Audience hall of creditors.
23. Creditors.
24. Stairs of committee of naval assurance and Lloyd's.
25. Syndicate of brokers.
26. Gallery.
27. Upper part of great hall.

X. Clock.

THE BOURSE AT MARSEILLES.

THE good people of Marseilles have for some time past, apparently, been troubled by the deficiencies of their city, one of the oldest in France (it claims a history of twenty-six centuries), in regard to public buildings, and especially those dedicated to the transaction of business. To quote from the address delivered by M. Fabricius Paranque, president of its chamber of commerce, on laying the foundation-stone of the "Palais de la Bourse," of which we now give illustrations,—"One would suppose that the business men of Marseilles, uncertain and fearful about their future, had, like travelling merchants, thought of nothing more than putting up their tents in a hurry, to take them down again the next day and pursue a new course of adventure. London, Antwerp, Odessa, Bordeaux, Nantes, Havre, all the great commercial cities, show with pride to their visitors the buildings which attest their wealth and prosperity. Marseilles, their fortunate rival, presents to the travellers who are attracted by its beautiful climate, its ancient origin, its admirable situation, and its commerce with all parts of the globe, nothing which in this respect is worth their attention. Cathedral, public library, palais de justice, museum, post-office, custom-house, bourse, tribunal of commerce, are all provisional only, are all yet to be built; everywhere there is an absence of grandeur and *éclat;* if it were true that the prosperity of a great city were to be judged of by its public monuments, Marseilles must at once resign itself to a descent into the rank of second-rate towns."

The "Palais de la Bourse," completed a few years since, must therefore, we presume, be regarded as the first decisive effort of the Marseillese to give to their city the outward aspect of a first-class commercial centre. The building was constructed under the auspices of the Chamber of Commerce, opposite the Place Royale, after the plans and designs of M. Pascal Coste, architect. The works were commenced in 1854, and finished in 1860.

The "*salle principale*," for the interchange of commercial transactions, comprises an area of 1,120 mètres, being considerably larger than that of the Bourse at Paris, which is only 1,020 mètres in extent. The ground-floor of the building includes a portico, two grand and secondary staircases, and offices in connexion with the business of the various commercial and maritime departments. The first-floor contains the Chamber of Commerce, with its accessory departments; the Tribunal of Commerce; the stockbrokers' exchange, &c. The second-floor is devoted to the record-office of the tribunal, the offices of the commercial agents, the maritime and insurance offices, Lloyd's agent, and the principal secretary of the Chamber; while the attic stage serves for the archives of the Tribunal of Commerce, and for living-rooms for various *employés*. Of the two principal floors we give plans.

The building is situated at the lowest part of the town, near the port, and the provision of a satisfactory foundation was a matter of some labour. A layer of ancient *débris*, 4 ft. or 5 ft. thick, was first penetrated, when a quantity of water from a hidden spring overflowed the site; this being eventually got under by pumping, a stratum of mud some feet thick was next penetrated, when a bed of clay was reached, which, with the assistance of a good deal of piling, gave a secure foundation for a first layer of rough concrete, upon which again a bed of cement concrete (the two concrete beds together forming a thickness of nearly 10 ft.), received the stone footings for the vaults of the basement.

The aim of the architect in regard to the principal front has been (we are informed) to give a monumental character by massing the decoration and reducing, as far as permissible, the size of the windows, "*nuisibles ordinairement à l'effet d'un monument.*" We do not hear how those who live and work in the rooms are satisfied as to the matter of light, which is an important consideration, though the remark as to the effect of over-large windows on a design of this character externally is true enough. The sculptured ornament has mostly been designed with direct reference to the objects of the building. The keystones of the large arches of the principal façade contain designs representing the attributes of Commerce, Navigation, Astronomy, Agriculture, and Industry. Under the tympana of the arches are sculptured the prows of vessels. Under the portico are placed, in niches, marble statues of colossal size, representing "France" and "Marseilles," by M. Ottin, sculptor. On the recessed portion of the façade are two bas-reliefs by M. Guillaume, sculptor (member of the Institute), representing respectively the genius of Navigation and of Commerce and Industry. Above the range of windows on the first floor, behind the colonnade, is a bas-relief above 80 ft. in length, representing "Marseilles" seated in the centre, receiving the peoples and products from the Mediterranean, and from beyond the ocean. On the right, arriving by way of the pillars of Hercules, are figures representing Africa, America, England, Scotland, &c., distinguished further by the presence of animals typical of the various countries. On the right, supposed to come by the Isthmus of Suez, are figures in like manner, bringing the products of China, India, Arabia, Egypt, &c. The whole is executed by M. Toussaint, whose name is a guarantee for the artistic excellence of the work. The statues on the recessed portion of the front on this level represent Enthymenes and Pitheas, names of

ancient Phocian navigators of the Mediterranean; these are by M. Ottin. Above the central colonnade the attic is ornamented with circular panels between the pilasters, inscribed with the names of celebrated navigators: La Pérouse, Tasman, Gama, Columbus, Magellan, Cook, and Durville; the centre panel being occupied by a clock face. The whole is surmounted by the arms of Marseilles, supported by the "Ocean" and the "Mediterranean." The two angles of the balustrade support winged children, representing "La Force" and "La Paix." These are connected by a range of antefixæ consisting alternately of a male head with an oak-leaf chaplet and a female head with an olive wreath. All this portion is the work of M. Toussaint.

It will be seen that no small thought has been given towards rendering the sculptured decoration appropriate, and giving it a distinct meaning in reference to the building. The back and side elevations are treated with more simplicity, not merely as being less seen, but as being devoted more to the mere practical business operations carried on in the building, and, therefore, not calling for such decorative treatment. The great hall, before alluded to, repeats in its decoration something of the ornate character of the principal façade. The keystones of the lower arcade are inscribed with the names of the countries with which Marseilles has its principal commercial relations. The floor is paved with black and white marble; the ceiling is decorated very richly, including ten allegorical bas-reliefs, referring to different crises in the legendary, religious, political, commercial, and diplomatic history of the city. The subjects represented are "Commerce receiving the Plans of the Palais de la Bourse" (over the entrance), and opposite to this is "*La Justice Consulaire.*" The remainder, which follow historical order, are as follow:—"The Foundation of Marseilles"; "Marseilles Christianised"; "The Departure for the Crusades"; "The Re-union of Provence with France"; "The Capitulation of Francis I. with the Levant"; "The Chamber of Commerce paying [*soldant*] the Consulates and the Scientific Expeditions"; "The Conquest of Algeria"; and "France receiving the Trophies of Conquest in the Crimea and Italy." The artist, M. Gilbert, has kept his work in strict subordination to the lines of the architectural design, and has contrived to blend the whole into a harmonious unity of effect. The rooms of the Chamber and of the Tribunal of Commerce are also decorated with wall paintings.

All the ornamental carving was executed by Parisian ornamentists; that of the exterior by MM. Thiebaud, Corbel, and Cottebrune; that of the interior by MM. Baleitz and Armand.

The total cost of the building was 3,200,000 francs, and that of the site, including amounts paid in compensation to owners, 4,800,800 francs, making a total of above 8,000,000 francs (320,000*l.*), of which the whole, except a subscription of 600,000 francs from the town, was borne by the Chamber of Commerce of Marseilles.

M. Coste, the distinguished architect of this building, now in his eighty-ninth year, is a great lover of Egypt, and has recently prepared a charming set of drawings for a church designed in the Egyptian style, rather, probably, to show its adaptability than with any probability of having them carried into execution.

CONVERSION OF THE HOLBORN AMPHITHEATRE.

The present rage for skating-rinks in the metropolis has extended itself to the spacious amphitheatre in Holborn, which has hitherto been devoted to equestrian and dramatic performances. The interior of the building is at present undergoing a complete transformation, with the view of adapting it to the purposes of a skating-rink, and also for promenade concerts. The spaces under the boxes, formerly the pit, have been thrown into the "ring," and the entire floor is being laid with concrete, 12 in. in thickness, which will be covered over with Portland cement, forming the facing of the floor of the rink. It will be 70 ft. in depth, with an average width of 60 ft., and will contain a skating area of about 4,000 superficial feet. A skirting, 4 ft. in height, is carried round the rear boundary-wall of what was the pit, together with seats for the skaters. That portion of the stage at the north end, immediately adjacent to the ring, has been converted into a refreshment-bar, whilst on the remaining portion of the stage space at the rear, an orchestra has been erected, uniform in height with the boxes, and also having a frontage corresponding with them. The ceiling is being raised, and skylights introduced, in order to give additional light to the skating-rink below, and is also undergoing an entire re-decoration. For the purpose of rendering the building suitable for the intended promenade concerts, all the partitions dividing the boxes have been removed, and the entire space thrown open for promenading. The whole of the interior is likewise being decorated, and the pillars, cantilevers, and ornamental figures round the boxes re-painted and gilt. The works in progress are to be completed, and the building opened for its new purpose, in a fortnight.

The alterations are being carried out under the superintendence of Messrs. Furber, Price, & Furber, of Warwick-court, and the contractor is Mr. E. Lawrence, Wharf-road, City-road.

DREDGING AND HARBOUR WORKS.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting of the session held on February 8th, Mr. Geo. Robt. Stephenson, president, in the chair, the paper read was on "Carlingford Lough and Greenore," by Mr. Jas. Barton, C.E. It was stated that the mouth of Carlingford Lough was sheltered by a natural breakwater of rock, leaving a channel about 700 ft. wide. Across this channel a bar of blue clay and boulders had existed previously to the works described, the depth of water being only 7½ ft. at low tide. Within the Lough the water was more than 18 ft. deep at low water over an area of 1,200 acres, affording safe anchorage. Although the cutting of a channel for navigation through this bar had been recommended by the Tidal Harbours Commissioners and by the Refuge Harbour Commissioners, it had not been carried out as a public work, but was undertaken locally under the Piers and Harbours Act, and was authorised by Parliament in 1864 to be executed by a Board of Commissioners, for which purpose a sum of 80,000*l.* was lent by the Public Works Loan Commissioners on the security of expected tolls. The exposed position of this work was somewhat unusual for dredging. The number of days in the year when the weather permitted the dredging to proceed varied from a minimum of sixty-seven in the year 1871, to a maximum of 131 in 1873, and upon many of these days the work was limited to two or three hours. The materials raised per season varied from 50,000 tons to 99,720 tons; the clay was generally blue and plastic, with boulders embedded, varying in size up to 4 tons in weight. The dredging plant had been specially designed, and was constructed by Messrs. Simons & Co., of Renfrew: it dredged in water 35 ft. deep, and lifted stones up to 30 cwt.; the larger ones were chained by divers and raised by a crane on the vessel's bow. The average lift for all days on which the dredger worked, whether one hour or sixteen hours, had been 850 tons; the maximum tonnage raised in one day was 4,000 tons. Some rock inside the Lough had been removed by first blasting on the surface with dynamite, and then dredging the broken-up rock. The channel already formed was 18 ft. at low water of spring tides for a width of 300 ft., and a further width of 50 ft. at each side had been cut to a depth of 14 ft. at low water. The channel was intended to be 600 ft. wide, and 18 ft. deep at low water. The cost of the works, including insurance of plant and Parliamentary contests, &c., had been approximately 1s. 9d. per ton. The cost of the actual work for any one season varied from 1s. 4d. to 1s. 6d. per ton. Two leading lighthouses had been erected to guide vessels through the channel, which was about three-quarters of a mile long. Within Carlingford Lough a point stretched out to the edge of deep water from the south side called Greenore, and here, three miles inside the bar, a marine station had been constructed and a railway to it formed from the Irish North-Western Railway at Dundalk, and another was in process of construction from Newry. This point afforded special facilities for a fixed hour steam service to Holyhead and elsewhere. The works at Greenore had been designed to provide for the convenient loading and unloading rapidly of steamers, with passengers, cattle, and goods, and to provide for the necessities of each kind of traffic. The front of the land end of the wall below low water was formed of concrete blocks of about 3½ tons, set by divers, and the back face of the wall had been formed of concrete in sacks, containing about 1 cubic yard each, put down soft, and built in courses; and the hearting was of concrete deposited soft. The foundation at the sea end had been formed of concrete blocks of 100 tons each, built upon the beach above low water in frames, and lifted, carried, and lowered between two barges by special machinery worked by hand. Two of these blocks, one upon the other, formed a length of 10 ft. of the wall up to low water. Above low water the wall had been built of heavy rubble limestone masonry, and it was fendered throughout. The cost of the works at Greenore had been 130,000*l.* The cost of the quay wall, 45 ft. high on an average, had been, including extras, 27*l.* 8s. per lineal foot. The concrete used was one of Portland cement to six of sand, gravel, and stones. The cost of the concrete blocks of 100 tons each, when set, exclusive of barges and machinery, had been 30s. per cubic yard. That of the concrete built in the back face of the wall in sacks had been 23s. per cubic yard, while the cost of the liquid concrete set in the foundations had been 18s. per cubic yard.

THE DEGRADATION OF THE PAINTER ON GLASS.

Sir,—Recent events having directed attention to the above important subject, I take the liberty, through your columns, of adding to the material for forming conclusions thereon a few reflections from a workman's point of view. As far as I have been enabled to gather, from expressions in public journals and other sources, those who have at heart the renaissance of art in England are persuaded that the two great levers to move to that end must be the education of workmen to produce art-work, but primarily, a much more urgent measure,—the education of public taste to create a demand for the same. In reference to the art-education of the workman, a great outcry has been raised of late concerning his technical instruction, doubtless a great desideratum, and which, when attained, will result in his and his country's benefit; but at present the main result has been the providing a cant phrase and rallying-cry for a handful of persons, who, self-appointed and self-accredited with superior attainments, set themselves on high to teach and raise to their standards their fellow workmen. For the comfort of the working-man patrons in a higher sphere, for whose motives one must perforce entertain the profoundest respect, I would humbly suggest an entirely new and much more promising field for a missionary enterprise of an æsthetic kind, namely, their own saloons, drawing-rooms, and clubs, where they could instruct their equals in the primary elements and ethics of fine art, educate their eye to detect at a glance the pure gem from the *Brumma-gem*, and teach them how nobly and wisely to expend the wealth they are so ready to lavish uselessly at the dictate of fashion. There can be no vigorous permanent reaction in an art direction until we "reform this altogether." This brings me back to the consideration of the question that when this general demand for real art in the homes, the churches and private chapels, and public halls of the richest aristocracy on earth is made, is the English workman capable of meeting that demand? Has he, since the establishment of Government schools, and the impetus given to other schools of art, sufficiently availed himself of such opportunities of improvement in his general art-training as to compete successfully with the Continental workman in his own branch? In stained glass, for instance, is the present alleged low ebb of its art element to be attributed to the workman's inability to produce better work, the absence of any demand for a higher class, or the incapacity of the draughtsman to design it?

On this head some light should be thrown by an important statement of a great authority on the subject given recently in a court of justice. This was in an arbitration case on a dispute as to the price of some fine-art work on glass, between Lord Beaumont, customer, and Messrs. O'Connor & Taylor, producers; heard before Sir Frederick Pollock, at his Chambers in Chancery, at the Court of Common Pleas, verdict being given on the 28th of January last. At the previous hearing, on the 20th, the witness in question affirmed on oath that in the execution of a stained-glass window the design and drawing were the main predominant consideration,—so much so, as to comprise half the cost of the whole; thus the other half includes collectively cutting, glazing, firing, fixing, cost of material, profits, and painting. He further laid it down

as his solemn dictum that glass-painting in itself was the merest, most mechanical of operations, requiring no art-knowledge whatever, and for which the lowest order of intelligence amply suffices, as it consists simply of the transference of the pattern on to the glass. Further, that a highly-finished piece of work shown in Court he would have given to boys or improvers to do (although he declined to name the price at which such mechanism should be paid). These may not have been that gentleman's precise words, but they are undeniably the substance of his remarks, and are completely consonant with his favourite axiom, of "the bigger the fool the better the glass-painter." This delicate sentiment has all the more weight when we consider that, though we gladly acknowledge our censor to be a splendid draughtsman (as far as such mechanics may presume to judge), still this severe critic of the art of glass-painting has not succeeded yet in painting one square foot of glass. And, for all he has proved to the contrary, cannot do so.

On which side this evidence referred to was given is, I am constrained to admit, rather vague, for all that can be learned from every source leaves the absurd, painful, and confused idea that at different periods of the case it was given in favour of both. Perhaps it was this too subtle refinement of truth that closed the sight of justice. Be it as it may, after a long poise of the scales,—eight days' consideration,—Sir F. Pollock gave judgment directly in the teeth of this evidence, the acknowledged position of the witnesses notwithstanding.

Now, Sir, being but one of these mere mechanics, it cannot much matter what my opinion may be, save and except as affording a still further illustration of that bitter class-feeling which exists; for to affect to feel insulted by the remarks referred to would be the height of ludicrous vanity and presumption. Therefore, from the vantage-ground of our utter insignificance, I take upon myself, in the name and with the concurrence of the main body of glass-painters (what few there are of us), and especially of the extra skilled hands and figure-painters, to deny simply the very essence of the statements referred to; and confidently challenge both him who uttered and those who coincided with them to substantiate their truthfulness. I am happy to think that not the workmen alone, but many employers, are fair and honourable enough to agree with Sir F. Pollock and a Royal Academician who gave evidence, in refusing such statements as being as mischievous as false, and as injurious to the workmen employed as they are dangerous to the present and future prospects of the art of glass-painting. For consider, Sir, a moment: stained-glass windows, not being a primary necessity of existence, are a luxury, or nothing; and if a luxury, their very existence must depend on the art-element retained in their composition and treatment. Had the startling anomaly been predicted of an attempt to restrict, to debase, and degrade, or altogether exclude, such element, it would have been ascribed to some soulless dealer or manufacturer ignorant of the very nature of the art by which he lived; but the man's sanity would have been seriously questioned who prophesied that the deadly blow would have been aimed by the very arm which should most have shielded her from such an attack. That not only the largest manufacturer of this class of goods goes out of his way to cry down his own wares; but he who is loudest in detraction and scornful denial of the existence of an art element, is the very man accredited with being *the first artist in its production*. And for what object are these statements uttered? What is the aim and end of such stultifying policy? Simply to take the last vestige of credit that might possibly still appertain to the *painter* in order to add a little more honour and glory to the inordinate claims of the *draughtsman*. No glass-painter wishes to claim any sort of share in the honours justly due to a good draughtsman, or underrates a good design for glass (a good drawing is much too scarce an article in most establishments not to be fully appreciated); but this design, however artistic and original, has to be got on to the glass somehow. It cannot be printed,—at least they do not print figures yet. The system pursued by some manufacturers, interested in sacrificing any art-element to the commercial consideration, has been pretty successful in eliminating any trace of a mind in a workman's work. By a combined method of ultra-subdivision and unremitted snubbing he is pulled down to as low a mechanical level as is compatible with being human at all; but, unfortunately, when as much individuality as dare show itself is carefully ground out of him, there still remains an awkward sediment, a *residuum*, that deludes him with the idea that he could distinguish his own copy from the other school-boy's; which reminds me respectfully to inquire as to what is mere reproduction? A translator or an actor merely reproduces the original poem or the playwright's text? An engraver reproduces; and yet is conceded to be an artist, and takes academical rank with the painter, whose picture he merely reproduces. Without multiplying instances, a dozen analagous occupations must suggest themselves that are neither pure art nor simple manufacture, but art-ware, wherein the manufactured article depends entirely for its value on the workman's ability to merely reproduce the original design on the final material. As in glass-painting, for instance, it may be pertinent to point out that, after all, the customer buys the glass and not the drawing. He gets the essential material, just as the workman leaves it; something specially done for him, and which cannot be used again for another customer. Whereas, a drawing, if considered good, *i.e.*, although incorrect in anatomy, disproportioned, artificial, and strained in pose and utterly void of expression, yet in strict conformity with some shadowy standard of style, is used for as many windows as it will fit up to twenty or thirty on a fair average, or may be the said drawing is a bare, bald, reduced, or enlarged copy of one of those Mediæval ideals by a draughtsman apprentice or improver, in which case the drawing is used just once,—too often, in short,—irrespective of the fact that to successfully reproduce a good design requires skill, knowledge, long practice, and some art-knowledge and feeling for what beauty the design may possess. So, conversely, a bad workman can spoil, for all art purposes, the best design, by simply *copying* it, mechanically and lifelessly, independently of such self-evident truth, whosesoever interest it may be to deny it. It is notorious that the best hands in many glass-painting establishments are much more frequently occupied in supplementing the inefficiency of the professional draughtsman, by putting on to the *glass* the art element that alone gives it its value, and which it possesses in exact proportion as the drawing is ignored and departed from. On the other hand, a figure drawn carefully from life or a portrait (often painted on glass from a small *carte*, or an enlarged drawing, *not safe to follow*) makes separate calls on the ignorance and incapacity of the painter, the reproducing machine. Whilst the best specimen of any period of old glass is justly admired for its mere manipulation, the same generous critics and artist-employers coolly tell the world no modern workman could produce such work; and they take care that, under the grinding and soul-slaying system they adopt and would justify, he never shall. Surely the eminent contractor for this class of goods (for as all the art is in the drawing, and the public only get the glass, this is the right term), and those who abet him, cannot have considered what the ultimate tendency must be of their own teaching; for from the prestige attached to their names and positions, only too many would be glad to credit their allegations, which, in my presumptuous estimation, simply aggravates the injury. We sincerely hope they will reconsider their position, not under any such pressure as the protest of the workmen aggrieved, but as the result of their own deliberate conviction, based on something a little nearer to truth and justice than the dictum complained of, otherwise their conduct will bear the unfortunate construction of taking the opportunity referred to to offer a gratuitous insult to a class of men whom they consider it quite safe to treat with open contempt; and that in defiance of all modern movement towards art education, against the strivings of national art-teaching, in mockery of the efforts of all enlightened patrons, in derision of the workman's struggle for self-improvement, and directly contrary to every recent expression of imperial policy.

A GLASS PAINTER.

Fine Art at Cambridge University.—The Slade Professorship of Fine Art at Cambridge having become vacant by the expiration of the three years for which the appointment is made, a meeting was held on the 12th inst. for the appointment of a successor to Professor Colvin. Professor Colvin, being eligible, was re-elected without opposition.

UNHEALTHY OCCUPATIONS.

DR. RICHARDSON delivered the concluding lecture of this series on the 4th inst. He said that it was his intention to consider that evening the remedial measures which might be adopted to check the apalling number of deaths resulting from the unhealthy occupations he had described in his previous lectures. He would repeat what he had before said on this point,—that many of the diseases could be arrested by science if she was assisted by a wise legislation, and others by science unaided by any legislation at all. From various sources it had been shown that the abridgment of the hours of labour had not had an entirely beneficial effect on the working-classes, for it had frequently led to more drinking and to such pursuits as pigeon-flying and dog-racing, and it was certainly not always conducive to an increase of home comforts. He had shown in his preceding lectures that the death-rate among the five millions of the working classes was at an appreciable increase over that of the ordinary population of England, and in view of this he considered that there should be a Minister of Health added to our Government, with a seat in the House of Commons, in order that he might always answer questions pertaining to his department. He submitted that at the present time all matters connected with the public health were in a most chaotic state. There were now distributed over the country 900 duly appointed factory surgeons, but their duties and powers were of the briefest and most unsatisfactory nature, and their chief work seemed to be the examination of the younger workers in order to see if they were old enough to be allowed to enter a factory. They had no power to look into such matters as the ventilation of workrooms, the proper clothing for the persons engaged, and their protection from disease in other ways. He would wish to increase the powers vested in the hands of these medical officers in order that matters of so much importance as he had named should receive due attention. He also would suggest the extension of the Bill for the construction of healthy homes for the working classes, and, again, he would like to see instituted a perfect system for the registration and comparison of the different descriptions of diseases by which the working classes were afflicted. He was satisfied that the results of such a system of registration would be most useful, and that no more difficulty would be experienced than in the compilation of the ordinary tables of mortality. Then science could do much for the health of the working classes if the men and women engaged in unhealthy occupations would but consent to use the protective appliances with which they could be supplied. He regretted to say that in many cases the workpeople were utterly neglectful of their own healths and lives, and had refused to wear the masks which had been constructed to prevent the inhalation of the dust and other substances which were so prejudicial to their health. Many ingenious inventions had of late years been made for the improvement of these respirators or filters, and their use had been invariably attended with beneficial results. It seemed at first sight to be a simple matter to make an efficient mask to exclude the dust and yet be thoroughly wearable and reliable, but it was a more difficult matter than it appeared. For not only must there be provision for free admission and for free expiration of air, but the mask must be of such materials as would not permit any accumulation of the moisture, as this rendered the appliance nearly useless. Very many respirators have been made with cloth, crape, and cotton wool as the filtering medium, and were in actual use among workers with good effects, but they would be found useless in many factories. After long research he (Dr. Richardson) had found that the most perfect filtering appliance that could be used was feathers, provided the feathers were not made into the form of a mat, as, if they were so used, they arrested the moisture which was expelled in the breath, and became useless. He had therefore constructed a mask in which the feathers were placed loosely around a tube pierced with holes for the admission of air, the mask being also provided with valves which allowed a free passage for the expiration of the breath, and had found this form to answer very well indeed, as it arrested the finest dust, and yet did not allow any moisture to remain on the respirator. Dr. Richardson then demonstrated the successful nature of his appliance by a conclusive experiment with corn-flour, and said that he hoped to see feathers soon

largely used as respirators by workers in factories where dusts were found to be injurious to health. He would further say, in concluding his remarks on the subject, that the question was one of truly national importance, and deserving of the closest attention, for how to render the lives of industrious toilers in our great country more healthy and more real was a matter which should be of absorbing interest to all. He considered that the whole of the industrial class was physically, and therefore morally, unhealthy, and in this state it existed, as rich men commonly existed, reckless about itself and mistrustful of all connected with itself. Greater attention should speedily be paid to the external conditions of its existence, and if the Society of Arts could succeed in opening the eyes of the Government on this important subject, it would, he thought, add to the number of those great works for which during the last century it had laboured with such entire devotion.

Mr. Benjamin Shaw (the chairman of the meeting), in presenting a cordial vote of thanks to Dr. Richardson for his interesting and valuable course of lectures, said that he must differ on one point with the worthy lecturer, for he considered that the governmental department which regulated matters pertaining to the national health had of late years effected much for the general welfare. The voice of public opinion must always guide all such reforms, and the intelligent classes should bring all their influence to bear on the commencement of further sanitary reforms, for the carrying out of which an administration already existed.

DOMESTIC CHAPEL, WYNNSTAY.

SIR WATKIN W. WYNN has recently built a Domestic Chapel adjoining the pleasure-grounds attached to his principal seat, Wynnstay, North Wales. Divine service previously had been performed in a building not specially adapted for that purpose. The chapel which takes its place, though it occupies the site of an older edifice, is practically new; but the south façade of the latter, though much altered, was considered worth preservation owing to its being of some architectural character (Italian in style), and executed of the freestone quarried in the park. A new north aisle and organ-chamber have been added, opening out into the nave through two bold and handsome arches. At the east end of the aisle the organ will be placed. Beyond, further north, is a lean-to vestibule leading to a porch, the entrance for the tenants and the servants, the private doorway being on the south side in the pleasure-grounds. The windows of the principal front are two-light and semicircular-headed, designed rather in the Veneto-Italian type. At the west end of the nave is a circular window filled with tracery of somewhat similar type, but the east wall contains no window, as the reredos—an adaptation of an old one—occupies the whole end. Externally the roofs are covered with slates, and internally these are ornamented with plaster ceilings divided into panels by richly-moulded ribs, also of plaster. There is a deep cove extending from the cornice to the soffits of the collar-beams. The nave and aisle are seated with ordinary chairs. The south entrance has handsome moulded solid oak doors. The windows are glazed with cathedral rolled glass of different tints in ornamental lead quarries intermixed with clear white glass. The passages are paved with encaustic tiles. The chapel is heated by hot water. The architect was Mr. Edmund B. Ferrey. The lighting is by sun-burners.

THE BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY, ROME.

ON the 27th of January the Society made an excursion to the Ghetto. The remains of the Theatre of Marcellus were first examined, but owing to the water, the Society were unable to visit the chambers under the theatre, which Mr. S. R. Forbes considers are the remains of the Decemviral prisons, built by Appius Claudius, and the scene of Roman charity, as recorded by Pliny. The ruins called the Portico of Octavia, and which Mr. Parker calls the Porta Triumphalis, were then visited. Mr. Parker thinks the Portico of Octavia was to the right, and the Portico of Philipius to the left, of this ruin, which is where the triumphal processions entered the city according to Mr. Parker's theory. One column still stands amongst the houses, supposed to be remains of the Temple outside the city where the General asked the triumph of the Senate. Passing up the piazza di S. M. del Pianto, in which is a house with the following curious Mediæval inscription, which was spoken of:—VRBE · ROMA · INPRISTINAM · FORMA · ENASCENTE · LAVR · MANLIVS · FARITAE · ERC · A · PATRI EDIS SV · NOMNE · MAN II AN · AS · PRO PORT AR · MEDIOCRITAE · AD · FOR · IVDEOR SIBI · POSTERISQ · AB · VRB · CON · M · M.CCXXI · L. AN · M · III · D · PRI · CAL · AVG. In the course of the promenade the two travertine Doric columns supporting an architrave of the first century, and thought to be the remains of the portico of the Theatre of Balbus, were visited, under the guidance of Mr. Forbes, also the remains of that theatre, so that the whole circuit of it was traced. The object which next attracted attention was the reputed house of St. Paul, No. 2, Via degli Strengeri, which, according to Jewish tradition, was the hired house of Paul. The house itself has been rebuilt, but the cellars are original work of the first century. The Roman Catholic church points out yet another site, the church of St. Paolo della Regola, which is close by,—this church was the site of his house; and a chapel adjoining, but of a different period, is said to have been where Paul had a school. The so-called house of Rienzi was then visited. Moral from the inscription:—

"In fair places remember even the sepulchre."

On Friday, February 4th, Mr. S. Russell Forbes read a lecture, written for the Society by Signor Visconti, on the Thermæ, with additional notes by Mr. Parker and Mr. Forbes, bringing the lecture down to the present state of the ruins.

HEALTH IS RICHES.

FOR THE USE OF SCHOOL BOARD SCHOOLS.

WORK and think while you're at school,
Do the same at trade and college;
Feet keep warm and head keep cool,
March athirst and master knowledge.
Strive not too much after gain,
Gold may build up empty niches;
But the statue is the brain,
Health with it is best of riches.

Clean in person, clean in dress,
Clean in thought, and word that's spoken,
Education 's cleanliness,
Health the outcome sterling token.
Onward each aspiring soul,—
Life's a ship that often pitches,
Though in wealth you may not roll,—
Health to man is always riches.

A SEWERAGE DILEMMA IN TORQUAY.

WE learn from the *Western Daily Mercury* that at the monthly meeting of the Torquay Local Board, on the 4th inst., a discussion took place on the high level sewerage scheme. It appears that some eight or nine months since the Local Board advertised for tenders for the construction of what is commonly known in Torquay as the "High Level *Blunder* Scheme." Messrs. Bell & Co. sent in a tender amounting to 43,000*l.*, whilst the highest was nearly double that amount. The Board accepted Messrs. Bell's tender, although it was generally surmised that the work would not be carried out by them for that amount, and certain events which have recently transpired prove that surmise to be correct. At the Board meeting on the 4th inst. the clerk stated the position of affairs. He said that he had received a letter from Sir Joseph Bazalgette stating that the contractors had done 14,000*l.* of work in connexion with the undertaking, and that he was of opinion they were losing money by the transaction, and suggested that they should terminate their contract. In pursuance of this the Main Drainage Committee recommended "that notice to determine the contract be served on the contractors and Sir Joseph Bazalgette be recommended to make such alterations in the drawings as experience shows to be necessary." The clerk saw Messrs. Bell, and they said that they were not desirous of making the sum asked for extras a hard and fast line, and they would revise their figures. The clerk telegraphed to Sir Joseph, who did not advise any delay. Meantime Sir Joseph had an interview with one of the Messrs. Bell, and then wrote, "I recommend you to determine your contract forthwith." He subsequently telegraphed: "Contractors have seen me; they promise no alterations I could recommend. Please serve the notice." There was the matter at present. Mr. W. Bridges said a more unfortunate position of affairs could hardly exist. It seemed to him an extraordinary state of things that the tender which was sent in for 43,000*l.* and then cut down to 38,000*l.* should be increased to 72,000*l.* He thought that Sir Joseph Bazalgette was somewhat to blame for not examining more strictly the calculations. He moved that a notice upon the contractors to determine the contract be served. This was carried unanimously.

LIGHT AND AIR CASES.

CLARK *v.* WATERLOW AND ANOTHER.

THIS was a claim (Common Pleas Division) for obstruction to light and air; also for an injunction against the injuries complained of.

The plaintiff was a greengrocer, and the defendants the well-known firm of wholesale stationers. In March, 1874, the plaintiff bought a thirty years' term in two houses, Nos. 12 and 13, South-street, Finsbury. These houses were over fifty years old, and until recently had enjoyed an unusual amount of light, owing to their being opposite to the old structure of Finsbury Market, which was only 25 ft. high. Some years before the plaintiff's purchase, the defendants bought the market, and erected upon its site a warehouse 65 ft. high, at a distance of 33 ft. from the plaintiff's frontage. For the loss in the value of the plaintiff's property occasioned by this building the plaintiff claimed 165*l.* The defence was that the plaintiff knew what was going to be done, and bought the property with his eyes open, and that the value of the property was not in reality diminished, the light being still amply sufficient for all practical purposes—a fact that was shown by the plaintiff having raised his rents since the completion of the defendants' building.

The jury found a verdict for the plaintiff—damages 100*l.*

ASSESSMENT OF BUILDINGS.

THE CORPORATION OF THE HALL OF ARTS AND SCIENCES, KENSINGTON GORE, APPELLANTS, AND THE ASSESSMENT COMMITTEE OF ST. GEORGE'S UNION, RESPONDENTS.

MR. POLAND and Mr. Besley appeared for the appellants, and Mr. F. M. White and Mr. Castle for the respondents.

This was an appeal (Court of Assessment) by the corporation of the Albert Hall against the valuation list approved by the respondents, in which the Albert Hall had been valued at 12,000*l.* gross value and 10,800*l.* rateable, and the Court was asked on behalf of the appellants to reduce the gross value to 1,500*l.* and the rateable value to 1,250*l.*

It appeared that the appellants were incorporated by Royal Charter, and the purposes of the corporation were therein stated to be the building and appropriation of the hall to the performance of music, and generally for any purpose connected with science and art. It was contended by the appellants that, these being the only purposes for which the hall could be used, the building was exempt from rateability under the statute 6 & 7 Vict., cap. 36, and it was proved that, in accordance with that Act, a certificate of a barrister had been obtained. A long argument ensued with regard to this point, and it was ultimately decided by the Court that the building was liable to be rated. The further question before the Court was in what mode the value should be estimated, whether it should be calculated according to the structural value or to the receipts and expenditure. It was urged that the building was totally unlettable, and that therefore the rateable value was *nil*. To support this view Mr. Ryde, the surveyor, and Mr. Cole, the manager of the hall, were called as witnesses. The latter proved that the enterprise had been unsuccessful, and that, in fact, the total expenditure from the 29th of March, 1871, when the building was opened, down to the present time, had greatly exceeded the receipts; that is to say, that the expenses had been 35,603*l.* and the receipts 33,076*l.* The last year had been worse than any of the other preceding years. The original members had appropriated to their own use 508 stalls, 33 boxes on the second tier and 31 on the first, and they possessed the right of disposing of their seats as they chose. The stalls, which were originally bought for 100*l.*, now sold for 40*l.* Mr. Robert Vigers and Mr. Charles Lee (surveyors) were called by the respondents to show what they considered should be the proper value of the property, and the result of the case, which lasted the whole day, was, that the Court adjudged that the figures in the valuation list should be altered to 5,000*l.* gross and 4,160*l.* rateable value, and no order as to costs.

MIDLAND RAILWAY COMPANY *v.* ST. PANCRAS.

The appellants in this case were the Midland Railway Company, and they are in the possession of large premises situate in the Euston-road, and amongst them is the Midland Grand Hotel, of which the Company are both owners and occupiers. The hotel premises are not yet completed, nor is the hotel fully furnished; but the hotel has been opened for business since the 18th of May, 1873, and large sums of money were still being expended in completing and furnishing the hotel premises. The appellants contended that the working expenses necessary to carry on the hotel business were large and constantly increasing, and that large deductions must be made from the gross receipts before estimating the assessable value of the premises. At first

the Assessment Committee, on the 18th of June, 1875, assessed the premises at 8,000*l.* gross and 6,667*l.* as the rateable value; but subsequently, on objection being raised by the appellants, reduced the gross value to 4,200*l.* and the rateable value to 3,500*l.* The appellants, however, still felt aggrieved at this amount, and contended that the sum of 4,200*l.* greatly exceeded the true gross value of the hotel premises, and that it ought to be reduced to 1,066*l.* They farther contended that the sum of 3,500*l.* greatly exceeded the true rateable value of the hotel premises, and that it should be reduced to 889*l.*

It was agreed that the appeal should be withdrawn without costs, that the gross value should be taken at 4,200*l.* and the rateable value at 3,500*l.*, and that these amounts shall be continued until 1880 without being disturbed.

IS A RINK A HOUSE?

GILLETT *v.* DAN.

THIS action, before Vice-chancellor Sir Charles Hall, in the Chancery Division, raises the rather curious question whether a skating-rink is a "house." The plaintiff had purchased a plot of building-land in Newton-road, Faversham, which, with the adjoining plots, was subject to conditions that the purchaser should build "houses" thereon, and which prohibited the building of "any shop, warehouse, factory, or building of a similar character."

The plaintiff had built a house on his plot, and finding recently that, on an adjoining plot which had been purchased by the defendants, a board had been placed, bearing the words "Faversham Skating Rink Company, site of rink," and that shingle was being carted and spread on this site, he issued his writ for an injunction to restrain the defendants from erecting the skating-rink, or any other building which was not in accordance with the conditions under which the plots were held.

Mr. Dickinson, Q.C., and Mr. Whitehorne, for the defendants, contended that, inasmuch as any room in a house might be used for the purposes of a skating-rink, and as there was no evidence of any intention to transgress the conditions, the motion must fall.

The Vice-chancellor then directed the postponement of the motion in order to give the plaintiff an opportunity of producing further evidence.

THE ROYAL AQUARIUM, WESTMINSTER.

YOUR correspondent "Truth" is wrong in supposing it is the large cost of the sea-water that prevents the tanks being filled. It is that they are not perfectly water-tight and leak, among other places, at the point where the glass joins the frame work.

Surely some of your readers will be able to instruct the parties concerned how to construct a water-tight fish show-tank as at other aquariums. The difficulty at Westminster appears to be fixing the glass perfectly rigid, so that when the weight of water (two tons) comes against it, and the glass having to contend with cold water on one side and a warm atmosphere on the other, it gives way, not being able to expand. Or has the vibration of the Underground Railway, which passes under the building, anything to do with the breakage of the glass? SEA WATER.

KNIGHTSBRIDGE BARRACKS.

LONG in a state of decay, this antiquated caserne has now become so ruinous that demolition and rebuilding are said to be the only alternative. It might have suited the halberdiers of Queen Anne's reign, but affords scant accommodation for 400 of her Majesty's Life Guards, with their officers, horses, and equipments, the principal fault being that all the chambers and compartments are too low by 2 ft. at least. It occupies the whole park margin between the park drive and the Kensington high road, extending a quarter of a mile and 35 yards over between the Duke of Wellington's stables and Prince's Gate, the entire length being 1,425 ft., and the width being for one half of its extent, 195 ft., which is reduced, by a slight divergence of both the outer road and the inner drive, to only 90 ft. at the western extremity.

The drill-yard within the barrack block is much restricted, on account of the narrow and elongated site originally chosen, and both the Kensington-road and the fashionable park drive are marred, obstructed, and disfigured by the obtrusion of old unsightly walls and windows along the verge of either side, exhibiting the varieties of troopers' toilets to the passers by on the road or the drive.

A quadrated block of equal dimensions, but nearer to a square, would give more room for the erection of a barrack more conformable to the taste of the day, and more commodious for the requirements of the regiment of Royal Horse Guards.

It is hardly requisite to state how ornamental it would be to the Park, and what a solace to passengers, both on the road and the drive, if this border of *over one quarter of a mile in length* were planted, shrubbed, and railed in; and it might suit the taste and interests of the public if the Park Ranger would concede a plot of nearly similar extent, within the Park, opposite to the present structure, and nearly upon the site of the Exhibition of 1851, the ground here being higher, more open, and not 100 yards from the present tottering structure.

A building in accordance with modern requirements, and presenting a fair architectural aspect, if properly quadrated, or nearly squared, might well be tolerated in this position, if given in exchange for a long, shrubbed border, of nearly the same dimensions or contents.

Two sites for the erection of new barracks were suggested in the *Builder* some years back; one near the Ranger's Lodge and the old Guards' station; the other within the old Palace gate, Kensington (where an old and unused Guards' barrack now serves for stables). The former, although newer, might prove too rusticated; the latter might be too distant from town, although nearer to the Palace.

There are localities, such as Chelsea, where the Foot Guards Barracks have been for years established, and where room could be obtained for transfer of the Knightsbridge squadrons, but the expediency of selection rests of course with the authorities at the Horse Guards. One point, however, ought to be considered, and it is this,—that if the present old buildings should be thoroughly repaired, they must be vacated by the troops; whereas, if new barracks are constructed, as herein suggested, they might continue to occupy their old quarters until all should be put in order for their entering upon possession of the new.

The promenading frequenters of Hyde Park cannot fail to be grateful to the Ranger and managers for the wondrous improvements effected, first by the demolition and removal of the old decrepit guard-house at the Kensington angle, and then for the tasteful planting and floral ornamentation of that lovely and apparently sequestered nook. Similar floral and shrubbed ornamentation might be carried out along the site of the present barracks, lending a grace to the park, the drive, and the main Kensington road, which is the principal Boulevard of West London. QUONDAM.

WATER FOR HASTINGS.

I TRUST, for the sake of the dwellers in St. Leonard's, that the Sanitary Authority of Hastings will not be allowed to pursue the unworthy expedient of robbing St. Leonard's of its good water, to supply Hastings with water, without your influential protest. The Hastings water is most deficient in quantity; it is also quite unfit for drinking; it is thick and filthy to the palate. All over the Hastings district it is the same; every man, woman, and child in Hastings knows it to be as I describe it. No filtering could make such water wholesome.

Pray call attention to this state of things.

INHABITANT.

DEVIL'S-ALLEY, BETHNAL-GREEN.

IN the Bethnal-green Vestry, the Works Committee reported that they had inspected the Devil's-alley, Cambridge-road, and had instructed the surveyor not to take any steps at present with regard to the reopening of the alley; and the Clerk read an application to the vestry not to reopen the same, in the interest of morality.

Mr. Jacobs described the alley as a filthy, wretched place, and unfit for habitation; it had been the residence of many a fallen angel, and had been an eyesore to the Sanitary Committee for more than two years. If it remained closed, public decency and morality would be promoted. At the same time that he was not in favour of giving up right of public way, yet this was an exceptional place which should not be confounded with the open spaces question, and the closing of which would result in the public welfare.

A long and lively discussion followed; and ultimately an amendment to the adoption of the report that the Clerk take the necessary legal steps to compel Messrs. Mann and Crossman to reopen and restore the right of way, was negatived, having only three supporters. The report of the Committee was then adopted, by twenty to three against.

From its name the above place would seem to have been the abode of a fallen archangel, as well as one of the lower order. Dirt and indecency have long been its normal condition, and, like Thorold's-square, it ought to be improved away.

CHURCH-BUILDING NEWS.

Malvern.—Christ Church, Malvern, which has been erected as a memorial of the late Rev. Geo. Fisk, LL.B., Vicar of Malvern, on a site given by Lady Emily Foley, was consecrated on the 28th Dec. The building has cost between 7,000*l.* and 8,000*l.*, and is substantially built in the Decorated style. It is constructed to seat upwards of 700 persons, and has a chancel 33 ft. by 22 ft.; chancel aisle, 33 ft. by 13 ft. on the south-east; organ-chamber, 15 ft. by 13 ft.; and vestry adjoining, 15 ft. by 13 ft. on the north-east; nave, 93 ft. by 25 ft.; north and south aisles, 63 ft. by 12 ft.; south porch, 10 ft. by 9 ft.; tower in centre of west front, 21 ft. by 21 ft., and 76 ft. high to the cornice, with broach spire, 92 ft. high. At the east end of the south aisle a small turret is introduced, 8 ft. by 8 ft., 40 ft. high, surmounted by a small stone spire, 20 ft. high. There is a narthex behind the porch. The warming is effected by Haden's apparatus. Provision is made in the chancel for thirty-two choristers. The walls are built of the local stone, lined with brick, and the external facing of Cradley stone, pitch-faced, squared, and coursed. The dressings are of Bath stone. The roofs are open-timbered to the apex, and the benches are of pitch-pine, varnished. The reading-desk is of oak, the pulpit of pitch-pine, and the font of Caen stone. The several passages and floors of the tower, porch, and chancel are of pattern tiles, those in the chancel being of a richer pattern. The roofs are covered with Broseley tiles in bands of varied colour. The gasfittings are by Messrs. Sparks, of Malvern. The architects were Messrs. T. D. Barry & Sons, and the contractor was Mr. Hugh Yates, all of Liverpool.

Ebchester.—In the ensuing spring it is intended to proceed with the restoration of Ebchester Church, co. Durham, designs for which, by Messrs. John Smith & Son, architects, Shotley Bridge, were prepared some two years ago. The church is small, consisting of nave and chancel of about equal length, and is of the earliest type of Norman. The original windows vary from 5 in. to 8 in. in width, splayed to a considerable width on the inside, and are from 2 ft. to 4 ft. high, with plain semicircular heads, and the glazing close to the outer face of the walls. Owing to the deficiency of light obtained from the original windows, others of the common sash pattern have been inserted both in the east end and other places, thus considerably damaging the walls, and rendering "restoration" in the strict acceptation of the term almost impossible. On account of the nature of the ground on the south side the original porch and entrance have been removed, and a doorway of later date placed in the west end, and, from the style of the bellcote and coping on the west gable, these features seem to have been renewed at the same time. The foundations of the old porch were discovered recently while excavating on the south side. The rude Norman font at the west end, the chancel arch (also unmistakeably Norman), a recess, and a small safe in the east wall, are the only remaining features worthy of mention. The east end seems to have been rebuilt from the window-sill at the time the present sash-window was inserted. The nave and chancel are filled with pews of the well-known high straight-backed type. The church is dedicated to St. Ebba, a daughter of Ethelfred, king of Northumberland, the story of whose life contains many interesting features, which, with other historical associations of the place, have been embalmed in song by Mr. Lax, a local poet.

Plymouth.—Christ Church, Plymouth, was opened on the 9th ult., after restoration. The Caen stone used in the windows and as dressings, wherever much exposed to the weather, had become very rotten. This has been patched in some places, and, if funds had allowed, all the windows on the south side would have been replaced. The east window was in so dilapidated a condition that Beer stone has been substituted for that from Caen. The glass also is new, that in the tracery being stained, the other parts being filled with cathedral glass, with the exception of the central light, which contains a coloured design, representing the Good Shepherd. The plain reredos, of Caen stone, has given place to a more ornate structure in Beer stone, with tablets, the centre arch having shafts of red Mansfield stone, the steps being of Portland stone. The heavy wooden communion-rails have been replaced by light ironwork, by Singer, of Frome. The centre aisle has been laid with red and black tiles, by Webb, of Worcester. The works have been carried out by Blowey & Son, of Buckland Monachorum, under the direction of Mr. James Hine, architect. The carving was done by Hems, of Exeter.

Parkstone.—Plans for the rebuilding of Parkstone Church, Dorsetshire, are being prepared by Mr. Frederick Rogers, architect, London, and in all probability operations will begin at once, as the subscriptions already promised amount to about 1,500*l.* The contemplated structure will be on a much larger scale than the present edifice.

Pontypool.—It is proposed to enlarge St. James's Church, Pontypoöl, by adding a new aisle capable of seating 140 persons, which, with the additional seats gained in the gallery by the removal of the choir to the chancel, will increase the accommodation by nearly 200. Plans have been prepared by Mr. Deacon, the

architect, and approved of by the committee; and it is expected that the work will be commenced by the 1st of March.

Portland.—The Vestry of St. John's parish, on the 20th ult., decided to effect considerable alterations and improvements in St. John's Church, from plans prepared by Mr. J. R. Crickmay, the diocesan architect, which provide for an apsidal chancel, 20 ft. by 18 ft., with a south-east porch, and a vestry and organ-chamber on the north side. The organ-chamber will have arches opening into the church and chancel. A new pulpit, lectern, and reading-desk, complete the contemplated alterations.

Newtimber (*Sussex*). — This church has been reopened, after restoration. The plan is, like many Sussex churches, a simple oblong, with no chancel-arch. The date is early thirteenth century. New roofs of a high pitch have been put on, that of the chancel being boarded and panelled with oak. The chancel seats are of oak; the floors of tiles; the altar dais is of polished Derbyshire marble. The reredos consists of three moulded arches, enclosing paintings in oil on slate panels, by Mr. Daniel Bell, representing the Adoration of the Lamb. The builder employed was Mr. Steer, of East Grinstead, under the architect, Mr. R. Herbert Carpenter.

Topsham.—The re-building of the Church of St. Margaret, Topsham, Devonshire, which was commenced in December, 1874, is making good progress towards completion. The church is being rebuilt in two halves or portions, so as to allow of a continuity of services. The first portion is now nearly complete. All that will be retained of the old church will be the tower. The work at present in hand includes the chancel, chancel aisles, and transept. The new church will be cruciform on plan, the tower abutting into, or rather against, the south transept upon its western side. The exterior walls are of nobbled limestone, the quoins and plinth being worked in the same material. All the dressings are of Bath stone, and the roofs are covered with grey slates capped by dark ridge tiles. The style adopted by the architect, Mr. Edward Ashworth, is Decorated Gothic. All the dressings are of fine Corsham Down stone, the walls being stuccoed. The roofs are open, and of timber, springing from carved corbels. There is a considerable amount of stone carving inside the church, all of which is naturalesque in type, and has been executed by Mr. Harry Hems and his assistants. All the old monuments, interesting memorials of a by-gone age, have been carefully preserved and re-fixed. The contract is being carried out by Messrs. Stephens & Sons, contractors, of Exeter, Mr. John Reed being their managing foreman. The clerk of the works is Mr. R. Bradford.

Abbeydale (*Notts.*).—The new Church of St. John, Abbeydale, which has been erected at the sole cost of Mr. John Roberts, of Abbeydale Park, has been consecrated by the Bishop of Lichfield. The church is a substantially-built stone edifice, in the Early English style, and consists of nave and chancel under a continuous roof, surmounted by a bell-turret. There is only one entrance, which faces the south. The roof is partially open, the principals springing from carved corbels. The seats are after the most modern style, with sloping backs. The wood used is pitch pine, French polished. The chancel is divided from the nave by ornamental rails of brass. The eagle lectern is of massive design, also in brass. On the right hand is the pulpit, of pitch pine, carved. The reading-desk, on the left of the chancel, is raised on steps above the choir stalls, which are also carved, and are capable of accomodating 28 choristers.

Iden.—The parish church of Iden, near Rye, has been closed for the past seven months, during restoration, the cost of which has been about 1,000*l.* The re-opening took place on the 27th ult. The architect under whom the restoration has been effected is Mr. A. Smith, and the builder was Mr. Bourne, of Woodchurch.

Dunston (*Lincolnshire*).—This church has been consecrated, having been, with the exception of the tower, entirely rebuilt. The new church is nearly double the size of the old one; but in the rebuilding the greatest care has been taken to preserve and rebuild, stone by stone, the ancient arcade, porch, south doorway, buttresses, and fine "Easter sepulchre." The plan of the old church consisted of a nave and north aisle of equal length and width, a modern apse, and west tower. The nave and north aisle are now extended a bay, and a south aisle is added, with a new chancel, priests' and choir vestries, and organ-chamber. The ancient parts are of First and Second Pointed dates, and these have been followed in the new work. The walls are faced with coursed local stone, inside as well as outside, with dressings of Ancaster stone, and the internal shafts of the windows are of Derbyshire marble. Tiles are used for the floors, with steps of polished Hopton Wood stone. Towards the cost the Marquis of Ripon contributed 3,500*l.*, and the Ecclesiastical Commissioners 500*l.* The works have been carried out by Messrs. Halkes, of Dunston, under Mr. R. Herbert Carpenter, architect, Mr. Chapman being clerk of works.

SCHOOL-BUILDING NEWS.

Glastonbury. — New National schools were opened at Glastonbury on the 13th ult. Messrs. Wainwrights & Heard, of Shepton Mallett, were the architects, and Messrs. Merrick & Son, of Glastonbury, the builders. The total cost has been 1,003*l.* 9s. 5d., in addition to 35*l.* 6s. 6d. for school fittings. The cost of the site, architects' expenses, gas-fittings, and other necessary disbursements, are estimated to amount to 375*l.* The schools, which will accommodate 270 children, are Gothic in style, and substantially constructed. The exterior is faced with blue hammer-dressed stone, with Doulting freestone dressings, and the roofs are covered with plain tiles. There are two school-rooms, one for the boys and the other for the girls, each 35 ft. by 18 ft., and 13 ft. high inside wall, and about 25 ft. to apex of roof. There are also two class-rooms, each 18 ft. by 14 ft. Large and spacious playgrounds are provided.

North Stoneham.—The new schools for the parish of North Stoneham, Southampton, are now completed, and were opened on the 10th ult. They comprise separate rooms for boys and girls, 34 ft. by 18 ft. each, with hat and cloak rooms, and the usual offices attached. The buildings, including a master's residence, are erected of local bricks, and have ornamental tiled roofs, surmounted by a bell-turret covered with oak shingling. The bell is the gift of the architect, Mr. Charles Pink, of Winchester. The works have been carried out by Messrs. Brinton & Bone, under the supervision of Mr. Thomas Micklam as clerk of the works.

Everton.—On the 18th ult. the memorial stones of the Primitive Methodist schools, Everton village, were laid. Space is provided for erecting a building 75 ft. long, 33 ft. wide, and parallel with the chapel. On the ground-floor there will be six class-rooms, a committee-room, and kitchen. The school-room is on the first floor, being 73 ft. long, 30 ft. wide, and 20 ft. high. The principal entrance to the school will be from a staircase 4 ft. wide, situated in the tower at the angle, the entrance doorway being in the centre of the principal *façade*. The elevation in front will be carried out with red patent brick and Stourton stone dressings, the angle nearest the chapel finishing with a tower and campanile roof, 60 ft. high. The contract is being carried out by Mr. A. Hall, and the architect is Mr. Richard Owens.

Kilmuir-Easter (*Inverness*).—The new school-buildings for Kilmuir-Easter have been contracted for as follows:—For the Kilmuir School—John Campbell, Portleich, mason; H. & A. Ross, Tain and Invergordon, carpenters; William Ross, Alness, slater; Macrae & Son, Tain, plumbers; J. Munro, Tain, plasterer; H. A. Ross, Tain, painter; D. Mackintosh, Inverness, bell-hanger. The Tallich School—W. Fraser, Tain, mason; H. & A. Ross, Tain and Invergordon, carpenters; William Ross, Alness, slater; A. Meikle, Tain, plumber; John Reid, Tullich, plasterer; H. A. Ross, Tain, painter; D. Mackintosh, Inverness, bell-hanger.

Handsworth.—A new middle-class school for boys was opened at Handsworth on the 24th ult. The buildings have been planned by the architect, Mr. W. T. Foulkes, of Birmingham, so as to be capable of being used for the purposes of assembly-rooms, suitable for concerts, lectures, balls, parties, &c. The school-hall is 50 ft. in length by 26 ft. in width, and is 26 ft. high to the collar-beam of the ceiling. The roof ceiling of the hall is divided into compartments by wrought principals and mouldings, with intersecting similar mouldings running along the ceiling. The hall is lighted by means of side-brackets and a pair of pendant coronas executed by Messrs. Proctor & Platt. The work has been carried out by Mr. Thomas Hughes, builder, Hockley.

Consett.—New National Schools at Consett, co. Durham, have just been completed and opened. Owing to the limited area of the site available, it was found necessary to arrange the schools in two stories, in order to avoid encroaching on the site of the church. Accommodation is provided for 375 children, allowing the minimum area per child required by the Education Department. The infants' school is on the ground-floor, and will hold 188, and is provided with large and small galleries, and other necessary fittings. The mixed school, or school for senior scholars, is over the infants' school, and is approached by a double staircase. The mixed school-room has been arranged with a view to its being utilised as a public room when required, and by an arrangement of folding-doors at one end of the school a class-room is obtained. The style is a free treatment of Gothic. The buildings have been designed and their erection superintended by Messrs. John Smith & Son, architects, Shotley Bridge. The contractors are as follow:—Mr. W. Shell, for mason's work; Mr. J. Routledge, joiner's work; Mr. J. R. Smith, plumbing and gasfitting; Mr. G. Nicholson, slating; Messrs. E. & D. Ormerod, plastering; and Mr. Richard Walker, painting and glaziing. The hot-water apparatus is by Messrs. Dinning & Cooke, of Newcastle.

Bishop's Stortford. — Extensive works, comprising both additions and alterations, have just been completed at the Nonconformist Grammar School, Bishop's Stortford. The old kitchens and out-offices, which were totally inadequate to the increasing requirements of the establishment, have been pulled down, and new kitchens, sculleries, &c., with dormitories and private apartments for the matron over, have been erected in their place; while an additional block of buildings, containing three class-rooms, library, lavatory, and cloak-room, with separate studies for the masters and elder boys on the first-floor, has been erected and connected with the present building by a covered way. The new buildings are of red brick, to match the old work. The kitchens, sculleries, &c., have been paved with Victoria stone, and the class-rooms and library floors are of wood blocks on concrete. Accommodation is now provided in the school for 150 boarders. The cost of the additions will be about 2,800*l.* Mr. John Slater, B.A., of London, is the architect; and the contractor is Mr. J. L. Glasscock, of Bishop's Stortford.

Hythe.—The memorial-stone of new Congregational Sunday schools was laid at Hythe on the 31st ult. The site is at the rear of the Congregational Church in High-street, and the building will comprise an upper school capable of seating 400 adults and an infant school to seat 150 children; besides a minister's vestry and a large class-room divided by folding-doors into smaller class-rooms. The entire cost, exclusive of land and fittings, will be 1,335*l.* The architect is Mr. Gardner, of Folkestone; and the contractor, Mr. Amos, of Hythe.

West Coker.—A new national school has been opened at West Coker, Dorsetshire. The building, which is Gothic in style, is of Ham stone, and is capable of accommodating 300 children. The entire cost amounts to about 1,000*l.* The architect is Mr. Henry Hall, of London; and the builder, Mr. S. G. Bartlett, of West Coker.

Teddington.—The school accommodation for this parish has recently been brought up to the required standard by the erection of an infant school building for eighty children, in the outlying district of South Teddington (and used as a mission church on Sundays), and by the erection of an infant school for 160 children, with class-room, &c., in connexion with the group of buildings known as the public schools, in Upper Teddington. A detached residence has also here been built for the master of the boys' school. The works have been carried out from the designs of Mr. T. Goodchild, architect, Adelphi, by Mr. F. James, builder, New Hampton.

Newhall. — The memorial stones of a new Primitive Methodist school-room at Newhall, Derbyshire, have been laid. The school is the first of a group of buildings which will ultimately include a new chapel, vestries, &c. Mr. J. Kerridge is the architect.

Tarrington.—The new schools which have for some time been in course of construction at Tarrington have recently been completed. They are provided by Lady Emily Foley for the benefit of the parishes of Stoke Edith, Tarrington, and Dormington. The buildings consist of a mixed school, 40 ft. by 20 ft., for 100 children, a large class-room for forty-seven children, an infant school for forty children, with cap and

cloak room, and a master's house adjoining. The house has parlour, kitchen, scullery, washhouse, three bedrooms, and the usual offices. The earth system has been adopted for the closets, a separate building having been designed for carrying it out in the most complete manner. Playgrounds, with covered play-sheds, are provided, and these last, together with the approaches to the different entrances, are laid with asphalte. The buildings are of brick, covered with slates. They have been purposely kept plain in appearance, the desire of Lady Emily Foley being to make them simple and substantial, with all modern appliances for education, cleanliness, and the health of the children. Ventilation is chiefly provided by means of the Galton stoves. The school furniture is by Lewis, of Ross. The cost of the whole work, including boundary walls, paths, school furniture, and apparatus, has been nearly 2,800*l*. The contractors were Messrs. Collins & Callis, of Tewkesbury, who have executed the work under the supervision of Mr. Thomas Blashill, architect.

SOUTHERN EMBANKMENT OF THE THAMES.

MESSRS. WIGGINTON & ROWLEY have submitted a plan for the Southern Embankment of the Thames, and the formation of Commercial Docks. The principal difficulty hitherto experienced in devising any plan for the protection of the low-lying portion of the southern bank of the Thames, which suffered so fearfully from the inundations caused by the late and other high tides, has been that of dealing with the warehouse property fronting the river, so as not to interfere in any way with the transaction of the gigantic businesses there carried on. This has led the designers to an earnest investigation of the matter, resulting in a plan showing a series of docks, if subdivided, or one long dock from London Bridge to the Albert Embankment,—the same plan, with modifications, being applicable to the river above the Albert Embankment to Chelsea. The engineering portion of the work would be the same as that adopted for the Victoria Embankment,—but instead of filling in the entire roadway, counterforts would be built from the river-wall inwards, and arches turned for the support of the roadway. The spaces thus left open could be utilised, if desired, by an inner wall, with projecting parts containing steps to same. Being made watertight, a large amount of goods could be stowed away, and loaded or unloaded with facility.

THE MARYLEBONE GUARDIANS AND THEIR ARCHITECT'S COMMISSION.

AT the meeting of the Marylebone Board of Guardians, on the 11th inst., a long report was presented from the Reconstruction Committee with reference to the rebuilding of that portion of the workhouse the frontage of which is in Northumberland-street, and recommending that in consequence of certain extra works found necessary to be carried out, an application be made to the Local Government Board for their sanction to the borrowing of an additional 15,000*l*. In the course of the discussion, Mr. Galsworthy observed that he was glad to find that the committee had thought it wise to cut the architect's estimate down by 1,000*l*. As regards the commission they were paying to the architect, that was the most serious item in the matter, and he hoped the committee had fully considered it. He did not wish to cut any gentleman's fees down, but they must look well after themselves. If no action had been taken, he thought something must be done, for to pay a commission of 5 per cent. on such an undertaking as that was far too high. It was true that the building operations had commenced, and difficulties stood in their way, but if it was pointed out that the matter was an oversight, Mr. Snell might see his way to a compromise. If he did not adopt that view, of course it would be for them to consider the matter in future undertakings. The report was adopted.

The Glasgow Lath-splitters.—A conference was held between masters and men in this trade on the 5th inst., when the masters offered an advance of a halfpenny per hour and an agreement for three months, which the men accepted. They resumed work on the 7th inst., after being a week out.

THE SLATE TRADE OF NORTH WALES.

NOT for many years, it is stated, has this branch of trade been so prosperous as at present. At all the quarries of Merionethshire and Carnarvonshire the men are fully employed, and were it possible to double the quantity of slates turned out there would be no difficulty in effecting sales. This largely-increased demand has arisen in a great measure owing to the extensive building that is going on in the principal towns in the kingdom. As some indication of the rapid advances in value, it may be mentioned that the description known as "small ladies," which in 1872 sold at 35*s*. per thousand, cannot now be obtained under 60*s*. per thousand, and all other qualities have advanced proportionately. Up to the present time the Festiniog Railway has been the sole means of communication to the principal quarries, but the other railway companies are beginning to be alive to the importance of the trade, and the London and North-Western Company are constructing a line which will materially shorten the distance between the slate district and the chief inland markets of the country. A new line, to connect with the Great Western at Bala, is also spoken of.

AN ARCHITECT'S ASSISTANT'S CLAIM.

HANCOCK *v.* TREHEARNE.

IN this case, heard in the Marylebone County Court on the 9th inst., the plaintiff sought to obtain 15*l*. 10*s*. 4*d*., for work done. The defendant paid 6*l*. 2*s*. 10*d*. into court, and denied further liability.

The plaintiff stated that he went to assist the defendant in getting out some drawings in the year 1873, and was to receive 1*s*. per hour. The engagement was for three days, but he stopped there for several months, and had his salary raised to 1*s*. 3*d*. per hour. When he left the defendant the first time he was not settled up with, but got the balance when he went to work for the defendant again about four months afterwards. From the first, until the May of last year, he continued to work for the defendant, on and off, and occasionally made him out a bill and received a cheque at same time. In all his bills he charged the defendant for the hour he occupied in getting his dinner, and also for the half-hour he took at tea-time when he worked after five o'clock at night, and no complaint had ever been made to him by the defendant for so doing; and, in fact, it was usual to do so. Sometimes he worked only two hours a day, at other times five or six hours, and occasionally as long as twelve or thirteen hours, but he never charged for dinner-time when he worked only for an hour or two.

The Judge.—It seems strange to me that a man employed to work by the hour should charge for his dinner-hour.

The defendant, an architect and surveyor, of Great Russell-street, did not deny employing the plaintiff, and said that he was recommended to him by a friend of his, and when the plaintiff made out his bill he never looked into it, but took it for granted that it was all right, and under those circumstances paid him. He was in entire ignorance of the meal-times having been charged until the last account was sent in, when the largeness of the amount claimed led him to inquire into the matter. Three witnesses were called by the defendant to show that the charging for the meal-hours was contrary to all custom or rule.

The Judge said he could not by his judgment encourage a system by which persons employed could claim for time occupied in having their meals, when their hiring was clearly for the purpose of producing labour.

Judgment for the defendant.

The Halifax Skating Rink.—The excavation of the ground for this rink, which will be one of the largest in England, is rapidly proceeding. Entering the ticket-office, in Arden-road, and by Crossley Almshouses, one will come upon the open rink, 95 ft. by 135 ft., having on two sides a covered colonnade. Eight arches, on the west side, the open rink, give access to the covered rink, 64 ft. broad by 140 ft. long. The roof, of 64 ft. span, with laminated wooden ribs, will be 40 ft. from floor to ridge. Retiring-rooms, skate-rooms, dressing-rooms, &c., will be provided, and altogether the establishment will be most complete. The architect is Mr. W. S. Barber.

Books Received.

Thrift. By SAMUEL SMILES, author of "Self-help," &c. John Murray. 1875.

THE author of this book, whose name is now almost a household word among a large section of English readers, is one of those writers who produce a more or less distinct effect upon the habits and thoughts of their own generation, by the main force of persistence in the proclaiming of some important and (as they believe) neglected principle, backed by the weight which is always lent to such an effort by an evidently sincere conviction and honest purpose. In his "Self-help," and "Character," and still more conspicuously, perhaps, in his graphically-written and sympathetic life of George Stephenson (his most permanently valuable work), Mr. Smiles has, with a manly simplicity and earnestness, preached the doctrine of *la carrière ouverte aux talens*, and called upon his fellow-men, those especially who are not born to independence or affluence, to consider and realise the power which lies in diligent and well-directed effort in the path of duty and hard work. He now returns to the charge in the present volume, intended as a sequel to the two above-named; "for Thrift is the basis of Self-help, and the foundation of much that is excellent in Character"; and, considering that "some of the finest qualities in human nature are intimately related to the right use of money," he thinks the lesson is worthy of being repeated and enforced. The book consists mainly of the putting together of various instances of success in life from humble beginnings, together with some more general and in many places eminently true and sensible remarks upon certain aspects of modern society, more especially on the mania of "keeping up appearances"; an *ignis fatuus* which has brought many of its victims to distress and even disgrace. The evil, he observes, does not stop with the moneyed classes:—

> "It descends to those who have nothing but their salary to live upon. It descends to the wives of clerks and shopmen. They, too, dress for respectability. They live beyond their means. They must live in gimcrack suburban villas, and 'give parties.' They must see what is going on at the theatres. Every farthing is spent as soon as earned; sometimes before. The husband does not insure his life, and the wife runs into debt. If the man died to-morrow, he would leave his wife and children paupers. The money he ought to have saved during his life of toil is spent on 'respectability'; and if he leaves a few pounds behind him, they are usually spent in giving the thriftless husband a respectable funeral."

These are sharp truths pointedly told, and so is the following sentence:—"'Is that dress paid for?' asked a husband. 'No.' '*Then you are allowing yourself to be clothed at another man's expense.*'" Which is what half society is doing continually. At the same time, we do not see why the thrifty family should not "know what is going on at the theatres" sometimes, and be all the better for it. It is a false and mistaken thrift which would consider a little money spent on an intellectual recreation (if we can still class the theatre so) as money thrown away. And there may be a good side which Mr. Smiles overlooks, in the desire for keeping up at least the best style of living which circumstances admit of. It may arise in some instances out of no false pride or "snobbishness," but out of a natural and genuine desire to give something a little more ornamental to every-day life than the average. There are two sides, also, to the question of "circles," against which the author is bitter. As he puts it, indeed (p. 237, &c.), every word is true in his animadversion; but, on the other hand, there is the incontestable fact that different classes of persons in the world do form such different associations, ideas, and standards of taste and manners that intimate intercourse between them is impossible with any ease or pleasure to either side. If society is to be more assimilated and united in these respects, it must be by levelling up the standard of culture, not levelling it down. Such a consummation is devoutly to be wished, and perhaps possible, but not for a long while yet.

The pith of what is incontestably excellent in Mr. Smiles's book is summed up in the last couplet of the strong sturdy verse of Burns which he places on his title-page, where the true object of thrift is defined as,—

> "—— the glorious privilege
> Of being independent."

But let it not be forgotten that he who learns to worship thrift as an end and not as a means (no uncommon error), is subjecting himself to a yoke almost as bad in its way as poverty, a bondage of the spirit which strikes at the root of the most

real and noble independence. It is true that no epithet conveys a greater stigma of weakness and worthlessness in a character than that of "thriftless"; but it is equally true that no more cutting and contemptuous sarcasm can be found in literature than that which the greatest poet breathes through the lips of his greatest character —"Thrift, thrift, Horatio!" Let us be thrifty, by all means, and let us thank the honest and persevering Mentor who inculcates the lesson; but let us not forget, all the same, that there are higher and nobler qualities of character than this, valuable as it unquestionably is.

VARIORUM.

"Laxton's Price Book" gets fatter, so to speak, every year, but this is not to be taken as a sign of weakness, but evidence that it contains an increased number of good things. The edition for 1876 just now issued (the 59th) fully maintains its position.——The City of London Directory contains a large amount of useful information not to be met with in any other work of a similar character. Not only is every firm carrying on business in the City duly described, but the names and addresses of individual members of each firm are also given under the proper headings. We have so often spoken well of it that we need only say of the new issue for 1876 that it appears to have been corrected to the latest date, and includes the statement of dividends declared within three hours of the work going to press.

Miscellanea.

Overcrowding in Birmingham. — An inquest was recently held in Birmingham on the body of the wife of a bellows-repairer, living in No. 8 Court, Smallbrook-street. The deceased's husband, a decrepit old man, stated that his house contained only two rooms—a kitchen and one bedroom. In this dwelling, deceased, himself, a son aged twenty, and a daughter aged seventeen, had lived for the past eighteen months. Witness was in the habit of sleeping upon an old pair of bellows, placed near the fire in the kitchen, whilst the other three members of the family occupied one bed in the room alone. The coroner, in addressing the jury, said:—"We have been to the tenement in which this poor woman resided, and where her husband and two others of the family lived. We have seen that wretched hovel, and it seems to be one of a dozen hovels running in a line in the midst of a somewhat dirty undrained court. The row of houses seems to be situated almost immediately behind the hotel, which is in Smallbrook-street. In this street there are living, or carrying on business, five members of the Birmingham Town Council. There is no other street in the town so honoured as Smallbrook-street. From the top to the bottom, in the middle, right away through it, and at each end of the street there are town councillors, magistrates, ex-mayors, and aldermen; and they all live within a stone's throw of this shocking place which we have visited."

Carlisle Castle.—Extensive works are in progress at Carlisle Castle. The interior of the keep has been converted into an armoury for the reserve forces, &c., the floor has been lowered 2 ft. 6 in., and stands for about 1,800 arms and outfit are erected. In the centre of the western wall, 11 ft. thick, a stone staircase has been put up to communicate with an upper story, and the windows have been widened in order to admit more light. The barrack-sergeant's quarters and a gun-shed on the west side of the yard have been demolished, and in their place now stands a new officers' mess, built of red stone. At the north-east corner of the yard a large brick building is being erected, and is nearly completed. It consists of a canteen for the men of the regiment, recreation-room, with reading-room above, and two barrack-rooms to accommodate thirty-six men. The old armoury at the entrance to the castle has been converted into a sergeants' mess, and additions are to be made to the hospital, and quarters built for the hospital sergeant and cook. As soon as the property in Annetwell-street is free of tenants, it is intended to make the entrance to the castle the same width as Castle-street, and build quarters for sixty or seventy married men. Mr. T. B. Nelson is the contractor; Major Nelson, R.E., the engineer; and the work is being carried on under the immediate superintendence of Mr. Stockwell.

Railway Construction in the United States.—The progress of railway construction in the United States has been seriously checked by the stagnation of business that has now lasted for more than two years. In 1872, the year before the panic, when speculation was at its height, and capital was eagerly seeking investment, no fewer than 7,340 miles of new lines were added to the railway system of the Union. In 1873 the amount of increase fell to 3,883 miles; in 1874 there was a decline of 2,025 miles; and in 1875 only 1,483 miles were opened. Thus the increase of mileage in 1872 was almost precisely equal to the aggregate increase in the three succeeding years. It is observable that of the mileage added in 1875,—the smallest recorded,—three-fourths were completed in the latter half of the year. This shows that the depression was greatest twelve months ago,—indeed, that railway construction was almost at a standstill,—and that there are now signs of revival. The collapse, however, may be regarded as affecting only the States of the Upper Mississippi Valley and the South. In New England, the middle States, and the States beyond the Rocky Mountains, the progress of construction was maintained steadily enough, considering the financial difficulties of the panic, and the fact that in the more thickly-peopled States there is a diminishing demand for new lines.

Building Prospects in Perth.—There is stated to be every probability of the building and kindred trades of Perth having abundance of work for many months to come. Extensive additions and alterations are about to be commenced at the barracks, involving an expenditure of upwards of 20,000*l*. It is believed that part, at least, of the contract has been obtained by an Edinburgh firm. It is also in contemplation to make a large addition to the general prison in the form of a four-story building to be used as a hospital. Another Government job, the addition to the post-office, has been settled, the contract for the work having been signed by Mr. Johnstone, joiner, Perth. Plans have now been adopted for the new drill-hall in South Tay-street, the committee appointed for this purpose having approved of the plans of Mr. Chalmers, architect. The building will have a frontage of 80 ft., the main portion being two stories, with side wings of one story. It is also stated that plans for Free St. Stephen's Church at Paradise-place have also been adopted. An effort is being made to provide the Baptist congregation with a new church, and in addition to these public buildings, there are several other private jobs in prospect, including some villas and a new public work in Glasgow-road.

The Court of Appeal on Rating of Mansions.—The ruling of the Court of Appeal in the case of Clive *v.* Foy has (says *Land and Water*) introduced a very important change in the law of rating as applied to large mansions. Up to the present time assessment committees have always held that the words of the statute—that the rateable value of a property should be what it "might reasonably be expected to let for from year to year," meant that they had to estimate what a tenant would give for it for one year and no more. In the case of very large houses it is evident that nobody would give anything for them on these terms. Assessment committees, therefore, were obliged to fix some almost nominal value, which was usually about the largest rent actually given for any house that might be let in the neighbourhood. This has always been held to be the law ever since the statute was passed, and country mansions have always been rated on this principle. But in the case in question the Court has, of its own accord, added a very important rider, which, practically, changes the law entirely. They hold that "the sessions may take into consideration the number of years for which a tenant from year to year may reasonably be expected to continue tenant," and in the particular case in point they fix this as seven years.

Death caused by a Lead Pencil.—A St. Panoras vestryman, Mr. Joseph Smith, died on the 7th inst. His death was occasioned in a very singular manner. It appears that, a fortnight ago, Mr. Smith was hurrying along a street, when a lead pencil, which had got into the lining of his coat, wounded his knee. Though the hurt was painful, he delayed having it seen to for a week, when he was laid up. The knee swelled to a large size, and a doctor lanced the wound, but erysipelas followed. On the following day mortification set in, and the deceased expired in an unconscious state.

The Baptistery at Ravenna.—The attention of the Government has been called to the condition of the Baptistery of Ravenna, a monument of high importance as regards the history of art. According to the *Times* correspondent, the mosaics of the fifth century it contains are rapidly perishing, and, in fact, the building itself is threatening ruin in consequence of the damage it has received in past times and the gradually increasing injury it is continually suffering from the damp, caused by the very low level on which it stands. With a view to saving the Baptistery from further injury, a project has been prepared by the Commendatore Lanciani, chief of the Department of Civil Engineers at Ravenna, which has just received the approval of the Minister of Public Works. It is proposed, after all the requisite precautions have been taken, to raise the edifice bodily to the modern level by means of a number of great screws worked simultaneously, new foundations to be built beneath it. This will be the first occasion of this means of raising buildings,—common in the United States,—being put into operation in connexion with an ancient edifice.

Alleged Trade Tyranny in Nottingham. An extraordinary case of trade tyranny is alleged to have come to light in Nottingham. It is stated that in November last all the hands employed by Messrs. Lewis, slaters, struck by order of their union, the reason assigned by the union for issuing the order being that the firm had employed a non-union man. Notwithstanding the denial of Messrs. Lewis, the union ordered the men not to resume work till Messrs. Lewis had paid a fine of 25*l*. Messrs. Lewis refusing to do so, the men remained out and were replaced by non-union hands. The Slaters' Union have now induced the amalgamated operatives to issue a circular to every employer in the building trade in Nottingham to the effect that if any firm should after this date buy or obtain materials of Messrs. Lewis, the whole of the men in every branch of their trade would strike and remain out till the materials were removed. Messrs. Lewis are taking steps to prosecute the issuers of the circular.

St. Marie's R. C. Church, Sheffield.—A new organ, presented by the Duke of Norfolk, has been placed in this church, on the north side of the chancel. It contains twenty-three speaking stops, viz., eight in the great organ, seven in the swell, six in the choir, and two in the pedal. It has also a tremulant acting in the swell registers, three composition pedals, and five coupling movements. The case is elaborately carved, and is Austrian oak, the pipes being spotted metal. The lower portion is an open traceried screen, behind which the organist sits, and the great organ is corbelled out into the chancel, and forms a canopy to the choir-stalls. The whole work has been executed under the direction of Messrs. Hadfield & Son, the architects of St. Marie's, by Messrs. T. C. Lewis & Co., of London, whose contract of 1,000*l*. also included the case, designed for them by Mr. Bentley, architect, and executed under his supervision.

A New Steam Dredger.—A trial of Dickman's patent steam dredger took place on the 10th inst. at Millwall, and is reported to have proved satisfactory. The peculiarities of the invention are, first, that the bucket apparatus is placed amidships; secondly, that the soil is discharged into two cylindrical tanks below deck; and thirdly, that it is pumped from these by means of a pneumatic pump through an iron pipe under the wharf and Millwall Extension Railway into a field some 150 yards distant. Its great recommendation is the speed with which the operation is performed, and the saving of labour which it effects, one man being sufficient to conduct the process of emptying the tanks after the hose connecting them with the cast-iron main on shore is adjusted. On the occasion of the trial the contents of the tanks, 200 cubic yards, were discharged into the adjacent field in the short space of twenty-two minutes.

Cement for Ovens.—A cement for covering the joints of ovens, which is said to be found excellent in practice and does not crack, but becomes very hard, may be made by mixing equal quantities of finely-sifted wood-ashes and crushed and sifted clay, and adding some salt and sufficient water to form it into a dough, with which the cracks are coated when the oven is cold. If this cement is employed instead of clay in setting new ovens they will be almost indestructible.

The Catacombs, Rome.—Between 731 and 816 no less than twenty-eight cemeteries were restored by the popes. Cemetery is the old name for catacomb, which is entirely a modern or Mediæval name originating in a misconception. The earliest Christian burial-place was under, or near to, the church of S. Sebastian, which was called "The Catacomb," because it was *Kata-cumba*, under the hill or *combe* on which the great tomb of Cecillia Metella stands. Twenty-eight catacombs were restored in the eighth and the beginning of the ninth century. The chief things to be restored in these burial vaults with their corridors or streets, which are for the most part cut out of the tufa rock, were necessarily the paintings, and therefore we find a large proportion of them to belong to that period. Another considerable part of these paintings are of the time of Pope John I., A.D. 523-526, who is recorded to have made the catacombs of SS. Peter and Adauctus, Nereus and Achilleus, and Saturninus, and restored that of Priscilla.

The Bolton Sewage.—The Corporation of Bolton, after trying one or more schemes for purifying the sewage of the borough, have finally adopted the precipitating process of the Clarifying and Utilisation of Sewage Company (Limited), Leeds, and at the last monthly meeting of the company a licence was granted authorising the corporation to work their patents. The population of Bolton is about 100,000, and the amount of intercepted sewage is estimated at 100,000 gallons per hour. The cost of purifying the same is about 30s. to 40s. per million gallons. Limited quantities of the refuse have been sold to agriculturists, and in a short time the sewage committee hope to be able to find a ready sale for all that they can produce.

How Epidemics might be Averted.—The medical officer of health for the Haslingden Union (Dr. Harrison) says, in his annual report submitted to the sanitary authority at their meeting on the 9th inst., that much of the usefulness of medical officers of health is impeded by their inability to obtain early and reliable information in respect of the outbreak of infectious diseases. The first information of an epidemic had to be gathered from the death-list, and by that time the disease had often gained such ground that it was found impossible to check its course. He urged that it should be made compulsory by Act of Parliament for householders to at once report cases of infectious disease to the local sanitary authority.

Public Spirit at Longton.—An incident of the meeting of the Longton Town Council, on the 3rd inst. is worth recording. It appears that a piece of land in the town excellently situated for public buildings, is in the market. The Council, having bought the gas-works, and being engaged on costly sewerage operations, have almost reached the present limit of their borrowing powers, and are not in a position to buy this land (for which 5,000*l.* are demanded), and also erect public buildings thereon. They might find the money for the buildings—say Public Baths and a Free Library, if the burgesses should so decree—but they cannot both buy the land and erect the buildings. Wherefore Mr. Alderman Hulse proposes that the site shall be acquired for the town by private subscription, and offers to head the list with 500*l.* It is to be hoped that Mr. Hulse's challenge will be promptly accepted by his well-to-do neighbours.

The Proposed Demolition of City Churches.—It may be remembered that at a recent meeting at Sion College, a report was adopted which practically recommended the removal of a large number of the existing City churches. Many of the fellows of the College, who are incumbents of benefices in London, have issued a protest against legislation based on the principles advocated in that report, which they allege omits to state how much has been effected under the provisions of the existing law for the union of benefices. Much having been done under a Permissive Act, they believe it would be inexpedient to resort to compulsion to effect the remaining unions that may be necessary.

A Recommendation Worth Heeding.—At an inquest held at Cardiff, on the 5th inst., it was shown that a boy, aged fourteen years, had been poisoned through inhaling the fumes of spelter while following his work at the coppersmith's shop of the Taff Vale Railway Company. The jury recommended that boys should not be employed at such work.

Bell-Chiming Apparatus.—A new chiming apparatus, invented by the Rev. H. P. Ellacombe, rector of Clyst St. George, Devon, has been fixed in the church of Moreton-on-Lugg, Herefordshire, by Messrs. Hooper & Stokes, church bell-hangers, of Woodbury, near Exeter, by which means the whole peal of six bells may be easily chimed for service by one person. Ball hammers are suspended beneath the mouths of the bells, out of the way of the swing of the bells, and by a system of pulleys the ropes connected with these hammers are brought down in parallel lines to a manual fixed on the belfry-wall. When the manual is put into gear for use, the ropes are all tightened, and the hammers thereby raised nearer to the bells, so that a slight pull at each rope causes the hammer to strike the bell. One person, therefore, standing in front of the manual, can readily chime all the bells by simply pulling rope after rope, or he can play a tune by varying the fingering of the ropes.

The Proposed Free Library and Baths, Wednesbury.—At a meeting of the Wednesbury Local Board on the 24th ult., it was resolved "that the site in Malthouse-street be purchased for a sum of 700*l.*, for the purpose of erecting baths and washhouses." Mr. W. Lloyd submitted plans of the site, from which it appeared that the total quantity of land to be bought would be over twelve hundred yards. A little more than eight hundred yards would be used for the baths and washhouses, and the remainder—something over three hundred yards—could be utilised for the purposes of a free library. About 305*l.* would be the actual purchase money for the land for the library. According to the plans, it was suggested that there should be only one bath—say sixty yards in length by twenty-two in width—instead of two. This would save much extra expense; a commodious bath would be provided, which upon certain specified days could be set apart for the use of the ladies. The outlay for the buildings is estimated at about 5,000*l.*

The Patent Laws.—On the 10th inst. a numerous meeting of the members of the Inventors' Institute was held for the purpose of discussing the present state of the Patent Laws, and determining upon the measures which ought to be taken to secure an amendment to the Act of last session. Sir Antonio Brady presided; he was supported by Admiral Selwin, Mr. Newton Wilson, Mr. Campin, and other gentlemen. In opening the proceedings, the chairman said that great dissatisfaction was felt at the results of the legislation of last year on this question. The Act did not secure to inventors the protection which they needed, neither did it reduce the cost of securing a patent, and in both respects an amendment of law was needed. After a discussion it was resolved that immediate action be taken for securing the introduction of a Bill into the House of Commons to amend the Patent Act of last session.

Archæological Discovery on a small scale is proceeding actively at Kadikeui. According to the *Levant Herald*, men, women, and children turn out, day after day, on to the beach under the cliffs of Moda Bay, where, for some time past, an incredible number of ancient coins, mostly Roman, have been discovered amongst the pebbles. As many as thirty have been picked up by one explorer in the course of a few hours. A few leaden ornaments, such as brooches, lockets, rings, &c., have also been found. It is uncertain whether these interesting objects were thrown up from the sea during the heavy southerly gales of December last, or have been washed down from the hillside by the rains. Most of the coins are of copper; but a gold one is stated to have also been discovered.

Philadelphia Exhibition.—Messrs. Wright & Mansfield have now on view, at their premises in Bond-street, the furniture to be exhibited by them at the Philadelphia Exhibition, comprising some choice pieces made in the English style of the eighteenth century. For example, a very fine inlaid mahogany sideboard; a mahogany and brass Louis XVI. lady's pedestal writing-table; a lady's inlaid satinwood wardrobe (a capital specimen of wood and workmanship); an inlaid satinwood cabinet; and many examples of chairs, *étagères*, &c., after Theraton, Hepplewhite, Chippendale, and Johnson.

A Water Supply for Otley.—The Otley Local Board, on the 8th inst., adopted a scheme for supplying the town with water, at an estimated cost of 10,000*l.*, and determined to apply to the Local Government Board for the loan of that sum for fifty years.

The Maidstone Cottage Improvement Company, Limited.—According to the thirteenth annual report, just issued, the net rental for the year, after paying for repairs, insurance, and other charges, has amounted to 798*l.* 13s. 7d. The working expenses have come to 16*l.* 9s., and a sum of 33*l.* 7s. 5d. for sanitary improvements at Barming, has been charged to the income account, so as not unduly to swell the amount charged to capital. The annual dividend of five per cent., free of income-tax, will take 644*l.* 12s. 6d., leaving 104*l.* 4s. 8d. as profit for the year, to be added to the reserve fund, which will also be increased by the dividend on the fund to 797*l.* 16s. 1d., exclusive of 40*l.* charged to the reserve fund as part of the loss incurred by taking down five cottages in Bonny's-yard.

The Liverpool Timber Trade.—At the weekly meeting of the Mersey Docks and Harbour Board, on the 10th inst., a memorial was read from thirty-nine firms in the timber trade, complaining of the want of dock accommodation for their business, pointing out how the trade had increased, and asking the Board to give them additional accommodation. A letter was also read from the secretary of the timber trade, enclosing a copy of a resolution passed by that body, asking that, as the importation of deals and sawn timber had so considerably increased, the bye-laws of the Board should be so altered as to admit of the discharging of that kind of timber at the upper quay as well as at the lower. The memorial was referred to the works committee; and the letter and resolution to the quays committee and the traffic committee.

Working Men v. Steam.—A memorial, signed by no fewer than 19,000 dock labourers, was read at the meeting of the Mersey Docks and Harbour Board, on the 10th inst. The memorial set forth that the steam-engines placed on the dock quays to assist in the discharge of ships greatly lessened manual labour, and imposed great hardships on working men, who had large and helpless families dependent on them, and on these grounds the board were requested to remove them. The secretary was instructed to reply to the memorial, pointing out that the subject could not be entertained. This complaint shows indeed retrogression.

New Reredos at Cambridge.—A carved oak reredos, from the design of Mr. G. G. Scott, has recently been erected in the church of St. Mary the Less, Cambridge. It is of Belgian oak, and was executed by Flemish artists at Bruges, under the direction of Messrs. Buckley & Co., London. The reredos consists of five compartments or panels, with open cresting above. Each compartment contains a statue: Our Lord in the centre, with St. John and St. Peter on either hand; and beyond them St. Mary and St. Gabriel. These figures are in coved recesses, with canopies and tabernacles of delicate character.

Mr. Ruskin's Sheffield Museum.—In the February number of *Fors Clavigera*, Mr. Ruskin announces the appointment of Mr. Henry Swan as curator of the Sheffield Museum, at a salary of 40*l.* a year. Mr. Swan was an old pupil of Mr. Ruskin's in the Working Men's College, London, and has since been known to him as an estimable and trustworthy person. At present Mr. Swan is obliged to live in the lower rooms of the house which is to be the nucleus of the museum; but as soon as the St. George's Company can afford it, a curator's house will be built.

New Bridge at Dumfries.—A new iron foot-bridge across the Nith, to connect the southern portion of Dumfries with Troqueer, has been opened. The structure is of the usual suspension form,—203 ft. in length, and 6 ft. 6 in. wide, with the sides of trellis-work. At each end of the bridge, between the large pillars, is erected an ornamental lamp. Beneath is a cast-iron archway. The cost will be about 1,800*l.* Mr. J. Willet is the engineer.

Piecework in the Building Trades at Plymouth.—The masons and plasterers in Plymouth and Devonport have given notice that they will no longer do piecework, but must be paid day wages; also, that if any master or foreman is found measuring the work of any man, or party of men, to see how much they have done, the whole of the men on the job will be called off. In consequence of the threatening aspect of affairs the new South-Western Railway Terminus at Plymouth is, it is said, to be built of wood instead of stone.

The Sewerage of Harwich.—It is stated that at a recent meeting between a deputation of the Town Council and the directors of the Great Eastern Railway on the question of proposed drainage, the latter gentlemen gave preference to Mr. Bruff's scheme (which is on the principle of precipitation), on account of its being less expensive than the irrigation scheme also laid before them, and because it would be less likely to interfere with works which the company propose carrying out at Ray Island.

Monumental.—On Saturday last, the statue of Colonel Akroyd, late M.P. for Halifax, one of the last important works of the late Mr. John Birnie Philip, was cast in bronze at the Manor Ironworks, Manor-street, Chelsea. The *pose* is excellent, and the likeness very striking. At this same foundry, whence have proceeded the bronze statues of Ross, Outram (for Calcutta), Lawrence, and Palmerston (recently erected at Westminster), a statue of Livingstone, by Mrs. Hill, has been just now cast.

Burntisland Dock Works. — Additional tenders have been advertised for to complete the works. These amount to 24,000*l.* odd. It only remains now for the Council to give the word for the execution of these extra works to have the dock ready for next season's traffic. The North British Company have gracefully abandoned their Transfer Bill, and all is therefore settled as it should be.

A New Court-house for St. Helen's.—In connexion with the new Town-hall at present in course of erection at St. Helen's are the Police-offices and Court-room, and these have been completed and formally opened for business. The architect for this, as well as the Town-hall proper, is Mr. H. Sumner; the contractor, Mr. George Rome; and the clerk of works, Mr. Richard Wood, all of Liverpool.

An Engineering Firm.—Mr. Edward Field, C.E., has taken into partnership his brother, Mr. Walter Field, and Mr. F. M. Cotton, M.I.M.E., who have been engaged with him for many years, and the business hitherto carried on by him as consulting engineer will be continued under the style of Field, Field, & Cotton, consulting engineers.

The late Mr. Cheverton.—Mr. Benjamin Cheverton, sculptor, died recently at his residence in Upper Holloway, aged 81. The deceased is best known by his excellent mechanical reductions. The interment took place at High-gate Cemetery.

Royal Scottish Academy.—A meeting of the Royal Scottish Academy was held in Edinburgh on the 9th inst., Mr. Macleay presiding, when Mr. Daniel MacNee, the portrait-painter, was unanimously elected president of the Academy, in room of the late Sir Geo. Harvey.

Cork.—We understand that Mr. Burges has received instructions to complete Cork new cathedral, and that money is ready for the purpose.

Death of Mr. Edmund Bristow.—Mr. Edmund Bristow, the landscape-painter, died at Eton, in his ninetieth year, on the 12th instant. The deceased was born at Windsor in 1786.

A Lift Accident in Bradford.—Last week a boy was descending in a lift, when the rope broke; he fell with the cage through six stories, and was killed.

TENDERS

For presbytery, Buxton, for Rev. J. Power. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Gillard:

Gladwin	£1,344 0 0
Gothard	1,305 0 0
Marsh	1,290 18 5
Barker	1,290 0 0
Pattinson	1,275 0 0
Izzard & Morten	1,251 0 0
Billiange	1,235 0 0
Hutton	1,200 0 0
Brown	1,195 0 0
Gill	1,105 0 0

For Bible Christian church, school, &c, Barrow-in-Furness. Mr. Howard Evans, architect

Ward	£2,947 12 7
Gilchrist	2,877 0 0
Saddler, Wood, & Andrews	2,555 0 0
Gradwell (accepted)	2,550 0 0
Henderson	2,503 15 0

For erecting stables, &c., at the Old Parr's Head, Blythe-lane, Hammersmith, for Mr. Carthew. Mr. F. W. Hamilton, architect:—

Stimpson & Co.	£333 0 0
Nash	330 0 0
Hutchings	315 0 0

For Billingborough schools. Mr. Ernest Carritt, architect:—

Glade	£3,392 0 0
Webber	2,837 0 0
Cooke & Jillings	2,380 0 0
Plowman	2,340 0 0
Easter	2,334 14 0
Hinson	2,293 0 0
Hobson & Taylor	2,257 0 0
Cohen	2,243 0 0
Morris & Co.	2,232 15 10
Millson	2,195 0 0
Hinson	2,135 0 0
Young	1,998 0 0

For alterations and additions to premises, Commercial-road East, for Messrs. Ling & Son. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Coleman	£1,245 0 0
Manning & Dowdney	1,130 0 0
Merritt & Ashby	1,115 0 0
Ennor	1,095 0 0
Palmer	1,075 0 0
Hearle & Son	1,023 0 0
Morter	993 0 0
Hollist	990 0 0
Ashby & Horner (accepted)	930 0 0

For Monmouth Infants' School, Monmouth School Board. Messrs. Laurence & Goodman, architects, Newport, Monmouth. Quantities supplied:—

Bethel & Lewellin	£2,000 0 0
Stephens & Bastow	1,942 0 0
Jones & Co.	1,901 0 0
Biggs	1,790 0 0
W. Jones	1,672 0 0
White	1,560 0 0
Morgan	1,554 0 0
Roberts (accepted)	1,483 0 0

TO CORRESPONDENTS.

J. A. M. R. L. E. S. M. L.—J. W.—C. S. F. A. R. C. L. C. G. S. D. E. M. S. J. A. A. E. B. J. E. E. K. T.—E. W. W. Son, & A.—B. I.—J. F.—O. S.—T. F. Mc C.—C. L.—R. A. C.—W. S. J. shall have attention when received.—J. S. (next week).—W. B. (next week).

We are compelled to decline pointing out books and giving addresses

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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" (Lombardy), 8, 10, 12, and 15 feet
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Monsieur Duc and some of his Colleagues.

THIS year, in accordance with custom, the Council of the Royal Institute of British Architects has nominated a foreigner for the distinction which the Queen is pleased to bestow annually upon some person who has contributed by a work of art or literature to the general advancement of civil architecture. This nomination will be submitted to a special meeting of members on the second Monday in next month, when, if it be, as it obviously will be, approved by the general body, the council will lay it before her Majesty. The gentleman to whom the Royal Medal will then be offered is Monsieur Joseph Louis Duc, architect of the Colonne de Juillet and the later buildings of the Palais de Justice in Paris.

It may, perhaps, be opportune to add, for the benefit of our foreign readers, and perhaps also for some of our English ones, that the Royal Institute of British Architects is a guild of professional men constituted under a charter granted by King William IV. to its first president, the late Earl de Grey. Here, in England, similar art corporations are comparatively young. The Royal Academy itself was only incorporated in 1768; and although it includes a school of architecture, with professors and masters, its reputation is derived from an almost exclusive cultivation of painting and sculpture. The corporation of British Architects was founded only a little more than forty years ago; and one of the founders is still an enthusiastic participator in its transactions. British science, on the contrary, has had a home and kindred associations since the days of Charles II.; and, if judgment by results be worth anything, it may safely be asserted that these societies, associations, or corporations, however they may be called, have a vast influence upon the spread and development of the particular *culte* it is their province to foster; for some scientific aptitude is as much the inheritance of educated Englishmen as artistic culture is of Frenchmen in general. In this regard the French have been fortunate. Among the great associations of Europe, the *Institut de France*, by right of age and tradition, perhaps, holds the highest rank. Originally founded by Cardinal Richelieu in 1635, it was re-modelled, after the Bourbon restoration, in 1816. It was then formed into four sections, to which King Louis Philippe added a fifth. It is still composed (we have heard of no radical changes in it since the fall of the Second Empire) of five sections, which take rank according to the order of their foundation. First, the Académie Française; second, the Académie des Inscriptions et Belles-lettres; third, the Académie des Sciences; fourth, the Académie des Beaux Arts; fifth, the Académie des Sciences morales et politiques. Each section is independent of the other; but the offices, secretariat, library, and all the *Institut* collections are common to the five. Each holds a meeting weekly, one on Thursday, another on Friday, and so on; each holds one public meeting annually; all the five hold a general public meeting once a year; and the *Institut* is presided over successively, and for one year, by each section. Thus, in 1868, the president of the Académie des Inscriptions et Belles-lettres presided over the *Institut*; in 1869, the president of the Académie des Sciences; and so on. The section of the Fine Arts contains forty members, of whom fourteen represent painting, eight sculpture, eight architecture, four engraving, and six musical composition. To be one of the eight is undoubtedly the highest honour that a French architect can receive; and M. Duc obtained this mark of eminence in 1866, when, among the candidates for the Academic chair were the late MM. Henri Labrouste and Vaudoyer. Therefore, the compliment about to be offered to a member of the French Institute by the Corporation of British Architects,—a compliment which the Queen franks,—is a professional recognition by his foreign brethren of one already weighted with honours; and it confers an obligation equally upon those who give and him who accepts. The first of these Royal medals was presented to the late Mr. Cockerell, in 1848; and the year after, the second was given to an Italian of some eminence. Since then the medal has been taken every third year by a foreigner; and the Frenchmen who have received it are MM. Hittorf and Texier (both deceased), MM. Le-Sueur and Viollet-le-Duc.*

Now what has M. Duc done to be thus preferred to such of his fellows as MM. Lefuel, Questel, Bailly, and others? Lord Bacon says:—"If a man perform that which hath not been attempted before, or attempted and given over; or hath been achieved but not with so good circumstance; he shall purchase more honour than by effecting a matter of greater difficulty or virtue wherein he is but a follower." In this fashion has M. Duc "purchased" honour. A description of some of the events connected with his career must certainly interest Englishmen. It may be possible thereby to convey a slight idea of the care and labour expended by the various hierarchies or sets of professional men, deputed for the purpose, in thinking out the construction of new public buildings, repairing old ones, and watching over those just erected in the city of Paris.

The first Napoleon, although necessarily a greater master of the arts of war than of peace, knew more of the latter than many of his friends and enemies are willing to admit; but it is a subject of congratulation that his scheme of a fountain, the principal feature of which was to be a bronze elephant, was never carried out. An architect named Alavoine was commissioned to design such a fountain to be placed on the site of the Bastille; and, in 1814, Napoleon decreed that the bronze should be supplied from the Imperial arsenals, and consist of cannon captured at the battle of Friedland. But the Fontaine de l'Eléphant was not to be. Although it had been decided so early as the 27th of June, 1792,—"in the year IV. of Liberty,"—it was only in 1833, and with the assistance of M. Thiers, that the long-expected monument to commemorate the destruction of the Bastille was seriously begun; and the architect of the projected fountain was chosen, after a lapse of twenty years, to erect the column of July. The works were hardly commenced when they were interrupted by the death of M. Alavoine, under whom M. Duc was acting as clerk of the works. The latter was therefore ordered not so much to continue as to begin the works. Ten years after the revolution of July, and nearly fifty years after the taking of the Bastille, the well-known monument as it now stands was inaugurated on the 28th of July, 1840, when the king made its architect a knight of the Legion d'Honneur. Soon afterwards M. Duc, who as a student had distinguished himself by an ingenious restoration of the Coliseum, was appointed to direct the alterations and extension of the Palais de Justice. The clerk of the works then employed at that building, M. Dommey, was ordered—as *architecte-adjoint*—to assist him; MM. Lenoir and Lassus were made clerks of the works, and of these four gentlemen only one remains alive at the present day—M. Duc.

The design of the column in the Place de la Bastille was almost completely altered at the death of M. Alavoine. Instead of a Doric it became a species of Corinthian column. Less Greek, and more natural in construction and expression, neither the Gallic cock nor the symbolic lion of revolution was forgotten. Civic arms and inscriptions identified it with the time, and the names of the dead to whom the column was dedicated proclaimed its purpose. The worst thing that can be said about it is, that it appears small, and is really big in proportion to other works of the same description. But this is hardly M. Duc's fault, for he was compelled to build upon the *soubassement* originally pro-

* The mistakes which are constantly arising in England between the name of Duc, architect to the Palais de Justice, and that of the celebrated author and archæologist, must be our excuse for adding that the latter gentleman's name in full is Eugène Emmanuel Viollet-le-Duc. That his claim to a chair at the French Institute is as great as that of M. Duc cannot possibly be questioned; and that he has never attained a similar position is probably due to a suspicion that the persistent opposition he has ever evinced to academic influence would lead to his refusal of the honour were it offered to him.

posed for the fountain—upon two basins, each 13 ft. high. Perhaps the strongest thing in its favour is that the smaller details of the monument are designed with scrupulous subservience to the nature of the material in which they are executed. A striking example of this is to be seen in the iron railing with which it is enclosed. One critic, however, whose opinion deserves respect—M. César Daly—has urged that the shaft of the column, composed of sheets of bronze, resembles a mass of dark stone or marble reposing upon a solid base; that, in fact, no attempt is made to hint at the system of construction concealed within. Undoubtedly this is a severe condemnation, for both shaft and base—solid in appearance—are hollow. But the criticism was more in advance of the time than even the column, which was a great stride to freedom in the use of Greek details. Our own critic, Mr. James Fergusson, with the remarkable faculty of analysis at his command, has summarised the superiority of M. Duc's column over others of the same kind. Declaring that the French have surpassed other European nations in "that Celtic form of art which expresses itself in the erection of trophies," he thinks that "of modern columnar monuments this is the most successful." As he justly adds, the column of the grand army at Boulogne seems to have "settled upon a plain with which it has no apparent connexion"; while that in the Place Vendôme is an exact copy of an ancient monument, with the exception that the Roman soldiers, instead of wearing helmets, shields, and breastplates, are burlesqued into the coats, cocked hats, and boots of modern costume,—absurdities which have been avoided in the column that graces the site of the Bastille.

But the great work of the day—a surprise to the mature, and a lesson to the young student—is the new Salle des Pas Perdus and the buildings connected with it at the Palais de Justice. Yet neither within nor without is this hall a model of beauty; although refined in all its details, it is perhaps inelegant in general outline. There are modern works, even in England, more captivating in effect, and in which the superficial elements of beauty are more strongly marked; but since the revival of letters, none have been erected which give, with greater decision, truthful expression to the thought and aim of the constructor, than this one. Neither original nor fantastic, it attracts neither by eccentricity of construction or details, nor by bits of ornament or masses of sculpture. How simply the means to an end have been used at times convince, without astonishing, the matter-of-fact inquirer. The new Salle des Pas Perdus is Greek in its closed portico, Roman in its arcades, Mediæval in its vaulting, French in its general effect. It is symmetrical, without any forced regularity; utilitarian, and not crude; classical, yet devoid of pedantry. It proves not so much the genius of the architect, as the pliability of "orders," "rules," and other antique *impedimenta*. The force of reason and common sense is there displayed in the manipulation of hard and cold materials, and its completion establishes a fact—promoted without a doubt by prolonged archæological researches in both Greek and Gothic fields of art—that all the constructional forms of every country may be so adapted to the style and habits of the present time as to produce a harmonious result, provided always that the cognate principles of ancient and Mediæval architecture be scrupulously followed and developed. The day has gone by, happily, when any professor dare intimate that the study of one form of pure art can militate against practice in another; and Englishmen who have designed the most successful adaptations of native architecture have owned, perhaps a little late, that from the Athenian Propylæa they first acquired a thorough appreciation of the principle and beauty of Mediæval construction. M. Duc, *vice versâ*, has leavened a profound knowledge of the ancient Greek with an admixture of Gothic method, and thereby produced a scientific, truthful, and artistic building. "For three centuries," said Mr. Fergusson to the Royal Engineers in 1862, "we have been labouring under the delusion that it was neither science that advanced the art, nor truth that rendered its production pleasing, but some strange notion that it would be beautiful if it could only be made to look like something it was not,"—keen, uncompromising, bitter criticism, which at this very hour applies to the general mass of modern buildings both public and private. That a great new work should appear in all its parts to be what it is, is therefore no small merit. But M. Duc has done more: he has instilled life into dead styles of architecture, and it remains for a succeeding generation, working on similar principles, to shape the innovation into beauty.

M. Jules Boucher, writing, in 1868, in the *Revue*, conducted by M. César Daly, said:—"L'œuvre de MM. Duc et Dommey doit son succès à la fusion savante que ces artistes ont su opérer entre le goût élevé de l'antiquité et le positivisme inséparable du progrès de notre temps." The same critic concluded his long notice with a characteristic anecdote:—"Cette phrase innocente que nous avons entendu débiter dans la cour même du Palais de Justice. . . . . 'Oui, mais qu'y a-t-il là de bien nouveau?' Du nouveau! mais est-ce qu'un beau sein de femme, le torse d'un beau garçon, un bel arbre, sont choses nouvelles? Et ces objets en sont-ils moins précieux pour être connus de temps immémorial?" Nor are M. Duc's brethren of another and partly antagonistic school of thought backward in rendering justice to his skill and learning. After commenting upon the sceptical indifference excusably evinced by people in general to the ordinary buildings of modern cities, M. Viollet-le-Duc declares that too much praise can never be given nor public attention too often directed to the work of a true artist. He then in a footnote in the second volume of his "Entretiens" cites the new portions of the Palais de Justice, in which "la décoration tient à la structure, l'appuie même et ne manque par cela ni de grandeur ni d'originalité. La Salle des Pas Perdus, extérieurement et intérieurement, est un de ces monuments qui fera honneur à notre temps. Là tout se tient; tout est lié par une pensée claire. L'exécution comme il arrive toujours répond à la composition. Elle est belle et pure. On sent l'artiste, chose rare dans notre temps, qui respecte son art et le public." These words convey no idle or interested compliment, for M. Viollet-le-Duc has never scrupled to express publicly a hostile opinion,—and generally a correct one, if identity with that of Mr. Fergusson may be taken as evidence,—of the works of men like the late MM. Hittorf, Duban, Labrouste, and others.

When first appointed, thirty-six years ago, to the Palais de Justice, the architects proposed, in conjunction with the then youthful Committee of Historical Monuments, to preserve the Renaissance remains in the courtyard of the old Préfecture de Police,—in fact, to make use of what was left of the old in the new work then contemplated. Part of the walls of an old Salle des Pas Perdus, of the time of Louis IX., had also been discovered; but it was found impossible to use or even restore them, without pulling down a large and important modern building. The first design for the suggested additions had been made by M. Huyot, under the administration of the Comte de Rabuteau, in 1836; but this was modified in plan, and almost entirely altered in elevation, by M. Duc, under whose direction the works, once begun, were continued without interruption until the fatal year 1870. A portion of the façade, on the Quay de l'Horloge, has been reconstructed in the style presumably of the fourteenth century; but this and restorations of a similar description are the least successful efforts of eminent Paris architects, and it is not surprising that M. Duc should have failed to impart Mediæval feeling to this portion of his work, however correct his construction may be in principle and even in details. A small villa, lately built at Croissy (Seine-et-Oise), for his own accommodation, shows him, however, both willing and able to descend to trifles of domestic architecture. M. Duc contributed a design for the Tomb of Napoleon, and in 1861 received the fourth premium in the great competition for the New Opera-house, the fifth and last premium having been obtained by M. Garnier, who, as is well known, ultimately erected the building. Before taking his seat at the *Institut*, M. Duc had been raised to the grade of officer of the Légion d'Honneur; and on August 15th, 1869, he received the Grand Prix of 100,000 francs, which the Emperor had decreed five years before should be awarded every five years to some artist who had specially distinguished himself in painting, sculpture, or architecture. M. Duc was consequently the first, and perhaps (yet who shall say?) the last, recipient of a magnificent and unsatisfactory prize.

The particulars of that event are interesting and instructive, for they show the appreciation the French have of architecture, and the place they give it in their world of art. Before the election, Parisian opinion on the subject was but slightly divided; and it was felt that of all men two most deserved the distinction,—M. Viollet-le-Duc and M. Duc, and of the two there was no difficulty in making a reasonable choice. The French apply to architectural works an expression which we also possess, but do not make use of for the same purpose: it is *créer*. It was felt that while M. Viollet-le-Duc had taught Frenchmen and the world how to "create" many buildings, M. Duc had actually "created" one,—a fact which certainly influenced the verdict of the special jury. This body held twenty-five sittings. Nine candidates were at length chosen: three for painting, three for sculpture, and three for architecture. The names of those in the last section were Duc (Palais de Justice), Garnier (Opéra), and Lefuel (Tuileries). At the election, twenty-nine of the jury were present. At the first division (Academicians vote *oui* or *non*, not by a show of hands), nineteen voices declared in favour of the three architects, and three other voices for a sculptor, seven members abstaining. At the thirteenth and last division, the numbers were fifteen for Duc, two for Lefuel, one for Garnier, and one for Perraud; ten of the jury having declined to vote. What followed was inevitable; for Parisian vivacity could hardly fail to draw an incongruous parallel between the winnings of Gladiateur and those of M. Duc. The Emperor nominated MM. Lefuel and Viollet-le-Duc *commandeurs* of the Légion d'Honneur. At once the cry of inconsistency was raised: these men had been promoted to a higher grade than Duc, who was "simple *officier* with 100,000 francs premium!"* The French have probably too much wit to possess much sentiment, and what little they have preserved of the latter is often eminently false. Every one remembers the famous Imperial communication about the New Opera-house and the New Hospital; how the completion of the building dedicated to profane deities ought to follow, not precede, that of the Hôtel dedicated to God! At the same time the "Cent Mille" of Longchamps was presumed to weigh more heavily upon the artistic conscience than the purse of the people, so a "Cent Mille" was consecrated to art as well as the horse!

M. Duc did not appropriate the whole sum of 4,000*l.* to himself. A few days after his victory he communicated to the Académie des Beaux Arts his intention to found an architectural prize (and one of some value) to be open to all Frenchmen, and to be awarded every two years. His letter, which was well and simply worded, loses in translation. He said:—"In every age architecture has been the great handwriting of history, and that of our country has faithfully expressed our civilisation and manners from the Roman domination to the time of Louis XVI. Since that period the signs and shapes which constitute the elements of our handwriting have been disturbed in their successive transformation by causes which are unconnected with the changes of society. The face of art has become *critique* instead of *organique*. . . . . Admitting the fact, against which our institutions are powerless, it has seemed useful to the founder to determine . . . . . the style and shape of the *éléments* of our modern architecture. The aim of this competition is therefore not to repeat those brilliant and ingenious compositions which are daily produced at the École des Beaux Arts. . . . . The competitors will have merely to present, as they may choose, the most simple subjects, and above all the fittest subjects to place in evidence the main principles of our architecture." We attach importance to the phraseology and point of this letter because the writer is not a latter-day enthusiast, harping on the cry of "true principles," but a Classical architect, who, in his youth, passed the usual curriculum of study as it is prescribed by our more academic neighbours, and who is undoubtedly imbued with excusable horror of the abortions which, both in France and England, are now tolerated under the plea of honest expression and native origin. To M. Duc more than to the architect of the Bibliothèque de St. Geneviève is owing the actual cultivation in Paris of the Neo-Greek school of architecture,—a school destined to produce in due time an eclectic European style of art with a firmer basis and broader aspirations than it would be wise, even if it were possible, to suggest.

Any one who is acquainted with the administration of public works in France, or, indeed, who is compelled to seek in French periodicals the dry facts connected with it, must remark the almost complicated position in which architects

* M. Duc has been since promoted to the grade of "commandeur."

in Paris are placed with regard to each other. We find young M. Duc clerk of the works under Alavoine; the late M. Espérandieu clerk of the works under the late M. Vaudoyer at the new cathedral of Marseilles, and that at a time when the former was erecting in the same city one of the finest modern buildings in France. During the greater part of the Second Empire the city of Paris was divided into eight *circonscriptions*, for the preservation and maintenance of public buildings. At the head of each was a professional architect. Thus, in 1869, the Colonne de Juillet, which remained under the charge of its architect, M. Duc, was in the seventh *circonscription*, of which M. Lefuel was Inspector-general; while the Cour de Cassation of M. Duc and the Ecole des Beaux Arts of the late M. Duban were both in the third *circonscription*, of which M. Questel was Inspector-general. At that same period the *Service des Travaux d'Architecture* was divided into four sections: first, the barracks, prisons, &c., under the late M. Gilbert; second, the colleges, schools, &c., under M. Duc; third, the municipal buildings, &c., under M. Bailly; fourth, the churches, under M. Ballu. But after 1870, when M. Léon Say was *préfet* of the Seine, this *service* was reorganised; and a council was then formed for the purpose of assisting the minister in building-schemes, designs, estimates, &c., in the choice of officers, and other questions concerning the direction of public works. This was confirmed by a decree, dated the 31st of June, 1871, the perusal of which would possibly astonish Lord Henry Lennox or Mr. Mitford, were either of these gentlemen disposed to learn how so ungovernable a people as the French manage architectural matters. The decree contains several articles, the first of which establishes "a permanent service of architecture," composed of three inspectors-general, twenty architects (of each *arrondissement*), one architect of the buildings occupied by the administration, twenty-one clerks of the works, twenty-one surveyors, and twenty-three clerks, sub-surveyors, &c. The second article prescribes the duties of the three inspectors-general. They are to give opinions upon designs and estimates, look after works in course of execution, as well as the *comptabilité* of the architects intrusted with such works, more particularly as regards the choice of materials, difference between estimate and outlay, alterations made during the progress of the works, &c. They are also expected, firstly, to prepare the programme of designs for new buildings, and if required, preliminary sketches for such works; and secondly, to inspect the works of art in the division to which each is attached. The first inspector-general has charge of the religious edifices, the Sorbonne, Lycées, schools, &c.; the second, the Hôtel de Ville, the Bourse, the Tribunal de Commerce, cemeteries, theatres, municipal buildings, museums, &c.; the third, the barracks, the Palais de Justice, police-offices, prisons, markets, granaries, custom-houses, &c. In 1871 the President of the Council was M. Alphand, and the Vice-president M. Duc. The three Inspectors-general were MM. Bailly, Davioud, and Magne, and M. E. Trélat was appointed chief architect of the department of the Seine. Architects were authorised to assist in the labours of the council, and to vote in matters relating to their own service.* It will thus be seen that, although French Governments of every colour tend in the long-run to despotic rule, the city of Paris, as far as the public works go, is sufficiently representative in its institutions. At least it is some satisfaction to know that the last French Republic is quite as favourably disposed to the profession of architects as the ruler who preceded it; and who was once sarcastically styled their Emperor.

This incomplete reference to M. Duc and some of his colleagues would be still more imperfect were we to omit one thing which savours of old rather than new France. M. Duc possesses the charm of manner and address to which our grandfathers were accustomed—a charm which equally pertains to his half namesake, M. Viollet-le-Duc. Those who have conversed with both of these gentlemen will bear out our assertion; and indeed the latter was but lately the worthy subject of more than one complimentary notice in the *Times* and other English journals. It is pleasant to be reminded of this fact, and particularly so when the *Quartier Latin* continues to foster that modern hybrid, of revolutionary tendencies, the artistic rough. M. Duc acquired the knowledge of his art in the same social school as the late Mr. Cockerell; and each is an example to the students of either nation. Nevertheless, in spite of things moral and things social, all classes of Frenchmen are ahead of their English neighbours in innate artistic appreciation by at least a hundred years. Their academies are older by that period of time than those established in this country; and intuitive respect for the arts comes by inheritance. If Paris is now the most beautiful of modern cities, the fact is due not to the labour of a score, but many scores of years. It is due as much to the taste of the people in general as to the education of architects in particular.*

* We refer our readers to page 94 of the Paris Post-office Directory for 1876 (in the library of the Institute of British Architects), in which the whole administration of French public works is catalogued. The original decree of M. Léon Say has been since slightly modified. At the present moment the artistic inspection of Paris is divided between MM. Ballu and Davioud, Inspectors-general. MM. Duc, Bailly, and Magne remain as honorary officers.

THE PINWELL EXHIBITION IN BOND-STREET.

CLOSE following on the late remarkable exhibition of the works of Frederick Walker, comes the collection, in the same room, of those of G. J. Pinwell. The system of putting together, for comparison and collective criticism, the productions of a deceased artist, seems to be becoming an accepted idea, and it is certainly, as well as an act of homage to the artist, a crucial test of his power. It is a very severe ordeal for any but the highest genius to be submitted to,—that of placing all a man's works in such close proximity that mannerism and repetition in style and idea are at once evident, if existing, and what appeared when taken by itself to be a very original and unique fancy may be found to be only one of a number with a strong family likeness. In such a collection the "critic" gets into the weak points of the painter's armour, if he ever does at all; and it is a great tribute to the genius of an artist to be able to say that you come out from such a collection of his works with a higher idea of his power than before. This, as we indicated at the time, was emphatically the case with the Walker exhibition; it can hardly be affirmed that it is equally so with the present exhibition of the productions of Pinwell.

No doubt the collection of Walker's paintings did show, as we noticed, a certain "manner" in dealing with the pose and expression of figures; but this was only what every one who had noticed his pictures since his name became famous was aware of. On the other hand, many who only knew him, or knew him chiefly, by his Academy pictures of late years, must have been surprised to find how various was his ability, how many things he had tried in his short artistic career, and how successful he had been in all of them. We can hardly say that the present exhibition produces a similar impression. That Pinwell had a manner, or a mannerism, every visitor to the old Society of Water Colours knew; and an examination of this collection of his works only seems to show that he had little grasp beyond the limits of his particular manner. What is in favour of his reputation is what we knew before, his high finish, feeling, and originality of style in certain works with which we were familiar; what we gather for the first time from the opportunities of comparison here afforded, is rather calculated to raise the question whether he had any claim, artistically, to such a special commemoration, and whether it does not offer rather an unfortunate exaggeration of his peculiarities and shortcomings.

The strong points of the collection are the works which have from time to time occupied places of honour on the walls of the Water-colour Society's Rooms, and of which, perhaps, the finest and most typical is the "Elixir of Love" (70). This shows, equally with any other of the artist's works, either before or since, the rich and harmonious tone, and the high finish, far beyond what is generally attempted in water-colour, with which the features are painted,—we may say "painted" without an apology, for they are executed in a medium and manner far more analogous to oil-painting than to what is usually understood as watercolour. And this work surpasses almost any of the others in combined point and variety in the action of the numerous figures composing the group. The idea of the picture is a good one; it appeals, in a sense, to universal interests, and the various action of the groups composing it is reduced to unity by the single interest which binds them together. This is attempted, but less successfully, in "Gilbert à Beckett's Troth" (80), where the group are all occupied, either in pity or scorn, with the foreign woman wandering in search of her sweetheart; but somehow the picture does not tell its story well—it is hardly a telling subject for pictorial treatment, and there is something scattered and unsatisfactory about it; one wonders what it all means, and why the young man and woman on the left assume such constrained and awkward attitudes. The face of the centre figure in the "Elixir," the girl who holds up the phial in loving contemplation, while her companion clings to her with the same kind of expression in countenance and pose, is very beautiful, and extraordinarily finished. But if we turn to "The Great Lady," also in itself a very admirable work (44), we find the same woman, the same identical face, and the same finish; and the figure and gait which represent very well the young sentimental girl, hardly represent equally the style of personage evidently intended in the title of this picture. That is an instance of what we mean by questioning the advisability of such an exhibition as this of Pinwell's works, unless as a means of estimating more accurately his exact position among artists. Each of these two pictures has deserved and received high admiration separately; each of them loses by juxtaposition, because they show a mere repetition of the same type in illustrating subjects utterly different.

The three works above referred to belong to the phase of Pinwell's career by which he will be best remembered, since it is in these works, and such as these, that he established a line of his own. It must be said, however, that there is a vagueness and unreality, a confusion as to time and place, which, however suitable to such subjects as the "Elixir" and "Gilbert à Beckett," seems out of place when it overshadows alike his treatment of other more everyday scenes. "The Country Walk" (57) is a production of the same time, and though the lady's face in it is very sweet in expression, and the landscape very picturesque in general forms, there is such a vagueness about the tones and the local colour, such an utter absence of "out-of-door" feeling, that it is like a country walk in dreamland. Previously to this, Pinwell had produced works, mostly small, which depended less upon finish and more upon human feeling and character for their effect. "A Seat in St. James's Park," for instance, has a more genuine pathos, in the figure of the worn anxious man (evidently one of those to whom modern Babylon is too cruel) seated in sad abstraction next to the nursery-maid and her military admirer. The tone of the uniform of the latter is not fortunate, and his leg, or rather shank, would seem more in place in the pages of *Punch*, who delights to represent these ornaments of our parks with the longest and thinnest of spindle-legs. But the other figure interests us more than most things in the room. Among the smaller works, again, the figure of the vagrant apostrophising the dog, illustrating a quotation from Dickens's "Uncommercial Traveller" (54), has real humour and vivacity of expression, of a kind which the artist seems very much to have lost in his subsequent more ambitious subjects. This was one of the earlier Dudley Gallery works; and one may compare it, in reference to the opinion just expressed, with the large sketch of "Sally in our Alley," in which there is a good deal of vivacity in the secondary figures; but who could accept the stiff, strutting young man escorting Sally as the hero of that most artless and natural of ballads? Other figures in the later pictures seem to us very inconsequential; the "Pied Piper," the first edition of him, at least, with the rat procession, is a very good bit of grotesque humour; but what in the world have the couple on the right got to do with it, and why do they stand in such affected attitudes? The second "Pied Piper," with the procession of children, we confess to regarding as an entire failure; it is neither weird nor life-like, the children are not half excited enough, nor the parents anxious enough for the occasion; they look as if they were only playing at the ballad in a nursery. More recently the artist seemed rather drawn to a more real and life-like style again; among instances of this is the very nice and characteristic old couple represented in the interior scene called "The Old Clock" (63), which we remember calling attention to in our

* It is absolutely necessary to add, in face of the contradictory statements even now published in this country, that the new Salle des Pas Perdus, the staircases and principal corridors executed by M. Duc at the Palais de Justice, were *not* destroyed during the fires of May, 1871. In fact, the work of completing the approaches to M. Duc's magnificent Salle was being actively proceeded with at the close of last year.

notice of last year's Exhibition of the Water Colour Society; and his visit to Tangier produced a work in a rather different manner from anything he had previously done,—"The Prison-hole, Tangier" (104),—and very admirable in its way. Among the more ideal subjects, the woman's figure in the "Earl o' Quarter-deck" (50), though rough in finish in comparison with his best-known works, and though the whole tone and manner of the picture is very *outré*, nevertheless has to our thinking more intensity and pathos than most other things in the room.

We looked with interest to the sketches and studies, but must confess to disappointment. The book illustration drawings seem to us very deficient in interest, and a large number of the studies exhibited are so rough as really scarcely to deserve the name. It is difficult to see what pretext, except a desire to fill the wall, there could be for hanging such a sketch as the "Knight Returning from War" (92), which gives the idea not so much of studying a picture as of trying for one out of accidental vagaries of the brush, much as the ancient painter got the foam on the dog's mouth by throwing the sponge at the canvas. There are many others equally rough, scarcely even suggestions. Nor can we see what good could be done to the artist's memory by hanging so unfortunate a production as "Sweet Melancholy," the title of which really seems meant for a joke. In short, we leave the exhibition with doubtful feelings as to the wisdom of having made it. The writer of the preface classes Pinwell, by implication, in his first sentence, among "our *great* painters." It is unfortunate that a claim should have been made for him for a position in the art which this very exhibition goes far to negative, though it contains works of unquestionable interest and beauty.

ROMAN REMAINS IN ALGERIA.

ALGERIA is a colony about which comparatively little is known beyond the history of the French campaign. If anybody doubts the assertion let him select some prominent event in its history and try to find out some trustworthy information on the subject. A Londoner would inevitably have recourse to the British Museum, only to discover the barrenness of the library and the general ignorance of its usually well-informed custodians on the topic. They can refer to a few books of modern travel, generally written by valetudinarians, and more or less valueless; and that is all. If he crosses the Channel, he will find that the majority of well-informed Frenchmen only remember the war, and the famine, and the bold bishop who bearded Napoleon in the zenith of his power; and that, even at the private *libraries*, where Algerian works are a speciality, there are bushels of chaff for every grain of good matter. The truth is, France has come to regard her colony as an *incubus*, and cares very little about it; and, if the owner is thus indifferent, it can scarcely be expected that strangers will, as a rule, display much greater interest in this corner of the great African Continent. Yet Algeria has had a most memorable past, and every scrap of information respecting its condition in those days when the warriors of Carthage and Rome contested its possession ought to be warmly welcomed by the archæologist. The most recent contributions to our knowledge of the interior has just been made by Lieut. Colonel Playfair, H.M.'s Consul-General, who visited it about six or seven months ago. His first discovery was made at a place called Guelma, where he found an interesting Roman tombstone,—that of a young man who too confidently hoped that his wife would have rested beside him. The work, he says, is rude in point of art, but extremely beautiful in conception. It is a monolith of rose-coloured marble, square in plan, consisting of a pedestal, with cornice, plinth, and base, supporting a crowning part rising on the same plan, terminating in an architectural feature which has now disappeared. On the principal façade, the top piece bears a circular wreath inclosing two portrait busts in relief, that of the man only being completed. The features of the woman are not chiselled. The plinth has a garland suspended from the cornice, below which the surface is divided vertically for two inscriptions, that of the man alone being filled up. On the left side of the plinth is a folding-door just shutting, and intended to represent the door of that terrestrial home which had then closed for ever. On the same side is another one, opening,—representing the life to come. This interpretation is confirmed by the sculpture on the opposite side, which bears on the plinth the figure of a winged child with reversed flambeau, while above it is a cock crowing to represent the dawning day.

Passing onward, Colonel Playfair everywhere found Roman remains of villas and castles, until he reached Mahajiba, the *Seniore* of the Itinerary of Antoninus. Looking at it with a soldier's eye, he says this stronghold was admirably chosen from a strategic point of view. The whole hill is still covered with the remains of buildings constructed of huge blocks of cut stone, some of the walls being entire to above the level of the first-floor, with the holes for the reception of the joists distinctly visible. The principal ruin is a tower which may have been the citadel of the place. It consists of a rectangular inner keep, about 30 ft. by 18 ft., and 40 ft. high, and is complete as far as the cornice. It was divided in the ground-plan into two portions, communicating with a door, which was about half the whole interior width; there were probably also two or more stories. This was surrounded on three sides by an outer wall, 4 ft. thick, forming a spacious enclosure, the whole being a part of the general system of defence. The fourth side of the tower towards the body of the place was not thus surrounded; but a simple prolongation of its face completed the *enceinte*. The walls of the tower are pierced with narrow apertures, like modern loop-holes for musketry, while the outer wall has larger ones resembling embrasures for artillery. Every building on the place seems to have been built with a view to defence; all have the same loop-holes, and many of them have what appears to have been a species of portcullis. This was formed of two immense upright blocks of stone, having an exterior and interior groove. In the former, large flat slabs of stone were dovetailed in; and it is probable that some of these were habitually left out, and only put into position during an actual siege. In times of peace, wooden bars, one above another let into the inner grooves, probably formed a more temporary barrier. In the tower or citadel above mentioned, two different styles of masonry are distinctly perceptible, and support the idea that like many other Roman strongholds, *Seniore* was overthrown by the Vandals, and was re-conquered by Belisarius or his successor. The stones are uniform throughout, but the upper courses are much more loosely joined together than the lower tiers. No inscriptions of importance were found in the place.

About 15 kilos. from Constantine there is a remarkable building, which has either served as a mausoleum for some distinguished person, or as a monument commemorative of a great victory. This edifice is composed of three principal parts —a square base of nearly 3 mètres high, surmounted by 3 gradients each 50 centimètres in height, and above these gradients rises a plinth of 1 mètre 10 centimètres, crowned by a splendid cornice of a bold and firm yet refined character, measuring 65 centimètres in height. At this level a course of stones, 50 centimètres high, retired from the cornice by 30 centimètres on all sides, extends like a pavement over the upper surface of the monument, and serves as a footing to four square pillars that occupy each angle, leaving a distance outside of nearly 1 mètre on each of the exterior faces. Prominent round bucklers decorate the outward faces of each of these pillars. From this point the structure has been thrown down, partly by earthquakes and partly by human agency; and the materials lie scattered in every direction. Our explorer saw capitals of the Doric order, frustra of columns without fluting of any description, soffits decorated with geometric forms, small entablatures, evidently belonging to the interior of the ruined part of the building, and fragments of the superior cornice. He says no doubt exists that the square pillars supported columns covered with a pediment, and leaving between them an open vista to expose to view and protect some notable object, such as a statue or sarcophagus. The whole building is formed of beautiful cut stone, joined with great perfection, not a trace of mortar being perceptible. The ground around this monument has risen in the course of ages nearly to the level of the base; but, in 1861, the south and part of the east side were cleared of *débris*, and a vain attempt was made to penetrate to the interior. The problem of its origin still remains unsolved; but a careful search among the accumulated ruins on the north side would doubtless be rewarded.

Throughout the whole of his tour, Colonel Playfair found abundant traces of the Roman occupation; but they exist nowhere in greater perfection, or numbers, than in and around the Aurès, a mountain region hitherto quite unknown to European travellers, and roughly corresponding with the *Mons Aurasius* of Procopius and other geographers. The whole area of this district is about 800 square kilos., and it is occupied by a race of Berber shepherds, who seem to have viewed their conquerors with kindliness, to have intermarried among them, and to have become assimilated to them. The features, language, and customs of these people bear unmistakable testimony to their classic origin; light hair and blue eyes are very frequently seen, and Colonel Playfair even ventures to assert that in no country is the average of female beauty so high. Their language is full of Latin words, and in their daily life they retain customs undoubtedly derived from their Christian ancestry. They observe the 25th of December as a feast, under the title of *Moolid* (birth); and use the solar instead of the lunar year. Some of the mountains attain an altitude of nearly 8,000 ft., and the villages are perched high up on the face of the hills, not unlike the castles along the banks of the Rhine. All over the district, wherever there is a valley of exceptional richness, or a little plain, there one is sure to find the remains of a Roman establishment, consisting of foundations of edifices, built with large and well-cut stones, frustra of columns, oil-mills, &c.; but the finest and largest towns are naturally on the outskirts of the neighbouring level country, and, as it were, surround the Aurès with a zone of architecture. Some of these ancient cities have been previously explored and described; but until now the old town of Thamugas has been unnoticed. This ancient city, which was situated in a rich plain on the northern slope of the Aurès, was founded to celebrate the victories of Trajan over the Parthians, and to recompense the veterans of the 30th Legion, Ulpia Victrix, for their participation in the struggle. This fact is proved by an inscription which still exists in duplicate on two magnificent pedestals of white marble, of octagonal form. Its bishops are mentioned as having assisted at several of the councils of Carthage. The principal ruins are on the north side of the town. The most remarkable of them are the fortress, the theatre, the forum, a triumphal arch, and a large temple. The stronghold measures 110 mètres by 90 mètres, flanked on each side by three salient towers. The theatre, which was formed on the slope of the hill, was built of costly materials, and was evidently intended for the accommodation of a considerable population. The forum consists of a long colonnade, running parallel to an extensive and beautiful valley. The back part was formed of a continuous wall, against which were constructed ranges of small buildings, which were probably shops, separated here and there by openings giving access to the body of the forum. Towards the southern extremity of the colonnade, which was of great length, another range of columns ran at right angles to it, and probably formed a second side to the forum. Great numbers of inscriptions are scattered about. These, no doubt, decorated this public resort, or commemorated distinguished citizens or important events. The most prominent monument, however, and one of the chief Roman relics in Algeria, is the triumphal arch. It consists of three openings, the side arches having above them square niches for statues. The monument is of the Corinthian order. Each side is decorated by four fluted columns, that occupy the angles and the spaces between the arches. To each column corresponds a pilaster, both being supported by a common pedestal. A powerful entablature connects all the columns and pilasters together, and was itself surmounted by an attic, with an entablature, of which a portion of the architrave alone remains. Over the two lateral arches and the square niches, and supported by two columns, are two curved pediments, such as surmount some of the niches in the interior of the Pantheon at Rome. None of the original inscription remains in place, but fragments of it have been found below and near the forum which enable it to be thus restored:—

Imp[erator] Cæsar [divi] Nervæ f[ilius] Nerva Trajan[us] [Au]g[ustus] Germanicus Pon[tifex] Max. Imperator III. t[r][i]b[unicia] Po[testate] IIII., Consul III., P[ater patriæ] co[loniam] Marci[anam] Tr[a]janam T[hamugadi per leg[ionem] tertiam [Augustam] f[ecit] . . . . anatim[ius f.] Gallus leg[atus] Aug[usti] pro prætore d[edicavit].

The two façades are identical in feature, and

each is in itself perfectly symmetrical, except that the capitals of the two columns on the southern façade, instead of having the angle of the abacus supported by volutes, have eagles in their place. The square niches have each their separate entablature and columns supported by sculptured brackets. The mass of the monument is of sandstone, but the columns, capitals, and bases of the pilasters, brackets, and entablatures, are entirely of white marble, as was also the crowning of the attic. The last building noted is a temple, which was probably dedicated to Jupiter, and which must have been a very splendid edifice. A large porch probably existed before the entrance, as the vestiges of a colonnade are still visible, parallel to the principal façade. This was most powerfully constructed; a transverse wall which may have corresponded to the entrance to the cella measures nearly two mètres in thickness, the stones varying from 1 to 1¼ mètre in length, and from 0·65c. to a mètre in breadth, and 0·50c. in height. An attic base in blue limestone, lying on the spot, measures 1·97c. at its plinth.

In the course of his wanderings Colonel Playfair also investigated the great cave of Djebel Thaya, which, as far as is known, had never previously been visited by an English traveller. This is a great natural cavern which appears to have been converted by the natives into a temple to the god Bacax—a deity who, from many existing inscriptions, would appear to have been adopted by their Roman conquerors. It is further gathered from these inscriptions that every year the magistrates of Aquæ Tibilitanæ came with much ceremony to offer a sacrifice to the god of the cavern. These records also contain the names of consuls who were elected under the Emperors Caracalla and Geta, A.D. 211, and from this date they are mentioned up to A.D. 268. Unfortunately we have no space to describe the cave, or rather the series of caverns; but we have said enough to show how interesting Colonel Playfair's journey was, and how well worthy this region is of the attention of English archæologists. Every courtesy and assistance is extended to visitors, and Algeria is within easy reach from Marseilles. Notwithstanding the extent of his experience and the voluminousness and carefulness of his notes, Colonel Playfair was not absent from his consulate for two months altogether.

CHARACTERISTICS OF GROUND PLANS ADOPTED BY THE GREATER CONVENTUAL ORDERS OF ENGLAND.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association, held on Friday evening, the 18th inst., Mr. John S. Quilter, president, in the chair, votes of thanks were tendered to Mr. Waterhouse for his kindness in conducting the members over the new Natural History Museum at South Kensington, and to Messrs. Dollman & Allen for permitting the members to visit the new Church of All Saints, Aden-grove, Stoke Newington.

It was announced that the next visit of the Association will take place on Monday next, the 28th inst., to Messrs. Cubitt's works in the Gray's Inn-road, when the whole of the departments, including the iron foundry, will be shown in full work.

The following new members were elected, viz., Messrs. R. Henry, W. H. Fisher, G. W. Ferguson, J. Butters, R. Boughton, G. T. Shaw, G. Smith, J. M. Smith, R. Milnes, and C. Richardson. It was announced that at the adjourned special meeting to consider the question of branch societies, it was resolved "That no person present at any meeting shall have more than one vote." (This resolution was passed in order to prevent delegates of a branch society, who might happen to be members of the Association, from having a vote in each capacity of delegate and member.) It was then resolved that the Birmingham Architectural Association should be admitted as a branch of the Architectural Association, subject to the conditions stated in the draft rule which we have already published, and which has been adopted as one of the rules of the Association.

The Rev. Mackenzie E. C. Walcott, B.D., then read a paper "On the Characteristics of Ground Plans adopted by the Greater Conventual Orders of England." He commenced by asking, What is a conventual church? What is conventual arrangement? A conventual or regular foundation, was composed of inmates supported on a common fund, living, sleeping, and eating in common; and the plan was designed to combine a number of distinct buildings in a compact, simple, and convenient manner, with a harmonious grouping of the exterior. These might be (1) under the rule of St. Benedict, monks religious, Benedictine, Cistercian, Clugniac, or, under a modified form, Carthusian; (2) under the rule of St. Augustine, Regular canons (black), Austins (white), and Præmonstrants, and friars Dominican, Franciscan, Carmelite (black, grey, and white), or Augustinian. In cathedrals of the new foundation, some Benedictine, one of Austin canons, a bishop's throne made their cathedrality. In all other respects they were conventual. Again, there were secular cathedrals of the old foundation, in which every member of the Great Chapter, being resident, lived in his own private home, maintained his own household, and possessed a separate income or prebend, apart from his share in the common fund. Their vicars had chambers in a college, with their own chapel and common hall. In all main respects similar, except in the absence of a bishop's throne, were collegiate churches. Both had, or might have, a cloister. They always possessed a chapter-house,—invariably of polygonal shape,—and library, but they had no dormitory or refectory. At Lincoln the cloister was ingeniously contrived on the north side, and at St. Paul's was converted into corridors of two stories, with a chapter-house in the centre. The name of Minster was common to all the great churches. The arrangements of the choirs differed. At the four corners, in a secular choir, sat the four dignitaries,—the dean at the south-west, the precentor at the north-west, the chancellor at the south-east, and the treasurer at the north-east, the archdeacons ranking next to them. Between them, in the upper stalls, were canons priests, below them canons deacons and subdeacons, and vicars choral. But in a regular choir the abbot fronted the friar, the precentor sat in the midst of the northern stalls, facing the succentor on the south. Novices sat in the second range. The ground-plan of the great Norman churches, both regular and secular, was the same. The high altar at first stood isolated in the chord of the apse, with the bishop's chair behind it, and a luna on either side for the priests (whence our term "presbytery"). When this part of the building was enlarged, and the reredos introduced, the altar was attached to the eastern wall. With regard to the *nave*, the Benedictines usually erected a distinct parish church, for the accommodation of their dependents and tenants (Westminster, Malmesbury, Gloucester, Peterborough), but sometimes made it an annexed building, or an aisle (St. Alban's, Chester, Leominster, Sherborne). In other cases there was a division made between the monks and the parishioners, the townsfolk occupying the nave and the religious community retaining the eastern arm, which is the reason why, at the Dissolution, many choirs were destroyed and the naves spared (Croyland, Wymondham, Thorney). The *Galilee porch*, used as the last station in a procession, occurs at Ely and at (secular) Chichester, at the west end. There is a small one annexed to the transept at (secular) Lincoln. They somewhat resemble the ante-church of a Clugniac church. The *choir* was arranged under the central tower, or in the crossing, and when additional space was needed the stalls were then continued along one or more bays of the nave westward. The *rood-loft* was usually the choir-screen, but at Durham it stood under the western arch of the tower, and the choir-screen under the eastern arch. At St. Alban's there was a double screen at the west end of the choir, and a presbytery screen under the eastern arch of the tower. The *transept* had always apsidal chapels on its eastern side; these were afterwards often converted into aisles for altars, and on the south side elongated into a sacristy, as at Norwich. At Winchester there are cross aisles, with an upper stage for the exhibition of reliquaries, as at St. Stephen's, Caen. The *presbytery* (*i.e.*, before 1085) was often erected over a large subterranean church or undercroft (in imitation of the Memoriæ of the ancient basilicas), which contained numerous altars. Where there was a popular saint buried in the church, his *shrine* took the place of the ancient high altar, and stood immediately east of the altar (Winchester, Westminster, St. Alban's, Durham, Bury, Canterbury); at the back of it ran the procession-path. Occasionally a range of chapels in a transverse aisle formed the extreme east end of the building, as at Durham (Benedictine), Fountains (Cistercian), Bridlington (Austin Canons'); and, again, there was a *choir transept*, which gave the building the form of a patriarchal cross (as at Canterbury, Rochester, Salisbury, and Lincoln). The *lady-chapel*, after the thirteenth century, was very often erected eastward of the main church, but it also held subordinate positions: detached, on the north side of the choir (Bury, Ely, Peterborough); attached, like a chapel south of the nave (Rochester), opening out of the north wing of the transept (Canterbury, Austin Canons', Oxford, Bristol); or at the west end of the nave (Durham, Glastonbury). Sometimes it was a grand prolongation of the presbytery of equal heights and dimensions (Worcester, secular York, London, and Austin Canons', Carlisle). In the *Benedictine conventual buildings*, the *sacristy* was usually on the south side of the presbytery or transept. The sacristan's chamber, or sextrey, was frequently on the north side of the church. The *treasury* for valuables, reliquaries, and charters consisted of chambers which could be easily approached from the church, sometimes detached, and sometimes communicating by stairs with it. The cloisters were sometimes to the northward and sometimes southward, according to the peculiarities of the site; with a single exception (Rochester), they adjoin the nave. On the opposite side to the church was always a refectory, and on the east side of the cloister-garth the chapter-house. Eastward or southward of the cloister, approached by a vaulted passage, was the cloister and home of the aged and sick, called the *infirmary*. In a third or base court, or court of the abbey, were arranged the servants' and farm buildings, and next to the great or church gate, the *almonry*. In close proximity were the lodging of the Superior and guest-houses. The cloister alleys were closed in with an arcade formed of wooden pillars, and shed-roofed; in the great houses they were replaced by grand vaulted walks, elaborately wrought in stone. The *slype* is one of the most distinctive features of the east alley. It formed the passage to the monks' cemetery, and nearly always intervened between the south wall of the transept and the chapter-house. There are instances where it formed the forensic or outer parlour. The chapter-house always occupied the central position in the east alley of the cloister. It was ordinarily an oblong. The Norman chapter-houses were sometimes apsidal, and we possess two exceptional forms which were not square-ended (Worcester and Westminster). Occasionally a prison, or rather a penitential cell, adjoined the chapter-house (Durham). The dormitory adjoined the church, with which it communicated by night-stairs, used in descending to the matin lauds. The day-stairs communicated with the cloister alley; in nearly all cases the dortor was parallel with the east alley (Westminster, Ely, Peterborough); but occasionally, for purposes of drainage, with that on the west (Durham, Worcester). It sometimes runs at right angles to the cloister (Chester, Winchester). Sometimes there was an additional dormitory (St. Alban's). In immediate connexion with the dormitory were the indispensable gong, and common jakys, or necessary house, well drained. The *refectory*, or frater, or fratery, or frater-house, always stood east and west, parallel to the church. At the west end were butteries, and facing the entrance-door was the passage to the kitchen, or else a dresser-window, through which the dishes were passed. In process of time, when discipline was relaxed, only a portion of the monks used the refectory, or it was actually deserted, except on certain days, for a room in which meat dinners were served. This was called the *misericord*, or locally, the loft, the disport, the oriel, or spane. The kitchen usually stood in a little court at the south-west end of the refectory. An important accessory to the refectory is the lavatory. The *common-house* was constructed in the undercroft of the dormitory. There were many parlours or colloques, —places for speech,—the private parlour for those who had been blooded, &c. The *infirmary* consisted of a large hall, with aisles or chambers for the reception of the sick and the aged, and at the east end was a chapel, so that the inmates could hear service even if confined to their beds. On one side was the lodging of the infirmarer, who had also charge of the *dungeon*, in which the grave offenders lay fettered, and fared on bread and water. The *Superior's Lodging* comprised a hall, chapel, guest-rooms, and kitchen. The *Guest-house*, or *Guesten Hall*, consisted of a large hall, with a central fireplace and lateral bed-chambers, and was provided with a chapel and stables. The *almonry* invariably adjoined the

great court gate. The Outer Court, or Abbey Court, contained all the brew- and bake-houses, the granary, laundry, stables, and workshops. Having described in detail the remaining arrangements of a Benedictine house, Mr. Walcott said that there is no missing our way at those six great plans of Westminster, Durham, Canterbury, Chester, or Worcester. We possess early chapter-books, and still earlier inventories, and the customal of the great abbey of England, the rites of the glorious minster of the North, the Monk Edwyn's map of the primatial church, a careful plan of the allotment of Chester at the suppression, and the distribution scheme of Worcester. You will at a glance see correspondences between the ground-plans on the banks of the Wear and the Severn, of Bury and Ely, of Durham and Glastonbury, but it is impossible to do more than trace a faint family-likeness through so many divergencies among those great representative abbeys. I mention this fact to stimulate your research and independent thought and sagacity when you apply yourselves to understand any others of the grand group of Benedictine churches or ruins in England. You have in them a sure foothold, and no individual theory can withstand the application of a test ready to our hand. I believe that the noblest and easiest study of architectural arrangement lies among the Benedictine houses as the grandest in conception, and the most remunerative to a patient scholar. I may observe, by the way, that no uniformity is found in the great nunnery churches: St. Rhadegund's, at Cambridge, and Romsey, are both fine cruciform churches; the latter had a north aisle as a parish church. St. Helen's, Bishopsgate, is longitudinally a double church, like Minster in Sheppey, the north aisle forming a nuns' choir, the south used by the parishioners. Eastbourne has nave and choir, with a short south-west aisle for the nuns; the cloister is symmetrical, but the chapter-house is interposed between the chancel and eastern range of the cloisters or dormitory. At Marrack, again, the nave formed the nuns' choir, whilst the chancel formed the parish church. The Survey of Ambresbury mentions the "olde infirmary, with the chapell, cloister, and lodgings adjoining prioress's lodging, the halle, buttre, pantre, kytchyn, and gatehouse, as it is inclosed within one quadraunte unto the convent kitchen, the gate in the gatehouse in the base courte; the church cloister, frayter, dormitory, chapter-house, the convent kitchen and all the house adjoining to the same; the sextry with houses joyning to the same; the stywards, receyvours, auditors, and preestys lodgings." These surveys were very valuable, and Mr. Walcott said he laid very great stress on their importance, for in them were to be found the original names, and we should not invent new names in the nineteenth century for things of which we know the proper names. Passing from the Benedictine houses to the luxurious houses of the Clugniac, Mr. Walcott said that pomp and splendour were the characteristics of their superb churches, radiant with colour, blazing with crystal, jewels, and crowns of light; the parent minster, with its vast apse girdled with marble pillars of large size, its double transept and splendid lanterns, produced no building so solemn or imposing in this country. Here they betray caprice, irregularity, and utter contempt for orderly arrangement. The cloisters of Wenlock and Lewes seem to have had their surrounding buildings thrown at hazard upon the ground. We find instances both of oblong and apsidal houses. Perhaps a shallow transept, imported from Continental examples, is one of the characteristics of the Clugniac churches. The antechurch may be traced at Lewes, which has also the rare feature of a coronal of chapels clustered round the aisles of its central apse. In Castle Acre and Wenlock we trace the fulfilment of careful and good design. The Clugniac order, which appears to have insisted on no distinctive features, had only thirty-two English houses. The *Cistercians*, on the other hand, pursued a closer observance of their original plan, although in time it was modified and underwent conspicious changes. A church rigidly divested of ornament, but fortunately erected in the purest style of architecture, with a long nave and aisles, a transept with eastern chapels,—which, however, have parallels both in Benedictine and secular churches (Durham, Westminster, Peterborough, Lincoln)—a very low tower, and a stunted, aisleless eastern arm, is the popular idea of the white monks' churches. But we shall find numerous modifications, except in one particular: there never was a distinct lady-chapel, as every minster was dedicated to St. Mary. Having described the various modifications in planning found in the Cistercian buildings, and stated that there were more than one hundred Cistercian houses in England, many of which have not yet been properly explored, Mr. Walcott passed on to the buildings of the Regular or Austin Canons, who had more than 200 houses in England, and in those which remain, said the lecturer, there are necessarily very considerable degrees of excellence and declension from the ordinary standard. Since Sir Walter Scott described Melrose, and painters and poets have doted on the exquisite scenery that encircles Fountains, Rievaulx, Byland, Tintern, or Valle Crucis, popular interest has centred on the Cistercians; but although there are none to compare with the majesty of Whitby and Durham, enthroned on their sovereign hills, the overpowering grandeur of Ely, the massive dignity of Peterborough and Norwich, the imperial splendour of Canterbury, the beauty of Gloucester, the richness of Sherborne, or the crowning glory of Westminster, Mr. Walcott urged the claims to attention of the noble ruins among the mountains of Llanthony, the choirs of Southwark and Carlisle, the venerable priory of Christchurch, the solid nave of Waltham, the noble remains of Bridlington, the windows of Dorchester, and the superb fragment of Hexham. Unhappily we have only a few remnants of cloistral buildings; but they show no deviation from a well-ordered and compact plan. In conclusion, Mr. Walcott pointed out that there is no absolute invariable canon of arrangement. It exists neither in nature nor in art; the primary ideal always receives accretions. The architecture of each country reflects the national character. The impress of the builders gave an individuality to the structure which they raised, whilst rivalry and imitation of adjacent houses, with an inevitable mutual reaction, effected changes and additions in the normal type, the characteristic ornamentation, the disposition of parts, and original ground-plan of the different orders. The student could only follow general rules of investigation and resemblance, without looking for minute correspondences and precise exactitude. We can only reach an approximation to the actual facts; beyond that limit we become theorists. We must be content with knowing as much as the past has spared to us, and this will teach us caution and temperate respectful consideration when testing our own deductions with those of contemporaries or of the men who have preceded us. This will be a far safer course than indulgence in the hope of making new discoveries, or of inventing a new order or style. We may by patience add largely to their acquisitions; but we should be grateful to the pioneers who cleared the way for our advance. There are stores of information lying yet unused in our museums, manuscripts, and libraries, and we need diligent students to delve and gather out thence such accessions to what we at present know; but there are more treasures of information buried underground, still hidden from our eyes, and when well guided and carefully overseen, the best expositors are practically the pickaxe and the spade.

In the discussion which followed,

Mr. Blashill, in moving a vote of thanks to Mr. Walcott for his paper, said that although it was quite true that there were no two instances throughout Christendom in which the monastic or conventual buildings of the Middle Ages were precisely alike, still they had certain main principles in common. He was glad to see the plan of Shap, referred to by Mr. Walcott, and was also glad that Mr. Walker, of Kendal, had shown so much talent and industry in tracing it out. Mr. Walcott had pointed out the angle between the north transept and the eastern arm of the chancel as a common position for the lady-chapel. Now, at Tewkesbury there were some chapels along the north end of the transept which were for a long time looked upon as being the remains of the chapter-house, but he (Mr. Blashill) had satisfied himself that they were the remains of a thirteenth-century lady-chapel, which existed before the later lady-chapel (afterwards destroyed). The position in the angle was common enough, but the position at the north end of the transept was, he thought, not so common.

Mr. E. Ferrey, in seconding the motion, said he should be glad if Mr. Walcott could explain how it was that there were so very few Carthusian remains existing in England; the most perfect one was, he thought, Mount Grace, already alluded to, and he thought that if these remains were further investigated a great deal of additional light would be thrown on the subject. He was there some months ago, and found the ruin situated in an undrained morass, and overgrown with brambles.

Mr. R. Morrison Marnock said he understood that for the management of their agricultural property the religious establishments built granges; did these granges follow their own arrangement, or were they like the ordinary manor-houses of the period?

Mr. Lacy W. Ridge said he should be glad if Mr. Walcott could give any further information on the subject of Lewes Priory.

A member asked whether the Llanthony Abbey referred to by Mr. Walcott was a Benedictine establishment, and whether it was identical with the building with which the name of Father Ignatius is now associated.

The motion having been carried by acclamation,

Mr. Walcott replied to the points raised in the discussion. He said Mr. Blashill was undoubtedly right as to the position of the thirteenth-century lady-chapel at Tewkesbury; it was similarly placed at Ely, Peterborough, and Bury St. Edmund's. In reply to Mr. Ferrey, he said that unfortunately there were very few Carthusian houses left in England, the only one accessible, although to a small degree, being the Charterhouse in London, but of this hardly anything remained. A strong protest ought to be made not only against the "restoration" of such ruins,—and surely architects had had enough of restoration,—but against their continued neglect; what was wanted was the careful and conservative preservation of such remains. He strongly advised the members of the Association to visit such old remains as were within their reach, and to take their sketch-books with them. In Westminster Abbey itself a day or two might profitably be spent, and the clerk of the works there, who was a most intelligent man, would always be found willing to conduct the architectural student over every part of the building. Then they might go and see a Benedictine nunnery, such as St. Helen's, Bishopsgate; then to St. Mary Overy's, St. Bartholomew's, the Charterhouse, &c. At Barking there still remained a portion of the gatehouse. Sketches of these remains would be of almost incalculable value in years to come. As an instance, he might mention that he had taken a sketch of the last remaining bit of Blackfriars, which had been removed to make way for the new office of the *Times* in Queen Victoria-street. In reply to Mr. Marnock's question, Mr. Walcott said that the granges were at certain distances from the monastery, and were very important appendages thereof. They had no distinctive plan, but generally resembled small monasteries. Very few granges remained in anything like a perfect condition, for wherever there was a grange there was now a farmhouse, and the modern farmhouse made sad havoc with the old remains. In reply to Mr. Ridge, Mr. Walcott said he some years ago published a plan of Lewes Priory. Llanthony, which was an Austin Canons' house, was entirely distinct from the Llanthony of Father Ignatius, which was entirely modern.

GLASGOW INSTITUTE OF ARCHITECTS AND THE ROYAL INSTITUTE.

At the annual dinner of the Glasgow Institute, the President, Mr. John Baird, in the chair, Mr. David Thomson proposed "Success and prosperity to the kindred societies," coupled with the name of Mr. John Honeyman, F.R.I.B.A. Mr. Honeyman regretted that he could not say that the compliment was deserved by the Royal Institute, and animadverted in very severe terms on the manner in which that body seems practically to ignore the Scottish architects. He referred particularly to the bad taste and bad policy of the committee recently engaged in considering the best means of increasing the usefulness of the Institute, who professed to have put themselves in communication "with the various provincial societies," when in point of fact they had only asked the advice of a few English societies, not one of which represented so large a number of the profession as the Glasgow Institute. He would not object to this if the Institute would but substitute the word English for British in its title. Still, having a strong conviction that the influence of the Institute might be extended in the provinces with advantage to the profession, he would greatly prefer that it should retain its name, and try in future not to forget that Scotland claims to be a part of Britain, and that it contains about a fifth part of all the British architects.

THE CLEANSING OF THE STREETS.

BY fits and starts we hear half-promises made of some special authoritative or legislative enactment to provide for the proper cleansing of the streets of the metropolis by a thorough organisation kept up by public money. Something of the kind was suggested a year ago, in a resolution announced as about to be moved by a member of Parliament active in sanitary matters, and which was to pave the way to a general reform in cleansing and lighting London. It was, perhaps, because the proposed reform was a little more sweeping than need have been that it seems never to have come to a head. There would be plenty of ground for objectors to urge that, on the whole, lighting was not in so very bad a case. But in the matter of dirt, things tend more and more every winter to reach a crisis at which human nature cannot be expected tamely to bear any more. The condition of streets with large traffic, after a thaw, is something indescribable to those who do not habitually experience it, and is a disgrace to somebody or some set of persons, if we could only get it settled exactly who they are. In regard to this matter, the "harmless necessary" crossing-sweeper is in reality an evil and an obstruction. By providing a few passable places here and there, he renders it just possible for the crowd of pedestrians to get about, and prevents the state of things from being absolutely insupportable. If he were suppressed for one day, one such day as those we are alluding to, the dirt nuisance would become so intolerable that it would be felt that a definite campaign against the enemy was a necessity. He just does enough, however, to keep pedestrians from getting desperate. But even were his efforts more extended and systematic, he would equally deserve suppression as an anomaly in political economy and municipal administration. He has not an inch of standing-ground, on any sound social or political principle. He, as every one knows, enters on his sphere of operations with the calculation of an adequate remuneration in the shape of the pence of benevolent passengers; and report says that in an active neighbourhood the speculation is far from being a bad one; but the whole principle of it is ludicrous. If every passenger across a crowded crossing gave the smallest coin of the realm to the sweeper, we should soon see crossing-sweepers driving to the sphere of their profession in their own carriages. In fact, only a very small proportion of passengers have time to think of such a douceur, even if they are inclined to give it; but, of course, they use the crossing all the same. The result is, that a necessary convenience for the prosecution of public traffic is paid for in a very unfair proportion by a small minority of the public, for the benefit of the whole.

The cleansing of the most frequented thoroughfares, at least, where of course both the dirt and the inconvenience it occasions are at a maximum, is a public duty which ought to be regularly and efficiently performed out of public funds. If a street-cleaning brigade were organised, useful employment might be given to many more men than are now engaged in voluntary street-sweeping,—employment which might render a good many idlers of service to the community, and the cost of which would then be properly divided among the public by a very small rate. The need of systematic operations is not, of course, confined to the "crossings." The foot pavements of many of our principal streets are, in rainy weather or after a thaw, like so many ditches, especially in cases (not a few) where the flags are laid with insufficient fall. It is absolutely essential that this public nuisance, increasing as population and traffic increase, should be systematically dealt with. In the meantime, we counsel the benevolent among our readers to harden their hearts and button up their pockets against the crossing-sweeper, seeing that by the thoughtless bestowal of their good-natured penny they are only perpetuating a wrong state of things, and taxing themselves for the public benefit in a manner which no one has any right to expect from them.

A Town Clock for High Wycombe.—The committee of the High Wycombe New Clock Fund have decided to recommend the subscribers to accept the tender of Messrs. Gillett & Bland for providing and fitting a new illuminated clock in the church tower. The total cost will be about 500*l*.

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THE fiftieth exhibition of the Royal Scottish Academy is now open, and having arrived at such a period of its existence, we may consider it as one of the permanent institutions of the country.

The tendency of academies and exhibitions of art is not altogether towards unmixed good, either as regards the artists themselves or the public at large. That annual exhibitions of the works of living artists do create a feeling for art amongst the people is evinced by the throngs which crowd the galleries, and the eagerness with which the merits of the various productions are canvassed. The comments made are, however, too frequently of a very superficial nature, showing that the true end of art is not understood, and that what is striking or pretty is often preferred to what possesses higher qualities. The artist is thus tempted to neglect the higher ideal, to court popularity, to look to the material rather than the æsthetic element, and to paint up to a high key so as to arrest the attention of the observer.

The exhibition room, again, is apt to be considered rather as a bazaar for the sale of works of art than as a means for educating and refining the taste of the people. The circumstance, too, that any one may enter the lists and have a chance of showing what he can do, tends to the production of a crowd of aspirants, the great majority of whom, with a misdirected ambition, waste their time in the useless labour of producing that which is stale, flat, and unprofitable.

We have here exhibited 1,090 works, and nearly an equal number have been rejected. Two thousand products of human labour, of which only a percentage are of any use, and a great part of which are worse than useless. The heartbreak amongst the unsuccessful is melancholy, the complaints of partiality and unfairness are lamentable; yet, when we look at the works accepted and hung on the walls, we cannot help thinking that many of them would have been better elsewhere. "Mediocrity in art is less tolerable than in aught else."

Last year there was an exhibition of rejected works, but this appeal to the public sufficiently proved the groundlessness of the complaints of the authors of these works. Far be it from us to attempt to put a check upon the endeavours of struggling merit. There is probably no more delightful life than that of the successful artist, whose daily work consists in the endeavour to realise the conceptions of his mind; yet even he will express himself as not quite satisfied, and confess that he falls short of his ideal. But the ideas must be there, and the power of realising them can only be attained by diligent study and hard work. It is to be feared that too many choose art as a profession under the mistaken notion that they will escape drudgery, and lead a pleasant, free, and easy life; and to such we repeat, with emphasis, the quotation from Ruskin, on the title-page of the catalogue:—"Painting, or art generally, as such, with its technicalities, difficulties, and peculiar ends, is nothing but a noble and expressive language, invaluable as the vehicle of thought."

Lively hopes were at one time entertained that in Scotland a new and distinctive school of art might be formed. Judging from precedent, the expectation was not unreasonable. In the Northern States of Italy, in the palmy days of art, the several small States had each its school, and why might Scotland not have one as distinguished from England? Many reasons, more or less feasible, could be adduced to account for the non-fruition of these expectations, but the most obvious one is, we think, the fact of the existence of the academies and exhibitions. The Royal Academy of England opens its doors to all nationalities; the Scot seems to be particularly welcomed, and the greater inducements held out cause a periodical exodus of those Scotsmen who have displayed special merit. These become merged in the larger society, and are influenced by new associations, and thus all distinctiveness is lost. The growth of a new school becomes an impossibility, and although there are two academies, there is only one school.

As a consequence of this state of matters, a considerable number of the works annually exhibited in Edinburgh,—and these generally the most noteworthy,—have previously been exhibited in London. This renders our task lighter than it would otherwise be, and there remains only to perform the duty of shortly referring to such works, exhibited for the first time, which are prominent, either as regards subject or manner of treatment. It may be well, however, as showing how the exhibition is made up, to state that the paintings formerly exhibited comprise examples of the handiwork of J. E. Millais, Alma Tadema, J. C. Horsley, Sir F. Grant, J. Pettie, W. Q. Orchardson, E. Long, J. Sant, Josef Israels, E. Frere, James Archer, E. Nichol, J. W. Oakes, T. Graham, K. Halswell, John Faed, J. Linnell, jun., R. Herdman, and others.

Proceeding in the order of the catalogue, we first notice the seapiece by John Nisbet, in which he has succeeded in catching an evanescent gleam of sunlight which touches part of the sea-cliffs and the tips of the wavelets, and so has imparted to the scene a poetical element. Beattie Brown has made a like endeavour in the "Woods of Hawthornden,"—

> "When the woods of autumn all around the vale
> Have put their glory on,"—

and has been fairly successful in rendering the effect of sunshine pouring through foliage.

With a firm brush and true colour, John M'Whirter gives a graphic representation of the beautiful "Runic Cross of St. Martin, Iona."

Age imparts new beauty to a picture which is soundly painted, the first glossiness disappears, the vehicle employed is not obtruded upon us, and we look upon it more as an emanation from the brain than as an example of dexterous handiwork. "The Gipsy Mother," by the late Graham Gilbert, has arrived at that stage, and very pleasing it is for the eye to rest upon its subdued but rich and harmonious colour, after the fatigue caused by the glare and glitter around.

William Mactaggart is as vigorous as ever in his manipulation, and more delicate than usual in his colouring. "On the Sandhills in Sunshine," we see a young lady in charge of two rosy little pets, who thoroughly enjoy the position, and make us long to join them in their healthy innocent employment of building castles of sand. When Mr. Paton overcomes his prevailing weakness for mauve, pink, and purple he produces very acceptable work. "In the Deer Forest of Mamore" is much more satisfactory than "Upper Morelaggan, Loch Long," which is spoiled by the sickly pink introduced into the sky, which is crude and out of tone with the rest of the landscape, a fine scene boldly modelled and otherwise good in colour.

One, who has never been in an orange grove during "The Orange Harvest," might be apt to say to W. E. Lockhart that he had surely exaggerated the effect of the glints of sunlight as they fall upon the figures of those gathering the fruit; and he might probably reply, with justice, that he had not done so. Be that as it may, the effect as he has depicted it is unpleasing, and detracts from a work which is otherwise well handled, with the exception, perhaps, of a little looseness in the drawing of one of the figures. W. F. Vallence appears to greater advantage in such subjects as "The Turn of the Tide" than when he attempts to delineate traits of Irish humour, after (and a good way after) Erskine Nichol. The scene is redolent of the sea breeze, the swirl of the breakers is well suggested, but the boats on the beach seem to be unfinished; the graceful sweep of the timbers, with their subtile lines, is always a beautiful feature in such objects, and should not be slurred over.

James Drummond has never deviated from the line of historical painting; his subjects are invariably chosen from Scottish history, and he is about the last of the old band who, had they been supported, might have formed a new school. "A Scene in Grayfriars Churchyard, A.D. 1679," represents the prisoners taken at the battle of Bothwell Bridge, who were confined for a period of five months in the churchyard without shelter; they are seen at their devotions, reading or earnestly debating upon spiritual matters. To the right a group of sympathising spectators are timidly observing them through the iron bars; and to the left, and within the enclosure, stands a grim sentinel. The scene is not invested by the artist with the interest which so tragical a scene is fitted to call forth, and the execution is weak and unsatisfactory.

George Hay finds a rich store of incident in the works of Sir Walter Scott. In the scene from "Redgauntlet" where "Peter Peebles captures Allen Fairford," he has hardly realised the humour of the episode, and he has made the crazy litigant rather too much of a guy, especially as regards the huge jack-boots, in which he is almost swallowed up.

W. Fettes Douglas is decidedly eccentric. Last year, and this year also, this phase of his

character is evinced by his choosing a narrow upright canvas, upon which he paints a scene from a height looking down upon the roofs of houses in the foreground, and thence out to sea, where a long line of "Herring Boats" are "entering Stonehaven Harbour."

G. Paul Chalmers is very fastidious as to what he exhibits. The only specimen of his work shown this year is a head, which, for technical excellence, is unsurpassed by anything in the galleries. There is here no sleight of hand or exaggeration of treatment, but downright careful manipulation, aided by a fine eye for colour.

J. M. Barclay, long favourably known as a portrait-painter, has made an essay at historical painting, choosing as his subject "The Gowery Conspiracy," at the moment when Ruthven breaks into the king's apartment, and attempts to bind his hands. The incident is graphically rendered, and the colouring rich and harmonious, but there is a lack of muscular action, especially in the limbs of Ruthven, and the man in armour who guards the door looks a lifeless dummy.

Very simple and pleasing is Thomas Graham's pastoral, "From his Flocks Strayed." The shepherd who leaves his flocks for the more attractive company of his sweetheart, as well as the girl herself, do not look like models got up for the occasion, but are real rustics, comely, but without artificiality, either in dress or manner, and the landscape is in admirable keeping.

Robert Gibb, in choosing such a subject as the "Death of St. Columba," has aimed high, and has fairly succeeded in his aim. The grouping is effective, the face of the saint expressive, as are those of the attendant monks and choristers. The manipulation is broad and free, and the general tone satisfactory. Mr. Gibb deserves encouragement to proceed in the path which he has chosen.

W. B. Hole also chooses a theme from the olden times, but one not of a serious nature, entitled, "Taken Unawares." A friar of orders grey has fallen asleep after partaking of the hospitality of a baronial hall, whilst a jester draws his likeness upon a slate, and the attendants watch the proceeding with interest. The contrast between the happy unconsciousness of the dozing friar and the jolly, free-and-easy manner of the jester, is well hit off. The drawing, manipulation, and composition are good, but the colour is in parts crude and raw, especially in the costume of the jester.

We have only noticed what appear to us to be the principal works exhibited; but there are many others which, although less prominent, are well worthy of attention. As we have lingered about the galleries the impression has grown upon us that the exhibition as a whole is up to the average, and only wants one or two first-rate works to make it the best that has yet appeared in the rooms of the Scottish Academy.

THE TESTING AND STRENGTH OF MATERIALS.*

Steel.—The simplest definition of the term *steel* that I have met with was supplied to me by a Sheffield firm, and is as follows:—"Steel, a combination or alloy of iron that will forge, harden, and temper." There are various kinds of steel, such as carbon cast steel, tungstein cast steel, chrome cast steel, cyanogen cast steel, and titanium cast steel, and several other metals have been alloyed with iron, to make steel. There is also blistered steel, which is made from malleable bar iron, by a process called cementation; German steel, which is made directly from the ore, and sometimes from pig-iron, in the Catalan forge. The line between cast iron and steel is,—when it is capable of being forged it is steel, and when it will not forge it is cast iron; and the line between malleable iron and steel is, when it will harden and temper it is steel, and when it will not harden and temper it is malleable iron. It is well known to manufacturers and to many others that steel of the strength of 33 to 36 tons per inch can be made, and is made, in large quantities, at moderate prices, possessing all the toughness and malleability required in engineering structures. We have this on the authority of Mr. W. H. Barlow; and yet engineers, as a rule, in England do not seem to take kindly to it, for bridge-building, at any rate. In this respect we are behind our American friends. The malleability of steel will be shown by the following test:—A piece of rail, weighing 80 lb. per yard, and 12 ft. in length, was held by one end and twisted at the other, and made 6½ complete revolutions before it broke. The fracture occurred at one end, leaving about 11 ft. of the rail in the twisted form which had been given to it. In this twisted state the rail was laid on two bearings, 3 ft. 6 in. apart, and subjected to the blows of 1 ton weight falling 30 ft., and it bore one of these blows without breaking. Mr. Barlow gives the limiting span of a girder, in iron, at 5 tons per inch strain, as 600 ft., and in steel, at 8 tons per inch strain, as 960 ft. We can obtain an idea of the effect of introducing steel by this, and Mr. Barlow says, assuming a load in addition to the weight of the girder of 1 ton to the foot, the relative weights under these circumstances would be:—

Span.	Weight of steel girder in tons.	Weight of iron girder in tons.
200	57	160
300	150	430
400	320	830

With these facts before us, surely we ought to turn our attention to this metal, and get the Board of Trade to state a limiting strain, as they do in iron.

Testing Railway Steel Axles.—The mode of testing usually adopted by Continental railway engineers is to take one out of each hundred axles, and to test it to destruction. It is usually stipulated in the specification that the whole lot may be rejected if this one, or at most a second, do not stand the trial, as several English makers have found to their cost. Some of these tests are very severe. Such is that required by the Austrian Northern Railway, according to which all 5-in. steel axles, when set on supports nearly 5 ft. apart, must undergo blows from a weight of about 7 cwt. falling from a height of nearly 19 ft., increased by 2 ft. for each successive blow. In this way it must withstand a bend of 9 in., and a further bending back of 9 in., the operations being continued until the axle has withstood more than 6,000 foot-pounds. A lighter test is that of the Southern Railway Company, who require for their 4½-in. steel axles that, with a distance between the supports of nearly 5 ft., they shall withstand a bend of more than 9½ in., under a 7-cwt. monkey falling from a height of nearly 15 ft. The axles must then be capable of being bent back straight in the same manner without breaking. In fact, almost every other company's engineer has a different test, differing as to the distance between the supports, the weight of the monkey, and the height of its fall. In truth, the process is merely that generally adopted for rails of which a certain per-centage is taken haphazard out of the lot and bent or fractured.

Malleable Cast Iron.—In 1804 Mr. S. Lucas, of Sheffield, patented a mode of producing malleable cast iron. His specification clearly shows the theory of conversion. The firm, Edward Lucas & Son, of Dronfield Foundry, are still engaged in its manufacture. In Mr. Lucas's specification, No. 2,767, he describes the process thus:—The cast iron being first made or cast into such form as may be most convenient for the purposes for which it is afterwards intended, is to be put into a steel-converting or other proper furnace, together with a suitable quantity of ironstone, iron ore, some of the metallic oxides, lime, or any combination of these (previously reduced into powder or small pieces), or with any other substance capable of combining with or absorbing the carbon of the crude iron. A degree of heat is then to be applied so intense as to effect a union of the carbon of the cast iron with the substance made use of, and continued during so long a time as shall be found necessary to make the cast iron either partially or perfectly malleable, according to the purposes for which it may be wanted. If it be intended to make the iron perfectly malleable, from one-half to two-thirds of its weight of ironstone, iron ore, or other substance will be found necessary; if only partially so, a much less quantity will be sufficient. Five or six days and nights will in general be found sufficient during which to continue the heat, which, towards the close of the process, cannot be too great. Care should be taken that the pieces of cast iron be not of too great thickness, as it would have the effect of lengthening the process; but the proportion of the several substances made use of, and the degree and duration of the heat to be applied, must greatly depend not only on the nature of those substances, but also on the nature or quality of the pig or cast iron employed, a knowledge of which can be obtained only by experience. The cast iron to be rendered malleable and the substances to be made use of for the purpose, may be placed in the furnace in alternate layers, and in order to prevent the iron-stone or iron ore from adhering to the iron, a thin layer of sand may be placed between them. The colour, both externally and of fractured specimens, approaches that of steel. The "malleableised" metal takes readily a very fine polish, which is not easily destroyed upon exposure to moisture. Malleable cast iron is easily stamped, drawn, and hammered without heating. It can also be worked well under the hammer at a low heat, and at this stage hammering appears to improve the grain. Very small sections may occasionally be welded, but as a rule, malleable cast iron is not weldable. It is readily brazed with copper. It melts only under a very high heat, and it stands fire so well that it is employed for foundry ladles, crucibles for gold and silver, and for the tubes of some descriptions of boilers. Malleable cast iron may be case-hardened more readily and to a greater depth than wrought iron. The castings are not blistered, scaled, or warped in the process, and the case-hardening may be effected either with bones, hoofs, or leather, in the ordinary manner, or with prussiate of potash. The articles made of malleable cast iron are all kinds of machinery fittings, steam-boiler tubes, gas joints, horse-shoes, bridle-bits, stirrups, gun fittings, bed fittings, railway signal pulleys, buffer and axle boxes, tram-car wheels, cross-heads, portable engine chimney caps and bases, bows for manholes of boilers, link reversing and expansion gear, cranks, pistons, and garden tools; in fact, malleable cast iron is used in place of wrought iron to a very great extent, especially since labour became so very dear, as in many cases it comes in cheaper than forged work, when the article is of a difficult form or shape; but it cannot compete successfully with forgings when the articles required are heavy, and tolerably easy to forge. Castings can be annealed up to any weight and size; the time taken for annealing light castings is about seven, and for heavy fourteen days. The metal chiefly used in the production of malleable castings is the finest brands of charcoal, and hematite pigs specially prepared. Its advantage over cast iron is that the same strength may be obtained with half the weight, and that it is easier to finish, and takes a finer polish. Unlike wrought iron, it is not liable to defective welds, and complicated patterns and shapes can be produced with ease at a reasonable cost. It is more easily worked than steel, and is freer from defects through blowing or honeycombing. A superior kind of small soft casting is made by the Nottingham Malleable Iron Company, which, from being subject to a partial annealing, is very easily given a bright polish, the difference in cost being fully recouped by saving in labour and tools. The specimens of malleable cast iron in Mr. Kirkaldy's museum that he has tested are well worth examination:—he allowed me every facility in passing through his works, and I am indebted to him for much information he kindly gave me.

Phosphor Bronze is the usual alloy of copper and tin, with the addition of some phosphorus: by varying the quantity of the latter, the alloy can be made from a ductile and malleable, but exceedingly tough, quality, to such as approach the main qualities of steel. The metal when cast has great fluidity, and fills the moulds perfectly to the smallest details; consequently it is well adapted to the production of works of art or decoration, as well as for engineering purposes. Ordinary bronze, by the admixture of phosphorus, changes its qualities and characteristics: the colour becomes warmer, more like that of gold when mixed with copper, the grain or fracture approaches that of steel, and the toughness, elasticity, and tensile strength are greatly increased. The uses to which phosphor bronze are applied are very numerous; to cite a few I may mention bearings for railway car-axles and machinery, &c., door keys, and inner plating for iron safes, tamping-bars for miners, and scissors, rollers, knives, and hammers for gunpowder mills: these tools are very hard, and can with difficulty be touched by a file, yet have the same advantage as copper in not emitting any sparks. It is also used for rock-drills, blast furnace tuyères, toothed gearing for rolling-mills, cavalry fitments, excentric straps, pump cylinders, piston packing, and other forms of mechanism; and used as a bell metal it is said to give a clear and louder ring than any other compound, for as the clappers can be made heavier, a greater volume of sound can be produced without risk of cracking the bells. As regards first cost, the price of phosphor bronze is from 30 to 40 per cent. higher than that of gun-metal, composed of about four parts copper with one part tin, but placed

* By Mr. R. M. Bancroft. See p. 163, *ante*.

in the very trying position of a railway-carriage bearing, it has been found by actual and long continued trial that 1*l.* worth of phosphor bronze will out-wear 4*l.* worth of the gun-metal. Compared with wrought iron, it appears from a drop test made that it took thirteen falling blows on a bar of phosphor bronze to bend it 1 in., against eight blows on a bar of forged charcoal iron,—the test bars being 6 in. long by 2 in. wide by ½ in. thick, the drop weight being 148 lb., and the height of stroke 12 in. Experiments on phosphor bronze made in the Royal Arsenal at Turin show an absolute resistance of 63,000 lb. per square inch. Mr. Kirkaldy sent specimen test bars for the inspection of the members of the Civil and Mechanical Engineers' Society, and a vote of thanks was passed to him for his kindness in so doing.

Portland Cement.—Ten years back Portland cement was specified by engineers to be 110 lb. weight per bushel, and 500 lb. tensile strain on a briquette 2½ in. area, or 222 lb. per inch. In some of the tests made for Mr. Joseph Cubitt during the building of Blackfriars Bridge, the tensile strain was 325 lb. per inch of section. The proper test now should be about 115 lb. per bushel, or 90 lb. per cubic foot, and the average tensile strain of 6 briquettes should equal 350 lb. per square inch after a week's immersion in water. It has also been proposed to apply a sieve test of 80 per cent. of the cement to pass a sieve of 2,250 meshes to the square inch, but to get the weight the cement has to be coarsely ground, and the coarse particles are themselves so many elements of danger. A simple test that I have heard one of our members give, when others cannot be applied, is making a small square or pat, and dropping it into water. If the sharp edges crack or break after a short time, the cement is too hot or fresh, or is inferior in quality. Michele's patent cement-testing machine is recommended and generally specified for all large works where cements are extensively used. The price varies from 24*l.* to 28*l.* each.

In the matter of timber structures, I would like to mention that, wherever creosoted timber can be applied, it seems advisable to use it, because it not only resists the changes of weather, but also adds to the strength of the wood. On the authority of Messrs. Armstrong & Foster, Sunderland, we know that a series of experiments proved this to be the case. Pieces of Memel fir and Scotch fir, each measuring 2 ft. 6 in. by 2 in. by 1 in., with a 2 ft. bearing, broke as follows:—

	Not creosoted broke with	Creosoted broke with	Creosoted. Gain.
Memel fir	11 cwt.	11¾ cwt.	¾ cwt.
Scotch fir	13⅜ ,, ...	15½ ,,	1⅛ ,,

In each of the above cases the breaking-weights are the averages of six tests. It should be remembered that while creosoted timber is impervious to wet, it is not so to the sun's rays. A creosoted piece of timber will always show on which side the sun shines. The oil is, by solar influence, brought to the surface of the wood, some of it evaporates, whilst more trickles down the timber; for this reason timber, although creosoted, should occasionally be paid over with a coat of tar. The writer acknowledged his indebtedness to Messrs. Bethell, and to Messrs. Armstrong & Foster, for much valuable information they had given them.

Flitch, Sandwich, or Salmon Beams.—In calculating composite girders of wood and iron, we must arrange that the different materials shall act in concert with each other. To this end the late Sir William Fairbairn, E. W. Tarn, and others, have experimented; but these authorities do not all agree as to the proportion the iron should bear to the wood. With Fairbairn, this kind of beam does not appear to have found much favour, for he describes it as being "composed of a plate between two pieces of timber, depending, probably, more upon these adjuncts than any amount of strength likely to be obtained from the centre plate, which, in such a position and in such a form, could not be considered as a beam." Cast-iron flitches have been used, but are now quite discontinued.

In Fairbairn's beam the proportion of iron plate to wood is 1.32nd; in experimental beams tried at Woolwich Arsenal, it was 1.12th; Tarn's proportion is 1.20th. The experimental flitch beams tried at Woolwich Arsenal will be found fully detailed in the *Builder* for June 9th, 1866, and I beg to refer those interested in this mode of constructing beams to the number for that date. It will be found that the formulæ given by Hurst's "Surveyor's Pocket-book" and these experiments do not agree, which in any new edition it would be well to revise. It has been suggested that the sides of the flitch plate should be roughed so as to have a surface like the teeth of a very coarse file, so as to increase its adhesion to the wood.

Timber Columns or Posts.—I noticed during the construction of Blackfriars Bridge that two whole baulks of timber were tested as to their compressive resistance, with the following results:—

	Length. Feet.	Size. Feet.	Crippled with, per foot. Tons.	Reduction Tons. in length.
Red	20 ...	13×13 ...	138 or 112 ...	⅝ in.
White ...	20 ...	13×13 ...	147 or 126 ...	½ in.

HINTS FROM AMERICAN PRACTICE.*

A WRITER in the *Times* a few years back remarked on the cosmopolitan character which attaches to some professions as compared with others that are of necessity more localised. As instances of the latter, he adduced the law, which, however brilliant may be the prospects it holds out to successful votaries, has its fields for exertion limited by the differing systems of jurisprudence which prevail in different countries. A Dublin barrister or solicitor, if obliged to transfer his sphere of practice to New York, or even to Quebec or Melbourne, would find a large part of his knowledge and experience of little use. Not so, however, with a physician or surgeon, whose knowledge of the human frame and its ailments would be of equal service in any part of the world. These latter professions accordingly are classed as cosmopolitan, and in the same category the writer above mentioned reckons our own and the kindred one of the engineer. As the laws of matter and motion, and the principles of taste, are the same all over the world, the architect or engineer, provided he be originally possessed of adequate capacity, will be in no way disconcerted by having a new field of practice open before him, but having devoted a brief space to acquire a knowledge of the local materials, will find his own training and experience of the fullest value in enabling him to utilise them. Differing requirements of climate and custom, so far from being obstacles in the way of a competent architect, will rather suggest to him new modes of construction and forms of design, and make it less difficult for him to achieve something novel, than where the conditions to be observed are unvarying; and it is hard if the practice of architects who have thus laboured to transplant European architecture to the soil of other continents does not suggest to them at least some few ideas which might with advantage be engrafted on home practice also. It is the consideration of some such, suggested to the writer during nearly three years' residence and practice in the United States, that your attention is invited this evening.

In a former paper on American architecture, I referred to the fact that American town houses formed by far the most satisfactory class of buildings to be seen on that continent. The conditions of social life which prevail there have led to their development to a greater extent than is now usual in most of our cities, and may be compared in their results to those which at one period of our history caused Dublin to be filled with stately town mansions, now, alas! deserted by their lordly occupants, and relegated to the uses of schools, warehouses, charitable institutions, and government offices. The town houses of the American cities are nearly on the same scale as these once aristocratic mansions of ours, but are finished and fitted up with a modern completeness fairly commensurate with the general advance in the industrial arts which the world has made in the interim. One of the most noticeable features about them (which applies also to other classes of building) is the completeness of their systems of heating. This has doubtless been enforced by the rigour of the climate in winter, and necessity has proved here, as in so many other instances, "the mother of invention." Compared with the imperfect and wasteful manner in which our houses and public buildings are warmed, one is led to the conclusion that the mildness of our winter has allowed us to fall into utter supineness and neglect on the subject. And yet we have plenty of cold, and, what is worse, damp weather here to make it important for us to attend to it. What can be more preposterous than to find the halls, staircases, passages, and often the bedrooms of a house or hotel destitute of any provision for warming them, and consequently filled with as cold and damp an atmosphere as prevails outside, while a few of the living-rooms are warmed by open fireplaces only, which just give a comfortable seat or two in their immediate vicinity,—the traditional "chimney-corner,"—and which are certain to draw powerful currents of cold air towards them whenever the doors are opened? The effect of this defective system, or rather want of system, is seen in our internal domestic architecture, which is cramped or confined as compared with either American or continental European. Our doors are miserably small, and have to be placed in lop-sided positions, with a total disregard of symmetry. Draughts have to be guarded against by frequent cross doorways, and the most careful adjustment given to the relative positions even of articles of furniture in the rooms, as may be seen by the planning in Professor Kerr's "Gentleman's House," simply to make what was originally bad tolerable.

Now, in the American houses and hotels, the moment one crosses the threshold he enters a mild and equable temperature, which pervades every part of the house, and permits the internal doors all through to be left open or shut independently of any considerations of temperature. It also permits of much more spacious and symmetrical doorways being used than with us; and, in fact, one of the most striking features to a British islander on his first arrival, is the superior dimensions and elegance of the doorways, which are generally 9 ft. or 10 ft. high, and 6 ft. or 8 ft. wide, circular-headed, in two leaves, either folding or sliding. The details of the methods by which this equable temperature is maintained vary somewhat, and to discuss them properly would require a volume by itself. Vast advances have been made in them during the last few years, so as to obviate most of the objections which have caused so much prejudice to exist amongst us against any other system of heating but the open fireplace. For example, some years back the use of stoves (somewhat like those we see still on the continent of Europe) in American houses was very general, the dry sulphurous heat evolved by them was very disagreeable, and they were denounced by Mr. Anthony Trollope and other English travellers as being the chief and, as he calls them, "accursed" means of destroying the complexions of the American ladies. Be that as it may, such stoves are no longer to be seen in well-appointed American houses, which are now heated by a hot-air apparatus either on the basement, or more commonly in the "sub-cellar," communicating by means of flues with openings into each important room, or else by steam; not so often by hot water. In fact, steam heating seems to have been brought to greater perfection there than anywhere else I know of, and as it admits of much smaller pipes being used than with water, and does not take so long to circulate, it possesses great advantages, and is well worthy of further attention at this side. The chief volume of heated air is arranged to be thrown into the halls and passages (the coldest parts with us), and in order to its diffusion to any rooms which may not have special connexion with the apparatus, such as smaller bedrooms and closets, fanlights moving on hinges are placed over all the doorways—an arrangement equally serviceable for diffusion of light as well as air. The upper panels of doors are also very often of ground plate-glass, in ornamental patterns, which is not only very elegant in appearance, but secures that the corridors and passages enjoy much better light than they would otherwise have. The halls, stairs, and passages are handsomely furnished and carpeted, and are generally quite as agreeable lounging-places as the sitting-rooms, to which they are thrown open by the large folding-doors already referred to, to a much greater extent than prevails with us. A comparison of the plans of some American houses, and an inspection of some of the details of internal doorways, will show the operation of these causes. Under a mode of heating by open fireplaces only, such plans and details would be inadmissible; but when once a proper system of general warming is applied, the architect is at liberty to deal with his internal plan and details in a much more symmetrical and spacious manner than before. It will be observed also that the open fireplace is still retained in the principal rooms; nor do I by any means advocate its discontinuance. I regard it, however, as a useful supplement to a more comprehensive system of heating which ought to be contrived for every well-planned dwelling-house or public building. And no such system should

* By Mr. William Fogerty, F.R.I.B.A. Read at the ordinary general meeting of the Architectural Association of Ireland, January 27th, 1876.

be adopted without at the same time arranging for a complete system of ventilation.

The next point to which I shall advert is the extent to which plumbing and engineering are applied to buildings, and especially dwelling-houses, so as to obviate the necessity for a large number of servants, and the use of detached pieces of crockery ware in the bed and dressing rooms. To this, too, the Americans have been led by the difficulty of procuring competent domestic servants. This is, indeed, the great trouble of American housekeepers, and drives so many respectable people to live in hotels and boarding-houses rather than their own homes; but, besides this, it renders it important that houses shall be contrived so as to require the least possible number of servants to attend to them. And I am not clear but that we are coming to a similar set of conditions here. The cost of domestic service has largely advanced with us during the last few years, and still the complaint of householders is that really good servants are hard to be obtained at any price. In the meantime, great advances have been made both with us and the Americans in the mechanical arts, in plumbing and engineering especially, and all our great cities are now blessed with abundant supplies of water; so why should we not advance with the times, and cease to entail upon our housemaids the necessity of carrying water, and filling and emptying ewers and basins by hand, which can all be accomplished almost instantaneously by a few simple and well-understood arrangements?

In every well-appointed American house each bedroom or dressing-room has a fixed basin-stand (and often a bath) provided, to which hot and cold water is constantly laid on. Besides the constant saving of service effected by this, there is a great saving of time and increase of comfort, and the supply is much more plentiful than when it has to be brought up by hand. There is also a great saving in furniture, and I venture to say the cost of detached basin-stands and crockery-ware all through a house would go a long way to defray the expense of fixed appliances such as the Americans use. The completeness and elegance with which they are fitted up leaves nothing to be desired, and the regularity with which they work, even through the hard frosts which prevail there, prove conclusively the high degree of perfection to which they have developed the plumber's art, and should encourage us in the endeavour to introduce such an obvious and desirable improvement here.

While referring to furniture, I am led to notice another particular in which American houses furnish us with a useful hint, namely, that a large number of things which with us form separate and cumbrous pieces of furniture, costly in themselves, difficult of removal, and often impossible to arrange comfortably in a room, are with them planned and built with and into the house. Of this class especially are bookcases, sideboards, mirrors, presses and wardrobes, plate-chests, and ice-boxes or refrigerators, which, when thus contrived, can be fitted into numerous spaces, otherwise likely to be wasted, and can be also, and are in America, designed and executed in harmony with the general finish of the interior of the house. Now surely this arrangement is well worthy of imitation. What can be more absurd than, when once the architect has issued his final certificate and the builder has departed, to see huge vans disgorging loads of heavy articles of furniture at the door of a new house, often utterly out of character with its architectural style, and often also impossible to be fitted into the rooms without blocking up doors and windows, while numberless tidy recesses remain in the mansion blank and bare, which, by a little judgment and forethought, might be handsomely and neatly fitted up so as to dispense with the necessity of heaving in these huge and unwieldy masses? I believe true economy in this case, as in the last, is decidedly in favour of the American practice, and the possibilities of artistic effect and completeness even more strongly so. Great variety and symmetry can be given to the forms of rooms by the judicious planning of such things as I refer to, which, as they will be required sooner or later, might as well be designed and arranged by the architect, and executed under his direction, as ordered from some cabinet-maker independent of him, and often totally at variance with the character of his building.

I might include, amongst the mechanical appliances which the Americans have brought into use with much skill and effect in their town houses, lifts or elevators for dishes and luggage. Every well-appointed house in New York has one or more of these, from the kitchen to the serving-room as a matter of course, and also from the basement or entrance-hall to the attic for luggage. These, as well as the plumbing work already referred to, having become general, have been gradually improved so as to approach as near as possible to perfection in their operation. The same may be said of passenger elevators, which are in extensive use in all the American cities, and with which, of course, we have some practical acquaintance here; but it must be admitted that ours are not to be compared to those in use in America, either in the extent to which they are applied, or in the simplicity and smoothness of their working.

Another noteworthy instance in which the Americans have brought both mechanical skill and artistic taste to bear on domestic architecture, has reference to the style of their hinges and other door furniture. The forms of these customary with us, and the manner in which they are applied, are both essentially commonplace and unartistic. What can be more disagreeably matter-of-fact than an ordinary butt-hinge, except, indeed, the transparent fiction usually attempted by the house-painter, who generally tries to paint or grain it over as if it was part of the woodwork of the door? Whenever a door or pair of doors is wanted to fold right round, there seems to be no better means of accomplishing this result than by using double width butt-hinges, projecting in all their hideous nakedness beyond the architraves. Since the revival of Gothic architecture there has been, to be sure, some attempt to introduce an artistic element into hinge-work, though even here it is too often confined to planting on sham branches, the butt-hinge keeping its own place; but in our Classic architecture the subject remains untouched. Now compare this state of things with the forms of hinges illustrated in American books, intended for and used in ordinary house-work, and bear in mind the fact that these are usually silver-plated, and kept brightly burnished, and you will agree with me, I think, that in this particular the Americans are, as they put it themselves, decidedly "ahead of us." The effect of these hinges shining on the dark polished walnut in general use for the doors and architraves is very fine, reminding one very much of jewelry on a lady's silk dress. As I understand the American manufacturers are now turning out hardware at prices such as to compete fairly with Birmingham or Sheffield, and certainly the forms of their hinges and other door furniture are far superior to anything to be had from those places, I think it would be worth while for some of our enterprising hardware merchants here to open communication with some of them, and let us have the opportunity of trying their work on some of our buildings.

The finish of the stairs in American buildings is much more elaborate and artistic than is usual with us; and here, too, we may derive some useful hints. Look for a moment at the ordinary finish of the stairs with us. Sir Gilbert Scott, in his work on "Gothic Architecture, Secular and Domestic," thus describes it:—"An ordinary staircase such as people are in the habit of dubbing 'handsome' without thinking it so, is after all a very dull thing: your neat steps with moulded nosings—with neat cast-iron or bronze balusters and French-polished mahogany rail screwed round like a *cornu-ammonis* at the foot, is an excellent thing in its way, and far be it from me to say a word against so time-honoured a contrivance. Let us speak well of the bridge which carries us safe over the stream, and on the same principle think gratefully of the staircase which conducts us so pleasantly to the drawing-room. All I have to say against it is, that with all its practical good qualities, there is a sleepy, self-satisfied look about it which no one would like to disturb." . . . "It does its duty so well, and so neatly and unobtrusively, that it is really a shame to find fault with it; all I ask is to give it a fillip just to make it brush up and look more lively." He then proceeds to advise how Gothic, and especially Elizabethan, architecture affords opportunities for improving on this type by the use of a "bold moulded string carved—the stately newels surmounted possibly by figures—the massive rail moulded to fit well to the hand—the balustrade formed either of individual balusters, arcading, tracery, or of continuous open scroll-work"; also "by the introduction of inlaid woods, a mode of enrichment too much overlooked in our Gothic works."

Now all these valuable ideas have been apparently well known to and acted on by the Americans for a long time past, and that, too, without departing from the spirit of Classic or Renaissance architecture, which as yet is their favourite. The stairs in American houses are really beautiful and elaborate pieces of work, usually entrusted to a specialist in that line called a "stair-builder," who apparently has far distanced his progenitor the "staircase hand" amongst ourselves.

The external doorways, especially of the town houses, next demand notice, as they form very imposing and attractive features in American houses, while so miserably bald and uninviting with us. I am inclined to think the architects or builders who erected the many stately aristocratic mansions of the past age in Dublin, already referred to, had much better ideas on that subject than those which have since become prevalent. At least, if we look about for a dignified and effective doorway, we are far more likely to hit on one of them than on one of our newest productions. There are bold and effective doorways to Powerscourt House (now Messrs. Ferrier & Pollock's), Charleville House (now the Roman Catholic University), and Avonmore House (now the United Service Club), also to many other old mansions; but the builders of more recent town houses seem to have had no better idea of a principal entrance-door than a plain semi-circular or semi-elliptical arched opening. The American town houses, small and great, have nearly always handsome doorways, with more or less of architectural character, and of spacious dimensions, the outer door in two folds, opening at right angles to the front, and forming a most useful and inviting recessed porch, with a pair of inner glazed doors within. The panelling and mouldings are really elegant and varied, instead of the regular old four-panel or six-panel that we ought to be sick of by this time, and the material commonly oak, walnut, or other ornamental hard wood. I am aware that a prejudice exists here against anything like style in a hall-door, as looking too much like a hotel or club-house, just like what once existed against plate glass, but it is one which deserves to be discountenanced. There is certainly much room for improvement; but the scarcity of oak or other hard wood with us makes it unlikely that we shall ever rival the Americans in this particular. It is doubtful, however, whether our damp climate is not adverse to the use of any unpainted wood in such a position,—at least, any instances where oak or mahogany have been used for external doors in Dublin are far less satisfactory than where painted or grained deal was used,—a remarkable instance in which the imitation is more lasting than the reality.

There is another very common feature in American Domestic architecture, more frequent, however, in the country and suburbs than in the towns, which at first sight might seem deserving of adoption here,—namely, the verandah. This is extensively adopted as affording a cool and airy place of retreat from the sun; and although we are not generally favoured in this latitude with a superabundance of the rays of that luminary, similar places of shelter might seem to be desirable as protecting from rain, which is so frequent with us. I believe, however, experience is against the general adoption of such adjuncts here, unless to a very limited extent. If we could only be sure that the rain would always come down vertically, they would be of some value; but, as unfortunately, it is so addicted to driving in nearly a horizontal direction, and sometimes assumes the form of a drizzling mist which apparently defies the ordinary laws of gravitation, an open verandah presents a very uncomfortable place of shelter. I have seldom known them added to houses in this country without sooner or later having to be glazed in. I think, therefore, this feature, however pleasant and attractive it appears in American country-houses, is one to the extensive adoption of which the climate of this country is decidedly unfavourable.

The planning of American town houses is deserving of some attention, as rather different from our regular types, and presents some advantages. That form known as the "high stoop" has many elements in common with that of the terraces of middle-class houses in our own suburbs, both having high flights of steps to the hall-door, with a basement nearly level with the street. I think, however, the Americans have developed and improved this plan considerably. The hall and staircase, it will be observed, are thrown into one, and the latter arranged to ascend in one flight for each story; also much greater depth from front to rear given than in our

houses,—the middle space being devoted to hall and dressing-rooms, lighted by a large skylight over the stairs, also by the extensive use of glazed panels and fanlights. Possibly such a disposition would be deficient in light with us; but, either from the superior brilliancy of their sunshine, or the effect of the other arrangements above described, it rarely seemed deficient in that respect there. One important advantage of the plan is, that it brings the kitchen and dining or breakfast rooms into very convenient proximity, and enables the business of the house to be performed with a minimum of servants.

There are two peculiarities of American architecture which can scarcely be passed over in a paper of this kind, but which, however successful they may be in that country, are not likely to be so here. I refer to the extensive use of wood in country houses, and of cast-iron in warehouses and shop-fronts. Both these materials would be so costly here as to present no advantage, and the type of design which has developed from their use in America is not likely to find favour with us. It should be noted, however, that, particularly in the use of cast-iron, the Americans have attained to a high degree of skill, and that I fear it would be a long time before our ironfounders could undertake the production of architectural forms with anything like the beauty and accuracy of their work.

American church architecture, I regret to say, furnishes but few hints to the European architect, unless it be to point out to him "what to avoid." Their most recent churches may be divided generally into three classes:—

(*a*) Direct imitations or reproductions of English Mediæval churches, seldom correct, however, either in plan or detail.

(*b*) Tabernacles or meeting-houses without any architectural pretension, but often well contrived and arranged for seeing and hearing.

(*c*) Attempts to combine these two discordant ideas, resulting commonly in all manner of shams and devices, to make what is a tabernacle within look like a Gothic cathedral without.

Of these three I need hardly say I consider the unadorned tabernacle by far the best, as having at least the merit of answering its purpose honestly. The last idea I look upon as the worst of all, but it is decidedly the most in fashion just now, most of the new and costly churches of New York being built in accordance with it, and, of course, lauded to the skies by the newspapers as noble structures, combining all the dignity and grandeur of the old world with the life and progress of the new. Imagine interiors like Spurgeon's Tabernacle, the Gaiety Theatre, or the Merrion Hall clothed in exteriors somewhat resembling Westminster Abbey or St. Patrick's, and you will form some idea of the effect.

There is, perhaps, one respect in which the arrangements of American churches are deserving of commendation, and that is in the comfortable manner in which they are furnished and fitted up. This is surely deserving of notice here, as whatever of comfort we may enjoy in our own homes, there is but little in our places of worship. The American churches are nearly always handsomely and uniformly carpeted and upholstered, not according to the individual means or fancy of the pewholders, as with us. Why the committees of our churches should not have proper and uniform upholstery provided in our churches as well as they provide the seats themselves, I cannot understand. As it is, how absurd to see one pew or seat handsomely cushioned and carpeted, the next bare, and the next again half-and-half! Now that we are come to the voluntary system,—which, I need hardly say, is universal in America,—and that every person pays for his church accommodation just as he pays for any other good thing, it is worth while for those who have the care of our churches to see that they are made a little more comfortable and attractive, without presenting such ugly contrasts as those just alluded to. The same observation applies to some extent to the theatres, which in America are furnished and fitted up in a manner to put us to shame. When we shall see any improvement in that respect cannot be predicted, but I fear the date is very far off.

I trust that these few hints derived from American practice may not be deemed unworthy of attention.

Proposed Town and Market Hall for Rugeley.—The Rugeley Local Board has decided to build a new town and market hall at an estimated cost of 6,000*l.*

THE COVENTRY SEWAGE WORKS.

The Coventry Sewage Works, of which a ground plan and perspective view are annexed, were commenced in the month of May, 1873. Although they were placed in operation on the 30th April, 1874, and have been kept continuously so ever since, they have only just now reached a final state of completion. The sewage of Coventry having thus been disposed of during the last twenty-two months, a good practical test of the value of the undertaking, in assisting to solve the great sewage difficulty, has been afforded.

Before proceeding to describe the works, it may be as well to say something about the sewage itself. Coventry contains a population of 40,000; it is a well-sewered town, with a good water supply; but the character of the sewage is extremely foul,—as polluting, perhaps, as any town sewage to be met with in the kingdom; it receives the fæcal matter, &c., from upwards of 4,000 water-closets, but its foulness is principally due to the large quantities of refuse liquid, &c., which are discharged from various dye and varnish works existing in the town of Coventry. This manufacturing refuse, mixed with the sewage, renders it of a character not only most offensive, but extremely difficult and costly to defecate. The dry-weather flow amounts to an average of two million gallons during twenty-four hours, but it is generally in excess of this. Previously to the construction of these works, the whole of this sewage was, in an undefecated state, cast into the river Sherburne, at a spot situated about a mile from the town. It rendered this stream so black and disgusting as to become not only a terrible nuisance in the neighbourhood, but a source of great danger to the public health as well, the sewage eventually finding its way, at some few miles' distance, into the source of the water supply to the town of Warwick. All this has now been remedied, the stream has been purified so that fishes have returned to its waters, and the Corporation of Coventry been relieved from further litigation and annoyance about its sewage.

The following account of the operations will explain the works and the various processes by which this has been accomplished.

Advantage has been taken in selecting the site of a small fall (about 6 ft.) in the nature of the ground to avoid the costly expense of pumping the sewage; it is therefore worked throughout by gravitation. A narrow strip of comparatively valueless land along the border of the Sherburne, in extent about thirteen acres, has been thoroughly drained, and embanked against the rising of the river during floods, and made available for the whole of the works; a smaller quantity of land would have sufficed, but as this quantity was available it has been employed.

The sewage is subjected to four processes, as follow:—I. Straining; II. Chemical precipitation; III. Filtering the effluent water; IV. Drying the precipitate.

The straining is effected by means of mechanical strainers known as Latham's solid sewage extractors. The solids thus removed form a rich and valuable manure, which, at the present time, at the Coventry works, is made use of in the orchard adjacent to the buildings.

The strained sewage, thus free from all its grosser contents, and therefore in a better condition for chemical treatment, next passes through a block of buildings where it receives continuously an addition of a solution of sulphate of alumina (manufactured and prepared in a cheap way on the works, which contain all the necessary appliances for this purpose). The sewage next receives a small addition of milk of lime, and after the addition of each chemical the whole mixture is thoroughly agitated. The mixture then passes on to the precipitating tanks, of which there are four, three being in use at the same time, while the fourth is being cleaned out, one tank being cleaned out each day, if practicable. Precipitation takes place in these tanks, while the effluent water flows in a thin sheet, from the surface, first over weirs extending quite across the tanks; and secondly over weirs which extend only half way across each tank. An arrangement of sluices and valves exists at the end of each tank for draining off the water from the precipitate when a tank has to be emptied.

The effluent water is conveyed by a culvert and open carriers to the filter-beds; of these there are three, each being three acres in extent; the water percolates through a depth of 5 ft. of earth, and is then discharged, through three 15-in. mains, into the river. This water is clear, bright, of a good standard of purity, and, according to an analysis of it made by Professor Voelcker, contains in each imperial gallon 45·22 grains of solid matter, and only ·630 of a grain of free (saline) ammonia, and ·042 of a grain of organic (albuminoid) ammonia.

The filter-beds are used intermittently, and are cropped with rye grass. The crop is pleasing to the eye, and assists in keeping the beds in good condition; but the produce, resembling ordinary sewage-grown vegetation, is coarse and almost valueless.

The sludge, or deposit, found on the bottoms of the precipitating tanks after the water is drained off, amounts to about 25 tons (containing 85 per cent. of moisture) in twenty-four hours, and, as scarcely any solid matter is allowed to enter with the chemicals, almost the whole of this is derived from the sewage. This quantity is capable of being reduced, when quite dry, to about 4½ tons. The sludge is swept from the bottoms of the tanks into underground chambers, placed below the tanks, in which simple arrangements exist for drawing off supernatant water; it is then elevated by ordinary chain and bucket elevators, and passed through Milburn's continuous sludge-filters, by which process a further considerable quantity of water is removed from it. The sludge in this comparatively stiff condition is then dealt with by various ways: some of it is subjected to heat, by passing it through Milburn's sludge-drying machines, and by this means, the remaining moisture being driven off, is converted into a dry manure. This manure, by an analysis of it made by Professor Voelcker, contains, in addition to other fertilising agents, 1·67 per cent. of ammonia, and 3·75 per cent. of phosphate of lime, and may be valued, according to chemical values, at about 35*s.* per ton. Some of the sludge is dried, and at the same time fortified by the addition of chemicals and fertilising agents, and thus furnishes a good manure which is brought up to any required value, and competes well with the best artificial manures produced in this country. Much of the sludge is, however, in its natural stiff and semi-dry state, bought and carted away by the farmers in the neighbourhood of the works.

The sale of sewage manures in any form, however, must be a slow and gradual process. They will not find a sale immediately, but there is no reason why they should not do so in time.

It might, even after the works have been in operation for twenty-two months, be apt to mislead, if detailed accounts of the working expenses were given; for this reason, that, almost daily, practical experience supports some opportunity for economising. In this way, since the works were put in operation, a saving or reduction of 30 per cent. in the cost of working has been effected; but, in order to show corporations that they might get out of their sewage difficulties without a very heavy expense, when the benefit received in a sanitary point of view is taken into consideration, it will be sufficient to say that the cost of chemicals for the purification of one million gallons of very foul sewage, as at Coventry, is about 30*s.*; that the work could be carried on independently of any return from sale of manure for an annual rate not exceeding 8*d.* in the pound; that if the whole of the manure found a sale at its chemical value, the return would nearly repay the cost of working; and that, if the plan of fortifying the manure were generally adopted, a considerable profit over and above the cost of working would result.

Corporations and sanitary authorities must, however, bear in mind that, in this matter, the question of national importance now is, not so much how to turn sewage to profitable account, as how to prevent it from being injurious to health, the latter being an affair of necessity, the former being desirable, but it cannot be put in the first rank.

J. C. Melliss.

New Docks for the Port of London.—Some extensive dock works have just been commenced on the banks of the Thames, and will extend a distance of four miles from Blackwall to Barking. These works, which comprise the extension of the St. Katharine and Victoria Docks, and the creation of extensive new shipping accommodation, have been rendered necessary by the increase of the shipping trade of London. The works just commenced will extend over a period of three years, and furnish employment to between 2,000 and 3,000 hands, chiefly excavators or navvies.

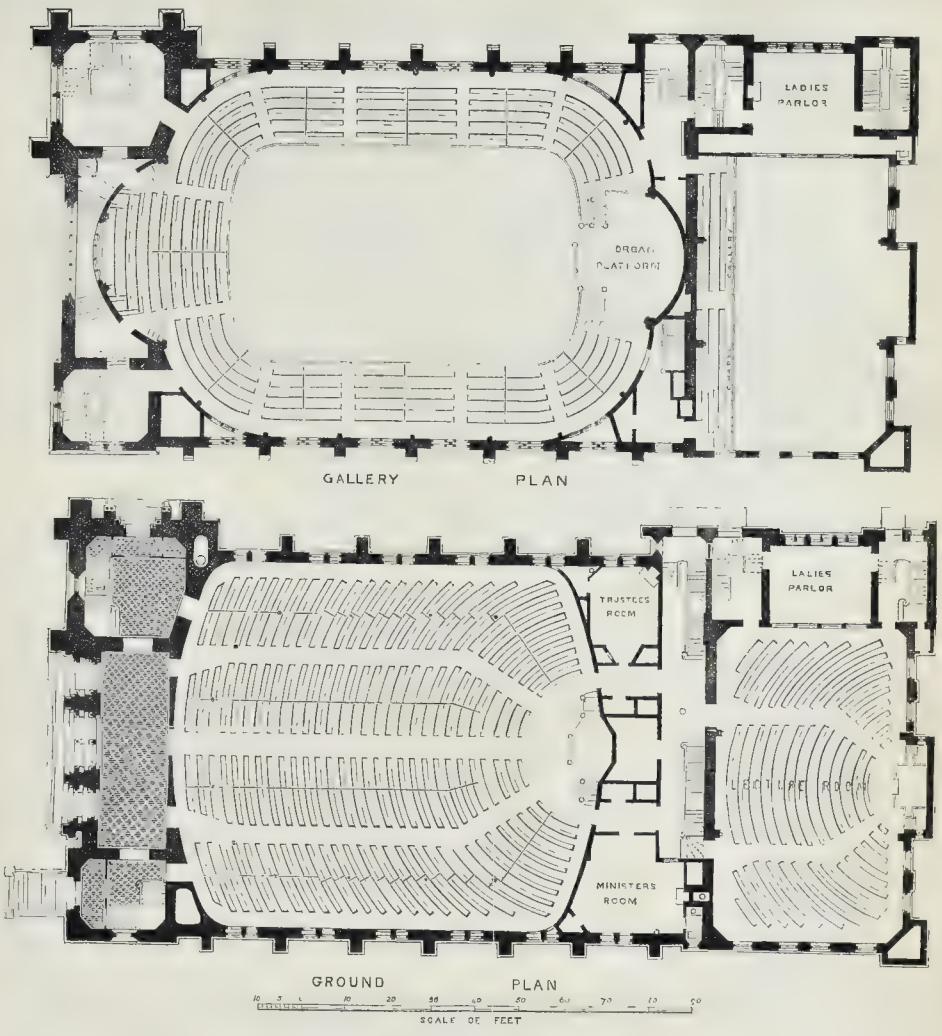


1. Main outfall sewer from Coventry.
2. Chemical works, containing Latham's solid sewage extractors, shale and chemical sheds, chemical vats, stirring or agitating well, mixing-room for chemicals, kilns, mill, 10-horse power engine, boiler for chemical purposes, and coal-sheds.
3. Lime works, containing stirring or agitating well, lime-store, lime-vats, and 10-horse power engine.
4. Drying and filtering rooms for sludge, containing Milburn's patent sludge-filters and sludge-drying machines.
5. Manure-store, containing 6-horse power portable steam engine, and mill for pulverising manure.
6. Precipitating tanks.
7. Underground sludge-chambers.
8. Effluent water culvert.
9. Weirs.
10. Outfall of filtered effluent water to river.
11. Outlet for effluent water to filter-beds.
12. Man-holes.
13. Ventilating-shafts and man-holes.
14. Carriers for effluent water.
15. Embankments.

THE COVENTRY SEWAGE WORKS.—MR. J. C. MELLISS, ENGINEER.



DR. HALL'S NEW PRESBYTERIAN CHURCH, NEW YORK, U.S.—MR. CARL PFEIFFER, ARCHITECT.



NEW PRESBYTERIAN CHURCH, NEW YORK.—*Plans.*

DR. HALL'S NEW PRESBYTERIAN CHURCH, NEW YORK.

THIS church, which we illustrate in our present number, is situated at the north-west corner of Fifty-fifth-street and Fifth-avenue, in New York, having a frontage of 200 ft. to the former and 100 ft. to the latter. The frontage to Fifth-avenue is flanked by two towers; that at the south-east angle being 30 ft. square at its base, and rising with a spire to a height of 300 ft.; and that at the north-east angle being 160 ft. high. The main entrances, consisting of four double doorways, are situated between these two towers, and are approached through a porch or narthex, 40 ft. front, with stone steps leading from the courtyard on Fifth-avenue.

In addition to these main entrances there is an entrance in the north-east tower on Fifth-avenue, also one in the main tower, at the corner of Fifty-fifth-street and Fifth-avenue, and three entrances, all double doorways, in Fifty-fifth-street, at the westerly end of the church, which also gives access to the lecture and Sunday-school rooms. There are thus very efficient means, both of ingress and egress, for the accommodation of a large congregation.

The front on Fifty-fifth-street has a tower at the westerly extremity, 105 ft. high. There is also a tower at the north-west extremity of the church, 100 ft. high, which acts as an air-shaft to supply the church with fresh air, which is taken at the top of this tower in order to have it pure and free from dust.

The principal entrances, on Fifth-avenue, lead into a vestibule, 45 ft. 7 in. by 16 ft. 6 in., the ceiling of which is formed of groined arches, enriched with moulded ribs, foliated bosses, &c., and supported upon columns with sculptured caps. The floor of this vestibule and those of the two towers are paved with tiles. The main floor of the auditorium is 85 ft. wide by 100 ft. deep; upon the gallery the auditorium is 136 ft. deep, total sitting-room being provided for 2,000 people. The ceiling is 60 ft. high. It is claimed that special attention has throughout been given to the acoustic properties of the building.

The style of the exterior is Early English, but the interior is more modern. The pews are arranged in concentric curves, all placed so as to command a direct view of the minister. The pulpit is large and of rich design; the centre panel is sculptured with an allegorical representation of the four Evangelists and the Holy Communion. Over the pulpit is an ornamental canopy, and above this the gallery for the precentor, choir, and large organ. With the exception of light iron columns to support the galleries, there are no pillars to obstruct the view. The ceiling is formed on three curves, rounded at each end to conform to the curves of the walls, and entirely constructed of wood, finished with panels, moulded groining-ribs, and corbels. The lighting is effected through twenty-four traceried windows over, and twenty-four smaller under the galleries, and traceried windows at the east end.

In addition to this, the entire upper cove of the ceiling, 30 ft. by 75 ft. deep, is filled in with stained glass, and lighted from the roof by sky-lights. All the windows have double sashes, an inner and an outer one, with the double object of securing complete immunity from external sounds, and of lighting the church in the evening by means of gas-lights placed between the

two sashes, illuminating the stained glass so as to be seen from the inside. The space between the two sashes forms a large ventilating flue, drawing the air from the church by means of perforated panels in the wainscoting, the current being increased by the heat from the gas-burners within the space. The gas-burners are hidden from view by ornamental glasswork, and are provided with self-ventilating flues. The entire basement of the church forms an air and heating chamber, fresh air being introduced by a large iron fan, 7 ft. in diameter, and capable of delivering 30,000 cubic feet of air per minute, situated in the north-west tower above referred to. At the ceiling of the basement there is a network of steam-pipes, in all 9,000 ft., and 3 in. in diameter. Thus, before entering the auditorium, the pure air supplied by the fan passes over and is warmed by the steam-pipes. It is then introduced into the auditorium through movable slats inserted in the risers of the fixed foot-benches of every pew, there being one slat to each sitting, which the occupant can open or shut at will. The steam is generated in two boilers, 16 ft. long by 4 ft. in diameter, each fifty-horse power. The basement of the church has been carefully concreted, and a smooth hard floor made of Portland cement, to prevent dampness.

In the rear of the chapel is a lecture-room, 75 ft. by 45 ft., and 25 ft. high, with a gallery on one side, and spacious ladies' parlours, one above another, on the Fifty-fifth-street end of the lecture-room, so arranged as to be thrown into connexion with the lecture-room, affording a total accommodation for 700 persons. Over the lecture-room is the Sunday schoolroom, of the same dimensions as the former, and having galleries at two sides and one end; also several large class-rooms and a library. There are also commodious trustees' and ministers' rooms. The pews, gallery fronts, and organ-case, and all the internal joinery work, are made of polished ash, and are the work of Messrs. Kimble & Cabus. The sculptured work has been executed partly by Ellin & Kitzen, and partly by Edward Plassman. The air-fan was constructed by the Nason Manufacturing Company, N.Y., and the heating apparatus by Pitken & Co., Hartford, Connecticut. The masonry and stone-cutters' work were contracted for by James Stewart; carpenters' work, by Jennings & Brown; the painting and internal decoration by John H. Molir; and the organ was built by Jardine & Son. Mr. Carl Pfeiffer, of New York, is the architect of the building.

CHURCHES AT STOKE NEWINGTON.

VISIT OF ARCHITECTURAL ASSOCIATION.

The Architectural Association's second visit for the present session to works in progress was made on Saturday afternoon, the 12th inst. The members assembled at three p.m. at All Saints' Church, Aden-grove, now in course of erection by Messrs. Hill, Higgs, & Co., Messrs. F. T. Dollman and W. T. Allen being joint architects. Mr. Allen was present, and conducted the visitors over the building, which is far advanced towards completion. The style is Early English, and the church consists on plan of nave, 83 ft. 8 in. long by 35 ft. wide; chancel, 36 ft. long and 35 ft. wide; and north and south aisles, 10 ft. 6½ in. wide. The nave and chancel are divided from the aisles by arcades of six bays, five of which open from the nave and the remaining one from the chancel. The piers of nave arcade, which are square on plan, with chamfered angles, are 2 ft. 3 in. in diameter, and 15 ft. 9 in. from centre to centre. They, together with the voussoirs, are of Box-ground stone, which is the only kind of stone used in the building except the Dumfries red shafts between clear-story windows. The walls are of yellow stocks, relieved internally and externally with bands of red and black. At the west end of the church is a narthex having entrances from the north and south, and opening into the nave by an arcade of three arches. The west end of the nave is lighted above the narthex by three lofty lancet lights, and the east end has three lancets of similar character, in addition to a lancet of the same dimensions, and with cill on the same level, on either side of the east wall in the north and south walls of the chancel. The clearstory is lighted by a group of three lancets over each of the nave arches, the centre lancet in each group being wider and taller than the side-lights. The aisles are lighted by coupled and single lancet-lights in alternate bays, the lights in all cases facing the centre of the arch openings. The clear-story windows are divided by means of detached shafts of red Dumfries stone, and advantage is taken of the diminishing thickness of the walls above the nave arcade to get a kind of narrow triforium, wide enough for convenience in fixing decorations, or laying or altering gaspipes, &c. On the nave face of each of the piers of the arcade a detached shaft is carried up, and is continued across the spandrels of the nave arcade to a height of 28 ft. 6 in.; from the tops of these shafts spring the roof principals. The roof is continuous throughout nave and chancel, and is 50 ft. high to the apex and 58 ft. high to the ridge. The junction of the nave and chancel will be marked by a bell-gable in brickwork, carried by a double arch of the same material. The roof internally is wagon-headed, ceiled under rafters. Provision for carrying off foul air is made by perforated cornices opening into the roof space, through which latter there will be a constant current. Flying buttresses (visible beneath aisle roofs) assist in taking the thrust from the clearstory walls to the buttresses on the exterior of aisle walls. Sittings will be provided for about 760 persons, on open benches of deal, stained and varnished. There will be three gangways or passages, one in the centre of the nave and one in each aisle; these passages will be paved with tiles. On the north-east side is a vestry for clergy and choir, with organ in front; this vestry is only intended to be temporary, as it occupies the site of the tower, which will be built as soon as funds permit. The cost (exclusive of tower) will be upwards of 6,000*l.*, in addition to 1,050*l.* which have been expended on foundations, which go down to a depth of upwards of 25 ft. in some parts of the site. The clerk of the works is Mr. F. W. Davis, Mr. Ross being the foreman in charge for the builders.

The members concluded their afternoon's outing by a visit to the neighbouring Church of St. Faith, Londesborough-road. This church, of which only the eastern half has been built, is from plans by Mr. W. Burges, and consists of a wide nave, with semicircular apse and wagon-roof. Only two bays in addition to the apse are completed. The style is Early French, but the effect, though somewhat heavy, cannot be fairly judged, owing to the incompleteness of the building. The church in its present state has been opened about two years, and seats about 600 persons, chairs being used. There is a passage down the centre, in addition to an ambulatory obtained in the thickness of the walls on either side, and which is continued round the apse. Above this ground-floor ambulatory, at a height of about 15 ft., is an upper ambulatory or triforium, also continuing round the apse. The walls where not pierced by openings are about 10 ft. thick. Each bay consists of two large pointed windows on the upper or triforium stage. Some 5 ft. in advance of these windows, nearly flush with interior surface of the nave wall, and immediately opposite to the division between the windows, a lofty cast-iron column or shaft, relieved with bands, takes the weight of the superincumbent brickwork above the windows, and divides each bay centrally. On the ground level the ambulatory is only lighted by small loops, but each bay opens out into the nave by an arcade of four arches. These have at present a heavy appearance, owing to the capitals being uncarved and in the square.

TORRENS'S ACT AND THE WESTMINSTER BOARD OF WORKS.

The Westminster District Board of Works, in reply to a communication from the Metropolitan Board of Works as to why they have not taken any action under Torrens's Artisans' and Labourers' Dwellings Act, state that their inaction has been caused by the general complexity of the proceedings under that Act, and principally on account of the difficulty of obtaining the certificate of the officer of health that any premises are in a condition or state dangerous to health so as to be unfit for human habitation. In their reply to the Central Board, the Westminster local authorities make a number of suggestions. One of these is, that powers should be given to deal with the large number of houses that it is well known need to be demolished and replaced by other and more suitable dwellings for the working classes, which, although it could not be strictly proved under the existing Act, were nevertheless, in a legal sense, unfit for human habitation. They further suggest that with a view to improve the dwellings of the artisans and labouring classes, power should be given to clear and re-arrange large sites, notwithstanding that the houses and premises to be demolished may not be provably unfit for human habitation on the ground of danger to health.

CONSTANT WATER SUPPLY.

The Water Examiner, Major Bolton, in his last report, informs us that the companies that are moving in the matter and giving constant supply under the provisions of the Act, in a portion of their districts, are the Kent, New River, and East London. The Act of 1871 provides power to compel the companies to give constant supply as and when the public authorities may see fit to demand. The number of miles of street which contain mains constantly charged, and upon which hydrants for fire purposes could at once be fixed, in each district of the metropolis, are as follows:—Kent, 80 miles; New River, 169; East London, 70; Southwark and Vauxhall, 100; West Middlesex, 70; Grand Junction, 41½; Lambeth, 90; Chelsea, 50; making a total length of 670½ miles; and the Water Companies are ready to affix hydrants thereon when required by the authorities. The total number of hydrants erected is at present 2,622, of which 2,077 are for private purposes, 276 for street watering, and 269 for public use.

COLOUR.

Sir,—On reading in the *Builder* of the 1st of January your interesting review of Section I. of Mr. Cave Thomas's "Revised Theory of Light," I procured as soon as possible a copy of that treatise, and shall be glad if you will insert a few additional remarks upon it, the subject being one which I have studied well. At this time, however, I can only touch upon a few of the prefatory remarks, and hope shortly to go on to some of the principal propositions.

In the preface it is most truly stated that "the science of the harmony of colour is a science of our colour sense, founded upon the inner experience, the taste of those who possess a perfectly healthy, a perfectly constituted, optical organisation. Every experiment necessary for the artist, and for the working out of a science of chromatic harmony, may therefore be made with that most beautiful instrument and only *colour-box*, the eye." But, then, in making these experiments, the instrument must be put in motion, or played upon; the sense must be excited; the colours of the box—that is, the sensations—must be produced; and this can only be properly and regularly done by the action of those wonderful luminiferous vibrations of the mysterious ether which (for want of a term more distinct) we commonly call light, using the same term to express not only the sensation, but also the moving cause of the sensation; and if there is to be any science in the matter, there surely must be some knowledge of the different sensations, their resemblances and their differences; some power to produce them at will, and to contemplate them at leisure; some means, and some understanding too of the means, by which they are to be produced. Mr. Cave Thomas, however, adds:—"We shall now proceed to show how every artist has it in his power to determine for himself the true harmonic of any colour without reference to book, diagram, or prism, and quite independently of any of those hybrid hypotheses, half Newtonian, half Huyghenian, which have so long been in vogue." I fear he here undertakes more than he can accomplish, even if we can limit the meaning of "the true harmonic of a colour" to what is commonly called its complementary colour, or in any other conceivable way. But this we shall see as we go on.

But before leaving the preface I must demur to the following observation,—"Our physicists are just beginning to perceive that the adoption either of the *emissive* or of the *undulatory* hypothesis, equally precludes the conception that any variety of light can exist apart from the sentient being, otherwise than as a mechanical impulse, or as a vibration." Just beginning to perceive! Why, the greatest physicist probably that the world has yet seen, Sir Isaac Newton, who may be regarded as the very founder of the science of colour, not only perceived it, but announced it, 200 years ago, in the following words:—"Definition.—The homogeneal light and rays which appear red, or rather make objects appear so, I call rubrific or red-making; those which make objects appear yellow, green, blue, and violet, I call yellow-

making, green-making, blue-making, violet-making, and so of the rest. And if at any time I speak of light and rays as coloured or endued with colours, I would be understood to speak not philosophically and properly, but grossly, and according to such conceptions as vulgar people in seeing all these experiments would be apt to frame. For the rays, to speak properly, are not coloured. In them there is nothing else than a certain power and disposition to stir up a sensation of this or that colour. For as sound, in a bell or musical string or other sounding body, is nothing but a trembling motion, and in the air, nothing but that motion propagated from the object, and in the sensorium is a sense of that motion under the form of sound; so colours in the object are nothing but a disposition to reflect this or that sort of rays more copiously than the rest; in the rays they are nothing but their dispositions to propagate this or that motion into the sensorium; and in the sensorium they are sensations of those motions under the forms of colours."

It may be safely said that no physicist worthy of the name ever from that day to this thought colours to be anything else but sensations. It is reserved to Mr. Colling (in your number for January 29) to prove that colours are something inherent in the object by breaking a brick and showing that the colour of the inside is the same as that of the outside.

W. Benson.

PUBLIC BUILDINGS IN ROME.

The committee intrusted with the supervision of the new palace to be built in Rome for the Ministry of Finance has communicated to the Italian papers some details concerning this important construction. Each of the two frontages will measure 300 mètres, and the sides 118 mètres. This palace will be built in the higher part of the town, and its foundations vary in depth from twelve to eighteen mètres; a fact which is not encouraging to those who contemplate building on this uncertain soil. The edifice will possess six stories, four porticoes, four large staircases, and eleven secondary or back stairs. It will cover a surface of 19,500 square mètres, and reach a height of 35 mètres. In the centre of the yard a statue will be placed of the celebrated Roman herald, crying *Hic manebimus optime*, which to some may recall Victor Emmanuel saying:—*Ci siamo e ci resteremo!* There will be no fewer than 1,200 rooms within this building, and the number of bricks employed will amount, it is calculated to twenty-five millions. Some 90,000 cubic mètres of that sandy earth peculiar to Italy, and called puzzolana, together with 12,000 cubic mètres of lime and mortar, will help to compose a total of 184,000 cubic mètres of masonry, which is to be varied and relieved by 70,000 *litres* of glass. The number of workmen employed varies from 1,200 to 1,400; but the official report we quote fails to add that three hundred accidents have already occasioned the deaths of from thirty to forty workmen.

ELECTRIC FIRE ALARUM.

The municipal council of Verviers recently debated on an ingenious method for saving the great factories of the town in the event of fire. A councilman proposed to connect the chief establishments together by means of a subterranean wire communicating with the fire-station. The system would be the same as that applied to railway carriages now extensively employed on the Belgian lines, and which has also been attempted in England. Each house could be provided with one or two electric bells, which it would suffice to touch according to the various signals agreed upon. For instance, a single call would mean that a policeman was required in the house from whence the battery had been set in motion. Two calls would signify that firemen and fire-engines were wanted; while three calls might imply that the street was in a state of riot. But, to prevent false alarms, the bell will be covered by a glass globe, which must be broken before the signal can be given. The inhabitants of Verviers, it is urged, have special reasons to adopt such precautions. The town is situated on the frontiers, and is therefore exposed to the depredations of German thieves, who find comparative immunity from pursuit by returning to their own country when they wish to avoid the Belgian police. As the centre for the manufacture of cloth, in which a great quantity of greasy and inflammable materials are used, fires are most frequent and destructive; while the excessive population of the town increases the possibility of riot. The proposed innovation would not involve any great expense. It is calculated that each householder might be charged 4*l.* for laying down the signal wires in his premises. The money thus obtained would suffice, with perhaps some 80*l.* more to be taken from the town funds.

GASLIGHT MEASURING.

At the Institution of Civil Engineers, on February 15th, the paper read was "On Estimating the Illuminating Power of Coal Gas," by Mr. William Sugg, C.E. It was generally acknowledged that the most accurate way of estimating the illuminating power of gas was by burning a known quantity of that gas in a standard burner, and comparing the light with that from a known quantity of oil or sperm, consumed in a certain kind of lamp or candle. In England, since the year 1852, the Parliamentary standard of comparison had been a sperm candle, of six to the pound, burning at the rate of 120 grains per hour. But the average normal rate of burning of these candles was nearer 130 grains than 120 grains; therefore it was desirable that the Parliamentary standard rate should be altered if a change could reasonably be made. The greatest obstruction to the adoption of a uniform system of gas photometry had always been the difficulty of settling the kind of burner with which the gas should be tested. With the standard quantity of the same gas different kinds of burners gave different results, and the same burner gave different results with the same standard quantity of gases of different illuminating powers, richer or poorer, according to the kind of gas it had been originally designed for.

By the system of the author, one standard burner only was proposed for all qualities of gas from twelve to thirty candles. This burner might be readily gauged and verified by actual trial against the Government standard burner. It was the Gas Referees' London Argand burner, with a chimney 6 in. or 7 in. long by 1¾ in. wide, producing a flame always 3 in. in height; in fact, such a burner as was ordinarily adopted by consumers.

The paper was illustrated by diagrams, and a specimen of a new apparatus, the invention of the author, termed an "illuminating power meter," by which the illuminating power of gas could be read off from a dial at once in standard sperm candles. No previous knowledge, either of the manufacture of gas or of its chemical composition, or of the mode of testing it, was requisite for the use of the instrument.

BREACH OF CONTRACT.

HALIFAX SCHOOL BOARD *v.* HALMSHAW.

This was an action, tried in the Halifax County Court on the 9th inst., to recover 50*l.* for damages occasioned by breach of contract to construct a hot-water heating apparatus at the new Booth Town Board School.

It appeared that in 1873 the School Board instructed Messrs. Leemings, architects, Halifax, to prepare plans for a new school at Booth Town. They advertised for tenders for the various works, and the defendant tendered to do the work connected with the providing and fixing the heating apparatus for the sum of 130*l.* 12*s.*, and he accordingly entered into an agreement with the Board, and signed the specification and plan. The defendant then proceeded to fix the apparatus, but as it was provided in the contract for the Board that the work was to be guaranteed for twelve months after it was completed, he felt himself at liberty to deviate considerably from the directions given to him by the architects as to the fixing of the pipes, &c. The defendant finished the apparatus in October, 1874, and tested it on a Sunday in that month, and the architects found on examination the following day, that the apparatus would not work efficiently. They found that the boiler was of insufficient heating capacity. Defendant made several attempts to make the apparatus workable, but finding that he could not do so, and being ordered by the Board to complete by a certain time, he requested the architects to send for Mr. Rishton, an engineer of experience in these matters. Mr. Rishton gave directions for the re-arrangement of the pipes according to the plan originally proposed by the architects. Defendant consented to carry out these alterations, but when he saw the serious cost they would entail, he gave up the apparatus into the architects' hands. The architects offered to take the matter into their own hands and complete it, which offer was accepted by the School Board. The architects then got a new boiler, re-arranged the pipes at considerable expense, and they now sued the defendant for 50*l.* expenses incurred. The defence was that defendant had deviated from the specifications and plans from the orders of the architects, and that was the reason the apparatus did not work.

His Honour, in giving judgment, said that the conduct of Messrs. Leeming & Leeming, in releasing the School Board from this contract, had been honourable and upright, and that the amount expended in putting the apparatus right after the contractor had left was not unreasonable. The verdict would be for the full amount, with costs.

BUILDING ON DUST SHOOTS AT HACKNEY.

At the last meeting of the Hackney District Board of Works, the Sanitary Committee submitted the following report, a copy of which they proposed should be sent to the Home Secretary:—

"Your committee have had under their serious consideration your reference as to the condition in which houses may be erected in the metropolis on deposits of house refuse and other made ground. After hearing portions of the shorthand writer's notes read, and the opinion of the medical officer of health, they agreed to submit the following resolutions for your approval, and recommend that a copy be sent to the Secretary of State for the Home Department, if you consider that they meet with the exigencies of the case,—1st, that no building be erected on made ground unless the whole internal area of the premises be covered with a layer of good concrete at least 6 in. thick, to the satisfaction of the surveyor to the District Board, or to the Vestry. 2nd. That all drain-pipes passing under buildings so erected, or outside the walls if within 4 ft. thereof, shall be constructed of glazed drain-pipes, embedded in a layer of concrete at least 6 in. in thickness, to the satisfaction of the surveyor to the District Board or Vestry. 3rd. That no building shall be erected on a foundation of house refuse until after the lapse of two years from the time of completing the deposit, or in the case of any other newly-made ground until the surveyor to the Board or Vestry be satisfied that sufficient time has elapsed for consolidation of the ground, and for the cessation of decomposition in the deposited matters. In the event of the Secretary of State for the Home Department being of opinion that it would be preferable to effect the proposed object by bye-laws, then that the District Board or Vestry should be empowered from time to time to make bye-laws in regard to houses to be hereafter built upon dust-shoots or other made ground, for the purpose of preventing injury to the health of the future occupants."

LINCOLN SCHOOL OF ART.

The annual distribution of medals and prizes took place on Monday, February 16, under the presidency of the Mayor (Mr. C. Beard). The Bishop Suffragan of Nottingham distributed the prizes, and the Precentor, Chancellor, and others took part in the meeting.

The awards by the Science and Art Department include,—National gold medal, 1; national silver medal, 1; national bronze medals, 3; national book prizes, 6.

According to the report of the head-master, Mr. E. K. Taylor,—"For many years Lincoln has kept the highest place for several classes of work. This year these are more than maintained, and another most important one has been added. In machine drawing we have again carried off the highest awards. In chalk studies of heads from life we are again not only the best represented school, but have also carried off the highest award. In studies from cathedral architecture we have been for several years the only school whose works have been thought worthy to be exhibited in the National Competition Exhibition, and we again take the highest award. But the new speciality is by far the most important success. It is for painting from nature in oil. This is the highest stage, and the competition is most numerous and severe. Taking first, however, both classes of painting,—that is, in oil and water-colours,—I find that thirty-seven awards are made, and of these Lincoln has seven, including the highest; but if we come still higher to the competition for painting in oil, our success is even more marked."

THE NEW VESTRY HALL AT KENSINGTON.

After repeated discussions upon the subject, during which the legal powers of the vestry to build upon certain sites have been questioned, the Kensington vestry have at length definitively agreed upon the erection of a new hall. At their last meeting they had under their consideration a motion brought forward by Mr. Wells, to the effect that a new hall and offices be built upon the site of the national schools lately purchased by the vestry.

A long discussion took place, in the course of which it was strongly urged by several members that the requirements of the parish demanded the erection of an entirely new building for the transaction of public business, and that whilst the patching up of any part of the old school-room would not supply the needed accommodation, it would be unworthy of the district, and that nothing less than the erection of an entirely new building would meet the necessities of the case. The suggestion that the vestry was not armed with legal powers to expend the funds of the parish in the erection of a new building for the transaction of the public business was held to be untenable. The motion for the erection of a new hall and offices on the site of

the national schools was adopted, and a committee was appointed to consider as to the particulars and details of the buildings required for the accommodation of the vestry and its officers.

INCREASE OF CAMBERWELL: THE SURVEYOR'S SALARY.

At a special meeting of the Camberwell Vestry held last week, Mr. Dresser Rogers stated that the rateable value of Camberwell was now 561,708*l.*, being more than double what it was when Mr. Reynolds, the surveyor, was appointed twenty years ago, when the vestry was organised, and considering the increased number of houses in the parish, the additional public and private roads, and the vast increase in the number of householders, the surveyor's salary ought to be raised considerably beyond its present amount.

Mr. Middlemas said another case could not be cited of a gentleman of Mr. Reynolds's ability, after twenty years' service, receiving a net income of about 450*l.*

Mr. Puckle, in moving that the salary of the surveyor be increased to 750*l.*, referred to the sewerage of the parish having been successfully carried out by him without an accident, and also without litigation.

Mr. Denny, in seconding the resolution, said it was a great compliment to Mr. Reynolds that so many important works had been carried out without any defect, and that alone justified him in applying for an increase in his salary.

After a lengthened discussion the original motion was modified, and the surveyor's salary raised to 650*l.* a year.

ARCHITECTS' POWERS.

Before the West Riding magistrates at Bradford, Mr. Thomas William Helliwell, architect, of Brighouse and Huddersfield, and of extensive practice in the West Riding, was charged by George Wright, of Cleckheaton, plasterer, with having maliciously injured certain plaster-work under his contract in the erection of a villa residence for Mr. Dawson, of Cleckheaton. Mr. Wright, of the firm of Lancaster & Wright, Bradford, appeared for the complainant, in support. Mr. Moseley, who defended, contended that the magistrates had no jurisdiction, and claimed for his client a right under the written contract of the complainant with Mr. Dawson to reject improper workmanship, and that he had acted accordingly. The magistrates took this view, and dismissed the case, observing that it never ought to have been brought, and that the prosecution appeared to be a malicious one.

LIGHT AND AIR CASE.

THEED V. DEBENHAM AND FREEBODY.

This case, which was before Vice-Chancellor Bacon for several days, was decided on the 18th inst.

It was a suit by Mr. Theed, the sculptor, against Messrs. Debenham & Freebody, mercers, of Wigmore-street, Cavendish-square, to restrain them from raising their buildings to such an additional height above their former elevation as to diminish the light hitherto enjoyed by Mr. Theed in his studio and work-rooms, situate in Millbull-yard, Welbeck-street. Several of these rooms were mentioned, but the particular room in respect of which the suit was brought was the "pointing"-room. This process was explained. It may be described as that whereby, after the artist has modelled his composition in clay, the workman or assistant follows him, and chisels the marble to the depth which is indicated by the model. It was asserted, and proved by the plaintiff's witnesses, that for this process a horizontal and diffused light was absolutely necessary; for if the workman cannot see distinctly into the hole made by the chisel, technically called a "pen," he may exceed the proper depth, and thus ruin the marble block. Amongst the pleas for the defence was this, that the defendants had, in deference to Mr. Theed's representation, brought down the sky-line of their proposed additional buildings to an angle of 45 deg. from Mr. Theed's pointing-room windows, and they said they were entitled to this amount of elevation. In support of the plaintiff's case several artists gave evidence, amongst them Mr. Bell, Mr. Thorneycroft, and Mr. Durham.

The Vice-Chancellor, in the course of an elaborate judgment, said that the plaintiff's case had been very clearly proved, without doubt or ambiguity, and there must be an injunction to restrain the defendants from diminishing the amount of light to which Mr. Theed had clearly shown himself to be entitled by prescription.

Messrs. Benham & Froud's Warehouse.—The firm who were named to us by Messrs. Benham & Froud as the architects of their new warehouse (pp. 144, 146, *ante*) wish us to state that the front was designed by Mr. F. Meeson.

SCHOOL BOARD SCHOOLS.

Shepherd's Bush.—These schools, situated in the Victoria-road, leading from the Uxbridge-road, consist of a block of buildings in the Domestic Gothic style, freely treated, and embellished with some carving. They are built to accommodate about 500 children (but capable of future extension when necessary), with convenient rooms for masters, mistresses, and care-taker. The girls have a covered playground, and each division spacious cloak-rooms, lavatories, &c. This school is the furthest west yet built by the London School Board, and was erected from the designs of Mr. E. R. Robson by Mr. Wm. Downs, of Walworth, the amount of whose tender was 5,848*l.* A public meeting in connexion with the opening was held at the schools under the chairmanship of Sir Charles Reed, at which several speeches were made. Previously to the meeting a selection of sacred music, comprising the principal numbers from Rossini's "Stabat Mater," &c., was performed by a select choir under the direction of the clerk of the works, Mr. E. Sibson.

Coupar-Angus.—At the last meeting of the Coupar-Angus School Board, tenders for the new buildings were submitted, when the following were selected:—Mason work, Thomas Lawson, Coupar-Angus, 1,544*l.* 10s.; joiner work, Anderson & Adam, Coupar-Angus, 667*l.*; plumber work, Andrew Laing & Son, 179*l.*; slater work, Wm. Craigie, Blairgowrie, 160*l.*; plaster work, P. Donaldson, Coupar-Angus, 51*l.* 19s. 6d.; iron railing, George Bannerman, Coupar-Angus, 50*l.* 12s. 11d.; in all, 2,653*l.* 2s. 5d.

New Byth.—On the 20th ult. an addition to the previously existing schoolroom at New Byth, Aberdeenshire, was opened under the auspices of the School Board. The new building consists of a large lofty schoolroom and two class-rooms. The contractors for the work were:—Mason work, Mr. Haddon, New Byth; carpenter work, Mr. Smart, Craigston; slater and plumber work, Mr. Reid, Macduff; plastering, Mr. Gibson, Turriff. The building has cost about 550*l.*

Invergordon.—The new public school of Invergordon was formally opened by the School Board of the parish of Rosskeen on the 12th ult. The new school is a commodious structure, surmounted by a belfry, and having teacher's residence and extensive playground. The principal classroom is 70 ft. by 20 ft.; and other class-rooms are 20 ft. by 19 ft., and 30 ft. by 19 ft. The architects were Messrs. Maitland & Sons, Tain, and the building was erected by local contractors.

Strontian.—New School Board schools at Strontian, Inverness, have just been opened. Mr. Burrell, of Fort William, is the architect, and the contractors were:—For the mason work, Mr. Ritchie; and for the carpenter, plastering, and painter work, Messrs. Maccallum, Fort William.

Holloway.—New schools in Poole's-park, Holloway, have been opened by the School Board for London. The building is situate in Gransden-road, leading out of Seven Sisters'-road, and is in the Queen Anne style. It consists of two stories, the ground-floor being devoted to the infants' school, and the upper story to the boys and girls, each having separate entrances, cloak-rooms, and lavatories. The schools were erected from the designs of Mr. E. R. Robson, the architect to the Board, the builder being Mr. G. S. Pritchard, of Finsbury. The schools will accommodate 716 children; and the contract amounted to 7,296*l.*

Strood.—At a meeting of the Rochester School Board, on the 3rd inst., Mr. Walker, architect, submitted plans for new board schools at Troy Town, Strood. The plans, which were approved, provide accommodation for 100 boys, 100 girls, and 160 infants, and provision is made for enlargement at any future time. The cost is estimated at 2,000*l.*

Prescot.—A special meeting of the Prescot School Board was held on the 1st inst. to consider a letter received from Messrs. Morrison & Son, builders, of Liverpool, whose tender for the erection of a board school for 2,220*l.* had been accepted. Messrs. Morrison & Son stated that they had made a mistake and increased the figure to 2,405*l.* 16s. The corrected tender was accepted.

Rillington.—A new Board school has lately been completed and opened at Rillington. The school has cost 900*l.* The architects were Messrs. Gibson & Son, of Malton.

Earlstoun, N.B.—The erection of a new Board school at Earlstoun has just been commenced, from plans by Messrs. Herbertson & Sons, architects, Galashiels. The contractors are,—Mr. Rodger, Earlstoun, mason's work; Mr. Archibald, Leith, joiner's work; Mr. Murdison, Earlstoun, slater's, plumber's, and gasfitter's work; and Messrs. Swann & Co., St. Boswell's, the plasterers' work. The total cost, including playground, will be about 2,470*l.*

Garveston and Thurton.—Mr. John B. Pearce, of Norwich, was on the 2nd inst. appointed architect to the School Board of Garveston and Thuxton.

Cullen, N.B.—New Board schools at Cullen, Banffshire, were opened on the 26th ult. The style adopted by the architect, Mr. Millar, is Elizabethan, the main architectural feature being a belfry, rising to a height of 50 ft. Accommodation is provided for 374 children, allowing 8 square feet of floor-space for each scholar, or a total of nearly 3,000 ft., which is as nearly as possible equally divided into a senior, a junior, and an infant department. Each of these three departments has a school-room with class-room adjoining. The work was done by contract, and the tradesmen, all of Cullen, are—Mr. Wm. Alexander, mason; Mr. Wm. Duffus, carpenter; Messrs. M'Ivor & Younnie, plasterers; Mr. Alexander Desson, sen., slater; Mr. Wm. M'Rae, plumber; and Mr. John Duffus, sen., who provided the school furnishings. The total cost will be about 2,500*l.*

Manchester.—The Manchester School Board has just completed new schools in Every-street, Ancoats, and Chester-street, Ardwick. The building in Every-street is in the Gothic style, with a frontage 150 ft. long. It is three stories high, including the basement. The walls are of white-headed bricks, with bands and arches of purposely-made bricks and block bricks, arranged in *voussoirs*. The total cost is about 14,000*l.*, of which 5,000*l.* have been spent in consequence of the unusual difficulties in the foundations, the site having been formerly occupied by gasworks. A covered playground, having an area of 474 square yards, the floor being covered with concrete, with the roof 10 ft. above it, occupies the greater part of the basement story. Four rooms, or rather halls, are the schools respectively for male and female infants and the elder boys and girls. The little ones will be taught in the rooms on the ground-floor, and the elder scholars on the first-floor. Each of these rooms measures 60 ft. by 30 ft.; but pillars are dispensed with, as the floors are supported by fitch-beams. All the floors are pugged. Adjoining each large room is a class-room, 20 ft. long and 17 ft. wide. At the rear of the building there is an open-air playground. Mr. J. L. Ward was the contractor for the work, which he has executed under the direction of Mr. W. Dawes, architect. The new schools will accommodate 1,000 scholars. The Chester-street schools have cost 6,000*l.* Here also there are four large rooms for the boys, girls, and male and female infants, the total accommodation being sufficient for 800 children. The contractor was Mr. J. Heard, Hulme; and the architects were Messrs. Royle & Bennett.

Nottingham.—The second set of schools erected by the Nottingham School Board was formally opened on the 28th ult. The schools have been built at a cost of about 6,000*l.*, or at an average of 7*l.* 10s. per head of pupils who will attend them. There will be accommodation for 250 boys, 250 girls, and 300 infants. The style is Gothic. The infants' school contains one large school-room 64 ft. by 22 ft., two class-rooms, one 25 ft. by 22 ft., and another 22 ft. by 22 ft., and also a babies' room, 22 ft. by 22 ft. The girls' school contains a school-room, and three class-rooms of the same size as those of the infants'. The boys' school contains one school-room 60 ft. by 22 ft., and three class-rooms, one 25 ft. by 22 ft., and two others 22 ft. by 22 ft. The playgrounds are extensive, and every accommodation has been provided for the healthy recreation of the children. The architects are Messrs. Bakewell & Bromley, of Nottingham. The furniture was made by Messrs. Wright & Son, Portland-road, the desks being the design and invention of Messrs. Gaskell & Wright. They consist of a seat and desk in one long block; under the seat is a receptacle for caps, books, slates, &c., so that each boy may have no difficulty in finding his own articles. The upper portion may be used for four different purposes. By the first movement it may be employed as a back to its own seat; then it may be elevated slightly and utilised as a desk; or, passing it a move further on, it becomes a table, so that when backed by another it forms a convenient table for tea parties; finally, it it can be turned upon the other side and be made

a back to the next seat, so as to be convenient for an audience looking either way.

Leith.—The Leith School Board has just opened its second school, which is situated between Giles-street and Yardheads. The building is as nearly as possible in the form of a square, and is two stories in height. The back part of the upper story is carried out on massive stone pillars, the space underneath forming a covered playground. The principal entrance is from Giles-street, the boys' and girls' doors being situated at each wing, and the infants' in the centre of the building. The class-rooms for the infants are on the ground-floor, the main one being fitted with two galleries, each for sixty children. The general class-rooms for boys and girls are on the second-floor. One large apartment affords a space of 10 superficial feet for 126 scholars, while one class-room gives accommodation for twenty-four girls, and another for thirty boys. The heating is secured by means of open fires. A spirelet is placed in the centre of the building, and forms at once a belfry and ventilator. The estimated outlay is 3,807*l.*, while the sum of 1,250*l.* was paid for the site. Lorne-street School is drawing near completion. It is being erected at a cost of nearly 7,000*l.*, including the price of the site, and will accommodate 500 children. This school is in the form of the letter T. The mixed school is placed in the front, and is two stories in height, while the infant school runs backwards from the centre of the front erection, and is one story in height. The mixed schools contain on each floor one large and three small class-rooms, while a similar number of apartments are planned in the infant section.

THE WHITECHAPEL BATHS AND WASHHOUSES.

THE Whitechapel Baths and Washhouses, the foundation-stone of which was laid about twenty years ago, are about to be entirely re-constructed by the Whitechapel Vestry. It may be remembered that the baths were originally erected and conducted by a company, but were closed about six years ago for want of support. In response to the desire expressed at several public meetings held since the period of the baths being closed, the Whitechapel Vestry have undertaken to re-open them, and become responsible for their management; but in order to carry out this object the re-arrangement and extension of the baths is necessary, which will involve a considerable outlay. Towards this 1,500*l.* have been already raised in subscriptions, and last week a special meeting of the Vestry was held to consider a proposal for borrowing the amount necessary for re-constructing the baths, and making them suitable for the use of the inhabitants. At this meeting it was explained that the Vestry propose to re-construct both the baths and washhouses, as regards their internal arrangements, and also to add a swimming-bath of large dimensions. The estimated expense of the proposed new works is 8,500*l.*, and a resolution to borrow that sum for the purpose was proposed and adopted.

SHEFFIELD SCHOOL OF ART.

MR. ALDERMAN BRAGGE, in taking the chair at the annual *conversazione* of this school, stated that this year the school had obtained a prize which had never before fallen to the lot of Sheffield,—one of the two gold medals and scholarships which were given to only two students in the land. It was a much-coveted prize, and he was glad that it had been obtained by the school. Yet they must not think that because the school was doing well it was doing all it ought to do. It was doing only a very small portion of what it should be doing. He was hoping that they might soon read in the Sheffield newspapers that a munificent donor had given 10,000*l.* to the School of Art, as was the case at Birmingham a few days ago. At present the school obtained from the inhabitants of Sheffield about 1*l.* for every 1,000 souls. Now that was rather too little, and if the school were dependent upon private generosity it would be utterly bankrupt. Still they were going on well.

Mr. J. H. Chamberlain, F.R.I.B.A., presented the prizes, and in the course of his address said one of the common wants of the present day, and of all time, was "decoration." It would be a very good thing if they could get a room filled with the ornaments with which people decorated their houses: they would then see what ordinary people really admired. What people wanted, if they could only get it, was art; and they did not wish to destroy the taste for art, but to encourage it, and develop it, so that it might grow into great and glorious results. There was a time when art was popular in the country; and they could develop it again if they chose; it was simply waiting for the right teaching. There were those who desired art from good motives, people who looked upon it neither as a toy, nor a pastime, nor as a means to an end. It was followed, in fact, for its own sake, and he could not say they could find a better reason. What art could do was this—it could teach, and reveal, and open the eyes of the blind, and widen the ears of the deaf. Of all history writers, art was the only one that was perfectly true, and at the same time enduring. Art was at its best when at its widest, and, so far from being helped by luxury, was destroyed by it. Neither were riches indispensable to art, for England was five times more artistic in the past, when she was not one hundredth part as rich as she was at present.

APROPOS OF THE ERECHTHEUM.

THE very able lecture delivered by Mr. Fergusson at the Institute the other evening, which, with the discussion following it, was reported in our last number, would, perhaps, scarcely receive due justice except from those who were present and could follow the elucidation of the subject by the diagrams referred to, and who heard in full the exposition of the lecturer's views,—the most abbreviated and bald report of which was alone permitted by those who manage the Institute. With the clearness of demonstration which is the result of a long and careful study of a subject, Mr. Fergusson proved at least,—as we think those present must, one and all, have admitted—that the theory of the existence of the Pandroseum as a separate building, of which nearly all trace above-ground has disappeared, gave an explanation of apparent discrepancies and contradictions in historic references to the building, never before reconciled, without clashing with any known fact in regard to it. The most decided point made by the lecturer, as a piece of architectural criticism, was, perhaps, the explanation of the projection of the main portico to the westward, beyond the angle of the existing building, as indicating that there was another door to be entered from it, no longer existing. If, however, Mr. Fergusson's theory contradicts no known facts, it was admitted by himself that it requires the support of some new facts to render its acceptance obligatory; and that the step now to be taken is the application of the logic of the spade to the plot of ground westward of the temple, where it may be reasonably concluded that on the supposition of the truth of the theory brought forward, some remains or indications of the wall-lines of the presumed western building would be brought to light. Until this is done, the theory, though perfectly possible, and perhaps highly probable, must, of course, remain, as the Scottish juries say, "not proven."

Awaiting this investigation, which we hope may be made, and the result of which would certainly be looked to with interest by all the architectural and archæological world, we are minded to say a word in regard to one or two observations which turned up in the course of the discussion that followed the lecture. The element of art was introduced very naturally into a discussion otherwise of a mainly practical turn, by the comments of a distinguished painter, who was present, on the characteristics of the well-known sculptured figure-columns of the south porch: the point of his remark being the evidence which these statues furnished of a system of free translation rather than mechanical reproduction of the original model; the whole of the number being evidently modelled on one design, and yet freely varied in detail; and it was this which constituted the marked distinction between English Greek practice to which the speaker referred. Following upon this came what we want specially to refer to, a general undervaluing, by another speaker, of the whole lecture, from an architectural point of view, on the ground that it treated only of the mere facts of the plan, which were not of the slightest real interest to us; we wanted to know how the Greeks decorated the Erechtheum, &c., and did not care whether the plan of the whole were correctly understood or not. It is satisfactory to make the memorandum that so extraordinary a statement (to be made in a society of architects) was received with some derision by the majority of the meeting, and perhaps it would hardly be necessary to offer any refutation of it, in regard to most of our readers. But it is vexatious to find professional men of real ability running away with the notion that architecture is decoration, and that (as we are to infer from such remarks) the basis and construction of a building are matters of little interest or consequence so long as its decorative treatment is good. Such an idea cannot be too strongly repudiated, as utterly subversive of the whole basis and logic of the profession and art of architecture; and the reply of the lecturer on the occasion was perfectly just, that until the plan of the building was settled, it was impossible to understand or deal satisfactorily with the decorative treatment; though it would seem strange that such a mere piece of common sense should have to be specially enunciated at a representative meeting of architects.

A suggestion that the subject should be carried on at one of the Conference meetings we should be very glad to see acted upon, more especially if the recommendation of the president, that all who have sketches or drawings illustrating the Erechtheum should contribute them for the occasion, be complied with. Mr. Fergusson has taken up a question of the greatest interest, and treated it in a very novel and ingenious manner, and it should be fully discussed and illustrated by all who are able to contribute to its final elucidation.

SIR,—Doubtless from some defect of my own, your report of my remarks at the Institute of British Architects in the discussion after Mr. Fergusson's paper is not quite accurate. The only feature to which I pointed as *introduced by Mr. Fergusson* in his restoration, and as being decidedly of Roman character, was the apsis; but I did point to features of the actually, or rather lately, existing original work, which were curiously analogous to features of Roman rather than Greek buildings. I particularly mentioned pilasters on the internal face of the western wall. I might have added the podium which carries these pilasters; for I cannot call to mind any other Greek example of a continuous pedestal base, though there is what belongs to the same family in the case of the rusticated pedestal of the Choragic monument of Lysicrates; and I suppose that attached columns are not found in any Grecian building other than the Erechtheum, excepting in the Temple of the Giants at Agrigentum. These analogies between, on the one hand, features to be ordinarily regarded as Roman, but which are found in a building classed as Greek, and, on the other hand, absolutely Roman features, were, I think, pointed to in my Institute prize-essay of somewhere about five-and-thirty years ago; and they seem to me curious, and deserving more attention than they have received. Such analogies are by no means to be likened to what there are between details of buildings of Athens that are Roman, and those of other Roman buildings. The error was at one time made of regarding all Athenian buildings as alike Greek. I do not know that the analogies of which the Erechtheum is evidence have any bearing upon the question; but something said in the discussion seemed to point to an uncertainty about exact date of the building: so that these analogies may have importance beyond what would at first be supposed. Another instance of analogy in Greek and Roman buildings is supplied by the two almost solitary examples of the use of windows, the Erechtheum and the Temple of Vesta at Tivoli.

EDWARD HALL.

GOVERNMENT AID FOR ART AND SCIENCE IN IRELAND.

HIS Grace the Lord Lieutenant of Ireland, during his speech at the Lord Mayor's banquet a few days since in Dublin, passed under review the agricultural and commercial prospects of the sister kingdom. He also touched upon criminal and sanitary aspects, pointedly alluding to the failure in regard to the Liffey purification measures. Apart from these, however, his Grace dwelt upon one subject which seemed to please his hearers, which will be better understood perhaps if given in his own words, which were as follow:—

There is another question which I hope may be worked with advantage to the nation at large, I mean the remodelling, under a liberal Govern-

For school and residence, West Tilbury, Essex, for the West Tilbury School Board. Mr. Thomas Goodman, architect. Quantities supplied:—

Roberts	£1,333	0	0
Patman & Co.	1,185	0	0
Hobson	1,133	0	0
Blake	1,056	0	0
Wood	1,048	0	0
Hammond	930	0	0

For ten houses at Crouch-hill. Mr. Lethbridge, architect. Quantities by Mr. Hawkes:—

Ramage	£3,015	0	0
Sherman	7,974	0	0
Niblett & Son	7,900	0	0
Rudkin	7,849	0	0
Tyerman	7,514	0	0
Carter	7,470	0	0
Morton	6,898	0	0
Proutt	6,542	0	0
Jugg & Hawkins	6,120	0	0

For the erection of a new school and offices at Belleville-road, Lambeth, for the London School Board. Mr. E. R. Robson, architect. Quantities by Mr. W. H. Barber:—

Brass	£10,012	0	0
Dove Brothers	9,786	0	0
Hill, Higgs, & Hill	9,700	0	0
Perry & Co.	9,680	0	0
Downes & Co.	9,810	0	0
Nixon & Son	9,596	0	0
Hook & Oldrey	9,240	0	0
Oliver	9,198	0	0
Tyerman	8,916	0	0
Pritchard	8,888	0	0
Thompson	8,870	0	0
Cullum	8,500	0	0

For the erection of a new pavilion, band-stand, and shops on the head of the north pier, Blackpool, Lancashire. Mr. E. Birch, engineer. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Neill & Sons (accepted)	£11,486	0	0

For the erection of a new school and offices at Westcott-street, Southwark, for the London School Board. Mr. E. R. Robson, architect. Quantities by Mr. J. Nicholls:—

Manley & Rogers	£9,392	0	0
Perry & Co.	9,333	0	0
Brass	9,147	0	0
Crockett	8,997	0	0
Hill, Higgs, & Hill	8,769	0	0
Nightingale	8,663	0	0
Downes & Co.	8,433	0	0
Hook & Oldrey	8,154	0	0
Kirk & Randall	8,077	0	0
Pritchard	8,065	0	0
Jarrard	7,983	0	0
Tyerman	7,895	0	0

For a pair of six-roomed labourers' cottages at Church Farm, Hughenden, Bucks, for the Right Hon. B. Disraeli. Mr. Arthur Vernon, architect:—

Taylor	£414	0	0
Silver	350	0	0
Woodbridge	350	0	0
Nash	335	10	0
Biggs	330	0	0
Bunt	309	0	0
Ward (accepted)	304	5	0

For a new residence, Totteridge-road, High Wycombe, for Mr. A. B. Weston. Mr. Arthur Vernon, architect:—

Taylor	£1,380	0	0
Reavell	1,241	0	0
Woodbridge	1,210	0	0
Bagley	1,206	0	0
Silver	1,160	0	0
Hunt (accepted)	1,090	0	0

For a new sewer, Blyth-lane, Hammersmith, for the Fulham District Board of Works. Mr. Bean, engineer. Quantities supplied by Mr. J. Bean:—

Pilditch	£3,200	0	0
Wigmore	3,500	0	0
Thompson & Son	3,485	0	0
Keeble	3,437	0	0
Cowderoy	3,325	0	0
Blomfield	2,877	0	0
Goodair	2,784	0	0
Nowell & Robson	2,650	0	0
Mears	2,240	0	0
Williams & Co. (accepted)	2,096	0	0

For a villa residence to be built at Shepherd's Bush for Mr. J. Woodger, Jun. Mr. A. C. Bean, architect:—

Johnson (accepted)	£2,020	0	0

For Fen Schools and Star-lane Schools, Bourne. To be completed by March, 1877. Mr. Charles Bell, architect:—

Priest	£4,544	0	0

For new w'carage at Market Rasen:—

Simms	£1,799	0	0
Barnes & Wright	1,586	0	0
Otter & Elsey	1,549	0	0
Binns	1,536	0	0
Hobson & Taylor	1,397	0	0
Scupham & Co.	1,344	10	0
Harrison	1,287	10	0

For the erection of a school for fifty-seven children, with mistress's residence, at West Tilbury, Essex. Mr Thos. Goodman, Southend, architect. Quantities supplied:—

	Buildings.			Enclosure.		
Roberts	£1,170	0	0	£163	0	0
Patman & Co.	1,049	0	0	135	0	0
Hobson	994	0	0	140	0	0
Blake	926	0	0	130	0	0
Wood	920	0	0	126	0	0
Hammond*	800	0	0	139	0	0

* Provisionally accepted.

For rebuilding the Black Prince Tavern, Walworth-road, for Mr. G. Cox. Mr. John Viney, architect:—

Atherton & Latta	£2,398	0	0
Godden	2,314	0	0
Shurmur	2,242	0	0
Downs (accepted)	2,177	0	0

For a new shop-front to No. 131, High-street, Kingsland, for Mr. Barnett:—

Jarvis & Sons (accepted)	£310	0	0

Crystal Palace Park Estate, Plot 8.—For Mr. Morris M. Roberts. Mr. John Norton, architect. Quantities by Mr. Thacker:—

Linzell	£3,900	0	0
Perigoe	3,560	0	0
Sharp & Maxwell	3,330	0	0
Smith	3,160	0	0
Seal	3,033	0	0
Willsons Brothers	2,998	0	0
Braid	2,950	0	0
Stephenson	2,926	0	0
Garrud	2,583	0	0

TO CORRESPONDENTS.

A large amount of correspondence received too late for acknowledgment.—I. W.—L.—R. H.—C. & Sons.—J. W. B.—H. B.—W.—N. S.—J B H M C H—C G—L. A—S J N. B G A K—G M J. D. H.—Rev S S.—One of Urban Committee.—R. A. & Co.—W. S.—J. C. O.—P. G.—R. L. C.—J. J. & Sons—A. J. B.—E F.—A. V.—Messrs. M.—H. & O.—C. C. S, Wales (the duties differ under various authorities)—B O L (we cannot advise It would need personal examination)—Education of bricklayers (in type)—J. B. (shall have attention next week) A S. (dittol.—Association of Municipal Engineers (ditto).—E B. F. (ditto).

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*Prof. Edward M. Barry's Lectures on Architecture.**

THINK I may perhaps profitably commence the first lecture of a new series by attempting to consider what may be the scope of an architect's duties, in the ever-changing circumstances among which he is likely to be called upon, in the future, to apply his art. Like all true artists, he will inquire how far he may expect to draw his inspiration from nature; and we may therefore also briefly consider what are the lessons which nature can teach us. As architects, moreover, must work in the midst of mankind; we may further see how they are to apply the principles they may have derived from nature, to their practice in crowded cities, and among the fever-haunted dwellings of the poor. To do this successfully, will tax their powers, both as artists and constructors, and may raise the question of that division of responsibilities, under these two heads, which has been a favourite idea of some theorists.

In an age which accepts the doctrine that every wish must have its justification, and that society is to be based on the principle of the "greatest happiness of the greatest number," the nineteenth-century architect is ever brought face to face with utilitarianism. He has to study social difficulties, and to ask himself how his art is to solve the problems to which they give rise. He may stand aside, like the rustic, while the stream rolls on, or he may strive to guide, control, and elevate, that which he is powerless to prevent. New provisions may be necessary for new wants, and an instructed society may perhaps find, in co-operation, a force to oppose to ignorance, and selfishness. I propose to-night to ask your attention for a short time to these points, as I think they raise questions on which a little thought on your part may not be thrown away; and to bring out such thought is the main object of these lectures. Let us first consider the aspect of nature towards architecture.

Since we last met in this place, I doubt not that many of you have been seeking health and recreation in travel. Some have, perhaps, devoted their time to the inspection of the great artistic monuments of the world. Others, and probably the larger number, have found their greatest happiness far from busy towns, amidst the plashing of waterfalls, the roaring of avalanches, or the glories of heath or sea. Nor, although architecture, as a technic art, may not seem to gain directly from holidays thus spent, am I disposed to say anything in opposition to such a course. It may be, that we are always apt to have a tendency to excess, so that our very virtues may become vices, "to scourge ourselves withal." A restlessness of body and of mind often leads to a course of travel, which is more of a toil than a pleasure, and leaves on the mind shadows of objects, and fragments of theories, half seen, and half digested, of no more value to the art-student than the feverish dreams of a brain-sick man.

I will not assume, however, that this is the spirit and temper of those among you who have devoted yourselves to the study of an art, such as architecture, which demands the serious purpose of a life, and which possesses an importance, as regards the public weal, to which a tardy justice seems now to be in some degree rendered.

If, therefore, those of you who, as architectural students, pass the major portion of your time in the study of lines, arches, and angles, devote a vacation's leisure to the enjoyment of the works of nature, I do not question, that in so doing, you follow a wholesome instinct.

Architecture, with all its glories, is but a work of man, easily comprehended, imitable, finite. How then can it be compared with the creation of God, infinite in variety, beauty, and power? The study of the former is necessary to the instruction of a skilful architect. A reverent love and admiration of the latter seems to me an essential portion of the character of a good man.

I would not have you infer, however, that I would draw any sharp line of demarcation between the love of Nature and the love of Architecture. There is, and should be, no necessary discordance between the two, though I cannot but admit, that there is a certain inferiority, in this respect, of our art, as compared with painting and sculpture.

These latter draw more directly on the fount of inspiration supplied by Nature, and no man who is insensible to her charms can ever be a great artist.

To an architect, any direct borrowing from nature is forbidden. He may accept principles, but their application must be determined by the rules of art, which exclude actual imitation. I do not, of course, forget the pleadings of some among us, for the exact reproduction, in architectural details, of examples of life from the animal and vegetable kingdoms. I pass this over for the present, not only as a controverted theory, but because it deals only with details, such as capitals, string-courses, keystones, and the like, which are after all only the subordinate parts of an architectural design. To the composition, as a whole, no such naturalistic theory can apply. No one, as far as I know, has yet proposed to build a house in the form of a tree, and we may dismiss from our minds any idea of direct imitation of Nature. In the crags of mountainous regions, a certain resemblance to castles may at times be imagined, but this would only apply to a distant view, which would take in the outline only; and not to the details and accessories, which would destroy all illusion on a closer inspection.

It is evident, therefore, that imitation of nature being forbidden to the architect, our lesson from her, architecturally speaking, must be negative, and I think much may be learnt in this way. Bear in mind, however, that, as I said just now, we must look for principles, not for their detailed application.

Let us, for a moment, try to analyse the effect produced on the spectator of natural beauty. He sees first variety; not any regular balance of parts, as in a great cathedral or temple; not formality, not regularity. No portion of a hill, river, or landscape, repeats any other part of it. The variety is infinite, symmetry, in an architectural sense, altogether absent. Light and shade are not, indeed, excluded, but they are subordinated to colour; pure, abundant, and local. No two trees, boughs, or even leaves, are absolutely alike.

Again, nature charms by motion; ever active, incessant. However still the sky, the leaves are restless, the waters ever bubbling in their pebbly beds, the animals fulfilling their appointed destiny. The clouds never remain the same; at one moment rolled into heaps of smoke-like mistiness, at another breaking out into the likeness of "gorgeous palaces, and cloud-capped towers." We see them perhaps, for a time, wearing a dull and leaden garment, to find them breaking forth presently into chameleon hues of colour, which no painter can rival.

You will notice that I have spoken here of the means by which Nature addresses herself to the eye. This is the aspect with which the architect is chiefly interested; and we need not concern ourselves here with the scarcely less important appeals she makes to the other senses, the music of her winged songsters, the perfume of her flowers.

The architect, having fully recognised his inability to find actual precedents in nature, has next to teach himself that in opposing her principles of beauty, he may find lessons for his artificial practice.

For, as we have seen, the principles which we admire in natural beauty, are exactly those which we neither wish, nor expect to find, in architecture. Against variety; we seek symmetry, formality, order: against motion; repose stability, unchangeableness.

Symmetry does not exclude variety in detail, but it requires a balance of parts, such as we do not see, in the inanimate works of nature. In all great architectural masterpieces of antiquity, you will find this balance of parts, not forced, or overstrained, but arranged simply; in accordance, it may be, with routine or precedent; but satisfying both the imagination, and the actual sense of sight.

You will not misunderstand me, by supposing that I mean here by symmetry any rigid uniformity of centre, and wings, nave and aisles, one on this side, and one on the other, regardless of

* First lecture, delivered at the Royal Academy, on the 24th of February, 1876.

the special circumstances of each case. No, I do not mean this: I am thinking rather of the symmetry which manifests itself alike, in the Greek temple, and Mediæval abbey; a recurrence of subsidiary details, each necessary to the other, a harmony of features, measured, orderly, and dignified. You may, of course, have a mere mechanical regularity, where each part may repeat its fellow, until it disgusts with its poverty and its insipidity.

But none the less is it true that our art loves a true symmetry, and finds its greatest effects in a repetition of well-proportioned parts. You know the beauty of the "long-drawn" aisle of any of our great churches, and the same principle holds good in more barbaric structures, such as the great Hall at Karnak, or the temples of India; while it also applies, with especial force, to the works of the Greeks.

Again, we seek in architecture repose and stability, as opposed to the motion of Nature. With her, everything is in perpetual change. The seasons press upon each other. Earth, air, and sky have each their thousand signs of life; and with life come change and motion. The sighing of the wind, the murmur of the stream, the hum of myriads of insects; all these proclaim the prevalence of change, the provisional character of the world in which we live.

Against this, in architecture, we oppose our attempts at permanence,—a permanence limited, indeed, by many shortcomings, but not without such a measure of success as to be able to exert a powerful influence on the mind. We know how strenuous and earnest have been the efforts of all ages, in this direction. "*Non omnis moriar*" was the touching cry, half boastful it may be, but full of pathos, of the Roman poet. There is no history, no mythology, which does not indicate the repugnance of the soul to the thought of extinction. Whatever criticisms we may hear on theological systems, we come upon this solid incontrovertible fact, that all times and nations, all philosophies and religions, have revolted from the idea of annihilation, and have sought in our art for enduring memorials of their aspirations. This it is which gives to architecture, one of its principal sources of power. Of course, she has no actual charm against that terrible fiat of change which has gone out against all human work. Her arches totter, and her stones crumble. Her permanence is only relative, but, such as it is, it is a powerful influence, and affects us all in a more or less degree. The visitor to the Pyramids, to Athens, or to Rome, feels a new interest in the people to whom the monuments he sees around him were household words; and the contrast between what has been, and what is, is calculated to teach lessons of grave and serious import to the most thoughtless among us. Alas for those who are past such lessons!

Architecture, then, has within its reach an interest due to the efflux of time, which is not shared by the other arts. The latter depend more completely on present sense. A symphony of Beethoven is neither more nor less sublime now, than when it first started from the brain of its afflicted composer. It is the same with a sculpture of Phidias, or a painting by Raffaelle. These works of artistic genius owe nothing to time,—in fact, they are more likely to be injured by it, than to gain anything by its influences. With us, it is different; the mellowing effect of time on architecture has a charm all its own, linking the past with the present, blending one age with another, and exciting powerfully the imagination of men.

Look, for example, at the study of archæology, see how it unites various tastes and natures; observe its almost too powerful influence on the architecture of the day.

And this leads to the consideration of a point which I dare say troubles many of us. In what will the architecture of to-day interest our successors? A writer on art has lately inquired, "Will the restorations on which this age has prided itself ever become a bye-word of reproach, as similar works, vaunted in their own day, have become among ourselves?" I noticed an expression of the same feeling, not long since, with reference to a work contemplated by one of the most highly-educated societies in this country. "What guarantee," it was asked, "have we, that, in thirty years, the notions of the present day may not have become antiquated and shocking to the tastes of our sons, and grandsons?" It is difficult to answer this question, if we are to have no higher aim than the fleeting fashion of the hour. I believe your safeguard will be in the application of common sense to architecture. Ask yourselves, not what is fashionable, but what is reasonable; for, depend upon it, good architecture has ever been founded on reason, and common sense. Fashion arises from a thousand passing influences, all of them more or less unworthy. Ostentation and vanity are its parents, and with them, it deserves to fall. If you would succeed in your art, avoid these pitfalls; seek to meet existing wants unobtrusively and sensibly. Do not believe that it is the duty of the architect to construct "startling effects"; rather aim at strength, solidity, and simplicity, and thus you will be on the way to obtain that permanence of interest, which we admire in the achievements of earlier times.

Once more, there is no vulgarity in nature. So should it be in architecture. Feebleness, however, is not the negation of vulgarity. Churchwardens' whitewash is not the evidence of a pure taste. We must seek the latter, rather in the absence of apparent effort, and in the harmony of colour and form. You know how the slang of the day stigmatises some peculiarities of costume or manners as "loud." Now, nature is never "loud," and you should eschew "loud" architecture; regardless of the praises of fashion, which may offer you the empty satisfaction of the moment. If some startling peculiarity challenges your notice, regard it with distrust, for the mission of architecture is not to startle, but to satisfy.

With repose in architecture is associated stability. We must be satisfied of the one, before we can appreciate the other. To obtain stability, in an artistic sense, a reserve of power is needed. It is not enough for us that a building stands. Our judgment must be satisfied that it ought to stand, and that it will go on standing. We must obtain on this head perfect satisfaction. It is the want of this confidence, which troubles us with so much of the iron constructions of the day. We see great spans covered, or bridged. We look up at the roofs, and are glad to get from under them. Will they last? The engineer will tell us the tensile strain on an iron plate, and the number of inches of sectional area necessary by calculation, and assures us that the stress upon his roof is well within the calculated strength. It may be so: our judgment may be convinced, but not in an artistic sense. The thing is bald and uninteresting; and we think of works of architectural art, as to which no such questions intruded themselves, because the requirements of true architecture were effectually supplied. The Mediæval architects were not always proof against the temptation of seeking to construct mere *tours de force*. Of such you may find an example in the Cathedral of Beauvais. Here the ambition of the architects to surpass what had previously been done led them to mistake bigness and daring construction for art. The spire has fallen, the roof gave way soon after its erection, and the nave arches have had to be strengthened by the insertion of intermediate columns, bisecting the original arches. Want of repose and stability are fatal to the artistic effect of the design, which deserves study, however, as an exaggeration and a warning.

To secure stability in architecture a margin of strength is therefore required over and above the necessary demands of the moment. In actual professional practice this is not always easy to obtain, so great is the demand for cheapness of construction, and architects not only live to please, but must please to live. How many of our cathedrals would be left to us if they had been built on a ninety-nine years lease? To our shame, be it said, there are few countries in which flimsy building is so much the rule as in our own. Low rents are more thought of than healthy homes. Thin walls and unsteady floors are regarded with indifference; and if it were not for the great value of land in our large towns, would have even more serious consequences than they now involve. Happily for us, one evil goes some way to cure another. Houses [at least in London] are so closely packed that they sustain each other, and also aid their neighbours with their surplus heat. But without good solid building there can be no architecture worthy of the name, and you must ever be on your guard against flimsiness and instability. If you are stinted for money, prune your ornament with an unsparing hand; part, however regretfully, with your carving or your pet effects; better by far put your substance into your walls. They may at least reward you with good, solid-looking reveals, with their effective shadows. At any rate, it is better to live in a substantial barn than in a flimsy palace, tottering to its fall.

I once heard a prominent civil engineer say that every railway-station ought to be pulled down and rebuilt every ten years. The growth of traffic, and of modern wants is rapid, and such structures are too often built for utility alone. Architecture, however, will not be satisfied with so brief an existence. It must aim at so much of permanence as it is permitted to mortals to attain; it must hand down the present to future ages, even as the past speaks ever to ourselves.

Do not believe that, in applying common sense to your architecture, you will necessarily injure its artistic effect. Such a creed would be an insult to your art, for it would imply that between it, and common sense there is a gulf. This is not the case. Observe Nature once more. How simple and sensible is her construction! Look at a tree in the full glory of summer verdure, with its weight resting on a single trunk. There is the type of the architectural column, utilitarian if you will, but also a truly artistic expedient for carrying weight. You will not find Nature placing the weight on the ground and the column in the air; nor will you see her shafts dotted about the structure as misapplied ornament. Here is an instance as to which we may fairly enough take a direct lesson from Nature, and remember that a column should have a reason for its existence.

The love of Nature, therefore, is good for the architect. It is good for him to be surrounded by beautiful things,—refreshing the eye, too much offended by its daily work among mean, or commonplace objects. He can study the eternal principles of beauty, and ask himself how to apply them to his art. Amongst the works of God, he may cultivate simplicity of character and refinement of feeling, which will surely make themselves felt in his works; for you can only get from a man what there is in him. Descending from principles to details, he will know how to admire Nature's harmonies of colour, form, and proportion, which will put him on his guard against those conceits and extravagances which too often mar modern architectural designs. If he is at times tempted to rebel against the utilitarian side of our art, and to complain that he is made to serve tables, let him notice how wonderfully adapted are Nature's means to her ends. Take the hollow stalk of a bulrush, for example, where you have the application of least expenditure of material, in the form of greatest strength. However seemingly prodigal of her resources, Nature, while neglecting nothing, is never wasteful or inharmonious. She has lessons for all, and for none more than the architect.

We have, however, to consider the other phases of his existence. An architect cannot be always indulging his taste for natural beauties. His art must lead him to the busy haunts of men, and there it will be chiefly exercised.

The gregarious instincts of mankind have ever led them to assemble themselves in cities. In early times of unsettled government, the guarantee of mutual safety supplied an obvious motive; with us, the claims of business constitute an inducement of no less strength. You all know the wonderful growth of London and other large towns, both here and in America.

Now this growth is but too often a matter of very mixed satisfaction. The architect has too few opportunities of guiding it, and mistakes are made which are irrevocable, and entail injurious consequences, of more or less serious import.

It is not of much use to rail at great cities, as monsters and abominations. This world of ours, as it advances in years, must of necessity become more crowded, and men will congregate in cities, for powerful reasons, against which objectors are impotent.

I think we should be on our guard against falling too readily into a spirit of general discontent. This is a tendency to which our countrymen are, perhaps, somewhat specially prone. We see very clearly evils which are before us. This is a good thing, for it is the first step towards a remedy. But we do not always allow so readily for advantages, more or less counterbalancing the grievances, of which we complain. Thus, we are most of us painfully alive to the mischief of overcrowding in our large towns, but we may not always be aware of the gains, of various kinds, as well intellectual, as physical, to be achieved by the power of association and co-operation.

We sometimes hear complaints that good honest work is more rare than formerly in this country, but this can scarcely be admitted.

Thousands now demand to be supplied with articles for which hundreds were lately the customers. The few good things are still to be obtained, but they are merged in the sea of mediocrity, and the rising value of labour, in the present day, makes good work more and more costly.

Nevertheless, it must not be readily conceded that man cannot do now, what he once did; for, to grant this, would be to deprive us of all heart in our work. We must, as architects, accept the conditions under which our exertions are possible, and however dispiriting the aspect of things external may at times appear, we may be sure there is a task for us to do, if we will but seek it, and that, seeking it, we shall find great objects to accomplish, and "good in everything."

Assuming, therefore, that large towns are a necessary concomitant of modern civilisation, what can architecture do for us in respect of them? Let us consider this.

In a simpler state of society, the duties of the architect were necessarily simpler also. He had space and labour more at his command than at present. The urgent demands of sanitary science did not perplex him. He was more able to devote himself unreservedly to the æsthetic side of his calling.

The traffic in the streets gave him little trouble in laying out the general plan of a town, if he were called on to do so, and he had definite traditions on which to proceed. With us, it has become a necessity for the architect to combine with his art no inconsiderable amount of science, to guide him in the constructive, or engineering portion of his duties.

The great architectural monuments of the past have been for the most part the work of the enlightened few,—the rich and powerful who pressed architecture into their service. For their purposes, grandeur was everything, and the beauties of architecture were valued by them, as adding a fresh glory to their magnificence. The poor might live in hovels, but there must be splendid palaces, and stately temples. We have now to take into account a different state of things. Great opportunities may hereafter occasionally arise for the architect; but, for the most part, he must prepare himself to take advantage of more numerous opportunities of smaller things; and in these architecture will have to justify herself by combining beauty of art with a full recognition of utility.

Some have considered that there should be a complete separation between the æsthetic and scientific branches of our art. The adoption of this theory would lead to the employment, on each architectural work, of two authorities; and there would be no small risk of the dangers which wait on divided counsels. There would also, I think, be a tendency on the part of the architect, no longer controlled by constructional necessities, to drift into a dreamy unreality opposed to the practical character of good architecture.

We need not dwell much upon the other aspect of this question, for our engineers have too often considered themselves free to disregard beauty, and we know the result.

Some have proposed, as you are aware, that everything be left to the individual workmen, on the principle, I suppose, that out of chaos order must of necessity spring. I need not trouble you now with this theory, as it has recently been discussed, and found inadmissible.

I do not think it would be a hopeful plan to release the architect from his constructional responsibilities, and it appears to me that the severance of architecture from engineering has been an artistic misfortune. It was not always so. The appearance of our public works was thought of, as well as their utility, in days not long gone by.

You remember, I dare say, the discussions which arose last autumn about widening London Bridge. I must not plunge with you into the controversies which that discussion aroused, but I may notice in passing that each party to it expressed a high admiration for the design of the existing bridge. This was the work of Rennie, a distinguished engineer, and one not blind to architectural beauty. Now, a bridge is primarily a utilitarian structure, but you may see, by this instance, that for such works there is scope for architectural art.

When it was built iron was far from being as familiar to our constructors as a building material as it is at present, and, if we are to judge by recent practice, the days of stone bridges of large span are gone. We have seen Westminster and Blackfriars Bridges constructed of iron, and the railway engineers have adopted the same material for similar structures.

However we may raise the question of respect for the work of Rennie, there is no doubt that those who lately proposed to use the readiest means of enlarging the bridge were but following the traditions of Mediæval times, when each new style turned impatiently from its predecessor, and Norman masonry was concealed without a scruple behind casings of later work. There can be little doubt that a Mediæval architect, engaged on a work which was mainly one of utility, would have used, as a matter of course, such materials as appeared to him most suitable and economical for the purpose in hand.

It is satisfactory to note the enthusiasm for the design of London Bridge, latent though it may long have been. Any such manifestation of public interest in our architecture is most welcome to the artist; but, while it is not desirable to discuss the merits of a contemporary design, it is allowable to point out that a respect for a work of yesterday may be pushed too far, if it is considered to forbid the application to purposes of public convenience, of the increased scientific knowledge which time has brought with it. Our interest in the art of the past, gains much from our conviction that it was perfectly truthful, and that we may rely upon it as a complete exemplification of the practice and skill of the day. If our work is ever to be regarded with similar interest in the future, it must be founded upon similar principles.

As affecting the question of the separation of the architect's duty into two independent parts, it should not be forgotten that our greatest public works are likely to possess more or less of a utilitarian character. With the increased influence of the many on public affairs, we may expect to see greater attention paid to problems hitherto more or less neglected. The time is past when the State was the only patron of art, and employed it to minister to its own magnificence.

If you will recall to your memory some of the principal London improvements of the last few years, you will understand my meaning. With the exception of some few public buildings, almost all the works of our time which have left an enduring mark on the face of the metropolis have been carried out by associations and companies, distinct from the Imperial Government.

We have been speaking about bridges. Of those over the Thames, I think Westminster Bridge is the only contribution of the State; Blackfriars Bridge has been rebuilt by the Corporation of London, and numerous iron bridges have been constructed by the railway companies. The Thames Embankment has been carried out by the Metropolitan Board of Works, who have also given us some valuable street improvements, besides a new system of drainage.

In these great undertakings, there has been scope for architectural art far wider, and more important, than private patrons could give. We have, all of us, an interest that considerations of artistic effect should not be merged in utilitarian exigencies. If the architect, as an artist, is to be separated from the architect as a constructor, I very much fear that it is the former who would go to the wall. To avoid this misfortune, I should deprecate a policy which might lead to so unfortunate a conclusion.

It does not, of course, follow that an architect must, of necessity, be as great a master of all the newest modes of construction as an engineer now claims to be. The applications of special science are so varied and extensive, that we must, of necessity, have need of experts to be called to our aid, as extraordinary circumstances may require.

It is a mistake to suppose that anything is so entirely utilitarian in its purpose that appearances may be neglected. Even sewer works require buildings and tower-like chimneys, which become landmarks. Our waterworks, beside similar requirements, may exercise the taste of their architect in bridges, enclosures, and the like. Railway stations may ornament or disfigure the quarter in which they are placed. River embankments give abundant opportunities to the architect, not only with regard to their own details, but also as to the larger question of building along their quays, and laying out the adjacent grounds to the greatest advantage.

In the interest of art, we must not surrender all those opportunities. The public mind is, I think, more alive to them than it has been, and it is to be hoped that its interest will thrive, and strengthen.

For the architect to be able to claim and occupy his proper position, he must be prepared to link himself heartily with the improver. A mere dilettante application of favourite details will not be enough; he must enter into the spirit of the work to be done, and must be prepared to submit his ideas to the arbitrament of reason. Far from thinking there is any degradation of his art in such a course, he will have the happiness of feeling that he is assisting her to claim her highest glory, that of ministering to the public good.

We conclude, therefore, that the architect should remain, as he always has been, an artist and a constructor; that his mission is to design with beauty,—to build with truth. If he can do these, he will find plenty of room for the exercise of his powers, even in these days, so often described as purely utilitarian.

If allowed to advise from the first, he might prevent many an error, found afterwards (and too late) to be irremediable. The planning of new streets, for example, is a matter of the greatest importance. The best laid-out thoroughfares in London are no doubt Regent-street and its accessories. They are well worthy of your consideration as you walk along them, from Charing-cross to Portland-place. They were of course designed before the traffic had become what it now is. The architecture of the houses is not in accordance with prevailing taste; but I am not asking you either to admire or criticise it. I do wish, however, to call your attention to the care and design shown by the general scheme, and we may remember, with some satisfaction, that it was the work of an architect.

You may easily point a contrast if you will examine some more recent examples of new streets, with their unpleasant angles and unstudied curves. Such streets may be convenient, but they will never add to the beauty of our cities.

In connexion with streets, we naturally think of the squares and open places to which they lead. In their arrangement and adornment, the architect may do much. No doubt the most agreeable sight to the urban pedestrian is verdure and flowers, rather than formal architecture, but some formality is called for by the necessities of the case, and it may be effectively treated in various ways. I should be glad to see more of our open spaces planted than is now the case; Trafalgar-square, for example, where turf, evergreens, and flowers, might encircle the fountains, and advantageously replace the dusty and heating asphalte. I think it was the late Professor Cockerell who pointed out that in arranging the streets leading to a square, it was better to let them enter the square a little way from the corners rather than at the corners themselves. In the former case, the trees and shrubs in the square garden would be visible from the streets, and would form a pleasing break to the formal monotony, which the other arrangement involves.

As to the height and sky-line of buildings also, architectural influence should be exerted. Some regulation seems to be called for as regards this important point, or I much fear we may drift into anarchy, from the present rage for lofty buildings. I cannot doubt that the healthiness of London, as compared with some other cities, has been much promoted by the circumstance, that its buildings are, as a rule, of moderate height. If every one is to be at liberty to make of his house a Tower of Babel, it is much to be feared that the evils he may cause, will not be architectural only.

The proper assignment of sites for our churches, theatres, and other public buildings, has also to be studied. These should be isolated, and so placed as to command important thoroughfares. The width of streets and their gradients are all questions in which architects are interested. Precautions against fire, and the important problems of construction raised by them, must not be neglected, while the urgency of sanitary requirements which affect our architecture becomes daily more pressing.

Now I claim for architects, as artists, an influence in the solution of all those questions. A building may be beautiful in itself, and, nevertheless, a failure, as to its effect, if it be badly placed, either by reason of its own site being unsuitable, or by the extravagant height or design of its neighbours. In the country, these matters may perhaps be left to themselves, but in towns, a certain amount of regulation is called for by the public interest. In respect of such regulation, the architect has a right to speak.

All the above subjects, besides others which will readily occur to you, affect, more or less, the

conditions under which our art can be exercised. To determine them rightly, we must bring to their consideration a fair and candid recognition of the circumstances of each case, and a hearty sympathy with the work to be accomplished.

The chief difficulties of the architect in dealing with the great mass of everyday work must always be financial, for, unfortunately for him, his art requires outlay, more or less considerable. As a consequence of this, there is always too much of a disposition to regard architecture, as a luxury of the few. Against this tendency I protest. There is no satisfaction in accepting a position for our art, so unworthy of her claims to instruct and gratify nations.

If, therefore, I am right in the view I have taken, we have to consider the tendencies of our times, as they must affect our practice of architecture; for if we either neglect them, or place ourselves in needless opposition to them, we shall but beat the air, and the result must be the annihilation of the architect as an artist. We have been warned by no less an authority than the late Prime Minister, that the great deficiency of our technical education, is a want of recognition of the claims of beauty. He has also pointed out the great changes now in progress in the value of labour. Our artisans, working with their hands, are daily bettering their condition. Our clerks, with their more or less intellectual labour, find themselves in danger of being left behind.

It is clear to me that architecture can never be regarded in a higher sense than that of one of the many indulgences of the rich, unless she can address herself to the masses, and interest them in her work. How this is to be effected is the problem of the day. If the great artisan class of our country be really advancing in social condition and power, is it too much to hope that with more leisure and increased education, will arise that love of beauty and art, of which Mr. Gladstone has spoken?

I know there are those who laugh to scorn such suggestions, and declare that more prosperity means more idleness, and more wages mean more beer. I must decline, however, to accept such pessimist views. I have confidence in my countrymen, and am persuaded that they will know how to profit by the great opportunities which are now presenting themselves.

But, it may be said, this is all very well, but "Englishmen have no taste. The Latin race will always beat the Saxon in artistic aptitude." This is a view which, in its superficial aspect, has much plausibility. In some of the applied arts, our workmen have certainly been distanced, though even in these, they have of late years done much to lessen their inferiority. It should be borne in mind, however, that while foreign Governments have wisely thought it one of their most important duties to foster art, we in England have almost prided ourselves on a neglect, which many of our most thoughtful statesmen now deplore.

But if in some instances, we must admit deficiencies, and strain every nerve to supply them, I cannot allow that in architectural skill the Englishman has always shown himself inferior to his continental rivals.

I am not speaking of the work of to-day. To do so would plunge us into a sea of divergent criticism, and raise that bugbear of our art,—the "Eastern Question" of architecture,—the battle of the styles. I must contend, however, that there is nothing in our ancient architecture to allow us to accept a position of inferiority to other nations. Our cathedrals may be more contracted, and display some insular peculiarities (such as, for example, the small size of their doors), but they are as beautiful, both in construction and detail, as their continental rivals. Our village churches are unrivalled, and we know from the fragments of domestic work which remain to us, how fully beauty entered into the every-day work of our forefathers.

I see no reason, therefore, to charge any of our difficulties on inherent artistic deficiencies.

We know "how oft the sight of means to do ill deeds makes ill deeds done," and the artistic sense soon becomes dull and weak in the presence of ugliness. Can we, therefore, who know the surrounding circumstances of the homes of the great majority of the population, wonder if there is need of the warning that beauty and science should dwell together?

Depend upon it, there is no reform of so pressing an importance in our day as the improvement of the homes of the million, and this is a question in the solution of which architecture should have her share. The rapid rise of various great industries, and the development of mineral wealth, has congregated great masses together, with but little provision for moral or physical improvement. Other causes, no less potent, have affected the country homes of the labourers. Let us hope that this rich and powerful country will be able to rid herself of the reproach that a majority of her sons are unable to house themselves with comfort, or even with decency.

If our artisan class be, as I believe them to be, as intelligent as any in the world, it is for them to look to this. With increased wages, they are daily gaining power for social improvement, and will have less and less necessity for reliance on others. The pinch of the present state of affairs is felt, as Mr. Gladstone has said, by others rather than by them. All the circumstances of the day are in their favour. The Legislature has lately given compulsory powers to their representatives for the purchase of sites, and the burden of educating their children is shared to a large extent by others. I should regard it as a most hopeful sign if we could see the great trade societies of our various industries uniting to answer the important inquiry of how to provide healthy, and I will add beautiful, homes for the people.

I feel sure that, until this be done, our hopes of any great artistic advance among our workmen will be doomed to disappointment; for the eye which is debased by dirt and squalidness at home, cannot shake off such depressing influences on its daily work.

I do not, moreover, see why such improved homes, as I have been speaking of, should be destitute of the graces of art, and I hope architects will not allow this to be the case. The artisan class, as a whole, is well able to pay for what it requires, and a taste, once implanted, is not easily eradicated. With the wants of the improvident and hopeless poor, who form so sad an element in the society of our large towns, I cannot deal here. It seems a cruel mockery to speak of architecture to classes whose first needs are those which spring from hunger and nakedness. This grave question is one for charity and well-considered benevolence to grapple with. It is not one to be profitably discussed here. The provision of healthy and artistic houses for our artisans is, however, a question with which society should be competent to deal, now that so many difficulties have been removed.

There can be no reason why these improvements should be of an eleemosynary character, or that the necessary arrangements should be so pared down that the new buildings should resemble prisons or union workhouses; without one sign of that homeliness which we all desire in our own houses. By the combination of many dwellings under one roof, or in large blocks, architecture may contrive to obtain beauties which would be unattainable on a smaller scale, besides being too costly for general adoption.

I have spoken thus far of artisans, who may be roughly described as those who live by skilled manual labour. To them it only seems now necessary to speak of self-reliance and self-help. The rich can of course take good care of themselves, and make their influence felt in the architecture of our cities. There is, however, the great middle-class between these two, and it is in the attempts to supply the wants of its lower section that many difficulties will be found.

A rising labour-market means to this class dearer houses; becoming every day more cramped and depressing, in dull and monotonous ugliness. With ever-increasing anxieties in the battle of life, its little elegancies give way before the more imperative calls of necessity, and an impetus is given to the production of all those shams, and cheap finery, which seek to pass off dross for gold.

How will all this affect our architecture? I fear that there is but one possible answer, if things are to remain as they are.

Much has been said of the advantages, to the householder of moderate means, of having his dwellings constructed in flats, in large buildings. Hitherto, however, little has been done in this direction, except for the two classes, at either end of our social system. The experiment of such buildings for those of whom I am now speaking, has yet to be tried, at least upon any large and sufficient scale.

Accustomed as we are to a different system, the change is difficult, and attended with some disadvantages, which it is needless to dissemble. There are doubtless some objections to the flat system, such as its defective privacy, and compulsory association, to a greater or less degree, of possibly discordant elements. But it may be pointed out that in the principle of association is almost the only hope of those whose wants we are now considering.

Other circumstances being equal, a combined dwelling must offer economical and other advantages, which are becoming daily more difficult to obtain under the separate system.

To architects belongs especially the study of this question, and I commend it therefore to your notice. The same principle of co-operation which has given us our palatial clubs, and which, still more recently, has cheapened to thousands, the price of the necessaries, and elegancies of life, must, as it seems to me, be, sooner or later, applied to our dwellings. The prospect is not without hope for the architect, and I advise him to qualify himself betimes for dealing with it.

We have seen a remarkable revival among our cultured classes for music and art. Never before have pictures, porcelain, or other artistic productions been more appreciated. Let us hope that our revival of architecture will not spend itself in our palaces and public buildings, but that it may extend to the homes of the poor, and the thousand wants of every-day life.

And now it is time to bring to an end, this, I fear, too discursive lecture. Let us recall the conclusions at which we have arrived. First, we have seen that we may go to nature for inspiration, not to carry out direct imitation, but to study her principles, and modes of action. Let us ponder well on the mingled beauty and utility of her simplest productions. Let us learn from her simplicity and truthfulness. Armed with these principles, we are to apply them to the practice of our art. We are not to seek to astonish by eccentricities; but, on the contrary, are to proceed to solve the problems submitted to us, with a taste chastened, and controlled, by common sense.

Having so prepared ourselves, we have to apply our knowledge for the good of others. If architecture, as an artificial art, leads us into the midst of great cities, with their often depressing associations, it is our duty to study carefully the conditions under which our art becomes available. We may often find at work, below the surface, causes of action, at first sight, little expected, but against which, no efforts of ours will prevail. In such cases, we may guide, where we cannot drive, and may make the refining influence of art felt, in movements, which owe their origin to social causes, far beyond our control.

If such things are difficult, that is only a reason for unflagging exertions. The architect must not give up a question because it is not easy to solve it, any more than a soldier may desert his post. His influence, properly exerted, will readily increase, and will spread upwards, as well as downwards. To render it effective, it is necessary to unite science with art, so that every one may be convinced, that in seeking the graces of the one, he will not be called upon to surrender the solid advantages of the other. The architect must be chary of declaring that the requirements of convenience are not to be satisfied, out of regard to æsthetic considerations, he must rather consider it his task, to reconcile the one, with the other.

In our large towns, we have seen that he may find scope for his art in many ways,—in laying out streets, devising improvements, and constructing bridges, as well as in planning separate structures. In his designs for the dwellings of all classes, he must keep steadily in view, the requirements, and circumstances of those who will be their inmates, and it must be his pride, not to force their habits into unison with his preconceived ideas of architectural propriety, but rather to apply his art to their necessities, and add a beauty to the exigencies of utility.

So shall architecture remain a living art, "a thing of beauty, and a joy for ever," the chosen companion of science, the handmaid of religion, and the pioneer of the social, and moral improvement of the people.

A Great Canal.—A writer in *Labour News* says,—Various provincial chambers of commerce have been communicating with each other with a view to electing a committee or syndicate to superintend and ensure the simultaneous improvements of the Rhone, the Yonne, the Seine, and the Bourgandy canal. To realise so vast an enterprise the Chambers of Commerce would advance 2,600,000*l.* to the State, and thus ensure in the course of about seven years a magnificent water-course, accessible even to large ships, and uniting the Northern seas with the Mediterranean!

THE SHAKSPEARE MEMORIAL COMPETITION AT STRATFORD-ON-AVON.

STRATFORD-ON-AVON has no theatre. Carefully as every memorial of the great name of English drama is cherished there, the works of Shakspeare cannot at present be performed in his native town, except by special provision at occasional festivals. The small theatre which did exist was removed some time since in the course of alterations in sites and property. The proposal to build a new theatre, arising perhaps out of the feeling that Stratford-on-Avon, of all places, ought not to move backward in theatrical matters, has developed into the idea of a central Shakspeare memorial edifice, comprising in one building or group of buildings a theatre, a library, and a picture gallery, and occupying a site by the river, of which the part not taken up by the building is to be laid out as a garden. The committee formed to carry out the scheme advertised, in the first instance, for small sketches only to be submitted by architects in competition, of which a certain number were to be selected, and the authors of them requested to prepare more complete schemes on fresh instructions and under new mottoes; the author of the design selected in the second competition to carry out the building, and the remaining candidates to be paid 25*l.* each for their work. Twenty-five sets of sketch-designs have been sent in, which have been exhibited in the Stratford Town-hall this week, and from which five have been selected for the further trial of strength. These five we proceed to notice in the first instance; premising that the sum proposed to be spent on the whole was from 8,000*l.* to 10,000*l.*; that it was required that the building should "front all round," or be equally presentable on every side; that it should be capable of further embellishment by the addition of sculpture or other ornamental adjuncts beyond the limits of the specified sum, but that the design should, nevertheless, appear architecturally complete without this; and that the whole should be so planned that it should be practicable to build the theatre first and add the other rooms afterwards; it being also thought desirable to keep these latter as separate as possible from the theatre in consideration of the chance of fire. The auditorium of the theatre was required to seat 700 persons, every one of whom is to have a good view of the stage, and provision was to be made, as far as possible, for shutting off a part of the auditorium by temporary screens, so as to prevent a desolate appearance of bareness and emptiness on occasions when only a small attendance was to be provided for. The first plan we light on is that entitled

"Merchant of Venice." In plan the auditorium is a circle internally, with a dome and lantern over, but a square externally; the line of the box front, with a double ogee curve, concave in centre, and convex to right and left, projecting, to our thinking, rather too far into the house. The proscenium opening is 23 ft. in width, and the stage 40 ft. from back to front: this is about the same width as most of the competitors have taken; but the depth of stage varies very considerably in the different schemes. The provision for access and entrance is on a liberal scale, including an entrance vestibule, with *foyer* and open loggia over, stretching narthex-wise right across the front, with staircase turrets at each extremity. Actors' dressing-rooms are provided below the stage level; the accommodation not shown in detail, but there is plenty of space. The library and picture-gallery are placed symmetrically, to right and left of the auditorium, so that the whole, with the stage and entrances, forms a tolerably regular Greek cross. The square form is not the best for a picture-gallery, and a more serious objection is, that the toplight of the gallery will be overshadowed by the higher roof of the theatre adjacent,—a consideration very frequently overlooked in placing picture galleries that are to be lighted from above. They should, in such a case, be where no other building can cast a shadow over them. As the gallery and library abut against the theatre for the whole length of one side, the appearance of the theatre, if built first, will be very unsightly, with the bare party-walls left waiting for the additions. As may be supposed from his title, the author aims at a Venetian-Gothic character (scarcely in place in Stratford), though there is a good deal of French feeling in details. Very extensive use is made of sculpture, and the elevation, as sketched in, is picturesque in general character, and refined in feeling; but it is a costly design, and without the sculpture would be absolutely nothing, or next to nothing; and there are features added, for the sake of skyline, which are the merest "constructed decoration," the centre pedimental erection over the loggia not even having any obvious pretext or means of support on the plan (we presume at least, from the tinting, that it comes over the loggia). The stone drum of the large lantern looks by no means secure on the ring of the dome, unless the latter were strongly "chained" between that point and the springing; but all this would have to be modified very much in execution, and we question the result of the domical form acoustically. Curtains are proposed to shut off the extra seats, and make a small house; most of the competitors propose curtains for this purpose. Upholstery tends to make a very "dead" house to speak in, however. The author puts his design at 11,000*l* for the whole, and 6,500*l.* for the theatre. Both amounts seem understated; so much money is run away with in the entrances.

"What here shall miss our toil shall strive to mend." A most complete contrast to the last-named. The style is thirteenth-century Gothic of a simple and severe type; there are no *made* ornamental features of any kind, the effect being got simply by the general mass, by the character of the walling, and the fenestration. The circle of the back of the auditorium is frankly displayed in the external wall (an unusual point in a theatre design, but surely the most logical treatment), which is solidly built of partially irregular masonry, apparently, with string-courses of squared work; a heavy cornice, corbelled out in three or four courses, caps the walling, and forms the base to a high conical timber roof, with a wooden lantern. The centre doorway to the auditorium is so arranged in regard to the interior that it can be used as the only door when the theatre is used for a general audience at a concert or lecture, and distinction of stalls and pit abolished. The construction of the timber roof is satisfactorily indicated. The author has the sense to see that if a building is to be capable of being erected in two parts, the smaller the point of contact between those parts the better: accordingly he bridges off his library and picture-gallery into a separate parallelogram at right angles to the theatre; a stone arch, which also serves as a carriage-porch, carries a timber gallery and staircase, connecting the stalls lobby directly with the picture-gallery. This gallery of communication is capable of improvement; the part of it containing the staircase clings awkwardly on to the picture-gallery wall. The subsidiary building is well treated; the library below with large windows, the picture-gallery above lighted from the top, and with large wall-arches forming frames for pictorial designs in mosaic. The defects of the design are that it is somewhat too severe and unfestive-looking in the theatre portion; that the penthouse roof which acts as porch over the centre entrance at the back of the auditorium has a mean and patched-on appearance; that the dressing-rooms on each side of the stage come too near the line of sight from the house and leave too little room in the wings; and that there is too much high unbroken mass of slate roof over both sections of the building. All these defects can be remedied without interfering with the main character of the design. It is, however, more than a question whether a Shakspearian theatre should go back for its architecture to a date long prior to that of Shakspeare. The merits of the design are that its treatment is solid and unpretentious; that there is not a single built-up or sham feature; that the whole design tells its tale and accords with its plan completely; that the plan is in the main a good one; and that, in spite of some rudeness and roughness of manner about it, the building is monumental in character and conceived in a true architectural spirit. Moreover, it can be built for the money.

"Are we all Met?" shows a beautiful set of drawings, which can hardly be called "sketches," being in fact about as highly finished as any drawings need be. The plan has admirable features. The picture-gallery building and the theatre are arranged in longitudinal fashion, end to end, connected by a vestibule or passage, which is entered from the side by the principal entrance, and then communicates to the right with the gallery, to the left with the main theatre-lobby and box-staircase. The auditorium of the theatre takes the form of a tolerably long ellipse externally, and internally that of a circle, the spandrel space between the boundaries of the circle and ellipse, at the side next the main entrance, being used for approaches and staircases, which are very cleverly planned here The defect is the stage, which is far too small in every way; it has no height over (the author suggesting the use of rolled scenes entirely), and no sufficient depth for effect. The design is Jacobean, with just a reminiscence of Elizabethan in the mullioned windows, for the theatre, and Elizabethan for the library building; the latter, with its large florid curved gables, scarcely harmonises with the more Classic aspect of the auditorium, with its flat domical roof and heavy coupled wall columns, which seems to be in its general idea a reminiscence of the Radcliffe Library. The materials shown are red brick, with heavy and costly stone dressings. The style is very ably treated, but the stage portion should have been combined more carefully and systematically with the auditorium, by continuing some of the string-courses through. The author knows that his design is expensive, and puts the whole at 15,000*l.*, and the theatre at 10,500*l.* We should doubt his getting any good contractor to take it at those amounts.

"Our Will." This is a very compact and well-arranged plan, with, however, the disadvantage that the library building is so closely united with the theatre that the building of the two separately is rendered much more difficult than need be. The plan presents no very special point. The design is French Renaissance, and is intended to be carried out, the author tells us, in local brick with stone dressings, the ornament being chiefly supplied by *sgraffito*. It is a style, however, that will not look well in that way of execution, which, moreover, will save little; for it is apparent, from the indications both of elevations and perspective view, that, after all, a great proportion of it must be stone, and the basement story seems to be entirely so, if tint and drawing mean anything. Architecturally the design is a falsity, for it treats the picture-gallery building and the stage building, at opposite ends of the centre block of the auditorium, in an identical manner, though no two structures could well differ more in their character and arrangement. On the whole, with some good points, this is a draughtsman's rather than an architect's design.

"Saint Valentin." The author has arranged the whole of the buildings in one longitudinal block, the length being broken, however, by projections at each end and near the centre, marking the cross blocks of the plan which contain, at one end the dressing-rooms, &c., behind the stage, at the other end the grand vestibule, and in the middle block the intermediate vestibule and staircase-hall between library and theatre. The plan is on a large scale in comparison with others, and is very symmetrically arranged, but has no special merit to recommend it, and the author has been so desirous of producing internal effect that he has swallowed up all the best part of his library building in a grand staircase, the library being arranged round the staircase-hall, and the reading-rooms are only two small insignificant rooms (one of them only 13 ft. by 13 ft.) cornered off where they can be spared from the show part. Such an arrangement is equally at variance with common sense and comfort. Externally the building is in that very unrefined modern brick Gothic style, the distinguishing brand of which is the arrangement of parti-coloured voussoirs so as to give the line of a round arch on the soffit and of a pointed arch above. The whole suggests a hotel, what would be the windows (in the theatre portion) being filled in with statuary and mosaic. Apart from whatever effect may be got from these, there is not an architectural feature to commend in the exterior, and as the plan is both unpractical and costly, we are completely at a loss to understand on what grounds this design was selected. The committee reserved the power to call in a professional assessor; and though, judging from the choice of the other designs, and from what we had the pleasure of ascertaining more directly as to the spirit in which the matter is being carried on, we think the Stratford Committee seem to know much better what they are about than competition committees generally do, they certainly wanted a little better advice in this case.

Turning to the designs not selected, we must especially mention one marked "Love's Labour Lost," which is in some respects the most original, as it is certainly one of the most meritorious designs in the room. One special point of the plan is that the circular line of the auditorium is carried out externally, a feature which it has in common with "What here shall miss";

but around this again is carried a broad aisle, divided partly into sections by internal buttresses, with a central feature something like a trisapsidal or *chevet* plan, and this aisle is made a library on one side and a museum on the other, the bookshelves being arranged against each side of the internal buttresses. The whole forms a wide gallery round the theatre, like a very spacious box lobby, in direct communication with the auditorium, and communicating at one end with the entrance-hall, and at the other end with the reading-room, which is a very quiet, retired apartment. The plan is simple, practical, and effective, and the unity of the whole idea internally and externally strikes one as most satisfactory, and conceived in a true architectural spirit. The exterior is shown in two slight but nicely-drawn pencil perspectives. The author adopts Tudor Gothic as the architecture which Shakspeare probably liked and had most associations with, as he thinks the poet would probably have disliked the Renaissance revival, much as many now dislike the Gothic revival. The principal entrance is a double porch, called "Queen Elizabeth's porch," and "Queen Victoria's porch," distinguished by "E. R." and "V. R.," and with the figure of Shakspeare between. The only blemish of the design in regard to detail is in the wretchedly small attenuated buttresses; they should either be much more massive or be omitted altogether; and the author has either not seen the site, or shirked a difficulty in attempting no architectural treatment of the rear or stage side; this, indeed, he is quite aware is the defect of his design, and has adroitly turned his two perspectives so as not to show it. But the general style of treatment is in excellent taste, and in fact, on first looking round, we at once picked this out as the design which best suited the place and occasion, in style and feeling, and were quite surprised on returning to it to find no "selected" ticket on it. Now the committee (if we rightly understand their "Instructions") undertook to select not less than five, nor more than ten designs; they are therefore not tied against selecting another, and we do strongly recommend them to give the author of this clever and original sketch the option of showing what he can do with his idea on further working out. To put such a design as "Saint Valentin," before "Love's Labour lost" was deplorable, and really almost an insult to the author of the latter.

Among the others, "A Deed without a Name" is a most elaborate and beautifully-drawn French Gothic design, twice too large and totally unsuitable to the occasion. The author says in his report that he does not pretend to offer a design at the cost named, but "will be happy to give that point his careful consideration," if his design is selected. That is, he has endeavoured to captivate the committee and take an unfair advantage of other competitors, by showing a fine set of drawings which he knows are far away beyond the mark, and persuading the judges to overlook the fact. This is the standard of competition honesty; but a committee would indeed be "green" to be taken in by it in this case. "As you like it" is, architecturally, one of the best designs here, Classic in general character, with Gothic feeling in detail; the building is effectively grouped, and the different portions distinguished by characteristic treatment. It is quite beyond the mark as to expenditure, but the author deserves a word in recognition of his admirable drawing and clever design. The set of drawings by "Avon" shows a design in modern French Renaissance of great excellence in many ways, in drawing and grouping, but almost palatial in character. It is to the credit of the Stratford committee that though, as we have said, they have made one mistake, they have apparently kept strictly by their conditions in forming a judgment, and have not allowed themselves to be led away by pretty or ambitious drawings.

There is some talk of exhibiting the selected designs in London, by way, we suppose, of exciting a little more general interest in the undertaking. As to the general scheme, we confess to having our doubts whether anything like a theatrical training-school, which is part of the object, would answer so far from London, or whether persons wishing to educate themselves for the higher walks of the actor's art would go and live at Stratford to do so, merely as a matter of sentiment (which is what it really comes to). But we see no reason why Stratford, especially with its summer assemblage of Shakspearian pilgrims, should not support a theatre; and that being resolved upon, it seems a most natural and suitable thing to take the opportunity of making the building a kind of central Shakspeare memorial, and furnishing the opportunity for collecting within the same walls whatever of interest can be brought together in reference to the history of the poet and the illustration of his works; and towards such an object we should hope many beyond the neighbourhood of Stratford would be willing to contribute.

One cannot be expected to say anything new about the Shakspeare relics of the place, but a visit to the church suggests the remark that there is a new Shakspeare tribute in progress there, consisting of a stained window, containing illustrations of the "Seven ages of man" by incidents in Scripture history, and which is being put in entirely from the subscriptions of Americans, who, as the kindly and intelligent custodian of the Shakspeare house tells us, are among the most numerous and enthusiastic visitors to the shrine.

ANNALS OF THE CONGRESS OF FRENCH ARCHITECTS.

THE report of the first Congress of French Architects comes to us rather late in the day, seeing that the Congress sat in 1873. Our neighbours take time over these matters; but they do the thing well, and nothing could be neater and more business-like than the admirably printed volume,* with its wide margins and grey cover, which gives us the record of the subjects treated of on that occasion, together with a memoir and portrait of M. Victor Baltard, the president of the first Congress, whose decease has intervened between the sitting of the Congress and the publication of its memoirs.

Of course the "Annales" is preceded by an "Introduction," giving a philosophical view of the subject of conferences, and their aims and uses; for without such a commencement it would not be French. "L'œuvre de l'homme n'est durable qu'à la condition d'emprunter à la nature quelqu'une de ses lois. Particulièrement, toute association d'individus doit être organisée en quelque sorte comme l'individu lui-même." So M. Paul Sedille, "secrétaire-adjoint" to the Conference, commences his introductory essay. We seem to have got a little past this in England, and do not think it necessary to prove the philosophical right or advantage of a meeting of professional men, before proceeding to business. However, if the French generalise rather too much and too inevitably, it may be admitted that on this side of the Channel there is somewhat of a deficiency in the opposite direction, and it is not a bad reminder sometimes to be taken back for a minute to first principles. M. Sedille sketches the history of the "Société Centrale," which he represents as arising out of a general movement in France about 1840, towards new literary and artistic ideas; a movement which drew together more than before the separate representatives of the architectural profession, not only with the view of illustrating more effectually their love of art, but also "*d'honorer la profession par des gages de mutuelle estime.*" This latter aspiration commonly has something to do with the foundation of professional societies, but it is, if one may judge from experience, a sentiment subject to decline without careful nurture. With some people, at least, the notion of honouring the profession seems to be connected with any feeling rather than that of "mutual esteem," and the greatest enthusiasts (according to their own account) for architecture are the greatest detractors of all architects, save themselves. Let us hope history will not repeat itself, in this respect at least, in the "Société Centrale," in which at present, if we may judge from these Annals, there seems certainly to be a very general and prevalent cordiality of feeling.

The Société seems to have devoted itself very much from the first to matters connected with the legal and business part of the profession; reforms in which can only, in fact, be carried out by united action. The publication of a *Manuel des Lois du Bâtiment*,† some twelve or fifteen years since, was one of the important acts of its earlier career. It was some time subsequent to this, not indeed till three or four years back, that the idea of realising the epithet "centrale," by extending the connexions of the Société in Paris with the representatives of the profession in the departments, was taken up and acted upon, resulting in the series of meetings in the chemical lecture-room of the École des Beaux-Arts, where the first conference held its session, of which we have here the detailed report.

Portions of the short and practical opening address of the President might have an application beyond the immediate circle of the audience who listened to it. After remarking that in after-days, as well as in youth, we feel the necessity of mutual support, together with the added duty of giving assistance to those who are commencing the profession, M. Baltard went on to say that if they had one regret, it was that their society (comprising 250 members) was not more numerous, although their brethren who were not on its list often addressed them with inquiries or consultations on some matter of interest in professional practice. "We willingly answer them, and do not bargain about the advice which may be useful to them; but our *confrères* might do much better by placing themselves permanently in community with us, taking part in our work, and giving in their turn counsel and instruction,—in a word, paying us in person. They would contribute thus to the soundness and sureness of the advice given in their own interests." In commenting on the existence of similar professional unions in other countries, the President observed that in America there was a peculiar feature in the constitution of architectural intercommunication, in that certain towns, having a relative importance beyond that of any provincial towns in France (such as Boston, Washington, Baltimore), were made successively the centres for re-unions of architects from other towns; adding, "I believe it is the same in England." M. Baltard was probably misled in regard to this latter point by our having the proposition for such a scheme of provincial gatherings so often mentioned in England. In America the thing is done, apparently; in England it is only talked about: a preliminary measure in which we are very proficient in this country, but which seldom seems to lead to any ultimate results.

The Presidential address is followed by what would be for those present certainly one of the most important, as it is, in a general way, among the ablest and most elaborate papers, in the volume,—that by M. Hermant, on the legal responsibility of the architect. This, however, is only of interest to English professional readers as far as regards the exposition of general principles of professional equity involved in it; for the main object of the essay was to clear away the confusion existing in the relations of the French architects with courts of law, arising from the fact that in the legal code of France *architecte* and *entrepreneur* (contractor) are synonymous and interchangeable terms. M. Hermant's essay is largely occupied with citations from the statutes, and from what we should call in England "leading cases," to instance the confusion of legal responsibility thus induced, and which, in theory, at all events, appears to be about as complete as it well could be. In the course of his argument the lecturer explained the origin of this confusion of persons, as arising from the fact that in former days the architect not unfrequently did undertake, commercially, for the production of the materials and the execution of the work, and that thus, at the time when some of the statutes and precedents complained of came into existence, the two titles were really, to the legislators, synonymous. This admission, however, is not to be taken as an argument in favour of "the inspired workman," for M. Hermant describes the architect, in the cases referred to, as the person "*qui avait dressé les plans*," and who was only requested to undertake a contract after that operation had been completed. The second portion of M. Hermant's paper, in which he applies the deductions from his previous reasoning to the question of the responsibility of the modern architect, is of more general interest. He distinguishes between the architect as an artist, or a dealer in something which he supplies (*locateur*), and as an agent (*mandataire*). When the architect acts only as an artist, that is to say, makes the design for a building, with no question of carrying it out under his own direction, he incurs no responsibility at all. He is no more liable because the person who buys his plan and design is dissatisfied with it than is the painter because the person who has commissioned a picture from him is dissatisfied with it. The

* Société Centrale des Architectes, fondée en 1840,—autorisée en 1844, déclarée d'utilité publique par décret du 4 Août, 1875. Annales, 1er volume, Année 1873. Congrès des Architectes Français, Première Session (1873). Comptes rendus et Mémoires. Paris. Ducher et Cie.

† Manuel des Lois du Bâtiment, élaboré par la Société Centrale des Architectes, suivi du Recueil des Lois, Ordonnances, et Arrêts concernant la Voirie ayant Trait aux Constructions. Paris: 1863.

law is no art critic, and takes no account of any element in the case except the question whether the artist has furnished the work he undertook to furnish. In all such cases, *caveat emptor* is the rule, and the buyer is supposed to be the judge of the artist's power, and whether he is worth his commission. There is only one point in connexion with this position of the architect which need cause any anxiety. A scheme badly conceived may have been carried out by a constructor other than the architect who designed it, and have failed: in that case is not the architect who designed it responsible? Certainly not, says M. Hermant. The purchaser bought the designs with his eyes open, and the original designer may say that had he carried it out himself he would have discovered and rectified its weak point in execution, or have substituted another material. "Un projet et bon ou mauvais; c'est au propriétaire qui l'a commandé qu'il appartient de le juger, de l'accepter, ou le rejeter." The architect, as artist or *locateur*, therefore, need not trouble himself about responsibility. There remained the question of his responsibility as agent or *mandataire*. This part of the subject, however, Mr. Hermant leaves in the main for separate consideration, as too extended and intricate to be treated of at the close of a long essay. His object was to show under what circumstances the architect was responsible, and under what circumstances he was not so; to discriminate between contractor, artist, and agent, or *mandataire*, and to urge that the architect can only be, according to equitable interpretation of the law, responsible, when the works were executed not only from his design, but under his superintendence. Of what nature was this responsibility, and how long it should endure, — whether, like the contractor who worked under him, the architect should be held responsible (as by Article 2,270 of the "Code Civil," the contractor is held) for ten years after the building is completed, or for what other term,—were questions for further consideration. But (and it is to this concluding sentiment of M. Hermant's essay that we draw attention) there should be no wish to limit either the extent or duration of the architect's responsibility: far from it; the object was only to place it on its proper footing. The high tone adopted by French architects in regard to this point, their pride in accepting responsibility, we have before had occasion to comment upon. It is a feeling which should everywhere in the profession be kept up and encouraged to the utmost. The more ready the architect shows himself to accept responsibility for his work, the higher he is likely to stand in public estimation.

The question of public competitions, which forms the subject of discussion at another sitting, seems to be viewed much more favourably by the profession in France than at the present moment it is in this country—in theory, at least; for in practice it must be admitted that English architects stand by it very faithfully. The remarks of M. Coisel, following a paper of suggestions for the improved regulation of competitions collected and put together by M. Davioud, assume almost as an understood thing that competitions are in the main beneficial; that, in fact, they could not advantageously be dispensed with. M. Coisel urges strongly that the carrying out of the work should always be intrusted to the author of the design which is classed as the first, and answers some objections to this principle, one of which is not unfrequently heard in this country, viz.: that the architect who receives the first premium may not have the general business ability and experience desirable in those who are charged with grave interests. To which M. Coisel very pithily responds that it is very rare to find a man capable of composing a really good and well-studied "project" who has not also the capacity to carry it into execution. A man may make pretty drawings, no doubt, and have little ability as an executive architect; but then a competition should not be decided by pretty drawings. The two other objections are that the author may be only an *instigateur pécuniaire* (rather a happy phrase) availing himself of the services of clever collaborators, or that "enfin la moralité peut être douteuse." M. Coisel knows none of his *confrères* whose honourable character could be contested; but no doubt, if such were the case, the author ought not to be employed, but should be bowed out with a premium. Having regard to these considerations, M. Coisel would recommend the signature of all designs with the authors' names, rather than the motto system, and the decision to be made in the first instance, not merely in regard to the general apparent excellence of the scheme, but also to the known business ability and honourable character of the author, the voting being:—

"Tant pour l'œuvre:
Tant pour l'expérience:
Tant pour la moralité."

This is a serious view, indeed, of the matter, and reminds one of Byron's comment when Macready was recommended to the Drury-lane Committee on the ground of his being not only a good actor, but a highly moral man, "Aha! then I suppose he asks 5*l.* a week more for his morality"? However, we will go so far with M. Coisel as to admit that there may be men capable of making very clever designs, to whom we should be very sorry to see large and important interests entrusted.

We must content ourselves with merely mentioning, as unquestionably the "centre-piece" of the group of essays here collected, that by M. Daly, "On the Relations existing between Monumental Archæology and Contemporary Architecture," in which the connexion of the art of architecture with the history and development of society is treated of in a masterly manner, and which we will rather advise our readers to peruse for themselves, than attempt an epitome of it, which we have not here space, at any rate just now, to do adequately. M. Davioud, whose name was recently brought before our readers as the designer of the proposed new Opéra Populaire in Paris, contributes a long paper on the history and development of the modern theatre, illustrated by a number of plans showing the progressive modifications of the general form and arrangement of the auditorium: some of the plans illustrating buildings long since removed, but of which reliable drawings remain. M. Davioud regards France and Italy as the two countries which have chiefly interested themselves in theatrical construction from a comparatively early date, and have thus more or less given the model to the rest of Europe: the two countries, however, leaning each towards a distinct form of house, arising from their different theatrical tastes; the enjoyments of the theatre in France being more literary than musical, and in Italy the reverse. We cannot quite see, however, that M. Davioud makes out his point in regard to the influence exercised by these conditions upon the shape of the plan; they would be more likely to influence size than shape, a lyric theatre always being capable of larger extension of area than a dramatic one, in proportion to the greater distance at which the singing voice can be heard in comparison with the speaking voice; and the preference of the modern Italian theatre architects, from the first, for an elliptical plan, while the French for a long time used straight-lined plans, seems rather traceable to the influence (which M. Davioud himself touches upon) of the traditions of the Roman amphitheatre upon the more modern buildings on the same soil. The paper, however, is one to be read with interest by all who concern themselves with theatrical architecture, on historic if not on scientific grounds.

The first volume of the "Annales," we may say in conclusion, is, in every respect, a record of permanent value, and noteworthy, not only for the information and suggestion it contains on important professional topics, but for the high tone maintained throughout. It is true that in London a report of this kind published two or three years after the date of the proceedings, would be considered quite superannuated; but we must say that the French architects do the thing uncommonly well, and seem to make it a main object to have something in the first instance worth publication in a permanent form, and to see that it is really well brought out when it does come. The publication of the Annals of the 1874 Congress was intended to be combined with this in one volume, but has been held back for a separate volume, solely to insure that it is more thoroughly edited. It is rather slow work, to be sure; but the subjects treated of are mostly of permanent rather than of passing interest, and the difference in what we may call the literary habits of France and England, in regard to periodical publications, must be allowed for.

There is another little distinction between the reports we have been noticing and those of our own Institute of Architects, and that is the insertion of memoranda as to the effect upon the audience of various points in the papers read, indicated by the parenthetical "*applaudissements, marques d'assentiment*," &c., &c. This kind of record sometimes becomes rather lively; for instance, when M. Daly is defining the word *organe*, as "un instrument qui sert à accomplir une fonction; par exemple, l'œil pour voir, l'oreille pour entendre, la langue pour parler. Voilà un organe dont j'abuse peut-être en ce moment. (*On rit.—Non! non! Parlez! parlez!*)" It would be very possible to decorate the reports of English architectural meetings with little memoranda of the same kind, but, on the whole, we venture to think that literary and professional dignity is better consulted by omitting any record of such momentary ebullitions of geniality. And as to "applaudissements," they sometimes come in the wrong place, as we all know, and then it is certainly better not to stereotype them.

ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

The designs for churches exhibited this year are few in number, but they show that the spirit of Gothic architecture is now better understood in Scotland than hitherto, and that Batty Langley is consigned to the limbo of the past.

The first drawing that meets us upon entering the small octagon is a perspective exterior of a "Competitive Design for Free Church, Mayfield, Edinburgh," by R. Thornton Shiells. No new Presbyterian church is now considered complete without a hall for weekly services and other gatherings being attached to it. These halls are generally relegated to the rear or basement of the church; but in this instance the hall is made to form a prominent feature in the design, being brought forward in a line with the west gable of the church, with which it is connected by the vestry and retiring-rooms. The church consists of nave, aisles, and transepts, with a gracefully-designed spire at the salient angle, the whole group being arranged in a picturesque manner, and having an air of importance not usually found in similar buildings. The interior of "Hillhead Established Church," by Campbell Douglas & Sellar, is designed upon the model of the Ste. Chapelle, Paris. The treatment of this interior is evidence of the leaning of the Church of Scotland towards the forms of the sister establishment of England, for it could, by the addition of a few accessories, be fitted for the ritual of the Prayer-book. Prominent in the centre of the apse stands the pulpit, with an unmistakable baldachino, which rises to a great height, over it. There is a certain fitness in this arrangement, seeing that in the Presbyterian Church the pulpit occupies the chief place, although it may be that in this instance the feature in question possesses no particular significance, but is merely introduced for æsthetic effect, and the effect of the whole interior, which is elaborately decorated in colour, is expressive and satisfactory. A "Competitive Design for St. Leonard's Church, Leicester," by William Bushworth, is an exterior of the severe muscular type, fairly effective, and showing some originality in the treatment of the lucarnes of the spire. Archibald Macpherson's "Essay in Church Design" is an exterior of a cross church, with tower at intersection, which is crowned by an embryo spire. Without pretending to originality, the design is accurate as to detail, and in good taste. Messrs. Peddie & Kinnear have not attempted too much in the "Lockie Memorial U.P. Church, Peebles," of which they exhibit an exterior view. The church, which is situated on a height, is a simple parallelogram, with a masculer broach spire at one angle. It will form a pleasing addition to the attractions of this delightful summer retreat in Upper Tweeddale. The "Interior of New Church, Stonehaven," combines that massiveness of character and gracefulness of proportion which Robert Anderson succeeds in imparting to his interiors. The clustered shafts supporting the clearstory, square on plan, are very effective, but they will act as an effectual barrier to the use of the aisles during service; it may be, however, that it is only intended to seat the centre of the nave, and leave the aisles free: an arrangement which is altogether the most satisfactory where it can be carried out.

"The Abbey Church, Edinburgh," by Robert Moreham, Junior, of which we have an exterior perspective, is far from being a happy composition; the parts are clumsy and huddled together in a manner destructive to breadth and unity of effect. There is nothing to find fault with as regards the detail, but the respective parts seem crushed and small, with the exception of the bulky tower and spire.

The "George A. Clark Hall, Paisley," by Rennison & Scott, is an imposing Gothic pile, with traceried windows, and a large turreted tower. The detail is bold and effective, and the composition picturesque, without being overstrained. It will group admirably with the old abbey church which it adjoins, and its situation by the river's bank would be greatly to its advantage were not the stream polluted by the refuse of manufactures, &c.

The "Public Hall," designed by Allen G. Macdonald, although good to a certain extent, contrasts unfavourably with the preceding. It is deficient in power, and rather fussy and uncertain in detail. From the drawing exhibited by Campbell Douglas & Sellar of "Additions to the Bank of Scotland Buildings, Glasgow," it does not appear what portion is new. The buildings are Italian in style, and the whole in thorough keeping. T. B. McFadyen exhibits the elevations of new streets at the Market-place and Vicers-street, Falkirk, which are in the ordinary style of modern street architecture, agreeably diversified and arranged. Mr. McFadyen's design for the "Mansion House of Arnothill, near Falkirk," is decidedly English in feeling, having none of the Scottish element incorporated with the Elizabethan, which is of the purest phase of the style, and happily carried out.

The "Dunfermline Corporation Buildings," by J. C. Walker, have the outline and grouping of a Gothic town-hall, but the style is after the Scottish manner, broadly treated. The lintels of the upper tier of windows do not rise above the line of cornice, and yet gablets are placed over them which are unnecessary and uncalled for, otherwise the design is commendable. The elevations of two new hotels in course of erection in Edinburgh, by M'Gibbon & Ross, display all the characteristics of stone construction, but the buildings themselves are being erected in brick and compo. One of these designs possesses sufficient merit to have been carried out in more presentable materials, but the range of chimney-pots which form the cresting of the mansard roof are frightful to behold. The Royal Hotel, in Princes-street, is to be furnished with a new façade, designed by William Beattie. The design is business-like and appropriate, but we hope that in this instance bricks and compo are not to supersede the present stone front.

The "Hydropathic Establishment at Moffat," by Fred. Thomas Pilkington, exhibits some of the mannerism peculiar to that gentleman, but in an unobtrusive way. The flanking towers of the centre block do not seem all of a piece, and appear as if designed without special purpose, unless it be to relieve the monotony of outline in a wide spreading façade.

Walter F. Lyon seems thoroughly imbued with the Mediæval spirit. The drawings of "Tyndyate House, near Aberfeldy," and "Pendly Manor House, near Tring," we at first sight mistook for drawings of ancient manor-houses. The halls and staircases are very quaint and picturesque. More stately and grand is the "Saloon of Wemyss Castle, Fyfe," by Messrs. Peddie & Kinnear, where massive oak panelling and a plaster ceiling, in the Elizabethan style, are brought into play.

The "Monument to the Earl of Galloway," by Alexander Skirving, a Gothic cross, with dumpy columns of coloured marble, contrasts unfavourably with the dignified repose of the monument designed by William Leiper, where a Runic cross, having the figure of an angel in front, is placed upon a well-designed basement, forming a happy combination.

THE RELATION OF MODERN ENGINEERING TO PUBLIC HEALTH AND LOCAL GOVERNMENT.*

THERE is no chapter in human history more interesting and instructive than that which tells of the progress of the art and science of engineering. When that whole history is hereafter written, it is not rash to say that British engineers will stand out pre-eminent. Though Indian work may rival theirs in beauty, Italian in grace, Egyptian in solidity, Roman in municipal service, they will, in the combination of their qualities, be found to have been equalled by none. And yet how short is the period in which British workmen have earned this fame. Some still living can remember when the lighthouse on the Eddystone was a novelty. As a boy I travelled on the first steam-worked passenger railway, shortly after Huskisson's death. Many now living saw the first telegraph-wire stretched along the western line. Steam applied to the largest men-of-war is but a recent affair. Ironclads were begun but the other day. A full appreciation by the masses of sanitary engineering, even if it exist now, is not of five years' duration. Three years ago, in this city, an able public man thought to gain a cheer by seeking to cast ridicule on those who prefer, like you, to prevent preventible disease rather than to cope with it unprevented. A like course would not be attempted now.

Considering, then, the infancy of knowledge and of public opinion on this matter, it is not strange that the place of the sanitary engineer is not yet precisely defined. To illustrate this place will be the object of the following remarks.

In the Public Health Act of 1875, the summary of all health enactments, his name does not once occur in the 343 clauses. He is still the old "surveyor" we all remember, –the plodding, energetic man of highways and byways, whose Anglo-Saxon vigour broke forth from the garb of corduroy, from the measuring-tape and links, into the transcendent skill of M'Adam, and whose followers take rank with men of courage, knowledge, and power, such as Brindley, Smeaton, Rennie, and Stephenson.

In considering the consolidated Public Health Act, it is strange to see how almost the high place of the engineer is unconsciously conceded to him. Every urban authority may be "surveyor of highways" (sec. 144), shall appoint "a fit and proper person to be surveyor" (sec. 189), and "the same person may be surveyor and inspector of nuisances" (sec. 192). But then the surveyor of the present day may be called to advise on anything, from the form and cost of an earthen syphon trap, to the calculation for work to be done by engines which are to supply half a million of persons with water, safe to be sipped in wine glasses, and delivered in quantities adequate to cleanse the foulest and largest of factories,—to be responsible for the construction of sanitary mechanism, from a housemaid's sink to an "intermittent downward filtration farm." If required to act also as inspector of nuisances, he has to have knowledge of what is dangerous to the public weal in respect of any and all nuisances; of all filth-producing agencies; of soundness and unsoundness of food; of occasions of epidemics and contagions. He is to be able to carry out all measures for prevention of infectious diseases advised by the medical authority. He is faithfully to observe and execute all lawful orders of the Local Government Board which may be hereafter issued. Such is the modern civil engineer when attached, for purposes of local government, to a sanitary authority, urban or rural.

I should not presume to speak on so wide a topic, but that my attention has been drawn to it from boyhood. While still a student at the university, I was much impressed by examining the gigantic arrangements for supplying ancient Rome with water, and by traversing along its whole length, the splendid aqueduct on the north coast of Africa, which, taking its rise on the hills of Lagonbau, supplied a vast stream to Udina and to Carthage.

I venture to show you various sketches illustrating this great work, made on the spot forty years ago. I would draw attention specially to the fact that the sources of the stream as it issued from the mountain were guarded by the walls of a spacious edifice with religious care. Not long after, during a residence of some weeks in Holland, the skill and engineering triumphs of that strange and noble country filled me with admiration. Chance fixed me in a professorship here, and I was forced by the local Acts to be officially a street commissioner.

What a contrast was then found by me to those works which had so instructed me in Rome, Carthage, and Holland. An undrained town in a sodden valley, a foul and filthy water-supply, and no power to obtain money to remove these evils. Still worse, there was an administrative Board, unfit and unable to cope with the evil or to appreciate the risk. It would be a strange tale for those who think we are not improving if the complacency were described with which men then lived on a site which we now know needed but a chance combination to decimate it with typhoid. The town was riddled with cesspools, in the midst of which the shallow wells were dug. The waterworks pumped up with an uncertain and infirm water-wheel a liquid fouled by the overhanging privies and the filthy ditches of the slums of the city. There was no systematic drainage. What drains there were were rudely executed in gaping brick. By a special engineering effort, a sewer was constructed from the north to the south of the town. When completed, it flowed the wrong way, and was abandoned. I forbear to describe the cesspools under kitchens and in entrance-halls, the alleys, the houses. An upper floor in one dwelling served as a fancy dog-kennel, which I saw filtering its filth through the rotten floor on to the bed of a woman in labour in the room below. The tenement belonged to an elected, not an official, street commissioner.

At length the local Acts were abolished, the imperial Acts were adopted, a local Board formed, and Mr. White has shown you the outcome in our drainage works to-day. Steadily, if slowly, the local Board is doing its work. Every year the number of those in the district who have mastered the sanitary problem to be worked out in this country increases. We have as the assiduous chairman of our drainage committee one of the first scholars of the age,—Dean Liddell. Many besides him now know well that the regulation of the surrounding flood-waters, the purification of the Thames and the Cherwell, the distribution of the sewage by irrigation, the destruction of bad courts and of cesspools, the erection of proper dwellings,—all, in short, of the requirements of a healthy town,—are to be steadily aimed at, and at the earliest moment secured. Yet progress cannot be always rapid. One of the wealthiest colleges, the chief landowner of the best building sites of the town, but lately allowed the erection of whole rows of villas without sewers or safe water-supply. It has thereby riddled the before virgin gravel with cesspools and wells, as in the arrangements of old, and left the unhappy householders to awake from their dream of possessing healthy suburban dwellings, and to find already various fevers and other maladies occurring from the combination of bad workmanship with imperfect drainage. These circumstances are alluded to because they are an illustration of what goes on in many places, and are therefore of general interest. Yet we must not conceal from ourselves that the complete sanitary administration of a densely-peopled state is fraught with much difficulty. Look once more at Oxford as an illustration. It was pointed out twenty years ago that the management of every river-basin as a whole is essential for the several towns on its banks. Though many riparian owners on the Thames have done much, and are spending much, Father Thames still goes his own way. He is still fouled by his neighbours. He still floods them in revenge. He still wastes his waters at his will. Would this have been tolerated in Holland even two centuries ago? Are we to have over Dutch engineers, as once in the days of Vermuyden, to confine him again to his banks? Will Mr. White's costly works keep the cellars of St. Ebbes and St. Thomas dry, or will they still leave the floods to permeate the subsoil of the lower parts of the town?

We may answer to this that there is every hope that the Duke of Marlborough's Commission will bring to practical effect the work on which it has been now so long engaged; and the rate about to be levied for the survey and other expenses will inaugurate a complete system of water regulation in the Thames valley; and, at all events, that English engineers are ready, when they return from their Dutch engagements, to undertake our minor works here. These circumstances connected with the place in which you meet have only been introduced to illustrate the subject before us, "The Relation of Modern Engineering to Public Health and Local Government."

In the case of all towns such as those comprised in the Thames Valley, there are, over and above the ordinary work of town management, such as laying out streets, erecting houses on healthy models, and constructing sewers, both the draining of the surrounding districts and securing an uncontaminated and ample water supply. A memorial was drawn up in 1862, urging the Government to attend to the regulation of the waters of the Thames, not to the purification only, but to the storage at one time, and the liberation on another, as afterwards recommended by the Water Commission of 1869. This cannot be effected without a united superintendence for the area of the whole valley. The plans of one superintending engineer must be followed through the whole basin, in the tribu-

* Read by Dr. Acland, F.R.S., President of Medical Council, at a district meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held at Oxford, February 16th, 1876. Mr. Lewis Angell in the chair.

taries as in the main channels. These plans could not be carried out without competent, well-trained, local sub-engineers, acting under the Local Sanitary Authorities, and in harmony with each other. The superintendence of wisely-devised sanitary areas for engineering purposes should be like the organisation of one of our best railways, viz., into districts and sub-districts, with connected supervision of the whole. There are, therefore, many points to which the attention of this Association may be usefully drawn. A few may be named:—

First, the Association may help to impress on the public the detailed, as well as the comprehensive character of sanitary engineering, which has at length become a special and important profession, and bids fair to rival in magnitude, though we hope not in cost, the establishment of railways thirty or forty years ago.

On the details of sanitary work it would be impertinent for me to enlarge. Yet, speaking as one of the public, I may remark that a very short time since architects and surveyors often undertook sanitary works with very imperfect knowledge of what had been done, or of the skilled contrivances which existed.

This Association will do good service by interchanging and making public the details of their experience. Many of the useful contrivances, such as those made years ago by Clark, of Carlisle, and many of the fittings introduced by Jennings, existed long before they were generally used. We spent much money here on bad fittings years after good ones were in the market. But this stage has passed, and we have another danger ahead—the danger of advertised and spurious wares "floated" under many names, and processes which have not a shadow of scientific foundation. Many will suggest themselves to your minds. This is the more to be regretted, because no profession affords so many instances of valuable contrivances, either suggested by untaught men of genius, or the result of scientific culture by true experts. I will name three: the arrangement for dividing overflow water by the property of its velocity,—applied, as I understand, first by Bateman in the Manchester Waterworks; the method of laying sewers in straight lines from manhole to manhole, planned, I believe, by Rawlinson (whose name I cannot mention without esteem as well as respect); and the scraper for internally honey-combed iron pipes, invented by William Froude; the outcome of consummate knowledge and masterly powers of observation.

When we see great results produced by such simple methods, we do not despair of the sanitary arrangements in houses and cities becoming very shortly reduced to an absolute certainty, when every district will have its superintending sanitary engineer, versed in the best knowledge of the time, and with a staff of trained and conscientious workmen.

The details are almost all known already. That sanitary pioneer, Chadwick, has lately summarised the wants of the house,—to be weather-tight, damp-proof, miasma-proof, with warm fresh air, unwasteful warming apparatus, safe water-supply and sewerage within, and an authority to remove refuse and dispose of it with economy and safety without. And so, in the case of large collections of houses, *i.e.*, cities, Mr. Rawlinson has, in his masterly way, sketched suggestions for main sewerage and water supply, on the principles on which skilled borough engineers are building. Gigantic works, indeed, are in operation or progress in every direction. Above all, the good sense of the country is embarked in the work. Every place has its Sanitary Authority composed of elected residents,—would they were always selected also,—and every place has but one Authority.

We have entirely passed out of the stage of needing proof of the evil of unsanitary conditions. We are in the hands of the Executive. We have to find out the cheapest form of permanent staff to carry out the instructions which accumulated biological knowledge and experience demand. The Medical Department of the Local Government Board will always have that knowledge. It is a knowledge only to be obtained by skilled experts giving their lives to its acquisition. Like most other knowledge, when obtained it may be handed over in a clear and intelligible form to all willing learners.* The advising inspectors and our highly-instructed periodical literature are making all such sound knowledge common property, possessed by the most intelligent persons in even remote districts.

Next with respect to the comprehensive character of sanitary engineering.

The Royal Sanitary Commission urged, and urged with effect, that there must be a Sanitary Authority for every spot, and but one Authority. This now is law. But it further advised that the areas of the Authorities should be readjusted. This is partially done, though it might have been better done. Medical officers can be appointed to areas of any size whatever, according to the conditions of the localities, and with the approval of the Central Board.

These two principles—the having even every hamlet under proper sanitary care, and the power of combining areas into the most suitable dimensions, according to the population and the physical conditions of the districts—lie at the root of the whole question of national sanitary arrangements.

But we may see at a glance that these principles touch, not only the details of local taxation and administration, but the mode of Imperial supervision of any national funds given in aid of local sanitary work. It is greatly to be regretted that popular writers do not always note this. They often blame Government for not settling by a stroke of the pen what touches every local interest and property in the country. So large a question has unavoidably baffled as yet every statesman who has approached the subject. But every session of Parliament throws light upon it, and brings us nearer to a solution. For my own part, I retain the conviction of many years, that the true policy for securing the national health lies in the steady education of the people to take a thorough and intelligent interest in perfecting, under local management and central or Imperial advice and supervision, their local sanitary arrangements.

I am more convinced than ever that coercion, even if attempted, will in the end retard progress. Theorists may dislike the political truth that in this country neither the Government nor the people, separately from each other, direct public opinion or make public laws. It is discussion, and action and reaction between the two, which bring about among us stable progress. Practical life in England does not rest on logical science.

The profession of engineers is one which, above all others, has been self-made, and without the trammels of regulations. This has been at once a source of strength on the practical side, and of danger on the scientific. But without pursuing that subject, it must be admitted that the sanitary engineers of the future will need as much consideration in a perfect sanitary organisation, as the legal or the medical department. It will be for the engineering profession itself to see to the training of its students, the due supply of its ranks, and the guarantee for the fitness of its members.

The public grievously need some guarantee. Health authorities have often been put in difficulty to know in whom they can place their trust, whether they seek for knowledge to guide them, or high character to keep down expenditure.

History has shown that much bad work has been heretofore done either from lack of training or want of experience. Much money, too, has been squandered because the interest of the employer has not always been the first object in the execution of works. There are many remarks worthy of attention on this subject in the writings and autobiography of Sir John Rennie. But, this being said, it is right to add that probably there never was a time when it was so easy as now to obtain competent and upright men for the superintendence of sanitary work. It will go far to reconcile England to complete redistribution of areas for purposes of local government, and for the establishment of a complete executive for the objects of preventive medicine, if people are convinced that no works are advised which are not really needed, and that none are taken in hand which are not faithfully executed in respect of durable workmanship, and carefully controlled in respect of cost.

For this end, as in other departments, but two things are necessary,—the average knowledge and good sense of the practical men of a district for all local purposes, with highly skilled imperial inspectors to occasionally advise and assist. The germs of this system we already have in both the medical and engineering departments. A few years more, and we may hope to see the full harvest of our experience gathered in, and a thickly-peopled country for the first time parcelled out into areas where all that can be done for health is done, and nothing done which is needless or fantastic.

Lastly, in a memorandum in the Report of the Royal Sanitary Commission, the "National or Chief Health Office," or the "Local Government Board," is said to be divided into six departments:—1. Legal; 2. Engineering; 3. Statistical; 4. Poor-law; 5. Medical; 6. Medical Legislation. In the Public Health Act of 1875 by far the greater number of clauses are necessarily devoted to subjects purely legal. Comparatively few are needed for the direction of the constituted authorities in respect of the medical officer of health or of the engineering officer of health. Every authority is obliged to appoint both, as well as an inspector of nuisances. But either of the two chief officers may act in the latter capacity also.

The engineering officer or surveyor has a very onerous duty. He has to execute and maintain what the science of medicine suggests as desirable to be attempted; to enforce and maintain cleanliness, and to provide pure air, pure water, dry and pure dwellings. All this is to be done, as far as the conditions of our climate and nation permit, from every cottage on the hillside to the palace in the city; and on every site, from the crowded alley to that princely, but often dangerous, dwelling, an English country seat.

There is a great future for the sanitary engineer in this country. The Institution of Engineers proudly boasts that it aims at "directing the great sources of power in Nature for the use and convenience of man." Well have the British engineers striven to this end. They have invented countless machines for useful and infinite ends;* have constructed all over the world railways and bridges, opening up unknown and before unattainable regions; have built lighthouses and docks, and ships with scarce a rival; and, lastly, they have begun a yet more useful work, more necessary, more blessed, soon we hope to be one more gem in their professional crown—they have entered on the search after the most economical means for providing a healthy home for every man, rich or poor, according to his wants, his place, and his condition, and thus they will make possible a virtuous and happy fireside for our crowded and toiling millions.

* See the instructions for medical officers of health by the General Board of Health, 1848; and the same of the Local Government Board, 1874, and those to inspectors of nuisances, and many local Acts and bye-laws.

"CUBITT'S," GRAYS-INN-ROAD.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

MOST Londoners have heard of "Cubitt's," but probably very few, comparatively speaking, even of those engaged in the architectural profession or connected with the building trades, have any idea of the largeness of the establishment and its resources. A visit to the works of such a firm, celebrated as they are not only for the quantity of work turned out, but for its variety and excellence, cannot fail to be of extreme interest and instruction to the young architect anxious to obtain as many "wrinkles" as he can in the details of practical construction; and it is, therefore, not to be wondered at that the members of the Association mustered in strong force on the occasion of the visit which, by the kindness of the principals of the firm, took place on Monday afternoon last. This visit was arranged for Monday in lieu of Saturday, on account of the Saturday half-holiday, in order that every department might be seen in full operation. The members, headed by Mr. John S. Quilter, president, and Messrs. Clarkson & Hayes, honorary secretaries, assembled at the works at three o'clock, and were courteously received by Mr. Robinson, one of the partners in the firm, who introduced them to Mr. Wyatt (manager of the carpentry and joinery department, saw-mills, &c.), and Mr. Keay (the engineer of the establishment), by whom they were conducted over the whole of the works, and to whom (together with the foremen of the various departments) they were greatly indebted for much practical information, and for the kindness with which it was imparted. The visitors first entered the principal joiners' shop, a very large, lofty, and well-lighted room, in which all the best joinery work is done. Here were to be seen in various stages of progress door and window frames, doors, partitions, office and other fittings, all the best of their kind, and in various woods, much of the work being for large mansions of the nobility which the firm is now engaged in erecting or enlarging. Mr. Wyatt

* See the preface to the first volume of Smiles's "British Engineers."

having explained and practically exhibited to the visitors the different modes of veneering, the party entered the "Wood Museum" of the establishment, which is a miniature edition of the Museum at Kew Gardens. The little museum at Cubitt's leads out of the principal joiners' shop, and contains specimens of every description of wood, British, foreign, and colonial, used in the building trade, and others besides. Among the many interesting practical points to which Mr. Wyatt drew attention was that a great deal of the "figure" of the wood depends upon the cutting. Wainscot oak cut in one direction may have no figure, but yet, cut in another manner, may be full of it. In bird's-eye maple, again, the figuring will present different appearances according as it is cut from the outside of the tree or towards the heart. Sections of various casement stiles, including one (made for the Duke of Westminster) of peculiar construction and shod with brass, in order to form an air-tight and dust-proof joint, having been explained, the visitors entered the machine joiners' shop, another very large and well-lighted apartment, where were to be seen in operation planing, mortising, tenoning, and various other machines capable of doing almost, if not quite, everything that can be done in the shape of wood-working. A very ingenious machine for doing all descriptions of "Gothic" work, sunk lozenges, &c., was particularly interesting; indeed, the wood working machinery generally attracted considerable attention, not only on account of the almost infinite variety of work which it is capable of turning out, but because of the excellence and beauty of finish, to say nothing of the marvellous rapidity with which the most elaborate pieces of work are produced. To give, in the form of a newspaper report, a tithe of the practical information imparted in this department alone would be well-nigh impossible, even if the exigencies of space allowed us to attempt it; but we may mention that among the specialities pointed out were a peculiar system of tongued-and-grooved flooring which Messrs. Cubitt have largely adopted, and the patent dowelled doors (made by special machinery), framed together with strong oak dowels instead of mortise and tenon joints, — these doors having been used very largely (if not exclusively) in the Peabody buildings. Having visited the saw-mills, the party passed to the wrought-iron girder shop, where girders were seen in process of building up and riveting, and powerful punching and shearing machines were cutting and holing stout iron plates as if the latter were no tougher in substance than cardboard. Passing to the stone-masons' yards and shops, work of various kinds and materials was in progress, both by hand and steam power, and machinery appeared to be used in this department of labour almost as largely as in wood-working. Much practical information as regards stone and stone-working was given to the visitors by Mr. Carter, the general foreman of masons. Particular attention was attracted to a heavy lathe in which a workman was turning a large baluster in Portland stone. The speed at which the work revolved was necessarily slow, but still it was great enough to cause chips large and small, and a cloud of coarse and fine dust, to fly off under the touch of the tool or chisel (somewhat resembling a short but rather stout crowbar) directly in the face of the workman, who was, however, unprovided with a mask or respirator of any kind. When we state that the chips and dust were thrown a distance of three or four yards, and that the workman was veritably in the thick of it all, the extremely injurious effect of the particles of stone inhaled by the lungs of the mason must be obvious. We spoke to the workman, who appeared to be a very intelligent man, and he said he formerly wore a respirator, but he found it too "choky," from the fact, we suppose, that it became clogged with the particles of stone; he had, therefore, discontinued it, his own remark being that "one can but be choked, either way." Will Dr. Richardson's feather respirator suit the case of men working under such trying circumstances? If so, the sooner it becomes known to them the better. The visitors passed from the stone-masons' department to that of the marble-masons, where machinery is also largely made use of, and where Mr. Greenham, the foreman, explained some of the methods of work. In this part of the establishment is another museum, where, in addition to a large number of beautiful chimneypieces, specimens of every variety of marble used for building purposes are exhibited, one of the rarest and most beautiful being that known as "Chinese." The visitors next proceeded to the iron foundry, where the operations of moulding and casting were practically exemplified, under the superintendence of Mr. Ridge, the foundry foreman. The engineers' shop was next visited, and it will convey some idea of the resources of the firm when we say that here are made all the machinery and mechanical appliances of every kind used on the establishment. Next was visited the stove-makers' and locksmiths' shops, the visitors passing thence to the terra-cotta and cement works and kilns, where they were received by Mr. Baldwin, the foreman. One of the kilns, only opened the same morning, was full of very well finished terra-cotta air-bricks; but all kinds of terra-cotta work, up to the largest and most elaborately moulded pieces, such as vases, cornices, &c., are made on the premises, and a very fine collection of specimens was exhibited in an adjoining show-room. The terra-cotta is compounded of broken glass and crockery (a quantity of which was being ground to powder for the purpose by two pairs of edge-runners), and London or Poole clay, according to the colour and material desired. In this department, too, the firm makes all its own cements. The visitors having passed through the plasterers' and modelling shops, where some interesting work was to be seen in progress, concluded their tour of inspection at half-past five by a visit to the general show-rooms. It may be interesting to state that about 800 men are employed on the premises; but reckoning those engaged on "works in progress," the number of men employed by the firm is about 3,000. That machinery is very largely employed will already have been gathered from what is previously stated; but the fact that upwards of a mile of shafting is used will perhaps convey this more strikingly. We were given to understand that the firm prefer to manufacture their own goods and materials throughout, not only from motives of economy, but from the higher consideration of securing the best of quality. On leaving the premises, votes of thanks were given by acclamation to "the firm" for permitting the visit, and to Messrs. Wyatt and Keay and the foremen of departments who had so kindly contributed to the instruction of the afternoon. The only drawback to the comfort of the visitors was that they were so numerous that (notwithstanding the spaciousness of Messrs. Cubitt's premises) it was impossible for all to see or hear equally well. However, one set of members did not continue long to monopolise the front ranks, for, by sudden turns or changes of route, those who were in front at one moment were behind at the next. The visit was one of the most instructive and interesting ever made by the Association.

A NEW RECREATION GROUND FOR SYDENHAM.

THE inhabitants of Sydenham and Forest Hill are taking steps for securing an ornamentally-laid-out recreation-ground for the use of the residents in the neighbourhood, and last week a meeting was held to promote the object in view at the Foresters' Hall, Forest Hill,—the Earl of Dartmouth in the chair. The Hon. and Rev. A. Legge proposed a resolution to the effect that the meeting heartily approved the securing an open space for a recreation-ground for the public use in Sydenham. The resolution was warmly supported by several persons present, and unanimously adopted. The next resolution, moved by the Rev. W. Taylor Jones, who is taking a warm interest in the matter, declared approval of a piece of land of seventeen acres in extent for the purpose of a people's recreation-ground for their free use for ever, and the appointment of a committee and officers to carry out the wishes of the resolution. Mr. Jones, in moving the resolution, observed that a piece of land had been placed at their disposal by the owner, Mr. Adams, on most liberal terms. It contained seventeen and a half acres, and was to be had for 8,500*l*. He had a confident hope that the Board of Works would help them, but they must at the same time help themselves. It was then proposed that a subscription list be opened to obtain funds to carry out the wishes expressed by the meeting, and several letters were read from gentlemen interested in the matter, one being from Mr. Horniman, giving a subscription of 100*l*. The Earl of Dartmouth, the chairman, also expressed his intention of subscribing 100*l*. towards the fund. It was stated at the meeting that the Lewisham Board of Works would see that the ground was made suitable for the purpose for which it was intended.

"AQUARIA AND THEIR CONSTRUCTION."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

MR. C. H. DRIVER, F.R.I.B.A., read a paper entitled "Aquaria and their Construction," before the Civil and Mechanical Engineers' Society on the 24th ult. The author devoted the first portion of his paper to a brief historical sketch of the subject, in the course of which he noticed the *vivaria* of the ancient Romans, and the tanks, &c., used by the Chinese and Japanese dealers many centuries ago, for keeping fish, &c., alive. He then proceeded to point out that the aquarium, in the sense in which the word was now generally understood, was quite a modern contrivance. The Fish-house in the Zoological Gardens, Regent's Park, opened in 1853, was the first public aquarium in England. In this aquarium the method adopted for keeping the sea-water in a fit state for the animals was by constantly renewing the contents of the tanks by obtaining fresh sea-water, and throwing away the water that was supposed to have become stale and unfit for further use. It was not then practically known that, by properly exposing the water to the action of the oxygen of the air, and by keeping it for a time in a dark chamber or reservoir, the same water could be used continuously, and would not require to be changed. The application of this knowledge to the subject of aquarium construction and management was first made by the Superintendent of the Crystal Palace Aquarium, Mr. W. A. Lloyd, whom Mr. Driver considered to be the greatest authority upon the subject of the aquarium and all its belongings that we have.* In 1862, Mr. Lloyd went to Hamburg, and in the Zoological Gardens there arranged an aquarium upon his system, which was opened in May, 1864, and was a great success, both scientifically and financially. Of the many aquaria subsequently erected, Mr. Driver selected the one at the Crystal Palace (of which he was the architect), and that at Brighton, as illustrating the two systems of aëration principally in use. Some plan by which the same sea-water might be supplied with oxygen, and kept in a clear and pure condition, was necessary for the very existence of the Crystal Palace Aquarium, whereas the position of Brighton made the sea-water so readily available that it could be changed as often as thought necessary. Loss of health to the animals was, however, always occasioned by the introduction of new sea-water. At the Crystal Palace Aquarium the water was never changed by the addition of sea-water, but fresh water was added as required, simply to supply the loss by evaporation, and any solid constituents which the animals might abstract from the water as material for their shells was replaced, so that the ordinary composition of sea-water was maintained. Although, as regarded architectural enrichment and size, the Crystal Palace Aquarium did not approach the one at Brighton, yet, as regarded the object for which it was intended, Mr. Driver ventured to say it was by far the most successful of the two. The matter of size, or even of architectural effect, was a mere question of expense and the circumstances of the site, but the system upon which an aquarium was worked was a matter of principle wholly independent of either of these conditions, and was either right or wrong as it conformed with or differed from what were the necessary requirements of an aquarium, viz., an arrangement for the preservation, maintenance, and exhibition of marine and fluviatile animal life in a natural state by artificial means, and which shall be equally adapted to inland and seaside places. The Crystal Palace Aquarium was commenced in July, 1870, and opened in August, 1871. The building is about 400 ft. long and 70 ft. broad, partially occupying the site of that portion of the palace which was burnt down in 1866. It is one story high, with a reservoir beneath the floor holding 100,000 gallons of seawater, and a series of sixty tanks holding collectively 20,000 gallons. All the tanks are constantly receiving water from the clear and cool reservoir below, which contains no animals, so that the motion of the water through

* A valuable article by Mr. Lloyd on the subject of "Public Aquaria" appeared in the volume of the *Builder* for 1874, vol. xxxii., pp. 626 *et seq.* This article has since been republished, with additions, in the form of a pamphlet, setting forth the whole subject, and pointing out what Mr. Lloyd maintains to be the errors of the system of water supply at the Brighton Aquarium. We hear that it has had much good effect in the direction intended. We may also state that Mr. Lloyd is now engaged on an elaborate *resumé* of the many articles, papers, lectures, &c., which the subject has called forth of late.

the tanks was incessant. The water was pumped through at the rate of from 5,000 to 7,000 gallons per hour. The pump was driven by a steam-engine working night and day. The machinery, pump, and steam-engine, and boiler are all in duplicate, to provide against the chance of a break-down from any cause. The water is poured into the two centre tanks in an equally divided stream, and by a simple fall of a few inches from tank to tank it flows by two routes to the lowest tank, from which it passes into the reservoir below. This incessant circulation of the water constantly exposes fresh surfaces to the action of the air, by which oxygen is absorbed. But, besides this, other small streams of water are made to forcibly enter the tanks from jets, by which a large quantity of air is carried down in very small bubbles. (These bubbles of air are so small and so numerous that they appear like very fine grains of sand diffusing themselves through the whole body of the water in the tanks.) The removal of carbonic acid is accomplished by the vegetation which spontaneously makes its appearance in sea and fresh water under suitable circumstances of light. The water is not, and never has been, filtered, but its clearness is obtained solely by the perfect system of circulation and of aëration. The unused food and excrementitious matters are oxygenated and dissipated by the air, which the water abundantly takes up and holds in solution. The whole process of purification is, therefore, chemical, and the success of the system may be judged from the fact that water seen in masses 9 ft. broad appears perfectly clear and bright. The aquarium was, as already stated, opened in 1871, and now, in 1876, the same water is in use as was then first put into the reservoir, excepting that which has been put in to supply that lost by evaporation and leakage. New water is a constant source of trouble, in many ways. Leakages, and especially small and continuous ones, are the curator's greatest enemy. Any one can see, and cure, great leaks, but the little ones give the most trouble. The building is very cool in summer; even in very hot weather the temperature is never higher than 68° Fahr., and that of the water in the tanks never exceeds 63°. Much of its success is due to its coolness of aspect. It is protected by a high bank of earth from the hot western sun, and sheltered by the northern end of the Palace from the still hotter southern sun. Its only open aspect, therefore, is the cool east. In winter, by means of hot-water pipes, the temperature of the air is maintained at from 60° to 65°, and the water at about 55°. The ventilation everywhere is remarkably good, and there is no tank in any of the entire series of sixty which cannot be brought, when required, into free contact with the open air. The amount of daylight can also be very exactly regulated. Turning to the Brighton Aquarium, of which Mr. E. Birch was engineer and architect, Mr. Driver said that, owing to conditions of site, it was necessary to place the greater part of the building below the level of the ground, a matter involving considerable engineering difficulties. It was close to the Chain Pier, and was protected from the waves by a strong sea-wall of concrete and Portland stone. The building was definitely opened in August, 1873. Its length is 715 ft., and its average width 100 ft. There are two series of tanks, twenty-one in number. These increase in dimensions from 11 ft. by 10 ft. upwards, the largest measuring over 100 ft. in length by 40 ft. in width, and holding 110,000 gallons of sea-water. This colossal tank is the largest in the building, and is devoted to the exhibition of porpoises, turtle, and other animals of large size. The system adopted for aërating the water at the Brighton Aquarium is altogether different from that in use at the Crystal Palace. In the Brighton Aquarium the water is pumped directly from the sea into reservoirs formed under the floors, and capable of holding 500,000 gallons, and from these reservoirs the water is pumped into the tanks as required. There is, however, no general circulation through the system of tanks and reservoirs, as at the Crystal Palace, but each tank is treated independently, and its water is aërated and kept moving by the injection of air by steam-power at the lower part. The effect is that the air, not being minutely divided and so permeating the whole of the water, rises rapidly in large bubbles to the surface, and the benefit of its presence is quickly lost. It has been said that this stream of slightly-compressed air *cools* the water through which it passes. This however, is a mere guess-statement, put forward at random with the hope that no one will question its accuracy. Unless the air were specially cooled, as is not done at Brighton, it might, indeed, *warm* the water. The only way in which cooling could be effected by such air is by the agitation caused at the surface when the bubbles there break, and a slight absorption of caloric would be caused by the evaporation thus occasioned, insufficient, however, to be indicated by any thermometer of ordinary construction. Practically, this attempt at aëration is not effective, for at times the water in the tanks is not clear, and it is then let out and replaced by fresh water, either drawn from the reservoirs or from the sea direct. Whatever success there is in the Brighton system is due to the immense body of water the show-tanks contain, which enables the water to remain longer unchanged in the tanks without detriment to the animals than would be possible in a smaller aquarium. It may be accepted as an inviolable law or axiom that whenever the water in any aquarium, sea or fresh, has to be changed at any time, or from any cause, such change or renewal is an admission of erroneous construction or management, or both. That cannot be a perfect system which is not applicable to *all* circumstances. The Brighton system is no doubt successful so far as it goes, but it is utterly unsuited for any inland town, owing to the expense of replacing the sea-water. On the other hand, the Crystal Palace system, while the only one which is suitable to inland towns, is equally suited to seaside situations.*

EXTENSION OF THE METROPOLITAN RAILWAY TO ALDGATE.

THE works for the extension of the Metropolitan Railway from Liverpool-street to Aldgate have just been commenced by Messrs. Aird and Messrs. Lucas, the contractors. The line, which is nearly three-quarters of a mile in length, commences by a continuation of the present line on the south-west side of Liverpool-street, near its junction with Bishopsgate-street, which it crosses under, and thence runs parallel with Houndsditch on the north-east side, terminating on the north side of Aldgate, nearly opposite the Minories. For the purposes of the line a large number of houses in Devonshire-square and other streets along the route, between Bishopsgate and Aldgate, are now in course of demolition, and to clear the ground for the erection of the Aldgate station seven houses and shops on the north side of Aldgate, having a frontage of about 120 ft. in length, are also being taken down, preparatory to the new station buildings being erected simultaneously with the construction of the extension line.

INAUGURATION OF THE SOUTH METROPOLITAN TEMPERANCE HALL.

THE South Metropolitan Temperance Hall in Blackfriars-road, which has already been noticed in the *Builder*, was formally inaugurated on the 21st ult. It may here be incidentally stated that, according to an announcement placed in front of the building on Saturday last, the structure is to be associated with the inevitable skating-rink, "Site for the South Metropolitan Skating-rink" being prominently displayed. The company who own the building have a large area of vacant land at the rear, extending to a depth of about 300 ft., and it is upon this land that the skating-rink is about to be formed, to which there will be a separate entrance from Blackfriars-road.

The new building, as now completed, is a prominent feature in the architecture of Blackfriars-road. The Blackfriars elevation is carried to a height of more than 60 ft. On each side of the ground-floor are two shops, the entrance to the hall being in the centre, approached by flights of steps on either side, with Portland stone piers at each angle, supporting ornamental lamps. Over the entrance, which is divided in the centre by a column in Mansfield stone, there are Gothic arches surmounted by carved pediments in Portland stone, and supported by Mansfield stone piers. Above this is a mezzanine floor, the elevation of this part of the structure being in Pether's red diaper brick, with a semicircular projecting stone balcony over the entrances beneath, and a bold projecting cornice carried across the line of frontage. Above is a lofty story, containing the great hall, lighted from Blackfriars-road by several large Gothic windows, the central window being 15 ft. in height and the six on each side 12 ft. high. The elevation is surmounted in the centre by a lofty gable, flanked on either side by stone turrets. Mr. John H. Swan is the architect, and Mr. Deards was the builder, and the cost has been about 7,000*l.*

* To be continued.

ASSESSMENT OF PROPERTY AT THE WEST END.

A PECULIAR assessment appeal against the rating of a West-end mansion came before the general assessment sessions last week. Sir D. C. Marjoribanks, together with the overseers and vestry of St. George's, Hanover-square, appealed against the assessment of the hon. baronet's mansion by the special sessions of that parish. It was stated that when the mansion was rated by the parish, he appealed to the special sessions, asking for a reduction of the amount. After an argument, the special sessions not only reduced the assessment to the amount originally asked for, but went even below that, which by this appeal the parish contended was illegal, arguing that the special sessions had no power to reduce the amount below that originally asked for in the court below. Sir D. C. Marjoribanks stated that the structural cost of the house was 55,000*l.*; but that did not include decorations, which amounted to about 10,000*l.* Witnesses in support of the appeal stated that it would be difficult to obtain a tenant for the house at more than 1,500*l.* a year; but the court fixed the rateable value at 2,000*l.* gross, and 1,667*l.* net.

PASSENGER TRAFFIC BETWEEN ENGLAND AND FRANCE.

NOW that the construction of a sub-marine tunnel is seriously contemplated, it will be of particular interest to study the statistics relating to the passengers who cross the Channel. During the year 1874, according to the English consular report, the number of persons who embarked and disembarked at Calais amounted to 199,345. At Dieppe, in the same year, there were 58,235 passengers; at Boulogne, 110,419; and 24,265 at Havre. If we add to these figures the 45,495 persons who crossed the Channel to or from Ostend, we have a total number of 437,759 passengers, of whom 217,145 left France and Belgium for England; while 220,614 left England for the Continent. It remains to be seen how many of these passengers will prefer the gloom of the tunnel to the nausea of the Channel. Sanguine promoters of the scheme are tempted to conclude that travellers will almost unanimously prefer the tunnel, and that their number will be greatly increased. Considering, however, that there are many persons who now travel to Newcastle, Edinburgh, Bristol, and other ports by sea, notwithstanding the elaborate network of railways running constantly to and from these towns, it will not be surprising if a still larger proportion of travellers continue to patronise the Channel steamers even when the tunnel has been proved a success. The question remains whether it is worth while incurring the risk and cost of constructing the tunnel if it is destined to be patronised by only a portion of the half-million or so travellers who will be journeying annually to and from the Continent by the time this great work is completed.

THE COST OF GERMAN RAILWAYS.

THE construction of the railway net of Germany, of a length of 18,760 miles at the end of 1875, has cost 322,500,000*l.* The 3,000 miles in course of construction have already consumed over 30,000,000*l.*; so that over 350,000,000*l.* altogether are invested in German railways. With few exceptions, they have been made within the last thirty-five years, the last ten years showing a growth greater than that of the previous twenty-five. While in the latter period only 9,075 miles have been opened, since 1865 9,685 miles have been thrown open for traffic. During the same time existing railways were greatly added to, so that during the last ten years about 225,000,000*l.* have been expended in railway works. This makes 5*l.* 8*s.* per head of population, which may be considered as savings of the nation, only inconsiderable amounts of German railway shares being held by foreign investors, while foreign railway stock to the value of several hundred million thalers is held in Germany.



LEATHER WAREHOUSES, BERMONDSEY.—Mr. Billing, Architect.

NEW WAREHOUSES, WESTON-STREET, BERMONDSEY.

"There's nothing like leather"; anyhow there is a movement in the market for it just now. The two large warehouses we have represented have just been erected for Messrs. Cleeve W. Hooper & Sons, late of Lime-street and Leadenhall-market, City, upon land belonging to the "Guy's Hospital Estate," the site having been cleared of a number of small houses for the purpose. They are situate near to the Bermondsey Leather Market, where several buildings for the leather trade have lately been erected, and a growing demand for others exists. They are built of brick, the principal front in Weston-street being faced with red brick and Bath stone, the side front of red and white bricks. The plinth is of granite. The basement is well lighted, and the floor formed of concrete and asphalte, the latter being carried up to the height of 4 ft. all round the inside walls to ensure the goods placed therein being free from damp. The ground and first floors, facing Weston-street, are fitted up and used as offices by the firm; the whole of the other floors are appropriated for hide and leather. The contract for the whole of the works has been carried out by Mr. Mann, builder, from the designs and under the superintendence of Mr. Arthur Billing (surveyor to the hospital), of the firm of Messrs. Newman & Billing, architects.

STREET ARCHITECTURE, MANCHESTER.

Our illustration shows the major part of a very considerable block of building at the junction of Deansgate, now one of the main thoroughfares in Manchester, with John Dalton-street. On the ground-floor are shops, and on the upper floors, offices, and the basement is unusually commodious and well lighted, there being a large area in the centre of the site, faced with white-glazed bricks. The open arcaded angle entrance, together with the banking-room adjoining, and the manager's, board, and strong rooms behind will be occupied by the Queen's Building Society, —a society which is probably the largest in the Provinces, its annual income being nearly 1,000,000*l.*, and having over 16,000 investors. The business transacted is so extensive that in reality it is a mortgage bank, as all its investments are used in making advances upon real property, including warehouses, shops, offices, dwelling-houses, and cottages, and its members are drawn from all classes of the community.

The total area of the buildings is 117,000 square feet, and the façades in the two principal streets are entirely faced with Yorkshire stone, the corridors and staircases being fireproof, lined to dado-height with glazed tiles. Messrs. Robt. Neill & Sons are carrying out the works. The style is an adaptation of English late Gothic to modern uses. The windows, being nearly all square-headed, and having an average width of 2 ft. of glass between each stone mullion, abundant light is obtained. The details of the style have been carefully considered and worked out by the architects, Messrs. Pennington & Bridgen, of Manchester & London.

ART AND HISTORY AT ST. ALBAN'S.

A meeting of the St. Albas's Architectural and Archæological Society was held a few days ago, and three papers were read. The Rev. H. Fowler described "The Boundary Wall of St. Alban's Monastery and its Adjuncts in the Time of Abbot Thomas de la Mare" (abbot 1349-96). Mr. R. R. Lloyd, the active secretary of the Society, read a paper "On the Paintings on the Choir Ceiling of the Abbey Church," the pith of which we give:—

It is my intention to bring before you a brief account of the paintings upon the ceiling of the choir, disclosed to view by the removal of the later series of paintings which had hidden the earlier ones from view. Reckoning from the western arch of the tower, westward as far as the rood-screen, there are sixty-six panels, arranged in eleven transverse rows of six panels each. In every row we find three panels, each charged with a shield supported by an angel, alternating with a like number bearing the sacred monogram I H C, drawn in four different ways, and surrounded by a scroll. The only exceptions to



STREET ARCHITECTURE, MANCHESTER.—MESSRS. PENNINGTON & BRIDGEN, ARCHITECTS.

this rule are to be found in the two central panels of the middle or sixth row, which contain representations of our Lord and St. Mary the Virgin, under canopies. There are also inscriptions, which occur only upon these panels bearing shields.

I will now proceed to read a description of the paintings and inscriptions, as they actually appear, adding the complete form of the quotations :—

Row I.—Panel 1.—Tibi laus & glia o ba trinitas
(Tibi laus et gloria o beata trinitas)
azure, 3 crowns or
Scutum sci Edmundi regis.
2. I H C.
3. Te laudat os creatu o ba trinitas
(Te laudat omnis creatura o beata trinitas)
azure, a saltire or
Scutu sci albani martiris.
4. I H C.
5. sals nra o ba trinitas
(salus nostra o beata trinitas)
gules, 3 crowns or
Scutu sci Oswyni regis.
6. I H C.
Row II.—Panel 1.—Simme trinitati once.
2. (Summe trinitati ?)
arg. a cross gu.
Scutu sci Georgii.
3. I H C.

* * * * *

[We must be satisfied with giving only a specimen of the inscriptions.]

Remarks upon the paintings fall naturally into—1st, the inscriptions above the shields; 2ndly, the charges upon the shields, and the inscriptions beneath them; 3rdly, the probable date of the execution of the work.

1st.—The inscriptions are only found upon those panels bearing shields, so that there are three in each row except the VIth, or thirty-two in all. Those in the first two rows are devoted to praise and prayer to the Holy Trinity. Next come portions of the *Te Deum*, amounting to twenty-three out of the twenty-nine clauses of which this hymn is composed, and occupying all the remaining rows, except the sixth or middle one. The first few words only of many of the clauses were given, as the space was too limited to contain the whole sentence. Thus the ceiling was made to re-echo, as it were, the glorious hymn of praise which the monks chanted in their stalls below.

The middle row (No. VI.), having its two central compartments occupied, as was mentioned above, by paintings of our Lord and St. Mary the Virgin,* two only of its panels possess inscriptions :—

2. Glory be to the Father, and to the Son, and to the Holy Ghost.

6. Glory to God in the highest.

Three clauses of the *Te Deum* (the number required for a single row in the ceiling) are missing between Rows V. and VII, as if they had at first been painted upon this middle or sixth row, and were afterwards painted out to make room for the existing designs.

2ndly.—I now come to the heraldic charges exhibited upon the thirty-two shields, and the inscriptions beneath them.

I.—1. Shield of St. Edmund (king of East Anglia).

5. Shield of the Emperor Constantiue.

In this example, as well as in that of the Crusader king of Jerusalem (Row VII., panel 3), the positive rule in heraldry that metal shall not be placed upon metal has been purposely broken, probably in order to distinguish these arms from those of every other sovereign.

IV.—4. Shield of the King of England.

The coat "France Ancient" (semée of fleurs-de-lys) was in use in the quartered arms of the English sovereign from 1340 up to 1403, when King Henry IV., following an alteration made by the French king as early as 1364, adopted "France Modern" (3 fleurs-de-lys). Here you will not fail to notice the use of the more ancient charge.

It is remarkable that in this instance the customary arrangement is reversed in the quartering, so that instead of France occupying the first and fourth quarters, these are assigned to England, and the second and third quarters given to France. It is also followed in the other four examples of the quartered coat of England and France which this ceiling furnishes, whilst on a sculptured shield on the western side of the doorway leading from the church to the cloister, the usual arrangement is adopted, as also in the stained glass, in a window in the north aisle of the nave.

* 3. B. V. M., seated, nimbed and crowned; round her seven stars; above her a groined canopy.
4. Our Lord seated, nimbed with cross nimbus, right hand raised to bless, in left hand orb and staff with vexillum; above Him a groined canopy.

6. Shield of the King of Portugal (Scutu regis portingalie).

This [arg. 3 dice sable, each charged with 6 dots arg.: the whole within a bordure gu. charged with 7 castles] differs from the arms commonly assigned to Portugal, viz., arg. five escutcheons in cross az., each charged with as many plates in saltire: the whole within a bordure gules, upon which eight castles or.

V.—5. Shield of the King of Man.

The Isle of Man belonged, at the presumed date of this work, to William Montacute, Earl of Salisbury, who sold it in 1393 to William Scrop.

VI.—2. The shield of Faith (Scutu fidei).

The triple tau [here Gu., a triple tau arg.] is a common Mediæval device, but I am not aware of any other instance in which it has this title assigned to it.

6. The shield of Salvation.

A very suitable name for this design (Scutum sa tionis) [arg. a cross with three nails, and crown of thorns sa., surtout a spear, and rod with sponge, in saltire, between a hammer and a scourge, all gu.], which represents the instruments of the Passion.

The middle row in the ceiling has thus a special dignity imparted to it by the elaborate paintings in the two central panels, and by sacred devices, in place of heraldic ones, being painted upon the shields.

VII.—3. Shield of the King of Jerusalem.

(See remarks upon the shield of the Emperor of the Romans.)

VIII.—6. Shield of Lord Thomas, son of the king (Thomas Woodstock, sixth and youngest son of King Edward III.).

IX.—5. Shield of the King of France.

This is France Ancient, the field being semée of fleurs de lys.

X.—2. Shield of the Duke of Lancaster. (John of Gaunt, fourth son of King Edward III.)

4. Shield of the Prince of Wales. (Edward the Black Prince, eldest son of King Edward III.)

6. Shield of the Duke of York. (Edmond of Langley, fifth son of Edward III.)

XI.—5. Shield of the King of Scotland. This has a single tressure in place of the usual double one.

The six shields in the first two rows are devoted to saints; Row III. has our Lord as king of the Jews on the middle shield, between two emperors on the side ones; sacred symbols appear upon the two shields in the middle row, No. VI.; all the shields in Rows IV., V., and VII., the second and fourth panels in Row VIII., and the six shields in Rows IX. and XI. are allotted to the arms of European sovereigns, those of the Crusader king of Jerusalem being reckoned with them. The third shield of Row VIII., and all those of Row X., are assigned to four out of the seven sons of Edward III.*

3rdly.—Nearly all the heraldic evidence is in favour of the date of the work belonging to the later years of King Edward III. (reigned from 1327 to 1377).

(*a.*) The arms on shield 4, Row IV., assigned to the "King of England" are those in use in his reign.

(*b.*) The omission of the arms of Lionel, Duke of Clarence, third son of Edward III., seems to show that the work was executed after his death, which took place in 1368. This date, then, we may take as a starting-point, since the ceiling cannot bear an earlier date.

(*c.*) The arms on shield 4, Row X., being those of the Prince of Wales, point to a date not later than 1376, the year of his death, and confirmatory of this are the arms and inscription on panel 6, Row VIII., of "Thomas, the King's son," or Thomas of Woodstock, who was known by this title and these arms until 1377, when he was created Earl of Buckingham.

So far all is clear; we seem to have arrived at a date, for the series of paintings, between 1368 and 1376, which is quite as near as we can hope to get.

With this, too, coincides the style of the two central figures in Row VI.

But, on the other hand,† the arms and the inscription upon panel 6, Row X., to Edmond of Langley, who is there styled "Duke of York," both belong to a period subsequent to 1385, in which year he was raised to the dukedom.

Here, then, we find ourselves in a difficulty; for this coat of arms and inscription carry us at least eight years later than the time of King Edward III.'s death.

I may add that the canopies over the two central figures above mentioned do not look earlier than 1385.

So far as I can see, there is but one solution of the puzzle, and it is this: That the main features of the work pertain to the period between 1368 and 1376, whilst certain additions and alterations, notably to the arms and inscription to Edmond of Langley, Duke of York, were made subsequently to 1385, and before 1402.

From the *Gesta Abbatum* we learn that about the year 1314, King Edward II. gave a quantity of timber for the repair of the choir-stalls, and these, which were constructed by workmen skilled in wood-carving, under the direction of one Master Geoffrey, seem to have cost many years of labour, and to have been brought to completion by the year 1369. The choir was probably bounded at each extremity by a light screen; the eastern one, which stood beneath the eastern arch of the tower, separating it from the presbytery, and the western one standing one bay east of the existing stone rood-screen. Between these two was a passage, running north and south, as at Durham, which served as a vestibule to the choir. The canopied stalls, which, starting on each side from the eastern arch of the tower, extended under it westward to within one bay of the rood-screen, had two return-stalls of their western limit. These return-stalls, facing east, were appropriated, the southern one to the abbot, the northern one to the prior, who were thus enabled to keep watch over the behaviour of the monks. In 1874, in lowering the floor to its original level, the rubble foundations of the whole series of stalls (including the return-stalls) were found, and this discovery confirmed the description in the *Gesta Abbatum* of the arrangement of the stalls in every particular. My reason for making these remarks upon the choir-stalls is, that the account of the date of their construction renders it very likely that the construction and decoration of the choir ceiling would be taken in hand soon after the stalls themselves had been completed, and it is therefore of great value as a piece of independent evidence.

Mr. J. Chapple read a paper "On the Work of Restoration." The following is an extract as to the choir ceiling :—I may be permitted to mention the circumstances which led to the discovery. Under the choir contract this ceiling was to be substantially repaired. In carrying out the works it was ascertained that the panels of this ceiling were loose (each panel could be lifted out). They were taken out, and while workmen were screwing strengthening-pieces on the backs, it was seen that some had had a former coat of colour. The whole surface of the ceiling had been repainted in a very indifferent manner in the seventeenth century. Mr. Cobham, an artist, from the firm of Burlison & Grylls, being at work at the Abbey, suggested the removal of the later paint. This was a work of some difficulty, and required much skill. However, it was by him successfully accomplished. He peeled off the outer skin, and exposed to view a painting of exquisite beauty,—"The Shield of Faith" (Row VI., panel 2). So signal a success attending the first efforts, five other panels were similarly treated, and each presented a new subject of similar artistic value. Feeling it would be an act of barbarism not to present to the world such a fine example of ancient art, the scaffolding was retained in the hope that some one would supply the necessary funds. The result of the expenditure (300 guineas) has been to save from oblivion a fine work of the fourteenth century—a painted ceiling not to be surpassed in England for beauty or historical associations.

* King Edward III., Edward Prince of Wales, John of Ghent, and Thomas of Woodstock, are all mentioned in the Book of Benefactors as having made gifts to the Convent.

† Quarterly England, and France Ancient: surtout a label of 3 points arg., each charged with 3 torteaux Scutum ducis Eboraci. It is not known at what exact period the label charged with torteaux was substituted for a new label counter componée, or chequée, which distinguishes this prince in the Burghersh monument at Lincoln, c. 1360.

Mr. Geo. Locke, Carver.—We are sorry to hear of the death of this gentleman, one of a family which, for four generations, has been identified with the art of wood-carving. He was many years the designer to Messrs. Charles Hindley & Sons, Oxford-street, but had been for some time in business on his own account, and was devoted to the development of artistic furniture and decoration. At the time when the Society of Arts offered prizes for art workmanship, Mr. Locke was very energetic in the aid he rendered, and we printed several letters from him. His death was caused by an overdose of morphia.

LIGHT AND COLOUR.

SIR,—In what a perplexing state of confusion is the subject of "light." Where will the student find rest if he merely desires to rely upon authority? The Newtonian hypothesis of gravitation we were once taught was fully adequate to explain the relative position and movements of the heavenly bodies. Now, light is said to be the repelling agent, and what is included, in our text-books, amongst the imponderables, is weighed! Vibrations are endowed with a propelling power, &c.! And thus what we are taught by one physicist is totally incompatible with what we are taught by another. The best course, then, is either to suspend our judgments, or to take the matter in hand and investigate it for ourselves. Mr. Benson will find, both in my treatise and in recent letters in the *Builder*, that I have stated that Newton did not attribute light to the rays themselves or to external things. In that particular part of my essay to which he refers, I am alluding to some moderns who do not possess the Newtonian grasp of thought. Even Mr. Benson himself does not seem quite to have mastered the conception that light is a sensation. He discourses about a luminiferous ether. This language does nothing more nor less than attribute light to matter itself. He, however, is, either fortunately or unfortunately, not alone in this misconception.

We have rejected Newton's hypothesis of propulsion, and have accepted the conception of vibratory action. Good! Now, do not let us veer and shift from this to re-import a little propulsion or introduce a luminiferous and very mysterious ether. Grant the existence of this ether, what then? It is but matter which, being made tremulous by the action of the sun, produces all the various sensations of light in the optical organisation. The ether is not luminiferous. Light has, as Newton stated with reference to his different hypotheses, no external existence to sense but as a mode of motion. Mr. Benson in his Manual further confuses this elementary portion of the subject by using the expressions, "Colour sensations simple and compound," "Three simple or elementary sensations of colour," &c. What Mr. Benson means to say I suppose is this, that there are three elementary wave periods which, either separately or combined, produce all the sensations of light. We know nothing more about sensations than that they are sensations. We do not combine the sensations. We either change or compound the external vibratory action, and thus produce a different sensation. W. C. T.

COLOUR.

SIR,—Mr. Benson decidedly goes beyond the mark when he says that "it is reserved to me to prove that colours are something inherent in the object by breaking a brick and showing that the colour of the inside is the same as that of the outside." I never attempted any proof of the kind. What I said merely amounted to an assertion of what common sense tells us is a simple fact, and it is for him to disprove it, if he can.

I again assert, what in my opinion requires no proof, that colour is inherent in everything, and that all objects in nature, of whatever kind, whether they be opaque or transparent, have their own natural colour. Even the atmosphere is not colourless, while light contains all the colours of the spectrum, and alters the colour of objects illuminated by it according as one or another of these colours predominates. I agree with him that colours are sensations—that is, we cannot perceive them but by the aid of one of our senses—the sense of vision. Nor can we perceive anything but through our senses, and therefore it follows, that there are many other kinds of sensations besides that of colour. For example, if Mr. Benson were to run his head against my redbrick, as he appears rather inclined to do, he would find that that was a sensation, and a very *striking* one too. JAMES K. COLLING.

SANITARY POLICE.

SIR,—With extreme pleasure I perused your remarks on the proposed action of the Society of Arts with reference to a sanitary conference. I have thought for years that the Government ought to establish a system of sanitary police to hunt up delinquent local authorities,—and they are legion.

I have looked into the condition of a great many of our towns and villages, and some of the results you have published, and do not need to assure you it will be perfectly useless for the Society of Arts Council, Government, or, for that matter, any one, to attempt to collect reliable information, either by correspondence or verbally: it should always be by personal examination on the spot, and close examination too, or those conducting the inquiry will be grievously deceived. Such is my experience, that local people will practise deception, though often unconsciously. R.

A DESERVED RECOGNITION.

On Tuesday evening last Mr. J. R. Planché was visited by a number of his friends to congratulate him on attaining the age of eighty. In the course of the evening the following little address (which had been hastily determined on), written on vellum and pleasantly illuminated, was presented to him:—

TO JAMES ROBINSON PLANCHÉ, ESQ.

Somerset Herald and Good Fellow.

On the occasion of his 80th Birthday,

FEB. 27, 1876.

WE, your loving friends, who are gathered together under your roof on the 29th of February, rarest of days, to celebrate your 80th birthday, not many hours past, desire to leave behind us some brief record of the incident more tangible than spoken words. Rejoicing, we salute you! And, while striving to do you honour, are gratifying our own feelings, inasmuch as we thus note ourselves the bidden guests who represent ten times the number of good friends out of doors, excluded only by brick-and-mortar limits. Some of us can look back to those times when the town was delighted with the "Revels," and the "Devils," "Riquet with the Tuft," "The Invisible Prince," "The Island of Jewels," and a dozen other bright compounds of poetry and fun, all free from the smallest taint of evil. The more legitimate amongst us will perhaps recall "Charles XII.," "My Lord and My Lady," and "The Knights of the Round Table"; the poetical will think of "Oberon" and "Love's Triumph," or long for "William with the Ring"; the younger may sigh out "Faint Heart never Won Fair Lady," and thank you afterwards for "The Loan of a Lover." While the student of history will prefer to have you all to himself in "A Corner of Kent," with "The Pursuivant at Arms" and "The Conqueror and His Companions"; make free with your better part locked up in "The Cyclopædia of Costume"; or study Arms and Armour under your scholarly guidance in the Tower. As dramatist, as poet, as antiquary, and Herald, we, in common with thousands besides, salute you; and then, more privileged, we go further and hail you, friend! Bright, cheery, good, and genial friend! Recollections of personal sacrifices, made at the call of Duty and Love, occur to some of us; but these have brought you their own reward, a satisfied conscience, and loving hearts all round you. Advancing years have for you no fears:—

> "For age is opportunity no less
> Than youth itself, though in another dress;
> And as the evening twilight fades away,
> The sky is fill'd with stars, invisible by day."

Long, dear Planché, may you live to serve and please the world, and to make happy your large circle of affectionate friends

Amongst the signatures were those of Mrs. Keeley, Mr. Birch, Mr. S. Tucker (Rouge Croix), Mr. and Mrs. German Reed, Mr. Corney Grain, Mr. Arthur Cecil, Mr. Arthur Sketchley, Mr. Dillon Croker, Mrs. March, Miss Thackeray, Mr. Palgrave Simpson, Mr. Gibson, Mr. John Clayton, Mrs. Twiss, Mr. Van Wart, Sig. Gilardoni, Mr. Bendall, Mr. G. Godwin, and others.

PROPOSED ROYAL ALBERT BRIDGE, CANADA.

THE impetus which for several years past has been given to the construction of railways on the north of the St. Lawrence and Ottawa rivers, with a continuation through to the waters of Lake Huron, to tap the lake traffic of north-western States, a more immediate connexion by rail of the great lumber districts of the St. Maurice and Ottawa rivers, including their numerous tributaries, with the leading markets in the United States, the geographical position of Montreal, almost on the air-line, as well as other important considerations to be glanced at, are thought to demand a second bridge over the St. Lawrence at this city, in order to effect a union of those Eastern, Northern, and Western roads with the great American system on the South, and secure an easy and cheap interchange of traffic.

The point of crossing determined on is nearly identical with the one pointed out many years ago for the Victoria Bridge, when it was proposed to pass the river by a span of then unheard-of dimensions, from St. Helen's Island to a point east of the Market-place, and thence by arches northward to Côte à Barron.

The idea of that day is now being realised in the proposed Royal Albert Bridge, a fit mate for the Royal consort a couple of miles farther up the river. In combination with its railway traffic it has also been thought desirable to accommodate that of ordinary character, such as city passenger cars with dummy engines, the various descriptions of vehicles, and also to afford ample space for pedestrians.

The *Canadian Illustrated News* of the 12th of February, which contains a view of the proposed bridge, gives also full particulars.

Leaving the level of the ground on the line of Sherbrooke-street, it is carried as a viaduct east of and parallel with Colborne-avenue, at a level of 90 ft. above the surface of the ground, in spans varying from 150 ft. to 200 ft. each. Striking the navigable channel of the River St. Lawrence, near Molson's Brewery, it passes over to St. Helen's Island with six spans. The bottom of the superstructure will be carried level from Sherbrooke-street to the centre of St. Helen's Island, there meeting the natural surface of the ground. This will give a clear headway of 130 ft. above summer water-level in the harbour, or say 120 ft. above winter level. (The latter figure is the height of the Britannia Bridge above mean tide level, determined by the British Admiralty as a suitable elevation for navigation purposes). Reaching St. Helen's Island, four spans of 240 ft. each will carry the bridge to the height of land, where this first section will terminate. From the south side of the island the second section of the bridge will be carried over the unnavigable channel of the St. Lawrence to the south shore by twenty-one spans of 200 ft. each, grading down with an inclination of 1 ft. in 100 ft. Reaching the south shore the bridge becomes again a viaduct, of five additional spans of 200 ft. each, or until the superstructure has approached within such a distance of the natural surface of the ground as to make embankment more economical; and thence proceeds with ordinary grading to a junction with the Montreal, Portland, and Boston Railway, and also the Grand Trunk.

The total length of the bridge and viaduct will be 15,500 ft., or within a fraction of three miles; and the extreme distance covered from the point of departure from the Quebec, Montreal, Ottawa, and Occidental Railway on the Mile End heights, to the junction with the line on the south side, will be 5½ miles.

The iron superstructure from end to end will be composed of four independent longitudinal ribs, or open lattice girders, placed certain distances apart, and strongly connected laterally.

These ribs will be provided with the usual friction rollers on each alternate pier, to provide for expansion and contraction. Between the two inner girders, on the lower floor, will be a span of 18 ft. to accommodate two tracks for trains of city cars, to be drawn by dummy engines. Between the two inner girders and outside girders, on each side of the bridge, will be spaces of 14 ft. respectively, for ordinary cart and wagon traffic, passing in one direction on the western, and in the opposite direction on the eastern side of the bridge. Exterior to these two outside girders will be footwalks, firmly supported on brackets of iron, strongly attached to the side girders and floor beams; they will each possess a width of 8 ft., and be provided with ornamental railing for the protection of pedestrians.

At a distance of 15 ft. above the lower floor will be placed a second one, strongly connected and braced with iron kelsons and gussets to the longitudinal girders; on this floor, between the two iron girders, will be placed a railway track, with crossing arrangements for trains at St. Helen's Island. The spaces existing between the inner and outer girders will each possess the width corresponding to the carriage-ways below, and are intended for carriages and other vehicles requiring a higher rate of speed than carts or wagons. Should a second track ever be required for railway purposes, across the entire length of the river, a fifth girder can be erected on the up-stream side of the bridge, and be supported by iron columns from the saddles of the ice-breakers, at a comparatively small cost.

The entire height of the bridge from the surface of the water will be 210 ft. for the centre span, or 250 ft. from the foundation.

Carriages and carts will have access to or departure from the bridge on the level of Sherbrooke-street, and possibly at some suitable points between that street and the river, by means of incline approaches. Pedestrians or those wishing to take the city cars will also ob-

tain access to the bridge in this manner. The total cost of the bridge is estimated at 5,000,000 dollars.

The superstructure has been designed for carrying the following live load under a coefficient or factor of safety of six; in other words, the weight of live load to be presently mentioned, including the weight of the bridge itself, is but one-sixth of the ultimate strength, or actual breaking-weight of the structure.

1. A train made up of locomotive engines, running thirty miles per hour, equal per lineal foot to 2,500 lb.

2. Two trains of city cars, with dummy engines loaded with passengers, going six miles an hour, say 2,500 lb.

3. Carriage-ways and foot-walks, loaded at 100 lb. per square foot, equal to 7,500 lb.

Making a total of 12,500 lb. per running foot, or, divided into the four girders, will make each one carry, in addition to its own weight, about 3,100 lb. per running foot. Mr. Charles Legge, C.E., is the engineer.

COATS OF ARMS, LEICESTER MUNICIPAL BUILDINGS.

IT is said to be the intention of the Town Council in Leicester to place in one of the windows of the new Municipal Buildings the coats of arms of all the gentlemen who have filled the office of Mayor of Leicester since the year 1837. As this will be an official act of the municipal body, and the insignia inserted in the window will remain there probably for generations, it has been properly urged that the armorial bearings should in each case be duly authenticated by the officers of the Heralds' College. If not, what check will be provided against the uninformed presumption of persons whose vanity may outweigh their scruples as to the honourable course in this respect? Should the Town Council permit the insertion of coats of arms without due evidence and authority, they may unwittingly countenance imposture, and the exhibition will become ridiculous in the eyes of well-informed persons.

Coats of arms ought only to used by those persons who are descended from families which were entitled to them before the date of the foundation of the Heralds' College in the reign of Richard III., or by a grant of arms at a subsequent date, obtained from that College. Any male descendant from an original grantee is entitled, after any lapse of time, to resume the family escutcheon, if so disposed. Strictly, however, no other person is justified in pursuing the same course,—not even a brother or cousin of the grantee. In the case of families recently enriched by commerce or manufactures, it is not uncommon for the heads of such families to procure grants of arms from the Heralds' College. These may be obtained at an expense of about 80*l.* in each case.

CHAPEL, VICARS' CLOSE, WELLS, SOMERSET.

THE interesting structure at the north end of the Vicars' Close, Wells, which consists of the chapel (formerly attached to the College of Vicars Choral), the work of Bishop Ralph de Salopia, and the library over it, probably the work of Bishop Beckington, has been lately restored handsomely. It had long been felt that the Theological College at Wells (almost the earliest of such institutions) ought to possess a chapel of its own, instead of using that attached to the bishop's palace. Some three years since the opportunity occurred of obtaining (on fifty years' lease) the above chapel, which for some time past had existed in a melancholy state of dilapidation, mouldy and dusty, the Vicars Choral being only obliged by their charter to have service there once a year. The total cost of the restoration (upwards of 1,000*l.*, including painted glass, &c.) has been borne by past and present students of the college, with the help of a few others. In size the building is very small, *i.e.*, 21 ft. 7 in. by 14 ft. 8 in., and is well delineated in Pugin's "Examples of Gothic Architecture."

Externally, the works of restoration may be thus briefly described. The ground has been excavated on the north and south sides, to relieve the excessive dampness, a dry area formed on the north side, and the plinth fully exposed to view on the south; the plaster and rough-cast removed (being not original), the joints of the stonework raked and pointed in Portland cement. The windows, south doorway (with its charming Mediæval handsome oak door), buttresses, and general ashlar facing, have been repaired where necessary, as well as the elegant embattled parapet and canopied niches on the south side, together with the gabled bell-turret.

The east window of the chapel (formerly blocked up) has been opened out. All the windows have been reglazed, several of them in painted glass, the Mediæval material worked up with the new, by Messrs. Clayton & Bell. The subject of the east window is Christ giving His charge to the Apostles to preach. The old stone altar-slab has been relaid under a new oak table, and an encaustic tile pavement put to the sanctuary. The ancient screen at the west end of the chapel has been repaired and added to, and wrought-iron gates are to be placed there. The original stalls have been replaced. The elaborate panelled oak ceiling has been repaired and strengthened. The whole of the internal walls have been replastered, and a scheme of coloured decoration, prepared by Messrs. Clayton & Bell, will shortly be carried out. A new fireplace, of handsome design, has been inserted in the north wall of the library, having an ornamental chimney-shaft, in character with those in the Vicars' Close. The roof of the library, too, formerly flatly ceiled, has been opened out and repaired.

The works have been carried out by Mr. G. P. White, of Vauxhall Bridge-road; Mr. Ferrey, F.S.A., being the architect.

PIECE-WORK.

AT the Artisans' Institute, last week, a discussion on "Piece-work,—Is it desirable under any conditions?" was resumed. The Rev. H. Solly presided, the workmen present numbering about 150. Of employers there were present, among others, Mr. Peter Graham, Mr. Hunter Donaldson, of Messrs. Gillow & Co., and Mr. Howard. The president moved the following resolution:—"That in certain trades, and under the management and supervision of a joint committee, composed of masters and workmen, piecework may be advantageous to all parties by giving to diligence, strength, and skill their legitimate reward, and by increasing the amount of production, which benefits alike the public, the employer, and the workman himself, as one of the public and a customer. But without such a committee it is liable to great abuse, tending to deteriorate the quality of work and the health of the worker, to foment jealousies, and unduly to bring down wages both in piece and day work."

An amendment to the above resolution was proposed by Mr. Weiler, cabinet-maker, and Mr. Godfrey, compositor, as follows:—"Seeing that no sound argument has been advanced to show that the system of piece-work is advantageous to the working classes and the general public, and seeing that the system has most injuriously affected those trades where it has been generally adopted, the meeting declares its preference for the principle of day-work." After a brief discussion, it was determined not to put either the resolution or the amendment to the meeting, it being thought that neither exactly met the case, and an adjournment took place.

FINE FEATHERS MAKE FINE BIRDS.

IN the course of a paper on "Ostrich Farming," read by Mr. Simmonds at the Society of Arts, it was stated that the export of feathers from Morocco was, in 1871, 59 cwt., 17,700*l.*; in 1873, 55 cwt., 18,700*l.* In Tripoli the ostrich feathers are brought from the plateau above the first range of mountains, where the ostriches are hunted down during the hot summer months. In 1865, the value of the feathers exported was 12,000*l.*; in 1866, 7,000*l.*; and in 1874, those sent to England rose to the value of 62,000*l.*, and to France, 37,600*l.*

Passing to the British possessions in South Africa, we find that ostrich farming is already an important branch of agricultural industry in the Cape Colony, and promises to become still more so. When it is understood that the value of an ostrich a few weeks old is 10*l.*, and that its value increases rapidly as it grows older, it will be at once apparent that the successful pursuit of this industry is a very remunerative investment of capital. The advance which has taken place in ten years, both in the price of the birds and of the feathers, will give an idea of the importance which this industry has already attained in the Cape Colony. In 1860, a pair of ostriches six months old could be bought for 10*s.*; now, for one bird alone, a few days after hatching, 5*l.* will be given, and for those of three or four months old, 8*l.* or 10*l.* In 1860, the quantity of ostrich plumes exported was 2,297lb., valued at 19,201*l.*; in 1873 the export was 31,581 lb., valued at 159,677*l.* In 1874, the quantity shipped was even larger.

We paid for ornamental feathers, chiefly those of the ostrich, in 1874, nearly 603,000*l.*; and the value of imports of the past year (not yet published) is probably more. Of this amount about one-fourth in value is re-exported, but close upon half a million of money is a large sum to pay annually for a trivial article like feathers, to minister to the pretty vanities and dainty whims of the ladies.

The elegance of the feathers of the ostrich, arising from their slender stems and the disunited barbs, has occasioned them to be prized in all ages, and they still constitute a valuable article of commerce. There is a singular feature which distinguishes them. The large wing feathers of other birds have always one side unequally plumed, whilst in those of the ostrich the quill is in the middle of the feather plume. This equal balance was probably the origin of the hieroglyphic of the Egyptians, who represented Justice by an ostrich feather.

Ostrich feathers dyed black are required for making funeral plumes for horses' heads, in sets of eleven for the hearse, and sets of six for the lid or coffin-board which is borne on the head of one of the undertakers. These plumes are made of a number of pieces of feathers, fastened on to supports of stout brass wire, which are bent downwards when used, so as to give a graceful fall to the plume. When not in use they are closed up on the centre stem. A full set of these plumes for a funeral is worth 200*l.* to 300*l.*, and they are let out by the makers to undertakers.

The total quantity of ostrich feathers imported into the United Kingdom in 1873 was 85,149 lb., valued at 347,390*l.*, and in 1874, 106,919 lb., valued at 323,669*l.*

NEW METHOD OF FIRING POTTERY.

MR. CHARLES MALPAS, of Tunstall, has patented a new system of firing pottery, bricks, tiles, and other ceramic ware, and for burning limestone. On the 15th ult., Mr. Malpas delivered an address, in the course of which he said a manufactory of six biscuit and eight glost ovens at full work would turn out six biscuit and eighteen glost ovens of ware per week. It took about 17 tons of coal to fire a biscuit oven of moderate size, and, about 6 or 7 tons for a glost oven. Six biscuit ovens would therefore take 102 tons a week, and eighteen glost ovens 117 tons, making together 219 tons. The computation might not be absolutely correct, but it was near enough for the purposes of comparison with his own system. He proposed to construct twenty-four small ovens, placed in a ring, and adjoining and connecting. He described the principles on which the ovens would be constructed, and added that there would always be twelve ovens out of the twenty-four in course of firing, and a total of eighty-five ovens of ware a week would be obtained. This, he calculated, would be about equal to six biscuit and eighteen glost ovens of the present kind. The consumption of coal would be 23 tons 15 cwt. for that quantity of ware, against 219 tons 5 cwt. under the present system, showing a saving of 195 tons 10 cwt. per week. His next calculation had reference to seggars. He said at the present time, in consequence of the great height of the "bungs," 3,360 seggars were destroyed per week in a manufactory of eight biscuit and six glost ovens, mainly because the weight of the top of the "bungs" broke or cracked the seggars lower down. There was a total loss by waste of seggars, which he estimated at 6½d. each, of 91*l.* per week. By his system he believed the cost would be reduced to less than one-half that amount, as his ovens would not be more than half the height of the present ovens. There would also be a great saving, both in seggars and wear, by a uniform distribution of heat. He proposed to occupy the interior circle with warehouses and workshops, and this would be a gain both of time and labour. He intended glost and biscuit firing to be going on both at the same time, and this would lead to a despatch in the execution of orders quite impracticable under the system now in use. There would also be a

great saving in the first cost of the ovens, and in the expense of keeping them in good repair. Lastly, the new system would put an end to the smoke-nuisance, so far as the firing of pottery was concerned.

NATIONAL FEDERATION OF EMPLOYERS.

THE second annual meeting of the members of this federation was held on the 25th ult., at the Westminster Palace Hotel; Mr. John Robinson, of Manchester (president of the Association), in the chair. Amongst those present were Sir Thomas Bazley, M.P., Mr. R. Heath, M.P., Mr. J. P. Corrie, M.P., Mr. W. B. Harrison, Mr. Richard Hayworth, Mr. Benjamin Hannen (chairman of Council), Mr. W. Sully (of Nottingham), Mr. Walter Ainsworth (Bolton), Mr. J. T. Smith (Barrow-in-Furness), and Mr. Peter Graham (Messrs. Jackson & Graham.)

The report contained the following paragraph: "The abolition of piecework already occupies the public mind upon the demand of the Amalgamated Society of Engineers, and a fund of 260,000*l.* is stated to be at its disposal for any purpose sought to be effected by its members. This suggests a reference to the gross injustice that money contributed by members against sickness and death should be squandered upon an industrial warfare. It seems to your committee that the time has arrived when there should be enforced, by legislative measures, a distinction between strike funds and benefit funds, so that persons who have contributed to the latter may have a legal claim upon them. At present a system of terrorism is practised, for men who have long contributed to benefit funds naturally shrink from forfeiting what they have saved by disobeying the edict of a committee, however much they may disapprove it."

The president, Mr. B. Hannen, Mr. Fisher Smith, of Dudley, Mr. Graham, Mr. Haworth, Mr. Morris, of Halifax, Mr. Thornton, of Nottingham, Mr. Jackson, of Blackburn, and Mr. Wilson, of Leeds, having spoken,

A vote of thanks was given to the Executive Committee for the zeal and ability with which they had discharged their duties during the past year; and the officers having been elected, the meeting closed with the usual compliment to the chairman.

ROUGH ESTIMATE NOT BINDING.

THE VESTRY OF ISLINGTON *v.* FREEMAN.

IN this case, heard in the Clerkenwell County Court on the 17th ult., before Mr. Gordon Whitbread, the Vestry of Islington claimed from the defendant the sum of 1*l.* 19*s.* 6*d.*, the balance of cost of making a new drain to the house, No. 1, Suffolk-street, Rotherfield-street.—Mr. Layton, vestry clerk, appeared for the plaintiffs. The defendant did not appear, but Mr. James Pope, builder, of Newington-green, who said he had the work in hand of making the drain, appeared for him.

The proceedings were taken under the provisions of the Metropolis Local Management Act of 1856.

In the first instance the cost of making the drain was estimated at 3*l.* 14*s.* 6*d.*, which was paid by the defendant, but on the completion of the work it was ascertained that the actual cost was 5*l.* 15*s.*, and the defendant having refused to pay the balance of 1*l.* 19*s.* 6*d.*, the present proceedings were ordered to be taken by the Vestry.

Mr. Charles Higgins, surveyor of sewers, &c., to the Vestry, stated that in consequence of complaints made as to the sanitary condition of the house, the drain was examined, and found to be defective, and a new drain was ordered to be made to the house. The distance from the house to the main sewer was supposed to be 20 ft., and the estimated cost of 3*l.* 14*s.* 6*d.* was made for that distance, but on the completion of the work it was found that the cost was 5*l.* 15*s.*, in consequence of the greater distance than anticipated of the main sewer from the house, and that was the sum which the Vestry would have to pay to the contractor for general sewer works.

Mr. Pope, for the defendant, said the Act of Parliament did not apply to a case like that where the work was done by a contractor for the parish. The estimate having been given for a distance of 20 ft., he contended that the parish were bound by it, and that to call upon the defendant now for the difference of cost was not the way in which a great parish like that should do its work. He had given in his estimate to the defendant of the cost of the work, founded on the distance being 20 ft., and the Vestry should be bound by the contract being for that distance.

Mr. Layton said Mr. Pope did not do the work, nor had he anything to do with it.

His Honour said that he could not see that the estimate was a binding contract for the work. It was not a special contract, but only a rough estimate.

Mr. Layton said they could not in all cases tell beforehand the exact cost, and when they received too much they paid it back. The Vestry got nothing by it.

The Judge gave judgment for the plaintiffs, but thought it not a case for the cost of witnesses.

NUISANCE CAUSED BY BRICKBURNING.

BUFFY *v.* STEVENS.

THIS was a suit to restrain an alleged nuisance from brickburning, and came before the Master of the Rolls on the 18th ult.

The plaintiff, Benjamin Buffy, was a platelayer, residing at Wimbleburry, near Hednesford, and in 1868 erected his house on ground he had purchased. The defendants, Charles Stevens and William Thomas, were the owners of a plot of ground opposite the plaintiff's house, and in June, 1874, they commenced to use it as a brickyard, erecting a brickkiln within thirty yards of the premises of Buffy, who alleged that the smoke and effluvia therefrom was blown across the street, to his great annoyance and the injury of his house, furniture, and garden.

The defendants contended that as the village of Wimbleburry was in the Cannock Chase Coalfield district, and possessed nothing of a rural character, the plaintiff could not prevent auxiliary works being carried on there, and, in fact, the place was only a collection of habitations occupied by people employed in the adjoining brickyards and collieries. The plaintiff himself was in the employment of the Wimblebury Company, whose brickyards were within 200 yards of his house, and emitted large quantities of smoke and effluvia.

His Lordship said there was really no defence to the case. The plaintiff and his neighbours proved that in summer time they had to keep their windows shut in order to keep out the smell and smoke, and were generally made uncomfortable by the defendants' brickyard. In answer to this no specific evidence was offered. A perpetual injunction was granted against the defendants, with costs.

COMPENSATION CASE.

SCHLEISCHER *v.* METROPOLITAN BOARD OF WORKS.

THIS was a compensation case, assessed by the magistrates under the 121st section of the Lands Clauses Act, in respect of the New Gun public-house, Wapping High-street, the same being required for the widening of that thoroughfare. The claimant held the premises under the usual brewer's agreement, subject to three months' notice to quit. Messrs. Fuller & Fuller, surveyors, were instructed by Mr. J. Webber, jun. (Dyers' Hall), Mr. Schleischer's solicitor, to prepare the claim, but no agreement was come to by the Board or any offer made. The profits from the business were agreed at 600*l.* per annum, and Mr. G. Fuller and other surveyors gave evidence to the effect that the claimant was entitled to two or three years' profits for compulsory removal; the Board, on the other hand, argued that the magistrate should only award at the most three months' trading as compensation. The magistrate, in delivering judgment, observed that the evidence given by the surveyors for the claimant had not been rebutted by evidence on behalf of the Board, and he awarded the claimant 1,650*l.* for compensation according to the Act, and further allowed the claimant a sum of sixty guineas towards his costs in the matter.

ARBITRATION CASE.

HOPSON *v.* LONDON SCHOOL BOARD.

THIS was an arbitration, held at the Surveyors' Institute, before Mr. G. Prickett as umpire. Mr. E. F. Fuller (Fuller & Fuller) represented the claimant, and Mr. Robson was appointed arbitrator on behalf of the Board. The claim was in respect of two houses known as Nos. 114 and 116, Rhodeswell-road, Limehouse, held for an unexpired term of 79½ years, at a ground rent of 7*l.* per annum; and the houses were let at 30*l.* a year each, the landlord paying taxes and doing repairs. Mr. Hopson's surveyors valued the property in question required for the enlargement of the school at from 650*l.* to about 670*l.*, whereas the Board did not call any witnesses. The umpire's award has since been received, and the amount given is 518*l.*

BORAX IN PASTE.

SIR,—Architecture being greatly indebted to Bibliomania, whereby many ancient views of buildings daily re-appear to us in London, I should feel greatly obliged to many of your readers who are interested in the preservation of ancient views and books, whether a small quantity of borax added to paste will in anywise impair its efficacy by discharging printing-ink, or affecting the paper, as much ancient-made paper is under-sized. The thought has just struck me, and is worthy attention of all interested.

PERFORATUS VERAX.

ECCLESIASTICAL DILAPIDATIONS.

AT an adjourned conference of the members of the United Deaneries of Bath and Keynsham, held at Bath a few days ago, the subject of ecclesiastical dilapidations was discussed. As at most clerical conferences on the subject, all the speakers agreed that the diocesan surveyors exercised their powers under the Ecclesiastical Dilapidations Act somewhat arbitrarily. The Rev. Canon Brooke, who introduced the subject, said,—

He brought it forward in consequence of what had taken place at Axbridge, where the diocesan surveyor made this order as to repairs in the chancel:—"The fourlight window in the east wall, with the tracery in head of the same, should be repaired and properly made good, filling the openings with glazed and leaded quarry lights as originally. This will necessitate the removal of the Corinthian columns and entablature in the interior, together with the woodwork at sides, now partly decayed. The stucco of the walls of interior to be then made good." The real matter was this: there had been a reredos put up 150 years before, and what was ordered was not simply the repair of that reredos, but its entire removal and the substitution of another, according to the idea of the surveyor of what had been the original; the reredos having existed for 150 years, it had been received by the outgoing incumbent in the state in which it now was, and now he was required to take it down and put up another one according to the surveyor's opinion of what it should be. There was another case—the Paulton case—in which an order was made for various things that never before existed; things which had been done by the tenant were ordered to be carried out by the incumbent, and other matters dealt with on the same principle. These were not singular instances. In one case, a house was roofed with tiles, more or less decayed, but as all the other houses in the street were covered with slate, a similar material had to be put on the house in question. He held that the surveyor had no business to order such a thing; the question was what the roof had been, and it was a distinct case, not of substantial repairs, but of an improvement. Another instance was the taking up of an elm floor, the surveyor thinking an oak one would be better, which he (Canon Brooke) thought was not a repair, but an improvement. If they were to admit such changes as those, they would impose upon the clergy a burden that would become simply unbearable. Under such circumstances as those, the clergy of Axbridge deanery had passed a resolution, "That a committee of this meeting be appointed to draft cases, to be reduced to formal shape by a solicitor, with the view of obtaining counsel's opinion thereon." He thought that all interested in the matter ought to take some action to join with their brethren in the Axbridge deanery in the course they proposed, and concluded by moving, "That this conference concurs in the resolution of the incumbents of the Axbridge deanery to take counsel's opinion as to the legal power of the diocesan surveyors of ecclesiastical dilapidations to order improvements as well as repairs on glebe property, and requests the rural deans to communicate with the rural dean of Axbridge on the question, and report to a further meeting." This resolution was carried.

PATENT VENTILATION.

AT a meeting of the London School Board, February 16th, a report from the Works Committee contained the following:—

"The committee have to report that the system of ventilation patented by Mr. Tobin has been adopted in many of the Board schools with great advantage. Mr. Tobin, however, has now brought an action against the Board and claimed 5,000*l.* for an infringement of his patent. In view of the substantial benefit received by the use of it, the committee have thought it right to make an offer of 250*l.* in preference to being involved in litigation, which, whether successful or unsuccessful, could only be conducted at considerable cost. For the above amount Mr. Tobin has agreed to give the Board a licence to use his system of ventilation in all buildings at present owned or occupied, or which will in future be owned or occupied, by the Board, and also to grant indemnity for the use already made of the system by the architect of the Board. The committee accordingly recommend that their offer be confirmed."

This was confirmed by the Board. Some of our correspondents who deny Mr. Tobin's right to a patent will not be pleased with this.

KNIGHTSBRIDGE BARRACKS.

AT the meeting of the Metropolitan Board of Works last week the Works Committee recommended that the Board do, subject to the passing of an Act of Parliament, agree to pay a sum of 5,000*l.*, in consideration of the surrender by her Majesty's Government of a strip of land forming a portion of the ground at present occupied by the Knightsbridge Barracks, for the purpose of widening the road at that point, the Board, in addition to the payment of the above sum, undertaking the work of making up the roadway.

Mr. Richardson, in moving the adoption of the report, said that the Government were willing to give up a space of 8,900 ft. for the sum of 5,000*l.* The land in question had only been valued at the price of garden land and not building land. If the space in question were thrown into the public way, the Government could not build the new barracks on the limited site, so that they would be compelled to purchase other property at a cost of 25,000*l.* Therefore it was only fair and reasonable for the Government to ask the Board to pay the sum of 5,000*l.* for the land to be given up.

General Sir William Codrington moved,—"That the proposal of her Majesty's Government for this Board to charge the ratepayers of London 5,000*l.*, either for improving the boundary line of Knightsbridge Barracks, or for the widening of the high road at that spot, or for the purchase of house property opposite the barracks, be not agreed to; and that the question be referred back to the committee for further consideration." He said he felt surprised at the Government asking 5,000*l.* for this slip of land. It was the duty of the Government to throw the same into the public way, and not tax the ratepayers for it.

On a division, the amendment was lost by 23 to 13, and the report of the committee adopted.

ERRORS OF LEVELLING.

THE INSTITUTION OF CIVIL ENGINEERS.

On the 22nd of February, the paper read was "On the Probable Errors of Levelling, with Rules for the Treatment of Accumulated Errors," by Mr. Wilfrid Airy, B.A.

It was stated, with respect to genuine errors of observation, that in most engineering works it was unnecessary to give much attention to the small discrepancies between the results arrived at by different observers; but, in the case of a complicated system of long lines of levelling, the aggregation of small errors became formidable, and the proper treatment of them required considerable method and skill.

Errors of levelling were of three kinds:—(1) Mistakes; (2) instrumental errors; and (3) errors of observation.

In considering the question of dealing in a satisfactory way with the adjustment of the levels on a complicated system of lines, it occurred to the author to frame tables of probable errors, such as would be applicable to the circumstances of the different lines of the system. The data for framing such tables would be drawn from the official records of standard levelling in different countries, and the value of the tables when framed would depend in a great degree upon the mass of statistics which were reduced in order to compile them.

A critical examination of the discrepancies between observers on the same lines of levels, showed that the average amount of the discrepancies depended very much upon the inclination of the ground.

"THE DEGRADATION OF THE PAINTER ON GLASS."

SIR,—A letter with the above heading appeared in the *Builder* of February 19, in which our names are mentioned, in connexion with an action we brought against a noble lord, and which was given in our favour by Sir Frederick Pollock. It was for a rather considerable amount of heraldic glass executed by us for Lord Beaumont's seat in Yorkshire, and illustrating the heraldic history of his family from the time of the Crusades. Being heard in chambers, no public report was printed; but we think it fair to the writer to say his account of the evidence appears substantially correct. We write from memory only; but the notes taken by the shorthand writers at the trial would confirm it if correct. The whole case turned upon the unreasonableness of estimating small and delicate painting suitable for a drawing-room (some of the coats containing ten and eleven quarterings), necessitating finished artists for its execution, at the same price per foot as the large work required for a hall or public building. We are not acquainted with the writer of the letter in question, but we think it will be indeed an evil day for glass-painting as an art when the painter himself subsides into a mere servile tracer of other men's drawings, however good they may be, and every spark of feeling in his art,—which is the essence of its worth,—is stamped out of him. To seek for and encourage the last-mentioned gift is, we think, the great duty of employers, and it will not fail to be responded to, and to eventually raise the standard of the work and the producer of it also. Commercially, we well know, it is not so advantageous as the commodity largely manufactured and sold by the square yard; but in the end, it yields far greater satisfaction to all concerned. Our wish to do justice to a comparatively small but most deserving class of men must be our apology for this communication.

O'CONNOR & TAYLOR.

EDUCATION OF BRICKLAYERS.

SIR,—In my last, I endeavoured,—however imperfectly,—to explain what, in my opinion, are the causes which lead up to, and perpetuate, the lamentable state of affairs that has given rise to this discussion. With your permission, I will now venture a few remarks, by way of comment, upon the remedies proposed by your correspondent, trusting that what I may say upon the subject may be taken in good faith,—not as an endeavour to undervalue his evidently good intentions, but rather as an earnest desire that the movement may take some practical form. In introducing his propositions, he says there are a class of men who would object to any movement having for its object the improvement in education and skill of those of their fellows who unfortunately are not so well informed as themselves. Now, I fail to see the force of this argument, for are they not, as I in my last letter explained, all, by a uniform rate of wage, put upon a pecuniary level? And as they offer no objection to these, their less-informed brethren, being levelled up to their standard of pay, surely they cannot consistently object to a nearer approach in intelligence and skill. Moreover, having a good start in advance of them in this respect, would they be worthy the name of intelligent men if, like the hare in the fable, they stood still while the tortoise passed them in the race? Again, if this movement is once set in motion, these very men will be scarcely able to resist the temptation to take a part in it, and they would be amply rewarded by a fuller development of their own knowledge, exactly in proportion as they used it in imparting instruction to others.

That the time in the lodge-room should be utilised for educational purposes, I quite agree; that, in my opinion, is the best use the lodge-room could be put to; but it must be borne in mind, in reference to this discussion, that there are a number, and I may say a large number, of bricklayers who are not members of a trade-union lodge: therefore, for this movement to be successful, some common ground must be chosen whereon all society and non-society men alike can meet on equal terms, because the principal element of success is to be found in the co-operation of, and the assistance to be rendered by, those bricklayers who, having not only made themselves masters of the art, have also acquired the intelligence and capability necessary to enable them to impart instruction to others; and as many of these men repudiate any connexion with the union, it is not likely they would lend their aid to a movement having for its object the improvement of lodge members only. Again, supposing in the ranks of the union a sufficient number of such men were to be found, and the movement by their aid were set in motion, and drew to the lodges,—which doubtless to a certain extent it would do,—those non-society men in search of instruction, what guarantee have we that the union leaders, having been placed in power through their proficiency in the art of agitating, not by a superior knowledge of the art of bricklaying, would be prepared to adopt a new platform? Would they not be rather tempted to use the increased strength derived from the additional number in still further pushing their old favourite policy of aggression? In which case the educational programme would inevitably become a dead-letter.

In reference to the subject of masters for the schooling,—or what I should more correctly designate the mental teachers,—it cannot be too clearly understood that the intended pupils are not children; because, if schoolmasters are selected whose business has been to teach children only, no greater mistake could be made. Many well-meant attempts at adult education have failed for this very reason: in teaching a man he must be treated as a man, or he will turn from his teacher in disgust. I am led to make this remark by the letter of your correspondent, Mr. Chessel (*vide* Jan. 29), wherein he laments the failure of his laudable endeavours to draw workmen to school; that he should fail to draw bricklayers, unless he were himself a bricklayer, is almost a matter of course. A bricklayer, such a one as I previously described, with the drawing-board and implements for practically describing the technical details of his craft by diagram, as suggested by Mr. Morris, would draw more pupils and engage more attention, than a dozen mere schoolmasters, however earnest in their work they may prove to be.

To the suggestion that architects would, if invited, join in the movement, I would remark that most likely some architects would gladly avail themselves of the opportunity to extend their knowledge of brickwork, by assisting at meetings of an advanced class of bricklayers, discussing the theory and practice of it; or to encourage by their presence at, or even lend their aid to, a drawing-class; but it would be forming a very low estimate of their educational attainments to expect them to join a class of uneducated bricklayers, met for mutual improvement in the rudimentary stages of the three R's.

Upon Mr. Houghton's letter (*vide* January 8th) I have but little new to say, as the matter contained therein is so nearly an echo of what has already been said; but there is one statement which calls for rather more than a passing remark. I allude to the statement touching clerks of works and builders' foremen,—a body of men hitherto considered to be the *élite* of the building trade,—a body with whom Mr. Houghton is not ashamed to identify himself. As one of that body, to which I am proud to belong, I beg to say, with all humility,—what may be truly said by all,—there are none perfect, no not one. But the best answer to the statement lies in the fact that these men receive their appointments in the one case, as a rule, by the architect, and in the other invariably by the contractor; and it is a poor tribute to their discernment to insinuate that the men appointed by them are wanting in the ability to read and write, or even to accomplish a bit of drawing,—setting aside the practical acquaintance with at least one branch of the building trade.

A BRICKLAYER CLERK OF WORKS.

CARRYING TOOLS.

SIR,—I have travelled some thousands of miles through Britain, Ireland, Canada, and the United States, and have seen some thousands of workmen, comprising ship carpenters, house carpenters, locksmiths, painters, &c., going to and returning from work, carrying tools, kits, &c.

Amongst that number in all of the above countries, I have never seen more than about one in a hundred carrying his tools in a scientific manner. The usual way in which most workmen carry their tools is to make a lever of an adze, an axe, a hammer, or a piece of rope; pass one end through the handles of the kit; shoulder it, and pull down with the hand in front to counterbalance the weight of tools behind. Supposing the kit and tools weigh 20 lb., then they have a weight of 40 lb. pressing on the shoulder; for it takes a force of 20 lb. to counterbalance a weight of 20 lb.

If the tools were placed in two small kits, joined by a leather strap passed over the shoulder, 10 lb. in front would counterbalance 10 lb. behind. Thus only 20 lb. would press on the shoulder instead of 40 lb.

McDUFF.

CHURCH BUILDING NEWS.

Privett.—At a meeting recently held at Privett, near Alton, the offer of Mr. William Nicholson, of Basing Park, to erect a new church at Privett, on the site of the present dilapidated building, was accepted. Mr. Blomfield, of London, is the architect, and the design includes a spire some 160 ft. high.

Uxbridge.—St. John's Church, Uxbridge Moor, has recently been much altered and added to, the principal improvement being the construction of a chancel. This has an open roof of stained timber, and is paved with Minton's tiles, while the windows are filled with stained glass. The seats in the body of the building have been rearranged and made open, there being now a centre aisle, instead of passage-ways at the sides as formerly. The walls have also been redecorated. The work was entrusted to Messrs. Fassnidge & Son, of St. Andrew's.

Hooton Pagnell.—The Church of All Saints, Hooton Pagnell, has been re-opened, after being closed for thirteen or fourteen weeks. In the interval the whole of the interior has undergone restoration and improvement. A new flooring has been substituted for the old and decayed one lately existing. The old high-backed seats have been removed, and in their stead have been introduced pitch-pine stalls. The old-fashioned galleries have been taken down, and by this arrangement two ancient and well-formed arches have been brought into view. The architect is Mr. J. M. Teale, and the contract was intrusted to Messrs. Shillitoe & Morgan, of Campsall. The contract for the supply and the laying of the new heating apparatus—the cost of which was nearly 100*l.*—was given to Mr. England, of Pontefract.

Kingston.—A new church for the district of St. Paul, Kingston-hill, Surrey, is about to be commenced. The building committee have accepted the plans of Messrs. Luck & Rushforth, architects, London. The church is to be in the Gothic style, and built of stone and Kentish rag, and is to consist of a chancel, transepts, nave, and two aisles, with a central tower. The accommodation is to be for 784 persons, the cost

of the entire building being estimated at 7,000*l.* The accommodation to be provided by the different parts of the church, taken independently, is as follows:—Chancel and transepts, 160; nave, 304; nave and north aisle, 458; nave and two aisles, 624.

Farsley.—St. John's Church, Farsley, was re-opened on the 2nd ult., after restoration and enlargement. The old painted pews in the body of the church have been cleared away, and open seats in solid oak substituted. New choir-stalls, lectern, reading-desk, and pulpit, all in oak, also contribute towards the improvement which has been effected. The roof has been underdrawn with diagonal boarding, stained and varnished, and the walls round the area of the church are also boarded up to the window-strings with pitch pine. At the tower entrance an inner porch in pitch pine has been added, and at the north-east corner of the nave an organ chapel, with a richly moulded arch of Early English character, has been erected. The various works have been executed under the supervision of Messrs Peterson & Thompson, architects, of Bradford; the contractor for the interior work being Mr. George Trickett, of Bramley, and for the stone work Messrs. Laycock & Turner, of Farsley. The cost of the entire works has been about 1,500*l.*, inclusive of the organ.

Bridlington.—A meeting was recently held at the Town-hall, Bridlington, for the purpose of opening a subscription for the restoration of the Priory Church. The Archbishop of York presided, and explained that it was proposed to restore the western front, and to erect a tower or towers, as funds permit, according to the plans of Sir Gilbert Scott. Towards this object the Rev. Y. Lloyd Greame has already offered 1,000*l.* on condition that at least 2,000*l.* be raised by September next. The estimated cost of restoration is 10,000*l.*

Hythe.—The parish church of St. Leonard, Hythe, was re-opened on the 23rd December, after restoration under the superintendence of Mr. G. E. Street, R.A., architect. The galleries over the north and south aisles have been taken down, and also the gallery at the west end, so that the simple beauty of the nave is now exhibited, together with the exquisite Early English chancel. The view from the west end up to the altar, which rises thirteen steps from the nave, is very striking. The church has been re-seated throughout with open sittings. In the south transept, the low ceiling has been removed, the roof gabled, and a new lancet window introduced. A great part of the floor has been laid in Minton's tiles, worked into a variety of patterns. A new carved pulpit has replaced the old wooden one.

Stow.—The new Scotch Presbyterian Church at Stow, near Galashiels, has been opened. The church is Early Decorated in style, and has an area capable of seating 800 persons, although only 700 have been provided for. The building consists of a nave 31 ft. broad, with cross transepts, and terminating with apsidal end, the total length being about 100 ft. There is a north side-aisle, and a small gallery, vestry, and ladies' room. The north porch, in which is the principal entrance, is surmounted by a tower and spire, upwards of 140 ft. in height. The walls are faced with red freestone, in courses (rockfaced), with dressings of Prudham freestone of a warm cream tint, polished and carried through all the window and door openings, showing solid masonry round them in the interior as well as the exterior of the building. The pillars of the aisle, and every alternate stone of the jambs and arches of the door and window openings, are of fine-grained freestone. On the wall at the back of the pulpit there is some Gothic wood-panelling by Davidson & Reid, Edinburgh. The stone carving on the capitals of the aisle pillars, roof corbels, &c., is by Messrs. Farmer & Brindley; and the floors of the passages and porches are laid with Minton's tiles. The gas-fittings, of polished brass, and very effective, are by J. Milne & Son, Edinburgh. In the tower, a clock and bell, the gift of Captain Tait, of Pinn, have been fitted up by J. Ritchie & Son, Edinburgh; and a complete system of warming by Perkins's hot-waterpipe apparatus has been carried out by Mr. Charles Ritchie, Edinburgh. Messrs. Wardrope & Reid were the architects; Messrs. A. Herbertson & Sons, Galashiels, builders; and Mr. Thomas Gordon acted as clerk of the works.

Llanvair.—The parish church of Llanvair, near Usk, has lately been re-opened, after having been almost entirely rebuilt, under the direction of Mr. J. D. Sedding, architect. The church had fallen into a lamentable state of decay, and, with the exception of a part of the north wall of the nave, the whole church has been rebuilt. The other works included in the restoration are an entirely new nave roof, the old roof having been a flat ceiling of the Georgian period; an extension of the church which will give accommodation to fifty more persons than formerly; a thorough renovation of the chancel roof; new traceried windows; new pavements; new chancel and nave seats; and a new pulpit. The chancel roof is of oak, with moulded ribs, and bosses at the intersections of the principals. The reredos is of alabaster, with traceried niches and carved panels, and the alabaster-faced work extends through the whole width of the east wall, having a plinth of glazed green tiles, which has a very beautiful effect. The chancel seats are of oak, with open cusped panels. The pulpit is of oak, and has sculptured upon it the figures of the four Evangelists. In plan the church is a simple nave and chancel, with a new organ-chamber and vestry on the north side of the chancel, and a new south porch. The restoration has been effected in the style of the fifteenth century, from which period the old church dated. The builder who first undertook the execution of the work was Mr. Lucas, of Usk; but the contract has been completed by Mr. William Bone, of Liscard. The total cost is about 1,400*l.*

Edworth (Bedfordshire).—St. George's Church has recently been reopened, after restoration. The roofs of the nave and aisles are new; that of the chancel has had the plastering removed, and boarded with diagonal boarding. The windows of the aisles, clearstory, and tower, have been restored. The font, which is very old and beautiful, has been restored, and removed from the south aisle to the west end of the nave. The church has been levelled throughout and paved with tiles. The walls of the west end of the entire church have been underpinned. The works have been carried out by Mr. William Osborne, contractor, St. Neot's, from the design and under the superintendence of Messrs. Raynes & Shum.

DISSENTING CHURCH-BUILDING NEWS.

Siddal.—A new Wesleyan chapel has been commenced at Siddal, from designs by Mr. Petty, architect, Halifax. It will be in the Gothic style. On the basement story will be a large school-room and five class-rooms. The chapel, which will have a good approach, will be 43 ft. wide, and 57 ft. long. At one end is an organ recess, with minister's vestry beneath. Over the entrance vestibule will be a gallery for the scholars, whilst the chapel itself will accommodate 400.

Illingworth.—Plans for a new Wesleyan chapel at Halifax have been prepared by Mr. James Farrar, architect, Halifax. The style chosen is Italian, and the front presents an entrance, boldly moulded, with an architrave overhead. On either side the entrance is a window similarly treated. In the second story, in the centre, is a coupled window with semicircular heading. In the rear of the chapel, separate from it, is a house for the chapel-keeper. Internally the chapel will be 62 ft. by 42 ft. All the seats will be open, of pitch pine, varnished, and there will be accommodation for 500 persons. A gallery will run round three sides. The total cost will be 2,500*l.*

Todmorden.—The corner-stones of a new Wesleyan Chapel at Shade, Todmorden, have been laid. The edifice will cost 2,500*l.*, and will accommodate 250 persons.

Dorchester.—The opening services of the new Primitive Methodist Chapel, in Durngate-street, took place a week or two ago. The architect is Mr. S. Jackson, of Weymouth. The builders were Messrs. Davis & Son, of Dorchester. The foundation stones were laid last August. Up to the present time the outlay has been 600*l.*, but it is intended to add a school-room, which will cost 200*l.* more.

Winchester. — Jewry-street Congregational Chapel, Winchester, has just been re-opened, after decoration and improvement, at a cost of 450*l.*, under the direction of Mr. Poulton, of Reading, architect, from whose design the chapel was built twenty-three years ago.

Ivybridge.—A new Wesleyan Chapel has been completed and opened at Ivybridge, Devon. The chapel, the whole cost of which has been defrayed by Messrs. Allen & Sons, is cruciform in plan, and consists of nave, chancel, transepts, with an organ-chamber. At the north-west angle of the nave is a tower, which with the spire is between 90 ft. and 100 ft. high. At the back of the chapel are class-rooms and vestry. The benches, which are open, seat (including the school children) about 550 persons. The chapel is Early Pointed in style, the French rather than the English type having been adopted,—the square abacus frequently occurring. A bold double chamfered plinth of wrought limestone surrounds the whole building. Each of the side walls of the nave is pierced by three double-light arched windows, and the principal façade towards the road has two double-light windows with detached shafts having carved capitals and moulded bases, a moulded circular window occupying the equilateral gable above. Externally all the walls are faced with dark limestone, and the quoins and dressings are of light limestone and Portland stone. The shafts of the pillars throughout are of red Mansfield stone. Internally the chancel and transept arches and the quoins and arches of doorways and windows are chiefly of Bath stone, of which material the pulpit, octagonal in form, is made. The internal woodwork is chiefly of pitch pine. At the feet of the roof principals, and resting on stone corbels, are figures representing (in the nave) apostles, prophets, and martyrs, and (in the chancel) angels with musical instruments. The figures have been executed by Mr. Trevennen, of Plymouth. In four panels of the pulpit are inlaid tiles representing the four Evangelists, made by Mr. Fouracre, of Stonehouse, who has decorated the chancel walls. The chancel window and the windows in the road façade are filled with stained glass in geometrical patterns, supplied by Messrs. Hall & Sons, of Bristol. The chapel is lighted by six coronæ of wrought iron and brass, and two chancel standards, all made by Mr. Singer, of Frome. The building is warmed by a hot-water apparatus, supplied by Garton & King, of Exeter. The font, made by Messrs. Goad, of Stonehouse, is octagonal, and of red Plymouth marble,—polished. Messrs. Blatchford & Son, of Tavistock, are the contractors, who have erected the chapel from the designs and under the direction of Messrs. James Hine & Alfred Norman, architects, of Plymouth.

Exeter.—The South-street Baptist Chapel, Exeter, was recently re-opened, after restoration and extension, from plans by Messrs. Spalding & Knight, architects. Messrs. Stephens & Sons, of Exeter, were the contractors. The total cost is estimated at 3,000*l.*

Banff.—Mr. Wilsone, architect, Aberdeen, has prepared plans for alterations and additions to the Free Church of Banff. Considerably over 1,000*l.* has been subscribed for the purpose.

Portobello (near Edinburgh).—Shortly after the destruction by fire of Regent-street Free Church, the congregation determined to erect a new and commodious building at Joppa. The new edifice was begun about six months ago, and considerable progress has now been made. The building is Gothic in style. Accommodation is provided for 660 persons. A gallery will be erected over the vestibule, but there will be no side galleries. The pulpit will be placed on a platform at the north end of the building. The principal entrance will be from the main Joppa-road, and there will also be side accesses from Hamilton-street. The scaffolding for the erection of a tower, 163 ft. in height, is now being prepared. The cost of the building will be about 8,000*l.* The mason-work is being executed by Mr. A. Wilson, Tranent; and the joiner-work by Mr. H. Scott, Portobello.

Anerley.—A new Congregational church was opened at Anerley recently. The new building is 130 ft. in length, 56 ft. in width, and 41 ft. in height from floor to ceiling. It will seat on the ground floor 780, and in the galleries 510. It is faced with red brick, having white Suffolk brick and Bath stone dressings, the style being Romanesque. Next the high road, and on the south front, are the chief entrances to the church, through arcaded porches and spacious lobbies, while the tower and one gallery staircase entrance are at one corner, and the other staircase entrance at the opposite corner, with a smaller turret. The total height of tower and spire is 159 feet. The roof is in one span. The architects are Messrs. George Elkington & Son; and the builders, Messrs. Thomas Brown & Sons, Upper Norwood. The iron castings were furnished by A. D. Dawnay & Co., while the heating of the building is by hot air by Messrs. Grundy's patent. The cost of the building is 12,500*l.*, including freehold of ground.

Todmorden. — The corner-stones of Millwood new Baptist chapel and school have

been laid. The new chapel will seat 700 people, and in the school there will be accommodation for 400 scholars. The estimated cost is about 3,500*l.*, exclusive of the ground. Messrs. J. Horsfall & Son, of Manchester, are the architects, and the style is Romanesque.

THE WINCHESTER GUILDHALL AND ITS ARCHITECTS.

A SPECIAL meeting of the Winchester Town Council was held on the 25th ult., to consider a series of resolutions, "tabled" by Alderman Forder, condemnatory of the architects, builders, and clerk of the works, with respect to the condition of the above-named building. The essential part of these condemnatory resolutions was embodied in the following clauses:—"And that it having been proved during the recent alterations that the building has not been erected according to the plans and specifications of the architects, and that the contract entered into by the builders has been departed from, and that the clerk of the works has consequently not done his duty, the Corporation considers that the architects, builders, and clerk of the works have each and all of them, in their several positions, signally failed to perform their duty to the Corporation, and have thereby incurred the grave censure of the Corporation of Winchester."

In the course of a long and animated discussion, Mr. Forder spoke in support of the resolution. The question was whether the contract had been properly carried out. The evidence taken, he contended, showed that it was not so.

Mr. E. D. Godwin seconded the resolution, for the sake of discussion with a view to a final decision.

The Mayor urged that the Council had themselves to blame, for the Corporation had endorsed all that had been done, and had appointed their own clerk of the works. They had taken the building over; they had had the expense cut down to suit their own requirements, to the detriment of the plans; and the architects, being young men, consented to what neither Sir Gilbert Scott nor Mr. Street would have done. They had taken the responsibility on themselves, and now they were going to bark without the power to bite,—a most unwise proceeding. The Town Clerk had advised them that they had no ground of action, and advised them not to waste more money on the matter.

Captain Moore supported Mr. Forder.

Eventually the Council divided,—Messrs. Moore, Naish, Forder, and Godwin voting for the resolutions, Col. Rich neutral, and sixteen against them. The Council then separated, thoroughly convinced (according to the reporter of the *Hampshire Advertiser*) that they had tried to get too large a cake for their money, *and had themselves alone to blame.*

"DUSTING AND SLOPPING" CONTRACTS IN ST. PANCRAS.

AT a special meeting of the Highways, Sewers, and Public Works Committee of the St. Pancras Vestry, on the 21st ult., tenders were received for the removal of dust from the houses, road-sweepings, &c., and for the supply of road materials.

For the removal of dust the tender of Mr. Edward Jackson, at the sum of 990*l.*, was accepted, against 800*l.* the last contract, for No. 1 Ward; and that of Mr. Alfred Culverhouse at 891*l.*, against 890*l.* last year, for No. 4 Ward. The tenders for Wards 2, 3, 5, 6, 7, and 8 were so much in excess of those of last year that none of them were accepted, and it was resolved to advertise again for tenders.

For the removal of road-sweepings, &c., the tender of Mr. James Smith was accepted, at 3*s.* 11*d.* per load, against 3*s.* 6*d.* last year, for No. 1 Ward. For No. 2 Ward that of Mr. Alfred Culverhouse, at 3*s.* 6*d.*, was accepted, against 3*s.* 9*d.* last year. For No. 3 Ward, that of Mr. Charles Killingback, at 4*s.* per load, against 3*s.* 6*d.* last year, was accepted. For No. 4 Ward, that of Mr. A. Culverhouse, at 4*s.* per load, was accepted, the price last year being the same. For No. 6 Ward, that of Mr. W. T. Williamson, at 3*s.* 5*d.* per load, was accepted, against 3*s.* 9*d.* last year. The lowest tenders for wards 5, 7, and 8 were so much above those of last year that none of them were accepted.

For the execution of general works to sewers, gullies, buildings, &c., the tender of Mr. Charles Killingback at 7½ per cent. below schedule of prices was accepted, against 15 per cent. last year.

The tender of Mr. Sewell for the supply of Mortfield granite, and of Mr. Culverhouse for Groby and Guernsey granites and of Kentish Rag, were accepted.

DISPUTE AS TO AN ARCHITECTURAL PARTNERSHIP.

WM. H. LYNN *v.* SIR CHARLES LANYON AND JOHN LANYON.

THIS case came before the Rolls Court, Dublin, on the 15th ult., on a reference from Chambers, and to consider the report of the chief clerk. The bill originally had been filed by Wm. Henry Lynn, of Belfast, architect, who had been in partnership in Belfast with the defendants as architects, under the firm of Lanyon & Lynn, and it prayed that an account might be taken of all the dealings and transactions of the partnership between plaintiff and defendants from the 1st of January, 1868, and that the affairs and business of the partnership might be wound up and settled under the direction of the Court. It prayed that any account should include an account of all architects' profits to be derived from the designing and building of a hotel for the Ulster Hotel Company and other works specified in the bill. The plaintiff contended that, in taking the accounts of the partnership there should be included therein the profits arising from the completion of all works respecting which the firm of Lanyon, Lynn, & Lanyon had been professionally consulted or employed before the 1st of July, 1872; that such profits should be declared to be partnership profits, and divided accordingly. The case had been before the chief clerk for several days.

The Master of the Rolls referred the case back to the chief clerk, and directed a certificate to be prepared, the matter to be again brought before the Court.

A BUILDER'S CLAIM FOR PLANS.

PERKINS *v.* WILLIAMS.

IN this case (heard in the Rugby County Court on the 17th ult.) the plaintiff, a builder, claimed 6*l.* 5*s.*, for preparing plans of a house, attending meeting of the Local Board with the same, &c.

It appeared that in 1871 defendant applied to the plaintiff to make plans and estimates for a house he wished to build. Defendant, however, found that it would cost more money than he could afford, and suggested that the matter should stand over for a time. In 1874, defendant again spoke to plaintiff, and made some alterations in the plan. Plaintiff gave a fresh estimate of the cost, and an agreement was made to build the house for 265*l.* On examining the site defendant told plaintiff he must set out the back buildings farther. Mr. Perkins said that was not according to his plans or the estimates. A dispute arose, and the defendant said he would get some one else to do the work, and pay plaintiff what he owed him. He had since, however, refused to compensate him for the work done.

Defendant denied the ordering of the plans. He simply showed him the plans and specifications of an adjoining house, and plaintiff made a copy of them, and got them passed at the Local Board. His offer to pay the plaintiff only referred to the expense Mr. Perkins had been at in setting out the work.

The judge thought the plaintiff was entitled to be paid a reasonable sum for copying the plans. The fixing of the amount was referred to Mr. Manning, architect, of Rugby.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

SIR,—I begin by quoting the very accurate words of "Meter" in your impression of February 12th, page 152:—"The human frame, like other fluctuating phenomena, oscillates about a certain mean type." This certain mean type has been found out by the ancient Greek sculptors, and recorded by your worthy predecessor, Vitruvius, in his Treatise on Architecture, book iii., cap. i.; and, in order to ascertain how far the proportions of the different races of the human family accord with the proportions given by Vitruvius, as those used by the Greek sculptors of antiquity, the instrument drawn and described in the pamphlet "for the Identification of Persons" (Longman & Co., 1872) was designed. The difficulty of measuring the rounded forms of the human proportions is very great indeed, and no photographic delineation of a man, whether against a reticulated frame or not, would enable one to produce what an architect calls a geometrical elevation of a man or a building, or any other object. The only known way, as far as I am aware, is to draw out the figure, according to a certain scale, from accurate measurements taken on the man or figure itself, whatever it may be.

JOSEPH BONOMI.

The Southend Surveyorship.—At a meeting of the Southend Local Board, on the 23rd ult., out of five selected candidates for the office of surveyor, Mr. Frank Buckham, surveyor to the Newmarket Local Board, was elected.

STAINED GLASS.

Northampton.—A memorial stained-glass window has been unveiled at St. Edmund's Church, Northampton. The window has been erected in memory of the late Mrs. Hughes, wife of the vicar of St. Edmunds, from a design by Messrs. Law & Sons, architects. The two small lancet lights formerly at the west end were considered to be altogether inadequate for the lighting of that part of the church, and it was therefore decided to erect an entirely new window, the masonry of which was executed by Mr. Cross, of Kingsthorpe. The stained-glass has been executed by Messrs. Heaton, Butler, & Bayne. The window consists of three lights, the centre one, however, being at present the only one filled with stained glass, the other two being temporarily glazed with tinted glass of three shades. The subjects, three in number, of the central light, are of a baptismal character. At the top is a representation of Christ receiving little children; in the centre, the subject is the baptism of Christ; and at the bottom, that of the baptism of the gaoler. On either side of the window are scrolls bearing inscriptions. A monumental brass, by Messrs. Hart, Son, & Peard, has been placed on the wall of the church, beneath the new window, bearing an inscription.

Lechlade.—A stained-glass window, by Mayer & Co., has lately been placed in Lechlade Church by Mr. George Milward, of the Manor House, in memory of his late father. It represents the raising of Lazarus.

Plymouth.—The east window of the recently-restored Christ Church, Plymouth, has been filled with stained cathedral glass by Messrs. Fouracre & Watson, of Stonehouse. In the upper portion of the central light is a representation of the Good Shepherd, and in the lower portion a scroll on which is an inscription in memory of Anne Emmeline Metcalf, eldest child of the Rev. James Metcalf, M.A., vicar of the parish, and Anne Emily, his wife, &c.

Abbeydale.—The windows of the new Church of St. John, Abbeydale, Nottinghamshire, have lately been filled with stained glass by Messrs. Mayer & Co. The chancel windows represent the principal events in the life of our Lord, beginning with the Annunciation and Nativity, an angel in the quatrefoil holding a scroll with the words "Let us love one another, for love is of God." In the centre lights are depicted the agony of our Lord, and our Lord bearing his cross, with the Last Supper in the quatrefoil. The third window has the Resurrection and Ascension, while the west window is dedicated to St. John, the patron of the church, and contains a representation of our Lord in glory, as described in the Apocalypse. Underneath is a figure of St. John in the Isle of Patmos, and another representing an incident in the life of the Evangelist. A window near the pulpit, is dedicated to the late Mrs. Roberts. This window, which cost over 100*l.*, represents Mrs. Roberts in the act of feeding the hungry and teaching the ignorant.

Stoke Holy Cross.—The east window of the parish church of Stoke Holy Cross has been filled with stained glass in memory of the late Mrs. E. C. Bailey. The window consists of three Early English lancets. The central light is designed with reference to the dedication of the church, presenting the Cross in the stages of (1) the Curse, (2) the Expiation, (3) the Exaltation. The Saviour bearing the Cross occupies the lowest compartment; a representation of the Crucifixion the centre; and the Cross, surmounted with a Celestial Crown, the uppermost. In the side lights are—on the north, the Nativity and the Baptism of our Lord; and on the south, His Resurrection and Ascension; at the base is the inscription. The window is by Mr. Henry Hughes, of the firm of Ward & Hughes.

Glastonbury.—St. Benedict's Church has just received an addition in the shape of a stained-glass window in memory of the late town-clerk, Mr. Stephen Holman. It is the work of Messrs. Clayton & Bell, and the design represents the figures of Faith, Hope, and Charity, as described by St. Paul. Faith, on the right, grasps the crozier, and holds the Bible in her left arm, turning upwards her countenance to the legend around her head, which states that "She is indeed the substance of things hoped for." Charity, in the centre, casts loving glances on the innocents in her arms, and on her knees; and Hope rests on her anchor, and directs her eyes towards the "Rock of Ages." Under the window, on a brass tablet, is the inscription.

Books Received.

The Late Visitation of Typhoid Fever in the School and Town of Uppingham. E. & F. N. Spon, London.

THIS is a statement of the action of the Sanitary Committee, by the Chairman, and includes reports furnished to the Committee by their medical officer of health, Mr. A. Haviland, and their engineer, Mr. Rogers Field. It contains much that should be suggestive to other bodies, and should be circulated so that the lamentable disaster at Uppingham may not be wholly without advantage. We hear with great regret that the fever has again made its appearance in the neighbourhood.

Miscellanea.

Demolition of Historical Old Houses at Edinburgh.—The Edinburgh Improvement Trustees are (we learn from the *Scotsman*) at present engaged in opening up a connexion between Bristo-street and Nicolson-street by way of Allison-square, and the works have necessitated the demolition of several interesting old buildings in Bristo and Potter-row. Among them is a house in General's-entry, in which at one time resided Mrs. M'Lehose, the "Clarinda" with whom Burns, under the name of "Sylvander," exchanged so many glowing letters. On the south side of the small quadrangle which formed the entry was a mansion, built in the seventeenth century, which tradition assigns as the residence of General Monk during his command in Scotland under Cromwell. A building with which was associated the name of the author of Waverley has been removed in connexion with the trustees' operations. This was Leechman's school, which stood in Hamilton's-entry. In order to form the connexion with Nicolson-street, the Improvement Trust are to remove the central portion of the old pile of buildings which forms Allison-square; and it cannot but be a matter of regret that it has been found necessary to destroy the character of so excellent a specimen of the domestic style of architecture of the last century. In this tenement the poet Campbell wrote "The Pleasures of Hope," but it does not appear that the part in which the poet resided is to be pulled down.

The Hoarding Nuisance.—The *City Press* says,—"There is a *proper* hoarding at the junction of the Embankment with New Bridge-street, that conforms to the line of the footpath and incloses land that will be built upon in time. But beyond it, a few yards to the west, is an *improper* hoarding, built out into and on the public footway. It serves no purpose of usefulness, it is a hideous obstruction and disfigurement, and it has all the appearance of a shanty put up for the purpose of extorting black-mail from somebody. Any one who will take the trouble to peep through the chinks will see that it does not cover a gap, but actually covers a portion of the proper boundary-wall; and this boundary-wall is certainly within the jurisdiction of the Metropolitan Board of Works. We could put our hands on the parties responsible for its existence, but for the present we refrain, on the supposition that they have hitherto been too dull to perceive that in retaining this offensive structure they are guilty of a gross public wrong. But what shall we say of the Metropolitan Board, that it endures this thing so patiently? Is it so occupied with great things that it is oblivious of small things? And if it permits this hoarding, might not a hundred such be put up along the whole line of the Thames Embankment?"

An Auxiliary Use for Board Schools.—The Free Library Committee of the Leicester Town Council, with a spirit of enterprsie which might be more generally emulated by similar bodies, has obtained the use of the Board Schools in Syston-street, with a view of trying the experiment of establishing a branch reading-room there in connexion with the free library. The School Board has met the Committee on the most liberal terms, and if the place is successful as a reading-room, a branch of the free library will be established there, and efforts will be made to utilise other board schools in the town in a similar manner. Of course, these reading-rooms will only be open after school-hours. The Syston-street reading-room has been opened with every promise of success.

Philadelphia Exhibition.—Messrs. Brown-Westhead, Moore, & Co., of Hanley, have prepared for the Centennial Exhibition a costly collection of goods in porcelain, earthenware, parian, and majolica. They have had constructed a spacious and elegant pavilion 35 ft. long by 23 ft. wide, and of proportionate height. It is of timber, but the framework is partly concealed by crimson drapery, and partly by an interesting collection of examples of mural decoration by means of tiles executed by a new process. The visitor, on approaching the pavilion, will have his attention arrested at once by the remarkably fine display of mural decoration, which occupies in all a space 100 ft. long by 8 ft. deep. All the tiles employed are decorated by a new patent process, the exclusive right to the use of which, so far as its application to pottery is concerned, is possessed by this house. It is the invention of Mr. Joseph Brown, of Chelsea. The exact particulars of the process are not made public, but we may say that it has this advantage,—that although engraving is the first stage in what may afterwards become elaborately finished pictures, the artist's own work appears on the ware without the intervention of an ordinary engraver. In the interior of the pavilion, one portion represents the wall of a drawing-room tiled from ceiling to floor, and with a mantelpiece also of ceramics. The tiles used for the mantelpiece have a white ground with birds painted thereupon, while the wall space is covered with smaller tiles of darker colour. Next to this is a composition designed for a library, and here the mantelpiece is of white embossed tiles, the embossing being also accomplished by a new process.

Female School of Art.—H.R.H. the Duke of Edinburgh distributed the prizes and medals gained by the successful students of the Female School of Art, Queen-square, Bloomsbury, on the 25th ult., in the theatre of the London University, Burlington-gardens. The Rev. Sir Emilius Bayley opened the proceedings by reading the thirteenth annual report of the committee, which stated that the past had been a most successful year as regarded the number of the students, the prizes won by them, and the quality of the works to which prizes had been awarded. Following on many previous successes, Miss Gann, the lady superintendent of the school, had for the year 1874–75 gained a premium of 40*l.* awarded by the Lords of the Committee of Council on Education, her name being second on the list of 130 competing schools. The report having been adopted, the Duke of Edinburgh presented the prizes to the students, the principal of these rewards being the Gilchrist Scholarship of 50*l.*, taken by Miss Frances Harriet Newton (of the Durham School of Art); a national silver medal and a subscriber's scholarship of 10*l.*, by Miss Gertrude Hamilton; the Queen's gold medal, a national bronze medal, and a third-grade prize, by Miss Ellen Isabella Hancock; the Queen's scholarship, value 30*l.*, with a national bronze medal, and other prizes, by Miss Alice Hanslip (who retains the prize for a second year); and a national gold medal and the Princess of Wales's first scholarship, value 25*l.*, with two other prizes, by Miss Susan Ruth Canton. Professor Donaldson introduced the prize-gainers, and Canon Thorold addressed the meeting.

The Construction of Street Tramways.—At an ordinary meeting of the Manchester Scientific and Mechanical Society, recently held, a paper on "The Construction of Street Tramways, with suggestions for a new section of rails and fastenings for the same," was read by Mr. I. Bowes. Amongst the chief requirements of a good serviceable tramway Mr. Bowes suggested that the rail and its fixings should present as small a surface of iron or any other slippery material on the face of the pavement as possible; that the rail should be of such a form as would give it the greatest strength vertically for the quantity of material in it, and that its strength should be sufficient in itself to prevent deflection, which not only caused a greater amount of traction power to be required, but also loosened the fastenings, and in many ways tended to destroy the efficiency and durability of the tramway. He described what he called the girder tram-rail, which was a rail and girder combined, in which the material was distributed in the proper shape for carrying a vertical pressure or weight,—viz., the girder shape. This form of rail also gave better facilities for connecting the rail ends than any other he had yet met with.

The Weymouth Surveyorship. — The Weymouth Local Board met in committee on the 23rd ult., and made a further selection of four from the 13 candidates originally picked out of 56 applicants. The 13 were,—Messrs. Francis Drake, from Shrewsbury, aged 41; G. J. Stead, Sheffield, 38; R. H. Inch, Croydon, 31; Morgan, Southampton, 32; Lloyd, Reading, 29; R. Bennett, Weymouth, 45; J. J. Webster, Birkenhead, 31; B. D. Henley, Malsty, 34; Walter Bradbury, London, 36; Richard Weaver, Uppingham, 34; H. O. Smith, Oxford, 33; A. Loader, Brighton, 36; J. F. Brown, Weymouth, 35 years. The committee decided that four of the above who obtained the most votes should be those from among whom the ultimate selection should be made. They were the following:—Mr. Loader, Brighton, 19; Mr. Morgan, Southampton, 17; Mr. Inch, Croydon and Plymouth, 9; Mr. Bennett, Weymouth, 9. The final choice was made on Tuesday last, the 29th ult., when the voting was as follows:—For Mr. Morgan, 15; for Mr. Inch, 14; for Mr. Loader, 10; and for Mr. Bennett, 6. The latter was rejected from the second voting, and Mr. Loader did not secure a single vote, while Mr. Morgan had 16 and Mr. Inch 11. The final voting was in favour of Mr. Morgan, who secured 13 votes against Mr. Inch's 5. Mr. Morgan was therefore elected.

Breakage of an Iron Bridge on the North British Railway.—On the 12th ult., the iron bridge on the North British Railway at North Back of Canongate, Edinburgh, a girder of which gave way on the previous evening, was propped with strong wooden stancheons, and both lines of rail were re-opened for traffic early in the forenoon. It is stated that for some time past Mr. Bell, the engineer of the North British Railway Company, has had plans in preparation for the erection of a new bridge over the roadway at Bernard's Brewery, and that the plans are now so far advanced as to admit of operations being commenced immediately. The present cast-iron bridge was constructed in 1845, and at that time was quite strong enough for the traffic which passed over it. Now, however, when engines and tenders weighing 60 tons have in many instances taken the place of machines little more than half that weight, and when between 300 and 400 trains daily pass through the Calton Hill tunnel, a much stronger bridge is required. The new structure will therefore be built of malleable iron, and the cost of its erection is expected to be about 4,000*l.*

Arsenical Wall-paper. — At the Belfast Quarter Sessions, recently, a case of very considerable importance, but of a somewhat novel character, was before the Court. Mr. Webb, linen merchant, of Randalstown, processed Mr. Malcolm, proprietor of an extensive room-paper warehouse in Victoria-street, Belfast, for 22*l.* odd, for expense incurred by the plaintiff "in procuring medicine and medical attendance for his children," through illness brought on by arsenic contained in a room-paper purchased in the defendant's establishment. Dr. Hodges, who examined the paper, proved that it contained arsenic, and it appeared that after it was put on plaintiff's room his children became ill, their throats being ulcerated, and this illness was attributed to the arsenic. It was stated on behalf of Mr. Malcolm that he had no knowledge of arsenic being in the paper; that he had to keep such qualities of paper as suited his customers; and that the paper in question had been selected by the plaintiff. On the 17th ult. the magistrate gave his decision in this case. His worship dismissed the process, on the ground that there was no warranty, expressed or implied, between Mr. Webb, the plaintiff, and Mr. Malcolm, the defendant, that the paper contained no poisonous matter.

Archæological Section of the Birmingham and Midland Institute.—At the monthly meeting of this section, held on the 23rd ult., Mr. W. G. Fretton read a paper on the Benedictine Monastery and Cathedral of Coventry, in which he traced the history and vicissitudes of the various foundations, from the time of the first institution of the monastery by Leofric, down to their demolition at, and the subsequent decay of their ruins after, the general suppression, until now, very few traces of their existence remaining. He was persuaded that a great many more interesting portions of the cathedral remained underground than at present appeared above it, and he suggested that an exploration of the site would form a very interesting field-day to the section.

The Artisans' and Labourers' Dwellings Improvement Act, 1875.—On the motion of Sir Sydney Waterlow, a return has been ordered from the Commissioners of Sewers, from the Metropolitan Board of Works, and from such urban sanitary authorities as have received official representations under the Artisans' and Labourers Dwellings' Improvement Act, 1875, of the number of official representations made to them; of the number, size, and locality of the areas to which they relate; of the number, size, and locality of the areas regarding which resolutions (under Section 3) have been passed, or for which improvement schemes have been made; and of the stage which each improvement scheme has reached; giving the date of each official representation, of each resolution, and of each improvement scheme. And from the Metropolitan Board of Works of any appointment, under Section 13 of the Artisans' and Labourers' Dwellings Improvement Act, 1875, of a medical officer or officers for the purpose of carrying the Act into operation, and of the amount of his or her remuneration.

Slaughter-houses at Greenock.—The question of providing proper slaughter-house accommodation is exciting much attention in Greenock. The present slaughter-house, owned by the Town Council, is situated in a densely populated locality in the centre of the town, and has been declared by the medical officer to be a nuisance. The Council recently resolved to renovate the old buildings, at an expense of between 3,000*l.* and 4,000*l.* The minority in the Council, who are also members of the Police Board, wish a new establishment, which, it is said, will cost at least 9,500*l.* With a view to bring matters to a practical issue, Mr. Erskine, at a meeting of the Police Board on the 25th ult., moved that that body proceed to the erection of a slaughter-house under the powers conferred on them by the Police Act of 1865. A long discussion took place, but the motion was lost by a majority, and the Board resolved not to take any action till it had been ascertained what the Council actually intended to do, whether it would persist in continuing the old buildings, or to secure a site for a new slaughter-house.

The Benevolent Fund of the Institution of Civil Engineers.—A meeting of the contributors to the Benevolent Fund connected with this institution was held on the 22nd ult. In the report read by the honorary secretary, it was stated that the fund was established to afford assistance to necessitous members, associates, and graduates of the Institution of Civil Engineers and their families, and to the families of deceased members, associates, and graduates; also to any one who may have been a member, associate, or graduate, and have paid his subscriptions for five years consecutively at least, or to the family of any such person. While the committee regretted that the subscribers to the fund were not more numerous, there being only 352 annual subscribers, out of a total of 2,373 members, [they announced that there had been an income proper exceeding 2,100*l.*, while the expenses, including twelve grants and office charges, amounted to under 1,500*l.*

Improved Floor Clamp. — Carpenters, cabinet-makers, and others who find it frequently necessary to clamp flooring-boards or portions of furniture together, are provided, by an invention patented June 8, 1875, to Mr. W. D. Clark, of Springfield, Ill., with a novel and simple tool especially adapted to such purposes. It consists of a sleeve, which at its lower extremity carries a cam, and at its upper end has a handle. Passing through the sleeve is a rod having a screw point at its lower end, and turned by the upper handle. Attached to a collar on the sleeve is a rearward extending arm, the end of which is turned downward and toothed so as to engage with the surface of the joist. A slotted and grooved arm is pressed by the cam against the boards, when the said cam is suitably revolved by the handle. The holding arm prevents any rearward motion of the device, which is still further secured by the screw point entering the wood of the joist.

How we Poison Ourselves with Bad Air. The introductory lecture in connexion with the Dale-street (Liverpool) District Sanitary Association was delivered at Waterloo, Mr. Thacker, chairman of the Waterloo Local Board, in the chair, by Mr. T. Mellard Reade, C.E., who gave an exhaustive summary of the principles of sanitary science in relation to engineering and architectural construction.

Rendering Wood Fire and Water Proof M. P. Folacci has devised a mode of rendering wood waterproof and incombustible, which involves the use of the following composition:—Sulphate of zinc, 55 lb.; American potash, 22 lb. alum (ammonia base), 44lb.; oxide of manganese, 22 lb.; sulphuric acid at 60° 22 lb.; river water 55 lb. The above ingredients, with the exception of the sulphuric acid, are mixed in a boiler, where the water is added at a temperature of 113° Fahr. As soon as solution is effected, the acid is gradually poured in. To prepare the wood, the timbers are placed in a suitable chamber, on gratings, and separated by spaces of about ¼ in. The composition is then pumped in to fill completely the receptacle, and is maintained therein in a state of ebullition for three hours. The wood is then withdrawn, and dried in the air. According to the inventor, it becomes practically petrified, and the most intense flame only carbonises the surface very slowly.

The Lincoln Drainage Dispute.—The Lincoln drainage question was before the Queen's Bench Division of the High Court of Justice on the 21st ult., when the *mandamus* applied for by the Local Government Board against the Lincoln Corporation was granted, the Court being unanimously of opinion that no farther time could be allowed the Corporation for commencing the work. It was also intimated by the Court that it solely depended upon the action taken in the matter by the Lincoln Corporation during the next three or four months how the *mandamus* should be enforced. Affidavits by the Mayor and Mr. Mansergh, the engineer, were produced on behalf of the Corporation in reply to those filed by the Local Government Board on the application for the Rule in November last.

Darlington Master Builders' Association. The annual meeting of the Darlington Master Builders' Association has just been held. The following officers were elected:—President, Mr. George Marshall; vice-president, Mr. J. C. Martin; treasurer, Mr. R. T. Snaith; secretary, Mr. John Hurworth; together with auditors and a committee of ten. A discussion took place on the demand of the masons for an advance of 3s. per week. Several gentlemen considered that the demand in the present state of trade was most unreasonable, an opinion which was generally agreed in. It was reported that the condition of trade was very slack throughout the district, jobs coming in but very slowly.

New Flooring.—A new system of parquet flooring, invented by M. Briffaut, is spoken of. The squares are composed of slips of oak or other wood, or a combination of woods forming patterns; the pieces are held together by a layer of bituminous cement laid hot on their under side; and this cement is in turn covered with a paving tile, so that the three substances are intimately united. In order to obtain a more perfect adherence, conical iron pins are driven through holes left in the tiles and into the wood while the cement is still in a liquid state. The squares are laid in mortar or cement over a layer of sand, and are joined together by very fine iron tongues fitting in grooves.

Something like a Boring Machine.—The *Mining Journal* says that one of the great objections raised against the Channel Tunnel scheme is the length of time it will take to execute; but if we are to believe the *Liberté*, this objection has now disappeared. In fact, according to that paper, the Tunnel can be completed in less than six months! It tells us that a machine has just been invented by which 55 mètres of ground may be pierced through per diem, and it calculates if both the English and the French begin piercing at the same time the Tunnel can be cut out in 144 days!

The Excelsior Lamp.—The peculiarity of this lamp is that the vase of the lamp is expanded so as to gather and concentrate a large quantity of atmosphere upon the flame: by which means an increased quantity of oxygen is forced to come in contact with the flame, resulting, it is claimed, in a white, brilliant light. These lamps may be seen in cluster form in front of the Mansion House, City; and in suspension form, as well as applied to columns and brackets, at the Great Northern Railway Station, King's-cross.

Dublin in Ruins.—At a meeting of the Dublin Statistical Society on the 15th ult., Dr. Grimshaw stated that there were 1,700 ruined houses in Dublin; that is, houses that ought to be taken down, being unfit for human habitation; 122 were utterly ruined.

The Brighton Picture Exhibition.—From a report on the proceedings of the Pavilion Committee, presented at a meeting of the Brighton Town Council on the 16th ult., it appears that the second annual exhibition of pictures at the Corporation Gallery was visited by 198,000 persons, as compared with 60,000 last year, and that upwards of 1,100 pictures were sent in for exhibition, of which 571 were exhibited for sale, and 190 were sold.

The Town Council of Peterborough, acting as the Urban Sanitary Authority, have presented petitions to the Local Government Board to issue provisional orders to empower the said Authority to provide works for water supply, sewerage, and sewage irrigation, according to plans prepared by Mr. John Addy, A.I.C.E., of Peterborough. Application has been made to the Local Government for sanction to borrow 120,000*l.* for the above works.

Painters' and Joiners' Wages at Crieff.—The Crieff journeymen painters have requested the masters to advance, on the 1st of March, their wages from 6½d. to 7d. per hour; to pay 9d. per hour for all extra time; and an allowance of 4s. per week when they travel three miles to work. The Crieff operative joiners have also asked a rise from 6d. to 7d. per hour, the advance to take effect on the 1st of March.

Royal Aldershott Skating Rink.—The tender of the Brunswick Rock Asphalt Paving Company has been accepted for the construction of the proposed new rink for the officers of the Aldershott Division. This company has already laid over 700 tons of asphalt for rinks and other purposes, and the work, executed under the company's manager, Mr. W. Hirst, is stated to have given satisfaction.

Lincoln.—About 1,000*l.*, subscribed to defray the Bishop of Lincoln's costs in the great Coates case, have been devoted by the recipient to the restoration of Bishop Alnwick's tower at the old Palace, Lincoln, for the purpose of lecture-rooms for theological students. Mr. J. Fowler is the architect; Mr. Barker, builder.

Andover Cottage Hospital.—Tenders for the erection of the Cottage Hospital at Andover have just been accepted, according to plans by Mr. White, F.S.A. The work is estimated to cost 1,490*l.*, this being the amount of Messrs. Annett & Son's tender, which has been accepted.

A Good Templars' Hall for Weymouth.—The new hall lately erected for the Good Templars of Weymouth in the High-street, has been opened. The architect is Mr. G. R. Crickmay, and the builder Mr. J. Larcombe. The new edifice is built at the rear of the old Town Hall.

Arabic Numerals in Japan.—The Japanese Government is said to have adopted a singular method for extending a knowledge of the Arabic numerals, with their English names; these are printed on cloth, which is sold at a low price to the peasantry.

New Mission Hall at Derby.—A new Mission-hall in connexion with Holy Trinity Church, Derby, was opened on the 20th ult. The total cost has been about 900*l.* Mr. Edwin Thompson was the builder.

Stockwell-green.—The endeavour to retain Stockwell-green as an open public space has failed, and it is to be speedily covered with buildings.

The Goux System.—The corporation of Sudbury, after an animated discussion, have decided to adopt the Goux closet system.

Architects' Benevolent Society.—The annual meeting of this society will be held at Conduit-street, on Wednesday next, the 8th inst.

TENDERS

For buildings at Helsey and Wainfleet, for the Governors of Bethleham Hospital: -

	House and Buildings.	Cottage.
Dunkley	£1,176 0 0	£202 0 0
Laycock & Co.	1,134 0 0	207 0 0
Hobson & Co.	1,117 0 0	
Turner		203 0 0

For completing four houses in St. Lawrence-road, Notting-hill, for Mr. J. J. Hickmott. Messrs. H. S. & C. A. Legg, architects:—

Hunt	£650 0 0
J. & H. Cooks	638 0 0
Judd & Hawkings	598 0 0
Webber	557 12 0
McFarland	497 0 0

For new Lincoln County Hospital. Mr. A. Graham, architect. Quantities supplied:—

Bustard	£31,277	0	0
Hill, Higgs, & Co.	24,800	0	0
Pattinson Brothers	23,700	0	0
Vickers	23,000	0	0
Sherwin	22,852	0	0
Dennitt	22,835	0	0
Warburton	21,900	0	0
Barnes & Wright (accepted)	21,100	0	0
Huddlestone & Son	20,938	0	0

For alterations and additions to Nettleham Hall, for Mr. Franklin Hood. Mr. W. Watkins, architect. Quantities supplied:—

Sims	£3,975	0	0
Brooks	3,963	0	0
Close	3,882	0	0
Bell & Middleton	3,780	0	0
Taylor & Son (accepted)	3,734	0	0

For new police station, Hunstanton, Norfolk, for the Magistrates of the County of Norfolk. Mr. R. M. Phipson, architect:—

Farrow	£595	0	0
Bardell	550	0	0
Beeton	495	0	0
Nelson	448	10	0
Fisher (accepted)	425	0	0

For board schools at Burston, Norfolk. Mr. R. M. Phipson, architect:—

Grimwood	£925	0	0
Ludkin	920	0	0
Limmer	862	0	0
Bishop (accepted)	825	0	0

For additions to Tharston Rectory, Norfolk. Mr. R. M. Phipson, architect:—

Downing	£903	0	0
Ludkin	826	0	0
Hawes	660	0	0
Bishop (accepted)	580	0	0

For alterations and additions to the County Lunatic Asylum, at Thorpe, near Norwich. Mr. R. M. Phipson, architect:—

Downing	£2,889	0	0
Youngs	2,879	0	0
Hawes	2,850	0	0
Newell	2,836	0	0

For restoration of Kirby Bedon Church, Norfolk.—

	Chancel.	Nave.
Ludkin (accepted)	£293 10 0	£515 0 0

For the foundations for new lunatic asylum for the city of Norwich. Mr. R. M. Phipson, architect:—

Youngs	£7,375	0	0
Botterill & Co.	7,310	0	0
Downing (accepted)	6,989	0	0

For the restoration of Burlingham St. Andrew's Church, Norfolk. Mr. R. M. Phipson, architect:—

Evans & Durrant (accepted)	£921	10	6

For the erection of mill building, including machinery, water-wheel, excavation, sluices, &c., at Brompton, Churchstoke. Messrs. Powell & Swettenham, architects:—

Contracts 1 and 2.

Hamer & Sons	£1,385	0	0
Gough & Sons	1,165	10	0
Contract 3.			
Holroyd, Horsfield, & Wilson	£1,400	0	0
Stevenson	1,325	0	0
Newtown Foundry Company	1,150	0	0
Alexander & Sons	1,050	0	0

For four houses at Teddington, for Mr. A. Sedley. Mr. W. G. Bartlett, architect. Quantities supplied by Messrs. Stoner & Sons:—

Aviss & Sons	£6,110	0	0
Collis & Co.	6,040	0	0
Wood	5,994	0	0
Bywater	5,925	13	0
Conder	5 920	0	0
Bonell & Harris	5,910	0	0
Ashby & Co.	5,854	0	0
Goddard	5,086	0	0

For new front, &c., 94, Western-road, Brighton. Mr. A. Loader, architect:—

Bruton	£432	0	0
Newenham (accepted)	421	0	0

For new roof and repairs, 33, Crown-street, Brighton. Mr. A. Loader, architect:—

Garrett	£116	0	0
Newnham (accepted)	104	5	0

For new entrance lodge, new ball-room, terrace wall, &c., at Saxe-gardens, New Shoreham, Sussex. Mr. A. Loader, architect:—

Reid (accepted)	£1,200	0	0

For widening and re-forming Hole Farm-road, from Pondbay-hill (top of Ore-lane), to junction with St. Helen's-road, Hastings, including construction of drain and laying down granite kerb:—

Howell & Son	£1,246	0	0
Hughes	1,125	0	0
Vidler	1,098	0	0

Accepted for the construction of about three miles length of main drainage, in the parish of Ore, Hastings, from Pondbay Bridge to Fairlight Down:—

King	£3,300	0	0

For alterations and additions to premises, High-street, Grays, Essex, for Mr. Hornecastle. Mr. W. T. Gosling, architect. Quantities supplied:—

Wood	£923	0	0
Pavit	907	12	0
Golden	900	0	0
Pickersgill Brothers (accepted)	895	0	0

For roadmaking and drainage works at Woodford, Essex, for the British Land Company, Limited:—

Marshall	£950	0	0
Peill	630	0	0
Bloomfield	610	0	0
Pizzey	590	0	0
Richardson	558	0	0
Jackson (accepted)	555	0	0

For alterations and repairs to cottages in Goslin's-yard, High-street, Battersea, for Mr. James J. Morgan. Messrs. Ebbetts & Cobb, architects:—

Steel Brothers	£250	0	0

For new warehouse, Newgate-street, for Messrs. Hutton & Co. Quantities by Messrs. Batstone & Sons. Mr. H. H. Collins, architect:—

Mitchell	£4,158	0	0
Browne & Robinson	4,012	0	0
Ball	3,965	0	0
Merritt & Ashby	3,923	0	0
Crabb	3,886	0	0
Bayes Bros. & Allen	3,867	0	0
Brass	3,862	0	0
Newmann & Mann	3,737	0	0
Pritchard	3,710	0	0
Kirk & Randall	3,697	0	0
Mark	3,454	0	0
Oliver (accepted)	3,415	0	0

For rebuilding No. 35, Little Russell-street, Bloomsbury, exclusive of asphalte floors and fittings, for the Express Country Milk Company, Limited. Mr. W. Paice, architect:—

Patman & Fotheringham	£1,810	0	0
Heath	1,730	0	0
Macey	1,699	0	0
Downs & Co.	1,695	0	0
Wagstaff & Co.	1,650	0	0
Carter	1,630	0	0

TO CORRESPONDENTS.

H H J G J S W—H. F.—W. S.—C. E. F—W. H. M.—H. J. J J s A B—R & S.—B.—J. W. G—W. D. C.—R. W.—S. T—A. S.—L L.—C. C. H.—B & H—J. M.—F. P.—W—R. R. R—F M—A L—J K C—G A R J. C M E I. L. Parnell is not aware no official regulation is under which the restoration of Hereford Map is carried on in Great Britain)—G T T (shall be proceeded with).—N. W. (declined, with thanks).—P. C. (thanks)—Verax—Minor type.—W B (next week).

We are compelled to decline pointing out books and giving addresses.

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Windsor and its Castle.



WHEN England is sending her tens of thousands on holiday excursions all over the globe, there is always some one ready to tell these travellers that they should see their own country before they go abroad. The advice is seldom heeded by those who can afford to cross the Channel, but the Englishman who sees Versailles or Fontainebleau before Windsor Castle certainly deserves censure. The Londoner is justly proud of his river, and of the beautiful places that are situated on its banks within easy distance of his home. Of all these places, the crown unquestionably belongs to Windsor and its castle, both for the beauty of their situation and the multiplicity of their historical associations.

Windsor Castle has been the residence of our kings for 800 years, and during the greater portion of that term it has been their chief palace, and the only one worthy of their position. Old Windsor dates still further back as a royal residence, and New Windsor grew into existence very shortly after the castle was built. The history of such places as these must necessarily be a long one, but we shall endeavour to condense into a small compass some account of the salient features in the growth of both castle and town. Old Windsor is supposed to have been known to the Romans, on account of its nearness to one point of the Roman road from London to Silchester, and also because Roman coins and urns have been found at St. Leonard's, near Windsor, and Roman bricks, &c., at Old Windsor. The manor belonged to the Saxon kings, who are supposed to have had a palace there from a very early period, and it is certain that Edward the Confessor sometimes held his court at the royal "ville of Wendlesore." In the year 1066 the king granted all his lands in Windsor and Staines to the Monastery of St. Peter at Westminster, but the new proprietors did not hold the property long, for William the Conqueror, being pleased with the situation of Old Windsor, obtained it in the first year of his reign by exchange for certain other lands. He and his successors used the old palace, which is supposed to have stood a little to the west of the church, for a long time, as a place for hawking and hunting. Camden proposed an etymology for Windsor which has been accepted by several writers, but which is quite without authority, and the great antiquary took no account of the fact that the earliest form of the name is Windlesore, and not Windsor. He says it was called by the Saxons Windeshora, "perhaps from the windings of the banks" of the river; but near by is the little river Windles, which gives its name to Windlesham, as it probably does also to Windsor. John Stow, in his description of the castle, gives some very amusing etymologies:—"The name whereof (not without cause) is called Wyndsore; whether it came as some affirme of ye fery over ye rivar there, ye passengers usynge (in callynge for ye boate) to bydd them wynd to shoar (because ye boate, then as now, also went to a rope and a pole, thoughe not in the same place where it is now, but where ye bridge is), or whither it toke name of ye qualitie of ye place, whiche standynge hyghe and open to the wethar is called Wyndesor, because ye wynd is sore and ye ayre very subtile and percynge there, as ye inhabitants fynde it, whiche etymologie devysynge with my selffe, of ye nature of ye place it selffe, I added anothar also thereto, *de situ loci*, at my fyrst comynge thethar of this effecte:—

> 'The wynd is sore, in highe Wyndsor, whereof it may take name,
> And Wynde, for wyndynge, may import assendynge to ye same,
> As eke the hawke is sayde to sore that lyethe on highe above,
> Of whiche etymologies, one the trewthe I guesse dothe prove.'"

When William the Conqueror was settled in England one of his first objects was to build strong castles in different parts of the country in order to preserve the power he had obtained. It is not known when Windsor Castle was first built or what its architectural character was, as no accounts are left, but it was in existence before the completion of Domesday Book in 1086. The site chosen by William for the castle was on the brow of a hill in the manor of Clewer, and about two miles north-west of Old Windsor. Neither the first nor the second William appears to have visited Windsor often, but Henry I. took a special liking to it, and greatly enlarged the castle. It is supposed that certain fragments in the Norman style which were brought to light during the progress of Sir Jeffrey Wyattville's improvements were relics of this building. Walter Fitz Other was the first governor of Windsor Castle, and was succeeded in his office by his son William Fitz Walter, who assumed the surname of Windsor. As the town grew up under the shadow of the castle the inhabitants had frequent cause to complain of the tyranny of the various constables. In 1273 the Royal Commissioners reported that Geoffry de Picheford, constable, "unjustly extorted great sums from the whole country, levied as his dues," and his conduct does not by any means appear to have been singular. When Byron described himself as standing on the Bridge of Sighs at Venice, he had "a palace and a prison on each hand," but our old kings appear to have had no objection to using the same building both as palace and prison. The Earl of Northumberland and some of his followers were confined in Windsor Castle in the reign of William Rufus, and this is the earliest notice of the castle as a state prison, which it continued to be until the close of the Commonwealth, and occasionally afterwards. Maud de Braose and her son were starved to death in Windsor Castle in John's reign; Treasurer Langton, bishop of Coventry and Lichfield, was confined here because he refused to supply Edward II. with money for the pursuit of his pleasures; King John of France, taken prisoner at Poictiers, was removed here from the Savoy, but he was treated more as a guest than as a prisoner, for "he was permitted to hunt and hawk, and take what other diversions he pleased, as well as the Lord Philip, his son." When Henry IV. took possession of the throne, he confined the Earl of March (then seven years old) in Windsor Castle, for the grave crime of having a better right than his own. The earl was descended from Lionel, Duke of Clarence, an elder brother of Henry's father, John of Gaunt. In the year 1405 Lady de Spenser undertook to liberate the child and his younger brother, who was with him. By means of false keys she obtained access to their apartment, and hurrying them out of the castle she led them towards the frontiers of Wales, where Owen Glendower was in arms against the king. News of the flight soon got abroad, and the fugitives were overtaken, but the unfortunate smith, "for making ye key lost fyrst his handes, after his bed." One of the first acts of Henry V. was to set the young prince at liberty. The most romantic of the imprisonments in the castle was that of James I. of Scotland. While standing at the window of his prison, "to see the warld and folk that went forbye," he saw walking in the garden below Jane Beanfort, daughter of the Earl of Somerset, and half-niece to Henry V. He often watched here, for he had fallen in love with the young lady, and his poem, "The King's Quair" (or Book), is largely devoted to her. He fondly describes the garden where he first saw Lady Jane, who became his wife before he returned free to his own country:—

> "Now was there maid, fast by the Touris wall,
> A gardyn faire, and in the corneris set,
> Ane herbere grene, with wandis long and small,
> Railit about, and so with treis set
> Was all the place, and hawthorn hegis knet,
> That lyf was non, walkyng there forbye,
> That mycht within scarce any wight aspye."

The tower referred to in these lines was situated on the south side of the castle, and south-east of the Round Tower or keep. It was called the Earl Marshal's, or the Devil's Tower, and was set apart for the custody of State prisoners. It was afterwards fitted up for the reception of the maids of honour, when it took the name of the Maidens' Tower. The accomplished Earl of Surrey, who spent much of his early life in the castle with his friend the Duke of Richmond (Henry VIII.'s illegitimate son), must not be forgotten as a prisoner also:—

> "So cruel prison, how could betide, alas!
> As proud Windsor, where I, in lust and joy,
> With a kinges son my childish years did pass,
> In greater feast than Priam's sons of Troy,
> Where each sweet place returns a taste full sour.
> The large green courts, where we were wont to heve
> With eyes cast up into the maidens' tower,
> And easy sighs such as folk draw in love."

These lines were written by Surrey in 1546, when he was imprisoned, in consequence of a quarrel and charges brought by him against Lord Hertford, the king's lieutenant-general in France.

We have already spoken of the additions made to the castle by Henry I., and we will now give a short notice of some of the chief alterations made since that time, and of the men who were employed upon them. A building of such size and importance as Windsor Castle requires constant attention, so that few reigns have passed without some important works having been carried out for its preservation, but our space will not allow us to do more than allude to the chief of these. Much was done in Henry III.'s long reign. In the year 1220 orders were issued for payment of money to Engelard de Cygony, the Constable, for the works at the castle, and in 1221 Engelard was ordered not to take the toll called *cheminage* from persons conveying timber to the castle for the building. In 1233 a new kitchen was built, and in 1236 the bridges of the castle were repaired. In 1256–7 considerable alterations were undertaken, but soon after were discontinued, probably for want of money, for in 1260 the sum of 410*l.* was delivered to Master John of Gloucester, the king's mason, to be distributed to the workmen, whose wages were two years in arrear. Edward III., after his foundation of the Order of the Garter, enlarged the castle almost to its present extent, and Stow relates the tradition that the king received the hint as to the direction of the new additions from the kings of France and Scotland, who were prisoners together at Windsor during part of the years 1356–7. The three kings were walking on the site of the Upper Ward, then a portion of the park, when "the strangers commending the situation, and judging the castle to have been better built in that place than where it was, as being on higher ground, and more open to see and to be seen afar off, the king approved their saying, adding pleasantly that it should so be, and that he would bring his castle thither, that is to say, enlarge it so far with two other wards, the charges whereof should be borne with their two ransoms, as after it came to pass."

In 1349 John Peynton was appointed surveyor of the works, and Richard de Rotheley superseded him in the following year. About this time very energetic endeavours were made to get on with the building. Masons and artificers of all kinds were pressed into the service, and John de Alkeshull had power assigned to him by the king to "seize in the kingdom of England, as well by land as by water, in whatever places as should seem fit to him, stone, wood, coal, timber, lead, glass, iron, and tiles and other necessaries" for the works. In 1356 a distinguished man appeared upon the scene, namely, William of Wykeham, then a simple "clerk" without any ecclesiastical preferment. He was appointed surveyor of the works, and received one shilling a day. The royal coffers at this time were not overflowing, and to Wykeham, in common with John Brokas and Edmund Rose, was given power to take some of the best beasts and oxen out of the king's park, and to sell them, in order to obtain money for the building operations at the castle. The Winchester Tower is more particularly associated with William of Wykeham on account of a tradition that he inscribed on the interior of one of the walls the words "Hoc fecit Wykeham." The king reading this legend as "Wykeham built this," remonstrated with the architect, but the latter explained the words to mean that the building made him. No trace of this inscription has ever been found, but Sir Jeffrey Wyatville perpetuated the anecdote by cutting the words "Hoc fecit Wykeham" in the ashlar work of the Winchester Tower. In the year 1366 the Round Tower, then called *La Rose*, was externally painted with various colours, apparently to imitate the flower of that name. William Burdon, the painter, was engaged upon the job for 123 days and a half, and during a portion of the time he had several journeymen painters working under him. They used 67 lb. of white lead, 12 lb. of verdigris, 18 lb. of red lead, and 8 lb. of vermilion, 22 gallons of oil, 9 lb. of varnish, and 1,400 leaves of gold. With such an expenditure of material it should have been very resplendent. Edward III. had to surmount many difficulties in his attempt to make Windsor Castle a magnificent habitation. During some years nothing could be done for want of money, and, when the works were in full swing, there were many obstructions continually arising: thus the metal-work was all executed on the spot, but forges and furnaces required fuel, and the king could get no coal nearer than the pit's mouth in Durham. No other sovereign rivalled Edward III. in his alterations of the castle until George IV. inaugurated the extensive changes made by Sir Jeffrey Wyatville.

The history of a palace that has been used by the Royal Family of England for 800 years cannot but be full of interesting associations, and, as might be expected, that of Windsor Castle teems with them. Prince Edward (afterwards Edward I.) was brought up here, and in the 26th year of Henry III.'s reign the sum of 200*l.* was ordered to be paid out of the Treasury to Hugh Giffard and William Burn "for the support of Edward our son and his attendants residing with him, in our castle of Windsor." In after years it became the favourite residence of his beloved wife Eleanor, and three of her children were born in the castle. Edward III. was born here on November 23, 1312, and in consequence he is often referred to as Edward of Windsor. He had a particular liking for the place, and called his seventh and youngest son William of Windsor. In 1361 Edward the Black Prince was married to Lady Joan "the fair Maid of Kent," in the chapel, and eight years afterwards his mother, the good Queen Philippa died at the castle. The memory of Richard II. (the Black Prince's degenerate son) is also associated with Windsor, for here his wedding festivities were held when he married Anne of Bohemia, daughter of the Emperor Charles IV., and here (not in London, as Shakspeare has it) the dukes of Hereford and Norfolk were called before a high court of chivalry previous to the trial of battle at Coventry. It is needless, however, to mention all the kings and queens who have been born or married, or have died in the old castle, and we will therefore hurry on to the reign of Henry VIII. The Princess Mary lived here for a time, and was much liked by the people about her, for she stood godmother to their children and distributed her alms generously. It was probably here that she worked the great arm-chair she gave her father as a new-year's present. She had a female fool to amuse her, and in her privy purse expenses the payment of 4*d.* for shaving poor Jane's head is an item of frequent occurrence.

Wolsey intended to be buried at Windsor, and he commenced the erection of a stately tomb, about half of which was completed when he fell. It was the work of Benedetto, a Florentine artist, who began it in 1524, and received 4,250 ducats for his labour. Besides this sum 380*l.* 13*s.* were spent upon the gilding. What remained at the time of the Civil Wars was demolished by order of the Long Parliament, and in April, 1646, the statues and figures of copper-gilt were removed and sold for 600*l.* A sarcophagus of black marble remained neglected until the year 1805, when it was appropriated, and it now covers the bones of a greater than Wolsey; for it surmounts the tomb of Nelson in the crypt of St. Paul's. Of the recent conversion of Wolsey's Chapel we have recently spoken, and have shown its present magnificent aspect. Wolsey's master died at Westminster on the 28th of January, 1547, and was buried with great solemnity at Windsor on the 16th of February. The funeral procession took two days to reach this place, and previously an order was made "for the clearing and mending of all the highways between Westminster and Windsor whereat the corps should pas; and the noisome boughs cut down of every side of the way, for prejudicing of the standards, banners, and bannerols, and where the ways were narrow there were edges opened on either side, so as the footmen might have free passage, without tarrying or disturbing of their orders." Queen Mary kept her wedding at the castle, and Queen Elizabeth completed here in thirty days a translation of that favourite book of our ancestors, "Boethius de Consolatione Philosophiæ." The building owes to Elizabeth one of its most striking features, for it was she who formed the world-famed "Terrace." James I. was often at Windsor, and in 1606 entertained his brother-in-law, Christian IV., king of Denmark, "most royally" in the castle. Charles I. found here one of his prisons and also a last resting-place. Parliament voted that Windsor Castle should be kept ready for Cromwell's use, and the Protector occasionally visited it. Charles II. made it his habitual summer residence, and the want of accommodation for his court caused him to commence a more extended system of additions than had been made since the erection of the upper ward by Edward III. James II. astonished the inhabitants of Windsor by his conduct in respect to the Roman Catholic religion, and on the 3rd of July, 1687, he received the Pope's Nuncio, who "was conducted to the castle by thirty-six coaches, six horses each." William III. spent but little time at Windsor, as his principal residence was at Hampton Court; but in the latter part of his life he contemplated considerable alterations in the castle. Sir Christopher Wren was called upon to design a plan for its conversion into a more regular edifice with centre and wings, but happily the king died before he had an opportunity of spoiling the time-honoured castle. Anne was a favourite at Windsor, which she made her summer residence both before and after she was queen. Hampton Court and Kensington were the favourite palaces of the two first Georges, and during the reigns of these sovereigns Windsor Castle was merely kept in repair, but it again came into favour with George III. Although the latter king was greatly attached to Windsor, he lived but little in the castle, and built himself a residence opposite the south terrace. This house was completed in 1782, and cost nearly 44,000*l.* Forty years afterwards it was swept away, as a first step in the improvements that were then in progress. The design of making the castle the magnificent building it has since become originated with George IV. William IV. is not particularly associated with the place, and the numerous interesting associations of the present reign, must be passed over now with the mere mention of that death in the castle on December 14, 1861, which brought the heaviest grief to the widowed heart of her Majesty, and threw the whole country into mourning. The town of Windsor is naturally overshadowed by the grandeur of the castle; nevertheless it has interesting associations of its own. People of mark have lived in the neighbourhood, and Shakspeare has done it the honour of laying the scene of his one English comedy, the "Merry Wives of Windsor," in the old town. There is evidence of the existence of New Windsor as early as the twelfth century, and an order was issued, in the year 1214, to the constable of the castle, and to William Barbet, keeper of the royal apartments, commanding them to sell the king's wine at Windsor, and the bacon that appeared likely to spoil by keeping. The first charter on record was granted in the 5th Edward I. (1276), and in this same reign the first members for the borough were elected. Thomas de Shawe and Henry de Bedeford were sent as representatives to the Parliament held at London in 1302. So little, however, was the honour then coveted that each elected person had to find mauucaptors, or sureties, that he would appear in Parliament on the day and at the place named in the writ. Among the names of eminent men who have represented Windsor, the most interesting to us is that of Sir Christopher Wren.

Windsor Forest was one of the noblest of those large tracts of country in which our early kings delighted to hunt. William the Conqueror is said in the *Saxon Chronicle* to have loved the tall stags as if he were their father, and he appointed a Warden of the Forest in the person of Walter Fitz Other, the constable of the castle. The warden and his foresters were fully occupied in seeing that the severe forest laws were not broken. The praises of—

> "Thy forest, Windsor! and thy green retreats,
> At once the monarch's and the muse's seats,"

were sung by Pope, but it is greatly changed since the poet's time, having been enclosed in the latter part of George III.'s reign.

The beautiful chapel of St. George, under the shadow of the mighty pile that towers above it, must not be passed by unnoticed, although its history and that of the Order of the Garter would require an article to themselves. It will be sufficient, however, to notice here that the original chapel was built by Edward III., and shortly afterwards falling into decay, the present one was commenced in the reign of Edward IV., and finished in that of Henry VIII.

Castle, chapel, forest, park, and town together form that Windsor which is one of the noblest showplaces in Europe, and better still, one of the centres of English history for many centuries.

National Health Society.—According to the report just now issued, the Committee are very well satisfied with the past year's work. A number of useful lectures have been delivered in various parts of London. Miss Lankester, the secretary, can usually be found at the office of the Society, 63, Berners-street, by those who wish to assist.

GWILT'S ENCYCLOPÆDIA.

THE fact that there should be a demand just now for a new edition * of this well-known and long-reputed work is, we may hope, an indication that, in spite of the apparent prevalent taste of the day, architecture has not in reality come to be entirely regarded as a mere matter of sentiment, and pretty drawing, and reproduction of the feeling of past styles. For to those who so regard it, a book like Gwilt's, in which the logical and scientific basis of architecture is so fully recognised and so completely exemplified, could hardly appear other than old-fashioned lumber. A business-like publishing firm, with a clear perception of trade interest, would not, however, be likely to commit themselves to an enlarged re-issue of a work, involving considerable expenditure, if they did not see a market for it; and the appearance of the seventh edition of Gwilt shows that a practical and scientific treatise of this kind has a permanent value, irrespective of any changes in mere architectural taste.

The amount of the additional matter in the recent editions, as compared with the work as originally issued, is roughly indicated in the reprint of the title-page in our note; we learn more particularly, from the advertisement to the new edition, that "the Tables of the English Cathedrals have been recompiled; many chapters on Public and Private Buildings rewritten, and new ones inserted; the List of Architects and their Principal Works has been removed from the Glossary and re-compiled; the List of Publications largely added to, and formed into a separate list; while the Glossary itself, during reprinting, has received numerous additional terms and illustrations, together with such amendments as appeared desirable."

To the elder section of the profession it is certainly unnecessary to say anything in regard to the scope and plan of the Encyclopædia. Even those who from their limited and purely sentimental view of architecture may undervalue it, are well aware of its position as what is called a "text-book," and have in most cases been through it as part of their curriculum. But we shrewdly suspect that to not a few of the rising generation of architects Gwilt is little more than a name, and that it will hardly be superfluous to bestow a little space in directing their attention to the contents of a work which has certainly this qualification in a pre-eminent degree, that it thoroughly corresponds with its pretensions. We can say for ourselves, as we have said before, that we have never referred to Gwilt for information on any point which ought to be included in its scope, without finding what we wanted, wholly or in part; and those who know the constant disappointment which attends research for special information in books which ought to contain it, know that this is no ordinary commendation to bestow on a work of reference.

Gwilt's Encyclopædia is fourfold in its general plan, treating separately the History, the Theory, and the Practice of Architecture, and the Valuation of Property. The Glossary of terms, and the list of books on architecture and of eminent architects and their works, form, in the present edition, separate and subsidiary sections. The incorporation of a section on valuation of property with the other sections on the study of architecture proper, and apparently on an equal footing of importance, would be in itself a matter for more than question with many of the most prominent champions of architecture at the present moment. If required to express a formal opinion on the question, from the standpoint of the present day, our judgment would be that such a branch of practice was most naturally included within the scope of the profession of the architect, who assuredly should, as far as possible, know everything and be able to pronounce an opinion upon everything that is directly connected with buildings; and that a knowledge of the points which affect the money value of a building only implies that kind of practical information which is an important part of the real basis of the profession. That one man cannot be equally a proficient and equally an authority upon every class of subject connected with architecture,—that if he has given much time to mastering the details which affect the value of property he is not likely to be equally master of ornamental design in its higher branches,—is very possible; but the dilemma has its counterpart in other professions. One lawyer is especially great in a special branch of law; one doctor is specially consulted for diseases of the eye, another for those of the heart, and so on. The attempt to shuffle off the burden of valuation, and its cognate studies, in favour of a more specially "artistic" view of the profession of architect, tends to deprive those who seek for reliable valuation of the services of the higher class of practitioners, and to leave the work to those whose status and education may not place them nearly so much above the reach of interested motives. On the other hand, the present tendency to lean so much towards the artistic theory of the profession has, we do not hesitate to say, been the occasion of not a little bad and what we should call sham art, evolved by those who think that an architect can be, in effect, sculptor and painter without going through sculptor's and painter's training. We may quote the precept and example of Sir C. Barry, who certainly was an Art-architect in the most correct meaning of the words, and who held a most decided opinion upon the direct duty of the architect in regard to acquiring every kind of practical acquaintance with building. Nor do we believe that a Mediæval architect or builder (whichever term we are to use) would have made any objection to pronouncing an opinion on the value of a building, if any case of inter-conventual litigation had rendered an authoritative judgment on such a subject desirable.

The History of Architecture included in the Encyclopædia cannot of course take place with some more recent historical work, either in extent or in power and suggestiveness of generalisation. Much has been learned, and some things unlearned, during the thirty-three years which have elapsed since the publication of the first edition. The collection of various ideas and theories as to the origin of the pointed arch it is curious to run through, now that we have finally settled down to the belief in its constructive and utilitarian origin. The inference as to the comparative importance of Gothic and Renaissance architecture, to be drawn from the tenor of their treatment in the History, will hardly meet the sympathy of many readers in the present day; but the impartial intention is manifest, and the inferior illustration of the Gothic style is partly due to the fact that a school of architecture in which constructive features play so large a part in the design is less easily illustrated by woodcuts showing the superficial aspect of the structure than is the less real and more artificially composed character of Renaissance architecture. The distinction between the style of illustration given here, and those with which the chief characteristics of Pointed architecture are illustrated in Viollet-le-Duc's *Dictionnaire*, is significant enough as marking the far clearer and more logical view of the genuine basis of the style given by the French critic. In short, the History is the least valuable portion of Gwilt, because its merits are of that kind which are necessarily superseded in time by the results of further research, and also, perhaps, we may add, because the great difficulty of finding a scheme by which so involved a subject as the history of architecture, with its varied ramifications in regard to time and place, and its connexion with race and manners, and culture, can be consolidated into a logically progressive and comprehensive whole, had hardly been adequately solved by Gwilt. As a first historical sketch for young students, however, preparatory to such larger works as Fergusson's, its value is unimpaired; and many of the remarks and passing criticisms in the course of the history are very comprehensive in their suggestions, such as the remark in comparing an illustration of Indian architecture (the Choultry at Madurah) with Greek, that an "examination of the details, and particularly of the system of corbelling over, destroys the charm which a first glance at it creates. In it the ornaments, which in Greek architecture are so well applied and balanced, seem more the work of chance than of consideration." This is an admirable though simple epitome of the distinction between the characteristic quality of Greek and Indian architecture, and a much more just valuation of the latter, to our thinking, than some later criticisms of a far more laudatory tone.

What does the rather vague term, "Theory of Architecture" include or stand for? The long array of subjects under this heading in Gwilt rather suggests the question, for it includes much which is essentially practical, such as the chapters on the materials used in building, and on specifications and working drawings; and it does not include (with the exception of a very short chapter on Principles of Composition, forming part of the section on Drawing) any consideration of the general principles by which architectural design should be governed, and which apply specially to this art rather than to others. At the time the Encyclopædia was first published, in fact, people troubled their heads much less than at present about any theorising of this kind, or in regard to questions of a new style or of the true style of the future; they were more content to take architectural styles as they found them, as accepted facts to work upon; and perhaps it is not of much use to push considerations of the suitability of this or that style, to the modern period, and other such problems, too far. It would naturally be supposed, however, that a discussion on the aim of architectural design, and the qualities which constitute expression in architecture, belonged to the theoretical part of the subject; but in Gwilt we find the consideration of this part of the subject forming the preliminary part of the section on the Practice of Architecture, which seems a mistake in regard to classification. The form which the theory of architecture does assume in Gwilt would be rather startling to some of those who are brought up entirely in the sentimental school of architectural study. Its four chapters are headed "Mathematics and Mechanics of Construction," "Materials used in Building," "Use of Materials, or Practical Building," and "Medium of Expression"; the latter rather misleading title referring to drawing. The first chapter sets out with Theoretical and Practical Geometry, Plane Trigonometry, Conic Sections, &c., ending with special adaptations of the mathematical knowledge, thus formulated, to the determining of the mechanics and statics of materials under different modes of construction. This logical progression, from the mathematical methods of dealing with forces and proportions, to their application to actual problems, thence to the properties of the materials in which these problems have to be reduced to fact, to the methods of using and working the materials, and finally to the methods of drawing out and showing the results arrived at, is a practical lesson on the nature and basis of architectural work which it is well to recall attention to. The mathematical department may be carried further, perhaps, than in actual practice is often found necessary; but the scientific thoroughness of the whole scheme, as a synopsis of the theoretic education of the architect, seems to infer that, although there has certainly been a considerable awakening of late years in regard to the artistic and decorative side of architecture, we have on the whole progressed rather in the wrong direction in regard to our ideas as to the scientific basis of the profession, looking at the matter from a comprehensive point of view. In regard to details, we may note that the section on the work done under the heading of various building trades (joinery, plumbing,* &c.) seems to be sufficiently brought up to the present date. Some of the joinery details belonging to the original edition seem in the present day a little like what naturalists would term a "survival of types" now somewhat in disuse, or no longer regarded as the essential and only method of procedure; as, for instance, the moulding and putting togther of door-panels, and some other instances. These, however, are scarcely worth mention amid the bulk of minute and valuable information contained in this section.

The chapter on drawing,—the "medium of expression,"—lays down views as to the primary importance of outline in drawing, and the futility of the process of setting students to learn to draw by indiscriminately copying from various drawings, which it is only necessary to refer to in order to notice how far the general truth of Gwilt's remarks has been in more recent days practically ratified by the practice of all schools of instruction in drawing that are worth the name. In reference to another point, the theory as to the mastery over drawing of every kind which is gained by a thorough knowledge of

* An Encyclopædia of Architecture, — Historical, Theoretical, and Practical. By Joseph Gwilt, F.S.A., F.R.A.S. Illustrated with more than 1,100 engravings on wood by R. Branston, from drawings by John Sebastian Gwilt. Revised, with alterations and considerable additions, by Wyatt Papworth, F.R.I.B.A.; additionally illustrated with nearly 400 engravings on wood by O. Jewitt, and nearly 200 other woodcuts. Longmans, Green, & Co. 1876.

* "Plumbing" is called "Plumbery" in the Encyclopædia; but though this construction is logically the same as "joinery," it is no use trying to disturb an expression which has been universally adopted. Besides why apply the rule only in this instance? To complete it one would have to say "Paintery," "Gildery," &c.

figure-drawing, which has been pressed very strongly of late, the criticism of Gwilt is worth requoting. In his opinion,—

"All the inferences are false which usually are derived from the assertion that he who can draw the human figure will be able to draw any other object that is submitted to him for representation. The few men who can *faithfully* draw the human figure as they see it may doubtless have eyes keen enough and hands true enough to repeat the minutest details so accurately that any comparison of a particular detail with the original shall be creditable to them; but these men have spent years in obtaining, besides delicacy of handling, that knowledge of anatomy which reminds them that such a muscle is in such a place, that here it overlaps another, that there it dies into a bone, and that consequently they have to mark the curves and angles which occur, for instance, six or seven times between the elbow and the wrist, &c." But, it is added, "the majority of men who can draw the figure tolerably well can draw nothing else equally correctly, for the reason that their attention has been given to the mechanism of the human form solely; the representation, by our best portrait-painters, of the accessories they introduce into their pictures, especially of architectural details, is almost without exception ludicrously inaccurate. . . . . The artist who wishes to give the effect of a suite of mouldings, or of a carved ornament, requires to know previously all the parts which compose the work. In other words, some men can pretend to sketch distant rocks, and yet miss the very features by which the outlines intimate the geological character"

The remarks as to inaccuracy in representation of accessories, in portraits, for instance, are certainly not so applicable to the present day as to the date of the Encyclopædia; but the line of argument and the inference from it, that a draughtsman requires to understand the construction of what he is drawing in order to represent it correctly, are incontrovertible. And upon this the suggestion is based that an architectural student should first learn to draw architectural detail and ornament in different styles, so as thoroughly to understand them, before mounting to the higher branch of figure-drawing. The real truth about the influence of figure-drawing upon promoting general power in drawing is stated sometimes in a way that is perhaps hardly correct. It is not that drawing the figure enables a man to draw anything else; but that the study of it renders any other class of drawing seem comparatively easy of acquirement. And it must be borne in mind that drawing, while it requires a knowledge of the object drawn, itself assists in giving that knowledge, and is thus, so to speak, a means and an end at the same time. Look at an architectural detail, even carefully, and you very soon forget its construction and minutiæ. Draw it carefully, and in the process you learn all about it, and remember it afterwards. And as the first business of the architect, so far as drawing is concerned, is to delineate architectural detail, it seems according to reason that he should adopt the process, in learning to draw, which will teach him most about that, and best enable him to sketch and represent it.

It is in the section on the Practice of Architecture that the Encyclopædia becomes to a certain extent out of date for the modern student. Some portions of this section might advantageously have been shortened, and some of the illustrations cut out; but on the whole it is better perhaps to retain these as they were, as landmarks of the progress of architectural practice. The list of eight axioms (p. 798), by which the designer is recommended to test his scheme, are very well worth the special attention of young architects: two especially among them are frequently transgressed, particularly in competition designs, "Let solidity be always real, and not brought to appear so by artifice"; and, "Let nothing be introduced that is not subordinate to the whole." One remark, which is given under the head of "Theory of Architecture," is (p. 792) so well and truly put, and propounds a truth so little remembered in contemporary architectural designing, that we will conclude our remarks on the new edition of the Encyclopædia by quoting this eminently practical piece of theory:—

"In ninety-nine cases out of a hundred, the student will find that a good distribution of his plan leads him, with anything like ordinary tact, to the composition of good sections and good elevations. . . . . Indeed, it is incontrovertibly true that distribution and disposition are the first objects that should engage the architect's attention, even of him whose great aim is to strike the attention by ornament, which can never please unless its source can be traced to the most convenient and economical distribution of the leading parts. Theorists may be laughed at, but it does not move us, or diminish our regret to see many architects without any other theory than that whereon, in an inverted position, their own wild fancies are grafted If what we have stated be true, and, from the nature of things, we cannot imagine a controversy can arise upon our observation, the talent of the architect is to be estimated, as Durand properly observes, according to his solution of the two following problems

First,—For a given sum, as in private buildings, to erect the most convenient and suitable house for his employer.

Second,—The requisites in a building being given, as in public buildings, to erect it at the smallest possible expense.

An investigation of all the modes of accomplishing these desiderata can only be fully effected in a work of much larger extent than this; but we have, in the practical part of our volume, so prepared the reader, that he will not generally be at a loss in respect to the construction of a building, whatever its nature or destination."

To say that the concluding remark is fully warranted by the extent, variety, and accuracy of the information contained in the book, is at the same time to give the fullest explanation of the continued value and present re-publication of Gwilt's Encyclopædia.

KNIGHTSBRIDGE BARRACKS.

THE public meeting which was held last Tuesday to protest against the rebuilding of the Knightsbridge Barracks on a portion of their present site possessed the elements of success, inasmuch as it appealed to the common sense of Londoners generally, and to that of the Government in particular. That the present barracks are condemned is certain; and that it is proposed by the competent authorities to widen the Kensington-road by selling a portion of the site upon which they are built to the Metropolitan Board of Works, is also certain. But we are disinclined to believe that the Government really intend to erect new cavalry barracks upon the limited and inconveniently oblong piece of ground which will be left after the high road is widened. It will be remembered that some twenty years ago a great barrack competition took place, in which many well-known architects assisted. The first premium of the Infantry section was awarded to Mr. George Morgan, who erected the buildings at present in use at Chelsea; and Mr. T. H. Wyatt received the first premium for the Cavalry section. With commendable justice the War Office have now commissioned Mr. Wyatt to plan and superintend the construction of the barracks intended to supersede those at Knightsbridge; and it is all the more commendable when it is remembered how architectural competitions, even Government competitions, sometimes terminate. But we venture to doubt whether Mr. Wyatt will do either justice to himself or to the building he is to erect if he be compelled to use the present inconvenient and restricted site. The Government say that the maintenance of cavalry barracks in that particular corner of Hyde Park is of strategical importance. But Lord Sandhurst the other day said just the contrary; and people very naturally laughed when Sir Harry Verney argued that "the peace of the metropolis would be considerably endangered if these barracks were got rid of." The resolution moved by Mr. Reginald Yorke, M.P., and seconded by Lord Headley, records, we think, the opinion of most Londoners who have considered the question; and it was carried by the meeting to which we refer:—

"That having heard the statement of General Lord Sandhurst that the presence of the Household Cavalry on the actual site of Knightsbridge Barracks is not essential to the maintenance of peace in the metropolis, and considering the great public improvement which could be effected by their entire removal, this meeting is of opinion that the proposal of the Government to reconstruct them on their present site is not only unnecessary, but also opposed to public interests."

The chairman, Lord Alfred Churchill, was ultimately requested to sign a petition to the House of Commons, begging the House not to grant money for the erection of new barracks on the present site; and we wish the petition the speed and attention it demands.

Indeed, at a time when the public advantage of the many improvements which are being carried out, both in the City and the Metropolis, is patent to all, the Household troops should not be permitted to bar the way to another. That 450 horsemen quartered in barracks which break a line of road forming one of the most important entrances to central London occupy that particular spot for the purpose of intimidating the uneducated portion of the community, is a bad argument! And is it the west end of London alone that contains a monopoly of uneducated people? It would seem so from the care bestowed upon its security and welfare. The great City guilds, the merchants' offices, the joint-stock banks, Threadneedle-street, indeed the whole City of London itself, are of such slight importance that a handful of soldiers quartered at the Tower is deemed sufficient protection! At the west end, on the contrary, a small portion of London is dotted with barracks which are filled with troops whose occupations west of Charing-cross consist in mounting guard at the Horse Guards, attending the Queen in her Majesty's visits to town, and walking up and and down in front of the public offices; while east of Charing-cross their only duty appears to be to provide a nightly guard to Drury-lane Theatre.

We cannot but urge that the inhabitants of Knightsbridge are doing a public service in suggesting not alone the removal of the barracks, but the demolition of that particular corner which at the present hour is an eyesore upon a great London thoroughfare,—and this not from any fancied faults of the soldiers themselves, but really from the accidents of tradition which have too long doomed that particular corner to be what it is, and must continue to be, unless a spur to improvement be given to the land and house owners of the neighbourhood by clearing away an obstruction, and opening out Hyde Park to the very edge of the high road.

THE GERMAN ATHENÆUM.

THE German Athenæum (*Verein für Kunst und Wissenschaft*), 21, Mortimer-street, has monthly exhibitions organised by that section of the society which is devoted exclusively to painting and sculpture, but ordinarily these remain for only one night. The last exhibition of this kind comprises a selection of Mr. Carl Haag's water-colour paintings, studies, and sketches, illustrative of his artistic career from an early period to the present time, and the owners being found good-natured, it is being kept open for a week. As this week, however, ends to-day, Saturday, 11th, after which the works will be returned, it will be useless for us to do more than say that the collection consists of 88 frames, including all the studies made for his best known pictures, and that it must have advanced the reputation of this able and agreeable artist.

THE HORUS MYTH.

AT the Victoria (Philosophical) Institute, on Monday evening last, a paper "On the Horus Myth in its Relation to Christianity" was read by Mr. W. R. Cooper. The author sought to prove that there were between the Christian and Egyptian religious ideas, some very striking resemblances, which could only be accounted for on the hypothesis of a pre-patriarchal revelation which was afterwards lost sight of. He then proceeded to analyze the Horus Myth, especially that portion which referred to the actions of Horus, the son of Osiris, as the Egyptian Redeemer, or rather Deliverer from the power of the Evil Being typified by the serpent, Apophis, and the hippopotamus, Typhon. The titles of the avenging Deity, such as "Beloved Son of his Father," "Eternal One," "Self Begotten," "Justifier of the Righteous," "Only Begotten Son," and "God the Son of God," were next considered, and it was shown that some of these epithets, while of the highest antiquity, did not necessarily embrace the ideas imputed to them in the religious commentaries of later times, especially after the contacts of the Egyptian Faith first with Judaism and afterwards with Christianity. Mr. Cooper then asserted that many of the errors of the Gnostics arose from the Egyptian Christians having, without due caution, pressed the analogy of the acts of Horus and our Lord into the service of religion,—an unwise proceeding which, though undertaken in good faith, and sanctioned by the metaphorical expressions of the early Fathers, chiefly of the Alexandrian Church, yet led the way to serious departures from truth, and a partiality for mystical expositions.

Enlargement of the Gloucester Corn Exchange.—At a special meeting of the Gloucester Town Council, held on the 3rd inst., from minutes which were read it appeared that there had been some differences between the Finance Committee and Mr. Medland as to the execution of the plans for the improvement of the Corn Exchange, Mr. Medland, as was understood, desiring to have some latitude in carrying them out, while the committee were anxious to avoid "extras." The council supported the committee's view. Mr. Moss pointed to the heavy sum charged for extras when the Eastgate Market was constructed, the flooring being at first left out of calculation. Explanations were given, and it was understood that no material variation would be made in the plans, and that no extras would be incurred without the consent of the committee.

PROFESSOR E. M. BARRY'S LECTURES ON ARCHITECTURE.*

LAST week we considered the part which architecture is called upon to fill in our towns, as distinguished from the country; and I propose to-night to follow up the same subject by the aid of light thrown upon it by the past.

I have endeavoured to point out to you some of the complexities with which architects must now grapple, and which, in my opinion, are not likely to diminish. For these, as far as they relate to scientific exigencies, we must not expect antiquity to aid us; but we may, perhaps, gain something from the study of the manner in which architects of old addressed themselves to the simpler problems submitted to them.

The monuments of Egypt will not assist us in solving the question I am placing before you, namely, the province of architecture in modern cities; not that I doubt the value of Egypt as a teacher, but because the conditions under which her builders worked differed radically from our own. The Egyptian architect employed the maximum of material, disposed without regard to space. We, if our art is to be of public utility, must study the converse, as leading to the happiness of the greatest number.

We may wander on the banks of the Nile, and marvel at the remains, on all sides, of civilisation and of art, but we are not likely to imitate either. Take, for example, the Great Pyramid of Gizeh. As a permanent monument it is perfect, but a monument of what?—of mechanical monotony, of dreary waste of labour. There would be no difficulty in erecting another pyramid to surpass this one, and I almost wonder that some worshipper of the Past has not entered upon such a task. So much is often said of the mischief of machinery, that we may, perhaps, sometimes ask ourselves if there is not such a thing as profligate waste of manual labour; and to such a question the Pyramids seem to me to supply an answer. No doubt, a pyramid is a wonderful work, and illustrates the stage of civilisation at which its builders had arrived. The London and North-Western Railway is a work at least as wonderful; and if we look at it in the light of a specimen of nineteenth-century enterprise, it will not compare disadvantageously with the Pyramids. Considering the circumstances of the time, the mechanical difficulties attending the erection of the latter will appear to many of us more formidable than in the modern case; but in the case of the railway, the triumph of intellect is immeasurably more apparent; and if we compare the results of both, we find that one ministers at best to a morbid ostentation, while the other serves the wants, and ministers to the convenience, of millions.

It is, of course, true that in Egypt we meet with works of architecture, besides the Pyramids, which claim more respeceful treatment at our hands, as works of art. In strictness, perhaps, the Pyramids are not works of architecture at all, for they represent mere building. The temples, however, come under a different category. Always striking from their massive grandeur, their æsthetic merits must be admitted within the circle of architectural art. No one, I think, will contest this, who has examined on the spot the acres of majestic ruins at Thebes, or Philæ, but the atmosphere and climate of Egypt affect the appearance of its architecture to so important a degree that its effect is hardly to be appreciated from drawings alone. This is perhaps more especially the case with the interiors, as, for example, the famous hypostyle Hall of Maneptbah at Karnak. It is difficult to believe, from the plan and section before you, that this hall is the object of almost universal admiration; but so it is, and Mr. Fergusson has gone so far as to describe it as "the greatest of man's architectural works"; qualifying this, it is true, by the statement, that it is "such a one as it would be impossible to reproduce, except in such a climate, and in that individual style in which, and for which, it was created." To this qualification I entirely assent; and in it you will find one of the reasons why I started by saying that we must not expect aid from Egypt, at least, in any direct influence on our work of to-day.

If this be the case with respect to public monuments, still more is it so with domestic architecture. Not, however, that the latter may not have been beautiful. In all probability the æsthetic taste of the Egyptians did not stop at their temples. Their houses must, of course, have been slighter in construction, and more varied in materials, but they were doubtless examples of the same wealth and skill which produced their public buildings. But the same considerations of climate, and other circumstances, which affect the one, must prevent the other from serving as models to ourselves.

Passing from Egypt, therefore, what are the most interesting remains of ancient domestic architecture? We turn instinctively to Greece, whenever any architectural inquiry presents itself, and we have no difficulty in ascertaining the principles which they applied to their public works. Starting with a Doric order, of a massiveness only second to the columns of Egypt, the Hellenic architects gradually reduced the sturdiness of its proportions and details till it was merged in the grace of the Ionic, and the even more highly decorated Corinthian. Nothing that was touched by Greek hands but was refined by the process, and Athens became the home of all that was exquisite in poetry and art. It must, therefore, be a source of unceasing regret to the architect that we know very little of the domestic architecture of the Greeks. It cannot have failed to have been pervaded by the pure taste which marks all their artistic remains, and must have afforded us some useful lessons. It is possible, however, that the private dwellings of Greek citizens may have been less important than we might at first be led to expect; for their public life (in Athens, at any rate) was so absorbing, that we may imagine the Athenians assigning a secondary importance to private affairs, and devoting their means and talents to the decoration of the public monuments, in preference to their domestic architecture.

Whatever the cause, however, we are left very much in the dark as to the latter, and can form but imperfect guesses as to its forms and decorations. This circumstance is in itself enough to justify us in refusing to accept the theory of perfect regularity, which some have sought to impose upon us, as a necessary condition of Grecian art.

When dignity is required, a certain measured regularity is essential in all good architecture, particularly in cases where the actual size is small; but the Greeks were far from insisting on exact regularity in all cases, as is seen by the example of the Erechtheum, and we may assume that their skill was great enough to adapt their architecture to the varied wants of domestic life without losing that exquisite taste which marked their designs for even the simplest objects.

Dismissing now the speculation of what might have been in Greece, we turn to Rome, as her conqueror and successor. As the metropolis of art, and queen of the world, she had opportunities without a parallel. How she used them we know from the remains of her public works, her amphitheatres, aqueducts, arches, and temples. Whatever wealth, power, and advancing civilisation could effect, became the marks of Roman dominion, and although we may miss the refined taste of the Greeks, we must admire the energy and Imperial qualities of the Romans. Until lately, the remains of Roman architecture were chiefly confined, as far as Rome itself is concerned, to those of public buildings, but recent investigations have done something to increase our knowledge of its domestic architecture. Fortunately, however, for my purpose this evening, there is a richer mine of information on this subject, only partially worked, and daily yielding new and valuable treasures.

I allude, of course, to Pompeii, to which I propose this evening especially to direct your attention. Let us first deal with the general aspect of the city. Owing to the enlightened activity of the Italian Government, in prosecuting the work of excavation, it is now possible to penetrate into all the more important parts of the city, and thus to form clear ideas of the daily life and habits of its former inhabitants.

Pompeii is placed on an eminence, and doubtless owes to this circumstance its comparatively perfect preservation. More fortunate than Herculaneum, it was not destroyed by lava, but by ashes. The lava becoming hard, like stone, still holds the latter in its petrified grasp, whereas the loose ashes, under which Pompeii was buried, have admitted of easy removal, without injury to the buildings and works of art, which they have preserved to a great extent from the ravages of time. As regards the style of the Pompeiian remains, it is right here to remark that we are not dealing with a city of first-rate importance. It was only about two miles in circumference outside the walls, and we must not, therefore, expect to find in it the grandeur and variety which no doubt characterised the buildings of Rome, and other important cities. Owing to the extension of Grecian rule in the south of Italy, it may, however, be presumed that Greek influence affected greatly the forms of Pompeiian architecture, and we shall see, in detailed examination, that this was the case. Indeed, Pompeii might almost be called a Grecian, rather than a Roman city, and we may therefore obtain from it much of that knowledge of the domestic habits of the Greeks which, as we have already seen, cannot be obtained from their own artistic remains.

Many who now visit the ruins express surprise at the imprudence which could have planted such an assemblage of human dwellings on the slope of a burning mountain; but it is supposed that, for some centuries before the destruction of Pompeii, Vesuvius had shown no indications of activity, such as the catastrophe which subsequently overwhelmed it in the year 79 of the Christian era. Pliny's description of the latter shows us that it was a surprise of the most terrible character; and had it not been so, many of the numerous valuable articles found in the ruins would, no doubt, have been previously removed to a place of safety. There were some warning shocks of earthquake before the final eruption, and we find evidences of the effect of them in the excavated buildings generally, some of which were evidently undergoing restoration at the time of the final destruction of the city.

The first sign of the eruption is described as a black and terrible cloud, resting on the summit of the mountain. This gradually expanded, and rose like some vast palm-tree, and at length burst into streams of fire and vapour, accompanied by lightning, and a strong sulphurous smell. Streams of molten lava then rolled down the sides of the mountain, and showers of stones and ashes fell around it.

Herculaneum, nestling close to the foot of the mountain, was soon buried in molten lava. Pompeii being four miles distant, was covered by the cinders or ashes thrown up from the crater, as above described.

This circumstance explains the paucity of the skeletons discovered in the ruins, and the good state of preservation of the houses. A general flight of the inhabitants occurred, and the cinders were sufficiently cooled in their passage through the air, not to destroy utterly the buildings they enveloped.

In approaching Pompeii, we come first on the street of the tombs. This was the principal approach, and is believed to have formed part of that famed Appian Way which extended from Rome to Capua. Amongst the Romans, the construction and the care of the public roads were considered a matter of the greatest importance, worthy of the care of emperors. Their construction showed the massiveness which Roman work ordinarily displays. Many examples remain, and some of you are doubtless familiar with the portion of the Appian way which is still intact and well preserved, and in which you may now find the sightseer of the nineteenth century enjoying his afternoon drive amidst the ruins of Imperial Rome.

The large upper stones which form the surface of the road are not, perhaps, adapted to the delicate springs of the London coach-builder, but they are carefully jointed, and after the lapse of centuries are in their original position, and available for daily use. Great care was taken with the foundation, which was composed of layers of stones and gravel, and the roads once made must have lasted for ever. The streets of Pompeii are all paved in this manner. There were no drains, nor did those enemies of the modern road-maker, the gas and water engineers, tear up the surface as soon as it was laid, and drive to despair those who were responsible for its maintenance. Along the main approach to the city, we find the tombs, varying in style and taste, according to the idiosyncrasies of their founders.

As regards intramural interment, the Romans had reached a conclusion which we have but too tardily accepted.

In some places, and in very rare cases, the honour of sepulture in the Forum, or other public places, was sparingly permitted, as a mark of special distinction; but, as a rule, neither interments nor burning were permitted within the city. As a natural consequence, the monuments were also outside the gates, as we see in the Appian Way at Rome, and in the street of tombs at Pompeii. They were held in great veneration, and it does not seem to have been necessary to enclose them, or afford them any protec-

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* Second lecture, delivered at the Royal Academy, on the 2nd of March, 1876.

tion, beyond that which their own sanctity supplied. Sumptuary laws restrained the extravagance of cost and epitaphs, into which a rich society is tempted to glide; and for slaves, and for the very poor, Horace speaks of an enclosed space at a distance as a "*commune sepulchrum.*"

The Pompeiian street is about 14 ft. wide, and shows the ruts worn by the traffic. On each side are the monuments of those who had borne some office, and to whom the erection of memorials had been decreed on public grounds. The cemeteries for general use were further removed from the gates of the town.

The monuments display every variety of design and scale, from the simple altar or bas-relief to the more ambitious structure, which, being furnished with a door, permitted the sepulchral vases containing the ashes of the dead to be placed within, as in a temple.

We have lately had a revival of interest in these matters, and it is high time that we should see our way clearly in respect of them. In our great cities, the dead press upon the living. Cemeteries once suburban are now the centres of large populations. Air is poisoned, springs are polluted. I cannot enter now into the important questions which this state of things will readily suggest to you; but it is not without interest to observe how they were dealt with by the Romans, whose care for the ashes of their forefathers was a sacred and pious duty.

At the entrance to the city the street is spanned by an arch over the carriage-way, with two side-openings for foot-passengers. The archway was closed, when required, by a portcullis, and there was a second gate inside for greater security.

The walls are of solid construction, with large stones laid horizontally. Some of them are 4 ft. or 5 ft. in length. The upright joints are not accurately vertical, but incline more or less,—a feature not uncommon in Greek work. Some portions appear to have been patched, or repaired, in a different style, with rubble work or brickwork. The latter is arranged in the diagonal manner, known as *opus reticulatum*, another feature familiar in Greece.

The walls were double, and with a connecting arch formed ramparts about 20 ft. wide, and from 25 ft. to 30 ft. from the ground. Towers were constructed at intervals. They were about 30 ft. square, and projected 7 ft. beyond the general line of the outer walls. Battlements crowned the upper surface of each wall. These differed from the battlements of Mediæval castles, in having a special arrangement of plan, for the greater security of the defender. Each battlement was constructed of large stones, with a piece returned inwards, an arrangement which not only increased its defensive advantages, but also added to its structural solidity.

Having passed the walls, the street becomes closely lined, on each side, with houses and shops, possessing little or no architectural interest externally; for with the exception of their public buildings, the Romans do not seem to have cared to make their houses ornaments to the public streets.

In the Forum, to which the principal thoroughfares led, we shall find the public edifices which formed the chief adornment of Pompeii. In the Forum of Roman cities, as in the great square of modern towns, we expect to find those buildings which, from their devotion to public purposes, are open to all. The temples of the gods, the Basilicas, or Law Courts, the Senate-house, or Assembly-rooms, the public granaries, Treasury, and Government Offices, were all congregated in the Forum, as well as market-places, and porticoes for various trades and pursuits. These buildings are marked in the plans on my right.

It was not unusual to use the Forum, in the absence of an amphitheatre, for gladiatorial shows, and it was often in such cases surrounded by colonnades or porticoes, under and over which spectators might congregate. The colonnades also afforded an agreeable protection from the Italian sun, and served the same purpose as the arcaded streets, so common now-a-days in southern towns, to the picturesqueness of which they are no mean addition.

At Pompeii, the Forum possessed these colonnades. There were also theatres, and an amphitheatre, but these were erected at a later date than the Forum. The latter was undergoing repairs at the time of its destruction, and large blocks of marble partly worked, and evidently under the hands of the masons, were found among the ruins. It was evidently the centre of Pompeiian public life, which according to the Roman customs, was far more engrossing than with us. The streets leading to the Forum had iron gates at their entrances, to be closed at night, or in case of tumult. They would also have been useful in restraining and regulating the crowd, attendant on shows or public meetings. There had been an alarming earthquake in the year A.D. 63, and this had caused much damage to the temples and other buildings of the Forum. The consequences of this calamity and the alarm caused by it were so serious, that the abandonment of the city had been discussed; but after a time, confidence returned, and the Pompeians set to work to restore the public monuments, in ignorance of the possibility of the tremendous misfortune which was so soon to befal them.

It is difficult to be quite sure of the particular destination of each of the buildings which surround the Forum of Pompeii. Indeed, there is some reason to think that the works of restoration, which were interrupted by the eruption, were connected with some changes of arrangement, then in course of execution. As to the more prominent structures, however,—the temples,—little doubt can exist.

The grandest of these was at the northern end, and has been usually termed the Temple of Jupiter. Sir W. Gell thinks it was the senaculum, or place of meeting of the decemviri, and certain peculiarities of internal construction favour this idea. Such meetings were commonly held in consecrated places, and on this assumption, the edifice in question might have been both a temple and a senate-house.

It is by far the grandest piece of architecture in Pompeii, and in its original condition must have presented an imposing appearance. The design of Roman temples was so evidently borrowed from Greece, that it is perhaps as well to point out here some of the differences between the two types. The temple at Pompeii is a fair specimen of the Roman manner; and the Parthenon may be selected as an example of Grecian principles of design.

In the Parthenon, as you may see, the interior is surrounded by a peristyle, or colonnade, a feature of great beauty, where the building crowned an eminence, as at the Acropolis. The effect of colonnades, in such a position, and under the influence of the sunlight of the fair south, is, I think, sufficient justification for such a feature. It would also protect the inner wall from moisture, and from heat, as to which latter point it would serve the same purpose as the verandahs of India.

We know now how largely colour entered into the architectural compositions of the Greeks, and if the walls were painted (as probably was the case), the shelter and protection afforded by the colonnades must have been very valuable. They are scarcely wide enough to have allowed processions to use them with dignity or convenience, but their width is just what we should expect to find, on the protective theory. If they were deeper, they would have cast too large a shadow, and would have marred the effect of the paintings on the walls.

The climate of Greece was, as we know, favourable to the habits of a people who passed much of their time in the open air, and we are struck by the small space occupied by the cella, or covered interior, in the plans of their temples. It was natural that they should revel in external effects, regarding the sun as their best friend. By deepening the porticoes at the ends, and adding a second row of columns, the entrances were duly marked by an increased depth of shadow, contrasting beautifully with the lights and shade of the peristyle.

If we turn to the Pompeian structure we shall notice the changes introduced by the Roman architects, changes which, in an artistic sense, are not in themselves improvements. In the first place, the peristyle has disappeared. The temple, being surrounded by other buildings, was not an isolated structure, in the sense in which the Parthenon was, and it may be presumed that, in the middle of a town, ground for a site was not very readily attainable. The portico at the entrance was deeper, and more spacious, by reason of no inner columns being introduced. On each side the portico was flanked by triumphal arches, and the whole front was evidently designed with special reference to its position, and intended to be seen principally from the Forum. A surrounding colonnade would, therefore, have been, to a great extent, wasted. The interior was also very different from that of the Parthenon. In that example the cella is small, relatively to the whole extent of the structure. Here the internal arrangements have gained in importance. By the suppression of the side colonnades, space was obtained, and the cella has expanded to the whole width of the portico.

At the end furthest from the entrance there are three vaults, with a passage behind them, connected with a staircase. If the interior was used, as conjectured, for meetings of senators, these vaults may have contained records, or other valuables, and the staircase may have given access to the platform, or rostrum, from which addresses could be delivered to the people below. There is a similar arrangement in the Temple of Isis, which seems to have been one of the most fashionable shrines of Pompeii. The rites and ceremonial of the worship of Isis are enshrouded in mystery.

Another point of contrast between the two types of temples is height. At Pompeii, they are elevated on a podium, or, as we should call it, a basement. The temple-builders of Greece chose, as a rule, lofty and commanding sites for their buildings. It was not therefore necessary for them to seek to elevate the latter. Had they done so, the exquisite charms of repose and contrast would have been lost. All that was necessary was to give such a base to their work, as would prevent their columns from seeming to start unprepared from the ground. They were not fond of bases for their columns, for it was not until after the decline of the Doric style that this feature was introduced in the Ionic and Corinthian orders. We therefore find in the Parthenon no base, plinth, or podium. Three steps projecting slightly beyond the columns gave a foundation to the structure, about corresponding to the projection of the cornice. They were evidently proportioned to the general architectural effect of the building, with the same care which the Greeks showed in every detail of their work.

Repose and refinement, as the leading principle of Greek works, were attained by compositions which relied on width rather than height, just as power and energy are represented by the towering structures of Mediæval architects.

The Romans lacked much of the pure taste of the Greeks, and, building in the midst of crowded towns, they sought for an imposing character in their works by giving them elevation, so as to separate them from the meaner structures around them. A podium and flight of steps became consequently common expedients, and we find this exemplified in the temples of Pompeii. A further increase of height was obtained by the difference of the order of columns which they employed.

The Greek order, *par excellence*, is the Doric, of which the Parthenon is an example. It is true that the Greeks allowed a sparing use of the Ionic order, as at the Erechtheum, and it was doubtless found to adapt itself to some special conveniences, not admissible under the stronger Doric sway. The Corinthian order was not accepted until the decline of art had begun to show itself, and was only employed in structures of less importance than the great temples of the gods.

The height of the Doric columns of the Parthenon was about six diameters; that of the Corinthian columns of the Temple of Jupiter at Pompeii was about ten diameters, or the same as the order known as that of Jupiter Stator at Rome. The effect of the portico of the latter was therefore quite different from that of the Parthenon, apart altogether from the divergence of the details. The principle of its composition was not the same, for by it reliance was placed on height rather than on width.

It is clear that these deviations were the result of deliberate intention, and not of ignorance; for the Pompeians were, as we have seen, more Grecian than Roman in their extraction. Moreover, we find, near to the theatres, remains of a Greek temple which, though not of the purest type, yet sufficiently illustrates the principles of which I have been treating. It was placed, according to Greek custom, on an elevated site. It is not, however, of the Doric, but of the Ionic order, with columns about $8\frac{3}{4}$ diameters in height. These have characteristic Grecian bases, without the lower square member which is met with in Roman examples. The volutes of the capitals are all angular. The restored elevation of the front before you will serve to explain the differences I have endeavoured to point out between Roman and Greek temples. The Greek temple at Pompeii was in ruins at the time of the destruction of the city, and little more than its foundations can now be perfectly traced; but, from our knowledge of the proportions which were usual in structures of this nature, and from the fragments of its architecture which have

been disinterred, we have little difficulty in discovering its general design.

The question of lighting temples is one of great interest, and on which there has been much diversity of opinion. Some have thought that no external light was admitted, and that artificial lights only were used, for greater solemnity; as we see at the present day, in shrines of great reputed sanctity in the East, and in some Roman Catholic churches. Others have suggested that there was a large opening in the centre of the roof, admitting light and air as by a skylight. It is easy, however, to see that such a plan would render it difficult to avoid external disfigurement, while it would also fail to protect the interior from rain and snow.

Mr. Fergusson has propounded a third theory, namely, that of a clearstory, with openings in the roof to allow light to pass through it. The Egyptian custom is in favour of this suggestion, for in many of their temples, as you may see, for example, at Karnak, such a plan of lighting is adopted, and with a very striking effect. You will be able to compare this plan with Mr. Fergusson's suggestion in the drawings before you, remembering that one represents fact, and the other theory.

That the Greeks were acquainted with Egyptian work there can be no doubt, and as they transferred the rites of Isis to their own soil, there is no great difficulty in supposing that they may have also borrowed some architectural ideas from the banks of the Nile.

It may, perhaps, be objected to the plan proposed that it is not quite consistent with the simplicity of the form of the roof, which would not readily suggest any complication of internal arrangements. There would also be some difficulty with gutters to carry off the water, and no evidence has as yet been discovered to show how this was effected.

We have seen that the temples of the Romans were used sometimes as places of assembly, and there is, therefore, in their case, a strong presumption in favour of their having been arranged to receive direct light and air; but I do not think this applies at all with equal force to Greek work. If we consider the small dimensions of the cellæ of Greek temples, there is no great difficulty, as it seems to me, in supposing that they depended chiefly on artificial modes of lighting. They were shrines for the safe custody of sacred statues of the gods, not places in which crowds could assemble, and any openings of the roof would have affected injuriously their protective qualities. The doors, being thrown open, would also admit a greater amount of light and air in a climate like that of Greece, than we can readily imagine in our land of fogs.

The simplicity of Greek principles of design must also be insisted on as a difficulty in the way of any suggestion that they employed elaborate contrivances. If they required light in their temples, the obvious course would have been to place windows in their walls, and this is precisely what was done at the Erechtheum, and also at Agrigentum. May it not well be the case that custom varied, and that some temples were constructed without that external provision for light and air which was thought necessary for others? At the Erechtheum the latter was doubtless the case, and the architect placed windows in the walls. May we not conclude that if they had been needed at the Parthenon they would have been supplied in a similar manner? The chief beauty of the Parthenon was the exterior, and it would scarcely be possible to arrange any openings in the roof which would not be more or less of a blot on its fair proportions.

Turning now again to the Pompeian temple, I think we must conclude that it was lighted by some such plan as those which I have just referred to. The interior was evidently a place of importance, and if used for assemblies, would require light and ventilation. From the great size of the portico, and the absence of any inner lines of columns, it would have been possible to partially light the interior from over the door, or by means of openings on each side. This would have the advantage of leaving the side walls unpierced, and thus susceptible of decoration; but as these latter are not surrounded by colonnades, and do not form a very important part of the design, I am inclined to think that side windows may have been placed here, in which case the interior of the temple would have had abundance of light and ventilation.

Leaving now the temples of Pompeii, we find that the largest building in the Forum is the Basilica. This is in accordance with Roman practice, for with them the temples were usually small, and the basilicas large and magnificent. The latter were used for matters of law, commerce, and politics, and it has been suggested that the Roman people cared a great deal for these things, and not very much for religion, a distinction typified in the differing principles of design applied to these two classes of their public edifices. To us, basilican architecture possesses a peculiar interest; for the basilicas having been the first buildings appropriated to Christian worship, they may have affected more or less the arrangement of Christian churches, throughout the world, and up to the present time. The basilica at Pompeii must have been both important and handsome. There are twenty-eight columns in the interior, about 3 ft. 7 in. in diameter, and 34 ft. in height. These supported the roof, and at the sides were windows for the admission of light. The roof was of wood, of simple construction, terminating in a pediment at each end.

In the chief basilicas with which we are acquainted, there was at one end a semicircular apse, nearly corresponding in width with the central space, or nave. This, which subsequently became the Christian chancel, was the place reserved for the magistrate. It was raised above the general level of the floor, and from his elevated position, he could preside with dignity and order. He was surrounded by his officials, and in front of his seat an altar was placed, so that all the solemnities of sacrifice could be invoked whenever desired.

This arrangement was common to the basilica class, and was carried out with more or less magnificence, according to circumstances. The splendid ruin known as the Temple of Peace at Rome, is perhaps the grandest example of these buildings, and the basilica at Pompeii is a good specimen of those of a more unpretending character. In the latter, we do not find the usual semicircular apse, but in its place there is a rectangular recess, or tribune, which served the same purpose. The tribune was raised, and had beneath it a vault or cellar, which may have served as a treasury or book-room, or have been used for the temporary custody of prisoners. Stairs at the sides of the tribune gave access to galleries.

There can be no doubt that the Romans attached great importance to the due administration of justice. This is an attribute of an imperial race, which, conscious of its strength, does not fear to be just. It was not the manner of the Romans, we read in our New Testament, to deliver any man to death until he had met his accusers face to face. Here, at Pompeii, the basilica was evidently the most important building, if we except the amphitheatre, and we can form a notion of its imposing character if we picture to ourselves the presiding judge surrounded by his assessors, officers, apparitors, and lictors, elevated above the people, and swearing upon the altar before him, to deliver judgment, without fear or favour, and do justice between man and man.

Close to the basilica, and occupying the end of the Forum, opposite to the Temple of Jupiter, are three buildings, the destination of which cannot be decided with certainty. They may have been connected with the Government offices, and have served for a treasury, or other similar purpose, or they may more probably have been the Curiæ, or law courts,—a conclusion favoured by their propinquity to the basilica.

On the south side of the latter, we find a second temple, smaller than the Temple of Jupiter, and supposed to have been dedicated to Venus. It is surrounded by a spacious enclosure, entered not only from the Forum, but from the street. Inhabitants of Pompeii could therefore obtain admission by the latter, when the Forum was closed by the iron gates at the ends of the approaches.

The statues and pictures here found indicate corruption of taste and morals, and belong to the time when the Romans sought in the mysterious and degrading superstitions of Egypt, stimulants which were only too readily assimilated by them in the debasing rites of Isis, Bacchus, and Ceres.

The temple itself is small, and the cella served as a shrine for the statue of the goddess, whose pedestal was found within it. No columns, or surrounding porticoes, have been discovered, and it seems probable that the temple was undergoing restoration. It stands according to the usual Roman manner, on an elevated basement, raised, by sixteen steps, above the pavement of the enclosure. This basement is so much larger than the cella requires, and the latter appears so bald and unornamented, that I have no doubt there must have been surrounding colonnades, after the Grecian custom, and I have therefore restored the same on half of the plan before you.

The columns may have been temporarily removed, in order to effect changes in their material or design, and this suggestion is the more probable, because we know that the columns of the porticoes around the enclosures had actually been so modified. At the time of which we are treating, the old worship of the gods was neglected for the more exciting rites I have already mentioned, and we may suppose that while the Temple of Jupiter represented the older and more respectable *régime* of Church and State, the youth and fashion of the day found for themselves a more congenial worship in those temples, which, like that of Venus, lent itself more readily to the newer tastes of the day.

If this were so, we should expect to see fashion, with her usual restlessness, anxious to change the older forms of the architecture, and to aim at that ever-sought desideratum of false taste, to make all things new.

We accordingly find that the alterations in course of execution were, architecturally, of an objectionable description. The columns around the enclosure were originally of stone; they were being repaired, and altered with plaster. Their design was Doric, of a Greek type, less than six diameters high. This proportion is quite unsuited for a Corinthian order, which requires nine or ten diameters for its right effect. Nevertheless, the Pompeians were engaged in converting these sturdy Doric columns into a dwarfed and corrupted Corinthian. They plastered over the Doric capital with acanthus-leaves and volutes, and continued the latter downwards, at the expense of the shaft of the column, which thus was stunted and disfigured. Variety was sought both in design and colour; but it was variety uncontrolled by taste. The columns were painted yellow and white.

Such as it was, the Temple of Venus was probably the fashionable temple of Pompeii, and may be understood to represent the prevailing taste of the people at the time of the destruction of their city. The Temple of Isis was in the neighbourhood of the theatres, and there is only one other temple in the Forum. This is opposite to the Temple of Venus, and consists of an open enclosure, with a small niche for a cella, just large enough to contain a statue. It is supposed that this edifice was the Temple of Mercury. Adjoining it is a spacious building, which may have been used for meetings; it is about 80 ft. square. It is often called the Senaculum, and was furnished with an altar. It had a fine portico of eight columns of white marble. Another building, which goes by the name of the Edifice of Eumachia, may probably have served as a second basilica or exchange.

The street near to the buildings above described leads to the theatre quarter, and to this we may now turn our attention. We have seen that Pompeii may be regarded to a great extent as a Grecian city, and this characteristic comes out the more strongly when we proceed to examine the remains of her theatres. The Romans attached less importance to these structures than was the case with the Greeks, amongst whom the stage had a semi-sacred character. To the Romans, the terrible sports of the amphitheatre were a greater attraction, and here they would assemble in their thousands, to see men fight to the death, or be torn to pieces before their eyes by ferocious wild beasts. Nor was this dreadful taste confined to the lower orders, or to the sterner sex, for each order of society had its appointed seats, disposed in zones, and here might be seen patrician and plebeian, stern warrior and fair lady, so that a crowded amphitheatre was a complete epitome of Roman society. We shall presently find that Pompeii possessed an amphitheatre of much grandeur, situated apart from the theatres which we are now considering.

The large theatre was of the ordinary semicircular plan, and was uncovered, except as regarded a few benches in the uppermost tier or gallery. The seats, originally open to all, had gradually been appropriated, and at the time now referred to were allotted by law to various sections of society. At Pompeii, three great divisions are traceable in the great theatre, besides that for the orchestra. The lowest was the place of honour, and the seats in it were arranged with ampler space accorded to them than in the upper tiers. Here were the magistrates, priests, and other important personages, each, it s sup-

posed, in his separate chair, displaying, probably, the insignia of his office.

The middle tier was for those of lesser degree; the seats in it were probably undistinguished, and they are believed to have been furnished with cushions. The people, in its wider sense, occupied the upper and outer zone, on stone benches or steps.

The only part that was permanently covered was a small part of the highest gallery, which was sheltered by a roof projected slightly from the outside wall. The whole of the interior was doubtless temporarily covered during the performances with an awning, or velarium, extending over the whole area. Attached to the theatre was a large square, with surrounding arcades, to which the audience could retire for change and refreshment, or for refuge in case of bad weather. The stage was of wood, and was consequently destroyed, though its position and form can be distinctly traced. It had a space below it, for machinery or other contrivances. It was probably covered over, for at Herculaneum, where there is also a theatre, remains of woodwork were found, embedded in the lava, which, from their position, must have formed part of a roof, and probably also machinery for producing scenic effects. The stage, or proscenium, was architecturally treated with columns, niches, and other ornaments, for the device of changing scenery was not known to antiquity. Those of you who may have seen Palladio's restoration of a Roman theatre at Vicenza will be in a position to apprehend clearly this part of the subject. The proscenium at Pompeii is too far ruined to allow its original design to be very clearly seen, and I have therefore placed before you a drawing of the proscenium in the theatre of Herculaneum, which is better preserved, and will enable you to understand the usual nature of such structures. Behind the stage was the post-scenium, or, as we might term it, the green-room, to which the actors retired, often, we may presume, not without trepidation; for the Romans, cruel in their sports, had little pity for want of success, and actors who had failed to please were sometimes publicly whipped in the open square near to the theatres. The musicians were placed in the front of the stage, and there seems to have been some contrivance for raising a screen when required, to conceal the stage, and to serve the purpose of the modern curtain, or drop-scene. Separate entrances gave access to the different orders of seats.

The Pompeians had followed the Greek custom of open theatres; but it may be supposed that these were not always convenient in winter, even in Southern Italy, and they therefore provided themselves with a smaller theatre, which was roofed in. We know that this was the case, from an inscription having been found in it to the effect that Marcus Portius, by a decree of the decemviri, superintended the erection of a covered theatre. It is much smaller than the great theatre, being about 90 ft. square, but it was similarly arranged, though with somewhat greater scenic facilities, as far as the stage was concerned. It had also its privileged seats, and its separate entrances, and had a ready communication with the great square.

This square commonly goes by the name of the Soldiers' Quarters, and in the rooms around it were found skeletons of prisoners, confined by iron fetters, which had caused the poor wretches to await their doom, while the gaolers saved themselves by flight. The architecture of this square is of a rough description, the columns being of coarse stone, covered with stucco, and coloured blue, red, and yellow.

At the upper end of the theatre is the Temple of Isis, before adverted to. In it a beautiful statue of the goddess was found. It is of marble, finely carved, and about 2 ft. high. It is now, with innumerable other objects found at Pompeii, in the museum at Naples. The drapery was coloured (it is believed, a tender purple), and portions were enriched by gilding. The statue holds the well-known Egyptian symbol of the key of the Nile. Many other works of art were discovered in this little temple, and among them, figures of Harpocrates, Bacchus, Venus, and Priapus. The walls were painted, and otherwise ornamented, and the exterior was evidently a favourite with the Pompeian people. The temple itself was raised on a podium like the others in the Forum. It had a portico of six columns, and behind the cella was a passage, supposed to have been used by the priests for some of the tricks of superstition with which they have been credited.

Translated from Egypt they were evidently thought likely to corrupt faith and morals; for in the year 57 B.C. they were forbidden by the Roman Senate. Nevertheless, we find them at Pompeii, and it would appear that they were winked at by the local authorities, whose independence of the central power was very considerable. The worship of Isis was probably the most superstitious of its day, and superstition must ever have its votaries. It is, moreover, thought to have afforded a cloak for licence and debauchery, and in the secret stairs leading to the backs of the niches, ready means existed for enabling the priests to personate the goddess, and deliver such oracles as they thought most conducive to their own interests.

In one corner of the enclosure there was a sacred well, with an altar before the door. The well was covered by a small building, decorated with bas reliefs, indicating the sacred character of the water within. Holy wells have never wanted worshippers; they have been common in all ages, and have not yet lost their reputation, as may be seen in the South of France, in the present day.

There are various other altars or pedestals for statues within the enclosure of the Temple of Isis, and in it was found the well-known tables of hieroglyphics now in the museum at Naples. The rooms near to the well probably belonged to the keeper of the temple, who was also a priest. Prayers were said twice a day, and fire and water were used at the solemn rites. The temple was closed at night.

Near to it are the ruins of another building, supposed to be a Temple of Æsculapius. From its out-of-the-way position it was probably not much frequented. Possibly the Romans thought more of the art of killing, than that of healing. The cella contains a pedestal. It had a portico in front of it, approached by a broad flight of steps. On the altar in front were found terra cotta statues of Æsculapius, Hygeia, and Priapus.

On the other side of the Temple of Isis, and near to the entrance to the theatres from the street leading from the Forum, were the schools. Here it was that the philosophers taught, and that each opposing system commended itself to its disciples. We know how important an influence this was in Greece, whose fierce democracies were wielded at will by the heaven-taught orator. In Roman society, the power of the schools was less, for they came in contact with a strong Government, which ruled with Imperial sway, and an iron power of centralization. Nevertheless, the schools of Pompeii doubtless played an important part in the life of the day. The orators first used the porticoes of temples for their rostra, and addressed their disciples standing around. This being found inconvenient, special buildings were in process of time set apart for schools, and to them children and young people of the highest rank, as well as others, resorted for instruction. They were usually near to the Forum, but at Pompeii this was already appropriated. Placed close to the theatres, the latter was readily available for illustration or declamation, and the open spaces around were convenient for the crowds of disciples who resorted hither, to hang upon the words of their favourite teachers.

In the courtyard of the schools was the pulpitum, or raised rostrum, from which the instructor addressed his pupils, just as did the Mediæval preachers from the open-air stone pulpits, of which we find many traces in our own country.

Time warns me to conclude, and I will only refer for a very few moments to the great amphitheatre. This is at the extremity of the city, and is of large size. It is oval in form, and contains twenty-four rows of seats, which might have contained some 10,000 people. There is nothing to call for special notice in its design, which is similar in character to the examples at Verona and Rome. It was to this amphitheatre that Pompeii poured out its thousands, on the very eve of the destruction of their homes. The shows were a matter of state concern, and the authorities were severely blamed if they failed to provide the much-prized and sanguinary amusements expected of them. Hundreds have been butchered in these bloody Roman amphitheatres before the eyes of those who no doubt passed for the refined, the delicate, the cultured classes of society.

We may imagine the consternation which spread among the vast multitude, savagely intent on its own amusement of watching the death agony of others, when first roused to an idea of their own peril. Hidden from them, for a time, by the velarium, the eruption of the burning mountain was not visible at first. A terrible darkness presently set in, to be followed only too soon by streams of fire and showers of burning cinders, amidst which the affrighted populace sought their homes, if haply they might find them standing.

Here I will close my examination of Pompeiian remains till next week, when I hope to refer to the light thrown by them on the private houses of the Romans, and to consider some of the points affecting the same questions amongst ourselves.

THE ST. GOTHARD TUNNEL.

THIS remarkable work, notwithstanding all discouragements, is steadily approaching to a prospect of completion. From the outset it was foreseen that for many years, a large capital, and extreme energy, would be required for the fulfilment of the enterprise,—one more difficult, in several ways, than the tunnelling of Mont Cenis. It may, perhaps, be remembered that the project was originally planned more than fifteen years ago, while the undertaking was actually commenced so late as the autumn of 1872, when a contractor undertook to pierce a granite mountain 17,000 yards in thickness, before the Christmas of 1881. We have heard of many impediments and disasters in the course of the undertaking, of unexpected water, mud, and gravel, in addition to the enormous stone masses, of the advanced and lateral galleries converted into living streams, and of barriers resisting for a time even the most powerful blasts; but, simultaneously, new methods of drainage and new perforating tools have been applied, and the chances of success are not in any appreciable degree diminished. With regard to the latter, however, the improvements upon M. Sommeillier's apparatus, described in our notice of the Mont Cenis Tunnel, are simply matters of mechanical detail. But the salient interest of the subject consists in the determination of modern engineers to perforate that mighty rampart which Nature has thrown up, as if for the isolation of Upper Italy. This, in the case of France, has been broken through by the Mont Cenis Tunnel. In the case of Switzerland, a railroad over the Brenner Pass was at one time considered sufficient, and not of Switzerland alone, since, geographically speaking, North-Eastern France, Baden, Wurtemburg, Rhenish Prussia, Belgium, and Italy, were included. Mont Cenis, for these purposes, was too near Marseilles, and Brenner too near Trieste. It was essential, then, to open a new passage between these, across, or, if possible, through, the Helvetic Alps. Numerous were the suggestions as to the line which should be followed,—the Simplon, the Grimsel, the Lukmanier, the Septimor, and the Splugen, or old postal road; but a preference was ultimately given, by the most eminent authority, to the St. Gothard, which connected Lucerne and the valley of the Reuss with that of the Ticino. To begin with, only a few engineers, of a peculiarly dauntless spirit, contemplated an excavation through that huge range of rock; the more timid were in favour of a climbing and winding way, with tunnels here and there. It was shown, however, that avalanches, shiftings of surface, frost, snow, and other natural circumstances, must blockade the line during several months of the year, and then the idea of a tunnel took more solid shape. Above a certain altitude, in fact, an open route was demonstrated to be worthless, and the example of Mont Cenis strongly encouraged a different suggestion. The Messrs. Beckh & Gerwig undertook to supply the calculations; their data, after a long delay, have been acted upon, and the result promises to be another triumph of nineteenth-century engineering. The St. Gothard is a mountain mass, situated between the cantons of Uri and Tessino, in Switzerland, with an elevation varying between 6,000 ft. and 7,000 ft. Over it lies the immemorial line of communication between Switzerland and Italy, and hence the reason, among others, for its preference. The actual tunnel is to be from Fluelen to Biasca, on opposite sides of the range; and here, it may be said, is the nucleus of the entire Alpine system, whence the waters of the melted glaciers flow at once towards the North Sea, the Mediterranean, and the Adriatic. It is not our task to examine its military importance, though this has often been tested by history; but it may be remarked that, in every direction, inferior excavations branch, which, in the course of years, must feed the enormous perforation now in progress. This begins at a point moderately raised above the

level of the sea, and terminates almost upon a level with it, although a considerable ascent and decline occur between the two orifices. It was evident from the first that the greater the altitude the shorter need the tunnel be, and that, supposing altitude to be no element in the question, there need not be a tunnel at all. But the problem was, as we have observed, how to get free from the effects of climate. The snow-fall on St. Gothard, in the months of January, February, March, and November, varies from 13 in. to 35 in. a day, and the permanent deposit from 7 ft. to 17 ft. Strangely enough, this is regarded as a far more serious peril than the avalanches. The avalanches, like the lava of Mount Vesuvius, have worn and traced for themselves ways and paths of their own, which they seldom transcend, and very frail protections are sufficient; the open line is easily isolated; but it is far different with the falling snow. At a lower elevation, such as the engineers have chosen, the tunnel is free from nearly all these objections and difficulties. Again, though the rock is more hard, the implements are superior, and the possibility of driving downward shafts does not seem so hopeless. Supposing, indeed, that the obstacles of climate and of geological formation are surmounted, there still remain complications which did not embarrass the Mont Cenis engineers, who worked from one face of the mountain to another, in a straight line, and met in the centre, with mathematical exactitude. In the heart of St. Gothard there must be, besides gradients more or less severe, large and sweeping curves, landing-places, leading from the dark stations to positions outside the hill, and even zig-zags, to overcome stupendous mechanical obstructions. Nevertheless, Messrs. Beckh & Gerwig, now that the works have progressed so far, profess themselves as entirely confident, and predict that the achievement will, taken for all-in-all, eclipse the tunnelling of Mont Cenis. They had to commence operations, no doubt, with the aid of imperfect surveys; but this deficiency was speedily remedied, and there is not a height or a distance, from Fluelen to Biasca, that has not been scientifically measured. And they report, in the latest official documents,—"That which characterises the tunnels of the Alps is less the extraordinary length necessitated than the circumstance that they must, in most instances, be executed without shafts." This was recorded with reference to the tunnels of La Nerthe, the Marseilles and Avignon Railway, the Credo, Blaisy, and the Bellegarde routes, and the Alexandrian and Genoese line. But, with all the ingenuity of the engineers, the question of piercing some particular mountains was never left, either in the case of Mont Cenis or in that of St. Gothard, to *les procédés ordinaires;* on the contrary, the French engineers found, as their genius always finds, a new process sufficient for their purpose. The Sommeillier method, as applied to Mont Cenis, was directed, principally, to mechanical perforation, accelerated by the opening of transverse galleries, in assistance of gunpowder explosions and other processes, quite inapplicable to the physical necessities, yet altogether apart, in a tunnel-maker's point of view, from the Mont Cenis principle. This tunnel, it will not have been forgotten, has been advanced, practically, through only one-fourth of the stages reaching towards its completion. If we enter the dismal caverns of the mountain,—so far dark and hitherto undiscovered hollows of the earth,—we find a world of mystery and perplexity, by which even the engineers of the tunnel confess themselves confounded. The work is going forward surely, but slowly, and the tunnel will be monumental of the century, before the year 1881 has arrived and gone.

"THE TREATMENT OF SCIENTIFIC ENGINEERING ARTISTICALLY."

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on Friday, the 3rd inst., Mr. H. C. Boyes, vice-president, in the chair, the following new members were elected, viz.:—Messrs. A. Greenwood, C. J. Smithson, H. Paterson, H. N. Wilkinson, and F. Fusedale. A hearty vote of thanks was tendered to Messrs. Cubitt for permitting the visit to their works of the members of the Association, as recorded at some length in last week's *Builder*. It was announced that to-day (Saturday), the 11th, a visit would be made to the Church of St. Agnes, Kennington Park, now in course of erection from plans by Mr. G. G. Scott, jun.

Professor Kerr then proceeded to lecture on "The Treatment of Scientific Engineering Artistically." He said he wished his hearers to regard the subject as being entirely practical and utilitarian, as he had no intention of going into questions of art, or speculations of any kind, more than might be absolutely necessary. His purpose was to lay before them, briefly and yet comprehensively, the general question, as one of exercise for their own minds, why the work of the engineer should not be as artistic as the work of the architect, and the supplementary question as to the direction which efforts intended to improve engineering works in respect of art ought to take. Addressing a body of architectural students, and some who were more than students, it was scarcely necessary for him to point out that the essence of architectural artistic design was the "beautification" (if he might be allowed to use the word in a comprehensive sense) of building construction. Without construction there could be no genuine architectural art; and, properly and philosophically speaking, apart from construction there was no architectural design. The architectural profession had been in existence, if history might be believed, for four thousand years,—not precisely in the form in which it was represented by his audience, but in such a form as to entitle them to consider themselves as the legitimate and direct representatives of a long and continuous succession of men who had devoted themselves to the artistic designing of buildings upon principles derived by express education. Now, it could not be denied that the building of the engineer was the same as the building of the architect, although on a largely-extended scale, for where the architect built an arch, the engineer built a bridge; where the architect constructed an ordinary roof, the engineer constructed some enormous vault of several hundred feet span; and where the architect used a box iron girder, the engineer used a tubular bridge. But the materials used by both architect and engineer were precisely the same; the workmen who did the work were precisely the same; and the scientific principles and laws of nature involved in each were precisely the same. Why, then, was it that for four thousand years the architect had been accustomed to beautify his work, while the engineer, with a few exceptions scarcely worth mentioning, had never attempted to do so at all? Speaking of our own engineers, as those with whom we were of course best acquainted, and speaking of engineering science in that sense which was best illustrated by the engineering works of our own country at the present day, the Professor said he thought it would strike his hearers, as it had struck him, that the engineer of every-day practice was a very busy man, and a man of large ideas, but one who had no time to devote to the proper study of a subject which was obviously so essentially secondary to the pursuit of professional success as art. Not only had the engineer to devote his attention exclusively to science,—not only had his education been based exclusively upon science,—but the principles of decoration of the simplest kind had never, as a matter of instruction, been introduced into his studies; and he might therefore be said to be not only uneducated as an appreciator of artistic design in a building, but quite uneducated in the discussion of the question whether the principles of decoration ought to be introduced at all. At the same time, it would be a great mistake to suppose that the engineer had not a sense of beauty of his own. He might never have contemplated, with any seriousness, the possibility of the great works of his profession being decorated and over-elaborated with architectural detail, but he could stand opposite to a work of engineering genius, and could appreciate and discern, and delight in, a certain degree of beauty which was visible to him, although, perhaps, totally invisible to the architect. To take the case of a suspension-bridge, it might be said that of all structures a suspension-bridge was the least capable of being made beautiful according to an architect's ideal; but yet, if an engineer were called upon to give an instance of extreme beauty, it was most likely that he would name a suspension-bridge entirely without ornament, and entirely without affectation or compromise of any kind, but displaying, to the mind of the engineer, a certain articulation, a certain anatomy of scientific construction, which the engineer had just as much right to consider beauty, and beauty of the highest order, as the architect had to apply those terms to that kind of artistic design with which he was most familiar. To carry the figure a little further, it might be said that the whole of the engineer's works were anatomical, exhibiting the strict application of science, without compromise, just as nature constructed the skeleton of the human frame, whereas the architect's work was more superficial,—not that architects were entitled or permitted to disregard the substructure or anatomy of their buildings, but, obviously enough, the principal qualities to which architects had been accustomed to direct their attention in building were superficial grace, elegance, adornment, and ornamentation. Now every one knew what the human figure was based upon, but to every one, except doctors, the skeleton of a man was about the ugliest thing that could possibly be presented to his gaze. From time immemorial it had been suggestive of all that was repulsive; but the anatomist looked upon it in quite a different light, and a skeleton would be beautiful in his eyes according to its proportions and the excellence of its configuration and pose. The anatomist was entitled to maintain that the beauty which he perceived in a skeleton was just as much real beauty as the beauty of any animal fully clothed with flesh. Again, the skeleton when only partially clothed, and exhibiting the raw muscles, was, if possible, still more repulsive to the ordinary observer than the bare skeleton, but to the anatomist there was no repulsiveness, and to those who were competent to go into the subject with him he could show wherein consisted the beauty of such anatomical "subjects." Now, architects were accustomed to deal with clothed construction, but engineers had hitherto been accustomed to deal with purely anatomical construction, and he (the Professor) fancied that this was the philosophical reason why engineering works were not beautiful. One accident arising out of the peculiar practice of architectural art had been,—not in this country alone, and not in this age only,—the introduction of various kinds of sentimentalism. To go no further than the first and grandest of all sentiments, everybody knew that religion had exercised a great influence upon architecture from the earliest times, and even in the present day a certain school of the clergy claimed to be very closely connected with architecture, and made it almost a matter of faith to adhere to one kind of architecture and to eschew the other. But apart from the religious element, there were the various archæological ideas which had been introduced, not only in the present day, but in the dilettanteism of half a century ago. Again, some architects exhibited an extreme weakness for the picturesque, and even for the grotesque. Now, if engineering works were to be made the subject of architectural design, they must be devoid of sentiment. The engineer would be, not merely horrified, but convulsed with laughter, if it were proposed to him that he should seek to make his structures more sightly by anything approaching to fancifulness or whimsicality. Those who would take up the question of the decoration of engineering structures must do so after having thrown over everything in the shape of preconceived notions of affectation or sentimentalism of any kind. Now, it was beyond question, he thought, that architectural taste in England was at present in a state of transition. Architecture, like all other art, was to a great extent a matter of fashion, and the fashion must be ever changing, for the human mind could not go on appreciating for ever the same beauties. Assuming, then, that in no great time hence there would be a change from that revived Mediæval architecture which had been practised in England of late years with great success, to that architecture which he believed could be practised with still greater success, it was desirable to inquire whether that change would not be more favourable to engineers' works being rendered more artistic by architectural forms. He thought it would be; for, seeing that engineers' works were essentially great, muscular, and grand, his audience would, he believed, agree with him that, looking at mere historical examples of various styles of architecture, grandeur and majesty were more easily attained with the simple forms of what was generally known as Classic architecture, than with the somewhat complex forms of Gothic. Again, Classic architecture was essentially an architecture of large stones,—lintels and columns,—but Gothic architecture was an architecture of small stones; indeed, in the Gothic style it was possible to construct the most huge fabric out of brick-bats. Therefore, if engineers in the future

were disposed to allow architects to adorn their (the engineers') structures, it would be all in favour of architects if they had forgotten all about Gothic architecture, and had a thorough knowledge of Classic. Now, what was the very first of first principles which the engineer would dictate to an architect whom he might call in to ornament his structures? In his (the Professor's) young days, when architectural criticism was studied, architects were taught to concentrate their attention upon a certain quality called *fitness*. He had heard no mention of it for many years, but it was a quality which the engineer would rake up from the dust of ages, and insist on its being applied, without compromise, to his work. He (the lecturer) would not go so far as to say that fitness was the reverse of affectation, but fitness must be the first consideration in the artistic decoration of scientific construction, or anything else. It was quite certain that the engineer would never allow the architect to conceal the scientific anatomy of his work. Now, he proposed, in the presence of a generation of draughtsmen far superior to those who existed in the days when he was brought up, to give, by a few rough sketches on the black board, a few suggestions as to the method in which he conceived engineering construction might be adorned by the architect. In the first place, he took an ordinary wrought-iron plate girder, and having explained the why and the wherefore of its constructional form, he showed that as the web had nothing to do but to keep the upper and lower members a certain distance apart, it might be pierced or perforated to almost any desired extent and design; the rivets might be designed so as to be alternated instead of being in parallel lines, and pateras and other ornamentation of that kind might be introduced with advantage. The box-girder, again, would lend itself to such ornamentation with even greater facility, for it was in itself a very close approximation to the familiar form of the rectangular breastsummer. The Professor next explained how he would treat "that difficult subject for architectural design, the ordinary kingpost truss." He had seen such trusses in which the members had been chamfered and turned, and adorned with mouldings, collars, and all that sort of thing, with very considerable effect; but he thought that the introduction of one or two additional members here and there would give a structure far more susceptible of being architecturally ornamented. Iron trussed roofs, however, presented much greater difficulties in the way of being dealt with architecturally, owing to the members which were in tension being, very often, mere thin rods, whilst the members in compression had necessarily to be of greater substance,—not that there was any very great difference between the strength of rolled iron to resist compression and tension, but because, when the members in compression were of any length, they had to be disproportionate in substance, in order to bear the cross strains to which they were subjected. In the case of an iron-roof truss of (say) four purlins, with the curved tie-rod, thought by the engineer to be of great beauty, the ordinary mode of procedure was to divide the tie into equal parts, and, at the same time, to get the struts as nearly as possible at right angles to the purlins. Now here was a structure which he did not think it was possible to make very ornamental; but if the engineer would sacrifice a little for the sake of effect, the same structure might be made nearly as strong (and quite as strong by a slight addition of substance), and far more pleasing to the eye, if the struts were fixed vertically instead of diagonally. The Professor next proceeded to speak of the large semicircular roof trusses, such as are to be seen over some of our London railway termini. If properly constructed, these trusses would increase in thickness towards the haunches; and where, as at St. Pancras, the truss came down to the ground line, it formed a curve of equilibration. At St. Pancras each truss was divided into so many portions, each of which was really an elongated arch-stone or voussoir, connected together at the butt ends by means of rivets. Such a structure, great as was the span, would, if properly equilibrated, not only bear its own weight, but would carry a very considerable load besides. In roof principals of this kind there were top and bottom flanges, connected together, or rather maintained a certain distance apart, by means of a web, which could be ornamented by perforation to almost any extent desired, and cast Gothic ornament might be applied to these principals (for such ornamentation would be strictly scientific), although probably that was the only case in which Gothic forms were to be recommended. The artistic decoration of engineering structures was not always regarded as satisfactory; for when Brunel sought the aid of Sir Digby Wyatt for the ornamentation of the Paddington Station, there was a great deal of adverse criticism, and for that reason the engineer did not like to go out of the beaten path unless he had some very strong inducement to do so. The architect, if called in to advise as to the artistic treatment of engineering structures, should scrupulously refrain from any attempt to introduce new forms, because the engineer would certainly refuse to adopt them, as his own forms were the outcome of, and were imperatively demanded by, mechanical science. In regard to bridges, there was a great deal that might be done by architects. Indeed, architects had been accustomed to maintain that bridges were their own special province, although it was true that tubular bridges and lattice bridges of large size were wholly in the hands of the engineer. It was incontestable that many of the best bridges in the world were the productions of architects; and it was not so very many years ago that Mr. Fowler, an architect, won the first prize, and produced the best design for a bridge, even though most of the competitors were engineers; but, as usual, the best design was not carried out. The discussion which took place on the subject of London Bridge last autumn would be fresh in the recollection of the audience, and parenthetically he would remark that the one great fault in the design of London Bridge was that the impost or springing of the arch was below the water-line at high tide; and therefore the bridge was, æsthetically considered, scarcely so creditable a work of engineering genius as it was generally considered to be. Between each of the arches was a projecting pier, utilised on the bridge level as a recess for seats. What Mr. Horace Jones and Mr. Gregory proposed to do in their joint design was to remove these seats and to throw the present footways into the roadway, and to provide space for a new footway on either side of the bridge by carrying flat iron arches (and therefore necessarily of a greater span, and springing from a higher level, than the granite arches of the bridge) from pier to pier. These iron arches appeared to be intended to be built together in short lengths, as if in imitation (whether intentional or not he could not say) of wrought stone work, the spandrels being filled in with the inevitable lattice work. Now, although it was impossible to admit that there could be any sound reason for adding ironwork to a stone bridge in the way proposed for London Bridge, it must not be assumed that the suggested *method* of widening the bridge,—irrespective of the incongruity of the materials,—was not perfectly legitimate; indeed, it was probably the only correct way to widen the bridge, and was surely not impracticable on engineering grounds. It should be remembered that by the proposed method of widening the bridge all the heavy or vehicular traffic would be thrown on the arches of the existing structure, while the footpaths and the pedestrians who used them would be the only load to be borne by the wider and flatter arches proposed to be added at either side, whether in iron or granite. Certainly as granite was the material of the bridge, the proposed additions should be in granite also; but whatever the diversity of materials, the principle of carrying the footpaths on a lighter substructure than the roadway for vehicular traffic was quite allowable, and had, indeed, been carried out in a bridge near Paris. In reference to Southwark Bridge, the lecturer described its construction, which he characterised as "perfectly sound," but he suggested that the artistic effect of the decoration attempted in the spandrels would have been far better had the prevailing lines been vertical instead of diagonal; and this mode of treatment need not have necessitated any sacrifice of the "anatomy" of the structure. In regard to bridges generally, he thought engineers often carried up the massive stone piers between the arches to too great a height. It would be far better, he thought, and more anatomically correct, to carry the parapet of the bridge in an unbroken line from end to end, and to have the face of the pier and the spandrels filled in with sculptured or other ornamentation. With regard to lattice bridges, he thought it very possible to give them a more satisfactory appearance by the insertion of ornamentation in the angles, and by certain projections on the upper and lower surfaces; and if the engineer would also, in this case, sacrifice a little of constructive utility to artistic appearance, a different manner of connecting the lattice bars might also be productive of good effect. With regard to some of the railway girders,—such, for instance, as one over the approach to the London Bridge Railway Termini,—they seemed to be the ugliest things in creation; but their surface, if not their outline, might be materially improved in appearance by judicious ornamentation. In conclusion, the Professor said that he wished his audience, as the men who would at no distant date constitute the bulk of practising architects, to turn their attention to the problem which he had sought to lay before them on this occasion, for there were two good purposes which it would serve. Firstly, the study of engineering construction would be the best study they could turn their attention to for the acquisition of science in their own profession. They would find it exceedingly simple, and should not be deterred from any fancied enormity of the subject. The fact was that the science of engineering was simple enough: it was the hugeness of the engineer's works which frightened people; but although it might be impossible for a tyro to construct a large work of engineering, it was quite possible for him to understand the principles upon which it was constructed. Ever since he (the Professor) was a student, there had been a cry for "something new," but the answer had always been that it was impossible to devise a new style except as the outcome of new constructive purposes. All the constructive purposes of the world had been long since satisfied and worked out; but as to the originality which people had been calling for so long, it must strike his hearers immediately as being palpably true that no originality was possible until there was an original purpose to be served. Here, then, was an original purpose: to take the engineer's work and beautify it with architectural forms.

A long discussion ensued, to which we will return.

THE PALACE OF TIROOMAL NAIK, MADRAS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, held on Monday, the 28th ult., Sir G. G. Scott, president, in the chair, the following gentlemen were elected Fellows, viz.:—Mr. J. J. Carroll, Great Brunswick-street, Dublin; Mr. J. J. McCurdy, Leinster-street, Dublin; Mr. J. H. Owen, M.A., of H.M. Board of Works, Dublin; and Mr. Thomas Wonnacott, of Farnham.

The Secretary announced that six candidates had sent in drawings, sketches, and testimonials in competition for this year's Pugin Travelling Studentship. He further announced that the Council had elected Mr. Edwin John May as the Pugin Student for this year, and, in the same competition, had awarded a medal of merit to Mr. Garrett, on account of the excellence of his drawings, with "honourable mention" to Mr. W. Talbot Browne.

The following letter has been received by the Council with reference to the proposed Loan Exhibition of Scientific Apparatus:—

"South Kensington Museum, Feb. 10th, 1876.

Sir,—I am directed by the Lords of the Committee of Council on Education to transmit for your information the enclosed papers relating to the approaching Loan Exhibition of Scientific Apparatus at South Kensington, and to request you to have the kindness to announce the holding of the Exhibition at the next meeting of the Royal Institute of British Architects, and to ask any members who may be willing to contribute, to furnish at their early convenience a description of the objects they propose to lend, on forms similar to the enclosed, which can be obtained on application at this Office.—I am, &c.,

P. CUNLIFFE OWEN, Director S. K. M.

The President, R.I.B.A."

Mr. R. F. Chisholm, Fellow, Executive Engineer and Consulting Architect to the Government of Madras, then read a paper "On the Palace of Tiroomal Naik, Madura." He commenced by giving a brief description of Madura, the ancient capital of Southern India, and reminded his audience that Tiroomal Naik was either the last, or the last resident Naik but one, of the line of kings descending from the great Visvanuthu Naik, and to Tiroomal are ascribed most of the civil works of Madura. He commenced his reign in A.D. 1622, and the palace is said to have been finished twelve years afterwards, viz., in 1634. The accessible literature of the country is chiefly confined to the translations of certain native documents by Mr. Taylor. These documents, originally collected by Mr.

Wheatley, a confidential *employé* of Governor Lushington, do not bear the marks of remote age, and are all in the same native handwriting. The lecturer then attempted to show, by the evidences of the buildings themselves, that it was doubtful whether the description of the palace found in these MSS. was actually written by a contemporary. Passing to the actual buildings, the lecturer explained that the group now known as the palace formed only part of a very extensive range, of which few vestiges now remain. The principal quadrangle measures internally 405 ft. by 235 ft. It is surrounded by a solid wall 40 ft. high, through which there appears to have been no public opening, access being gained to the interior by smaller surrounding apartments. In the centre there is an open courtyard, originally 200 ft. by 100 ft. Between this open courtyard and the wall, the building consists of arcades on massive columns, roofed in by vaults and domes of various dimensions. The principal dome is upwards of 64 ft. across. The style of architecture is a mixture of Hindoo and Mohammedan art. In tracing the history of the building, the lecturer endeavoured to show that, as there were three periods of construction, and as nothing but a hasty surface renovation took place since the days of Tiroomal Naik, some doubt might exist as to whether Tiroomal actually commenced the structure. The lecturer admitted that the buildings told their own tale of sixteenth and seventeenth century work; but at the same time, he reminded his hearers that it was an extraordinary freak for an orthodox Hindoo rajah to have accepted the form of a Mohammedan mosque as the most suited to the requirements of his royal residence. It was improbable, though not impossible, for the Mohammedans to have commenced a mosque here, for they conquered Madura A.D. 1324, and held it for upwards of forty-eight years; and although Hindoo literature represents them as a mere bloodthirsty rabble, they accuse them of pulling down their places of worship; but people who pull down religious edifices of one creed, invariably build up religious edifices of another. Until Lord Napier and Ettrick visited the place, the buildings were simply picturesque ruins. The Government deputed Mr. Chisholm to examine them, with the view to possible restoration, and the successful attempts which were made in this direction led the Government to vote a small sum annually to uphold the structure. Finally, estimates were prepared to restore the whole, at a cost of 20,000*l.*, and to make use of the buildings as public offices. The lecturer stated that the rental now paid by Government for various offices in Madura would, if capitalised, scarcely exceed the sum required for this interesting work.

In the discussion which followed,

Lord Napier and Ettrick (formerly Governor of Madras, and for a time Viceroy of India) said it would be needless for him to endeavour to convince an audience of professional architects that it was our duty and our interest in England to contribute, according to our means, to perpetuate and preserve the ancient monuments of India. It would be an unworthy thing on the part of the British Government, going to India with such large resources and with such a large amount of knowledge with reference to the arts and industries of the world, to allow the ancient monuments and buildings of India to go to decay. Our love for what was beautiful and instructive would oblige us, as a matter of duty to the whole world, to preserve these monuments of the past; but in addition to this, it was also, in a certain sense, a matter of policy for us to do so, for when we knew that our tenure of India was largely dependent upon the goodwill of the native dynasties, the very least we could do was to preserve those harmless monuments of the past with which their affections and historical predilections were identified. But with regard to buildings used for religious purposes, a difficulty had arisen which materially interfered with the efforts made by the Government of India in this direction. The Government formerly administered the very considerable revenues which accrued to some of the religious buildings of India, and these funds were devoted in a large degree to the preservation and repair of the structures. But there came an outburst of Protestant or Christian zeal in the matter, and the Government was reproached with being "the stewards of idolators," and the result had been that the Government, ever desirous to be just and generous, had given back into native hands the administration of the whole of the revenues of the temples and mosques. Consequent upon this, in Southern India certain local committees of native gentlemen had been constituted the administrators of these revenues, but, inasmuch, as they felt no interest in the preservation of their ancient monuments, the funds were generally otherwise applied. But, besides this, religious zeal amongst the natives was far more likely to find vent in the construction of new monuments than in the preservation of old ones. It was doubtful whether it would ever enter into the mind of an Oriental, and especially a native of India, that it was a pious thing to preserve the monuments of the past,—the work of other men's hands; but they would devote themselves to the construction of new monuments of the same general character, though of very inferior excellence. The "religious difficulty" referred to compelled the Government to confine its efforts in preservation and restoration to secular buildings. As far as he (the speaker) remembered, there were not above half a dozen ancient, secular, or civil structures throughout the South of India which were in a tolerable condition of preservation, and which could be used for any modern administrative purposes. Many of these monuments had been in past times, and still remained, very much neglected; the truth was that the revenues for public works had, up to the present time, been too exclusively expended upon works of public utility, such as tanks, river channels, works of irrigation, railways, &c. But it must be allowed that, even if the Government had been disposed to expend more money in the preservation and restoration of the ancient monuments of the country, the architects at the disposal of the Government were, as a rule, hardly capable either of appreciating or restoring them. The public works of India had, up to the present time, been almost exclusively in the hands of the officers of the Royal Engineers, than whom there did not exist a more devoted body of men in the world, and who were men of great resource and ingenuity in practical construction; but who had rarely had that amount of art-culture which was necessary to enable them to so fully appreciate works of architecture as to seek to restore them in the most conservative spirit. Lord Napier and Ettrick then proceeded to recount the circumstances which induced him to undertake the commencement of the restoration of the Palace of Tiroomal Naik, one of the principal inducements being his confidence in the ability of Mr. Chisholm to carry out the work with a due regard to the architectural feeling of the building. The building was not very ancient, and was far from being pure, as it exhibited traces of three styles,—Saracenic, Hindoo, and Renaissance; in this respect it could not compare with the monuments of the Mogul emperors in the north. No valuable material was used in its construction; there was no tesselation, no inlay of marbles, nothing which would give to the building anything of the splendour of the Taj Mahal at Agra. On the contrary, it was a rather rude and coarse building of brick and stone. But it possessed one or two points of pre-eminent interest. In the first place, it greatly exceeded in dimensions most of the Mussulman and mixed buildings of India; and although it was not a pure or refined building, it certainly was a very picturesque and impressive one. Secondly, it offered exceedingly interesting examples of mural decoration in colour. Having discussed the question of the probable dates of various parts of the building, as evidenced by variations in style, and expressed his concurrence with Mr. Chisholm's views on this point, Lord Napier and Ettrick concluded a long and interesting speech by raising the question as to whether the pillared hall or court-yard was ever intended to be roofed in, his own opinion being that it was intended to be left open.

Mr. W. H. White, in allusion to the very meagre attendance of members, said the Institute really owed some apology to Mr. Chisholm for the state of the room. It seemed as if the members of the Institute were endeavouring to follow the reprehensible custom of the House of Commons, which was generally very thinly attended whenever anything relating to India was "on."

The President concurred in this expression of regret, and was also sorry that Mr. Fergusson was not present, although he had been fully expected.

Mr. Thomas Morris said the Institute was not only indebted to Mr. Chisholm for bringing forward an exceedingly interesting subject, but for the able manner in which he had done so. The details of the building described in the paper presented some very curious and suggestive resemblances to the details of Romanesque, Elizabethan, and other European styles.

Mr. Arthur Cates suggested that the value of the paper would be greatly increased if Mr. Chisholm would be good enough to add, in the form of an appendix or otherwise, a few details as to the manner in which the domes were constructed. The paper was one of peculiar interest, and inasmuch as the building described was coated with stucco, again raised the question as to the legitimacy of the use of that material properly so called (in contradistinction to the vile compound used as material for "dressings" in the suburbs of London and elsewhere). Stucco seemed to have found favour in all ages of the world, and was even found in the work of the Greeks at Agrigentum in Sicily, where the large figures in the Temple of the Giants were entirely of stucco. It would appear that the method adopted in India to produce a fine surface with stucco consisted in the continued manipulation of a finely-powdered plaster, beaten up closely and worked in with plenty of "elbow-grease." This very closely resembled the Greek method of using stucco, which resulted in the attainment of a hard and compact marble-like surface. Perhaps Mr. Chisholm would also be kind enough to add to his paper a few notes as to the manner in which the stucco or *chunam* was prepared and applied. It was to be regretted that the exigencies of the public service should call for the erection of partitions in the noble columnar courtyard of the palace. Having suggested that a collection of photographs (taken some years ago under the auspices of the Government) of Indian architectural monuments should be acquired for the Institute Library, Mr. Cates concluded by proposing a vote of thanks to Mr. Chisholm for his paper, and to Lord Napier and Ettrick for his interesting address.

The President said he would take the privilege of seconding the motion, and explained, by reference to the plans exhibited on the walls, his reasons for believing that a portion of the area now left open in the centre of the palace was originally covered in, or intended to be covered in. With regard to Indian buildings generally, it would be of the greatest possible benefit, not only to architecture, but to India, if a general system of restoration upon the lines observed by Mr. Chisholm could be adopted and thoroughly carried out before the ancient buildings fell into a more ruinous condition. This was a work which ought to be initiated and followed up at the public expense. He would rather that these buildings should perish, however, than that they should be restored in the sense in which much restoration was carried out in Europe. The only way of handing down buildings to future ages was by faithful restoration and careful conservation, after the manner in which Mr. Chisholm had dealt with the Palace of Tiroomal Naik.

The vote of thanks having been carried,

Mr. Chisholm replied to various questions which were put to him by Mr. Wyatt Papworth, Mr. C. Fowler, Mr. Phené Spiers, Mr. Arthur Cates, and other gentlemen. Among other things he briefly described the construction of the domes (the largest of which springs from a square of 64 ft.). They were, he said, built of brick and mortar or cement, the bricks being 8 in. by 4 in., by 1 in. thick. These were laid one on top of another, each course very slightly overlapping (towards the interior) the course preceding it. Those domes were constructed by the native builders without any centreing whatever, and Mr. Chisholm said he had himself constructed a cupola of that kind, 30 ft. in diameter, without centreing, the rate of progress being a ring of 18 in. every four days, an interval of that length being required for the mortar to set. With regard to the *chunam*, or plaster, there was no very great secret as to its composition; the real merit of its good qualities was due chiefly to the mode in which it was applied and worked. He should have great pleasure in complying with the suggestions thrown out by Mr. Cates.

The meeting then terminated. Although the audience was very small, the interest evoked by the paper was proportionately great, and so many questions were put to Mr. Chisholm that it was not until half-past ten that the President declared the meeting at an end. Amongst the visitors was Mr. Hugh Leonard, C.E., lately Officiating Chief Engineer of Bengal, who did not, however, take any part in the discussion.

The next meeting will be held on Monday, the 13th inst., when the following papers will be read, viz.:—(1) "On some Sixteenth-

Century Chantries," by Mr. J. D. Sedding; and (2) "Biographical Notices of Deceased Foreign Members," by Mr. F. P. Cockerell, Hon. Sec. for Foreign Correspondence.

CONSTITUTION HILL AND THE KNIGHTSBRIDGE BARRACKS.

SIR,—There are two metropolitan improvements, awaiting the decision of the Government, in which the public feel considerable interest, but as those in authority do not feel quite able to make up their minds regarding them, I hope I may be allowed to make one or two suggestions which I fancy would meet most of the difficulties which occur in carrying them into effect.

First, regarding the block at Hyde Park-corner, the solution appears to me simple and obvious. It is to continue the blind piece of roadway that exists to the eastward of the Duke of Wellington's archway, partly with a straight, partly with a curved, eastern boundary line, till it meets the angle of the Buckingham Palace gardens. It would then be necessary to continue the straight line of the roadway on Constitution-hill until it meets Grosvenor-place at right angles opposite the centre of the first division of houses, and to form a new entrance to the park with a lodge where the footway now is. The slope of the new roadway on the east side of the archway must, of course, be made identical with that now existing between the archway and the hospital, and the carriageway through the arch must be assimilated to these two.

If this were done, instead of one roadway less than 40 ft. in width, the public would have two, each 50 ft. wide, the footways, in consequence, on each side of the arch being abolished; and the traffic going north would naturally keep its own side to the westward of the arch, that going south as naturally passing downwards by the roadway on the east side, so that collision or confusion would be impossible. If there were any doubt about this, a single policeman during the busy time of the day could easily enforce the division, and, in so far as the traffic was concerned, I have no hesitation in saying that there would be no junction in London between two streets at right angles with one another so commodious and so convenient.*

Among the minor advantages of this proposal may be enumerated First, that it takes nothing from the "recreation grounds of the people." All that is proposed is to throw what is now a useless piece of roadway inside the park railings into the public thoroughfare; neither does it interfere in any way with the Palace Gardens, which ought to be respected. A second advantage, in these economical times, is, that it would be very cheap. All that is required is to move a few cubic yards of earth, build a new lodge, and supply new gates for the park. A third advantage is, that, if determined upon, it could be commenced on the following day, and opened to the public within a month, without interrupting the traffic for an hour. But to my mind its greatest recommendation is the immense architectural improvement it would effect in the locality. The northern aspect of the gateway would not be interfered with, but, as seen from the south at present, its appearance is lopsided and undignified to the last degree; but if placed in the centre of a "Place" 200 ft. wide, and with the ground rising towards it for 400 ft. in front, it would gain in dignity and grandeur to an extent it is not easy to overrate; and if the adjuncts were managed with a little taste, the Place between the hospital and the park might easily be made one of the most ornamental at the West End of London. Besides this, combined with the screen opposite, it would be a more symmetrical arrangement than at present, and form a really dignified entrance to Hyde Park from the Belgravian regions, and the south of London generally.

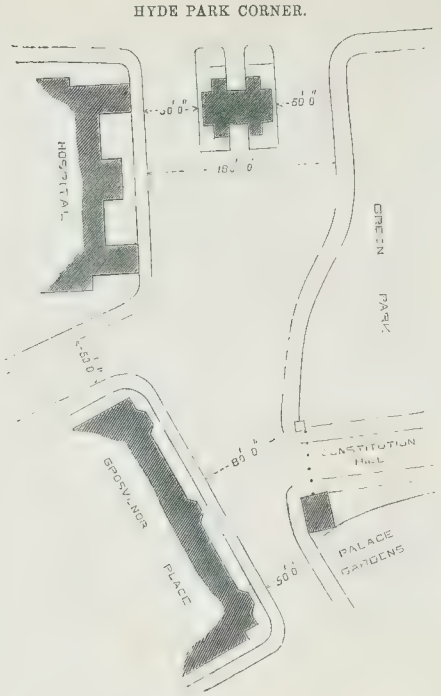
The other improvement I would suggest cannot, I fear, be carried out so economically as the last; but as the Government have determined, for military reasons, that they cannot remove the cavalry barracks from the neighbourhood of Knightsbridge, I think they may fairly be asked to incur whatever outlay may be necessary to make their presence there as little objectionable as the circumstances of the case will admit of. What I, therefore, would suggest is, that they should buy up all that second-class property between the tall houses at Albert Gate and the present barracks, and on the site so acquired erect the new buildings. After the necessary rectification and widening of the roadway, there would be room on this new site for a barrack 20 ft. wider and 40 ft. longer than the present one, besides space for a yard 300 ft. by 120 ft., in which the riding-house and loose boxes might be placed. The officers' quarters, and perhaps the hospital, might be erected on the east end of the present barrack site; and if this were done, and all the rest westward thrown into the park and roadway, it would be all the public could fairly ask for. Among the advantages of this new site is, that it is separated from the carriage-way in the park by a belt of trees and shrubs, 40 ft. wide, instead of actually abutting on the roadway as it now does; and if the barrack were made a handsome building, which it might easily be, it would be a far more pleasing object from the Drive in the park than the backs of the houses in Alfred-row, and the rubbishy summer-houses that now disfigure the locality.

If this were done, in the course of a very few years the Knightsbridge-road would become by far the finest and most noble, as it is now the most important, entrance to the metropolis.

JAS. FERGUSSON.

* As already stated in the *Builder*, the Duke of Westminster has offered to contribute largely towards the cost of some such arrangement as this.—ED.

HYDE PARK CORNER.



PROPOSED NEW CATHEDRAL FOR MANCHESTER.

OUR readers are aware that designs for a new cathedral in Manchester, by Mr. R. H. Carpenter, architect, have been before the public of that city for some time. The accompanying view of the design for the interior is taken halfway down the nave, looking through the central octagon to the choir beyond.

It shows the last scheme prepared, namely, that of an entirely new cathedral built away from the present one, which latter serves now both as a parish church and cathedral, but which, in the event of the new scheme being carried out, would remain simply a parish church. Various plans were discussed:—1. To retain the present cathedral, making it the nave of the new one; and by raising the clearstory and introducing a blank panelled triforium stage, to bring it somewhat in proportion with the proposed new choir, the octagon lantern-tower at the intersection of the nave, choir, and transepts helping to bring together the somewhat incongruous parts.

The second scheme was to do away entirely with the present structure and, retaining the site, to clear away some of the surrounding buildings, and by arching over the river Irwell and placing the church farther west, to make it the centre of a large square, to which the principal thoroughfares of Manchester and Salford should converge.

The last scheme was for building the cathedral some distance away from the present one, for which many sites were proposed; one being Infirmary-square. The dimensions of the cathedral, as last proposed, would be as follow:—

A nave of ten bays, 34 ft. wide between the arcades, with double aisles (a peculiar feature in the present church, the other English example being Chichester), making a total width of 115 ft.; the length from the western doors to the octagon being 195 ft. The central octagon is 70 ft. across, and terminates internally with a vaulted dome, 180 ft. high. The octagon tower externally is about 320 ft. high.

The choir is of seven bays, 34 ft. wide, the same width as the nave, but with single aisles. Total width, 70 ft.; length, 136 ft.

The choir and nave are the same height, viz., 100 ft. from the floor line of the nave to the crown of the vaulting. The choir terminates square, the aisles returning round eastward, forming an ambulatory, out of which the morning-prayer chapel opens.

The total internal length of the cathedral from the west doors of the nave to the east wall of the morning-prayer chapel is about 500 ft.

The transepts opening north and south out of the octagon are each of three bays with aisles, the total width being 190 ft.

The present cathedral is dedicated to St. George and St. Denis. The ground-floor stages of the western towers in the new design are, therefore, arranged as chapels named after these saints.

At the intersections of the nave and transepts and choir are chapels dedicated severally to SS. James and John, Jesus, St. Nicholas, and the Holy Trinity, as in the old cathedral.

The chapter-house and a vaulted muniment-room, together with choir and vergers' vestries, are on the south side.

It was proposed also to build on the south side of the cathedral a cloistered quadrangle, where, in lieu of the refectory, abbot's buildings, parlour, guest-house, &c., found in old abbey and monastic communities, would be placed the diocesan buildings, synod hall, library, and offices devoted to the use of the various missionary societies, the propagation of the Gospel, &c. In addition, it was proposed to erect in connexion with these a choir school and the necessary masters' residences.

From the above description it will be seen that the proposed new building in size and proportions would rank with the first of our cathedrals.

A Sacrifice to Theory.—At the beginning of last year Oxford University granted an annuity of 50*l.* to Mr. Geo. A. Rowell, "in consideration as well of the valuable services which have been rendered to the University for a long period by him in connexion with the Ashmolean and University Museums, as of the attainments in Science, of which he has given evidence in several published works." Mr. Rowell has just now declined any farther acceptance of the annuity, and has published a letter to show his reasons. He says he accepted it because it seemed to promise that attention would be given to his Meteorological Theory as to evaporation and electricity, and resigns it because this has been altogether lost sight of.





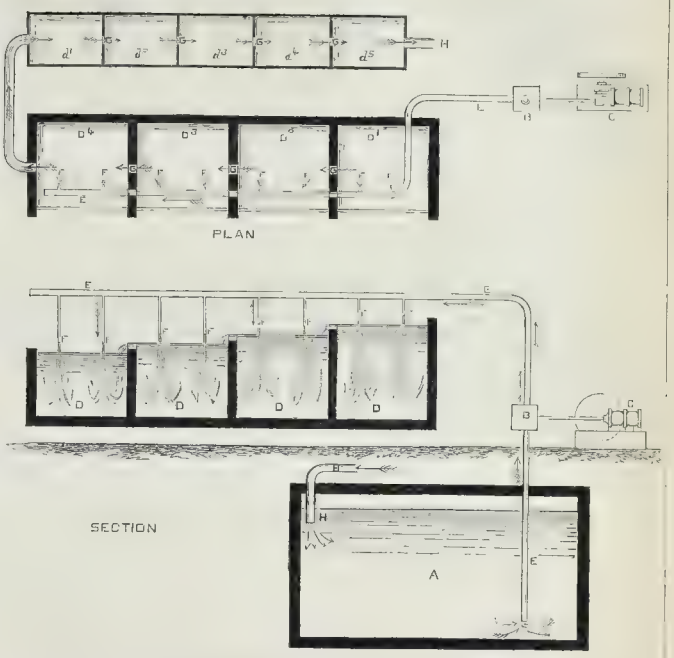
PROPOSED NEW CATHEDRAL FOR MANCHESTER.—VIEW FROM THE NAVE, LOOKING EAST.—DESIGNED BY MR. R. H. CARPENTER, ARCHITECT.

"AQUARIA AND THEIR CONSTRUCTION."

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.*

TURNING his attention to the essential points in the construction of aquariums, viz., general arrangement, light, temperature, water supply and storage, and the materials to be used, Mr. Driver remarked that as very much of the success or non-success of an aquarium depends upon its general arrangement, too much care and pains could not be bestowed upon it. Generally it will be found advisable to keep the accommodation for spectators, and the show-tanks, in the centre of the building, avoiding as much as possible breaks in the continuity of the tanks, as all such breaks involve expense and increase the labour of maintenance, besides causing a loss of show-tank area. Probably the most economical, if not the most effective, arrangement would be a hall (say) 200 ft. or 300 ft. long, with the show-tanks on either side, with a chamber at the end for the table-tanks to contain the small specimens that have to be seen from above. Another, and perhaps a better, arrangement as regards effect consists in placing the tanks in a corridor surrounding the central hall, which can be used for concerts or as a conservatory, similar to that at the new Westminster Aquarium, avoiding, however, the excess of light in the public portion that exists there. It is only fair to say, however, that sufficiently long experience has not been obtained at Westminster on this point. The galleries shading the tanks below them are very broad and overhanging, and provision has been made not only for diminishing the light in front of the tanks by screens, but also, if needed, for isolating the tanks by glass screens in warm weather, if it be found that there is too great and too frequent condensation of water on the outsides of the glasses of the tanks as a consequence of the difference of temperature between the water inside the tanks and the water-charged atmosphere *outside* them. The arrangement of the show-tanks at the Brighton Aquarium is all that can be desired, but whether the show-tanks are in a long hall, as at the Crystal Palace; in corridors, as at Westminster; or in cathedral-like aisles, as at Brighton, the question of *light* is all-important, for to enable the contents of the show-tanks to be properly seen, it is absolutely necessary that the hall or corridor in which the spectators are should be much shaded, and that nearly all the light it receives should come through the water in the tanks. The animals being generally accustomed to deep water, into which the light penetrates but feebly, naturally seek the darkest places they can find in the tanks; and as the spectators' part nearest the tanks is, or should be, the darkest, the animals will come to the glass, thus bringing themselves close to the spectator, who will be able to see the animals without being seen himself. The absence of light near the glass prevents the growth of vegetation upon it, and obviates the necessity of much cleaning of it, and of the scratching of its surface which is a consequence of the cleaning, whatever may be the care used. The presence of light in other parts of the tanks is useful in encouraging the growth of vegetation where it is wanted, viz., on the rockwork. It may, therefore, be considered a vital necessity that there must be an absence of light in the spectators' part of an aquarium; but it must be present in the show-tanks, and this being so, it should be one of the principal things borne in mind in planning an aquarium. The darkness of the spectators' portion does not apply to the room in which the small table-tanks are placed; this apartment should, on the contrary, be moderately illuminated, as the tanks have to be looked down upon. But though light is required in the tanks, it is not desirable that the direct rays of the sun should pass through the water; on the contrary, the best possible light is that from the north; but as this is not always to be had, a wall should be built high enough, or shutters should be arranged, so as to keep the corridor behind the tanks always in shade, and which will insure not only an even amount of light, but an even temperature. As to the best angle at which to pass the light through the water, Mr. Driver said he was by no means certain. At the Crystal Palace Aquarium the angle is about 60°, and that answers perfectly. Closely connected with the question of light, and in a great measure dependent upon it, is that of *temperature*. It is highly important, with respect to the healthiness of the animals, that the water in the tanks and reservoirs should be kept at an even and comparatively low temperature, for the waters of the seas or rivers which are their natural homes rarely rise above 50° or 55°, or fall below 40°, and hence the advantage of keeping the direct rays of the sun from falling on the water or in the corridors behind the tanks. Every means should be taken, by thick walls, thorough ventilation, and shade, to keep the air cool and fresh in summer, and, by hot-water pipes, warm in winter. One reason why coolness in aquaria is so essential is because water varies in its capability of holding air in solution according to its temperature, and the higher the latter is the less it absorbs of air. The question of *water supply* has been in a great measure touched upon in the earlier portion of the paper, but there are still some things to say about it of much importance. The most important of all is the necessity of avoiding contact of water with any corrodible metal, either in the tanks or in the store reservoir. The water may pass through slate troughs, glass, stoneware, or hard india-rubber (vulcanite) pipes, but no copper or other ordinary metal pipes or fittings of any kind must be used, as the oxydation of the metal contaminates the water and makes it poisonous for the animals. It must be kept in constant motion day and night—always flowing—in fact, a regular and sufficient circulation must be kept up. In addition to the flow of water from one tank to another,* there must be a constant supply of purified water (*i.e.*, water which has remained for a time in the dark reservoir) into each and every tank, and this is done by pumping it up from the reservoir, and forcing it through pipes in a series of jets of varying size into the tanks, and the water, passing through these jets with considerable force, takes down with it into the tanks a large quantity of air which is minutely divided, and which has the purifying effect before described. The whole arrangement of the system of the circulation of the water will be better understood by reference to the accompanying ideal diagram. But to ensure this constant and steady flow, and to provide against accidents, it is necessary, as before stated, to duplicate all the machinery, boilers, &c., and a supply of piping, &c., must be kept in reserve, so as readily to repair any damage. The jets must be provided with stopcocks and spare nozzles of different sizes, so as to regulate the force of the supply, or to turn it off altogether if necessary. The sluices, also, must have gates or troughs to pass the water right across one tank to an adjoining one, as it is necessary at times to empty a tank, though the general circulation must still be kept up. The reservoir for the *storage of water* is a very important part of the aquarium indeed. It must be absolutely water-tight, as any leakage means loss of money, and not only does it mean loss of money, but it has a directly bad effect on the animals, as the lost water has to be replaced by other water, which has to go through a long process of chemical change before it arrives at a state fit for aquarium purposes, and while it is getting into that state the animals suffer. The capacity of this reservoir should be such that it contains from four to six times the whole contents of the tanks.* It is usually placed beneath the floor of the public part, or under the tanks, but its position is a mere matter of convenience. Wherever it is placed, there should be means of readily inspecting it, and in large aquaria it would be well to divide it into two or more compartments communicating with each other, but yet capable of being completely disconnected, each reservoir to be capable of containing the contents of the others in addition to its own. In small aquaria, where the expense of the attendants required to keep the machinery going by night as well as by day would prove a

Aquarium Construction.—Arrangement of Water Supply.



A. Reservoir (to be kept perfectly dark and cool).
B. Pumps (Forbes's Rotary are the best, as they can be made in vulcanite).
C. Engine (steam or water).
D¹ D², &c. Show-tanks.
d¹ d², &c. Spare or store tanks.
E E. Supply-pipe from pumps.
F F. Jet-pipes with nozzles at end of same.
G G. Sluices or gates.
H. Return-pipe into Reservoir.

Note.—The arrows show the direction of the flow of water.

* See p. 212, *ante*.

* Such falls as those of the Crystal Palace Aquarium are not absolutely necessary. At Westminster, every one of each series of tanks is on the same level. At the Crystal Palace, too, the tanks in the north and south rooms, which contain the smaller animals, have no difference of level.

* In hot countries the reservoir should be much larger than 4 or 5 to 1; 20 to 1 would be still better.

serious item, it would be advantageous to have, if possible, a sufficiently large reservoir at a higher level than the tanks, into which water could be pumped during the day while the engines were at work, and from which the necessary flow of water could be derived at night, thus dispensing for a time with the use of the machinery and attendance, and further giving the opportunity of repairing the engines and other machinery. The materials principally used in aquarium buildings are brick, Portland cement, stone, slate, glass, and vulcanite. For the reservoirs, good hard well-burnt bricks and Portland cement will be found to be some of the best materials. If great care is taken in getting a solid foundation, so that there may be no settlement, and if the brickwork be bedded in and surrounded with good Portland cement concrete and built in cement, and then lined inside with two or three courses of plain tiles, all well bedded and floated in cement, and then all rendered carefully over in cement, the author believes that a perfectly water-tight reservoir can be made. To avoid settlements, and consequent leakage, it will be well, where possible, to construct the reservoir quite independent of any other part of the building. At the Westminster Aquarium a plan has been tried of covering the brickwork with asphalte. This is reported to have failed, but the failure was due, possibly, to the mode of using the material. It seemed to Mr. Driver that if the bricks were made very dry and hot, and dipped into asphalte, and built in with asphalte instead of cement, and then rendered over with asphalte, a perfectly water-tight reservoir or tank could be obtained. But better still would be a brick-in-cement reservoir lined with slate, or even, if expense were not a paramount object, a series of large slate tanks joined by vulcanite pipes. But there would be the objection of a multiplicity of joints, and consequent chances of leakage, in having so many slate cisterns. The show-tanks at the Crystal Palace are built of brick in cement, but for the Vienna Aquarium Mr. Driver said he designed an arrangement of slate tanks. A great advantage in the use of slate was the economy of space,—a very important matter in a small aquarium. Having built the show-tanks, it is necessary to build in them rockwork, which, however, is not put in for purposes of ornament merely, but for use, as it is necessary that the animals should have holes for shelter and other purposes; it also encourages the growth of the necessary vegetation. The stone should be thoroughly soaked, so as to remove as far as possible the various salts that may be present in the stone; and after the tanks are all furnished with rockwork, they must be soaked out to remove the soluble salts of the cements used to fix the rockwork in place. The glass used in the tanks, and through which the specimens are seen, is the very best British plate, and requires, for the large tanks, to be not less than 1 in. thick. The edges must be all ground, so as to be perfectly flat and true, as, owing to the pressure of the water, any inequality of bedding increases the risk of leakage and breakage. The size of the squares of glass is, however, limited, and it will not be found advisable to use squares of more than 24 ft. superficial. At the Crystal Palace, squares of from 30 ft. to 36 ft. superficial area were tried, but some of them failed, and it was necessary to strengthen the others by introducing iron mullions. In addition to the risk of breakage, the element of cost is a serious item, as the difference of price between the large and small squares per foot super. is as 3 or 4 to 1. Squares 6 ft. high and 3 ft. wide will be found to answer all practical purposes. The glass must be bedded into the rebate of the stone or iron cills and mullions by a cement insoluble in water. The cement used at the Crystal Palace was from a recipe of Mr. Lloyd's, and was composed of white lead, 14 parts by weight; red lead, 2 parts, litharge of silver, 2 parts, burnt umber, 1 part. These were thoroughly incorporated, by long-continued beating, with as much boiled oil as made the mass somewhat thinner than glaziers' putty. This cement was also used to cover bolt and screw heads, or any other metal work, to prevent the contact of water. The table-tanks for the small specimens are usually constructed with sides, divisions, &c., of enamelled slate, and with plate-glass fronts; these tanks also should have rockwork in them. As it sometimes happens that collectors for aquaria will send in more specimens of a particular kind than are wanted for immediate exhibition, it is absolutely necessary to provide a proportionate number of reserve tanks for them, which will also be available for the isolation of any of the show specimens in the event of their becoming sickly, and for the storage of the living food for the animals generally. These tanks, not being exposed to public view, may be ordinary slate cisterns, connected together by ordinary glazed stoneware pipes, the iron bolts, however, being on the outside. If stone is used for the cills to the tanks, or in any other part of the work, Mr. Driver suggested that only granite, marble, or other non-porous stone should be employed, for he found at the Crystal Palace that the pressure of the water was sufficient to force it through the hard Portland-stone cills, causing a waste of seawater, and a discoloration of stone. These cills were 1 foot. 6½ in. by 12 in., and were rendered at the back in cement. The pumps, piping, sluices, nozzles, and all other fittings connected with the supply and flow of water must be either of vulcanite, glazed stoneware, or some similar material. Vulcanite was one of the best materials that could be used, as it could be made in any form, and used in all positions where metal would be usually employed. After mentioning that Messrs. Leete, Edwards, & Norman, engineers, of Euston-road, had given great attention to aquarium machinery, and been very successful in all they had undertaken, Mr. Driver brought his interesting and practical paper to a close.

A discussion ensued, in the course of which the Chairman (Mr. R. M. Bancroft), and Messrs. Pownall, Rew, Alex. Payne, Valpy, Norman, Leete, and Guillaume, took part. Mr. W. H. Lloyd was also present, and was kind enough to answer a number of questions put to him. He exhibited photographs of a specimen of the *sagartia victuata*, formerly known as *actinia anguiconia*, a sea anemone or zoopbyte. This specimen, taken at Menai, on the coast of North Wales, in June, 1855, has lived in a glass jar (containing three pints of water) in London, Paris, Hamburg, and Sydenham, since May, 1856. This now historical and still perfectly healthy and vigorous animal has, during the last twenty years, served for the performance of many experiments as to the kind and amount of food it will eat; the time taken in digesting it; the quantity of aërated water it needs under different conditions; the mode in which it repairs wounds and other accidental injuries; the manner in which its young are born; the influences upon it of various temperatures and of degrees of light, and so forth. The results thus obtained have been largely used in the arrangement of most of the public aquaria in Britain and on the Continent, and, amongst others, of the Royal Aquarium at Westminster. This famous animal has travelled with Mr. Lloyd, in company with a favourite black Angora cat, "Mim," all over Europe. Puss is still alive and well, though she is seventeen years old.

THE LAW OF CONTRACTS.*

The paper which I have the honour to read for you to-night was, in a cruder form, intended for a class meeting later on in the session; but, owing to a recent change in the programme, my notes had to be got into shape rather more hastily than I could wish. I have, therefore, to ask your forbearance with its inadequacy and incompleteness. It is not my intention to attempt more than a mere outline of the most important questions affecting architects which are included in the law of contracts. The subject belongs more to the region of law than to that of architecture; and in many cases legal assistance will be as necessary for the architect as medical advice would be to a man who might feel himself out of health.

To know what contingencies are to be provided for in the "general conditions" of an ordinary contract, to recognise and avoid a legal difficulty, and to gauge the different courses of action which might suggest themselves when dealing with a troublesome client or contractor, are questions that come more within the architect's province than would points of abstract law. In short, an architect is only bound to know "as much law as would enable him to keep out of it." Most persons have a notion what the words "contract" and "agreement" imply; but for sake of clearness it will be well to consider the meanings a lawyer would be likely to give these terms, and to the minor terms included in the more general definitions. A contract, then, is "an agreement between two or more persons to do, or to abstain from doing, some definite thing or things." The term "agreement" carries in law the same meaning, and is interchangeable with that of "contract."

A contract may be expressed or it may be implied. In an expressed contract the parties to it have defined their terms either verbally or in writing; but in an implied contract no stipulations were made by the parties, yet there must be something in their acts from which the law can infer an agreement. Also, a contract may be personal or non-personal. By the former is meant one the performance of which depends on peculiar technical skill and judgment; by the latter, one not involving these qualifications for its due execution. These are some of the different kinds of contracts of which the law takes cognisance, but in addition there is another and more important classification used, and this is the division into "specialty" and "simple" contracts. Specialty contracts are agreements under seal; and simple contracts are those in writing but not under seal, and also those made by word of mouth.

There are three elements in every simple contract; these are—the request, the consideration, and the promise. The request may be either implied, or it may be expressed; it is implied when the individual for whom the work is done accepts the benefit thereof, although he may not have given an order for it previously to its being done; it is expressed when the order for the work was actually made. The consideration is on the one hand the equivalent to be given for the work done, and on the other the work done in lieu of the promised equivalent. The promise is the undertaking, either implied or expressed, to pay or yield some consideration for the work done in accordance with the request. You will understand from this that the consideration is the essential element of a simple contract: a request may be implied and a promise inferred, but the consideration is a *sine quâ non*.

We next come to specialty contracts, or those under seal, and the essential difference between them and simple contracts is that they do not require a consideration to make them valid; and, as regards architects, it is well to know that a corporation can only contract under seal, and nothing but the seal will make him legally secure with the body as such, although the individuals of which it is composed may make themselves personally liable to him. It is not absolutely necessary to have the agreement in writing, but it is safer that it should be. For a similar reason legal words should be adopted, as their meanings are clearly defined.

Having made these preliminary observations on the different classes of contracts and their elements, we have next to consider the duties, rights, and authority of each of the three persons concerned in a building contract, viz., the architect, the contractor, and the employer, including such questions as the death or bankruptcy of any one of these. This task, however, in a short paper can only be accomplished in a general way, but a little more attention will be given to special points.

To begin with: the architect will be legally bound to bring to the exercise of his profession proper qualifications, and to undertake to use a reasonable amount of skill and care in the designs, and an adequate supervision in the execution of the work. If he does not, he will be liable for the consequences that can be proved to have been caused by his neglect or want of skill. In undertaking work for a client, a distinct agreement should be drawn up as early as possible in the transaction, and will be generally found to save much subsequent annoyance to the persons concerned. A contract to prepare plans on approval is very unsafe, as there is no remedy for the architect in the event of his plans being disapproved; and a contingent contract, or one in which the payment depends on a contingency, is nearly as bad, for the individual for whom the work is done may render the contingency impossible, in which case the architect will lose his remuneration, unless there is some special covenant or provision in the agreement on which he can fall back. With respect to the architect's right of payment, he will be entitled to whatever sum is mentioned in the agreement with his employer when he has performed the condition, or "condition precedent," as it is termed, entitling him to payment. Should no sum have been agreed upon, it will be inferred that a reasonable remuneration was intended; and therefore, in the event of a dispute about his charges, an architect must be ready to prove

* By Mr. H. C. Brett (hon. secretary). Read at ordinary general meeting of the Architectural Association of Ireland, on the 24th ult.

that they are only fair and reasonable. He cannot fall back upon a "Schedule of Fees," such as that of the Institute of Architects, for it is not admissible in evidence; consequently, should his charges be based on those prescribed in the schedule, their reasonableness must be proved all the same.

Analogous to the question of remuneration is that of the ownership of the plans. This point has not, I understand, been as yet finally settled by the courts. The Royal Institute of British Architects maintain that "it has hitherto been the general custom for the architect to be paid for their use only, those documents remaining his property." But Baron Bramwell, in speaking on this point, held that "the usage was impossible, and perfectly suicidal. It no sooner came into existence than it cut its own throat by its absurdity,"—a view that the *Times* and other newspapers approved of highly. If, then, the architect wishes to retain his plans, the safest course for him is to express an intention to that effect in the agreement.

The authority an architect may exercise in the superintendence of works will depend mainly upon the terms set forth in the contract; but should this document be silent on the point in question, the architect's authority would probably be limited by usages, provided such usages were reasonable.

"If the parties so agree there is practically no limit to the authority with which the architect may be invested; that he may be endowed with a discretion the extent of which would depend only on the power of his employer; that if the terms of the contract are clearly expressed, the builder may be placed almost absolutely at his mercy; but that if this be intended, in each and every case the conditions should be expressed in unmistakable language, for if anything is left to be implied by the law, that only will be implied which is reasonable."*

One of the most powerful weapons by which an architect can enforce his authority, and insure good workmanship and materials in his buildings, is the certificate; for if the contract requires that, to entitle the builder to payment, the architect must previously testify by a certificate his satisfaction with the work done, the contractor cannot recover his money without that certificate, even if the work were well done, and the party for whom it is done satisfied. There is, however, one exception to this general rule, and that is—should the architect be guilty of fraud or misconduct in withholding his certificate, as, should these delinquencies be proved, the contractor will probably have the Court's assistance. An architect is not ordinarily liable for the interferences which the erection of buildings under his charge may cause to his employer's neighbours—light, air, water, &c.—unless there is a stipulation to the contrary in his agreement. For instance, if the architect undertook that in designing a house no infringement of neighbours' rights would occur, but afterwards, in course of erection, an interference does take place through his fault, it seems only fair that he should be responsible for the error.

The general rules relative to the "quantities," where no special arrangement has been made relative thereto between the architect and his client, will depend to a great extent on the usage extant. If, then, it is the practice of the profession to employ a surveyor to take out the quantities, the architect is impliedly authorised to engage a surveyor, and the contract (if conditional) will be binding on his client until after the tender has been accepted, when the liability to the surveyor shifts on to the builder.

An architect's contract with his client is what has been above described as a personal contract, or depending on peculiar technical skill. The way this peculiarity affects him is important in the event of his becoming incapacitated for work, or should such casualties as death or bankruptcy occur; for the trustees, executors, or assignees can only recover the remuneration due for such work as the incapacitated, deceased, or bankrupt architect has executed; but they are not entitled to complete his unfinished works, unless by special agreement. In all cases, however, much will depend on the terms of the architect's contract with his client.

Passing on to the builder, we are told that his contract is not a personal one, like the architect's, unless it is made so by some special covenant in the agreement. His duty is defined in that document, his liability in case of default fixed, and the payment or consideration to which he is to be entitled set forth, as well as all the privileges he is to be granted. All these points, as well as all others which the architect considers advisable to include, should be distinctly specified, and nothing, if possible, left an open question. The clauses requiring greatest caution are those bearing on the architect's certificate and authority, mode of payment, the extras, the penalties, and what are termed the bankruptcy clauses.

The state of the case as regards the architect's authority and certificate has been already mentioned; it will, however, be necessary to say a few words on the subject of the builder's right of payment. In the absence of special provision on this point in the agreement, the following appear to be the general rules sanctioned:—If the contractor has undertaken to do certain work for a fixed sum, so long as that work remains unfinished he cannot recover payment even for the part of the work he may have done, unless the employer has refused to perform his own part of the bargain, or incapacitated himself from doing so; or, again, if he has accepted the benefit of the work done in a manner which would make it possible to infer an intention to pay for it; or if he has dispensed with the conditions of the contract; or, lastly, if the work done was not included in the contract. If the contractor has unfaithfully or carelessly performed his contract, and seeks payment therefor, the employer can seek to reduce the claim by proving defective workmanship or materials.

Probably the most delicate point in a building contract is the question of extras. They are not seldom the *casus belli* for a triangular duel between architect, builder, and employer. The principles which regulate them are not, however, very complicated. Speaking generally, if the contract provides that alterations and additions are not to be charged unless authorised in a particular manner, that provision must be followed to enable the contractor to recover for extras; also, the order therefor must have been given previously, and not subsequently to the execution of the work.

Again, in an action to recover extras ordered by the architect, it must be proved that he was either impliedly or expressly authorised by his client to give the order for the works. Should, however, the contract declare the architect arbiter of the value of the work done, and have given his certificate therefor, the question whether or not an order was given will be nugatory. Finally, it must be distinctly remembered that if the conditions of the contract with reference to "extras" are to be rigidly enforced, the architect must not travel out of that agreement; for if the contractor succeeds in proving that the additional works are not within his contract he does not require a written order to recover payment for them, nor even a verbal one, if he can establish some act on the employer's part which will enable a court of law to imply a request.

What are usually termed the "penalties" in building contracts in reality come under the legal term of "liquidated damages," otherwise they would not be recoverable in a court of law. They are to be considered as an assessment which the parties have agreed to in compensation for the damages occasioned by a breach of contract, and they will be bound by it. But should an action arise, and the court consider the assessment to be in reality a penalty, the oppressed party will be entitled to relief; and the jury will be directed to assess the employer only such damages as will fairly compensate him. It would also appear that if the failure on the part of the builder to complete his contract be due to some act of his employer, the latter will not be entitled to recover damages unless there is some special covenant in the contract which will enable him to do so. In the event of an inevitable accident happening to the works in progress, there are three cases to be considered:—1st. When the agreement is to do certain works, there being no stipulation deferring payment until their completion. In this case the builder would be entitled to payment for the work done up to the time the accident occurred, as well as for the materials used. 2nd. If the agreement was that the contractor was not to be paid until the work was complete, he would not be entitled to any remuneration on account of an accident, but should make good the damage. 3rd. If the works are to be paid for in instalments the contractor will be only entitled to such instalments as he may have earned up to the time the accident took place.

The builder's contract not being personal, in the event of his death, or his becoming a bankrupt, when there is no special clause in the contract providing for such a contingency, the executors or assignees, as the case may be, will be entitled to his rights of contract; they are bound, if they have assets, to complete his unfinished work.

As the paper has already exceeded the length originally intended, I shall say only a few words about the employer. It is needless to say that his duties will depend on the agreements with the architect and with the builder. In the event of there being no agreement between the architect and his client, it may be useful to know how the case would stand in a question like the following, which is not uncommon. Suppose the order to the architect is to design a house that will cost a certain sum, but when the tenders are opened it is found that they exceed the amount specified, would the architect be entitled to remuneration? The answer appears to be that if the lowest tender were reasonably near the stipulated cost, the architect could recover his fees. Similarly, the client would be entitled to object, were the plans for his house not prepared within a reasonable space of time. The word "reasonable," however, allows great latitude of opinion; for, to quote Baron Bramwell's simile, "We know that at noonday it is light, and at midnight it is dark; but it is difficult to say exactly when daylight ceases and night begins." When, however, there is an arrangement between the architect and his client on this point, of course each party may hold the other to his bargain.

The rules applicable in the event of the bankruptcy, death, or incapacitation of the employer are nearly identical to those above mentioned in the builder's case; therefore, the contract not being personal, I shall not trouble you with a repetition of them.

I shall now conclude by attempting to summarise the principal points to which I have called your attention.

When the contract is only implied, a court of law only seeks to enforce fair and reasonable terms between the parties. It will admit of no usage being imported of which one of the parties was in ignorance, and none whatever that is illegal or unreasonable.

When there is an agreement, either verbal or written, between the parties, the court will seek to discover and enforce the intention of that agreement; but wherever it finds itself free to act according to its judgment, it will be guided wholly by "reason and authority."

In framing contracts, therefore, it is necessary to express every point in the most distinct manner, so as to leave no room for doubt as to the real intention of the agrement.

"The law will not afford any relief on account of the absurdity, the unreasonableness, or even the impossibility, of the particular thing which is undertaken; and if a man unmistakably contracts to do that which is impossible, he must on default pay damages, provided there is no fraud in the matter, and that it is not that which is termed a 'catching bargain.'"*

* "Legal Handbook for Architects," &c. (by Jenkins and Raymond), cap. v., sec. 36.

STAINED GLASS WINDOWS.†

THE fragile nature of coloured glass, exposed amid troublous times, has unfortunately deprived us of any remains of the earliest examples; but the writings of ancient historians record the art as early as the fourth century. St. Chrysostome and St. Jerome mention its beautiful effect in churches of that time, and Prudentius, also speaking of windows in St. Paulo fuori de la Mura at Rome, says, "in the windows are placed glass of various colours, which shine like meadows decked in the flowers of spring." The art of colouring glass in the form of beads, cups, and other ornaments, though found to be as old as the ancient Egyptians and Phœnicians, and afterwards known in the form of mosaics in Greece, Rome, and Byzantium, has no record of its application in a transparent state to windows previously to the fourth century. Several writers of the sixth century describe the illuminated windows then placed in St. Sophia, Constantinople. Procopius says of them "that day seemed to be born under the vaults of the temple." Gregory of Tours takes note of the breakage of a coloured window by a soldier in

* "Legal Handbook for Architects," cap. v., s. 35.

† Read by Mr. Alexander Ballantine, at a meeting of the Edinburgh Architectural Association, in St. George's Hall, Edinburgh.

the church of Brionde; and this prelate, in decorating St. Martin's, Tours, caused the windows to be filled with glass of various colours. The Bishop of Poictiers, in his account of Notre Dame, in Paris, as built by Childebert, admires the gorgeous effect produced by the light passing through the coloured glass, and compares it to the fine tints of the morning sun. England's first employment of the art would appear to have been in the seventh century, when St. Wilfrid, at York, lamenting that coloured windows could not be procured in this country, sent to France for skilled workmen. By the eighth century stained glass became general; and in 863 France was so engaged in this art as to have several masters of eminence.

Having thus referred to these early records of our subject, which give a fair idea of the gradual importance it attained in these early times, but unfortunately supply no particulars of the designs, we pass on to 1052, when a historian of Dijon, describing a small window in his monastery as representing the mystery of the Holy Eucharist, seems to give the first distinct mention of the employment of the art as a means of figure illustration, and this he says had previously been in a church of earlier date.

The earliest application of coloured glass is supposed to have been pieces set in the piercings of the marble slabs or fret which were used in windows in the East at a very remote time. The effect would be brilliant, like jewels, and quite sufficient to impart all the eloquence to those early writers. If their windows were composed entirely of coloured glass, the first attempts may have been rude in design, aiming only at a glowing combination of colour; but the probability is that so soon as the art was capable of this the taste manifested in the missals of the period, and in the figure mosaics,—for instance, at Ravenna,—as early as the sixth century, would also seek expression in stained glass.

An ancient window at Neuvilles (Bas Rhin), dating from the eleventh century, partakes strongly of the character of these Greco-Byzantine mosaics. In the twelfth century, the Abbot of St. Denis invited from all countries those most skilled in the decorative arts. Chartres, Mans, Sens, Bourges, Ecouen, and Chantilly were enriched with gorgeous windows; and, with all the sad havoc of 700 years, there still remain portions exhibiting the state of the art at that time.

In describing the stained glass of the twelfth century, we may, for all practical purposes, include the greater portion of the thirteenth, and together term this the first period. The designs are in the form of small medallions inclosed in iron frames, upon a groundwork composed of patterns of diagonal, circle, square, or scale arrangement, the window surrounded by rich bordering, and the whole wrought together in small pieces of glass united by lead fret. Deep blue and ruby colours alternate as grounds throughout the design. Light colours are applied to the figures and details, such as greenish white, pale yellow, lilac, green, and occasionally light blue. The glass is thick and uneven in its surface and shade, so that the rays of light are transmitted with a much more brilliant or jewelled appearance than through ordinary smooth glass. In style of drawing these windows in a great many respects follow closely the figures and ornaments of the illuminated missals, and there is assuredly not a more reliable guide for the period of ancient glass than reference to these contemporary works. The broad, black, hatching lines of the drapery folds are identical. The scrolls, composed of conventional foliage, winged reptiles, and interlaced bands, are not only similar in design, but seem almost as mosaic in character as the glass, and are surrounded by stout black outlines, as if the illuminators had copied the appearance of the lead fret, or as if those in the habit of preparing designs for the windows had applied their rich powerful combinations of colour and strong outline while engaged upon the embellishing of these ancient manuscripts.

Probably the most ancient glass preserved in England is in the choir of Canterbury Cathedral, dating about the end of the twelfth century. The architect of that time was from Sens, and from this glass being similar to the contemporary French windows, and no evidence of the art having then attained such proficiency in England, we have no doubt these beautiful windows were imported from France. As we proceed we will see how foreign artists continued to be employed upon numerous windows throughout England.

In addition to the medallion window, a large bolder style was adopted in clearstory or other windows distant from ordinary view. These contained in each light a single tall figure of a saint executed in a very archaic manner. Some of these figures are masterly in simple severe line, but in a great many cases the harshness of the style imparts a more ogry than saintly sensation. The heads are not entirely composed of a piece of light or skin-coloured glass, with the features delineated thereon as in other work, but are formed of several pieces. The eyes are bluish glass, each surrounded by the lead, which is united together at the corners across the nose,—spectacle fashion,—then shades of purple, blue, or green set in the same manner from the moustache, beard, and hair. By the right placing of these leads across the features a good expression at a distance is attempted to be produced; but one might as well try to produce portraiture by some system of tatoo. The figures are drawn in a very attenuated manner, to suit the tall narrow spaces, and the drapery hangs in a few straight lines, formed either by the lead fret, or equally broad black lines fused upon the glass. Shading, to impart any appearance of relief, is entirely avoided, and the combination is much after the manner of a diagram in flat vivid surfaces of colour. The style seems to have been more employed upon the Continent than in England, though in the modern copyism of Mediæval glass we have numerous reproductions. The thirteenth century produced also many fine Jesse windows, thus termed from the design enclosing within interlacing branches and foliage all the generations from Jesse, who usually reclines at the roots or base, to the Madonna or our Lord in majesty at the top of the window or tracery. The great west window of Durham Cathedral, recently skilfully restored, is a good specimen. There is also a famous one of later date in Nuremberg, designed by Volkamer.

The introduction of light ornamental grisaille windows belongs to this time, and, as a decorative treatment, was well calculated to produce a more airy and spacious feeling in the interior of these Early Pointed structures. From the general absence of figures, some have supposed that the reformed notions of the Cistercians devised this style.

The effect of the grisaille, or grey, is produced by light cool pieces of glass, ornamented with an outlined leaf or pattern, and hatched over the ground by thin black lines, that blend together at a short distance, like a semi-tint. Colour is interspersed sparingly in bosses or geometric bands, as at Salisbury and York. The north transept window of York Minster,—known as "The Five Sisters," shedding their gentle light upon the clustered shafting and richly-moulded arches,—forms a perfect poem of architecture. The legend tells of the design having been in needlework, and sent to foreign countries to be produced in stained glass. This may be, though from the quantities throughout England during this and the following century, when the wars with France were raging, it is evident that this light style of glass was manufactured in this country. The tints are irregular, and seem just such as would be produced by the impurities of the ingredients before the application of manganese was known as a clarifying or purifying agent. The thickness and coarseness was obviously of great service for a rich crystalline effect.

The quarry or lozenge-paned window, diapered in a similar manner, and set at intervals with ornamental bosses or panels, formed a simpler description of window during the latter part of the thirteenth century. The declaration of war with France in 1293 by Edward I., and which lasted with scarcely any intermission for a century, would sever our opportunities of further importations of the richer specimens of art. Whether, by the alliance then formed betwixt France and Scotland, any of the Scottish ecclesiastical edifices received foreign specimens of glass, we are unable to ascertain. There is, however, evidence that many of these contained coloured windows, from the fragments that have from time to time been discovered in a decayed state amongst the earth adjoining Dunblane, Cambuskenneth, &c.

Stained windows of the fourteenth century or Decorated period contain, like the detail of the architecture, a more natural character of foliage, and the figures have no longer a sameness of feature, but are taken more directly from life. Canopy and shrine work forms a prominent part of the design. In tall lights, figures and their canopies are ranged one over another in several tiers, or a panel group to a smaller scale forms a base to the saint and canopy above; or a simple design has only a portion of each light occupied by a figure and small canopy, while the remaining space above and below is filled with light ornamentation not usually cross-hatched in grisaille, but simply outlined. Yellow stain, produced by the fusion of oxidised silver upon light glass, first occurs at this period, and by its application a warmer amber colouring is obtained. A deeper golden shade is also substituted in the pot-metal glass for the pale yellow of earlier work, and secondary combinations of colour, such as purples, greens, &c., attain greater richness. The stirring incidents of our history provide abundant illustrations, and knights accoutred in all the trappings of the field are enshrined in the chapel windows for their heroism in the Holy War, thus forming most precious relics of armour, heraldry, and costume. As the drawing improves, there is a more studied use of shading in the heads and draperies, without losing brilliancy, but rather gaining by the lights, thereby shining more prominently. Faces are wrought with remarkable vigour upon skin-coloured glass, and the shade colour is frequently left upon the hair, so as to distinguish it firmly from the flesh. With the Perpendicular style of architecture, commencing towards the close of the fourteenth century, light silvery glass pervades the windows. A greater delicacy of execution is found in the tracing lines and shading. The glass is also thinner and smoother, while richness is imparted by diapering and staining light yellow. Canopy or tabernacle work is executed in white, to which the gold-colour stain is freely applied. Profuse elaboration of crockets, pinnacles, and tracery form the design, and the backgrounds, with occasional intervening parts, are ruby or blue. The leaves are not nearly so naturally delineated, nor are the heads generally so noble. The draperies of the larger figures have in many cases a grain or stipple shadow, whereby a pleasing transmission of light is preserved. As the style advanced, this became rougher and more open in the grain, and was ably practised in the Dureresque windows upon the north side of the nave in Cologne Cathedral.

A grey hue and paleness pervade all the blue then used, and the ruby also loses in strength. The fine sapphire shade of earlier glass was entirely lost, and with all the chaste delicacy of the colouring in Perpendicular glass, and the glowing combinations of Cinque-cento, the blue partakes either of a cold greyness or an obtrusive purply hue.

The manufacture of coloured glass had, in the fifteenth century, in Germany, been brought to a high state of perfection, and their blue in Nuremberg windows possesses all the quality of earlier colouring, while the blue in Cologne windows, date 1509, is inferior.

In England, during the fifteenth century, the Continental coloured glass was held in high repute. In a contract of "John Prudde, of Westminster, glazier," 1447, he "covenanteth to Earl of Beauchamp to glaze all the windows in the new chappell in Warwick with glasse beyond the seas, and with no glasse of England." A few years later was issued a prohibition of any importation of "painted windows."

The famous windows of Fairford Church, Gloucestershire, twenty-eight in number, are quite in the old German manner of the end of the fifteenth century, which in its freely composed draperies and bold conventional folds, and decisive character of heads, is remarkably effective. A fine set of fac-simile drawings of these windows has been published by the Arundel Society as important examples of the art.

These several periods of stained glass that we have traced are identified with the different developments of Gothic architecture, and partake intimately of their features and spirit; but an entire change of style, as in architecture, takes place in the sixteenth century, or cinque-cento period. The old, with all its associations obnoxious to the new spirit and fashion of the Reformation, subsides, and new forces of art spread over Europe. Painting, sculpture, architecture, music, and poetry all excelling at this time in Italy, there also we find gorgeous and masterly application of stained glass. The Venetians conferred high honours upon numerous eminent "gentlemen glaziers," as they were then quaintly termed. It is, however, to be lamented that few examples of these works have survived the incessant invasions and civil wars throughout that gifted land. Windows of the Duomo smashed so that the lead thereof

would provide bullets for the besieged, tells too frequently their desperate fate. Santa Maria in Florence, Perugia, Sienna, and Milan cathedrals show how to combine magnificent breadth of light with richness of colour. Flemish Cinquecento glass fills the choir windows of Lichfield, and the Dutch artists were skilful in this art. The Swiss produced also some choice combinations with enamel tints. In the reign of Henry VIII. those twenty large windows of King's College, Cambridge, were erected. The great east window has not unworthily been ascribed to Holbein.

In substance and colour the glass was similar to that of the preceding century, but the processes of execution were somewhat changed by the introduction of enamel tints as auxiliaries, and by the removal of ruby from the flashed side of the glass by means of fluoric acid. By so much roundness attempted in the shading, and by the concealment of the lead-lines amongst the shadows, the work is discovered to have been directed by a painter, who has not discriminated between the principles applicable to a window as differing from a picture. This, fortunately, is not always the case, for there are many instances where a clear silvery effect of light, gemmed with brilliant disposal of colour, is the result. So varied, however, are the productions, compared to the more conventional arrangement of the Gothic styles, that it is impossible within present limits to state more than general points of resemblance. Ornamental adjuncts to their large illustrations were either of the most florid Late Gothic or Renaissance, which committed great incongruities by spreading huge baldachino designs, executed in coloured glass, over several narrow lights, heedless alike of relative proportion or style. When the grouping of figures forming one illustration throughout two, three, or more lights, has regard to the due architectural importance of the mullions, a grander and more impressive whole is obtained, with the advantage of larger figures; but the temptation to a designer of glass is so great that there is in this treatment great danger of the architectural design of the mullions and tracery being disregarded. This proved to be the case by the close of the sixteenth century, and with the free use of enamels a resemblance to painting became general, and stained glass, instead of a medium of light and beautiful crystalline colour, became feeble and opaque. Heraldry alone retained in its decided tinctures and medals somewhat of the old brilliancy, and by means of flashed colours and yellow stain great nicety of execution was practised.

During the seventeenth and eighteenth centuries a very meagre account can be given of the art, as the prevailing Puritanical tastes discouraged all such ecclesiastical embellishments. As a decoration to the mansions, however, it was freely applied. Oxford is said to have the best examples of church glass of this time in the windows by the brothers Van Linge, which are treated in the usual Dutch style of square leaded panes, with a group upon large surfaces of enamelled landscape. Reynolds's window, in the College Chapel, notwithstanding the graceful conception and expression of the figures, is merely a warm sepia picture disfigured by rectangular lead joinings of the panes of glass. Until the revival of the study of Mediæval architecture no attempt was made to resume the principles and processes of ancient glass. A considerable time was required to overcome the harsh vivid colours and smooth uniform surface which modern manufacturers of coloured glass thought immense improvements upon the old. Modern combinations of such glass was accordingly unsatisfactory to those familiar with the effects of the ancient, and though the surface was bespattered with dirt, and many other deceptions were adopted to anticipate the action of time, all was unavailing for catching the real quality of colour, until, by Mr. Winston and Messrs. Powell's analysis of old glass, they produced in 1849, their beautiful antique pot-metals. Messrs. Hartley, of Sunderland, soon followed, and afterwards Messrs. Chance, of Birmingham (both eminent glass manufacturers), in producing similar glass, and thereby the great difficulty that the revived art had in obtaining substance, texture, and the mellow brillancy of ancient windows was overcome. Varied as this is now produced, from pale to deep, according as each piece varies in thickness, the flat uniformity of colour is broken up, and this is carried further by doubling one colour, in a molten layer, over another, thus having ruby blending to blue, or ruby to orange, or blue to green, almost rainbow-like in their glowing gradations. Draperies, foliage, &c., gradating in this manner undulate richly in their colours. The more diversity that can thus be produced, and skilfully applied, in the working together of the many pieces composing a window, the more hopeful are grand rich effects for the future of the art. Browns like autumn tints, whites iridescent as the pearl, greens and colour varying as in leaves and flowers are no over-sanguine hopes; and if this art can also woo master-minds to reveal in her the treasures of Scripture, depict the loveliness of nature, record the scenes and history of human life, and indulge in "divers fancyes," the storied panes of the future may be even more richly dight than those of old.

LEGISLATION ON THE CONSTRUCTION OF HOUSES.

The Council of the Social Science Association had under consideration on Thursday last (9th) the following

Report from the Standing Committee of the Health Department, on the subject of necessity for further and more complete legislation on the construction of dwelling-houses:—

"(*a.*) That the earnest attention of the Local Government Board be directed to the necessity for amending and consolidating the law with regard to building construction into one Act applicable to the whole country.

(*b.*) That the present state of the law, permitting as it does of the erection of houses totally devoid of all necessary sanitary considerations, is calculated to defeat the object and to render nugatory the otherwise beneficial operation and action of recent sanitary legislation.

(*c.*) That the administration of any Act of Parliament relating to the proper hygienic construction of houses should be entrusted to proper and efficient officers, under the direction of the local authorities, with controlling power of a central authority (say the Board of Works for the Metropolis).

(*d.*) That inasmuch as the defective sanitary construction of houses in all large cities materially contributes towards creating a high rate of mortality, no legislative measure can be considered effective which does not determine a standard of habitability, and which does not contain a clause enacting that all newly-built houses and their appurtenances shall be certified as fit for habitation by the officers of the local authority before it shall be lawful for the same to be occupied."

A NEW LOOKING-GLASS.

M. Lenoir, the well-known inventor of the gas engine, has brought out a method calculated to facilitate the safe manufacture of looking-glasses. His new system was subjected to the Société d'Encouragement, and this important body has, after due investigation, published a favourable report. It is notorious that innumerable efforts have been made to replace the dangerous use of mercury by some more innocuous substance. The silver foliating process, conceived by M. Drayton, and perfected by M. Petitjean, is the only system which as yet affords any practical solution to the difficulty. We may mention that it consists of placing a thin layer of silver, which is obtained by previously reducing with tartaric acid an ammoniacal dissolution of nitrate of silver. Unfortunately, the mirrors thus produced are marked by a disagreeable yellowish tint, which does not exist in the glasses prepared according to the old and dangerous system. Further, it has been remarked that the adherence of the silver on the glass is not very reliable; and it has also a tendency to blacken under the influence of sulphurous emanations, notwithstanding the varnish laid on to protect the back of the mirror. This deterioration is particularly noticeable when mirrors are exported beyond the equator, and confined for several months in the hold of a ship.

By means, however, of the improvements which M. Lenoir has suggested, these inconveniences are entirely obviated. His process consists of the amalgamation of a very small quantity of mercury with the layer of silver previously affixed to the glass. This is easily obtained by dropping a solution of cyanide of mercury over the silver. This salt reacts on the silver, dissolves it in part, leaving a small quantity of mercury free to combine with the silver remaining on the glass. Thus prepared, the mirror loses its objectionable yellow tint, and the silver is less susceptible to sulphurous emanations. Finally, the adherence of the metal on the glass is better secured. M. Lenoir's success is not merely theoretical; his mirrors have been submitted to an experimental test lasting two years. During this time they were exposed to the trial of long sea journeys, and the metal preserved its colour and position against the glass. This new invention will be all the more welcome when we remember that the mercury usually employed endangers the very lives of the workmen who manipulate this treacherous substance; and sometimes also, when yielding to certain atmospherical influences, gravely compromises the health of persons living in rooms profusely ornamented with mirrors.

MODERN MOSAICS.

An interesting report on Briffaut's mosaic floors has been drawn up by the Industrial Society of Northern France. These are not made of pebbles or shells, but of thin pieces of oak and other woods placed together so as to form designs. These pieces are not, however, held by frames or by glue, but are maintained in their proper position by a layer of bituminous mastic poured while warm over the wood, and then covered by a large terra-cotta or hardware tile. Thus the three substances are knit together, and, to render their adherence still more secure, conical iron bolts are driven into holes previously pierced through the terra-cotta to the wood. This also is done while the mastic is still pliable. The mosaic fixed in this manner on a tile is about 20 centimètres square, and can be placed on a layer of sand and a bed of mortar or cement, to constitute a floor. The tiles supporting the mosaic are connected by thin iron spikes, which readily fit into grooves previously prepared. This system of flooring can, therefore, be used wherever terra-cotta, hardware, or porcelain tiles are now employed. It is easily removed from place to place, and the inventor further intends so modifying his system as to render it applicable to cabinet-work. M. Briffaut, we should add, does not consider that the cost of this style of ornamentation is likely to be any impediment to its success.

THE IMPROVEMENT OF FRENCH PORTS.

During the last few weeks we have been pleased to note the publication of decrees in the *Official Journal*, sanctioning extensive works for the improvement of various French ports. The Minister for Public Works is, for instance, instructed to accept, in the name of the State, a loan of 600,000*l.*, offered by the Calais Chamber of Commerce, to forward works in the harbour of that town. M. Teisserene de Bart, who will probably succeed M. de Meaux in the Ministry of Public Works, submitted to the Budget Committee a project for raising a loan of 505,000*l.*, which will be accepted by the State for the purpose of continuing the works and improvements of Dunkerque Harbour. The port of Rouen, also, is to be enlarged, and a loan of 120,000*l.* will facilitate this work. This inland town will thus be rendered more accessible to sea-going ships. This is a step towards satisfying the ambition of those patriots who long to see the capital of France become a maritime port, though Paris is so much farther up the Seine than Rouen.

In Algeria, the Chamber of Commerce of Philippeville has received official notification that it may issue a loan at six per cent. for the completion of its port. The loan is to be refunded by means of a tax levied on all ships availing themselves of the new harbour.

THE DUBLIN SCHOOLS OF ART.

The prizes awarded to the successful students of the Royal Dublin Society's Schools of Art for the year 1875, were distributed on Monday, the 28th ult., by his Grace the Lord Lieutenant of Ireland. More than ordinary interest was manifested on the occasion in consequence of the Government scheme *re* science and art, which, if carried out, will place these schools on a wider basis, and effect changes in the constitution of the Royal Dublin Society and the Royal Irish Academy. The report of the head master and general director (Mr. R. Edwin Lyne) was submitted to the meeting, showing that considerable progress in art instruction has been made in the Dublin schools. From the report we learn that the total number of national awards made to the whole of the schools of the United Kingdom since their institution in

1866 to the present time has been 1,546. The Dublin School has obtained one-nineteenth of the entire number of such awards, though competed for by an average of 115 schools of art; one-seventeenth exclusive of those gained at South Kensington, and one-thirteenth exclusive of those taken by South Kensington and other London Schools of Art. Despite of difficulties, the Dublin schools have, it appears, obtained a success that has been denied to institutions enjoying Government aid. Since 1866 the principal studies have been transmitted to London to compete for prizes of the highest grade, and for national awards, with the chief productions of the whole of the art schools. In the late London International Exhibition of 1874, the Dublin Society's schools submitted eighty-four works illustrative of the higher stages of original art study, including specimens of manufacture executed from the designs of the schools. The whole of these works, and the students by whom they were executed, obtained, during the past year, medals. An exhibition of the works of drawing, painting, and modelling of last year took place during the Christmas vacation, and was visited by 8,000 persons. The number of works selected to enter the national competition amounted to fifty-two, and five awards were obtained. The examiners of these works refer in their report to the satisfactory studies in the higher stages of art instruction, making particular mention of the studies executed from the living model, the figure from the antique, and the still-life studies in oil.

THE COST OF BUILDING ST. THOMAS'S HOSPITAL, AND ASSESSMENT.

THE outlay incurred in building St. Thomas's Hospital was disclosed in the course of an inquiry before the magistrates at the general assessment sessions last week. The overseers of Lambeth appealed against a decision of the assessment committee of the Lambeth vestry, under which the gross value was set down at 8,400*l.*, and the rateable value at 7,000*l.*, although in 1872 the magistrates fixed the gross value at 13,080*l.*, and the rateable value at 10,900*l.* The overseers now applied to the court to restore the gross and rateable value to that amount.

Amongst the witnesses examined on behalf of the appellants was Mr. Vigers, surveyor, who gave evidence as to the cost of the building, including the land. He stated that the ground upon which the hospital was erected was 8½ acres in extent, and the price paid for it was 90,000*l.* The sum of 48,000*l.* was expended upon the foundations, bringing up the outlay on land and foundations to 138,000*l.* The structure cost, excluding all ornamentation, 294,000*l.* Altogether, the total cost was 432,000*l.*, and he thought that, at 3½ per cent., would give 15,120*l.* as the value, the landlord doing the repairs. From that amount he deducted 10 per cent., and that made the rateable value 13,680*l.* Looking at the cost of land in other parts of the metropolis and buildings generally, he should say 10 per cent. was the deduction. He took in his valuation a plain building at the cost of 8d. per foot; but residences would, at the present time, cost 1s. per foot.

Mr. Trollope, surveyor and builder, corroborated Mr. Vigers's statement, and added that such a structure could not now be erected for 350,000*l.*

Mr. Henry Currey, the architect of the building, was also called as a witness during the inquiry, and in the course of his evidence he said that one reason why the hospital was so expensive was, that part of the foundation was on land which formerly formed a portion of the bed of the river, and they had to place concrete and form a basement under the whole building.

Other witnesses were called on the part of the governors of the hospital to prove that the gross value was 6,000*l.*, and the rateable value 5,000*l.*, and Sir Francis Hicks, the treasurer, stated that the high rating had rendered it necessary to close 141 beds. In order to show that Lambeth saved a large amount in parochial expenditure through the hospital, he stated that they had as many as 50,000 out-patients, more than one half of whom came from Lambeth. He added that the figures of the indoor patients did not include maternity cases, which amounted to 1,100 or 1,200 from Lambeth, for which that parish would have had to pay 10s. each case to their medical officers, if the women had not been relieved at the hospital. In answer to a question, he stated that the income of the hospital was 40,000*l.*, from which had to be deducted 7,000*l.* interest on borrowed money.

The Court ultimately decided that the valuation should be restored to the original amount fixed by the Court in 1872, viz., 13,080*l.* gross, and 10,900*l.* rateable value.

THE TRADE AND ANNUAL VALUE OF THE SURREY COMMERCIAL DOCK COMPANY.

THE amount of business annually carried on at the Surrey Commercial Docks, which is chiefly confined to the timber trade, was disclosed at an investigation at the General Assessment Sessions, Westminster, when the Company appealed against the sum at which they had been rated by the Rotherhithe local authorities. The dock premises had been assessed on a gross value of 64,461*l.*, with a rateable value of 48,346*l.*, and it was this valuation that was appealed against. It was stated on behalf of the company that the old assessment was 42,850*l.*, and in November, 1867, it was raised to 42,869*l.*, which in 1870 was again reduced to 37,061*l.* Since that time new buildings had been erected and other alterations made to the premises, and the rateable value was increased in the supplemental valuation list to 38,525*l.* Since that valuation there had been no substantial change in the character of any of the property. The docks were chiefly used for the importation of timber, and the trade in connexion with it. The years 1873 and 1874 were exceptional years as far as the wood trade was concerned. In 1873 the importation was 754,000 tons, and in 1874 it increased to 878,000 tons, dropping in 1875 to 744,000 tons. That showed that there was an inflated state of trade in 1873 and 1874, which suddenly dropped in 1875, and therefore it was not fair to base the assessment upon these exceptional years. The respondents seemed to have based the assessment on the average of the gross receipts of 1874, which was inequitable. It should be based on the preceding five years, or, at least, three years. The average annual gross receipts for five years amounted to 210,765*l.*; for three years, 222,152*l.*; and for 1874, 252,585*l.* The dues received in 1870 amounted to 71,500*l.*; in 1871, 75,000*l.*; in 1872, 76,800*l.*; in 1873, 89,000*l.*; and in 1874, 91,000*l.* During these last two years there was an increase in the price of coal, and that led to an enormous importation of wood, but that was altogether exceptional. It was contended that the basis should be five years; but if three years were taken, 1872, 1873, and 1874, it would give the two exceptional years, and one bad year. On behalf of the respondents it was urged that the docks were a progressive concern, and that it would be unjust to take the average of the last five years, as they would be taking years worse than any future year was likely to be. The Court decided to take the average of the three years 1872, 1873, and 1874; and it was agreed, after a consultation between the parties, to reduce the gross value from 64,461*l.* to 50,000*l.*, and the rateable value from 48,346*l.* to 40,000*l.*

THE FLOODS.

THE INSTITUTION OF CIVIL ENGINEERS.

ON the 29th of February a paper was read "On the Floods in England and Wales during 1875, and on Water Economy," by Mr. G. J. Symons, secretary to the Meteorological Society.

The first flood, on the 15th of July, was the result of a rainfall of large amount and duration. The rain lasted on an average about thirty hours, but in most localities 90 or more per cent. of the amount fell in twenty-four hours, and at some stations all fell in twenty-four hours. This flood was chiefly confined to the West of England, and its effects were most serious in Monmouthshire and South Wales, where at many stations the rainfall on the 15th of July was nearly twice as great as the amount previously recorded at those places. Generally heavy summer rains occur in thunder-storms, but the July rain in Monmouthshire and South Wales was not of this type, and was quite as remarkable for its steady persistent rate, of about 1 in. in each of five successive periods of five hours, as for the total quantity. The damage caused by this flood was considerable. The Avon and Frome overflowed their banks; at Cinderford, Gloucester, a reservoir burst and flooded two or more mines; at Monmouth a reservoir burst and numerous bridges were swept away; and the traffic on the greater number of the Monmouthshire and Glamorganshire railways was interrupted.

From the 16th to the 18th of July heavy rain fell in various parts of the east of England and the midland counties, but with no very exceptional amounts, the largest reported being near Louth, 1·36 in., and at Halifax, 1·18 in.

Some idea of the exceptional nature of the floods of 1875 might be gathered from the observations made on the height of the Avon, at Stratford-on-Avon. Since 1800 there had been only ten floods exceeding the height of 4 ft. above the weir, and four of these were in 1875, in which year alone more than one flood had reached over 4 ft. Observations at Evesham, sixteen miles lower down the river, gave nearly the same results, the slight difference probably being due to the tributaries which the Avon received between the two towns.

The enormous amount of damage and loss caused by these floods, suggested forcibly the question, "Can future floods be abated," either by embanking, constructing storage reservoirs, or lowering the water level? There was a prevailing popular demand that the flood waters of the upper Thames should be stored, but probably those who urged this did not realise the enormous amount of water to be dealt with. The reservoir storage adequate to prevent floods on this river would have to be at least 160,000,000,000 gallons, and owing to the Thames valley being singularly destitute of good natural sites for reservoirs, their construction of adequate capacity would cost at least 15,000,000*l.* sterling; this probably was a sufficient reply to the suggestion of storage, regarded solely as a remedial measure against floods.

Considering that the health of the nation depended on the purity of its water supply, and considering the multitude of uses of water for manufacturing purposes, and the great pecuniary loss resulting from floods, it seemed remarkable that there was in England no central body charged with the supervision and control of so important a matter. It was believed that had a central department existed to receive information of the depth of the rainfalls, and with power to telegraph the information to local officers, having the sluices, &c., under their absolute control, much of the recent damage might have been averted.

THE PEABODY FUND.

THE trustees of the Peabody Donation Fund have issued a report of their proceedings for the year ending December 31, 1875. The financial accounts show that the net income of the year 1875 was 18,425*l.* 18s. 9d.; which sum, added to the amount of the fund given in the last report (593,627*l.* 17s. 7d.) makes the total, on the 31st of December last, 612,053*l.* 16s. 4d. During the year the trustees have laid out, in the purchase of land and the erection of buildings, 69,092*l.* 5s. 3d.; and the sum in their hands at the end of the year available for future operations was 162,676*l.* 11s. 6d. In April last the new buildings in Duke-street, Stamford-street, were opened, and in July those in Bermondsey, giving accommodation to 424 families. The twelve new blocks of buildings in Southwark-street, for 264 families, are now finished and being occupied. These buildings being in such close proximity to the business parts of the City are most eagerly sought after, upwards of 1,000 applications having being made for 264 sets of rooms. Twelve blocks of building of 200 tenements, near the Grosvenor-road, Pimlico, are rapidly approaching completion, and will be opened during the summer. When these are occupied, the trustees will have provided dwellings for 1,846 families. The freehold of about an acre and a quarter of land in Little Coram-street has lately been purchased; but as the leases on this property have several years to run, this site may not be available for building purposes for some time to come. The average weekly earnings of the head of each family in residence at the close of the year was 1*l.* 3s. 10s. The average rent of each tenement was 4s. 0½d. per week, and of each room 1s. 11d. The tenants have the use of soulleries, laundries, and bath-rooms free of charge. The net income derived from the buildings occupied was a trifle over 3 per cent. per annum on the actual cost of land and buildings. Notwithstanding an epidemic at the Chelsea buildings, which caused a large number of deaths among the children, the death-rate for the year in the whole of the buildings taken together was 20·8 per 1,000.

THE METROPOLITAN WATER SUPPLY.

At the last week's meeting of the Metropolitan Board of Works, the Parliamentary Committee submitted a report to the effect that having considered a reference made to them by the Board on the subject of the water-supply of the metropolis, they were of opinion that the most effective mode of dealing with the question would be to obtain power to carry out the recommendation of the Royal Commission of 1869, that the water-supply should be in the hands of the responsible public authorities. Mr. Roche, in moving the adoption of the report, said that the question was a large and important one, and they had almost practically decided it when they settled that they could not carry out a system of hydrants while the supply remained in the hands of private companies. The whole matter had been under the consideration of a sub-committee of the Corporation and a sub-committee of the Board of Works. These committees had been attended by Mr. Goldney and Lord Camperdown, and they had come to the unanimous conclusion that they could not do better than recommend the Board to adopt the report of the Royal Commission of 1869.

After a long discussion the report was adopted, with three dissentients.

LIGHT AND COLOUR.

SIR,—In my last I demurred to the assertion, in the preface of Mr. Cave Thomas's book, "Our physicists are just beginning to perceive" that under either hypothesis light can exist apart from the sentient being, only "as a mechanical impulse or as a vibration." Had this been said of our artists, it might have been more just. Mr. Cave Thomas himself is the first artist (so far as I know) who has clearly seen and publicly insisted upon this first principle in the science of colour; but no adept in natural philosophy can fail to distinguish between the physical agent and the sensations which it excites. They know perfectly well that the word "colour," applied to an object, merely expresses the disposition of its molecules to send somehow to the eye those kinds of light which excite the corresponding sensation. Such would be astonished to find that an artist who has thought so much on the subject should suppose there was any novelty in this part of his conclusions, except to his brother artists. But the merit due to our author is rather that which belongs to one who has struggled by his own researches to arrive at truth, than that which belongs to one who first patiently ascertains what truths have already been attained to, and then endeavours, by his own researches, to extend the bounds of knowledge. To find physicists who knew no better than to account colour in itself as a quality of the object, we should have to go back to the ages when men drew their philosophy from the conceptions of the ancient Greeks, who thought that bodies sent forth to the eye emanations from their surfaces, and that the office of light was to make the medium transparent to such emanations. In some such way as this, perhaps, Mr. Colling conceives that we become conscious of the redness of his broken brick.

I have often wondered why it is that artists in general and teachers of art do still so often contend, and so uselessly, for the notion that colour is something residing in the object. Is it that they are so enamoured of the means by which they produce their magical effects on the canvas as to attribute all to their pigments and nothing at all to the mysterious invisible agency which makes the very pigments visible, and distinguishes one from another to our sense? Is it because our Department of Science and Art still suffer to be taught in their schools the conventional system of Field, who knew no difference between pigments and colours, and founded his system upon the mixture of pigments, and, mistaking subtraction for addition, measured the intensity of his colours by the thicknesses of the coloured infusions which he used to produce them? But no rational account can be given why notions so utterly unfounded should still be maintained, and still be taught by the very class which would derive the greatest benefit from their rejection. Some ask, Why not let these notions still be taught? Does it make any difference whether artists think that they mix their colours when they mix their pigments, or not? and whether they understand the true relations of colours to each other or not? I answer: It makes the difference between an educated, intelligent, well-directed skill, and a so far empirical, and sometimes misdirected skill. Great would be the difference were nothing taught; but much greater the difference where a false theory is taught, and false rules of harmony, as the consequence of it. If what is taught is misleading, it is of course directly mischievous; if only useless, it is vexatious and discouraging, and so still mischievous. The simple truth of nature alone can be useful in this, as in every other department of science; improving the taste of the student, opening his intelligence, directing his hand, supplying what might else be wanting in his productions, and every way adding to the value of his work.

In his Introduction, Mr. Cave Thomas again asserts that any reference to colours as sensations is "a very recent innovation," and adds,—"Till lately, the theory of light was exclusively treated as a mechanical question, and quite independently of any considerations touching the sentient being. That Newton had glanced at the subject from a physiological point of view, and in reference to sensation, is probable. . . . but whatever the ideas of the master may have been with reference to the physiological aspects of his hypothesis, they were either undivulged, or were passed unnoticed by succeeding writers upon the subject." Newton's definition, given in my last letter, shows what a mistake this is, so far as Newton is concerned; and it would be easy to show from the lectures of Dr. Thomas Young, and other writers, that it is equally wrong with respect to his followers. I will give one more quotation from Newton's "Optics," to show that he not only ascribed the colour sensations to the action of the different rays of light on the optic nerves, but suggested the mode in which the nerves are probably acted on, to produce the different sensations.

"Query 12.—Do not the several sorts of rays make vibrations of several bignesses, which according to their bignesses excite sensations of several colours, much after the manner that the vibrations of the air, according to their several bignesses, excite sensations of several sounds? And particularly, do not the most refrangible rays excite the shortest vibrations for making a sensation of deep violet, the least refrangible the largest for making a sensation of deep red; and the several intermediate sorts of rays vibrations of several intermediate bignesses to make sensations of the several intermediate colours?" To which quotation, did space permit, I might add others, suggesting that the harmony and discord of colours may arise from the proportions of these vibrations; and giving a reason for thinking that the cause is of this nature on account of the "lastingness" of the sensations excited by light, and the ease with which the like sensations are produced by pressure or impact on the eye. He even goes so far as to conjecture the existence of an ethereal all-pervading medium, through which such vibrations are propagated, and to calculate that they must be above 700,000 times quicker than the vibrations of the air which produce the sensation of sound in the ear. It is much to be regretted that Mr. Cave Thomas did not attach more importance to the study of what Newton and others have recorded, before attempting a revised theory: it could not have failed to modify considerably the opinions he has expressed.

A short notice of one point more in the Introduction must conclude this letter. In page 3 Mr. Cave Thomas quotes a sentence from the late Sir J. Herschel's "Outlines of Natural Philosophy," to the effect that the undulatory theory has not been so successful as the corpuscular theory in accounting for "the production of colours by refraction of light by a prism." The treatise referred to was written, I believe, more than forty years ago, when Herschel was not fully satisfied of the truth of the undulatory theory. In a letter which he addressed to me, May 27, 1869, he refers to his more recent writings on the subject, in which no such hesitation will be found; and as in the same letter he also touches upon the subjects of this communication in other respects, I hope I shall not be thought wrong in giving the following extract from it:—

"I have to thank you for your lecture to the Royal Institute of British Architects on the Science of Colour. . . . The principles you advocate, and which, no doubt, are the true and fundamental ones of the subject, are precisely those which I have taken great pains to make current among the artistic and non-scientific part of the public, from time to time, in various publications, and more especially in a work which I must presume you have not seen, or I think you would hardly have omitted some mention of it I mean my 'Familiar Lectures on Scientific Subjects' (Strahan, London, 1866), where, in pages 257, 258, 261–265, you will find those principles clearly laid down, and their application to pictorial art pointedly insisted on. I regret to perceive, however, from the remarks made on your lecture in the discussion which ensued, by one and all the interlocutors (yourself excepted)—remarks displaying what I should call crass ignorance of the whole subject of light and colours,—how very little progress has yet been made in clearing from the artistic mind those *idola*, which, from a jargon, have fixed themselves into a doctrine, and which I highly applaud your standing forward thus prominently to dispel. The substitution of green for yellow as one of the primary colours is due to Dr. Young; but neither Wollaston nor Young ever, I believe, tried to compound yellow by mixing prismatic red and green. The experiments of Helmholtz, Maxwell, and myself have, I presume, definitely settled that point."

The last two sentences of this extract bear upon a question which I hope to discuss in my next letter. Mr. Cave Thomas asserts that all colours are equally simple: I shall endeavour to state again, and, if I can, more clearly than before, the reasons for believing that there are three simple elementary or primary colours.

W. BENSON.

P.S.—Since writing the above I have seen the letters of Mr. Cave Thomas and Mr. Colling in your number for 4th March. From the latter I hope there is not so much difference between us as seemed to be, and that Mr. Colling does not mean to deny that we become consoious of colours by means of different kinds of light, any more than I mean to deny a certain quality inherent in each object which is the cause of its colour: namely, that which makes it reflect or otherwise send to the eye those kinds of light which produce the sensation of its colour. But why does he not admit that the blue-producing rays, and the yellow-producing rays, and all, equally come from the sun, and are included in ordinary daylight? Why not agree with the whole established theory of light and colour? My next letter I hope to commence with a few remarks on Mr. Cave Thomas's letter.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

SIR,—Can Mr. Bonomi give us any information how the Grecian canon of proportion, handed down to us by Vitruvius, was obtained? Does Vitruvius give the method by which it was established, or any hint by which we may arrive at the method? If not, we must accept this canon with caution as an assumption not yet proven. It is quite probable that the Greeks did set about their art in a common-sense, practical, and scientific way,—that they did not adopt certain proportions in sculpture and architecture without having sufficient reason for so doing. Still, I say, as a common-sense and practical people, we cannot accept the results handed down to us without being in possession of the data on which the Grecian canons were established,—without having, ourselves, sufficient reason for adopting them. The fatal mistake of the authors of modern works on proportion is that they think it sufficient to quote Greek example. This, however, is not enough for the scientific thinker, who requires to know the why and wherefore certain measures were adopted. The fact is, the science of proportion requires to be worked out *de novo*: this is being done, is done, but till the entire work is fully before the world we must still lend our aid.

Perhaps some of your readers will be surprised when I state that the War Office could render the arts most signal service in the matter of determining the English canon of proportion of the human figure. The height of every man in the army is, I believe, registered. We could, therefore, not only get at the standard of height in the aggregate, but at the typal stature of each regiment. Possibly the authorities may have other measurements recorded which would also furnish data. If not, with a very little additional trouble, they might have, and even obtain for us, all that we require. This example would possibly have the effect of moving other nations to do the same work, and then in a very short time we should have more extensive data than ever the Greeks had. We should be able to establish our own canons of proportion, and to test those of the Greeks.

In such a work the instrument designed by Mr. Bonomi might be of great service, and I should be well pleased if he were to be entrusted with this interesting survey and mapping out of the human frame. But if he should consider it a too formidable undertaking it would be one well worthy of the British Association if this had in view, as it ought, the advancement of art as well as of science. METER.

SILICATE PAINT.

SIR,—I have noticed an article in your number of February 5th, 1876, under the heading, "Lead Colic in Devonport Dockyard." It strikes me that the workmen in Devonport Dockyard, who, as the article says, are exposed to great danger from the cloud of dust produced by hammering off the ships the old lead paint, might be spared the great risk, as also might the painters. I do not know whether the authorities of that dockyard are aware of the existence of the silicate paint which is being manufactured in Liverpool. This paint is altogether free from lead or any other poison, and is superior to white-lead in many ways. First of all, it is quite harmless to the health of the painter; next, it always retains its opacity, which white-lead does not; it never tarnishes, and it will not change tint even in water-closets, or near drains, or in foul air. I have seen objects painted with the silicate paints which were submitted to all kinds of experiments to test the merits of the pigment, and I was surprised at its valuable properties. It certainly deserves the attention of every one in the trade. ALFRED LUTSCHAUNIG.

Liverpool Assay Office.

CEMENTS.

SIR,—Portland cement is the most useful article ever introduced for plastering and brick-work, both for external and internal work, but I am sorry to say there is a great difference in some of the Portland cements. In many instances it has been abandoned for plastering purposes on account of failure, but as I travel about the metropolis and look at the various buildings done with the original material, as a practical man I cannot detect any failure, or see where the action of the weather has disarranged the work to any extent; but whether it is on account of competition in the manufacture, or the great demand for the material, a great deal of the Portland cement of the present day is different from what it was originally. Other cements used for internal purposes, such as Keene's, Parian, and Martin's, are all very valuable materials if not abused by mixing other materials with them, thus destroying their properties, and making them less hard than the ordinary plastering. In some cases, where the work is supposed to be done with one or the other of the above-named materials, scarcely anything has been used in the works but coloured water or putty and plaster.

A PRACTICAL PLASTERER.

"STEEPLE JACK."

SIR,—I do not know whether the following suggestion is new or not:—To get a rope over the top of a high chimney, fire a rocket, with cord attached, up the inside of the chimney. The head of the rocket may require a wire guard to prevent it catching against the sides.

W. H. M.

SOME NEW BANK PREMISES.

Dundee.—The new Clydesdale Bank buildings, Dundee, are being rapidly proceeded with. The site is triangular, with the corners rounded off. The building takes the same form, and is surrounded by streets on every side, from 50 ft. to 60 ft. wide. The bank building and its accessories may be said to have three sides, two stories and a basement. That to the High-street is 36 ft. 6 in., and to the Seagate 74 ft., and to the Murraygate 68 ft., receding from the High-street 63 ft. The remaining portion of the building is a parallelogram, with the ends slightly rounded, and facing Commercial-street, with a frontage of 89 ft., in which will be shops on the ground-floor and offices above. The style is Italian, of a bold and massive character. The architect is Mr. William Spence, of Glasgow, and the contractors for the various works are:—Messrs. Mann & Myles, masons, Dundee; Messrs. D. Kidd & Son, joiners, Dundee; Mr. D. Brown, plumber, Dundee; Messrs. Alison, Brothers, ironfounders, Glasgow; and Messrs. Stewart & Murray, glaziers, Dundee. Mr. John Proudfoot, Glasgow, is the inspector of works.

Elgin.—The directors of the City of Glasgow Bank have just determined upon some extensive alterations and additions to their banking premises at Elgin, a building recently purchased, but which is just a century old. The successful contractors are:—Messrs. Alexander Allan, mason; James Macbeth, carpenter; John Gordon, plumber; M'Ivor & Younrie, plasterers; and John Kintrea, painter. The alterations will consist chiefly of the conversion of the present three stories into two, and the enlargement of the office, shop, and other internal accommodation. The front of the entire structure is to be refaced with Greenbrae and Clashach freestone, from the quarries near Hopeman; and the architect—Mr. A. M. Mackenzie—has endeavoured to preserve in its entirety the style, which is Queen Anne or Georgian.

Norwich.—Messrs. Lacon & Co.'s new branch bank, situated on the Gentlemen's Walk, which will shortly be opened for business, is an imposing building in the Italian style. It has been built by Mr. Downing, of Norwich, from the designs of Mr. W. O. Chambers, architect, of Lowestoft. The stonework was entrusted to Mr. Rust, and the decorative carving, of which the façade presents some elaborate specimens, was executed by Mr. Barrett.

Stockton.—The premises for the Stockton Branch of the National Provincial Bank of England have so far approached completion as to have been opened for business. The total cost will be about 20,000*l*. The structure, which has been two years in progress, is situated in a commanding position in the centre of High-street, having a front of Barnard Castle stone. Mr. Marshall, of Darlington, is contractor for the building; Messrs. Punch Brothers, of Middlesbrough, for the office fittings; Mr. Myes, of Redcar, for plastering; Messrs. Hind & Son, of Stockton, for gas fittings and plumbers' work; Messrs. Gargate & Son, Darlington, joiners; Mr. Dryden, of Darlington, for the painting; and Mr. C. Young, of Stockton, for mantel-pieces, &c.

ST. WERBURGH'S TOWER, BRISTOL.

THE Vandalistic mania for church destruction seems to have travelled from London to Bristol. St. Antholin's and other churches in London have been and are to be sacrificed at the behest of the Ecclesiastical Commissioners,—whether in pursuance of statutory powers or not it is comparatively useless to inquire after the mischief has been done. Street improvements are the pretext at Bristol. It appears that a Bill is now before Parliament for the purpose of pulling down St. Werburgh's Church, and, with the funds realised by the sale of the churchyard, to build another church in one of the outskirts of the city; but we are glad to see that an influential meeting was held on the 3rd inst., under the presidency of the Mayor, to endeavour to take steps to secure the retention of the tower. The following resolution was unanimously adopted:—

"That, considering the picturesque beauty of the tower of St. Werburgh's Church, which forms so striking an ornament to our ancient city of Bristol; considering the historical associations, dating from the fourteenth century; and considering, moreover, that the proposed widening of the adjacent streets need not be interfered with by the retention of the tower in question, this meeting strongly urges the retention of the tower and the construction of a footway through it, and respectfully solicits the Bristol Town Council to take such steps as may be necessary to this object."

As at St. Antholin's, London, it seems to be a foregone conclusion that the church must go, but it is earnestly to be hoped that the efforts to preserve the Bristol tower will be more successful than the exertions made to preserve Wren's tower at St. Antholin's.

HOW DRAIN-PIPES ARE LAID AT BILSTON (AND ELSEWHERE).

AT a recent meeting of the Bilston Township Commissioners, Mr. Rogers, chairman of the Streets and Sewers Committee, stated that a few weeks ago, Mr. Morell, the agent of certain property in the neighbourhood of Salop-street, called his special attention to some sewerage work which was being executed by the Board's contractor for private drainage works (Mr. Roper). On going there he saw a large number of pipes, and he was much surprised to see what he considered imperfections in them, both as regarded the quality of the material of which the pipes were made and the manner in which they were being laid. He afterwards instructed the clerk to write to Mr. Roper, the contractor, asking him to postpone further operations. The Streets Committee subsequently met, and at his (Mr. Rogers's) request a sub-committee was appointed to investigate the works that had been carried out by the contractor. This had accordingly been done, and they had drawn up the following report:—

"Your sub-committee appointed by your Streets Committee, and also instructed by your Board, have proceeded with their investigations into the sewering on private property, and constructed by your Board's contractor, with results as follows:—

"Your sub-committee have investigated cases in which the earth was thrown out and the pipes bared, and in some instances taken out. In the first case, they found, in a total of nineteen pipes, ten had broken sockets, in five other cases they found 4-in. pipes were used and 6-in. charged. In all cases, with one exception, where junctions should have been used, none were put, the end of one pipe being placed against another, which was broken to receive it. No clay was used to joint the pipes, as required in the specifications, and in the only case where we levelled we found the fall 3 in. in 34 ft., equal to 1 ft. in 136 ft., instead of 1 in. in 20 in., as required by the specification. The drain traps were inefficient. One was broken, and in some cases the yards were badly laid or relaid. In all the cases we investigated we found materials of a very inferior character, and the work executed in a most wretched and unsatisfactory manner, and almost useless for its purpose. In three other cases your committee intended investigating we found your contractor had preceded us, and taken out and relaid the sewering. The above cases are so serious that your sub-committee cannot arrive at any satisfactory decision, but leave it in the hands of your Board."

Mr. Rogers moved the adoption of the report, and advocated the taking of legal proceedings against the contractor.

Mr. Jeavons asserted that the information contained in the report was no news to the Board. Last summer some private drainage work was done so badly that the pipes had to be relaid. He complained to the Board, but was only snubbed for his pains.

Mr. Taylor, the surveyor to the Board, said it had always been his rule to allow the contractor to put a 4-in. in place of a 6-in. in connexion with gullies, as the smaller pipe made the better joint, but he had never had the least suspicion that the contractor had been using 4-in. pipes generally, and with an exceptional number of broken sockets. He had never certified that the contractor's work had been properly done until he had interviewed the contractor three times,—when he told him what work was to be done, when he saw the work being done, and when he measured the work after it had been completed.

The Chairman admitted that the Board had known what was going on, but had deferred taking action until the matter could be put before the public.

The motion was adopted, and the committee was directed to inquire into the conduct of the surveyor in the matter, and to take advice as to legal proceedings against the contractor.

DAMAGE OF BUILDING GOODS BY RAILWAY COMPANY.

CARD *v.* LONDON, BRIGHTON, AND SOUTH COAST RAILWAY COMPANY.

IN this case, heard in the Lewes County Court on the 22nd ult., Messrs. Card & Sons, builders, of Lewes, sued the London, Brighton, and South Coast Railway Company for 1*l*. 16s. 4d., value of goods damaged by negligence. The plaintiffs' case was that their agents put on the rail at Battersea some 140 drain-pipes for delivery to Mr. Henry Constable, of Barcombe. On arrival at the latter station twenty-seven were found to be broken, and the present action was to recover from the company the value of the broken pipes. It appeared that the goods were packed by the plaintiffs' agents, and a note was signed declaring the pipes to be forwarded at owner's risk; but the judge held that as this note was signed after the packing of the pipes in the wagon, and as by it the company declared to have received the goods in good condition, they were liable for the damage done, unless it could be shown that the breakage had resulted from a collision or circumstances of pure accident. For the defence it was contended that the state of the goods on arrival at Barcombe showed that they were improperly packed; but the judge, holding that this was not sufficient, gave a verdict for the plaintiffs for the amount claimed.

Society of Lady Artists.—The Exhibition for 1876 will be held in the Gallery, 48, Great Marlborough-street, and will be opened to the public on the 13th inst.

"TOBIN'S VENTILATORS."

SIR,—I have read with much astonishment a statement to the effect that the School Board for London have paid Mr. Tobin a sum of money for permitting them to make use of the system of air-inlets which now bears his name.

I should like to add my testimony to that which I have little doubt your announcement will draw forth from other quarters, of the completeness with which this so-called invention had been anticipated. In 1862 I employed these inlets in St. Paul's Schools, Allen-street, Clerkenwell, of which building I was architect, on the recommendation of Mr. Richard Moreland, the well-known engineer, who had himself known them to be successfully in use in previous instances. This carries the matter back thirteen years. I have no doubt it might be carried back still further. T. ROGER SMITH.

Miscellanea.

Masons' Wages at Newcastle-upon-Tyne. A meeting of stonemasons was held on the 3rd inst., at Newcastle, for the purpose of considering the wages question, and deciding what course should be pursued in the future in view of the compromise offered by the masters. Six months ago notice, was given by the working masons to their masters of their intention to apply for an increase of wages on the 1st inst. A meeting took place between masters and men, when both sides of the case were stated. The men held that their standard wages,—34s. a week,—was much too little remuneration for their labour, and demanded an augmentation to the extent of 4s. per week. The employers, on the other hand, maintained that the advance sought was more than they ought to be called upon to concede; but they offered to compromise the matter by giving them 2s. a week extra. The meeting of the men on the 3rd inst. was convened for the purpose of submitting this proposition to the general body of the workmen and ascertaining their views on the matter. The meeting was throughout in favour of adhering to their original demand, and resolutions were passed rejecting the offer of their employers, and asserting the expediency of standing out for the entire advance demanded. The question of arbitration was mooted, but the feeling of the meeting was decidedly against submitting to that mode of settlement.

The Strike of Sheffield Plumbers.—On the 29th ult., the six months' notice given by the operative plumbers of Sheffield to their masters, for a reduction of hours and an advance of wages, expired, and as no settlement had been arrived at, the men were paid off at their own request. The plumbers have hitherto been working on the "datal" system, by which they made fifty-five and a half hours per week, and received 5s. 8d. per day for five days, and 3s. 8d. on the Saturday, or 32s. per week. The notice which they sent to the employers was to the effect that their wages should be increased to 34s. per week, and that the working-hours should be reduced to forty-nine and a half, as in the other branches of the building trade. This having been the standard of the latter for about three years, the masters agreed to put the plumbers on an equal footing, but instead of paying them by the day, to give them 8d. per hour. The men accepted the proposed hour-system, but asked for 8½d. per hour. On the 29th ult. the employers met at the Three Tuns Inn, and passed a resolution agreeing to refer the matter to arbitration of disinterested parties, chosen by both sides; and to pay the difference from the present date should the decision go against them, on the understanding that the men in the meantime should resume work. This resolution was communicated to the workmen's committee, but they sent a reply stating that they would abide by their former resolution.

Sewage Utilisation at Liverpool.—The report of the directors of the Liverpool Sewage Utilisation Company, which has just been issued, shows that the affairs of the company are not in a very flourishing condition. The directors have had to advance or guarantee about 1,900*l.*, and though they consider it is only a question of time for the demands of the sewage to become larger, they think some fresh arrangements ought to be made for the future. It is proposed, therefore, to enter into certain arrangements as to leasing, or failing these, to wind up the company altogether.

United States Pottery.—A recent number of the *Crockery and Glass Journal*, published in New York, contains an account of the second annual convention of the United States Potters' Association, held at Pittsburgh a few weeks ago. The first "regular toast" was "The Ceramic Art," proposed by the president and responded to by the Hon. J. H. Brewer, of Trenton. In the course of his speech, Mr. Brewer said thirty years ago there was no successfully-worked pottery in the United States, while now no less than forty-three firms were busily engaged in producing ware, from the cheapest to the best quality. He gave the following statistics relative to the United States Potters' Association:—Number of kilns of the association, 136; value of goods sold in 1875, $2,993,000; increased value sold in 1875 over 1874, $200,000; capital invested, $4,089,000; yearly wages, $1,110,000; horse-power, 1,000; capacity worked full, $4,895,000; coal used, 50,000 tons; clay used, 20,000 tons; flint and spar used, 15,000 tons; white lead used, 300 tons; imported goods sold in 1873, 80,000 packages; in 1874, 66,000; in 1875, 61,000; showing a steady decrease in importations amounting to $1,500,000 in ten years, which the United States had gained.

Ely Chapel, Holborn.—We mentioned some time ago that the ancient chapel belonging to the palace of the Bishops of Ely in Holborn was sold at the Auction Mart, and that it was purchased by one of the religious orders of the Roman Catholic Church. The chapel was at that time under a lease to the Welsh Protestant Episcopalians, who have continued to use it for their services for about thirty years. Their lease expires at Lady-day, but we understand that possession will to-day be handed over to the Fathers of the Institute of Charity, founded by the Abbate Rosmini. The pews and galleries will be cleared away, the walls relieved of their coats of plaster, and the inner ceiling, also of plaster, removed, so as to display the oak timbers of the roof. The crypt, when emptied of the rubble and rubbish with which it is now blocked up, will form a spacious apartment, partly lighted by side windows, and will be used as a place for the meetings of religious confraternities, temperance associations, &c., and possibly also for purposes of instruction and lectures. Messrs. Young & Whelan are the architects.

The New Street from Charing-cross to the Embankment.—At last week's meeting of the Board of Works, Mr. Richardson brought up a report from the works committee, recommending that the new line of roadway from Charing-cross to the Victoria Embankment be named Northumberland-avenue. He said the committee had carefully considered the question of the name to be applied to this thoroughfare, and the majority appeared to be of opinion that the old name of Northumberland should be retained. A short and lively discussion ensued, in which it was stated that there were three streets in the metropolis named Northumberland,—one in the Strand, one in Poplar, and the other in Marylebone. The word "avenue" was objected to on the ground that it was an American term, and that there was no wish to Americanise the streets of London. The report of the committee was adopted, and the new street, which will be opened on the 11th inst., will thus be called "Northumberland-avenue." We cannot say we like it much; however, "it will serve."

The Proposed Aquarium and Winter Garden for Ramsgate.—The plans sent in in competition for the new Winter Gardens, Skating-rink, Aquarium, and Assembly-rooms at Ramsgate, are now on exhibition at the Custom-house. The design of Messrs. Pennington & Bridgen shows a Palace of Varieties, intended to be comprised in an area of 320 ft. by 85 ft. The style of architecture is Italian, and the centre of the building, which will be devoted to a floral hall, will contain foliage plants and choice exotics, rock-work, and fountain, and will be flanked with four campanile towers, and domed, whilst the east wing will be occupied by a spacious assembly-room, available for all description of entertainments, and on the basement will be a fresh water and marine aquarium, where the salt-water tanks, being almost on the same level as the sea, will be supplied with water without the aid of costly pumping machinery. The skating-rink, which will be in the east wing, will be decorated with shrubs and rocks in the centre.

New Groynes at Brighton.—At a meeting of the Brighton Town Council, on the 1st inst., the Works Committee brought up a special report upon the subject of repairing the existing groynes and constructing new ones, in accordance with suggestions of the surveyor (Mr. P. C. Lockwood). It was proposed to heighten the wooden groyne opposite the Old Steine, and extend it 160 ft. from the tower-like erection forming the termination of the storm-water overflow; such extension to be formed of concrete blocks 9 ft. in width at the top. This, it was calculated, would carry the fall of the beach 130 ft. further southward on the west side, and fill in the bay as far as the concrete groyne opposite East-street, rendering no other defensive structure necessary between those two points. The surveyor also proposed to repair the Black Rock groyne, a portion of which had been washed away. He was also preparing plans for a concrete groyne opposite Paston-place. The committee resolved that the works recommended by the surveyor be done, at an estimated cost of 3,000*l.* for the groyne opposite the Old Steine, and 800*l.* for the repairs to the Black Rock groyne. The report was adopted.

Contracts for Paving Materials, &c., at Newington.—At the meeting of the Newington Vestry, on the 1st inst., the following tenders were accepted, viz.,—Messrs. Stiff & Son, drain-pipes; Messrs. Jukes, Coulson, Stoke, & Company, ironwork; Mrs. E. Beevers, for the supply and execution of paving works, at the following prices:—2½-in. York paving, 9d. per foot; Rockhill, 9½d. per foot (laid); Aberdeen granite kerb, 12 in. by 6 in. (laid), 1s. 7½d. per foot; Guernsey granite kerb (laid), 1s. 7½d. per foot; 2½-in. Yorkshire paving, 2*l.* 19s. per 100 feet; ditto, 2½-in., squared, 3*l.* 4s. per 100 feet; Mr. G. Roots, broken flints, 3s. 10½d. per cubic yard; Mr. John Chamberlain, brooms, &c.

Parochial Contracts at Chelsea.—At the meeting of the Chelsea Vestry on the 29th ult., Mr. Lahee, the clerk, read a tender from Mr. Charles Wright for horse-hire, which was:—For man and horse for working Bayley's vans, 15s. per day, and for ordinary carts, 12s.; for carting granite, &c., 12s. per day; for horse, driver, and one-horse cart for general use, 12s. per day; for horse, cart, and man, and a man for slopping, 15s.; for dusting, 15s.; for horse for sweeping machine, 12s. 6d. per day; for a single chaise-horse, and driver, 10s. 6d. per day. Mr. Wynn, contractor for the first item, 12s. per day; th, next, 10s. 6d.; the third, 1s. 10*l.* (per load, noe per day), the two next 10s. 6d., the next, 15s.t and the last, 10s. The tender of Mr. Wynn was, accepted.

China Clay in the Helston District.—It is stated that there is a prospect of the china-clay deposits of the Helston district being worked on a rather considerable scale. So far, although the clay has been found to be of good quality, operations have been carried on in so contracted a way as to place this business at an unmerited disadvantage when compared with the immense establishments of the St. Stephen's district. This, however, it is hoped, will speedily be remedied, and it is believed that the Tregoning Hill district will rival in quantity and quality the most favoured localities that are now the scene of china clay and stone production, and introduce a fresh element of prosperity to the town of Helston.

Oxford Architectural and Historical Society.—The first walk of this Society for the present term took place on Saturday, the 19th ult., when a numerous party assembled in the Hall of Oriel College, where Mr. Butler gave an interesting historical sketch of the origin and early history of the college, and the party then proceeded to visit the chapel, library, and other buildings. At the conclusion, a hearty vote of thanks was accorded to Mr. Butler. It had been intended to pay a visit to St. Mary's Hall the same afternoon, but time would not permit of this. A meeting of the Society was held on the 22nd ult., in the Taylor Building, when a paper was read by Mr. A. J. Evans, B.A., Brasenose College, on "Some Roman and other Antiquities in Ancient Illyricum."

Mr. Ruskin was, on the 26th ult., re-elected to the Slade Professorship of Fine Art at Oxford, an office which he has already held for two terms of three years. During Mr. Ruskin's tenure of office, he has given 5,000*l.* for the purpose of a drawing-school, and a collection of pictures valued at a similar sum. He also provides 150*l.* per annum for the payment of a teacher of drawing.

Hastings Baths and Aquarium.—At a special meeting of the shareholders of this company, on Monday, the directors reported that the tender for the completion of the whole work was in excess of 33,000*l.*, and which sum is beyond the capital powers of the company. The directors recommended the abandonment of the aquarium part of the scheme, which would cost 5,000*l.*, for the present; and (owing to a difficulty in arranging with the contractor) that they should be sanctioned in carrying out the work for the baths themselves. The architects concurred in the recommendation. It was unanimously agreed to confirm the proposals of the directors.

Gift to Birmingham.—The late Mr. William Dudley, an old Birmingham resident, who died recently, has vested the sum of 100,000*l.* in trustees, to be applied for the following purposes:—First, to assist young tradesmen of good character in Birmingham who are commencing business, by lending them moderate sums of money at a low rate of interest; secondly, to make annual grants or benefactions towards the maintenance and support of aged tradesmen within the limits of the borough; thirdly, any surplus income arising from the trusts to be divided among the medical charities of the town.

The Heating Apparatus at the Yarmouth Workhouse.—A new heating apparatus has just been erected in Yarmouth Workhouse by Messrs. Warner & Sons, Ipswich, the architects being Mr. Whitmore and Mr. J. T. Bottle. The apparatus itself is to some extent similar to one erected in the Ipswich Asylum. Three boilers in the washhouse and those throughout the house formerly heated by fires, are heated by steam. In the washhouse of the women's sick-ward the agency of steam is also employed with two boilers. In the cooking department all is done by steam.

The Institution of Civil Engineers.—The attention and consideration shown by the members of this body to foreign professional brethren, when visiting our public works and engineering establishments, has been recently recognised by the King of Portugal, who has conferred on the secretary of the Society, Mr. James Forrest, the insignia of a Commander of his Military Order of Jesus. On a former occasion the Emperor of Brazil appointed Mr. Forrest a Knight of his Imperial Order of the Rose.

Art in Japan.—The Japanese Government have applied to the Italian Government for three professors to fill three chairs of architectural drawing, ornamentation, and sculptural painting in the Academy of Fine Arts recently founded. 20,000 francs a year, besides lodging and the expenses of their journey, will be given to each.

Architects' Benevolent Society.—The annual meeting of this Society was held at Conduit-street, on Wednesday evening, Mr. Horace Jones in the chair. Our report is crowded out this week, but will appear in our next number.

London Hospital.—According to the daily papers, her Majesty the Queen, on Tuesday last, opened a new wing here, which has been built mainly at the cost of the Grocers' Company. The managers of the hospital apparently thought it best not to invite criticism.

Reimes Cathedral.—On the report of M. Viollet-le-Duc considerable works of restoration are to be done here. The Government has made a grant equal to about 80,000*l.* for the purpose. Parts of the cathedral are described as being in a very threatening condition.

The Boucicault Memorial.—At a meeting of the Huntingdon Town Council recently the mayor stated that Mr. Boucicault had expressed a desire to place a fountain on the Market-hill, and restore the Grammar School building inside and out.

Siberian Ivory.—A letter from Yakoutsk states that at the last fair in that town a larger quantity of mammoth ivory was disposed of than has ever before been known. Several of the tusks were of great size, one pair weighing 60 lb.

Slaughter-houses.—The paper on London Slaughter-houses and Cow-sheds, read by Dr. Orme Dudfield at a meeting of the Society of Medical Officers of Health, together with a report of the discussion which followed, has been printed in a separate form.

The Wolverhampton Carpenters.—The operative carpenters and joiners of Wolverhampton have sent in a request to their employers for an increase of 1d. per hour wages. The present rate is 7½d. per hour.

Artisans' Institute.—The hon. secretary of the Society of Dressmakers writes to say that, on the third evening of the discussion as to Piece-work, the amendment condemning piece-work was carried unanimously.

Aquaria: Their Construction, Management, and Utility.—A paper on this subject was read at the Society of Arts by Mr. Saville Kent, on the 1st of March. It is printed in the journal of the Society.

Aberdare Local Board Waterworks.—The contracts for the pipe-laying, amounting to 23,000 yards, undertaken by Messrs. Chandler & Sons, of York-street, Southwark, has been completed, and within the specified time.

TENDERS

For new club-room at Brighton, for Mr. F. E. Clarke. Messrs. W. F. Stevens & Co., architects:—

Colwell	£679	0	0
Patching & Webber	667	10	0
Hindess (accepted)	425	0	0

For draining and laying out new cemetery at Wimbledon, for the Local Board:—

Andrews	£3,800	0	0
G. Jackson	2,523	0	0
J. Jackson	2,449	0	0
Gregory	2,161	0	0
Crockett (accepted)	2,030	0	0
Bull	1,979	0	0
Taylor	1,140	0	0

For school and residence, West Tilbury, for the West Tilbury School Board. Mr. Thomas Goodman, architect. Quantities supplied:—

Roberts	£1,333	0	0
Patman & Co.	1,185	0	0
Hobson	1,133	0	0
Blake	1,056	0	0
Wood	1,046	0	0
Hammond	930	0	0

For the erection of villa residence at Leigh Woods, near Bristol, for Dr. Wheeler. Mr. H. Shaw, architect:—

Eastcourt	£2,451	0	0
Davey	2,219	0	0
Eastbrook & Sons	2,192	0	0
Veals	2,120	0	0
Williams	2,080	0	0
Davis & Sons	1,950	0	0
Stephens & Bastow	1,940	0	0

For fire-proof floor and additional story to warehouse, Hatton-garden. Mr. J. W. Reed, architect:—

Brown (too late)	£462	0	0
Bamford	456	0	0
Smith	452	0	0
Hawkes	425	0	0
Bayes, Bros., & Allen	415	0	0

For erection of detached villa residence, Edgware. Mr. J. W. Reed, architect:—

Crabb	£2,350	0	0
Hunt	2,350	0	0
Ramage	2,315	0	0
Bayes, Bros., & Allen	2,290	0	0
Hawkes	2,220	0	0
Southcott & Co.	2,197	0	0
Allen	2,120	10	0
Thomas	2,047	0	0

For erection of detached villa residence (to be called "Oaklands") upon the Oakfield Estate, Crouch-end-hill, Hornsey. Mr. J. W. Reed, architect:—

Kirk & Randall	£3,622	0	0
Downs & Co.	3,244	0	0
Southcott & Co.	3,174	0	0
Crabb	3,100	0	0
Ramage	3,073	0	0
Scrivener & White	3,065	0	0
Bayes, Bros., & Allen	3,050	0	0
Hunt	3,047	0	0
Hawkes	2,715	0	0

For sinking a deep well on the site of proposed School for Imbecile Children, Darenth, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects:—

Tilley (accepted)	£1,198	0	0

For building new Congregational Church and School, Guildhall-street, Canterbury. Mr. J. G. Hall, architect. Quantities not supplied:—

Cosens	£4,470	0	0
Gaskin	4,426	0	0
Wilson	4,400	0	0
Naylar (accepted)	4,311	0	0

For the erection of a factory at the corner of Great Suffolk-street and John-street, Southwark, for Mr. Thos. Bear. Mr. Joseph S. Moye, architect:—

Henderson	£2,563	13	0
Manley & Rogers	2,514	0	0
Sharpington & Cole	2,243	0	0
Newman & Mann (accepted)	2,145	0	0

For erection of new premises, 393, High Holborn, for Mr. Lynch. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Southcott & Co.	£2,692	0	0
Grover	2,613	0	0
Hook & Oldrey	2,520	0	0
Newman & Mann	2,510	0	0
Bayes, Bros., & Allen	2,468	0	0
Nightingale	2,463	0	0
Crabb	2,449	0	0
Stephenson	2,251	0	0

For the erection of a mortuary, coroner's court, &c., on the Spa-fields Burial-ground, for the Vestry of the Parish of St. James and St. John, Clerkenwell. Mr. H. Saxon Snell, architect:—

Crockett	£2,700	0	0
Wall Bros.	2,491	0	0
Stephenson	2,452	0	0
Staines & Son	2,443	0	0
Ebbage	2,438	12	6
Hunt	2,327	0	0
Patten (accepted)	2,280	0	0

For a tenement block of buildings, Disney-street, Borough, for the Workmen's Dwellings Improvement Company (Limited). Mr. Frank E. Thicke, architect. Quantities supplied by Mr. C. S. Mumby:—

Stephenson (accepted)	£10,104	0	0

For the erection of house and stables, Kidbrooke-grove, Blackheath, for Mr. A. Marten. Messrs. E. C. Barlow & J. C. Boys, architects. Quantities prepared by Mr. W. Matthews:—

		Extra for Stone Front.
Colls	£3,940	£450
Newman & Mann	5,453	500
Carter	5,294	440
Gorham	5,159	535
Bayes, Bros., & Allen	5,143	350
Bland	5,105	560

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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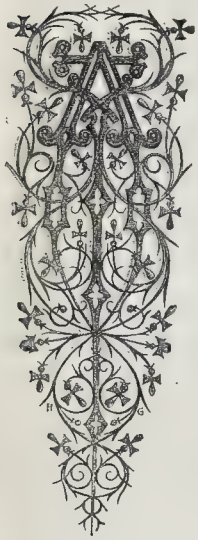
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The Habitations of Man in all Ages.



AFTER years spent in the accumulation and arrangement of facts of architectural design, construction, and history, the author of the "Dictionnaire Raisonnée" seems to be turning his thoughts from details to wider generalisations, and quitting the path of literal and statistical teaching for one in which fancy and theory are allowed more play. We have noticed how happily this has been done in the two works giving the history of a fortress and of the building of a modern house. In those two brilliantly-written volumes, however, the information was historical and practical, the exercise of fancy lay only in the manner in which the information was conveyed to the reader. In M. Viollet-le-Duc's latest work of the kind, the English version of which* we owe to the same hand to which we were indebted for the translations of the two previous books referred to, the subject treated is wider and more theoretical in its bearing, and the matter as well as the manner is necessarily the production, to a considerable extent, of imagination and conjecture building upon a footing of historic record, sometimes full and complete, but at other times incomplete and insecure, and offering ground for deduction rather than positive statement.

The field occupied by the author in this comparatively small book is, in fact, very extended, being no less than a general survey of the history of domestic architecture,—of the building regarded as a habitation. Of course there is no attempt to treat the subject in detail, which, even with the imperfect data to go on in many cases, would require a dozen volumes rather than one. The aim of the book is to present a kind of bird's-eye view of the principal forms which the dwelling-house assumed among different races and in different ages; to trace their connexion with the habits and *locale* amid which they arose; the continuity of idea which is shown sometimes by the buildings of the same race for many ages, though with changes in detail; the extent to which one form of habitation is borrowed from that of other races; to give, in short, a general idea of the historic and theoretic relations of the whole development of domestic architecture. The subject, however, does not afford either the continuity or the unity of place which enabled the author to treat the subjects of the Fortress and the Modern House in the form of an historical sketch and a novelette. To get over this difficulty, and to give connexion and dramatic unity to the whole, he invents two personages who have the same perpetuity of existence, and habit of turning up unexpectedly every two or three centuries, which characterised the more celebrated "Wandering Jew." These two personages, named Epergos and Doxius, represent, according to the translator's preface, "the spirit of progress and that of obstinate adherence to traditional forms and habits." They do represent this, in their respective way of looking at things; but we take it, judging from the meaning implied in their names,* as well as from their expressed sentiments, that there is more intended than this; that Epergos is the practical man who studies a subject from data before him and looks to its practical application, while Doxius is the theorist, the dreamer, who cannot trouble himself about the stern logic of facts. In this view of the matter is implied a bit of satire which the translator seems to miss: the author evidently inferring that it is the theorist, the dealer in precedents (whom he has already satirised as "the critic" in the *Histoire d'une Maison*), who is in everybody's way, and is always the stumbling-block in the path of progress.

The scene rises upon a primeval landscape of rapine and contention among furious beasts, which Doxius thinks quite satisfactory, and evidently what was intended to be the normal state of things; but Epergos, the "vain and restless spirit," as his companion terms him, is attracted by the doings of some beings who seem to have something like a system of co-operation, and are not moved by such mere blind impulse as the rest of the animals. "Are they men?" is the question to be answered in the next chapter, where Epergos and Doxius mingle with them, and find them shivering and endeavouring to shelter themselves under the lee of some large trees in a tempest of rain and wind. Epergos, moved by compassion, selects two young trees a few paces apart, and contrives to bend their two tops together, and tie them with rushes. He then shows the benighted beings how to continue the hint thus started, by getting other similar trees, fixing them in a circle with their tops together, and filling up the spaces with rushes, branches, and long grass, interlaced, and thus the first house is made, to the disgust of Doxius, who thinks his companion might as well be for teaching the birds how to improve their nests, or the beavers a new method of building. But, answers Epergos,—

"'Let us return here in a hundred thousand days, and we shall see whether these creatures have forgotten my instructions, and live as they were living yesterday. If so, then I am wrong in meddling with their affairs, and I have not found what I have been seeking; but if they have profited by my suggestions,—if the huts we see then are better made than these,—I have been successful, for in that case these creatures are not mere animals.'

'Folly,' returns Doxius; 'what can they be then?'

'How can I tell?'"

So the question is unanswered until it is seen whether the race can improve on their original type of habitation.

At the next Avatar, as we may term it, of Epergos and Doxius, they find the Aryans living in regularly constructed log-built houses, with a projecting roof in front for shelter, and a little railed-off enclosure before the entrance; two sheds of outbuildings adjoin it, one for forage and the other for cattle. The house is against a rock which shelters it, and on the side of the interior next the rock a fire burns brightly, and the smoke finds its way through a chimney built up against the rock. This is the typical Aryan dwelling, in its rudest form. But the typical dwelling is carried away in a heavy storm, and it is the work of Epergos to improve upon it in rebuilding, to employ stones piled on each other instead of logs, to divide the plan into two or three chambers for greater comfort; and especially to persuade the intending inmates that it is no use trying to put up a building in too great a hurry, if they want it to be lasting. In its new form the Aryan house shows the main points of the model to which the Aryan has ever since been addicted. This is summed up in the concluding chapter (p. 389).

"Observe how ineffaceable is this influence of race. Look at the English *cottage*†; we have still the Arya's house, not only in construction, but arrangement. There you invariably see the living-room (hall) where the family assemble, — the parlour, — reception-room, — place of assembly; and next, that separation of the domestic life from the public life; the *gynæceum* of the Greeks and the *nursery* of the English is pretty much the same place, for the gynæceum must not be confounded with the harem; the one is the *sanctum* of the family, the other a sort of aviary shut in from the gaze of strangers. Go to Sweden or Denmark and you will find in the private houses those arrangements which date from the primitive times of the Aryan race,—the hall, and the place reserved for the life of the family; a place inviolable. Your old French *châteaux* exhibited the same arrangement before Gallo Roman influences predominated over the Indo-Germanic; *i.e.*, derived from what we call the Franks. In its structure the true English villa is still the timber house of the Arya, and even when built of stone the forms are suggested by the timber structure. Similarly, if you go to Damascus, to Cairo, to Ispahan, as also in Algeria or Tunis, or even in Spain, you find one and the same plan adopted from a remote antiquity and adhered to down to the present day. The court, surrounded by porticos, the *patio* with its little chambers, and the upper room opening out of this patio, with its divans, and receiving only a borrowed light,—a cool and quiet place for the family gathering. Well, this very arrangement was to be found in a rudimentary form, and is still to be seen, in some almost deserted cities of Southern Syria."

We have quoted the whole paragraph, from a little address by Epergos to a party of con-

* "The Habitations of Man in all Ages." By Eugene Viollet-le-Duc. Translated by Benjamin Bucknall: with numerous illustrations. Sampson Low & Co. 1876.

* We do not know whether the mistake is that of the author or of the translator, but it is evident that the terminations of the two names should be the same; they are both Greek names, and as the Greek termination "os" is kept in the first name, it should have been retained in the other also: they should have either been "Epergos and Doxios," or "Epergus and Doxius."

† The translator rightly substitutes "villa," which is evidently the class of house Viollet-le-Duc is thinking of, for "cottage," which the French author has apparently used with an incorrect idea of its precise meaning.

temporary Frenchmen in the last chapter, in anticipation of some further remarks on the bulk of the book, as it illustrates one of the principal clues to the author's intention and general view of his subject, in insisting on the continuity of types in the domestic buildings of different races; and attention to this renders more intelligible the point of the short indications we shall have space to give as to his manner of further working out the subject.

In touching, in the chapter following that about the Aryan house, on "the yellow race," the author evidently considers the whole fabric of Chinese architecture as arising out of the abundance of bamboo-trees, which at once suggested the light and fragile-looking character of Chinese and other more or less similar architecture. We next meet with our friends the Aryas in a new site, and have sketches of their earliest habitations on the upper Indus. From a sketch of the method of supporting the roof, it appears that M. Viollet-le-Duc deduces the characteristic Indian bracket from the branching of a forked tree used as a story-post, one cross-beam resting between the forks, and the other, at right angles to it, being carried on the ends of the forks. The similarity of construction is, however, rather apparent than real; for it must be admitted that the bracket stands in a rather different relation to the upright, mechanically, from that of the fork-forming part of the upright itself. However, Epergos taught the Indo-Aryans some new refinements in building, particularly the utilising of the stores of timber in their country by making the upper part of their residences of timber overhanging the stone basement; and the sketch of this style of building (p. 60) gives the primitive type of a large class of buildings, afterwards, as one need not remind the reader, imitated even in rock-cut structures. Then follows an episode among the nomadic tribes of Central Asia, who had only wide, low tents to dwell in, supported by a number of stakes, and who at night decamped, carrying off with them the horses of the two investigators,—a kind of delicate suggestion that people who have not arrived at making any fixed habitations are likely to exhibit a very incomplete moral development. Among the "dwellings of the Egyptians" we find the pyramidal form suggested for the houses (this is long before the age of the great temples) by Epergos, because they would best resist the action of earthquakes, from which the inhabitants of the Delta suffered much. When, however, the circular form of plan was suggested also, as offering still less chance of a weak point to be shaken in by an earthquake, Epergos was met with unanswerable arguments against so heterodox a suggestion. "One of the most respected members of the assembly, rising, said,—'The dwelling of man should face the four points of the heavens; that is a sacred custom. It is becoming that such a structure should have a front and sides, which a circular building cannot possess. It should have its corners, and these corners ought to be square.' Epergos spoke without due consideration." This is not a bad sample of the kind of reasoning which often overrides the real practical requirements of the case in actual building. As to the theory here intended, of the origin of the Egyptian love of pyramidal buildings, it is, of course, pure critical conjecture,—probable enough if the Delta really was at any time in its history peculiarly subject to earthquakes; and as to the evidence of an intended symbolical meaning in the sloping sides, in the temple period, there are plenty of instances in history of subsequent symbolic meanings engrafted on forms or rites originally of purely practical origin.

Epergos, however, by no means approved of a people who built temples with massive stone columns, fashioned into reminiscences of bundles of reeds, merely because their first buildings had originated in this way. This was what he found them doing when he visited them again many centuries later; and this, and their general slow-going, looking-back character rather disgusted Epergos, and sent him away prematurely. We cannot follow him and his friend Doxius (who, by the way, seems to have been as insufferable a "prig" as a man could have for a companion) through all their various wanderings; but must confine ourselves to mentioning some of the critical and theoretical points which arise out of what they see. Everywhere they come upon traces of forms of building or of detail derived from some constructive necessity originally prompted by a material no longer in use. On the walls of an Assyrian palace (fig. 52) Epergos notices "that the walls are very frequently ornamented with large vertical cylinders, like trunks of trees put close together. 'Yes, that is a tradition of the first constructions of our ancestors, which were made of trunks of trees placed together; and though we now build with bricks, we have preserved the *souvenir* of that primitive structure. In fact, I remember having seen in Media houses thus built.'" It is in Assyria also that they learn of the first experiments with the flat-coursed arch, and the proposal of a very clever man, Kabu, to carry the walls right round the top in an unbroken semicircle, and of the difficulty he had in getting his views accepted; "the elder men pronounced him crazed, asserting that a wall ceased to be able to stand the moment it deviated from the vertical." Kabu made a small model, and was told that it might do very well in miniature, but would never answer on a large scale; whereupon he built an arch on a large scale, and was banished for sorcery, leaving his idea behind him to be worked out by the next generation. The fate of Kabu, in a sense, is certainly no uncommon one.

In the chapter on Ionian buildings, it is noticeable that our author derives the Ionic capital from a wooden bracket which is only a modified form of the Indian bracket, and which is shown in the interesting sketches of the interior and exterior of an Ionian house, before the stone style was fairly formed; and where the germ of the later Ionic capital appears in the bracket, which though flat-sided and only as thick as the support one way, stretches far on each side of the post the other way, in the parallel direction to the beam which it carries, and for which it provides a better seat and a shorter bearing than the wooden support alone would have afforded. The theory which regards the Ionic capital as arising from a bracket developed altogether in the longitudinal and not in the transverse plane of the construction, seems at least as probable as any explanation that has been offered; the suggestion illustrates the author's capacity for going back in thought to the first form of a structure by a process of inductive reasoning. It is noticeable, however, that in coming to the Doric style in a subsequent chapter, the author entirely opposes, at some length, all idea of its wooden origin in detail, instancing the Doric capital as a form utterly unsuitable to, and unsuggested by, timber construction. Of course in its finished form it manifestly is so; but the idea of the wooden theorists is only a square block of wood, the moulding coming afterwards in the refined marble edition of the style. Viollet-le-Duc's opinion evidently is (and there is reason and analogy on his side) that anything like a support placed between beam and post in a wooden construction would take, and has always taken, the form of a bracket the long way of the construction, not that of a flat square abacus of slight projection, which is essentially a stone form. This, and a great deal more which is very well put about the origin and theory of that superb architectural style (which the author, in spite of his usual Gothic leaning, does full justice to), is put into the mouth of Eicos, an Athenian architect, at a small wine party at which Epergos was present. Eicos concludes his argument thus:—

"'I say again, it is scarcely admissible that a wooden structure suggested the stone structure in the Doric order; indeed, I should rather suppose the converse, especially since the further we go back into antiquity the more the entablatures of the Doric order deviate from the style of a structure in wood, to conform to that dictated by the use of stone. Still, it must be acknowledged that our architects have been able skilfully to adapt the form to the structure in both cases.'

'By Athene!' said Chremyles, 'Eicos shows that he understands his art; fill his cup; he must be thirsty: I do not regret having got him to put wooden entablatures on the columns of my porticos, since he demonstrates so ably that they are in place there. But, the regula!—he did not tell us all this when we were talking about putting them up; indeed, he assured me that it was a shame to put these painted timbers on columns of marble.'

'It would evidently have been better to complete them with marble,' replied Eicos.

'Yes, certainly; but could you protect me against the informers who were beginning to croak like frogs after rain, when they saw the columns carved here? And, what would they have said if, after the columns, the ox-teams had brought the entablatures of marble!'"

The quotation may serve as a specimen of the author's lively style of presenting his ideas. An interesting point is touched further on in the same conversation, when Epergos asks why the Greek builders have never adopted the vaulted roof, familiar to the Dorians and Hellenes of Magna Græcia and Sicily. Eicos tells him it is partly, perhaps, that the Greeks do not care to copy barbarians, but also a strong reason is that vaultings require a coarse kind of work, which is not to the taste of the Greek artisan, who desired that all his labour should be such as should be seen and appreciated for its artistic results:—

"'The capitals in the portico of this residence,' continued Eicos, 'were turned and cut by four skilful workmen; if one of them should chance to be summoned to this house, you may be quite sure he will cast a loving look at the parts wrought by him. He knows thoroughly well whether they are on the right or the left side. It is owing to this feeling of pride, which is sometimes beyond bearing, that we are able to secure work whose execution is perfect. *It is quite a gift sent by the gods, that one of our artisans finds the work of one of his comrades is more careful than his, to make him surpass himself.* But we have great difficulty in getting even tolerable work, if it is not destined to attract observation; every one tries to shirk it. In such cases we are obliged to have recourse to slaves. This, too, is the reason why you do not see among us such enormous edifices as those of Egypt. No one could be found to cut the crowning stones, the work in which, on account of the height, can only be appreciated by the birds.'

'There is matter for reflection here,' said Epergos, after a moment's silence. 'I see how the matter stands—and this explains antagonisms I did not perceive. You love the arts so well that you make a point of keeping their various expressions within easy grasp. If your edifices are small compared with those of many other nations, it is because you wish to enjoy all their parts at a glance—to embrace their *ensemble* easily. Hellas has no such palaces to show as those of Babylon, which are too vast for one day's exploration.'"

Epergos's interlocutor, in reply, further explains that in a democratic community there is an objection to very large buildings; citizens who are fortunate enough to possess large property must not offend the democratic sentiment by making a public display of it. The connexion of despotism with the production of great buildings was touched upon in our own columns some time since.* The fact is unquestionable; though, as we then pointed out, the influence of wider and more general art-education would go to raise the same desire in a federal society for grand architectural monuments, which was once confined to the "great ones" of despotic and feudal society. The desire for public recognition of his work by the Greek artist, inferred in the above quotation, is quite in keeping with what we know of the Greek character; it forms a striking contrast to the idea of devotion and self-effacement, which is regarded by modern critics, perhaps not altogether correctly, as a leading characteristic of the Mediæval artist. The sentence we have italicised is worth note, whether true or not as a representation of the Greek workman. In modern England, to tell a workman that another is surpassing him is to kindle no spirit of emulation; it is only to put him on finding means of stopping and crippling the superior powers or energy of the other. A state of things more deplorable,—we might say despicable,—in the field of skilled labour could hardly be imagined. Let us hope the time is not far off when the English craftsman will learn to be ashamed of it.

We must pass over the experiences of Epergos among the Romans, interesting as they are, merely quoting one remark which touches a question that has been sometimes rather hotly debated. Being entertained in the house of Mummius, a wealthy Roman, and asked what he thinks—he who has traversed Greece, Asia, and Egypt,—of his host's museum, Epergos replies that he has not been able to reconcile himself to the love for collections of works of art "which is so much in vogue in the cultivated class of Roman society. I like to see works of art in their proper place; so that when I find them thus assembled in a gallery, my thoughts involuntarily recur to the buildings from which they have been carried off." Epergos, in fact, as he sums it up afterwards, "prefers an orchard to a fruit-stall." So does every one if he can get it; but we cannot stop here to argue the question, about which there is, no doubt, something to be said from Epergos's point of view. In their further wanderings over various parts of the world, the pair of undying critics get into the Mexican neighbourhood, and among the architecture of the Nahuans and the Toltecs. In the exterior of the Nahuan palace, of which a view is given (p. 305), they find again the remains in masonry of a timber construction, evidenced particularly in the want of bond between the stones of the masonry, which are set like the squares of a chess-board. Their native *cicerone* tells them that in former times their buildings were in fact built of logs superimposed and corbelling out, and these unbonded stones represent the ends of the logs. "But what is the good of that, when the material has been changed?" "Because we have seen ancient buildings thus fashioned, and we wish to preserve the remembrance of them." The same string is harped upon when we come to the Renaissance period; the theory which per-

* See "Architecture and National Polity," in the *Builder* for September 24, 1870.

vades the book, and aids in giving continuity to the subject, that mankind can never wholly shake themselves loose from or forget the past, is continually exemplified:—

"'My good and learned friend,' said Epergos to Philibert, an architect in great request in the construction of important buildings, both in the provinces and in the city,—'My good and learned friend, despite all you may say, your architecture is neither Greek nor Roman, but, really and truly, French architecture in the reign of the most Christian and most glorious King Charles the Ninth, who no more resembles Pericles or Augustus than your palaces do those of Athens or ancient Rome.'

'Indeed,' replied Philibert, 'did not the great King Francis, like the Medici, and other princes whom it is needless to mention, send for and purchase all sorts of rare books that could be found in Syria, Egypt, Greece, and other foreign countries, in order to enrich his libraries and facilitate the investigations of the learned in matters relating to Pagan antiquity, and particularly the noble art of architecture?'

'Say that, if you please, in your writings, my good friend, but I should like much to see those ancient books which instruct you in your profession.'

'Well, then, there is Vitruvius.'

'I grant you him, with all my heart; but go on, please?'

'Frontinus, Cicero, Herodotus, Plato, Aristotle, and others.'

'My good friend, you might read Aristotle, Plato, Pliny, Cicero, and Frontinus, for a hundred years; but I will give you a kingdom, if you will find enough information in them all to enable you to build a house. . . . . Your charming mansion is a French mansion, planned like those erected one or two hundred years ago; only, instead of pointed arches, you have put semicircular arcades in your porticos; instead of Gothic piers, you have put Roman Doric columns, with caryatides above. In place of pyramidal roofs on your pavilions, you have erected square cupolettes, surmounted by lanterns. It is a dress in the fashion of the day; but the body has changed neither in form nor structure. Mind, I am not finding fault; I am simply making an observation.'"

In the last chapter, where eight persons are met at Brébant's to celebrate the promotion of a naval officer, who was one of the party, some of the company complain that this view, again brought forward, is taking away all the picturesque force of national and secular contrasts. "Epergos is intolerable," said a painter who was present; "he puts a grey glaze over everything." Epergos's "glaze" is, however, of a very luminous quality in itself, and if it rounds off the picture a little too much to an even tone, it serves at least to give a remarkable unity to the whole.

SIXTEENTH-CENTURY GOTHIC ARCHITECTURE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the Institute, to consider the recommendations of the Council with regard to the award of the Royal Gold Medal, the Soane Medallion, and the other medals and prizes of the Institute, and to consider the conditions of medals and prizes for session 1876-7, preceded the ordinary general meeting on Monday evening last. The business of the special meeting was not concluded until half past nine o'clock, and therefore it was fortunate that the two papers originally announced for the evening were not both on the programme. As it was, the reading of Mr. Sedding's paper, of which we append an abstract, was not concluded until half-past ten, when discussion was out of the question. Mr. C. H. Cooke presided We are not at liberty to give any detailed report of the discussion which took place at the special meeting, inasmuch as, although reporters were present, the meeting was intended for members only. We shall be committing no breach of faith, however, by giving the list of prize-winners, and by recording the fact that a prolonged discussion arose on the Council's draft conditions for prizes for next session, some of which, it was contended, were not sufficiently complete and explicit. These were amended and added to by the meeting, with the view of preventing, if possible, any future *contretemps*. The following recommendations of the Council were unanimously agreed to:—

That the royal gold medal be awarded, subject to her Majesty's gracious sanction, to M. Joseph Louis Duc, Knight Commander of the Legion of Honour, member of the Institute of France, honorary and corresponding member of the Royal Institute of British Architects, &c.

That the Soane medallion (with the sum of 50*l.* added, under the usual conditions of Continental study) be awarded to the author of the drawings submitted under the motto "Loyal Espoir" (subject: Design for a Country House). The author's name was announced to be Mr. J. Conder.

That in the same competition a medal of merit be awarded to each of the authors of the drawings submitted respectively under the motto "Εις αριστον" and the device of a triangle. The author of the former was stated to be Mr. William Niven; that of the latter, Mr. J. O. Harris, Leicester.

That Sir William Tite's prize of 40*l.** be awarded to the author of the drawings submitted under the device of a square and a cross within a circle (subject: Design for a Public Concert-room). Author, Mr. Alfred Reading, Handsworth, Birmingham.

That the Grissell Medal be awarded to the author of the drawings submitted under the device of a star within a circle and the letters T.E.A.K. (subject: Design for a Hall and Staircase, showing their construction). Author, Mr. Geo. D. Stevenson.

That the Institute Silver Medal and 5*l.* 5*s.* be awarded to the author of the measured drawings submitted under the motto "Try" (Building illustrated, St. Alban's Abbey). Author, Mr. James Neale, St. Alban's.

That in the same competition another Institute Silver Medal be awarded to the author of the measured drawings submitted under the motto "Waverley" (Building illustrated, Dryburgh Abbey). Author, Mr. James Lindsay, of Glasgow.

That the Student's Prize in Books be awarded to the author of the drawings submitted under the motto "For a Park" (subject: Design for a Park Lodge). Author, Mr. Henry Branch.

It was stated that no essays had been received in competition for the Essay Prize of 1875-6.

The business of the special meeting concluded, the following new members were balloted for and duly elected, viz.,—as Fellow, Mr. Robert Walker; and as Associates, Messrs. G. H. Birch, R. Griggs, and J. W. James. It was announced that Mr. Goodchild had presented two views, tinted by the late Professor Cockerell, of the interior of Wren's first design for St. Paul's; and in answer to a question by Mr. Wyatt Papworth, it was stated by the chairman that the committee on the Affairs of the Institute was losing no time in carrying out its duties.

Mr. F. P. Cockerell wished to say, before Mr. Sedding commenced to read his paper, that finding that his (the speaker's) paper promised for that evening ("Notices of Deceased Foreign Members") contained a mass of matter which would hardly prove interesting if read to a public meeting, he had proposed to forego its reading, but to print it in the "Transactions." Since that determination had been arrived at, however, Mr. Brassey, M.P., had written to say that, owing to his Parliamentary duties, he should be unable to read his promised paper on the 27th inst., "On the Rise and Fall of Wages in the Building Trades"; therefore his (Mr. Cockerell's) paper would be read on that occasion.

Mr. J. D. Sedding then read a paper on "Sixteenth-century Gothic Architecture." He remarked that the three central charges made against this period of Gothic architecture are that its structures betray inert purpose, effete thought, and such a use or misuse of ornament as led its designers to rely solely on the exuberance of its enrichments for their effects. The whole of these charges could (said the author) only be met face to face with the productions of the period; but it seemed to him that the first and second reflected as much, or more, upon the era which produced the work than upon the art itself. First, then, of the spirit of the time, and the mutual reaction of the age and the art upon each other. The epoch was one in which two important movements were in progress, not altogether dissimilar in their impulse, though outwardly disconnected in their agencies,—an artistic and literary revolution known as the Renaissance, which had its generation in Italy, and a religious revolution which had Germany for its head-quarters. England was not exactly apt at adopting new ways of thought or action; yet, in those active, swift-minded days, there was change in the air, and it was not possible for one nation long to hang back when others had eagerly assimilated one or other phases of these movements. With regard to the third charge, of overdone ornament, a degree of spiritual beauty might exist in both the simpler and the more ornate phases of art; yet every one would grant that art was in most peril when most susceptible of embellishment, or, to put it in Shakspeare's words,—

"Ornament is but the guilèd shore
To a most dangerous sea."

Still, this did not say that there was no such thing as legitimate ornament, or even a legitimate magnificence of ornamentation. The defence of the period under review, however, rested on the proof that the proper bounds of ornamentation had not been overstepped. Assuming that a fine-art composition consisted of two parts, its structural thought or primary purpose, and the artistic expression in which it was arrayed, most frequently those parts had no real relation to one another, as, for instance, the grouped cylinders of Early English architecture, which had no real relation to construction whatsoever, "but," in the words of Ruskin ("Slade Lectures," Oxford, 1870, pp. 21, 22), "in fact, contend with it, and deny the construction, their principal purpose seeming to be concealment of the joints of the voussoirs." On the face of it, it was quite conceivable that both the structural thought and the artistic expression were, separate or combined, liable to abuse, according to the fluctuations of taste. But it could not be otherwise than that the highest art should be that which united the highest qualities of both thought and expression. Early work had been described by Mr. Ruskin as bearing more or less the character of a good solid wall with irregular holes in it, well carved where there was room. This sounded like simplicity and goodness itself. But there were two kinds of simplicity, that of schooled restraint and chastened purpose, and that which sprang from artlessness and impotence, and, in Mr. Sedding's opinion, the simplicity of early work answered to the latter description and not to the former. For, when we examined sixteenth-century work, we found that, unlike the unequal past, it summoned to its aid every secret of the artist's craft, and every power of his hand and brain. As to the legitimacy of its magnificence, it was, the author contended, both possible and good to unite a gorgeously-coloured diction to noble thought, just as it was right and possible to wed forceful lines in architecture to a studied magnificence of style; and—to use a literary simile—it was only when word-painting became so florid that it obscured thought by its pointless conceits; when diction and style were followed as the end, instead of the means, that we might consider ourselves fallen on evil days. Briefly, the resources of the accumulative phase of architecture characteristic of the sixteenth century were these: carefully-considered structural effects; the admixture of architectural mouldings with fanciful sculpture; great constructive science exhibited in balanced masonry of fretted roof or internal or external supports; delicate execution of freehand carving; sculpture in niches and canopies, traceried wall-surfaces, parapets and buttresses, and wherever there was room. All these scientific and artistic embellishments did the Gothic artist of the sixteenth century bring to harmonise with the constructive necessities of the building under his hand, and therewith graced the last crowning efforts of his ancestral art. The work of the period was thoroughly characteristic of the national genius; it was historic, and bore the marks of a self-sustaining life; its creations had an independent and a relative value, and they were good in that they were pleasant, profitable, and honest. Though not devotional, the work was earnest and serious, like even the most fanciful English work of that day; and what it lost in ascetic spirit it gained in increased graphic power and naturalesque treatment. Its human interest was also enhanced by playful renderings of home-life and home-pursuits, personal badges, emblems of trade and industry, or fanciful rebus, while it was by no means negligent of the higher region of figure-sculpture, nor forgetful of brute and flower. Let it not be said, in the words of Shakspeare, that this "gracious voice obscures the show of evil"; that it was assumed virtue "hiding the grossness with fair ornament"; because he (Mr. Sedding) failed to see the corruption of the stock to which these fair features were engrafted, and it rested on those who made the assertion to prove that the enrichments were applied to conceal defects, and not to enhance beauty. And all the while one was canvassing its characters, one felt that the death-knell of Gothic art was being tolled, even as

"Fancy dies
In the cradle where it lies."

But the last passage of its life was clearly not that of an imbecile thing dying of inanition; nor was it destitute of the elements of grandeur and pathos. Though old with the weight of years, it revolved memories of a glorious past, and fought gallantly to the last for a place in English hearts. And gathering all its forces together,—uniting skilled and elaborate architectural form to the splendid harmonies of colour and sculpture,—it was only put to silence as the last ray of Mediævalism faded from English soil. In illustration of his remarks, Mr. Sedding described a few typical examples of a class of erections specially connected with the sixteenth-century phase of Gothic architecture, viz., chantry-chapels, erected as separate structures for the tombs of great men. Thus we found that the first stone of Henry VII.'s Chapel at Westminster was laid in 1503. One year later the chapel for Prince Arthur's Tomb was erected in Worcester Cathedral. About the same time was built Bishop Alcock's Chapel at Ely, and a host of others followed, too numerous to mention in

* This is the first award of this prize, and owing to lapse of time in making arrangements, there is an accumulation of 10*l.* over and above the normal value of the prize, which is 30*l.*, to which sum it will in future be confined.

detail. Chantry chapels were chapels endowed with a yearly revenue for the maintenance of one or more priests to say or chant mass for the souls of the donors and others named by them. Having described in detail the Greenwaye Chauntry at Tiverton (date 1517), the Speke Chauntry in Exeter Cathedral (date about 1520), and the Lane Chauntry at Collumpton (date 1528), Mr. Sedding concluded by saying that the English artist of those days, like his progenitors of earlier time, held to Nature as his mainspring. He got not only as much, but even more, delight and content out of the hedgerows, and the flowers, and the beasts of the fields than they, and also much more out of the familiar incidents of common life—the provinces of their labour differing (1) because Gothic art was elastic, and therefore admitted of accessory characters; and (2) that the children of different epochs needed their own special mode of expression. And wherein did the distinctions lie between the dealings with Nature of the early and late phases of Mediæval art? Mainly, in that the early schools came to Nature timidly, and with a childlike simplicity, while the latter schools treated her with familiarity. And it seemed to Mr. Sedding that these diverse attitudes were explainable by the light of the varying degrees of culture of the artist's times, and the changed requirements of their art. The early sculptor learned humble lessons of her, because his limited perceptions kept him unconscious of the great extent of her capabilities for art purposes. On the other hand, the familiarity apparent in late work spoke of a closer identification of man with nature. Hence the individualism of the workman and the naturalism of his art; the inauguration of an elaborate style, enriched by graphic and picturesque sculpture, being the result of a fastidious taste that called for the greatest excellence that could be had, and demanded a display of the studied effects of a conscious art. So we might look at this epoch as a sort of middle stage between early art and the art of to-day; neither quite ancient nor quite modern; neither quite conventional nor ideal; and, just because of its complex character, getting small favour from the style that immediately succeeded it, or from the romantic antique Gothic of to-day. This epoch was the middle stage of English art, and hence its importance and interest to us, for as the horizon was lifted we got a glimpse into the character of the art that was to succeed it. From that period to the present, the ever-increasing identification of man with Nature had been slowly but surely going on; and in our day the old enthusiasm for her had found a new channel, and had emerged into still fuller light through the works of Landseer and Turner. But it was not the simple nature that these men dealt with; it was Nature spiritualised by man's imagination, exalted by an indescribable charm of poetical emotion, till, in contemplating Landseer's pathetic tragedies and comedies of brute beasts, or the landscapes of Turner transfused by his exquisite imagination, the spectator was puzzled to know whether the spirit of the things pictured had passed into the artist's brain, or whether the man himself had been absorbed into them. Yet in truth these men, as they passed on to their triumphs, did but catch up the links of old English art in the far-off times, and did but take up the less perfectly arrested work of the great unremembered dead of earlier days, with whom they now rested from their labours.

On the motion of Mr. M'Vicar Anderson, a vote of thanks was given to the author of the paper, and the meeting terminated.

PRIZE DESIGNS AT THE INSTITUTE OF ARCHITECTS.

THE designs sent in competition for the various annual prizes offered by the Institute made a very good show on the walls of the Institute room at the last meeting. The designs submitted for the Soane medallion were for a country house, the one selected being that marked "Loyal Espoir," by Mr. J. Conder. We must concur in the judgment which gave the medallion to this design, which has a very fine and effective plan as regards the entertaining-rooms, and is admirably drawn, and put together with knowledge and thought; but the external design has not the homelike repose of character which should belong to a country house: it has too much of a town-hall appearance. The oblique placing of the conservatory is not quite happily managed, and looks too much like an afterthought. "Triangle," by Mr. J. O. Harris, is a picturesque external design, in half-timber style, and fitter for its object than the last-named; but there is nothing special in the plan. Εις αριστον, by Mr. W. Niven, shows a good Jacobean exterior, of a type, however, which looks better when old and weather-stained than when new; it is a little too mechanical and regular. "Aspect," a Gothic design, shows some good qualities, and the author treats his staircase fenestration in a picturesque manner.

The design for a concert-room, for the Tite prize, is a well got-up set of drawings, but presents nothing original in design, and in the general plan the author (Mr. A. Reading) has taken St. James's Hall for his model, which is not by any means a satisfactory one. There is no evidence of the author of the design having thought of the peculiar requirements of a concert-room, or the best way to meet them at all: except for the orchestra seats, it might be any room for large meetings. When a special subject of this kind is given, there should be an attempt to study and solve the problem on its own special grounds, not merely to make drawings. The prize for the Student's designs for an entrance-lodge has probably been awarded to Mr. H. Branch partly on the ground of the perspective sketch, which is good, and shows the small design to advantage; but there is more style and originality in the one marked "Tudor."

The prize for measured drawings has elicited two admirable sets of drawings, those of "St. Alban's Abbey," by Mr. Neale, and of "Dryburgh Abbey," by Mr. Lindsay. The prize was adjudged to the former set, which, indeed, are of great excellence, both as to accuracy and effective drawing; but the Council thought so highly of the other set that they gave a second prize to the author, who, it was mentioned, was a very young student, and whose careful drawings do him the highest credit. The response to the offer of prizes this year has not been great in regard to quantity, but no complaint can be made of the result as regards quality.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual meeting of this Society was held on the 8th inst., in the Library of the Royal Institute of British Architects, Conduit-street, Mr. Horace Jones in the chair, in the unavoidable absence of the president, Mr. Sidney Smirke, R.A. There were also present Messrs. G. J. J. Mair (treasurer), Wyatt Papworth, H. H. Collins, Benjamin Ferrey, J. H. Hakewill, S. W. Kershaw, Mr. J. Goldicutt Turner, and others. The chairman read the following annual report:

The Council has again to congratulate the Society on the balance, however moderate, it has made during the past year. The list of annual subscribers contains seven new members, and three others have doubled their contributions. The amount received during the past year in subscriptions and donations has been 313*l.* 0s. 6d., whilst in the year previously, from the same sources, the gross receipts were 299*l.* 16s. 6d. On the other hand, five members have died, and the number of gifts made has increased by five, causing an additional call upon the funds of 41*l.* The total amount expended by the Society in gifts to applicants during the past twelve months has been 318*l.*, and this by no means represents what the Council have wished to do, but simply that which they have felt themselves capable of doing. They continuously regret that the means of the Society do not increase in proportion to its needs; they hope, however, that they may reasonably look forward to a more auspicious period, inasmuch as sumptuous buildings, both public and private, are rising, not only in London, but in all the great commercial centres of the country, many involving an expenditure which but a few years ago would have been considered extravagant or excessive. It is hoped that the benevolent feeling of our professional brethren, who are receiving emoluments from these costly structures, may be roused to nobler efforts to lighten the oppressive mass of suffering that assuredly exists among the humbler and less fortunate class. The junior members of the profession, if so the Council may designate those enrolled under the banner of the Architectural Association, set the good example of year by year making their contributions in excess of the last; thus in the year 1874 the Society received, through collections made by the officers of the Association, 4*l.* 2s.; last year it was 5*l.* 19s. 5d. In addition, the president of the Association lends us his countenance and gives us his sympathy in his inaugural address to his constituents. The Royal Institute of British Architects continues to do for us what has been in years past, and will ever be, a great relief to the working expenses of that society, viz., it provides us with a shelter whereunder to hold the meetings both of the council and of the society in general; and the council again takes this opportunity of bringing this fact under the notice of its subscribers, and of manifesting to the Institute its appreciation of such a convenience and saving in its economy. That there is need for exertion in the direction of strengthening the council's hands by increased subscriptions, so as to place under its command larger funds to administer, those who are engaged in the practical working out of the work of the society can testify, and, if need be, give distressing accounts of the decayed members of the profession, the widows, and the orphans, who are around us pleading earnestly for aid. The council hopes and firmly believes that these pleadings will not be passed by unheeded, and that in the next year's report it may be enabled to announce a great accession of income. The Council, in announcing their regret at the resignation of Mr. John Turner, who has held the office of honorary secretary to the Architectural Benevolent Society for a period of more than a quarter of a century, desire to tender their cordial thanks and acknowledgments for the very able and zealous manner in which he has performed the various duties entrusted to him, and likewise for the care and untiring energy evinced by him in carrying out the principles laid down for his guidance in the distribution of the benefits afforded by the Society. Impressed as the Council and its former members are with Mr. Turner's valuable services, so satisfactorily and advantageously bestowed in the faithful discharge of his official duties, and his liberal support to the Society's funds, the Council are not unmindful of the deep debt of gratitude which the profession owes Mr. John Turner for having mainly founded the Architects' Benevolent Society. In conclusion, the Council begs to announce that, under Bye-law 70, it has made during the past year its first grant of an annuity, and that this has been to the almost destitute widow of a most distinguished and accomplished member of the profession, one who was a Gold Medallist at the Royal Academy, who had a large practice, and was one of the founders of the Royal Institute of British Architects.

The report was unanimously adopted, as was also the balance-sheet, which contained the following items, viz.:—Subscriptions, 226*l.* 11s.; donations, 86*l.* 9s. 6d.; dividends on stock, 62*l.* 16s. 2d.; these amounts, with a balance of 127*l.* 9s. 1d. brought forward from previous year, making a grand total of 503*l.* 5s. 9d. The working expenses of the Society amounted to 77*l.* 3s. 11d.; 30*l.* were expended in the purchase of additional stock; and the amount of gifts to applicants was 318*l.*, leaving a balance in hand of 78*l.* 1s. 10d. Votes of thanks were given to the auditors (Messrs. C. L. Eastlake and John Young) and to the officers and council, and Mr. John Goldicutt Turner was unanimously elected hon. secretary. Messrs. Edwin Nash & Christopher Eales were elected auditors, and the existing officers and members of council were re-elected, with the exception of Messrs. C. J. Knight, C. Barry, B. Ferrey, E. N. Clifton, and A. W. Blomfield, whose term of service on the Council had expired, and who were replaced by Messrs. E. A. Grüning, H. H. Collins, James Edmeston, Edwin Nash, and Robert R. Arntz.

SOCIETY OF LADY ARTISTS.

THE committee of this Society have hung 666 works in their Gallery, 48, Great Marlborough-street, forming in the whole a very agreeable exhibition. It includes a number of excellent pictures, and is disfigured by fewer ugly blots than has been the case on some previous occasions. The Society is probably regarded merely as a stepping-stone by many of the members, but even as thus it has its use. If there were no recruits we should soon have no veterans. We will not pretend to examine and compare: all we can do just now is to mention a few of the artists whose works fell under our notice in the bustle of a more than usually crowded "private view"; first suggesting to the hanging committee that on another occasion they should let the numbers run on, and not, as now, stop at 544 on the walls and begin with No. 1 again on the screens. Such a mode is very inconvenient. Mrs. Marrable sends the largest number of pictures, and shows considerable advance in her art. No. 172, "Sunset on the Pitz Rosegg, Engadine," and 173, "Looking towards Como," are charming works; No. 148, the largest of her pictures shows a striking effect of "Sunshine on Monte Rosa." Miss Rayner sends a number of capital little drawings of places. Miss Louisa B. Swift has made dogs her speciality, and has few rivals in the field. No. 192, "The Quiet Joys of my Kennel," is a remarkable specimen of her work. Her sister, Madame Bisschop, sends an excellent picture, "Pour les Pauvres" (492), and other members of the family, Mrs. Swift and Miss Georgina Swift contribute effectively. Mrs. Jopling is one of the stays of the Society, for proof of which we may point to (228) "Louis XVII." Miss Gastineau reminds us greatly of her father in (418) "A Glen near Loch Goilhead, Scotland." No. 246, "Far Away," by Hilda Montalba, is one of the most interesting pictures in the collection. Useful contributions will also be found from Miss Elizabeth Thompson, Miss Warren, Miss Walter, Miss Edwards, Miss Alice Manly, Madame Bodichon, Mrs. Benham Hay, and other known artists.

Northumberland Avenue.—This Saturday (the 18th) has been fixed for the opening of the new street on the site of Northumberland House, Charing-cross. The proceedings, which will take place at one o'clock on the day named, will be quite of an informal character.

PROFESSOR E. M. BARRY'S LECTURES ON ARCHITECTURE.*

IN my last lecture I described most of the public buildings of Pompeii. On the present occasion, our attention will chiefly be directed to its domestic architecture. But, before discussing in detail the plans and arrangements of the houses of private persons, it may be as well to examine the remains of some buildings of a class which serve as an interesting illustration of the habits and manners of the Romans,—I mean the public baths.

Visitors to Rome are aware of the magnificence of these edifices, from having seen the splendid ruins of the Baths of Caracalla and Diocletian. Some idea may be formed of the grand scale of the latter from the fact that the great hall was converted into a church of noble dimensions, by no less an architect than Michelangelo. This church, which goes by the name of Sta. Maria degli Angeli, is, even now, among the finest architectural monuments of Rome.

There were many public baths in ancient Rome besides the two great establishments which I have mentioned, and no Roman town was considered complete without its Thermæ. There are two public baths at Pompeii. The smaller, or old baths, shown on the drawings on the wall, were excavated in 1824, in a position near to the Forum, and therefore central, as regards the city. They are especially interesting, because from their smaller size,—as compared with the great Roman examples,—it is more easy to understand the uses of the several apartments into which they are divided.

In the capital, the bathing had reached to such a pitch of luxury that the buildings seem to have combined the attractions of the bath, the exchange, the theatre, the gymnasium, and even the modern club. The number of rooms in them is so great, that it is difficult to feel assured, in all cases, of their exact original destination. In the old baths at Pompeii, the scale was necessarily more modest, and the arrangements there will be found to correspond, very nearly, with those in daily use among Oriental nations at the present time. In fact, the plan which is now before you is not unlike the buildings which any one may now see at Constantinople or Cairo. The baths were not vapour baths, as in Russia, but were warmed by means of flues in the walls and floors, and the temperature was not very high.

The Romans attached great importance to their baths, which were as much a place of general resort as the Forum. A small fee was charged for admission, and different hours, or days, were allotted to the two sexes, in places where a separate establishment for women did not exist.

The bath is an institution of immemorial antiquity. It was well known to the Greeks, and was doubtless borrowed from them by the Romans. Indeed, the names of the various apartments are of Greek origin. Public baths had been multiplied excessively under the Empire, and after the rise of Christianity, the thermæ, like the basilicas, were often converted into churches, as we have seen in the instance at Rome.

Christianity seems to have looked with disapproval on the public baths, by reason probably of the abuses of them, to which the general corruption of morals had led. A change of life was necessary to the new converts, and a feeling arose that those who had once received the regenerating cleansing of baptism needed no further purification. It was this superstition which gave a reputation for sanctity to habits amongst hermits, monks, and others, which are repugnant to modern ideas, and led by reaction to the maxim accepted by medical science, that cleanliness is next to godliness. In Spain, after the conquest of Granada, one of the first acts of the intolerant victors was to forbid to the subject Moors the use of their public baths, and even private bathing was interdicted.

Let us now return to Pompeii, and endeavour to ascertain the probable uses of each portion of the building.

From its central position in the city we may assume that from the value of the site it was not found possible to indulge in any arrangements which required great space. At the same time, we may be sure that everything was provided which was really necessary, and we can thus form a pretty correct notion of what was considered by the Romans to be indispensable in their thermæ. It is supposed that, in addition to the public establishments, there may have been other private baths of less importance, especially sea-water baths, as Pompeii was situated on the sea-shore.

The old baths, now under notice, being surrounded by shops, had several entrances from the adjoining streets. These all communicated with an open court, surrounded on three sides by colonnades. In this court was found a money-box, containing the fees of the bathers. Seats of stone are found in the portico towards the south, and here were posted the notices, or advertisements, of the theatres, combats of gladiators, and other matters of public interest. A large recess in one of the sides of the court may have served as a more private retreat for the upper class of bathers, or for refreshments. It is well placed for such a purpose, as it could readily be served by attendants on duty in the baths generally. The central courtyard was planted with flowers and shrubs, and had possibly a fountain in the centre. In summer time, an awning over the whole would exclude the rays of the sun, and afford a pleasant shade and coolness. Some have supposed that this outer portico was a waiting-room only for persons about to bathe, or for slaves in attendance on their masters. Looking, however, to the small size of the other apartments, I think it is more probable that it served also as a waiting or cooling room, for those who had bathed, rather than for those only who were about to do so.

Having entered by one of the passages, the bather left his clothes in the *apodyterium* or *spoliatorium*, having deposited his outer garments, and probably his sandals, in the waiting-room. The *apodyterium* probably served not only as a room for undressing, but also as a cooling-room, for those who preferred it to the outer court. There are niches in the walls; these may have contained the clothes and property of the bathers, which were placed in the charge of slaves, or attendants, liable to the penalty of death in case of theft. The chamber was warmed by a large brazier of bronze, which was discovered in it, and which was probably convenient for warming clothes, and the linen used in the bath. In the outer room, holes exist in the walls, and it is conjectured that wooden poles were inserted in them, to carry the towels and linen while drying, just as we see in the Eastern baths nowadays.

From the *apodyterium* access is obtained to the next chamber, the *caldarium*, or *sudatorium*. This was the hot room, and at Pompeii was probably used for various purposes, for which in larger structures separate chambers were provided. The floor is furnished with flues for heating, and the bathers probably wore wooden shoes, or pattens. At the upper end is a circular basin, or fountain, from which cold water might be obtained for the head; and at the other end of the room is a plunge-bath of hot water. Couches round the walls, or thick mattresses on the floor, were probably arranged for the convenience of the bathers.

Having left the *sudatorium*, the bathers, or those of them who cared to do so, could pass into another room, where cold water was found. This chamber was constructed with a basin in the centre for plunging or swimming, called the *natatorium*, or *baptisterium*. The most accepted name for the chamber itself is the *frigidarium*. You will notice that it is so placed that it might be conveniently used by those who did not wish to enter the other parts of the bath, while it might also be available for bathers who had already done so. This is quite consistent with the habits of the East; for in Oriental baths generally, the use of cold water is not encouraged, and forms no part of the regular course of bathing.

The furnaces for heating are placed at the side; and adjoining them are some chambers of irregular shape, the use of which has been much disputed. Sir W. Gell has termed them the women's baths, but others have thought that they are only the old or original buildings, which had been superseded in course of time by those which I have just described. They are very inferior to the latter, in size, style, and decoration, and do not call for detailed description.

Much surprise has often been expressed at the small size of the building we have been discussing, and recent excavations have shown that it was not the principal bath of Pompeii, a more extensive structure having been discovered near to the theatres. These are called the Great or Stabian baths, and are very interesting architecturally. The arrangements are very similar to those in the smaller baths. You will see them marked on the map, and they are supposed to have been built about 150 years before the destruction of the city.

Considering the bathing propensities of the Romans, it is possible that further excavations may even yet bring to light other buildings of a similar nature. The men used the public baths more than the women, and, it has been said, even passed half their time in them. It does not necessarily follow, however, that this was from choice; for we shall see presently, in treating of the private houses, that these were nearly destitute of warmth and comfort,—matters for the want of which even the charms of a Neapolitan climate might not compensate. In their thermæ, on the other hand, the Pompeian people had an agreeable place of resort, well planned, covered, and completely warmed, and the whole available to them at a moderate expense. The same causes which lead many a poor man among ourselves to the comparatively comfortable public-house, had doubtless their influence, in olden days, in attracting the lower classes to the public baths, which formed so important a feature in the every-day life of the Roman people.

The architectural design of the building is pleasing, and the construction solid and good, far more so, indeed, than is common with Pompeian remains. The various rooms have arched roofs, and the natatorium is domed. The door to the hot room was set in jambs slightly inclined, so as to cause it to shut by its own weight.

The apodyterium is the chamber which is most highly decorated, and this is reasonable, because the bathers would spend more time in this room than in the others, and as it was only heated to a moderate temperature, there would be no vapour to interfere with the decorations. The pavement was of mosaic, composed of white tesseræ, with black borders. At the springing of the arched roof there was a bold projecting cornice, supported by a row of figures of the Caryatid character, with their arms upheld. Some have supposed these figures to represent fawns. Between the figures were the niches or recesses to which allusion has already been made, and which served as receptacles for the clothes of the bathers. The vaulted ceiling was panelled with ornaments and figures, delicately executed in low relief, in stucco. The caldarium was also vaulted and decorated, but the construction and ornament were both simpler than in the apodyterium. Although the bath was a hot-air bath, there must always have been a considerable quantity of vapour from the water used in it. This would not only have destroyed any elaborate ornamentation, but would have rendered it difficult to see and appreciate any but simple details. In the cool rooms windows exist for light, and there are holes in the vault of the caldarium for a similar purpose. This is in accordance with the custom at the present day in Turkish or Eastern baths. The holes were probably covered with glass or shutters.

Taken altogether, these baths are among the most interesting ruins in Pompeii, and are a fair indication of the architectural taste of its former inhabitants.

We will now turn our attention to the dwellings of the latter. Having considered the temples and public buildings generally, let us see what the ruins of Pompeii can tell us about the homes of its people.

Greek as were the traditions which evidently guided to a very great extent the architecture of Pompeii, the houses may, nevertheless, be described as Roman in their plan and arrangements, and they include the hall, or atrium, which was a distinctive Roman feature. The plans of the houses at Pompeii agree, also, in a remarkable degree with the remains discovered in Rome itself. We may, therefore, briefly consider with advantage the characteristic features of Roman houses. We shall find them very uniform in their general arrangements, and for this uniformity there were various reasons. Beginning with such simplicity that permanent roofs were unknown, the Romans ended by giving scope to all the refinements of decoration and luxury which the wealth of later times had rendered possible.

In early times, rigid sumptuary laws regulated the style in which each class might live, and it was a special privilege of senators to have their door of entrance opening to the street. Most of the houses at Pompeii consisted of one story only, and this was the original mode of construction. As, however, ground became more valuable, and population increased, buildings of several stories

* Third Lecture, delivered at the Royal Academy on March 9, 1876.

became common. These were finished with a flat terrace roof, called the *solarium*, which was used by the inhabitants as a place in which to take the air, or enjoy the sun in winter. Here also would sometimes be eaten the principal meal of the day, the *cœna*; and from this use arose the term *cœnaculum*, which was applied by the Romans to the upper story of their houses.

The construction of the walls was originally very slight, as no great strength was needed for buildings one story only in height. As height increased, however, an improvement became necessary, and the walls were made thicker and more solid. In late times it was found necessary to restrain the height of buildings in towns, and the Emperor Augustus issued a decree limiting the height of town buildings to 70 ft. This, however, was still thought excessive, and the limit was further reduced by Trajan to 60 ft.

It is interesting to find the Romans dealing with the same difficulties which trouble our municipal authorities in the nineteenth century, and it is curious to note that the height of 60 ft. prescribed by Trajan is the very limit which our own Metropolitan Board of Works recently sought (though unsuccessfully) to impose upon future buildings in London. There can be little doubt, I think, that some limitation is required in our great towns, not only in the interests of architecture, but in those of general convenience and the public health.

Ostentation of all sorts was sternly repressed in the early days of the Republic. Afterwards, the Romans, as conquerors of the world, could avail themseves of the experience of all nations. Admiring the arts of Greece, they corrupted them, and loaded them with ornamentation. Their houses became palaces, and brick gave way to marble.

The great patricians vied with each other in the magnificence of their dwellings, and even Cicero could spare time from affairs of State for the decoration of his villa at Tusculum. Augustus might be simple in his tastes, but Mæcenas has shown, by his villa at Tivoli, how completely the austerity of Republican manners had become lost in the magnificence of the empire. Nero followed, and exaggerated the prevailing taste for luxury, and after his time pure taste seems to have departed.

It is remarkable, however, that through all changes of scale and style, the plans of the houses preserved a great amount of uniformity. The dimensions might be more or less grand, the decoration elaborate or simple; but the general arrangements suffered little change, and they have left their trace on many of the earlier ecclesiastical buildings of Italy, and even on the private houses of comparatively modern times.

It is not, perhaps, to be wondered at, that uniformity such as I have referred to should be found among ancient buildings, for do we not experience it ourselves? Custom becomes, in time, almost a religion, and is as little to be transgressed. Local circumstances first give rise to some special type of plan, and this becomes an iron rule, against which it is difficult to strive. Who does not know the plan of the ordinary London house, so distressing by its monotony of front and back rooms, narrow entrance, and stairs squeezed on one side? If we could imagine our city suddenly overwhelmed, as was Pompeii, how much might not be written by its discoverers, centuries hence, on the uniform plans of the dwellings of the ancient Londoners?

Vitruvius speaks of Roman houses as if their arrangements were too well known to need description, and this was doubtless the case in his time. We should have been very glad, however, if he had told us more about them, as without the discoveries at Pompeii, his account would not be very intelligible. Thanks to the latter, we can now understand that the general distribution of parts was made according to a common custom, and that the houses of patrician and plebeian showed the same principal divisions, however much they might differ in details or decoration.

Bearing this in mind, let us proceed to examine the arrangements of the Roman habitation.

For this purpose, I will refer you to a plan which I have had prepared of an ideal house, founded on the discoveries made at Pompeii, and on the general information derived from Vitruvius and from the excavations at Rome. I have supposed it to have belonged to a wealthy patrician living in Rome. You can compare it with the plans of houses actually existing at Pompeii, and called after the names of Pansa, Sallust, and Diomede, which are also before you, and which will explain the authority for various parts of it.

Taking first the leading principles, we shall find the house divided into two great divisions, the public and the private. The Romans, while fond of public life, were jealous of the privacy of their domestic arrangements. As regarded the public portion of their houses, access was readily attainable, but they were not accustomed to entertain guests, and, when they did so, lodged them usually in separate buildings, rather than under their own roofs, although they occasionally accommodated them in rooms round the *atrium*, or outer hall.

The division, of a more or less public character, contained the entrance, the hall, and some of the surrounding chambers and corridors.

In the case of palaces, or houses of importance, there was usually an open space in front. This was called the *area*. It was sometimes planted, but more often laid out architecturally, and ornamented by statues or fountains. You will find the traces of this arrangement in the numerous piazze, or open squares, of modern Rome.

Opening from the *area* was the principal entrance, approached by a portico, or colonnade, which was sometimes arched. This adjunct, so useful in southern climes, served also to give dignity to the mansion to which it was the entrance. It was only applicable, as it would be among ourselves, to the more important buildings. At Pompeii it is not found, as the space in that small town is too much occupied to allow of it. In such cases, the houses had no piazza, or area, but there was sometimes a small porch or portico opening on the public street,—as in the building which goes by the name of the house of Diomede. The latter feature was, as I have said, at first reserved as a privilege of the great; but after the time of Nero it became common, and was in ordinary use in the improved houses built at Rome, after the great fires of that emperor's reign. The porticoes served to break the monotony of the streets, and afforded an agreeable shade, not only to the entrances of the houses, but also to the shops which usually flanked them. At Pompeii the streets are too narrow for porticoes, and their monotony and poverty of architectural effect are mainly due to this circumstance.

Between the portico and the *atrium* we find the vestibule serving as an out-door waiting-room, or approach to the house. This arrangement is not without architectural importance. However striking a building may be, the eye requires to be gradually introduced to it, and the effect of an interior is greatly enhanced by a proper mode of approach. In the palaces of the Romans vestibules were usually found; and Vitruvius says that in the mansions of great people they should be spacious and dignified. In smaller houses the vestibule was, of course, on a reduced scale, and was sometimes altogether omitted. In Pompeii it is found occasionally, but not in any case of large size. The arrangement of a vestibule is still found existing in the great churches of Rome, such as St. John Lateran and St. Peter's. It is, of course, only suitable on an extensive scale to important edifices of considerable dimensions, and of some architectural magnificence.

Entering the portico, and then the inner doorway, through the vestibule, the great hall, or *atrium*, is seen beyond; but between the door and the *atrium* is a corridor, or outer hall. This latter was called the *prothyra*. It was not only the entrance to the house, but also served as a means of access to the apartments on either side, which in small houses were sometimes shops, where the proprietor sold the produce of his farm or other property. In large houses they served as inner vestibules, or rooms for porters or slaves. The possession of a doorway in the street being reserved as a special mark of honour, the meaner dwellings had to be content with doors from the *prothyra*. There were in some cases more than one door, so that the master of the house should not be obliged to pass through the crowd of servants or dependents who thronged the vestibules and outer corridor of the mansion. In the *prothyra* was the place for the porter, or the guardian of the door, and sometimes a dog was kept there. It was this custom which led to the representation of dogs in mosaic, or in painting, on the floor or walls, as we find in some cases at Pompeii.

We now come to the distinctive feature of a Roman house, the hall, called the *atrium*, or *cavædium*. This was the central feature of the public division of the building, and the name of *cavædium* thus came to be applied sometimes, as a general term, for the portion to which access was commonly allowed, much as we say, now-a-days, "under my roof," to include every part of the house. The *atrium* was a collection of small rooms, forming a hollow square, with a court in the middle. It was a place of general resort, to which access was readily permitted. Here business was transacted, appointments made, and complaints heard. It was decorated with family portraits, or other paintings, and sculpture. Originally it was also the living and eating room of the family, but in later times separate apartments were appropriated to those purposes. The *atrium* then became a waiting-hall, and place of assemblage for clients and dependents, who passed much of their time in it, in attendance on their patrons. The *atrium* was, in fact, common to most Southern habitations of any importance. It is supposed that it was known to the Jews, and adopted by them during the time of the Roman conquest of Judea. St. Matthew tells us that St. Peter followed our Lord into the hall of the high priest, and this description would seem to point to an arrangement such as I have been describing.

Vitruvius attaches great importance to the *atrium*, or *cavædium*, and speaks of five different designs, as being in common use. Those are,—(1) the *Tuscan*; (2) the *Tetrastyle*; (3) the *Corinthian*; (4) the *Displuviatum*; and (5) the *Testudinatum*, or covered.

A few words may be given to the description of these varieties, which are shown on some of the diagrams.

The Tuscan *atrium* had its roof supported by four beams, crossing each other at right angles. The centre was open, and this was called the "*compluvium*." The roof, or rather the four roofs, covered the sides only, and sloped from the walls to the beams, being of the description known to us as lean-to roofs, such as you commonly see over the aisles of a church. The water from these roofs was conveyed into a shallow basin in the centre of the *atrium*, which was known as the "*impluvium*." This is the oldest and simplest type of *atrium* known, and is the form most common in Pompeii. It was an addition to Greek arrangements, for the *atrium* is believed to be a purely Roman invention. In the houses of the Greeks there was not the distinction between the public and private portions of the building which distinguished the Roman houses.

The next description is the *Tetrastyle*,—it is very similar to the Tuscan, but is adapted to larger dimensions by having columns placed at the right angles of the *impluvium*, to sustain the weight of the roof. It was only a step from this arrangement to a regular colonnade, which latter is called by Vitruvius the Corinthian *atrium*. Rows of columns surrounded the *impluvium*, which became a larger and more important feature, and this was the means of affording light and air to the various apartments placed around the *atrium*.

In all these types the roofs inclined inwards, and conducted the water towards the centre, which was occupied by the *impluvium*. There was, however, another arrangement known as the "*Displuviatum*," by which the water was directed outwards, and away from the centre. The *impluvium* was no longer necessary, and its place was supplied by fountains or sculpture. The last species of *atrium* is the *Testudinatum*, or that which was entirely covered. In this case the roofs sheltered the whole area within the four walls of the *atrium*. There was no open space or *compluvium* in the centre, nor was any *impluvium* necessary. Light was probably introduced by means of openings over the columns, after the manner of a clearstory, and it is evident that this mode of arranging the *atrium* is susceptible of a large amount of decorative architectural design, and is suitable for our own use in houses of importance.

The *tablinum* was an important feature of a Roman house. This was a room at one end of the *atrium* which was dedicated to images of ancestors, inscriptions in their honour, and pedigrees. The patricians prided themselves greatly on the contents of the *tablinum*, and the possession of one well filled with records of family honours was one of the recognised social distinctions of the day.

The rooms at the sides were called *alæ*. They were decorated in a similar way, and served as waiting-rooms, or sitting-rooms, or even as guest-chambers, in houses of moderate dimensions.

The space at the end of the *atrium*, between the latter and the private portion of the house,

and, indeed, the passages and corridors generally, were known as the *fauces*. There was commonly an altar in or near the atrium, dedicated to the lares, or household gods; the chamber in which these figures were placed was called the *lararium*, and sometimes served also as the *bibliotheca* or library. In some cases, where there was no space for an altar, a painting on the wall sufficed, and, indeed, the altar was a corruption of original simplicity; for, by the old laws of the Republic, the worship of the gods was only to be offered in the temples or sacred shrines.

Passing by the altar, we may now, by means of the *fauces*, leave the public portion of the building, and examine the more domestic apartments, where the family resided, and where are placed the eating-rooms, the bed-rooms, and the women's quarters, baths, &c.

The most striking feature here is the peristyle. This was an uncovered court, treated generally as a garden, and surrounded by colonnades. The rooms opened out of the peristyle just as we see still in the older Italian inns.

The bedrooms, or *cubiculæ*, around the peristyle had little in accordance with modern ideas of comfort. They were evidently resting-places only, and were little larger than a sleeping cabin of a ship, being commonly less than 10 ft. square. Bronze bedsteads have been found at Pompeii, and these were often arranged in alcoves, a common plan on the Continent to this day. The *cubiculæ* in the better kind of houses were sometimes approached by an ante-room, which served to shut them out from the open peristyle, and secured some sort of privacy. An eastern aspect was thought the best for the bed-rooms, so as to be exposed to the first rays of the sun, which were considered to be the most health giving.

The dining-room went by the name of *triclinium*, the title also of the couch in which the later Romans reclined at meals. The original name of the room was *dicta*, or *cænaculum*, the latter being derived from *cœna*, already referred to as the chief meal of the day, which was taken between four and five in the afternoon. It was usual, for those who could afford the luxury, to have two or even more *triclinia*, suitable for the different seasons of the year. The Romans did not entertain large parties, nine being the maximum number that could be ordinarily accommodated with convenience. Great feasts, when given, were served in the atrium. Women did not ordinarily share in these hospitalities at the time of the destruction of Pompeii, though they were accustomed to sit at table until the time of the Cæsars, when the habit of reclining at meals became common.

The dining apartments were often highly decorated with paintings, and sculpture, the figures of Bacchus and the lares being among its ornaments. Among the very rich and luxurious arose various curious devices for adding zest to the pleasures of the table, and there are records that in some cases, rope-dancers performed their evolutions over the heads of the guests, a form of entertainment likely, one would think, to cause the latter some anxiety. In other cases, we read of movable platforms to be let down, at the proper time, with showers of perfumes and flowers. The *triclinia* were covered with quilts, more or less elaborately embroidered, and the guests reclined upon them, on three sides of a small central table, of wood or marble.

In connexion with the peristyle were the private sitting-rooms, or *œci*, which were in accordance with the style of the house. They were sometimes ornamented with columns after the manner of the *atrium*, but were, more ordinarily, of modest dimensions and decoration. A larger room, termed the *exedra*, served as a place of general resort, or conversation. There were also, in grand houses, a *pinacotheca*, or picture-gallery, and a separate *bibliotheca*, or library. The Romans were not a reading people, and very little has been discovered at Pompeii of a literary character. At Herculaneum, however, manuscripts have been found in considerable numbers. It is possible, therefore, that further researches at Pompeii may bring to light more information under this head.

Baths were not uncommon in good houses, and were fitted up occasionally with great luxury. They were placed in a retired corner, and were heated in the same manner as the public baths. In the house of Diomede, the ruins of the baths are very perfect, and enable us to understand the elaboration of this portion of the plan in the mansions of the wealthy. The baths have their own little court, with a colonnade, sometimes circular on plan; and grouped around this court are the various bathing chambers, constructed in general accordance with the arrangements, which I have already described in treating of the public baths.

The baths sometimes, though rarely, occupied a basement story. The slaves were also often placed here. Their quarters were called the *ergastulum*, and were little cared for, either as regarded convenience or healthiness.

We have seen that in the public division of the house, one altar was commonly dedicated to the gods. In the private division, and often in the most secret corner of it, was another oratory, or chapel. This was called the *sacrarium*, and was especially sacred to the particular divinity, often of a questionable character, to whom the family, or a part of it, was most attached. This little retreat was generally highly decorated.

Attached to the mansions there was in some cases a garden, or other uncovered space, for walking and exercise. This was called the *xystus*, and was planted with flowers and shrubs. There was also occasionally a room for tennis, or athletic exercises, called a *sphæristorium*, and another for games of chance, called an *aleatorium*. Several sets of dice have been found at Pompeii, and some of them unfairly loaded.

In the above description of a Roman house I have kept to the arrangements of town buildings, such as may be seen exemplified in Pompeii. For such features as are not common there we have the authority of the fragments of the plan of ancient Rome, now preserved in the museum of the Capitol. This plan, which is engraved on marble, is believed to have been executed about the time of the emperor Severus, and shows the style of the buildings erected both before and after the great fire, which occurred in the reign of Nero. Until that date no attention seems to have been paid to the means of preventing the spread of fire, but afterwards the buildings were laid out in isolated blocks. This plan is very interesting, as it shows an almost exact similarity between the domestic architecture of Rome and Pompeii, and we are thus able to assume that the latter forms the key to the former.

Country houses were, doubtless, far less uniform in their arrangements than those in towns, just as is the custom among ourselves. The *atrium* and public rooms were often much modified, or altogether dispensed with. At the same time, the disposition of the other parts of the house must have been essentially similar to those in towns, for the habits and manners of the people were the same in both.

We have now passed in review, though necessarily in a very imperfect manner, the chief buildings of Pompeii, and have been enabled to picture to ourselves something of the daily life of its inhabitants.

In treating of the temples of the gods we have seen how far the simplicity of manners had become corrupted to the weakening of the moral and religious character of society. Superstitious and debasing rites in the temples led only too naturally to the excitements of a licentious stage, and the savage cruelty of the amphitheatre. We have not found traces of a single building devoted to the relief of distress, whether of body or of mind. No hospital ever opened its haven of refuge to the sick poor, with a benevolence demanding but one passport for admittance,—namely, the existence of suffering and need. For such things, and for the principle which gives rise to them, we look in vain to the hard civilisation of Roman society. The spirit of Christianity had not yet arisen with healing in its wings.*

On the other hand, it must be confessed, that we have not found evidences of that wretchedness and extreme poverty which is always with us in our cities, and ever and anon appals us by its presence in the midst of our wealth and luxury,—a skeleton never absent from the feast.

If London were buried to-morrow, what sad contrasts would not the future excavator lay bare? Palaces in one quarter, hovels elsewhere not fit for the dwellings of the beasts that perish. But by the side of such sad revelations, he would also come upon hospitals, schools, almshouses, and the like, which would, we may hope, prove to him that there was a principle in the society of our day which was ever battling with evil, and which recognised, however defectively, the claims of sick and suffering humanity.

You will perhaps remember what I said to you in my first lecture on the great subject of providing healthy homes for the masses. Let it be the pride of architects to do their utmost to solve so important and difficult a question. They have already been represented in the battle. If the problem has now, to a great extent, passed from the hands of philanthropists into those of statesmen and men of business, no small share in that result is due to the untiring advocacy of at least one portion of the architectural press, which has unceasingly urged the claims of the poor, and has shown how sad and dark are those terrible "London Shadows" which exist side by side with the glitter and the wealth of this proud city. I cannot but hope that at some future day there may be no need to apologise for the difference, in this respect, between our great modern cities of Christendom and the heathen towns of Pompeii and Herculaneum.

We will now devote a few moments to the consideration of some matters of detail in the construction and decoration of the Pompeian houses.

There is not much for us to learn as to the first of these matters; the dimensions are so moderate, that there were few mechanical difficulties to be overcome, and no call on the ingenuity of the architect, excepting always as regarded the arrangement of his plan. The walls of the dwellings are, as a rule, badly built, with ill-burnt bricks and rubble, and owe much of their stability to the plaster with which they are encased, and which is of good quality. Some of the surfaces, indeed, are so hard and fine that they bear a polish, like scagliola, or our hardest cements. In such cases great care has been taken with the last or finishing coat, formed of sand, lime, and pounded marble. This was well rubbed down, and Vitruvius says the colours were laid on while it was wet, so that they became a part of the structure, like the more modern fresco, which was incorporated with the plaster, instead of being a mere surface application, like ordinary painting.

When we consider that almost the whole of the painting discovered at Pompeii was exposed to the action of climatic influences, its state of preservation is sufficient to prove that the Romans knew how to ensure that their work should be lasting.

The paintings at Pompeii vary greatly. Some are very beautiful, and display the influences of a Greek taste, if indeed they were not the work of Grecian artists. Others, on the contrary, are of a coarser character, both in design and execution, as might be expected in a small provincial town. You may see on the illustrations in front of me specimens of each of the different types of Pompeian decoration both of ceilings, walls, and floors. The custom most in vogue was to divide the walls into compartments, surmounted by ornamental borders. The divisions thus obtained were painted in brilliant colours, and decorated with a central subject, or sometimes a single figure.

There is often great freedom of drawing and elegance of treatment in these works, and it is clear that they appealed to an instructed love of the arts in the society of the day.

There is also a second style of decoration to be seen in Pompeii. This consists of the application of attenuated architectural forms to wall decoration. We find in it tall columns, so thin as to appear metallic, broken entablature, mouldings in confusion, and a medley of strange perspective and fantastic lines. Vitruvius speaks of this style of decoration only to condemn it in the strongest terms, as beneath the dignity of architecture, and altogether uninteresting to the mind. It has been suggested that as the attenuated architectural features were wholly inconsistent with solid stone or marble construction, and as they must have been suggested by existing architectural forms, they were probably taken from a style of building in iron or bronze, the traces of which have now been lost. It seems, however, somewhat improbable that if such a style was in common use, remains of it should not have been found. Numerous articles of bronze and other metals have been discovered in Pompeii, and among them candelabra which display the elongated columns common in the decoration to which I am alluding, but I am not aware that the excavations have brought to light any traces of a metallic architecture. Further evidence will therefore be necessary before we may safely conclude that the Romans used iron as a constructive material, as has been done in modern times, though we know that they employed it for ornaments and applied decoration, as in the case of the panels in the dome of the Pantheon, which have now disappeared.

* Although Pompeii was not destroyed until the year 79 of the Christian era, no traces of Christian influences have been discovered among the ruins.

The Roman floors were often very beautiful, as you may see from the specimens preserved in the museums of Europe, and particularly in the Louvre at Paris. They were made of cement in which fragments of marble were set, constituting mosaics. These existed in Pompeii in great variety, and some of the panels were very finely designed and executed. We have lately witnessed amongst ourselves a revival of this mode of constructing floors, the chief credit of which belongs, I believe, to the authorities at South Kensington.

The doors of the Pompeian houses were of wood. They were consequently destroyed, but their form and character can be distinctly traced. They had no hinges, but revolved on pivots, and must have made much noise when they were opened or shut. The creaking of a door was not objected to, however, as it was considered a proper mode of announcing the approach of a visitor, and thus served the same purpose as the modern bell. Iron chains and bolts were used at night for securing the doors.

It is known that there was glass in Pompeii, not only for domestic utensils, but also for use in windows. It was, however, rarely used, in consequence probably of its great cost. Some of the rooms in the public baths had glazed windows, and the glass was found in fragments when the building was first excavated. It is of good quality, and ground on one side to prevent persons outside from looking into the baths.

In the museum at Naples there are great quantities of glass bottles and other vessels of the same material, all of which were found at Pompeii, and we may feel confident that so clever a people as the Romans were could not have employed glass for such purposes, without perceiving its advantages for windows, when they wished to admit light, while excluding the external air. Indeed, during the later times of the Roman Empire, there is reason to believe that the walls of the great public baths were lined with glass, as well as marble, and even decorated with mirrors. In connexion with this subject it may be here stated that in addition to glass vessels, almost every conceivable household utensil has been found at Pompeii, and among them portable fireplaces, braziers, and contrivances for heating water.

In the houses generally there are no fireplaces or other permanent arrangements for warming, and it is difficult for us to understand how the people can have lived in health or comfort in these slight dwellings, with their courts uncovered and exposed to the vicissitudes of the climate, although the climate of the South of Italy. The latter is, of course, very different from our own; but in winter time the modern Neapolitan is glad to welcome the comforts of fire and warmth, which in northern countries are more constant necessities. Moreover, the climate is far from unvarying; there is sometimes a great amount of cold, and I have myself seen a fog at Naples which would have stood comparison with one on the banks of the Thames.

It is possible that the Romans were of a hardier and more enduring constitution than their descendants; but though this may, perhaps, have been the case in the Spartan-like days of the Republic, it can scarcely be contended for in respect of the later time, of which we have been treating.

From the general absence of warming arrangements in the houses, and the paucity of the portable contrivances that have been discovered, it is evident that, as a general rule, the Pompeian people lived without these comforts. This, moreover, was not because they knew nothing of them; for in their baths they had in actual practice an admirable method of heating rooms, which has often been thought worthy of imitation. Not only the floors, but the walls, and sometimes the roofs, were built hollow, and riddled with flues, into which hot air was conducted. By this means the whole of the apartment to be heated was surrounded by an envelope of warm air, which kept the inner surface of the room of a constant and uniform heat radiating in all directions. You will have noticed the small size of the rooms in the houses, and this may be connected with the fact of absence of artificial methods of heating them. The bedrooms, in particular, are very contracted, and without windows. The only possible access for fresh air, or egress for vitiated air, was the door, which opened into the atrium or the peristyle. The doorways were usually of good height, and may probably have been fitted with doors divided horizontally, after the manner of our stable doors in England. With these doors partly shut, and with a well-covered couch, it is possible that the sleeper might bid defiance to the cold; and it may be remembered that no less an authority than Miss Nightingale has declared that, except in cases of particular diseases, patients in a hospital may sleep with impunity in a room with windows open, in the coldest weather, provided that their beds are sufficiently covered.

It is possible, moreover, that temporary means of covering the open *atria* may have been resorted to. The *velarium* was the well-known contrivance for this purpose in the theatres, and there would be no difficulty in applying the same principle to the more easily managed dimensions of private houses. By this expedient, or even by movable shutters, the short-lived rigours of a Southern winter may have been conquered or evaded. In Malta, whose climate is not very different from that of Pompeii, such expedients are commonly used, and may probably have descended, with other traditions, from Classical times.

Another defect, to our eyes, in the arrangements of these Roman houses, is the utter want of privacy which they involve, according to our understanding of the term. Small rooms all round a central semi-public hall, or court, with no means of admitting light, save an open door, or a borrowed light over it, are certainly very far from our idea of domestic comfort. On entering one of these dwellings, such as, for example, the house of Pansa, the eye ranged freely over almost the whole of the building. Curtains were probably employed in winter, and when warmth or privacy was desired. At other times, the interior was open to view throughout, as shown in the drawing I have placed before you, and the effect of the vista, with its intermediate screens of columns, must have been very pleasing.

The Romans led far more of a public life than we do, and practised more uniformity and simplicity in their domestic customs. There was, therefore, a more constant surveillance of their private life, by the public opinion of their day, than modern feeling would tolerate. In the primitive days, any excess of luxury by a private person, however eminent, was repressed by opinion, and even by law; and from the manner in which the public were allowed access to the interior of private residences, no one could calculate on his habits escaping notice.

The men, at any rate, accepted this state of things, and contented themselves with securing a greater amount of privacy for their wives and families. The women's apartments, in a wing, or *gynæconitis*, were kept well apart from the rest of the house. In connexion with them were the kitchen and offices, often arranged round a court, after the usual plan. Here the ladies of the family might reside in something of the seclusion of an Eastern harem.

Having secured a quiet retreat for the female members of his family, the Roman was contented to live very much in public, and perhaps it is not always borne in mind that our present requirements of perfect domestic privacy are of very modern date. They were unknown in Mediæval times, and in the palaces of Italy and France the rooms often communicate with and through each other. The same idea of arrangement obtains in old English mansions, and it is not many years since a modern architect was employed to add separate passages of communication to the palatial mansion of Burghleigh, so as to prevent the necessity of passing through one room to reach another.

With us, the love of privacy may, perhaps, be carried to an extreme, so as to degenerate into selfishness and disregard of the public good. Public life is now more and more confined to a special class, and the rest live to a greater degree for themselves than was the case with the Romans. Excessive consideration for the luxuries of domestic life easily leads to forgetfulness of the demands of public duty or patriotism. What might not this London of ours become if some of the vast stores of public wealth were opened for its adornment or improvement, which are daily expended in evanescent show, and the costly baubles of fashion?

In considering Roman times and habits, we may pride ourselves, and pride ourselves justly, on improvement wrought by the influences of a higher sense of moral responsibility. May it not be possible, however, that something has been lost, and that our private virtues would lose nothing if more constantly associated with that care for the State which the public life of the Greeks and Romans was so well calculated to foster and develope?

To build a bridge, to give water to a city, to erect a great public work, might well add lustre to the proudest title, and secure for an honoured name the gratitude of millions yet unborn.

In their extended empire, in their love of justice, and in their Imperial qualities, the Romans were not, as we think, without resemblance to our own countrymen. At first, a simple, hardy, and rude nation of soldiers, they became first the conquerors of the world, and then enfeebled by the consequences of their own victories.

In their later times, a corruption of public and private virtue led to stagnation, decline, and fall. Power was used for unbridled excesses, and the very sports and amusements of the people were stained, as we have seen, by cruelty and bloodshed.

In these respects history is an open book for us. The softness of modern manners, to say nothing of higher influences, will never allow a recurrence to the grosser forms of Roman decadence. The danger is in a different direction, and may well become manifest when care for public duties may be obscured by the pursuit of private gain, and each considers it the duty of another to support and defend the State.

It is impossible to wander through the deserted streets of Pompeii without some such thoughts as these on the contrast between the present and the past. We can there picture to ourselves a life, unlike our own indeed, but still one in which all humanity can sympathise. We can study the habits of the people in their streets and temples; their law-courts, baths, and theatres; their shops and daily business; their games and amusements. To the architect the ruins around him will teach many a lesson, clear up many a mystery. By the general student an even more extended interest may be felt, for he knows that the worthiest object of study is Man, and will ever remember the words of the Preacher,—"*The thing that hath been, it is that which shall be; and that which is done is that which shall be done: and there is no new thing under the sun.*"

A BIRD'S EYE VIEW OF THE RAILWAY COMPANIES.

FURTHER LARGE OUTLAY ON EXTENSIONS.

The conclusion of the half-yearly meetings of the several railway companies which have been held within the last few weeks enables us again to pass in review the operations of these various corporations during the half-year ending with December last, and also to give some particulars of the still further expenditure on new works during the current half-year, which a constant and steady increase of traffic renders necessary. A striking and favourable feature in the reports of all the companies is the large increase of traffic, and general development of the several undertakings, which makes the expenditure of an enormous amount of further capital on new lines and station buildings imperative.

The traffic of the *London and North-Western line*, during the half-year, amounted to 4,764,348*l.*, as compared with 4,645,499*l.* during the corresponding half-year of 1874, showing an increase of 118,849*l.* In addition to a very large outlay now being incurred on works in progress, the sum of 464,360*l.* was granted to be expended on other new works during the current half-year. Of this amount 118,000*l.* are for the enlargement of the Liverpool-road Goods Station at Manchester; 26,790*l.* for new carriage-sheds at Crewe; and 100,000*l.* for additional engines and carriages. Referring to some portions of the heaviest new works in course of construction, the engineer's report stated that the greater portion of the excavation has been removed from the ends of the new tunnel at Primrose-hill, and that of the total length of 1,180 yards of tunnel, 400 yards are finished. The widening of the line for four lines of rails, between Willesden and Bletchley, is finished as far as Tring, and the portion between Tring and Bletchley will be completed during the present month. An additional double line has also just been completed between Stafford and Crewe. Adverting to the very large extension of the Lime-street Station at Liverpool, the engineer states that 150,000 cubic yards of excavation have already been removed from the site, and the conversion of the tunnel between Lime-street and Brownlow-street into an open cutting has been commenced. The enlargement of the goods stations at Waterloo and Wapping, Liverpool, is nearly complete; and at Holyhead, the coffer-dam for the enlargement of the inner harbour is complete, and the

contractors have made every preparation to insure rapid progress with the excavation and masonry during the spring and summer. On the Betts-y-Coed and Festiniog line, one shaft of the Festiniog tunnel (3,872 yards in length) is sunk to the full depth of 190 ft., and the other two shafts, which are to be 417 ft. and 430 ft., are already to a depth of 309 ft. and 396 ft. respectively. For the extension of the Great Southern and Western Railway to the North Wall, Dublin, about 510,000 cubic yards of earthwork have been removed, leaving 60,000 cubic yards yet to be excavated. The ironwork for the bridge over the river Liffey is being fixed, and of the 750 yards of tunnel under Phœnix Park, 680 yards are finished. Contracts have just been entered into for widening the railway between Longsight and Ardwick, in Manchester, for six lines of rails; and also for the erection of a goods warehouse at Broad-street Station, London. Jointly with the Lancashire and Yorkshire Company, the company are about to expend 250,000*l.* on the rebuilding and enlargement of the Preston Station.

The proceedings at the meeting of the *Midland Company* showed that on the half-year's traffic there was an increase of 133,320*l.* as compared with the corresponding period of the previous half-year. The company expended during the past half-year 2,081,000*l.* on new works, and the further outlay on similar works for the current half-year was estimated at 1,650,000*l.* Of this sum 272,000*l.* are for the erection of new workshops at Derby. The chairman stated at the meeting that that costly building, the St. Pancras Hotel, was now completed, and that in a short time it would be fully opened for business. He added that the directors were satisfied, from their experience already, that it would not only pay a moderate interest on its outlay, but would also be largely conducive to the traffic on the line.

The *Great Northern Company's* traffic for the half-year also shows an increase, being 1,538,915*l.* against 1,493,953*l.* during the corresponding half-year of 1874. The report states that satisfactory progress has been made with the new Copenhagen Tunnel, near King's-cross, and that plans for the formation of an additional tunnel at Maiden-lane have been prepared by the engineer, and that the works will be commenced without delay. The directors state that the increasing business of the company necessitates further outlay from time to time for rolling stock, and at the meeting 92,615*l.* were granted for this purpose. The report also stated that on lines in course of construction in Nottinghamshire, Derbyshire, and Yorkshire, the expenditure during the half-year was 364,882*l.*, and it might be anticipated that this rate of expenditure would be continued, and, probably, slightly increased, until the company's engagements for the construction of new lines were completed. The total cost of these is estimated at 2,500,000*l.*

The traffic on the *South-Eastern line* during the half-year showed an increase of 52,000*l.* as compared with last year. The most interesting portion of the proceedings at the meeting of this company was the reference made to the proposals for improving the harbours of Folkestone and Boulogne. As regards the latter project, the chairman explained that they proposed to extend and improve the harbour of Boulogne, and the department of the French Government which had the control of all Government engineering had intimated their readiness to approve of a plan, which was simply a modification of their own, and should this plan be finally adopted he expected that a proposition would be made to the company to lend the Government of France a limited sum of money to improve the harbour: and he was ready to accept the security of the Government of France for a four per cent. guarantee. By getting the harbour opened they could secure, by the route of Folkestone and Boulogne, a large majority of the traffic between England and the Continent. Adverting to the improvement of the harbour of Folkestone, which had been strongly urged upon the board by several shareholders, the chairman said the question of improving the harbour of Folkestone was a matter of very great importance, but he thought it should only be done when they were perfectly sure and convinced that the funds would be forthcoming for improving the harbour of Boulogne. He thought they ought to continue to do all they could to get the harbour at Boulogne improved, and then, when they saw that was certain, to do something with respect to the harbour at Folkestone.

At the meeting of the *London, Brighton, and South Coast Company*, the chairman stated that the average annual increase of the traffic of the company during the last five years was seven per cent., the increase being about 120,000*l.* in each year. He predicted a continuous increase of traffic at the same rate for several years to come, observing that as long as London continued to grow and increase in wealth and population, Brighton and the other places upon their line were sure to grow also. When the business of a company increased by more than one-third in amount it was obvious that it could not be worked with the same capital as a small traffic. He then explained that the directors proposed to raise and expend a further capital of 600,000*l.* in new lines and other works, a proposal which was sanctioned by the shareholders.

At the meeting of the *Great Eastern Company* the directors reported an increase of traffic for the half-year, but only to a small extent, amounting to 13,055*l.* With regard to further expenditure, the chairman said that although they had expended a very large amount in doubling lines and the improvement of stations, they had yet a great deal more to do in that respect, and they should from time to time expend more money upon these improvements. With respect to the extensive works about to be carried out at the Bishopsgate-street station, he remarked that one of the objects in making the Liverpool-street Station was to provide accommodation for the goods traffic. They had a large space cleared at Bishopsgate, which would make, he believed, one of the best stations in London. It might not be the largest in point of area, but its position and contiguity to the business parts of the City, and its easy access to the docks, would undoubtedly make it one of the most convenient and valuable goods stations in the metropolis. In addition to the conversion of Bishopsgate Station they wanted also a number of new small stations, and for these purposes from 100,000*l.* to 150,000*l.* would be required. He added that the Continental traffic involved improved works, and a large new quay at Harwich, the construction of which the directors proposed to undertake. The meeting confirmed the proposal for the expenditure on the above-named works.

The report and proceedings at the meeting of the *London, Chatham, and Dover Company* disclosed the same increase of traffic during the past half-year which has characterised the different lines already named, the result of the half-year's working showing a receipt of 563,179*l.*, as compared with 542,915*l.* for the corresponding period of 1874. The report states that during the next two or three years it will be necessary to incur considerable additional expenditure in the provision of further accommodation and material for the growing traffic of the railway. The income of the company is now suffering from the want of such outlay. Extensions at several of the stations on the line have become indispensable, and to secure a punctual and efficient service, a large quantity of additional sidings at various points must be constructed. The chairman stated that the total estimated outlay for the proposed new works was 350,000*l.*, and the directors wished for power to raise 500,000*l.*, which the meeting granted.

The report submitted to the shareholders of the *Great Western Company* showed the receipts for the past half-year to be 2,918,546*l.*, as against 2,859,804*l.* for the corresponding period of 1874, increase 58,742*l.* The report also stated that the heading for the Severn tunnel had been driven to a distance of 667 yards from the shaft, and was now within 151 yards of the "shorts." The material was still the same hard and strong Pennant sandstone mentioned in the last report. The chairman stated that with regard to the heading there was nothing to cast any doubt on the success of the operation. The meeting sanctioned the expenditure, during the current half-year, of 246,185*l.*, in additional works and rolling stock, which included 33,000*l.* for new passenger stations at Cardiff and Swansea, and a new goods station at Bath; 10,000*l.* for the extension of carriage-shops at Swindon; 36,000*l.* for increased station accommodation at several towns and other places along the line; 6,000*l.* for new stables at Paddington; 3,000*l.* for a bridge under the line at Cardiff; and 2,375*l.* for refreshment-rooms at Westbourne-park station.

At the meeting of the *South-Western Company* the chairman stated that there had been a steady increase in the traffic, which was not to be attributed to any exceptional cause, but was a *bonâ fide* development of traffic. The revenue for the half-year showed an increase of 59,338*l.* over the corresponding half of 1874. The report detailed the progress made in the construction of new lines going forward in the neighbourhoods of Portsmouth, Southampton, Winchester, and other places, and stated that the Clapham Junction improvements were approaching completion. The chairman said an improvement was about to be carried out at Nine Elms, by diverting the rails southward, and taking in the engine-shed into the goods yard. The works had increased to such an extent that they had one part of the goods traffic on the south, and another on the north, which was inconvenient and expensive.

The reports and proceedings of the *Metropolitan* and *Metropolitan District Companies* showed that there was an increase in the traffic receipts of both lines for the half-year, as compared with 1874, the increase on the Metropolitan being 20,500*l.*, and on the Metropolitan District 19,761*l.* The chairman of the Metropolitan Company stated that the surplus estate brought in 55,000*l.* a year; and the report of the Metropolitan District Company stated that during the half-year the sum of 61,942*l.* had been received from the sale of surplus lands.

At the meeting of the *North London Company* it was stated that the fourth line into Broad-street Station was nearly ready for opening, and that during the half-year considerable progress had been made with the excavation and walling for the new dock at Poplar, which would cost 100,000*l.*

The chairman stated, at the meeting of the *East London Company*, that the line between Wapping and Liverpool-street was now almost completed, and was expected to be opened on the 5th of April. The company had paid the London and St. Katherine Docks Company 45,000*l.* penalties, in settlement, for the prolongued occupation of their property. The Dock Company originally claimed 141,200*l.*

The *Lancashire and Yorkshire Company's* report, and also that of the *Manchester and Sheffield Company*, show a large increase of traffic, and that of the former company details the progress being made in the construction of several new and costly lines in various districts in the two counties. The chairman of the company also stated that they were about to widen the line into the Exchange Station at Liverpool, and to enlarge that station, at a cost of 587,000*l.*

MOVEMENT IN INDIA.

ARRANGEMENTS are being made by the Government of India for a complete archæological survey of the whole country; and General Cunningham, who will be entrusted with the duty of conducting it, has issued a circular to the various local Governments, requesting information as to the origin or derivation of the names of noteworthy places, the date of their foundation, the extent of the ruins, the nature and colour of the materials used in building, the form, size, style, and ornamentation of each building, and its history and probable cost, with detailed plans and sections if possible. General Cunningham divides the archæological remains of India into two periods,—Hindu from B.C. 1000 to A.D. 1200, and Mahomedan from A.D. 1200 to 1750. Hindu architecture during the Mahomedan period is distinguished as Modern Brahmanic. The strictly Hindu period is divided into five groups, and the Mahomedan period into eight classes. The divisions of the Hindu period are, first, archaic, which comprises the earliest remains, funeral mounds, earthen barrows, cromlechs, monoliths, stone or bronze implements or weapons, and silver or copper "punch-marked" coins. This period extends from B.C. 1000 to B.C. 250, or from the age of Menu till after the Greek invasions. The second or Indo-Grecian period covers about 200 years, and includes such relics as the Asoka rock inscriptions. Next comes the Indo-Scythian, including the Buddhist cave monasteries and temples; then there is the Indo-Sassanian period of four centuries, terminating A.D. 700, and including some of the structural temples of Buddhist construction. Last of all is the Mediæval-Brahmanic. In the return made by the Madras Government attention is specially called to the ruins of the city of Vijianagar, which are situated on the south bank of the Thungabadra river, about thirty-six miles north-west of Bellary, and cover an area of nearly nine square miles. There are still in tolerable preservation some fine temples, elephant stables, the remains of a zenana, an arena

for wild-beast combats, and some large monolithic statues,—one of the god Siva, about 35 ft. high. A monolithic trough near the arena for watering the beasts measures 41 ft. by 3 ft. by 2 ft., and one of the temples contains a remarkable stone carving of a car and elephant, 30 ft. high. In General Cunningham's scheme of work he has divided the whole of India into five provinces of nearly equal size, and each of these again is divided into three sections, and each section is to form the work of one party for a year. At the same time, orders have been issued to prevent the indiscriminate destruction of ancient buildings, but this will not be easily accomplished unless special custodians are appointed. Meantime the Government itself does not display so much archæological zeal as we might expect when it propounds a scheme like this. A collection of 165 pieces of sculpture dug out from the ruined monasteries of the Peshawur valley, by General Cunningham, is lying in packing-cases at Lahore ready for despatch to Calcutta, but nobody seems willing to pay for their removal or to superintend their transport.

The Indian journals assert that a new railway is proposed from Alexandria *viâ* Cairo to Massowah,—a line which would bring India within a fortnight's easy journey of England.

The united Masonic bodies in Bombay intend to build a new Masonic Hall, which will cost about 15,000*l*. There will be a large hall, independent of the purely Masonic portions of the building, which will be available for concerts and other public purposes.

The Government of Bengal are endeavouring to establish an art-gallery in connexion with the Calcutta School of Arts, to be filled with copies of good pictures in Europe.

The Burmese master of the mixed school at Chounzone, in the island of Beloongyoon, is introducing a novelty into female education by training a batch of girls to become land surveyors.

The Madras Government has decided to drain the Colair Lake to the lowest possible level by extending the existing calingulah.

The north groyne of the new Madras Harbour Works is progressing into the surf at the rate of 20 ft. per day, and additional plant is expected from England and Kurrachee, which will enable operations to be prosecuted much more rapidly.

Some of the Indian journals contain long descriptions of the new Phulbagh Palace, which Scindiah made such herculean efforts to get ready for the reception of the Prince of Wales at Gwalior. The structure, which is almost an exact imitation of Buckingham Palace, stands on the north-west of the fortress, on ground which is slightly raised above the Lushkar, or native city of Gwalior. The grand drawing-room, which is furnished in the best European style, will accommodate 2,000 persons. The grounds attached to the palace are very extensive, and are laid out in the Italian style. They greatly excited the admiration of the "special" of the *Bombay Gazette*, who says:—"They are entered from the Morar cantonments through a large ornamental arch, from which a road, shaded by trees, leads directly to the palace gates. Smaller roads branch off to the right and left, and lead through park-like meadows to large roads, which run close to the outer walls, which inclose an expansive square. Pretty little houses are placed here and there in the centre of groves or flower-beds. Towards the centre of the grounds there are ornamental pieces of water, studded with islands and summer-houses, and at certain portions of the embankment the water is permitted to fall over into lakes on a lower level, forming cascades. On the embankments marble statues of nude figures stand among the shrubs and trees. Beneath some spreading banyan trees there are little marble platforms with the backs beautifully fretted, and from marble couches on these the luxurious idler can obtain pleasant views of the falling waters and the surrounding wealth of trees and flowers."

The Liverpool Water Supply.—A meeting of the special committee of the Liverpool Corporation was held last week. The project of procuring a supply from Ullswater, in conjunction with Manchester, was again reviewed, and the *pros* and *cons*. brought prominently forward. The Windermere scheme was likewise considered at considerable length, and after a long and animated debate a resolution was carried that Windermere should have the preference over all other gravitation schemes.

TESTING THE FROST-RESISTING POWERS OF STONE.

M. Husson has communicated to the French Academy of Sciences, the following rules for testing the frost-resisting powers of stones, as the result of long practical experience:

1. The samples of stone should first be thoroughly dried in an oven, so as to get rid of all the moisture contained in them.

2. The sulphate of soda test-solution should be prepared at a temperature of 32·75° C. (91° Fahr.), and at the maximum strength, viz., 322·12 parts of soda sulphate per 100 parts of water.

3. The samples of stone should be completely immersed in the solution, which should be slowly raised to a temperature of 32·75° C. (91° Fahr.), and kept thereat until air bubbles are emitted from its surface.

4. The bath, with the samples in it, should then be placed in some colder medium. Each sample should then become the nucleus of a collection of sulphate of soda crystals. If these crystals take a needle shape, as they sometimes will, the experiment must be begun afresh.

5. If a sample treated as above opens or splits, or disintegrates under a slight pressure, the stone must be rejected. If it resists, there must not be undue haste in assuming that the stone is good. Sometimes the tendency to split will not show itself before the end of seven or eight days, under the influence of some slight change of temperature. It is, therefore, well to place the samples, after they have been in the soda bath, in a cylindrical glass vessel, which should be stood in some refrigerating liquid for the requisite time. If the stone bears all these tests, it may be regarded as of good quality, and fairly frost-proof.

In winter time, the following will be found a more reliable method. The sample of stone should be immersed in water of 15° C. (59° Fahr.) for twenty-four hours. When it is well soaked, it should be taken out, and exposed to a temperature of 4° to 8° C. (39° to 46° Fahr.). Then, every day pour boiling water upon it, three times a day. When this test has been repeated for four or five consecutive days, if it be found that the stone withstands all the changes of temperature to which it has been exposed, it may be pronounced of good quality in respect of its powers of resisting the action of frost.

THE NEW OPERA HOUSE AT BUDA-PEST.

The want of a house for opera, which has hitherto found a home in the national theatre, has long been felt at Buda-Pest, but the execution of the plan was taken up in real earnest only recently. The Government took the first steps in 1873, by appointing a commission for carrying out the works. Previously the municipality had voted a sum of over 40,000*l*. for the purchase of a site, and a large sum for the works had besides accumulated, mostly through the liberality of the Emperor-King, who yearly provides most bountifully from his civil list for the promotion of art. Nikolaus Ybl, a native of Buda-Pest, from amongst six called upon to submit plans, was the architect chosen.

His building, in the Italian Renaissance style, has a pleasing appearance. The site chosen for it is the square known as the Herminenplatz. Its principal front will be in the Radialstrasse, an entirely new street, which, when finished, it is affirmed, will be one of the longest and straightest boulevards of any city. The carriage approach is at the principal front, while at the western front is that for the court, and at the east that for the administration. There are, besides, four entrances for the general public. In cases of fire, moreover, two other exits from the pit may be thrown open. Round the grand vestibule are grouped guard-rooms for military and police, rooms for the officer of the guard, superintendent of police, and surgeon, as well as money-takers' boxes and porters' room. There are two auxiliary flights of stairs besides the principal staircase. The auditory is calculated to contain 2,059 persons. The stage is over 120 ft. deep, 60 ft. being taken up by the proscenium, the width of the latter being 40 ft. The space adjoining the stage contains in five stories all the localities required in a large opera-house. In the cellars are heating apparatus, coal and wood stores, workshops for joiners, engineers, &c., dressing-rooms for "supers," work-room for engineer-in-chief, living-rooms for the fire brigade, &c. On a level with the street are dressing-rooms for the choirs, and two tuning-rooms for the musicians. The entire rear part is used as a store for the decorations. The dressing-rooms and foyers are in close proximity to the stage, and the first floor contains a fire-proof library and property-room; the second, the rooms for the administration; the third, rooms for the stage-managers and different officials, besides four rehearsal-rooms for the singers, and one for the ballet, another for general rehearsals, and so on; the fourth story contains the workshops for the costumiers, and the store-rooms for the wardrobe and jewelry, armour and weapons, furniture, &c.; and the fifth, finally, a painters' fire-proof room, and a lift by means of which painted scenes may be let down at the back of the stage.

It should be added that great care has been bestowed on the subjects of ventilation, warming, and lighting, always surrounded with difficulties in a theatre, as well as the delicate question of acoustics. Great endeavours have likewise been made to protect the building against fire. It is intended to confine possible outbreaks of fire to the part where they originate by fire-proof walls, iron doors, and wire curtains.

The original estimate for the building was 200,000*l*., but it has since been raised to 300,000*l*., including the complete fitting up of the interior. It is expected that the building will soon be completed.

ART TREASURES EXHIBITION OF NORTH WALES AND THE ADJACENT COUNTIES.

The proposed Exhibition at Wrexham in 1876, opening simultaneously with the Eisteddvod, and to remain on view for two months, is making good progress. Mr. William Chaffers is appointed superintendent and honorary secretary.

The object of the proposed exhibition of art treasures at Wrexham is to enable those persons who have not the facilities of inspecting the choice examples preserved in the mansions of the wealthy and intelligent nobility and gentry in this country an opportunity to study them under one roof, and bring them as it were to their very doors.

The aim of such an exhibition as is proposed should be to present to the working classes an opportunity of improving and cultivating the intellectual faculties of the mind, by observation and comparison, and moreover to arouse within them a sense of the refining and ennobling influence of art in all its branches, decorative, pictorial, or ornamental.

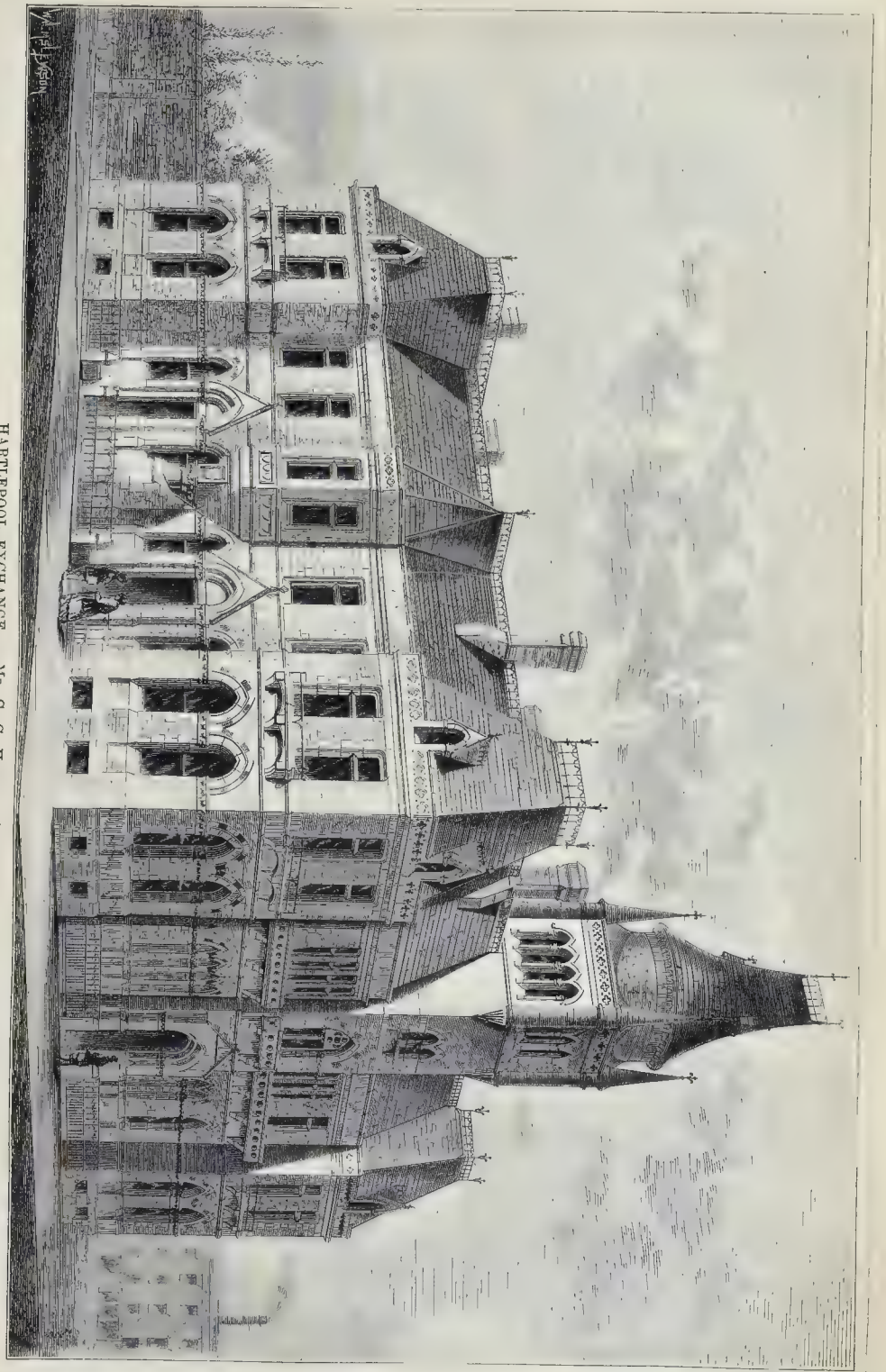
Arrangements will be made for the display of paintings and drawings by the old masters, illustrating as far as practicable the various Schools of Italy, Germany, Spain, Holland, Belgium, England, France, &c. In the English school it will be desirable to bring together the paintings of the great Welsh painter, Richard Wilson, whose works are much scattered, and the committee trust to the generosity of the possessors to consent to their being lent. Another portion of the building will be allotted to the works of modern artists.

The superintendent suggests the formation of a gallery of "Welsh worthies" as a distinguishing feature of the Exhibition, consisting of portraits of noble and illustrious persons born or resident in the Principality, and we hope this will be carried out.

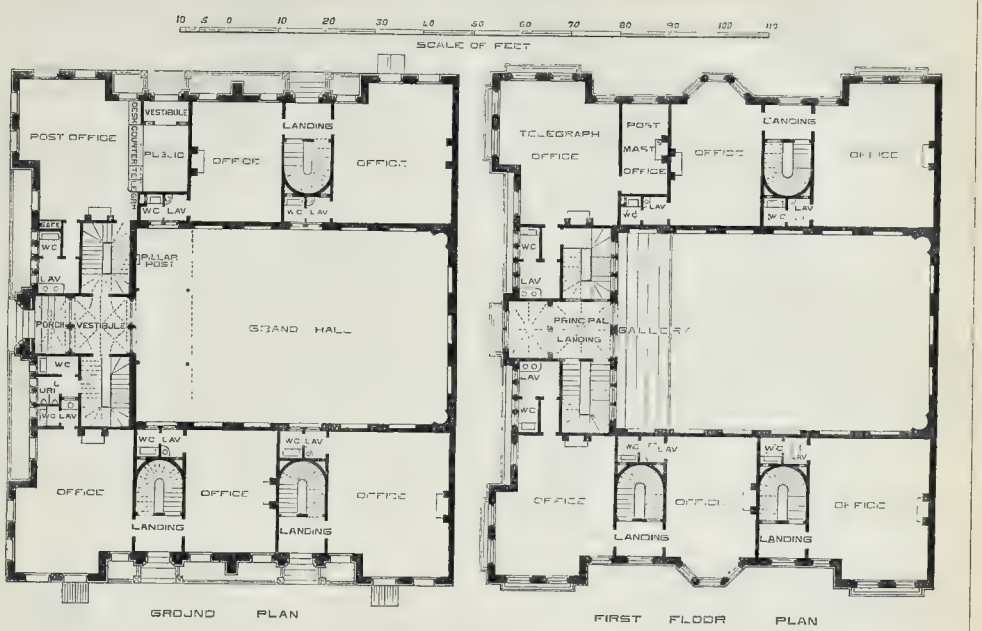
Newhaven (N.B.) Harbour Improvements.—The work of improving Newhaven Harbour, which was projected some time ago, and for which powers were subsequently obtained by the Leith Dock Commission, has now been fairly commenced. The execution of it has been entrusted to Mr. Morrison, contractor, and a large staff of men will shortly be employed in the work. Preparatory operations have been completed, including the erection of extensive shedding, storehouses, office, forge, &c. A number of men are also at work, during both day and night tides, squaring and forming into a foundation the loose stones deposited by the fishermen about twelve years ago. This portion of the work will form, when completed, the western arm of the harbour. The pier will still be the protection from the easterly storms, but to render it more effective for this purpose, it is to be extended in a northerly and westerly direction over 100 ft.



THE NEW OPERA HOUSE, BUDA-PEST.—Herr Nikolaus Ysl, Architect.



HARTLEPOOL EXCHANGE.—Mr. G. G. Hoskins, Architect.



HARTLEPOOL EXCHANGE.

HARTLEPOOL EXCHANGE.

EARLY in 1872 the directors of the Hartlepool Exchange invited twelve local architects to submit designs. The selected one was by Mr. G. G. Hoskins, of Darlington.

The building has three principal fronts. The one on the north has a tower and angle-turret breaking the sky-line. The materials are red pressed brick, with stone dressings. The Post-office and the North-Eastern Bank have taken offices in the building.

THE STAINED WINDOWS OF FAIRFORD AND ALBERT DÜRER.*

IN the course of this paper, I propose to compare the chief outlines of these beautiful windows with some of the salient features of Dürer's character, and to show you that it is extremely probable that he designed the whole and executed a part of the paintings; in short, I hope to show that the authorship of that master is based upon sufficient evidence. I intend to take *an entirely independent course*, and to treat the question solely on its merits. When I began to study it, if I had any bias at all, the bias was rather against, than in favour of, the authorship of Dürer. It was the view of the evidence which led me gradually to the conclusion I now hold. Hence I think I may be fairly allowed to claim the love of truth—rather than enthusiasm for a favourite master—as the guiding star and light of my path, not less to-day, than in the past. In consequence, I shall ask you, to accept my conclusions, so far only as they are supported by the evidence.

Fairford is a quiet town of East Gloucestershire, pleasantly seated upon the banks of the Colne. According to Leland, the place "never florished afore the cumming of the Tames onto it." The church belongs for the most part to the period of Late Perpendicular; it has considerable interest in connexion with the noble families whose patrimony was the Honor of Gloucester, of which the manor of Fairford formed part. The date of the church has occasioned me some difficulty, but my researches on this head have not been wholly without fruit. Leland, the antiquary, visited Fairford in the year 1543. At folio 22 of his *MS. Itinerary* he says:—"John Tame began the fair new chirch of Fairforde, and Edmunde Tame finished it." This is good as far as it goes, but it is not very precise, for he does not tell us what Edmunde's share in the work was. Hence it appears to me that nothing very exact as to the date of the glass can be inferred from this passage of Leland. Anthony à Wood visited Fairford more than once; in the year 1678, he writes:—"This church may compare with any country church in England. The windows also, considering the time when set up (about 200 yeares agoe) may compare with severall cathedrals." [Wood's MSS., D. 11, fol. 23, Bodleian Library.]

In the MS. collections of Dr. Parsons, Chancellor of Gloucester, from 1669 to 1711, is the following statement:—"The church was dedicated to the Virgin Mary, Hen. VII., 1493."* This is the earliest mention of any exact date which I have been able to find, and I see no sufficient ground for rejecting this statement, especially as it agrees substantially with Anthony à Wood's account. The date of the windows—whether we accept or reject the story as to the capture at sea—would naturally fall about the same period, and if we may judge from internal evidence, the windows belong rather to the close of the fifteenth, than to the beginning of the sixteenth, century. This opinion has been formed both from a comparison of the armour and costumes with armour and costumes of the fifteenth and sixteenth centuries, and from a comparison with the glass at Nürnberg and Cologne. The windows were designed to form a single whole, complete in itself; hence, in my opinion, the plan must have been designed by a single mind, but that, probably, a master-mind.

One source of the symbolism therein developed was, as no doubt you are aware, a most interesting block book called the "Biblia Pauperum." Yet the plan is by no means a servile copy from the woodcuts of that book. The "Fall," and other types from the Old Testament, the "Life of the B. Virgin," "The Redemption," and "The Last Judgment," form the leading groups of the subjects. The windows exhibit much analogy to the pictures, both of the German and of the Early Flemish School. The reason is not far to seek. Dr. Waagen tells us that through Roger Van der Weyden the elder, the school of the Van Eycks pervaded all Germany. Hence the co-existence of Flemish style along with admitted German details, is, I contend, by no means inconsistent with the authorship of Dürer, the artistic descendant of Roger Van der Weyden.

The characteristic beauties admired by all writers, with more or less of enthusiasm for over two centuries past, may be summed up in a few words. There we see at work the originality and poetry of a master-mind, displaying itself in the scenes of the dire and dreadful doom,—scenes at once fantastic and terrible,—in the rich and vivid colouring, the life and action of the figures, in the tenderness and devotional feeling, *in the domestic character*, and, lastly, in the exquisite finish of the details, seen in many of the pictures. Along with these characteristics, the style of the glass is entirely Mediæval and Catholic, thus contrasting with many works even of the early part of the sixteenth century.

I proceed to the proofs I have promised to lay before you. To begin, there is no improbability upon the face of it to bar the claim of Dürer, for he is well known to have been *a universal genius*, who succeeded in whatever he undertook; and, besides, he was sometimes very hard pressed for money, as he tells us in his own words. Then, if we have independent testimony from several sources to the fact of his having not only designed, but also painted windows, in that case the authorship will be rendered so far probable. Again, if the Fairford windows can be shown to be not only of German origin, but if they can be traced unmistakably to Nürnberg, then the probability will evidently be increased. Lastly, if we can find there manifest resemblances of design, of composition, of detail, to Dürer's known works; moreover, if we can find there *certain marks, specially belonging to him*; then I contend that the authorship of that master is so extremely probable that for all practical purposes it may rank as a *moral certainty*.

Out of a mass of evidence I have collected on the question, I now proceed to offer you what I conceive is sufficient to prove what I have advanced. In the north aisle of Cologne Cathedral there are five very fine windows attributed to

* By Mr. J. Powell. Read at meeting of the Royal Archæological Institute.

* MSS. Rawl. Collections, B. 323, fol. 114.

Dürer. Now there is the closest analogy, both in subjects and in the arrangement of them, between those five windows and these under consideration. This I shall show later on. Winston himself bore witness to this analogy by the fact that he mentions consecutively at pp. 113-114 of his "Inquiry" the seven east windows of St. Lawrence, Nurnberg, those five windows at Cologne, and the Fairford windows. Again, he remarks on the "panelled arrangements" at Nürnberg, and "similar arrangements" at Cologne. Thirdly, at p. 263, Cologne and Fairford are mentioned together a second time. And in the first-mentioned work he shows that the similarity is by no means confined to the arrangement, but is manifest in the character of the paintings, and in the progress therein rendered evident.

Mr. Macray, in *Notes and Queries*, of September 19, 1868, gives the following extract from Gessert (a German writer on stained glass):—"Neither from any notices on Dürer's part, nor by his contemporaries, nor from modern works which treat of his life and art, can any certainty be arrived at that he actually painted on glass. That he was reckoned among the masters of our art appears, however, from this, that he experimented, with German industry, in the most varied branches of art, and therefore could scarcely have wholly abstained from glass-painting, which at his time was flourishing in its utmost glory. Besides, in the drawing of many glass-paintings, the unmistakable style of this master has led to the opinion that he completed them in all their parts, while, perhaps, he only supplied the *carton*, an assistance which the most distinguished artists of that period did not disdain to give" (p. 135). The drift of this extract is to show that Gessert and others in Germany believe that Dürer at least designed windows.

M. Alexandre Lenoir, an authority in his day, having under his eye twenty windows from the desecrated church of the Temple in Paris, attributes them without hesitation to Dürer, in the following passage: — "These windows, designed and painted by Albert Dürer, are of very great beauty; they represent the most striking subjects in the life of Christ, from his birth to his death. A. Dürer, an artist born, put into this composition great energy and vivacity; the colouring is full of beauty and power; the drawing is correct, and the backgrounds are well arranged" ("Histoire de la Peinture sur Verre," pp. 28, 29). The same author also assigns to Durer the windows at Passy, of which he possessed one, and remarking on its grand style and fine colouring, concludes that these also must have come from the designs of a great master. Lacroix, in his valuable work ("The Arts in the Middle Ages," pp. 264-266, English edition), confirms and developes the testimony of Lenoir as to the windows of the Temple, and adds:—"The celebrated German did not work alone, other artists assisted him; and notwithstanding the devastation which took place during the Revolution, in many a church and mansion traces of these skilful masters may still be found." In fine, the engraving of an English window, of the time of Henry VII., seen last summer, bore upon the face of it undoubted marks of a Dürer origin.

I now come to the German origin of the Fairford windows, which I think I shall be able to trace unmistakably to Nürnberg itself. Not only does Winston admit the "Germanic" character of the figures, but in regard to the "panelled arrangements" mentioned by him at Nürnberg and Cologne, he is a valuable witness, for you will see them in these photographs of the Fairford windows. These panels are very rich. The slender shafts on either side are sometimes diapered, sometimes filleted and beaded, sometimes adorned with fleurs-de-lys in sunk panels. Now those details you will see a little more prominently developed in the windows at Cologne.

To sum up, the architecture of the windows, wherein Romanesque and Gothic blend happily together, is, then, decidedly German, and neither English nor Flemish, as distinguished from German. More than this, the intersecting circular tracery is seen in great perfection over Wohlgemuth's altarpiece, in the Church of our Lady at Nürnberg; the serpentine crockets and finials may be found in stained glass in the German Museum and at the Church of St. Lawrence, in the same city. The interlacing tendril cusping seen at Fairford and Cologne bears the closest analogy to the well-known *Sacramenthauslein*, or Tabernacle of Adam Kraft, in St. Lawrence, and the foliated heads crowned by the octagonal or squared abacus, are seen in the churches of Our Lady and St. Sebald, all at Nürnberg. For further proof of the Nürnberg character of these accessories, I beg to refer you to the correspondence with Mr. Underwood. Any one may verify these statements without the trouble of a journey to that interesting city; for in the *Nürnberg Chronicle* and *Schatzbehalter* (to be found in the British Museum) some of the more characteristic of these details will be readily seen.

But the resemblances between Fairford, Cologne, and Nürnberg, by no means end with the architecture, the similarity in the paintings themselves is very close and striking. Not only will you find the same subjects and the same manner of grouping them together, not only similarities of composition and similarities of detail, but certain of the figures are as nearly as may be identical, *Ex. gr.*: the angels at Fairford, Cologne, and Nürnberg; B. V. M. in the Nativity at Fairford and Cologne; the small Madonna in the tracery; the Goldsmith's tablets. The resemblances to Nürnberg are quite as remarkable, for the stained windows at the three principal churches there present the most striking points of analogy to Cologne on the one hand, and to Fairford on the other.

The limits of this paper forbid me citing more than one other example of the similarity between Fairford and Nürnberg. I found the peculiar treatment of the Fairford "Crucifixion," especially the angel and the demon receiving the souls of the penitent and the impenitent thief, first of all in a picture of Wohlgemuth's in the Chapel of St. John. But later on I found it actually, *in stained glass*, in the Church of St. Sebald. I regard the windows there and at St. Lawrence's as most valuable towards clearing up the question of the origin of the Fairford glass, for there we find examples of stained windows immediately preceding, of the exact period, and immediately succeeding, the Fairford windows.

The following is a detailed comparison of windows at Nurnberg with the Fairford windows and A. Dürer:—

St. Sebald's (beginning with north aisle of the choir).

Window III. is similar to Fairford in the rich crimson colour, in design and execution, and in the architectural ornamentation, such as filleted shafts, round-headed and Gothic arches, foliated and spreading capitals. Appears to be older than Fairford.

Window IV. is remarkably like Fairford in colours (crimson, green, and blue), and also (1) in composition, (2) execution, (3) details. The similarity of this window to the east window at Fairford is much more striking than of the Brussels "Crucifixion" (alluded to in 1868 by Rev. J. Fuller Russell) to the same. [We see there, *e.g.*, T-crosses; thieves bound to crosses of unworked wood with ropes; central figure nailed to cross of worked wood; angel and demon over penitent and impenitent thieves.] There can be no doubt that if the painter of Fairford and of this window was not the same he must have seen this, or some similar window or design.

Window VII. appears to be of the same date as Fairford. Figures of bishops similar to fathers of the church at Fairford. Similarity also extends to the mitres and copes, which are jewelled in the same manner, and the fingers of the hands are adorned with rings in both alike. This window (VII.) contains canopies similar to Fairford and Cologne,—a figure of St. Peter in the style of Wohlgemath, and a figure of St. Paul similar to A. Dürer's St. Paul.

St. Lawrence's (north aisle of the choir).

Window I., apparently of the same date as Fairford, contains many resemblances of design and detail to Fairford, with architecture like Cologne windows.

Window II. Renaissance. In this window may be seen A. Dürer's "Adoration of the Trinity" (Christ on the Cross. See *Waagen*).

Window III. A most important window, for it contains the most clear and close resemblance in its architecture to Fairford.

Widow IV., comes still closer to Fairford. Here is *the cruciform fleur-de-lys nimbus*, so prominent a feature of the former controversy. It has two different degrees of development, exactly similar to the same at Fairford.

Window VI. contains circular, ogival, and intersecting tracery, and other accessories similar to Fairford and Cologne (pointed out from tracing and photograph in two last instances).

Window X. comes nearest of all to Dürer. His influence here is evident; and, indeed, the modern restorations are actually after him. [An extremely fine window, though somewhat imperfect. The chief similarities to Dürer are in subjects, drapery, and fantastic tendencies. On the other hand, the peculiar architecture of Fairford is here surpassed, though the design and details of it are as nearly as possible *identical*.]

I will conclude this part of my subject by remarking that the analogy of these windows under consideration to the Nürnberg schools in the fifteenth century is evidenced and brought home very forcibly to the mind by the study, not merely of stained glass, but also by attention to the pictures, the carvings, the sculptures, and other works of art of that Mediæval city.

In coming to a most important class of proofs, namely, those attaching to Dürer himself, I must ask your indulgence if I weary you with details. One of my chief difficulties in preparation has been, not the want of evidence, but the vast amount of it: hence the absolute necessity of condensing it into the limits of one hour's reading. I commence, then, with the similarities of *design*, shown in the choice and arrangement of the subjects themselves. Dürer was too wise not to make use of the knowledge and experience of his predecessors. M. Berjean expressly says that he followed the general outline of the woodcuts of the "Biblia Pauperum," in his "Ascension," "Entry into Jerusalem," and "Apotheosis of Christ." That Dürer engraved a series of woodcuts on the "Life of the Blessed Virgin" is well known. Hence I contend that the analogy between the symbolism of the "Biblia Pauperum" and the grouping of the subjects together in types and antitypes at Fairford, and the fact that the identical subjects of the windows are found among the acknowledged works of the master, both point to the probability of his authorship. The similarities of composition, or arrangement of the various figures of the pictures, form proofs of a more striking character than those we have just now touched upon. While on this part of my subject, I am compelled by the nature of the evidence itself to allude incidentally to Wohlgemuth (Dürer's master), as well as to Martin Schon (virtually his master, and actually his model). The similarities at Fairford to both these masters are undoubted. It is in the pictorial windows, as distinguished from the figure and canopy windows, that these similarities in composition are principally observable. And in regard to the subject of "The Last Judgment," in the west window, the resemblances of the demons there to the same figures in Martin Schön's St. Anthony, was pointed out by Mr. Scharf, in *Notes and Queries* (Sept. 26, 1868). But the fact that such resemblances exist is no bar to the claim of the disciple of both these masters, and the disciple who is known to have copied one, at least, of them rather *closely* in some of the best of his earlier works. But I shall not be satisfied with the mention of Wohlgemuth and Martin Schön, but will point out to you similarity to Dürer himself. In the first place, the pleasing backgrounds often seen through an open window of some old building, the fantastic tendencies, the prominent attitudes, the violent motives of executioners and other figures, which are such evident features of the glass, all belong to Dürer. Secondly, to come to facts, the "Annunciation," the "Nativity," the "Flight into Egypt," the "Crucifixion," the "Taking down from the Cross," the "Resurrection," the "Last Judgment," and the subjects of the life of the Blessed Virgin, are all more or less similar in treatment, to the same subjects in Dürer's acknowledged works. Out of all these I will take one for special comparison. The "Annunciation" is extremely similar. The Eternal Father in the clouds, with rays of light descending, the Holy Ghost represented by the dove, the Blessed Virgin kneeling and facing the spectator, the angel, a coarse figure in full garments, the canopy, and the lily, are all found at Fairford. The similarities in detail to Dürer's known works are very remarkable. The realistic tendencies of the Van Eycks, of Roger van der Weyden, of Martin Schön were, it is well known, carried to an extreme by Dürer, as may be seen by a glance at any two or three of his works. Now this *realism* is manifested very plainly in the Fairford windows, and, moreover, it is (in innumerable instances) found exemplified in the identical details. The minute execution of the leaves of trees and blades of grass, the stones upon the ground, the details of the landscape

backgrounds, such as winding streams, woods, gardens, and the buildings seen therein, are all examples of this tendency. The attention paid to articles of furniture, and the wonderful execution of the goldsmith's and jeweller's work, might also be cited, but of these I intend to speak later. Again, the introduction of the wheel-barrow into the Fairford "Inferno," and the coarse figures of the aged Simeon, of Nicodemus and Joseph of Arimathea, of St. Joseph in the "Flight into Egypt," and of numerous secular figures among the grisailles, may all be cited to prove the realistic character of the details. The execution of many of these grisaille figures, which are found in the small openings of the tracery, would do no discredit to the more mature eye and hand of Dürer. Of these I may mention a very beautiful little Madonna, now misplaced in the west window, St. Margaret with the Dragon, and the Angels bearing various instruments of the Passion. The full and flowing drapery of the angel Gabriel, and the angular breaks and the peculiar curves of the drapery generally, also proclaim the hand of Dürer. The *Tau*-shaped crosses, especially the three seen upon Mount Calvery in the background, in the "Taking down from the Cross," are also shown in Dürer's works. And to come to smaller matters, the chalices, the tablet of Moses, the harp of David, the portcullis, the turban, all present similarities, small if taken singly, but which, nevertheless, when united together add to *cumulative force of the argument*. Lastly, not only did Dürer often use a nimbus or glory, but I have actually found the Fairford *fleur-de-lys* nimbus (combined with the rayed glory more usually seen) *among his works in the British Museum*.

I come now to certain specialities which, I think you will allow, belong to Dürer, and to him alone. The first is the monogram, which you see is something more than an A. Now, not only does his later monogram, wherein the D is inscribed, often resemble A.T.D. (*e.g.*, the carrying of the Cross, G. Passion, the Knight and the Lady); but we know that he actually wrote his own and his father's name, Albert Thürer, and in allusion to the meaning of the word, he sometimes used a double door as the *rebus* for his name. Secondly, the initials A. D. are found in the belt of a persecutor in the clearstory. These letters are not initials, it may be objected. I admit that were this the only instance in which these letters are found, and were it the only proof of Dürer's hand, it might be objected to as insufficient. But these very letters of similar form are found twice in the Nürnberg *Schatzbehalter* of the year 1491, in the production of which there is every probability that young Durer had a hand when he worked in the studio of Wohlgemuth, whose name appears in the book. The letters are found, as I have already pointed out in my letters to the papers, around the flower-pot containing the lily, the emblem of the Blessed Virgin. Subject,—the Annunciation. And then this is only one of many proofs of the master's hand.

Thirdly, there is a figure in a brown cap in the subject of the marriage of the Blessed Virgin, bearing great resemblance in the outline and the expression of the face to two of Dürer's portraits, taken by himself at the ages of thirteen and fifty. Two other figures also bear considerable resemblance to his own portraits. And the identical cap seen upon the head of the boy-artist of thirteen is found more than once repeated in the grisailles of the tracery (*e.g.*, in the window X. and I.). Now Dürer is known to have inserted his own portrait into his paintings, *e.g.*, he did so in this beautiful picture of the "Adoration of the Trinity." (See *Waagen.*) Hence I argue that all these figures furnish proof of Dürer's hand of a *very special kind*.

Lastly, there is found not only in the pictorial, but also in the figure and canopy windows, a remarkable profusion of goldsmith's and jeweller's work of admirable execution. Whether you study closely the subject of the "Queen of Sheba before Solomon," the "Assumption of the Blessed Virgin," the pearled caparisons of the horses in the window of the "Crucifixion," or the jewelled hands of the fathers of the Church, everywhere you will find the same profusion, the same taste in design, the same skill in execution. To what great master shall we look for all this, if not to the goldsmith's son, Albert Dürer, of Nürnberg? In fine, in the subject of the "Annunciation" is that very *tablet* which he adopted and made specially his own, the identical *mark* he must have *purposely* intended to distinguish *his handiwork*, for it is a *goldsmith's sign*.

At the risk of tiring out your patience, I propose now to reply to some of the chief objections which have been raised to the authorship. It has been urged that the windows, admittedly beautiful, yet show a want of "power," and an absence of correct drawing inconsistent with that authorship. But these objections can be readily answered. If there is such want of "power," how do we account for the encomiums passed upon these pictures by old writers and critics, from Anthony à Wood to Mr. Joyce and Mr. Jackson? Let us hear what Vandyck said about them. According to a MS. in the Bodleian*: "Sir Anthony Vandyck came to see Fairford windows, and told me the drawing was the work of A. Dürer." Hearne implies that King Charles I. came to see the windows with his gifted court painter, in these words:—"The most celebrated Sir A. Vandyck often affirmed to King Charles I. and others, that many of the figures were *so exquisitely well done* that they could not be exceeded by the best pencil."† These windows, you understand, are contended to be the outcome of Dürer's early work, when under thirty years of age. Now let us see if we cannot find some conventionally bad drawings in his works to set off against the same in the windows.‡ Indeed, the fact that the very defects of the master are found in the windows is a striking proof, in itself of no small weight. On examination of his works, we may find, in the first place, a great deal of conventional treatment derived from his predecessors,—a characteristic which shows itself, of course, more in his earlier works. Mrs. Heaton, in her "Life of Dürer," not only admits the faulty drawing and want of power visible in some of his works, but specially laments over his adherence to the conventional treatment of his predecessors in the "Last Judgment of the Little Passion," instead of giving us something more characteristic of his own inventive and original genius.

One of the chief defects of his earlier drawing is a defect of "foreshortening," that is, faces and other objects seen obliquely are more or less incorrectly drawn. [For proof, see his portrait of 1498,—hands and arm too large, also the nose giving the face an unnaturally wide appearance. A figure in the "Meeting of Joachim and Anne," St. Sigismund's.] He tells us himself that he made a journey to Bologna for improvement in perspective in 1506.§

I cannot close this paper without sketching a few of the chief outlines of the master's character, derived, on the one hand, from the best written sources, and, on the other, from a study of his works. Albert Dürer was born in Nürnberg in 1471, and died there 1528, thus living at a critical epoch,—an epoch of change and convulsion, for the Middle Ages ended during his life, and the Modern period began before his death. He was thus the bridge over the gulf separating the past from the present. In consequence, we find in his works three styles: the style of his predecessors, the style especially characterised by his own vigorous individuality, and the style adapted from the Italian masters.

Dürer possesses the poetry and originality of a true artist. Great power of imagination is one of his chief features, resulting in the terrible scenes of his "Apocalypse," as well as in the fantastic tendencies shown in his "Knight, Death, and the Devil." On the other hand, "the minute details of his execution bind him down to the earth." The exactitude of his copies from life place him in the foreground as the best type of German realism. "The expression he gives to joy, sorrow, and hatred, all seem to bear a manifest character of exaggeration. Upon the whole, however, *his beautiful colouring*, the skilful firmness of his drawing, his grand characteristics, his depth of thought, the poetry, often terrible, of his compositions, place him in the first rank of masters" [Michiels]. Again, although he fails in feeling for beauty and gracefulness of form, and his nude figures are often vulgar, and even ugly [Waagen], yet he shows in many works great tenderness and devotional character. He had a special attraction for *death* subjects and for *domestic* scenes, in which he is sure to portray exactly every article of furniture and other accessories of his subject, as witness his "Death of Our Lady," "Birth of St. John the Baptist," and others. The "Birth of Our Lady" exemplifies the same domestic scenes and accessories. A few words more and I have done. If you take the outlines I have drawn of Durer's character and compare them with the sketch of the windows given above you will note some remarkable points of resemblance. I will, however, call attention to the "Taking down from the Cross," the demon behind the fiery grate, the Assumption, the figures of St. Peter and St. Michael, the devils and Hell of the west window, and many of the Virgins of the series, as subjects and figures calculated, on the one hand, to do credit to the artist, whoever he was, and on the other to exemplify the characteristics I have pointed out. To sum up, then, I think I have not only shown you the points of agreement between two sketches, I have pointed out a number of special marks which could not well have belonged to any man but Dürer himself. In other words, in cases of this kind, where direct documentary evidence of a fact is wanting, similarities of design, of composition, of detail,—above all, the presence of special marks known to belong to a master,—so much, but no more, is held to be sufficient proof of a master's hand, therefore it should be sufficient in this case. As an illustration of the nature of the argument, we may take the fact that the cumulative force of the evidence from the strata of rocks is held to be sufficient proof of the geological periods, even though direct documentary evidence is wanting.

* *Notes and Queries*, Jan. 23, 1869. Quoted by Sir T. Warrington.

† See Roper's "Life of Sir T. Moore."

‡ A tracing of a dove from the windows was compared with several doves, exhibiting drawing conventionally bad in Durer's works.

§ Perspective includes "foreshortening."

THE RATING OF THE RAILWAYS IN THE METROPOLIS.

THE general assessment session just held has resulted in a considerable reduction having been made on the rating of several of the railways in respect of their lines and property within the metropolis, whilst, on the other hand, the rating of some of the great companies, more particularly in St. Pancras parish, has been largely increased. The rating of the South-Eastern Company in the parish of Woolwich has been reduced from 400*l.* to 340*l.*; in St. Martin's-in-the-fields, from 1,000*l.* to 500*l.*; and in Plumstead from 4,000*l.* to 1,792*l.* The London, Chatham, and Dover Company, who were rated by the Camberwell authorities at 2,150*l.*, have had this sum reduced to 1,250*l.* The North London Company, who were rated by the Poplar authorities at 180*l.*, have had it reduced to 120*l.*; in Bromley St. Leonard's, from 4,500*l.* to 4,000*l.*; whilst in the parish of St. Leonard's, Shoreditch, the rating of their line and buildings has been reduced from 30,052*l.* to 16,000*l.* The London and North Western Company, in respect of lines and buildings in the same parish, have had the rates reduced from 16,525*l.* to 9,048*l.*; and in Hampstead parish from 11,216*l.* to 8,250*l.* The rating of the property of the several leading lines in the parish of St. Pancras has been largely increased, the London and North-Western Company being now rated in that parish at 34,000*l.*, the increase in the assessment being 5,857*l.* The increase on additional buildings on the Midland line is 1,000*l.*, the rateable value of the Midland Grand Hotel alone being 3,500*l.* The rateable value of the Great Western Company's property in the parish has been fixed at 27,250*l.*, being an increase of 5,250*l.* The rating of the property of the Great Northern Company has also been largely increasing, the rateable value having been settled between the parties out of court. The property of the gas and water companies in St. Pancras parish has likewise been rated at a much higher amount than formerly. The rateable value of the Imperial Gas Company has been fixed at 25,000*l.*, increase 12,243*l.*, or nearly double its former amount. The New River Water Company, rateable value 15,220*l.*, increase 6,220*l.*; and West Middlesex Water Company, rateable value 2,500*l.*, increase 1,500*l.*, or about 75 per cent.

New Baths for Glasgow.—The directors of the Victoria Bath Company, Glasgow, have had under their consideration several competitive plans for the Swimming and Turkish Baths proposed to be erected in Butterbiggins-road, and, with professional assistance, have selected the designs furnished by Mr. T. L. Watson, which will, it is stated, be immediately carried into effect. The façade of the building will be two stories in height, with a projecting gable in the middle and octagonal oriels at each of the extreme angles, the style being of a Moorish or Oriental character. The cost is estimated at 8,000*l.*

HOUSES IN FLATS.

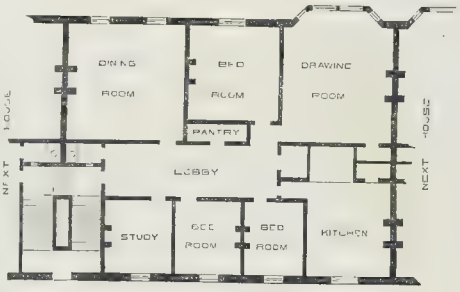
A TENANT'S RECOLLECTIONS.

It has happened to the writer of these lines to live in various countries, and in houses of widely different construction,—from a single-storied cottage in the Scottish north, and a "shielin" in a Highland glen, to a Genoese-built mansion in Pera, and a pole-supported dwelling in the wilds of Roumania, -from an ever-so-many-ieth-ième in Paris, to a semi-detached villa in London; but at no time has he ever enjoyed so much cosy comfort in a dwelling as he experienced in a "flat" in the money-grubbing city of Glasgow; and, with the permission of the conductor of this journal, it gives him pleasure to bear this testimony, and to add this trifling contribution to the discussion respecting the comparative merits of the horizontally and vertically constructed house. Mr. White, in his able paper, has explained every detail of the Parisian residence, from cesspit and basement to attic and Mansard roof; but it has been made questionable in the discussion which has since followed, whether, among English, or at least London, builders, more is not known about the houses of Paris, Lyons, and Marseilles, than about those of Edinburgh, Glasgow, and Aberdeen. Such references as have been made to the Scottish house have been so peculiarly off-hand that they leave an impression of ignorance, and an ill-defined notion that those who mention the tall "lands" of old Edinburgh so glibly have never been further than the close-mouths, and know more of the reception-rooms than of the general internal economy of a Scottish city home. It is partly for this reason that these lines are written, and partly for the real pleasure of reviving a very pleasant period of life, for the student-time is generally among the happiest of all.

Our household was a very small one,—the professional father, the darling mother, the student son, and a sturdy serving-maid to wait upon us. Now this is just the kind of family for which little suitable provision is made, as we afterwards found when we had to expend twice the money to secure no greater convenience or comfort. But in Glasgow we had no difficulty in getting precisely what we wanted, and that where we wanted it. We watched the structure as it rose, for it was near our former dwelling, and, if need were, could even now vouch for its substantiality and the precautions which were taken to prevent damp. We saw a coating of asphalte laid on the foundations, as described by Mr. White; and we certainly did not observe that any mud or road-sweepings entered into the mortar, but only good lime and sand. There was no sunken or semi-sunken basement; but instead, the ground-floor was raised a couple of feet above the street level, and there were iron ventilating gratings to permit the free passage of air underneath. The house was one in a terrace composed of about twenty, and, the street being a retired one, there were no shops. Shops are rarely regarded with much favour by the Scottish householders who live above them. The shopkeeper is generally disposed to lay claim to a share of the back premises; he very often has a bad habit of stacking his shutters, if they are of wood, in some retired part of the "close," and the sweepings and rubbish from his shop accumulate very rapidly in the dust-bin or ash-pit. We were free from this nuisance, and on either side of our close-mouth, for we lived on the first-floor, there was what is locally known as a "self-contained house," and the dwellers in these had side-doors opening into the "close," and shared with us in the common privileges of the back yard. Moreover, they had little ornamental plots of shrubbery, of which we shared the greenness and the glory, while we had none of the trouble and expense. The city being Glasgow, the terrace was built of polished ashlar in front, it was three stories in height; and large bay windows ran up the whole three floors. Four families lived up each "close," but they were almost as independent of each other as four families are when living in juxta-position in the same street in London.

To begin with the "close" itself, which is the common means of communication, yet which does away with the necessity for the obnoxious *concierge*. Ours was fitted with a sturdy door, of which the balanced hinges were regularly oiled, and which by common consent was invariably kept shut to preserve us from "gangrel bodies," and dirty, and may be thievish, bodies as well. It must be admitted that sometimes a knavish message-boy did prop it back with a stone, and so leave us open to undersirable raids and incursions; but each member of our little community had a brazen latch-key, and the first incomer who found no necessity for his key indignantly kicked the obstruction into the street; while, on the other hand, the first outgoer would have similarly removed it as a duty which was due to his neighbours as well as to himself and those of his own household. Thus our seclusion was preserved, and most of those who wanted us had to "ring the bell." There were four handsome bell-pulls, two on either side of the street-door, with a space for a name-plate above each, and except that they were of the same *genus*, bearing no outward resemblance to the miniature bell-knobs of Soho. Each separate house-door had a bell-pull on one of its own door-posts, but it was rarely resorted to, and the street bell-pull, and an arrangement of chain and crank worked from each stair-head, and communicating with the heavy latch, was the real *concierge*.

The sisterhood of serving-maids had an agreement amongst themselves for cleansing the common thoroughfare, staircase, and outside steps, which gave satisfaction to everybody; and we had an agreement of our own about the lighting which answered all practical purposes. The landlord provided a lamp for the "close" itself, which was lighted and extinguished at sunset and sunrise by the public lamplighter. In addition to this, there was a bracket on each stair-head, between the house-doors, and this was connected with the meters of both houses by a couple of yards of ordinary tinned tubing. We fancied we saved money by this arrangement. The gas company would have charged us high for a small light which would have burned all night, whereas we had a big, clear fish-tail burner, which each house supplied weekly in rotation, keeping up the illumination to the good old Scotch hour of ten o'clock. If after that time, when Paterfamilias A went to bed, Paterfamilias B chose to stay out of doors, and wanted a light to discover the keyhole, he had only to leave instructions that it should be provided at his own expense, and could put it out when he came home. The following rough plan will give the best notion of the house itself.



The above representation does not pretend to be very accurate in its proportions; for this is only the recollection of a tenant, and words must compensate when artistic and technical skill fails.

To begin, then, with the lobby, it will be seen that, having no direct communication with the outside, it was of necessity somewhat dimly lighted; but it was not so dark as might be supposed. A great fan-light over the entrance-doorway always supplied twilight, and allowed all but very short-sighted persons to find their way about; and the upper panels of all the doors in the rear being filled with frosted glass, occasional glimpses even of sunshine penetrated, and there was usually plenty of light. A Cockney might think that too much space was devoted to this introductory department, for it was sufficiently large to hold a table, a big hatstand, and three or four chairs, and was not at all an unsuitable waiting-place for certain medium-class callers, and we never dubbed it the "Hall," but were content to term it, and to think of it only as the "lobby." In the darkest, coldest evenings of winter a stained-glass lantern in the centre was called into requisition for light, while a little gas stove in the cosy nook near the drawing-room door supplied the requisite heat, and destroyed any draughts which might have come to us from the outside staircase.

Passing round our little show, we come first to the "study." It must be admitted that although it was rather cramped with our tables and books of reference, and gave us no space to lounge and idle in, was sufficient to form a "den," both for the writer and the companionly *alter ego*, whose business it was in those days to supply pocket-money, college fees, and encouraging sympathy and affection. As stated, the city was Glasgow, and if we perverted a tolerable bedroom for a maiden into a diaphané-lighted and paper-encumbered "houf," we had only ourselves to blame. Yet, so queerly-constructed are mortals, that neither of us would perhaps desire a fairer final recollection of this world than that afforded by these few feet of lumber and love, and literature. At any rate, we never found it a bad study, and it would certainly have made a good bedroom. The next apartment, the chamber of the father and mother, would in London have been termed a commodious apartment by middle-class people. But in Scotland folks seem to be less easily contented with miniature rooms than they are in England. Parlours which merely permit their occupants to dodge round a little centre table would not be tolerated; and bed-rooms which do not leave a good bit of floor space after accommodating a four-poster and a three-door wardrobe, with all the customary concomitants, give rise to grumbling. To say the truth, if we had a fault to find with our home, it was because these back-rooms were (as we then considered bedrooms) rather small. But having gained cosmopolitan experience, we should be disposed to murmur less in that old domicile. In it we enjoyed one advantage of the flat-system, for which we were not sufficiently grateful,—our bedrooms were all of the same height as the reception-rooms, namely, 13 ft., so that if we were circumscribed in our movements, we at least had plenty of air to breathe. The next bedroom was smaller still,—a place not to be incautiously entered in the dark for fear of banging up against something.

Leaving it without further comment we arrive at the kitchen. It was fitted with a roomy "dresser" and a deep plate-rack, which provided storage for the articles in common use. Crockery shone above, knives and napkins lay concealed in the drawers, and saucepans slumbered in the hidden gloom beneath, in the company of coal-scuttles and blacklead-brushes. In the corner, near the window, was the "coal-bunker,"—a formidable institution only to be spoken of with reverence. Our landlord must have liked a good fire, for prominent as the "bunker" generally is, this one out-Heroded Herod: 6 ft. high, and 4 ft. or 5 ft. square, when full it contained about a ton of coals; a mighty flap in front enabled its surface contents to be reached when it was half empty; and, if anybody cared to run the risk, there was a small sliding-door at the bottom, whence a shovelful might have been extracted without difficulty, or half a cartload might have been ejected on the snowy floor. The window-sill was fitted with a cast-iron "jaw-box," or sink, which was in turn supplied with pure Loch Katrine water by means of a swan-necked tap. (Since those days these leaky agents have been superseded by screw-down taps.) Outside the window, suspended on strong hinges, was a huge meat-safe, with perforated sides,—the property, be it remarked, of the landlord, and not of the tenant. High up on the walls were shelves, whereon rested those mysterious "clearing" things wherein Scotch servants take delight. There was the brazen "jelly-pan," which shone like the sun when the gas was lighted; and there, also, the brazen candlesticks and the glittering tin canisters, which were never known to produce anything useful. On the yellow-ochred walls themselves, interspersed with shining dish-covers, &c., were suspended mysterious leaden bas-reliefs of angels blowing trumpets, Napoleon crossing an impossible Alps, &c., which were kept in a state of surpassing brilliance, and appeared to afford much satisfaction to every Abigail who had charge of this little dominion. In a recess in the narrow section between the kitchen and the drawing-room was the servants' bed,—a box-bedstead let into the wall, with folding-doors to hide its existence during the daytime. Healthy? Perhaps not; but sanitary science was in its infancy in those days, and the box-bed is an

"institution" in Scotland. An English maid-servant must have a separate bedroom of some kind, though it be an attic or in a basement, just as she must have her beer. A Scottish girl does without either. The kitchen itself was well ventilated by fireplace, door, and window, and the comparative healthiness of a recess, say 7 ft. in length by 5 ft. breadth, and 9 ft. in height, in such an apartment, and a bed on a basement or attic is a matter of opinion. Above this recess, and reachable only by house-steps, was a "press," or cupboard, for the reception of the soiled household linen. It was an awkward place to get at, and it may be doubted if it was often put to its intended purpose. The box-bed only occupying the middle of the narrow slice taken out of the house between the kitchen and the drawing-room, the end parts of it were utilised as cupboards. The cupboard question is one of some moment in Scottish houses, but the thick stone walls give the architect an advantage for recesses which his English brother does not possess. Thus, in our dining-room we had two, which, with the fireplace, were sunk in the party-wall between our own and the next house. In the drawing-room there was one which penetrated half way through this same recess, and was met by another in the kitchen, while the other end contained a store-closet opening on the lobby. With all, the Mater occasionally grumbled on this head, as it is in feminine nature to do,—for even Eve was not content in Paradise,—but her grief was not deep, and she laughed with us when we laughed at her. There were other causes for complaint which were far more serious. The kitchen-range was none of the best, and when that is the case a Scotch housewife has a right to complain of her landlord. It is the only grate which he supplies, and he ought to make it a good one. In this particular the Scottish and English practices vary. The Scottish tenant on entering a new domicile finds every fireplace a yawning chasm which he has to fill up, and it is almost a certainty that the grates which he has transferred from his former residence will not fit. True, in Glasgow the ironworks are at the door, and grates are cheap, but they are most inconvenient articles to transport, and it would be far better if the English custom of supplying them as fixtures prevailed. Gasfittings might also be included in the same category, except in the public rooms. As it is, a "flittin'" is a horror which most men shirk in Scotland, because it involves cheerless half-lighted rooms during the transition period. It must also be borne in mind that Glasgow does not share in London's prejudice as to gas. There is a bracket in every bedroom there, and capital gas it is. Tastes differ as to gaseliers, and one man likes crystal whereas another prefers bronze; but the anti-gas prejudice being non-existent, it would not be too much to expect that plain bedroom brackets should always be supplied, and that the kitchen, at least, should invariably be fitted with range and jet, so that the discomfort which is unavoidable might not be intensified by needless difficulty in obtaining food, or the necessity for going to bed by candle-light. And now, to finish this fault-finding, we cross the lobby to the water-closet. It was a dismal hole, half-lighted by a little bole or window, placed high up in the wall, and usually kept open for purposes of ventilation. There can be no doubt that the water-closets are (or, at least, were in those days) the weakest place in the local system of house-building. There was no communication with the external air, and no means of ventilation, except by the little window opening on the staircase; therefore, if there was a draught from without it was almost certain that the air from the closet would find its way—perhaps imperceptibly but still surely—through the house. Added to this was the even more marked defect that the cistern from which the household water-supply was derived was not only situated immediately above the soil-pan, and open to any contamination which might arise from this source, but was directly connected with it or with the foul-drain tube by an open waste-pipe. That these were grave drawbacks there can be no doubt; but they were not beyond remedy. They were not peculiar to this particular house, but were common; but as a compensation for them the Glasgow landlord provides his tenant with both plunge and shower bath. In our case the fittings were exceptionally good, and the size unusually large; but the common artisan's dwelling of two or three rooms is rarely without its leaden plunge-bath, and the advantage from a sanitary point of view is enormous.

The reception-rooms do not require very particular mention; they not differing greatly, except perhaps in size, from similar rooms in an English house. After a dozen or a score of years a man forgets builder's measurements; but, at all events, our dining-room was big enough to permit the extension of an 18 ft. dining-table, of which the Pater was rather proud. Let us take it as 20 ft., and the drawing-room, inclusive of the broad bay-window, as 22 or 23 ft., both being of proportionate width. The cornices and centre-pieces for the gaseliers were very rich, and the painting in the one instance, and the paper-hanging in the other, all that could be desired. The mantelpieces were in the one case of black, and in the other of white, marble (not gimcrack affairs, but made of thick slabs), and the doors were fitted with finger-plates to harmonise with the knobs on the window-shutters and the bell-pulls. This, however, I am disposed to think was an exceptional kindness on the part of the landlord, for I remember we had spare finger-plates of our own, which had been used in our previous domicile. The room between these two was a spare bedroom, which enjoyed the distinction of being the guest-chamber solely because it had an outlook to the front, and was larger than the others. This was a Scotch flat in 1864, and the rental of it then was forty guineas, on a three years' lease.

A word about the premises in the rear. A distance of nearly 200 ft. separated ours from the next terrace. A narrow lane ran between the two, just wide enough for a cart to pass along and remove the contents of the ashpits as they became filled. The small portion of this intervening territory, which we shared in common with the other five families who had the use of our "close," contained a turfed bleaching-green, a common ashpit and two wash-houses. As a rule, only one wash-house would have been provided for such a number of families, and in all probability each family would have had the use of it for two days in rotation. The extra wash-house enabled each to claim a week, and gave opportunities for some interchange of civilities and goodfellowship among the servants in the way of "lendin' the key," when the institution was not in actual requisition. When it is added that the wash-houses were filled with tubs, furnished with hot and cold water taps, that the bleaching-green was furnished with drying-poles, and that the landlord's agents saw to it that all the lawns were trimly mown, and that the ashpits were duly emptied, all has been said that need be stated. The description given is scrupulously accurate in every particular, and it has been rendered thus minute solely that each reader may judge for himself of the comparative advantages and disadvantages of the flat system as practised in Scotland.

HERALDRY IN ARCHITECTURE.

BELFAST ARCHITECTURAL ASSOCIATION.

At a meeting of the above Association on the 28th of February, a paper was read by Mr. John Vinycombe on "The Science of Heraldry: its Relation to, and Uses in, Architecture in the Past and Present." The Rev. Dr. MacIlwaine presided.

Mr. Vinycombe said that in the eager pursuit of knowledge which characterised the present age, heraldry had not received the same attention by people generally as those subjects which lie more closely to their material interests and success in life: but to the student of antiquity, the archæologist, the architect, and the artist, it has ever been to the more thoughtful among them a most engrossing study. Connected as the subject was with history and antiquities, it gave a clue to the elucidation of much that was obscure, and with many of the distinctions which divided the people into classes, it had unquestionably been found serviceable as the means of marking that distinction. To signalise merit and preserve the memory of the illustrious were the useful purposes of this science, which would ever secure it from contempt, notwithstanding that the total change in the military system in which it flourished had tended greatly to lessen its necessity and importance. It presented itself at too many points not to secure from the thoughtful and inquiring the attention it deserved; it was a key to the interpretation of much in our literature. Spenser, Shakspeare, and the early poets abound in allusions to heraldic science, and to signs and symbols in general use expressible of well-understood ideas. Indeed, a book might be written about the heraldry of Shakspeare or of Spenser alone. Although the literature of this science was very voluminous, it was to most people what was called a very dry subject, as all such subjects were that required time and thought to understand them. Later writers had, however, done much, and there had now sprung up an ardent desire on all sides to become acquainted with the art and science of armoury. The lecturer proceeded to give an account of the progress of heraldry in England from the date of the Norman conquest, and showed how it was applied to architectural and armorial devices, to the illustrations in ecclesiastical and secular buildings, and also for the purposes of domestic decoration, and especially in its connexion with the science of military emblems, which it really was in the beginning. But, he said, it was not alone in its warlike aspect that heraldry might have a use to convey a meaning. "Peace has its victories far more renowned than war," and its triumphs and aspirations were as capable of being depicted by signs which preached a lesson as those pertaining exclusively to battles and bloodshed; and many persons who, while professing to despise heraldry, were not unfrequently the first to adopt its principles to record their achievements in the arts of peace. He proceeded to show who, according to heraldic authority, were entitled to bear arms. This turned upon the vexed question, "What is a gentleman?" The terms "gentle" and "noble" were formerly synonymous, and opposed to "ignoble" and "plebeian." All who were entitled to coat armour were included in the word "gentleman," but it was more particularly applied to the lowest ranks of these, because not having any honour or title, for want of a specific term it was necessary to employ the general one to distinguish them from the "ignoble." The origin of many of the honorary symbols used in coat armour had been preserved by tradition, but when this was wanting it was an interesting task to display their hidden meaning, and by comparison of the charges and tinctures, as the figures on the shield and colours were termed, to elucidate in a scientific manner their probable origin, and, while proving that "the gentle science of armoury" did not consist of mere arbitrary signs, but was based on philosophic principles, enable the bearer to hand down to posterity some reasonable account of his ancestral honours. Heraldic devices in architecture, decorations, and adornment were explained at considerable length by the aid of diagrams, and the lecturer then proceeded to show what was meant by a coat of arms—1st, the shield; 2nd, the crest; 3rd, the motto; in addition to which, but forming no integral part of the arms, was the helmet and mantling which were used to display the rank of the bearer. At considerable length and in minute detail Mr. Vinycombe explained the mysteries of heraldry, mantling, marshalling of arms, quartering, differences or marks of cadency, supporters, crests, the wreath on which the crest was placed, mottoes, impaling, blazoning, lines of partition, ordinaries, and the cross, with respect to which he said the adoption of the cross as an heraldic bearing had its origin, no doubt, at the time of the first crusade, and pilgrims took the cross as a badge or cognisance, not only in their pilgrimage, but afterwards, to perpetuate the memory of their piety and zeal. It was the ensign or banner in those holy, or rather unholy, wars against the infidels, from which they derived the name of Crusades. In the "Encyclopædia of Heraldry" 396 varieties of crosses were described and illustrated. The lecturer then went on to describe the different portions of the shield, the terms which distinguished its different parts, also the colours or tinctures, they being as significant as the charges or bearings. "Tricking," which was the marking out of the charges upon the shield in outline, was next referred to at great length, also the attitudes of animals, which had their positions blazoned; and the paper concluded with an extract from Barry's "Encyclopædia of Heraldry," in which it was said the privilege of using armorial ensigns was first limited and select; gradual encroachments were made, and at length the custom became so common as to impair the estimation in which heraldry had before been held. Every person, from the emperor to the mechanic, pretended to something of the kind, founded on real or fictitious claims. All trades, professions, or societies, ecclesiastical as well as temporal, assumed particular emblems, and these innumerable pretenders to armorial distinctions, even to the present day, coupled with the fact that the general bent of men's minds had long since been turned from the ideal to the useful, would sufficiently account for the decadence of heraldry and the decreased importance of family digni-

taries. Still, there were many who took pleasure in the study of heraldry, and cherish with pride the honourable emblems which distinguished their ancestors, and have descended undefiled to themselves. The art was undoubtedly valuable as an historical record; and although illustrious descent was but a stigma to a man of depraved character, yet to a respectable and virtuous member of society it might serve as a noble incentive, and the fact that his ancestors were noble and meritorious would add to the lustre of his own name.

Mr. Lindsey moved, and Mr. Lockwood seconded, a vote of thanks to the lecturer, which was passed unanimously.

THE PALACE OF LAEKEN.

BY order of his Majesty the King of the Belgians, important additions to the Palace of Laeken are in course of construction. This charming retreat is a modern mansion, dating only from 1782, when it was built to suit the Florentine taste of the Archduke Albert, then governor of the Low Countries. The site was admirably chosen, and a noble park surrounds the palace. The present improvements will consist of a monumental conservatory, and, according to the Queen's express desire, a new theatre will be built close at hand. Here some of the best actors and musicians who have won European renown will be invited to entertain the Court. From the conservatory a covered way, composed almost exclusively of glass, will lead across the park to a spot selected as the site of a future railway station; for if the King does not care to live in Brussels he will at least do his best to bring Brussels to Laeken. Guests at the Court will thus be able to walk under shelter from the station to the Palace, shaded by the orange-trees and rare plants to be placed within this gallery. Considering the marked preferences shown by the present and the late king for this rural retreat, it was necessary to organise a prompt means of communication with the capital. Laeken was also the favourite resort of Napoleon I. when the chances of war brought him to Belgium, and the fatal declaration of hostilities against Russia was dated from this palace.

CONSTITUTION-HILL AND THE KNIGHTSBRIDGE BARRACKS.

SIR,—Mr. Fergusson's suggestion under the above heading, given in your last number, ought to receive careful consideration from every one who feels interested in the possible improvement of two important points in the great thoroughfare of West London. His plan for relieving the pressure of traffic at Hyde Park Corner, and combining this practical gain with a new architectural effect at that point, seems to be the most simple and effective that has been proposed, and is in its main idea well worthy of its author's reputation as an original and thoughtful critic both on the practice and theory of architecture. In looking at the site with reference to Mr. Fergusson's plan, there are, however, I venture to think, one or two points open to consideration in regard to the effect of the whole, though not such as to be by any means insuperable objections to the general idea.

Mr. Fergusson refers to the very "lop-sided" look of the Wellington Arch when seen from the Grosvenor-place side, which would be removed by his scheme. This may be true; but at the same time the arch, as the roads are at present placed, has a definite purpose and meaning: it is the gate to the privileged drive of Constitution-hill, on which it confers a certain apparent dignity and exclusiveness; and its archway has a proper proportionate width to that of the drive to which it gives access. But suppose Mr. Fergusson's alteration carried out, and the Wellington Arch left as the centre object at the top of the proposed *place*. In order to make the scheme of practical avail for extending the space for traffic, of course the whole of the widened roadway or *place* below and on each side of the arch would have to be reduced to a uniform fall and a uniform level. We should then have the spectacle of a wide roadway of 50 ft. on each side, and in the centre a kind of triumphal arch plainly indicating that the centre was the path of honour, but with a central roadway a great deal narrower than the side ones, and leading to nothing, merely opening into the centre of a large space given over to general traffic. Thus, in one sense at any rate, the arch would lose its meaning, and Constitution-hill would lose some of its dignity, by the arrangement.

Another point in regard to the arch requires to be realised in imagining the effect of Mr. Fergusson's scheme. The upper part of Grosvenor-place falls rather rapidly from Piccadilly, and the new road at the east side of the arch, of course, would have to be the same fall. This would leave a great part of the basement of the arch "high and dry," so to speak, on the east, west, and south sides, and when seen from Grosvenor-place it would have the appearance of standing upon a heap in the middle of the roadway. Something like a flight of steps, or some additional architectural substructure, would be necessary to complete the effect, and prevent the whole structure appearing stilted and misproportioned from the south side. Steps across the south side, partially returned on the flanks to meet the slope of the ground, would be the best way, architecturally, of effecting this. Such a project would, of course, put an end to the use of the arch as a centre roadway at once, and make it a mere ornamental structure. Possibly this would really be the best way of treating it, as its apparent use and meaning would be gone when the line of Constitution-hill was diverted from it. If otherwise, and if the arch were retained as a roadway, then I certainly think it should be connected with the side thoroughfares by some such architectural screen as that of Hyde-Park gate opposite. This would make the archway only the centre portion of a large gateway erection, and would obviate the inconsequential effect which would be presented by a grand gateway spanning a middle thoroughfare that was never used, while the streams of traffic flowed on each side of it.

There is no doubt that Constitution-hill would be spoiled to a certain extent by Mr. Fergusson's scheme. It would not only lose its grand entrance, but also its effective sweep round at the top into Piccadilly, on a gentle but continuous rise. For this would be substituted a straight cut into Grosvenor-place, with a fall; a more rapid and ignominious fall than I think Mr. Fergusson has quite counted upon. On the other hand, the scheme would certainly secure, at a very moderate cost, a great convenience to public traffic, and, with certain modifications, a fine architectural effect. The new boundary line of the road, on the Green Park side, would be better if carried down in a straight line parallel with the hospital, till it reached the point opposite the end of Gloucester-crescent; a much more dignified and symmetrical effect would thus be obtained than by the sinuous line shown on Mr. Fergusson's plan, and the additional slice taken out of the Green Park to effect this would be quite insignificant: the boundary could then be turned with a good sweep round into the new end of Constitution-hill.

Mr. Fergusson's proposal for the rebuilding of the Knightsbridge barracks would certainly be an improvement on the preposterous idea (as it surely must be considered) of rebuilding them on the present narrow site, after still further reducing it by giving up a piece to the roadway. Every one must agree that a barrack building might very well be made to look more attractive than the motley assemblage of unpicturesque and mean-looking houses which would have to be got rid of to secure the site. But why suggest a scheme to render a little more palatable a proceeding which, in whatever form, is cordially disliked by all the public who have any good reasons to give? It is contrary to common sense and public opinion to rebuild the barracks at that point; and no one, beyond a certain section of military men, believes the idea of a strategical necessity for the position to be anything better than moonshine. The idea of making the building attractive involves, together with the purchase of the site recommended by Mr. Fergusson, a large outlay, to come out of public funds. Why incur this, when, if the barracks are once fairly removed from the neighbourhood, the demolition and rebuilding of the house property in question is a matter of almost absolute certainty, by private enterprise, within no very long period? The move for improving and raising the character of the neighbourhood is already begun in the large new houses nearly opposite the barracks; it is only the latter that stop the way; get rid of them, and before many years are out there will be a complete line of high-class buildings from the present site to Albert Gate. The present house property is bound to go in such a case; it is only a question of time, and it would certainly be no very wise economy to spend public money in acquiring it in the lump, only to perpetuate a military whim, which has nothing really to recommend it except the fact that the barracks always have stood there. The scheme would certainly be better than rebuilding them on their present site; but the game would not be worth the candle, and it is to be hoped that the pressure of public opinion may still prove strong enough to prevent any necessity for resorting to it. H. H. STATHAM.

LIGHT AND COLOUR.

SIR,—If, as Mr. Benson states, artists as a rule are unacquainted with the sensational phase of the theory of light, the more imperatively is it demanded of any work designed for their instruction that that phase of the subject should be emphasised. And, in order that this less-regarded phase of the truth may be the more impressed upon the artists' minds, it is equally imperatively demanded that the language used in such a work should accurately and literally express the facts. Any work, therefore, especially addressed to artists on the subject of light, which fails in this respect, and which, *in the letter*, for the most part, attributes exteriority to light and colour, as Mr. Benson's treatises do, must be open to grave censure. For instance, take the following passages, from amongst many others, in his principles, &c.:—"But in general, a large part of the incident light *enters* the body, and of this part some of the *ingredients* are often more powerfully *absorbed*, and, therefore, sooner *extinguished* than the rest, so that after *traversing* a certain thickness, any of it *emerges* and *reaches the eye*, it is no longer of *the colour of the incident light*." "The variety of colours *in* natural objects illuminated by the same *white light of the sun*." Now I will ask of any one who really understands the subject, whether the expressions which I have underlined in the foregoing passages taken from Mr. Benson's treatises, are either calculated to impress upon the artist the sensational nature of light, or to assure the scientific reader that the writer himself comprehends that phase of the truth?

Again, the colour cube, on which Mr. Benson lays so much stress, especially when coupled with the expression "natural system," is anything but calculated to impress the student with the fact that colours have no exteriority, but, as undulations in matter, are simply sensations,—effects of a certain mode of motion on the nervous system. The colour cube may be a very good aid to memory, but it is as entirely a conventional thing as the square in the system of artificial memory, or the plan of associating either words or thoughts with certain corners of a room; the true natural system really being based, as I have shown, on the phenomena of sensation and the ocular spectra.

I have yet to learn that science should express itself in a language diametrically opposed to facts. Exact science has always demanded precise language. How is it, I would ask, if the exposition of the sensational phase of the theory of light has been so common, that not only artists, but even architects and the public in general, look upon any one who attempts to enunciate that doctrine as somewhat shaky in his attic story? The artistic mind generally seizes upon the salient principles of any subject; if, therefore, he is found wanting, not in possession of these, we may be sure that the teachers have been at fault. Who have been his teachers?

Your correspondent appears to me to have given himself very unnecessary trouble to restate what I have frequently stated, that Newton recognised the great fact that there is no light but to eyes, and no sound but to ears; though the physical hypothesis which he favoured was very different to that now accepted. "A New Theory of Light" would have been considered a presumptuous title, but a "Revised Theory" infers a reconsideration of what has been previously taught. He will, in my hypothesis of the Libration of Sensation, find that I have given an entirely new explanation of the phenomena of the ocular spectra, which I think will better bear the test of experiment than that which has been and is even now given.

In my next, sir, if you will still accord space for the further discussion of this very interesting subject, I propose showing that Mr. Benson's principle, "that all colours are combinations of three simple sensations," is an entirely erroneous statement of the sensational theory of colour.

W. C. T.

*** We will not refuse "W. C. T." space for one more communication. Mr. Benson may then reply on the whole, and with that the correspondence between these two gentlemen must end.

THE TREATMENT OF SCIENTIFIC ENGINEERING ARTISTICALLY.

IN the discussion which followed Professor Kerr's lecture on this subject at the Architectural Association, on the 3rd inst.,*

The Chairman (Mr. H. C. Boyes) said the greater part of the address was full of suggestions of great practical value; but, accepting the practicability of the greater part of the suggestions thrown out, he (the chairman) did not think it was at all conclusive that Classic was a style more suited than Gothic to architectural expression in engineering structures. He thought that the "first principles" of Pugin were just as applicable to the works of the engineer as to those of the architect, and that there should be no ornament about a work of engineering which was inconsistent with the purpose of the structure. The lecturer had contended for the preservation of the "anatomy" of engineering structures, but that was essentially a principle of Gothic rather than Classic work. His (the Chairman's) own impression was that the artistic treatment of engineering structures must be approached without any very marked predilections for either style, remembering that the principal object in view was to ornament the construction as gracefully as possible, consistently with its answering its true purpose.

Mr. Riddett, in moving a vote of thanks to Professor Kerr for his lecture, said he thought the lecturer had rather reduced the architect to the level of the *modiste*; for he absolutely claimed for the engineer the merit of creating the "skeleton," which was, in reality, but the groundwork of the form. Now he (the speaker) considered that, in its way, a naked girder was as beautiful as a naked human figure, and he did not think that any amount of piercing, gilding, or "tinkering," would improve it. Indeed, so far as girders so treated varied from their simplest expression, he thought they would vary from the true principles of beauty. He confessed that his sympathy would decidedly incline towards the engineer who had a preference for suspension bridges. For instance, he had an undisguised preference for the old Charing-cross suspension bridge as contrasted with the bridge which now spanned the river at Charing-cross.

Mr. R. Phené Spiers said he agreed with Mr. Riddett in deprecating any attempts to decorate engineers' structures with mere surface ornament. Such structures needed to be improved, if possible, in their outlines; any attempt to decorate the present unsightly forms would only tend to make them more hideous. It was to be regretted that so valuable a material as iron seemed of necessity, with regard to economy of construction, to assume forms which were so devoid of beauty. It was impossible to say whether science would continue to advance with the same rapidity which it had done during the past fifty years; but he could conceive of the possibility, and almost hope, that the time was not far distant when science would not make such rapid advances as it had done in the past—when, so to speak, it would reach the length of its tether, at all events in regard to constructive ironwork. When the period arrived when the ultimate capabilities of iron as a constructive material had been reached, engineers and architects would be able to devote more time to the artistic aspect of such structures, and then, perhaps, engineering works would begin to show some improvement æsthetically. One of the great disadvantages of the use of ironwork was its apparent insufficiency of strength and stability. He could hardly agree with the lecturer as to the desirability of dispensing with bridge-piers carried above the parapet line; they were often useful, not only in emphasising the structure, but in weighting it where weight was most wanted, serving, indeed, somewhat the same purpose as a pinnacle in a Gothic building. He had hoped that Professor Kerr would have pointed out how architects might reclaim to themselves some of the work which had now passed into the hands of the engineer. He certainly agreed with the Professor in thinking that bridges were specially within the domain of the architect, and their study would well repay attention. Indeed, the subject of bridge-building had been taken up abroad by architects with marked success. By taking up and thoroughly mastering the subject of bridge-building, architects would be likely to do much more good, and have much greater influence on engineering design, than by seeking to plaster the rude forms of engineers' structures with surface decoration.

Mr. G. W. Usill, C.E., thought that some of the remarks made by the lecturer would be conducive of a great deal of good to both architects and engineers; but the lecturer appeared to have lost sight of one or two important points. He seemed to have forgotten, for instance, that many of the works of the engineer were the result of emergency and expediency. Again, the Professor seemed to think that engineers were devoid of all æsthetic susceptibilities; but such a supposition was very far from being correct, for engineers, as a body, had a high appreciation of art, notwithstanding that constructive economy frequently necessitated their structures being far from sightly. One difficulty which the engineer had to encounter in rendering his structures more sightly than they generally were, was limitation in cost,—a limitation also felt by the architect, though in a less degree, owing to the comparative smallness of his works. He was sorry to say that works of engineering were retrogressing in cost, for while, in the days of Brunel, 40,000*l.* or 50,000*l.* was an ordinary price for a mile of railway, the average cost per mile in the present day was hardly ever more than 7,000*l.* This retrogression in cost necessarily implied less solidity of workmanship, and there was less opportunity than ever for introducing anything like artistic effect in engineering works. As an instance in point, an estimate was sent in not long ago for some waterworks, including a tank or reservoir in a conspicuous position. The designer had sought to make this tank somewhat of an architectural feature, at an extra outlay of perhaps 2,000*l.*; but when the directors became aware of this, the estimate was reduced by that amount. He must confess that it was his own opinion, and that of the majority of the engineering profession, that much of the gimcrack ornamentation and panelling, such as that suggested by the Professor, would be best omitted. At the same time, he quite agreed that there was ample scope for improvement in the design of engineering structures. With regard to roofs, Professor Kerr had passed some strictures upon the roof of the St. Pancras Station, the work of Mr. Barlow, an engineer; but he ought in all fairness to have compared with it the roof of the Royal Aquarium at Westminster, the work of an architect. With regard to Messrs. Jones & Gregory's plan for widening London Bridge, nine out of ten of the engineers with whom he (Mr. Usill) had had the opportunity of conversing on the subject, were unanimous in condemning it. With regard to Professor Kerr's remarks as to bridge-piers, would he supplant the noble columnar piers of Waterloo Bridge by any such treatment as that he had suggested? In conclusion, Mr. Usill said he was glad to say that there was a growing inclination on the part of engineers and architects to consult each other on their constructive specialities, and this interchange of advice and services would be productive of much good to both professions and to the public at large.

Mr. Robertson, in seconding the vote of thanks to the lecturer, said he thought his object had been somewhat misunderstood. It was not at all a question of glorifying one profession at the expense of the other. Mr. Usill had spoken of restricted cost as a disability pressing upon the engineer, but this was a disability which, if anything, pressed more unduly upon the architect than upon the engineer. Restriction in cost was not necessarily a bar to artistic effect; indeed, much of the most unsatisfactory architecture was due to injudicious expenditure.

The vote of thanks having been carried, the meeting terminated.

* See p. 235, *ante*.

HASTINGS WATER SUPPLY.

SIR,—As I see that, at *last*, an "Inhabitant" of Hastings has complained in your valuable paper of the state of the water supply to the town, and that the Mayor has contradicted his statement, permit me to give my independent account of the water supply as a "visitor." As regards my experience of the quality, the water is simply abominable. My reason for saying so is the result of my own personal observation. In August, 1873, I stopped at Hastings some weeks; also in 1874, and again in 1875; and each year in the best part of Hastings proper, where the houses and fittings are kept in good order. When I was there in 1873 my attention was called by one of my family to the contents of a quart decanter of water on the first day of my arrival. On holding the decanter up to the light, I could plainly see numerous insects (some of them one-twentieth part of an inch long) disporting themselves in the water, which was discoloured. If Dr. Frankland, who is so clever in discovering the minute "*living organisms*" in the London waters, had witnessed such a sight during his investigation, his report would have terrified every inhabitant of the metropolis. Knowing something about water supply to towns, I at once concluded that the cistern required cleaning; this was done without delay, but when the cistern was refilled the water was quite as bad, and even more discoloured. I then went to purchase a filter; and, on making some remarks about the water, the owner of the shop said he was connected with the management of the water supply, and that I must be mistaken. He requested that I would see the water as drawn from his cistern; I did so, and to his astonishment the water was discoloured, and contained the objectionable insects. I therefore got a charcoal filter, and had the water boiled first, giving directions to my family not on any account to drink the water without filtration.

While at Hastings that year I heard that the quality of the water was a general complaint. Having taken the necessary precautions, I looked upon the matter as one of the inconveniences that people have to put up with at the seaside; and though I was advised by several friends to write to the authorities or to the papers, I did neither, as I was taking a holiday, and had quite enough to do with the water-supply of London the rest of the year. Each summer since I have gone to Hastings, and the water was of the same quality, though last year it might have been slightly better. I shall go again this summer, but shall not omit to take my filter.

Now, I quite agree with the Mayor, that Hastings ought to be supplied with pure water; for it is quite consistent with the geological features of the locality that it should be so. I must say, that I did not inquire particularly as to the supply; I simply made observations as I strolled about the country round Hastings. I was struck with the great waste of money expended in the erection of useless works, scattered about on all sides of the town. There were numerous reservoirs, brick culverts, penstocks, &c., in the different valleys, the former all containing more or less sewage, and the latter apparently never used. For instance, there were two reservoirs near the Bohemia-road. Drainage from houses and surface-water from manured fields entered them; also there I saw a temporary engine pumping spring water from a well into one of them. The pure water should have gone direct to the town. Again, the reservoirs in the valley of "Old Roar" get a certain amount of sewage and land drainage; also the reservoirs in the "Ore" valley are open to the same objection. Again, at Fairlight Glen, the reservoir there is tainted, and what it was made for I do not understand.

I was told the water in these reservoirs was principally used for sanitary purposes, and that the water for domestic use was all taken from the well near the Gas Works. Again, I heard that when the well supply failed the reservoirs were used as an auxiliary supply. Of course I may have been misinformed, as I did not make any direct inquiry of the competent authorities, but I formed my own conclusions from the quality of the water as I found it. As I said before, nothing could be easier than to supply Hastings properly with pure water. The present large well being in the centre of the town is liable to get sewage contamination, particularly as it is situated in a valley where the natural drainage is at times dammed back by the rise of the sea, and the land drainage, and a portion of the sewers get charged with sea-water, notwithstanding the system of intercepting sewers draining to the east of the town. The pumping-station should be removed some miles from the town, and a larger covered reservoir constructed on the Castle-hill or another on the East-hill. Here all the mains should be disconnected from the various open drainage reservoirs and thoroughly scoured out and charged with pure water.

I must apologise for the length of my letter; but as the subject has already been discussed in your paper, I think it right that the matter should be well ventilated, both for the benefit of the "inhabitant" and also of the

VISITOR.

P.S.—I enclose my name and address, and you will suppose that I ought to know something about the supply of water to towns, though probably the mayor and the analytical chemist of Hastings will say that I know nothing about the supply of their town.*

RAMSGATE.

AFTER nine months' deliberation a committee of the Local Board of Ramsgate, appointed to consider the question of a marine drive connecting the East and West Cliffs, have made their report. The committee state that they have had the schemes of five engineers laid before them, all of which treat the subject in a different manner. Ramsgate, as many of our readers are aware, is cut in two by a valley, which forms the centre and business streets of the town; the existing roads to the Cliffs are tortuous and very steep; that to the East Cliff has a gradient of 1 in 8; that to the West Cliff 1 in 15. The inconvenience arising from these roads has been, and still is felt to be, very great, and must have retarded the extension of the town on both sides to a very considerable degree. The object of the committee was to inquire and report on the best means of constructing approaches to and connecting these cliffs. The committee having had models and plans explained by the engineers, came to the conclusion that the scheme designed by Mr. Ellice-Clark best met

* We may state that at a meeting of the Hastings town council, held on the 3rd inst., the Water Committee brought up the following report, which was unanimously adopted:—"The committee, taking into consideration the articles and letters which have lately appeared, and continue to appear, in certain papers, reflecting seriously on the water supply of this town, and the fact that the assertions made therein are groundless and untrue, recommend the council to appoint a committee, consistin of his Worship the Mayor, Aldermen Gausden and Croucher, and Councillors Brown and Ayers, for the purpose of drawing up a strong protest against, and doubts to, these letters, &c., and get the same confirmed by medical men and analysis; and that such protest be made public through the press. Also that such committee have power to watch the interests of the town in this matter, and, if necessary, to direct such proceedings to be taken as may be deemed advisable."—ED.

the requirements of the town, and reported that he proposed to construct a roadway a chain wide, from the Granville Hotel to the highest point in Harbour-street, which is the principal street in the valley and chief business thoroughfare in the town. The question of cost was not gone into in detail, but it was ascertained that the probable cost to the town would be about 30,000*l*. If Ramsgate is to keep pace with the times and not sink to a mere sea-side resort of excursionists, her authorities must be up and doing.

AN ARCHITECT'S CLAIM.

ABRAHAM *v.* BETHELL.

THIS was a claim (heard in the Clerkenwell County County Court on the 2nd inst.) made by Mr. Henry Robert Abraham, architect and surveyor, 59, Tufnell Park-road, against Mr. Slingsby Bethell, clerk of Parliament, to recover the sum of 38*l*. for professional services.

The plaintiff stated that he was an architect and surveyor, and related by marriage to the defendant, who was one of the officials of the House of Lords. The defendant was about to take Portobello House at Mortlake, and wished him to go down in a professional way and examine the house. He surveyed the house and grounds; he also made inquiries, the result of which was that he advised the defendant not to take the house, and the defendant acted upon his advice. He afterwards went to Richmond and surveyed a house there, Spring-grove, which Mr. Bethell was about to take, and in consequence of his representations Mr. Bethell did not take it. He afterwards received a letter from the defendant, in which he stated that he had taken the lease of Tangier House, near Basingstoke, and asked him to go down and see it, and advise him as to plans for repairs, &c. He went down and made plans and sections of what was required, and he authorised him to employ some one to supply the warming apparatus. For these services he charged 38*l*., which was too cheap.

Mr. Alfred B. Friend, architect, said the charges made by Mr Abraham were fair and reasonable, supposing the work was done in the usual way. On looking at the sketches of the plans as to Tangier House, he said they were done in the usual way.

It was submitted, on the part of the defendant, that the claim was made without the shadow of a right, and that the plaintiff gave his advice as a friend and relation, and at Tangier House while he was staying there as a visitor, and this was supported by the evidence given by the defendant.

Judgment for defendant, with costs.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

AT the ninth annual general meeting of the above society, held February 29th, Mr. Benjamin Colls, president, in the chair,

The report stated that one additional pensioner had been elected since the last annual meeting, making a total of nine pensioners now on the funds, all of whom are widows. The income to the relief fund during the year was 194*l*., being in excess of that of the preceding year, but, with regard to the orphan fund, the total income of which for the year was 77*l*. 10*s* 6*d*., although the amount of the annual subscription had been greater, the sum received in donations had been somewhat less, with, at the same time, an increase in the working expenses caused by the extra advertising, &c., in connexion with the passing of the new rules for working the orphan fund. The passing of these rules is the greatest event of interest in connexion with the Institution since its foundation by Mr. Thomas Peto Ward, in 1866, and it will be gratifying to the many friends who have taken an interest in the orphan fund to know that, in accordance with the new rules, the purchase of one life presentation was ordered at this meeting, the Institution selected being the Orphan Working School, Haverstock-hill.

The resignations of Mr. George Prestige as treasurer, and Mr. F. T. Mullett as secretary, were announced, Mr. H. T. Bayes consenting to fill the former, and Mr. H. J. Wheatley was appointed to fill the latter vacancy.

The services of the retiring President, Mr. George F. Trollope, were warmly acknowledged. A compliment was also paid to Mr. H. T. Bayes, to whom belongs the credit of preparing the new rules.

PAVING HARDSHIPS.

AT Hammersmith, Mr. Edmund Tattersall, residing at Coleherne-court, West Brompton, was summoned by Mr. Harding, clerk of the Kensington Vestry, for the sum of 288*l*. 18*s*. 2*d*., being the apportioned expenses assessed upon him in respect of paving works carried out in Redcliffe-gardens. Mr. A. Glen appeared in support of the summons, and Mr. F. A. Bosanquet for the defendant.

It appeared that the defendant's house stood in the Old Brompton-road. The side garden wall, abutting upon an old footpath known as Walnut-tree-walk, ran into the Fulham-road. During the improvements carried out on the Redcliffe estate, Walnut-tree-walk was converted into a road 50 ft. in width, and renamed Redcliffe-gardens.

Mr. Harding explained the position of the walk in respect to defendant's premises. He said that between the footpath and the wall there was an occupation-road leading into a field, but the Vestry had no control over it. That had now been paved, and the defendant was called upon to pay for it.

Mr. William Weaver, the Vestry's surveyor, said he had charged the defendant with the whole cost of the work done on his side, and with half the cost of the road. The pavement on the other side was laid down by the builders.

Mr. Bosanquet submitted that it was very hard upon the defendant, as he derived no benefit from the road. The whole of the expenses should have been apportioned among the different owners, and the defendant should not have been charged with the whole cost of his side.

Mr. Bridge said it was argued for the Kensington Vestry that it was part of the apportionment, as the other side of the road was paved. They had a right to apportion the expenses as they liked, and there were no means of reversing it. It was a case in which the expenses ought to have been made less, as he could not conceive one of greater hardship. A question arose whether the apportionment should have been made under the 105th section of the first Act or the 77th section of the second Act. If under the former, the duty of apportioning the expenses devolved upon the surveyor. The 77th section referred to land, and then it was a question for the vestry and not for the surveyor.

Mr. Bosanquet thought if the matter had been brought under the notice of the Vestry, they would not have charged in this way.

Mr. Harding said the Vestry had considered the matter and adopted the surveyor's apportionment.

The minutes were produced, showing that the apportionment was the surveyor's and not the Vestry's.

Mr. Bridge said he was bound by the 77th section, and as there was no evidence of an apportionment of the Vestry before him, he dismissed the summons.

*** Great injustice has been legally committed in numerous similar cases, sometimes amounting to the confiscation of a property. In the present instance, Mr. Tattersall's house and premises have been flanked for years by an old roadway used by the public, though, as asserted, never actually taken to by the parish, and now that it is paved he is called upon to pay a large sum of money for what is wholly for the benefit of the public, and of no use whatever to him.

TRADE DOINGS IN PARIS.

THE vast forest of timber work which forms the scaffolding for the reconstruction of the Hôtel de Ville now attracts great attention on the Rue Rivoli, which it skirts. It is the largest ever seen in Paris. It forms a quadrangle, and encloses a space 497 ft. by 427 ft., in which there are over 547 yards of scaffold platform. Its height, so far as may be judged by the portions now finished, is about 88 ft., and is flanked at the angles by square towers, which rise to about 120 ft. There are eight other towers for lifting purposes, which extend about 13 ft. or 14 ft. from the scaffold platforms. The work is proceeding briskly.

The contracts were let for the Salle des Pas-Perdus last week. The cost is entered at 79,520*l*., the mason's work alone costing 60,426*l*.

The contracts, also, of the Institute of the Christian Brethren in the Rue Oudinot have been let, and but for the wretched weather and the great rise in the waters of the Seine, which stops all foundation work, there would be considerable activity in the building trade in Paris just now.

EARLY GLASS.

SIR,—In reply to the letter of Mr. Ballantine, in your issue of last week, I should beg to offer one or two observations with the most extreme delicacy towards him. Mr. Ballantine says that troublous times have deprived us of any remains of the earliest examples of vitreous art. This I am prepared to totally deny. Should not Mr. Ballantine study abroad before he makes such a sweeping assertion as that which he has ventured to do in your paper? I would refer that gentleman to cathedrals of Seville, Milan, Bourges, Chartres, and Notre Dame de Paris. I trust you will find space to insert this in your next impression.

WILLIAM HENRY O'CONNOR.

Miscellanea.

Royal Italian Opera.—Mr. Gye, with unabated energy, is again to the fore, and announces that the opera season of 1876 will commence on Tuesday, March 28th, when "Guglielmo Tell" will be performed. He heads his list of engagements with Mdme. Adelina Patti, Mdlle. Zaré Thalberg, Mdlle. Emma Albani, Signor Nicolini, Signor Carpi, Signor Bolis, M. Capoul, Signor Graziani, M. Maurel, Signor Medica (his first appearance in London), and Signor Cotogni, and promises several "first appearances in England." In addition to a selection from the existing *répertoire*, it is intended that three at least of the following works shall be given:—Verdi's "Aïda," Wagner's "Tannhaüser," Donnizetti's "L'Elisir d'Amore," and Rossini's "Mosé in Egitto."

Proposed Baths and Winter Garden for Morecambe.—A project is on foot for erecting at Morecambe premises to comprise swimming and other baths, summer and winter gardens, aquarium, &c., and land for the purpose is said to have been already acquired. The site of the proposed building is to the north of the Midland Railway Station, and has a short frontage to the sea-promenade. It is proposed to erect in the first place a summer and winter garden, 170 ft. long by 70 ft. wide. This will front the sea. The building will be 50 ft. in height. The ground-floor will be used as a promenade, and around three sides at the height of 14 ft. from the floor will be galleries. At the south end will be an orchestra for concerts and musical entertainments. Underneath the gallery on the west side of the buildings is to be the aquarium, some of the largest tanks of which will be 20 ft. long, mostly arranged for the accommodation of deep-sea fish. Although this aquarium is to be so near the sea, the water will not be changed, but, by a system of circulation and aëration, will be kept in a healthy and clean state. In the rear of the building will be capacious swimming and other baths. The undertaking is to be carried out by a limited liability company. The construction of the baths will be proceeded with forthwith. Mr. John Waugh, of Bradford, is the engineer and architect.

Yorkshire Architectural Society.—The annual general meeting of this Society was held on the 7th inst., the Rev. Canon Eden in the chair. The Rev. G. Rowe, one of the honorary secretaries, read the 31st annual report, which showed that the Society was in a most flourishing condition, and that there was now a balance in the hands of the treasurer of 220*l*. 7*s*. 5*d*., as against 194*l*. 14*s*. last year. Three papers would be published in the official journal, two of which were to be read that day—one being "Architectural Notices from the Correction Books of the Archdeacon of York, from 1664 to 1700," by the Rev. C. B. Norcliffe, which, the report stated, unfolded a sad state of things in the churches of that day; the other, "On the Fresco Paintings in Easby Church, Richmond," by the Rev. G. Rowe. The third paper would be by the Rev. C. Lukis, and was "On the History and Restoration of Wath Church." The report then referred to a trip taken by the Society during the summer, to the progress being made with the restoration of the cathedral and a number of the churches of the city, and regretted the loss by death as members of Mr. Robert Davies, Mr. J. B. Atkinson, and Mr. J. Manby. The report was adopted, and several new members elected.

Demolition of the Old Colonial Office and Opening-out of Downing-street.—In a short time there will be a direct thoroughfare between Whitehall and St. James's Park, *vid* Downing-street, which, at the west end, is at present a *cul de sac*, owing to the old Colonial Office occupying the site. The dilapidated old building will, however, be cleared away in a few days, the materials having been publicly sold on Monday last by Messrs. Horne, Eversfield, & Co., by order of her Majesty's Commissioners of Works. As that portion of Downing-street upon which the old Colonial Office buildings stand is on a much higher elevation than the open area immediately adjoining St. James's Park, the approach to the latter will be down a number of steps on the north side of the new Colonial Offices, uniform with those by which the park is at present approached from the India Office block.

Society of Engineers.—At a meeting of this society on the 6th inst., Mr. V. Pendred, president, in the chair, a paper was read by Mr. Perry F. Nursey on the Channel Railway. After referring to the public importance and utility of a means of direct railway communication between Great Britain and the Continent of Europe, and so of the East generally, the author pointed out that there were three main questions which had to be answered before effect could be given to the idea. The first was, could such a project be accomplished? the second, could the capital be raised? and the third, would the undertaking prove a commercial success? The reading of the paper was followed by a warm discussion on the merits of the Tube *versus* the Tunnel scheme, in which several leading engineers took part. The discussion was adjourned.

The Bolton Painters.—The operative painters of Bolton have decided, at a meeting of over 200 of their number, to persist in the demand for an advance in their wages of 1d. per hour, or 4*s*. 6*d*. a week.

Library Accommodation at South Kensington Museum.—In the House of Commons, on the 7th inst., Mr. Mundella asked the First Commissioner of Works whether it was true that the library accommodation at South Kensington is now totally inefficient for the large number of art readers who resort to it; and whether Government proposed during the present year to build a new library, which would also provide for the Dyce and Forster libraries recently left to the nation? Lord H. Lennox said he had reason to believe that the statement contained in the first part of the question was correct, and that the library accommodation was insufficient for the number of students. With reference to the latter part of the inquiry, he had not been able in the estimates for the year to include any sum to provide for the libraries referred to.

Society for the Encouragement of the Fine Arts.—On the 2nd inst. Mr. Daniel Grant delivered a lecture on "Characteristics in Art," Mr. J. Edmeston in the chair. The lecturer said that the essential basis of all art is the typical reproduction of the real. This reproduction becomes modified by climate, creed, and race, and thus puts on its special characteristics. In Assyria and Egypt in its fullest development it has created the highest forms of symbolism; in Greece it has created the exuberant and perfect form of physical life; in early Christian art it changes into a rendering of spiritual teaching under the form of asceticism, which became modified in its passage through the middle ages into the full growth of ecclesiasticism. It is not difficult to see that all these have faded, or are fading, and over them is arising the art of our own day,—the art of æsthetic realism.

Pig Iron as a Paving Material.—Twenty different kinds of paving have been tried in Paris: wood paving has been judged, gutta-percha paving is too dear, in bitumen paving there is room for improvement, and now paving by pig iron is to be tried. A bed of mortar is first laid down, which is covered by a strong layer of asphalte: it is in this layer that the iron cakes, which are about four centimètres thick, are set. These cakes, it appears, preserve the homogeneity of the bitumen, and prevent its depression, and render the asphalte less slippery for horses. This pavement will, it is thought, cost more than the compressed asphalte, but it is estimated that this mode of paving will save 50 per cent. upon the repairing expenses, which are very considerable.

Strike of Carpenters at Maryport.—For the last fortnight or three weeks the carpenters and shipwrights of Maryport, Cumberland, have been out on strike. The cause alleged by the workmen is that higher wages are given in neighbouring towns for shorter hours. It appears that at Workington and Whitehaven 30s. per week is paid for inside work, and 32s. for outside, on the nine-hours system; whereas at Maryport the wages are only 28s. for inside and 30s. for outside, for ten hours' work. It is alleged by the employers, on the other hand, that constant employment has been given the men all through the winter, while at the other places mentioned work has been very irregular. Many of the carpenters have left the town to seek work in other places.

The Vacant Spaces on the Albert Embankment.—The Lambeth Vestry have taken action on the reply forwarded to them by the Metropolitan Board of Works, to the effect that they were not able to accede to the request of the Vestry that the triangular piece of land on the Albert Embankment be left unbuilt upon. The Vestry are desirous that it should be left open as an ornamental piece of ground, and a resolution was passed that a request be made to the Metropolitan Board to inform the Vestry of the terms upon which they would dispose of the land in order that the parish might plant trees upon it, and maintain it at the cost of the Vestry.

Chester Archæological Society.—A meeting of the members of the Chester Architectural, Archæological, and Historic Society was held on the 6th inst., at the Albion Rooms, Chester, when the Dean of Chester gave an interesting address upon Roman altars, with special reference to the altar recently given to the Society, and which formerly belonged to the Rev. Mr. Prescott, of Stockport. Mr. Thomas Hughes, F.S.A., afterwards read a paper upon the modes of sepulture practised by the Romans and early Christians in Chester.

Extravagant Plumbers' Charges.—At the Hartlepool County Court, on the 3rd inst., the case of Bainbridge (plumber) *v.* Atley (shipbuilder), previously referred by the judge, for arbitration, to Mr. James Laidler, of Durham, was disposed of by the arbitrator's award. The claim was for 89*l.*, and was for work done and material supplied. The arbitrator found that after a careful examination and measurement of the work, the account put in by the plaintiff was 30*l.* 3*s.* in excess of the value of the work done and goods supplied, and the defendant was therefore entitled to have that amount deducted, the plaintiff to pay the costs of award.

Strike in the Newcastle Building Trade.—The strike in the Newcastle building trade has now commenced in reality. The stonemasons were idle the whole of the 6th inst., and the notice of the bricklayers expired on the 10th. The masons demand an increase from 34*s.* to 38*s.* a week, and the bricklayers demand an increase from 36*s.* to 40*s.* a week. The employers offered, as a compromise, an advance of 2*s.* a week, refusing, however, to make any alteration in the present arrangements as to piecework, or otherwise, or offered to submit the matter to arbitration. The men refused these overtures.

Raffaelle and the Dresden Madonna.—Mr. F. G. Prange recently read a paper before the Liverpool Art Club on the "Sixtine Madonna." The introductory remarks dwell on the uncertainty of the causes which render the events of one age memorable and praiseworthy in the estimation of succeeding generations. Augustus III. of Saxony committed great mistakes as a politician, but has secured the gratitude of posterity by his acquisition of Raffaelle's masterpiece, together with that of Holbein—the one, as Mr. Prange says, "the highest expression of Catholic, and the other the tenderest and most beautiful interpretation of Protestant feeling."

Hayle Foundry Wharf, Nine Elms.—This extensive freehold, of nearly an acre of land, and large engineering works thereon, situated on the bank of the Thames, was put up for sale by auction, at the Mart, on the 8th inst. After a spirited contest, the "lot" was knocked down to Messrs. H. Young & Co., for 13,500*l.* We learn it is Messrs. Young's intention to work this factory as well as their present establishment, the Eccleston Iron Works.

The Bradford Painters.—At the annual meeting of the master painters of Bradford, held on the 1st inst., the question of the differences between them and their workmen was discussed, and the offer of the men to refer the whole question to arbitration on the basis of the position at the time of the meeting of the deputies of both associations on the 7th of January, was considered. It was decided that the masters should go to arbitration only on the questions discussed at the mutual conference on the 7th of January.

Water Supply at Edinburgh.—The Edinburgh Water Trust on the 9th inst. agreed to accept an offer for the construction of a reservoir and other works at Alnwick-hill, at a cost of 54,000*l.* There was also under the consideration of the Trust a motion by Bailie Cranston, proposing that a clause be inserted in the Bill now before Parliament providing that houses under 8*l.* rental be rated for water in the same way as larger houses, but this proposal was negatived by a large majority.

Memorial of Sir Christopher Wren.—The parish church of East Knoyle (the birth-place of Sir Christopher Wren) is now in course of restoration, and it is proposed to insert in the chancel a stained-glass window to the memory of Sir Christopher Wren, no other monument having hitherto been erected at East Knoyle for that purpose. The Rev. R. N. Milford, rector of East Knoyle, will be glad to receive subscriptions in aid of this object.

Costumes at the Alexandra Palace.—After Easter prizes will be awarded by the Alexandra Palace Company and a Committee for the best designs in ladies' costumes, the decisions being based upon the originality, elegance, and economy of the dresses displayed.

St. Pancras.—We regret to hear of the death, on the 14th inst., of Mr. Richard Richardson, confidential assistant for the past nineteen years of Mr. Henry Baker, the district surveyor.

Linlithgow Palace.—At the meeting of the Linlithgow Town Council on the 7th inst., it was resolved "That the Magistrates and Council resolve to memorialise the Lords of the Treasury and the Commissioners of Public Works and Buildings, &c., to convert Queen Mary's bed-room in the Palace, or some other portion of the Palace of Linlithgow, into an antiquarian museum, more particularly for the collection and exhibition of local relics and articles of interest.

The Yarmouth Aquarium.—The works of the Yarmouth Aquarium have been recently much delayed, owing, according to a Norfolk paper, to the non-delivery of the ironwork, which, we regret to observe, is being manufactured in Belgium. As was recently noted in the *Builder*, the whole of the ironwork of the new Natural History Museum at South Kensington also comes from Belgium.

The Fever Huts at Woolwich.—The soldiers' huts on Woolwich-common, which were emptied of their tenants by an epidemic of fever which compelled the survivors to take flight, are now being demolished. Various efforts have been made to patch and repair them; but it was impossible to get rid of the damp and rot, and they are to be entirely swept away. Provision is made in the Army Estimates to spend 8,600*l.* in married soldiers' quarters this year.

Mr. George Smith, of Coalville.—We understand a movement is on foot among the working classes and others at Coalville to present Mr. George Smith with a purse to help him in his up-hill work of improving the condition of the women and children living and working on the inland canals. Mr. Smith's labours amongst brickyard *employés* are well known to many of our readers.

The Shakspeare Theatre.—Lord Leigh presided at a meeting in Leamington in furtherance of a National Memorial Theatre, Library, and Picture Gallery, to be erected at Stratford-on-Avon, in honour of Shakspeare. His lordship warmly eulogised the project. The estimated cost is 10,000*l.*, of which 4,000*l.* have been already subscribed. An association has been formed under the Limited Liability Act to carry out the scheme.

The King's Norton Surveyorship.—At a meeting of the King's Norton Rural Sanitary Authority, on the 8th inst., applications were received for the situation of surveyor and nuisance inspector to the Authority. Three candidates presented themselves, and, after they had been questioned, the Authority unanimously appointed Mr. Hubert R. Tipton, of the Borough Surveyor's Office, Birmingham, at a salary of 150*l.* per annum.

The Galashiels Masons.—The masons of Galashiels have demanded a rise of wages from 8*d.* to 8½*d.* per hour, which the employers have determinedly refused to grant, and there is every prospect of a strike. The workmen have given notice that if their demand is not complied with they will stop work, and masons are advertised to keep away from Galashiels during the dispute.

Hamburg Lutheran Chapel.—At the last meeting of the British Archæological Association Mr. Brock, F.S.A., read notes on the reredos of the Hamburg Lutheran Church, Little Trinity-lane, and now being re-erected at Dalston, said to be the work of Grinling Gibbons, and he exhibited some fine specimens of the carving described.

A Skating Rink for Carlisle.—The new skating-rink which has been for some time in course of formation at the Volunteer Drill-hall, Carlisle, was opened on Wednesday, the 15th inst. The works have been carried out by Messrs. D. Green & Sons, Bedford, at a cost not far short of 1,000*l.* The floor is 133 ft. by 52 ft.

New Cemetery, Taunton.—The tender of Mr. H. J. Spiller, of Bridge-street, Taunton, amounting to 2,325*l.*, has been accepted for erecting chapels, entrance-lodge, boundary-walls, &c., for the above cemetery, and the works are now in progress. Mr. J. Bevan, of Nicholas-street, Bristol, is the architect.

Competition.—In a limited competition for a proposed new church, Steelhouse-lane, Wolverhampton, the committee have selected the design submitted by Messrs. T. Taylor Smith & Geo. Freeth Roper. All the designs were previously submitted to Mr. Ewan Christian to report upon.

A New Vicarage for Ashted, Birmingham.—It is proposed to erect a new vicarage for the parish of St. James, Ashted, from plans prepared by Mr. Osborn, architect, Birmingham. The estimated cost is 3,000*l.*

Piece-work.—At the Social Science Association, on Monday evening next, the 20th inst., a paper by Mr. Frederic Hill, "On Piece-work as compared with Time-work," will be read and discussed.

Cemetery Chapels, Mortuary, and Lodge. The Wimbledon Local Board have selected the designs of Mr. Banister Fletcher out of the seventeen sets of designs submitted in public competition.

TENDERS

For the erection of a factory in Carnarvon-street, Nottingham (exclusive of ironwork). Messrs. Robert Clarke & Son, architects:—

Hodson & Facon	£3,706 0 0
Stevenson	3,618 0 0
Wooll	3,389 0 0
Jelley	3,360 0 0
Bradley & Barker	3,333 0 0
Clarke	3,205 0 0
Hind	3,185 0 0
Slim	3,182 10 0
Slight	3,173 0 0
Vickers (accepted)	3,111 0 0

For manufacturing premises, for Messrs. Hayward, Brothers, situated in Union-street, Borough, for the production of their new prismatic pavement lights:—

Gammon & Sons	£2,236 0 0
Braid & Co.	2,220 0 0
Downs & Co.	2,045 0 0
Shepherd	1,999 0 0
Rider & Son	1,968 0 0
Newman & Mann	1,915 0 0

For the erection of two houses at Kensington, for Mr. Thomas Thornycroft. Mr. Baker, architect:—

Jackson & Shaw	£9,375 0 0
Lascelles	7,707 0 0
Wagner	7,000 0 0
Adamson & Sons	5,885 0 0
Nash	5,840 0 0

For the erection of a house at Ealing, for Mr. Edwin James. Mr. T. Cooper, architect:—

Timewell	£2,359 0 0
Heath	2,287 0 0
Nye	2,150 0 0
Wagner	2,127 0 0
Adamson	2,083 0 0
Rhodes	1,981 0 0

For alterations to a warehouse, corner of Love-lane and Little Love-lane, City, for the Patent Woollen Cloth Company. Messrs. Ford & Hesketh, architects:—

Tongue	£2,951 10 0
Morter	2,915 0 0
Kirk & Randall	2,737 0 0
Brass	2,618 0 0
Kilby	2,408 0 0
Lawrence	2,389 0 0
Adamson & Sons	2,376 12 0
Merrill & Ashby	2,326 0 0
Scrivener & White	2,284 0 0
Foster	2,253 0 0
Crabb (accepted)	2,125 0 0

For alterations and additions to the Half-way House publichouse, Fulham, for Mr. J. C. Bell. Mr. F. N. Kemp, architect:—

Dredge (accepted)	£225 5 0

For a warehouse and store on the premises of Mallett, Porter, & Dowd, Caledonian-road:—

Holding	£448 15 0
Cross	462 0 0
Grover	428 0 0
Linfield	398 0 0
Aitchison	397 0 0
Scowen	369 0 0
Kirk	331 0 0

For alterations and additions to 7, Cannon-place, Brighton. Mr. Thos. Simpson, architect.

Patching & Webber	£418 0 0
Cheesman & Co.	398 0 0
Lockyer (accepted)	383 0 0

For house and shop, for Mr. Junor, North-street, Brighton. Mr. B. H. Nunn, architect:—

Newnham	£1,993 0 0
Patching & Webber	1,937 0 0
Barnes	1,878 0 0
Parsons	1,836 0 0
Howard	1,799 0 0
Lockyer	1,775 0 0
Bruton (accepted)	1,750 0 0

For public elementary school for infants, Boyces-street, Brighton, for the Brighton School Board. Mr. Thos. Simpson, architect:

Sterning	£2,854 0 0
Chappell	2,800 0 0
Cheesman & Co.	2,750 0 0
Bruton	2,750 0 0
Bolling	2,640 0 0
Parsons	2,627 0 0
Barnes	2,584 0 0
Patching & Webber	2,579 0 0
Lockyer (accepted)	2,550 0 0

For alterations at the Earl Grey publichouse, Mile-end-road, for Mr. Thos. Jennings:—

Howard	£192 0 0
Harrison	176 0 0
Crisp	175 0 0
Ellis	157 0 0
Cocks (accepted)	138 0 0

Accepted for Board schools, for the United District of Beal, Birkin, and Kellington. Mr. William Watson, architect:—

Excavating, Bricklaying, Stonework, Plastering, and Slating.

Adams	£1,280 0 0

Carpenter, Joiner, Painter, and Scanner's Work.

Wright	321 0 0

Plumbing, Glazing, and Ironwork.

Tate	258 10 0

Accepted for enlarging business premises, at Doncaster, for Messrs. D. Roberts & Son. Mr. William Watson, architect:—

Arnold	£765 0 0

Accepted for a wooden drill-shed, 60 ft. by 45 ft., at Normanton, for the 5th West Yorkshire Rifle Volunteers. Mr. William Watson, architect:—

Denison	£234 0 0

For new cemetery church, for the Manor Park Cemetery Company. Mr. H. J. Jones, architect:—

Bass	£2,835 0 0
Staines & Son	2,383 0 0

For new railway station and offices, at Bexhill, for London, Brighton, and South Coast Railway Company. Mr. F. D. Banister, architect:—

Vidler (accepted)	£2,044 0 0

For asphalte footways, in Mayfair, for the Fulham Board of Works:—

Brunswick Co.	£465 0 0
Val de Travers Co.	401 10 0
Société Française des Asphaltes	395 0 0
Grindley & Co.	350 0 0

For the erection of four detached villas in Caufield-road, St. John's Wood. Mr. Banister Fletcher, architect:—

Dexter	£7,332 0 0
Aitchison & Walker	6,848 0 0
Prout	6,001 0 0

For the erection of a new wing to St Mildred's, Barnet, for Mr. J. W. Billinghurst. Mr. Fras. L. Pither, architect:—

	Old Materials.
Axford	£410 0 0 ... £45
Kinninmont & Son	354 10 0 ... Nett.
Temple & Foster	348 0 0 ... 10
Miskin (accepted)	345 0 0 ... 10

For the erection of two houses in the Second-avenue, Brighton, for Mr. W. A. Oakley. Mr. Waghorn, architect:—

	Design A.	Design B.
Cheesman & Co.	£3,050	£2,870
Nash & Co.	2,940	2,541
Bruton	2,850	2,450
Steyning	2,850	2,420
Colwell	2,735	2,349
Barns	2,670	2,345
Longley	2,370	1,890

For addition to St. John's, Putney-hill, for Mr. Geo. Allen. Mr. Sancton Wood, architect. No quantities:—

Simpson	£820 0 0
Avias & Co.	788 0 0
Aries (accepted)	735 0 0

For the erection of stables, and living-rooms over, for Messrs. Nutter & Greenland, High-street, St. Giles's. Mr. F. Beeston, architect. Quantities by Mr. James Barnett:—

Kinninmont	£2,167 17 0
Oliver	2,030 0 0
Bracher & Son	1,849 0 0
Avias	1,820 0 0
Coleman	1,748 0 0
Smale	1,695 0 0

For villa residence, &c., at Brownswood Park, for Mr. J. Newton. Mr. John Viney, architect:—

Sutton (accepted)	£1,700 0 0

For general repairs at the Oxford Tavern, Kentish-town, for Mr. George Ayres. Mr. John Viney, architect:—

Cox	£114 19 6
MacIntosh	135 0 0
Knotts & Drane (accepted)	125 0 0

For new counters, pewtering, &c., at the Raglan Hotel, St. Martin's-le-Grand, for Mr. Thomas Young. Mr. John Viney, architect:—

Heath (accepted)	£209 0 0

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Gas-Lighting of Paris.

THE Report just issued by the Municipality of Paris upon this subject is not altogether new, but rather an amplification—a very valuable one, however,—on that of 1873, dealing with a question which, in this country, never sleeps. Like all French documents of the kind, it has an historical preface, and the practice is not without a certain utility of its own. During long centuries, the French capital, a labyrinth of narrow and crooked streets, and frightful no-thoroughfares, gained a repute as the most dangerous and infested city of Europe. The inhabitants, warned by no Curfew-bell, wandered *au claire de la lune*, but it is impossible to do more, in the space permissible, than indicate the gradual progress by which the actual brilliance of the Boulevards,—the best lighted thoroughfares of Europe, the Unter-den-Linden of Berlin not excepted,—has been attained. In the middle of the sixteenth century, it was ordained that there should be a lantern at every corner, or a fire-basket, answering the same purpose. This regulation left half the town, after dark, in a state of blindness. A hundred years elapsed before the Parliament of Paris ordained that every grocer should keep in stock candles of yellow wax, weighing not less than twenty ounces each, and having the Royal arms stamped upon them, and also glass-enclosed lamps for the convenience of traffic. A few years later, however, Nicolas de la Raynie, founder of the Parisian police, established the Parisian system of public lighting. His motto was, — "Promptness, brightness, and safety." The difficulties he encountered were enormous, and it is a fact of significance in social history that the opposition of Alsatia counted for much as an obstacle to this far-sighted scheme. He found Paris with a lantern suspended here and there from a rope swung across the street, almost invisible in winter time, and totally extinguished, on grounds of economy, in the summer. It was positively a question with the noble and the business classes whether the lighting season should begin on the 1st of October and end on the 1st of April, or commence on October 15th and cease on a similar date in March. To the mind of the living generation, these controversies appear surely impossible. It will not do, however, to linger among antiquities. At the close of the seventeenth century, then, Paris consumed eighteen hundred pounds weight of common wax each night, and was not half so well illuminated as are the Polar regions in mid-winter. Later on tallow was adopted for the sake of cheapness, and the "light thickened," to the infinite profit of foot-pads. It was of this darkness made visible that Sterne so pathetically complained. "I saw," he says, "what I thought was a minute fixed star, high above the fog, for there are French fogs, and it proved to be a public light, which merely served to mislead." Next came the era of a patent,—twisted cotton dipped in oil, and aided by reflectors. Now the Parisians thought they had arrived at the *ne plus ultra*, and they laughed at their ancient Feasts of Lanterns. Ten thousand of these were unhung, and the fresh invention took their places. It is upon record that the lieutenant of police had some difficulty in restraining the popular delight when it was found that a carriage could travel 300 yards without a company of torch-bearers. Generations passed, and in the epoch of the Revolution, the solitary and sinister illustration to be noted upon the subject is the fearful cry of "*À la lanterne!*" "You will see a little clearer then," said a Republican to a Royalist patriot. The public lamps were at that time somewhat similar to those of antiquity, such as are still used in Italy and the East, flat, urn-shaped vessels of coarse bronze or tin, replaced in 1787 by the first crude inventions of Argand, whose name has come down to us, but whose reward was stolen from him by his partner,—which is not an unfrequent case in these histories. But all these improvements failed to satisfy the growing necessity for an increased power and an increased expansion of the illuminating element. Their numbers increased, yet the results were complained of until gas was introduced, and, even then, so clumsy was the method of its introduction, that the car conveying the remains of Napoleon I. brought back from St. Helena, was left on a Boulevard all night, owing to a hitch in the system. From that time the advance was rapid, and in 1850 Paris was lighted by 3,000 reflectors (equivalent, perhaps, to our Bude lights), and 9,000 gas-lamps. But the idea of the new illumination had not been adopted without a long and strange controversy. It was attributed to sorcery: the lamp-glasses were broken; the experimental lights in the Passage des Panoramas, evening after evening, were violently put out; those around the Théâtre de l'Odéon, in the most intellectual quarter of the city, were ruthlessly extinguished; seven gas companies collapsed in succession, on account of the general prejudice, which declared that this novelty would poison the atmosphere, and prevent the people from breathing. Then occurred an episode very French in its character. On the last day of December, 1839, the Rue de la Paix was, without previous announcement, lighted up with gas; six months later the Rue Vivienne followed suit; yet still the opposition was not quelled. Charles Nodier took the lead, affirming that the trees would wither, the *cafés* be choked, the picture-galleries ruined, the population suffocated, vehicles misled, houses set on fire, and—save the mark!—cholera attracted. At length, however, common sense prevailed, and M. Nodier himself—the Sibthorpe of his day—rejoiced in the establishment of those ten great gas-works which, extending, like fortresses in a circle round Paris, make of its nights a splendour. The work was commenced by the Compagnie Parisienne d'Éclairage et de Chauffage par le Gaz, and its operations were started in 1855. The head-quarters are in the Rue Condorcet, but they represent simply the administrative business. The principal activity is at La Villette, where stands a red house, with a bust of Racine in front of it, in the midst of a scorched and barren land. Here the gas-people may be seen at work, hot and half-dressed, amid furnace-flames and hills of coke, enormous work-shops, tunnels of uncouth form, stone or brick cottages, and all else that constitutes the unsightliness of a manufacturing centre. The apparatus—to employ the term in its largest sense—is complete. Every metal implement or utensil can be wrought upon the spot; there are kilns for bricks, and distilleries for the utilisation of ammoniacal liquor. A railway encompasses the works, with stations pointing, as it were, towards every region of France; a special line brings the supply of English and Belgian coal. The sight of this enormous organisation is imposing, and goes far to justify the remark of Abd-el-Kader, "I have been most astonished in Paris by the stars which you put every night into your lamps."

With any differences notable between the French and English, or other European processes of manufacture and distribution, we have nothing at present to do. An account of the works themselves, when in full activity, might be made picturesque enough, in itself; but it is with the administration of this service, so essential to modern life, that we have, just now, to do. In a moment of extreme precaution, the Parisian municipality determined that all gasworks should be erected outside of the fortifications. During the siege, therefore, something like a panic existed, lest the retorts should blow up themselves and the ramparts together. But nothing of the kind happened. A shell exploded in one, at Ivry; an explosion took place, a fire burned for six or seven minutes, and no serious harm was done. So at Villette. In the hour of the Commune's triumph, indeed, the gasworks were absolutely bombarded, without the slightest interruption to their activity, unless when every man had to take up arms and fight. Paris, the worst-lighted city in the world formerly, in the second half of the nineteenth century could not exist without gas. In 1855 it consumed 40,777,400 cubic mètres, and in 1872, 147,688,372,—an augmentation in sixteen years of 107,000,000. How is this supply,—mighty for Paris, though not comparable with the necessities of London,—distributed? By nearly two million yards of large and small piping. But the company, while in a great degree a monopolist, is not free to break

up the roadway, or direct its main or inferior arteries, at pleasure. Paris has its "subterranean architect," who looks after more than a single interest. He will not permit gas to approach too near an aqueduct or any channel, above or underground, conveying water for domestic or sanitary purposes; he will have no leakage of one element into the other; he will not even permit an exudation from the gas-pipes into the drains, which, according to the Report, gathering in one locality might, at contact with one of those lamps so continually carried through the Parisian sewers, blow up half a district. Consequently, the gas is distinct from the water and drainage networks, and disasters are exceedingly rare. In addition to this, the company pays to the municipal government the sum of 8,000*l.* a year for the retention of its privileges. Moreover, it has to pay for the breaking up and restoration of streets, and the re-laying of streets; but, on the other hand, the company pays coal dues in a very limited proportion, yet the Parisian tax on its public lighting amounts none the less to nearly 400,000*l.* a year, as the world is officially informed. It must be admitted that the arrangements are admirable. Eight hundred men sally forth at a given moment, and the city at dusk is suddenly enchanted, as it were, with light, without any clumsy apparatus such as we have at last got rid of, of ladders and lanterns. Twelve hundred miles are expected to be covered within forty minutes. The process of "putting out" is carried on more expeditiously still, for it takes up only half an hour. Now, when it is remembered that Paris is lighted up by 40,000 public gas jets, exclusive of grand occasions when the Arch of Triumph, the Hôtel de Ville, the Champs Élysées, are kindled into festive flames, will it be believed that large quarters of Paris are still unlighted by gas? that the old reflectors survive? that oil-lamps still hang from ropes, reminding us of the worst days in the revolutionary time? So it is, however. The police counted more than 1,000 corner reflectors and swinging lamps in the centre of civilisation last year. But, even with all the administrative accommodation, what would the French capital be in its brightest quarters without the assistance of the light which floods out from the *cafés* and shops, the opera-houses and theatres, the arcades, the galleries of the Palais Royal, and the windows of the wealthy, who, unlike the English, delight in turning forth the silver lining (of their dinner-tables) to the night? Why, a comparative dimness after all. In parts of Paris where these accessories do not abound a sort of semi-obscurity to this day prevails, and in all it may be said there is a general shadiness after the hour of eleven, p.m. Long streets may be traversed in which scarcely a glimmer is perceptible. So that, however admirable the intentions of the Parisian municipality, they have as yet been incompletely carried out, and the "darkness favourable to insurrections" has not been entirely dissipated. In one respect, the French capital requires less artificial illumination than our own. In the better quarters the white-built houses reflect and, so to speak, multiply the light, and the effect thus produced is greater than, upon a casual thought, might be imagined. "Gas," says the Report, "enters day by day more and more into our domestic habits and necessities. Before a hundred years are over, there will not be a garret without its jet. That will signify an immense advance; but it will not stop there; it must become the great economiser and preserver of warmth and of heat in every degree; it will become manageable fire, and a farther safeguard against incendiarism than any other ever suggested; it will, again, render obsolete the furnaces,—for they are nothing less,—which stifle the miserable slaves of our cramped Parisian kitchens." When a Frenchman,—and an official Frenchman,—has been brought to say this, it is clear that gas is about to play a prominent part in Parisian domestic economy. It has been a long time, however, in penetrating the routine of family habit. In 1872 there were in Paris 850,000 gas-jets taxed, of which a third, it is said, belonged to the theatres,—an almost incredible conclusion. But, it is added, "every new house, of any pretentions, has its gas in our time,—in the saloons, the dining-rooms, the ante-chambers, the staircases, the very wine-cellars themselves." "Gas," exclaim the authors of the Report, "was our auxiliary during the war; when Paris was blockaded, it enabled her to converse [through the medium of balloons, it may be presumed] with the provinces"; and in however inflated a manner the statement may be put, the truth of the matter is unquestionable. The Parisians may not have hitherto availed themselves to its utmost extent of this invaluable aid; but of what metropolis in Europe,—in the world,—cannot the same be said? There never was a city so dark as Paris of the seventeeth century, and there is none, probably, more magnificently illuminated, all shortcomings apart, than the Paris of the nineteenth.

THE BLAKE DRAWINGS AT THE BURLINGTON ART CLUB.

WHEN noticing the last collection in the rooms of the Burlington Club, the painted glass belonging to the Marquis d'Azeglio, we mentioned that a collection was about to be formed there of drawings and designs by William Blake. This, which will shortly be open to visitors, under the usual regulations, is of even more interest than admirers of the work of that extraordinary genius would have anticipated. The number of drawings got together is considerable, filling entirely the whole space of the room usually devoted to exhibitions; and as scarcely any of the drawings are large, it will be seen that this implies a tolerably extensive collection. It is true that some of the most complete and characteristic developments of Blake's genius are not represented here, as they occur in the copies of illustrated poems, the finest specimens of which are in the hands of amateurs, who think them, probably, too precious to lend. Some very remarkable copies also are to be seen in the print-room of the British Museum. But there is enough in the drawings now hung at the Burlington Club to afford the greatest interest and enjoyment to those who are already acquainted with the published designs of Blake, and no little matter for astonishment to those who are not, and who will find themselves almost in a new artistic world on entering the first-floor room in Savile-row.

The special characteristic of Blake's genius, as developed in his drawings (for into the wider consideration of his whole intellectual and mental position as evidenced in his life and writings we can hardly enter here), is what has been well called by Mr. W. B. Scott, in his preface to the printed catalogue, its "supersensuousness." His figures are not reproductions of nature, except, of course, within certain limits, but might be called embodied thoughts. Although Blake, in these productions, and even in his poems, is not half so obscure and enigmatical as some very matter-of-fact people imagine, it is necessary to be to a certain extent acquainted with the artist's history and turn of mind, and to look at his works from his own standpoint, in order to duly appreciate their extraordinary but peculiar power. It is necessary to remember that the imitation of accidental facts of nature, the facts of texture and form and colour, made no part of Blake's object, unless in a few very exceptional instances. His aim was to express or imply, through the human form, the thought or feeling that was always the basis of his work. His figure-drawing and design, and composition, cannot be judged, with any fairness, according to ordinary standards of academical correctness. His figures, in their expression and action, are concentrated and sometimes most powerful expressions of abstract passions or ideas, the general intention of which is usually obvious enough (at least to those who bring any imagination of their own to meet that of the artist), though it would often be nearly impossible to translate it into words. This predominance of the mental over the physical part of the art in Blake's designs renders his frequent eccentricities and peculiarities of drawing of far less moment than would otherwise be the case. His variations in figure-drawing are, in fact, very curious. Sometimes, but rarely, he adheres with almost scrupulous fidelity to nature. In many cases, on the other hand, his figures seem built up almost according to the inspiration of the artist, and the requirements of the particular expression or effect aimed at. But this special aim, whatever it may chance to be, is, for the most part, so powerfully and directly rendered, that the eccentricities of drawing are passed over as merely a part of the artist's peculiarity of language. It is owing to this supersensuous character, again, that there is so much to be found in many of his slighter sketches, and that, in fact, these fully equal, and sometimes surpass in value, the more elaborate and finished drawings.

Those who intend to avail themselves of this opportunity of making acquaintance with the works of one of the most remarkable men in the history of English art should, if hitherto unacquainted with the subject (and the almost utter ignorance about Blake among well-educated people has often been matter of surprise to us), look through the life of the artist by Gilchrist, or the critical essay by Mr. Swinburne; the latter, in fact, the most valuable work of the two as a piece of literary art-criticism, though requiring much allowance to be made for the author's exaggerated and over-enthusiastic style. A glance at either of these works, however, together with the prefatory essay in the catalogue (which gives a good deal in a little space), will enable the visitor previously unacquainted with Blake to visit the collection with some idea what to expect and what to look for.

Blake's modes of execution were very various, and one of the things which will strike even those acquainted with his published works is the remarkable distinction and dissimilarity between one branch of his work and another, in regard to style and execution. Most of his best things are in water-colour; but even here we recognise several distinct styles. The two or three carefully-finished drawings illustrating the story of Joseph and his brethren are, both in execution and conception, more after the manner of ordinary mortals than most of his works, and scarcely anything else in the room resembles them; visitors who had been initiated into the most Blakian only of the artist's productions would scarcely ascribe them to him at all, though perhaps it would be hard to say who else could or would have done them. The "Lazar-house" (from Milton), which hangs near these (No. 19), is a typical specimen of his more unearthly style, with figures of almost sculpturesque severity and solidity of manner, emphasised the more, here and there, by a tendency to strong and thick outline. Here, too, the colouring is weird and supernatural, as in other designs of a similar type, such as the "Tenth Plague of Egypt" (134), where a gigantic scaly demon stalks through the city dealing death on all sides: a tremendous embodiment of "the pestilence that walketh in darkness." Then, in the beautiful series of designs from "Paradise Lost," we have quite another tone and temper, these drawings being finished mostly in light cool tints, with an effect verging at times towards that of monochrome. Of the beauty of design and feeling in this set of drawings too much could hardly be said. The subject, mainly the history of Adam and Eve, as told by Milton, gave the artist opportunities and suggestions after his own heart for the treatment of the human figure in the highest and noblest type he could realise. One or two of the figures of Eve in the series are most remarkable for the combination of dignity and simplicity which they exhibit. His power in another way is shown in the illustration of Sin and Death disputing the passage of Satan through the infernal gate; the shadowy figure of Death is of extraordinary force and fury of expression, and may be said, without fear of contradiction, to be the most successful attempt ever made to embody Milton's conception in drawing. It is worth while also to compare the larger and final designs in the series with some of the smaller studies for them, and notice the progress and slight modifications in the artist's idea.

Of oil painting, as we generally use the term, there is nothing; and in estimating the technical power of Blake, as well as his tendencies in style, it is important to remember that he was bred an engraver, and received no regular painter's education at all. It was partly owing to this, no doubt, that he took to such singular and abnormal methods of manipulation, which may have in some instances helped his individuality of style, but have also no doubt had the effect, and will have the effect, of repelling the large class of every-day picture-fanciers who are puzzled and even indignant at anything out of their usual experience. The paintings which take, æsthetically, the place of oil pictures with Blake, are in tempera, oiled over, with an idea of giving "tone," it is to be supposed. An analogous habit of the painter was that of varnishing his water-colours; a most pernicious process, it is needless to say, in regard to all that constitutes the real beauty of tone and texture in water-colour. A certain proportion of these oiled temperas, again, form a class by themselves, recognisable at a glance, and which we have seen very well characterised, somewhere, as presenting the appearance of having been painted on a mahogany table, "with the colour of the

mahogany left for the high lights." This last, however, is not a strictly correct way of putting it, as in several of these works a strong yellow tint is partially applied so as to produce an effect something like gilding. The combination of a kind of metallic lustre with the deep and sometimes almost impalpable darkness of the parts in shadow, gives an extraordinary effect to these productions. It was in this style that Blake preferred to embody some of his most important conceptions. The finest specimen here is perhaps the "Spiritual Form of Napoleon" (90), a powerful figure chained to the ground and in violent action, surrounded by angels or demons (for with Blake the two classes of beings are nearly synonymous). If the precise meaning of this design is difficult to define, its nature and general purport, as an allegorical representation, are obvious enough. Two slightly differing designs of "Satan calling the rebel Angels," in this manner of execution, are truly magnificent in composition and in their shadowy lurid effect.

Of the most characteristic, in one sense, of all Blake's productions, we have not yet spoken: we mean the poetical and imaginative works engraved, both letterpress and illustrations, by himself. These works, of which the best known, and, in a literary point of view the most valuable, is the "Songs of Innocence and Experience," we owe, it might be said, indirectly to Blake's poverty. He could not afford to publish in the ordinary manner; so he wrote out his poems in a beautifully neat and clear hand, something between writing and print character, on copper with a medium insoluble by acid, with which latter the interstices of the design and writing were subsequently bitten down, leaving the design in relief in a kind of stereotype form. Impressions were printed from these, and subsequently coloured by hand with various degrees of finish and brilliancy, according to the artist's mood, or his regard for the appreciation of the giver of the commission. In most of these a pictorial design occupies the head or foot of the poem, or both, and a decorative design winds about the margin and in and out between the verses, or branches out from the letters themselves. The variety and beauty of these decorations are extraordinary; and indeed, in regard to the whole exhibition, we cannot but observe how numerous are the suggestions and types for decorative design to be gleaned from Blake, independently of his higher powers. The beauty and the deep moral significance of some of the pictorial embellishments must be studied, and studied by congenial minds, to be appreciated. We must guard the visitor to the Arts Club collection, however, against judging of Blake's power in this kind of work only from what he sees there. Many of the illustrated works are much beyond this in power and grandeur, though none perhaps exceed it in beauty; but copies are scarce, and the few specimens of them at Savile-row are not good impressions. Those who possess the really fine impressions are chary of lending them,—and no wonder.

The best known of Blake's engraved works is, or was, the "Young's Night Thoughts," a folio book with large-size engravings, some rather grotesque, many of them of great and original power and grandeur. Since the publication of Gilchrist's "Life," however, more notice has been attracted to the designs to the Book of Job, one of the finest series the artist ever drew. A very fine set of impressions from the original engravings, of which reduced copies were published by Gilchrist, is framed in the room. The illustrations to Blair's "Grave" have also become somewhat generally known; these designs, however, are engraved by Schiavonetti, whose finished handiwork appealed much more to popular taste, probably, than Blake's own singular and unusual style of engraving. All, however, who look at art from an artist's point of view, will rate at its true value the interest of individual style and workmanship, and prize it far beyond the mere "handiwork" finish of the professional engraver. In this connexion the frame of small engravings to Philips's Pastorals should be examined: they exhibit wood engraving reduced, one might say, to its primary elements, and are most interesting as specimens of the work of a master mind turning to a fresh medium of expression and using it in his own way. They were the object of the sneers of engravers and publishers contemporary with Blake; they are now among the treasures of artists, and give the principal if not the only value to the book they were formerly not thought good enough for as illustrations. Such are the fallacies of contemporary judgment on a genius who is in advance of his generation.

We have indicated but in a brief and cursory manner the chief characteristics of this remarkable collection of drawings, and space would fail us to refer in detail to half of the most interesting among them, where, indeed, all deserve to be so classed. The drawings are to remain at the club, we believe, for two or three months, and we hope that many will be able to avail themselves of the opportunity of making the acquaintance of a lofty genius whose true stature has only recently begun to be rightly estimated.

THE METROPOLITAN BUILDING ACT.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on the 17th inst., Mr. John S. Quilter in the chair, Messrs. C. McLachlan and F. P. Huggins were elected members. Votes of thanks were given to Mr. G. G. Scott, jun., and to Mr. James Fowler, for allowing the Association to visit the new churches of St. Agnes, Kennington, and St. Mary, Newington, respectively; and it was announced that the next visit of the Association would take place to-day (Saturday) to some industrial dwellings now in course of erection at Pimlico under the superintendence of Mr. Darbishire.

Mr. T. Roger Smith then read the following paper "On the Metropolitan Building Act":—

The Metropolitan Building Act bears more or less directly upon the work in which all of us are now engaged, for we all are occupied in one shape or another upon buildings within the limits of the metropolis, and it will affect the future professional engagements of that large proportion of our members who are proposing to remain in London.

No architect, and no architect's assistant, can do work in any way connected with the new buildings, or alterations in the metropolis, without its being necessary for him to know what the law which governs buildings in London requires shall be done; and I have therefore thought that some account of the Building Act might prove useful to the members of this Association.

There are other Acts, and there are many legal rights which bear upon building, and upon London buildings; but it would require many evenings instead of one to give them an examination. This paper will be strictly confined to the Building Act (except that one or two of the requirements of the Metropolitan Local Management Act must be referred to), and it will not touch the other matters which go to make up building law, a subject which might, however, I think, be most usefully taken up by the Association.

In dealing with the Metropolitan Building Act, it is my desire to make you acquainted with the principles upon which it proceeds, rather than with the details of its enactments, and in this way probably you will best gain an insight into the subject. If we were to take the Act and go through it from beginning to end, many points of detail might be mentioned which will be passed over to-night; but in all probability you would be wearied rather than instructed. If I can show you what objects are aimed at, and what are the portions of the Act which are intended to secure those objects, I may perhaps succeed in giving you clear leading ideas upon the subject. You may then afterwards, without difficulty, trace out for yourselves the details as you require to apply them.

One or two preliminary matters must, however, be disposed of. First comes the question of the necessity for legislation at all. How does it come to pass that if an Englishman's house is his castle, he may not build that castle in London without being in various ways bound by a special and somewhat strict law? The short answer is that every man in London has a great many neighbours. Even the builder of a castle, when castles *were* castles, was very much controlled and constrained by his neighbour. He would have made a much more roomy, pleasant dwelling of it had he not been obliged to make it strong enough to keep his neighbours out, and so to contrive it that it would aid him in doing them all the harm in his power if they came too near. It is true the conditions are somewhat altered; the Act is intended to prevent a man from doing harm to his neighbours by his building; but it is still the neighbours whose existence renders it necessary legally to control the construction of buildings.

The harm which a man may do to his neighbours (including under the term the general public, the dwellers and owners near him, and the inmates of his own house) by the faulty erection of a building may be divided as follows:—

1. He may build so badly, or so neglect to maintain, that the building may fall down. Security must, therefore, be insured.

2. He may build so that his premises may be liable to catch fire, and to communicate fire to the adjoining premises. *Protection against fire* must, therefore, be insured.

3. He may grievously annoy his next-door neighbour by himself building in an unreasonable way, or by hindering his neighbour when he wants to build. Rights of adjoining owners must, therefore, be defined.

4. He may build a house that is thoroughly unhealthy.

5. He may interfere with his neighbour's enjoyment of the street in which they both stand.

6. He may cut off his neighbour's light and air. Out of these six ways of injuring a neighbour, the Building Act only deals fully with the first three; it touches briefly on the fourth, namely, sanitary regulation, but its companion Act, the Metropolis Management Act, mainly attends to that and the fifth regulation of frontage. The sixth, light and air, is amply, in fact too amply, provided for in other ways.

As the Building Act is our subject, the topics to-night will be all but exclusively those which it embraces, namely:—Structural security; protection against fire; rights of adjoining houses.

It is, of course, of great importance for you to know the state of the law as relates to the other points which I have named, but as that is chiefly dealt with by other enactments, it lies outside of to-night's limits.

After going through these three heads, I shall have to tell you something about exception to the general rules; and about the means provided for enforcing the observance of the law.

It is right to say that in the Act itself the provisions which relate to security against fire and to soundness of construction are not separated as I propose to separate them to-night, but the various enactments are a good deal intermixed. Upon any system we should, in examining the Act, have to refer, first to one section and then to another, and the method I have selected, that of separating the enactments, according to the purposes which they are intended, will not, I think, occasion more of this inconvenience than any other method.

Structural Security.—This was not, I believe, the object contemplated by the Legislature when enactments were first made about London buildings. The Fire of London first gave occasion to legislation; and precautions against fire were the subject of enactment as early as Charles II.'s reign. Structural security is, however, a feature of the Act which is now law, and which was passed in August, 1855, that is to say, a little more than twenty years ago. Considerable pains are there taken to secure that buildings, or more properly the walls of buildings, shall be solid enough not to fall down. The Act does not attempt to secure that degree of general solidity and excellence which any person for whom a building is erected ought to secure for himself by the employment of a competent architect, and it gives only an indirect control over the construction of roofs, floors, or partitions, so far as relates to their structural stability.

The structural regulations with regard to walls are mainly to be found in the twelfth, thirteenth, and fifteenth sections of the Act, and in a schedule of rules appended thereto. The foundations are to be solid ground, concrete, or other solid substructure. The footings are to be of a certain height and width. The materials allowed are brick or stone, or other hard or incombustible substance; these materials are to be solidly put together, and properly bonded. Mortar or cement is to be used, the courses are to be horizontal (or if not the wall is to be one-third thicker than otherwise). No portion of a wall may overhang, and the thicknesses of the external or party walls of a building are determined by certain tables.

External and party walls may have recesses in them, but only to a certain extent, and with a certain thickness of back. External walls may have openings. Party-walls may have chases in them, but not so large or so placed as to weaken the wall. Bond timbers must not be built into any party-wall. Bressummers must be suitably supported, and neither they nor any other tim-

bers must be built in within half a brick of the centre line of a party wall.

By far the most important of these regulations are those which fix the thicknesses of walls. They appear on the whole to be very sensible, practical, and satisfactory building rules. I have found them of service in enabling me to determine what was a reasonable thickness for walls in buildings out of London, and though there are circumstances in which it is desirable to make walls thicker than the Act requires, especially in the upper stories of dwelling-houses, the rules will be found in almost every case to give a minimum which is sufficient for security, and the cases in which the legal thickness could be safely reduced are very few indeed.

The thickness of walls is regulated in the tables, by their length, their height, and the height of the stories they enclose, and for this purpose buildings are divided into two classes,—the warehouse class and the dwelling-house class.

The warehouse class includes buildings intended for use as warehouses, manufactories, breweries, and distilleries; here the weights with which the floors are liable to be loaded are heavy, and the clear spaces are frequently large, and, consequently, thick walls are required. Other buildings fall into the dwelling-house class; the walls of these are less thick, for the obvious reasons that the weights are expected to be less, and the points of intermediate support more numerous.

The height of a wall for the purposes of this measurement is the height from its base, that is, the course above the footings, to the top of the topmost story; this, by the bye, in cases where there are stories in the roof, may be a greater height than the actual height of the brickwork.

The length of the wall is measured from the centre line of one return-wall to the centre line of another; the return-walls available for this purpose being either external walls, or party walls, or what are termed cross walls, that is to say, internal walls of a sufficient height and substance.

Let us see how these regulations are applied.

Suppose, for instance, the distance from the base of a front wall of a house which I wish to build to the ceiling of the top story was between 50 ft. and 60 ft., and I want to know the proper thickness for that wall, there being no cross wall, and the length from centre to centre of the return walls, at the two ends of the front, being more than 30 ft., and less than 50 ft. On referring to the table, I find that I must have two stories of two bricks, and the remainder of one brick and a half. Had the length been greater than 50 ft., the rule for the same height would have been—one story, two bricks and a half; two stories, two bricks; remainder one and a half. Had the wall, however, been buttressed by an internal wall sufficiently thick and high to merit the name of a cross wall, and so placed as to divide the main wall into two pieces, each less than 30 ft., the wall in question need only have been two bricks for one story of its height, and a brick and a half for the remainder.

For a building of the same height of the warehouse class, the rules would have required, in each case, a somewhat greater thickness.

Most editions of the Building Act include a diagram of the various heights and thicknesses, provided for in the table, and this diagram is generally employed, and, as far as I have tested, it is correct; but it should not be forgotten that it has no authority, the authoritative rules being the tables of lengths and heights and consequent thicknesses appended to the Act.

There is room for one or two miscellaneous observations upon this head. There is a general rule that no story of a dwelling-house is to be built with walls less than 1-16th of its height in thickness, and no story of a warehouse less than 1-14th of its height; and if, owing to unusually lofty stories or otherwise, the ordinary rules would bring this about, the wall in question must be thickened (or fortified by piers). Secondly, if two walls are not more than 25 ft. from centre to centre, and are tied together between the ground-floors and the roof by the beams of one or more floors, their length is not to be taken into account in computing their thickness, but the intermediate floor-tie gives them sufficient steadiness to permit its being disregarded, and their thickness is to be computed as though they were under 30 ft. long. This rule often acts beneficially to the builders of schools. A cross wall, to be of use in limiting the length of the wall to which it is joined, must be at least two-thirds as high as the external or party wall, and two-thirds as stout as such a wall of the same dimensions. No story of a dwelling-house more than 10 ft. is to be enclosed by 9-in. walls.

In practice these rules are generally easy of definite application. They often render it necessary to thicken old walls when a building is partially rebuilt, and they occasionally lead to other difficulties, but, on the whole, they leave but little to be desired.

The next series of regulations affecting security form a distinct part of the Act,—the second part relating to dangerous structures.

If any building, or part of a building, or thing affixed to or projecting from a building, is considered dangerous, and a notification is sent to the Metropolitan Board of Works to that effect, they employ the district surveyor to examine and report upon it. If he reports that this structure is dangerous, the Board issues a notice to the owner to pull down or otherwise secure what is dangerous, and proceeds to get that notice legally enforced, if it be not attended to. This, of course, ordinarily refers to buildings which have been allowed to fall into decay, or in some other way are neglected.

The sort of danger contemplated is danger from human life by accident, and a building, however insalubrious or out-at-elbows, is only dangerous in this sense if part of it is in danger of falling down or breaking down. Here, therefore, the Act provides for those cases of neglect which from time to time arise, and sometimes for the result of faults of construction which it is powerless to prevent. Here also is a power which, under exceptional circumstances, might be brought to bear upon parts of a structure which are not in any other way subject to the Building Act. For example, I can imagine the case of a floor in a roof, so flagrantly ill constructed that the district surveyor might feel bound to put in action the machinery of the Act, and to cause a notice to be served upon the builder to take it down, though he is not empowered to prevent its being put up. But such cases are necessarily of infrequent occurrence.

The dangerous structures ordinarily found are old walls and chimneys out of the perpendicular, and in half the cases that occur the failure is traceable to the vicious habit that once prevailed largely of building bond timbers and timber plates into walls. This decays, the brickwork collapses as the timber disappears into pulp, and the ruin of the wall is the result.

I now come to the second part of my subject, the provisions intended to prevent the spread of fire. These we meet with throughout the whole of the first part of the Act, that part which relates to the construction and supervision of buildings; and if you become familiar with the mode in which fires originate and spread in a building, you will recognise that many apparently capricious provisions of the Act are really precautions of greater or less value against some part of the risk of conflagration.

Where do fires originate? Setting aside, of course, the causes which have nothing to do with the structure, such as lucifer matches, reading in bed, or escapes of gas, the cause is ordinarily to be found where it is a structural one, in the fire-place or the flue.

Timber exposed for a length of time to heat eventually becomes so inflammable as to burn readily, and many fires are due to timber in or close to a flue, or under a hearth, or adjoining the back of a fire in the next house, to flame from burning soot finding its way through crevices in the flue, and to heating apparatus, stoves, and stove-pipes too near woodwork. We have, accordingly, a long series of rules, chiefly occupying the 20th and 21st sections, which regulate chimneys and flues, and, the general effect of which is to introduce safeguards against these sources of danger. They are minute and precise, and here, as elsewhere, I shall only give you their general scope.

The fireplace and chimney can only be corbelled out when above the ground-floor, and then only to a certain extent. There must be a hearth to each fire-opening, with stone or iron bearers to brick trimmers, except it be on the ground-floor; the fire-opening must have an iron chimney-bar and a back, 9 in. thick at least if in party wall. The enclosure of a flue must be at least half a brick thick, and pargetted inside and on the outer face; where it slopes more than 45 degrees, its top must be a brick thick, and every flat flue must have soot-doors. A chimney may not be built against an existing party-wall, unless a proper wyth (or back) half a brick thick be secured thereto; once built, it may not be removed, except on certificate of the district surveyor, and it may not be cut into except for certain specified purposes. The floor under, and for 18 in. round every manufacturing oven or stove, is to be incombustible.

The rules as to keeping timber away from flues are stringent. No timber or woodwork is to be introduced into any wall chimney-breast nearer than 12 in., to inside of a flue or under a hearth within 18 in. of the upper surface, nor to come within 2 in. of the face of the brickwork or stonework of a flue, unless that face be rendered, or the walls of the flue be a brick thick. No wooden plugs are to be driven nearer than 6 in. to the inside of any flue or chimney-opening, no iron hold-fast nearer than 2 in. No pipe for conveying hot-air or steam may be fixed nearer than 6 in. to combustible materials, or if it convey hot-water alone, than 3 in., under a penalty of 20*l*.

Curiously enough, though the Chimney-sweep Act, which it has been lately attempted to revive, provides that it shall be illegal to build a flue less than 14 in. by 9 in.,—this regulation is not in force in London, and there is no legal size for a London flue. This is probably no loss, but it is possible that some of the enactments about the thickness of walls of a flue, and its construction generally, might with advantage be much more stringent.

Secondly, when a fire occurs, how does it spread? If it is inclosed between brick walls it rarely spreads through them, but if there be even one opening in a wall, it readily bursts through it. It runs out of the window openings in long tongues of flame, which are blown along the surface of the wall and set light to anything they catch. It comes out of the roof, and especially out of any skylight or dormer or projection, and it shoots along the roof, and if it can reach any woodwork it sets it in a blaze. We shall find another series of enactments occupying from the 14th to the 19th sections, directed as safeguards against this evil, and intended to impede the spread of fire. First, there is the general rule that all buildings shall be inclosed by walls of incombustible materials, and following are the rules that the back of a recess in a party wall is not to be less than a brick and a-half thick; that there are to be no openings in party walls except where the two buildings on each side of the wall are entirely in the same occupation; and that separate sets of rooms must, under certain circumstances, be separated by fire-proof floors. These rules all tend to inclose the fire within the brick walls.*

THE BIRMINGHAM IMPROVEMENT SCHEME.

A LOCAL Government Board inquiry was held on the 16th and 17th inst. at Birmingham, relative to the proposed borough improvements scheme. This is the first inquiry under the Artisans' Dwellings Act. The Mayor appeared on behalf of the Corporation, and said that notices had been served on 1,446 occupiers of property, and and there were 324 dissentients. The total area to be dealt with was 93 acres, the population about 18,000, and houses about 4,000. All the evils which arose from overcrowding elsewhere existed, and dwellings abutted upon privies and other abominations. Of the 3,351 houses in the unhealthy area, 2,258 were built back to back. The death-rate varied from 28 to 97 per thousand per annum, the normal death-rate for Birmingham in healthy times being about 22. The majority of the houses at present were rude tenements, let at rents varying from 2*s.* 6*d.* to 5*s.* per week, and the Council anticipated supplying much better houses at 6*d.* or 1*s.* more. A number of witnesses were examined in support of the scheme, and the inquiry was adjourned.

The Windsor Drainage.—The Drainage Committee of the Windsor Sanitary Authority have further considered the tenders for the construction of precipitating tanks, engine-house, sewers, dwelling-house, and other works at the Ham, Old Windsor. Mr. Prout, of London, whose tender for 7,900*l.* was the lowest, has withdrawn, as he has discovered that he has made an error in his calculation. The tender next above Mr. Prout's was that of Mr. Acock, the contractor for the works in progress, for 11,500*l.*, and this has been provisionally accepted. The other tenders were Mr. Chamberlain, London, 13,700*l.*, and Mr. Dickinson, of Oxford, 12,200*l.*

* To be continued.

BOGNOR WATERWORKS.

The town of Bognor is rising rapidly into importance. It is a clean, pleasant watering-place, with some shingle and some sand; and it maintains, by a long line of defensive works, a somewhat precarious footing against the advances of the sea. The stranger who first visits Bognor beach cannot fail to be struck with the formidable stockade of groynes, and the infinite variety of slopes and materials employed in the construction of the esplanade walls; and he may also employ half an hour profitably in studying the varied ingenuity that has been displayed in sundry combinations of paving, pile-driving, and fascining, which in the result seems neither efficient nor ornamental.

Still, the beach is very popular in the summer time; and Bognor continues to grow and to flourish, for there is a fine bracing air, and clear open sea, and a pier with a band upon it in the evening; and, except in the Goodwood week, good accommodation can usually be obtained at fair prices.

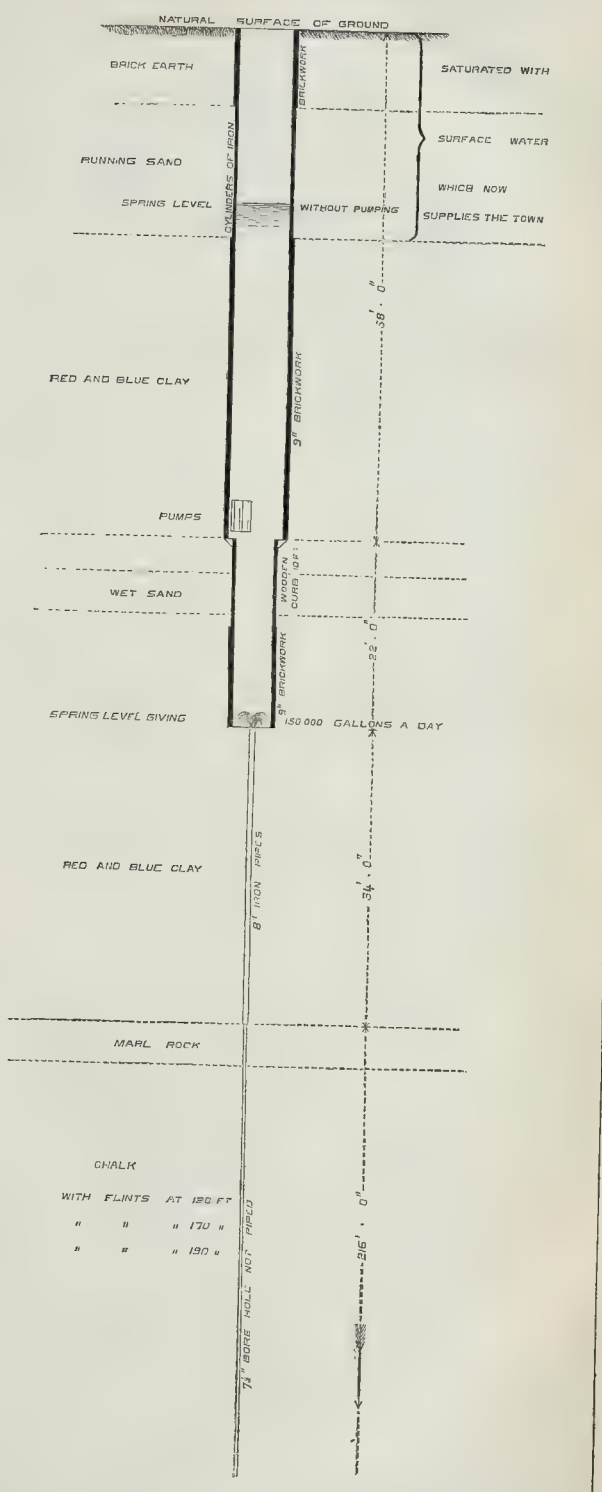
But Bognor, in spite of an active Local Board, is without proper drainage or water supply. The visitor on the beach is offended by smells (now, happily, in process of removal), and in his apartments may be equally astonished at the inspection of his water-bottle. A Local Water Works Company has been formed amongst the principal inhabitants of the town, and, as the works are now in a fair state of progress, a short account of them may not be uninteresting, because they form a fair example of the kind of small waterworks which might be profitably and advantageously carried out in many of our smaller towns by private enterprise.

The first provisional order from the Board of Trade was obtained in 1871, but, as is often the case in such matters, there was delay, and nothing was done till 1874, when the well was sunk. A section of this is appended, and shows the various strata passed through. The first 58 ft. passes through brick earth, running sand, and red and blue clay. Then come more wet sands, and red and blue London clays, down to 114 ft. from the top, where the chalk begins, having upon it a thin bed of marsh rock. The chalk is entered by an artesian boring, 216 ft., making a total depth of 330 ft. At this depth a fine chalk spring was struck, for the water rose nearly to the top of the well when the pumps were not at work, and when they were the water-level was brought down to 80 ft. from the surface, at which level the spring maintained itself at a yield of about 150,000 gallons in the twenty-four hours, being considerably more than could be required for the town. At this point the thickness of the great chalk-bed is probably 850 ft. or thereabouts, and the finding of so fine a body of water near the surface was satisfactory, because only a few miles off northward a deep well was sunk entirely through the chalk, and affording a poor supply. At Worthing, however, which is considerably further off, but, relatively to the sea, more similarly situated, the results of well-sinking appear to correspond with those at Bognor.

In sinking for water in chalk on the south coast it is found that the supply generally comes out of fissures, and it then rises to the level of saturation of the district. In sinking, at Bognor, so close to the sea, the most formidable risk would be that some connexion might exist between the spring and the sea. Such would, if it existed, be manifest in the well's water level, which would vary with the tides. It may, however, even in such a case, be generally assumed that where there is hilly country in the district, the inland or spring fresh waters will, at most seasons of the year, overpower the salt seawater by their superior pressure. In very dry weather the flow may be inwards, and render the springs brackish.

In a work of this character too great care cannot be taken to exclude all water except that which comes from the bottom of the bore-hole itself, in wells passing through clays of the Lower Eocene Formation, known as "London" clays. This is particularly necessary, because those clays have wet beds of impure water, which has an offensive smell, and is full of organic matter, and this water, getting into the well, destroys its purity. As a rule, wells are sunk without proper supervision and without proper design or study.

The well at Bognor has a 6 ft. diameter shaft, made of brickwork, 9 in. thick, set in cement for a depth of 58 ft. Below this for 22 ft. the shaft is reduced to 4 ft. 6 in. diameter. Wherever wet sand is passed through, iron cylinders are used;



Bognor Waterworks.—Section of Well.

and as the lower portion of the well is found to admit external water, a cylinder, 3 ft. diameter, and 22 ft. long, is to be placed in it, and over the bore-hole, and surrounded with concrete, the success of the whole enterprise depending as much on the purity of the water as its quantity. Water derived from deep chalk springs is certain to be pure water, but it may be hard.

Having found water in sufficient quantity, it became necessary to create a reservoir at a high level to pump it into. The country immediately adjacent is all one dead level, affording no elevated site whereon to erect a reservoir: consequently a tower had to be constructed, having a cast-iron tank at the top. This tower is now very far advanced towards completion; it is square on plan, measuring 25 ft. on each side, and is of brickwork; the height from the floor to the bottom of the tank is 42 ft. The tank is supported on brick arches. In the centre of the tower there is a square brick chimney-shaft which passes up through the centre of the tank, and whose cap forms the apex of the pointed roof which covers the tank and protects the water from sunshine. The tank is 25 ft. square and 10 ft. deep, and is composed of cast-iron plates bolted together; it is also tied across with tie-rods of wrought-iron. The chimney-shaft is also lined with cast-iron plates.

The design of the tower is ornamental; it is pierced with Gothic arches, faced with coloured bricks, and it is divided up into three flours. At the top there is to be a small staircase outside and door for access into the tank, which has a capacity of 37,500 gallons. This quantity of water will be sufficient to afford a constant service to the town when the engine is not at work.

The pumping machinery is to consist of one 7-h.p. upright direct-acting overhead cylinder engine of the Britannia pattern, made by Messrs. Grover & Co. (Limited). In this engine the cylinder is placed on the top of a cast-iron frame resembling the letter A, at the bottom of which, close to the ground, comes the crank-shaft. The engine stands close to the well. The shaft is carried over it, and connects by two cranks to two sets of pump-rods, which work directly down the well. The cylinder of the engine is 1 ft. 6 in. stroke and 9½ in. diameter. The pumps consist of a pair of combined lift and plunger pumps, having a 10 in. stroke, and a diameter of barrel of 5⅞ in., the plungers being 4 in. diameter. These pumps are independent of each other, but are connected to cranks which are placed at right angles, so that on both the up and down strokes there will be a continual discharge of water and no dead point.

The lift and plunger pump throws equally on the up and down stroke, and is useful where the height of the column of water to be raised is not excessive; where that is very great it is better to employ some kind of lift-pump, so as not to bring any excessive compressive force on the pump-rods.

The pumps for these water-works are designed to lift 100 gallons a minute, nearly, so as to fill the tank in about seven hours.

The boiler to be employed is a Cornish one, of rather large size, 14 ft. 6 in. long, 4 ft. 6 in. diameter, with a 2 ft. 8 in. flue, the shell to be ⅜ in. thick, and the flue $\frac{7}{16}$ in., the ends to be ½ in. thick.

It was originally intended to have an upright boiler with internal tubes, but this has been superseded.

The situation of the water-tower is convenient: it immediately faces the traveller on his entrance into the town. The grounds around it will be laid out with ornamental gardens and shrubberies, and beside it stands a now nearly completed, substantial, and sightly dwelling-house for the engine-man.

The cost of the present undertaking is about 6,000*l.*, but the capital of the company is 10,000*l.* to meet increasing demands for supply, and the shares are taken up in the locality.

Waterworks divide themselves into two classes: those which depend on pumping, and those which derive their supply from gathering-grounds and have large storage reservoirs. It is manifest that only a few situations, comparatively, will allow the latter type of work to be carried out, and even then the great first cost involved makes such undertakings rather the work of corporations labouring for the public good, than of local shareholders seeking dividends as well as pure water. Still, gravitation schemes are correct in principle, and everywhere to be preferred.

It may be taken as a "rough and ready" principle that from 2*l.* to 3*l.* a head of the population supplied may be expended on a pumping scheme; whereas, in gravitation works, the expenditure may reach, and even double, that,—in all cases, assuming that the district really needs supply.

In gravitation schemes, there are so many landowners' and millers' interests affected, that it is a formidable undertaking to run the gauntlet of them all; whereas, in a pumping project, there is a tolerable command of the country, both for the pumping station and the service reservoir: consequently, the same difficulties do not occur. For small towns in the highly civilised agricultural South of England, pumping is alone possible; but it is often worth while to consider if assistance cannot be obtained from the natural forces in air or water. At Faversham, in Kent, the pumping machinery is sometimes driven by a windmill, and much economy results.

At Bridgend (where the works were designed by the same engineer as those at Bognor), the spring, which is nearly two miles below the town, is dammed back, and made to lift itself by means of a water-wheel the entire distance, and to a considerable height above the town, into the reservoirs.

On the other hand, where a steam-engine is erected for pumping purposes, if it be, as it ought, capable of doing two days' work in one, its services may be valuably employed in some other operation, such as stone-breaking, sawing, or grinding.

A good deal of the commercial success of a waterworks enterprise depends on the situation of the houses relatively no less than on the tastes of their inhabitants. A straggling country town, where the houses have large gardens, and are separated from each other, stands at a disadvantage; whereas, a town where the houses by time have got well together, and jostle each other, will pay for water supply, and feels the need of it more, although it may perhaps have the same surface supply as its neighbour. Towns having an influx of visitors at different seasons stand more in need of efficient water supply than those whose populations are permanent and sedentary. Above all things in a constant-service and pumping project, it is necessary carefully to guard against waste either in the mains or the fittings, and to keep up a vigilant system of inspection.

The contract for the works at Bognor was taken by Mr. Arthur Smith of that town, the engineer to the company being Mr. J. W. Grover, of Victoria-chambers, Westminster.

WESTMINSTER ABBEY AND ITS MEMORIES.

IN MEMORIAM.

WESTMINSTER ABBEY! We have often and often wondered at how little attention has been paid to the *changes* which have, since its foundation, been perpetually going on in and about this so deeply-venerated place. What a history would it tell, could it but speak, of all that is strange and curious, and notable! What a series of chances and changes have the very walls themselves undergone, and been witness to, and how much has the very ground round and about them changed in aspect! No "old inhabitant" of Westminster could now possibly recognise it, or could know his way about without a special guide. We may yet, by dint of curious looking at old prints and written memoranda, get a glimpse, imperfect though it may be, of what it looked like in any bygone century, so that all is not wholly lost. And we may even people the place again in its old way, and get at a notion of how they of that time looked and what they did. But this is, and must be, all of it, but very imperfect, and shadowy, and dreamy. It must be always difficult to transport oneself into a bygone state of things, and most certainly into a past state of feeling and sentiment. What a difference, to wit, between the aspect of things in the days of Abbot Islip and the present guardian and guide of things in Westminster Abbey!

We need not dream of "Thorney Island," on which the venerable Abbey is said, in legendary story, to have been founded, nor go back to that older Pagan time which lasted so long. But it would be interesting, were it possible to do so, to get a notion of the church which stood here before King Henry III. pulled it down, and enlarged the plan of this ancient Abbey. Not only did he do this, as we now find, but he added chapels to it, and made it, indeed, what it now is, with the exception of the towers, and the chapel built by Henry VII.—not, by the way, the least portion of the building. The date of that building may be usefully noted: the first stone of it was laid on the 24th of January, 1502. King Henry designed it as a burying-place for himself and his successors, expressly enjoining by his will that none but those of the blood-royal should be inhumed in it. It is, indeed, as a place of sepulture for the illustrious dead that this old Abbey Church is of so much, and of such all-enduring, interest. The place is right full of the dim forms and memories of those who have gone before us in life's race, in so many remarkable ways.

It is, therefore, in this light that we would now look at it and think about it, and there is surely matter enough and even to spare for it, for the "monuments" of the Abbey are not a little startling in very many ways. It is hard to know where to begin, for the whole church is full of them on floor and walls. They are in nave and transepts, and well-nigh fill a multitude of "chapels." These chapels, at the east end of the cathedral, are in themselves not a little curious. These chapels retain their ancient names, — St. Benedict's, St. Edmund's, St. Nicholas's, Henry VII.'s Chapel, St. John's, the Chapel of Islip, otherwise St. John the Baptist's, and the Chapel of St. John the Evangelist, the Chapel of St. Andrew, and that of St. Michael.

In the chapel of St. Benedict there is, as the guide-book tells us, an "ancient tomb of stone," with formerly a canopy of wood, and on it lies the effigy of Archbishop Langham, monk, prior, and abbot of this Abbey, afterwards bishop of Ely, and then Primate and Chancellor of England, and a Cardinal Bishop and Papal Nuncio,—a great man in his day. He died on the Feast of St. Mary Magdalen, in the year of grace 1376, and on whose soul, says his epitaph, "May God have mercy." A notable man in his own day, and doubtless did he officiate many times in this very chapel of St. Benedict, and before the altar of it, which stood at the east end of the chapel. The space of it is now occupied by a monument to the memory of Lady Frances, Countess of Hertford, who died in 1598. There is here also the tomb of Dean Goodman, the fifth dean of Westminster, who presided over the Abbey "for forty years," with much applause,—a man of regular and devout life. He died in 1601. There is here, too, Dr. William Bill, also a dean of Westminster, and master of Eton College, and of Trinity in Cambridge, and chief almoner to Queen Elizabeth. He died in 1361. A good and learned man, says his epitaph, and a "friend to those that were so." Others are here buried of equal renown, so that this small chapel is full, as we have said, of memories, and is, indeed, typical of the whole Abbey. If the reader stays long enough in it, or by the side of it, much of the past may come before him.

We might thus go through these many shrines, filled with so many and varied matters for thought, but must forbear, for every chapel is full,—too full, some might think,—of "memorials"! But the one thought and impression that all must needs get from a visit to Westminster Abbey is that it is now, above all, a place of sepulture for the illustrious dead, with memorials of them, and with "inscriptions" more or less descriptive of them. Forms of faith may, and do, change, but this desire to perpetuate the memory of those who have preceded us in life's race must always be, and can never fail. It is the same yesterday, to-day, and for ever. It was so yesterday, and it was so in the days of King Sebert, king and ruler over the East Saxons, in the seventh century; also of his Queen, Athelgoda, a long time back. This takes us to the very first-known thing respecting this Abbey of Westminster. George II. was the last king buried here. In all, thirteen English sovereigns have found a final resting-place in Westminster Abbey. We might well, as we have said, go through all these chapels, and take note of those who have been buried in them, and it is difficult to stop, or to know well whose memorial to pause before and take note of, and which to pass by. There are many "nameless" graves,—graves of men of mark in their own day, or they would not be here, but now forgotten,—even their very names worn away from the stones which cover them!

In these chapels, so lone and still now, and with the "dust of antiquity" yet on them (thanks to Sir G. Scott, they are not being restored), there are many, many tombs of men equally

remarkable, their names alone full of meaning. John of Eltham, son of Edward II., and the children of Edward III. Churchmen are here also. We are now in the Chapel of St. Edmund. There is Monck, bishop of Hereford, and Ferne, bishop of Chester, and these men may have not unfrequently officiated in this very chapel. Some altar-tombs are here, as that of Edward Talbot, eighth Earl of Shrewsbury, with his lady, Jane. Much might be here said of the art aspect of these memorials, looking at the past and present of memorial architecture and sculpture. It might be usefully asked, are we progressing, and doing better and better things? If there are those who are curious in such matters, here is the place for them to study in, for there are all kinds and degrees of workmanship, from the primitive "hand-work" of the old artist-workman to the "art-manufacture" of to-day. Great lessons in stone and marble cutting.

We must needs leave our notes of the northern chapels, and of the nave and aisles, and call but a moment's attention to the imposing "tombs" in the north transept, for these truly form a contrast to those early and more humble "memorials." Some of them are finely executed, and as works of art and sculpture are notable; but they positively crush the Abbey, and dwarf it. There is Lord Mansfield's ponderous tomb. Lord Mansfield was a great man in his day, and died, as the guide tells us, full of years and honours, and from the love he bore to the place where he now finally rests, he desired to be buried "privately" in it. He would himself most certainly have forbidden the putting up of so huge and conspicuous a monument to his memory. It was through an accident more than anything else that this was done. Flaxman was the sculptor, and the face of the great judge is very finely executed. At the north end is William Pitt, speaking to the "House,"—a clever and a well-executed thought of Bacon, the sculptor of it, but the ponderous basement on which it stands all but spoils it. Many others there are here, and some good work may be seen in parts in and about them, and it seems almost a pity that some at least of these ponderous "basements," which answer no useful purpose, cannot be put aside. The true "memorials" would then be far more impressive than they now are. Very much more might be said, and really needs to be said. Here again does our art-manufacture come in, and there is right plenty of it.

We can but take a parting look into the Chapel of Henry VII. It seems hardly possible to do otherwise than to dwell, if but for a moment, on its merits as a work of art and architecture. The "phase" of Gothic in which it is built has been a little slighted, the earlier styles which preceded it having the sway. But it is well worth attentive study. It is, in sober and unprejudiced fact, a finished work of art and architecture, and is full of inventive power and refinement of design and art workmanship, and is to the full worthy of the great building of which it forms a part. In it is the magnificent tomb of its builder, Henry VII. and his Queen; and there now, close by, reposes in final rest a woman and lady, second most surely to none whose mortal remains are here. Of her it might truly be said, that her right hand knew not of that which her left hand did; and, what is, to our mind, more, time and repetition of kind and gracious acts did not weary her. Many, many are there who will do a good act once, or even twice, and then stop, but here it was not so. With life only did the Lady Augusta Stanley's charity cease! Let us hope one thing,—that if a "memorial" or monument be built up to her memory, it will be an art work, in that one and only way in which real art work is possible, one wrought by the very hand of the sculptor. It would be hard, nay, impossible, to find a subject more worthy of his art.

Test for Arsenical Room-papers.—Professor Hodges, writing to an Irish contemporary, says it is merely necessary to place a piece of the suspected paper,—about the size of a penny-piece will be enough,—on a saucer, and to pour over it about half a teaspoonful of the solution of ammonia. If any of the arsenical green be present, the solution in a few seconds will become of a rich blue colour, and if, on placing a bit of lunar caustic (nitrate of silver) about the size of a pea in the solution, a yellow ring or crust of yellow arsenite of silver forms round the caustic, the presence of the poison may be regarded as certain.

AN OLD GATE-PIER.

MOST passers-by would probably have wondered what there was in it to attract special attention or elicit a loving admiration. There was no want of other attraction for the eye and mind in the perspective of a beautifully-wooded undulating landscape on one of those cold and misty, yet bright, mornings when one gets the first hint that spring is going to supersede winter; and certainly the prospect had none the less of charm for that peculiar quiet in the air which seems to mark the English Sunday, even far out in the country, not less than in the neighbourhood of town. However it may be explained, the fact was, that the old gate-pier in question was the feature which most pleasantly struck the eye of a rambler from town on the particular bright morning referred to.

The gates were nothing in particular, to be sure; and perhaps it was the contrast with their style and associations which the more emphasised the very different suggestions of their surroundings. They were, in fact, what may be termed, with reference to style and character rather than topographical origin, "Brummagem." They were of ostentatious and pronouncedly florid design, and resplendent in the bright blue, chocolate, and gilding by which metal-work of this school is usually recommended to the discerning eye. Through their painted twistings one looked down a lawn, terminated by a respectable-looking square mansion of no particular style or character; the sleepy repose of which, with all the blinds down, contrasted oddly with the "all-alive" look of the gates. But the brick pier which formed the framework of the picture on each hand, and to which these self-asserting gates were hung, was, in fact, a picture by itself, and quite threw into the shade, to the eye of artist or architect, either gates, house, or lawn.

As a matter of association, there is a good deal of interest in an old domestic gateway. It is the connexion between the public and private domain, the architectural feature which belongs equally to both, and commonly suggests, or should suggest, to the outside passenger the architectural character and treatment of the house itself. It conveys reminiscences of all the various generations, residents and visitors, who have passed its advanced guard in entering the family house, or turned to look at it, as a last glimpse of the place, in leaving. In the present case, however, it was not merely this sentimental interest that struck the casual observer; but an architectural and artistic suggestiveness. It was merely a plain brick pier, with a brick plinth and a by no means elaborate square stone capping, dating probably from the reign of good Queen Anne,—who has unexpectedly given in these latter days a name to a style,—or perhaps not quite so far back. At all events, the brickwork was of that kind which it does the eye good to see, considered either constructively or artistically. The bricks were smaller,—that is, thinner and flatter than at present used, and of a rich red tint, which, in combination with weather stains, and the slight greens and greys of moss and lichen here and there, made the whole such a beautiful combination of colour, warm and cool, as any artist might justifiably have spent some trouble in reproducing as a study of effect. The tints, owing to natural influences, however, did not predominate much over the original tone of the brickwork, which may have been mellowed by time a little, but which, at least, showed that, at the date when it was built, it was possible to get a brick of really fine colour and smooth close texture, far superior in finish of appearance to the best stock brick of the present day, and equally superior in depth and richness of tone to our modern smoothed-out "patent compressed" brick, and which was dependent on no artificial colouring or touching up. And the question is, why cannot we have such a brick now? If an architect wants something beyond ordinary brickwork in the present day, and scorns the wretched and perishable expedient of applied colouring, whereby all tone and surface texture that the brick may have are defaced; if he chooses to think, moreover, that a thinner brick than the normal size has a better appearance, and makes better work; he cannot get what he wants. He must take the size the trade choose to give him, and he must choose between bricks of no colour or tone at all, or the raw effect of applied colour, by which brickwork is reduced practically to the level of cement. Yet, if such beautiful bricks as these of our old gate-pier were made then, why cannot they be made now?

There is something in the absolute solidity of the workmanship which also attracts our respectful attention. Our old pier seems likely to outlast the new wall which has been built to flank it, and which is a fair specimen of modern brickwork. Its lines and joints are as true as when first built. It is not improbable, certainly, that originally it was tuck-pointed, and time has gradually and quietly removed this one defective and perishable element in its structure, and left the thin clean-run joints with that line of dark shadow which adds so much to the appearance of the whole, and which proprietors of old buildings of this date seem often so ready to destroy by the unnecessary process of re-pointing. The excessive development of pointing was the one defect in the brickwork of the period to which our pier belongs, which of course the revivers of it are blindly and inconsiderately copying, producing buildings which are all a network of crossed white lines; the characteristic effect of which, even if it be of any value at all, is impaired as soon as the mortar begins first to lose its colour, and then gradually to drop off, as it infallibly will. Independently of that, however, there is this about the period which our gate-pier represents, that it was a time when, as our pier stands in evidence, those who paid for good, solid, honest, durable work could get it. Such work is at least very hard to come at now, in days when a workman thinks only how he can get the highest wages for the least labour, and a contractor too often is occupied in considering how far he can make bad and cheap materials do the work of good ones; days when, as a well-known modern philosopher is reported to have said, in his characteristic, caustic manner, a man thinks nothing of "breaking the whole of the Ten Commandments with every stroke of his hammer." Under such an evil condition of things, there are, perhaps, some lessons not only architectural, but practical and moral, to be learned from an old brick gate-pier.

THE GALE AND THE TELEGRAPH WIRES.

THE recent heavy gales have wrought terrible havoc among the telegraph posts and wires, and made more evident a danger to travellers in the streets to which we have before now alluded. Not only in London, but in most of the large cities and towns of the country, many miles of wire—to be measured, indeed, by hundreds of miles,—are suspended from posts and chimney stacks on the tops of houses; the state of tension to which these wires are strung is evident from the exceedingly slight curve which they make between each post, and in many instances a number of them, from ten to a dozen and more, are strung across the most crowded thoroughfares. The resistence which such a row of wires, many of them an inch in diameter, must offer to the wind is immense, and the strain placed upon them and their supports is very severe. Sir John Hawkshaw, in a timely letter to the *Times*, points out that these wires, exposed to the action of the smoky, foggy atmosphere of a town like London, are liable to rapid decay; and this is more particularly the case at those parts which, by their position, as when twisted round the posts, or otherwise fixed, are apt to retain the water in rainy weather, and the rust and filth when it is fine. But telegraph wires are not accessible to periodical inspection, and as they are subjected to no ordinary mechanical wear and tear, they are likely to be overlooked.

Three accidents, one attended with fatal results, in one city within twenty-four hours, show that the fears are not groundless; and the total destruction of a chimney in a thoroughfare like Cheapside, through the strain placed upon it by the telegraph wire during such heavy weather as we have experienced, shows that the dangers do not cease with the mere snapping of the wire. The sudden removal of the normal pressure on one side of a post or chimney is sufficient to cause the "pull" on the opposite side to become too great for it, and in this way a whole series of accidents might be set going along the whole length of the line.

After the warning of the past week it will be necessary for the Post-office authorities to take precautions for the prevention of such accidents for the future. It is, perhaps, inevitable that we have telegraph wires hung over our heads; for although many miles are laid underground with our sewers and gas and water pipes, the delay and expense of creating communication by this method would prevent its exclusive adoption. But at least we have a right to claim immunity from a death by hanging or decapitation.

SOME OLD HOUSES AND THEIR STORIES.

SIR ISAAC NEWTON'S HOUSE IN ST. MARTIN'S FIELDS.

IT is curious to note how the greatest masters in art, literature, and science arose to the dominant positions they seem destined ever to retain, when art, literature, and science were in the earliest stages of their infancy. The great philosophers, sculptors, and architects of ancient Greece, the great painters of Italy, the great poets and dramatists of the Elizabethan age, were giants amongst pigmies,—giants, mounted upon whose shoulders we often look contemptuously down to boast our more extensive prospect. There is to be noted, however, the fact that these wonderful men were of necessity creators, not imitators; and there is no doubt, as Sir Humphrey Davy once said, that imitation cramps the best energies of the mind.

In the earliest records of experimental science, amongst the little unintentional follies and earnestly childish absurdities of its few first efforts, stands another of these intellectually gigantic creatures, of whom it was with excusable exaggeration written, as everybody knows,—

> "Nature and Nature's laws lay hid in night:
> God said, 'Let Newton be,' and all was light."

We have been looking upon the house in which the last portion of his life was spent. Our readers may look upon its resemblance. It still stands in an obscure and little used street running out from Leicester-square, adjoining one of the most interesting old places of worship in the country. The observatory Newton built upon its roof, shown in our sketch (from an old print), is no longer there, and the old porch has been removed, while the exterior of the building has an appearance of dilapidation and neglect drearily ominous of its too speedy departure.

The observatory was removed about nine or ten years ago, and was sold, we are told, to supply some new pews for the chapel next door! Newton once said the happiest hours in his life were passed in that observatory. In a day when people came from all parts of the world to see the place he loved in connexion with this his now neglected and almost-forgotten old house, it was associated with the chapel as a sunday school, and was carefully kept in repair for the inspection of visitors by the school committee. This was in 1824, before which time foreign philosophers had gone away from it mournful or indignant, and with no little contempt in their hearts for a nation which could suffer a relic of such national importance to fall into ruin and decay. What do they say of it, and of so many other old houses of ours, similarly interesting and important, now? Would Shakspeare's house be in existence if Americans had not threatened to preserve and remove it from England?

Let us bring Newton, the Shakspeare of science, from the dim past, and in our imagination briefly trace his life on its way to this quiet, old, seventeenth-century suburban dwelling.

We see him enjoying perfect tranquility and repose in a time of riot and turbulence, noble where all around are ignoble, pious when religion was laughable, unambitious, diffident, and retiring, with his pleasure at the mercy of no outer influences, and with his greatest wants supplied from within himself. When, as a famous lady of the period said, "the beasts of the field and the birds of the air are better company than the beau-monde," when vice was fashionable, and virtue scornfully regarded, and when even men of genius passed half their time growing excited, feverish, owlish, or quarrelsome in tavern parlours, he lived, separate and apart, a kind of dual life, at once in the world and out of it.

Even as a boy, said an old lady, Mrs. Vincent, who had known him familiarly at that time, Newton "was always a sober, silent, thinking lad, and was never known scarce to play with the boys abroad at their silly amusements, but would rather choose to be at home, even among the girls." When older, and sent by his mother to sell the produce of her land at Grantham market, a distance of five miles, and bring back certain commodities from that town to his quiet home, embosomed among the lonely hills of Woolsthorpe, he displayed the same characteristics. As soon as he and the servant who attended him arrived at the Saracen's Head in Westgate, Isaac generally left the market business to be transacted by the man, and retired to a garret belonging to Mr. Clarke, an apothecary, with whom he had previously lodged when at the Grantham Grammar School. There he plunged into the pages of certain old books, and, oblivious of the fleeting time, would emerge only when the trusty, old, indulgent servant who had known, and, perhaps, loved, his dead father, summoned him to commence their return journey. The books which attracted him were probably those he had taken delight in as a school boy, dear friends in shabby bindings, from which he parted in sorrow every Saturday afternoon, and rejoined with eagerness and pleasure every Saturday morning. When sent forth by his twice-widowed mother, Mrs. Smith, to look after the sheep or corn, or labourers, in the fields, he would be found under a tree or hedge, deaf to all extraneous sounds, blind to all extraneous sights, absorbed in the perplexing difficulties of some mathematical problem, or busy with his pocket-knife cutting wooden models to test mechanical theories, or down by the river-side constructing experimental mill-wheels. He was a great trouble to his poor mother, and we can imagine how in her deep distress she often went to her brother, the Rev. William Ayscough, of Burton Coggles, and asked him despairingly whatever she should or could do with that troublesome boy Isaac, who would not make himself useful, and yet was such a wonderfully clever fellow, who was so amiable and yet so unmanageable.

When his mother, acting upon the advice of her brothers and others, who saw the bent of young Isaac's natural inclinations, and gravely advised her to encourage them, sent him to college, he sat at the feet of the famous Dr. Isaac Barrow, "and spent," says Mr. Conduit, "the greatest part of his time in his closet." When he was tired with his severer studies of philosophy, his relief and amusement, we are told, were found neither in dissipation nor athletic sports, but in going to some other study, that of history, chronology, divinity, or chemistry, which had then hardly emerged from alchemy. A dreamy, quiet, genuine student-life, full of placid enjoyment, which estranged him from the rest of the collegians, at least as effectually then as it would now.

This power of abstracting his mind from outer surroundings never departed from him. In his later life he would often pause in the process of dressing after a night's rest, and become absorbed in the pursuit of some train of subtle reasoning, sitting for hours motionless, more or less unclothed, on the side of the bed, with his venerable white head bent, and his brows contracted over his downcast eyes, patiently following a fresh clue to some new truth, which should be a death-blow to some old error, or a stepping-stone on the way to ground still more advanced in wisdom. Often, in that old house of our sketch, was he repeatedly reminded of some forgotten frugal meal, which had long been waiting for him, the frequent neglect of which was seriously impairing his health.

In Cambridge commenced his wonderful career of greatness. There he became the scholar, Bachelor, and Master of Arts, was appointed senior Fellow, won,—although he did not wear,—the honour of the fellowship of law; and on Dr. Barrow's deserting philosophy for divinity, took his place as Lucasian professor of mathematics. There he made himself familiar with all the great philosophical writings then extant,—those of poor, unappreciated Descartes, of Kepler, Wallis, Oughtred, Van Schooten, and others. There he made himself perfectly master of all the different methods of calculation and research adopted by the greatest known geometricians and astronomers, wherewith he proceeded to verify or disprove the most valuable discoveries of past ages. Unearthing as he went better and more exhaustive experiments, whereby truth could be patiently and elaborately evolved from falsehood, he founded new systems of philosophy. Proceeding from effects to causes, and thence to new experiments developing other effects traceable to new causes, he thus made rapid and astonishing progress in fields which up to that time had been altogether unknown and undreamed of. What the Royal Society then was we have described in our article on its first house in Crane-court, still standing (see p. 32, *ante*). The readers of that paper will feel sure that its members could not long overlook the existence of a Newton amongst them. He was invited, with profound respect and reverence, to do honour to their meetings by his attendance.

To that Society,—be it never forgotten,—we owe it that Newton, diffident and retiring, and almost morbidly loth to court publicity for either himself or his discoveries, asserting that he was far too young to play the part of a reformer in philosophy, came forth into the light, whereby we see him, as without such inducements it is possible he might never have come. Hence became known those extraordinary truths involved in his communications on the methods of "fluxions," universal gravitation, and the properties and nature of light, discoveries of unexampled grandeur and importance, which, as M. Biot declares, he had conceived and soundly demonstrated before he had attained his twenty-fourth year. The chambers he occupied at Cambridge are said to have been next to the chief gate, and to have communicated with the observatory in the great tower, which was furnished by Newton, Cotes, and others.

In the library of the Royal Society is preserved the first complete reflecting telescope, which had so much to do with the evolvement of astronomy from astrology, labelled "Invented by Sir Isaac Newton, and made with his own hands, 1671." This instrument, which Newton regarded with contempt, was received in December—the month in which Newton had been born—and in the following January he was enthusiastically elected a member of the Society, not long after he had received its "solemn thanks" for the paper in which he had given an account of his investigations.

Newton's dread of public notice and love of quiet and solitude were intensified by the events which succeeded his being made conspicuous by the Royal Society. Envy-begotten controversy, of course, arose; but Newton's wonderful discoveries passed through that test of fire, and came forth unchanged and confirmed. His optical lectures, which Dr. Barrow had published for him, were desperately assailed. The curator of the Royal Society, Dr. Hooke, a man ingenious enough in some branches of mechanics, who was alike deformed in mind and body, was his bitter and violent antagonist. He denounced Mr. Newton's conclusions with ill-disguised contempt and anger. How dare this man from Cambridge assert that light was a compound of seven coloured rays with distinct properties, when he, the curator of the Royal Society, had previously and distinctly asserted that it was composed of only two, the violet and the red! Such impudence was unbearable. Then a man of real learning and ability, but one who, as many do, fashioned his facts to fit his theories, a French Jesuit, Father Pardies, who died in 1673, attacked Newton's discoveries. He argued positively that all the rays of light were equally refrangible! Then, again, a physician, with no conscience to speak of, and no scruples about the means whereby he attained his self-laudatory ends, Linus of Liége, actually asserted that the elongated image said to be produced by the prism was a mere fiction. He had himself often tried the experiment—as almost every schoolboy now does—and he had never been able to see anything more than a luminous spot perfectly round and perfectly colourless! Did he lie, or did he look through a hole, forgetting to put the prism in its place? He was polite enough, and sensible enough, to add that Newton was probably (how merrily the great English philosopher must have laughed) not purposely deceiving, but accidentally deceived, by—what, in the name of all that is nonsensical, do you think?—"some coloured cloud accidentally passing along the heavens!"

These, and many such things, duly made their appearance in the "Philosophical Transactions" published by the Royal Society, and were gravely read and considered by the members. Newton quietly smiled at their nonsense, and, putting them aside, would have speedily forgotten all about them. But his friends would not permit him to do so. They were angry, and when they saw clumsy dabblers in philosophy chuckling at his silence as a proof of the unanswerability of these curious arguments, they persistently and anxiously urged him to reply, in the cause of truth, and for the sake of his own dignity. His gentle nature, formed for quiet contemplation, shrank in pain from the mere idea of such uncongenial occupation. With extreme reluctance, and after he had been long teazed with repeated applications, he commenced a very troublesome and most unprofitable controversy, referring to which, in December, 1675, he mournfully blamed his own rash imprudence in "parting with so substantial a blessing as quiet to run after a shadow." To attempt the conviction of arrogant, overbearing, wilfully ignorant men, arguing rather for triumph than for truth, or naturally stupid unconvincible men, who cannot see truth, is in fact—as most men

who have tried it know—the very worst and most foolish kind of shadow-hunting. "Philosophy," said Newton, in a letter to Halley, "is such an impertinently litigious lady, that a man had as good be engaged in lawsuits as have to do with her"; and his words retain their truth to this day. Such a terror had he of controversy, that he absolutely declined to publish his completed work on Fluxions, lest new attacks should re-awaken this obnoxious thing, and once more involve him in its pain, trouble, and peace-destroying influences.

Happy and contented in his labours, Newton merely wished to be left alone to pursue the darling mistress he had wedded, the "impertinently litigious lady" of his jealous would-be rivals. She had no charms for that faithful and devoted lover apart from her beautiful self. She certainly brought him no dowry in the shape of money, and the fame her blissful favours won him were as nothing in the presence of their enjoyment. We see how poor he was in 1675, in the January of which year the Council of the Royal Society, then holding its meetings at Gresham College, in Bishopsgate-street, with our familiar old friend of the famous Diary, Samuel Pepys, in the presidential chair, brought forward a motion whereby Newton was "excused from the weekly contribution of one shilling on account of his low circumstances, as he represented."

"As he represented"! Methinks we scent here the odour of the Society's then new secretary, Dr. Hooke. They are words which may chronicle the cowardly insinuation of a doubt, and consequently an insult. By-the-bye,—a term we are rather given to using,—how few under precisely similar circumstances have the courage of honesty to admit their poverty. If it were not so, how soon the income of every society in the land would lessen, and the lists of their members grow less, for in these days, as the writer's poor dead friend, John Timbs, could have told us, we do not excuse the payment of fees to learned societies on the ground of poverty, which in this country has always been regarded, and in one way or another punished, as a crime, and it is probable, always will be.

Charles II., who prided himself nearly as much upon his taste for science as he did upon his taste for licentiousness, granted Newton a special dispensation in 1675, that he might continue his fellowship without taking orders.

In 1684, Newton's glorious "Principia" was laid in manuscript before the Royal Society, and its secretary began at last to admit the vast importance and value of its great discoveries. He claimed them for his own! But the Society, ignoring his passionate appeals and indignant denunciations, ordered the work to be printed as Isaac Newton's, at the sole expense of Mr. Newton's personal friend, the Society's clerk, Halley, the astronomer, he whom Newton sternly rebuked for his infidelity, and to whom the art of navigation is so deeply indebted.

Then the fame of Isaac Newton first took wings and went abroad into the farther regions of the earth. The disciples of Aristotle, who had refused to look through the earliest invented telescope lest it should disturb their favourite ancient theories, were still in arms against him, but his disciples began to grow and multiply in wisdom and in strength, and the end of numerous ancient errors was at hand. Yet it is curious to turn to the records of social and political life in England at this time and find how little the general public knew of, or cared for, these grand discoveries. One of the greatest mathematicians of his age, the Marquis l'Hôpital, was so anxious to know all about the wonderful Mr. Newton, how he ate, drank, slept, what he looked like, where he lived, in what kind of house, &c., that he put these and similar questions to every English man and woman he met, and he was doubtless often astonished and indignant to receive for reply "Newton! Newton! pray who and what is he, Marquis? I never met him in Society." If he had spoken of Sir Charles Sedley, how animated and talkative they would have been!

For two years Newton's "Principia" had been his life. He existed in it only; waking and dreaming, it was always before him. "Often," says Biot, "lost in the contemplation of those sublime truths he went through the ordinary duties of life without perceiving that he did so, and without his thinking principle seeming to preserve any connexion with his body. It is said that oftener than once after he had begun to dress himself in the morning, he suddenly sat down again upon his bed, arrested by some thought, and remained in that situation half-naked for hours, pursuing the idea which occupied him. He would have even forgotten to take his food if they had not reminded him of it; nay, even sometimes when he felt himself hungry before any of his meals it would not have been impossible to persuade him that he had already finished it." One day his particular friend Dr. Stukely (the famous Lincolnshire divine and antiquary) had come to dine with him in his quiet retreat at Cambridge. He waited so long for Newton to come out of the study in which he was shut up, that he began to grow faint. It was most tantalising. There was the table ready laid and the dinner upon it, and there was the doctor growing more and more hungry and faint. At last he ventured to help himself to a chicken, and, progressing slowly, had picked its bones tolerably clean and retired from the table before the philosopher entered the room. After saluting him genially, and remarking that it must be quite late for he felt very hungry, Newton sat down to the table, and lifting the cover saw the picked bones. Without the least emotion he placidly replaced it, quietly remarking, "I thought I had not dined, but I perceive I have."

We can imagine the doctor's roar of laughter and Newton's amusement when the explanation and apology followed.

King Charles "the Merry" was dead, and King James the Gloomy reigned in his stead, when the "Principia" was published; and in the same year that last-named unamiable-looking monarch thought proper to send down to the University of Cambridge one Father Francis, a Benedictine monk, with the royal command that he should be admitted as a master of arts without the exaction of the ordinary oaths of allegiance and supremacy. Such a freak of arbitrary power, interfering with the privileges of the University, and offensive to the prejudices of Protestantism, dispelled the lingering hopes of the most loyal and king-loving subjects. The vice-chancellor of Cambridge University, Dr. Peachall, and his senate declined to obey King James, and were summoned to answer for their disobedience before the most infamous and unscrupulous Judge Jeffreys. Peachall was consequently deprived of his office, and suspended from the mastership of Magdalen College.

Then sprang forth hidden and most unsuspected, fiercely burning, fire. Even the gentle, modest, peace-loving student, Newton, shared the general excitement. Cambridge was in a state of ferment. Oxford shared the wrongs of Cambridge, and also the passionate and feverish agitation. Wrath spread in every direction. James grew alarmed, and strove to repress by fear. All parties and sects were on the eve of uniting against the Government, despite the terrible punishments it inflicted. He was a daring man who stood up for the popular cause; but Newton had never displayed that quality before. He had become a strictly pious man, a stanch Protestant, and a true patriot, knowing nothing and caring little about politics; but now he shared the common indignation. As he had been the first and foremost to oppose the royal mandate, so he was the most fierce in denouncing the gross injustice of the royal Government. In that time of universal excitement, when the national Church was in sore danger and distress, the student became the patriot, ready to risk life and liberty for his country's well-being. It was a latent phase of his character, never seen before, and startling in the flash-like suddenness of its development. So deeply did it impress the popular mind in Cambridge, that when the last of the only two Convention Parliaments we have had in this country was elected, Newton was one of the representatives of that city.

It was a very cruel honour. A man more unfitted by nature for such a position could not have been discovered. If the comparatively playful and peaceful struggles of literary and philosophical controversy had been so terrible to him, awful indeed must have been the half savage, madly turbulent torrent of political strife at a period when party-feelings were wildly dominant, when men's prejudices and passions were at white heat, and a throne was tottering to its fall. The poor philosopher grew utterly confused and bewildered, his old calmness deserted him, his old feelings of diffidence and doubt were concentrated into absolute terror, his health suffered, his brain was affected, men said he was mad. At last the storm and the whirlwind which had caught him up began to cease. In February, 1690, when William of Orange was on the British throne, the Convention Parliament was dissolved. But it left Newton a changed man. He retired to Cambridge, and resumed his delightful studies, but not with the old feeling of entire and perfect devotedness.

Where Newton resided when in London for the performance of his Parliamentary duties we have not just now the means of ascertaining, but afterwards he resided, until the year 1695, almost exclusively in Cambridge, so that we have not even yet fairly brought him to the house in St. Martin's-street, where in the meantime strange changes had been going on. The rural character of that locality had been fast disappearing, and it began to assume that air of being in a foreign country, which it has ever since retained. The hedges had been disappearing in Hedge-lane, afterwards called Whitcomb-street, and new buildings were cropping up near Leicester Palace in the fields then named after it, but now known as Leicester-square. Louis XIV. "by the grace of God, king of France and Navarre," having revoked the famous edict of Nantes, had commenced that horrible persecution of the French Protestants which soon after drove 500,000 skilful and able artisans out of France. Of these about 50,000 had come to England, and settled down in Leicester-fields, Spitalfields, and Soho, to establish themselves in their trades as jewellers, watch-makers, silk-weavers, glass-blowers, &c.

Upon a piece of ground adjoining Newton's house, most probably belonging to it, aided by public subscriptions and by a grant from the Government, these unhappy fugitives had erected a place of worship, afterwards known as the Orange-street Chapel,—it is partially shown in our sketch,—wherein it is touching to find how the poor French exiles prayed in the true spirit of Christian forgiveness for the persecutor who had driven them in wild terror from their home and relatives, friends and country. "And thou," prayed one, "thou, dread prince, whom I once honoured as my king, and whom I yet respect as the Almighty's scourge, thou also shalt share my prayers, and have my good wishes."

The chapel was built in the year of the "Principia's" publication, and amongst those who would be interested most deeply in it and its builders we may be sure Newton was one. We feel as sure of that as if we had seen his short, well-set figure, and kindly, comely face, going about amongst these poor outcasts of country and kindred, who, for the sake of God and their conscience, were enduring uncomplainingly such cruel sufferings and bitter wrongs. What fearful stories they may have told him of those horrible dragonades which preceded and followed the Revocation, of painful hidings in woods and caves, where hundreds died of cold and hunger, of their being forbidden to exercise the various callings and trades whereby they had lived, of incredibly cruel insults and degradations heaped upon them, of their dead being denied Christian burial, the pulling down of their churches, and the cruelly killing of their ministers. The heart of all England was aglow with furious indignation at the story of their sufferings and in admiration of their heroism. All Europe shuddered to hear of the horrible tortures inflicted upon these truthful, simple-hearted, unoffending, and industrious people. Isaac Newton may have remembered all the things thus vividly impressed upon his mind when shortly afterwards the arbitrary acts of King James, the Papist, and the cruel, blood-thirsty doings of Judge Jeffreys fired him with patriotic rage, and brought him so unexpectedly and surprisingly to the front as a political and religious leader, when the dreary old never-quite-won battle of right against might was once more to be fought out on English soil.

Many a romantic incident of patient endurance and heroic self-devotion touched his sympathies as he went amongst these poor people with outstretched hand, giving of his little more than he could spare; and when he took up his residence amongst them a comparatively wealthy man, being Master of the Mint for Queen Anne, whose special favourite he became, and having other sources to swell his large income, he may have done so with the idea of assisting and being useful in various ways to these poor French families, for the locality was not by any means the most convenient for either his duties or his pleasures.

But we must go back once more. Following, but too closely, upon his disastrous plunge into politics, by which there is little room for doubting that his mind had been very seriously and injuriously affected, and from which he had not then recovered, came another sickening disaster, the stunning force of which only a true thinker

and student can appreciate. He was bringing to a conclusion some extremely important calculations arrived at by long and deeply pondering over each successive stage of its advancement, by fitting fact to fact with growing firmness and assurance, and was fast nearing the goal of another glorious success, when all his efforts were rendered useless in a moment. His favourite pet dog upset a lighted candle amongst his papers, and they were all destroyed. "Ah! Diamond, Diamond, thou little knowest the mischief thou hast done," is all he is said to have exclaimed on discovering his loss, but we learn from another source that, nevertheless, he "was so troubled thereat that every one thought he would have run mad, and he was not himself for a month after. Indeed, according to a letter dated May 29th, 1694, published in Lord King's "Life of Locke," his friends found it necessary to confine him.

There are some strange letters of his still preserved, in which a morbid, excitable, restlessly suspicious state of mind is displayed utterly foreign to his ordinary condition. In one of these he solicits forgiveness for having accused his true and loving friend Locke of endeavouring to "embroil him with women," of being a Hobbist, of attempting to injure his, Newton's, political character, and for having said when he heard Locke was ill and likely to die, "It were better he were dead." And in another letter, by way of explaining how these baseless ideas and suspicions got into his mind, he writes:—

"The last winter, by sleeping too often by my fire, I got an ill habit of sleeping; and a distemper, which this summer (1693) has been epidemical, put me farther out of order, so that when I wrote to you, I had not slept an hour at night for a fortnight together, and for five nights together not a wink. I remember I wrote to you, but what I said of your book I remember not. If you will please to send me a transcript of that passage, I will give you an account of it, if I can."

A letter of a somewhat similar tendency to Pepys as secretary of the Royal Society, dated September, 169?, was published by Dr. Brewster. Soon afterwards Newton appears to have been restored to his usual state of health, and to have resumed his labours, the earliest results of which were those famous profoundly elaborate epistles on the existence of a deity addressed to his friend Dr. Bentley.

In 1695 he was appointed, through the interest of a friend, of whom also he had been wrongfully suspicious at the time of his mental distemper—Mr. Charles Montague, afterwards Earl of Halifax,—to the post of warden of the Mint, whereby he secured an income of five or six hundred a year. Then it probably was that he removed to London and occupied permanently the house in St. Martin's-lane with which his name has ever since been associated. Four years after he became Master of the Mint, with an income varying from twelve to fifteen hundred a year.

In 1699 he was elected Foreign Associate of the Royal Academy of Science in France, to which it is probable our own Society of Science owes indirectly its epithet "Royal." In 1701, he was again returned to Parliament as the representative of Cambridge, to play his part in the still agitated and unsettled work of governing at a time when rumours of war were rife, and things generally were assuming a very complicated threatening aspect.

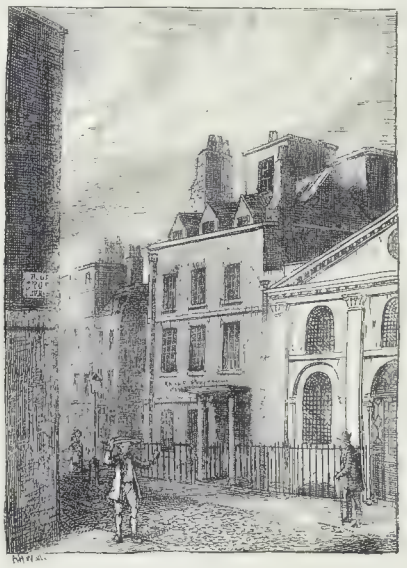
In 1703 Newton became president of the Royal Society, as the successor of John Lord Somers, and, to assume an importance suited to his position, kept a carriage, with a small establishment of three male and as many female servants. As usual he was always hospitable, kind, and, above all, charitable. Indeed, to his charity and generosity he set no bounds, and used often to observe that those who reserved their wealth to be bequeathed to the poor after their death never gave at all. He lived very humbly and frugally, and spent the bulk of his income in assisting his poverty-stricken and distressed neighbours, and in the furtherance of all causes which aimed at the spread of education and knowledge. In 1724 he wrote to the Lord Provost of Edinburgh, offering a yearly sum of 20*l.* to induce Mr. Maclaurin to fill the post of assistant to Mr. James Gregory, who was professor of mathematics in the University. The Royal Society of Edinburgh has in its museum the door of Newton's bookcase, which derives some, at least, of its interest in the eyes of Scotchmen from the fact that the great philosopher himself believed that his family was of Scottish descent.

On the 16th of April, 1705, at Cambridge, Newton was knighted by Queen Anne, who frequently declared that she considered herself happy and honoured in belonging to an age and country that could boast a genius so extraordinary. But in the same year Cambridge declined to re-elect him, and he ceased to sit in Parliament.

We see the change public life had wrought in the knightly recluse and scholar when the hot controversy arose between himself and Leibnitz on the subject of their respective claims to the original discovery of the "fluxionary," or differential calculus, on which the mild, modest, shrinking philosopher of early life has degenerated into the angry, vehement swash-buckler of paper warfare. But to the poor, and to those who needed help and sympathy, he was what he had ever been. Prosperity and fame wrought no evil in this direction, but much good. Mr. Conduit, who married his niece, says,—"I believe no man of his circumstances ever gave away so much in his lifetime in alms, in encouraging ingenuity and learning, and to his relations; nor upon all occasions showed a greater contempt of his own money, or a more scrupulous frugality of that which belonged to the public, or to any society he was entrusted for. He refused pensions and additional employments that were offered him." From the same source we learn how temperate he was, eating but little flesh, and living chiefly upon broth, vegetables, and fruit, of which he always ate very heartily.

One Tuesday in February, 1726, he came to St. Martin's-street for the last time. He had been unwell, and had been living in temporary lodgings at Kensington for the sake of improved air. His object was to attend a meeting of the Royal Society. "The next day," says Mr. Conduit, "I was with him, and thought I had not seen him better for many years, and he was sensible of it himself, and told me, smiling, that he had slept the Sunday before from eleven at night to eight in the morning without waking; but his great fatigue in going to the Society, and making and receiving visits, brought his old complaint violently upon him. He returned to Kensington on the Saturday following," and his poor, old, deserted house never saw him again. At Kensington, on the 20th of March, between one and two o'clock in the morning, strong and clear in thought, with all his mental faculties in their prime, and just after he had put aside his work for the last time, he died, aged eighty-five. His sufferings during this illness had been terrible, and Addison records for us that, when his agony was so great that drops of sweat forced themselves through a double nightcap he wore, he never complained or cried out.

We have completed the story of the old house in St. Martin's lane so far as it concerns Sir Isaac Newton, but the story of the house is incomplete. However, what we have to say of it in connexion with other famous occupants must be reserved for another paper.



Sir Isaac Newton's House, St. Martin's Fields.

MODERN STREET ARCHITECTURE IN STOCKHOLM.

THE illustration given in this number shows a good specimen of architecture in Sweden, and represents the residence of Herr Jean Bolinder, in Blasieholmen, Stockholm. When completed, it will be an ornament to the city in more than one respect. The problem the architect had to solve was not easy, although he was not fettered in his design by any instructions of the owner's, the latter having given him *carte blanche*. But other difficulties arose. The frontage is comparatively small, and the building is placed between the colossal proportions of the grand hotel on the one side and the official residence of the Norwegian Minister, with its front retired from the line of the street, on the other side. An edifice had to be designed which, by its elevation, and by the details and characteristic features of its ornamentation, as well as by a gentle rounding off at both corners, should be distinguished amidst the neighbouring buildings, thus forming, as it were, the centre-piece in the whole setting, without, at the same time, losing its own individuality. A glance at the illustration will serve to show that the problem has been satisfactorily solved.

A detailed description of the building is scarcely required. Designed in the style of the Venetian Renaissance, the work, when completed, will be a proof of Herr Zettervall's (the architect's) abilities. The ground floor is intended for shops and offices, the other floors for private residence. At the back, the central part, containing the domestic offices, juts out into a garden.

The foundation was laid in the autumn of 1874, and the superstructure was commenced in the spring of 1875. It is expected that the building will be completed in the course of 1877. The contractor for the works is Herr Thavenius, and they are carried on under the supervision of Herr Erikson, in the absence of Herr Zettervall, the architect. The greater part of the façade is executed in Portland cement, and it is decorated with about fifty columns and pilasters of polished Malmön granite. The figures and other decorative portions will be in cement and terra cotta.

Victoria (Philosophical) Institute.—The usual fortnightly meeting of this Society took place on Monday, at 10, Adelphi-terrace, when a paper was read upon the Flint Implements found in Brixham Cavern, in which the author, Mr. Whitley, alluded to the statements of Mr. Pengelly, whose active superintendence of the exploration of the cavern under the auspices of the Royal and Geological Societies was deserving of the warmest thanks of all geologists. Mr. Whitley complained that the Report of the Royal Society and the specimens had been allowed to lie by for fifteen years before being published and rendered accessible to the public. The consequence was, that for a long time theories having no foundation in fact had been promulgated as to these specimens, and several statements in regard to Brixham Cavern and its contents had been made in well-known geological works, which did not accord either with the recent Report of the Royal Society or Mr. Pengelly's subsequent one.



STREET ARCHITECTURE, SWEDEN. A RESIDENCE IN



HOLMEN, STOCKHOLM.—HERR HELGO ZETTERVALL, ARCHITECT.

NEW CHURCHES IN SOUTH LONDON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon, the 11th inst., the Architectural Association visited two churches now in course of erection in South London, viz., those of St. Agnes, Kennington Park, and St. Mary, Newington. The church of St. Agnes, which was first visited, is being erected from plans by Mr. George Gilbert Scott, jun., and is far advanced towards completion, the roof timbers being nearly all *in situ*. The church consists of nave, aisles, and chancel, and has a total length of about 170 ft. The style is somewhat mixed, the main features of the building being Early English, with Decorated detail introduced in some portions. The material used is brick, red bricks from Sudbury, Fareham, and South Malling being used for the exterior. The aisle walls are 2 ft. 1 in. thick, built hollow, with a 2-in. cavity, the ties consisting of bricks dipped in tar, two of them being used for every superficial yard. These walls are made hollow in order to secure a dry surface for frescoes, &c. The width of the nave is 23 ft. 6 in., and of the aisles, 15 ft. 9 in., the height to the wall-plate being 48 ft. 6 in. from the nave datum. The chancel floor will be 2 ft. 6 in. above the level of the nave. The roof of the nave and chancel is continuous, with the exception that a small bell-gable is carried up above the chancel arch. The nave and chancel roof will be boarded, and of half barrel form, the aisle roofs being vaulted in wood, with stone springers. The nave bays are 16 ft. 6 in. wide from centre to centre of the piers. Provision is made for carrying a small gallery at the west end, where will ultimately be the tower. The chancel will be divided from the nave by a screen surmounted by a rood-loft, on which the organist will have his seat, the organ being divided and placed in recessed chambers over chancel aisles. The courses of the nave piers are bedded with thick mortar-joints. The stone used throughout is Box Ground, and, in the case of the mullions and other small details, the pieces are additionally secured together by pebble dowels. An oak dado is intended to run round the wall, and also round the columns of the chancel. Messrs. Niblett & Son are the contractors, their foreman being Mr. Brown. Mr. John Kaberry, the clerk of the works, received the visitors, and kindly explained many constructive details. The contract price of this church, exclusive of the tower, is 11,000*l*.

Proceeding a short distance northward along the Kennington Park-road, the visitors arrived at the new parochial church of St. Mary, Newington. This church, as will be known to many of our readers, is intended to replace the present unsightly eighteenth-century structure which juts out so awkwardly into the roadway of the thoroughfare known as Newington - butts, about five minutes' walk north of the new church. The old church, which has long been a great impediment to traffic, will be removed soon after the consecration of the new church, which event is fixed for the 1st of May. The new church is being erected from plans (selected in limited competition) by Mr. James Fowler, architect, Louth, and comprises nave, aisles, chancel, and tower and spire. The erection of the spire is deferred at present for want of funds. The materials used are Kentish rag and Bath stone dressings, externally; and, internally, Anaster stone for the columns and voussoirs of the nave arcade, red Mansfield stone for the detached columns in clearstory, &c., and Hassock stone, rendered with cement, for the walling. The nave is 100 ft. long by 35 ft. wide, divided into five bays, 20 ft. 5 in. from centre to centre. The roofs of the nave and the chancel are of hammer-beam construction, the height in the nave being 70 ft. from floor to ridge. The chancel is 44 ft. long by 32 ft. wide, and will rise by seven steps of 6¼ in. each from the level of the nave floor. The tower is at present carried up to a height of about 80 ft., the total height of the tower and spire when completed being about 186 ft. The east end of the chancel is lighted by five large lancet lights, with a rose-window above, in addition to twelve smaller windows, six on either side, at the clearstory level. It was incidentally stated during the visit to this building that 1,000*l*. had just been given for the purpose of filling the east windows with stained glass, and providing a stone and marble pulpit. The heating will be effected by means of Haden's apparatus. Sittings are provided for 1,200 persons on the ground-floor, in addition to 150 children, who will be accommodated in a small gallery over the porch at the west end. The sittings in the nave and aisles will be open deal benches, stained and varnished, oak fittings being used in the chancel. Over the principal entrance-porch at the west end will be a sculptured representation of the Majesty, &c. Mr. Ruddick has executed the whole of the carving. The contract price is 17,500*l*., exclusive of the spire, which will cost 3,000*l*. more, making the total cost 20,500*l*. Messrs. W. Downs & Co., of Union-street, Borough, are the contractors (Mr. A. G. Cook being their foreman), and Mr. Hugh Hogan is the clerk of works. Having thanked Mr. Hogan, Mr. Downs, and Mr. Cook for their kindness in explaining the works, the members separated. We gave illustrations of this church not long ago.

HOUSES IN FLATS.

SIR,—The perusal of "A Tenant's Recollections," most graphically rendered in your last number, reminds me, unwillingly, of the French exquisite who was introduced one afternoon during the carnival season in Paris to a well-known *danseuse*. The lady apologetically intimated that she had spent the small hours of the morning at the opera ball; to which the gentleman rejoined that, inasmuch as under the circumstances she was *ravissante*, her beauty would have completely overpowered him had she retired to rest at an orthodox hour. When "A Tenant," who appears to have resided at different times in the four corners of Europe, is honestly *ravi* with a certain Glasgow "flat,"—wherein, according to the plan he has given, pantry and bed-room, kitchen and drawing-room are promiscuously huddled together,—I am tempted to inquire what effect might not a similar horizontal dwelling exercise upon him and others were it but arranged in accordance with those social and sanitary laws upon which home comforts in a great measure depend. Nevertheless, it is almost certain that were it possible for Londoners to get,—for money,—even such residences as the unwholesome "self-contained house" which your correspondent has admirably described, those uninteresting persons who profitably farm so many of the London houses, would gradually disappear, or, at least, only the "fittest" would survive; and in this colossal city a large majority of the houses situated within the four-mile radius are lodging-houses,—that is, houses inhabited by two or three families or groups. More than one satirist has told his readers how the London lodging-house keeper and his lodgers are perpetually attempting to ignore each other, and to impress upon their neighbours an idea that the house they share is a private one. The term "lodging-house" is studiously avoided by all; yet, in spite of this, there are more than fifteen hundred householders in London who are courageous enough to describe themselves in the Post Office Directory of last year as "lodging-house keepers." Indeed, in one broad street of fifty-six really good houses, leading into a fashionable square, within a mile of Regent-circus, there are twenty-five houses described as lodging-houses, and seven as private hotels. In London, such is the force of custom, no "family man" likes to admit that he occupies only part of a house. Many, therefore, fly away to semi-detached bandboxes in the remote outskirts of town, access to which is obtained very often by two miles of omnibus, five miles of railway, and a mile of walking. How socially inconvenient this custom has become may be seen any night at a London theatre. In Paris, Vienna, Cairo, or even Calcutta, it is thought impolite to rise from a seat before the performance is concluded; but, in London, ten minutes, often, before the curtain descends, confusion reigns in stalls, boxes, and pit. Anxiety is depicted upon every countenance! No heed is paid to the presence of spectators who wish to see the end of a tragedy or farce; and in this the "stalls" are frequently the worst offenders. But the reason is that most of these unfortunate pleasure-seekers live miles away. They have to catch train, omnibus, or tram, or to undergo a melancholy drive to Clapham, Brompton, or Notting-hill. The denizen of the gallery, on the contrary, strolls away in an easy and unconcerned manner to one of those slums of which central London is largely composed; and on the way probably refreshes himself at his club. But then, cry the suburbs, the advantage of inhaling fresh air at least eight hours out of the twenty-four! Town can now retort that the air to be obtained on the Victoria Embankment is quite as fresh as that which sometimes lingers over the Hampstead and Highgate ponds; and that Pall-mall is a more agreeable lounge than Haverstock-hill. My individual experience during the last dense fog proved to me that I could find my way right and morning with comparative ease in London itself, but that at the top of the Finchley-road it was difficult to follow even the lighted footway I had trodden for years.

To build slips of three-story vertical houses for the accommodation of a single family in the heart of a great city like London is, to say the least, an extravagant way of covering valuable land; and to divide such houses, after they are built, into extemporised dwellings for two or more groups of people, is to admit an absence of forethought in the owners both of the land and of the houses. Of the two, however, the freeholder is the more blind, for he does not seem to see that the value of his land would increase if the lessee were induced to build upon it twelve horizontal houses instead of six vertical ones. Only lately, to my own knowledge, a ducal ground-landlord forbade an enterprising tenant to build a house-in-flats upon the plot of ground he leased; and compelled him to erect a party-wall in the very centre of it.

The objection which Londoners evince to the "flat" system of house-building is doubtless increased by the primitive examples already erected in parts of the metropolis. Nearly all these "flats"—and I have lately visited several blocks of them—suffer from an entire absence of any systematic distribution or principle of plan. Yet nearly all are inhabited and let at comparatively enormous rentals. They possess dark and stuffy passages, with kitchens, bed-rooms, and sitting-rooms intermingled—with here and there blind closets, proclaiming that poverty of invention which devotes, in the plan, waste space that should not exist, to cupboards; and, in the elevation, attempts to enliven a dead wall with niches or panels. A primary canon of the horizontal dwelling excludes from every part of it a dark or an ill-ventilated corner. Water-closets must be lighted and ventilated not from an internal area or courtyard, but from the street. The three sections of an ordinary house—the dining and reception-rooms; the bed-rooms; the kitchen and domestic offices—must be distinct in themselves, and shut off from each other. The Parisian principle of plan which governs the architects of such buildings in Vienna, St. Petersburg, Geneva, Hamburg, and Berlin, in Turin, Naples, and Rome, in Cairo, and other Eastern cities, will not do for London. The Englishman's nose is a highly sensitive organ; and he expects his house to be fresh and pure without keeping the windows and doors perpetually open. He will not reside in a house in which the staircase is guarded by a man and wife with the chance of an additional incumbrance every ten months and a half. He will not mount more than four flights of stairs,—say forty-five steps,—at a time, although he will do this without grumbling several times a day. He will not live continuously in any building that resembles an hotel. The noise of any instrument of insular music, either of human or mechanical contrivance, which he will tolerate through a party wall, he strenuously condemns if under his feet or above his head. In fact, to make horizontal dwellings really successful in central London, where tall houses are inevitably necessary, the floors must be as thick as party-walls, and sound-resisting; and both the Parisian door-porter and the London staircase must be superseded, if not altogether abolished.

WILLIAM H. WHITE.

LIGHT AND COLOUR.

SIR,—I did not commence this controversy. My little book had been reviewed in these columns, when, suddenly, a letter appeared from your correspondent announcing that he was going to tilt at the views contained in it, *seriatim*, beginning at the preface, and going on to its end. I was therefore somewhat in fear that I should have to write another book of replies to Mr. Benson's attacks on my Revised Theory. You have, however, very kindly and mercifully limited our contention.

It is scarcely, perhaps, the acme of good taste for two writers upon the same subject to run down each other's work. I am quite sure I should have left Mr. Benson's treatises to repose on their laurels had he not assumed the function of critic. I have not, myself, the least objection to a pen tourney; but he who enters the lists to joust with me must be quite sure that he is

not equipped in glass; so, without more ado or further parley, I drive full tilt at

Mr. Benson's "Three Colour Sensations."

I find in Mr. Benson's writings the following several statements of his *leading* principle, a principle so utterly erroneous and calculated to mislead that the sooner it is borne down the better.

"*All colours* are *combinations* of *three simple sensations*." "They are sure to be some *mixture* of the *three sensations*." "So that if the *three colour sensations* are excited all at once." "The eye is so constituted in the great majority of persons as to be capable of *three simple* or *elementary sensations* of colour." "The *simple sensations* are *never* excited separately with *perfect purity*."

The foregoing passages, derived from Mr. Benson's writings, will, I think, most conclusively show that he has never thoroughly apprehended the sensuous phase of the theory of light. *Imprimis*, it may be observed that he speaks of the *three sensations* as if they were causative,—as if they were capable of being shuffled about and combined so as to produce all other sensations of colour. The several passages, indeed, exhibit a most remarkable entanglement of notions, capped, as I shall presently show, by the last, which, from a logical point of view, is the most extraordinary statement of the series. Mr. Benson, it would appear to me, has thought that the mere substitution of "sensations" for "colours," in the antiquated formula that "there are three primary colours," would rectify this ancient misstatement; if so, he is most grievously mistaken. For there are not *three elementary colour sensations*, but an infinite variety of colour sensations. This infinite variety, however, is not produced, as Mr. Benson teaches, by admixture of three *elementary sensations*, but by an external differentiation of vibratory action. When we do combine anything to produce a colour sensation differing from that produced by either of the ingredients singly, we combine things which reflect different vibrations, waves of different periodicity, not sensations. We know nothing about the sensations themselves, except that they differ the one from the other, and that they are succeeded by other sensations which are the results of reactions or librations in the nervous system. We do not mix and compound sensations, but the vibrations which produce them. The strangest enunciation of all, however, is that which is contained in the last quotation of the series, in that which affirms that these *three colour sensations* are *never* excited *separately* with *perfect purity!*" Then how in the name of science can Mr. Benson affirm that they exist? For, according to his own showing, his *three pure elementary sensations* have never been experienced, never been felt; *ergo* they are more impalpable even than sensations, mere phantoms of the writer's brain. In fact, he first sets up, and then, in his own peculiar way, knocks down, his own hypothesis,—thus showing, by his own writings, as I have previously stated, that there is very grave need for clearer teaching in reference to the sensuous phase of the theory of light.

Are there Three Elementary or Primary Wave Periods?

Seeing, then, that the sensations of colour are not themselves causative, we have no colourable pretext for calling *colour sensations* either "primaries" or "secondaries." Moreover, the excitement of a sensation of a "secondary" colour is followed by a reaction producing that of a "primary." If, therefore, the sensations were themselves causative, a "secondary" would be as much a "primary" as the "primary" itself. From the sensations themselves, therefore, we get no support for the ancient nomenclature of "primaries" and "secondaries." Let us, therefore, transfer the inquiry to the vibrations. The question, then, resolves itself into this,—Is there any valid reason for calling certain wave periods "primaries," and certain other wave periods "secondaries"? For the following reasons I think not. In the first place the only difference in the wave periods is a difference of proportion; they do not differ in kind, but only in degree. They differ, in fact, only as degrees of temperature differ. The only primary is, therefore, wave force. It would be as reasonable to call three widely-separated degrees of temperature "primaries" as the three periods of wave differentiation which produce the sensations of red, green, and blue.

Finally, let us interrogate the prism, which differentiates the solar action, so as to produce between the opposite poles of its spectrum an infinite variety of gradation of vibrations,—those vibrations which produce the colour sensations called "secondaries," as well as those which produce the sensations called "primaries." If, then, these "secondaries" are compounds,—are produced, say, by two combined wave periods,—what becomes of the integrity of the principle of *different refrangibility?* for in this case every prismatic "secondary" would be compounded of two widely differing wave periods, having precisely the same refrangibility. Which, then, shall we abandon,—the nomenclature of "primaries" and "secondaries," or the hypothesis of refrangibility? One of our famous physicists, however, has determined that all the prismatic wave periods are indecomposible; *ergo* all alike are "primaries." The law of special refrangibility was vindicated. There is, therefore, no choice left us in this matter but to abandon our long-esteemed friends the "primaries" and "secondaries."

Nevertheless, we may artificially combine two so-called primary wave periods, so as to produce the sensation of a "secondary" colour, but in this case the same authority tells us that the compounded vibrations which produce that "secondary," unlike the single wave which produces the same "secondary" colour by the prism, can be again resolved into two component elements.

Moreover, the testimony of sensation would place black and white on a par with any "primary" and "secondary"; for the sensation of a black spot is succeeded by an ocular spectrum of a white spot, and *vice versâ*. Why not, therefore, call one of these a "primary" and the other a "secondary"?

Do not let it be forgotten that the eye itself is the real field for experimentally testing colours, and that the general principle which we derive from so experimenting is that every sensation of colour of one kind is succeeded by an ocular spectrum of one of another and opposite kind, and that whichever of the two sensations is first experienced will be followed by its opposite. In sensation, therefore, it will be clear that the distinction of "primary" and "secondary" will not hold. It is evident also from the testimony of sense that all colours are so differentiated that in the entire scale of gradation for every colour on one side of the mean there is a compensating colour in a corresponding and opposite position on the other side of the scale. But as the gradation of our colour sensations must bear a certain relation to the gradation of wave periods which cause them, we may infer that the scale of wave periods corresponds with the gradations of sensation, and consequently that there must be a series of vibrations, every one of which on one side of the mean will have its corresponding, compensating, or neutralising one on the other or opposite side. The natural system of chromatic harmony is not therefore tertiary, but binary. I have experimentally satisfied myself that this is so, by observing the ocular spectrum of the prismatic scale; and when I come to the physical portion of my Revised Theory, I hope to bring the testimony of the prism to bear upon this portion of my subject.

Actinism.

Is actinism the result of vibratory action? It is the name of the virtue of the so-called chemical ray which is spoken of as if it were composed of matter emitted from the sun. If it be the result of a wave of different periodicity only, from those which are supposed to compose the solar beam, the notion may be consistent enough; but if actinism be looked upon as the chemical action of matter projected from the sun, the vibratory theory is impugned, and we should have a hybrid hypothesis of a corpuscular and vibratory system working side by side.

I have now, Sir, I think, fully shown that the theory of light is not altogether in that settled state that we can as yet fold our hands contentedly, rest, and be thankful, as Mr. Benson would have us.

W. CAVE THOMAS.

Pontefract Borough Surveyor and Inspector of Nuisances.—The Sanitary Committee recommended the Town Council to appoint Mr. Hewitt, of Manchester, Sanitary Inspector and Borough Surveyor, at a salary of 120*l.* per annum. It was strongly objected that he was no scholar. His friends said he was a good pavior, and the motion was carried.

THE NEW CATHOLIC APOSTOLIC CHURCH, CAMBERWELL NEW ROAD.

THE new Catholic Apostolic Church at Camberwell, for the denomination having their head quarters at the well-known edifice in Gordon-square, was opened recently, with much ceremony.

The edifice, which has been erected from designs furnished by Messrs. Belcher, is in the Early English style, and built of red brick, with stone dressings. In front of the main building, which is set back from the roadway upwards of 40 ft., there is a cloister. The north and south sides lead into the narthex, from which there are four separate entrances into the edifice. The church consists of a nave of five bays, the columns from which the arches spring being of blue Bath stone; also north and south aisles, transepts, and a spacious chancel 40 ft. in depth, terminating with a semicircular apse. The south transept forms a chapel, and in that on the north side is placed the organ and choir. Internally the edifice has been arranged and fitted for the peculiar services intended. It has a vaulted ceiling elaborately decorated. The chancel has nine upper windows, all of which are intended to be filled in with stained glass containing representations of our Lord in the centre, with the Apostles and four Evangelists on either side, the latter being already placed. The chancel portion of the edifice is in three divisions, viz., the sanctuary, the upper or priests' stalls, and the lower or deacons' stalls. Beyond the sanctuary is the altar-table, on which is a tabernacle, where the consecrated bread and wine are reserved for the communion of the sick. The altar is of Caen stone, with marble shafts, elevated by three steps above the level of the sanctuary. A lofty baldachino surmounts it. At the west end, under a recessed canopy or niche, is placed the font. It is in Caen stone, with red Irish marble shafts. In front there is stone carved work. A band around the font represents lilies of the valley, with four medallions, containing bas-reliefs of the Crucifixion, Resurrection, Ascension, and the Descent of the Holy Ghost. Beyond the chancel there are several distinct vestries for the priests, deacons, and choir, whilst at the west end, near the cloister, there is a retiring-room for females, together with other rooms for meetings in connexion with the church.

The builders are Messrs. Braid & Jopling, of Chelsea.

LICENCE FOR HOARDINGS.

VESTRY NO POWER TO MAKE CONDITIONS.

MR. ARNOLD, the magistrate at the Westminster Police Court, had before him recently a case of importance to the building interest, in which Mr. Chas. Hunt, of No. 1a, Longridge-road, Kensington, was summoned by Mr. Chas. Lahee on behalf of the Vestry of St. Luke, Chelsea, "for that he having been granted a licence in writing by the surveyor of the Vestry to erect a hoarding for building purposes at King's-road, Chelsea, in the said parish, did, on the 24th of February, an act not permitted by the said licence,—to wit, allow bill placards or advertisements to be affixed to such hoard."

Mr. Geo. Lewis, jun., in arguing the case for Mr. Willing, the advertisement contractor, contended that sec. 113 of the Metropolis Local Management Act (18 & 19 Vict., cap. 120) contained no such restrictive powers as those sought to be imposed by the Vestry, and cited in support of his case the arguments in an application in 1870 by Mr. Brass, the contractor, for a mandamus to the Court of Queen's Bench in 1870 to compel the Commissioners of Sewers in the City of London to issue to him a licence to erect a hoarding at the works going on at the new Post Office, St. Martin's-le-Grand. The Judges were Sir A. Cockburn and Justices Mellor and Hannen; there were three questions in dispute between Mr. Brass and the Commissioners. The third question was the most important in the present case. The Commissioners had said, "You are not to put any advertisements on the hoard," and as the Government had held out to the contractor for the works that he would have the benefit of letting the hoard for advertising purposes as long as the building was in course of erection, this would realise a considerable sum (730*l.*), and if the Court were against Mr. Brass on that point he could come on the Government for compensation caused by the loss of letting the hoard.

Mr. Lewis, in continuation, argued that the Vestry had no more right to say "You shall not

post up bills, &c.," than they had to specify the kind of wood to be used, ornamental or otherwise, or the colour; in fact, all that the licence (and the Act had laid down the terms) required was that the hoarding should be put up to protect the public from the falling of bricks or rubbish, falling into holes, or anything of that kind, and that it should be lighted at night. Now in the application he was quoting from, their Lordships agreed that all the statute required was the name of the street in which the hoarding was to be erected (and that the hoarding, if in two streets or four, was to be taken as a single hoard, and licensed accordingly), the size and time to be standing, and the word "purpose" only meant "the purpose of erecting the building," having no reference to colour, material, or advertisements; and that the licence must grant that which the Legislature intended it should grant, not something put in which the Legislature had not contemplated; and the Court made a rule absolute, in the first instance, to compel the Commissioners to grant the licence without the restrictions they had attempted to impose. Under these circumstances, he (Mr. Lewis) asked whether he need argue the case further.

Mr. Arnold asked whether, after the expression of the opinion of the Court above, the Vestry could proceed further.

Mr. Lahee, the Vestry clerk, said he would prefer to withdraw the summons.

Mr. Lewis did not ask for costs under the circumstances.

THE TRAFFIC AT HYDE PARK CORNER.

SIR,—I have not the smallest possible idea of objecting to Mr. Statham's friendly criticism on my proposal to improve the approach to Belgravia at Hyde Park-corner; but, as I now see that in trying to be brief I have managed to be obscure, perhaps you will allow me to try and make my meaning clearer on one or two points.

As every one has not the Ordnance Survey before him, I ought perhaps to have explained that as the level of the roadway on Constitution-hill is identical with that of Grosvenor-place at a distance of about 200 yards from the proposed junction, it might be made absolutely level if desired. I would prefer a slight rise, and as 1 in 100 would take it nearly up to the bend in the roadway, that was what I had in my mind; but it may be made 1 in 1,000 if any one wishes, to avoid a fall either "rapid or ignominious."

I ought, also, perhaps to have explained that the sinuous line of the park railing as I drew it had really little or nothing to do with the straight lines of the buildings opposite. Had it been proposed to erect buildings on that side, they ought, of course, to be parallel to those on the west; but the railings and the buildings are incommensurate, and do not compete with each other. No one, for instance, objects that the circular enclosures in the centre of our squares are not parallel with the rectangular buildings that surround them, and the effect here would be precisely similar. Besides this, if a roadway is sufficiently wide for the carriage traffic upon it, every additional foot is an inconvenience to foot-passengers, who have a right to be considered. I may also remark that every superficial yard added to such an unadorned gravel surface as this proposed *place*, is not only ugly in itself, but diminishes *pro tanto* the apparent size of the archway at its upper end. The consequence is that, rather than see its width increased at its lower end, I would prefer its being diminished beyond what I have drawn.

When I last wrote I avoided the architectural treatment of the arch altogether, wishing to confine attention to the practical question of the necessity of providing for the traffic; but I may now as well say that, instead of Mr. Statham's steps, what I had in my mind, to get over the difference of level between the two fronts, were two granite pedestals on the south side, in advance of the bases of the coupled columns, with couchant lions upon them, which I fancy would meet the difficulty easily, and improve the appearance of the arch to a considerable extent.

Indeed, if I dared to whisper such a thing, I would suggest that the Great Duke himself should be invited to descend from his lofty perch, where he cannot be properly seen, and only looks ridiculous, and should take his stand on a pedestal provided for him, 100 ft. in advance of the arch, at the junction of the two roadways on the south, where the statue would be seen under the most favourable circumstances in which it can be placed. If this were done, and he were replaced by a statue of Victory on the summit, and the statues and bas-reliefs of the arch were completed as originally designed, the whole group would become one of the greatest ornaments to the metropolis. As a park-gate, and the residence of a park-keeper, it is an absurdity and a sham. If treated in this manner, it would, on a smaller but still on an appropriate scale, be the exact counterpart of the Arc de l'Étoile at Paris,—not a thing to be driven through, but a triumphal archway and an appropriate memorial of the greatest victory of the great Duke.

But these are dreams that probably may never be realised, and fortunately their consideration may for the present be easily postponed; for it does not in any way interfere with the practical question of how the block of traffic at Hyde Park-corner can best be relieved, which is that to which it would be well if attention were, for the present at least, to be confined.

JAS. FERGUSSON.

THE LIVERPOOL NEW WATER SUPPLY.

FOR several months past the Liverpool Corporation have had under their consideration the question of the additional supply of water required for the borough beyond what their present sources can furnish, and up to within the last week they were undecided as to whether they would adopt the proposal by Mr. Bateman, C.E., to obtain a supply from the Westmoreland or Cumberland lakes, or rely upon certain wells, which several parties in the borough have been contending would furnish a sufficient supply in addition to that of which the Corporation are at present in possession. It now appears, however, that the well supply has been finally abandoned, on the double ground that the quantity would be uncertain, and the water itself, even if obtained in sufficient quantities, be subject to impurities. On these grounds it has been determined to adhere to the gravitation principle, and at a meeting of the Water Committee of the Corporation, the question of obtaining water from Windermere Lake or Ullswater Lake, was under consideration. Both alternative schemes have been laid before the municipal authorities by Mr. Bateman, and after much discussion the committee decided to recommend the Windermere Lake project for the council's adoption. The carrying out of either scheme would secure an ample supply of water, but Windermere possesses the advantage of being not more than eighty miles from Liverpool, whereas Ullswater is not much less than 100 miles distant. In the event of the Windermere Lake project being carried out the borough will have three distinct sources of supply, being now in possession of works at Rivington, about twenty miles from the town, by means of which a gravitation supply is obtained, in addition to the water obtained from wells in the neighbourhood of the town.

THE ART UNION OF IRELAND.

THE annual drawing of prizes of the Art Union of Ireland took place on Friday, the 10th inst., in the Gallery of the Royal Hibernian Academy, Dublin. Lord Viscount Powerscourt, K.P., president, occupied the chair. From a statement made by Mr. T. A. Jones, P.R.H.A., and hon. sec. of the Union, it appears that the body is prospering. Their list had closed at 400*l*., and they were enabled to devote a sum of 310*l*. to prizes. A small sum had also been put aside for expenses of the next year. Before the distribution of prizes took place, Lord Powerscourt delivered a discriminating address, reviewing the position of art in several of its aspects at home and abroad, and pointing to successful examples of its culture in these islands. He indicated certain requisite necessities for study, and the ends to be aimed at and avoided by artists and patrons of art. Lord Powerscourt considered that French painters, taking them as a whole, were at the present time the most highly educated school of art in Europe. The reason why he thought the French and other Continental schools were more highly educated than our own, was from the fact that the pupils of some at least of these schools abroad had to go through a more severe curriculum of study than that in use in the United Kingdom.

Ecclesiastical Dilapidations Acts.—The House of Commons have appointed a committee to inquire into the working of these Acts.

THE PROPOSED APPROACH TO THE EMBANKMENT FROM THE SAVOY, AND THE NEW MINT BUILDINGS.

THE materials of the old German Lutheran Church in Savoy-street, and the south side of the Chapel Royal, Savoy, together with two other blocks of buildings adjoining on the west side, were last week sold by auction, and are now in course of removal, preparatory to the contemplated alterations in that locality, which originally included an approach from Savoy-street to the Embankment, to be constructed by the Metropolitan Board of Works, but which is now likely to be interfered with by the project of the Government to build the new Mint on the land which has been cleared facing the Embankment, and which it is understood will also absorb the site on which the old Lutheran Church, now being taken down, stands. It is, however, suggested that notwithstanding the erection of the contemplated new Mint buildings, Savoy-street might still be carried in a direction southward to the Embankment, forming a continuous line, on the west side, from the south-west corner of the burial-ground of the Chapel Royal, but not admitting of the widening of Savoy-street as at first intended by the Metropolitan Board of Works. It appears that the making of this approach will depend upon the arrangements ultimately entered into between the Government authorities and the Metropolitan Board, but there are fears that the Mint project, if carried out, will have the effect of reducing the Embankment approach from a carriage thoroughfare to a pedestrian subway.

THE NEW ASSESSMENT OF PROPERTY IN BERMONDSEY AND ELSEWHERE.

THERE has been a remarkable increase in the new assessment of property in Bermondsey, as compared with the re-assessments in the other parishes within the metropolis, which has led to much dissatisfaction, and to a public meeting to protest against such assessment. At this meeting, Mr. Cyrus Legg, the representative at the Metropolitan Board for Bermondsey, was one of the speakers, and he stated that the increase in Bermondsey was the highest in its rateable value in the whole metropolis. The average increase over the whole metropolis was 7·4, whilst in Bermondsey it was over 20 per cent. This showed that the parish of Bermondsey was paying more than their fair share of the metropolitan burdens. The whole of Bermondsey was rated at 20·6 per cent. above the original rating, and he thought that Bermondsey must have improved amazingly, in order that such an increase in the assessments should be placed upon it. Now in Lambeth there was a vast amount of building going on, and improvements were increasing; but they rose but 4·0 per cent.; Newington, 7·9; Camberwell, 7·8; Chelsea, 5·2; St. George-in-the-East, a little over 1·0; Mile-end Old Town, 4·2; Westminster, 6·5.; Deptford, 7·5; Greenwich, 4·7; Hackney, 9·2; Fulham, 8·5; and Penge, 6·0 per cent.; and all these were districts which had improved even in a greater ratio than Bermondsey. He gave several instances where the assessments had been appealed against, and where the parties had succeeded in getting them reduced more than one-half.

EFFECTUAL FILTRATION.

THE official Water Examiner says in his last report,—The rate of filtration of the metropolitan water supply should not exceed 2½ gallons per square foot of filter-bed per hour; this will give 540 gallons per square yard each twenty-four hours, and at this rate, with properly-constructed filter-beds, filtration should be effectual. Effectual filtration is greatly facilitated by previous subsidence for several days. Of the companies drawing their supplies from the Thames, the West Middlesex and Lambeth are the only two that have at present sufficient storage capacity, or impounding reservoirs, to avoid taking in water when floods prevail.

From the report it will be seen that the Chelsea Company are proceeding with the construction of the requisite subsiding reservoirs at Molesey, and the Southwark and Vauxhall and Grand Junction Companies are preparing to construct suitable storage and other works at Hampton; when these companies have completed their improvements they should be able to avoid the floods, and supply water effectually filtered and of better quality.

THE BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY, ROME.

ON February 11th Mr. Parker gave an instructive lecture upon the present walls of Rome, illustrated with views by aid of the lantern. At the *conversazione*, on the 14th, Mr. Tighe exhibited various coins, and the subject of the walls was discussed. The Society made an excursion on February 15th from the Porta del Popolo to the Porta Maggiore, examining the various construction of the wall in detail. On the 17th the Society visited the new Mediæval Museum, in the Collegio Romano, under the guidance of Mr. Hemans. On Friday, February 18th, the Rev. Dr. Phillip gave an interesting lecture upon the Ghetto in Rome.

At the *conversazione*, on Monday, the 21st inst., according to the *Tourist's Directory*, Mr. Parker first gave an account of the fortifications of Rome on the other side of the Tiber, including the triangular space of which the Tiber forms the base, and going up the side of the Janiculum to the apex at the Porta di S. Pancrazio, including the Church of S. Pietro in Montorio, near the summit, and the other churches in the valley between the hill and the curve of the Tiber. The wall of Aurelian, which had been carried along the opposite bank of the river from the Porta Flaminia, or del Popolo, to near the bridge called Ponte Sisto, has all been swept away by the great floods, but owing to the current running more strongly on one side than the other, one of the towers of Aurelian is still standing in the river on the northern side of the bridge. Several other towers are standing.

GLASGOW INSTITUTE OF ARCHITECTS.

A MEETING of this Institute was held on the 13th inst., Mr. John Baird, I.A., president, in the chair. Mr. John Thomson, architect, Airdrie, was unanimously elected a member of the Institute. Mr. John Honeyman brought up an interim report of the committee appointed to consider what steps ought to be taken with the view of obtaining a suitable Building Act for Glasgow:—

"1. The committee resolved that, as a preliminary to further consideration of the subject, it was desirable to obtain full information as to the provisions and practical working of the Building Acts and bye-laws affecting buildings at present in force in other large cities.

2. They therefore obtained copies of the London Building Act, the Metropolis Local Management Act, the Liverpool Building Act, the bye-laws relating to buildings in Manchester and Birmingham, and also copies of the recommendations of the Special Committee of the Glasgow Police Board, of which Mr. W. R. W. Smith was convener, and they have carefully considered these various Acts.

3. Although not yet prepared to make any definite proposals as to the details of a suitable Act for Glasgow, they deem it right, in the meantime, to report certain general conclusions which the consideration of the subject has forced upon them, and to submit certain suggestions which may be of use to members of the Institute and others while the exact terms of the desired measure are still under consideration. In general, then, the opinion of the committee at present is—(1) That the operation of a Building Act for Glasgow should not be confined within the limits of the present municipal boundaries, but should extend over a much larger area; (2) The preliminary proceedings at present necessary before leave to erect a building in Glasgow is obtained are, as compered with such proceedings in other cities, tedious, expensive, and in other respects objectionable; (3) The powers which the authorities at present possess for the efficient supervision of buildings are entirely inadequate; but it is not desirable that any additional powers should be vested in the Dean of Guild Court as at present constituted.

4. In view of the very great difficulties which must be encountered in framing an Act which may, on the one hand, effectually secure all that can reasonably be demanded in the interests of the public, without, on the other hand, unduly interfering with the rights of property and the privileges of individuals, it is of the greatest importance that the authorities should take measures to ascertain fully the views of all parties interested before taking any decided action. Your committee strongly recommend that you should take steps to bring the matter under the special notice of the Town Council, and to impress upon that body the propriety and the advantage of securing the advice and co-operation of all parties concerned while there is still time for calm deliberation.

5. In conclusion, the committee desire to offer the following suggestion:—That, inasmuch as it is evident from the information obtained that there is considerable dissatisfaction with existing Building Acts in other large cities, the discussion of the whole subject might most appropriately and usefully form part of the business of the ensuing Conference of Architects under the auspices of the Royal Institute of British Architects."

On the motion of Mr. John Gordon, I.A., the Report was adopted; and it was resolved that, before approaching the authorities as suggested in the Report, the committee should take the subject again into consideration, and bring up some definite proposals for the consideration of the Institute.

"INSTITUT DES ARTS INDUSTRIELS."

FROM Paris comes a request that we would mention that the Institution named above, the object of which is to encourage and reward efforts towards the advancement of arts, sciences, and industrial occupations, will award, towards the close of April, an honorary diploma and medals to artists, men of science, and artisans, who may be specially distinguished in the various departments.

The *Institut* will also present medals to working men, or to the foremen of *ateliers* or building yards, who may be recommended by their employers as uniting irreproachable conduct with recognised ability in their work.

Applications or claims for this distinction, written in or translated into French, and plans, models, or statements submitted with the same object, must be addressed before the 1st of April to the *Institut des Arts Industriels*, office of the *Revue Nouvelle de l'Architecture*, 16 *bis*, Cité Trévisé, Paris.

We willingly give currency to this announcement, published in the *Revue Nouvelle*, hoping that some candidates for the distinction offered may be found among our readers, especially of the artisan and art-workman class. The names of a few of the persons connected with the Institution should be given.

NORTHUMBERLAND AVENUE.

THE new roadway to the Embankment from Charing-cross was opened on the 18th inst., by Sir James Hogg, without ceremony. We confine ourselves at present to a few official details, not without interest. The formation of a subway here for gas and water pipes, after experience of that in Garrick-street, is an answer to the objections, even sneers, with which we were met when, early, we advocated such an arrangement.

The new roadway is about 1,000 ft. in length, and its width is 90 ft., divided into a carriageway of 60 ft. and two footways of 15 ft. each. The gradient for one-half its length is 1 in 90, the remainder being practically level. Carriage and foot way communications have been formed with Northumberland-street, Craven-street, and Scotland-yard, the first of which it is proposed to widen. The subway for gas and water pipes alluded to has been formed along the entire length of the street, and one of the main sewers, known as the Northumberland-street sewer, has been diverted for a portion of its length to bring it under the site of the public way, and a new sewer formed under the subway for the drainage of the houses to be erected in the new street. Plane trees have been planted on the footways next the curb, thus making the approach correspond in character with the roadway on the Embankment. The subway is of the same general character as that adopted in Garrick-street. It is of brickwork, in the form of a semi-circular arch slightly stilted, its width being 12 ft. and its height 7 ft. 6 in. The gas and water mains will be laid in this main passage, and the service-pipes will be carried from them through side arched passages—one to every two houses, so that both the main and service pipes will be accessible without disturbing the surface of the road. The street was designed and completed by Sir J. Bazalgette, C.B., and Mr. George Vulliamy, the Board's architect. The contract was let to Messrs. John Mowlem & Co. on the 25th of June, 1875, for the sum of 15,750*l*. Their contract, however, did not include the construction of the carriage-way paving, which is of wood, and which has been executed by the Improved Wood Paving Company, at a cost of about 4,500*l*. The money expended in the purchase of the property amounts to about 643,754*l*., including 500,000*l*. paid for Northumberland-house and estate; but the Board anticipate that the surplus land will sell for a very large sum. It is stated, as the result of several experiments, that while the average time occupied by a Hansom cab in travelling between Charing-cross and the Mansion-house by the Strand route is 22 minutes, the journey can be easily performed by way of the Embankment in 11½ minutes.

THE SANITARY CONDITION OF WESTHOUGHTON.

A PLAIN-SPOKEN MEDICAL OFFICER OF HEALTH.

THE Local Board of Westhoughton, near Wigan, in Lancashire, have got a medical officer of health who appears to have a habit of expressing himself in an unmistakably plain manner on the *laches* of the authorities whom he serves. At a recent meeting of the Board there was a warm discussion on certain terms contained in the medical officer's report. He complained that the Board had failed to remove certain nuisances which he had reported as prejudicial to health, and, by implication, he gravely accused the Board of having contributed to an increased mortality by not having acted upon his advice. In his report he says:—"The mortality is under 16 per 1,000. Of the dozen deaths during the month, some were drifting downwards in the direction of dotage. One-third of the deceased ought to have been alive, and *would have been* alive now had your Board, or inspector, or predecessors, or all of you, done your duty." In the discussion which followed the reading of this report, the chairman denied that the Board had thrown any obstacles in the way of the removal of nuisances. Ultimately they refused to receive the report until he explained the meaning of the terms complained of.

DAMP-PROOF BUILDING MATERIAL.

FIRE-BRICKS and other heat-resisting pottery have been manufactured in the vicinity of Gunnislake for several years. It has been reserved for the proprietors of the Phœnix Works in that locality, to make also vitrified bricks and ware, from a material that hitherto has been almost worse than useless. They seem to have thus solved a most important problem, by the manufacture of a building material which is damp-proof, and which can be produced at a reasonable price.

Common clays when vitrified are apt to swell and puff out like a pudding. Hitherto the blue "terro metallic" bricks and tiles of Staffordshire have been accepted as the sole solution of the problem.

At the Phœnix Works, however, both white and blue damp-proof bricks are manufactured thoroughly vitrified throughout, and impervious. They are not made of clay in the ordinary sense of the term, but of a soft unctuous killas, or clay slate, which abounds on the sett, and which on being exposed to the weather becomes quite friable. Experimenting upon this Mr. Cowell found that it would burn without change of shape to a semi-porcellanous substance. Two varieties of killas occur in the sett, differing chiefly in the amount of iron they contain. From one of these—the irony—blue bricks, &c., are made; and from the other white. The uses of the material are not confined to bricks, but it is worked up into paving tiles, stable pitching, kerbing, copings, damp-proof string-courses, and the like.

London Commercial Deposit Building Society.—The twelfth annual meeting of this society was held on the 6th inst. at Doughty Hall, Bedford-row, Mr. W. Hurran, chairman of the Board, presiding. The annual report, which was taken as read, stated that there had been, during the past year, an increase of 18½ per cent. in the number of investing members; of 21 per cent. in the number of borrowing members. The report says:—"The receipts have increased from 5,674*l*. 15s. 4d. in 1874, to 7,410*l*. 11s. 3d. in 1875; and the amount out on mortgage has increased from 11,380*l*. 14s. in 1874, to 13,689*l*. 4s. 8d. in 1875."

SETTING-OUT ANGLES.

A VERY simple little instrument for setting out angles of 90 deg. or 45 deg. is figured and described in the *Memorial de Ingeineros* for the 1st of January last. It is the invention of a Spanish Marine engineer, Don Casimir de Bena. It consists of a small tube, to be carried in the pocket, and small enough to be hidden in the hollow of the hand. The end, which is to be applied to the eye, is flat, with two eye-holes. At the opposite extremity of the tube is fixed a rectangular strip of glass, half silvered and half plain, forming an angle of 56 deg. 15 min. with the axis of the tube. The observer looks at an object through the tube and the unsilvered portion; then the appearance of some other object, by reflection on the silvered portion, shows that the two objects subtend at the observer's station an angle either 90 deg. or 45 deg., according to the hole through which the observation is made. A third hole, in the axis of the tube, allows of the determination of certain other angles. The instrument is perfectly simple, without movable limb, adjustment-screws, or any other additions whatever, and is reported to give very good results. Diagrams are given showing its application to a great variety of engineering work.

DAMAGES FOR EXCESS OF TIME.

MILLARD *v.* NEW CIVIL SERVICE CO-OPERATION, NEW QUEEN VICTORIA-STREET.

THIS was an action brought in the Exchequer Division of the High Court of Justice to recover the sum of 650*l.* 2s. 10d., for balance of contract dated May 10, 1875, and extra works, at No. 30, Sloane-street.

The defendants, through their managing director, paid, May 28, on account, 100*l.*; but refused any further payment unless plaintiff admitted in writing his liability for damages under the penalty clause of contract, as follows: Certain portions were required to be finished "by the 27th day of May and the 1st day of June, and the remainder of the work to be completely finished by the 3rd day of July following." It further says:—"If the works be not completed by the *day* named, then for every day's delay after that time in the completion thereof, the said G. Millard will, on demand, pay to the said Co-operation, as and for liquidated damages, the sum of 5*l.*" The plaintiff was unable to complete the first portions named on account of the extra works (ordered by their architect subsequently to the contract being signed) interfering with the fixing of fittings, &c.; but the whole was completed by the last day named, together with all the extra works. The defendants paid into court 564*l.* 14s., claiming as damages against the contractor, 457*l.*, further pleading as to the rest, "Not indebted." The plaintiff now sought to recover the balance of 85*l.* 8s. 10d.

The case was heard before Master C. H. Walton, who was clearly of opinion that plaintiff had incurred no penalty, inasmuch as the whole was completed by the last day named in the contract, together with all the extra works; at the same time offering the defendants a case for the court above. Verdict for plaintiff, with costs.

PRACTICE OF EMPLOYING PARTIALLY CLERKS OF WORKS.

THE Lord Chief Justice and a special jury, at the Queen's Bench on Saturday and Tuesday, the 18th and 21st inst., were engaged in the case of Farmer *v.* Richards, in which the plaintiff, Henry Farmer (a clerk of works), sought to recover the sum of 61*l.* 5s. from the defendant, the Rev. E. H. Richards, for services as partial clerk of works.

Mr. Day, Q.C., Mr. A. L. Smith, and Mr. Bray, were the counsel for the plaintiff; and Mr. McIntyre, Q.C., and Mr. Bowles represented the defendant.

The plaintiff, upon examination, stated that he had had nearly twenty years' experience as clerk of works, and had been employed by Sir Gilbert Scott. In 1874, the defendant, Vicar of Farlington Church, near Havant, was having a new nave added to his church, and, after repeated requests from the defendant, witness undertook to superintend the building as partial clerk of the works. Mr. Smith was the builder, and Mr. Street, the architect. Witness generally visited the works from six to eight in the morning and from four to half-past five in the afternoon. He had occasion to complain of the builder, and from time to time his work had to be re-executed. In June, 1875, Mr. Tanner (manager for Mr. Street) requested witness to give his whole time to the work; but he had objected on account of other works he had in hand. Although he had endeavoured to obtain a settlement with the defendant, up to that time he had paid nothing. Witness shortly after received a letter requesting him to send in his account, and informing him that his services would no longer be required. Previously no complaints had been made as to his supervision. He first sent in an account at the rate of 30s. per week and 10*l.* for travelling expenses, but afterwards reduced the charge to 25s. per week and 5*l.* for expenses,—61*l.* 5s.,—which was a very low charge compared with what he was receiving for his other works. In cross-examination, he said the usual weekly payment for the entire services of a clerk of works was 3*l.* 13s. 6d. He was receiving 3*l.* 3s. and 15s. per week in respect of two other engagements at the same time that he was superintending Farlington Church. Witness requested the defendant to look to the works in his (plaintiff's) absence.

George Wood said that he was the private secretary of Sir Gilbert Scott, who had employed plaintiff. A fair remuneration for a clerk of works would be 3½gs. to 4½gs. per week. For partial services 25s. per week would be a low rate. Partial clerks of works were frequently employed, and the practice was recognised in the profession. In reply to his lordship, witness said that the arrangement was a delusive one, especially where the contractor could not be depended upon.

Mr. Bowley (surveyor, of Abingdon-street, Westminster) said that the employment of partial clerks of works was frequently resorted to to save expense, and where an honest contractor was engaged the practice worked extremely well.

Mr. Kaberry (of Brixton) said that he was engaged as partial clerk of the works at St. Agnes's Church, Kennington, and at Lincoln's Inn. The employment of partial clerks of works was customary in the profession.

Mr. McIntyre, on behalf of the defendant, stated that the plaintiff when engaged would not state what his remuneration was to be, and on several occasions said that it would only be a trifle. He had admitted that he was receiving 3*l.* 3s., and 16s. from other sources whilst superintending defendant's work, which sum was more than the full payment to a clerk of works. From the way in which he had allowed the works to proceed, plaintiff was either incompetent or negligent. Defendant had tendered 28*l.* 5s., which ought to more than satisfy plaintiff for his negligent supervision.

The defendant was then examined. He said that he was rector of St. Andrew's Church, Farlington, Hampshire. Had seen plaintiff at Havant Church, and in August, 1874, engaged him as partial clerk of works at Farlington Church. During the course of the works witness called attention to the damp-course, and to the fact that the cement did not appear to set properly. White instead of grey lime was used; and bonding courses of bricks were not used where they should have been. In cross-examination, he said that he knew when he engaged plaintiff that he was also at work at a Roman Catholic chapel, and at a church at Havant. Witness did not complain of the superintendence, but left that to the architect and surveyor.

Mr. G. E. Street, R.A., said that he prepared the plans for the restoration of Farlington Church. The contract was entered into in July, 1874, and the building was to have been completed in four months. There was great delay in the progress of the works, and he had to complain of the slowness. Some of the walls had no footings, and the concrete was not properly laid. The foundations were imperfect, being composed chiefly of rubbish, with only a small layer of concrete above it. The bonding courses were omitted altogether. He ordered a thorough examination.

William Davies (stonemason), James Clear (artisan), and Mr. Richards (son of the defendant) having been examined,

Mr. McIntyre, Q.C., and Mr. Day, Q.C., addressed the jury for their respective clients.

The Lord Chief Justice then summed up, and in so doing said that there could be no question as to the imperfect and defective nature of the work; but could that have been done if the plaintiff had exercised proper supervision? He was bound to give a reasonable degree of time, diligence, and care to the task he had undertaken.

The jury, after consultation, gave a verdict for the plaintiff for the sum of 31*l.* 5s., 5*l.* beyond the amount paid into court.

DAMAGE TO STONE CARVINGS IN TRANSIT BY RAIL.

BOLTON *v.* MIDLAND RAILWAY COMPANY.

At the Cheltenham County Court, on the 17th inst., an action was brought by Mr. Richard Bolton, stone-carver, Cheltenham, against the Midland Railway Company to recover 33*l.* 15s., for damage done to seven Bath-stone figures of angels, which the plaintiff had carved to be placed at the top of the screen in Belmont Catholic Church, Hereford, and which, on the 12th of November, were conveyed by the defendants from Cheltenham to Belmont, directed as follows:—"One case carved stone, Mr. Spray, mason, Catholic Church, Belmont, near Hereford, at the company's risk; very fragile."

The evidence went to show that the case having arrived at Belmont was opened, when it was found that four of the angels, value 6*l.* each, had been entirely destroyed, and the others damaged to the extent of 3*l.* 5s. each. One principal point in the case was whether the figures were statuary, because for the defence it was contended that if they were statuary the defendant was not bound to carry them at all, and certainly not, unless under special agreement, which did not exist in this case. Plaintiff's definition of statuary was, any marble figure able to stand alone, which the solicitor quoted from two dictionaries from 1762 to the present time, to show that the angels were statuary. It was, besides, denied that the injury to the figure was done while they were in defendant's care.

His Honour decided that the figures were statuary, but that the company were liable even in the absence of a special agreement, because their attention having been called to the contents of the parcel in the direction "carved stone," they should have extended their inquiries and discovered what was in the case. Verdict for the plaintiff to the full amount.

LIABILITY OF EMPLOYERS.

WICKS *v.* THE NATIONAL SAFE DEPOSIT COMPANY (LIMITED).

THIS was an action in the Queen's Bench Division, brought to recover compensation for personal injuries. The plaintiff is a journeyman engineer, and was employed by Messrs. Rosser & Russell, who were fitting the water and other pipes at the defendants' building, near the Mansion-house. For the purposes of their work, the workmen of Messrs. Rosser & Russell used a forge. Two days before the accident the clerk of the works gave directions that the forge should be moved from one room to another. In the room to which this was moved there was a hole in the floor, which was concealed by a board. The plaintiff being ignorant of the existence of this hole, on the 1st of April last fell through it to the floor beneath, and sustained a compound fracture of the thigh and a fracture of the jaw. During the progress of the plaintiff's case,

The Lord Chief Justice intimated that, unless the defendants were in a position to prove that the clerk of the works was not their agent, the verdict must be for the plaintiff.

In the result it was agreed that his lordship should assess the damages, which he did at 400*l.*

CLAIM AGAINST A COUNTY SURVEYOR.

ADAMSON *v.* CROZIER.

THIS claim (heard in the Darlington County Court, on the 15th inst., before Mr. E. R. Turner), was by Mr. Swanston Adamson, of Gainford, contractor, who sued Mr. Crozier, the Durham county surveyor, for the sum of 10*l.* 3s. 6d. compensation for injuries sustained in November last, as was alleged, through the negligence of defendant.

The facts were that the plaintiff, accompanied by Mr. Vaughan, left Darlington on the night of November 25th, to drive to Gainford. At Brydale Beck Bridge the vehicle was pitched over, and both occupants thrown out. There was a brazier, containing fire, at the other side of the bridge, away from the obstruction which plaintiff's vehicle encountered, and which caused the accident. Some alterations were going on, and the road on one side was 18 in. to 2 ft. higher than on the other. The snow on the road prevented the obstruction being seen. A man came up who was appointed to watch, after the accident occurred, who appeared, it was said, as if he was under the influence of drink, or had been asleep. Damage to the vehicle was sustained, the lamps being broken. Plaintiff lost his whip, and his hat was crushed. For the defence it was not sought to be shown that the road was not being repaired under the direction of Mr. Crozier, but it was argued that the claim could not be sustained against the surveyor unless it could be proved that there was negligence on his part, which had failed to be shown by the other side. The snow prevented the plaintiff from noticing the state of the road, which should be regarded more as the "act of God" than that of the defendant. His Honour gave a verdict for the plaintiff for 9*l.* 5s., with costs, considering that the light on the road was too far away from the obstruction.

DARLINGTON.

WHAT might have proved a disastrous fire was discovered the other day at Russell-street Chambers in this town, occupied on the ground floor by a depôt of the Bible Society, and the upper floor as offices. Smoke was seen coming out from the top of one of the shop-windows, and it was suspected that it was caused by the absurd practice of carrying the joists beneath the fireplace. The builder, Watson, was sent for, and workmen were set to open up the suspected fireplace, and found the two joists beneath the hearthstone smouldering away, when a cement remedy was applied.

The corporation have decided on building municipal offices at the end of the new street opening on to the market-place, when it is to be hoped the selection of competition plans will be better managed than it was with the workhouse, the roof of which was so imperfectly built that it has now to be thoroughly overhauled, and slates substituted for tiles to ease the weight on the roof.

Some of your speculating London builders are wanted down here to build cheap, so as to enable working men to have a cottage at a reasonable rent. They let now at 12 per cent. on the outlay, a pretty good return. The Skerne is being widened in its approach to the town, to save the periodical flooding the lower parts of the town are subject to, and it will then be found that the old stone bridge will prove a barrier to the flow of the flood water, and when more damage has been done the corporation will then think of making a new iron bridge in one span. That is the way they manage things in Darlington.

J. B. W.

ARMORIAL BEARINGS.

SIR,—In your paper of the 4th February (p. 219), it is stated that no person is justified in using armorial bearings who cannot show a grant upon the books of the Heralds' College, or prove that his ancestor in the male line used them before the date of the establishment of that college. Now, I happen to be one of a class of persons whose ancestors have displayed armorial ensigns upon their seals, tombs, and upon published engraved portraits at various times, from the reign of Elizabeth downwards, and yet whose arms do not appear in the Heralds' books. Some years ago I inquired whether the list of grants was perfect, and I found that such was not the case, and that the authorities of the College could not positively declare that any given crest

had not been granted or sanctioned by their body. Under these circumstances, I declined to accept a new grant placing me on an heraldic level with those whose use of armorial bearings is of modern date. No doubt the statement in your paper is in substance generally true; but I think an exception should be made by the College in favour of such persons as can show that their ancestors publicly used arms in a time when the heralds were in the habit of fining those who so used them without authority. If a man used arms before the reign of Charles II., the presumption is that he had a right to do so.

ARMIGER.

EDUCATION OF BRICKLAYERS.

SIR,—It gives me pleasure to reply to those gentlemen who have so kindly taken up this subject, and I will be as brief, clear, and to the point as possible. Mr. Houghton does not concur with me that it is the thoughtful workman who is surprised at this wide-spread ignorance. Allow me to explain, he is surprised at the ignorance when he contemplates how near and how cheap is the remedy. All the following gentlemen, as well as Mr. Houghton, seem either to forget or not to know that there are ample means for all to learn geometry, drawing, &c., at our artisans' institutes and working men's colleges; but, note what proportion of bricklayers attend the building construction classes. Not one in six. Therefore, to one who has the real interest of those connected with his own trade at heart, seeing they will not avail themselves of this opportunity, he will devise other means. The means that I propose are mutual improvement classes for bricklayers only. "Bricklayer Clerk of Works" is very hard on my position as a trade unionist, and it is to this gentleman's communication that I shall chiefly direct my reply. In his opening remarks he regrets that I omitted to explain the causes of this widespread ignorance. My reasons for so doing were that I hoped I should be answered by some of our leading unionists; but, I am sorry they are so busy as not to be able to spare a little time to a purpose that I contend would better the condition of our trade more than twenty strikes about some paltry infringement of rules. Before I proceed to explain the cause, allow me to say that there are two classes of bricklayers. One class come from the hod at manhood; the other class are bricklayers' sons, or have been at the trade from boyhood as apprentices or otherwise. The majority of the boys become good bricklayers, able to undertake any part of our trade; whilst the majority of those who come from the hod are confined to working along the line. "Bricklayer Clerk of Works" has fully explained how these men become bricklayers, therefore I need not reiterate his explanation. But he does not tell that there is a great aversion among the real bricklayers to teaching these hod-carriers, and, as their name is legion, hence the ignorance. We are also accused of encouraging this class of men into the Union. Our system of a uniform rate of wages is also designated a vicious system. Let me offer a few words in defence of the Union. Knowing that there are so many labourers turning bricklayers, the Union has a rule that no one be admitted a member until he has served three years; and it is necessary for our own protection that we take them into the Union, and obtain for them the same rate of wage as the proficient workman. Why? Because we find that masters are so grasping, that if they could obtain these men at a lower rate of wage, the skilled workman, instead of being kept on all through the job and being sought after, would only be required where there was skilled work to be done, and would be out of work half his time: there would then be less encouragement to become proficient than now, and that is not desirable. "Bricklayer Clerk of Works," if he were a foreman, would rate their pay according to their ability: would he not rather try to get his work done as cheaply as possible? Would he employ skilled labour where unskilled would do? Would he not, to curry favour with his master, try to make the unskilled do the skilled work? But I think I have said enough to defend the system of the Union: what I want to do is to make all skilled that all may deserve what they get, to raise the standard of intelligence among all, and make the bricklayer (if he already is not) able to compete with the carpenter for the leading position on the works. I hope it will not be thought that I wish to annex the classes that I propose to the Union. Not at all. As "Bricklayer Clerk of Works" suggests, let there be common ground for Union and Non-union men; but this I urge, that our lodges might be made productive of more good, if, instead of useless discussion, they were used for educational purposes; and, as a teetotaller, I would urge every right-minded bricklayer to use his influence to remove the lodge from the public-house.

I now come to the second letter by "Bricklayer Clerk of Works," in which he seems to doubt that those who have united to obtain for the unskilled workman skilled workman's pay, would object to the movement of mutual improvement. Now, having brought my proposition before the lodge, where it was freely discussed, I will state the arguments that were used against the movement,—the skilled bricklayers consider that they have a right to reserve the knowledge of skilled work to those who have come into the trade as bricklayers' sons, that is one opinion; another is, that if the (I will call him mature) bricklayer makes the young man as competent as himself, that proficiency that he has striven years to gain will be useless in his old age, because, having transferred that knowledge to those much younger than himself, the young man with skill on his side would have the preference. Now, these arguments appear reasonable enough, if they are true, but I contend that they are not; to admit that they are true would amount to saying that there is no room for improvement in the skilled departments of our trade, also that newly-acquired skill is preferable to skill and experience combined. With reference to the statement of Mr. Houghton's as to the qualifications of some clerks of works and builders' foreman, I could say much in support of it, having had to be brains and penman for them myself, in the capacity of bricklayer foreman, though these very men have been my superiors. I can also tell of an instance of a clerk of works who had been a sailor all the early part of his life, and when I first knew him could not make a dove-tailed clothes-box: he was under my tuition, we being neighbours for some time, and I freely taught him anything he asked, and in four years he was clerk of works over, I believe it was, a new workhouse,—if not, some very extensive additions. I could give many instances, but I have no wish to injure my prospects by expositions, and I am now only a journeyman bricklayer. But I feel that I have already trespassed as far as your valuable space will allow, but do hope that this movement will take some practical form; the difficulty lies in concentrating into one body all those who are in favour of the movement, and for that object I would ask all those who are willing to take part in the movement to send their names and addresses to me, 6, Angel-place, Broadwall, Stamford-street, S.E., and I will try and convene a meeting, where this question may be properly ventilated.

J. P. MORRIS,
Sec. London Lodge M. U. O. B.

*** With this, the correspondence, which, it may be hoped, has not been useless, may end.

TITHE-RENT CHARGE.

SIR,—I built a house *nine* years ago on a certain copyhold field, and the vendor has paid *tithe-rent charge* for the whole field up to last year, but, having sold his land, he refuses to pay any more. Now, though I have but one seven-roomed house myself, I am threatened with a distraint, if 1*l.* 5*s.* 3*d.* be not paid within ten days, that sum being the total charge for one year upon the whole estate. Many have larger houses thereon, and some have two or more houses, yet I am asked to pay; and the rector's agent says he cannot receive my proper proportion, but that he has power to charge and enforce the whole from *any owner* who has built on the field, further stating that the payer has power to collect of the others their proportions (how should I know what to charge them?), and in default could summon them before two justices, who have power to order payment with all costs.

If this is the law, the sooner the tithe question (as practised here, at any rate, as to building land) is legislated upon, and made something like equitable, the better.

Hanley. RECTOR'S TAX.

SUBSTITUTE FOR SLATES.

SIR,—May I be allowed to call your attention to the fact that I am now paying 70 per cent. more for slates at a Carnarvonshire quarry than I did only two years since. If present prices continue to rule (and I am told they will, and most likely become still higher) it must check the building trade, without mentioning the present high price of labour. It seems strange, in the present advanced state of science, that the chemist has not yet been able to come to our assistance in producing a good and cheap substitute for nature's rocks. A common black wine-bottle (if spread out) would cover 100 square inches at the least. These, at 9*d.* a dozen—the price I get for them—are quite as cheap as the best slates. Why could not large sheets of this common glass or slag be rolled out? Again, could not ground stone be incorporated with some vitreous ingredient which would be waterproof, durable, and not brittle? As to corrugated iron and such like metallic roofings, they either corrode in *time*, or are very expensive. A substitute has been found for oak bark (for tanning purposes) and other materials; why should not a durable and cheap one be found to take the place of slates? There *must* be a price at which the latter will become virtually prohibited. I am not *in* the building trade myself, but, as a landed proprietor who has a great deal to do in that line, I feel most seriously the present exorbitant price of slates.

P. W. YORKE.

EARLY GLASS.

SIR,—Your correspondent, Mr. O'Connor, maintains that *examples* of the *earliest* stained glass are still extant. The art is known from contemporary *writers* to have existed as early as the fourth century; yet the earliest specimen of glass that has been adduced is that of Neuwiller (Bas Rhin), dating about the middle of the eleventh century. There is thus a period of about 700 years, during which the art was practised, and yet no *example* remains.

I need not recapitulate my lecture in tracing other periods of the art, but will only remark that Mr. O'Connor will contribute a very interesting addition to the archæology of this subject if he favours your readers with *his* list of *earliest examples*. At the same time, I would say, for the sake of "the Englishman abroad," pray do not direct him for such to Milan and Seville,—cathedrals of the fifteenth and sixteenth centuries!

ALEXANDER BALLANTINE.

Improvements in Hyde Park.—Mounds of earth are now being raised on the south side of the Serpentine in Hyde Park. They are set up in convenient spaces between the fine old beech and elm trees, in such positions that, with the aid of the latter, they will form a complete screen between the Serpentine and Rotten-row when they are planted with shrubs, so that it will be impossible for any person riding, driving, or walking in the fashionable quarter to see the bathers.

WATER WASTE PREVENTERS.

SIR,—For some time past the public has been clamorous for a larger and better supply of water; the water companies have been spurred in various ways, and probably have done their best to answer to the call; but in doing so have imposed upon their tenants vexatious regulations, standing at the head of which is that abominable contrivance the water-waste preventer. Now, I make it a rule neither to praise nor blame any invention until I have fairly tested it, and having had several of these preventers fixed, and finding all bad alike, I think the time has come when we should insist on the water companies either ceasing to compel their use, or to give us something better. The design is simply inane, for, whilst the supply-pipe is of half-inch bore, the overflow pipe is only an eighth of an inch in diameter; a pipe of such diminutive size is liable to frequent stoppage, and when this takes place, or when the valve of the ball-cock acts imperfectly, then an overflow and flooding of the premises results. However, pending a change in the rules of the water companies, I would advise every one who may be annoyed with these wretched tanks to take the law into his own hands, and substitute an overflow pipe of greater diameter than the supply pipe; and when the companies find it out, and threaten pains and penalties, take them before the proper authorities, and get the rule altered,

T. E. KNIGHTLEY.

A BUILDING BEE.

THE "Spelling Bee" craze of this leap-year of grace should be utilised before it dies out by a "Building Bee" competition, at which prizes might be given for a variety of useful suggestions or satisfactory answers to questions of which the following are examples:—

What quantity of road-stuff may be used in the walls and on the walls of a room without producing dry-rot? And does sewer-gas, escaping in the basement of a house built upon a shoot, retard or accelerate the growth of the fungi?

To what extent are sites obtained, and modern houses built, with a view to obtaining damages through public improvements?

What is the best material for making artificial knots for inserting in defective wood for furniture and other purposes, and the best for "killing" these knots?

As a test for the stability of speculative buildings, ought a new Building Act to empower the local authorities to compel the builder to keep his houses in repair for the first twelve months; and if doors, door-frames, window-frames dropped out of square, joints opened half an inch wide, flooring-boards split and warped, stairs creaked and thick walls cracked, plaster fell, and drains smelt abominably, what should be the proper punishment for the delinquent Jerry for such atrocious "scamping"?

What religious or moral training would be the best suited to make the present or the next generation of civil engineers act more civilly, and speak more respectfully, of the opinions and abilities of their contemporaries, the architects?

How far is the "Queen Anne style" a piece of the patchwork quilt of William and Mary, and to what extent should the Jacobean trimmings of the previous reign still be retained?

What are the earliest instances of dome construction in the British islands, and were the builders or workmen Pagan or Christian? Did they use lime cement or not; and if dry wall masonry, how did they dispense with centreing?

A PRACTICAL BEE.

"Not Fit for a Dog to Live in."—On the 29th ult. the Wolverhampton Borough Coroner and a jury inquired into the death of the infant daughter of John M'Munn, galvanizer, residing at No. 3 Court, Eagle-street, Steelhouse-lane. The child had died in convulsions on its mother's breast, and the jury had therefore no difficulty in finding a verdict. The coroner called attention to the damp and unwholesome character of the house in which the parents lived as most injurious to health. A juror said he would not let a dog of his live in the house. Mrs. M'Munn said she had often asked the agent to put the house in proper repair, but had asked in vain.—A Juror: The landlords are fast enough in raising the rents, and they ought to be so in making the houses tenantable. The attention of the Borough Surveyor ought to be called to the place.

A PROPOSED BRIDGE ACROSS THE THAMES.

On the 15th inst. Mr. Frederic Barnett laid before the Society of Arts a proposition for a new bridge, for providing for the traffic across the Thames below London Bridge. Mr. Barnett said,—"My patent bridge has but one approach from each shore. When these approaches have extended into the river about one-third its width, the roadway splits into two roads, each the same width as the approaches, by easy inclined angles, outwardly extending till they meet midway, thus forming a sort of angular oval or loop in the largest diameter. I have on each side two openings, practically covered and united by platforms, turning on their centres, each opening or closing by one operation. These openings permit the entrance on the port side of the largest ships that come up the Thames; there is also a sufficient width allowed for the length of the ships within the loop. From the central piers on which the turntables work, there is extended a platform uniting the two extremes, so that this platform lies with the axis of the river, dividing the loop into halves, furnishing the means of mooring the ship a few minutes alongside by mooring blocks. There are two other platforms running parallel to the chief platform, which keep the ships straight on their road. The vessels return on the opposite, still going port; thus all risk of collision is avoided. The platform will have narrow lighters, rising and falling with the tide, thus protecting both piers and vessels from injury. As soon as a vessel is about to enter the loop, the roadway on the side by which it is to enter is closed, and the vehicular and general traffic, by closing the gates (when the roads divide), is diverted to the opposite side; then immediately the turntable-bridge is opened, and the vessel enters the loop, so that when it is fairly in, the bridge is closed behind it, and, as before described, the traffic is diverted on the road behind the ship, and the opposite turntable-bridge is opened, suffering the ship to pass out on its way."

Such a structure as that proposed would block up the river and prove an enormous nuisance. Further consideration of it would seem to be useless.

STAINES TOWN HALL COMPETITION.

A special meeting of the Staines Local Board was held on the 10th inst., for the purpose of inspecting the twenty-five plans submitted in competition for laying out the Town-hall site; and the plans having been inspected, Mr. Taylor moved, and Mr. Earee seconded,—"That all plans be rejected that do not show a considerable portion of open space for public promenade by the side of the river." This was carried unanimously. The meeting then adjourned until the 13th inst., when another meeting was held, and after the remaining plans had been discussed and inspected, it was resolved,—"That the premium of 20*l.* be awarded to the author of the plan with the motto 'Toujours fidèle' appended." It was then ordered that the clerk should communicate with Mr. Byrne, of 31, Park-street, Windsor, the author of this plan, and that the remaining plans should be returned.

RAILWAY COLLISIONS.

I have read your leading article, "Recent Collisions on Railways, and the proposed Modes of Prevention." All will agree with you that a better system must be devised. (Commercially speaking, if there is an inquiry for this article it can be supplied.)

Now, Sir, to my mind, the desideratum is a self-acting automaton that will signal fore and aft in defiance of present obstacles. Let us try pneumatics; it will do much cheaply. An india-rubber bellows in a box near the rail: a passing train would act on this wind instrument, causing a sound, bell, or whistle, &c., at stations in front and rear; the bellows, by gravitation, to take ten minutes to regain its inflation, during which time a fog signal is held over the rail by metallic fingers from the box; shunters to pull the lever

1 2 3 4 5

five times, S H U N T, to signal up and down stations to that effect.

R. T.

Water Supply of London.—The Home Secretary has appointed Tuesday, the 28th (at half-past two o'clock), to receive a deputation from the National Health Society on this subject.

LONDON BOARD SCHOOLS.

Two more schools have been publicly opened by the Board recently. The first, situate at High-street, Stoke Newington, nearly opposite the entrance to Abney Park Cemetery, and consisting of a three-storied building set back some distance from the road, affords accommodation for nearly 900 children. Each department (infants', boys', and girls') has school and two class rooms, with ample cloak-rooms and lavatories, the playgrounds being all in front. Mr. T. Boyce, of Hackney, was the contractor, whose tender amounted to 6,850*l.*, and Mr. Ellacott was clerk of works. The second school is placed in the Portobello-road, Bayswater, on the south side of the Metropolitan Railway, facing which is the principal front. The arrangement carried out is somewhat different to that generally adopted, the whole of the premises being on the ground floor. Nearest to the entrance in Portobello-road is placed the infants', then the girls', and, lastly, the boys' departments, each having a large schoolrom and four class-rooms, with spacious playgrounds. The schools will accommodate 1,059 children; the builders being Messrs. Kirk & Randall, of Woolwich, and the clerk of works Mr. Jefferson. The amount of the contract was 9,790*l.*; both these schools being erected from the designs of the Board architect, Mr. E. R. Robson. At the opening of the latter, both before and after the public meeting, a selection of vocal music, from the works of Mendelssohn, Rossini, Croft, and Weber, was performed by an efficient choir under the direction of Mr. E. Sibson.

The Board recently obtained tenders for the erection of a school to provide accommodation for 828 children, on the site in Buck's-row, Whitechapel, in lieu of the existing building. The following are the respective amounts:—

Timewell	£9,346	0	0
F. & F. J. Wood	9,170	0	0
L. H. & R. Roberts	9,049	0	0
Grover	8,890	0	0
Killby	8,814	0	0
Sewell & Son	8,792	0	0
Brass	8,749	0	0
Pritchard	8,595	0	0
Ennor	8,590	0	0
Sheffield	8,487	0	0
Jerrard	8,413	0	0
Nightingale	8,432	0	0
Williams & Son	8,300	0	0
Atherton & Latta	8,254	0	0

The committee recommended the acceptance of the lowest tender, that of Messrs. Atherton & Latta, of Poplar, amounting to 8,254*l.* The site contains an area of only 6,925 square feet, and as additional land could only be acquired at great expense, the school has been planned on arches, with playgrounds underneath and also on the roof, thus increasing the cost of the building in order to save a larger expenditure on the site. Cost per head of school buildings only, 8*l.* 2*s.* 7*d.* Total cost per head of buildings, including tarpavement, &c., 9*l.* 19*s.* 4*d.*

SCHOOL BOARD SCHOOLS.

Scone.—A new Board School was opened at Scone on the 1st ult. The style is Elizabethan, and the building comprises two principal school-rooms, each 42 ft. long by 20 ft. wide, and 18 ft. high. These are separated by folding-doors, which can be thrown open at any time. Connected with these principal rooms are two class-rooms, each 24 ft. long by 16 ft. wide, and 18 ft. high. On either side of the principal school-rooms are lavatories and cloak-rooms for both boys and girls. The room used as the infants' department is large and commodious, measuring 32 ft. long by 20 ft. wide, and is 14 ft. in height. Accommodation is provided for 380 scholars. The contractors for the work were:—Mason, Mr. Mitchell, Scone; joiners, Messrs. Clunie & Wilson, Bridgend; plasterers, Messrs. Annan & Son, Perth; slater, Mr. Buchan, Perth; painters, Messrs. Stalker & Boyd, Perth; glaziers, G. R. Douglas & Son, Perth; plumbers, Ramsay, Brothers, Perth; levelling the ground and making playgrounds, Mr. Stalker, Murrayshall. The whole of the buildings were erected from plans by and under the superintendence of Mr. Macdonald, inspector of works to the Earl of Mansfield.

Brighton. — The Brighton School Board's Lewes-road schools are now completed. The style is Domestic Gothic. The chief frontage is to Fairlight-place (135 ft.). The material used is clamp brick, the grey tone of which is relieved by bands of red kiln bricks, a projecting course of this latter and a pattern-work of red, brown, and buff brick marking the division of the boys' from the girls' schools; the boys in the upper story, the girls in the lower. The windows are set in Doulting freestone, with stone mullions, cills, heads, &c., and the copings and the finials to dormers and gables are also of stone. The roof is formed of brown tiles, relieved with bands of red. The windows are glazed with diamond rough plate. The dimensions of the girls' schoolroom, adjoining the infants', are 34 ft. by 22 ft., and it is 15 ft. high. The two class-rooms connected with it are each 20 ft. by 20 ft. The boys' schoolroom is 57 ft. by 22 ft. and 18 ft. 6 in. to the ceiling. The class-rooms are of the same size as the girls'. These latter boys' rooms can be added to at any time, if necessary. At present they will accommodate 200, the girls' school 150, and the infants' 250. To each of the schoolrooms a master's or mistress's room is attached, with lavatories, hat-pegs, &c. Mr. Thomas Simpson, of Brighton, is the architect, Messrs. J. & A. Stenning are the general contractors; and Mr. Ernest Black has acted as clerk of the works. The total cost, with ground, &c., will be 7,700*l.*

Bonnybridge.—The Bonnybridge Public School, which has just been erected by the Falkirk Parish School Board, from designs prepared by Mr. T. B. M'Fadzen, architect, Edinburgh, was opened in presence of a large assemblage on the 4th instant. The school is planned on the narrow-roomed principle, to accommodate 300 pupils, and consists of large school-room, infant school-room, and two small class-rooms. The building has two principal entrances on the south side, one being for the girls and infants and the other for the boys, and they are so arranged that admission may be gained into any of the rooms without disturbing the teaching that is being carried on in any of the other apartments. The total cost has been 1,951*l.* 7*s.* 11*d.* The School Board has at the same time erected a teacher's house, at a cost of 847*l.* 19*s.* 10*d.*

Books Received.

Architectural Studies in France. By W. Galsworthy Davie, Architect, Gold Medallist R.A., and Soane Medallist R.I.B.A., 21, King William-street, Strand.

The first part of this work, which is to consist of measured drawings and sketches (plotted on the spot) of stone, wood and iron, enamels, stained glass, encaustic tiles, tapestry, and so on, has been issued. Some of the mouldings and sculptures are given full-size, whilst others have been reduced from full-size drawings. The work is to be published in fifteen monthly parts, and when completed will contain ninety plates, including fifteen in colours. It promises to be a very useful work, and we cordially wish Mr. Davie success in his undertaking.

Miscellanea.

Alleged Libel upon a Timber Merchant by a Builder.—At the Liverpool police-court on the 7th inst., Mr. Thomas Fox was charged with libelling Mr. R. A. Weston, timber merchant and a member of the Liverpool Town Council. It appeared that some years ago the defendant was in business as a builder, and had some transactions with Mr. Weston, who, however, had to resort to law courts to obtain payment. Since that time the defendant had almost incessantly persecuted the prosecutor, calling him a gentleman robber, and accusing him of fraud of various kinds. He published these libels by means of post-cards, letters, and posting-bills, and had already been bound over for threatening Mr. Weston, to whom his conduct had become intolerable. The stipendiary magistrate suggested that the prisoner was not right in his head, and remanded him for examination by a doctor.

Art Gallery for Manchester.—Mr. Alderman Heywood announced, at the annual meeting of the School of Art at Manchester, on the 15th inst., that he had had an interview with a gentleman who desired to contribute 100,000*l.* for the purposes of an Art Gallery in that city. The committee of the school have determined to undertake the responsibility of obtaining a new School of Art, which they thought should also include an art gallery.

Rome and Britain.—At Cysicus, in Asia Minor, an inscription in Latin has been found, engraved upon a stone wall, recording a victory over the Britons, and the capture of their king Caractacus by the Emperor Claudius.

The Liability of Employers for Injuries to Workmen.—A Bill to amend the law relating to the liability of employers for injuries negligently caused to persons in their employment, has been introduced to the House of Commons by Mr. Macdonald, M.P., and read for the first time. It sets forth that "where any action or proceeding is brought for recovery of damages or compensation in respect of bodily injury or loss of life (alleged to have been occasioned after the passing of the Act) to any person, it shall not be any ground of defence that the person by whose negligence the injury or loss of life is alleged to have been occasioned, was employed in a common employment with the person injured or killed, or that the risk of injury or loss of life was knowingly or voluntarily incurred by the person injured or killed in the course of his employment." The Bill contains a proviso to the effect that the Act shall not render an employer liable in any case where the person injured or killed materially contributed to those results by his own negligence, and also another proviso which sets forth that no action shall be sustainable unless notice of action is given within six weeks or commence within six months of the occurrence of the accident. As to injuries caused to minors, the Bill provides that when compensation for damages has been recovered the Court may direct the money to be paid into the hands of some person in trust for the minor, and that the amount shall be applied for the education or advancement of the minor, or otherwise for his benefit, as the Court or Judge of the High Court of Justice may direct.

Improvements in Bristol.—At a special meeting of the Bristol Town Council, on the 10th inst., it was resolved to adopt a recommendation of the Sanitary Committee to spend 10,522*l.* in restoring the wall and footway by the side of the River Froome from Ashley-road Bridge to Wade-street, in raising the footway above flood-level, and in clearing out from the river the materials and *débris* of the old wall and footway which have fallen into it. But the Council (says the *Bristol Times and Mirror*) instead of adopting the recommendation that steps be taken to procure powers to enable the authority to execute works above the Ashley-road Bridge, at a total expenditure of 25,000*l.*, carried a resolution empowering the Sanitary Authority to call in an engineer of the "highest eminence," and suggesting that before the work is done the authority should consider in what way and in what proportion the expenses of any improvement that may be carried out can with justice be thrown upon the persons whose property will be benefited, and in what proportion upon the ratepayers of the rest of the city, many members of the Council objecting to tax the city in order to improve the low-lying ground of Ashley-road, and thus to induce a host of speculative builders to commence operations there.

The New North Porch at Bristol Cathedral.—It is stated that an "ecclesiastical difficulty" has arisen at Bristol Cathedral. In the restoration works of the nave of the cathedral now going on, a new north porch, the gift of Mr. Wait, M.P., is being added. Over the entrance is a cluster of figures in bas-relief, to which attention has been called by correspondents of the local newspapers. Exception is taken to one of the four figures which represent the Fathers of the Church. They are St. Jerome, St. Gregory, St. Augustine, and St. Ambrose; and St. Gregory is represented with the tiara, the figure being in fact, an exact counterpart of one of Pope Gregory, now being erected at the new Roman Catholic Cathedral in Clifton. The facts having been brought to the notice of the Dean of Bristol, Dr. Elliott, he has written home from Nice, ordering the work to be stopped until his return.

Belfast Architectural Association.—On the 13th of March Mr. Wm. J. Gilliland read a paper in the Museum, College-square North, on "Warming and Ventilation." Mr. John Vinycomb occupied the chair. The paper was illustrated by diagrams, including Mr. John Lanyon's lately patented ventilators. The lecturer, in the course of his paper, gave descriptions of Capt. Galton's stove, Perkins's hot-water system of pipes, and other methods of warming houses and public buildings. The theory of ventilation was entered into, and the best methods of supplying fresh air, whilst obviating draughts, described. After some remarks from Mr. Lockwood and Mr. R. M. Young, a vote of thanks to the lecturer, proposed by Mr. Braddell and seconded by Mr. Phillips, was passed.

Mr. Ruskin and Sheffield.—"Spectator in Hallamshire," writing in the *Sheffield Independent*, says:—"Our Sheffield artists have formed a society, and propose this year, at last, to hold an exhibition of pictures, to be preceded by a *conversazione*. As Mr. Ruskin has shown some little interest in Sheffield by buying a house and commencing a museum of the Society of St. George, the artists ventured to hope that he would shed upon them a few gleams of the light of his countenance. They accordingly asked him to preside at the opening of their exhibition, but he has declined in what, I suppose, we must call a characteristic letter. Mr. Ruskin will have nothing to do with Sheffield artists. No artist, he says, worth sixpence a day would consent to live in such a town, beneath a canopy of smoke, and no lover of art would take up his abode here for a million a year. Mr. Ruskin is imaginative enough to think that art may, perhaps, flourish in Hell, for he believes in the ability of the Devil to overcome natural obstacles, and consume his own smoke; but in Sheffield—pah! Don't mention Sheffield and art in the same century."

A Third-rate French Town compared with Newcastle-on-Tyne.—At a public meeting, held in Newcastle-on-Tyne, at which it was resolved to call upon the Town Council to purchase the Elswick Hall Estate for a free public park, a letter was read from Mr. Cowen, M.P., in which he said:—"I spent the greater part of the last recess in and around a country town in France. The population of the place was only 43,000. There were no manufactures. The inhabitants chiefly were interested and engaged in the growth of vines, and the raising of agricultural produce. Yet in this third-rate French town there was a public library, open every day in the week to the people, free, containing nearly 50,000 books; there were a museum and an art gallery much superior to anything in Newcastle, also free and open daily; and there were zoological gardens, with a good collection of birds and animals, equally open and free. In addition to two miles of beautiful boulevards, which constitute a magnificent promenade, there is a spacious public park four times the size of the one at Elswick, kept in excellent order, and constantly open free to the people."

The Highways Act.—A deputation, representing a large number of local boards in the parish of Halifax and Bradford, have had an interview with the President of the Local Government Board, on the subject of narrow cart and wagon wheels, and the destruction caused to roadways by reasons of heavy loads, carried by vehicles having thin wheels. The Right Hon. J. Stansfeld, M.P., introduced the deputation, and in doing so said the matter had engaged his attention when President of the Local Government Board. His own opinion was that one way of dealing with the matter would be for power to be given to the local boards to make bye-laws regulating the width of wheels on carts and wagons, the laws to be subject to the Local Government Board, which would doubtless lay down a scale suitable for the requirements of the whole country. He suggested that vehicles carrying over 600 lb. should be restricted to wheels of not less than 4 in., and carts and wagons drawn by three or more horses to have wheels not less than 6 in. in width. Mr. Solater-Booth, in reply, said the matter should have his best attention.

Lock-out of Painters at Huddersfield.—On Monday last, the 20th inst., nearly the whole of the operative painters of Huddersfield were locked out. The men had demanded, on a three months' notice, to expire on the second Saturday in April, 7d. per hour as the lowest price for work. The masters, who had hitherto paid 6d. as the lowest, offered 6½d. This the men refused, but offered to go to work for that price till the second Saturday in April if the masters would withdraw certain rules, and pending further negotiations to settle the whole dispute. The masters, contending that putting off the settlement of the dispute till the second Saturday in April would land them in the busy season and give the men a great advantage, refused the offer of the men, and demanded the adherence of the men to the rules with the compromise of 6½d. per hour.

Royal Institute of British Architects.—Mr. Charles Barry will be proposed as President for the ensuing year. The intended conference of architects will be held during the week commencing Monday, the 12th of June.

A Cathedral for a French Colony.—A cathedral church is (according to the Singapore *Straits Times Overland Journal*) to be erected in Saigon, the capital of Cochin China, and the French Government is advertising in the Hongkong papers, inviting competitive plans for the building. The cost of erection is estimated at 800,000 fcs., or about $160,000. The competition will be open till the 1st July, 1876, when all the plans and designs will be publicly exhibited in Saigon, and two prizes,—one of 8,000 fcs. ($1,600) and one of 4,000 fcs. ($800),—will be awarded to the two designs adjudged to be the best by a jury composed of seven members nominated by the French Government. Four plans must be presented for these prizes, for the approval of the jury, and, if a less number be given in, the jury will assess the value of the premiums to be paid. The successful designs will become the property of the French Government, and the unsuccessful ones will be returned to their authors. The building is to include one or two towers, belfries or domes, calculated to carry a cathedral peal of bells, and the Roman or Gothic style will be preferred to Renaissance. The Hongkong papers praise the liberality of the Saigon Government in inviting the Hongkong architects to compete, and the same liberality has been extended to Straits architects.

The Moabite Stone.—A cast of M. Clermont Ganneau's restoration of this monument has been presented by the directors of the Louvre to the committee of the Palestine Exploration Fund. The long delay of seven years in putting together the fragments which remain must be laid partly to the account of M. Ganneau's official occupations in Constantinople, and partly to his recent work of research in Palestine. The stone, as now reconstructed, is 4 ft. 1 in. long by 2 ft. 2 in. broad, having a raised border of 2 in. running round. The upper end is circular, the lower square. About two-thirds of the inscription are preserved in the fragments. There are twenty-one of these; two are of considerable size, the rest being quite small. The remainder of the inscription is made up from M. Ganneau's squeeze of the whole, and from six consecutive lines copied for him by the Arab who took the squeeze. The cast will remain a short time at the office of the Fund, 9, Pall-mall East, and will then be removed to the Society's room at the South Kensington Museum.

The Hull Borough Surveyorship.—At a meeting of the Hull Town Council on the 16th inst., Mr. Wells moved "That the Council do rescind their previous resolution adopting the report of the Amalgamation Committee, so far as such resolution confirms the appointment of a borough engineer and surveyor, at a salary of 600*l.* per annum, and that in lieu thereof the Council do offer to Mr. Joseph Fox Sharp to appoint him as borough engineer and surveyor, at a salary of 700*l.* per annum, with liberty to take pupils, and to receive for his own use the premiums paid by them, such pupils to devote their time to the service of the Corporation." Mr. Elam moved as an amendment, "That the Council offer to Mr. Joseph Fox Sharp the office of borough engineer and surveyor, at the salary of 600*l.* per annum; and that they do at their next meeting proceed to elect Mr. Sharp to such office by voting papers, agreeably to the fifth standing order of the Council." The amendment was lost by twenty-six to fourteen, and the original motion was then put and carried.

Lodging-houses and Dwellings.—A Parliamentary Return (obtained by Mr. Cawley) has just been issued of the number of lodging-houses provided by the local authorities or Commissioners under the Act 14 & 15 Vict., cap. 34. At Huddersfield there is one capable of accommodating 150 persons; the average number last year was 135; the cost was 4,185*l.*; the annual receipts as rent, 690*l.*; and the debt remaining due of the money borrowed, 2,000*l.* At Liverpool there are two places, the cost of which amounted to 17,928*l.* 16*s.*, which was repaid in October, 1869. There are twenty-six other places erected at the instance of companies and private persons, and the required particulars are given in the document now printed.

Further Dividend under the Bankruptcy of Messrs. Peto, Betts, & Crampton.—In the Court of Bankruptcy on the 13th inst., a dividend meeting was held under the failure of Sir S. Morton Peto, and Messrs. Betts & Crampton. It was reported that 29,396*l.* were available on the separate estate of Sir S. M. Peto, and 19,051*l.* on that of Mr. Betts. These amounts are to be distributed in due course.

New Steel Works near Middlesbrough.—Messrs. Bolckow, Vaughan, & Co. (Limited) have commenced the erection of very extensive Bessemer steel works near to their Cleveland ironworks. They have purchased about forty acres of land adjoining the railway, and upon this they intend to erect six new blast furnaces specially designed for smelting hematite ores, and for running the molten iron into vessels for the purpose of being conveyed direct to the Bessemer converters. In close proximity will be the appliances requisite for making Bessemer steel, and for manufacturing this into steel rails. It is confidently anticipated that in a year or so one of the largest steel plants in the country will be in active operation at Eston Junction, four miles from Middlesbrough.

Wages in the Building Trade at Nairn. The operative plasterers of Nairn gave notice to their employers three months ago that they would require an advance on their wages from and after 1st March inst. The masters acceded to the extent of ½d. per hour, so that whereas they were paid up to 1st March with 5d. per hour in town and 5½d. in the country, they now receive 5½d. in town and 6d. in the country. The masons have also received a rise of 1d. per hour, so that their wage now is 7½d. per hour in town and 8½d. in the country, and work nine hours per day.

The late Professor Parkes and Netley Hospital.—The death of Dr. Parkes, F.R.S., which occurred last week, will prove a great loss to the army and to medical science. He was acknowledged, on the Continent, no less than in England, to be one of the founders of military hygiene. "Just as his death is announced" (says the London correspondent of the *Birmingham Gazette*) "comes the rumour that Netley Hospital is to be closed. Structurally, it has never been a satisfactory building,"—for saying which, long ago, we were much abused.

The Darlington New Grammar School was begun last week, the chief contractors being Messrs. Hornsey for the brickwork and masonry, and Mr. Snaith for the carpentry. The time for completion is eighteen months, with a penalty of 5*l.* per day for non-compliance. The situation is at the west end of the town, and is a very pleasant one, being on an elevation with the old town to the chief front, and well wooded lawns and mansions in the distance at the back, the schoolmistresses' training college adjoining it on the east side.

Strike of Carpenters in Paris.—The working carpenters of Paris have turned out on strike. They demand a rise of two sous per hour, a bonus of two francs when they work on the river, and to be paid every fortnight instead of every month. The masters, it is said, are willing to grant the two first demands, but they unanimously refuse the third, for the reason that the men, by being paid more frequently, would lose more time at the wine-shop, and be less fit to do their work.

The Liverpool Timber Trade and the Dock Board.—A letter was received by the Mersey Docks and Harbour Board some time ago asking for a revision of the bye-law which restricts the discharge of deals and sawn timber to the Low Water Quay; but at the meeting of the Board held on the 16th inst., it appeared from the proceedings of the Docks and Quays Committee that they had come to the conclusion that they could not see their way to adopt the suggested alteration in the bye-laws.

Blake's Stone-breaker.—The business so long carried on at the Soho Foundry, Leeds, by the late Mr. H. R. Marsden, will still be conducted in the same name. Mrs. Marsden, the administratrix, having disposed of the foundry and business, together with the stock-in-trade, machinery, plant, and patents, to her son-in-law, Mr. George Dalton, who has been educated as an engineer, and long connected with the manufacturing department of Mr. Marsden's business.

British Archæological Association.—A joint meeting of one of the Penzance Town Council's committees and of the officers of the Penzance Natural History Society was held on the 10th inst., to concert a plan for welcoming the Association to the West. Several suggestions were thrown out, and it was resolved to invite the public to express their views at a Guildhall meeting, and to co-operate in maintaining the repute of the West for its hospitable reception of all who merit courtesy.

Moths in Carpets.—Moths will work in carpets in rooms that are kept warm in winter as well as in summer. A sure method of removing the pests is to pour strong alum-water on the floor to the distance of half a yard around the edges before laying the carpets. Then once or twice during the season sprinkle dry salt over the carpet before sweeping. Insects do not like salt, and sufficient adheres to the carpet to prevent them alighting upon it.—*The Gardener's Magazine.*

The New Museum, Rome.—This Museum was opened on Friday, the 25th of February. It is formed of the remains found in the excavations of the Municipality since Rome became the capital of United Italy. The new circular hall designed by Sig. Vespignani presents a light and elegant effect. On entering, in the centre is a fountain formed out of a magnificent marble vase found upon the Esquiline, called by the Greeks a *Rhyton*: it is the work of Pontios, an Athenian sculptor.

Trade Unions.—Last year 43 trade unions were registered, making 173 since the passing of the Act on the 29th of June, 1871, of which 29 have been dissolved; alterations of the rules of 18 trade unions were registered; 129 trade unions from which returns had been received by the Registrar of Friendly Societies show that the funds amounted on the 31st of December last to 273,757*l.*, and the annual income to 369,089*l.* There were 282,646 members

The House on the Greenhill Estate, Hampstead, which has been erected by Mr. W. H. Lascelles, for Mr. Norman Shaw, A.R.A., being now completed, the workmen employed were, through the kindness of Mr. Shaw, entertained at supper on the 10th inst. The cloth was laid in the large dining-hall, and Mr. Allan Clark, the foreman of works, presided. The house is built in the "Queen Anne" style.

Working Men's College, 45, Great Ormond-street.—The summer session will commence on Wednesday, March 29th, with a lecture at 8.30 p.m. (free to the public), by Professor J. R. Seeley, on "Stein, and the Regeneration of Prussia."

TENDERS

For premises, Conduit-street, Regent-street, for Mr. B. Benjamin. Mr. H. H. Collins, architect. Quantities by Messrs. Batstone & Sons:—

Mark	£6,365	0	0
Kirk & Randall	6,340	0	0
Brass	6,245	0	0
Merritt & Ashby (too late)	6,220	0	0
Waldram & Co.	6,210	0	0
Newman & Mann	6,115	0	0
Oliver (accepted)	5,700	0	0

For the erection of six cottages at Bryant's-place, Stroud, Kent, for Mr. J. Elvy. Mr. J. H. Andrews, architect:—

West	£1,170	0	0
Gates	1,170	0	0
Tollett	1,152	0	0
Nye	1,125	0	0
Jeffery (accepted)	1,100	0	0

For buildings on plot F, Holborn Viaduct. Mr. E. N. Clifton, architect:—

Smith & Co.	£36,599	0	0
Holland & Hannen	36,828	0	0
Macey	35,960	0	0
Brass	35,783	0	0
Peto	35,540	0	0
Conder	35,393	0	0
Ashby, Bros.	34,990	0	0
Lawrence	34,692	0	0

For new house, stables, and other offices, at Malpas, near Newport, Monmouthshire, for Mr. J. W. Jones, Mr. E. A. Lansdowne, architect. No quantities:—

Jones & Son	£2,679	0	0
Miles	2,624	0	0
Williams & Sons	2,429	0	0
Richards	2,345	0	0
Small	2,309	0	0
Prosser & Bamfield	2,300	0	0
Linton	2,300	0	0

For the erection of warehouse at Bath-buildings, Baldwin-street, for Messrs. Tubbs & Lewis. Mr. John Collier, architect:—

Cohen	£1,500	0	0
Crabb	1,493	0	0
Wicks & Bangs	1,488	0	0
Newman & Mann	1,365	0	0
Hart	1,335	0	0
Aitchson & Co.	1,325	0	0
Coleman & Son	1,325	0	0
Elkington	1,265	0	0
Scrivener & White	1,253	0	0

For finishing six houses at Potter's Bar, for Mr. F. Dimsdale. Messrs. E. Habershon & Brock, architects:—

Ward	£3,745	0	0
Mattock	2,593	0	0
Bowman	2,282	0	0
Prout	2,275	0	0

For the erection of a pair of semi-detached residences at Wood green, N., for Mr. Thomas Clark. Messrs. Habershon & Brock, architects:—
Mattock, Bros. (accepted).

For erecting new church at Hethersgill, Cumberland. Messrs. E. Habershon & Brock, architects:—
Armstrong (accepted) £1,300 0 0

For the erection of warehouse at No. 13, Knightrider-street. Mr. G. Vickery, architect:—
Crabb (accepted) £1,450 0 0

For erection of new brewery at Cranleigh, Surrey, for Mr. G. Benford. Mr. W. Barns Kinsey, architect:—
Walker (accepted) £891 0 0

For second section of New Star Brewery, at East bourne, for Messrs. Alexander Hurst & Co. Mr. W. Barns Kinsey, architect:—
Walker (accepted) £2,188 0 0

For new coal-store and shop, Leatherhead, for Mr. Henry Moore. Mr. R. W. Moore, architect:—
Walker (accepted) £366 0 0

For alterations at No. 3, Savage-gardens, E.C., for Messrs. M. & N. Salsman. Mr. E. Ellis, architect:—
Mark (accepted) £356 0 0

For alterations to Nos. 18 and 20, Southwark Bridge-road, for Mr. Stannah. Mr. S. Chamberlain, architect:—

Brass	£604	0	0
Joselyne (accepted)	569	0	0

For alterations to the Royal Arms, Battersea Park-road, for Mr. N. Hardy. Mr. Henry Roberts, architect:—

Brass & Boons	£335	0	0
Street	410	0	0
Parsons	335	0	0
Hancock	323	0	0
Williams	295	0	0
Lathey, Bros. (accepted)	290	0	0

For alterations and repairs to the Fountain and Star, Nos. 31 and 32, Coleman-street, E.C., for Mrs. Stevens. Mr. James A. Howland, architect:—

Richardson, Bros.	£545	0	0
Read & Son	478	0	0
Judd & Hawkins	389	0	0
Howard	351	0	0

For alterations and additions to shop at Balham, for Mr. English. Messrs. Tolley & Dale, architects:—

Marriage (accepted)	£425	0	0
Livett	420	0	0

For building sea-wall and making approach to Sands at Ramsgate, for the Local Board:—

Phillips	£14,580	0	0
Home	13,349	0	0
Paramor & Son	13,200	0	0
Pickering (accepted)	11,205	0	0

For erecting St. John's Lodge, Stamford-hill. Mr. A. Nickerson, architect:—

Downs & Co.	£3,360	0	0
Crabb	3,267	0	0
Ellis	3,144	0	0
Boyce	3,129	0	0
Axford	3,055	0	0
Bayes & Co.	2,903	0	0
Newman & Mann	2,836	0	0
Aitchison & Co.	2,730	0	0

For the erection of warehouse buildings in rear of Mile-end-road, for Messrs. Spills, & Co. Messrs. H. S. & C. A. Legg, architects. Quantities by Mr. W. Hawker:—

Hearle	£1,775	0	0
Ennor	1,738	0	0
Thorpe	1,675	0	0
Hunt	1,673	0	0
Judd & Hawkins	1,669	0	0

For road-making and sewerage works at Hampstead, for the British Land Company (Limited):—

Pearson	£7,777	0	0
Richardson	5,156	0	0
Keeble	5,113	0	0
Thompson & Son	4,957	0	0
Johnson	4,950	0	0
Crockett	4,835	0	0
Dunmore	4,387	0	0
Bloomfield	4,350	0	0
Harris	4,120	0	0
Pizzey (accepted)	3,977	0	0

For the erection of a house and stable, London Fields, for Mr. H. Grant. Mr. Edward C. Homer, architect. Quantities by Messrs. J. & A. E. Bull:—

Watts	£1,289	0	0
Dabbs	1,275	0	0
Sheffield	1,238	0	0
Staines & Son	1,223	0	0
Bangs & Co.	1,220	0	0

For additional story to warehouse, London Fields. Mr. Edward C. Homer, architect:—

Dabbs	£507	0	0
Bangs & Co.	580	0	0
Staines & Son	553	0	0
Sheffield	545	0	0
Watts	496	0	0

For schools, Peter-street, Farringdon-road. Mr. E. R. Robson, architect:—

Perry & Co.	£7,975	0	0
Williams & Son	7,871	0	0
Scrivener & White	7,841	0	0
Nightingale	7,838	0	0
Grover	7,829	0	0
Pritchard	7,787	0	0
Brass	7,750	0	0
Tongue	7,736	0	0
Ennor	7,716	0	0
Hobson	7,687	0	0
Wall, Bros.	7,648	0	0

For stabling, &c., on No. 10 Wharf, Amberley-road, for the parish of Paddington. Mr. R. Gadsden, architect:—

Clack	£1,170	0	0
Stimpson	1,100	0	0
Vears & Co.	1,059	0	0
Temple & Forster	993	0	0
Lindfield	937	0	0
Brass	890	0	0
Thomas & Butland (accepted)	890	0	0
Seowen	835	0	0
Beach	649	0	0

For alteration and additions to Boston-road Congregational Chapel, Brentford. Mr. John W. Smithies, architect:—

Nye	£1,492	0	0
Barnes	1,477	0	0
Adamson & Sons	1,458	0	0
Taylor	1,332	0	0
Beauchamp	1,300	0	0
Gibson	1,268	0	0

For alterations and additions to house, Boston-road, Brentford, for Mr. G. Powell. Mr. John W. Smithies, architect:—

Beauchamp	£573	0	0
Barnes*	566	16	0

* Accepted, subject to amendment.

For additions, alterations, and repairs to the residence and stabling, No. 17, Finchley-road, for Mr. P. W. Reuter. Mr. R. W. Axman, architect:—

Hackworth (accepted)	£1,100	0	0

For house and stables near Newmarket, for Mr. W. S. Mitchell Innes. Messrs. Clark & Holland, architects. Quantities by Mr. S. J. Thacker:—

Longmire & Burge	£8,196	0	0
Langmead & Way	7,998	0	0
Boyce	7,898	0	0
Hill, Higgs, & Hill	7,747	0	0
Garrad	7,483	0	0
Braid & Co.	6,900	0	0

For chapel, school, and vestries, Westbourne Park-place, Paddington. Mr. J. Wallis Chapman, architect. Extra if part of the seatings are in pitch-pine, and part of the pulpit-fittings in oak:—

	Deal.	Extra for Pitch-pine.	Extra for Oak.
Battley	£8,950	£190	£84
Hook & Oldrey	7,953	100	153
Gould & Brand	7,700	79	79
Haines & Sons	7,480	100	150
Stevenson	7,467	137	118
Niblett & Sons	7,395	115	195
Garrett & Son	6,980	162	107
Braid & Co.	7,100	63	63

TO CORRESPONDENTS.

Hastings Water Supply.—Some communications on this subject have reached us too late for consideration this week.

M. N. & Co.—W.—R. W. A.—J. R.—J. P. C.—J. W. S.—G. C.—F. M. J. A. H.—W.—E. P.—A. C.—J. H.—Mr. W.—H. P.—W. M.—C. F. F.—M. M.—E. H.—W. G. T.—I. D. H.—B. & Co.—J. A. H.—B. S. M.—E. A. L.—C. J.—H. J. J.—E. L.—Dr. D.—J. F.—H. & B.—W. S.—S. F.—E. C. H.—J. W. S.—G. C.—W. H.—H. S. S. (will be engraved of size sent).—J. P. (shall be happy to hear from him).—T. C. (too late to be of use).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTICE. The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Advertisements cannot be received for the current week's issue later than **THREE** *o'clock p.m. on THURSDAY.*

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BOROUGH of NEWARK, in the County of NOTTINGHAM. URBAN SANITARY AUTHORITY of NEWARK.—Notice is hereby given, that the Urban Sanitary Authority of Newark will at a meeting to be held on FRIDAY, 7th day of APRIL next, proceed to the APPOINTMENT of a SURVEYOR. The salary to be paid will be 80l. a year. The person appointed will be allowed to carry on private practice, but will be required personally to perform the duties of the Office of Surveyor and will be required to conform to the regulations now made or hereafter to be made with respect thereto by the above authority, and will be required to commence his duties on the 17th day of APRIL next. Applications for the appointment, together with recent testimonials, must be sent on or before the 5th APRIL next to my Office, Newark, where a copy of the Regulations of the Urban Sanitary Authority with reference to the Office of Surveyor may be seen by any one intending to become an applicant for the Office. Personal attendance of applicants will not be required.—By order,
GODFREY TALLENTS, Jun. Clerk to the U. S. Authority.
March 20th 1876.

MERTHYR TYDFIL LOCAL BOARD of HEALTH—ASSISTANT SURVEYOR.—The Board requires the SERVICES of a competent person as ASSISTANT SURVEYOR. One who has had experience in the performance of duties appertaining to the office of Town Surveyor will be preferred. The salary will be 150l. a year. The person appointed will be required to devote the whole of his time to the service of the Board under the direction of the Board's Surveyor. Applications, endorsed "Assistant Surveyor," with recent testimonials, to be left at my Office, 71, High-street, Merthyr Tydfil, on or before the 3rd day of APRIL next. Further particulars may be obtained on application to the Board's Surveyor.
THOMAS WILLIAMS, Clerk.
Merthyr Tydfil, March 16th, 1876.

BOROUGH of SOUTHAMPTON.—ASSISTANT WANTED, in the Office of the Borough Surveyor. He must be competent to survey, level, and take fair and working detail drawings, and possess a knowledge of building construction. Salary 100l. per annum. Applications with testimonials from previous and present employers only, to be sent to me at my Office, on or before FRIDAY, the 31st instant.
JAMES LEMON, Borough Surveyor, Southampton.
March 14th, 1876.

GLAMORGANSHIRE HIGHWAYS.—To SURVEYORS.—Notice is hereby given, that the County Roads Board of the County of Glamorgan will meet on WEDNESDAY, the 5th day of APRIL next, at the Town Hall, Llandaff, in the said county, at TWELVE o'clock at Noon, and then and there proceed to the appointment of SURVEYOR of the HIGHWAYS in the Pontardawe Highway District, with a salary of 80l. a year. The Surveyor of Highways must reside within the district, and devote his whole time to the duties of his office, unless appointed Sanitary Inspector to the Pontardawe Union, in which case an exception to this rule will be made. If the Surveyor misconduct himself he may be dismissed at any meeting of the County Roads Board; but if for any other cause the Board should desire him to resign, three calendar months' notice shall be given by either party. The names of two sureties for the sum of 200l. for the due discharge of the duties, must be sent in with testimonials. The Surveyor will not be required to keep a horse. Persons desirous of obtaining the above appointment are requested to send testimonials, addressed to the County Roads Board, under cover to me, on or before the 20th day of APRIL, 1876.
THOS. M. DALTON, Clerk to the County Roads Board.
No. 6, Working-street, Cardiff.

PONTARDAWE UNION.—PUBLIC HEALTH ACTS.—INSPECTOR of NUISANCES WANTED. Notice is hereby given, that the Guardians of the Pontardawe Union, acting as the Rural Sanitary Authority, will, at their meeting, to be holden at the Union Office, Pontardawe, on THURSDAY, the 13th day of APRIL next, at ELEVEN o'clock in the forenoon, proceed to the APPOINTMENT of an INSPECTOR of NUISANCES for the Union, at a salary of 120l. per annum. The district comprises the Parishes or Hamlets of Kilybebyll, Llangyfelach Mawr, Blaydwcydfach, Llangiwg, Ystradgunlais Higher, and Ystradgunlais Lower, containing a population, according to the census of 1871, of 17,489. The person appointed must reside in the district, devote the whole of his time to the duties of the office (unless appointed Surveyor of Highways for the Pontardawe District, in which case he will be allowed to hold both appointments), and be fully competent to perform all the duties required by the Guardians, and such as are prescribed by the regulations of the Local Government Board. Applications, stating age and present occupation, in the handwriting of each candidate, accompanied by recent testimonials for this appointment specially, and not exceeding six in number, to be sent to me at my Office, at Pontardawe, not later than WEDNESDAY, the 29th MARCH instant. Canvassing of the guardians is strictly prohibited, and will be held to be a disqualification.—By order,
D. B. TURBERVILLE, Clerk.
Union Office, Pontardawe 11th March, 1876.

The Builder.

VOL. XXXIV. No. 1730. SATURDAY, APRIL 1, 1876.

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A New Life of Michelangelo.

THE fame of Michelangelo Buonarotti, sculptor, painter, poet, and architect, seems to gain a firmer and wider basis, a loftier and grander outline, the more the records of his life and works are examined. The faults (we can hardly say shortcomings, for they are mostly faults of exuberance) of his daring genius are, of course, evident enough; soon catalogued and, to a certain extent, accounted for. They have been the subject of much criticism, from the artist's life-time down to the present day; but this amounts only to old and manifest objections repeated almost by rote, and has been pushed no further, in the course of generations, than the ground it has covered from the first. On the other hand, against the really grand elements of Buonarotti's genius the waves of criticism or detraction have beaten in vain. But perhaps what strikes us even more than the artistic power and originality of his productions in various forms of art, is the impression of the great and lofty nature of the man—of a character completely raised above the ordinary interests and motives of mankind, and above the conventionalisms and corruptions of the society of his day, which becomes more and more confirmed the more we learn about him as a man. More complete and balanced types of character there may have been; but it is difficult, in all biographical record, to find a figure which bears such a stamp of grandeur as that of the stern high-minded man of genius, unswerving in his aims, incorruptible in his integrity, self-denying in his life, proud and haughty to all who ventured to oppose or attack him, yet with such a deep human tenderness and feeling beneath his pride, who has left his name for ever associated with what is noblest in human genius and character. Of such a man we can hardly know too much, and we welcome a biography * which, while tolerably concentrated in form, gives us some information as to its subject from sources not hitherto available for biographical purposes, at least by English writers.

The specialty of Mr. Wilson's book is the embodiment in it of a number of letters, or the substance of them, from the Buonarotti archives, the publication of which, for the first time, was one of the incidents connected with the recent Michelangelo commemoration at Florence. These, besides being published separately, formed the basis of a new life of the artist by Commendatore Aurelio Gotti, and this Mr. Wilson had at first intended merely to translate, but eventually undertook an original work in English, wishing to incorporate in his publication the results of some special observations and notes he had previously made on the Sistine Chapel frescoes, in regard to their mode of execution and state of preservation. The Commendatore Gotti, with a most laudable liberality, placed at Mr. Wilson's disposal all the inedited documents selected for his own work on Michelangelo; so that instead of a mere translation, we have an English work published in parallelism with the Italian work, resting on the same documentary basis in regard to much of its new matter, but containing also notes and criticisms which are the result of the English author's own special observations.

The "Life," which is comprised in one full but not unwieldy volume, is very direct in its plan. The author simply goes through the main facts of the artist's life, using the new documents, as he proceeds, to give further detail and colouring to special phases of the history, especially in regard to Michelangelo's relations with his family (which, as illustrated by some of these documents, throw a good deal of new light on his character), and adds his own detailed criticisms on the artist's genius at the points in the history where the mention of his principal works naturally comes in chronologically; so that the whole is very straightforward reading, and there is no break in the continuity of the narrative.

One is painfully struck, in the first instance, on reading the earlier chapters, with the degree of poverty and struggle which the artist seems to have passed through, at the outset of his career especially; painfully in one sense, though not in another, for there could hardly be a nobler moral spectacle than that of this gifted man, already under full conviction of the greatness of his own genius, overworking himself, taxing his health, and restricting himself to the barest necessaries of life, during his first sojourn in Rome (1496–1501),* in order, while pursuing his art with all his energy, to do something at the same time for the temporal advantage and advancement of his family, who seem to have been no very deserving or appreciative tribe of people. The letters of Buonarotti *père* are at least evidence that the genius of Michelangelo was not hereditary; they are characteristic enough,—of a very common-place, narrow-minded, but apparently well-meaning man. So much as this could not evidently be said of one of the brothers, Giovansimone, who, as may be gathered from the correspondence, had been greatly indebted to Michelangelo, and whose evil-dealing provoked the latter at last to an outburst of wrath and rebuke in a letter which is one of the most characteristic things in the book. In a previous letter to his father, the artist alludes to the news about this brother's behaviour, as "the worst news he had received these ten years"; the letter to the offending brother himself is a remarkable outbreak of righteous indignation on the part of a strong nature provoked beyond endurance:—

"August, 1508.

Giovansimone,—It is said that whoever benefits a good man, makes him better; but to benefit a bad man is to make him worse. I have tried now for some years, with good words and deeds, to induce thee to live in peace with my father and with us, and thou becomest altogether worse. I do not say to thee that thou art a bad fellow, but thou art such that thou greatly displeasest me and the others. I could say much to thee as to thy conduct, but this would be mere words to thee, like other advice given thee. To be brief, then, I tell thee that thou art nothing in the world. Thy house-room and expenses I give thee, and have given thee long, for the love of God, thinking thee to be my brother like the others; now, I am certain that thou art no brother of mine, for if thou wert, thou wouldst not menace my father. Thou art a brute, and as a brute I will treat thee. Know that whoever menaces or strikes his father is held to risk his life. Enough. I tell thee that thou hast nothing in this world, and if I hear even the smallest instance of thy misconduct, I shall come by post to Florence and show thee thine error, and teach thee what it costs to destroy thy things, or to set fire to houses or farms; if I come, I will show thee that which shall make thee weep with burning tears, and thou shalt learn on what thou hadst set thy pride. I have yet this once more to say to thee, that, if thou triest to do well, and to honour and revere thy father, I will aid thee like the others, and will provide for thee in good time a place of business; but if thou dost not, then I shall be there and shall so settle thy affairs that thou shalt better know what thou art than thou hast ever done before, and thou shalt know what thou really hast wherefer thou goest. I say no more; what is wanting in words I will supply with deeds.

MICHELANGELO.

In Rome.

I cannot do less than add two sentences, and these are, that I have not wandered about all Italy, nor borne every mortification, suffered hardships, lacerated my body with hard labour, placed my life on a thousand dangers, but to aid my family; and now that I have begun to raise it somewhat, thou alone art the one to embroil and ruin in an hour that which I have laboured so many years to do. By the body of Christ, but it shall be found true, that I shall confound ten thousand such as thou art, if it be needful. Be wise, and tempt not one who has already too much to bear."

We quote the foregoing in full as one of the most interesting specimens of the new matter contained in Mr. Wilson's book, and also as a letter conveying in a short space a great deal as to the character and the worldly circumstances of the artist which is little brought forward or recognised in an ordinary estimate of him. The statement in his indignant postscript, that his labour had been mainly with the idea of advancing his family, is a very extraordinary one, and perhaps was due partially to an exaggerated feeling at the moment; but it is not by any means inconsistent with a good deal else that comes out in the course of the book. Michelangelo's care about the honour and position of the family name is shown in the way he clung to the idea of their descent from the ancient house of Canossa, and his interest in every antiquarian relic connected therewith, and every paper which helped to establish this hereditary nobility. If it be said that this was but a small ambition for a man who possessed a genius itself sufficient to ennoble any name, it must be remembered not only that family went for much in those days, but that Michelangelo had apparently no such exalted idea of his own works as we have of them now, as is shown in several instances from the newly-published documents.

Up to the period of the above quotation, the most remarkable event in the artist's career was his commission to design and cast the colossal bronze statue of Julius II. over the entrance doorway of St. Petronio at Bologna. Here Michelangelo was undertaking a new and untried form of work; and it may be remarked inci-

* Life and Words of Michelangelo Buonarotti. By Charles Heath Wilson. The Life partly compiled from that by the Commend. Aurelio Gotti, director of the Royal Galleries of Florence. London: John Murray. 1876.

* We may just remind the reader, as dates are things that will not always come when called, that Michelangelo was born in 1475, and died in 1564.

dentally how much of his greatest work was done under circumstances of special drawback and difficulty. The Sistine ceiling he undertook, with misgiving and reluctance, as a novice in fresco, and protesting that painting was not his profession, he having up to that time regarded himself as a sculptor; the "David" he carved out of an injured block, entrusted to him to see what he could make of it; the office of architect of St. Peter's he undertook without having been in the way of any special study of the art, as the *facsimiles* of some of his architectural sketches of a previous date, given by Mr. Wilson, are sufficient to show, even in the absence of other evidence. In this affair of the casting of the statue of the arrogant old Pope (which was thrown down violently from its place of dignity not many years after) he was put to great expense and anxiety by the failure of the first casting, though he had engaged the assistance of a founder, one "Master Bernardino," in whose cleverness he had such faith, that he "could have believed him capable of founding even without fire." However, Master Bernardino failed, and Michelangelo's patience under the disappointment is worth note; he would not even blame Bernardino; "it is not that he is not a good master, or has not done it with good will; but he who fails, fails." This, for a naturally irritable temperament, under such a serious disappointment, shows Michelangelo in a very different light from the overbearing person which he is sometimes represented to have been.

We come next to Mr. Wilson's chapters on that great work, the Sistine ceiling, the notion of which seems to have grown up gradually, as with great works is often the case. The Pope offered him first 3,000 ducats to paint figures of the Apostles in the lunettes, the rest of the ceiling to be merely filled up with decorative work. In a letter giving an account of the affair, at a later period, to his friend Fattucci, he says,—"After having begun that work, it seemed to me that it would prove a poor thing, and I said to the Pope that to represent the Apostles only it would prove a poor thing. He asked me why? I said to him because they were poor also. Then he gave me a new commission that I should do what I pleased, and that he would satisfy me," &c. What it was that he "pleased," all the world knows now. Into the whole of the observations and memoranda of Mr. Wilson on this interesting subject we cannot go. The author devotes a considerable space to showing, by the logic of dates and facts, that the account long accepted as to the extreme rapidity with which the work was executed is quite at variance with probability, or even possibility; and he treats with contempt the idea that the artist literally worked "alone," and mixed his own plaster, and ground his own colours for the work. "He required hundredweights of colour and lime to cover 10,000 square feet of surface"; and, as the author remarks, the story is really an insult to his memory, seeing that he was a man of common sense, as well as genius, and would not have wasted his time and strength over mere mechanical processes which he could have done for him by assistants, even if such extended and multifarious labour were possible for a single pair of hands. Moreover, Mr. Wilson, who has, with a travelling scaffold, made for the purpose, minutely inspected the ceiling, notes, among other things, that the plaster must have been prepared and set by a most practised hand, as the joinings of the different portions are so perfect and fine as often to be hardly visible even on close inspection; and it is obvious that the artist himself could not have had such practice in this kind of work. The story probably is an amplification of the known fact that he did at first employ artists who were to colour from his cartoons, and finding at once that their manner of executing the work did not satisfy him, and would not tally with his own work, abruptly dismissed them. It is remarkable that no coloured sketches remain, only cartoons, so that we are to infer that Michelangelo must have trusted to verbal instructions and his own example for guiding the assisting artists in their colouring. That such a scheme could never answer, except in the case of pupils or assistants who had long worked under the master, and learned his method, is almost self-evident. Michelangelo's assistants came from Florence for the purpose, and were very soon sent back there, with rather scant leave-taking.

Mr. Wilson's remarks on the execution of the figures in the Sistine Chapel, based on the close observation for which special opportunity was afforded him, are of the greatest interest. It appears, from sketches which remain by the artist's hand, that "he first embodied his ideas on paper in figures on a very small scale; he appears to have made most of these in red or black chalk. He then summoned his model, and made a drawing from nature, in which the figure was in some cases about 1 ft. in height, at other times larger. Some of these drawings are not much more than outlined; others are shaded and highly finished. . . . . It would appear from his sketches of draped figures, as well as from the finished paintings, that he provided costumes for his models. There are many slight details and accidents of fold which must have been imitated from the reality." The author has minutely examined the evidence as to the mode in which the figures were transferred to and outlined upon the plaster. The usual system of the day was to place the cartoon upon the surface of the wet plaster, and indent the outlines in the plaster by passing a point or style over them on the drawing. Michelangelo was not satisfied with this certainly rather rough method. He preferred the process which is called "pouncing."

"This can be seen in his frescoes, and the small holes necessary for the operation are found in the cartoons at Naples. The cartoons were nailed to the wall during the process; the nail-holes are visible in the fresco of the 'Last Judgment'; and in that of Ezekiel, in one of the pendentives of the ceiling, an original nail still remains in its place, close to this figure. . . . . When the outline was pounced, he appears to have passed round it with a point as sharp as a penknife, so fine is the cut; and it is easily distinguished from the line pressed through paper, for besides its sharpness, the instrument has frequently broken out a morsel of lime, where the hand has stopped. He did not draw in the features in this manner, but marked in the muscles in the beautiful figure of Adam, and possibly in others. . . . . Drapery he generally marked with the point in very rapid sweeps, and sometimes adhered to these lines, at others not. . . . . So far as could be observed, the groups of children on the piers have been painted without any outline at all; a single guiding perpendicular line ruled between them on the plaster sufficed to enable him to paint them at once in their places without any other preparation.

The architecture is outlined with the stylus, and the lines are often carried over part of the figures. This is common in old frescoes. It shows that subject and background were painted simultaneously; and this is very evident in Michelangelo's work, for he often cut the plaster away from his finished day's painting at some distance from the outline of the figure. Thus he avoided hardness of contour. The lesson is an important one, especially to modern fresco painters."

Mr. Wilson appends to these remarks an outline of the "Adam," where the stylus outline is shown by clean lines, and the plaster joint by a dotted line, which follows the figure round (in this case) about half an inch apparently outside the stylus line. The surface of the plaster, it is observed, is finished very smooth. The whole examination, of which the author has given us these and other interesting results, seems to indicate a degree of minute refinement of execution which is surprising in work on so colossal a scale, and so far from the eye. In his later fresco of the "Last Judgment," Michelangelo seems to have been contented, to a great extent, with a more massive and less finished execution. The colouring of the ceiling-figures is described as "in a soft Tuscan manner, much in contrast with his forcible drawing"; that is, design. For the rest of the remarks on this great work we must refer our readers to Mr. Wilson's pages, only quoting one rather noteworthy extract from a letter of the artist to his father (January 20, 1509), illustrating what we before observed as to the small value he set on works which have since been classed among the world's wonders. "I am still," he says, "in great trouble, for it is now a year since I have had a groat from this Pope, and I do not ask it, for my work does not make progress, *so that it does not seem to me to merit it*, and this is from the difficulty of the work, and that it is not my profession. And I lose my time without reward, God help me." And again, after the work is completed, he dismisses it as if he had completed a piece of furniture,—"I have finished the chapel which I painted: the Pope is very well satisfied; but other things do not happen as I wished; lay blame on the times, which are unfavourable to art."

Among the newly-published letters with which we meet in turning the pages further, is a very amusing one in reply to the notion of Clement VII. of employing him to make a colossal statue on the Piazza of San Lorenzo, in Florence, in which the artist turns the whole notion to ridicule, in a tone of assumed seriousness, suggesting how, if the figure were made sitting, a shop could be formed under it, and how a greengrocer in the Piazza, "my great friend," had hinted that the head would make a capital pigeon-house. Nothing more was heard of the colossus. A letter very characteristic of the period is quoted in regard to the well-known story of the envoy of the Duke of Ferrara refusing to accept for his master the "Leda," which seems to have been treated in a manner too plain-dealing even for that not very precise age. The subject, however, was sufficiently popular, apparently, to lead to a copy being made of it, with the artist's consent, about which a note to him is quoted, in which it is observed that "this Benedetto" (the copyist) "has a refined spirit: I am of the mind that they will make the 'Leda' beautiful, if it please God." This pious remark in regard to so ultra-Pagan a subject reminds one of the direction of the dying bishop in a poem of Browning (who has so completely penetrated the cinque-cento feeling), for the sculpture on his tomb in "St. Praxed's church":—

> "The bas-relief in bronze ye promised me,
> Those Pans and Nymphs ye wot of, and perchance
> Some tripod, Thyrsus, with a vase or so,
> The Saviour at his sermon on the mount,
> Saint Praxed in a glory, and one Pan
> Ready to twitch the Nymph's last garment off,
> And Moses with the tables."

Our author is evidently rather shocked at the whole thing, and on this point fairly gives up Michelangelo; and certes the subject is an unsavoury one, but there can be no doubt that to the painter it was purely a matter of art, dealing with a legend familiar in those days of revived Paganism. The author adopts, as we see further on, and indeed amplifies, all that has been said as to the objectionable and incongruous nudity of the figures in the "Last Judgment" fresco; incongruous, that is to say, in regard to the uses and associations of the building they are placed in, and to the representation of the Apostles and angels by naked figures. He praises Luca Signorelli for not having fallen into the excess, in his "Resurrection" picture, of "stripping the angels of those beautiful and modest garments with which they have hitherto been always represented. This was reserved for the frescoes of the Sixtine." Now, the dilemma of representing spiritual beings by corporeal forms is a difficult one either way; but it is a question of artistic suitability, and perhaps of good taste, but certainly not one to indulge a tone of moral reprobation about. The author's comments seem to us in worse taste than Michelangelo's figures, and they have the additional drawback of being artistically weak, which the figures at any rate are not. Every one knows that the conventional angel of painting is a sheet with a head at the top, and a couple of wings tacked on; and, according to modern feeling at any rate, this is perhaps the only way of escaping the dilemma, if angelic beings are painted at all. But it is not justifiable to use harsh language about Michelangelo's opposite method of representation, ignoring the difference in the times, and forgetting also that an artist who had been all his life studying and using the figure as the medium of his loftiest expressions, must have entirely lost, for himself, the idea of connecting its representation with any insult to propriety. As to the expression and treatment of the figures, in connexion with the subject, much may be said in the way of criticism, not without reason; but can we be quite sure that we have really got at the painter's own view of the subject, and the feeling with which he regarded it? Mr. Wilson's book affords no new light on this point.

The interest attached to everything connected with so great a genius has led us so far that we can hardly conclude our remarks in the present number; more especially as we cannot, in these columns, leave the consideration of the architectural work of Michelangelo, as treated of by our author, to a mere final paragraph. We may, however, just dismiss here one little piece of criticism we have to make on the literary workmanship of Mr. Wilson's book. The volume has been printed, he tells us in the preface, at the establishment of the *Gazetta d'Italia*, the workmen being all Italians, with no knowledge of English,—a fact which might excuse, he says, a longer list of *errata* than that which is appended. Perhaps so; but, as we must presume the author revised the sheets, it cannot excuse the extraordinary errors and confusion of punctuation throughout. The author innocently makes *one* correction of punctuation in his *errata* list, apparently unconscious that every page of his book teems with inaccuracies of punctuation, many of which argue either ignorance of or entire indifference to the construction of the English language; and which in at least one instance that we noticed, result in making a sentence really signify exactly the contrary of what the author evidently, from the context,

intended it to signify. If the book reaches (as we hope) a second edition, we seriously counsel the author to pass his proofs through the hands of some one capable of properly correcting such lapses.

THE VENUS OF MILO.

With a deep feeling of relief, the art world learns that the statue, celebrated through ages as the Venus of Milo, after a final scrutiny and measurement, remains intact, at least so far that it has been determined to tamper with it no more. That it should have been so slightly altered, not to say uninjured, by the vicissitudes to which it has been exposed, is in itself a wonderful circumstance since its adventures, so to speak, have been without a parallel, probably, in modern times. The successor, however, of M. Jeanron, late Director-General of the Louvre Galleries, and his colleagues, while testifying to this fact, have not to this day been able to assure themselves that the exact proportions of even the original restoration have been preserved. It will be remembered, perhaps, that, while the Germans were besieging Paris, this incomparable piece of sculpture, under orders from the Ministry of Public Instruction, was removed from its pedestal in the public museum, and concealed in a deeply-excavated cellar, lest it should fall into the hands of the victorious enemies. Happily, it remained there during the brief domination of the iconoclastic Commune; in fact, its interment lasted through a period of nearly eighteen months, exposed to all the chances of damp, neglect, and ignorant violence; after which it was somewhat rudely lifted out, and prepared for replacement in the great chamber of Classical Antiquities. Still, a discovery was then made which disconcerted, to a considerable extent, the community of sculptors, and which had escaped the restorers of fifty years ago. The marble itself had sustained no injury; but its fragments had fallen apart; the softer substance connecting them had decayed, and the whole fabric of this lovely image became far less a secret than in 1820, when its existence was first made known, and when it was packed and repacked, shipped and reshipped, and transmitted to and fro, until the only marvel was that it ever reached its destination at all. Of course, the whole tribe of the people who evolve things from their inner consciences fell to work upon the beautiful relics, seizing it by the arms, legs, waist, and head, until they had reproduced a Venus, but whether the Venus of Milo,—supposing Milo not to have been a myth,—or a Parisian improvement upon her, it is impossible to say. The most minute examination, however, then as recently, failed to resolve, for the satisfaction of all, the problem whether this pure masterpiece of antiquity was originally wrought from several blocks, two, or only one. The evenness of the joints, and the elaboration of the cement, favours the former theory, while the general theory and practice of Grecian art contradict it. Between the two ideas, nevertheless, a third interposes itself, which is to the effect that the marvellous grace of the attitude is in part due to an accident, rather than to those secrets which genius surprises, uncontemplated in the studio.

The Venus, as it is popularly called, of Milo, was discovered in 1820 by a peasant, in an excavation in the island of Melos, and was then lying divided into two principal fragments, with others of less importance close at hand. The Turks carried the treasure away, and, of course, they mauled it fearfully; they knocked off the marble head-dress, reputed to have been among the most exquisite among all adornments of its kind; they roughened the edges where the separated limbs should have met; they threw the form out of its balance, with the drapery that so lightly enwrapped the lower proportions; and, after all the niceties of the artists have been weighed, it is doubtful yet whether they did not, through their barbarity and clumsiness, distort the dimpled waist into that bend which connoisseurship now declares to be its principal perfection. Nevertheless, it was pretty well evident from the first, although contrary opinions to this day prevail, that the figure had never been chiselled from a single block; the lines of junction, notwithstanding their maltreatment by the Turks, were too finely and softly distinguished to suggest the idea of a fracture, either designed or accidental; there was not the trace, at all events, of a saw. Sculptors, indeed, have gone so far as to believe that they can identify the characteristics of two different quarries and two different sets of tools. This, however, may only be refining upon a refinement, yet it deserves to be taken for what it is worth; and, at any rate, the world must be glad that the Venus is re-enthroned, if not in all her pristine glory, still in some magnificent semblance of it, beneath the golden roofs of the Louvre. It was a frequent custom of the Greeks, whatever may have been the truth in this instance, to adopt the principle of composite sculpture. They were impatient in the working of their quarries, and many of their finest examples are wrought from two or more pieces, delicately and deftly joined. It is true that Paros, whence the materials of this particular statue was supposed to have been excavated, could have supplied a block of adequate dimensions; but the artists of that era thought more of their ideal than of their mechanics, and believed that so long as they satisfied themselves, they might be content to deceive posterity. The French commissioners add to this, that it was a work executed in a rude time, when no absolute finish was required; but that notion is at once set aside, by what we see of the fond and careful study bestowed on the work by its creators, whoever they actually were. The question then arises,—did they rely upon the perpetual immobility of the soil above which this trophy of their genius rose? Probably, like all other architects, they did. Had they, in their own belief, invented some invisible and indestructible cement? Or did they rely upon an iron bracing? Since the recovery of the Goddess from the vault wherein she was concealed, from both the Babylonians without, and the Babylonians within, the City, some information upon these points has been incontestably supplied. There are two cavities, above and below, in which two metal bars might have been fixed, in conjunction with others into which, possibly, molten lead was poured, though the fitting on of the upper half must have been a task of the utmost delicacy. This is one hypothesis. But there is another, to which the Parisian critics, now that the darling of their galleries has been once more brought to light, persist in clinging. They say that the Venus was chiselled from a single block; but that the matchless monolith, long afterwards, was broken in two; that the image we possess is simply a restoration of a restoration, and that the original splendour of the statue has, in reality, been marred by the very efforts made to preserve it. Of course, in such a case, a decisive judgment is next to impossible; but a few facts are worthy of notice. The holes drilled in the marble certainly went very near splitting it, in more than one direction; the iron uprights, passing through the most solid portions of the figure, tainted its interior with deep stains of rust, the ultimate effects of which no metallurgist of that period would, in all likelihood, have foreseen; and yet this is the merest speculation, because we know nothing about the Venus of Milo as an entirety, if it ever was one. It was found in fragments; it was put together in an empirical laboratory of sculpture at the Louvre; one of the chief outlines was confessedly misplaced,—and so much so that the most perilous artifices were resorted to for remedying the blunder. That is to say, two wooden wedges were inserted, to maintain the symmetry of the posture, and the result, of course, could not have been otherwise than artificial. This patching up of antique examples is a practice to which the "art renovators" of France are only too commonly addicted. Nevertheless, the anatomy of this celebrated form allows of no serious suspicion that it has been botched, disfigured, or thrown far out of the attitude designed for it by the artist. The question, however, will long remain an interesting one in "the marble mart" of Europe. We must remember, always, the romance, if so it may be termed, of which, even in this unclassic age, the Queen of the Grecian mythology has played heroine. Her foothold was taken away; the plinth was broken. The tiara was snatched off her head, and the countenance marred. Infinitely more fortunate, in these respects, were the Sauroctonic Apollo, the Dying Gladiator, the Venus of the Capitol, or that which is vulgarly called the Venus of the Louvre. If the plinth could be discovered, the difficulty, as most sculptors admit, would be at an end, so far as the intention of the artist is concerned. Leonardo da Vinci was fond of arguing upon these points, though not, of course, with reference to this especial Venus, and the French are as fond of quoting him; but such discussions are apt to trespass upon the domain of pedantry; and it may be enough to observe that in the circles of Parisian art a formidable fear is confessed lest the restored goddess should not have been replaced, with classic exactitude, upon her new pedestal. The measurements she has undergone have been endless, and it is now declared, in many high courts of criticism, that the Venus is not in all respects precisely the same as that which was protected, in a vault, from the bombardments of 1870. True, it retains all the appearance of perfect equilibrium and perfect stability; the general expression retains the traditional characteristics of the antique; nothing has been lost from the nobility and grace of the face or figure; Paris, indeed, possesses a matchless treasure still. But what if one solitary line has been turned from the original flow,—one solitary conception of the artist changed? Why, then, a monumental work of classic art is practically lost, for all time to come. It is in their perfections that the arts of antiquity are best to be studied. And it may be feared that, grand and beautiful though the Venus of Milo continues to be, a flaw has been created, during the process of restoration, which is irreparable. A bit of the old plinth has been joined to the fragment of a new one, upon no authority whatever as to the precise relative sizes or levels; and the drapery,—among the most magnificent illustrations of its class which have descended to us from antique times,—has been unscrupulously tampered with; a thing to be regretted, because the Venus of Milo belonged to no country; it was the inheritance of the world.

Well, the task has been accomplished, and cannot well be undertaken again. The two halves have been joined, the one resting obliquely upon the other; marble lying upon marble, heraldry on heraldry, with a little lead and woodwork added, at a guess; and a slight slant given to the whole figure, also at a guess, as who should reconstruct the leaning tower of Pisa! It must not be forgotten that, when all this reparation had been completed, the statue was still imperfect. Should it be restored, ideally? M. Quatremère de Quincy resisted the proposal strenuously; he was opposed to all such restorations as a rule, he said, but especially to the attempt in this particular instance; for it was not an isolated statue, but a group, he said, that would have to be restored. To complete the sculptor's conception, the God of War should stand by the Goddess of Love, which would be to produce an illustration of hybrid art without its parallel in Europe. The advice of this distinguished antiquary was followed, and no experiment was made in linking the lost hands of the Egæan deity with those of an Olympian gladiator, modelled after some wine-bibbing Hercules in a nineteenth-century studio. Of course, one theory is that the statue was originally intended to stand alone. An arm, with a hand holding an apple, almost exactly, though not quite, fitting it has been found, which would support the supposition; but even the restorers of the Louvre have not ventured upon attaching the one fragment to the other, though both were disinterred from the same quarry of ancient relics. The notion was, however, that this particular Venus represented was she who triumphed in the contest of beauty over Hera and Pallas, and was stripping for the trial; yet the garment suggests the idea of a recent bath rather than that of the rivalry in which Paris was permitted to be umpire; but, taken for all in all, this drapery is excessively enigmatical, as, indeed, is the entire work, which, to say the truth, may not have been designed to represent any Venus whatever. The people of Melos offered sacrifices to a protecting divinity. May not this image have represented her? May it not have been a Victory instead of a Venus? There is a bronze in the museum of Brescia which, beyond doubt, is a Victory, and which resembles the Venus of Milo in nearly every respect; except, in a special degree, with regard to the disposition of the drapery. The point was formerly disputed, but has been set at rest by the unanswerable language of an inscription. This controversy, however, simply proves how vague our knowledge is of these antique works, few of which, indeed, are capable of absolute identification. The Romans rarely associated the God of War with the Goddess of Love; the Greeks almost invariably did; and hence an infinite confusion of opinion on the part of the academies. Still, one truth is evident, which is that we appreciate the monumental arts of neither, nor are the better for endeavouring to replace that which has been irrevocably lost, and substituting a modern for the original conception. Maltreated though it may have been, the Venus of Milo,

before its consignment to the Parisian cellar, was a work of unsurpassed beauty and nobility; and, even since its re-installation, may challenge a contrast with the purest trophies of classic art; but the notion of "re-creating" the original, when we do not even know to what epoch it belonged, is monstrous. It stands alone, upon a solitary pedestal. The name of the artist, as a matter of fact, is buried out of sight and memory for ever,—and whether he was known to Virgil, or obscured among the Homeric shadows, no scholar, however profound, can tell us. In the interest, therefore, of that art which derives a true inspiration from these remnant works of antiquity, we would have them left, so far as possible, in their pristine glory,—fragments, of course, but fragments, as it were, in perfection, such as have come down to us, in descriptions, if not as realities, from the studios of Phidias and Praxiteles. In order to act upon the newest French theory, which takes as its basis the remnants recovered from the Parisian cellar, the whole dimensions of the statue would have to be reduced, its gesture forced, a new significance invented for it, and fresh expression given to the marble face, already too much tampered with by arbitrary connoisseurs; and, from first to last, from heel to head, a Venus modelled which might be very superb, but which would not, we repeat, be the Venus of Milo. It may be hoped that the galleries of antique sculpture, in the more cultivated cities of Europe, are under a more conscientious and intelligent charge than one which would permit, employing the term in its strictest sense, of these or any similar depravities. Restorations may be made very attractive for popular museums; but they should be attempted with the utmost scruple and delicacy when designed for those porticos through which the highest modern criticism strives to study the highest antique ideal.

THE FRENCH GALLERY.

THE twenty-third annual exhibition at Mr. Wallis's Gallery is unquestionably a very "telling" one for the mass of visitors, though some of the principal works are marked rather by brilliancy than by qualities of the highest class. Two of the pictures occupying central positions on the walls are, however, of no ordinary power and interest. The first place must certainly be given to Jules Breton's remarkable work, "La Saint Jean" (157), representing a group of peasant women and girls dancing wildly round a fire in the middle of a field, in twilight. The subject gives, of course, scope for a powerful effect of lighting, which is made the most of without being overdone, or carried to the extent of trickery; and the figures illustrate almost a new phase in the genius of the painter, something totally different from the quiet sentiment and pathos we are used to in his scenes of French peasant life. The action and swing of the group as they go round is admirably given; the faces are each a separate study, full of character and individuality; pathos and merriment are singularly blended in the whole work, which is as interesting on close study as it is striking at first sight. The other work referred to is De Neuville's picture of an incident in the late war,—French soldiers "setting fire to a barricaded house at Villersexel" (121). Fire is again an element, but in no festive sense, in this scene, which is one of the most real and startling representations of the actualities of warfare that ever shocked the senses of peaceable people. There is nothing here of the conventional heroics and paint of the ordinary battle-picture. The tumult and confusion of the struggle, the despairing and agonised gestures of the wounded men, the anxiety depicted in the face of the young soldier helping to push forward the cart of fuel, and at the same time half sheltering behind it, and looking up, nervously, to see if there is a chance of getting up to the gate without being shot, tell a plain and unvarnished tale of the desperate reality of such a life-and-death combat. The execution of all the details, though broad and massive in touch, is perfectly satisfying.

The other two works which hold the central position on the remaining walls seem to represent respectively the decadence of a great artist and the step in advance of a very clever painter, Pasini, who, in his "Interview of Chiefs on Mount Lebanon" (21), quits the style of work for which we have usually known him in this gallery for something more extended and ambitious. We can hardly say that there is the same satisfactory result here as in those small and brilliant little Eastern scenes by which he has often delighted us; the attempt to represent a scene on a tolerably large scale, and with many figures, in a merciless glare of light, is very bold; and the manner in which the vivid green of the foliage stands out against the equally vivid tone of the rocky hill in full light behind, is remarkable; but the collection of figures is not satisfactory, and they are not sufficiently separated and distinguished. We would rather have the old manner. Gérôme's "L'Eminence Grise" (73) is a falling off from his work of last year, which, again, was a falling off from previous works. The picture shows the painter's marvellous mechanical facility and power of manipulation, but little more.

Two admirable Meissoniers, in the artist's larger size (figures about 6 in. or 7 in. high), flank this on either side; "Waiting for his Charger," and the "Standard-bearer" (68, 74), are splendidly contrasted,—the one a dark-complexioned warrior, a man of iron,—the other a ceremonial figure, not without chivalry either, but in a lighter and more showy style; the standard affords a rich effect of colour. The execution of the details of armour, &c., in the other figure, is superb. Among other *habitués* of the gallery, Vibert is clever, but uninteresting, in "An Official Messenger" (6); superb in "An Unequal Match" (75), which, however, has been exhibited before; and rather "nasty" in "A Revelation" (188), which he might as well have let alone. Chevilliard, who has adopted the priestly character as his special butt, is almost better than ever in his tiny and highly-finished figures of members of the holy church under different aspects of mundane weakness and frailty; "Avant l'Attaque" and "Après le Combat" (11, 33) are on the same *motif* as Hunt's well-known "Attack" and "Defeat," but with a far more delicate and refined humour. We should be curious to know what sort of ecclesiastical excommunications, maledictions, and anathemas are hanging over the head of this daring and irreverent artist, who thus rushes in where angels fear to tread. Kurzbauer's "Fortune-telling in the Bavarian Tyrol" (48), though in a heavy brown loaded style, has more of expression and interest in the countenances than appears at first glance, and is a very conscientious picture. Goupil's name is appended to one work not in the artist's best style (152). "The Last Day of the Sale" (106), by Adan, is a brilliant picture of a motley group of gaily-dressed people crowding around the auctioneer in the hall of a large mansion, who stands with his coat off and his back to the spectator, garrulously recommending the merits of a couple of candlesticks which he holds one in each hand; the humour and style of the figure remind one of Figaro in *Il Barbiere*. Of this, however, and still more of some others in the collection—the "Fête Champêtre" (62) of Palmaroli, "Japanese Theatricals" (132) by Moreau, "Summer Time" (186), by Rossi, and others—the succinct criticism would be *beaucoup de "chic"*; the style is becoming too familiar in the gallery, we regret to see.

Among one or two less familiar names, that of A. Spring is appended to a small group, under the title "At Church" (59), of very great beauty of design and feeling; it is a small, quiet, unpretending work, but will well repay attention. "When Music, Heavenly Maid, was young" (80), by Lagye, an interior with two figures, is notable for the refinement in the quiet tones of colour, as well as the old-fashioned grace in the figure of the girl at the harpsichord. Breling's two little works, "Bringing in a Prisoner," and "A Stroll in the Woods" (40, 154), should be looked at; the figures are full of character. "A Disciple of Fouché," by Jazet (90), is a capital study of the police bloodhound of the period. Kauffmann, in two small pictures (11, 112), has made much of the figure and manners of an aristocratic coachman, as a foil to the figures of tavern boors; the second, "A Luxurious Customer," is a perfect piece of quiet humour. Duverger's little child scenes, "A Safe Shot," and "A Rehearsal" (113, 127), are pretty, and Seignac's "Brotherly Service," and "Sisterly Service" (83, 91), are more than pretty, and contain real humour and feeling; he goes to the essentials of child nature, while Duverger does not get beyond mere nursery sports. There is much humour, too, in the two schoolboy scenes of Geertz, "The Defence" and "Surrendered" (13, 31); notice the maliciously compressed lip, in the latter, of the urchin who pinches his victim's ear. Munthe is as well represented as usual; Blommers and Bougereau are not quite up to their respective standards. A life-size nude study by Bertrand, called "Madeleine" (156), is admirable as a study; it is noticeable that it is almost exactly the attitude, if we remember rightly, of the clothed figure of the drowned girl, by the same artist, which hung at the top of the room in a previous exhibition a few seasons ago. "The Bathers" (114) of Diaz is a sweet bit of modern Poussinesque. A small work of Israels, "The Little Helpmate" (93), is in the artist's finest and purest style and feeling; the languid look of the invalid, and the serious earnestness of the little child who with difficulty brings the stool for her feet, are full of pathos; the picture is an old one, and has just been re-varnished, which gives it for the present a glossy and shiny look at variance with the painter's usual deep and full texture. Lavrenz's "German Lady of the Last Century" (170) is a very pretty miniature half-length, in an effective costume. To conclude with the dessert, there is a wonderful basket of apricots by Muraton, which positively look as if one could set one's teeth into them.

LONDON TOPOGRAPHY.

LAST week was sold at Messrs. Puttick & Simpson's a collection of upwards of forty topographical drawings in pen and ink, by Wenceslaus Hollar, made between 1641 and 1644. They include views of great interest; among them "Ye ancient Inne of ye Tabard in Southwark," the exterior, the interior court, and the large room; "Ye Abbey Church of St. Saviours in Bermondseye," "Ye ancient House of ye Earles of Warren and Surrey near unto St. Olave," "Gower's House in Long Southwarke," "Winchester House," "The old Lodgings of the Bishops of Rochester near Winchester Place," "The Bishop of Carlisle's House in Lambeth," "Fawkeshall Manor House, 1643" (Kingshold), the room in which the gunpowder-plot conspirators held their meetings; "Prince Edward's Hall in Kennynton House, 1643"; "John of Ghendt's Chamber and Staircase" in ditto; the old Manor House of Stockwell, &c. The drawings were made for Captain John Eyre, who was in Cromwell's own regiment, and an interesting manuscript by him is included in the collection. When the female heir of the Eyres married Archer of Coopersall in Essex, these drawings were sent with the deeds and papers of the family to Messrs. Graham, of Lincoln's Inn, in 1754, and lay there until 1846. The whole of the above drawings were purchased by Mr. Crace, to whose extensive collection of maps and views of London they will be a valuable addition.

FALL OF HOUSES IN EARL'S COURT ROAD.

As the workmen's bell rang at noon on Saturday last for them to cease, the fronts of two houses, part of a block of three, which have just been "run up" to the fourth story, close against the District Railway, on land belonging to Lord Kensington, on the west side of the Earl's-court-road, fell down, part of the brick-work on to the line, leaving the side wall of one house so that, had another train passed, the wall must have fallen. The weak point seems to have been where the ends of the two iron breesummers (the buildings were for shops) went into the party-wall, not an unusual circumstance, builders being often idiotic enough to postpone putting in the story-posts required by Act of Parliament until the necessity for them has almost passed away. Whether or not it was so in the present case, we cannot say. Nor has our examination on the spot been close enough to enable us to speak decisively as to the materials employed. We will simply say, by way of warning, that when lofty houses are hastily run up, the mortar and the bricks should be of the best quality, to render disaster less likely. To what extent the vibration of a passing train, and the concurrent descent of the men by the ladder, contributed to the fall in the case under notice might be worth investigation.

Cheesemongers' Benevolent Society.—Mr. J. T. Peacock (Sudbury House, Hammersmith) has organised a concert at the Royal Albert Hall, for the 17th inst., in aid of the abovenamed institution, he himself undertaking to pay all the expenses. We are glad to hear that the charity will be benefited to the extent of upwards of 1,000*l.* by the tickets already sold.



MAP OF THE HEART OF LONDON.

MODEL DWELLINGS FOR THE RICH.*

If it be tacitly admitted by most Englishmen that whoever can make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before does more essential service to his country than the whole race of politicians put together,† perhaps he who can make two healthy houses to stand in this colossal city where a single unhealthy one stood before, confers a greater benefit upon his fellow-citizens than all the enterprising persons daily engaged in enlarging the area of inhabited London. At the present day, when the custom has become all but universal for Londoners to live out of London,—to regard town, in fact, as a place of probation, through which men must pass daily before hoping to enjoy their lives elsewhere,—it may seem Quixotic to suggest a contrary procedure. Yet, to dwell within reach of the heart of London is almost a necessity for that increasing class whose mental activity is of most importance to the community in general. Parliament, the Courts of Law, the Public Offices, the various professions, the daily and weekly journals, make large demands upon the time of the more accomplished minority of Londoners; and for these persons the clubs, the learned societies, the places of public amusement, and congenial neighbours, are more or less necessities of intellectual life. There are, consequently, and there always will be, a large number of people to whom the neighbourhood of Westminster Hall, Pall-mall, Burlington House, and the Strand is not merely attractive, but essential; and who, if they can reside in central London, will enjoy advantages for which no consideration except that of health can be accepted as an equivalent.

In point of fact, such residences, both large and small, as can be obtained within a mile of Charing-cross are eagerly sought, and are occupied at high rentals. To show what is obtainable under existing circumstances, we have prepared a rough map, comprising an area of between two and two and a half square miles, which represent the heart of London.*

On the map will be found marked with black those portions which are so laid out and constituted as not to be available for high-class occupation, while the portions so available are etched. It will be at once seen that the residential part forms but a fraction of the whole; and if we may judge by past analogy, there is more likelihood of the black encroaching still further upon the grey, than of the grey regaining possession of the black. For instance, within three minutes' stroll of Charing-cross there is the Piazza of Covent-garden, which Hogarth painted while the houses were occupied by people of quality; further on, Soho-square, once a favourite haunt of fashion; Golden-square, inhabited in the last century by "lords and ministers of State"; St. James's-square and Jermyn-street, built "near the Court," for the accommodation of those who frequented it. The clubs, the joint-stock banks, the hotels, the private lodging-houses, and the professional chambers are gradually but surely ousting peers, both spiritual and temporal, millionaires, and others who still cling to a spot near which "Norfolk, Ormond, Kent, and Pembroke gave banquets and balls."† Shops and lodging-houses are creeping up to the very portals of Grosvenor and Berkeley squares, Mayfair is already shaken by more than one unwelcome intrusion. Portman-square, with its adjacent great thoroughfares, is the quarter most affected by the large family of the "Harley-Bakers" whom Thackeray has immortalised; while the Portland and Bedford estates have been long besieged upon their eastern side with a pertinacity of mischance which has left many of their symmetrical streets in the "parlous" condition of lodgings and the upper-part-of-this-house-to-be-let.

All who know town well will doubtless concur in our assumption that unless some new system of construction and arrangement of residences be introduced, no enlargement of the area now devoted to first-class residences in the heart of London is likely to take place. The violent expedient of making certain new streets has done good to commerce, but to domestic households it has brought literally nothing,—in fact, it has driven them further into the outskirts of this enormous city; and in London new streets are always a question of years, sometimes of a generation. On the other hand, two remarkable and suggestive modifications in town buildings have been made within the present century. They encourage us to believe that a similar one, such as we advocate, may be readily adopted. The huge blocks of offices for merchants and professional men now to be found in the City, and the Model Dwellings for operatives and others lately erected in parts of the metropolis, are comparative novelties; and Model Dwellings for a different class of the community are a natural sequel to them. Little more than fifty years ago a great many merchants resided east of Temple Bar often over their counting-houses. Even at that time a few houses were let in separate floors, and used as offices; but buildings erected expressly for offices were unknown, and one of the first houses planned and constructed for that purpose was a stack of offices in Clements-lane, built about 1823.* During the last twenty years the growth of this class of building has been enormous. Several companies have been formed for the erection of such specially-contrived blocks. The huge houses on either side of Queen Victoria-street, the latest buildings of this sort, are arranged on the horizontal system, by floors, in sets of offices, or even single rooms. The upper stories are often reached by a lift, and there are continuous rows of shops on the street level.

Let us now turn to the Model Dwellings, and to what they supersede. On visiting any district of London where operatives and some of the poorer class of the community reside,—on pene-

* By Mr. T. Roger Smith and Mr. W. H. White. Read at the Society of Arts on Wednesday last. A discussion followed, to which we will return.

† The King of Brobdingnag's Speech to Gulliver.

* See map. † "State of England in 1685." Macaulay.

* See papers by Mr. I'Anson in the "Transactions" of the Institute of British Architects.

trating behind the main thoroughfares, -you will find large spaces covered by small, low, irregular, and ill-built houses, of two stories, badly approached and badly drained. The best of them are often in narrow lanes, the remainder in courts and alleys, and all suffer from a stagnation of air; yet they are let at exorbitant rents! Here and there, however, you may discern a group of solid, substantial buildings, lofty, well drained, well supplied with water, with a liberal provision of light, air, and comfort. These are the Model Dwellings. If you examine into the whole history of these buildings you will find that where the management is economical and thorough, it is possible to obtain a fair return for the outlay expended on land, building, and maintenance. Owing to the fact that they contain four, five, or even six stories, as compared with the two by which the land was covered before, it has been possible to pay for a good site, to allow ample space around the buildings, to construct them with a solidity worthy of a public building, and yet to let them to families equal in number and extent to those which covered the ground on the old system for rents favourable in comparison with those of the original tenements.

The subject of such model dwellings is already almost an old one, and the idea of extending their usefulness is not new. For half a century the propriety of adopting the mode of house accommodation practised in most of the European capitals has been discussed in London. Twenty-one years ago one of our colleagues* since dead published a pamphlet on the subject, in which he declared that three-fourths of London houses were lodging-houses,—that is to say, houses in which two or more families or groups extemporise residences in a building constructed for the accommodation of a single one. Our map bears out his assertion, for almost all the houses which help to compose the black portions of it are built for the express accommodation of a single family, and are inhabited by two or more groups of people. Without, however, going into statistics, it is certain that a large lodger population exists in the metropolis; that it is composed of offshoots from all classes—even the upper classes—of the community; and that the Legislature has recognised the fact. It is certain also that on the great patrician estates of central London there arise periodically new houses built to accommodate one group of persons which are immediately let to several groups. At this very moment hard by there stands a new street just presented to the public by the Metropolitan Board of Works—a street of which even Paris might be proud—and in which, according to all probability, the same false economy and commercial waste will be suicidally rampant. Northumberland-avenue from Charing-cross to the Embankment is 90 ft. wide, planted with trees and paved with wood. It may be lined with houses 80 ft. or 90 ft. high from pavement to cornice; and, according to the London system, the builders of these new houses will devote their skill and energies to the distribution of the ground and first stories alone, and leave the upper ones to take care of themselves, confident in the fact that in the neighbourhood of Charing-cross sets of rooms are so urgently required and diligently sought that anything of the kind, however primitive, will let at an almost fancy price.

This time-honoured system of London house-building—both unscientific and inartistic—is due partly to the tenure of land customary in the metropolis, almost the whole of which is leasehold—that is to say, consists of houses erected on land, not sold, but let on what is known as a building lease. The nature of a building lease is that the possessor of a piece of freehold land lets it for a term of years to some one who undertakes to pay an annual rent for it; to build and maintain a house upon it; and at the end of the term to surrender the land and all that stands upon it back to the owner of the soil. The immediate result of this system is that it is to the lessee's or leaseholder's interest to build a house as cheaply and nastily as he can; and very little to the interest of the lessor or freeholder to prevent him from doing so. The lessee will lose the house he builds at the end of his term of sixty or seventy years, and the freeholder will not get it for that time. The one therefore desires to make as much of it as he can before it slips away from him,—and at the same time to do nothing superfluous, or from which the freeholder may ultimately profit,—and the other, so long as the security for his ground-rent be sufficient, cares but little what is the nature of a property which will come into his or his heir's possession at so distant a day; and when, if the lessee has displayed only common shrewdness, it will be worn out.

Our description, however, of this transaction represents it as far simpler than it really is; for we have omitted a chain of circumstances which often tends to burden the building of a London house with expenses to be ultimately defrayed by the unfortunate tenants. As a rule, the land is not leased to the actual builder, but to a middle-man, who gains a profit by re-letting it at a higher rate. The builder is usually a needy man, who builds with borrowed money; and the high interest he has to pay, the expenses of solicitors and surveyors, and the profits on the original ground-rent, must all come out of the house-rent. How enormous an evil this system has grown to be was described a few years ago by a writer in the *Quarterly Review*, whose vigorous attacks created some astonishment at the time of their publication.* On the other side, it has been urged that the control of the ground-landlord prevents irregularities of all kinds, and that this fact outweighs a few acknowledged disadvantages. That the ground-landlord exercises a control which renders it extremely difficult to improve a London dwelling-house, is eminently true; and experience shows that that control is no safeguard against the fatal violation of sanitary laws. How can it be otherwise while "houses are built not primarily as a comfort for the occupant, but as a security for the freeholder?" And such houses are not exceptional cases,—to be found here and there, old or soon to be pulled down. It has been computed that the buildings in London of one year alone would cover "an extent of frontage of something more than fifty miles." And it may unhesitatingly be added that, both as regards solidity and sanitary provisions, half these leasehold houses are unsound.† But, at least, they are convenient, comfortable, private, and thoroughly English? They are and they are not. The traditional system of town residence, as carried on in London, makes the British capital socially inconvenient as compared with those of France or Austria. The chief advantage of living in Paris or Vienna consists in what Dr. Johnson was able to say of London, that there "a man is always so near his burrow." The French and Austrian capitals of our time are to the Parisians and the Viennese "what Athens was to the Athenians of the age of Pericles, what Florence was to the Florentines of the fifteenth century." But it will be argued, London contains double the population of Paris. True; not only is it double, but it is increasing at an enormous, although perfectly calculable, rate of progression. Streets after streets of houses, far beyond the four-miles' radius, have risen and are still rising into existence.‡ These streets mean miles of roadway, which have to be paved, maintained, and scavenged; miles of gas and water pipes; of main and branch sewers; of police supervision, and of all those things which are known to Londoners under the comprehensive and disagreeable title of "rates." Meanwhile central London, where the great mind of the capital is daily and nightly at work, is more than partly covered by low, irregular, unhealthy, makeshift tenements,—often the houses of the poorer classes of the population,—traversed by narrow thoroughfares, into which flow, so to speak, alleys and courts as bad as the worst wynds of old Edinburgh.

Even admitting that the residential parts of central London please the well-to-do families who inhabit them, it cannot be difficult to convince the majority of those who believe in the London system, that metropolitan house accommodation is not so distributed as to suit the habits and wants of all classes of occupiers. A certain situation and a certain respectability of appearance being essential, the householder takes the best house he can find in the position he wants, and makes the best of it. But if his family be small, or if he be a bachelor or an unincumbered widower, the householder is saddled, for the sake of situation, with three times as many bedrooms, and a set of drawing-rooms twice as extensive as he requires. Indeed, a bachelor of fortune, ensconced in the only snug parlour of a fashionable London mansion, reminds his visitors more of a sailor on an abandoned ship, or of a "man in possession," than of an English gentleman enjoying the lettered ease and artistic refinements of modern home life!

The case, as far as we have yet gone, is that residential London covers a far smaller area than appears credible; that there is a demand for the re-arrangement of some of its dwellings; and that if possible an encroachment of its territory upon that of non-residential London is desirable.

The actual town residence is a vertical slip of comparatively tall building, and it consists, above the street pavement, of perhaps four or five stories and a low roof. The Londoner cooks underground, dines on the ground level, receives visitors on the first-floor, sleeps on the second floor, lodges his children and guests on the third floor, and his servants in the roof. From the bottom to the top of this house is an open shaft, called the staircase, which is a complete conductor of smell, noise, and draught,—an intolerable evil to old people, children, and invalids. The long, weary flights of stairs render efficient attendance so difficult that many well-to-do persons give up the idea of being waited upon, and those who insist upon it have to pay for a large staff of servants, which in some fashionable streets means filling up the passages and stairs. In many aristocratic dwellings a butler and his assistant will effectually block up the entrance passage, while in the majority of even very good houses stairs exclusively devoted to the domestic service are unknown.

As a singular instance of custom, engendered by the vertical system of house building, the labours of a London dinner-party may be cited. First, from the street-door to the curb-stone of the pavement a strip of carpet is spread, and over this the guests are conducted, often under an umbrella, to the threshold. Having passed through a long, narrow passage, they are made to climb two flights of stairs. The ceremony of reception over, they then descend to the street level, only, however, to scale, after dinner, the same two flights of stairs, and ultimately to be conducted down them again to their carriages,—this process of climbing having to be renewed before they reach their own bedrooms.

Another evil of the narrow vertical slip of building is the slenderness of its constructive parts. The floor-joists, boards, and ceilings are generally so slight as to admit the easy passage of sound, and to vibrate with the mere motion of the inmates or the shifting of furniture. One wall of each room in the house is what is called a party-wall; and the Metropolitan Building Act is sometimes so cleverly worked that there may be a thickness in parts of only 4½ in. between house and house; while a thickness of one brick is legal in many places. Of the other walls one or more is often a partition of lath and plaster. The stairs and the floors are of deal, and often concealed within the latter lie yards of leaky gas-pipes. The walls and partitions are covered with absorbent paper, and the floor-boards are hidden by an equally absorbent carpet. Exactly in front of the windows which light the principal living-room is the sole entrance and exit for the household service; and the kitchen and household refuse of several days festers in a dustbin, artfully placed in the area, just under the dining-room window.

We by no means assert that the Parisian is better off in his home,—and many Frenchmen enjoy their homes quite as much as Englishmen do,—than the Londoner; but we do assert that the ordinary Paris houses are more scientifically planned, more artistically rendered, and more solidly constructed, than even the best London ones. Half a dozen London houses turned on their sides, and piled one over the other, may help to convey a rough notion of a Paris house; but for English brick and deal you must substitute French stone, iron, and oak. In Paris, Brussels, Vienna, St. Petersburg, Geneva, Hamburg, and

* "Town Dwellings," by the late Mr. Arthur Ashpitel, F.S.A., in connexion with his partner, Mr. Whichcord.

* April, 1872. "The State of English Architecture."

† It is within Mr. T. R. Smith's personal knowledge that on one of the best estates in London the main drains of a comparatively modern leasehold house were of inferior brick; and, owing to their failure, these had to be relaid in tubular tiles by the tenant. On another such estate a magnificent house was found to be literally built on a dunghill. All the walls had to be underpinned, and several hundred cubic feet of filth were removed. In a third instance, in one of the finest leasehold houses which London possesses, the arrangements for taking sewer gas into the proprietor's bed-room were fully as complete in their way as those for supplying combustible gas to the gaseliers. It turned out also that the flooring of what was built for a ball-room was so weak as to be actually in danger of breaking down under the weight of the people who would fill the room, irrespective of any dancing.

‡ Mr. Thomas Carlyle, writing in *Macmillan's Magazine*, August, 1867, said:—"Truly the state of London houses and London house-building at this time who shall express how detestable it is, how frightful! 'Not a house this of mine,' said one indignant gentleman who had searched the London Environs all around for any bit of villa, Alpha-cottage or Omega, which was less inhuman, but found none; 'Not a built house, but a congeries of plastered bandboxes; shambling askew in all joints and corners of it: creaking, quaking under every step,—filling you with disgust and despair.'"

Berlin; in Turin, Naples, and Rome; in Calcutta, Cairo, and other Eastern cities; in Edinburgh, Glasgow, and other Scotch towns, families inhabit what are called "flats," and which are slightly known to Londoners by certain examples in Westminster, Marylebone, and elsewhere. But a large number of these, planned upon the Continental and Scotch systems, possess the defects inevitable to a first attempt. They have dark, close, stuffy passages, with kitchens, bedrooms, and living-rooms, all huddled together, and the majority are reached, only after a fatiguing climb,—faults which have given a bad name in England to the horizontal system of residence. They no more prove, however, that such defects are inherent to the system than the existence of a certain number of blind people is a proof that the human race cannot see! Indeed, the study of actual buildings of this description, both at home and abroad, will be of little avail unless it convince the British architect that a primary canon of the horizontal dwelling excludes from all parts of it either a dark or an ill-ventilated corner. Not only must the corridors be spacious and light, but the three sections of a house,—the living-rooms, the service-rooms, and the sleeping-rooms,—must be entirely distinct. At the present moment, the Parisian principle of plan governs the architects of these special buildings in European capitals; but some of our insular habits are opposed to its adoption in this country. One important difference, for example, is that Englishmen often pass the day in their dining-rooms, and only sleep in their bed-rooms, whereas a Frenchman lives in his bed-room, and only eats in his dining-room.* In London, more space is required for the household service than in Paris, where kitchen economy is pushed to an extent almost incomprehensible to English housewives. In Scotland, Rome, and in the London Inns of Court, the public staircase is synonymous with the street, and often equally dirty, since there is no one to look after it, and no external door. In Paris it is protected by a *concierge*, his wife, and family, who are responsible for its cleanliness and safety. Still even this staircase and this social incumbrance, the married porter, must be improved upon, if we are ever successfully to turn six vertical English houses on their sides and convert them into twelve horizontal residences,—that is to say, if a dozen self-contained healthy houses are to be provided for the dozen different groups of people who previously dwelt in the six unhealthy ones.

We will now, with your approval, describe a block of horizontal dwellings, suitable, as we humbly think, to the wants and associations of English families of position and means.

The site must be in the heart of London,—in a wide street or a square, facing a park, or on the new Embankment. At present it would be unwise to erect a building of the kind, except in an open and therefore expensive situation. Were it not almost impossible to buy land in London, the site ought to be freehold. A corner or triangular plot of ground lends itself extremely well to the kind of building contemplated; but it must be open enough to admit of lofty façades, containing, in cases where the basement and ground stories can be devoted to mercantile and professional offices, as many as eight stories. Above the business offices there would be six stories, that is, twelve residences, each containing fourteen or sixteen rooms. We may be told that to reach the top story, some 150 steps or more would have to be scaled; and in an ordinary London house there are rarely more than fifty steps from the pavement to the level of the bedroom floor. But now that people cheerfully cross a street,—say the Edgware-road to the Great Western Hotel,—by steam, we propose that the inhabitants of our model dwellings shall similarly travel from the street pavement to the particular story in which they reside. The tenants and their families shall go up first class, their servants and tradesmen second class, and to this carriage a goods-van shall be coupled. We propose, in fact, without absolutely abolishing the traditional staircase, to construct a brick shaft, in which shall be placed an "elevator," fitted up like railway compartments, and that a guard shall be always in attendance to accompany passengers in their ascent and descent.

As we have previously hinted, each residence would be divided into three distinct sections, each served by its own corridor. That in the service section would communicate by a special passage with the dining-room and in this passage a small tramway might be laid down for the conveyance of dishes and similar articles. The section containing the living-rooms would comprise a large hall, a dining-room, a library, a drawing-room, and sometimes a gentlemen's smoking-room as well as a ladies' boudoir. The sleeping-room section would consist of a sufficient number of bed, dressing, and bath rooms, with a fireplace in each room. In the service-section would be placed a butler's pantry, a servants' hall, in addition to the kitchen, scullery, and stores, and bed-rooms for the female servants; but all the men-servants would be lodged in separate rooms in the roof. Each section would communicate with the others by means of swing folding-doors, without locks. In all the rooms of the sleeping-section water would be laid on, and a means of exit for it provided.

The façades of our building would receive attention of a utilitarian as well as of an ornamental nature. We propose to face the external walls, both towards the street and towards the quadrangle, with hard impervious substances such as glazed bricks, relieved by majolica ware and a little polished granite,—in fact, to use externally only those materials that will "wash."*

In a building of such a character and such dimensions many sanitary precautions could be taken in the construction of the foundations and lower floors, which, to say the least, are not taken in even the best London houses. A layer of concrete would be spread over the whole surface of the site between the foundation-walls; and damp-courses of brick laid in asphalte upon the walls themselves. Cellars vaulted with brick arches would be arranged under the basement floor, and these cellars would be allotted to the different residents, and be let with each residence. There would also be in each service-section, small cellars for coal and wine, which would be replenished from the stores kept in the larger cellars situated in the sub-basement.

All the chimney-flues would not only ascend to above the roof, but also descend perpendicularly to the cellar level, whence they could be swept, so that no sweep need enter any of the residences or business offices.

A special external feature of the building would be the street entrance to the residences; and this would be so arranged that tenants and their guests could alight under cover from their carriages. None but those residing in the house and their visitors would use this special entrance. The entrance to the business offices,—where they were admissible,—would be in an opposite part of the building; and the servants' and tradesmen's entrance would be distinct from both that of the residences and that of the offices.

Our Model Dwellings would form so extensive a block that the external and party walls would perforce be of more than ordinary dimensions; most of the partitions would be of brick; the floors would be equivalent to horizontal party walls, fire and sound resisting, and composed of rolled iron entirely enveloped in concrete. The staircase would be absolutely fire-proof. The outer doors of each residence would be of solid oak, and not only folding, but double, like the outer doors of chambers in the London Inns of Court. The floors of the corridors would be covered with marble mosaics; and those of the principal rooms with oak parquetry. From top to bottom of the building the kitchens, sculleries, &c., of each residence would be over one another, and the danger of fire or explosion from range or boiler thus concentrated in one spot.

The landlord or manager of such a building should have a certain share in its internal economy; because it offers, we venture to think, an easy opportunity for the practical application of co-operative advantages. In several modern buildings, both public and private, it is quite an ordinary thing to find in the basement a steam engine at work for purposes of ventilation. We propose to place one under the central courtyard of our building for a threefold purpose: to ventilate and to warm, as well as to work the elevator. Not only the public entrance-hall, public stairs and passages, but the private vestibules, ante-chambers, and corridors of each residence would be warmed and ventilated by means of this same steam-engine.

The management would have to provide certain general servants, each with special functions, to do part of the domestic work of all the families residing on the six stories, and of the business offices on the lower floors,—to be paid for by the tenants. For instance, a hall-porter, to open and shut the external door, to direct visitors, to receive, distribute, and post letters; an attendant at the elevator; a man to perform window-cleaning, and maintain bright and clean all the portions of the house common to the families residing in it, and also to remove dust regularly every night and morning. Our proposition aims at getting the dirty, and therefore menial, work of each household done by outsiders, exactly as such work is now done by the time-honoured "laundress" of the London Inns of Court. By previous arrangement with the landlord, much general assistance might be thus rendered by the servants of the house to the tenants without prejudicing the internal domestic privacy of each family. They might, for example, clean boots and brush clothes; they might polish the oak and mosaic floors of the different residences; and, indeed, do any similar work specified by landlord and tenant.

There are, of course, objections to our scheme. In the first place, our suggestion tends indirectly to mix up in one block of buildings professional and mercantile offices with family residences. But one of the causes of the present unwieldy condition of London is that the different classes of the community are always trying to fly away from each other; and, as a direct consequence, they are always invading each other's territory. Those who desire to live in the heart of a great city must accept the logic of circumstances; and we would so arrange the houses that some of the upper and middle classes should inhabit the same streets without incommoding, or, so to speak, compromising each other.

The insular objection to live in the upper stories of a tall house is perfectly natural, so long as people are compelled to climb up to their residences. It should cease when they can be carried up to them easily, and without moving, in less time than would be required to reach their bedrooms on the old system. For several families to live under one roof, and to be partly "helped" by the landlord's servants, is also startling in an English point of view. But it is less startling when the present condition of London life is calmly considered. More than one recent satire, treating of popular social questions, seems to foreshadow change in the thought and custom of society. One book, called the "Coming Race," sketched a sub-terrestrial nation, in which men and women were lifted from one floor to another of their houses by invisible machinery, and waited upon by automata.* Another book, called "Erewhon," on the contrary, described a beautiful race of beings, who regarded machines with loathing, who held picnics in the ivied ruins of a railway-station, and who placed in their museums fragments of ancient watches and steam-engines, just as we nowadays collect the bones of a dodo or a mammoth. The one hinted that science having gone so far must go yet further; the other suggested what might happen if it went too far. For the present, however, we may safely assert that steam is still youthful; and with a very little thought an ascending chamber could be made to supersede a staircase as effectually as the railway has superseded the stage-coach. Of course, a steam or hydraulic elevator implies a certain amount of risk, but so do railways, and yet people seldom hesitate to travel upon them. An elevator would make some ladies ill; and ladies are sometimes affected by sitting with their backs to horses or to engines; but the number of persons liable to this inconvenience is happily very small. On the other hand, there are real human distresses in both men and women which are aggravated by the enforced climbing of a London staircase-ladder.

We hold it of great importance to arrange London dwellings in such a way as to lighten domestic labour of every description.† The rela-

* See papers on "Paris Houses" in the *Builder*, December 11th, 18th, and 25th, of last year.

* A great deal of the dirt which enters a London residence is due to the fact that the house-fronts are begrimed with soot and dust,—formed by moisture into a paste,—which in fine weather dries, disintegrates, and is then blown into the rooms through the open windows.

* The late Lord Lytton wrote: "Some words in a low tone passed between the living representative of the group touched an automaton, which darted forward and glided from the room. . . . My guide again took me by the hand, and re-entering the gallery, halted at a metallic plate inscribed with strange figures, and which I rightly conjectured to be of the nature of our telegraphs. A platform descended, but this time we mounted to a much greater height than in the former building, and found ourselves in a room of moderate dimensions. . . . Four automatic mechanical contrivances which answer the ordinary purposes of domestic service, stood phantom-like at each angle in the wall."

† The late Cardinal Wiseman, lecturing in April, 1844, said:—"The French word *grenier*, originally the granary,

tions of master and servant in England never were so strained as they are at present. The old type of domestic servant is now very rarely found; the new type is seldom worth the having. Men and women are no longer for hire. They will do a certain amount of definite work, and sell that work to their superiors; but they aspire to the right, at least the men do, of disposing of themselves as they choose when their work is done and the contract with their masters is thus fulfilled. The patrician, the historical family, a few people of exceptional position and winning manners, may gather around them domestics who identify themselves with those they serve, but old-fashioned service cannot be exacted by the mere payment of wages. Under a system such as we propose the number of domestic servants would be considerably reduced, and the ordinary household labour diminished. A professional housekeeper would become an incumbrance; and in these days, when ladies and gentlemen carry home their own stores from the various co-operative shops, the place of housekeeper in a London residence ought not to be worth many years' purchase.

To sum up: a building planned upon the principle of which we have given an outline, a principle which we have worked out upon paper, and which applies equally to a square, an oblong, or a triangular site, combines internal economy and constructive strength,—economy in the kitchen and domestic arrangements, extra comforts in the dressing-rooms, and a set of sitting-rooms, not *en suite*, but on the same level, and entered from the same corridor. It divides the three sections of a house, so that the foul air generated in each may pass away naturally without rising, as in our actual houses, from one section through the others. All our living-rooms, both of day and night occupation, would face a public street, only the corridors and service-sections being lighted from the back of the house or the courtyard. The tenants need not mount a single stair from one year's end to another. The members of each family would be as privately located as if they inhabited a vertical slip of building, in which the various rooms are connected by the usual staircase ladder; but, instead of climbing, they would walk from room to room. By the horizontal system of residence families desirous of living in the heart of London can be agreeably lodged, and at comparatively reasonable cost. Houserent would rise, but household expenses and household annoyances would diminish. The character of London housebuilding would be raised. Bad neighbourhoods could thereby, perhaps, be redeemed, and good neighbourhoods undoubtedly guaranteed from deterioration. Such buildings as our Model Dwellings for the Rich would "pay," we are confident, all those concerned in their erection. When the upper classes have set an example by inhabiting them the insular prejudice against such residences will surely disappear; and the middle classes who most require a reform in the London system, will soon follow in the steps of their more fortunate brethren.

ELECTRICITY *v.* GAS.

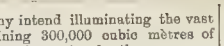
THE Great Northern Railway Company of France has undertaken a series of experiments which seem to indicate the approach of a great revolution in the mode of lighting public buildings and thoroughfares. To judge from the reports recently published, electricity seems destined to eclipse gas altogether. A few weeks ago a three-horse power Gamme machine was employed to light the luggage department of the Paris Great Northern Railway station. This room or hall measures 20,000 cubic feet, and is generally illuminated by twenty-five gas-burners. The new electric light was placed at a distance of 10 mètres from the ground, and gave a light of a peculiarly soft character, which rendered the use of the dull globe employed to check the irritating glare of gas quite unnecessary,—a fact of some importance, as it tends to augment the economy realised by the new system. The light continued to burn the whole evening with great regularity, excepting, of course, when it was purposely lowered. The success attained was so conclusive, if we may believe accounts, that the company intend illuminating the vast structure, containing 300,000 cubic mètres of space, where the trains arrive, by the same process. For this purpose electric lanterns, if we may so call them, of exceptional power, will be placed at a height of 20 mètres. They will be placed at the four summits of a rectangle, so there will be no shade or dark corner in the whole edifice. The goods station at La Chapelle will also be lighted in a similar manner.

M. Tresca, an energetic advocate of the electric system, has been able at last to estimate the amount of power required to produce a given quantity of light by the magneto-electric machines. In this respect former experiments had been eminently unsatisfactory, and M. Tresca gives an exhaustive description of all the difficulties that had to be surmounted in a report which is inserted in the minutes of the Academy of Science. The results have been obtained chiefly from two machines; the first giving a light equivalent to 1,850 carcel-burners, that consume forty grammes of oil per hour, and the second equal to 502 similar burners. With the former it is easy to read at a distance of 21·50 m., and with the latter at 7·70 m. The reflection, also, from the walls is so strong that persons can read at these distances even when holding the book with its back to the light. From a lamp equal to a hundred burners the same result can be obtained at a distance of five mètres. Four electric lamps of this power have been used during the last year in the factory of Messrs. Heilmann, Ducommun, & Steinlen, of Mulhouse, and give a satisfactory light over an area of 1,850 square mètres. The most important and crowning fact, however, is the assertion that the electric light is a hundred times less expensive than oil, and fifty times cheaper than gas. Should a prolonged and practical application of the new system prove this startling comparison to be correct, we may look forward to a great change, which will altimately compel the gas-makers to, at any rate, make a great alteration in their scale of charges, if it should not interfere even more seriously with their interests.

A DISCOVERY IN THE BAY OF NIKMID.

THE Constantinople journals reported quite recently the discovery, in the Bay of Kadikeni (Chalcedon), of an old temple, 20 ft. below the surface, which information had been transmitted by the governor of Scutari, Ahmed Pasha, to the prefect of police of Constantinople. It was added that the temple rested on four large columns of black marble. The Minister of Public Education, Safvet Pasha, instructed Dr. Dethier, director of the Imperial Museum, to investigate the matter. Dr. Dethier has just now published an account of the discovery in the *Colonie Gazette*, from which we translate the following particulars. A whole day, the writer says, was lost in trying to find the place, some directing me to Kadikoi, others to Scutari. I afterwards applied to the governor in Scutari, and the information I received led me to a point, distant over two (? German) miles, behind Phenar-Bahtshe, near Bostandji-Köprn. I, therefore, went, in the first place, to Kadikoi, hired a *kaïk* (long, narrow boat), sailed round Moda-Burnon (Chalcedon), out across the harbour of Kalammish (Eutrops), then round Phenar-Bahtshe (Heraion), and, after a further sail of an hour, stopped at a tar manufactory, my information saying that the discovery had been made near this establishment. The sea here forms a small bay, and, behind a narrow path along the shore, covered with fragments of masonry and marble, which have rolled down from above, rises the wall of the shore, about 20 ft. high, consisting mostly of rock. In a bend of the shore, closed in by remnants of a mole, the ruins in question of a building, in the shore wall, are noticed; how far they stretch into the wall, upon which they are perpendicular from the side, cannot be seen. There are two large and two small columns; the former, in grey granite, 2 ft.; the latter, in white marble, 9 in. in diameter. But the building itself is supported by the walls, and has an arch of bricks of 1 ft. 3 in. square, with hardened mortar, thicker than the bricks. The walls are two paces thick. Three of the walls are distant from each other ten paces (another, twenty-five paces further to the right, without a vault). Before the section farthest to the left lies a Corinthian capital of white marble, with two acanthus wreaths, well preserved, but showing the beginning of careless execution. The diameter of the capital at its base is 2 ft. The impression caused by the ruins is that the building was violently destroyed, either by an earthquake or the hand of man.

An explanation as to the building and to the time to which it belongs could only be obtained from the inscription on the bricks. Broken-off fragments gave me only parts of the inscription. I borrowed a large iron crowbar from the manufactory, and succeeded, after much trouble,—the mortar being harder than the bricks,—in breaking off a perfect brick, bearing the following inscription:—



It has been cut right in the die; appears, consequently, reversed on the bricks; so that it must be read backwards, from right to left, viz., with + at the beginning and at the end; then INΔS=INΔIKTOY, where the S is always a sign of abbreviation; next follows IA as a number=XI. of the cycle of indiction; finally, the emperor's name, MAϱ. At first we believed we had to read MAN[OVHA], which would point to the first emperor of that name, Manuel Comnenus, so well known through the crusades of Emperor Conrad and King Louis II., under whose long reign the indiction number XI. recurs three times, viz. 1148, 1163, and 1178; but history does not supply us with any support for this theory, nor does the form INΔS, as little as the shape of the handsome capital, belong to his time. But when I considered that in the coins, seals, brick inscriptions, &c., the most curious distortions and intertwinings of the letters take place, I recognised in the ϱ a headless Ч, connected with the final cross, and thus obtained the name of the Emperor Mauritius, with the year 593 or 594, upon which his cyclical number falls, consequently a time suitable to the handsome capital. I may add, for the information of non-archæologists, that there exist from all periods of the history of humanity monuments not only of the greatness of the human mind, but also of its stupidity, and that the archæologist has to explain the one or the other as it turns up. Those periods are the worst where mysticism seeks in "darkness" and "obscurity" the beautiful and the sublime. The inscription is smothered, entwined; we read to the right, we read to the left; we combine the letters to a monogram, so that the inscription serves just the reverse of what it is intended to be: it becomes a rebus that cannot be read; it is then that some one, by inspiration, gets possessed of the secret key, or he be an Œdipus. This is the case with the dates of years in the Middle Ages. The mind occupied itself only with the period of fifteen years, for which a payment of tithes was fixed by the government. The indiction is for 1, 2, 3, &c., up to fifteen years; and then a new indiction begins afresh, and those cycles may be reduced in the case of monuments to chronological dates only if the name of a sovereign is connected with them. Thus we are brought with the indiction XI. Mauritius to the year 593-594 A.D., a leaf in the book of history belonging to the most sanguinary, and forming a stain in the history of Christian States, viz., the murder of the whole family of the Emperor Mauritius by the monster Phokas, bodily and morally depraved, but blessed by the Vatican. The known history of this crime illustrates our discovery, and *vice versâ*.

We may read everywhere, though sometimes marred, how, at the approach of the rebel Phokas, the Emperor Mauritius, in the night of November 22, 602, because forsaken and despised by the Byzantines, took off his imperial robes, and, in plain citizen's dress, accompanied by his wife and nine children (six boys and three girls), and some faithful dignitaries, and taking with him some treasures, went on board an imperial barque, to fly over Nicæa, to the King of Persia, Chosroes. A terrible storm from the south compelled him to desist, and to seek safety in the church of St. Autonomus, near Prainete, whence he despatched his eldest son, Theodosius, with a companion, to Chosroes, on account of his being prevented by an attack of gout from going on; but soon recalled him from Nicæa. On the 27th a quarrel broke out at a banquet of the new emperor in the Hippodrome at Byzantium. The neglected Blues had the imprudence to call out, "Mauritius is still alive!" Soon Phokas despatched his assassins. All the male members of the family,—the sons first, the father last,—were dragged from their hiding-place, and beheaded on the mole of the Entropius harbour of Chalcedon, the corpses thrown a prey to the waves, and the heads exposed on lances, first in the

now means an attic; because the provision of grain and other stores was first and foremost carried to the dry top of the strong, well-built house, whence the domestics had the lighter task of bringing them down in detail. Was not this a wise economy? Now, we send our coals, for instance, a story lower than the ground to have them carried up to a third or fourth floor above it."

town, and then in the tribunal of the Campi, until the stench emitted led to their removal. Prince Theodosius was taken on his way at Diadromoi (Pass), near the Cape of Akriton (? Gebshe), and beheaded.

As regards the church of St. Autonomus, we have the somewhat uncertain information that it was distant 150 stades from Byzantium,—of course, from the great milestone in the Forum. The rapidity, however, with which the murder was committed on the mole of the Eutropius harbour leads us to the conclusion that the distance was less.

But now we learn that just in the year 593–594, which is on our brick, Philippicus, the brother-in-law of Mauritius, appointed Count of the East, built at Chrysopolis (Scutari) a church to Our Lady, besides a convent (where is not stated) with gardens and fish-ponds, where once the Emperor and his children found shelter. It will thus be seen that we must not think of Scutari, nor of too great a distance, so that the newly-discovered ruin appears as the small church of the Martyr Antonomus. Here is a suitable place for beautiful gardens and fishing as well as fish-ponds. The ruins found may therefore be considered the chapel and adjoining convent. It may also be supposed that the above-mentioned principal church to our Lady in Chrysopolis (Scutari) received as rent from the rural convent a tithe in kind,—vegetables, meat, and fish. Gibbon, in the "History of the Decline," vol. viii., p. 189, remarks as follows on the church of St. Autonomus:—"The church of St. Autonomus (whom I have not the honour to know) was 150 stades from Constantinople." We consequently know at the present day this point quite exactly, and if, what cannot be doubted, further excavations be made in the ruins, pictures, reliques, and biographical notices of this unknown martyr may possibly be brought to light.

PEABODY BUILDINGS AT PIMLICO.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a visit was paid by some of the members of this Association to the new buildings now in course of erection near Ebury Bridge, Pimlico, for the Trustees of the Peabody Fund. The new buildings are situate on a strip of land bounded on the one side by the Chatham and Dover and Brighton Railways, and on the other by a narrow lane, known as "Turpentine-lane," in the rear of Westmoreland-street. This lane, which is at present a sort of No Man's Land, it is sought by the trustees to close, and a Bill is before Parliament with that object. The fronts of the dwellings are towards the railway, the backs facing Turpentine-lane. Two hundred tenements are provided, twenty-four of which consist of one room, seventy-six of two rooms, eighty of three rooms, and twenty of four rooms. These tenements are contained in twelve distinct, though not detached, blocks, the buildings consisting of one continuous range 923 ft. long, with an average width of 28 ft., and a height of 40 ft. to the ridge. The blocks are divided by party walls. There are three floors above the ground-floor, and the various-sized tenements are, as far as possible, evenly distributed on each floor and in each block. As there is plenty of ground to spare between the new buildings and the railway, it is proposed to erect a similar range of buildings opposite to those visited on Saturday, with a roadway 57 ft. wide between, thus forming a street of Peabody-buildings nearly 1,000 ft. long, which will, however, be inclosed by gates at either end. The site appears to be a very good one for its purpose, the northern end being near Ebury Bridge and within a short distance of Victoria Station, and the southern end almost abutting on the Grosvenor-road, on the river bank, close to the Grosvenor-road Station and the Battersea Suspension Bridge. The workmen who are to inhabit these dwellings will thus be within easy reach of rail and steamboat, and they and their wives and families will only have to cross the bridge (at which a toll of one halfpenny each person is payable, however, except on Sundays) to get to Battersea Park. The buildings are therefore likely to be much sought after; indeed, though none of the 200 tenements are yet completed and ready for occupation, 443 applications for them had, up to the end of last week, been made. The visitors on Saturday last were received and conducted over the works by Mr. Darbishire, the architect, and Mr. Bidgood, clerk of the works. It was explained that it was originally intended to make the buildings a story higher than at present, *i.e.*, to have four stories instead of three above the ground-floor, but this would have injuriously affected the light to the houses in Westmoreland-street, the backs of which abut on Turpentine-lane. Externally the buildings are of yellow stock bricks, relieved with hard white Suffolks in string-courses, jambs, &c., terra-cotta being used for keystones, quoins, corbels, chimney terminals, &c. The whole of the terra-cotta is manufactured by the contractors for the buildings, Messrs. W. Cubitt & Co. (whose works were recently described in the *Builder*), and Mr. Darbishire said it was the best terra-cotta he knew of. It need hardly be said that no attempt has been made at anything like an ambitious architectural display, the chief aim being to obtain sound construction with the best materials. Some amount of architectural effect is obtained by projecting, to the extent of about 3 ft., the centre portion of the front of each block, and by recessing the windows well into the walls, the latter expedient having the further advantage of obviating any ledges or reveals round the windows inside of the rooms, the sashes being made flush with the wall surface, and so preventing the accumulation of dirt and dust. Each block has a frontage of about 76 ft. 11 in., and has only one entrance, which is placed in the centre of the projecting portion of the façade already referred to. The staircases and landings are of the best sawn York (Gazeby) stone, with plain and substantial, though not heavy, iron handrails. On each landing there are two water-closets, which are jointly used by the occupants of four or five tenements. There is also a laundry on each floor, occupying the central portion of each block. Each laundry contains a copper, with water-tap over, and dressed round the top with sheet-lead; two fixed troughs, with water-taps over, one for washing and one for rinsing; a small movable bench or tub-stand, and a wooden trellis-board for standing upon, the floor being covered with red tiles, which are laid on rough boarding over the ordinary floor-joists, in the following manner:—a thin layer of concrete is spread over the rough boards; over this is laid asphalted felt, and over this the tiles, set in cement, with a slight inclination towards one side of the laundry, where there is a channel gutter to carry off any water which may be spilled. As there are only four or five tenements on each floor, each of the tenants is enabled to have the entire use of the laundry for one day in each week, each housewife supplying her own fuel for the copper fire. The drying of the clothes is effected by hanging them on lines stretched across the laundry, the windows of which are of the hospital louvre kind, opening outwards on pivots. On each landing is a dust-shoot, which communicates with the dust-chamber in the basement of each block, immediately below the ground-floor laundry. Access to this dust-chamber, for inspection or emptying, is obtained by an external flight of steps at the back of each block. Of the tenements themselves, we may say that the height from floor to floor is 9 ft. 6 in., the thickness of floor being 8 in. The floors are not of what is called "fireproof" construction, but are of ordinary joists and boards, with plaster ceilings beneath. No pugging is used. Mr. Darbishire incidentally stated that the insurance offices will insure buildings of this construction at a lower rate than they will accept for so-called "fireproof" structures, being of opinion that good wood and plaster work is in reality more fireproof than iron and concrete. The walls of the rooms are rendered with a thin coating of Portland cement,—only just thick enough to cover the inequalities of the brickwork. This plaster will, when distempered, form the surface of the walls, no paperhangings being employed, in order to obviate the harbouring of vermin, cement skirtings being adopted for the same reason. Each dwelling is provided with a coal-bunker, capable of holding about 3 cwt., and with plenty of cupboards, those for food having perforated zinc panels. Pieces of battening are fixed to the walls to receive nails or hooks for suspending pictures from. Each room is provided with a fireplace. The mantel-pieces and sinks throughout are of slate. A kitchen range, with oven and boiler, is provided for each tenement. The boilers are not self-filling, but, in order to prevent their cracking through being filled when red-hot, the cocks are placed about 2 in. above the level of the bottoms, so that there will in all probability always be sufficient water in them to keep them from getting red-hot. The water-closets are of the simplest kind, it being found that apparatus which is in the least complicated is liable to speedily get out of order by the rough usage of the, to a great extent, migratory population of such buildings. Each stack of soil-pipes is ventilated by a pipe going up above the top of the roof. There are only two bath-rooms to the whole of the two hundred tenements,—one in each of the end blocks. This may seem to be inadequate, but it is stated that where, in other of the Peabody buildings, a bath-room has been provided on each floor, little or no use has been made of it, and the accommodation provided at Pimlico is said to be quite equal to the demand for it. As before stated, Messrs. W. Cubitt & Co. are the contractors, the contract price being 36,416*l.*

WATER SUPPLY OF THE METROPOLIS.

On this subject Mr. Edwin Chadwick, C.B., read an elaborate paper at a meeting of the Social Science Association, on the 24th ult., Lord Aberdare in the chair. At the close of the paper an animated discussion followed. We give reports of a few of the more representative speeches.

Mr. G. B. Richardson, of the Metropolitan Board of Works, said Mr. Chadwick was not altogether correct in his figures, not only as regarded a supply of water to houses, but also respecting the supply for the extinguishing fires in the metropolis. The Board of Works had recently visited Liverpool and Manchester to obtain information which would give a different phase to the matter than that conveyed by Mr. Chadwick's paper. Mr. Richardson quoted several statistics showing the population of London and Manchester, the gross rentals of each town, and the water-rates chargeable in each, as also the profits derived by the companies for supplying water in London, with the view to show that the profit earned was very small compared with the size of the undertakings for supplying water. The Board were empowered by the Legislature to give to the whole of the metropolis a constant supply, if they thought fit, but they were deterred from taking steps to do so, as the insurmountable difficulty was to be found in supplying hydrants throughout and the fittings to all the houses. They had made it a subject of considerable inquiry as to the course to pursue, and they found, on the lowest estimate, that the cost of making necessary alterations and fittings in the metropolis alone would amount to from 4,000,000*l.* to 5,000,000*l.* With regard to hydrants, taking Manchester as a criterion, where they would require 10,000 in their streets, the metropolis would require 100,000, the work of putting up which would cost nearly 6*l.* each. It was a subject of serious consideration whether it was the Board's duty to put in force the powers granted to them for requiring a constant supply. They had lately considered the hydrant question, and the conclusion arrived at was that, so long as the different companies in the metropolis were not required by the Government to put greater pressure on their mains than that supplied to houses in their respective districts, it would be unjust to the public for the Board to expend 5,000,000*l.* of money in obtaining that which, when they had got it would not be of any more force to extinguish fires than the present supply. At Liverpool they could get a pressure of 100 lb. on the square inch, but in London the highest was 60 lb., and it ran down as low as 5 lb. But directly hydrants were put on, the present pressure would be reduced which was used for extinguishing fires. Captain Shaw had told them that it would be practically useless to attempt to incur the expense of putting on these hydrants. He did not think that the metropolis could be supplied in the same way that Manchester was. He believed he was correct in saying that whenever there was a large fire in the metropolis they sent to the companies to ask them to put on extra pressure, as the normal pressure would be of little use in putting the fire out. It showed the water supply was not good, and as long as Parliament allowed private companies, for private gain, to supply water, it would be unfair to call upon them to do more than they do. Besides, they were paying very small dividends, the mass of them did not pay more than 6 per cent., and only two paid 9 per cent. The only remedy would be to put the water supply under one authority, such as the municipal authority of the centre of London. As to trusting it to a new body, that he thought perfectly absurd, as no Government in the

present day would create a new taxing body throughout the metropolis, which had already too many. If the Government chose to entrust the power to the Board to purchase these companies and supply the metropolis, he undertook to say that they would do it efficiently and satisfactorily, and with every regard to the interests of the ratepayers and the people of the metropolis.

Mr. William Rendle ridiculed the idea of drawing any comparison between London and Manchester. Rich people could take care of themselves, but poor people were not able to do so. Speaking as a medical officer of health, he thought the poor engendered the diseases which they fostered and spread partly by reason of their indifference as to sanitary precautions. Their tanks were made out of the worst materials, and he had seen the water in them often so discoloured that it was like ditch water. The water on examination contained animalcules and vegetation. With respect to fires, he had found the water generally came too late. He believed that fires were limited more from the fact of the thickness and height of party-walls to houses than from the water pumped on to fires. The only remedy was constant supply. The Royal Commission had said that constant supply ought to be promptly introduced, but that it could not be effectually done so long as the supply of water remained in the hands of the great companies. Moreover, the public would never admit officers into their houses, to make inquiries about the supply, except the representatives of a body elected by themselves. At present an average of 30 gallons of water was distributed to every individual in London. In his own house 800 gallons per week were used, being 14 gallons per head per day. The poor, however, owing to the state of their cisterns and fittings, did not get more than 3 gallons or 4 gallons per day, so that much was habitually wasted, and in summer-time they were frequently without for days together. Constant supply was the only remedy; but it could not be entrusted to the management of private companies, whose whole and sole thought was how much profit they could make. Was it reasonable that the supplying of the greatest necessary of life should be left in the hands of private enterprise, using it for the purpose of profit? In days gone by, no doubt, it was most convenient to let private individuals supply it; but the time had come when Parliament ought to rectify the errors of former periods. To show the anomaly of the present state of things, four years ago he paid for his house in London 1*l.* 16*s.* to 2*l.*, but for his house at Forest-hill the same company charged 10*l.* a year, although the one supply was no better than the other, and the same number of persons enjoyed the supply. As to the interest, in some cases 8 per cent., in others 6 per cent., resulted, and that was an enormous interest to receive when it was considered that they had no competitors, and rarely made bad debts. With regard to the supply of water, was it not monstrous that they could not bring the water to the fires, as was done elsewhere, say in five minutes? Poor Braidwood said the rule was that water was not obtainable when wanted. Greater unity of management was necessary. The charge for supplying water in Southwark, he found, was increasing, without any change of quality or quantity. In some cases the charge had been raised from 2*l.* to 3*l.* and 4*l.*, and from 1*l.* 10*s.* to 2*l.* 10*s.*, and so on. Water was not a commodity that should any longer be an article of profit; its supply should be put in the hands of those who were the representatives of the people.

Dr. Farr, F.R.S., could not help expressing his thanks to Mr. Chadwick for his clear statement of the disadvantages of the intermittent system. There was not a single person who would defend the system. He thought they wanted a strong municipal body, such as the Metropolitan Board of Works, strengthened in the mode of electing its members, to have power to deal with the companies. All the evils had arisen from municipal disorganisation; and it was only right to say that, in that disordered state of things, the water companies had rendered London great service, for it was at the time of their establishment impossible for parishes to undertake the supply of water to London. Myddelton, when he applied to the City of London to aid him in bringing water to London, was refused assistance, partly owing to the City being very small. During the first nineteen years of the existence of the New River that company got no dividends; it was clear, therefore, that they were entitled to get 5 per cent. for their money. He thought the question of the management of both gas and water would have to be referred to one municipal organisation. Those companies together had 20,000,000*l.* of capital. Their total revenue was 4,800,000*l.*, a year, or a profit of 1,600,000*l.*, being an equivalent to a rate on the metropolitan rateable property of 1*s.* 6*d.* in the pound. Assuming the Metropolitan Board wanted to establish the means of supplying London with gas and water, he believed they could borrow the 20,000,000*l.* at 4 per cent., which would be 800,000*l.* a year; that would give the Board a profit of 800,000*l.* a year, which the twenty-two gas and water companies enjoy.

Mr. Baldwin Latham, C.E., thanked Mr. Chadwick for bringing forward such a paper; at the same time there were many matters in it which could not be held with. The paper contradicted itself on many points. He had told them that water brought from the Thames was put into reservoirs where it became de-aërated, and from there being passed into cisterns, where it got diluted and drawn into jugs, where it got re-aërated, which was a contradictory state of things. With regard to the universal condemnation of cisterns, he thought it would be very injudicious to assume that cisterns were not to be used for water supply. He believed that drinking-water ought to be taken direct from the main; but water for general use could be drawn from cisterns. With respect to extinguishing fires, constant supply was indispensable. The Continent was much better off than England in regard to the obtainment of immediate supplies of water for putting out fires. The engines in Berlin always carry barrels of water with them so as to obviate the necessity for waiting for turncocks. He did not think much stress had been laid upon the intermittent supply and the fouling of mains. He had known where the fouling of water had taken place, but had never been able to trace a single instance where he could say disease had arisen from the impurities drawn into water by mains; but it had rather been in districts where the mains had been laid down in subsoil, and where it had passed in by direct percolation. There was little tendency to draw impurities into water-mains, for, in order to do that, it was necessary to create a vacuum in the main. Engineers would always provide a sufficient number of air-valves to admit air at such a height as to make it impossible to describe that as a source of disease. Although in Croydon they had air-valves at such an altitude where no contamination could arise from the water being shut up, still they had had typhoid fever; and while that in Lambeth parish was intermittent every day in the week, yet they had had no fever at all. They in Croydon had had this species of enteric fever from 1862 till now, and the cause was traceable to ill-filtration of water; and about 1,000 ratepayers there had passed a resolution that it was undesirable to extend the waterworks on the present site, but they had not been able to move them. They had a local board determined to carry out their own peculiar crotchets rather than conform to the wishes of those who return them; and such was the state of feeling in their local bodies that it took three years before they could get any changes effected.

Lord Aberdare.—We have had a very interesting and instructive debate; it was opened by a paper which was worthy of that veteran sanitary reformer to whom this country owes a great debt of gratitude for many changes he has initiated in various directions. Now, I think, although there is considerable unanimity of opinion on some points, there is yet a formidable diversity of opinion on others. There is unanimity in the general impression that the one thing needful is a continuous supply of water; but that would not satisfy Dr. Sandwith, for he says that the continuous supply of such water as is drawn from the reservoirs cannot be otherwise than injurious to health. However, supposing the water to be good, the question then is, how is this constant supply to be secured? Mr. Richardson stated, and I believe with truth, that this cannot be done through the agency of private companies. In that I entirely agree. In 1871 it was my duty to bring in a Bill on the subject of the Metropolitan Supply of Water. The late Government has been charged with having neglected sanitary questions, and in sacrificing them to political ones. I believe that all fair-judging persons will admit that the circumstances under which they were called into political existence made it absolutely necessary that they should deal with large political questions which had been occupying the public mind for a number of years; and that where legislation is carried on by 650 members, progress cannot be very rapid, and it is absolutely impossible to carry on simultaneously great political, sanitary, and other local reforms. I found that to my cost. I proposed to give to the Metropolitan Board of Works power to buy up the water companies; but the resistance to it was so great that I found it necessary to choose between its abandonment and the offer of a portion of it for the acceptance of the House. I endeavoured to secure a continuous supply by making it incumbent upon the companies, whenever any district called for the continuous supply of water, to give it; and certain compulsory powers were vested in the Board of Trade. I am afraid that experience has shown that, although *primâ facie* it might appear that these powers were sufficient, they have in practice proved insufficient for the purpose. I believe the Metropolitan Board of Works has done its best, but that it has found its power too small, and the difficulties of the question too great, to enable it to grapple with the subject satisfactorily. I think, whether we regard the question of constant supply, or the improvement of the existing supply of water, the creation of a great official body is absolutely necessary. I must say that, although no doubt the Bill brought in by Colonel Beresford, if passed, would have been an improvement on the present state of things, yet that experience has shown that the power of obtaining and administering supplies of water is best reposed in public representative bodies. It is their duty to consult, not merely the profits of the undertaking, but the interests of their constituents, whereas public companies very naturally look to profits first and the public convenience in the second place. Now the creation of such a body is a work of great difficulty. The area of the Metropolitan Board of Works would have to be greatly enlarged, for at present it does not cover the whole of what is called "Greater London," nor those parts of London in which the greater part of the increase in the population is going on. London must some day extend itself into the outer circle, and we should have to create a large metropolitan body, and one that would possess every claim upon the public confidence. I do not mean to say one word against the Metropolitan Board of Works: I believe they have executed great works, and done their work well, but they know themselves under what system they are elected; and they must see, although they make the most of their position, that that position is far less strong than if they were elected by other means and constituted more completely representatives of the metropolis. I have listened, I must say, with something like terror to many of the statements that have been made; and one thing that has struck me as the outcome of it is, what must be the prodigious vitality of the people of the metropolis. How they have encountered all this danger, and yet contrived to exist, is a circumstance very difficult of explanation. But I do not wish to cast ridicule at all upon the statement that, although our health is not affected as much as might be expected by these impurities, still it does occasionally suffer, especially when the public health is low from other causes; and although the general death rate in the metropolis is not high as compared with large towns of other countries, still it is higher than it ought to be. We know there are death-rates in parts of London which are exceptionally high, which, I have no doubt, among other causes, would be found to arise from foul and polluted water. We arrive, therefore, at these conclusions, that we should like to see a better and purer supply than we have, and that a constant supply; and that this can only be done by vesting the water in one great public body. The necessity for that we all feel, and everything points to the advantage of immediate action. A few years ago the companies might have been bought for about 6,000,000*l.*: so says Mr. Chadwick; if my memory serves me right, he is perfectly accurate in that statement; and now the cost would probably be 12,000,000*l.* sterling, and if we wait much longer the sum will be further increased; and, therefore, in the interests of economy and public health, immediate action ought to be taken. The present Government has not, as the late one had, a legacy of political difficulties to be settled. They had no Irish Church, no Irish Land, no Public Education, no great political measure to carry through Parliament against enormous obstacles. All is clear to them, and they have only got a selection of measures to make. They came in specially with the cry of

Sanitas sanitatum, and here is a sanitary measure affecting 4,000,000 of not the least important part of the population. I trust we shall make some contribution to the ripening of this question by the proceedings of this evening. We may hope that Mr. Chadwick's paper will receive the attention it deserves from the public press; that our discussions will give some impulse to a movement long ago begun; and that, if the Government is, as I believe it to be, really in earnest in promoting sanitary improvements, among the earliest they will undertake will be the measures necessary for giving a constant supply of pure water to the inhabitants of this vast city.

SCOTTISH BUILDING STONES.

EDINBURGH ARCHITECTURAL ASSOCIATION.

At a popular meeting of the Edinburgh Architectural Association, held in the hall of the Royal Scottish Society of Arts, Mr. R. Anderson, architect, in the chair,

Mr. James Geikie, F.R.S., delivered an address on "The Geology of Scottish Building Stones." After remarking that all building stones belonged to one of two classes,—that they were either crystalline or non-crystalline,—Mr. Geikie proceeded to give a sketch of the geological formations as they had developed themselves in Scotland. The oldest of these formations was the Lawrentian, chiefly developed in the north-western Highlands and the Outer Hebrides. The name was derived from the Gulf of St. Lawrence, where rocks of the same age were to be found to a large extent. In the Scottish Lawrentia no fossils were found, but in Canada they recognised the presence of the oldest of all animals which had lived in the world. The only rock of any utility belonging to that period was rarely got in large blocks, and it would never pay to work it for other than local purposes. The next formation was the Cambrian, developed generally in the north-western Highlands. The rocks consisted of dark, dull, red sandstones, grits, and conglomerates, which for building purposes were almost valueless. They contained no fossils, but from the coarseness of their deposits they could not have been formed in deep water. After the Cambrian they came to the Silurian formation, which was widely distributed over Scotland, except in the central valley. In the northern Highlands almost all the rocks were crystalline, and in the southern uplands, as a rule, the granular character of the rocks was very prevalent. The Silurian strata yielded a number of fossils, amongst the higher of which were molluscs and crustaceans. Scotland then appeared to have been under the level of the sea, forming, probably, here and there a few mud banks. While the climate was comparatively mild, we had distinct evidence of icebergs floating occasionally across our seas. Among the building stones developed in this period were the granites and slates. The next formation was the Old Red Sandstone, which occurred in the north and centre of Scotland, and also in Ayrshire. There were two types of that formation, that which bordered the Moray Firth being different from what was found south of the Grampians. Fossils, chiefly fish, were found in some of these, and others were barren. These fishes were now almost extinct, or represented only by a few species which occurred in the Nile and in the lakes of North America. The conclusion was come to that in these times Scotland formed part and parcel of a large tract of country stretching across the German Ocean into Europe, and in hollows there appeared to have been extensive lakes crowded with fish, though these were not favourable to shell life. Next came the Carboniferous formation, perhaps the most important in Scotland, occurring generally in the central lowlands, in the region of the Tweed, and the Solway Firth. In this formation occurred the coal measures, beneath which were the millstone grit, the limestone, and the calciferous sandstone series, from which the best of our Scottish building stones are obtained. The last formation of any importance in Scotland was the Permian, which was confined almost to Ayrshire, although patches were found in Dumfriesshire (Sanquhar) and other places, the rocks being chiefly igneous and red sandstone, and the fossils showing a very genial climate. Then followed the secondary and tertiary strata, but these were of very little importance. In concluding, Mr. Geikie stated that in a humid and smoky atmosphere it was necessary in selecting building stones to pay attention to the chemical composition, structure and destiny of the rock. Many buildings now-a-days were put up as if they were not intended to be lasting, and therefore it did not matter much what they were built of. All good building, especially Carboniferous, stones contained more or less of carbonate of lime. The new Houses of Parliament were built of stones containing carbonate of lime and magnesia, which stood well in a district where there was not much smoke, but being erected in London, every one knew what had happened to them. He alluded to the discolouration that had taken place through the presence of iron in the stone with which the church of Forrest-road was built; and mentioned that another instance of what might happen through stones being badly selected had occurred at Floors Castle. That building had been erected of sandstone so very badly selected that in some places it had scaled off into great holes and was quite corroded; and the Duke of Roxburghe had been at great expense in having all these stones taken out and new stones put in. One ought to avoid as much as possible micaceous sandstones, seeing how they split and scaled off through the effects of the weather; and selections of sandstones should not be made from hand specimens, but by going to the quarry.

Dr. Hunter, in moving a vote of thanks to the lecturer, referred to Edinburgh as being in the centre of, perhaps, the finest building material in the world.

Mr. Anderson seconded the motion. Alluding to Mr. Geikie's remarks on the subject of mica in stone, he stated that it enabled one to detect the bed of the stone. If they found the flakes of mica lying flat and parallel to the stone, the stone was lying the right way; if they were in any other position, the stone was lying the wrong way.

Mr. Geikie, in acknowledging the compliment paid to him, said that Mr. Anderson was quite correct,—that the position of the mica was an unfailing test of the bed of the rock; but what he deprecated,—in which Mr. Anderson would concur with him,—was its presence in great abundance.

THE CHAPEL OF ST. ETHELREDA, ELY-PLACE, HOLBORN.

A paper was read on Monday, the 20th ult., at the ancient Chapel of St. Ethelreda, Ely-place, on the history and antiquities of the chapel and its vicinity, by Father Lockhart, the author of the paper, Mr. Wood, being prevented by indisposition from reading it himself. Cardinal Manning was present, together with Sir Gilbert Scott, and a considerable number of antiquaries and others interested in the subject. The paper, which occupied nearly an hour and a half in its delivery, dealt not only with the antiquarian, but also the religious associations of the place, and was listened to attentively throughout. The chapel, now almost the only vestige remaining of the palace of the bishops of Ely, was lately used as a proprietary chapel by the Welsh Episcopalians, but their lease expiring a short time since, it was purchased by the Lazarist Fathers, who are about to restore it as a Roman Catholic place of worship. Although it has suffered considerably by modern alterations, the building retains many of its pristine features, the east window being a very perfect and exceptional example of fourteenth-century work; the west window also retains the tracery of its upper part, and the timbers of the roof have been discovered to be intact, although now hidden by a plaster ceiling of a segmental form. Sufficient of the tracery of two of the side windows also remains to enable a perfect restoration of the remainder to be made. Sir Gilbert Scott, in one of his Royal Academy lectures, drew attention to the resemblance of the chapel in its general proportions to the Saint Chapelle at Paris, and the Chapel of St. Stephen at Westminster. There is a basement story or crypt under the chapel, until lately used as a beer cellar, with massive posts of oak supporting the floor above. These posts, which are of fine design, had become decayed, and are being replaced by stone piers.

It would appear that at one time it was proposed by the City authorities to transfer the Fleet Prison from Farringdon-street to the site of Ely House, as a petition was presented to Parliament about 1767, by the Earl of Winchilsea and Nottingham, praying that the proposed removal might not be carried out, alleging the depreciation that would ensue if his estate became "a habitation for debtors, insolvents, and men of the worst principles and characters."

The petition further sets forth that, "contiguous to the palace is the uniform, spacious, straight, and pleasant street called Hatton Garden, which is upwards of a quarter of a mile in length, and also Kirby-street, Cross-street, and several other streets, all which were formerly part of the estate of Sir Christopher Hatton, Lord Chancellor of England in the reign of Queen Elizabeth, and from him, through a variety of descents and otherwise, are become vested in the Earl of Winchilsea and Nottingham, subject to a fee-farm rent of 100*l.* per annum, payable to the Bishop of Ely and his successors."

The houses in the street are described as "chiefly inhabited by merchants retired from business, gentlemen of estates and fortunes, and in general by persons of the most respectable characters."

The architect to the building is Mr. John Young, jun., of King-street, Cheapside, who, in conjunction with Mr. Whelan, will carry out the work so soon as the necessary funds are forthcoming.

THE EARL OF DURHAM'S NEW MANSION, NEAR WOOLER.

The Earl of Durham has, within the last few years, acquired by purchase at different times the estates of the Fentons, Nesbitt, Humbleton, and Lanton, in North Northumberland, which, unitedly, now form a compact, extensive, and beautifully-situated property; but, as there was no mansion-house on any of them when he came into possession, his lordship resolved to erect one. The site selected is on the Fenton estate, about four miles and a half from Wooler. The work of building was commenced in 1871, and is now nearly completed. The mansion-house, consisting of three stories, is in the Gothic style, and the principal façade, with a frontage of 200 ft., is formed of polished freestone, with granite columns, and carved embellishments in stone. The main front faces the north-east, in which is the principal entrance. In the south-west corner a tower 140 ft. high has been erected. The architect is Mr. Ferrar, London. The sole contractors for every department of the work are Messrs. Jackson & Shaw, London, and the carrying out of the operations was under the superintendence of Mr. M'Donald, master of the works. To celebrate the completion, the Earl of Durham recently entertained the whole of the workmen, nearly eighty in number, to a substantial dinner in the Tankerville Arms inn, Wooler.

THE FREE BRIDGES QUESTION.

As the subject of freeing the metropolitan bridges is again about to be discussed in Parliament on the consideration of the Bill which has been introduced, and now stands for second reading, some facts which have been set forth in a document just issued by Mr. F. H. Fowler, the chairman of the Metropolitan Free Bridges Association, become interesting. The writer endeavours to show that the evidence taken by the several committees in respect of toll-bridges, in 1835, 1854, 1855, 1859, and again in 1865, proves that the tolls bear with grinding severity on the very poorest classes of the community. He observes that to the poor labourer who has to cross a toll-bridge to his work, a half-penny toll means sixpence per week, or, if he comes home to dinner, one shilling per week. With the view of pointing out how prejudicially the toll-bridges affect the working classes, he remarks that throughout the whole line of the metropolis the centres of industrial activity, where labourers obtain employment, are on one side of the river, and the neighbourhood where they can obtain the cheapest and healthiest dwellings is on the other. He insists upon the fact that over-crowded and unhealthy neighbourhoods are another prominent evil to which toll-bridges contribute, and that whilst St. Giles's and the district lying just west of Lincoln's-inn and the new Law Courts is well known to be one of the most densely crowded districts of the metropolis, labourers' dwellings on the other side of Waterloo Bridge are cheaper and superior in a sanitary point of view, but that the inhabitants of St. Giles's are precisely the class who cannot afford to pay a daily toll for going to work. He likewise urges that another evil caused by the existence of tolls is serious injury to the value of property, inasmuch as premises in the neighbourhood of toll-bridges, whether used for residential or business purposes, are reduced in value by means of the annual tolls which have to be paid

by the occupier. In order to show that where toll-bridges and free bridges exist near one another, the effect is that the toll-bridge is not nearly of so much use to the community as it would be if free, he gives a comparative statement as to pedestrians and vehicles passing over Blackfriars, Waterloo, and Westminster bridges respectively, between the hours of nine a.m. and six p.m. on the same day. This return showed that there passed over Blackfriars (free) 30,089 pedestrians, and 4,359 vehicles; Waterloo (toll), 6,234 pedestrians, and 1,709 vehicles; and Westminster (free), 26,170 pedestrians, and 5,840 vehicles.

Adverting to the question of the manner in which the funds necessary for freeing the bridges shall be raised, he alludes to the Government having in 1873, and also in 1875, declined to sanction an extension of the coal and wine duties for ten years for that purpose, and points out that it will now be for Parliament to say, in the event of its being inclined to abolish these tolls, over what area a tax for the purpose should be assessed. Three proposals, he says, are before the Legislature, in the Bill to be discussed, one of which is the counties of Middlesex and Surrey (including the City of London), with a rateable value of property amounting to 23,795,609*l.*; the rateable value of property in the Metropolitan Police district, including the city of London, 25,314,354*l.*; and the rateable value of property in the district of the Metropolitan Board of Works, 21,292,553*l.* He states that a rate a little exceeding a halfpenny in the pound upon any of these districts would suffice for the purpose, and if 200,000*l.* were granted from some other source a halfpenny rate would be ample. He adds that a rate of five-eighths of a penny in the pound would raise a sufficient sum to pay the interest and provide an annual sinking-fund of about 12,000*l.*; and, assuming that there was no increase in the rateable assessment of the district, this sum would pay off the entire cost in about fifty years.

THE LAMBETH VESTRY AND BATHS AND WASHHOUSES.

THE Lambeth Vestry and ratepayers would seem to be desirous of securing for themselves a bad eminence as the obstinate and unreasoning opponents of two measures recognised by the legislature in the form of permissive Acts of Parliament now in force, the one for the promotion of free libraries in order to meet the evils of ignorance, and the other to promote cleanliness and the sanitary improvement of the community. It is only a few months since that a meeting of the ratepayers, held at the Horns Assembly-rooms, Kennington, which was chiefly distinguished for the disgraceful manner in which it refused to hear arguments, except on one side, declined to adopt the Free Libraries Act, and last week a meeting of the Vestry, of a somewhat similar character, and with like results, was held at the Vestry-hall on the subject of adopting the Baths and Washhouses Act.

After various speeches the meeting became very disorderly, and would not listen to any further arguments in favour of their establishment. Ultimately a personal dispute between Mr. Storr and Mr. Parker Rhodes resulted in the opponents of the baths succeeding in adjourning the consideration of the subject *sine die*, Mr. Percy Wells observing that the opponents had been successful in their desire to "burke" it.

THE COLLECTION OF DUST BY THE CAMBERWELL VESTRY.—ERECTION OF NEW PREMISES.

THE Camberwell Vestry have resolved to take into their own hands the collection of dust within the parish, instead of having it done by contract, having found that in the neighbouring parish of Newington the local authorities have succeeded in making the collection profitable since their new depôt at Walworth, adjoining the Chatham and Dover Railway, has been in operation. With the view above stated, the Camberwell authorities have arranged for the purchase of plant and the erection of premises to carry out the work. At the meeting of the Board last week, the sewers and sanitary committee reported that they had accepted the tender of Mr. Henry Vickery, of Old Kent-road, coach-builder, to construct twelve dust-carts, at a cost of 26*l.* each, similar to those belonging to the Vestry of Newington. After some objection, on the ground that the construction of the carts had not been submitted to open tender, the act of the committee was confirmed. The committee also recommended that stabling, sheds, and other buildings for twelve horses and dust-carts be erected at the Vestry's wharf, in Park-road, which is held by the Vestry upon lease for an unexpired term of eighteen years, at a rent of 65*l.* per annum. Considerable objection was raised to this proposal, on the ground that it would be better to build on a freehold site than on ground of which there was only a short lease, but it was urged, on the other hand, that the Vestry were paying 65*l.* per annum for what was at present almost useless to them, whereas it could be profitably utilised by the proposed buildings being erected upon it, whilst Mr. Middlemass, the chairman of the committee, observed that it was really a question of time, as there was at the most only six weeks before the duties would have to be commenced. He added that the committee had been everywhere after stables, but as soon as it was known that the Vestry wanted them the price went up far beyond their value, and the same was the case in reference to the proposal to build on freehold sites. The recommendation was adopted, and the erection of the new buildings will be at once commenced.

"LOST IN LONDON."

UNDER the above heading a correspondent who signs himself "J. E. S.," writes thus to the *Daily News* of a few days back:—

"I cannot find my way about London without asking at almost every turn, and I believe there are thousands of others, like myself, ignorant of the geography of that great city, only visiting it three or four times a year, who would be equally grateful if something could be done to give them a clue to their whereabouts without the aid of a cab, policeman, or good-natured shopkeeper. There are many streets with no names visible at all, and even in the principal thoroughfares one may walk half a mile and not be able to find the name on either side of the street. This state of things is bad enough by day, but it is much worse by night, when, even if the names were up, one could not see them. What I wish to propose, or rather suggest, is this, that the names of the streets be put on the lamp glasses as you now see at many of the railway stations; the cost would be trifling, and the boon immense."

The inconvenience complained of has been constantly the subject of comment in our columns, and is such a serious one that we are disposed to give full value to any representation in reference to it. Scarcely any town in England is so wretchedly ill provided with guides to the passenger as London, which of all others ought to be the best provided in this respect, not only as the place where more strangers come than to any other city, but because it is so extensive in itself that those who have lived years in one part of it are liable to find themselves "at sea" if unexpectedly called into a region they have not become acquainted with. There is no excuse whatever for the state of uncertainty and irregularity in which the numbering of houses and the naming of streets is left, as the revision of the system of numbering, and the adequate and complete naming of all the streets, is only a matter of little trouble and a very moderate expenditure. The numbering may be the most difficult part of the job, perhaps, but is the least important, as when a man has found the right street he can generally after a short search find the number he wants, if he bears in mind that the numbering will probably not be consecutive, and that the particular number he happens to want will generally be round the corner and not in the street it professes to belong to at all. But the mere putting up of names at the street-corners is a matter for the neglect of which there is not a shadow of excuse. The suggestion as to painting the names on the street-lamps, originally made in our columns, has been carried out in Piccadilly and a few other places, and should be generally adopted.

NEW LAMBETH INFIRMARY: LAYING THE MEMORIAL STONE.

ALTHOUGH the new infirmary for Lambeth, which is in course of erection adjacent to the new workhouse, at a cost of 50,000*l.*, is already considerably advanced, the memorial stone was not laid until last week, when the ceremony was performed on Wednesday afternoon by Mr. Ward, the chairman of the Lambeth Board of Guardians, in the presence of the churchwardens and nearly all the members of the vestry, the trowel being presented to the chairman by Mr. Robert Taylor, who was the first to bring the subject before the guardians and urge the necessity for the erection of the new building. The inscription on the stone contains the names of the guardians, together with those of Messrs. Fowler & Hill, the architects, and Mr. James Taylor, the builder.

Mr. Ward, in addressing the company after laying the stone, observed that many persons had been opposed to the erection of a new infirmary, and so had he been himself at one time, but that opinion had undergone a change, both as regarded himself and others, and after due consideration they had come to the conclusion that such a building was necessary. He believed the new building would be the means of adequately relieving the condition of the poor. The infirmary will accommodate 278 males and 357 females.

THREATENED DESTRUCTION OF ST. WERBURGH'S CHURCH, BRISTOL.

THE following petition is being numerously signed by the inhabitants of Bristol and its neighbourhood:—

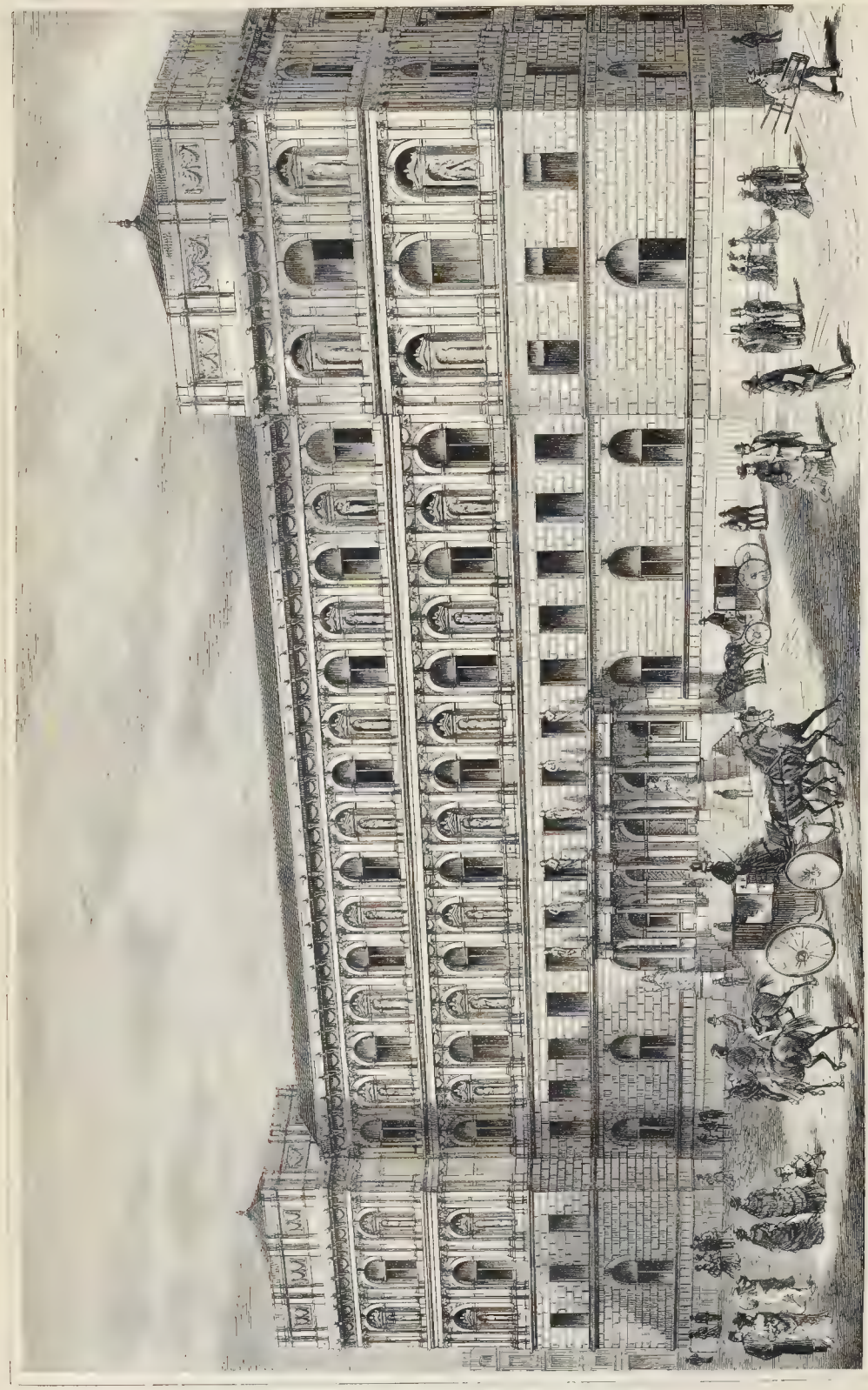
"Showeth that your Petitioners have heard with grief that a Bill is being promoted in your Right Honourable House of Parliament for the desecration and destruction of the ancient Church of Saint Werburgh in the central part of the City of Bristol. And whereas the said Church with its handsome Tower is a great ornament to the said City, and indicates to all who resort to or pass through the same, that it has been for many ages past one of the most important commercial cities of this Kingdom, as it still is, and as your Petitioners devoutly wish and pray that it may continue to be for many more ages yet to come. We your Petitioners earnestly entreat your Right Honourable House to reject the aforesaid Bill, so that if any street improvements should be necessary they may be made by the setting back of retail shops and houses, and that the Church may remain a monument to future citizens that their ancestors have for many generations practised those social observances that belong to a civilised and Christian people, and a means whereby they and their successors may also long continue to do the same."

It is to be hoped that Parliament will listen.

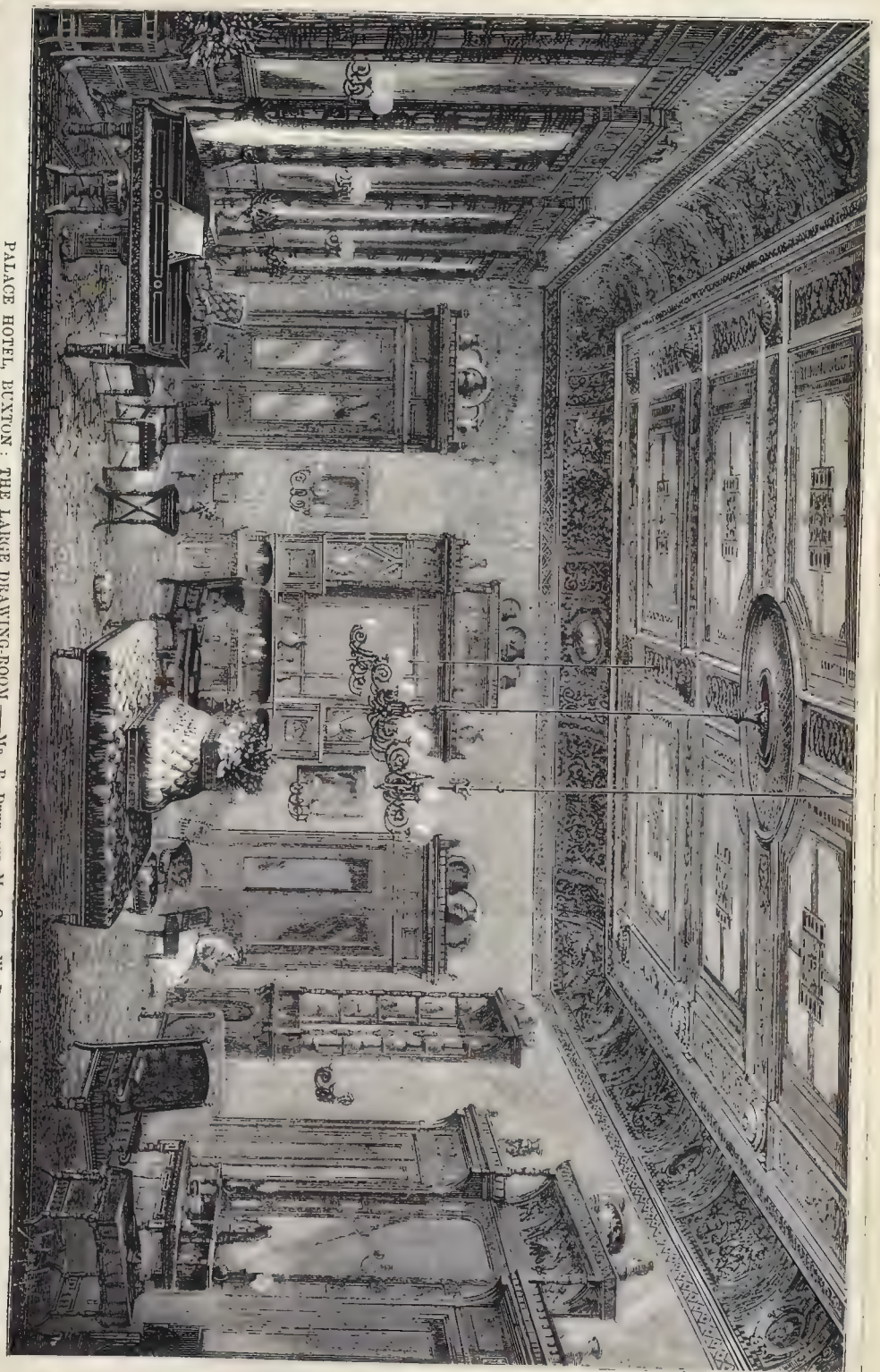
THE NEW ACADEMY OF THE PLASTIC ARTS, VIENNA.

ON a most frequented part of the Ring,—that circle of the finest erections adorning modern Vienna,—in the Opernring, between the Imperial Opera and the Kaiserburg, the Albrechtsgasse opens to the eye a vista, permitting it to rest on a colossal building in the background, occupying one side of a square. This is the new Academy of the Plastic Arts of Vienna, set off by grounds in front, the centre of which will be occupied by a statue of Schiller, the pedestal for which has already been placed.

The architect of the academy is Herr Hansen, whose co-operation and ability have been repeatedly called into requisition for the rebuilding of Vienna. The most striking feature in his design is the portal of columns of the principal front, to which a number of steps lead up in two sections. The carriages of the stairs form two imposing socles, to be decorated with sculpture. The six columns support an entablature, which is at the same time a balcony, and which is adorned by six statues standing free. Thus an imposing portico is created, from which we may enter through one of the three gates with semicircular arches of the vestibule. At the ends of the two flanks, projections jut forth, interrupting the uniformity of the front, however, only by wider windows and arches and double columns. These projections rise turret-like above the roof, and have closed facing-walls, adorned with plastic decorations. The style of the whole building is a kind of Italian Renaissance. A massive ground-story of freestone, with only scanty, broad, round-headed windows; has over it an entresol, also of freestone, but provided with numerous square-headed windows. Above this base rises a two-storied series of semicircular arches, imposing by their great number, and decorated with pilasters, festoons, wreaths, and so on. Not each round-headed arch contains a window, niches alternating with windows. In these niches, which contain another smaller arch with pedimental head, small statues, casts of classic models, will be placed. The building contains large courts, admitting the necessary light, and offers in its well-lighted rooms every requirement for students and teachers. There are arcades in the courts for facilitating intercommunication. Side-light alternates with sky-light, according to requirement, thus assisting very much in displaying the merits of the Lamberg Gallery, left by its noble donor to the Institute, and to be transferred to this new abode. Ample provision is farther made for the library and collection of engravings and drawings of the Academy, which have recently been very much enriched, and which hitherto were stored away in unsuitable localities.



THE NEW ACADEMY OF THE PLASTIC ARTS, VIENNA.—Herr Hansen, Architect.



PALACE HOTEL, BUXTON: THE LARGE DRAWING-ROOM.—Mr. E. Duke and Mr. Owen W. Davis, Architects.

THE PALACE HOTEL, BUXTON.

LARGE DRAWING-ROOM.

This room has been decorated and furnished on a scale seldom adopted in similar establishments. The arrangements of the carpet and furniture are such that the room can be speedily converted into a ball-room, the flooring having been specially prepared for that purpose. The room is 70 ft. by 40 ft., and is lighted by six large windows, the entrance being obtained from the corridor on the west, with an exit to the croquet lawn. The furniture is in the style of the last century, and one is struck on entering with the rich, yet subdued effect which is obtained by the low-toned covering of the furniture, draperies, and decorations, relieved from monotony by the masses being broken up with hand-painted panels of birds and flowers on gold ground. The ceiling is divided into panels of cool buff and pale blue, the ornament being of the same period as the furniture, some of the members being picked out in colour and gold. The large cove over the cornice, extending round the room, is divided into panels, with the signs of the zodiac, and flowers, fruits, and birds, typical of the months, painted by hand.

The walls are covered with an all-over pattern in different shades of neutral green; the furniture is ebonised, with mouldings picked out in gold, carved frieze, bevelled edged mirrors, and panels of figures, peacocks and other birds, and flowers, painted on gold ground. The principal pieces of furniture are a large cabinet, console-table, jardinière, chimney-glasses, and centre ottoman. The architectural woodwork has been carried out in the same spirit, the panels of the doors being filled with stained glass of appropriate design. The carpet is of Wilton manufacture. The room at night is lighted with gas, having a ten-light chandelier of polished brass, with a five-light chandelier on either side, and lights fixed to the mirrors in various parts of the room. The work was carried out by Messrs. Kendal, Milne, & Co., of Manchester, under the direction of Mr. R. Dake, of Buxton, and Mr. Owen W. Davis, of London, architects.

THE METROPOLITAN BUILDING ACT.*

ARCHITECTURAL ASSOCIATION.

The next set of regulations refer to the progress of actual flames. With certain exceptions, such as bressumers, no timber is to be fixed nearer than half a brick to the face of the wall. This is the origin of the half brick reveal which is now universal, and which we do not see in the houses of Queen Anne's reign, and the object of which is to do something towards keeping windows and doors a little out of harm's way when there is a fire next door. For the same purpose is the very salutary rule that every party wall must go up of the full thickness which it has at the top story through the roof to a height of at least 15 in. above the adjoining roof, and if there is any projection like a lantern or dormer fixed on the roof within 4 ft., the party wall is to rise 15 in. above the highest part of it, and 1 ft. wider each way. Fifteen inches may seem a small parapet, and so it is, but I have watched the progress of fires in London, and have noticed that this low barrier is often sufficient to save the roof of the next-door house from catching, and always serves to delay its catching for a long time.

All roofs and projections upon them are to be covered with incombustible materials. All cornices and other projections, except in buildings placed far from neighbouring buildings, are to be of incombustible materials; and where a gutter at an external wall is made of wood, there must be a parapet in front of it.

Lastly: When fire gets a strong hold, where does it do most mischief? In places where many people assemble, and their escape is endangered, the mischief is incalculable; and in places where a vast body of fire is allowed to accumulate it forms a furnace so fierce, that not only is it incapable of being put out, but it cannot even be kept under control. This, again, is the subject of definite regulations intended to hinder the spread of it when great danger is expected. There is a very stringent rule, indeed (Sect. 27) that no single building is to be erected for trade or manufacture containing more than 216,000 cubic feet, and no two buildings which together would amount to such a bulk may be thrown together, except by an opening of certain specified moderate dimensions, and fitted with two iron doors. This is an endeavour to limit the bulk of fire to be dealt with in the case of warehouses.

There is also a regulation that the staircases and corridors of all public buildings must be of stone or other fire-proof material, and that the same must be the case in every building above a certain size, and let out in separate tenements. Opinion has altered as to the practical value of stone, for staircases and landings which it is desired to render fire-resisting, during the twenty years which have elapsed since this Act became law, and whenever it is amended, this rule will, in all probability, be varied, and other rules bearing upon the question of fireproof construction will be introduced; but at present the rule is very definite, and permits stone to be considered and employed as a fireproof material.

We now reach the third division of our subject,—rights of adjoining occupiers,—and in respect of these we have in the Building Act a distinct part (the third), in addition to some isolated regulations which occur in other parts of the Act.

At the threshold of this subject, it will be necessary to give some description of that famous architectural bone of contention, a "party-wall," a portion of a building to which I have already had to make reference on several occasions, but which I have not yet attempted to define or explain.

The natural idea of a party-wall is that it is one which stands partly on the property of one owner and partly upon that of another, and such a situation is necessary to make a wall into a party-wall for some purposes. But the Building Act does not recognise the question of whose land the wall stands upon, and gives the following definition (in the interpretation clause, section 3):—"Party-wall shall apply to every wall used or built in order to be used as a separation of any building from any other building with a view to the same being occupied by different persons." It is, therefore, only when a wall is actually used as a separation between two buildings, or obviously intended for that use, that it is a party-wall under the Act, and it appears that it would still be so if wholly on one owner's land, and yet serving to separate two structures. Recent decisions have made it appear that when a house in a row is higher than its neighbours, the side walls which separate it from those right and left of it will be considered party-walls as high as they separate different buildings, but their upper portions, which inclose the sides of the higher house, may be considered external walls.

Now, ninety-nine out of every hundred buildings in London are separated from neighbours by party-walls. It becomes, therefore, of some moment to know what may and what may not be done to these walls, because it is obvious that, on the one hand, if I desire to build, and have no power to interfere with the party-walls, I am extremely limited as to the work I can do; while, if I and my adjoining neighbour are free to do just as we like, I can inflict the greatest hardships at pleasure on my neighbours right and left, or they on me.

The law with regard to this is in effect a clever compromise, and one which in practice works fairly well. It is briefly this,—If I want to rebuild or build, I am at liberty to repair the party-walls,—even to rebuild them if they need it; to substitute brick for wood, if a wooden framework does duty as a party-wall; to raise the party-walls, to strengthen them, to thicken them, to build against them, and, in short, to do anything with them which I can reasonably desire to do. But my neighbours have a right to three months' formal notice of my intention to do this. Consequently those who are wise, as soon as there is a talk of building in London, give notices right and left, even before plans are made out, and give them to every person who can possibly be interfered with; but the wise are few, and even in their case three months is long to wait; and it constantly happens that leave to go on before the expiry of the three months is purchased by some money payment.

Elaborate rules are included in the Act as to the expense of dealing with a party wall; they may be shortly summed up thus: If the work to be done to the wall is occasioned by its being decayed or unsuitable, its cost is to be divided between the owners on each side. If, however, it has to be done to suit the convenience of the man who is erecting the new building, then the cost is to be borne by him. There are careful provisions for ascertaining and dividing this cost, and on the whole this section of the Act is perhaps the most thoroughly distinct and complete of any.

These provisions extend beyond party walls to arches and fire-proof floors, which may be employed to form a horizontal separation, between two tenements that are under one roof, the whole of them being included under the name of party structures.

Among the general rules of construction there are several which affect party-walls, but of these the greater part have come under our notice.

The Act contemplates the possibility of a party-wall ceasing to be so if the buildings on both sides of it are in the same occupation, and this may be done at pleasure, except the two buildings would have a cubic contents of more than 216,000 cubic feet. When this is the case strict rules as to a limited opening, and two wrought-iron doors, come into play.

Our fourth and fifth heads may be very briefly disposed of.

The fourth, you may recollect, was the question of health. There are very few provisions that relate to health in the Building Act. There are, however, some in the Local Management Act, and the Act now under consideration especially directs that cellars and underground rooms must be built as that Act directs. That is to say, 7 ft. high, with a fire-place and a window, with ceiling 1 ft. above the pavement, with an area 3 ft. wide, to extend the whole length of the room, and having its floor 6 in. below the room floor. These provisions, allow me to observe, ought to be insisted upon in the case of suburban houses.

The Building Act further requires all habitable rooms to be at least 7 ft. high. If they are attics, they are to be 7 ft. high over at least half their area. It also requires that to every building where all the rooms cannot be ventilated and lighted from the street there shall be an open space of at least 100 ft. super., but it omits to require that this shall be used for the purpose of ventilation.

These, I think, are all the scanty provisions with regard to health. Under other Acts there are provisions with regard to drainage and water supply, but I am not aware of any applicable to the soil on which houses are built, and which is often both damp and noisome.

The legislation which regulates enjoyment of the street frontage is our fifth head. What is actually incorporated in the Building Act is contained in Part I. (Sec. 26), and briefly provides that shop-fronts in narrow streets may project 5 in., and wide ones 10 in., and that except these fronts and the architectural decorations of the building, nothing may project beyond the general line of front in any street, except with the consent of the Board of Works. The general line of buildings is not always easy to determine, and leads to many differences and to many references to the Board of Works; but the general effect of the enactment is, that in a street you cannot bring out the front of your house at all beyond your neighbour's, or throw out a portico, or a bay-window, or any such projection, without leave first obtained. The Metropolis Management Act and the City Sewers Act extend these stipulations, and give the authorities power to demolish a building which transgresses the proper line. There is a relaxation of the rule if the projection be more than 30 ft. from a street.

We have now gone through the most important of the provisions of the Act. It is, I think, advisable that we should next notice exceptions and exemptions. There are a certain number of buildings exempt by Act of Parliament, such as for example Royal and Government buildings and railway buildings. There are also certain buildings exempt by their nature. These are insulated buildings under a certain size and at a certain prescribed distance from roads and adjoining owners. Conservatories are also exempt.

Repairs that do not affect the structure are also exempt, but with these exceptions, all new buildings and alterations are subject to the Act, and when an alteration is so extensive as to amount to more than half a rebuilding, the whole building is required to be taken down if not in conformity to the Act. There is one very remarkable exception, however, which must not be passed over lightly, as it introduces a very important element into the practice of district surveyors and into their relations with their brother architects. I allude to the rule (Sec. 30, the last of the rules of construction) which says that every public building shall be constructed in such manner as may be approved by the district surveyor, or, in the event of disagreement,

* By Mr. T. Roger Smith. See p. 279, *ante*.

as may be determined by the Metropolitan Board. This is extremely wide, it fixes a great responsibility upon the district surveyor, and it of course leaves room for diversity of practice. The members of the District Surveyors' Association have come to an agreement among themselves as to certain main rules, but these of course still leave a considerable amount of individual responsibility. These rules amount to this, that buildings with ordinary floors, tie-beam roofs, and no doubtful construction, should be as strong as warehouses, or in fact a little more so, and that in the case of special and unusual constructions the district surveyor should consult with the standing committee on the subject.

As a consequence of the discretion with regard to public buildings given to the district surveyor, he ought to see the complete drawings before any public building is begun, and ought to be supplied with a set of tracings. As a matter of fact, this is customary; but it is not provided for by any express stipulation or regulation in the Act. I recommend you, however, in your own practice, to adhere to it, as otherwise that officer is almost bound, for his own protection, to object to matters with regard to which, having the explanation before him, he would probably not need to raise a question.

There is another large series of exceptional cases, being those to which the rules of the Act do not apply, or those features which may be, in some cases, exempt from the Act, and for these it is provided that the sanction of the Metropolitan Board must be obtained. Such cases are constantly occurring. Concrete buildings and iron buildings are familiar examples of irregularities in the main structures; and roofs with barge-boards, wooden porticoes, and open sheds, are such examples of irregularities in features. These and projections beyond the general line of frontage have to be applied for by letter, accompanied by a cloth tracing, showing the work or building for which a sanction is requested, and stating the circumstances which make it reasonable to grant consent. It is not invariably the case that applicants are reasonable, and not quite a matter of course that the Board will take the view which they are asked to take; but I cannot say that many serious difficulties arising out of these regulations have come to my knowledge.

I have to say something about the working of the Act, which is, as you all know, carried out by the district surveyors of the various districts of the metropolis. Most of them are practising architects. They are now appointed by the Metropolitan Board of Works, and no person is admitted to be even a candidate for the appointment who has not first passed an examination which is held by the Institute of Architects, and has not received a certificate of competency from that body. Each surveyor superintends a district, which may be a parish, or two or three parishes, or part of a parish, as it may happen, within the limits of which it is his duty to see that the Building Act is enforced, and he has to keep an office within his district.

The builder engaged to do any building work situated within a metropolitan district, and which comes under the Act, is bound, except it be an emergency, to give two days' previous notice in writing to the district surveyor, and though, in case of emergency, he may begin at once, he is bound to give immediate notice, and he is liable to a fine for commencing to build without notice. The Act does not make it incumbent on the architect to give this notice, nor indeed, recognise an architect in any shape or way. This, by the bye, we may, I think, accept as a compliment to our profession, as it is implied that it is on those buildings where no architect is concerned that the district surveyor is most needed.

The district surveyor inspects the work during its progress. If any irregularity or infringement of the Act presents itself, he gives notice that it is to be rectified, and if the notice is not attended to he can summon the builder before a magistrate, who, if on hearing the case he is satisfied that the order is a proper one, enforces its observance.

When the building is completed, the district surveyor is paid by the builder his fee, which is regulated by the size of the building, and can be enforced by law if not paid. Lastly, every month the surveyor reports to the Metropolitan Board the buildings completed within his district during the month, and the superintending architect, who is the executive officer of the Board in all that relates to London buildings, examines and tabulates these returns.

In drawing these remarks to a close, I wish distinctly to warn you that I have not attempted to give an exhaustive or even a minutely exact account of the provisions of the Act. I have only proposed to give you a general idea of the nature of its principal provisions, and above all of the reasons for them; and if I have succeeded in enabling you to understand the why and the wherefore of the regulations which it contains, I shall have fully accomplished all that I proposed to myself, and you will not have given your attendance here in vain. For the details, you must search the Act for yourselves.

I may, however, perhaps, add a word or two respecting the office of district surveyor, as I have no doubt many of my hearers are more or less ambitious of holding the appointment.

The preliminary examination, as far as I am at liberty to give you an account of it, is partly by written questions, and partly *viva voce*. It requires the candidate to have a good general acquaintance with both the theory and practice of construction, and a familiarity with the actual application of the Building Act to practice, before he can hope to pass. Of course, in an examination which does not occupy many hours, the questions cannot go over a very large range of subjects, and they may happen to dwell upon some topic which is a candidate's strong point, or to hit him in a weak point; but, generally speaking, and especially since the paper-work is supplemented by *viva voce* questions, the examination is certain to disclose any decided want of preparation or of experience on the part of candidates. My advice would be that, before offering himself for this examination, the young architect, even when well up in theory, should see some practice, and incur some responsibility, and become to some extent acquainted with the working of the Building Act when applied to London buildings.

The same sort of advice is, in my opinion, needed as to subsequent procedure. Gentlemen often make themselves candidates for the appointment of district surveyor when they are young and unknown, and spend their five, or six, or eight, or even ten years, slowly making their way to the front with an amount of labour which is very disheartening. I am quite aware that there is no obtaining a district without repeated applications; but I am, at the same time, quite sure that the candidate who does not start until he has made some friends and got some position, and until he has experience and skill enough to warrant him in feeling confident that when he got a district he could do it full justice, has by far the best chance, is saving the members of the Board trouble, and will relieve himself from a great deal of disheartening and unnecessary waiting and pains.

It requires that knowledge of building which nothing in the world but experience can give, to enable a district surveyor to discharge his duties with success and completeness. Within a month of my own appointment to the office, for example, I had more than one structural matter of great importance to deal with, which required care, but which, with care, was to me perfectly clear and straightforward; yet in each of these cases, had I been unable to bring some considerable experience to bear, I should have felt painfully responsible, and should in all probability have come to wrong conclusions. Those of you, therefore, who propose to become candidates for these appointments will permit me to suggest to you that you be not in too great a hurry, and that you look upon the office as one which by no means consists merely of a dull round of routine work, agreeably diversified by the receipt of occasional fees. The work of a district surveyor, if it contain, as it does, a great deal of routine, makes also constant demands on his vigilance, his firmness, his tact in dealing with men, his knowledge of building and of the Building Act, and his honesty of purpose.

One word as to another aspect of the question, namely, your relations to the district surveyor when you have to deal with him in your capacity as architects. Do not look upon him as a bugbear and a nuisance, to be avoided if possible, and endured only when you cannot escape him; but recollect that he is a brother professional man, whose official position entitles him to recognition. Whatever the work may be, small or large, which you have to carry out in his district, ask him for an appointment beforehand, take him the plans, request him to do you the favour to examine them with you, and if he points out that you are clearly proposing to contravene the Building Act, either alter your plans, or (if the case is one which admits of such a course) apply in the regular way to the Board of Works for permission to carry out what you want. There is no use in trying to evade or get over an Act of Parliament which has to be administered, and which the official surveyor knows better than you do. You, as a professional man, will find the district surveyor ready to give you any help or advice that he can, if you approach him properly; but if you differ from him, and determine to fight it out, the chances are against you.

Our subject is not even yet exhausted, but I shall not pursue it further. It would, perhaps, be interesting to tell you something about that unwritten law which the decisions of the courts or of the police magistrates have gradually though slowly created by way of interpretations and limitations of the verbal enactments of the statute. It would be very curious to trace the history of enactments for London down from the first beginning to the present day. It would be curious, also, to compare the Acts in force in those towns and cities which possess a local Act with the London Building Act, and to note the points of resemblance and of contrast. It would be not a little instructive to consider the various attempts that have been made to amend the present Act by bills, none of which have become law, and it would be very useful to place before you all the other legislative enactments which bear upon buildings in London. But I simply name these topics as showing that the subject is a very large one, and one that may be advantageously discussed and can be profitably pursued in various directions by yourselves, or which might possibly be resumed at some future day with advantage to this Association. For the present I think we shall have done enough if we have managed to understand the basis upon which this, the principal enactment relating to London buildings, is constructed,—a basis which, as I told you at starting, consists in regulations directed mainly towards security of structure, security against fire, a fair regulation of party structures, some slight regard to public health, and regularity of frontage to the streets.

DISCUSSION.

Mr. Nash, in response to an invitation by the Chairman to open the discussion, said that Mr. Roger Smith's papers were always so very ample and perspicuous that it was generally difficult to add to them. With regard to Mr. Smith's remarks as to the time when building regulations for London were first promulgated, although there were no Building Acts, properly so-called, in early days, yet, 600 years ago the first Lord Mayor of London and his aldermen made regulations for party-walls in the City of London. Nearly 100 years later another regulation was promulgated requiring that all the buildings in the metropolis should be covered with tiles and slates instead of with straw. Then, in the reign of Elizabeth, several Acts were passed having relation to buildings; but of course the most important Act, and the one most analogous to that which we had now, was that passed in 1667, a year after the Fire of London; but then, in the hurry and bustle of rebuilding the City, it was found so extremely difficult to control men in their buildings, that three years afterwards (*i.e.*, in 1670) another and much more stringent Act was passed, which made it compulsory for every man who was going to erect a building to pay 6s. 8d. to the Chamberlain of London, upon which the surveyor would inspect the site, but until this was done no man was allowed to build. If a similar provision were in force at the present day much good might result. The Act of 1670 was followed by the very excellent Act of the 14 Geo. III., which served its purpose very well indeed until the year 1844, when another Act was passed, followed by the present Act in 1855. After 1844 there occurred what might be described as a great disturbance in the building atmosphere of London, and it was not until the present Act was passed that there was anything like settled weather. In his (Mr. Nash's) opinion, the present Act was a most excellent one, notwithstanding the cavilling and quibbling which it sometimes gave rise to, and was worthy of the utmost consideration as the only possible foundation of any future Act, for in framing new Building Acts it was extremely detrimental to be continually changing the style and manner of the Act. He was not perhaps disposed to wholly agree with everything in Mr. Smith's paper. On public grounds, a Building Act should seek to ensure the stability of buildings without an undue interference with private rights. Mr. Smith had admirably sketched the provisions of the Act which had for their object the prevention of fire; but in his (Mr. Nash's)

opinion the Act should chiefly be directed to the purpose of preventing the spread of fire after it had once originated. If a man erected his building so that it could be rapidly burned down, he was the greatest sufferer; but he should not be allowed to build so that others should suffer through his remissness. In other words, as to matters of constructional stability and such matters as affect the public safety, the Building Acts should contain imperative provisions; but it should interfere only to a slight degree for the protection of the individual who was to inhabit the house. Likewise with regard to sanitary matters, the public sanitation should be most thoroughly taken care of; and within certain limits it was necessary to protect the individual also. With regard to the drains of private houses, it would be well if they were regulated under a special Act of Parliament, which should exercise a more efficient control over them than that exercised by the present Metropolis Local Management Act. The construction of drains beneath the basements of houses was a work which needed very special supervision, and he did not think that the district surveyor, with the duties which he had already to perform, could be expected to undertake such supervision. It was necessary to have some special officer, in addition to the district surveyor, to undertake that work. When a new Act was passed he hoped some change would be made as to the legality of 9-in. walls, which could now be built 25 ft. high. He had seen houses of three stories built with only 9-in. walls,—a most flimsy construction. It should be made illegal to erect a house of more than two stories with 9-in. walls. Another point which required amendment in any future Act was the question of district surveyors' fees. The district surveyor should not be put to the extreme difficulty he sometimes experienced in recovering his fees, after having bestowed a great deal of time and trouble in seeing that the provisions of the Act were complied with. Several proposals had been made for remedying this defect in the Act, but none had been adopted. The most effective way would probably be to impose a slight tax on the building, just sufficient to cover surveyors' fees. The tax could be collected by means of stamps to be affixed upon the licence to commence building, and until the builder had obtained such licence, he should not be allowed to commence operations.

Mr. C. F. Hayward said he hoped that no one present would learn to regard the district surveyor as a bugbear, although there were some members of the architectural profession who affected to regard him in that light, and who delighted to put themselves in opposition to the authority which the surveyor wielded by virtue of the powers conferred upon him by the Building Act, as if his whole and sole object was to place obstacles in the way of their buildings being erected. It should be remembered that the district surveyor was generally a professional man of long standing, and one whose sympathies were likely to be with rather than against those who found some difficulties in making their buildings comply with all the provisions of the Building Act. It was necessary, in the interests of the public, that the law should make certain stipulations as to building, and it was to the interest of the profession, no less than to that of the public, that the enforcement of the enactments of the Legislature should be vested in the hands of architectural practitioners. It was, therefore, greatly to be regretted that district surveyors, in the conscientious discharge of their duties, should ever evoke anything like a feeling of hostility on the part of their professional brethren. It was also, he thought, to be regretted that the subject of Mr. Smith's paper was only a local Act,—the Metropolitan Building Act,—and that there were many Acts in force in other large towns which were likewise purely local. Professional men whose practice extended over a wide area would find that these local Acts differed very materially from each other and from the Metropolitan Building Act, and their provisions were often quoted by those who wished to controvert the district surveyor's interpretation of the Metropolitan Building Act. The multiplicity of building laws was a great inconvenience and anomaly. Surely if a certain set of general rules were necessary in London to regulate the putting together of bricks, tiles, stone, and timber, surely the same rules might be made applicable all over the country, subject to such slight modifications,—which might be provided for in bye-laws,—as local circumstances might render necessary. What was wanted was one general Building Act for the country at large. Why should modes of construction allowable in one town be forbidden in another? And why should a party-wall in London be different to a party-wall in Liverpool, or elsewhere? In his opinion, the architectural profession ought to seek to obtain an efficient Building Act adapted to the nation at large, and defining the general principles upon which buildings should alone be constructed, subject, of course, to such slight modifications as might be demanded owing to the character of the materials available in various localities. If the profession as a body would strive to obtain a Building Act of this kind, they would be doing something to consolidate the laws relating to construction. He thought that, by the hearty co-operation of the local professional societies of the country, such a result was quite within the reach of attainment. With regard to the existing Metropolitan Building Act, Mr. Hayward said he was not particularly enamoured of it, but he thought that if the architectural student would take it as it is, and study its provisions with the view of understanding them,—why this thing was to be done, and this left undone, — he could not have a better basis for the study of practical building, because the Act certainly did embody in its regulations the collective wisdom of the architectural and building professions, after being winnowed and sifted by committee after committee. If an examination under portions of the Act were established by the Institute, in addition to the examination of candidates for district surveyorships, the result would, he thought, be most beneficial. There was one portion of a district surveyor's duties which probably did not come within the knowledge of people generally, or even of many members of the profession: he alluded to the duties imposed upon him without any definite provision in the Act. Some of the district surveyors were called upon, every now and then, by the Metropolitan Board of Works, to survey, at extremely short notice, large numbers of temporary wooden structures for the accommodation of spectators of royal and other processions. This was a duty involving the district surveyor in immense responsibility and its attendant anxiety, although it was really a farce to suppose that one man could personally vouch for the stability of hundreds of such structures, the whole of which are erected within two or three days. Whenever a new Building Act was brought forward, some stringent and effective regulation should be made concerning such structures. Notwithstanding the enormous responsibility which such structures entailed upon the district surveyor, he had no means of recovering fees for examining them.

Mr. J. Douglass Mathews thought that Mr. Roger Smith had very clearly and lucidly summarised the main provisions of the Act. Complaints were sometimes made of the restrictions imposed by the Act, but in his experience it was almost the best possible Act that one could have to build under. Of late years local Boards outside the metropolis, in conformity with the Local Board of Health Act, had drawn up their own building bye-laws, and got them sanctioned by the Secretary of State. These local bye-laws were, as a rule, much more binding and difficult to comply with than the provisions of the Metropolitan Building Act, and their penalties and exactions were proportionately greater, and they frequently stipulated for the lodgment with the local surveyor of most complete sections and detailed drawings, a stipulation which was utterly indefensible. Indeed, he did not think that, as a general rule, architects ought to supply district surveyors with tracings. It was true that district surveyors were generally professional men; but he (Mr. Mathews) had been personally concerned in building operations in one of our large towns, in which the surveyor whose duty it was to see that the local building bye-laws were enforced was a tailor (!), who had obtained the appointment by some informality. He (Mr. Mathews) was disposed to go a little further than Mr. Smith with regard to the sanitary provisions of the Building Act; for he thought that if the Act contained more stringent sanitary clauses it would be all the better, especially with regard to foundations. It constantly happened within the metropolitan area that large numbers of buildings were put upon the most miserable and unwholesome foundations conceivable. There was no doubt that people looked to the district surveyors as being responsible for this evil, but they were at present powerless to prevent such things. The use of concrete should be compulsory in basements wherever the soil was at all damp.

Mr. W. H. White said he might be considered presumptuous in attempting to offer any remarks upon the Metropolitan Building Act, but he wished to point out one or two differences between the London and Paris Building Acts. Mr. Smith had remarked that though the Englishman was in the habit of regarding his house as his castle, the Metropolitan Building Act expressly implied that the house-owner owed certain duties to his neighbour. But the Act did not imply that the property-owner owed also a certain duty to the municipality. It said little or nothing as to what in Paris would be called the *alignement* of the streets. In London, a man might set his building back or askew, or, in fact, anyhow, provided that he kept behind the line of the street; whereas in Paris the building-owner had to keep up to the line of the street as laid down by the municipality. Another point of difference between the Building Acts of the two capitals was that whereas in London the minimum height of any room was 7 ft., in Paris the minimum height was 2 mètres 60 centimètres, — about 8 ft. 7 in. On the boulevards and in the principal streets of Paris it was compulsory that the façades should be built in stone, and although he did not know whether they *must* be, yet he knew that all the houses *were* built with iron and concrete floors, *i.e.*, with wrought-iron joists entirely enveloped in plaster concrete. He was told that in London 9 in. was a sufficient thickness, according to the Building Act, for a party wall, and that this was sometimes reduced to 4½ in. by recessing (?). In Paris, on the contrary, 18 in. was the minimum thickness, and this thickness had to be carried right up through the roof. As to timber in party-walls, it was unknown in Paris. He did not know whether the Metropolitan Building Act contained any stipulation as to the proportion of the heights of houses to the width of the streets; but in Paris the maximum height of a house on a boulevard or public place was 20 mètres,— about 65 ft. 10 in. Then, again, in Paris there was a stringent law against hiding gas-pipes anywhere. Gas-pipes in Paris houses must not be buried in plaster or hidden between floors, and the consequence was that that abomination of the London house, the leaky gas-pipe, was unknown in Paris. Notwithstanding what had been said by Mr. Nash as to the efficacy of the Metropolitan Building Act in preventing the spread of fire, he (Mr. White) could not help thinking that the whole of the income-tax-paying portion of the inhabitants of the Metropolis nightly ran the risk of being burnt to death, while those who did not pay income-tax were even more dangerously situated. As to fees, he thought that the principle of paying district surveyors by fees was wrong, and led many people to write foolish, but none the less hurtful, things to the newspapers. Whenever a district surveyor was particularly active, he was accused of seeking to multiply fees, and of course the only remedy for this would be to pay him a fixed salary.

Mr. Gordon Smith remarked that something had been said as to local building bye-laws requiring tracings to be deposited, but such a stipulation could not be enforced by law, even although the local bye-law had received the sanction of the Secretary of State or the Local Government Board. There was certainly a great diversity in the building bye-laws of different localities, but an effort was now being made to bring them as much as possible into uniformity, under the Public Health Act of 1874, which not only empowered local boards to make building bye-laws with reference to the materials and construction of walls, roofs, foundations, and chimneys, for the purpose of preventing fire and ensuring stability, but it empowered them to make bye-laws for ensuring the health of the inmates, and the framing of these bye-laws would give great scope for improvement in building throughout the country.

Mr. W. F. Potter had rather expected Mr. Smith to have discussed the provisions essential in a new Building Act, but probably that would have been to enter upon too wide a field. With reference to the proposed new Act which was before Parliament a year or two ago, he noticed that it contained a provision (whether introduced with a sinister motive by some extreme partisan of the Gothic school he did not know) which would have totally precluded the employment of Classic architecture, inasmuch as it proposed the total abolition of the cornice. As Mr. Smith had pointed out, barge-boards were prohibited on account of their liability to cause fire to

spread: but why should the licensed victuallers be allowed to put up their enormous flaunting signboards without let or hindrance?

Mr. H. H. Statham said that in looking over the proposed new Building Act he had been amused at some of the exceptions made, especially that in favour of the wooden shop-cornice, which appeared to be the pet architectural feature of the Bill.

Mr. S. F. Clarkson said that while fully concurring with all that had been said as to district surveyors, they were but fallible beings after all. It was true that they were practical men; true that as a rule they were ever ready to suggest means of overcoming difficulties; true that they were fully conversant with the Building Act; but they sometimes,—not often, perhaps,—lost sight of the spirit of the Act by insisting to the full on the letter, and good service was sometimes done by architects fighting out with them a disputed point. District surveyors, as architects, should always bear in mind that it was for the well-being of architects that building should be encouraged, and no unnecessary impediments placed in the way. In dealing with dangerous structures they should guard against being made catspaws for securing the demolition of a building merely because its demolition might be to the interest of particular parties.

The Chairman (Mr. Quilter) in putting the vote of thanks which had been proposed and seconded to Mr. Roger Smith for his paper, said he could hardly agree with Mr. Nash as to the latitude to be allowed under the Building Act on sanitary matters, because, as a rule, the man who built a house did not inhabit it himself.

Mr. Nash said that it was always open for a man when buying or leasing a house to call in a surveyor, and take his advice as to its compliance with structural and sanitary requirements.

The Chairman said he was of opinion that such an examination or survey of a finished building could not possibly be put on a par with the proper supervision of the building when in progress.

Mr. Roger Smith, in acknowledging the vote of thanks, said he had purposely avoided any reference to the proposed new Building Act. He agreed with Mr. Nash and others in thinking that the present Act was a fairly satisfactory one, and as it would probably continue in force for ten or twelve years longer, it was desirable to make the best of it. He agreed in thinking that district surveyors should have more power in reference to the sanitation of houses; but too much interference would be subversive of the object sought to be attained.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute on Monday evening last, Sir G. G. Scott, president, in the chair, the following gentlemen were elected Associates, viz.: Mr. W. J. Buxton, Kennington; Mr. C. W. Davies, George-street, Portman-square; Mr. J. S. Edmeston, Ealing; Mr. E. G. Hayes, Ludgate-hill; Mr. G. E. S. Langford, Bloomsbury-square; and Mr. H. Saxon Snell, jun., Southampton-buildings.

Some considerable amount of time was spent in the discussion of the question whether the proceedings at the special general meeting a fortnight ago were not invalid by reason of informality in the appointment of the chairman (Mr. C. H. Cooke.) On that occasion the president and the three vice-presidents were absent, and Mr. Cooke, a member of the Council, took the chair at the request, so it was stated, of the Council. It was contended on Monday evening last that one of the bye-laws of the Institute provides that, in the absence of the president and vice-presidents from a special general meeting, the chairman must be appointed by the meeting. After some desultory conversation, the subject was dropped.

Mr. Wyatt Papworth asked why the names of the members of three sub-committees appointed by the Committee on the Affairs of the Institute were not given on the agenda?

Mr. Cockerell replied that the appointment of the sub-committees in question was to a great extent "confidential," and it was not thought advisable to publish the names of the members who had been appointed. At the same time, any member of the Institute might ascertain the names by private inquiry. In reply to a further question, Mr. Cockerell said he did not know that there was anything to prevent the names being made public by any one who might happen to get hold of them.

Mr. Hansard protested against the discussion as a great waste of time. He contended that if the Institute had confidence in the large and important committee which it had appointed, it was no business of the general body to inquire as to the *personnel* of sub-committees appointed by that committee. The appointment of such sub-committees, and all other proceedings of the committee, were private and confidental matters until the committee had reported to the general body. At present it was the policy of the committee not to publish what had been done.

Mr. W. H. White suggested that "the lodge should be tyled" at once, and the reporters turned out, inasmuch as it appeared to be the desire to conduct the affairs of the Institute with something of the mystery pertaining to a Masonic meeting.

The President said he might state that Mr. Whichcord had been appointed permanent chairman of the committee.

Mr. Cockerell said he had been authorised by Professor Donaldson to call attention to a scientific congress to be held at Perigueux in May next, in which some distinguished foreign architects would take part.

The President said it was with very great regret that he had to announce the death of an old and highly-respected member of the Institute, Mr. Henry Roberts. He knew Mr. Roberts very well many years ago; in fact, he was for three or four years in Mr. Roberts's office. Mr. Roberts was a pupil of Sir Robert Smirke's, and architect of the Fishmongers' Hall and other buildings of importance. After practising for a considerable period he retired, and for the last few years had been living at Florence, where he died. Since his retirement Mr. Roberts had devoted a great deal of attention to the improvement of the dwellings of the working classes, and had published some very useful pamphlets on the subject. He was a most estimable man in all respects.

Mr. Wyatt Papworth said he believed that Mr. Roberts was the architect of the first block of improved dwellings for workmen erected in London,—somewhere in St. Giles's.

Mr. Cockerell announced that the Royal Association of Archæologists and Architects of Portugal had elected the president of the Institute (Sir Gilbert Scott) an honorary member. He further announced that he had received a letter from M. J. L. Duc, in which the writer acknowledged the compliment implied to French architecture by his nomination as the recipient of this year's Royal Gold Medal, and expressed the hope that he might be able to come to England to receive it in person.

On the motion of Mr. Cates, it was resolved that the letter be entered on the minutes.

Further time was taken up in discussing the reason why the "heads" of Mr. Cockerell's paper were not published on the agenda, in conformity with a resolution of the council.

Mr. Cockerell replied that he had regarded the resolution in question in the light of a recommendation to be adopted if possible, rather than as an injunction compliance with which was imperative. In his case he had not seen the advisability of hampering himself before preparing his paper by complying with the recommendation.

Mr. Chatfeild Clarke very pertinently suggested that the best thing would be to get to the paper itself without further delay.

Mr. Hebb interposed before Mr. Cockerell commenced to read his paper, with the object of calling attention to the proposed restoration of an interesting and well-known pavement at Sienna. Hitherto the pavement, although much worn by the feet and knees of worshippers, had been preserved, owing to the poverty of the city, but it appeared that funds being now available, it was proposed to restore the pavement. "Restoration," in Italy no less than in some other countries, was a very wide term, and often meant destruction. For instance, a fountain which Mr. Hebb named had been "restored" by removing all the old carving and ornamental work to the Museum, and replacing it by entirely new work; and it was to be feared that, although the work was in competent hands, the "restoration" of the pavement would practically mean its annihilation as a specimen of Mediæval artwork. A distinguished Italian photographer, Signor Cavalieri Lombardi, had, at the request of a committee, consented to take a number of photographs of the pavement, and he (Mr. Hebb) thought that possibly some of the members of the Institute would like to obtain copies, inasmuch as the cost would be trifling. Mr. Eastlake had kindly consented to receive applications for the photographs.

The President said he had no doubt many members would be glad to possess photographs of the pavement, and he thought the Institute might go further than that, and refer the matter to the standing Committee for the Conservation of Ancient Monuments, with the view of inducing the authorities at Sienna to leave the pavement as it is.

Mr. F. P. Cockerell then read a paper entitled "Memoirs of some deceased Foreign Members." The paper, which was of considerable length, was confined to notices of the lives and works of three French architects, viz., MM. Felix Duban, Léon Vaudoyer, and Henri Labrouste. At the outset of his paper, however, Mr. Cockerell suggested that some member of the Institute who was a good German scholar should undertake to prepare memoirs of some of the most distinguished of modern German architects. We are compelled to postpone further notice of the paper for the following reasons:—Firstly, the paper was not in print, nor was any abstract of it prepared for the reporters, as has been usually the practice of late; neither was access to the MS. obtainable. In the second place, it was out of the question to attempt to take a shorthand note of the paper, for not only did Mr. Cockerell read with great rapidity, but the paper was bristling with French names of men and buildings and phrases unfamiliar to English ears. Moreover, as we may here take occasion to state, it is always difficult, even when the readers of papers are exceptionally good elocutionists, for the reporters to hear well, for the reader of the paper stands in one corner of the room and the reporters are placed in the other corner.

A brief discussion followed the reading of the paper, the speakers being Messrs. R. P. Spiers, Wyatt Papworth, Arthur Cates, and G. H. West.

An interesting series of sketches and drawings prepared by Mr. W. Hilton Nash, the Soane Medallist for 1875, was exhibited on the walls, and Mr. Nash was to have read some "Notes" thereon; but owing to the lateness of the hour at which the first paper was concluded, this portion of the evening's programme had necessarily to be postponed. It was suggested whether Mr. Nash's paper could not be read at the next meeting of the Institute, on the 10th inst., when Mr. Alexander Payne is to read a paper on "Concrete as a Building Material." Mr. Cates, however, urged that the subject of concrete was one of such great importance to the profession that instead of devoting only half an evening to it they ought to devote two or three evenings. The matter was therefore left open, and the proceedings terminated.

LANDLORD'S LIABILITY FOR OVERCROWDING.

HOME *v.* KELSO LOCAL AUTHORITY.

THIS case was heard at a sitting of the High Court of Justiciary, Edinburgh, on the 17th ult., the Lord Justice-Clerk and Lords Young and Craighill on the bench.

It appeared that the appellant in this case, Mr. G. H. M. Binning Home, had been convicted by the Sheriff-Substitute of Roxburgh of a contravention of the Public Health (Scotland) Act, 1867. He was proprietor, amongst others, of the farm of Softlaw, which was let to a tenant named Kay, who originally intended to be an appellant, but at the last moment withdrew his appeal. The farm had upon it a number of cottages; at May, the tenant of the farm engaged a hind named Cockburn, and as part of the wages due to him for his services agreed to let him a house for himself and family. The hind took possession of the house, and as it turned out that he had a pretty large family (his wife and seven children), the Local Authority of the parish of Kelso presented a complaint, not against him, but against the proprietor of the land and the tenant of the farm, under the Public Health Act, for having the cottage overcrowded. On the part of the appellant it was argued that this was a conviction that could not stand for a moment. The author of the nuisance must be either the occupant or owner; and, according to the interpretation clause, the owner signified the person entitled to receive the rent of the premises. In this case the tenant of the farm received the rent of the premises. In this case the farm received the rent of the cottage, in respect that he got the services of the hind. It never could be said that it was through the fault of the proprietor that this nuisance existed. There was no contract between him and the hind. He did not bring him there, and he could not say, "You shall cease to occupy that house."

The Lord Justice Clerk stated that he did not see how in the present case, where the landlord had given over the occupation entirely to his tenant, he could be held responsible. He thought they must sustain the plea of the appellant, and answer the question put to them in his favour.

The other judges concurred.

The appeal was thereupon sustained.

LIGHT AND COLOUR.

Sir,—I will now proceed to state, as briefly as possible, those points in which I think Mr. Cave Thomas's treatise and letters (in your Nos. for March 11, 18, and 25) are likely, if unrefuted, to prove most prejudicial to students in this most beautiful and useful branch of science.

1. In his letter of March 4, he says,—"In what a perplexing state of confusion is the subject of 'light'!"—and, indeed, his whole writings imply the same. On the contrary, all who know what has been discovered about light, know that a science has been gradually elaborated during the past 200 years, by the most accurate observers and profound mathematicians that the world has ever seen, which stands solid, clear, and glorious, a splendid monument of human intelligence; which to attempt to upset, to alter, or even to revise, would now be as vain as an onslaught on the truths of astronomy. No real student in this science is asked to rely on authority; he may see the phenomena, and comprehend the mathematical proofs. Physicists have ceased to contradict each other on its principles. "W. C. T." may be assured that the recent discovery by Mr. Crookes, which he alludes to, that matter may be moved by those æthereal waves which make us to see, will not be thought by any adept to show that light is a substance, ponderable or imponderable; it will only open a fresh door for research, and give further insight into the mysteries of the universe, and new triumphs for this magnificent science, making revision more hopeless than before. I cordially endorse his own words,—"The best course, then, is either to suspend our judgments, or to take the matter in hand and investigate for ourselves;" but, in doing so, travel by the road which has, with so much pains, been opened, avail yourself of what has been ascertained by others; otherwise you will infallibly be lost in the wood. Master the science before you attempt to revise it.

One great source of the confusion and perplexity which "W. C. T." complains of, and which his writings are certainly calculated to produce, is a misconception about the very meaning of the word "light." He regards it solely as meaning a sensation, saying it is entirely a phenomenon of the sentient being; it does not travel; it does not pass through anything; and he affects to misunderstand those who use it to denote the cause of the sensation. Yet this is its first meaning in our dictionaries, and its commonest meaning in our language. The same is true of the corresponding terms in all languages. The first time we meet with the word in the Bible, we read "And God said, Let there be light, and there was light," when no sentient creature existed. We can no more alter the meaning of the word "light" than we cease to describe the prismatic rays by the names of their colours, or to talk of the colours of bodies, and call one surface white and another black. However we may regret the double meaning of words it is certainly better to define and explain them, than to irritate and mystify the student by attempting to impose impossible restrictions upon language.

2. On p. 8 of his Treatise, "W. C. T." says,—"Sensations cannot be mixed. We may combine two vibratory actions separately, producing two distinct sensations of colour, so as to produce a sensation distinct from either. But each sensation is a fact intact, neither to be decomposed nor compounded." The same doctrine is repeated with the like positiveness in the letter of March 4, and elsewhere; but nowhere do I find it supported by any proof or argument. In p. 10, it is said "a logical deduction from the undulatory hypothesis" is "that as colours are sensations, we cannot speak, correctly, of mixing them, of combining two to make a third, and so on, which most men, painters in particular, think so self-evidently the fact." But how this is deduced from the undulatory theory I cannot conceive, and no explanation is given. I deny both the doctrine and the deduction. It may be shown, on very easy suppositions, that there may be certain simple or elementary colour-sensations, and that these may be literally mixed with each other in any degree.

Suppose that the nervous tissue at the back of the eye contains innumerable minute organisms, each so constituted as to be thrown into vibration, perhaps at two or three different rates at the same time, and no more, by the impact of the ethereal waves; just as it is known a musical cord may be by the same blow, or by different blows. Is it not conceivable that one of the possible rates of vibration may give the sensation of red, another of blue, and so on, and that these may be blended together, just as the co-existing vibrations in the chord may give the notes C or G, and their octaves so blended together that the ear cannot easily distinguish them? It is a known principle in mechanics that such vibrations cannot combine to form any intermediate simple vibration, but must continue at their own proper rates, superadded on each other till they cease; and, as the separate vibrations are mixed, why may we not say that the sensations they produce are likewise mixed?

Again, suppose,—and it is perhaps a still simpler supposition, and a very probable one, in view of the observations which Exner, a pupil of Helmholtz, recently made in Germany upon the different figures perceived on the retina of his own eye when momentarily excited first by the red, then by the green, and then by the deep blue rays of the spectrum,—suppose that there are three different kinds of nervous fibres, mingled together all over the retina, which are capable of vibrating each at its own rate, and that these respond most freely to a wave of some given period, and less so to other waves. May not three simple sensations be thus mixed together, and mixed so intimately as to be quite undistinguishable in the mixture?

But I am not aware that it has ever been conclusively shown that the sensations are caused by means of vibrations excited in the nerves, though "W. C. T." takes it for granted. Some (as Sir John Herschel, in one of his books) have thought it more probable that it is rather by some peculiar chemical effects of the different rays. The mode of action is of little consequence to the science of colour: the fact that different simple sensations are produced, and that these are continually more or less mixed, is the essential point.

3. On page 11 it is said that one of the "main and important conclusions at which advanced thinkers on the theory of light have at present arrived" is, "that all differences of colour which are spoken of under the general name of 'light' are so many different and distinct sensations." As the possibility of mixed sensations has been denied before, this must mean that all colours are essentially different, and all equally simple. Who are the advanced thinkers that have arrived at this astounding doctrine we are not told, and to me it is quite unknown. Many have supposed that all the prismatic colours are equally simple, because they are the colours produced by unmixed homogeneous lights; but none that I ever met with have maintained that the colours produced by mixed lights are not mixtures of the corresponding prismatic colours. On "W. C. T.'s" principles blue and white are equally simple. As in neither of these, when contemplated separately or together, the eye perceives anything in common, or anything leading to the idea of a mixture, let us suppose for the present that both are equally simple. But we can make a continuous gradation of tints between the blue and the white. Are all these tints equally simple too? Does not the eye see a continual increase of white as it passes from the blue end to the white end? If so, it sees each tint in the gradation is not a simple colour, but a mixture of blue and white. Again, we may make a continuous gradation between blue and red, passing through varieties of violet, mauve, purple, crimson, cerise, all of uniform brightness; and the eye will distinctly perceive that each of these intermediate colours is a mixture of blue and red. So, again, we may do between blue and yellow, passing through a series of blues, becoming more and more grey, till we arrive at a neutral grey, and then through a series of yellows, becoming less and less grey, till we arrive at the terminal yellow. Here, though in the middle grey, isolated from the rest, no eye, perhaps, would detect either blue or yellow; yet, when the whole gradation is viewed together, we distinctly see that there is a continuous decrease of blue and increase of yellow, or *vice versâ*, as the eye passes from one end to the other. In short, we know that a true direct gradation may be made from any one colour to any other; and what can possibly determine the place of any colour in any such gradation, except the proportions in which the terminal colours are mixed or blended in it? Thus the blending or mixing of colours is evident to the eye, in view and contemplation of all colours together, though the eye does not resolve any single colour, isolated from others, into its simple elements; and there can be no appeal from the deliberate judgment of the eye in the matter of its own peculiar sensations.

We may, however, test the judgment of the eye by physical considerations; and so doing, we find it confirmed in every possible way. We may mingle the prismatic rays, as in the exquisitely beautiful and instructive methods I have proposed in my "Manual and Principles of the Science of Colour"; or may mingle the lights reflected from two coloured surfaces, as blue and red, blue and yellow, blue and white, by the elegant method of the slip of polished glass, and we find that the colour of the mixture of the lights always agrees with what the eye judges to be the mixture of the colours. We may cause the eye to be affected with the different colours in rapid succession, as when we view a rotating coloured disc: the result is the same. We may cause minute neighbouring points in the retina to be affected with the different colours, as when we view a mixture of coloured powders (if we can get them sufficiently opaque): the result is the same. We may even, with some little difficulty, receive the coloured lights separately on corresponding parts of the retinas of the two eyes (as when blue and red or blue and yellow papers are put into the slides of a stereoscope), and we find the sensations thus received through the separate eyes still blend into the same result.

We have been accustomed to many strange notions about colours, but those so positively asserted by "W. C. T.," that colour-sensations cannot be mixed, and that all differences of colour are so many different and distinct sensations, seem the most paradoxical of all. The admission of them would close all intelligent seach into the laws of harmony; but fortunately their admission is impossible.

4. On p. 8 we read, "Thus you will find men talking of '*three primary colour sensations, making all the variety of colour in Nature.*' Imagine the smile with which such an enunciation would be received in Germany. 'Three colour-sensations the cause of all the variety of colour in Nature!'" It is difficult, in reading "W. C. T.'s" observations, to know whether his objection is to the matter or to the words. Here it is probably to both. When I first read the above passage, I supposed he was attacking the doctrine of three simple colours, which the experiments of Clerk Maxwell in England, and afterwards of J. J. Müller in Germany, have established, by showing that there are three and only three colours (namely, the best red, green, and violet-blue of the spectrum) which blend together to produce all the other prismatic colours, and consequently the colours of all things,—a doctrine which immediately commends itself to the eye, because when we view a pure spectrum we are at once struck with the superiority of these colours over all the rest in depth or fulness. But when I came to read pp. 14 and 15 (the substance of which is repeated in "W. C. T.'s" letter of March 25th) I found that he has also an objection to the words "primaries" and "secondaries," as importing cause and effect, or succession in order of time. How such an idea arose is not easy to see, since the words are merely an importation into English of the Latin words *primarii* and *secondarii*, belonging to the first and second ranks; they merely indicate a supposed difference of importance in the classes of colours referred to; the supposed simple colours being put in the first rank, and the binary colours in the second; nor did I ever hear of the terms being misunderstood as by "W. C. T."

Having removed this source of perplexity, we may return to the doctrine of three simple colours, which is, as "W. C. T." supposes, a leading principle. The reader will find the worst that "W. C. T." has to say against it in the beginning of his letter of March 25; and if my armour is glass, as he implies, it is yet too tough to be pierced by his cloudy lance. To say I speak of the three simple sensations as if they were "causative," or can be "shuffled about," and that I do not realise the fact that colours are sensations, is mere misrepresentation. The assertion "there are not three elementary colour-sensations, but an infinite variety of colour-sensations," &c., is mere unsupported contradiction of the question, which I have before refuted. If "W. C. T." denies the fact that all colours can be produced by mixtures of the prismatic red, green, and blue rays, let him show the colour that cannot be so produced, and refute the physicists who say that they have proved it. If he thinks he can produce all colours by mixtures of other three prismatic rays, let him show which three, and refute the physicists again. If he admits the fact, let him exercise his ingenuity in

explaining it otherwise that by the supposition that these three are simple elementary colours, and all other colours mixtures of these.

The only approximation to an argument on the part of "W. C. T." is what he says about my statement that the simple sensations are never excited separately with perfect purity. This, he says, "is the strangest enunciation of all." "Then how, in the name of science, can Mr. Benson affirm that they exist? For, according to his own showing, his three pure elementary sensations have never been experienced, never been felt; *ergo*, they are more impalpable than even sensations, — mere phantoms of the writer's brain." I answer, with respect to the colours of all substances, they never can come up to the purity of the prismatic colours, because no substance ever sends unmixed homogeneous light to the eye. Superficial reflection dilutes the best of those colours with white. But with respect to the colours of the prismatic rays which produce the best red, green, and blue, though the superiority of these colours to the rest is so marked as to leave no doubt they are entitled to be "*primarii*," there is yet every reason to believe even they are diluted with a considerable quantity of white; and the stronger the rays the greater the proportion of white. Fluorescence, and the wonderful sensitiveness of the retina under any excitement, are quite sufficient to account for this; and however we should like to perceive the simple colour-sensations separately, in perfect purity and with the same intensity with which we believe they co-exist in white, we must be content without it. Still this imperfection does not much affect the question, since the mixtures also are likewise diluted, and is evidently no ground for the assertion that by admitting it I have "knocked down" my own hypothesis.

5. In his letter of March 18, referring to the "colour-cube" (which I have described as the natural system of colours, in comparison with the many more or less imperfect systems that have been prepared), "W. C. T." says it is "anything but calculated to impress the student with the fact that colours have no exteriority." It is not intended to teach that fact, but to aid the conception of the true relations of all colours, and of their innumerable gradations. That it is possible for all colours to have a place in this form, so that every line drawn through it shall pass through a true gradation of colour, is not only an extremely beautiful fact of itself, but an evident proof that all colours are really mixtures of three in the proportions represented by the distance of their place in the cube from the three initial planes. I think it deserved a little more consideration than it seems to have obtained from "W. C. T."; but as it is, according to his views, a thing of no meaning, I can hardly expect him to give it much. Nor does it seem easy on his principles to understand how every section through this cube can give a fresh harmony of colours.

6. Having rejected the theory of three colour-sensations, "W. C. T." proceeds, in the latter part of his treatise (p. 12 to end), to build up a theory of the harmony of colour, which purports to be founded on the phenomena of ocular spectra. But the whole system seems to me to have no foundation, because of a fatal mistake in observing these curious phenomena, as I will show; and if they were correctly observed, what a flimsy foundation would be afforded by the weak, uncertain, changeable, rapidly-fading after-sensations of the nerves of sight, when the immediate action of light has ceased! The eye may be compared to a wonderfully delicate system of musical chords, played upon by the ethereal waves. Who would found a theory of music upon the dying notes that linger amongst the stricken cords after the hand of the musician is withdrawn? Yet this is what "W. C. T." does with colours. Why search for complementary colours in ocular spectra, or attempt to explain them by imaginary librations of the optic nerves, to compensate or restore a disturbed equilibrium? I have shown in my treatises the most simple and reliable methods of seeing the perfect complementary colours in juxtaposition in their utmost possible purity and with invariable accuracy. Has "W. C. T." ever taken the trouble to look at these? I can scarcely suppose that if he had once seen them he would have turned from that beautiful sight and contemplation to dwell upon these feeble after-sensations, and build up a theory on spectral illusions; and has he ever considered how imperfect any theory of harmony must be which is founded only on the complementary or opposite colours, and disregards their lateral affinities? He repudiates the system that puts all colours in their true relations, and gives us a hotch-potch of loose, disjointed pairs of opposites.

The fatal mistake which I think "W. C. T." must have made in observing the ocular spectra has been the omission of due precautions for entirely removing the disturbing influence of light. The coloured spot should be bright, but not so bright as in the least to dazzle the eye. It should be always seen alone upon a black ground, and after a short, steadfast view, the eye should be closed, and instantly covered with a thick black cover, excluding all light. If these precautions are used, I cannot tell what another may see, but for myself I see merely a fading spectrum of the same colour as the bright spot, which does not change colour at all unless the spot has been dazzling bright, and then only sometimes, and, when nearly gone, changes to an imperfect complementary hue. But if, while this direct spectrum lasts, the least light enters, the colour is modified. This is best seen by suddenly directing the eye to a grey surface, when it immediately appears as a spot *darker than the grey*, and complementary to its former colour. This certainly appears to me to arise from a diminished sensibility of the part of the retina, though "W. C. T." combats this explanation (pp. 21, 22). If, however, he sees these phenomena differently, it shows the danger of founding a theory or phenomena which differ in different persons. I think, however, I have given the correct account, and the idea of diminished sensibility agrees with Chevreul's doctrine of simultaneous contrast.

There are some other points in which "W. C. T." appears to be misled in this part of his treatise, particularly in supposing a spectrum to have arisen from a black spot on a white ground (pages 22, 24). The white ground would cause a white direct spectrum, and a dark reversed one; but the black spot could not have affected the eye, otherwise we might expect to see light arise of its own accord in the dark. But setting aside these, there are many interesting observations recorded there; and I should be extremely glad if I could induce Mr. Cave Thomas to turn his energy and ingenuity to the furtherance of the true science of colour instead of its overthrow. An excellent artist, and an earnest seeker after truth, he ought to be a leader on the right side of the question, and not in the vain and hopeless fight of Fancy *versus* Fact.

W. BENSON.

NEED OF ARTISANS' DWELLINGS AT SHREWSBURY.

MR. EDW. O. A. GREG writes to the *Shrewsbury Chronicle*:—"In the *Builder*, of last Saturday, I observe an article on 'Houses in Flats,' and the thought occurred to me whether it would not be possible to form a company for the erection of similar buildings in this town of Shrewsbury. That they are wanted no one can deny who takes the trouble to penetrate and examine the dens and slums in which the poorer people who reside here are compelled to 'pig' together. (This term, if vulgar, is not too strong.) The state of the poorer classes of property is a disgrace to any civilised community; the houses are dilapidated, the alleys are narrow, excluding both light and air, and the sanitary arrangements are horrible and disgusting, both to the sight and other senses, while in many cases the dwellings are of the most Lilliputian dimensions. Many of the houses in which mechanics live are only a trifle better; they are draughty and leaky, the water supply is meagre, and only one closet is provided for a certain number of dwellings. To sum up in a word, I have visited many large towns in England and a few on the Continent, but I never saw a town in a worse condition in this respect than Shrewsbury. I do not know whether the Corporation appoint an inspector of nuisances. If they do I should like to know when, where, and how he performs his duty. From my own windows I can see two rows of houses with only a few square yards between them, in which are crushed those conveniences necessary to a household. The one row forms one side of a court, so that in a depth from the high road of about 40 ft. there are no less than three rows of houses, and at the end of the last two is a range of privies. On the other side a number of dwelling-houses, stables, slaughter-houses, and pigstyes exist adjacent to each other. Here are all the elements for creating fevers. I should recommend the erection of houses in flats. This could either be taken in hand by a company, or it could be carried out by the borough authorities under the powers given by an Act of Parliament passed last Session, called the Artisans' Dwelling Act."

RENOVATION OF HISTORICAL ITALIAN CHURCHES.

THE Italian Government has, at last, sanction the restoration of some of the most ancient Christian temples of Europe. Some three miles from Nola, a city of the Campagna, where the Emperor Augustus died, the little village of Cimitila boasts of five ancient churches, all of which are to be restored. The two most important of these edifices still possess some mural paintings and sculpture, which date from the fourth century. Taking into consideration the financial difficulties which beset the Italian Government, and which have just brought about the defeat of the Minghetti cabinet, the resolution to protect the artistic remains of Cimitila is the more laudable, as it entails the greater sacrifice.

ST. THOMAS'S HOSPITAL ASSESSMENT.

SIR,—In your notice of the above case I am reported in the summary of my evidence to have stated that a deduction of 7,000*l.* per annum has to be made from the hospital's gross income "for interest on borrowed money."

I said that this sum was required "for *repayment by instalments* of the interest of the borrowed money." The interest would amount to little more than half the sum named.

I also stated that of the poor in-patients more than one-third were from the parish of Lambeth, which is taking from the hospital nearly 3,000*l.* a year for rates.

Kindly insert this explanation, and oblige

FRANCIS HICKS, Treasurer.

THE NEW RAILWAY BRIDGE OVER THE CLYDE.

THE Caledonian Railway Extension scheme includes the erection of a grand new central station, in Gordon-street, Glasgow, and in order to connect this with the existing line on the south side it will be necessary not merely to bridge over Argyle-street, the longest and finest thoroughfare in the city, but to carry a viaduct over the river Clyde. The plans and specifications for the last named, which will be a work of considerable magnitude, have been already prepared by Messrs. Blythe & Canningham, C.E., Edinburgh, and estimates are being invited which will be decided early in April. It is expected that the construction of the viaduct will be commenced during the ensuing summer. The new bridge will run parallel to the existing Broomielaw or Jamaica-street Bridge, and as it will only be about 100 ft. further westward, an alteration in the present harbour arrangements will be necessary. Although on a larger scale, the new viaduct will be upon a similar plan to that which crosses the Clyde further to the east, and belongs to the City Union Railway. The bridge will be sufficiently wide for four lines of rails, and will consist of three spans across the river in addition to two shorter arches, one on either side crossing respectively Clyde-place and Broomielaw. Including these two smallar arches the entire length of the bridge will be about 700 ft., and the width about 50 ft. Equidistant from the centre of the river will be placed two piers, the connecting girders having a clear span of 185 ft., while the spans extending on either side will be each a few feet less.

PAYMENT OF RENT CHARGE.

THE insertion of the letter from our correspondent "Rector's Tax" has brought us notes from several other complainants. We fear there is no help for them. The rent-charge is to be paid by the occupier, and allowed by the landlord out of the rent, except when agreed to be paid by the tenant, or when the lease was made subsequently to the date of the Tithe Commutation Act, 6 & 7 Wm. IV.

Frequent changes of owners and occupiers having recently taken place, and much misconception arisen as to their liabilities, it may not be improper to state that, as the land itself is the security for the tithe rent-charges, each

new purchaser or occupier should see that all arrears are paid up before taking possession. Where property happens to be divided into a number of holdings, by the Act of Parliament any single occupier is liable to be called upon to pay the entire amount, and to deduct it from the rent due to the landlord; but no power is given to sub-divide the tithe according to the proportions supposed to belong to each separate holding. The collector therefore is compelled to make application to some one occupier for the whole. In case any land charged with one amount of rent-charge shall belong to two or more landowners in several portions, and the owner of any one of such portions, or his tenant, shall have paid the whole of such rent-charge, or any portion thereof greater than shall appear to him to be his just proportion, and contribution thereto shall have been refused or neglected to be made by any other of the said landowners or tenants, the 5 & 6 Vic., cap. 54, sec. 16, gives remedy for enforcing payment of contributions to rent-charge.

HASTINGS WATER SUPPLY.

Sir,—I am very pleased to see that a professional gentleman, for such I judge your correspondent, "Visitor," to be, has given us his independent opinion upon this important question. Without entering into detail, I may say that I have elsewhere criticised the present system of water-supply. Especially I have urged that the town should not be dependent upon surface-water derived from questionable sources; that we should cease to rely on storage for our summer supply, neither water nor reservoirs being adapted for the purpose; that the amount of good water available is far too small for the needs of the population, even if we set aside the fact that the town is rapidly growing; and lastly, that the authorities are spending large sums of money on muddling and inefficient schemes.

On one point, however, I am not quite in accordance with your correspondent. I venture to think that the geological features of the district are hardly such as to warrant the hope of a large supply being derived therefrom. The author of an able paper on this question has pointed out that since we are on an anticlinal and near the axis, but little room is left for a water-shed; that, in consequence of the steepness of the surrounding hills, much of the rainfall runs off; and that "the numerous valleys running down to the sea, and the long line of cliffs, drain off a large quantity of water, and lower the water-level considerably." The quantity of clay is another disadvantage. Mr. Topley states that "deep wells and borings near Hastings are not likely to be successful, the reason being that the strata reached by deep borings have only a small area of outcrop, and consequently can collect but little water. Wells, too, which give a good yield at first, are prone to fail, as, for example, the well at the Pelham Baths. The error of deriving surface-water from a cultivated and thickly-populated district is obvious. For these and other reasons, therefore, I have advocated the seeking of a supply from a distance,—an opinion, however, which I advance with all deference and reserve.

In conclusion, I would protest against the hasty letters of official writers, who, by ill-considered statements, not only discredit their cause, but injure the reputation of the town.

The mayor, I see, wrote to inform you that "Hastings is well and abundantly supplied with water of pure and good quality." The town clerk designates the statements of those who think otherwise as "a tissue of falsehoods," and thus disposes of the question in a manner, summary no doubt, but satisfactory in *no* sense of the word.

Nevertheless, town clerks, and even mayors, are not infallible. In 1874 the water supply was severely criticised. The mayor at that time wrote, as mayors are apparently bound to do, to defend it. He answered in the public press "with perfect confidence" that the water supply of Hastings and St. Leonards was "in every respect satisfactory." Unfortunately for this reassuring proclamation, the town was then, as now, largely dependent upon surface water: a drought came, the surface water failed, and a water famine of extreme severity followed close upon the heels of the mayor's letter.

I observe, moreover, that, in answer to "Inhabitant's" strictures upon the quality of the water, a chemist wrote to you stating a glass of it was then before him, "clear and bright as crystal."

It somewhat detracts from this testimony when I inform you that this gentleman has since freely confessed that he spoke of *filtered* water when he gave that description of the water supplied by the Hastings Board!

I enclose my card. M. D.

ON THE PURIFICATION OF THE LONDON ATMOSPHERE.

Any one coming to London for the first time in the foggy season is of course deeply impressed with the phenomenon, and can hardly prevent his mind dwelling on the subject, and endeavouring to solve the cause of this strange and painful experience. With an increasing population we shall have the London atmosphere in the winter time more fatal to the weak and aged than it is at present. This is a matter which affects everybody; the strongest feel its depressing influence. The writer invites a friendly criticism to the following plan for aiding the purification of the atmosphere by collecting the smoke of dwellings, taking the smoke of several streets to a central spot, burning the smoke and organic compounds contained in the air, collecting as much of these nitrous and sulphurous compounds as possible, and sending the remainder high into the air by means of a tall stack: this in outline is the proposed plan. The idea being brought in contact with many minds the friction may evolve the most ready means of accomplishing it. For instance, let A, B, C, and D represent houses, and instead of letting their chimneys empty their smoke into the air, drain-pipes are to rest on the roof, and the outlets of the chimneys be fastened into them in the same way as drain-pipes in the earth receive the drainage of several houses. In making stacks the great object is to make the flue as long as possible; to this end the flue from an engine-house is often carried in a little tunnel to a stack in a field some way off. You may carry this flue up or down, as long as the last ascent,—the stack,—is higher than any preceding descent. Acting on this fact, the flue in the drain-pipe from the houses, A, B, C, D, is carried to F, a retort which is loosely packed with a metallic oxide,—say, cupric oxide. Through this retort the draft finds its way, the smoke being consumed in the passage, and the organic substance likewise burnt up. Soot is a commercial substance, useful as a manure, from the fact that soot, or carbon, has the remarkable property of holding in the little cells of its substances different chemical gases. The soot lining the chimneys of houses holds thus the ammonia formed by the consumption of the coal in the grate below; of course, only a small portion of the air thus produced is caught, as its absorbent properties are limited, and it can only retain that which impinges on its surface. If the ammonia present, after passing through the fire, be caught, of course it would go to lessen the expense of the method. I should, therefore, propose that it be passed through one of those towers we see for a similar purpose at vitriol works, packed with coke or pumice-stone, and vitriol dripping down to absorb the gases from the ascending current of air. The current of air would now consist of carbonic acid, a very small proportion of watery vapour, and whatever nitrous gases that had escaped the retainers in an inorganic condition. In order to maintain a steady and powerful draught through the circuitous flue, a pipe should be fitted into the side of the stack from a steam-boiler: the intensity of the draught could thus be insured and regulated. The inhabitants of the houses connected with the smoke-consuming apparatus would find the air of their rooms constantly renewed, and their fires would burn cheerily, by reason of the brisk draught kept up, which they could regulate by a draught-plate. The chimneys would rarely want sweeping, unless the people kept but a small opening for the escape of the smoke up the chimney; the main on the top of the house would never require sweeping, as the steady onward flow of the air to supply the vacuum made by the steam jet would not allow any smoke to settle and become soot. At the chimney top, where it entered the main, a valve could be placed for shutting off any particular house that may be necessary to isolate from the system. Of necessity, in a paper like this, the sketch is a rough and the subject a vast one, and I may be allowed further opportunities of explaining details of the plan, which a friendly criticism may evolve. Fogs would still appear, but they could no longer beat down upon us the smoke of the fires and the effluvia of the millions of London. All this would be burnt up and dispersed high into the air, far out of reach of our lungs. I hope the novelty of the plan will not rob it of an impartial consideration.* E. S. G.

EARLY GLASS.

Sir,—In reply to Mr. Ballantine's letter, I have to express to him my extreme regret that the term, "Early Glass," and a mistaken report of what his letter contained, have led me into a very great misconception. I have, since my letter to your journal of the 18th, reperused his able *resumé* of the history of our art, and from the accuracy of his views therein expressed, can only say they have my entire concurrence. In justice to us both I hope you will give this a place in your next edition.

William H. O'Connor.

THE FORM OF CHIMNEY SHAFTS.

Sir,—As a constant subscriber to the *Builder* for the past twenty-five years, I venture to address you on the matter of steam-chimneys. Here, in the West of England, we have been in the habit of building our chimneys taper, that is to say, a chimney 130 ft. high would be 1½ ft. inside at bottom, and 3 ft. at the top. Some clients of mine are inclined to the opinion that the practice of building chimneys in this manner, though general among us, is wrong, and that the inside flue of a chimney should be the reverse, that is, larger at the top than at the bottom. Have any of your readers known chimneys constructed in this manner? If so, will they kindly give us, through your valuable journal, their experiences in this matter. Nil Desperandum.

, The question was discussed some years ago. We are satisfied ourselves that the present system is right.

STAINED GLASS.

Ashbourn.—A stained-glass window has lately been inserted in the west wall of the south transept of Ashbourn parish church, Derbyshire. The subject is "The appearance of our Lord after His Resurrection." The window has been executed by Messrs. Hardman for Miss Dalby, as a memorial of her brother, the late Mr. John Dalby.

Woodbridge.—A stained-glass window, to the memory of the late Mr. Thomas Temple Silver, has been placed in the parish church of Woodbridge, Suffolk. It contains three lights, the centre compartment representing Christ stilling the waves,—the Presentation in the Temple and the Good Samaritan being the subjects of the side lights. The window is by Ward & Hughes.

Edinburgh.—In St. Giles's Cathedral, Edinburgh, another window has been completed and fixed in the east wall of the choir, to the memory of Robert Smith, S.S.C. The design of the window illustrates the resurrection of our Lord; and this has been accomplished, not by attempting any actual representation of an event so mysterious and supernatural, but by a selection from the various scenes by which the resurrection was revealed to the Marys and the disciples. The inscription along the base of the window is—"In memory of Robert Smith, S.S.C. Born 1789; died 1875. Erected by his relatives and friends." The designs and execution are by Messrs. Ballantine & Son, and have been carried out under the direction of Mr. Robert Herdman, R.S.A.

Acton.—The large west window in All Saints' Church, Acton, is to be filled with stained glass, at a cost of 400*l*. The work has been entrusted to Messrs. Powell, Brothers, of Leeds, who have already painted the glass in the chancel windows.

Flimby.—The east window of Flimby Church has lately been filled with stained glass, by the Misses Walker, in memory of their parents, and brothers, and sisters. The several compartments on the two sides represent the Magi at the birth of Christ, His Baptism, Transfiguration, and Entrance into Jerusalem; while the central compartments represent the Crucifixion, Arising from the Dead, and the Ascension, all of which are beautifully and artistically pourtrayed.

Ipswich.—A stained-glass window has just been placed in St. Nicholas's Church, Ipswich, in memory of the late Mr. S. B. Jackaman, many times churchwarden of the parish. It is placed in the south chancel aisle, and is a three-light aisle illustrating the parable of the Good Samaritan. The first light shows the finding of the man who fell among thieves, wounded by the roadside. The Good Samaritan is lending his aid, while in the back-ground are the priest and Levite who passed by on the other side. The centre light shows the sufferer riding to the inn, his benefactor walking by the side of the animal and supporting him in the saddle, while the

* Somewhat similar schemes have been discussed in these pages before now.—Ed.

remaining light represents the arrival at the inn, and the payment to the host to give attention to the wounded one. In the tracery at the head of the window are vine branches with fruit. The window, the cost of which is about 100 guineas, is the work of Messrs. O'Connor & Taylor, 4, Berners-street, London, and has been inserted under the superintendence of Mr. R. M. Phipson, Mr. Chinnock, stone mason, doing the stone work.

Ovingham.—A stained-glass window has been placed in the south transept of Ovingham Church, in memory of the late Miss Mary Charlton, of Ovingham. The window is nearly 20 ft. high, and Early English in style. The design is arranged to exhibit three subjects in our Lord's history, namely, "The Agony in Gethsemane," "The Atonement on Calvary," and "The Burial." Between each group is rich foliage, and the general effect of the work is good. It was executed by Mr. Baguley, of Newcastle.

Gloucester.—The western window of the north aisle of Gloucester Cathedral, over the entrance to the cloisters, has recently been filled with stained glass, as a memorial of the late Mr. Thomas Churchus, of Clevedon. The window was originally of four lights, with tracery, but one half of it was blocked by the erection of the Dean's library. The new glass is by Clayton & Bell, and the subjects are the Entombment and the Resurrection of the Saviour, with figures of angels in the tracery, and in the uppermost light are flowers and a crown. The whole of the windows of the nave of the cathedral are now filled with stained glass.

Woodbridge.—A stained-glass window, to the memory of the late Mr. Thomas Temple Silver, has just been placed in the parish church, Woodbridge. It contains three lights. The centre represents "Christ stilling the Waves," and the two sides "The Presentation in the Temple" and "The Good Samaritan." The tracery is filled with sacred emblems and foliage. The window is by Messrs. Ward & Hughes.

Silchester.—A stained-glass east window has just been placed in the parish church, Silchester, by Mrs. Davis, of Silchester House, in remembrance of her late husband, Mr. Henry Newnham Davis. The subjects represented are "The Ascension," in the centre light; "The Marys at the Tomb," and "The Angel at the Tomb," in the side lights. The work was executed by Messrs. Clayton & Bell, of Regent-street.

Frome.—It has been decided to place a painted glass window in the chancel of Trinity Church, Frome, as a memorial to the late Rev. A. Daniel, first vicar of that church, whose ministry extended over a period of thirty-five years. The work has been entrusted to Messrs. Horwood.

Wiveliscombe.—A window in the north aisle of St. Andrew's Church has just been filled with stained glass by Mrs. Boucher, in memory of her husband, Mr. B. Boucher. The subjects are "Raising the Widow's Son," "The Crucifixion," "The Ascension," "The Resurrection," and "Receiving Little Children."

CHURCH BUILDING NEWS.

Oldberrow.—The parish church of Oldberrow, in the county of Worcester, dedicated to St. Mary the Blessed Virgin, has been re-opened. The living of Oldberrow has been for several generations in the possession of the ancient family of Peshall; and the old church having fallen into a great state of dilapidation, a new building has been erected on the old foundations, mainly at the expense of the present rector, the Rev. Samuel Peshall, M.A. The new church is built of Bromsgrove stone, with an old tower and spire. The interior is fitted with open seats in English oak, and a carved rood-screen. The designs are by Mr. T. Garner, of the firm of Bodley & Garner, and the work has been carried out by Messrs. Franklin & Son, of Deddington.

Twyford. — The insufficiency of the church accommodation afforded to the increasing population of Twyford, near Winchester, has been long felt, and a wish to restore and enlarge the ancient parish church was entertained by several parishioners; but, after consideration, this having been found to be impracticable, it has been decided to erect a new church on a site more conveniently situated for the parishioners, for which plans have been prepared by Mr. Waterhouse. Sir Thomas Fairbairn and Mrs. Waddington have each subscribed 1,000*l.* towards the building fund.

Winstone.—The ancient church of Winstone, on the Cotteswold Hills, half-way between Gloucester and Cirencester, which has been undergoing repair and restoration for some months past, under the direction of Messrs. Waller & Son, architects, has been re-opened. The church is very small, and consists of only a nave and chancel, with south porch, and small saddle-backed tower. The north and south doors are specimens of very interesting Norman work, as are also the chancel arch, the nave, and one of the north windows. One peculiarity of the building is, that there is no east window to the chancel,—a peculiarity also exhibited in one or two other churches in the same neighbourhood. The east wall was taken down and carefully examined for traces of a window, but none could be found. Upon the chancel arch and surrounding walls were discovered traces of early painting. Prior to the restoration, the chancel, the nave walls, and all the roofs were in a very dilapidated state. The nave roof has since been entirely stripped, and partly new-timbered; buttresses have been placed against the nave walls in several places to ensure their stability, and the chancel has been almost entirely rebuilt and re-roofed. The whole of the church has been re-seated and re-floored, and a new vestry built. The chancel-floor is covered with Godwin's tiles, and the church placed in good order throughout. The work has occupied five or six months, and has been effected at a cost of 800*l.* or 900*l.*

Swalecliffe.—The new church of St. John the Baptist, Swalecliffe, has been consecrated by the Archbishop of Canterbury. The new church has been erected on the exact site where at least two similar edifices have stood in times gone by, and stands at a short distance from the seashore. The exterior walls are of Kentish rag, with Bath stone dressings, while the roof, which is surmounted by a bell-cote, is covered with red and black tiles disposed in patterns. The interior, which is estimated to accommodate about 160 worshippers, is of red brick. The chancel is furnished with oaken benches, those in the nave being of deal, varnished. The pulpit is of Bath stone, with dwarf columns of marble. The lectern is of unpolished oak, and was given by Miss Karney, the sister of the rector. The roof of the chancel is panelled in wood, the panels being decorated with the sacred monogram, "I.H.S.," with crosses of various shapes, &c. The nave is open to the roof, the woodwork being stained and varnished. The floor of the chancel is two steps above that of the nave, the space within the communion-rail being raised still higher by two additional steps, and the whole is paved with Maw's tiles. The church has been provided with the organ from St. Mary Bredin's Church, Canterbury, which answers admirably. The total cost will be about 1,300*l.* Mr. Robert Wheeler, of Tunbridge Wells, was the architect; and Mr. Cephas Foad, of Whitstable, the builder.

Durham.—The ancient church of St. Giles, Durham, which dated from the time of Bishop Flambard (1099–1132), is now almost ready for consecration, having been rebuilt under the supervision of Messrs. Austin & Johnson, of Newcastle, architects. The cost is estimated at about 6,000*l.*

Godalming.—Plans for the completion of the restoration of the parish church of Godalming have been prepared by Sir Gilbert Scott.

Chalvey.—A contract has been entered into with Messrs. Wheeler, of Reading, for getting out the foundations, &c., preliminary to the intended alterations and additions to the parish church of Chalvey, Bucks. The sums at present paid or promised to the Improvement Fund amount to about 4,900*l.*, including a donation of 100*l.* from her Majesty the Queen. It is proposed to add to the present building a chancel, chancel aisles, and large transepts, to accommodate about 300 additional people. The present building will then be re-seated, and serve as a nave, until such time as it may be possible to build a new nave to harmonise with the portion that is now to be added. By this means seats will at once be secured for 1,000 people, the estimated cost being about 8,000*l.* Plans have been prepared by Mr. John Oldrid Scott. It is proposed to place a window in the church to the memory of the late Sir William and Sir John Herschel, whose former connexion with Slough is well known.

Huddersfield.—The foundation-stone of the new church of St. Philip, at Birchencliff, near Huddersfield, has been laid. The new edifice will be in the Geometric Decorated style; it will be built of stone, and is to seat 350 people. The total cost is estimated at 2,900*l.* The architect is Mr. J. N. Croft, Liverpool, and the following are the contractors:—Masonry, Messrs. Rhodes & Bates, Lindley; joiner's work, Messrs. Whiteley & Nephew; plumber's work, Mr. G. Garton; and slater's work, Messrs. Goodwin & Sons.

Moulton. — The memorial-stone of a new church at Moulton, dedicated to St. Stephen the Martyr, has been laid. The church is to accommodate 300 persons, in open seats, and in plan it consists of nave, chancel, organ-chamber on north side, vestry and porch on south side. It is being built of Macclesfield stone walling, with dressings from the Eddisbury quarries. The style is Early Gothic. The roof will be open-timbered, and covered with green slates. At the west end there will be a shingled spirelet for the bell. A commodious parsonage is being erected near to the Bee Hive Farm, adjoining the high road to Winsford. It is also proposed to erect new schools near the church. Mr. John Douglas, of Chester, is the architect, and Mr. R. Beckett, of Hartford, the builder.

Huntingdon.—It has been decided to restore St. Mary's Church, Huntingdon, at a cost of 1,300*l.* Mr. A. W. Blomfield has been entrusted with the work.

Chipping Norton. — The parish church of Chipping Norton has been re-opened, after restoration under the direction of Mr. Bruton, architect, Oxford. The whole of the clearstory windows have been taken out, and replaced where necessary; new stone has been inserted in the tracery, and throughout the whole rolled cathedral tinted glass has been substituted for the plain kind which was there before. In addition, the walls and pillars have been scraped and the wash removed.

Mildenhall.—The new church, dedicated to St. John the Evangelist, and situate in Aspal-close, half way between the hamlets of Beck-row and Holywell-row, near Mildenhall, Suffolk, has been consecrated by the Bishop of Ely. The style is Geometric Decorated, and the plan comprises nave, chancel, and south transept, with small lean-to vestry. The south porch is of open construction in wood-work, and the bell turret is also of wood, covered with oak shingle. The walls are substantially built, partly of flint, and partly of stone and brick, the latter being employed also in ornamental bands. The roof is covered with slates of two colours. The east window has three traceried lights, and the side windows are either coupled or single lancets with cusped heads; the glazing is in quarries of two tints. The roofs are of open construction. The walls internally are plastered, but ornamental bands of red brick are introduced at intervals. The seating at present is not completed, but when finished it is calculated that nearly 300 people may be accommodated. The architect is Mr. J. Drayton Wyatt, consulting architect to the Church Building Society of the Archdeaconry, and the entire work has been carried out by Mr. Wm. Edwards, of Mildenhall.

Hooton Roberts.—The parish church of Hooton Roberts, South Yorkshire, has been re-opened, after restoration. It is a very ancient church, there being traces of what is believed to be Saxon work in one of the old arches, and in April last, when the restoration commenced, it was in a very dilapidated condition. The church is a parallelogram on plan, and originally consisted of nave and chancel, with tower. It was built in the Early Transitional style, and a new Transitional arch and columns have been erected where formerly stood an arch of the same kind. A rough arch, plastered over, separated the nave from the chancel. This has been removed and placed in the south wall of the chancel, a wall having had to be broken through to receive it; this being about one of the first additions or alterations to the church, and at that time would answer as a chapel. The new Transitional arch has been placed as a proper chancel arch, and, considering the style of the building, it is one of the best features of the restoration. The church has been re-pewed with pitch-pine seats. The work has been carried out by Messrs. Waring & Stenton, of Doncaster, under the superintendence of Messrs. Wilson & Masters, of Sheffield, architects. When the plaster was taken off the wall, traces of several quaint old paintings were discovered.

Newcastle (Staffordshire).—The rebuilding of St. Giles's Church, Newcastle, is now nearly completed. The chancel arch is 45 ft. high by 24 ft. wide, and the east-end seven-light window is flanked by four chancel windows, north and south, of four lights each. The floor rises from west to east about 7 ft. Sir G. G. Scott is the architect, Mr. Clarke being the clerk of works.

TOBIN'S VENTILATION.

Sir,—In your publication of the 11th ult. appears a communication from Mr. T. Roger Smith, expressing his astonishment that the School Board for London should have paid me a sum of money for permitting them to make use of the system of air-inlets, which now bears my name, and wishing to add his testimony to the completeness with which he had anticipated what he is pleased to term my "so-called invention" in a school of which he was architect fourteen years ago at Clerkenwell, and winding up with the assurance that the matter might be carried back still further. I merely beg for space in your columns to increase that gentleman's astonishment by placing him, in my reply, on the horns of a dilemma, from which he will find it difficult to extricate himself.

If, as he alleges, he employed those inlets in 1862, their merits must have been but ill-appreciated by him; or else, why, ten years afterwards, build three schools for the London School Board, as he did four years ago, not only without inserting such inlets, but leaving those schools so defective in ventilation of any kind worthy the name that the architect to the Board is now obliged to apply my "so-called invention" to make good the shortcomings of Mr. Smith. But perhaps the most astonishing part of this gentleman's dilemma is the fact that, since writing you, he has acknowledged he cannot find the pearls he discovered at Clerkenwell, or give any explanation whatever of that which he terms my "so-called invention," never having made himself acquainted with it, so as to know anything at all about it. There are several gentlemen like Mr. Smith, who have been ventilating their vanities for some time at my expense in your columns, and to whom I shall have something to say at an early date. M. Tobin.

Miscellanea.

A Bibliography of Printing.—It is a curious fact that that art which is the principal medium for the diffusion of all other arts, and the literature which concerns them, should hitherto have been in possession of so meagre a record of the literature which more immediately concerns itself. The deficiency, however, we are glad to say, appears to be in a fair way of being removed. The *Printing Times and Lithographer*, we perceive, is devoting a portion of its columns to the "Bibliography of Printing," in which it proposes to give some account of all the works,—so far at least as they are accessible to the most diligent research,—which have ever been written in any European language on the noble art of printing, and any of its collateral branches, interspersed with numerous illustrations, portraits, and biographical notices of the authors who have produced them, their symbols and their mottoes, and any other information concerning them which it may deem interesting to its readers. Judging from what has already appeared, we should say that there is every probability that the *Printing Times and Lithographer* will worthily perform the arduous task which it has proposed to itself, and thus eventually produce a work which cannot fail to be interesting to every one connected with the profession, and of great utility to all future writers on the history of printing.

New Bridge over the Stour.—A new bridge over the Stour, between Stratford and Dedham, was opened on the 11th ult. It is a one-arch iron bridge of 80 ft. span, 13 ft. high above the water, and giving a roadway 20 ft. wide, and has been erected from plans prepared by the county surveyors of Essex and Suffolk, Mr. Henry Stock and Mr. H. M. Eyton. It cost something over 2,000*l.*, and is a substitute for an old pile bridge which was built eighty years ago. The Essex half was made 2 ft. higher than the Suffolk half, and consequently there had to be a slope in the curve, so as to make both ends meet in the middle, and the designers in preparing the plans for the new bridge, had some difficulty in dealing with the road on the Suffolk side. The contractors were Messrs. Saunders & Son, Dedham.

Bristol and Gloucestershire Archæological Society.—There are nearly 400 names enrolled in connexion with this Society. The inaugural meeting will be held during the Easter holidays, when the Society will be duly established.

The Royal School of Art Needlework.—The exhibition of specimens prepared by the Royal School of Art Needlework for the Centennial Exhibition at Philadelphia has proved a great success. The attendance indeed was so numerous as to prove embarrassing. Miss Wade, the manager, under whose care the school has advanced from its early crude efforts to its present high level as an art institution, had sufficient work on her hands to answer the numerous queries addressed to her. We were surprised not only at the beauty of the needlework as such, but at the skill with which a thoroughly artistic air had been communicated to the slightest productions. Needlework has advanced rapidly in the Royal School. Not only has the supervision of an efficient Art Committee been secured, but the actual designs of Mr. Walter Crane, Mr. William Norris, Mr. Pollen, Mr. Wade, and Mr. Aitchison, have been worked carefully out by the painstaking gentlewomen, who, it should be mentioned, are not pursuing art-needlework in a *dilettante* spirit, but as real work to be faithfully performed and duly paid for. The school has done its work so quietly that the public was astonished.

The late Mr. Samuel Redgrave.—Many of our readers will hear with regret of the death of this gentleman, brother of Mr. R. Redgrave, R.A. On retirement from official life he devoted himself to art literature, and was connected with several of our international exhibitions in having charge of the Fine Arts section. The Exhibition of Miniatures of the British School was got up by him, and the elaborate catalogue compiled by him; and the three annual exhibitions of portraits of distinguished personages, proposed by the late Lord Derby, were wholly carried out, and the catalogues compiled, by him. Of his literary works his "Guide to the Public Offices of the Country," published by Mr. Murray, was one of his earliest. His "Century of Painters of the English School" was written jointly with his brother. His "Dictionary of Artists of the British School" was wholly his own, and at the time of his death he was engaged in preparing for the museum at South Kensington a catalogue, with a preface, of the "Historical Collection of Paintings in Water Colours" in that museum.

Death of Mr. Mark Antony Lower, F.S.A. We regret to have to announce the death of Mr. Mark Antony Lower, whose numerous works in connexion with archæology, heraldry, and the history, biography, antiquities, and nomenclature especially of his native county,—Sussex,—are well known to antiquaries. Mr. Lower died at his residence at Enfield, Middlesex, on the 22nd ult., after an illness of several months' duration, in his sixty-third year. He thus only survived by a few months his colleague in the work of founding and carrying on for many years the Sussex Archæological Society, Mr. William Durrant Cooper.

Somersetshire Archæological and Natural History Society.—A special general meeting of the members of the above society was held at Taunton Castle, on the 17th ult., when it was resolved to purchase a house and garden adjoining the castle, at the sum of 460*l.* Mr. Surtees, on behalf of the trustees of the Jones Memorial Fund, announced that it was proposed to devote the amount subscribed for that purpose towards the purchase of this property, and several additional subscriptions to this fund were announced in the room. An application for a lease of the Castle Hall and grounds for the purpose of a skating-rink was declined.

New Infants' School, St. John-street-road.—The new infants' school in connexion with the Martyrs' Memorial Church is now open and in full operation. It is designed to harmonise with the style of the adjoining church, and is lighted chiefly by skylights and dormer windows on account of the circumscribed nature of the site. The walls are all faced internally with white pressed bricks, tuck pointed, and the roofs are boarded with wrought and chamfered rafters, and covered with felt. The architect is Mr. J. C. Hukins, of Westbourne-grove, and the builders are Messrs. Stainer & Son, of Great St. Helen's.

Institution of Surveyors.—At the ordinary general meeting, on March 20, a discussion (introduced by a paper by Mr. E. Ryde) took place upon the provisions of the new Valuation Bill introduced into the House of Commons, and was adjourned to the next meeting. The next meeting will be held on Monday evening, April 3, when the discussion on the new Valuation Bill will be resumed.

Byland Abbey.—A movement is on foot to explore the remains of Byland Abbey. Major Stapylton, the owner of the ruins, has consented to their examination by Mr. Edmund Sharpe, and the council of the Yorkshire Archæological Society is endeavouring to raise a special fund for the purpose of putting the whole ground occupied by buildings or the traces of foundations into the same state of order as that which renders Fountains and Jervaulx so interesting. The walls of the north aisle of the nave are still standing, as well as the greater part of the west front, the south-east corner of the south transept, and portions of the north transept and east end, but the whole of the cloisters and conventual buildings have perished.

The Oxford Carpenters and Joiners.—A meeting of the Oxford carpenters and joiners was held on the 21st ult., at the Chequers Inn, High-street, for the purpose of hearing a report from the committee, respecting the answers received from the masters, who had been asked to give an additional 1d. per hour to those in their employ; and also to decide upon what course to pursue towards those who had not complied with the request. It was unanimously resolved to induce, by legitimate purposes, all masters to give that which the majority have willingly conceded.

The Gentili Memorial.—At a meeting of the Gentili Memorial Committee, held on the 21st ult., at the house of its chairman, Sir Robert Phillimore, it was resolved:—1. That a monumental tablet be erected in the church of St. Helen's, Bishopsgate, where Gentili was buried. 2. That Gentili's principal work, the "De Jura Belli," should be reprinted, under the supervision of Professor Holland, at the Oxford University Press. 3. That another meeting should be held later to decide upon the use to be made of the residuary balance.

The Dundee Painters.—A dispute has arisen between the Dundee operative house and ship painters and their employers, regarding a demand for a rise of ½d. per hour after the 1st of April. The masters have resolved not to grant the increase, and to look out the men on Saturday should they insist on their demand. On the 23rd ult. a mass meeting of the painters was held, and it was resolved to insist on the demand.

The Carlisle Joiners.—On the 23rd ult. a meeting of the master joiners of Carlisle was held to consider a demand of their men for an advance of ½d. per hour in their pay. At present the wages are 6½d. per hour, and the men want to have 7½d. After consideration, the masters agreed to offer 7¼d. an hour, or an advance of a halfpenny an hour. The masters also determined to form themselves into a protection society, and appointed a committee to arrange the preliminaries.

The Sunday Society.—A report read at the first annual meeting of the Society, held lately, has been published by the Sunday Society, 1, Adam-street, Adelphi, and will be read with interest. The object of the Society is to obtain the opening of museums, art galleries, libraries, aquariums, and gardens on Sundays. The Society, under certain restrictions, has our entire sympathy. Mr. James Heywood, F.R.S., is president for the first year, and Mr. Mark H. Judge the honorary secretary.

The Royal Horticultural Society.—The Council, being desirous of extending a knowledge of practical horticulture, contemplate the foundation of lectures and demonstrations on the subject. Their intention is to have lectures delivered by properly qualified instructors, in the Society's Hall, at South Kensington, and to give practical instruction in the garden at Chiswick.

The Strike of Masons and Bricklayers at Newcastle.—A meeting of the Master Builders' Association was held on the 23rd ult., at the Mechanics' Institute, New Bridge-street, Newcastle, to consider the state of affairs in connexion with the strike of masons and bricklayers, and after a short conversation it was again unanimously decided to withstand the demand made by the workmen.

Fall of Stairs.—Whilst a number of workmen were engaged in building a house in Thistle-street, Glasgow, the stairs, which reached to the fourth story, suddenly gave way, throwing four of the men from a height of 50 ft. to the ground. One of them was killed on the spot, and the others seriously injured. The contractor for the building is in custody pending an inquiry.

New Town-hall at Annan. — On the 20th ult. the foundation stone of a new town-hall for the burgh of Annan was laid by Mr. Robert Jardine, of Castlemilk. The building is in the Scottish Baronial style, and besides a large hall for courts and council meetings, will contain a number of offices, &c., for the burgh officials. The building is designed by Mr. Peter Smith, architect, Glasgow, and is estimated to cost fully 3,000*l.*

Partial Employment of Clerks of Works. In the case Farmer *v.* Richards (see p. 295, *ante*), the Court of Queen's Bench has granted a rule to set aside the verdict.

Grantham.—On Monday last Mr. Sidney G. Gamble (of the Borough Engineer's Office Leeds,) was unanimously elected Borough Surveyor to the Corporation of Grantham.

The Trustees of Sir John Soane's Distressed Architects' Fund met last week at the Museum and distributed the dividends which had accrued during the past year.

TENDERS

For erecting a town residence, at South Kensington, for Mr. J. E. Boehm. Mr. Walter Graves, architect. Quantities supplied: -

Scott	£6,757 0 0
Pritchard	6,161 0 0
Langmead & Way	6,000 0 0
Stimpson & Co.	5,500 0 0
Hook & Oldrey	5,423 0 0

For the erection of a Girls' Industrial School at Sale. Mr. Henry R. Price, architect. Quantities supplied:—

Ward	£5,700 0 0
Webster	4,767 0 0
Southern (accepted)	4,495 0 0
Napier	4,450 0 0
Holt	4,444 0 0
Head	4,298 0 0

For the erection of a gymnasium and lecture-hall at Manchester. Mr. Henry R. Price, architect. Quantities supplied:—

Neill & Sons	£4,810 0 0
Thompson	4,597 0 0
Webster	4,320 0 0
Holt	4,219 0 0
Southern (accepted)	4,295 0 0
Haynes	4,119 0 0

For various painting works to Blackfriars Bridge, for the Corporation of London. Mr. Horace Jones, architect:—

Macintosh	£3,890 0 0!
Holland & Hansen	2,983 0 0
Taylor	2,688 0 0
Pitman & Cuthbertson	2,218 0 0
Smith & Sons	1,979 0 0
Harrisson & Wood (accepted)	1,944 0 0!

For four semi-detached villas (in two blocks), at Bromsgrove, for Mr. William Bennett. Mr. John Cotton, architect. Quantities supplied:—

Harris	£1,993 0 0
Cook	1,918 0 0
Brazier & Weaver (accepted)	1,830 0 0

For a play-shed at the Grammar School, Bromsgrove, for Mr. Herbert Millington. Mr. John Cotton, architect. Quantities supplied:—

Cook	£349 0 0
Brazier & Weaver*	306 0 0
Widdowson & Lerrigo	305 0 0
Read	300 0 0

* Accepted, after revision and reduction, at 250*l.*

For new board school and residence at Bexley, near Redditch. Mr. John Cotton, architect. Quantities supplied:—

Widdowson & Lerrigo	£1,818 0 0
Hemming	1,802 0 0
Johnson	1,796 0 0
Brazier & Weaver	1,624 0 0
Collins & Cullis (accepted)	1,475 0 0
Clark & Smallwood*	1,460 0 0
Hughes & Sons	1,430 0 0

* Levelling and gravelling play-grounds not included.

For the erection of School of Art & Science on the Grand Parade, Brighton. Mr. John George Gibbins, architect.—

	Separate estimate.
Newman	£6,993 0 ... £300 0
Howard	6,970 0 ... 263 0
Bruton	6,687 0 ... 240 0
Barnes	6,612 0 ... 270 0
Chappell	6,550 0 ... 150 0
Cheesman & Co.	6,180 0 ... 180 0
Patching & Webber	6,350 0 ... 275 0
Reynolds, jun.	6,298 0 ... 238 0
Lockyer (accepted)	6,150 0 ... 220 0

For billiard-room, additions and first portion of alterations to Kearsney Abbey, near Dover, for Mr. F. L. Barrington. Mr. H. H. Collins, architect:—

Parker, Ayres, & Son	£4,072 0 0
Matthews	3,971 0 0
Adcock (accepted)	3,795 0 0

For the erection of two chapels, lodge, mortuary, and boundary fencing, at Wimbledon Cemetery. Mr. Banister Fletcher, architect. Quantities by Mr. Waghorn:—

	Stone walls.	Additional front fencing.	Deduct if faced with brick.
Crockett	£4,836 0	... £315 0	... £30 0
Turner & Endersen	4,630 0	... 810 0	... 112 0
Niblett	4,343 0	... 770 0	... 135 0
Kirk	3,997 0	... 750 0	... 50 0
Prout	3,939 0	... 739 0	... 55 0

For new Baptist chapel, school, vestries, &c., Westbourne Park-place, Paddington. Mr. J. Wallis Chapman, architect:—

	If pitch-pine seating.	If wainscot recess.
Batley	£8,950 0 ... £190 0 ...	£84 0
Hook & Oldrey	7,953 0 ... 100 0 ...	153 0
Gould & Brand	7,700 0 ... 79 0 ...	20 0
Staines & Son	7,480 0 ... 100 0 ...	150 0
Stephenson	7,467 0 ... 137 0 ...	118 0
Niblett & Son	7,395 0 ... 115 0 ...	195 0
Braid & Co.	7,100 0 ... 63 0 ...	62 0
Tarrant & Sons	6,980 0 ... 162 0 ...	107 0

For house and stabling and additional story to warehouse, for Mr. H. G. Grant, London Fields. Mr. E. C. Homer, architect. Quantities by Messrs. J. & A. E. Bull:—

	House, &c.	Warehouse.
Dabbs	£1,275 0 0	£597 0 0
Bangs	1,220 0 0	580 0 0
Watts	1,239 0 0	493 0 0
Sheffield	1,236 0 0	545 0 0
Staines & Son	1,223 0 0	553 0 0

For the construction of pipe-sewers, with manholes and other works, for the Stroud Local Board of Health. Mr. W. H. C. Fisher, engineer:—

Cowdery & Sons	£840 8 0
Croxford	609 0 0
Everist	597 0 0
Savage	578 0 0
Bendall	560 0 0
Haynes (accepted)	524 10 0

For building three houses at Cologne-road, St. John's-hill, Wandsworth, for Mr. G. F. Mackley. Mr. W. Bradbear, architect:—

Shurmer	£1,513 0 0
Steel, Bros. (accepted)	1,498 0 0

For erecting mission-hall at The Crescent, Hanger-lane, Tottenham. Messrs. Lamb & Church, architects:—

Hicks	£635 12 0
Coldwell	624 10 0
Shurmer	602 0 0
Steel, Bros. (accepted)	550 0 0

For alterations to the Cock Tavern, Old Town, Clapham, for Mr. G. Aldridge.

Mills	£185 10 0
Lathey, Bros.	153 0 0
Lacy	145 0 0
Howse	135 0 0
Borrie (accepted)	127 0 0

For alterations and additions to a warehouse, St. Andrew's-hill, for Messrs. Swinbourne & Co. Mr. Robert J. Worley, architect:—

Croker	£503 0 0
Falkner	475 0 0
Abrahams	438 0 0
Rudkin	373 0 0
Smith (too late)	348 0 0
Beeton	332 0 0

For extra story and alterations to a warehouse, Upper Thames-street. Mr. Robert J. Worley, architect:—

Croker	£670 0 0
Abrahams	661 0 0
Falkner	628 0 0
Rudkin (too late)	610 0 0
Smith (accepted)	519 0 0

For a Primitive Methodist Chapel, Newbury, Berks.

Whiter	£4,040 0 0
Sargent	4,031 0 0
Dover	3,590 0 0
Elliott	3,533 0 0
James	3,103 0 0
Lock	2,760 0 0

For new Primitive Methodist Chapel, Newmarket-road, Cambridge. Mr. Wm. Ranger, architect:—

Bell & Son	£3,997 0 0
Rutter	2,785 0 0
Richardson, Bros.	2,445 0 0
Redding & Sons*	2,230 0 0

* Accepted provisionally.

For new Wesleyan Chapel, Marple, Chester. Mr. Wm. Ranger, architect: -

Bowden, Bros. (accepted)	£1,070 0 0

For addition to No. 107, Charlotte-street, Fitzroy-square, for Mr. Abrahams. Messrs. Stewart & Robertson, architects:—

Mawson & Berrycloth	£386 0 0
Lamble (accepted)	349 0 0

Accepted for a pair of semi-detached houses in the Bulmershe-road, Reading, for Mr. G. Harris. Mr. W. Ravencroft, architect:—

Excavator, Bricklayer, Slater, Mason, and Plasterer.

Strong, Bros.	£727 10 0

Carpenter and Joiner.

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For mortar-mills, mixing and other machines at Aylesbury Sewage Works, for the Native Guano Co. Mr. T. W. Grindle, engineer:

Wurr & Lewis (accepted).

For Board schools and residence at Tadley. Mr. James H. Hoore, architect:—

Musselwhite, Bros.	£1,790 0 0
Gregory	1,519 0 0
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Crook	1,479 0 0
Elliott	1,462 0 0
Pelham & Tigwell	1,425 0 0
Clements	1,390 0 0
Lock (accepted)	1,236 7 0

For the erection of a new coal-store and landing-stage at the works of the West Ham Gas Company, Stratford. Mr. Edwd. H. Thorman, architect:—

Munday	£2,425 0 0
Perry & Co.	2,379 0 0
Ennor	2,360 0 0
Bangs	2,350 0 0
Rivett (accepted)	2,318 0 0

For pumping and engine-house, pumps, pier-walls, &c., at the Deptford-green Dock. Mr. E. C. Homer, engineer:—

Walker & Co.	£2,545 0 0

For quay-walls at Deptford-green. Mr. E. C. Homer, engineer:—

Carter	£389 0 0

For finishing four carcasses, at Grove-road, Hammersmith. Messrs. Newman & Billing, architects:—

Seale	£2,393 0 0!
Brown	1,887 0 0
Slade & Son	1,740 0 0
Johnson	1,689 0 0
Hey	1,483 0 0
Blackmore	1,470 0 0
Bartlett	1,445 0 0
Brass	1,383 0 0
Hill	1,336 0 0
Sharp & Marsh	1,300 0 0
Dickson	1,137 0 0
Brown	1,055 0 0!

Chapel, &c., Westbourne Park place. In list of tenders last week, for "Garrett & Son" read *Turrant & Sons.*

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S. B.—L.—W. P.—M. D.—C. F.—J. R.—H. St. J.—Col Y.—C. E. F.—W. W.—S. Bros.—J. W.—W. H. C. F.—W. B.—R. M. & Co.—S. & S.—J. G.—E. H.—H. M. G.—J. G. C.—D. M.—W. & L.—T. & Sons.—T. L. D.—B. F.—S. R. L.—W. R.—O. W. D.—W. H. H.—J. D. R.—K. K. K. (should learn his own deficiencies and apply himself in those directions).—J. M. A. (next week).—A. W. R. (next week)

We are compelled to decline pointing out books and giving addresses

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO ADVERTISERS.

GOOD FRIDAY.

"THE BUILDER," for the week ending APRIL 15th will be published at ELEVEN a.m. on THURSDAY, 13th instant. Advertisements for insertion in that Number must therefore reach the Office before THREE p.m. *on WEDNESDAY, the 12th.*

Advertisements cannot be received for the current week's issue later than THREE o'clock p.m. *on THURSDAY.*

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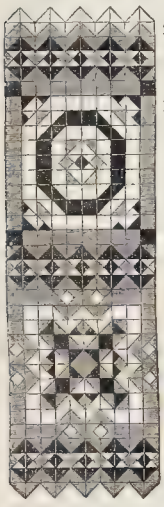
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The Persian Collection at South Kensington.

IN Thursday there was opened to private view, at South Kensington Museum, a collection of no small richness and interest, which has been in process of formation for some three years, and is, even now, not entirely complete, as a considerable number of specimens are still on their way, though the bulk of the collection is now arranged in the space allotted to it, in the north cloister, parallel to and beyond the refreshment-room corridor. The collection, as our heading implies, is illustrative of the art of Persia, and may be said to have grown to its present extent by a kind of "composition and resolution of forces" in collecting. Persian art has been, of course, represented at South Kensington, to some extent, for a good while past; and when Major Murdoch Smith, some little time ago, returned from a Government mission in Persia, and, having paid considerable attention to the art of the country during his visit, inspected the Persian objects at South Kensington, he succeeded in convincing the authorities there that what they had *not* got was much more the object of remark to a traveller acquainted with the country, than what they had; though this included some admirable articles forming important items in the new collection. One result of this was, that Major Smith was authorised, on revisiting Persia, to purchase, to a certain rather limited extent, on behalf of South Kensington. The gallant major, however, made such excellent use of the trust thus imposed upon him, and showed so good and in every way valuable a return for the funds entrusted to him, that his commission, from being limited, speedily became practically nearly unlimited. While the major was thus, in a double sense, serving his country abroad, M Richard, a French gentleman, who had been long in Persia, and had formed a large collection, hearing that South Kensington was interesting itself so much in Persian art, offered his collection for sale, preferring to realise rather than have the trouble and risk of conveying it home himself. Some other privately collected articles also came into English hands in a similar manner. The difficulty and risk of conveying these articles to England have been considerable, and breakages on the way have been numerous enough, in the porcelain and earthenware department, to keep a man in employment riveting for two months. However, these difficulties have now been fairly surmounted, and a large and well-arranged collection is added as a new attraction to the great establishment at South Kensington, now under the able control of Mr. Cunliffe Owen.

The main divisions of the collection are porcelain and pottery, metal work, and textile fabrics; there are also to be seen specimens (very fine ones) of wood carving, arms and armour, painting, illuminated manuscripts, and musical instruments. These latter sections, however, are less numerous and less fully illustrative than the first-named three departments; or, in regard to one or two of them, there is perhaps less to illustrate. The objects of ceramic art are arranged in cases down the centre and south side of the room, and the textile fabrics in cases against the north wall, opposite the light. Looking first at the pottery work, we find at the top of the room a collection of fragmentary wall-tiles, with inscriptions on a large scale, evidently forming portions of ornamental "strings" in buildings, and at once recalling the similar use of tiles in Arabian and Moorish, indeed in Saracenic architecture generally. The close connexion between Persian and Arabian art is manifest, in fact, in a great deal of the work here, the metal work especially; while the wood-carving and inlay have equally close relations with Indian work. To proceed, however, with our examination of the pottery: this may be divided, as far as process of manufacture goes, into two main classes,—that of which the basis is coarse earthenware, with an enamel poured over it, and that which partakes of the nature of porcelain, is translucent or semi-translucent, and glazed. Some of the latter, the specimens of which are chiefly in the side cases, shows a characteristic treatment in the shape of pierced ornament, in which the glaze is left, and forms a transparent filling to the piercings, with a rather unusual and pretty effect. A distinct style of ornamental effect in a good many of the specimens at the upper end of the room is that which consists in giving a metallic lustre to the ornamental design, or to the surface generally. A large proportion of the objects exhibited, however, are in a style strongly resembling Chinese ware, with designs in strong blue on a white ground. Their Chinese origin, in regard to style, is further indicated by the presence of Chinese letters and inscriptions, used ornamentally, and apparently copied by the Persian workmen. This class of ware is the best executed; but our admiration for it, in regard to artistic quality, is not on a par with that expressed in the hand-book written by Major Smith for the museum authorities. Its decorative effect, regarded as a class of objects for adding to the combination of colours in a room, is very good. Its artistic qualities, when considered more minutely as decorative design *per se*, are not of a high type. The great admiration for this sort of ware at present is, in fact (though we shall probably scarcely be pardoned for saying so), a good deal an acquired, we will even venture to add, an affected taste. What enthusiasts for this style of ware mean by talking of the "admirable drawing" of the designs we do not pretend to understand, since it is mostly such as would be laughed to scorn (we hope) if committed by any pupil in the Art Department. A good many of the objects classed by Major Smith as of an inferior and declined style in the art, are so in regard to mode of execution and richness of surface and tone perhaps, but are superior, as design, to the earlier specimens. We may mention the three large rice-bowls side by side in one of the cases, one of which is engraved opposite page 12 of the Hand-book. The centre one of the group, however, is finer and more original than the one engraved; but all are superior in point of design to a good deal which is put in advance of them in the Hand-book. In the earlier work, in fact, the execution and the material are better; in the later work the design is better. The large flattened pear-shaped vase, with a modern chased brass top, in one of the side cases, strikes us as one of the best objects here; it is decorated in red and blue design, and there is some other work in the same style in this case. Some jars, called "Siculo-Arabian" work, in one of the centre cases, with mixed tones, including a rich brown, are very effective as combinations of tone, and with a coarse vigour in the design of the ornament. But in the main we regard this collection of pottery rather as a highly interesting historic and illustrative exhibition, than as furnishing much matter for instruction to the modern artistic mind, except merely as a matter of trade, and as long as the pottery mania lasts. In one respect, indeed, Persian is shorn of a glory, in the recent arrangement and classification of her pottery at South Kensington. The style of free-flowing leafage decoration, in fine colour, displayed on the surface of large circular plates and dishes, which has been long counted as Persian work, and is really fine, has been discredited as Persian during the recent fuller investigation of the subject, and is now separated from the Persian section, and classed as "Rhodian." There is nothing in a name; but this work, even in the specimens shown at South Kensington (and they are by no means the best we have seen) is far superior in artistic effect and suggestiveness to anything classed as Persian pottery in the new collection; and to prefer the Persian blue and white to this, as a matter of art, is simply collectors' bigotry.

We come now from the pottery to the metal work, and here we may indulge in admiration freely. The style here, as before remarked, is essentially what we have been accustomed to consider as Arabic. It consists mainly of delicately relieved or incised geometrical design, or design which, when not obviously geometrical, is formed on a geometric basis. The general shapes of the articles here are mostly as good and artistic as the detailed design; some of them, such as the ewers, are familiar and often repeated forms; others are less familiar, and there

is much greater variety of design in regard to general form than among the pottery. An extraordinary specimen is a brass figure of a peacock, conventionally treated, with outspread tail; the whole surface is covered with minute ornament, and the breast bears an embossed face forming a symbol of the sun, with rays round it. Among objects showing very minute ornamental work, some small circular plates, a little larger than a crown-piece, and used as talismans, may be mentioned; and two of the finest specimens of this class of work are the two large circular trays in an adjoining case, in which the decorative work is of the highest and richest type. These formed part of the former Persian collection; and we may mention that the two were purchased for 8*l.*, an extraordinarily low price, and far beneath their real value; which we may take, perhaps, as an indication that, in spite of occasional grumblings about expenditure, South Kensington is no such extravagant place after all. In regard to the Persian collection, at any rate, it would seem to us that much more than money's worth has been secured, taking the aggregate of the whole. Before quitting the metal work, which, in fact, deserves far more than the few words which time and space permit us to bestow on it, we remark on the great beauty of the case of zinc-work and tinned copper, placed near the principal cases of brass work, and forming an effective contrast to it. We may also observe that in instances where metal work of the present day is placed in juxtaposition with old work, it is remarkable how much the modern Persian artist keeps up the style and feeling of the old work, so that there seems little to choose between them. The Persians will soon get over that, however, when their communication with Europe becomes closer and more constant, and they, like the Japanese, will take to Europeanising just as earnestly and systematically as a good many Europeans have taken to Japanising. It is a real pity, however, that in the progress of intercommunication the originality and individual character of national arts should continually be absorbed and destroyed; but it is apparently a result we must count upon, and which no power can prevent: good reason for making representative collections of such arts while they are still to be found in their real life and vigour.

The woodwork represented here brings us, as we remarked, very close to India, and in regard to the inlay, that style of delicate minute Geometric work in ivory inlay, we are disposed to say that the fine examples here are superior to most, if not any, Indian work of the kind that we have seen; equal in execution, and superior in fancifulness of arrangement. The case of sherbet-spoons, entirely cut, except the bowl portion, in the most delicate and almost lace-like openwork carving, of beautiful design, is a thing to hold up one's hands over. Among specimens which may be classed with wood-carving is a dervish's wallet, consisting of a double cocoa-nut shell elaborately carved in relief; the material is quite black, and looks like ebony carving. This is nineteenth century, and certainly as far from our usual ideas of nineteenth-century work as anything could be. Among the illuminated books which are placed near here we are more taken with some of the older and less gaudy than with the later specimens. There is one copy of the Koran ascribed to the tenth or eleventh century, with each line of writing separated from the next by an interspace defined by a thin blue line, and in which interspace a circular gold seal or symbol is stamped here and there at irregular intervals: the effect is unusual and piquant.

Looking at the textile fabrics, which constitute one of the most important portions of the collection both as to quantity and quality, we observe that the distinction between modern and old work is more discernible in these than in the wood and metal work. Some of the newer fabrics, carpets, &c., are too raw and pronounced in colour, and in this respect cannot compete with contemporary Indian work. The first thing we notice, returning the reverse way up the room, is the beautiful though simple work on a linen veil in a small case; a little panel, so to speak, of delicate open-work in it, has a charming effect. The various "prayer-carpets" shown here are very good in colour, design, and workmanship, and show all the same characteristic of the representation of a Saracenic foliated arch with diaper ornament in the spandrels over it. This evidently simulates or recalls the gateway of the mosque; and it is curious to compare this with the precisely analogous habit in modern England of decorating articles in connexion with devotion—hymn-books, prayer-books, &c.—with suggestions and imitations of bits of church furniture. One of these prayer-carpets, one of the largest and richest here, has in addition two open or uplifted hands embroidered on it, as if symbolical of devotion. We notice as we pass up the row of cases, in one of the smaller ones, "a tunic for a lady," early seventeenth-century work; the exterior a diaper of leaf-shaped forms something like a Cashmere shawl on a small scale, and with most rich colour and minute work; the lining consists of an orange ground powdered with sprigs. A more picturesque and beautiful costume to set off a dark Eastern beauty it is impossible to imagine: the image of the "dark-lidded Persian girl" in such a setting as this is one to turn the head equally of the artist and the man, even in imagination. Among the further beauties of this part of the collection are some very fine (modern) carpets in white quilted cotton with a flowing foliage design over them in green, with coloured, mostly scarlet, blossoms; the lines of these designs are admirable for freedom, and the colour effect of the whole excellent, though too light and too easily soiled for our notion of carpets. Some of the best stuffs here, and the richest and most characteristic in style, are the pieces in diagonal patterns which form what was mostly used, in the old Persian costume, for what would have been the ladies' petticoats had they been Europeans; but which, not being petticoats, are unmentionable. They serve to show what a rich profusion of colour a Persian drawing-room must have displayed in the days "of good Haroun Alraschid." But the love of the Persians for fine dress, in both sexes, dates from long before the time even of that worthy. There is a passage in Xenophon, if we remember rightly, narrating how in an engagement, the Persian soldiers, in obedience to some order, jumped down into the mud "in their embroidered trousers." As to the paintings ranged above the fabrics, mostly portraits of Persian ladies, they are bad enough in regard to form, but show very good and minute treatment of decorative details of dress, &c. The best bit of figure-work we noticed in the collection is in the two small paintings of the Virgin and Child on a couple of minor frames in a case at the west end of the room; these have the air, however, of being an attempted imitation of European painting.

We are asked to mention, and willingly do so, that besides the special private view by invitation on Thursday, this day (Saturday) is specially set apart for the first visit of students of district art-schools to the collection; the first time that such a special recognition has been made, on such an occasion, of a class of visitors to whom any new work of this kind should be specially interesting.

In concluding our remarks we may just observe that the expense gone to in making such large additions as this to our great art museum is not one to be grudged because part of it comes indirectly from the pockets of some who may, or think they may, never reap any benefit from it. Not only does the artistic taste of the whole country benefit in the end by an establishment which affords such opportunities of study, but much is done to make the provinces direct sharers in this benefit, by lending objects for a certain term (three months) to provincial art museums and exhibitions. Some of our readers will be surprised to learn that, during last year only, 10,000 objects were lent to thirty-nine different localities. Surely such a statement is sufficient to take away one weapon at least from the hands of those disciples of an over-acted economy, who, if they could, would reduce art itself to a matter of £. s. d.

MICHELANGELO AS AN ARCHITECT.

Consideration of space compelled us to break off our previous notice of Mr. Heath Wilson's "Life of Michelangelo" before giving any attention to the portion of the volume which refers to the artist's work as an architect.* In resuming the consideration of the "Life" at this point, it must be admitted that it is not in his architectural achievements that Michelangelo was most successful. At the same time, this phase of his career is one which could not possibly be passed over in these columns as of only secondary interest.

In connexion with this part of the subject, we may here call attention to the fact that the *Gazette des Beaux Arts* of January contains a brief but excellently-written article by M. Garnier, the eminent architect of the Paris Opera-house, on "Michel Ange, Architecte." The critical judgment there expressed is pretty much the same which, as we think, every competent and impartial critic must in the main adopt in regard to the work of Michelangelo as an architect. M. Garnier, contributing to a number of the *Gazette* which was entirely devoted to Michelangelo, laments, in fact, the invidious position in which he is placed, in being the only contributor to that number who cannot freely indulge in enthusiasm, but is compelled instead to adopt the tone of an apologetic critic. The ordinary triad of attributes, "painter, sculptor, and architect," assigned to Michelangelo, conveys, as he observes, a false impression to the unthinking reader, as if the master's achievements in these three arts were to be "bracketed together" as of equal greatness and importance; whereas in fact the artist, perfectly at home in the details of sculpture and painting, in the accurate knowledge of the anatomical construction and minutiæ of the figure, was, when he came to practise architecture, in the position of a man with grand ideas, but with too little knowledge of the structure of the language in which he wished to express them, to do himself any real justice. "It would seem," says the French architect, "as if he sketched out, in accordance with his first general conception, the main lines of a grand composition, and then wrote upon it almost arbitrarily, at various points, 'Here one may have a cornice,' and 'Here put a capital'; and so the cornice and capital are duly put in their respective places." It is a just remark, also, of M. Garnier, that the violence and abruptness of design, almost in defiance of natural principle, which is a defect in some of his figures, becomes the origin of more serious defects in his architectural design, where symmetry and mechanical conditions of construction have so much more importance; and that it leads in this case to "*ruptures d'équilibre si abnormales que les sensations en restent profondement troublées.*" This is a perfectly just judgment as far as it goes, and the whole tenour of M. Garnier's criticism is, abstractedly considered, almost unanswerable. At the same time, it must be said that the great importance of the building the completion of which was Michelangelo's crowning effort as an architect, has given it an interest scarcely second to that of the Sistine Chapel; and in considering the artist's efforts as an architect, it must be borne in mind that he took up this branch of art late in life, and that even with the small practice he had, the details of his later work show a marked improvement upon his earlier, as is evident enough if we compare the original design for the façade of San Lorenzo with that for the dome of St. Peter's; and there seems little reason to doubt that, could he have lived to pursue architecture further, and to have time and opportunity for more systematically studying it, he would have brought it under his control as successfully as he did the art of painting, in which he declared himself quite a novice when he undertook the Sistine frescoes.

Of some of the original architectural sketches of Michelangelo, copies of one or two of which are engraved by Mr. Wilson, it is to be observed that they not only are not ostensibly drawn to scale, but that there appears to be a degree of oversight as to the proportions of the parts to the eye. The proposed design for the front of San Lorenzo (p. 212), from a drawing in the Buonarotti archives, seems put together in a most random fashion. The sketch for part of the monument of Julius II. (p. 74) is even more like what we should at present take to be the work of a young pupil, so far as the architectural detail is concerned. This was earlier work still. On the other hand, the drawing for the entrance door in the Laurentian Library (p. 309), which was much praised by the Pope, is not deserving of all the censure bestowed upon it by Mr. Wilson, if, as we suppose, his remarks refer to the drawing which he engraves. The columns are, indeed, weakly designed, but the "trabeation" is certainly not "of the heaviest kind" or "literally gigantic in its parts"; on the contrary, the whole is in very good balance. It is difficult, however, to tell whether the author, who is rather confused in his references to his illustrations, is speaking of the doorway as executed, or of Michelangelo's drawing as intended. If the actual design deserves all his strictures, it is clear that the fault was not entirely with Michelangelo, whose own drawing shows a well-considered proportion, and is cer-

* See p. 301, *ante*.

tainly in advance of the previous architectural drawings of which illustrations are given.

That Michelangelo, in addition to the title of "architect," might at one time have borne that of "contractor," is less generally known. But it is evident that his enforced occupation at Carrara in 1517, in connexion with the San Lorenzo scheme, was really that of a contractor looking after building materials, and the "getting out" of stone for the various portions of the work. Ignominious as such an employment seems for such a genius, it is not improbable that the author is correct in supposing that during this period, when he was forced to give his attention to the practical consideration of working drawings, and of fitting the blocks for the intended construction, Michelangelo gained a good deal of experience, which was subsequently to prove of value to him in his great work at St. Peter's. The selfishness with which this great genius was turned, first by one Pope, then by another, to be a mere worker-out of schemes for their own glory, though it resulted in exalting the artist far above his so-called patrons, is a fact to be taken account of in forming a conception of the conditions under which Michelangelo had to work. Pope Clement wanted to keep the artist entirely to himself; and hearing that he was besieged with commissions from others for paintings, said "Let him stick a brush between his toes and make four marks and say 'there is a picture,'" and sent him a brief ordering him to undertake no work for any one else on pain of excommunication, which was to furnish him a valid ground for declining all commissions from other quarters. Such was the Papal method of patronising a great artist.

Coming to the great architectural work of Michelangelo, Mr. Wilson observes that the drawings by the various architects successively employed on the structure, a good many of which are preserved in the Uffizi gallery, convey the idea that each had considered, not how he could carry out his predecessor's idea, but how far he could alter it. This showed a deficiency in artistic morality, no doubt, but it is characteristic of the restless and ambitious spirit that reigned in the art world of the Renaissance period. Michelangelo, however, seems to have had considerable admiration for the original scheme of Bramante: so much so as to make it probable, one might say, that he would have adhered as far as possible to that plan had he been the direct successor of Bramante on the work. In a letter dated "Rome, 1555," after observing that Bramante had laid out the first plan with clearness and precision, making the building isolated and with daylight all round, he proceeds to say that Sangallo (between whom and Michelangelo, indeed, there was no love lost) had, in departing from the design of Bramante, "left true architecture on one side."

"He, with that circle which he makes outside, in the first place deprives the design of Bramante of light; and not only this, but in his own there is a want of light above and below, with so many hiding-places as to provide convenience for the performance of the worst crimes, for hiding convicts, coining false money, seducing foolish nuns, and other abominations; so that in the evening, when the church is to be closed, at least twenty-five men would be required to look round and search that no one remained hidden, and they would find it a difficult task. There would be this other inconvenience, that in the circuit which the model makes outside the building of Bramante, it would be necessary to take down the Pauline Chapel, the rooms for plumbing, the court of the Ruota, and many others; I doubt even if the Sistine Chapel could escape entirely. With regard to the portion of the outer circle, which is erected, and which they say cost a hundred thousand crowns, this is not true, for it could be made with sixteen thousand; and by taking it down there would be no great loss, for the stones in which it is built and the foundations come most conveniently to hand, and the fabric would be improved to the value of two hundred thousand crowns, and three centuries of duration. This is what appears to me, without prejudice, *for to me to conquer is loss*. If you can make the Pope understand this you will do me pleasure; at present I do not feel well.

Yours, MICHELANGELO.

Adhering to the model of Sangallo, it follows that all that has been done in my time must be taken down, which would be a very great loss."

There are several points of interest in this letter. It affords evidence of the practical common sense which Michelangelo combined with his greater qualities; while his representation of the probable evils resulting from the intricacy of Sangallo's design affords a curious instance, given quite naturally and *en passant*, of the violent and licentious character of those great days of æsthetic cultivation. The sentence we print in italics is significant of the writer's forebodings and previous experience as to the difficulties and vexations which attended an artist favoured by Popes and regarded with jealousy and envy by inferior men. The author prints in juxtaposition with this Sangallo's letter of report when he had previously been appointed to the same office. Among his objections to the building, in the motley state in which it then was, it was stated that the external Dorio pilasters were twelve diameters in height (!), and must be altered to a right proportion. Which of the preceding architects was responsible for these attenuated pilasters there is no evidence to show. He complains also that the nave, if carried out as it has been begun, "will be so long, high, and narrow that it will be like a lane." The confusion of Babel seems to have had its counterpart in that of the great modern monument of human building ambition.

Mr. Wilson's criticism as to the error of carrying a colossal order of pilasters up to the front, and designing the fenestration in three stories behind it, and his remarks as to the ill effect of the large-sized details of ornament, are, of course, what every one is agreed about now. He observes that in the use of enormous shell ornaments Bramante had anticipated and indeed gone beyond Michelangelo, for among his sketches in the Florentine Gallery is one which shows that "he contemplated a shell big enough to serve as the vault of an entire chapel. This fashion lasted for some time in Rome, and is observable in a number of buildings there." The author's remark that Michelangelo's total neglect of landscape, whether generally or in detail, in his paintings, must have shut him out from many suggestions for ornamental work, has some truth in it, and assists in explaining why a genius generally so original should have been reduced, in this branch of design, to copying the mannerisms of the corrupt Classic architecture of the time. "In the architectural ornaments of Desiderio da Settignano may be observed the most exquisite ideal treatment of familiar plants which grow in Tuscany. By such simple means he thus excelled Michelangelo, and enriched art with novel and beautiful forms and ideas." On the other hand, Michelangelo seems to have regarded the general design of architecture as directly founded on nature, as appears from a curious letter, quoted p. 488, in which he explains to his correspondent that one part of a building should be a counterpart of another, just as "one hand is bound to resemble another." Had he applied this principle less to the general design, and more to the ornamental detail of his buildings, the result would probably have been better.

An engraving is given of a slight sketch executed with pen in bistre, and preserved in the Florence Gallery, giving a view of St. Peter's in progress during the time of Michelangelo. The drum of the dome is being constructed, and a great block of stone in process of being lifted by very primitive-looking machinery. A portion of an older building is shown still in existence under the dome, and reaching nearly to the springing of the nave and transept arches. The sketch gives a very real idea of the bit-by-bit nature of the work, though, as Mr. Wilson observes, it conveys no notion of the scale of the building. It is noticeable, in looking at the design of the cupola as originally made, and which was spoiled in more than one respect in execution after the death of its designer, to how far truer a feeling for architectural line and proportion Michelangelo had arrived, at the time he made this design in his old age, than any of his previous architectural schemes evince. This is the more remarkable, as he seems to have come to the work so unwillingly. His complaints that he is not an architect, and that he had been compelled to undertake the work against his will, are frequent. That he gradually acquired a great interest in it is natural enough, after the trouble he had gone through in designing it, endeavouring to get his subordinates to understand and carry out his ideas, and contending with the accusations of those whom Vasari calls the "Sangallo sect" among the "deputies of the fabric," who, though they were his real masters and officially responsible to the Pope, the high-handed architect treated as so many puppets, and refused to give them an explanation of intentions of which he probably thought they were no competent judges. Michelangelo's own high sense of responsibility, however, in regard to the fabric committed to his care, is shown in the following letter addressed to Vasari (but not printed in his Life) in reference to the efforts of Duke Cosmo to induce him to return to Florence:—

"I was placed by force over the fabric of St. Peter's, and I have served for eight years, not only as a free gift, but to my great loss and discomfort; now that progress has been made, and now that there is money, and that I am about to turn the cupola, if I departed it would be the ruin of the fabric, it would be a reproach to me throughout Christendom, and a grievous sin on my part. Therefore, my dear Messer Giorgio, I pray you to thank the duke for his noble offers which you have written to me about, and to beseech his highness that, with his grace and permission, I desire to remain here till I can leave with reputation, honour, and without sin."

What adds to the force of this letter, as evidence of his devotion to the successful issue of the work he had undertaken, is a letter on the same subject dated only a month later (June, 1555), in which, after repeating the same argument of his desire to go on with the work of St. Peter's till it was completed, "so that it might not be altered and another form given to it, for did I depart before this, it would be a cause of great misfortune, shame, and crime"; he adds, "You must see in my handwriting that I touch the twenty-fourth hour, and no thought is now born in my mind in which death is not mixed. *God grant that a few years of labour may yet be mine.*"

The "few years of labour" thus pathetically craved were indeed his; but he was denied the satisfaction of witnessing the completion of his work, and of preserving his design intact from alteration. It may be considered fortunate, indeed, that the dome was built so nearly on his design as it is; but the omission of the graceful curved buttresses round the drum is certainly a great loss. It is probable, too, that in regard to the construction of the dome the premature loss of its architect had a bad effect, for the section of the model is a much more stable one than the section actually carried out, and exhibits provision for ties which were neglected in the actual construction, and had to be added afterwards to keep it in security. We may conclude our comments on Michelangelo as an architect, suggested by Mr. Wilson's "Life," by citing the reflection which M. Garnier makes, in the article in the *Gazette* before referred to, that "Michelangelo has been saluted with the title of the grandest of painters and most impressive of sculptors, and that he is still far above the praises that have been bestowed on him in these capacities. Let him, however, be saluted as 'architect' also, for, under the influence of his name, the populace will perhaps come to believe presently that architecture is really an art, and that for its successful practice some degree of accomplishment is required!"

One or two other general points of interest we may just touch upon before dismissing finally, and with congratulations, Mr. Heath Wilson's interesting and valuable contribution to the history of the artist. In the critical judgments on special qualities in Michelangelo's art we often concur. They are mostly very just and discriminating, not without, in some cases, novelty and originality. With the character of his hero, however, it is evident that he has but imperfect sympathy, and that the strong and fiery element in Michelangelo's nature is a doubt and a puzzle to him. For instance, he draws moral reflections (p. 18) in regard to the well-known Torregiano outrage; that it was a pity the greater artist did not learn from this event the value of peaceable words, and remember the lesson through life. Now, there is plenty of evidence, some of it amongst the new matter supplied by this very biography, that Michelangelo was capable of great self-control and patience under vexations which were the result of circumstances only. That he was not always equally patient or submissive with persons who, through malevolence, little-mindedness, or sheer stupidity vexed his soul, is simply to say that he was not one of those respectable and genteel geniuses who go through the world simpering and bowing to every one, and making no enemies anywhere; and if he had been such, he would not have been Michelangelo. The personal and family pride of the artist is a point which this volume strongly brings out, and it must certainly throw a new light on his character for those who have always thought of him simply as a great artist. It is evident he thought of himself as a man rather than an artist, and was possibly the greater and loftier artist in consequence. In a letter to one of his family, May, 1548, he says, "Tell Fattucci not to address, *Michelangelo, Sculptor*, for I am not known but as Michelangelo Buonarotti; if a Florentine citizen wishes to have a picture painted for an altar, let him find a painter, for I never was painter or sculptor, as those who make merchandise. I have striven for the honour of my parents and brothers: true, I have served three Popes, but I was forced to do so." The direction about the address reminds one of Congreve's refusal to be called on by Voltaire as "a literary man" (as a gentleman, he should be happy to make his acquaintance); but the contemptuous touch about

'three Popes" is in pure Michelangelo vein. Writing to the same correspondent, his nephew Lionardo, who was about to marry, he is urgent that he should first procure a residence worthy of the family name; he offers to forward the money for a handsome house (p. 498),—"for I think that a handsome house in town does more honour to a family, because so observable, than country possessions. We are citizens descended from a very noble race. I have all my life done my best to resuscitate my family; but I have not had brothers to help me. However, exert thyself to do what I tell thee, and let Gismondo return to live in Florence, that I may not be made ashamed by that which they say to me here, that I have a brother who drives oxen." This kind of anxiety for the family honour, which he seemed to think had fallen below its hereditary rights, is at least a pardonable, if not a praiseworthy form of social pride, and quite above the vulgar idea of "keeping up appearances." About the latter object, indeed, Michelangelo seems to have troubled himself as little as well could be, in regard to his own personal *ménage*. The beautiful episode which his friendship with Vittoria Colonna forms in his life, the noblest thing in a life full of noble things, receives no fresh light from the new biography. We commend it, however, to the attention of all who are interested in the great painter of the Sistine frescoes; there is much interesting matter that we have not been able to touch upon; and if the author does not perhaps fully appreciate Michelangelo as a man, he shows for Michelangelo as an artist an enthusiasm none the less valuable for being tempered with a little critical discretion.

THE AMERICAN CENTENNIAL EXHIBITION.

Two hundred and thirty-six acres of the most beautiful and undulating portion of West Fairmount Park have been inclosed for the purposes of the Main Exhibition. This inclosure has thirteen entrances, corresponding in number to the thirteen original States.

Other inclosures are for exhibits of live stock, trials of agricultural implements, and international matches of various kinds. The main buildings* are five in number, but with the special buildings which have been constructed in answer to demands for space, and with the pavilions of the various States and commissions, the number of buildings is considerably over 100. The Main Exhibition is finished and decorated, and is being rapidly filled with the various exhibits. The space is divided among thirty nations. The United States, Germany, France, and Great Britain are in the centre, each occupying one of the four great towers with the adjoining space. The visitor is agreeably surprised at the extreme lightness of the interior, the size of the iron columns which support the structure being only 10½ in. square. The colouring of the roof is a ground of very light blue, the edge of the slope above the cornice being decorated with a border of lotus in vermilion. The principals and the rods are of buff picked out with lake. The columns and framing have a ground of sage green, with bright streaks of vermilion with blue and yellow stencilling and scroll-work capitals of buff. The architraves are also of buff, with stencils of blue and white, and black and white. In each alternate section is the monogram C.E. in black and blue upon a vermilion ground. On every third capital is the date 1776. The transept is similarly treated. The circles in the upper part of the side windows have painted linen panels with rather poor representations of the arts and sciences.

As yet there is little sign of life in the portion taken up by the United States. Chili is erecting a polygonal pavilion, Gothic in shape, with gables. Japan is putting up a number of handsome screens on which to display its exhibits. The cases of Egypt adjoin Japan.

The Spanish have erected a lofty enclosure, the façade fronting the main avenue reaching to the tie-rod of the roof principals. The centre pediment will be filled with an allegorical painting of "Spain withdrawing the curtain that overshadowed the New World." The remainder of the façade will be decorated with the portraits of famous Spaniards connected with the discovery and conquest of America. Queensland, Sweden, and Norway are enclosing their spaces. Cases from England are rapidly arriving and being put in place, but there will be no enclosure.

To the north of this main building is a hall being built for the exhibition of wagons, carriages, cars (train or tram), and stoves. Further east the Permanent Art Gallery is approaching completion. To the north of this it has been found necessary to erect another art gallery of the same size, this will be only temporary. The works of art to be exhibited by the United States are chosen by a committee from the preliminary exhibition held at New York, Boston, and Philadelphia. On the granite pedestals of the Permanent Art Gallery are two colossal groups in bronze discarded from the Continent, and presented by an enterprising American to the Park Committee. These and the "land" colouring of the main building scarcely do credit to the national taste.

To the east of the bronze groups is the Photographic Art Gallery. The Machinery Hall, which has been finished for some time, is a perfect labyrinth of foundations for machinery.

The huge engine erecting by the Corliss firm of New York will supply the motive power. It is one of 1,400 horse-power, with a driving-wheel weighing 56 tons. Great assistance has been rendered in handling these masses of metal by the English locomotive cranes made by Messrs. Appleby. In the Annexe is a large open tank, 160 ft. by 60 ft., and 7 ft. deep, for supplying the hydraulic machinery. At the south end will be a "cataract," with a fall of 30 ft., worked by the centrifugal pumps of Messrs. Andrews Brothers, of New York, raising 30,000 gallons per minute. Parallel with this annexe are the several boiler-houses, and south of that allotted to Great Britain is the Shoe and Leather Exhibition Building. West of the Machinery Hall, on Fountain-avenue, is a special building, 526 ft. by 80 ft., for the exhibition of saw-mill machinery. It will contain one stone and seven timber saw-mills.

The horticultural building is in the hands of the decorators; the conservatories are already filled with tropical plants and lemon and orange trees laden with fruit. The adjoining slopes have been allotted in sections to North American, European, North African, and South American States, for the exhibition of trees and plants. Agricultural Hall would now be ready for exhibits, but the framework of one of the wings was blown down. The aquarium will be commenced at once, the tanks running along the west side of the northern end for 450 ft. Adjoining the United States Government building are the model hospital, hospital-tent, and laboratory. In the grounds are the offices of the Commissions, the various State pavilions, fire-engine and hose stations, restaurants, the Centennial National Bank, with access from within and without the enclosure; a Moorish villa, which has arrived in sections from Morocco; a pretty Swedish schoolhouse, wholly of timber, covered with shingle; the Japanese dwellings, the Bartholdi fountain and Catholic Total Abstinence Union fountain, with statuary from Austria; the New England log-house and modern kitchen, the World's Ticket Office, dairy, and Vienna bakery.

There are also miniature representations of the topographical and other features of Italy and Switzerland, and of the cities of Jerusalem, Paris, Naples, and Mexico, the plan of the latter occupying a space of 330 ft. by 232 ft.

The approaches from the city cross the Pennsylvania Railway. The company are finishing several new iron bridges, carrying the road over its main line.

The Centennial Depôt is opposite the principal entrance. New roads are made and buildings are springing up in all directions, the most prominent being a theatre, and the Globe and United States Hotels, the latter built by Mr. Dobbins, the contractor for the main Exhibition buildings, in little over three months. It remains principally with the home exhibitors and the United States Custom-house officers whether everything will be ready by the 10th of May, but the Centennial Commissioners have everything in their power to make this stupendous show a magnificent success.

Philadelphia.

* See p. 111, *ante*.

THE PROPOSED IMPROVEMENTS AT HYDE PARK CORNER.

Sir,—The proposals of Mr. Fergusson for the accommodation of the traffic at Hyde Park Corner appear to me to be in most respects admirable, and certainly worthy of the most serious consideration. The widening of Grosvenor-place at its junction with Piccadilly, as suggested by him, would not only successfully solve the vexed question of the "Traffic at Hyde Park Corner," but it could not fail to prove, in point of effect, an immense public improvement.

There is, however, one part of Mr. Fergusson's plan which I think would be extremely undignified and unsatisfactory, viz., the termination of Constitution-hill in Grosvenor-place at the point where the little footway now exists. Admitting that the question of the respective levels of Constitution-hill and Grosvenor-place can be arranged, the former would, nevertheless, take an awkward turn into Grosvenor-place at the lower level, involving the rapid ascent of the latter up to the higher level of Hyde Park Corner. A very much handsomer, and as it seems to me simpler, plan would be to continue the line of Constitution-hill from Buckingham Palace, in what would be a very gentle curve, and with an easy gradient, so as to let it terminate in Piccadilly, opposite Hyde Park Corner. In this way, the awkward turn and dip into Grosvenor-place would be avoided, the line of Constitution-hill would



be direct instead of tortuous, the gradient would be an easy and gradual ascent up to Hyde Park Corner, instead of the steep and sudden rise in Grosvenor-place, and the entrance from Piccadilly would be spacious and handsome.

It does appear to me that no plan for this improvement is worthy of acceptation which does not provide for a direct and handsome roadway in Constitution-hill; seeing that, apart from other considerations, it forms the Royal approach from our principal park to the residence of the Queen in London.

It is true that the plan I propose in the annexed diagram would involve the cutting off of a small corner of the Green Park, and this may possibly be urged as an objection to its adoption, but I think the enormous advantages which would accrue to the public by the widening of Grosvenor-place would much more than counterbalance any such slight and inconsiderable sacrifice.

J. Macvicar Anderson.

Hampstead Vestry-hall Competition.—The competitive designs for the proposed Vestry-hall and offices for the parishes of St. John, Hampstead, have been on view during the present week.

SOCIETY OF BRITISH ARTISTS.

This exhibition is certainly on the line of improvement. We noticed, in speaking of the last collection in these rooms, some apparent signs of a better standard of work, and in the present (the fifty-third annual exhibition) it is gratifying to note that the move in the same direction seems continued and carried further. There are works in this year's collection of real merit and interest; and in spite of the efforts of the gentleman who sends three portraits of the same model as "Olivia," "Portia," and "Beatrice," and of the other who exhibits a painting of a girl of plebeian features and rather dirty face, with a pork-pie hat and feather, as "Die Vernon," we may say that there are no examples of such horrors in the way of pictures as used to affright the nerves some years back.

Mr. A. B. Donaldson's contributions are really remarkable for their variety as well as extent of ability. We can hardly say that his large work in the first room, "An ancient Fountain" (9), satisfies us; the peculiar and rather conventional tone and manner which the artist adopts in the treatment of figures, the rather heavy execution of the clouds, give to the whole a mannered effect, and look like something between realistic and decorative painting; not quite either the one thing or the other. It is, however, a distinctly original work. The artist's small landscapes show fully his usual beauty of colour and originality of treatment, and his water-colour interior representing "The Newly-found Statue" (649) inspected by some richly-robed connoisseurs in a Florentine saloon, is a most brilliant little thing: the only slip in it is that the artist has, in his desire for brilliancy, given the statue a whiteness and glitter inconsistent with its supposed circumstances as a dug-up "antique." Going round the rooms, we notice Mr. Mann's "Watching the Lifeboat from Yarmouth Jetty" as a very good study of eager but differing expression and action in a crowd of figures. The "Bridge and Banks of Dee, Chester" (14) is a fine sunset scene, broad in treatment and with much solemnity and repose of feeling. In the "Interior of Treves Cathedral" (52) Mr. Wyke Bayliss shows his usual ability in delineating architecture, with a more aërial and real effect than he sometimes obtains. Sir John Gilbert's little picture, "A Rest by the Way" (63), is a masterly specimen of broad free treatment of landscape; it seems as if this painter, after spending much of his life in the production of works which, with all their cleverness, appealed mainly to the popular taste, has in his later years taken to painting for artists. Mr. Woolmer's "Fountain of Pleasure" (90) will hardly pass muster now; it belongs to the old school, when it was thought in keeping to give a sort of stage effect and glitter to such a classic scene; still in its way it is effective. Mr. Dawson's "Durham Cathedral" (123) also belongs to a style of landscape-painting that has rather had its day; but there is glow and power about it, though in a mannerised way. Mr. Wyllie's "End of the Day" (106), a scene on the beach of some south-coast fishing village, belongs to a higher order of art; and though not so entirely satisfactory to us as some of his smaller works that we have seen here, well deserves attention. He has found a novelty of subject in his "Wreck of a Dutch Fruiter" (121), where the whole beach is strewed with oranges,—a new sort of effect in seaside colouring, and evidently a fact. Mr. A. Goodwin shows his usual fine and poetic feeling in "The Fisherman's Island," and "After the Storm" (151, 255), the latter a remarkable piece of effect. Mr. Cattermole's "After the Combat" (158) is a capital bit in his old way. Mr. Banerle is clever and sparkling in his interior with three children, "Be Quiet!" (276), with a garden-scene through the window. Mr. Pope's painting of a cottage girl bewailing the death of her canary (339) has excellent qualities; and Mr. E. Ellis, in "The Old Silk Mill, Derby" (385), shows a landscape, combined with buildings, of real originality and brilliancy of manner; he has rather missed the texture in the red brick-work of the mill, but the tones of the buildings are very fine, and the bright sparkling treatment of sky and water admirable, in spite of the rather raw blue of the sky. In the north-west room we notice that Mr. Grace has worked out exactly the same view of the "Thames at Great Marlow" (450) which Mr. Aumonier has familiarised us with: the time of day is different, and the treatment also; there is a great deal of refinement in the picture. Among other things to be noted as good we may mention "My Chambers" (171), by G. R. Clarke; "Autumn" (75), a small "upright," by Mr. E. Ellis, showing much feeling; "A Summer's Day on the Trent" (262), by Mr. Jas. Peel, and "The Road to the Village" (391), by the same artist; "The Troubadour" (502), a clever sketch of a man with a violoncello slung over his back, by Mr. Glindoni; "Portel Sands" (506), by Mr. Wyllie; "Attempts at Pencilling" (523), a study of a child's head, by Mr. Banerle; "A Coast Scene" (530), by Mr. Val Prinsep, admirable in itself, but having no connexion with the verse of Tennyson appended to it; "The Village Tenor" (566), a large water-colour, by Mr. J. H. Barnes, with well-studied figures; and a very sweet and expressive portrait of a lady (618), by Mr. E. Clifford.

The exhibition will repay a visit.

THE DANGER OF INSUFFICIENT EGRESS FROM CHURCHES.

We have to call attention to a point in ecclesiastical architecture which has of late fallen somewhat into neglect, although such neglect may at any moment involve a terrible disaster. We refer to the proper proportioning of the means of egress from a building to the largest number of persons that it can at any time contain. It will be at once admitted that the maintenance of such a proportion is a primary duty of the architect. In those prodigious structures in which the Roman emperors were accustomed to collect such vast bodies of people, the care taken for the due arrangement of the vomitories is the more apparent the more we study the structure of the building. Looking like shadows dotting the lines that divide the *cunei* of the amphitheatres, the numerous apertures of the *vomitoria* are almost as convenient as the rabbit-holes in a warren. In what number of seconds the great area of the Colosseum, which is said to have been capable of containing 100,000 persons (though we ourselves cannot find sitting-room therein for more than 45,000) could be cleared, we have never seen calculated. But there is no doubt that the spectators would enter and depart almost with the speed of a drifting shoal of leaves, and what was even more important than the actual facility of egress, was the knowledge that such facility existed. With the sound and wise arrangements of the Roman architects, panic, so far as difficulty in leaving the building was concerned, was impossible; and it is certain that it is not so much actual inconvenience as panic that is the source of disaster in any case of sudden determination to leave a building.

It is true that accidents from panic of this nature are rare. But, on the other hand, they are of terrible magnitude when they do occur. Two will be fresh within the memory of our readers. One was in a cathedral, the other in a theatre. Fire was the cause of alarm in one instance; mere stupidity, we believe, in the second. In each case the loss of life was serious, and the amount of personal injury sustained very considerable indeed.

It is hardly necessary to point out that those calamities which rarely occur, but which may occur at any moment, are precisely those against which it is the duty of the guardians of public safety to take the utmost care. When to constant liability to unseen danger is added the circumstance that the danger, if it should arise, is of a very fatal description, it is obvious that no further consideration is necessary as to the duty of whoever is responsible for the plan of a public building, viewed with reference to the proportion between the internal area of the building itself and the area occupied by the ways of egress and access.

In speaking of the ways of egress, it will not do to confine the attention to the mere width of the doorway. This, it is true, is a limiting feature of the case, but it is not the only limiting feature. The doorways of many of our new churches are at the top of a flight of steps. Such a position has the effect of reducing the accommodation which would be offered by a doorway of equal width on a level pathway. Hesitation is felt, even by the most active and self-controlled person, on descending a flight of steps. And when those steps are hidden from the eye, which is always the case when one descends steps in a crowd, or even in an orderly procession, the hesitation is increased. If there is any pressure in the rear, or any call for haste, such influence at once increases the timidity of those who are descending, and thus tends to check the outflow of the whole body of people. We only point to these elements, as to the importance of which we think there can be no dispute, as matters which have not yet been reduced to their true arithmetical value. It is highly important that architects should arrive at positive formulæ as to the number of people that may be expected to pass a gate of a given width in a given period of time, and as to the increase of time that would be needed if the gateway were at the head of one, three, or more numerous stairs.

Another point of hardly less importance is the direction of the streams of traffic, or directions in which the spectators have to move, on leaving a building before they arrive at the outer door. The importance of this feature of a building can hardly be exaggerated. The worst form of interior arrangement is probably that of an unbroken open space. Where there are no passages, aisles, or means of directing the outgoing people, but all are able to press at once towards a door, somewhat as water rushes towards the orifice in a vessel, the worst crowding, and the greatest danger and inconvenience, occur. Next bad to this is the interference of two streams of people meeting at right angles. This is a very frequent evil in many new churches. It occurs in two ways. Either one passage comes into another at right angles, as when there is a main line of exit to the north doors of a church, into which pathways lead from the nave and aisles, or there may be a vestibule within the church-door, with doors at right angles to one another. For warmth, freedom from draught, and exclusion of external noise, the use of a vestibule of this kind is well adapted. But its mischievous action as a throttle valve, in any case of panic, unless the ways of egress be abundantly numerous, is such that its introduction should be regarded with the utmost jealousy.

There is no doubt that the care which our old ecclesiastical builders exercised in this respect has been but too much laid aside by their successors. We could enumerate, on the spur of the moment, many churches in which one or more of the ancient doorways have been positively walled up. This has been done, no doubt, during the reign of whitewash. It has been thought that the church would be made warmer, and that it was cheaper to run up a few yards of wall, and smooth it over with plaster, than to put a new door, and hang over it a decent curtain. Moreover, these things were done, for the most part, when the attendance in the parish churches was at its lowest ebb, when the services were most rare, cold, and unattractive, and when the idea of a crowd in a church would have seemed almost as improbable as that of a snow-storm in July.

In this respect our eyes have witnessed a great change, speaking only from the builder's point of view. Considering that it is the object of a public building to accommodate a number of persons sufficient to fill it, and that it performs its function the more thoroughly the more often it is filled, this change is a highly desirable one. Anyhow it exists. The question then deserves consideration, in many a quiet parish, and many a time-honoured and picturesque country church, how far it is safe to leave the mischievous walling up of the doors, which took place some years ago, unrestored and unrepaired.

The question is more serious when it regards new churches. We do not hesitate to admit that it is in this form that it has pressed most fully upon us. We had occasion to observe recently the plans of a very fine church, which is near completion in an important town in a home county, in which the egress afforded is so limited that in the case of any alarm arising during a service the consequence would be very serious. We earnestly entreat any architect whom it may concern,—and we do not speak of one case alone,—to reconsider his plans in such a case, and to protect his own reputation from the chance of any such disaster as would arise from a sudden alarm. A church without a western door is a building wanting in one of the most characteristic features proper to its structure. If, instead of the three normal entrances, at the north, south, and west, we have only two doorways at the west end of the north and south walls; if one of these be so narrow that only two, and the other that only three persons can pass out abreast without jostling, and if the wider of the two be approached from within by a vestibule with two doorways at right angles to each other, it really looks as if disaster were courted. We will suppose the church to be intended to seat some 850 people, besides schools and choir, and that there are only two little postern doors, not readily accessible from the church.

Now we very much question whether, in case of a rush towards a door of the kind we have supposed, approached by a vestibule, any person would get over the space from within the inner to without the outer door in a less period of time than twenty seconds. This would not allow more than ten persons per minute to leave the church by this entrance. If we allow the same rate of egress for the narrower door, without a vestibule, we shall still find that it would take fifty minutes to get 1,000 people out of the church. This may be an over-estimate. On the other hand, if we take observations made as to the rapidity of emptying neighbouring churches when it rains, and suppose that the delay caused by struggle and alarm is equal to that allowed for putting up umbrellas, we are under the mark. In any case, we entreat all those to whom any such case as we have put may be at all applicable,—bishops, incumbents, churchwardens, and architects,—to ponder a word of friendly warning, and to take care that the egress from any new church is demonstrated to be ample, before they share in the very great responsibility of endeavouring to attract a large congregation within its walls.

THE HOARWITHY BRIDGE OVER THE RIVER WYE.*

THE site of this bridge on the River Wye is between Hereford and Ross, about six miles by road from the latter place, and nine miles from Hereford. By river it is eleven miles from Ross and sixteen miles from Hereford. The only other public-road bridge over the river in this distance is at Fownhope, about eight miles above Hoarwithy; hence it will be seen that this part of the River Wye is very scantily supplied with bridges. Before the old timber bridge was built there existed a ferry at this point. The old bridge was built on the site of the ferry, presumably on account of the existence of the approaches, for better sites were obtainable within a quarter of a mile below the ferry. At the point where the bridge is erected the river is as wide, if not wider, than at any other part of it for many miles, either up or down; and on the western side it is deeper than usual, and very shallow on the eastern side, so that the river-bed under the east span is quite dry in summer. Formerly, before the advent of railways, the Wye from Hereford to the tideway was navigable, rafts of timber and barges containing goods being floated down with the rapid stream to Ross, Monmouth, Chepstow, &c. This traffic is now entirely superseded by the railway running from Hereford to Gloucester; but it explains the reason for the great height of the old bridge above the water, even at flood-level, the roadway being 30 ft. above ordinary level. In the Act of Parliament obtained for the construction of this bridge in 1855, this height was stipulated for to avoid injury to the craft passing under the bridge in time of floods. The bridge was built on stone piers and abutments of good ashlar masonry. These have stood very well, and are now in as good a condition as when first built, no settlement whatever having taken place. The superstructure was of Spanish chesnut timber, which seems to have been much used in former times. The work, however, was not well looked after, and it is said that a good deal of green unseasoned wood was used, with the result that after a lapse of nineteen years the greater part of the timber was found to be in an advanced state of decay, although there were many pieces as sound as when sawn. The small scantlings decayed first, the lattice handrailing and spandrel filling, the struts between the ribs, &c.; and these generally at the ends, or where two bars crossed each other in contact; in fact, the decay was most marked at all points where the wet lodged. Hence in all structures, whether of timber or iron, the minimum number of pieces consistent with practicability should be used. This was especially pointed out in a paper read before the Society a year or two back by Mr. Meakin, on the preservation of iron, in which was noticed the wasting that had taken place in the metal of the Charing-cross Bridge, owing principally to the great number of pieces of which the girders were composed, and the difficulty,—and in some cases the impossibility,—of getting at certain surfaces with a paint-brush. The old bridge consisted of three arches of 80 ft. span and 10 ft. rise. Each arch was composed of four curved laminated ribs, 4 ft. 6 in. from centre to centre. The two outer ribs were 12 in. by 10 in., and the two inner ones 12 in. by 14 in. section, each composed of four laminations or thicknesses of 3 in. Two horizontal beams, 12 in. by 14 in., were fixed along the crown of these arches, bolted through the curved rib one on each side of it. The vertical ends of each rib at the piers and abutments were 12 in. by 6 in., and the sprandrel lattice-bars 4 in. by 4 in. Between each two ribs were pairs of struts, 6 in. by 4 in., at intervals of about 6 ft.; and 1¼ in. wrought-iron tie-bolts were placed between each pair of struts, terminating on the face of each exterior rib with a circular cast-iron washer 6 in. diameter. On the horizontal timber beams was spiked 3 in. planking, on which the road-metalling was laid; and this was constantly renewed, as nobody ever thought of lightening the load by its removal, for when the ribs sank and a hollow occurred this was immediately filled up with fresh macadam, till finally there was about 18 in. thick of metalling on the bridge,—about three times as much as was needed. The bridge began to show signs of settlement,—the curved ribs becoming unsymmetrical and the roadway slightly undulating, within a very few years after its completion, and this increased until it was deemed necessary to shore up the arches with vertical timbers, resting on sill-pieces in the bed of the river. This was done to the two side arches, the centre one keeping its true curve till within a year or two of the new bridge being commenced. The settlement took place generally at a scarfing, or where a tie-bolt passed through a rib, as might be expected. The roadway was so uneven that it made one quite uncomfortable to pass along it, and the transit of a vehicle caused the whole structure to vibrate most unpleasantly. The cost of the timber bridge, stone piers and abutments, and toll-houses and approaches, was 1,000*l*. The utmost amount of capital the Hoarwithy Bridge Act enabled the company to raise being 6,000*l*., there only remained 2,000*l*. for the new superstructure, and the question was how it was to be done. About two years ago the Hoarwithy Bridge Company advertised for competitive designs for a new bridge or new superstructure. It was stated that whatever stone might be required was to be had for the quarrying, free of charge, from a quarry about half a mile above the bridge, close to the river bank. This fact induced Mr. Whitaker to send in two alternative designs, in stone and wrought iron. Not being sure of the capabilities of the abutments to withstand the thrust of an arch of a span of 80 ft., even if the springings had been lowered considerably and the arcs increased, he determined upon building three new piers similar to those existing, and dividing the three 80 ft. spans into six of 37 ft. each. These he proposed to make semi-circular, springing them 8 ft. lower than the timber arches, and thus reducing the lateral thrust at the abutments to a minimum. The design for a stone bridge, however, had to be abandoned, owing to the lowest tender sent in amounting to 2,800*l*., or 800*l*. in excess of the funds available. Mr. Whitaker estimated the cost at 2,0 0*l*. only, and is convinced that had the work been offered to a contractor accustomed to engineering work, and not to church, school, and house builders, it could have been done for the money. The other design was for a lattice-girder bridge in three separate spans (not continuous). The cost of this was estimated at 2,500*l*. Mr. Whitaker then set about endeavouring to cheapen this bridge, which he was enabled to effect to a great extent by the adoption of Messrs. Westwood & Baillie's patent corrugated flooring, without the ordinary cross girders. Still, however, the estimated cost was in excess of the 2,000*l*. available, and the price of iron keeping high, the company had almost become resigned to letting the bridge fall down and winding up their affairs. About this time a friend suggested to Mr. Whitaker the possibility of reducing the cost of construction by having a continuous girder over the three spans instead of a separate girder for each span. It was found that continuous girders were much more economical, effecting a saving of 12½ tons of metal in the structure. Mr. Whitaker at first thought of placing the roadway on the bottom flange, thereby saving the cost of a hand-rail; but afterwards, considering the lightness of construction, width of road, &c., he determined on placing the road on the top, and the girders nearer together than if the roadway had been on the bottom flange, which would of necessity have been the full width of the roadway, viz., 15 ft. The main girders are 255 ft. 5 in. in length, 5 ft. 6 in. in depth, with flanges 1 ft. 3 in. wide, and from ¼ in. to ⅜ in. thick. Vertical web-plates ⅜ in. thick, 9 in. deep, are attached to the flange plates by 3½ in. by 3½ in. by ⅜ in. L-iron throughout. The roadway overhangs the main girders 1 ft. 6 in. on each side. The main girders are braced together by diagonal L-iron bracing 3 in. by 3 in. by ⅜ in. at intervals of about 20 ft. The roadway is formed of Westwood's patent corrugated flooring plates ¼ in. thick, and 1 ft. from centre to centre of corrugations. These corrugated plates form a great element of stiffness in the structure, the whole becoming something like a box in cross section. The corrugated plates are trussed every 4 ft. by a flat bar riveted to the under side of the bottom flanges of the main girders, and bent down under a vertical strut, consisting of a small girder, 1 ft. 3 in. deep, running the entire length of the bridge along its centre. The corrugations are filled in with asphalte, composed of gravel, ashes, tar, &c., forming the roadway. The hand-rail consists of a fir base and cap, with L-iron vertical standards and T-iron top and bottom next the woodwork. The filling-in is of wrought-iron lattice bars, 1½ in. by ⅜ in., the whole being fastened to the corrugated plates, and a raking L-iron from the end of this to the vertical L-iron standard as a strut. By this means a rather good form of railing was obtained, 4 ft. high, and costing about 10*s*. per foot run. The main girders being continuous, the strains are partly in tension and partly in compression. The point of contrary flexure in the side spans is taken at 17 ft. 8 in. from centre of pier, and in the centre span at 25 ft. from centre of pier. The rolling load was taken at 1 cwt. per superficial foot, or 15 cwt. per foot run of bridge, and the weight of one span at 40 tons, giving a total distributed load of 100 tons on two girders in one span, or 50 tons on one girder. The contract for the ironwork was let to Messrs. Westwood & Baillie in May, 1875, for the sum of 1,492*l*. The main girders and trussing, and, in fact, nearly the entire superstructure, were built up and put together on the old bridge as a staging, the metalling being first taken off to lighten the structure. The flexibility of the old bridge was such that it was found extremely difficult to build up the main girders symmetrically, for directly a few hundredweights of metal were put together on one end, the portion of flooring immediately below would sink, and the other side of the span would rise simultaneously. It was therefore only by constant care and continual levelling and packing that the proper straight line of the flanges could be kept. The main girders and diagonal bracing, &c., were completed about a fortnight before Christmas last, and the weight being transmitted to the piers by timber packing, the timbers of the old bridge were cut away underneath, and allowed to fall into the river, when they were secured and towed ashore by boats. The two longitudinal girders were completed, and the transverse diagonal bracing and trussing finished, before the lowering commenced. The corrugated plates over the centre span were also fixed (bolted, but not riveted), in order to make the structure more compact and rigid. The plates and corrugations over the end spans were not laid on, for they would only have added to the weight, and sufficient rigidity was obtained by the centre plates being fixed. Four hydraulic rams were fixed to timbers below the underside of the girders,—two rams to each pier, one underneath each girder. There were no rams at the abutments, the weight of the girders, overhanging 80 ft. at each end, being supported by long timber levers, 1 ft. by 6 in., resting on a fulcrum at the face of abutments, consisting of baulks of timber as packing. The pumps were placed in the centre of the bridge, ¾ in. wrought-iron tubes communicating with the rams, which were 8 in. in diameter. The pistons of the rams were pushed out about 5 in., when they took the weight, and a piece of the packing being removed the structure was lowered a few inches. This operation was repeated until the structure was lowered the whole distance of 10 ft. 6 in., and rested on the bed plates fixed to the masonry of the piers. The work of lowering might have been done in two days, but it really occupied six weeks, owing firstly to the leakage of a ram; secondly, to the freezing of the water in the pumps; and thirdly, to the prevalence of high winds, during the continuance of which it was not thought advisable to proceed with the lowering. The structure was, however, lowered

* From a Paper read at a recent meeting of the Civil and Mechanical Engineers' Society, by Mr. C. W. Whitaker, C.E.

to within about 1 ft. of its ultimate position (practically the whole distance) in about a fortnight. Then the weight was supported from the middle of the piers so that the masonry under the girders could be got at and rebuilt for about 3 ft. 6 in. in height, each course corbelling over from 6 ft. wide at bottom to 8 ft. at top, so as to give the necessary length of bearing for the girders. The girders are fixed to the western pier by 1 in. lewis bolts, and rest on friction rollers 1 in. in diameter at the east pier and two abutments, $\frac{3}{4}$ in. steel bearing-plates, with countersunk rivet-heads, being fixed under the bottom plate of girders over the friction-rollers. A space of $2\frac{1}{2}$ in. at the east end, and $1\frac{1}{2}$ in. at the west end, is left for expansion. The height of the old bridge above the river caused the approaches to be much steeper than those to the new bridge. The roadway of the latter is 2 ft. $7\frac{1}{2}$ in. lower than the old bridge, and this has enabled the approaches to be made with gradients of about 1 in 50, instead of 1 in 30, as was formerly the case. In conclusion, Mr. Whitaker testified to the satisfactory manner in which the work had been carried out by Messrs. Westwood & Baillie, the contractors for the iron-work, their representative on the works being Mr. Hunter, while Mr. Leigh, a pupil of Mr. Whitaker, had acted as clerk of works.

In the discussion which ensued, the speakers were unanimous in expressing the opinion that the bridge, considering its size, was a marvel of constructive economy.

QUESTIONS AFFECTING THE IRON TRADE.

At the recent meeting of the British Iron Trade Association, Mr. G. T. Clark, president, delivered an inaugural address, in the course of which he said,—There is a close and an increasing connexion between the iron trade and the railways of the country, not only as regards the manufacture of the rails, but as regards the conveyance upon them of ore, fuel, and iron. To the introduction of railways is due the great development of the iron trade, and it is the continued demand for railway iron that has raised and maintained this trade as one of the great industries of the world. Where other customers have taken from us scores and hundreds of tons, railways have taken tens of thousands, and to them it is mainly due that, in the thirty years following their introduction, our make of malleable iron quintupled. Nor is it only as customers that railways have benefited our trade. By the facilities they afford we are enabled to draw our ironmaking materials from sources that would otherwise have been closed. Forty or even thirty years ago, the convenient conjunction of iron ore, coal, and limestone, was the cause of the prosperity of some of the most important seats of manufacture. This is no longer the case to anything like the same extent. By the rail we can transport the coke of Durham at a cheap rate to the Cleveland iron stone, and the same admirable fuel across England to the rich hematites of Barrow. It is not too much to say that, but for the facilities of transit afforded by railways, the progress of Middlesbrough must have been slow, and Barrow could scarcely have existed at all as a great centre of the manufacture of iron and steel.

But, much as we owe to railways and the railway system, and good customers as we and our brothers of the coal trade are to them, our interests are by no means identical at all points, though our alliance need not be the less cordial that it requires careful and constant watching. Railway managers are a very able and a very quick-witted class of men, and though generally aware, and ready to admit in the abstract, that the safest profits are those derived from low rates and great facilities for transport, they sometimes are found to sacrifice these broad and well-formed views for present gain. It is true that the ultimate object of a railway manager is the giving a good dividend to his shareholders, and not the development of the resources of a district, but what we have to keep steadily and powerfully before these gentlemen is the fact that these two points are in the main inseparable, and that, not only where the resources of a district are large, but even where they are but moderate, it is sound policy, even at a present loss, or with a very moderate margin of profit, to induce their development. Sam Slick's plan with his clocks was a very good one. Lend your clocks freely, and after a short time people find they cannot do without them and will purchase. Once let a railway be at work and the interests which it generates become too strong to be allowed to drop. Many of us know cases in which a single railway has held the monopoly of a district and checked its progress, as proved by the vast increase of trade which has followed upon the opening of rival lines.

This subject of facilities of transit is one to which the attention of our association should be directed, and the just and wise regulation of which we should promote with such influence as we may possess. As the margin of our profit becomes less, so much the more important does it become that we should have cheap and convenient facilities for the transit of our raw material and our finished or half-finished produce; nor are there any two points in England so distant that a profitable trade might not be made to spring up between them by a liberal railway policy, or, what is even more important, the trade between which might not be diverted or even destroyed by one of a short-sighted character. When I state that in stirring times the pig-iron of Middlesbrough is actually brought by rail to South Wales, I adduce a very strong argument in favour of cheap transit, and show how extreme a case is made possible under a liberal railway policy. To obtain and maintain the exercise of such a policy, no exertions on our part should be wanting.

We have proposed, and, I think, wisely, to exclude from the scope of our association "questions affecting the regulation of wages or those of a local character." These are best left to the consideration of the associations now to be found in every manufacturing district. For their equitable adjustment they require a close knowledge of circumstances, and are, besides, accompanied too often by irritations and heart-burnings and mutual animosities, which it is very undesirable to import into our discussions. But it by no means follows that the philosophy of wages and the distribution of returns between labour and capital are not to be considered here, as well as those questions of interference with natural laws and individual freedom of action which are connected with fluctuations in the price of labour, and with the general relations between the employer and the employed; for such questions lie at the root of our own and every other trade. Upon their solution rests the prosperity, not only of our trade or of our country, but of the whole world; and the statistics of production, commercial treaties and tariffs, and home legislation, important as such subjects are, sink almost into insignificance before that one great question of the wages of labour.

Labour and capital, which is the accumulation of labour, are co-equal powers. Without labour capital yields no return, and will be dissipated; without capital labour cannot be employed to advantage, and the labourer cannot rise to independence. Unfortunately this truth, which is as fixed and indestructible as any other of the laws by which the world is governed, has not yet forced its way into the understandings of the masses in this or any other country. If it be too much to say that labour in England, as in the centres of manufacture in France, has declared war against capital, it is at least true that it places itself in opposition to capital, and the employer who but recently was regarded as a useful citizen, is now, to some extent, thought to be one who desires to reap where he has not sown, or at the best claims more of the joint produce than he ought to do. The causes of this change are deep-seated. During the last half-century, since the end of the wars of the first Napoleon, there has arisen all over Europe and in the United States a great development of the industrial arts, fostered by the general use of steam-power, by vast improvements in machinery, by the tendency of such machinery to create large establishments and augment already overgrown towns, by the construction of railways and steamboats, by immense facilities in postal communications, by the removal of the tax on newspapers, and, finally, by the invention of the electric telegraph. The effect of all this has been a rise in the wages of labour not nominal only, such as might be produced by the greater plenty of the precious metals, but real, great, and rapid beyond anything before experienced, and raising, in every article into the production of which labour at all largely enters, the cost of production in a far higher proportion than that of the necessaries of life, though most of these have also risen, and considerably. During that long period from the commencement of the reign of Louis XIV. to the battle of Waterloo, while other nations were distracted from the arts of peace by war or the apprehension of war, England, from her insular position, was at rest, and became gradually a hive of successful industry. During the latter part of that time she was supreme in the markets of the world for manufactured goods. The English capitalist took the lead in boldness of adventure; the English artisan in skill and perseverance. "*Indocilis pauperiem pati*," the device of the merchant venturers of one of our great seaports, was the sentiment of the whole nation. In the employment of her coal, the construction of her machinery, the outlay of her capital, the industry of her artisans, and the force and energy of her marine, England had no co-rival. "Wherever," said Napoleon, with the bitterness of deadly hate and envy, "wherever a cockboat can float, there I find the British flag," and beneath that flag were poured forth the cotton and the cutlery of Britain.

But the fall of Napoleon, and the repose that followed, enabled other nations to come forward in the race, and whatever may have been the continued progress of England, and it was great, France, Belgium, Germany, and the United States gained greatly upon her, though even as lately as the introduction of railways on the Continent, Mr. Brassey could testify that, although English wages were higher than in any other country, railway works could be executed more cheaply by English than by any other labour.

There arose in England a belief, and a not ill-founded belief, on the part of the artisan, that he obtained too small a share of the returns to which, by his industry, he had largely contributed, and for this larger share, as for all good things in this world, he had to contend. At first, in the ignorance in which the working classes had culpably been suffered to remain, they had recourse to riots and open violence, but by degrees, better instructed, they formed the combinations known as trade-unions, organised at first as provident or benefit societies for the sick or aged, afterwards extended to take in hand the regulation of wages and particulars of labour, and, from time to time, with perhaps equal excuse, but with less wisdom, employed also in political questions.

Our immediate and direct business as British manufacturers is with British unions; but, as these combinations exist in extreme forms elsewhere, our Association will have also to pay attention to the fruits which they produce in other countries.

Now combinations on the part of the artisan classes and in their interest are natural and right, and, since the alteration of the law in 1824, are legal. Although capital and labour are so intimately connected that one cannot be deeply injured without injury to the other, they have also points of variance, and it is only by a conflict of forces that a resultant course, representing each, can be arrived at. What has to be secured in these struggles, in the interests of the whole community, is that neither party interfere with that entire freedom to employ himself at pleasure in any lawful trade, which is the ancient right of every man under the common law of England, and which, though from time hampered by statute, was never lost, and is now once more fully recognised by the Legislature.

Trade-unions being thus in themselves lawful and right, and the recognised organs of labour, it becomes essential that their course of action should be understood, and this must be gathered not so much from their professions, though these are not indistinct, as from their practice. Their first and main, and very legitimate object, is to increase the wages of labour, and to bring this about by the means, equally legitimate, of combination. But having, by the setting forth so desirable an object, by means so legitimate, obtained the confidence of the artisan classes, they proceed to steps of a different character. To raise wages they adopt means which diminish production, and this by restricting the number of artisans admitted as apprentices into a trade, by shortening the hours of work, by discouraging piece-work, and, where possible, the employment of machinery, and it is difficult to say which of these devices is the more opposed to sound principles or to the general interests of the whole commonwealth.

What rent is to land and wages are to labour, profits are to capital, and as they form the residue of the fund of returns out of which, where a trade is successful, wages must ultimately be paid, anything that diminishes that fund has, so far, a tendency to lower wages; and, therefore, whatever means are adopted to obtain for the labourer a larger proportion out

of the fund, great care should be taken that they are not such as to diminish its total amount. But profits depend for their rate upon the cost, not upon the wages, of labour; and the cost of labour is determined by the proportion between the wages of the labourer and the value of his production: consequently, measures that have a direct tendency to diminish the quantity of an article produced and to raise its cost, will, so far, depress the trade in favour of rivals who are allowed more freedom of action, and so will work injury to all. To restrict by artificial means the number who may follow any particular trade is only to throw upon the mass a number of persons who might be better employed, and who, by adding to the general supply, have a direct tendency to lower the average of wages.

Profit, or that which remains to the employer when his capital is replaced and the wages of labour have been paid, is the joint produce of capital, skill, and industry, but it is an error to represent it, as is now often done, as the fruit of industry alone, and therefore the property of the workman; nor is the step from this a great one to that of representing the interest of the employer as altogether opposed to those of the employed, and seeking to compel him to raise wages with but little regard to the source whence alone they can be derived.

As to the hours of labour, it may be admitted that in some trades they have been too long for the average workman, and so far as they tend to depress him physically and intellectually were therefore injurious to the community. Relief on this head was no doubt needed, but to forbid any man, whatever may be his strength or skill, to employ those qualities for his special benefit, was scarcely the way to bring it about. The tendency of such an order is to place the weak and strong, the skilful and the unskilful, the idle and industrious, on the same dead level. It is true that in practice the unions do not carry their opposition to piece-work to the length of absolutely prohibiting it, but the arguments employed by them, if followed to their legitimate consequences, would be prohibitory.

The manner in which these restrictions have been enforced is equally objectionable with the restrictions themselves, and includes all methods of coercion, from social exclusion up to serious bodily injury and even death. All individual liberty is forbidden. The conditions of labour are dictated by a committee of delegates whose deliberations are, not unfrequently, kept secret, and whose authority is paramount.

It may be said, probably with truth, that the regulations of the Manchester and Sheffield unions, conceived in ignorance and enforced by crime, are confined to unions composed of the lowest and most ignorant class of workmen, and are disapproved of by all others. Still, admitting this to the full, the violation of sound economy and the interference with individual liberty are rather in degree than in principle.

Of course it often happens that a union is not strong enough to carry out its wishes to their full extent, but their tendency is such as I describe. Even if the restrictions were in themselves in some respects beneficial, they are not the less an interference with that individual freedom for which we in England have struggled so long; and their direct effect is to lower the standard of excellence attained by British industry, to deteriorate quality, to check quantity, and to enhance cost, and to do this by forbidding individual freedom of action, and diverting the natural course of labour into artificial channels. It is scarcely for a Government, still less for an irresponsible and private body, to judge what trades are overcrowded. That this and similar points are best left to be settled by natural laws is a truth which we, in this country, have been slow to learn, but which we have learned, and will, I trust, yet maintain.

Moreover, this system of interference with natural law, supported by petty annoyances, rising to social terrorism, is even now producing its effects in England by the stimulus it affords to the productions of other countries. Belgium already runs England very close in all her great industries. Wages in that country are far lower than here, and the cost of living is about the same. Her artisans are skilful and industrious, and her progress has been effected during a period when her very existence, as an independent nation, was threatened.

There is the less excuse for this suicidal policy, that not only in Belgium but in France and Germany, wages are lower, and the position of the artisan less advantageous than with us. Here there exist few or none of those old legal restrictions on trade that linger in parts of the Continent, and especially in Germany, and which are described as having been, in the United States, at the close of the late war, far more vexatious than those prevailing in England in the days of Mr. Pitt, and the contemplation of which drove Mr. Wells to become a freetrader. In England, food, clothing, and lodging, are as cheap, or cheaper, than on the Continent, and the industrious, prudent, and skilled workman, can at this time do better for himself here than even in the United States. The consular returns to the Foreign Office, first called for by Lord Clarendon in 1869,—returns which might be consulted with advantage by our working classes,—show that in no country, excepting perhaps Holland and Switzerland, is an artisan better off than in England; and in Switzerland the difference seems to be due only to their greater frugality and the absence of intemperance.

In these disputes about labour, as in not a few of our national troubles, the cause is mainly ignorance. The English artisan is not usually by any means a vicious man. Even where he joins in attacking employers as a class, he not unfrequently bears no sort of malice against his own employer. He does not seek to regenerate his country by bringing every capitalist to the scaffold, or even to the poorhouse, or by destroying public monuments or other evidences of national greatness or accumulated wealth. Where the individual master, and, in some considerable degree, where the masters of a special district are allowed to deal directly with his or their own men, the men are usually willing to listen patiently to reason. Nevertheless, it is vain to disguise or deny the fact that British workmen, by their representatives, the trade-unions, are at this time acting in opposition to the doctrines of free trade and of freedom of action.

The drift of the Western world, ever since the invention of printing, has been all in one direction, and every movement has contributed to improve the condition of the masses. Privilege after privilege, restriction after restriction, has crumbled away. The discovery of America, the doubling of the Cape of Good Hope, the use of gunpowder, the reformation in religion, the colonisation of the fifth division of the globe, every discovery, every invention, has been a step in the same direction, tending powerfully to equalise social conditions, to break down divisions, to bring about, not that equality of individuals which is the empty but dangerous dream of the socialist, but the removal of artificial restrictions, and to allow each man freedom to employ his powers in that way which seems to him the best, and which has been found to be on the whole the best for the community.

But a few years ago, the policy of protection was almost an integral part of our industrial system, in manufactures, commerce, and agriculture. And yet in England, a country very distrustful of change, as change, the voice of reason has been heard, and great and powerful interests, such as those involved in the navigation laws, and the growth of corn, have given way. It has only been after severe struggles, and at great cost to specific interests, that perfect freedom of manufacture and of trade, and individual freedom of action, have been won and established; and we are now asked in the interests of labour to reverse this decision, and to return to a system of restrictions and interferences which is at direct variance with all our convictions.

I have touched at some length upon these burning topics, I hope in no spirit of cavil or exaggeration. I have described the operation of trade-unions, as they are now, or have recently been, carried on, and especially as they affect the iron, and its subsidiary, the coal trade; and this I have done because, although it is highly undesirable that this Association should become an arena of controversy, it cannot but be that we shall have to give our attention, and our most serious and anxious attention too, to one of the most complex and most pressing problems of modern times, and one upon the solution of which depends the prosperity of our own trade, and, in a great measure, that of our own country.

Our Association enters upon its existence in a time of general depression, and one in which we have to grapple with new and somewhat formidable dangers. But the qualities which have gained will maintain success, and they know but little of England who suppose that the energy and boldness of our capitalists, or the skill and industry of our working classes, have seriously fallen off, or that our internal disputes will not be conducted, on the whole, with that practical sense and moderation to which we, as a nation, lay claim. Even now, dark as is the hour, and deep the winter of our discontent, there are not wanting symptoms of a revival, nor, perhaps, is it too much to express a hope that we may soon be able to hail with the poet, as a sign of the returning spring, that

"Vulcanus ardens urit officinas,"

and may see

"The silent furnace once again in blast."

THE ARCHITECTURE OF SOUTH HOLLAND.*

Some years ago I had the pleasure of spending several weeks in a ramble amongst the beautiful churches of Norfolk and Suffolk, and as I approached the coast, and looked upon the North Sea, I often found myself wondering, as one does wonder when one looks at the sea, what the land on the other side of that ocean was like; and from this I was led to speculate whether its churches would resemble those beautiful structures which I was then engaged in studying. Speculation naturally led to inquiry, and I was assured that there existed the greatest similarity between the churches of Holland and those of Norfolk and Suffolk; not only so, but I was told over and over again that the beautiful roofs which form such marked features in the Norfolk and Suffolk churches were absolutely framed and carved in Holland and sent over here. Now, as the form of roof adopted in Norfolk and Suffolk influences the entire plan of the churches in those counties, leading to the adoption of light and elegant clearstories, with little or no wall space, and lofty and slight arch piers, I pictured to myself a Dutch church as being a kind of enlarged edition of St. Peter's Mancroft, Norwich, or St. Nicholas's, Lynn, and there was certainly much in the history of Holland to favour this hypothesis. The requirements of the two people, as far as church matters went, were very similar,—that is to say, both required large important parish churches, capable of holding vast congregations, and not abbeys or cathedrals. The difficulties were much the same on both shores of the North Sea,—the absence of good building stone, and a soft, spongy soil, incapable of sustaining great weight, and bad for foundations. With these speculations working in my mind I visited Holland, and it is hardly necessary to say the very first Dutch church I saw caused my air-built edifice to vanish like smoke. Instead of a rich exterior, with elaborate parapets, panelled buttresses, and light and elegant clearstory, I had before me a huge building of red brick, without either parapets, strings, or labels, and great bare walls, pierced with immense windows, filled with very wiry curvilinear tracery. The interior was, if anything, still more unlike what I had pictured to myself; there were no capitals or bases, the piers were composed of curious rude arch-moulds brought down to the ground; there were no strings, panelling, and carving of any kind, and hardly anything deserving the name of a moulding. It is true there was a wooden roof, but how different to the wooden roofs of Norfolk or Suffolk! Instead of the richly-carved hammer-beam, with its graceful angel terminal, the cusped principal, and elaborate wall cornice, here was a huge barrel-vault, devoid of panelling or even ribs, its monotony only broken here and there by ponderous tie-beams. Yet with all this bareness, baldness, and absence of detail, there was something striking and solemn about this vast plain church, and it struck me at once that with rich furniture, pictures, and stained glass, the effect of one of these interiors must have been very impressive. Now the account I have here given would serve as a description of about seven-eighths of the whole of the churches in Holland, and one is at once tempted to ask the question, How is it that two peoples, both having the same wants, suffering under the same difficulties, and so nearly connected by race and geographical position, should have developed two styles so totally dissimilar as those of the East of England and the West of Holland? I think it is not difficult to answer this question. The fact is, the Mediæval builders of Norfolk looked the difficulties they had to encounter boldly in the face, carefully studied them, and created for

* By Mr. H. W. Brewer. Read at the Architectural Association, as elsewhere stated.

themselves a style of church architecture thoroughly applicable to their needs. Thus finding that they could only obtain stone at great expense and with great difficulty, they used it very sparingly, and constructed their walls chiefly of flint. Now a more unpromising material could scarcely be imagined; yet, after a time, how beautifully they came to treat it. If any one doubt this, let him look at the south side of the nave of Wymondham Church, or the south chancel of St. Michael's Coslany, Norwich, and then say whether a truer application of surface ornamentation, or a more artistic treatment of material, is to be found, even in Venice or Sienna. Again, finding vaulting an impossibility, on account of the bad nature of their foundations, the East Anglian architects invented a form of wooden roof so perfect and so ornamental, that when looking at the interiors of such churches as St. Peter's Mancroft, Norwich, North Walsham, or Lavenham, one hardly envies France and Germany their magnificent vaulted roofs. Now the Dutch architects of the Middle Ages worked upon a different principle, and I think this will account for the fact that their architecture is, comparatively speaking, a failure. Their buildings are often monotonous, and devoid of originality; their construction is frequently faulty, and their detail poor and uninteresting,—at any rate, to a great extent. Of course, there are churches in Holland,—such, for instance, as the cathedrals of Maestricht, Utrecht, Bois-le-Duc, and Breda, and the minster church at Roermond,—which avoid all these defects. However, these defects are certainly the *rule* in Dutch churches, and the exceptions are few and rare. What led to these defects is the fact that instead of originating an architecture for themselves, the Dutch Mediæval architects copied the plans of their churches bodily from the French. Thus nearly all churches of any size in Holland posses a chevet, with radiating chapels; the naves generally have double aisles or aisles and chapels; and the smaller churches universally have one or more apses at the east end. The most marked departure which they frequently made from the French plan was in exaggerating the length of the transepts, and using one western tower instead of two. There are, however, exceptions to this rule, for the Catholic church at Arnheim, erected between the years 1328-1340, has two western towers. Curious examples of the exaggeration of the length of the transepts are to be seen in the great Protestant church at Bergen-op-Zoom, where each transept has six bays, while the nave has only four bays in the cathedral at Roermond, and at St. Pancras Church at Leyden. I can offer no suggestion for the cause of this peculiarity. Having copied the plan of his church from France, the Dutchman borrows his detail ready-made from Germany; he never seems to have given sufficient consideration to the difficulties of site or material; thus, although, except in a few instances, driven to use brick, he adopts a plan almost peculiar to stone buildings, and suggesting, if not absolutely requiring, vaulting to give a reason for its form and construction; and although driven by the insecure foundation to construct his roof of timber, this is generally made like a poor imitation of a stone roof. Nothing can, I venture to think, be less pleasing than the effect of many of these Dutch timber roofs, especially when, as at Gouda, the great church at Amsterdam, and Bergen-op-Zoom, &c., they are unbroken by any arches at the crossing, and simply mitre at the intersection of the nave and transepts. I do not think that any one who has seen these roofs can for a moment believe that the Dutch constructed or carved the beautiful roofs over the churches in Norfolk and Suffolk. It is true that there does exist one hammer-beam roof in Holland, and that of a rather early date. It is over the great hall of the palace at the Hague, and is of large span, but very rude, and unadorned by carving or mouldings. It may date from the commencement of the fourteenth century, and looks like a clumsy imitation of English work. All the Dutch timber roofs which I have seen look like makeshifts, and, what is so singular, they never seem to have anything to do with the buildings they cover. The churches are built just as if they were intended for vaulting, and then covered in with one of these ponderous heavy-looking barrel-roofs. I am told that the Government architects in Berlin show no roofs upon the elevations of their designs for public buildings, because they consider that where the roof begins architecture ends. One would almost think that the Dutch Mediæval architects laboured under some similar kind of superstition, when they found themselves prevented from putting up a stone vault over their churches. Another singular thing is that although the Dutch architects were obliged to use brick, and were able to procure this material in great perfection, they rarely attempted any artistic treatment, but confined its use entirely to plain walling. It is true that there are two or three churches; for instance, the Protestant church at Roermond, and the desecrated Carmelite church at Venloo, in which the arches, piers, and vaulting-ribs are all formed of brick, rather roughly cut and covered with a thin coat of plaster. The latter church also has some ornamental patterns stamped upon the brickwork of the gable, and the Roman Catholic cathedral (formerly the Carmelite church) at Utrecht has its western gable adorned with curvilinear tracery executed in brick (1524). With all these defects in design and construction, and poverty of invention in the use of material, the Dutch churches are generally very striking, partly, no doubt, on account of their vast size and height, and also by reason of their pleasing proportions. The Dutch Mediæval architects seem to have succeeded thoroughly well in the towers which they designed for their churches. That of the great Protestant church, formerly the cathedral, at Breda is a noble and beautiful example, dating from about the year 1410; it is 362 ft. high. The great and now isolated tower of the cathedral at Utrecht is another grand example of a Dutch tower; 72 ft. square at the base, it is crowned by a beautiful octagonal lantern, and in its present mutilated condition reaches a height of 321 ft. It was erected between the years 1321 and 1331. The tower of the Protestant church of St. John at Maestricht is very singular in design, but not so grand as to its dimensions. It is, however a noble tower, 230 ft. high. The church of St. Ursula Delft, has a rather squat stone spire, and four pinnacles. The cathedral of Middlesbourg, in the Walcheren, and Bois le Duc, and the churches of Boxtel, Helvetsluis, Flushing, &c., have fine Gothic towers crowned with lofty renaissance spires of timber. The churches of Rotterdam, Dortrecht, and Delft, have grand but unfinished square towers. There is, of course, little furniture to be found in the Dutch churches, but what little does exist is remarkably fine. I will just mention, in passing, the stalls in the Catholic church at Venloo and the Protestant church at Breda, as fine examples of Gothic woodwork; and the stalls at Dortrecht, and the marble high altar in the Catholic church at Venloo, are noble examples of Early Renaissance. The font at Breda is a beautiful example of Early Renaissance metal-work, though, from the church now being Protestant, all the figures which formerly adorned it have been destroyed. Examples of metal-work abound in the Dutch churches of every date, and are universally good,—sometimes remarkably beautiful. There is little stained glass left in Holland except at Gouda, which contains seventy-five windows filled with it, dating from the years 1560 to 1603, so that the latter windows were added after the Reformation, and, with singular inconsistency, the people of Gouda must have been tearing down pictures from the walls, and putting pictures into the windows at the same time!—a brilliant example of consistency which has recently been copied at Exeter Cathedral; but to make this matter the more singular, all the other stained glass in the country was smashed as being idolatrous! However, whatever reason, or want of reason, has saved these windows, all lovers of art must be thankful. I will not enter into any description of them, because the glass at Gouda would deserve a paper to itself, in addition to which I have no drawings of it. I may, however, in passing, say that I was slightly disappointed with it, as it seems to me to have a kind of opacity about it which reminded me of the modern German glass. Of course, the drawing and design of these windows are superb. A Dutch gentleman pointed out to me that the windows, previously to the Reformation, were filled with sacred subjects, chiefly from the Scriptures, whereas those after the Reformation were all allegorical subjects, illustrated by Pagan mythology, and he said (I do not think he quite saw the deduction to be made from his words),—"You see, there is no *Christianity* in these later windows, consequently there is *nothing* to which one can possibly object."

I will now enter into a detailed account of a few of the churches in Holland which, either from their importance or their peculiarities, or from their being unlike the general run of ecclesiastical buildings in that country, merit particular notice, and I shall confine myself entirely to churches south of the river Rhine. Holland possesses remarkably few churches of an earlier date than the fourteenth century, and those which do exist are, as a rule, marked by no very distinguishing peculiarities. They are, in fact, as a rule, exactly similar to the German Romanesque churches of the Lower Rhine. The most interesting examples of early churches to be found in Holland are the circular chapel, called sometimes the temple, and sometimes the baptistery, at Nijmegen (it is rather a rude example of Romanesque work, probably not earlier than the twelfth century); the church of Rolduc, which is a tolerable example of German Romanesque; the cathedral and church of Notre Dame at Maestricht; and the minster church at Roermond in Limberg. The three last-named buildings are so important and so remarkable that they demand a detailed account.* The minster church in Roermond is another most interesting building. It consists of a nave of four bays, vaulted in two; western transepts, with a kind of fore-nave to the west of one bay; a deep western porch; eastern apsidal transepts; and a very short chancel, consisting of only one bay and a semi-circular apse. There are towers flanking the choir, and also the fore-nave, and over the crossing is an octagonal lantern, crowned by a dome. The exterior of this beautiful church had been sadly mutilated during the last two centuries. Of the four towers three had been pulled down to the level of the roof, and a heavy and clumsy tower of brick had been erected over the western porch. The weight of this tower had rendered the western portion of the church so unsafe that it was found necessary to pull it down, and entirely reconstruct the western porch. This has been very skilfully done under the superintendence of Mr. Cuypers. The two eastern towers have also been carried up to their original height, and crowned with slate spires, and the two western towers are at present in course of construction. Great fault has been found with Mr. Cuypers, by some of the local archæological geniuses, because he has carefully restored the domical roof of the centre lantern just as he found it, instead of capping the lantern with a pyramidal roof. Mr. Cuypers's defence will, I think, commend itself to all sensible people. The dome, says Mr. Cuypers, dated from the fifteenth century, and is probably a unique example of such a feature erected in Northern Europe at this date—so uncommon, in fact, that it is very probable that the fifteenth century restorers simply copied what they found already in existence. This dome is of timber, covered with lead, and it is constructed in what is called ridge and furrow,—that is to say, it is a star in plan, and not an octagon. The nave, transepts, and choir of this church are rich German Romanesque work, but the western transepts are most beautiful First Pointed work, far more French than German in general treatment. They are the only examples of this style I have met with in Holland, a thing greatly to be regretted, for there is a noble simplicity, together with an effect of richness, about this portion of the minster at Roermond that I have rarely seen surpassed anywhere. The nave and western transepts have very large and grand triforia, which are not carried round the eastern transepts, but terminate in small apses which are bracketed out from the western walls of the transept, and from the interior of the transepts appear like oriel windows. Each of these singular little structures contains its original altar. Two ancient altars also exist in the triforium space, under the eastern towers; but what is most remarkable is the fact that the original high altar still exists *in situ*, not, as one would suppose, in the great apse of the choir, but in a semicircular recess on its eastern extremity. Mr. Cuypers told me that he had, over and over again, examined the altar, and he could not find the least mark of its having been removed at any time. There can also be no doubt that it was originally the high altar, because it is of very large dimensions. Mr. Cuypers has determined, when he comes to restore this portion of the church, to remove the modern high altar, and restore this one to its ancient use. Under the crossing is a fine thirteenth-century altar-tomb,

* The Cathedral and Church of St. Servais, at Maestricht, were described, and the porch of the church illustrated, in the volume of the *Builder* for 1871, pp. 314 and 347. Illustrations of many of the other buildings mentioned in this paper will also be found in the *Builder*.

with recumbent figures of a later date, probably fifteenth-century, commemorating Girardus III. of Nassau, and his wife. In the south transept is an altar, with a most superb carved tryptich reredos of the fifteenth century. It is filled with scenes from Our Lord's Passion, represented by hundreds of small figures, most delicately carved and finished, and the wings are painted in oil by a master of the Early Flemish school. The whole is richly painted and gilt, and is a most splendid example of ancient church furniture. This church possesses also a splendid monstrance of silver, 3 ft. 3 in. high, and adorned with the most delicate tracery and tabernacle work.

Roermond contains two other churches, both of which I have already mentioned. The Cathedral, dedicated to St. Christopher, is a large fifteenth-century church, possessing, I think, many of the defects that are to be found in a Dutch church, together with most of the peculiarities. It has immensely long transepts, which terminate in apses; but attached to the apse of the southern transept is a small porch, the roof of which is a regular piece of English vaulting, with rich bosses and lien ribs. This church was erected into a bishop's see by Cardinal Granville in 1560, but the see was shortly afterwards suppressed. In 1850 it was again restored, and forms the cathedral church of the Roman Catholic bishop of Roermond. The Protestant church in Roermond is remarkable for its piers, arches, and vaulting-ribs all being constructed of brick. The nave and aisles are of one height, under one external roof. The piers are square, the arch-moulds being bracketed out from each face at the springing of the arches. These piers are very thin. This is probably one of the most economical vaulted churches ever erected during the Middle Ages. The chancel alone is used, the nave serving as a stable! There is some good old domestic work, chiefly in brick, in the town, and the ancient fifteenth-century brick walls are the earliest example of "Flemish bond" I have ever seen.

The last church with which I shall have to trouble you with any detailed account is the cathedral or church of St. John at Bois-le-Duc, in North Brabant; and I shall dwell for some time upon the consideration of this noble edifice, because it may be looked upon as the only perfect realisation of the ideas of a Dutch Mediæval architect passed down to our times. It is possible that the great metropolitan church of Utrecht may, in the days of its splendour, have surpassed that of Bois-le-Duc, to which it bears so striking a resemblance, but unfortunately the nave of this noble cathedral no longer exists; its fine tower has been robbed of a portion of its height; and the choir and transepts, which alone remain to attest its former grandeur, have been fitted up in a style so barbarous, and are so forlorn, desolate, and neglected, that they are a sight that can only fill one's mind with sorrow and regret. It is true that a kind of restoration has been commenced, but this promises rather to add to the havoc and destruction, for a beautiful little doorway which leads to the remains of the cloisters has been "restored" by having the delicate sculpture of its tympanum cut away and replaced by a vulgar representation of a very badly-bound Bible surrounded by rays. The interior of the church more resembles a lecture-theatre than anything else, and the apse, which is walled off and full of decayed tombs, seems to be used as a kind of dusthole or receptacle for disused lumber. Now the cathedral at Bois-le-Duc has fortunately escaped many of the misfortunes which have befallen other Dutch churches, and so in its present condition may, I think, without doubt, be pronounced to be the finest church in Holland. In plan it consists of a nave with four aisles, transept with aisles, and a spacious choir with aisles, chevet, and eleven radiating chapels. Over the intersection of the nave and transepts is a lantern crowned with an ogee dome. At the west end rises a lofty tower, capped by a singularly graceful Renaissance spire of wood and lead. Attached to this tower is a single western transept, and at the west end of the outer south aisle is a curious small tower and spire. The tower and western transept are of brick, and formed a portion of an earlier church. They are Geometrical in character, and date from the commencement of the fourteenth century; whereas the rest of the church, which was erected between the years 1419–1497, is entirely of stone. Attached to the south aisle of the choir is a very large chapel covered all over with the most elaborate Flamboyant tracery and panelling, very French in appearance, and to the east of this is the equally elaborate basement story of an octagonal building, which could, I think, only have been intended for a chapter-house; and if so, it is the only example of an octagonal chapter-house out of England. This is now the cathedral church of the Roman Catholic diocese of Bois-le-Duc, or, as it is called in Holland, St. Hertzogen-bosch. I cannot, unfortunately, give you the dimensions of this magnificent church, but, judging from its appearance, I should say it must be about 400 ft. long, and, as far as I could measure by stepping it, the nave is nearly 45 ft. in the clear, and the height to the vaulting cannot be less than 115 ft. The exterior of this church is singularly rich in detail, and although late (it was erected between the years 1419–97. Cardinal de Granville erected this church into a bishop's see in 1560), is singularly pure and beautiful. The clearstories are supported by noble flying buttresses, which are in two ranges, and the buttresses are crowned with groups of pinnacles, their fronts and sides being adorned with niches and panelling work. All the windows have straight-sided canopies, the tympana of which are adorned with sculpture, representing ecclesiastics, knights, ladies, and, in the nave, grotesque subjects. The two transept ends are most noble compositions. The northern one has a splendid portal, and the southern an open porch with two lofty arches. Both are adorned with Scripture, but that on the north side has been restored under the direction of Messrs. Hessemans & Venneman, the architects to the cathedral chapter; and although the ancient sculpture has been copied with some amount of faithfulness, the modern figures which have been added are far from satisfactory. It is difficult to convey by any description the effect of the interior of this church; it is grand and impressive to an extraordinary degree. The piers, which have lofty bases, are a continuation of the arch-moulds. The triforium consists of very rich pierced panelling, and the whole wall-space is covered with tracery, which in the chancel is arranged in Geometrical patterns, and in the nave is Curvilinear. Over the crossing is the lantern, which is wonderfully cleverly arranged. It is an irregular octagon, the cardinal sides being twice as long as the oblique ones. These oblique sides are blocked by octagonal turrets, but the others are pierced by windows, which, by a singular arrangement of bipping away the roofs of the nave, choir, and transept, are brought down to the very crown of the arches, thus admitting a flood of light into the very centre of the church. The effect of this is perfectly charming. It avoids that dark blank space which usually intervenes between the windows of a lantern tower and the crown of the arches of the crossing. The furniture of this fine church is even more interesting and splendid than the building itself. At the west end of the south aisle is the baptistery, which is separated from the church by a metal screen. The font is probably one of the very finest in existence; it is unusually large, and, together with its canopied cover, is entirely of brass, richly gilt. The lever which swings off the cover is the most elaborate piece of fifteenth-century metal-work I have ever seen. It is composed of iron and latten; the more delicate portions of the detail are of the latter metal. It would be impossible to give any adequate idea of this beautiful and sumptuous article of church furniture by description. I may, however, explain that the figures surrounding the base, which are perfect examples of modelling, represent the cripples at the Pool of Bethesda. In the lowermost niches of the cover the baptism of our Lord by St. John, and the Annunciation, are represented. In the upper series of niches are the four Doctors of the Church, and the top niche is filled with a figure of the Eternal Father in the attitude of benediction. The whole is completed by a finial representing the Pelican in her piety. The sponsors' candle sconce, the crysm-box, and shelf for holding the font-cover when it is swung off the font, are all ancient and most interesting. There are two other fine examples of Gothic furniture in this church, and there are a beautiful lampadarium or chandelier (hanging in the side chapel before mentioned), the centre of which forms a canopied niche containing the statue of a saint, from the base of which spring the candle-brackets; and the choir-stalls, which look as if they were earlier in date than the present building. The rest of the furniture of this church is in the most sumptuous and magnificent style of the Renaissance. The organ-case, which is 80 ft. high and nearly 40 ft. wide, is built of solid logs of oak. It is dated 1602; it is a most noble composition, enriched with figures (many of which are life-size), arabesques, foliage, grotesques, and architectural ornament beautifully designed and executed in the most spirited and masterly manner. This organ is one of those wonderful productions of the earlier Renaissance age which seems to have been carried out quite regardless of expense, labour, and time. To give you some idea of its wonderful richness, I should state that the flutings of the quasi-Corinthian columns supporting the upper portion of the organ "towers" have delicate incised enrichments running up them. The pipes are very skilfully arranged; in the "flats" they are left in white metal, with the tongue chamfer alone gilded, but in the "towers" the centre pipe is gilt, and is embossed, twisted, and ornamented. The choir organ is rather later in date than the great organ, but equally splendid. The organ at Bois-le-Duc possesses what every organ-case ought to be provided with,—a ceiling or roof. If this is omitted in an organ the pipes draw in the dust, and the organ becomes clogged and is always out of tune, in addition to which, as sound ascends, the roof or top to an organ is as necessary as a sounding-board to a pulpit unless the organ is under ground. The tone of this Bois-le-Duc organ is as magnificent as its appearance,—vastly, to my mind, superior to the Haarlem one. It does not, it is true, imitate thunderstorms, waterfalls, or stone rolling down the hill, but it has a grand, rich, diapason tone, which, it seems to me, is what one wishes to hear upon an organ, which is, after all, a musical instrument, and not a box of conjuring tricks. The pulpit is in the same style, and nearly as richly carved as the organ; and the side screens of the choir and chapels are composed of oak panelling about 3 ft. high, and upon this rest brass-gilt balusters beautifully moulded, the whole being crowned by rich cornices carved with arabesques and foliage. The altars are not worthy of such a magnificent church; they are late Renaissance, and rather poor and uninteresting. Originally, there was an altar against every pillar of the nave, the piscinæ and ambries of which remain.

I now have a sad tale to tell. This church, until five or six years ago, possessed a magnificent rood-screen of marble and alabaster, a worthy companion to the pulpit, organ, and font; but, alas! under the absurd plea of restoration, this fine work of art was removed, and is now in the South Kensington Museum! I was told that the architects to the Dean and Chapter absolutely advised the removal of the organ and pulpit, as being out of place in a Gothic church; but this advice was fortunately not taken, chiefly owing, I think, to the expostulations of Mr. Cuypers, who, when consulted as to his opinion of this restoration, said, — "Gentlemen, you should instruct your architects to take away everything which they have put into the church, and to put back everything which they have taken away." To a certain extent this advice has been acted upon, for the modern Gothic bishop's throne (a preposterous structure about 60 ft. high) has been removed from the choir, which it disfigured. I wish I could say the same of the statues placed in the niches of the choir-piers, and Messrs. Hessemans & Venneman are now turning their attention to the windows, most of which had been robbed of their tracery. This they are reconstructing very creditably, and the windows of the choir and transepts are being filled with stained glass, which is not so bad as most Continental glass, and the windows of the nave are being filled with grisaille, which is decidedly good. The vaulting of the church is decorated with a kind of thistle-pattern scroll, painted in green, yellow, dull red, and black,—very effective and striking. This has been excellently restored some twenty-five or thirty years ago, though M. Venniman quite laughed at me when I said so, and showed me some decoration which had been done under his direction in a chapel, which struck me as being the most abominable use of colour I ever saw in my life. I do not wish to speak too strongly about Mr. Venniman, as he was very polite and obliging, but I cannot help saying that it is a pity, with such an admirable restorer at hand as Mr. Cuypers,—and in saying this I do not give you my own opinion, for Mr. James Brooks told me that he was delighted with Mr. Cuypers's restoration at Maestricht,—that the Dean and Chapter of Bois-le-Duc should have entrusted their cathedral to Messrs. Hessemans & Venneman for restoration. Bois-le-Duc is not rich in domestic work, but there are two wooden houses which are said to date from the thirteenth

century. They are certainly, in appearance, the earliest timber houses I have ever seen. I regret that my time will not allow me to say more of the domestic architecture of Holland, but that is a subject which would of itself require a paper; neither have I touched upon the Renaissance buildings in Holland, nor the revival of Gothic architecture, which has produced several fine modern churches, especially the new R.C. churches of Vechel, Eyndhoven, and Breda, by Mr. Cuypers. In conclusion, I think the ecclesiastical architecture of Holland during the Middle Ages, although it cannot be considered a success, owing to its want of originality, is worthy of study, because it shows how well thoroughly plain buildings may be made to look, and that grandeur may be obtained without richness of detail or great solidity. There is a breadth of treatment about these Dutch churches which is very suggestive, and an entire absence of that busy prettiness which is the bane of modern architecture. And I feel sure that any architect who has to build churches in large manufacturing towns would find a careful study of Dutch architecture of great use to him. The very failures of these Mediæval architects are instructive; for, although it is always more agreeable to contemplate success than failure, yet the failures of men who have striven bravely are worthy of admiration, because the nobleness of their strife has given to their failure the very nature of success.

MOVEMENT IN INDIA.

As has been already reported, Bombay is to have an equestrian statue of the Prince of Wales, the workmanship of Mr. Boehm, and the gift of Sir Albert Sassoon. The Prince is said to have expressed himself gratified that the memorial of his visit should take this form; and it has been proposed, in more than one of the large Indian cities, that efforts should be made to procure *replicas* of Mr. Boehm's work, for erection in their own midst. In several of the places which have been visited by the Heir Apparent, there are balances still in the hands of the reception committees, and it is thought that these balances might form the bases of memorial funds to commemorate in this or some other equally conspicuous manner what is undoubtedly an important event in Indian history.

The Duke of Buckingham has just returned to Madras, after a protracted visit to Calcutta. During his stay he carefully inspected the Calcutta Waterworks, and twice visited the head works at Miranapur. He also inspected several of the minor stations, and is said to have displayed a thorough acquaintance with the subject of supplying water to large towns which considerably astonished the engineers. As he had previously expressed himself dissatisfied with the Madras supply, the local journals anticipate some benefit from his trip to the metropolis.

Scindiah has given a lakh of rupees (10,000*l.*) to the architect of the new palace in which the Prince of Wales was received. The architect is a descendant of Jean Baptiste Filose, an Italian who entered the service of the Gwalior princes four or five generations ago, and whose descendants have always been held in high favour at the Mahratta court. None of the family have intermarried with the natives, and the present Signor Filose was educated in Europe.

Messrs. Glover & Co., contractors, of Bombay, have received a telegram from the Government of India, informing them that their tender for the Scindiah State railway has been accepted. This contract is for a broad gauge line, seventy-five miles in length, from Agra to Gwalior. Among other heavy works, it includes a viaduct across the river Chumbul, consisting of fourteen spans of 200 ft. each, the piers being about 115 ft. high.

By way of commemorating the Prince of Wales's visit to India, Raj Dunput Sing Bahadoor has offered the Bengal Education Department a scholarship of 150*l.* a year, tenable for three years. It will be assigned to the school of practical science which the Indian League means to start in Calcutta. There is abundant need for this and all similar endowments in India, and it is to be hoped that many more of them will be given by intelligent princes and zemindars. We may presume that these gifts, which have been so liberally bestowed in memory of the Royal visit, are not fettered by harsh restrictions, and are as open to the competition of Eurasians as of pure-born Hindoos. In that case they may be the means of doing great good, and of benefiting India by rousing the dormant energies of a clever but very unsatisfactory and listless section of the Indian community.

His golden-footed and elephant-controlling Majesty of Burmah intends to construct a railway from Myujan to Mandalay and Bhamo. The route selected is one in which very few engineering difficulties will be encountered. The contract has been given to an Italian firm, who have undertaken to complete it in three years from the date of commencing the line.

Mr. Adams Acton, sculptor, now of Bombay, has been commissioned to execute a bust of the Prince of Wales for the public library of Jullundur. The bust is a present to the library from two of the native sirdars.

Sir Arthur Cotton has sent out a long letter to one of the opponents of the Madras Harbour project, in which he commends the scheme of the unsuccessful competitor, and condemns Mr. Parkes's plans, which have been sanctioned and are being carried into execution. The document, which is one of those of which "you can make any use you please," has, of course been published, although it is not likely to fulfil its author's anticipations and lead to the stoppage of the work. He protests against the authorised scheme:—1st. As being open to seaward, so that there never can be smooth water in the harbour when there is any sea in the bay; 2nd. Because it will be difficult of access in stormy weather,—*i.e.*, because vessels cannot go out and in to it in all winds and seas; 3rd. Because it is insufficient in space, and makes no proper provision for the vast future increase of shipping at Madras. On this point he rather intemperately says:—"To project any work whatever on the basis of present traffic is the greatest possible mistake, *and shows an officer quite incompetent to project works.*" The blunder, however, has not been committed, and even if it had, Madras shows so few signs of development into a great port that Mr. Parkes may rest at ease respecting his professional reputation. 4th. Because in a sanitary point of view the new harbour will be an insufferable nuisance; and 5th. Because it is a needless waste of money. Having thus disposed of Mr. Parkes, Sir Arthur advances a scheme of his own. He is uncertain whether the form of the breakwater should be a perfectly straight line parallel with the coast, a moderately curved line, or a straight line with wings running east and west. As to the mode of construction he proposes "casting loose stones with outer ones of large dimensions. It is quite certain that no sea in the bay would move a quarried stone of 50 tons, on a slope of little more than 45°, perhaps 60°. If the sea moved such stones it would only be to pack them till nothing but blasting would extract one. In 7 fathoms I am satisfied that no stone of 50 tons would be displaced. If, therefore, the work was carried to within 2 fathoms of the surface with the smaller materials, and covered on the outside and top with large, the section of the work in 7 fathoms would not be much more than 300 square yards, or 400 tons per yard. One of the unaccountable fancies of civil engineers at present is, that it is necessary to go to a great expense in order to go to a far greater to put them together again so imperfectly that it requires three or four times as much material to make anything like a secure work. They are beginning now to get over this pure fancy, stones of 100 tons having lately been used. The hills of Madras afford the most perfect quarries, and will allow of a working face of 100 ft. or 150 ft., and mines of 5,000 lb. or 20,000 lb. of gunpowder (what a crash!) and with a canal to the beach at Madras, the cost of the stone would be exceedingly small." We cannot quote further, but may simply add, that Sir Arthur Cotton has forwarded this communication to Madras because the progress of the present work "is a continual distress" to him.

New Pulpits.—A carved stone pulpit has just been erected in Boldre Church, Hants, in memory of the late Rev. C. Shrubb, who was for more than half a century vicar of the parish. The pulpit has been executed by Mr. Cooke, of London, in Bath stone, from designs furnished by Mr. Norman Shaw.——Sir Gilbert Scott has been commissioned by the family of the late Dean Hook to prepare a design for a memorial of the Dean separate from the public one. It will take the form of a stone pulpit in Chichester Cathedral.

RESTORATIONS AT THE CHURCH OF ST. MARY ALDERMARY.

The last of the services in the church of St. Mary Aldermary, Queen Victoria-street, previously to its being closed for extensive alterations and repairs, took place on Sunday week. The works, which will involve an expenditure of about 12,000*l.*, are at once to be commenced, and, as a preparatory step, the present interior fittings, which are of considerable value, were last week sold by tender, and are now in course of removal. It will be seen, from the nature of these old materials, that the interior of the edifice is about to undergo a complete reconstruction. The fittings were divided into sixteen lots; the most valuable of which was the ornamental and carved altar-piece, with fluted columns and tablets, on which are inscribed the Decalogue and the Creed. They also include the oak moulded panelling round the walls of the church; the whole of the pews, also in oak; together with an old oak moulded and glazed screen across the church; the front of the gallery (which is to be altogether done away with); the oak enclosure to the altar space, with the marble paving in front; and also those portions of the pulpit structure containing the reading-desk and clerk's desk; but the pulpit itself, which is of elaborately-carved oak, is to be retained, and re-erected in the church, as re-arranged. The principal item in the work of restoration externally will consist of the re-facing of a considerable part of the upper stage of the tower, and the building of new turrets, more ornamental than the old ones in their architectural character. The walls and windows of the edifice will also be restored and renewed in places where decay has affected them; and new railings will be erected at the Watling-street and Bow-lane frontages. Internally, there will be extensive structural alterations, necessitating a certain amount of excavation. The church throughout will be fitted with low, open benches, and the floor of the nave and aisles will be laid with tiles. The structural alterations will include the formation of an entirely new and much enlarged chancel, approached from the nave by a flight of five steps, paved with polished Sicilian marble. Each side of the chancel will be fitted with clergy and choir stalls, in carved oak, and over the altar-table will be a sculptured reredos. The mural decorations will be of an elaborate character, and in the windows stained glass is to be introduced.

The alterations and restorations are by direction of the Church Repairs Committee of the united parishes of St. Mary Aldermary, St. Thomas Apostle, St. Antholin, and St. John the Baptist, and will be carried out from designs prepared by Messrs. Tress & Innes, architects; the contractor being Mr. Fish, of Pimlico.

THE SURREY ARCHÆOLOGICAL SOCIETY.

The twenty-second annual general meeting of this Society was held on Wednesday, last week, in the Council-room, 8, Dane's Inn, Strand. Mr. Joshua W. Butterworth, F.S.A., member of the Council, presided. The report stated, amongst other things, that—

"The Council wish to direct the attention of the members to the following resolution which they passed on the 16th June last, and which, it is believed, will be approved by the Society:—'That this Council, being informed that it is proposed to make certain alterations in Newdegate Church, desire to express their hope that the main features of archæological interest in the building may be preserved. They trust that the west gallery, which is a good specimen of woodwork of its date, will be retained, and this, they consider, can easily be done without interfering with the appearance of the church, by reducing it somewhat in size. They also hear, with great regret, that the proposed addition of a north aisle will necessitate the destruction of the wall-painting on the north wall of the nave, it being a very interesting example of a class of art now becoming rare, and their appreciation of it having been shown by the publication of Mr. Waller's excellent paper upon the subject, with an expensive illustration, in the last volume of the Society's proceedings. They hope that some other scheme may be devised for affording increased accommodation, or that, at any rate, the painting will be preserved and transferred to the new wall.'"

The patron, president, vice-presidents, and retiring members of the Council were then re-elected, and Dr. Alfred Carpenter, F.R.S., and Mr. S. W. Kershaw, M.A., were elected to supply vacancies.

Mr. W. F. Potter moved, and Major Anderson seconded, that Messrs. Curling, Hanbury, and Hovenden be the auditors for the ensuing year. Carried. Mr. W. Tayler, F.S.A., F.S.S., then moved that the best thanks of the Society be given to Mr. Hayton, the hon. sec., for his efficient service during the past year, which was also carried unanimously.



PLYMOUTH AQUARIUM: SECTION THROUGH TANKS.

PLYMOUTH AQUARIUM.

Our illustrations represent the exterior elevation, and the interior transverse section of the proposed aquarium for Plymouth. From the latter it will be seen that there is a somewhat novel arrangement of the tanks. There are two main corridors running parallel to one another, and the tanks down the centre are placed back to back, so that the supply of water can be effected with only one set of pipes. This seems an improvement, as not only can the water-supply be economically arranged, but the attendants can more easily feed and superintend the little creatures placed under their care. The whole building is about 300 ft. long by 100 ft. wide. At the end shown on the accompanying view, there are refreshment-rooms, up-stairs dining and reading rooms, waiting-rooms, and other usual conveniences. The main entrance, which is through this end of the building, leads into a covered hall, and on each side of the hall are the ends of the two corridors above referred to. A concert-hall, about 80 ft. by 50 ft., with a domed roof, is placed in the centre of the main building, and the corridors from both ends lead to this hall. On one side of the building there is an opening leading to a conservatory and fernery, with cascades and rockwork, and beyond that to a skating-rink. Thus it may be said that while the physical enjoyment and muscular development of the visitors will be provided for, the aquarium proper may be made to educate their æsthetic and scientific tastes. These designs are understood to have the approval of the local supporters of the project, but we hear that a difference of opinion has arisen as to the site to be chosen: as soon as a final selection has been made, the buildings will be proceeded with. The designs have been jointly prepared by Mr. A. Bedborough, architect, and Messrs. J. E. & A. Dowson, C.E.



PLYMOUTH AQUARIUM.—Mr. Bedborough, Architect; Messrs. Dowson, Engineers.

CASTLE RISING.

Castle Rising, probably so called from its position on ground that is high or rising compared with the low levels of the district, stands about two miles from the estuary of the Wash upon its eastern or Norfolk shore. Half a mile north of the village a large tract of low land is traversed by the Babingley river, and it is evident that before this part of the country was drained and reclaimed by tillage the approaches to the village upon at least three sides, the north, west, and east, were almost impracticable. These considerations probably governed those who chose Rising as a residence. The soil is light and sandy, like that of the Dunes of Holland, but contains just enough of vegetable mould to support a growth of turf. The trees are chiefly ash and willow of very large size, and upon the slopes of the castle are some noble and very ancient thorns. The richness of the vegetation in and about the village is in favourable contrast with the dreary and barren heath land by which it is surrounded.

The earthworks are on a large scale, and probably the remains of a great English residence, the centre of a large estate; circumstances which no doubt led to the adaptation of this position for the Norman fortress whence the village has derived the prefix to its more ancient name.

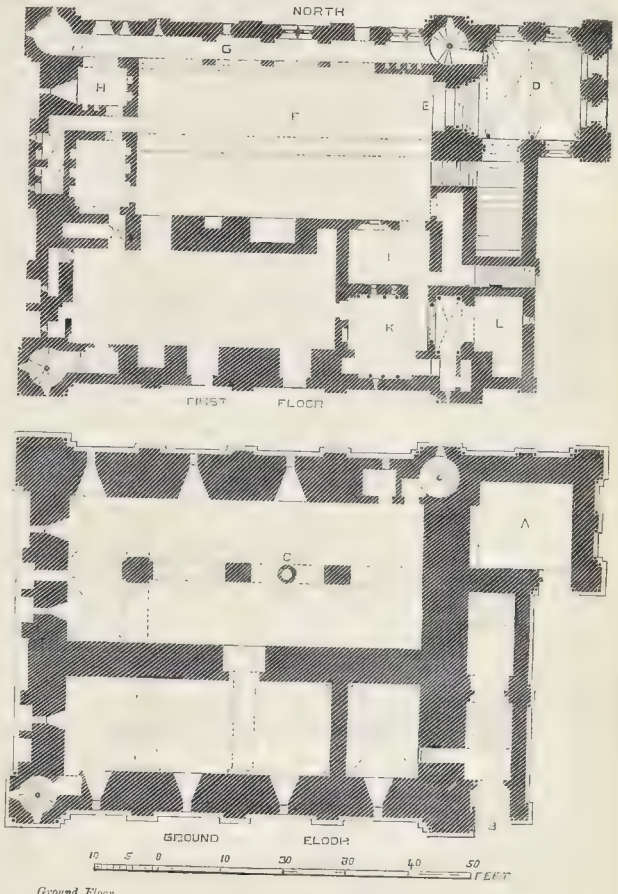
The central and principal division of the fortress is composed of an irregular oval area about 67 yards east and west by 80 yards north and south, contained within a broad and lofty bank, which, in its turn, is surrounded by a very formidable ditch. Outside this ditch, covering the east face, is a subsidiary work, also within a bank and ditch. It is in form nearly a parallelogram, but its sides are somewhat irregularly convex, and its angles rounded. Its north end is about 60 yards and its south 70 yards broad, and its length of front 90 yards; but the ends are inclined, so that where it abuts upon the main ditch it is about 80 yards.

This is balanced by a corresponding earthwork on the west point of the central work. This earthwork is about 100 yards north and south by 30 yards broad, and is also contained within a bank and ditch. The ditches of these earthworks do not actually run into the main ditch. A narrow causeway of earth is left between them. The whole exterior girth of the ditch is reported to be 10,803 yards. The central earthwork is about 30 ft. high from the inclosed area, and outside is about 60 ft. above the bottom of the ditch. It is about 15 ft. wide at the top, and, being composed of light soil, has a considerable slope. The banks of the outworks are not so high, being about 20 ft. inside and 40 ft. outside. Those to the east are, however, higher, and at points nearly as high as those of the centre. The westward work is altogether of a lighter character, though still of great strength. The works cover about 13 acres. They are wholly artificial.

The main entrance was from the north, along the edge of the counterscarp of the main ditch, and it thus entered the eastern outwork. Near its centre the road crossed the ditch by a bridge, and entered the central ward by a notch in its eastern bank. The western outwork seems to have been entered from the central ward by steps up and down the bank, connected probably with a light bridge over the ditch. It may be, however, that it was used only for cattle, and had no direct entrance from the central ward.

It has been thought that these earthworks are of somewhat different dates, and that the central is the oldest. The circle, or irregular oval, with a bank and ditch, with or without a mound, is a not uncommon form of earthwork in England, and is probably the work of the English in the seventh or eighth centuries. That is to say, where the work is on a low site, and the form not governed, as in British works, by the outline of the ground. These English enclosures rarely stand alone. Usually there were one or more appendages outside, and abutting upon the main ditch, as at Laughton and Kilpeck, probably additions, but not much later than the main work. They were also usually at no great distance from the parish church. From the tendency of the outworks at Castle Rising to the rectangular form, they have been supposed, by good authority, to be Roman, and the Romans had no doubt a settlement at Brancaster, about fifteen miles to the north. But works probably Roman seldom if ever are composed of earthworks of this magnitude, the Roman custom, where great security was needed, having been to build a wall. Also, if the outworks be Roman, the central work must be British, which is scarcely consistent with what is known of the defences of that people. Most probably the central is an English work, and the outworks either of the same date or early additions by the same people. But, be the principal origin what it may, it is clear that here, as at Norwich, Clare, Hedingham, and Castle Acre, the Norman invader having grasped the estate of the English lord, proceeded, as in Normandy, to combine the new fashion of castle-building with the old defences.

CASTLE RISING KEEP.



Ground Floor.

A. Prison.
B. Main entrance.
C. Well.

First Floor

D. Vestibule.
E. Entrance.
F. Hall.
G. Gallery.
H. Kitchen.
I. Ante-chapel.
K. Chapel.
L. Upper part of fore-building.

The keep, the chapel, and the gate-house, the only parts in early masonry of which anything now remains, were probably among the works earliest executed. The *keep* is a very noble example of the rectangular Norman type. Not that its area, still less its height, would place it in the first rank, but to considerable dimensions it adds a degree of ornament rarely bestowed upon military buildings, and though a ruin, its parts are unusually well preserved, and excellent both in material and workmanship. Like Hedingham, it stands within, but not in the centre of, the inner ward. It almost touches the slope of the western bank, and is about thirty yards from the gatehouse and the eastern bank. Between the north and south banks it is nearly midway. It is in plan rectangular, measuring at the base 75 ft. east and west, by 64 ft. north and south, and, to the rampart walk, 50 ft. high. Each face is flanked by two pilasters, 7 ft. broad by 6 in. projection. These meet at, but do not cover, the angle, and the nook so formed is occupied by a shaft, not quite detached, and similar shafts take the place of the other angles of each flanking pilaster. Intermediate, on the north and south faces, are three pilasters of 3 ft. breadth, and there is one on the east face, all dying into the parapets. The west face is of a complex character. Upon it are two larger recesses, 9 ft. broad and 2 ft. deep.

of which one is arched over near the parapet level. There are besides four recesses, each of 4 ft. opening, by 2 ft. 6 in. deep, arched over a little below the first-floor level. All these five recesses have their soffits pierced by the vents of garderobes. The wall has only one slight set-off near its summit. The flanking pilasters have none, the others mostly two, but very high up. There was a square turret at each angle, now nearly gone. At the base of these turrets, the nook shafts ceased, and the turret angle was solid. The parapet is gone. Considerably below its base were round holes, apparently to take off the water. The walls at the base are, the north and east sides, 7 ft., the south 6 ft. 6 in., and the west 6 ft. thick, and this thickness is preserved to the top, or very nearly so. The east face is covered by the fore-building, here very perfect. This prolongs the north front by 20 ft., and the south by 9 ft. The keep has a basement at the ground level, and a first floor. At two points, however, the upper floor is subdivided so as to give a partial second floor. Part of the fore-building also, as at Rochester, has a second floor. The entrance is in the south end of the building, in which a straight stair rises to the main door of the keep, which is at the first-floor level. There are well-staircases, 7 ft. diameter, in the north-east and south-west angles of the keep, ascending by seventy-six steps from the base to the summit, and communicating with the first floor. It is, however, to be observed that the base of the well-stair is about 4 ft. above the ground level, so that it is entered by a stair of five steps, projecting into the rooms. This seems to have been the case at Dover, before the floor was raised. It is difficult to discover the reason for this.

The keep is divided into a north and south chamber by a cross wall, 6 ft. thick, which ascends to the roof. The two chambers are 58 ft. long,—the north 25 ft., and the south 16 ft. broad. The *north chamber* was again divided equally, longways, by an arcade of four lofty arches, of 11 ft. span, springing from corbels in the wall, and from three square piers, 3 ft. broad by 4 ft. The spandrel walls of this arcade supported the joists of the floor above. The three eastern arches and their two piers are gone. The western pier gives off two lateral arches north and south, dividing the end bay into two square spaces, which are vaulted and groined and carry upper chambers, which shorten by so much the upper great room or hall. This lower room is aired rather than lighted by three loops in the north and two in the west wall, placed high up and in splayed recesses, round-headed. There is also in the north wall a small lobby at the foot of the well-stair, from which there seems to have been a passage rising 3 ft. into a mural chamber 8 ft. above the ground. In the west end of the great chamber an interior door at the ground level has been broken. It has a pointed head, and is an insertion. Probably it represents a loop. A round-headed doorway of 4 ft. opening opens in a segmental recess in the cross-wall into the south chamber. The door opened towards the north, and was barred on that side. The recess is groined. The well is in the floor of the north chamber, between two of the piers, under the second arch from the east. It is 4 ft. diameter, with a pipe of ashlar rising about 3 ft. above the ground level.

The *south chamber* was crossed by three plain broad arches, springing from corbels high up in the wall, and carrying the joists of the floor above. The eastern bay, however, is vaulted and groined, and supports the chapel. The other two arches are broken away. This chamber has four loops to the south and one to the west. Its well-stair also has a small lobby in the wall 5 ft. above the floor. In the east end of the south wall is a door ascending four steps, which opens into the staircase of the forebuilding. Although this door, in its present state, is not original, it may be really so. There is one in a somewhat similar position at Dover.

The first-floor is also divided into two main chambers by the cross-wall, and each is shortened by the rooms cut off, in one at the east, and in the other at the west, end. The great chambers are, the north, 47 ft. by 23 ft., and the south, 42 ft. by 15 ft. The north room was the *hall*. It was entered from the vestibule of the forebuilding by a handsome main door, of 6 ft. opening, near the north end of the east wall. Close to it, in the same wall, is a second round-headed door, which descends by ten steps upon the staircase of the fore-building. This door is evidently an insertion in the place of a loop. A third and small door, segmental, opens into a narrow mural passage leading over the middle gate of the fore-building, and by a branch into the chapel. In the cross-wall a door opens into the south chamber, and near it is a deep round-headed recess, 5 ft. from the floor, perhaps a cupboard, and again a recess, 8 ft. broad and 5 ft. deep, at the floor-level, possibly for a brazier of charcoal, but without a flue. Near the east end of this same wall is a small window, a Decorated insertion, and near it a segmental door, both opening into the ante-chapel. The north wall is pierced by a gallery, 3 ft. 6 in. broad, of five bays, between each of which is a plain arch, reducing the way to 2 ft. 9 in. Two of these bays have coupled exterior windows, one pair square-headed, the other round-headed and trefoiled, and on each cusp a disc, as in the recess at Coningsburgh, producing a heavy effect. The fifth bay has a loop. Four of these bays open by large arches, at the floor-level, into the great chamber, of which this gallery thus formed a part. The eastern bay communicates with the well-stair. It is groined, and its side towards the chamber seems to have been partially closed, and there are three small shafts which seem to have dropped into the mural chamber below. They cannot be for garderobes, and their use is obscure. This bay has a very handsome window, of two lights, coupled, and the shaft common to the two is worked in a rather remarkable fret or knot. These windows had shutters. There is no trace of glass. The gallery, which is 62 ft. long, has a loop at its west end, and a rude opening, probably once a window, of three small lights, near that end in the north wall. The north-west aisle is occupied by a cylindrical shaft, 5 ft. 6 in. diameter, which commences with the floor-level, and is open like a fireplace. At the roof-level it is gathered in with brick, and ascends as a chimney-shaft. In its sides are four loops, in two tiers, besides six small round-headed niches higher up, probably for the escape of smoke and steam. At this end the gallery opens into a lofty vaulted chamber, in the east wall of which an opening has been broken into the hall, and in the south wall is a curious low segmental recess, of 10 ft. span and 3 ft. rise, partly walled up, and in the upfilling some small niches. The great height of this chamber, the vaulted roof, the shaft and steam-holes at one corner, the niches round it, and its position next to the hall, point it out as the kitchen.

In the west end of the hall a door leads into a room corresponding with the kitchen, to the south of it. This is 8 ft. by 12 ft., and has three niches in its west and two in its east wall. In its north and south walls are arches of relief, like that of the flat recess in the kitchen. The reason for these three arches, turned in three parallel walls, is not apparent. Two of these might serve to direct the weight of the wall above from the vault below upon the piers, but the third is in the cross-wall, which is solid. The south room had a timber roof, and was probably a sort of still-room, for light cooking or pastry. Between these two rooms a door from the hall opens into an L-shaped vaulted passage, ending in a mural vault, 10 ft. by 5 ft., in the west wall of which are two loops and two double garderobes.

The roof of the hall was of timber, resting on six pairs of principals, of which the corbels that carried the hammer-beams remain. Some are carved as male or female heads, and one re-presents an animal. The pitch of the gable is marked upon the east wall, across which, at the level of the corbels, is a bold band of chevron work, and upon this rests a window of 2 ft. 6 in. opening, which gave light from an upper mural gallery into the roof. In this gable a second opening, 7 ft. wide, has been made into the same gallery. This larger window cuts the chevron band, descending somewhat below it. It was evidently an insertion to give more light to the hall, and it is opened on one side instead of in the place of the small window, in order that it may be clear of the fore-building.

The *south chamber* was entered from the hall by a doorway 5 ft. broad, placed in a large recess 5 ft. deep. In the south wall are two round-headed windows, trefoiled, with discs on the cusps, and between them a fireplace and chimney-shaft have been inserted, probably during the Tudor period. There is also a sort of cupboard in this wall, and a door opening into a lobby 7 ft. by 3 ft. 4 in., which opens upon the south-west well-stair. In the east wall is a small door, a Decorated insertion, opening into the chapel. In the north wall, besides the door from the hall, are a cupboard and a small segmental door, opening into a mural garderobe in the west wall. In the west end are two small doors opening into mural chambers, each containing a garderobe lighted by a loop. It will thus be seen that all the garderobes are upon the west front, and there seem to have been others in the battlements above them. The south chamber had a lofty open roof like that of the hall, but high up in its west gable a window has been opened as though to suit an added interior gallery or balcony at the level of the room above the chapel at the opposite end. This window, however, is the only indication of such an insertion, nor are there any other windows or any traces of floor-joists, only below the window are some joist-holes. This window is of two lights, lancet-shaped and trefoiled. In the central spandrel is a peculiar ornament composed of four loops, which outside are replaced by a small circle. This window stands in a full-centred recess which may be original, but the window itself is an insertion.

Walled off at the east end of the chamber is the *ante-chapel*, 9 ft. by 13 ft., and vaulted. It is placed partly in the cross-wall and partly in the south chamber. It has a door and window into the hall, of which the latter seems an insertion. Also a door and two loops, of hour-glass section, in the opposite or south wall opening into the chapel. In the east wall is a door, whence a narrow passage leads upon the roof of the forebuilding over the middle gate.

The *chapel*, which could be entered from the hall either through the ante-chapel or round it by a mural passage, has but one original door, which is in its north wall. A second door has been opened, in the Early English period, in the west wall. The chapel is 13 ft. east and west by 14 ft., and has a flat timber ceiling. The southern side has a deep recess, let into the wall of the keep, and in it are the remains of a triple window, probably formed of three loops. In the two jambs of this arch are side recesses. High up in the north wall are the two hour-glass loops from the ante-chapel. The chapel has been much injured; but there are remains of a handsome arcade with detached shafts upon the lower half of the west and north walls, and in the south is what seems to have been a coupled window. In the east wall is a handsome arch of 7 ft. 6 in. span, with shafts in front of the piers with carved caps. This opens into a sort of chancel 5 ft. deep by 9 ft. wide, with nook-shafts. It is vaulted, groined, and ribbed. There is no boss, but about the intersection of the ribs is some rude carving, from which a lamp seems to have been suspended. There is a window to the east, now broken down, but which was probably composed of three coupled lights, and in the south wall is a recess with a loop. An attempt has been made, apparently in the Tudor period, to insert a fireplace in the north wall.

From the first floor the south-west well-stair leads to the roof only; but the north-east stair, in its way to the roof, has two side openings, of which the first, 2 ft. 4 in. wide, leads by a narrow passage up fourteen steps towards the ramparts of the vestibule tower. This is now blocked by the inserted vault, with which that building is covered in. Eight steps above this lower opening a second leads into a gallery in the east wall. Above this opening, seventeen more steps lead to the ramparts of the keep, which are 22 ft. above the level of the first floor. The eastern gallery is vaulted, and 32 ft. long. From one side of it a door enters the second floor of the forebuilding tower, and beyond it, also in the east or outer side, is a loop. In the west side are two openings, already described, which open into the gable end of the hall roof. At its south end this gallery makes a turn at right angles, and ends in a small bedchamber, 18 ft. by 14 ft., which is over the chapel, and has a window to the south. As the parapets are gone, and the ramparts not accessible, the roof above the kitchen cannot be examined; but there does not appear to have been any second floor in that quarter.

The *fore-building* is a very perfect and a very good example of this sort of appendage to a Norman keep. It is composed of three parts,—a lower staircase, an upper staircase, and a vestibule tower. At its south end is the outer gateway, at the ground-level, in line with the southern face of the keep. The portal is full-centred, and flanked by two columns beneath a plain abacus, from which springs the arch with a bold roll-moulding. There is no portcullis. The door opened inwards, and was strongly barred. The wall is 6 ft. thick, and the passage through it, inside the doorway, is segmental,

vaulted and groined. Within, the passage is 8 ft. wide, and contains the lower staircase of fifteen steps. In the inner face of the wall, over the doorway, is a large, deep recess, probably to lighten the weight on the entrance arch. On the right, or outer wall, high up, is a loop, and on the left, at the fourth step, a large door, already mentioned, opens into the southern chamber. It seems to be of Late Decorated date, and probably represents an original loop, or it may be a doorway. At the head of this first staircase is the middle or second doorway, of 5 ft. opening, also full-centred, with flanking columns. The head, also, has a bold roll moulding. The wall in which it is placed is 4 ft. thick, and the landing 5 ft. deep. The portal is recessed, and in the soffit in front of it is an opening, 2 ft. broad by 6 in. deep, a shaft or *meurtrière* from top of the wall, where is a walk. This seems to have had high parapets, and a loop looking down the staircase. The opening was for the defence of the portal. This door, also, was barred. Within it rises the second staircase, in the same line, of nineteen steps, 8 ft. wide, and ascending to the upper and inner doorway, the door of the vestibule. On the right is a second loop, on the left a clumsy door ascending to the hall, already mentioned, and evidently an insertion. The staircase is solid, containing no vault or chamber below. It was roofed with timber, at two levels, of a low pitch, divided by the wall of the middle gate, and leaning against the keep wall.

The doorway at the stairhead much resembles those below. It is set in a deep recess, has flanking shafts, and a roll-moulding round the head. There is no portcullis. The doorway opens into a chamber 14 ft. by 15 ft., which is the vestibule to the main entrance of the keep, and at the level of its first-floor. It has two windows to the north, two to the east, and to the south the staircase door and a window, which rakes the exterior of the outer wall of the staircase. These windows seem to have been of 12-in. opening, but have been enlarged. They are placed in deep recesses as in an arcade. In the west wall is the great entrance,—a noble archway,—deeply recessed, and flanked with four shafts on either side. The exterior arch is 10 ft. span, the doorway itself 6 ft. The plinths are unusually high, being 3 ft. The caps are fluted and cushioned. The outer arch is full-centred, the actual doorway segmental. The arch bands are worked in chevron and other mouldings. Close north of the great entrance a plain narrow door opens into the adjacent well-stair, but this is clearly an enlarged loop, which was intended to light the staircase. The original covering of this room, like its present floor, was of timber, but this has been replaced by an ill-executed vault of the Early Decorated period. It is arranged in two bays, the dividing rib springing from pilasters let into the north and south walls. Each bay is crossed diagonally by two ribs, springing from corbels of half-octagon figure. The vaulting obscures and spoils the old Norman details of this very handsome chamber.

Below the vestibule is the ground floor, probably a prison, a mere pit, 14 ft. by 16 ft., and 21 ft. high, aired by two loops very high up in the east wall, and possibly by a third in the south wall. In the west wall, the wall of the keep, is a lofty recess beneath the keep entrance, within which a hole has been broken. At present this chamber is entered by a door at the ground level in the south wall, but this is certainly an insertion. The original entrance must have been by a trap and ladder from the vestibule floor.

The second floor of the vestibule tower was 16 ft. square, and had four round-headed windows of 2 ft. opening, now converted into shoulder-headed windows. There are two in the north, two in the east, and one in the south faces, each in a plain flat-sided recess, 3 ft. broad. In the west wall, where is the entrance from the mural gallery, is a recess, 12 ft. broad and 2 ft. deep, above the grand entrance of the keep. Its angle is replaced by a nook shaft, the particulars of which show that though the walls and the position of the windows are original, the floor-level has been raised, and a fireplace inserted in the south wall. Like the vestibule, this room has had its flat timber roof replaced by a high-pitched vau" in two bays, groined and ribbed, and with a dividing rib. All the ribs spring from semi-octagonal piers inserted into the old walls. This vault appears outside in the form of a high-pitched roof. It is of the age of that below.

The material of this keep is in substance flint rubble, coursed, but it is faced largely with ashlar; and far more attention has been paid to ornamentation than is usual within military buildings. The fore-building is faced wholly with ashlar, and richly ornamented. Over the outer portal are broad bands of hatched and chevron work, filling up an arcade of two arches, above which is a circle, with a centre carved as a head. The south-eastern angle is occupied by a nook shaft. The east front, the wall of the staircase, is even more richly wrought. Here are two arcades at different levels, corresponding to the level of each staircase roof, and above is a line of circles, with centres carved as heads. There is a notion that the mural passage over the middle doorway ended in a postern high up in this wall, whence a ladder could be dropped; but there seems no ground for this improbable opinion. Had there been such a postern, the two loops on the stair would have been arranged for its defence; whereas they are too high up to be used, save for light and air. It is curious that the fore-building should be so much more ornate outside than the keep; whereas at Dover and Rochester, where also it contained a chapel, it is outside romarkably plain. The subordinate staircases,—that is, those at the two angles,—are clumsily arranged. There is no arrangement by means of a landing to suit the steps to the level of the floors supplied. No doubt the main stair was that chiefly in use. The keep bears a close resemblance to that of Norwich, especially in the position of its kitchen, north gallery, and chapel. The fore-building also is on the same plan. The arches generally are full-centred, though a few of the doorways are segmental. Where the mural galleries are at all expanded in breadth, and in the door recesses of the cross-wall and of the outer entrance, the vaulting is lightly groined; and this, which occurs also in the Tower of London and at Rochester, produces a good effect, and takes off from the sameness of the barrel-vault. In the kitchen are piled up a heap of fragments of carved stones found in or about the castle. They are in all the styles,—Norman, Early English, Decorated, and a few Perpendicular. Probably some came from the chapel of St. Nicholas; many of them can scarcely have belonged to the keep. If Castle Rising was built by the architect of Norwich keep, it must be Early Norman, for Norwich was besieged 1076, at the revolt of Earl Guader, and Harrod supposes the present keep to have been then standing; but the ornamentation of Castle Rising looks much later, and on the whole there is no reason to refuse assent to the tradition which attributes it to William d'Albini, who died 1176. As usual, there are no subterranean chambers. The fore-building, though its three doorways had not, as at Dover, each a tower, had each a distinct defence. The outer from the battlement over the portal, the middle also from a battlement pierced by a shaft, and communicating with the keep, and the inner as a part of the vestibule tower.

The *gate-house* stands near the centre of the east side of the keep ward, in the earth bank which has been cut away to allow it to be built. It is 325 yards from the north-east angle of the keep, and of the same age. It is of the usual Norman pattern, a rectangular tower pierced by a passage, with an arch of 12 ft. opening at each end, set in the walls, of which the outer is 6 ft., and the inner 5 ft. thick. The arches are quite plain, without rebate or chamfer. The passage between the two is also 12 ft. wide and 13 ft. long, and had a flat timber roof, the floor of the chamber above, now removed. The outer arch has a portcullis groove, 3½ in. broad by 4½ in. deep, and square. In the north wall are two shallow recesses, of 4 ft. span by 1 ft. 10 in. deep. In the south wall is one similar recess, and a door of 2 ft. 6 in. opening, which seems to have led into a well-stair in the south-west angle of the building. In front of the outer gateway the approach, 15 ft. wide, lies between two walls, of which the southern still projects 15 ft. They probably protected the drawbridge, and between them was the bridge-pit. Beyond these walls is the great ditch of the place, here about 80 ft. broad and 30 ft. deep, crossed by a bridge in masonry, of two arches, of which the inner one is walled up. The open arch seems of the Tudor date, but the piers look original. The outer end of the bridge rests upon the counterscarp of the ditch, about the centre of the eastern ward.

The gate-house stood on the ground level, and, therefore, lower than the curtain of the *enceinte*, which was built on the crest of the earth bank. The original curtain, if one there was, as is probable, is entirely gone, and has been replaced by a brick wall of the age of Henry VII., also nearly all gone. Of this wall there remain, on the south side of the gate, about 12 yards. It is 2 ft. thick, but within was lined by an arcade 3 ft. thick, which carried the rampart walk, as at Southampton. These arches are 8 ft. span, and four-centred, with piers 3 ft. broad, and within each arch or recess was a loop. There remain three arches and a half. Besides this there is a fragment of curtain south-west of the keep, and traces of foundations along the bank.

In the keep or central ward, a few yards north of the keep, is a well, and further north are the remains of the great chapel. This was composed of a nave, choir or presbytery, and apse. The nave is about 12 ft. broad and 25 ft. long. The arch into the presbytery was 5 ft. broad, and across it is the base of a stone screen with a door of 3 ft. There was a south door and a north window. The font stood in the centre, near the west end. The presbytery was 8 ft. long by 9 ft. broad, with a loop to the south, and an arch of 6 ft. opening into the apse. The apse was rounded, and 8 ft. broad by 9 ft. long, and had loops splayed internally to the north and east, and probably to the south. It is said that the very early Norman font, now in the parish church, came from hence. The masonry of what remains of this building is of a rude character, and it is probably older than the keep. This is supposed to be the chapel of St. Nicholas mentioned in the records. At present its remains are niched into the bank, and it has the appearance of being the older of the two, though this can scarcely be the case. The sand of the bank is liable to be shifted by the wind, and as late as the commencement of the present century the central ward was much encumbered with it, and the keep more or less buried, so that this is probably the cause of the half-buried condition of the ruins of the chapel.

The keep, chapel, and gate-house are the only remains of Norman masonry at present seen above ground. The inner ward must have contained domestic buildings on a large scale, fit for the reception of royalty, but the foundations which remain on the south of the keep seem very late, probably of the Tudor period. They are said to be those of the constable's lodgings. There is no trace of masonry of any kind in the two outer wards.

The parish church, standing in the village of Castle Rising, is a fine example of the Late Norman style. Its west front, especially, is very rich, and it has a good central tower. The chancel is rather later. The font is very massive. Its square bowl is covered with carvings of an early character, and it stands upon a plain cylinder, properly copied from the original support. The bowl is said to have come from the castle.

Rising, or rather Snettisham, in which manor it is contained, was a part of the estate of Edwyn, a Dane, and a follower of Canute. So says Dugdale. In Domesday it is entered as a "bervite" of the manor of Snettisham. "*Huic manerio jacet una bervita Risinga.*" It had belonged to Archbishop Stigaud, and, on his forfeiture, William gave it to Bishop Odo, then Earl of Kent. After Odo's fall, Rufus granted it to William d'Albini, the royal "pincerna," or butler, son of Roger, and whose younger brother Nigel was ancestor of the great house of Mowbray. The son of William was "William with the Strong Hand," the celebrated Earl of Arundel, and Lord of Buckenham, in Norfolk, who married Adeliza of Louvaine, the Dowager Queen of Henry I., and is the reputed builder of the keep before 1176.

Their son, a third William, died 1190, leaving a fourth William, who died 1221, and whose eldest son, a fifth William, died childless in 1224, when Rising came to his brother Hugh, who left four sisters, co-heirs, of whom Cecily had Rising, and married Roger, Lord Montalt. Their eldest son, John Montalt, died childless, and was followed by his brother Robert, who died 3 Edw. I., leaving Roger, who died childless 25 Edw. I., and Robert, who succeeded. This Robert de Montalt was a very considerable person both as a warrior and a statesman. He is locally celebrated for the winning of a very important law-suit against the corporation of Lynn for the tolls of that port and market in the reign of Edward II. Having no issue, he, in 1 Edw. III., sold the reversion of Castle Rising to the Crown, for the benefit of Queen Isabella, the "She-Wolf of France," with remainder to John of Eltham, the king's brother. In 1331 Isabella came into possession, and here lived in retirement to within a year of her death, which occurred at Hertford in 1358. Edward, with his queen, here visited his mother, in the fourteenth year of his reign.

John of Eltham having died childless, the castle came to the Black Prince, and became part of the duchy of Cornwall, and so descended to Richard II., who exchanged it with John, Duke of Bretagne, who held it in 1397, and occasionally resided there. It was afterwards recovered by the Crown, and granted to Edmund of Langley, Duke of York, from whom it passed to Edward IV., who again annexed it to the duchy, but the castle was probably then in a ruinous state. In the time of Henry VII. it seems to have been repaired. The roof of the keep was then covered with tiles, with great gutters of lead. In the reign of Henry VIII. it was again in decay, and the keep and gatehouse were roofless, and it would seem that the constable's lodging was the only habitable part. Finally, the king exchanged the castle manor and chase of Rising with Thomas Howard, Duke of Norfolk, and in 1693 it came to another Thomas Howard, ancestor of the Earls of Suffolk and Berks, one of whose descendants still holds it. As late as the 31st of Elizabeth there was a curtain-wall upon the bank which was in danger from the burrowing of the conies, and there was also a gatehouse and a bridge 90 yards long and 7 yards broad. Under the castle, by the tenure of castle-guard, were held the manors of Hunstanton, Reydon, and the Wottons.

1875. G. T. C.

"MODEL DWELLINGS FOR THE RICH."

At the close of the paper read at the Society of Arts, and printed in our last issue, the following letter was read from Mr. Edwin Chadwick, C.B.:—

"I consider that the paper of Mr. White and his colleague, on 'Model Dwellings for the Rich,' opens up important sanitary and economical improvements for the benefit of the large class of the very moderately rich, and for professional persons who cannot individually help themselves, and who need collective aid and service from sanitary science and architectural art.

Dr. Richardson's paper on the construction of an ideal city, under sanitary science, a 'Hygeia,' has, I am glad to learn, given rise to suggestions from various quarters that the idea should not be postponed to an indefinite future, and that steps should be taken for its early practical realisation. Constructions on the principle advocated in the paper would enter into prominent consideration for such a city.

In my observation, however, most of the existing buildings on the 'flat' principle have sanitary defects which will require careful attention for their prevention in new buildings. During the cholera visitations, these classes of houses, in Edinburgh, Paris, and elsewhere, were marked by the excessive severity of the attacks upon the occupiers of the basements and the upper floors of these dwellings, or the attics; whilst the occupiers of the intermediate dwellings or apartments had an almost complete immunity from the pestilence. Much of such differences of sickness and death-rates between the upper, the lower, and the intermediate classes of occupiers is manifest in ordinary times. The comparative severity of attacks upon the occupiers of the basement tenements is attributable to the obvious inferior sanitary conditions belonging to them. The comparatively lower health of the occupiers of the highest tenements to the intermediate occupiers is ascribable to defects of ventilation, by which the attics are made inverted receivers, as it were, for the detention and accumulation of the vitiated warmed air ascending from the basement, as well as from the intermediate tenements opening into the common staircase. In tall town houses of the well-to-do classes, servants working in the lower rooms and sleeping in close attics suffer in their health proportionately to the greater amount of aërial impurities to which they are exposed. The remedy to be applied is that the rooms of each stage shall be provided with distinct means of ventilation from the out-door air, entirely independent of any supply from what I call the aërial common sewer,—the common staircase. With these precautions, the higher flats may have a superior supply of out-door air, above the lower stratum of air commonly polluted by street dust, and be placed in the best sanitary condition as to aëration. Each living-room should have its separate warming as well as ventilating apparatus for protection against rushes of cold air from the staircase.

There are now in course of construction some houses on a plan of hollow concrete walls and floors by Mr. Pope, the architect,—of which I hope we may shortly have an account,—that serve for the leading of warmed air to warm floors, also to warm walls, and effect a restoration of the Roman warmed floor and warmed wall, with great economy of fuel, specially applicable to this class of residences, and to the erection of a Hygeia, in providing a greatly improved quality of construction at a reduced cost. Blocks of these tall houses should be laid out, with sanitary precautions for the avoidance of the inclosure of deep reservoirs of stagnant and vitiated air, such as may be pointed out at the west end of the metropolis, and for insuring the free sweep of the wind, and external ventilation.

The economical construction, and the economical working of the lift for application to this species of dwellings, would be an object of great importance, and I should desire some particulars from the authors on these points.

The general advantages to be derived from the principle of construction propounded by them appear to be in giving to three or fourfold populations economically the advantage of the finest sites and aspects, a great economy of servant power, and attendance of a good trustworthy quality, now getting more scarce and more expensive; in giving parties facilities to leave their homes and enjoy vacations with greater comfort and security than at present. The reports of the occupiers of flats, in new West-end edifices, even as they are at present constructed and conducted, are in accordance with the representations of Mr. White and his colleague and with what I have heard of the experience in Paris and Vienna, and are highly favourable.

The deplorably-distressed capitalist, who, at this time, by lending a thousand pounds of his capital for a day, cannot get more than 2s. for its use,—actually not more than half the day's pay of a journeyman bricklayer,—may have the assurance that, by its application to the construction of a Hygeia, or in the minor way proposed, he may obtain safe and more satisfactory remuneration for his labour and thrift. The distressed and bewildered capitalists of Liverpool and Manchester who do not know where to get remunerative employment for their money may with profit obtain, by the means opened to them, better health for themselves, and a prolongation of their working ability, with better health for their families, in new suburban sites, than they can ever hope to have by continued residence in those pre-eminently heavily death-rated cities. Of this we may give them assurance.

Edwin Chadwick."

Mr. Lawrence said there was no doubt this system of building in flats would succeed to a certain extent in London, following the example of Paris and Vienna, but he did not think the time would ever come when the ordinary Englishman would adopt such a system, which simply meant the total absence of home life. It did very well for professional men, but was quite unsuited for families with children. A Frenchman's house was the last place he looked upon as his home, and you could not take up a child's book in French without seeing allusions to old gentlemen below complaining of the noise of children above. No doubt lifts would be a great accommodation, such as were in use in the Grand Hotel in Paris, which had sleeping-room for more than a thousand persons. On the whole, while there must be a certain demand for this class of buildings, he did not think noblemen would ever occupy them, or that they would come back to live in the heart of London as in former days, or as they did now in Paris, and for that reason he feared London would never be so handsome a city as Paris.

Mr. Tilghman said this system had been to some extent adopted in New York, and, as far as he knew, had succeeded very well. The lifts had been found a great advantage, and he understood that in business houses the upper floors were preferred, even at the same rents, on account of the greater amount of light and air which reached them. Some years ago a portion of Boston was burned down, and it had been partly rebuilt in large blocks, where lifts were almost universal, not only in business premises, but in hotels and boarding-houses. There was this great advantage in connexion with this plan, that where there was a lift there must be a steam-engine, and you could consequently warm the house by steam-pipes, to the great comfort of the inhabitants and the great economy of fuel.

Professor Kerr desired to guard against the supposition that the authors of the paper had exaggerated their case because one could not quite go all the way with them in all that they had advanced, any more than Dr. Richardson had in his "Hygeia," because he had gone further than many people could follow him. Custom was held to be binding in England until it was forcibly overthrown, and therefore all reformers had to state their case as strongly as possible in order to get a hearing. He recognised the maxim more, perhaps, in building than in anything else—"Whatever is, is right," and if London was found to be built on one plan, it must be taken that that was, on the whole, the best plan. All that could be said against it was, that in certain exceptional cases it would be advisable to build upon another system. Although it was complained that the working classes lived two or three families together in houses arranged for one family only, still a further examination would show that this was the right plan, and that the bulk of model lodging-houses had departed too much from it. It was in vain to contend that any better plan could be provided for London than that adopted at the West End. Every family man who could afford it would have his own front door, and would not like having any one else either under him or above him. It was easy to laugh at this as insular prejudice or John Bullism, but there was common sense at the bottom of it, and at any rate it could not be got over. At the same time, there was no doubt a large class in London who would be glad of the accommodation of chambers or apartments in flats, but the extent of this kind of accommodation required must be considered, and also how it was to be provided. These questions had been discussed many times, but he did not know that up to the present moment any completely successful solution of the problem had been given. The authors had not gone much into detail, no doubt feeling it preferable to confine the discussion as much as possible to the general principle. Efforts had been made to provide these kind of apartments in Victoria-street, and elsewhere, and he believed they had answered fairly well, but he was not sure whether they were not occupied almost exclusively by bachelors. At all events, ladies had a decided objection to going up a common stair, and this difficulty must be fairly met. Then, if two staircases were provided, there would be a difficulty in drawing the line who should go up the one and who should go up the other. Again, there was the question who was to live in the attics. People would never live in London as they did in Paris, a shoemaker or seamstress at the top of the house, and a nobleman at the bottom. He did not see, however, why large houses should not be built in such a way that they could be divided into two, with two separate entrances, one for the lower half and the other the upper, the advantage of which would be that all the family rooms must be on one floor, which would render them much more convenient for occupation.

Mr. Gruneisen was inclined to take a broader view of the question than had been adopted by the previous speaker, especially considering the enormous and constantly-increasing population of London. There had been a strong tendency for some years past for people to live out of town, and the suburbs had grown to such an extent as quite to belie their name. Many also had taken to live at longer distances, such as Brighton, but of late medical men had discountenanced this as being injurious to health. It would not do to take as a standard the spirit of exclusiveness which formerly prevailed amongst Englishmen. No doubt there were some who liked to surround themselves with high walls until their houses looked like lunatic asylums or prisons, but there was also a numerous class who would be very strongly disposed to live in flats. He had lived for five years in Paris *au troisième*, and was never more comfortable or independent. By having a *concierge* you to a great extent get rid of the nuisance of domestic servants, and, of course, in London, with lifts, the Paris system might be greatly improved upon. He believed if the plan could be carried out it would prove a great success.

Mr. Hale did not think the aristocracy and upper classes would approve much of the proposed system.

Mr. Strong wished to know how light and ventilation would be provided for in these large blocks if they were erected in a street so as to open at the back and front, but enclosed at the two sides. He had lived some time abroad, and had always found a great annoyance from the shafts leading to the larders, &c. There was but one shaft all the way up, which conveyed the smell from the larders and closets. The only remedy

would be to have separate shafts, which would require a great deal more room. Another objection was, that whenever you entered a flat you could tell what the occupants were going to have for dinner. The top floor was generally used as store-rooms, and for fuel; and the roof being flat afforded a means of escape from fire. After all, an Englishman's house was his castle, and he did not think men with families would like to live in flats, but he admitted their value in cases of bachelors and childless couples.

Dr. Wylde said some gentlemen thought there would be a great demand for this class of buildings, and others doubted it, but the question had been to a great extent answered already. When model lodgings for the poor were built they were occupied almost immediately; and there had recently been erected near Regent's Park some better class buildings called Cornwallis Mansions, six stories high, on the same principle, and they were all taken long before they were completed. He knew ladies who resided in them, and who were highly pleased with the accommodation. Rich men who lived in the squares would not take these flats, but there were many people, to whom economy was an object, who would be glad to do so. Domestic service would be greatly economised, because in such cases ladies and gentlemen would not mind opening their own door to visitors, and the kitchens being small, and well fitted with kitcheners or gas apparatus, ladies could do a great deal of their own cooking.

Mr. Hyde Clarke was glad that one or two of the speakers had come out of the realm of fancy into that of fact. It was all very well to talk about an Englishman's castle, but the question was, What kind of castle could he have? In such a place as London there were people having different requirements, and they all ought to be provided for. There were a great number constantly living in lodgings or chambers, and many who only came to town for a few months in the year. One great cause of the present taste for living in what were called in the North "self-contained" houses, was the window duty, which altered the whole construction of London during the last century. Previously to that the English had been a clubable people; for though they were independent, they also liked association. At the dissolution of the monasteries they were all occupied by families, and in the sixteenth century a large portion of the population lived in flats, exclusive of the inhabitants of the Inns of Court and Chancery. The circumstances of London were not those of the whole country, and there would always be in the metropolis a large number who must live in apartments of some kind. At one time every peer had a residence in London, but that had been greatly altered by the railway system; and many only came up for a month or two, and had no permanent residence here. With regard to the annoyance which had been spoken of from children, and so on, it must be remembered that at present there was a constant annoyance from noises next door, and that under an improved system of construction this would be greatly modified, if not altogether removed. Possibly, if one person in a house gave a party, it might be an annoyance to his neighbours, but not more so than was the case at present from the same event next door. None of these considerations were sufficient to detract from the value of a suggestion which was practicable architecturally, and would, no doubt, be economically advantageous. It was, after all, a question whether those who were compelled to live in apartments should do so in houses constructed for the purpose. The residential portion of London was continually being encroached upon, and if any one would walk about Bloomsbury and the surrounding district, he could not help being convinced of the value of the suggestion which had been made.

Mr. R. Manuel said the paper opened out a new vein of thought with regard to the construction of houses, but he feared the ideas contained in it were somewhat in advance of public opinion and insular prejudices. He hoped Mr. Smith, in his reply, would state how he proposed to ensure builders carrying out his plan, supposing it commended itself to the public. The defects of modern house-building were notorious, and he thought the Legislature might well pay more attention to the subject.

Mr. Robert Rawlinson, C.B., had listened to the paper with very great pleasure, but he knew his friends the authors were not so sanguine as to imagine they were going to subvert the existing order of things. They only proposed to introduce an improvement. Many persons came to London for short periods only, and if they rented a residence, it must greatly deteriorate while unoccupied. These block-buildings, properly arranged on sanitary principles, would offer great facilities to such persons, and there was plenty of room for them. He had been actually alarmed at the progress of building at the West End during the last ten years, and had been for a long time expecting some catastrophe to put a stop to it. But still it went on year by year, though it must come to an end some day in all human probability. The class of buildings run up in the suburbs was of the worst possible description, and he could not understand what the surveyors were about. Only last week two large houses, partly built, came down like a pack of cards; and not more than two years ago three or four houses, of rentals varying from 200*l.* to 300*l.*, suddenly collapsed in the same way. These proposed buildings would be thoroughly well built from foundation to attics, solid in construction, fireproof, and giving easy access to the upper floors by means of a lift. Probably the objection with regard to children was a valid one, but there would always be plenty of ordinary house accommodation for families with young children, and there were numbers of others who would appreciate the superior comfort of a superior class of buildings.

Mr. Baruchson said there were numerous lifts in constant use in London, as well as at the Grand Hotel in Paris, where they were now constructing a second one. He had lived a long time in Paris, and thought the annoyance from children and other causes was quite imaginary. Concerts and balls were constantly given without causing any inconvenience to those living underneath or above, and the same system of building was followed all over the Continent. At Naples he had seen a duke living on the ground-floor and a shoemaker at the top. The great objection was the staircase, and that would be overcome by the lift; but he did not know whether the grand folks on the first floor would like to go up in the same lift with the shoemaker who lived at the top. He believed this plan had been successful in Victoria-street, and it had long been followed in Edinburgh and Glasgow.

Mr. White said the common notion in England that in Paris houses the ground-floor was occupied by a tradesman, the first by a duke, the second by a marquis, the third by a baron, the fourth by ordinary people, and the fifth by labourers, was quite mistaken. As a rule, all the inhabitants of a house belonged to the same class in society, and if there were poor people at the top they went up by a separate staircase. He had lived ten years in Paris, and nobody ever complained of his making a noise, nor had he complained of his neighbours; neither had he been assaulted on the staircase, nor assaulted any one else. Since he had lived in London, however, he had been constantly annoyed by an abominable piano on one side of him, and by worse singing on the other.

The Chairman (Lord Alfred Churchill), in moving a vote of thanks to the authors of the paper, said he believed there was a great need for such buildings as they had described, and there was a large class who would gladly take advantage of them. They must be well built, and many domestic annoyances would be obviated. When in New York two years ago, he found a lift in the hotel in which he stopped, which was only an ordinary sized one; it was fitted up like a drawing-room, and was a great convenience. He saw no reason why there should not be a second-class lift for the servants and goods, and a first-class for the family and visitors. The suggestion to put ornamental glazed tiles on the outside of the walls he thought a very good one, and had seen very handsome effects produced by it in Lisbon, where it was quite common. He doubted, however, whether this style of building would accommodate more persons on the same area than at present.

The vote of thanks having been passed unanimously,

Mr. Roger Smith, in responding, said it was not necessary to notice all that had been said, as many of the objections advanced had been already met. Practically the case had been admitted which they had brought forward. They did not propose to alter the habits of all London, or even of a great portion, but there were large numbers to whom it was important to live in a certain locality, and to make the question definite they had dealt especially with one district; but he believed an equally strong case could be made out for the dwellings in many other quarters. In reply to the question put by Mr. Manuel, he thought the only way of insuring good building was that the persons engaged in it should build for investment and not for speculation. The circumstances under which the houses were built should be such that the builders should have an interest in the wholesome and satisfactory investment of their money, and then buildings would be put up substantially and with judgment. At present, the conditions under which most London houses were built were inimical to anything like solidity of construction. With regard to the number of persons to be accommodated on a given area, he believed that generally speaking it would be about double those under the present system. Of course there would not be so many bedrooms, nor such large offices in the basement; but taking it for granted that the tenants would be satisfied in convenient and comfortable sitting-rooms, and with as many bedrooms as were necessary for a moderate family, it would be possible for very nearly, if not quite, twice as many families to occupy a given site as at present. It was on that footing they rested the economy of the proposition, because both the erection and maintenance of the buildings, working the lifts, &c., would necessarily be more expensive. By having rent from a greater number, however, these expenses would be met, and greater comfort would be obtainable for the same outlay.

THE UNDERGROUND CABLE FROM HALLE TO BERLIN.

An innovation in telegraphy is being made in Germany which, to our knowledge, has not yet been attempted in this country (where underground telegraph lines have been laid in iron pipes), and which deserves notice on account of its novelty, consisting in laying down in the ground a cable resembling in all its details a submarine cable. Naturally, the undertaking has excited some amount of interest in Germany, not confined to telegraph circles alone.

According to the *Halle'sche Tageblatt*, the laying down of an underground cable, which is to connect the university town of Halle, in Saxony, a great centre of railway communication, with the capital of the empire (a distance of 22 German, equal to 103 English, miles) has just been begun. The cable includes seven wires, and, as already remarked, in its appearance resembles very closely the cables now immersed in oceans for connecting parts of the globe, all the latest improvements, which in telegraphic science especially are considerable, having been applied in its manufacture. It has been made by Felten & Guillaume, of Cologne, and is said to be a pattern of durability and finish. The seven conduits, each enveloped in gutta-percha, are laid closely together, and protected by a coating said to resist effectually the dampness and other injurious influences of the ground, not to mention any violence to which it may be exposed.

The cable will not be laid along the Anhalt Railway, which goes over Bitterfeld, Wittenberg, and Jüterbog, to Berlin, but along the old public high-road (*chaussée*). The latter route is considered the safest for the cable; here it will rest under a macadamised roadway, while along the railway it would be exposed to the danger of interruption by railway accidents, &c. The method of laying, too, as we shall see presently, is against the cable being laid alongside the line. As it will be about 3 ft. below the surface, this necessitates the digging of a trench of a length of over 100 English miles.

The works have been begun from Halle, under the supervision of an eminent government telegraph engineer, Baurath Wohlfahrt. The mode of laying down is described as follows. A couple of hundred navvies go in advance to dig the trench, the sole of which, as will be easily understood, must be made as even as possible. The navvies are followed by a column of six wagons. On the first are the measuring instruments, batteries, and apparatus; the next four wagons contain the cable, and the sixth is filled with liquid asphalt. The four wagons containing the cable, when filled, take up 800 metres (875 yards, or half a mile) of cable. The six wagons perform the laying with similar apparatus as is used on cable-ships. The uncoiling of the cable, its laying down in the trench, and the covering with asphalt, is a slow, sure, and regular process, which proceeds more slowly or quickly according to the nature of the road and the difficulties encountered. Only six miles (or twenty-eight English miles) of cable are at present ready for laying down; the manufactory, however, has undertaken the completion of the contract at the

stipulated time, so that no stoppage is to be expected in the work. The several lengths of cable of 800 metres are severely tested as to isolation and resistance before they leave the manufactory; great hydraulic pressure being applied to test its power of resistance.

The most difficult part of the work is the splicing of the cable sections, of which there will be over 200. The experience we have had in this country with submarine cables has taught us that everything depends on the nicety with which the whole length of the cable is spliced into a homogeneous whole. As there is a want in Germany of men familiar with this operation, highly experienced workmen have been especially engaged from England for this part of the work.

The first obstacle will be met with at Landsberg, between Halle and Bitterfeld, where the workmen will encounter porphyry, through which they will have to work their way. But greater difficulties are expected in the passage of the rivers Mulde and Elbe respectively. The laying of the cable across the Elbe will require special means being adopted for protecting it against the action of the towing chain laid down for the navigation of the river, which might otherwise destroy it in time. The experience gained at a recent accident of this nature will be made use of.

Herr Wohlfahrt is assisted in his work by two telegraph officials, who were sent by the German Postmaster-General, Dr. Stephan, in the beginning of February, to London to obtain all the information they could as to the electrical action of the cable, the required measurements, and the manipulation of the apparatus.

But it was especially necessary to gain the most exact information as to the mode of removing the so-called counter currents in the cable. As is well known, a certain amount of electricity is generated in cables, which, if it is allowed to remain, retards the electrical stream and confuses it to such a degree that the signs as they arrive becomes at first indistinct and then blurred, until they at last cease altogether. As soon, therefore, as the procedure of freeing the cable from the counter currents is perfectly known, its immersion is no longer problematical; the cable guarantees to us the unconditional security of telegraphic communication.

The laying down of this cable must be finished by the beginning of July, for the gutta-percha would deteriorate under the influence of great heat, thus injuring its capability of isolation. The laying down is estimated at 1,000,000 marks (50,000*l.*), and this sum appears small considering the length of the cable (over 100 miles), and the fact that at places with railway stations the cable will be brought into their telegraph offices. This is done mostly for the sake of detecting more quickly any disturbing influence in the cable, which sometimes leads to complete interruption.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on Friday, the 31st ult., Mr. H. L. Florence, vice-president, in the chair, the following new members were elected, viz., Messrs. W. H. Miles (of Spalding), J. M. Jones, and W. Hernaman Wooler. The thanks of the Association were given by acclamation to Mr. Darbishire for conducting the members over the new Peabody dwellings in Pimlico, as reported in last week's *Builder*; and it was announced that to-day (Saturday, the 8th) the Association would visit the new house now being built for Mr. Millais at Kensington-gate (close to the Albert Hall), from a design by Mr. Hardwick. The drawings of St. Alban's Abbey, by Mr. Neale (a member of the Association), who won the Institute Silver Medal this year, were exhibited on the walls. A letter (dated March 28th) was read from the Conference Committee of the Institute, announcing that the Conference would be held during the week commencing June 12, and inviting suggestions as to the papers to be read or the subjects to be discussed, such suggestions to be sent in before the 5th inst. As the time was too short to permit of any organised arrangements, it was decided to leave individual members of the Association to send in direct to the Conference Committee such suggestions as they might deem advisable. It was announced that the members' *soirée* would take place on the 21st inst.

Mr. H. W. Brewer then read a paper "On the Architecture of South Holland," which we have printed in full.

ENLARGEMENT OF THE ST. GEORGE'S WORKHOUSE AT CHELSEA, AND NEW CHAPEL AND INFIRMARY BUILDINGS.

New buildings of a very extensive character have for some time been in course of erection at the Workhouse in Fulham-road, Chelsea, jointly for the St. George's (Hanover-square) Union, and the parishes of St. James and St. Margaret, Westminster. The works include an enlargement of the workhouse, together with the erection of an entirely new chapel of large dimensions; and likewise extensive new infirmary buildings in separate blocks, covering a ground area of about two acres and a half in extent. The estimated cost of the several buildings, when completed, is about 110,000*l.*

The enlargement of the workhouse, which is now almost finished, consists of additional men and women's receiving wards; an extension of the male and female infirmary wards, carried up two stories above the ground-floor; a new block on the east side containing additional able-bodied wards, to accommodate 400 inmates, and which is 246 ft. long by 74 ft. wide, including a dining-hall one story in height, the main building containing two stories above the ground-floor. The dining-room runs the entire length of the main building, and is 15 ft. in width. The extensions further include new administrative offices, a new master's house, additions to the married inmates' department, to accommodate ten additional couples, together with a new engine-house.

On the open area in front of the workhouse buildings, with its principal elevation at the south side of Fulham-road, a new chapel, Early English in style, has been erected, to seat a congregation of a little more than 600. It is about 120 ft. in length, and 50 ft. in width. The Fulham-road frontage terminates with a gable, surmounted by a bell-turret and vane. In addition to lofty three-light windows at each end, and similar side-aisle windows, the nave is further lighted by clearstory windows. The principal entrance is at the Fulham-road frontage, with two other entrances on the east and west sides. The nave is 95 ft. in length to the chancel steps, and the chancel itself 15 ft. in length, making the entire length of the interior, 110 ft. Five arches on either side divide the nave from the aisles. The circular arcade columns are in Dumfries stone, with red brick arches. The external as well as the internal walls are in stock brick, with red brick bands. The floor levels of the chancel and table are raised considerably above that of the nave, from which they are approached by a flight of five steps. The organ-chamber is on the east side, and the vestry on the west side, of the chancel; and at the north end, over the Fulham-road entrance, there is a gallery 15 ft. in depth. The whole of the carpenter and joiner's work in the interior, including the open ceiling, and the benches, pulpit, and other fittings, is in stained pitch-pine.

The new infirmary in course of erection is situated on a piece of ground immediately adjoining the workhouse buildings, and which, as already stated, is two acres and a half in extent. It is on the pavilion plan, and will consist of seven blocks. The Fulham-road frontage is 160 ft. in length, the several blocks being carried to a depth southwards of 600 ft. The Fulham-road elevation has a tower and turret with vane, carried to a height of 140 ft.; and at the east and west angles of the tower there are pinnacles. At the top of the tower there will be a large cistern, with a capacity to contain several thousand gallons of water. There are two entrances from the Fulham-road frontage,—one to the blocks containing the patients' wards, and the other to the administrative department, a separate block on the extreme west side. The several blocks containing the wards consist of three stories in addition to the ground-floor, and are 60 ft. in height to the eaves. Each floor is 84 ft. in length from east to west, and 24 ft. wide; and, in addition to the wards, there are nurses' rooms, lavatories, and other conveniences, to every floor. The airing and recreation space facing the west, between the different blocks, is 60 ft. in width. The wards are approached by a corridor on the west side, running the entire length of the buildings. The administrative block contains the general offices, kitchens, stores, nurses' apartments, committee-rooms, and dispensary, and close adjoining are the washhouses and steam laundry. A new residence for the house-surgeon to the infirmary, having a covered communication with it, has been erected at the Fulham-road frontage; and a corridor on the east side of the infirmary, 80 ft. in length, and 6 ft. in width, connects it with the new chapel.

The architect is Mr. H. Saxon Snell; and the contractors are Messrs. Wall, Brothers. The works are being carried out under the superintendence of Mr. Walter E. Blake; and Mr. E. Thompson is clerk of works.

THE WORKS AT THE NEW VEGETABLE MARKET IN THE CITY.

The preliminary works for the new Vegetable Market to be erected by the Corporation on the vacant land between Charterhouse-street and Snow-hill, and adjoining the new Poultry Market, are actively proceeding. Messrs. Holland & Hannen, the contractors for the foundations at 13,968*l.*, commenced this portion of the work about a fortnight ago. They have a force of several hundreds of men employed, and upwards of twenty carts and horses in the excavations required, and they have already cleared away a large extent of earthwork between the east side, near the Poultry Market, and the Farringdon-street boundary, on the upper side, to the depth of about 20 ft. It is estimated that about 20,000 cubic yards of earthwork will have to be removed before the basement flooring—intended to be of concrete—and the foundation walls, can be proceeded with. The building is to be uniform in its external features with the two markets already erected, and will extend on the south side in a westerly direction to Farringdon-street, in a line with the south boundary of the Poultry Market. Between the south boundary and Snow-hill and King-street a new street leading out of Farringdon-street will be constructed on the vacant land, and will give access from the last-named street to all the three several markets on the south side in a manner similar to that by which the markets are now entered from Charterhouse-street on the north side. The new street will cross over the Metropolitan and London, Chatham, and Dover Railway at the point where the lines diverge respectively to Moorgate-street and Farringdon-street Stations. A considerable extent of property on the east side of the railway has already been cleared away for the purpose of continuing the new street in that direction. The new market will occupy an area of upwards of two acres in extent.

TITHE RENT-CHARGE.

Sir,—My attention has been called to a letter signed "Rector's Tax," in a recent issue, and being aware that the provisions of the Act of Parliament in relation to the subject are very imperfectly known and understood, and as I have had some experience in connexion with these matters, I will endeavour to give a few particulars bearing upon the question, in the hope that they may be of interest, and perhaps of service, to some of your readers.

After the passing of the Act for the Commutation of Tithes in England and Wales (6 & 7 Wm. 4, c. 71), rent-charges in lieu of tithes were fixed upon the land, in certain cases, in the form of gross sums upon estates or holdings, or, as perhaps is more frequently the case, in the form of separate sums upon each field or close of land, the same being shown on the Tithe Map, and fully set forth and described in the tithe apportionment of each parish.

It is enacted that no person shall be personally liable for tithe rent-charge, the same being recoverable by distress on the land subject to the payment thereof, a restriction being placed upon the arrears recoverable at two years only.

When, in consequence of building operations, or from other causes, a field has become divided into numerous plots, the property of different owners, it should be understood that the only legal course is for the tithe-owner to collect the rent-charge from any part of the land, he having no right to constitute himself an apportioner. It then rests with the owners of the land to avail themselves of the powers which the Act affords either to effect an altered apportionment of the rent-charge, or to relieve the land altogether from the charge by redemption.

Where land charged with rent-charge has been divided into plots of such a size that the fair contribution of each towards the rent-charge would be at least 5*s.*, the owners will find it convenient to have an altered apportionment made, the cost of which would be charged amongst all

the owners in rateable proportion to their respective interests.

Where, on the other hand, the fair contribution would be less than 5s., the owner of any one of the subdivisions may apply to the Commissioners to order the redemption of the rent-charge, and they have power to enforce contribution towards the redemption money and expenses, which, as in the case of the expenses of an altered apportionment, are spread over the entire plot, each owner being responsible for an amount proportionate to the area of his holding.

I frequently find that owners are deterred from availing themselves of these remedies, simple though they are, by a vague feeling that by so doing they may render themselves responsible for more than their fair proportion of the expense of the transaction; but, in all cases, these are borne by the owners *pro rata*, the applicant incurring no additional expense whatsoever.

HARLEY M. GEELLIER.

SIR,—Your correspondent, "Rector's Tax," in the *Builder* of the 25th ult., is much exercised because he is called upon to pay the rent-charge on the original inclosure. If he will apply to the Tithe Commissioners for England and Wales, 3, St. James's-square, S.W. (by letter), they will send him a form to fill up, stating that the ground has been sub-divided, &c.; whereupon the Commissioners will put him in the way of getting the rent-charge redeemed, and every landowner will have to pay his own share in proportion to the area of his property.

Your correspondent is wrong, however, in supposing that tithe-rent charges are any one's tax, as tithe-rent charge is an incorporeal hereditament, and as such is chargeable with property-tax and poor and other rates. A little reflection will show that, if upon the cutting up of a field for building, the tithe-owner had to collect the tithe rateably from some scores or hundreds of people, it would be equivalent to his property being confiscated. Let him remember, also, that if a field of ten acres pays a rent-charge of 3*l.*, when that field is cut up and built upon, and is decupled in value, the tithe-owner gets no more tithe than before. If your correspondent has any difficulty in filling up the form which the Commissioners will send him, he should seek the assistance of some local surveyor, or the local tithe collector.

RECTOR'S PROPPETY.

MANOR PARK CEMETERY CHURCH COMPETITION.

SIR,—Referring to the *Builder* of the 18th ult., I have observed that *two* tenders are inserted therein, viz., Brass, 2,835*l.*; Staines & Son, 2,083*l.* As no tender was accepted, and as the shareholders in this company may be misled by the above, I beg to say that a tender from Mr. J. Winters, amounting to 2,163*l.* had been received and accepted for erection of the church previously to the publication of the first-named amounts.

J. W. DUNCAN, Secretary.

BRISTOL CATHEDRAL NORTH PORCH.

SIR,—In your notice of the so-called ecclesiastical difficulty at Bristol, which has arisen out of the sculpture recently placed on the new north porch, there is a statement to which, as sculptor of the statues, and imputing as it does to me direct plagiarism in the execution of one of them, I should be obliged if you would permit me to refer. You rightly inform your readers that exception has been taken to St. Gregory because of his being represented as wearing the tiara; but when you go on to say that "the figure is, in fact, an exact counterpart of Pope Gregory, now being erected at the new Roman Catholic Cathedral at Clifton," this is so far devoid of fact that I must beg to give it direct denial. There is no such statue, I am told, at the Roman Catholic Cathedral, and if there were, I must still disavow the fact of mine being an exact counterpart of it; for, never having seen either the church at Clifton or one single work destined for it, and not having copied from any source whatever, the thing is impossible. My statues were approved by Mr. Street as original works, and have no resemblance to other works, only so far that each has the distinguishing costume and emblems allowed by the traditions of art; and the attributes of St. Gregory, by which he is recognised as one of the four Latin Doctors, seem to have been wrongly interpreted by a certain section of the Church at Bristol as only pointing to Rome, in which idea these objections appear to be singular, for on other English churches the figure of St. Gregory has often been erected (on two other cathedrals by myself) where he has been accepted, as he was intended to be, simply as one of the great fathers of the Church.

J. F. REDFERN.

THE HEALTH AND SEWAGE CONFERENCE.

SIR,—A paragraph has appeared this week in some of your contemporaries having reference to an intended conference to be held by the Society of Arts, in May next, on the "Health and Sewage of Towns." It is stated that a circular asking for information has been issued to the mayors, town clerks, chairmen, and medical officers of the various sanitary authorities.

Now, every person interested in sanitary matters must hope that the conference will be productive of good, but I cannot help thinking that to apply to the above-named officials for such information, entirely ignoring the surveyors to the authorities, from whom alone a reliable description of the method, cost, &c., of sewage disposal in their respective localities can be obtained, is scarcely a practical way of going to work; nor does it, I think, tend to give our surveyors their share of the honour due to those who do so much towards increasing the health and happiness of their fellow-creatures. I have seen one of the circulars, and noticed that nine-tenths of the queries in it applied directly to the surveyor's department. I also happen to know that in the case alluded to the surveyor furnished almost all the needful replies, and I have little doubt that the like will be done in one form or another in nearly every town. I venture to ask space for these few remarks, as I think it may be of service to call the attention of your readers to what is, in my humble opinion, one of the many causes conducing to the imperfect understanding of the sewage difficulty which prevails, even among those who, from the most valuable praiseworthy motives, devote much time and attention to the subject.

C.

MASTERS AND MEN.

Birmingham House Painters.—On the 1st of December last the operative house-painters of Birmingham gave their employers notice for an advance of ½d. per hour upon their wages of 7d. per hour, the same to come into operation on the 1st of April of the present year, and not being able to settle the matter without arbitration, it was referred to Mr. T. C. S. Kynnersley, who, on the 17th ult., awarded as follows, namely, ½d. per hour on the 1st of April, 1876, and another ½d. on the 1st. of April, 1877, the reason assigned for so dividing the halfpenny being that some of the employers had entered into heavy contracts in the early part of last year on the basis of wages at that time, and some of which contracts now stand in abeyance.

Northampton Plasterers.—The members of the Northampton District of the National Association of Operative Plasterers met to celebrate their first anniversary on the 27th ult. On the same day a four months' notice expired for an advance of 1d. per hour on the wages, which was acceded to by the employers, so that their wages will, in future, be 7½d. per hour, instead of 6½d.

Dublin.—A meeting of delegates, representing the carpenters employed at some of the principal builders' yards in this city, has just been held at the rooms of the Amalgamated Society of Carpenters and Joiners, Wellington Quay. Mr. Hearns occupied the chair. It was resolved, on the motion of Mr. Foley, seconded by Mr. Hayden, "That, taking into consideration the many friendly advances which have been made to the societies whose members, by exceptional principles of combination, compel those who do not agree with them to keep from seeking work in any employments, without success, that we use our best endeavours to make our grievances known to the public, and that we solicit the co-operation of all carpenters who feel aggrieved."

VARIORUM.

DEBRETT'S Peerage, Baronetage, Knighthood, and Titles of Courtesy are this year published (by Dean & Son) in one thick, but not at all inconvenient, volume. The work has obtained so eminent a character that commendation is unnecessary. Debrett's House of Commons and the Judicial Bench, 1876, form a separate volume, compiled by Dr. R. H. Mair. It includes 1,000 armorial bearings, and a large amount of cognate information.——Those who require a Peerage, Baronetage, and Knightage at less cost may safely obtain the little shilling volumes published by Hardwicke & Bogue. It is a recommendation to say that they are edited by Mr. Edward Walford, M.A.—— "Landlord and Tenant":—The *London and Provincial Illustrated Paper* says:—"Yearly, quarterly, and indeed other tenants will be glad to notice that there is some prospect of getting a clear legal decision about the precise allegations of landlords as to keeping houses in 'tenantable' condition when there is no exactly-worded clause (applicable to the question) in the agreement. At present there is a conflict of authorities, and the whole subject is in the greatest confusion. In the case of Lady Winchelsea and the trustees of Mr. Hall, Mr. Justice Quain has decided that a landlord is under an implied covenant to keep the house he lets in good sanitary condition. The case will, however, come before the judges *in banco*, where we may reasonably hope the arguments and the decision will settle, more or less directly, a good many points concerning which both landlords and tenants are now in doubt. The sanitary condition of a house is a very wide matter, and covers a great variety of details."——*Leisure Hour* deals with British Lighthouses:—"The lighthouses of this country are under the management of three distinct boards, incorporated by Act of Parliament. The Trinity Board, having its head-quarters in London, conducts all affairs relating to the coasts of England; the Board of Commissioners of Northern Lights, having its head-quarters in Edinburgh, attends to all matters connected with the coasts of Scotland; and the Ballast Board of Dublin, having its head-quarters in Dublin, looks after all matters relating to the coasts of Ireland. A royal Commission appointed to inquire into the condition of the British lights in 1861, reported to Parliament very favourably, and especially regarding the Scottish lights. Here it may be mentioned that, although the Northern Lighthouse Board consists chiefly of members of the legal profession, it has always had in its service officers of high scientific attainment and practical skill in all matters relating to lighthouse engineering and duty. The name of Stevenson is well known to all who have taken any interest in lighthouse matters. Robert, the father, built the well-known tower on the Bell Rock, the light of which was first exhibited in February, 1811; Allan, the son, built the classic tower on the wild rocks of Skerryvore, the light of which was first exhibited in February, 1844; David and Thomas, the present engineers to the Board, lately erected the substantial tower on the savage rock of Dhu-Heartach, fifteen miles S.S.W. of Iona."

Miscellanea.

Unsanitary Condition of the District West of Hull.—At a recent meeting of the Newington Board, whose jurisdiction is over the district west of Hull, Dr. Holden presented a report which he had prepared at the instance of the Government Inspector. The report showed an alarmingly unsanitary condition of the neighbourhood. The main street was reported to be surface clay, ploughed into ruts by carts, some ruts being 20 in. deep, proportionately wide, and full of water. He was informed one resident had had four children down in fever during the winter, and as medical men would not or could not come down the street, he had had to carry the children to a dispensary, thereby endangering their lives and the safety of the public. In one street a terrace had been completely deserted by its inhabitants in consequence of the general unsanitary condition of the place, and the increased expense of porterage for coals, &c. In an adjoining street the crown of the drain was so near the surface that carts had broken through, and the holes in the drains were merely covered with boards, &c. The medical officer stated he could certify certain houses as unfit for habitation. The whole of Beetonsville he considers is in a dangerously unsanitary condition, and that it is his duty to advise prompt action to remedy the evils he had faintly attempted to describe.

Civic Heraldry at Middlesbrough.—At a recent meeting of the Middlesbrough Town Council, the Mayor drew the attention of the Council to what is described by the *York Herald* as "an elaborate painting of the Middlesbrough Borough arms, which, enclosed in a gilt frame, was let into a panel over the Mayor's chair." He hoped they would accept it at his hands. There was a suggestion he would like to make, and that was, that some recognition ought to be made on the coat of arms of the staple industry of the town. He would not desire to remove the lion on the crest, because that connected them with the De Brus family, but he thought that the lion on the shield seemed rather out of place, and he would like to have blast furnaces on the shield instead of the lion. (!) Mr. T. H. Bell disagreed with the Mayor. They might as Englishmen say that the lion on their national coat of arms was out of place, and a sheep would better suit them. He must point out that the crest was a personal insignia, and that if they wanted to retain any connexion with the De Brus family, they must leave the lion on the shield. They might, however, if they liked, place blast furnaces in a canton or small square on the shield. The Mayor said that he had no strong feeling in the matter, and was content to leave it at present. He must, however, remind them that their coat of arms had no antiquity, having been manufactured for them in 1854.

Fall of New Barracks.—A serious accident has just occurred in Bordeaux. The north wing of the barracks called Alsace fell in with a dreadful crash. The building was five stories high, measuring some 80 ft., and the whole gave way in one vast heap of ruins. It was nearly completed, only five men being still at work on it.

Bedfordshire Archæological Society.—The quarterly meeting of this Society was held in the Bedford Library, when Mr. Wyatt laid on the table several Tradesmen's Tokens, presented by Mr. Ekins. They were found on a farm at Sundon, on which fragments of Mediæval pottery and other remains have also been discovered, indicating the proximity of the spot to the old Roman road. Mr. Hurst read a paper on the ancient Corporation of Bedford. After briefly noticing the various charters which have been granted to the town from the time of Henry II. down to that of Charles II., he proceeded to describe the origin of the different offices which obtained in the old corporate body, viz., those of bailiff, chamberlain, alderman, mayor, &c., recording many interesting details respecting the mode of electing these functionaries in bygone times. Quoting from Luigo Brentano's "History of Guilds," he showed that in all probability a guild merchant existed in Bedford at a very remote period, and that the town possessed municipal privileges long anterior to the time of Henry II. Mr. Wyatt subsequently read a record upon the Corporation maces from the "Bedfordshire Notes." The mayor's mace and those of the two bailiffs were exhibited at the meeting. They all date from the time of Charles II.

Enlargement of Charing-cross Railway Station.—The Parliamentary Committee on the South-Eastern Railway Company's Bill have considered this subject. Sir Edward Watkin, chairman of the Company, informed the Committee that it was proposed in the Bill to extend the Charing-cross Station by erections on the east side of Villiers-street. For this purpose the company had purchased the requisite land at a cost of 50,000*l*. To connect the new buildings with the existing station a bridge of an ornamental character in the form of a covered gallery was intended to be constructed across Villiers-street from the side of the hotel, and in order to avoid interference with the traffic of the thoroughfare, it would be carried at a height of 31 ft. from the level of the roadway. Mr. Brady, the company's engineer, said his estimate for the erection of the bridge was 1,100*l*. The Metropolitan Board of Works and the Vestry of St. Martin's parish opposed, and called evidence to show that the construction of the proposed bridge was an unnecessary work, and would be a public eyesore. The Committee declared the preamble proved, subject to a clause being inserted to ensure the construction of the bridge in accordance with the views of the Metropolitan Board of Works.

Ascot Grand Stand.—Since the last race meeting at Ascot the old wooden and thatched building, close to the high road, forming the entrance to the Grand Stand, which was built after a plan of the late Captain Seymour, one of the trustees, and was opened for business at the Spring Meeting in May, 1866, has been removed, and the trustees have had erected a new building, in the Italian style of architecture, consisting of a colonnade of nine arched openings, entering a hall 120 ft. long by 25 ft. wide, flanked at each end by pavilions, one containing the telegraph department, and the other devoted to apartments for the officials belonging to the Grand Stand. The approach from the Central Hall to the lawn and Grand Stand is through an arch of 22 ft. span, and connecting the new building with the iron verandah. On each side of this arch are the money-takers' offices. The materials of the building are red brick with stone dressings; the capitals of the piers, the arches, and the entablature are of stone, surmounted by an ornamental balustrade. The entire building is 160 ft. long and 25 ft. wide. The central portion is paved with coloured tiles, and the ceiling divided into bold panels of wood, stained and varnished. The architect is Mr. B. Ferrey, and the building has been erected by Mr. John L. Hollis, of Windsor.

Belfast Architectural Association.—A meeting of the above society was held on Monday evening, 27th March, at the Museum, College-square North. There was a large attendance of members. Mr. Conway Scott, B.E., occupied the chair. A paper entitled "Some Notes on Construction" was read by Mr. L. Livingstone Macassey, C.E. Mr. Macassey, in the course of his remarks illustrated by diagrams on the black board the various precautions necessary for the insurance of sound construction in foundation, walling, &c. The proper use and formation of concrete was described, and the recent experiments of Mr. Cotton, of Dublin, with regard to concrete in the form of beams explained.

Monumental.—A bronze statue of the late Lord Rosse has been erected in the principal street of Parsontown, Dublin. It is one of the latest of Foley's works, and a good specimen. The late Earl is represented as standing in his robes as Chancellor of the University of Dublin, wearing also the collar and badge of the Order of St. Patrick. The pursuit in which he attained celebrity is indicated by the addition of a globe, on which one hand is resting. The statue is 8 ft. in height, and stands on a pedestal 8 ft. 6 in. high. It is an excellent likeness. It was cast at the works in Manor-street, Chelsea, where we saw it before its departure.——A tablet of black and white marble has just been placed in the Wesleyan Methodist Chapel at Heanor, to the memory of Mrs. Martha Smith, of Heanor Hall, and of Dr. Edward Smith, F.R.S., of Heanor Hall, and Harley-street, London, son of the above. The commission for its erection was placed in the hands of Mr. J. B. Robinson, of Derby.——The statue of Sir James Simpson, for Edinburgh, has been cast at the Manor Iron-works. The statue is by Mr. Wm. Brodie, R.S.A., and will be erected in Princes-street.

New Hospital at Helensburgh.—A new hospital at Helensburgh, near Glasgow, has just been erected by the magistrates and town council, principally from funds bequeathed by the late Miss Ann Alexander. The architect is Mr. W. N. Tait, of Glasgow, whose plans were selected in competition. The new hospital is built in the villa or cottage style of architecture, having gable tops over the centre or administrative department, and with corner wings for lavatories and water-closets, the front ones being relieved by tower roofs. The hospital combines under one roof a fever hospital; a hospital for infectious diseases other than fever, principally intended for small-pox; and an ordinary hospital, intended for non-infectious cases, or as casualty wards. Each has a separate entrance and distinct airing-grounds. The works were executed by the following contractors:—Mason-work, Messrs. Shaw & Campbell, Glasgow; joiner-work, Mr. George Buchanan, Helensburgh; slater-work, Mr. James Forsyth, Helensburgh; plumber-work, Mr. Wm. M'Kinlay, Helensburgh; and plaster-work, Mr. Allan Armit, Helensburgh. The total cost has been about 3,000*l*.

Buckingham Borough Surveyorship.—A special meeting of the members of the Buckingham Town Council and Urban Sanitary Authority was held on the 27th ult., to receive applications from persons willing to undertake the duties of borough surveyor. Three applications were read,—from Mr. J. T. Beards, Maidsmoreton, 80*l*.; Mr. R. W. Munday, Buckingham, 50*l*.; and Mr. Wm. King, Gawcott, 45*l*. A letter was also read from the late surveyor, expressing his approval of the appointment of a practical working surveyor, and mentioning a person named Allen as fully capable to undertake the duties. It was, however, considered by the council that they should adhere to the terms of the advertisement, which stated that the surveyor should keep his own accounts, and this it was stated Allen could not do; and, therefore, his name and that of King was passed over. It was resolved unanimously "That Mr. R. W. Munday be appointed, at the annual salary of 50*l*. The duties to commence at once."

"A Principal Cause of Illegitimacy in Scotland."—"A Servant," writing to a Scottish paper, says,—"What I believe to be one of the principal causes, if not the principal, for the large amount of illegitimacy that prevails in the agricultural districts, is the want of proper accommodation for what in Kircudbrightshire we call the 'cotman.' This I consider to be the fountain-head of the evil. Moralists may cry shame at us, and preachers may cry out against this growing evil; but all the preachers in the world will be of no avail as long as cotmen are housed in the manner they are. The stream cannot rise above its level nor be purified in its flow if bitter waters proceed out of the fountain; and as long as cotmen's children (for in time it is they that become the agricultural labourers), boys and girls, father and mother, are huddled together for the want of house-room, and as long as landlords are content to let the cottages on their estates remain as they are, just as long will the agricultural districts be festering with the immoral plague of illegitimacy."

Skelton Wesleyan Chapel and Schools Competition.—A Darlington paper states that the successful plans in this competition were those sent in by Mr. Neil Macara, architect, Darlington.

"Steeple Jack" at Dundee.—About a month ago, part of the masonry beneath one of the dormer windows of the spire of St. Paul's Free Church, Dundee, fell to the ground, owing to the corrosion of the iron cramps with which the work was fixed. It was thereupon determined by the managers of the church to thoroughly repair the spire, and Messrs. Goodchild, Moir, & Co. were employed to execute the work, which has now been safely accomplished. To enable the work to be done without scaffolding, it was necessary to secure a tackling of ropes and pulleys to the top of the spire, which is about 150 ft. high. The ordinary method of reaching the top of such lofty buildings is by flying a kite over them, but the weather was unfavourable for such an operation. After consultation with Mr. Goodchild, Mr. Moir resolved to reach the top by ladders. The fixing of the hoisting tackle over the top of the spire occupied two days. The finial was strengthened, and a new lightning-conductor fixed.

An Extensive Brickmaker.—The Bill for the proposed Maidstone and Sittingbourne Railway was before a Select Committee of the House of Commons a few days ago. One of the witnesses examined on behalf of the promoters was Mr. Smeed, of Gore Park, near Sittingbourne, who said he had lived all his life in the neighbourhood, and was one of the largest landowners in the district, including a quantity of valuable brick earth. He supported the Bill, notwithstanding that it passed through his brick land. He made more bricks than any two other persons engaged in the trade, and at the present time was paying about 2,000*l*. in weekly wages. He now sent bricks to Maidstone by water, and had barges of his own. If the projected line was made, he should make considerable use of it, but not so much as other brickmakers who did not possess barges. In cross-examination by Sir Edmund Beckett, Mr. Smeed said he exported bricks to India and China, and sent as many as a million a year to Maidstone.

The Sewerage of the Potteries.—Sir Henry Cole met at Stoke, on the 27th ult., a number of delegates from the local governing bodies in the Potteries, and discussed with them the sewerage question as it affects that district. Sir Henry appeared as the advocate of the Scott Sewage Company, and offered its services to those towns which, as he tersely put it, "desired to be clean at the least expense to the ratepayers." As the Duke of Sutherland is at the head of this company, as Sir Henry was accompanied by the agent on the Trentham Estate, and as, moreover, he reiterated that proceedings would certainly be taken by the Duke against Hanley, Burslem, and Stoke as they had been against Tunstall and Newcastle, the visit had a significance which it might not otherwise have possessed. At the suggestion of Sir Henry, a resolution was passed affirming that present plans for individual towns should be devised with a view to their being utilised if, in the future, a general scheme for the entire district be decided upon.

The History of Egypt and the Bible.—The Victoria (Philosophical) Institute held its usual fortnightly meeting at 10, Adelphi-terrace, on Monday, when Mr. Howard, F.R.S., read a paper on the "History of Egypt in connexion with the Bible." He stated that he wished, without dogmatism or assumption, to trace the bearing of recent researches on the historical accuracy of Scripture. He examined the history of Egypt as showing, from Menes downwards, that *man* was in possession of the same faculties, as indicated by his high civilization and distinctly religious tendencies. The dates were, on the admission of the best authorities, in a state of deplorable confusion at present. The religion of the country was shown to have included grand truths of primitive revelation and precepts of excellent morality, but the priests kept the best of their knowledge to themselves; the bulk of the people were sunk in idolatry, the chief influence for good being connected with the descendants of Shem, especially the Israelites.

Society of Engineers.—On Monday evening, the 3rd of April, Mr. V. Pendred, president, in the chair, a paper by Mr. J. Steel on "Air Compression," was read. The author pointed out the necessity of placing air compression on a proper basis, as, whether an economical mode of using power or not, in mines, chemical works, diving-bells, raising ships, and other operations, it had become a necessity. It was also to be regarded as an alternative from the cost and waste of horse-flesh to propel tramway cars.

Working Men in New York.—The *New York Times* states that a recent careful investigation into the condition of the labour market in that city shows that the mechanical industries have not recovered from the depression caused by the financial panic of 1873. "The trade-unions now number only about one-third of their total strength three years ago. This is specially to be seen in the building trades, the societies in 1873 numbering over 10,000, while at the present time the number on their rolls in good standing is not much above 3,000. In 1873 the various unions had 48,180 members, while at the present time they contain less than 18,000, of which 3,790 are out of employment. A careful estimate of the workmen outside of trade organisations shows the probable number to be 58,350, of whom 21,420 are idle. The plumbers, gas-fitters, painters, and those engaged in the building trades appear to have suffered most. In some of the departments of the iron trade the manufacturers have succeeded in maintaining full forces and full prices. Of those who have suffered, the stove-makers have perhaps fared the worst.

Operatic Society.—Some of our readers may like to know that Signor Gilardoni (32, King-street, W.), with the view of supplying a want long felt by amateurs, as well as by those studying for the musical profession, is forming a society for the practice of operatic music, with the immediate object of affording the members an opportunity of appearing from time to time in Italian and English opera, with costumes and full orchestra, under his direction. Rehearsals will be held weekly in a suitable hall, and it is contemplated to produce three operas in the course of the season; in addition to which two or three evenings will be set apart for *soirées musicales*. A successful public rehearsal of Beethoven's "Fidelio," English version, was recently given at the Royal Albert Hall Theatre, and it is to be performed early in May, with complete appointments.

New Cemetery at Wimbledon.—The Wimbledon Local Board are about to construct a new cemetery for the use of the parish, at a cost of 6,000*l.*, exclusive of the land, and the contract for laying-out and draining the ground has just been taken by Mr. Crockett, who will enter upon the works immediately, the estimated cost of this portion of the undertaking being 2,000*l.* The ground which the local board have secured for the purposes of the cemetery is twenty acres in extent, but only ten acres are to be laid out for the present, the remaining ten acres being reserved for the extension of the cemetery whenever it may be required. The site consists of a plot of ground in an elevated position, on the east side of the district, abutting on the South-Western Railway, and about a mile from the Wimbledon Station.

Blackburn.—The Wesleyan Methodists of this town, a short time ago, purchased a large plot of land at the junction of Preston-road and Montague-street, for the purpose of erecting a chapel. Invitations were sent out to the following architects for plans:—Mr. Wm. Waddington, Burnley; Mr. C. O. Ellison, Liverpool; Mr. William S. Varley, Blackburn; Mr. Proctor, Bolton; Messrs. Woodhouse & Potts, Bolton; and Messrs. Maxwell & Tuke, Bury. Plans have been received from the four first-named gentlemen, and, after considerable consideration, the committee have resolved to entrust the work to Mr. William S. Varley, Blackburn. The accepted design is a Gothic building, with tower and spire, and will seat upwards of 1,000 worshippers. The great fall in the land from front to back has been utilised by placing a large school and vestries under the chapel floor.

Public Works in Cochin.—Mr. Henry W. Hudson, late of the engineer's staff, Great Northern Railway, King's-cross, has been appointed Chief Engineer of Cochin, in succession to Mr. Macdonald, who held charge for a few years. We learn from the *Madras Mail* for February 17th last, that the Cochin State, with a revenue of twelve or thirteen lakhs, spends 250,000 rupees for public works in each year. The newly-appointed engineer is likely to undertake some large works which are necessary for the improvement of communication between the different parts of the province.

The Fitzwilliam Museum, Cambridge.—The election of a director of the Fitzwilliam Museum took place on the 1st inst. There were eight candidates. Mr. Colvin, of Trinity, at present Slade Professor of Fine Art, was elected.

Winchester Cathedral.—A small reredos, in Derbyshire alabaster and Dove marble, the design and work of Mr. N. Hitch, architectural sculptor, has just been placed in the Lady Chapel of Winchester Cathedral, at the cost of the Dean. The reredos is a composition in three divisions, the centre being occupied by a white marble cross within an alabaster vesica. The outer divisions are richly diapered with lilies and roses. The cornice is of Dove marble, and carved with the fruit and foliage of the pomegranate, whilst the "retable" is a projecting slab of the same marble. The Dean and Chapter have also, within the past week, had placed within the communion-rails a pair of metal standards of thirty lights each, with crystal and decorated metal ornaments, the gas from which will illuminate the entire area of the presbytery, and obviate the use of the jets round the pillars and along the cornice beneath the mortuary chests of the Saxon kings.

Lightning.—A thunderstorm passed over the village of Snettisham, which is situated within three miles of Sandringham, recently. The electric fluid from this discharge struck the spire of the fine old parish church in two places, on the south-eastern side in the upper portion and on the north-western in the centre, effecting deep incisions, and hurling some of the massive stones a considerable distance. The current appears then to have passed through the belfry, tearing up the flooring and destroying pinnacles and coping in its course. Finding its way into the vestry, and thence into the church, it has left traces of seeking various outlets, but ultimately it passed out beneath the western door.

New Offices for the Board of Trade, Southampton.—A new building has recently been erected near the Docks and Custom House, Southampton, for the Board of Trade. The offices comprise rooms for the superintendent, officers' waiting-rooms, cashier's and general office for paying off crews and carrying on the business of a seamen's savings-bank, engaging-room (where seamen are mustered before signing articles), surveyor's offices, examination-room for engineers and officers, emigration offices, &c. The whole of the offices are heated by hot water, the apparatus being capable of regulation in each room. The building was erected from the designs of Mr. Giles, the Dock Company's engineer.

Co-operative Stores at Gloucester.—The Gloucester Co-operative Society has decided to purchase a plot of land at the corner of Brunswick-road, facing Clarence-street, and to construct three shops in which to carry on the drapery, boot and shoe, and ironmongery and hardware departments. The new building will be of Bath and Forest stone, with three gables fronting Barton-street, one on the angle between Barton-street and Brunswick-road, below which will be an illuminated clock, and another gable in Brunswick-road, terminated with crocketed finials. The style will be Gothic. Messrs. Medland & Son are the architects.

Discovery of Wall Paintings in New Zealand.—An interesting discovery is said to have been made by Dr. Von Haast, in Canterbury, New Zealand. In the course of his explorations he came upon a shallow cove, the limestone walls of which were covered, for a space of about 100 ft. by 5 ft. high, with remarkable drawings apparently of antiquity. Dr. Haast had all these drawings carefully copied, and the information in detail will shortly be published. There are three distinct sets of drawings, the oldest of them in red, the others in black. The scaling off from the surface of the limestone rock affords proof of the antiquity of the work.

Marble Mosaic Pavements.—The mosaic pavements laid down in the new bank erected for Messrs. S. Smith & Co., in Derby, and one in the new bank erected in Worcester, for the Stourbridge and Kidderminster Company, both mentioned by us on previous occasions, were executed by Messrs. Burke & Co., of Newman-street, Oxford-street. Messrs. Burke have made the revived ancient system of marble mosaics, *opus incertum*, a specialty, and have a large staff of Venetian workmen qualified for the work. This mode of flooring might often be advantageously resorted to instead of tiles.

Memorial Chancel Screen at Sneinton.—It is proposed to erect an oak chancel-screen in the parish church at Sneinton, Notts, in memory of the late Rev. W. H. Wyatt, vicar of the parish for thirty-one years. A design by Mr. Truman, architect, has been accepted.

National Health Society.—The committee have arranged a course of lectures to be given under the auspices of the National Health Society, in the rooms of the Social Science Association, Adam-street, Adelphi. This is the list:—Mr. H. C. Bartlett, Tuesday, April 11th, "The Chemistry of Every-day Food"; Miss Florence Lees, Wednesday, May 10th, "Nurses for the Sick"; Miss Miranda Hill, Wednesday, May 24th, "The Influence of Beauty on the Life and Health of the Nation"; Dr. Samuel Wilks, Wednesday, June 7th, "Our Predisposition to Special Forms of Disease"; and Mr. Eassie, Wednesday, June 21st, "Healthy Houses."

New Workhouse Infirmary, Manchester. At the meeting of the Manchester Board of Guardians on the 30th ult., it was stated the Infirmary Building Committee had considered the following tenders which had been sent in, viz.:—Mr. Samuel Warburton, 91,800*l.*; Messrs. Robert Neill & Sons, 94,300*l.*; Mr. William Southern, 96,500*l.*; Mr. Edward Johnson, 98,480*l.*; and Messrs. Thomas Clay & Sons, 101,900*l.* After much careful consideration, and consultation with the architects, the committee had resolved to recommend that the tender of Messrs. R. Neill & Sons should be accepted by the Board. This recommendation was adopted.

Royal Italian Opera.—"Les Huguenots," given with complete *ensemble*, is always a delight, difficult as it is on the part of those who knew Grisi and Mario in the opera to avoid damaging comparisons. At Covent Garden, on Monday night last, Signor Carpi fully maintained the good opinions he won last season in "Lohengrin"; and Mdlle. d'Angeri (*Valentina*) did more, for she showed increased power and impressiveness. Mdlle. Bianchi was as good a *Marghérita di Valois* as could be desired.

Association of Municipal and Sanitary Engineers and Surveyors.—The next meeting of the District Committee for the Midlands will be held in the Court House, Warwick, on Wednesday, the 19th of April. A paper on the Water Supply of Warwick, by Mr. E. Pritchard, Engineer to the Corporation, will be read and discussed, and the existing waterworks and pumping-engines will be inspected. This will be the last meeting of the committte, prior to the general meeting to be held in London.

Mr. and Mrs. German Reed's Entertainment.—A new second part is announced to be produced at St. George's Hall on the 10th of April, in lieu of "A Spanish Bond." The novelty, in which Mrs. German Reed, Miss Leonora Braham, Mr. Corney Grain, Mr. A. E. Bishop, and Mr. Alfred Reed, will appear, will be entitled "Gramp's Ménage," and is from the pen of Mr. John Hermitage, with music by Mr. Fred. E. Barnes.

Society for the Encouragement of the Fine Arts.—At the last meeting of this society, Mr. J. Forbes Robertson, well and appreciatively known in literary circles as an art critic, lectured on "Art in 1476." Mr. Tom Taylor was in the chair. There was a good audience, and a lively discussion afterwards.

Proposed International Exhibition, Paris.—It appears to be definitely settled that an International Exhibition shall be held in Paris in 1879. A decree has been issued to organise a commission of forty-five persons to carry it out.

A House in Berlin.—Lord Odo Russell, the British Ambassador in Berlin, is said to be in negotiation with the new proprietor of the handsome mansion in the Wilhelmstrasse, lately the property of Dr. Strousberg, for a ten years' lease of that building, at a rent of 2,500*l.* a year.

TENDERS

For a dwelling-house in the Southgate-road, Winchester. Mr. A. W. Galbraith, architect. Grates and chimney-pieces to be provided by the building owner:—

Crook	£1,225 0 0
Marsh	1,050 0 0
Bell & Ayling	995 0 0
Carter & Son	966 0 0
Beavis	878 0 0
Allen (accepted)	735 0 0

Accepted for a new vicarage, at Lumb, in Rossendale. Quantities by the architect, Mr. Harry T. Percival:—

Maden Bros. (masons)	£636 15 0
Whittaker (joiner)	325 0 0
Kay (plumber)	145 0 0
Rushton (slater)	106 10 0
Lord (plasterer)	85 0 0

For alteration and repair at No. 20, South-terrace, Littlehampton:—

Colwell	£800	0	0
Cheesman	760	0	0
Snowin	500	0	0

For alterations and additions to the Wesleyan Chapel, at Bardney, Lincoln. Mr. James Thropp, architect. Quantities supplied:—

Sims (in error)	£1,370	0	0
Close	1,198	0	0
Binns	1,090	0	0
Plowman & Son	1,050	0	0
Kendall	899	0	0
Slingsby	875	0	0
Hatcliff & Bell (accepted)	788	0	0

For alterations and additions to the Struggler Inn, Lincoln, for Messrs. Cartwright & Wilson, brewers. Mr. J. Whillon, architect. Quantities supplied:—

Crosby & Sons	£630	0	0
Taylor	600	0	0
Oller & Elsey	594	0	0
Sims	593	0	0
Rousam & Son	583	0	0
Close	549	0	0
Kendall	534	0	0
Basker	522	10	0

For the erection of a proposed house at Malden, for Mr. R. A. Levis. Mr. T. J. May, architect:—

Croxford & Co.	£1,499	0	0 !
R. & E. Smith	872	0	0
Vincent	823	0	0
Turtle & Appleton	780	0	0 !

For new stables, coach-house, &c., at Pinewood, Witley, Surrey, for Sir H. T. Holland, bart., M.P. Quantities by Mr. W. H. Brayshaw:—

Burgess (accepted)	£933	0	0

For rebuilding No. 141, White Cross-street, St. Luke's, for Mr. John Knowles. Mr. J. W. Saunders, architect. Quantities by Mr. W. H. Brayshaw:—

Knight	£880	0	0
Burgess	683	0	0
Read & Son (accepted)	625	0	0

For restoration of Wellow Church, Notts. Mr. J. Birch, architect:—

	In Oak.			In Deal.		
Hopkinson	£1,668	0	5	£1,378	12	6
Young	1,426	10	0	1,295	10	0
Clipsham	1,397	0	0	1,132	0	0

For the erection of Board school, at Newtown, for the (U. D.) Disley-Stanley School Board. Mr. J. A. Brown, architect. Quantities supplied by Messrs. Taylor & Jackson:—

Goddard	£2,500	0	0

For alterations and additions to the Up Hill Post-office, for Mr. Lillburn. Messrs. Drury & Mortimer, architects:—

Sims (accepted)	£178	0	0

For the construction of brick sewers, with manholes and other works, for the Cadogan and Hans-place Estate, Limited. Second contract. Mr. J. Ashdown, engineer:—

Jackson & Shaw	£9,350	0	0
Nowell & Robson	8,866	0	0
Pearson (accepted)	8,600	0	0

For premises in Charlotte-street, Finsbury, for Mr. J. K. Farlow. Mr. R. P. Notley, architect:—

Morter	£1,264	0	0
Faulkner	1,245	0	0
Greenwood & Sons	1,235	0	0
Browne & Robinson	1,190	0	0
Hart	1,187	0	0
Newman & Mann	1,136	0	0

For trimming-up and gravelling roads and footpaths at Kilburn, for the British Land Company, Limited:—

Keeble	£2,558	0	0
Dunmare	1,686	0	0
Bloomfield	1,658	0	0
Killingback (accepted)	1,560	0	0

For alterations at Highbury New Park Tavern, for Mr. Joseph Hough. Mr. Chas. Strange, architect:—

Moore	£277	0	0
Sabey	267	0	0
Vivian	260	0	0
Smale & Taylor (accepted)	247	0	0

For the erection of stables, for the Vestry of St. Giles, Camberwell:—

Oliver	£850	0	0
Cullum	725	0	0
Battley	621	0	0
Harris	598	0	0
Fisher	590	0	0
Thompson	582	0	0
Downs & Co.	570	0	0

For the erection of schools at Moseley village, for the Wednesfield School Board. Mr. W. D. Griffin, architect:—

Clark	£1,670	0	0
Groves	1,611	13	0
G. & F. Higham	1,600	0	0
J. & W. Cockerill (accepted)	1,540	0	0

For rebuilding Chatham House, 131, High-road, Knightsbridge, for Captain Mercier. Mr. A. Payne, architect:—

Reading	£2,427	0	0
Nash	2,375	0	0
Turrell	2,337	0	0
Brass & Son	2,303	0	0
Prout	2,300	0	0
Sholl & Jones	2,284	0	0
Stephenson	2,204	0	0
Staines & Son	2,145	0	0
Lee & Co.	2,131	0	0
Croxford & Co.	2,093	0	0
Wagner	2,047	0	0
Aitchison & Walker	1,977	0	0
Linfield	1,809	0	0
Lacy (accepted)	1,804	0	0

TO CORRESPONDENTS.

G. M.—J. T.—O.—W. S.—R. K.—A. G.—W. G. S.—Mr. R.—A. E. S.—M.—T. H.—C. H. L.—J. C.—R. M. B.—W. S. V.—E. S. C.—M. O. T.—Mr. H.—J. H. B.—H. M. G.—C. S.—J. F.—H. M. C.—H. J. J.—J. A.—P. H. B.—F. P. A. B. A. S. W. G. D.—W. T.—A. H. A. (please send particulars).—Quondam (in type).—F. W. C. cannot undertake to do our correspondents' "sums").—W. B (next week).—T. B (next week).—J. J. S. (next week)

We are compelled to decline pointing out books and givin addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO ADVERTISERS.

GOOD FRIDAY.

"THE BUILDER," for the week ending APRIL 15th, will be published at ELEVEN a.m. on THURSDAY, 13th instant. Advertisements for insertion in that Number must therefore reach the Office **before THREE p.m.** *on WEDNESDAY, the 12th.*

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The want of a Ground Stone superior to the Box Ground, has long been recognised, and we are now in a position to meet that want.

Our Quarries at Westwood are producing a Ground Stone of excellent quality, which surpasses the Box Ground in the following particulars.

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The Builder.

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Health, Water, and Gas.

NOT a few interesting particulars with regard to the population, as well as to the sanitary movement, of the metropolis, are given in the last Report of the Registrar-General. The increase in the number of the inhabitants, during the past year, was 44,459, of which figures 41,358 represent the excess of births over deaths, and the remaining 3,101 the balance of country immigration. The balance between the number of the sexes, which is the test—at least, which genealogy shows to have often been the test,—of decrease in the reproductive power of race, retains its normal proportion, the extra number of births and deaths of males very nearly counterbalancing one another. More boy babies are born than girls; but more boys die at an early age, so that the fair proportion of the sexes is normally maintained. We find indications of the result of the wholesale clearance and demolition of overcrowded houses that have for some time past been going on in the metropolis to be given in a very marked manner in the Report. The average number of inhabitants per house in 1869 was given in the Report for that year at 7·8 persons. In the past year the density of population was reduced by no less than 15 per cent., the average number of inhabitants per house being only 6·6. This great improvement as to the crowding of houses must be set off against a general increase in density of population per acre of 40 to 44 persons. The rate of mortality for 1875 was 237 deaths out of every 10,000 persons. In 1869 it was 246 deaths out of the same number.

It is stated by the Registrar-General that, under the existing sanitary conditions prevailing in England, the rate of mortality increases with the density of the population; and that the relation of the two rates of increase is such that the increase in the former is as the eighth root of the increase of the latter. Of course, any facts inconsistent with such a theory can be set down to a change in existing conditions. Thus, to find an improvement in life-rate to the amount of 4 per cent. coincident with a deterioration by reason of augmented density to the amount of 10 per cent., shows that sanitary reform has been both active and effective. At the same time we cannot but remark that a mathematical proportion so subtle, far-fetched, and inexplicable as is involved by the extraction of the eighth root of a given number, does not commend itself to reception. In all relations in which the increase follows the law of a series of squares or of cubes, a mathematical reason may usually be detected. When we pass the third dimension we leave the region of geometry. Although coincidences may exist, we should be very slow to imagine that anything of the nature of a physiological law can be indicated by such an extraordinary process. As we have, on the one hand, an assumed identity of sanitary conditions, and, on the other hand, anomalous results as to density, it is far more natural to conclude that we have attributed too much permanence to the former element, and have assigned an imaginary value to the latter. Again, density may be viewed under two aspects, as it affects the district, and as it affects the house. Of these two, we should be disposed to expect that the latter was by far the most potent element in the sanitary condition of a city. It will probably be found that the respective rates of mortality which prevail in the metropolis and in our larger towns depend far more closely on the state of the most unhealthy districts, and thus on the maximum mortality of the worst abodes, than on the difference between the more open and better-built portions of the towns. If so, overcrowding in comparatively a few number of houses is a more serious evil, as measured by the average death-rate of the town, than increase of density per acre by building and inhabiting new houses. In this view of the case, if an increase of density of four or five persons per acre is accompanied by such an improvement in the way of pulling down over-crowded houses as to reduce the average number of inhabitants per house from 7·8 to 6·6, we cannot but think that the effect of the increase per acre would be altogether inappreciable,—or, to say the very least, incapable of even approximate determination.

The increase which has actually taken place has been chiefly in the outlying districts of Kensington, Hampstead, Islington, Hackney, Mile-end Old Town, Poplar, St. Olave, Southwark, Lambeth, Wandsworth, Camberwell, Greenwich, and Lewisham. The number of residents (that is to say, of persons who sleep) in the City seems to be steadily on the decrease, and likely to continue to decline in proportion to the architectural improvement of this portion of the metropolis. The area of the municipal and Parliamentary limits of the City of London, according to the latest publication on the subject, covers 650 acres. The population of this district in 1871 was returned at 74,688, which gives a density of between 114 and 115 souls per acre. The area of London within the Registrar-General's tables of mortality is returned by the same authority (Mr. Firth), at 75,362 acres, the population of which, at the middle of the present year, is estimated at 3,445,160. This gives a density of 45 souls per acre. A third town is mentioned in the Report, as comprising what is called Greater London. This area extends over the City and metropolitan police district. It is a circle including all parishes of which any part is within a radius of 12 miles from Charing-cross, and all parishes which come entirely within a radius of 15 miles from the same central point. This area comprehends 698 square miles, being equivalent to the area of a circle of 14·9 miles radius. It includes Richmond and Kingston, in Surrey; Bromley, in Kent; Brentford, Harrow, and Uxbridge, in Middlesex; Cheshunt, in Hertfordshire; and Stratford and Barking, in Essex. The bounds were fixed by Sir Robert Peel. The area is equivalent to 446,720 acres; and the population is estimated by the Registrar-General at 4,207,167 for 1875. The density is thus about ten souls per acre, or rather less than a fourth of that of the second zone. The rate of mortality of Greater London is 22·7; of which 3·7 is by zymotic diseases. In the outer ring alone the annual mortality is set down at the corrected rate of 17·9. But fever is more fatal in this outer ring than in inner London. The sewage of this district is in an unsatisfactory condition, and the water supply is inadequate. For the service of this whole great province of Greater London there are forty-eight gas companies; fourteen in inner London, and thirty-four in the outer ring; and seventeen water companies, eight in inner London, nine in the outer ring. Five local boards only have yet supplied their districts with water. As to the companies in the inner district, the share capital of nine gas companies is returned at 10,482,900*l.*, and the loans raised by them at 1,729,212*l.*; making a total capital of 12,212,112*l.* The total capital expended by the eight metropolitan water companies is stated at 10,738,716*l.* The annual payments by way of dividend and interest on the above capital of 22,950,828*l.* were by the last published accounts 981,176*l.* for the gas companies, and 662,483*l.* for the water companies; being 1,643,659*l.* in all. This gives a rate of interest of a little over eight per cent. for the gas companies, and a little over six per cent. for the water companies, the average paid on the aggregate capital being a little over seven per cent.

The Registrar-General is not content with the sanitary and purely statistical information of which his report contains so much. He enters into the subject of the heavy pressure of rates on the inhabitants of the metropolis, and expresses his opinion that they might be supplied with gas and water at half the present cost. The paid-up capital is stated by the Registrar at 20,667,555*l.*, and the profits at 1,627,454*l.* In this statement there is some discrepancy as compared with which we have quoted from Mr. Firth. The difference of the year taken for analysis explains the difference of annual profit, and a portion of the loan capital appears to have been left out of sight; so that the profit of the companies seems to be estimated by the Registrar-General at nearly one per cent. too much, or at eight per cent. instead of seven per cent. Thus the saving which that officer considers could be effected, and which he sets down at 800,000*l.* per annum, is over-stated by nearly 200,000*l.* Nor does it appear in any way clear how the ratepayers are to set to work to obtain so desirable a reduction. The companies are in possession of the ground. They have rights, more or less just and equitable, more or less firmly secured by their several Acts of Parliament. The holders of property which

has cost, so far as the capital accounts can be relied on, twenty-two millions sterling, and which, if we take a four per cent. stock at par, is worth in the market thirty-eight millions sterling, would make a very hard fight to maintain their actual status, even though that status may be regarded as a monopoly preying upon the pockets of three millions of citizens. That unity of direction ought to obtain, few persons will be disposed to deny. If diversity of sources of supply allowed of a wholesome, and not a ruinous, competition, the case might be otherwise. But the system of districting has so far been carried out that the former contests between the various companies have been succeeded by that mutual respect of each for the district boundaries of one another which allows the average prices to be fully kept up. It is difficult to see how this monopoly is to be abated, except at a cost which would leave the ratepayers but little benefited by the change. The sanction by the Legislature of new competing companies would no doubt render the existing companies disposed to treat for the surrender of their property at a reduced rate. But the mere proposal to make new companies, even if sanctioned by Parliament, would have but little effect in this direction. It would not be until the good faith and resolution of the new association was vouched by the expenditure of their capital, that those who hold the ground would be convinced that their antagonists were in earnest, and had the power as well as the will to fight them. The remedy, then, would be as bad as the malady, as the capital account would be doubled by the cost of the new works, even if the original stock were thus reduced to a par value.

While, then, we fully admit that the pressure of the present gas and water rates, which the Registrar-General puts at 1s. 6d. in the pound, and which we reckon at 1*l.* 3s. 9d. per head for the inhabitants of the London of the bills of mortality, is excessive: and while we admit that the Legislature has shown the same improvidence and want of regard for the interests of the general public in dealing with the gas and water supplies of London that it has evinced, on a still more gigantic scale, in making over the fee simple of the railways to the several railway companies, we confess that we are at a loss as to the remedy. The nation has made a bad bargain. Of that there can be no doubt; but it is not, for that reason,—according to those principles of honour which we trust not to outlive,—entitled to repudiate that bargain. All that can be done, so far as we see, is to look the matter in the face. A frank admission of legislative error is the first step to be taken. A resolution to keep good faith ought to be unnecessary; but some intimation of the acknowledgment of this duty might very well accompany the first effort of Parliament to right itself in the matter. The case thus laid down, the fact being admitted that the companies hold rights which are opposed to public policy, but which are none the less under the sanction of the public faith, the exercise of a stringent supervision will be the unquestionable right of the functionaries whose duty it is to watch over the interests of the nation. The actual rights of each company should be accurately and authoritatively determined. Such operations as the issuing of new stock at a nominal rate, so as to increase the dividends under a false pretext, should be exposed and set to rights. Those conditions as to photometric value of gas, and chemical purity of water, as to which the public or the administration have a right to insist, should be sternly and unremittingly insisted on. It is certain that a policy of this kind, at once honest and resolute, would tend to the great advantage of the ratepayer. Either his payment would be reduced, or the article supplied to him would be so much improved in quality that the result would be the same.

According to the figures above given, we find that the daily water supply of London is 529,752 metric tons per diem, or 56 tons per inhabitant per annum. It cannot be deemed that this is an ample supply. The cost price to the consumer comes to almost exactly 1·4d. per ton, nor can this be regarded as exorbitant. The question of purity is another matter. But if we regard the quantity of water necessary for drinking, for cooking, and for washing, per each individual, we must admit that of the allowance of 33 gallons per head per diem very little goes to these purposes. It is manufacture on the one hand, and sewage and the water-closet system on the other, that makes the great demand. The great brewers use their own wells; so do other great establishments. The Bank of England has done so since 1862, when it sank a well for 90 ft. into the chalk, in which the water has subsided since that time until it now stands at 120 ft. below the surface. If we allow 10 per cent., or say the odd 6 tons per head per annum, for water of a degree of purity fit for personal use, the remaining 50 tons might, without disadvantage, be of a somewhat less degree of purity. It is far from impossible that the great question of water supply will have thus to be regarded hereafter, though it is not the course we should advocate.

As to gas, the case is much harder upon the Londoner. In the first place, the actual price per head that he pays for this great convenience,—we cannot call it a necessary, and we will not call it a luxury,—is very high. It is as much as 17s. 3d. per head per annum, or nearly three times as much as the cost of water, this charge, of course including the cost of the lighting of the thoroughfares, which is a matter of police and public safety, as well as the lighting of shops, churches, public edifices, and private buildings, which goes in diminution of domestic expenditure. As to this supply, there is ample room for improvement. Coal gas has great disadvantages, as well as great advantages, as an illuminating medium. Its use is not free from danger. As at present made and purified it is, according to the opinion of many persons, with whom we are not altogether disposed to disagree, inadmissible in sleeping or private living apartments. Although an excellent light for the streets, for promenading purposes, or for any cases where close use of the vision is not needed, it is a very trying light for the reader, the worker, and the draughtsman. Its reflection from paper is very trying to the eyes. Its effect on the atmosphere of a house is known by the fact that plants will not live in rooms lighted by gas. Therefore we are far from thinking that there is no room for improvement, and for radical improvement, in a mode of illumination that has now been practised for two-thirds of a century. That view refers to gas of the best quality now produced. But how much of the London gas is of the best quality, and at what price is it produced, as well as at what price is it sold? The Gas Light and Coke Company, according to Mr. Firth, in 1874 charged 5s. per 1,000 cubic feet for fifteen-candle gas. This is at the rate of 3¾d. per candle for 1,000 feet. At the same time the South Metropolitan Company was supplying fourteen-candle gas at 3s. per 1,000 ft. This is at the rate of 2·57d. per candle per 1,000 ft., or at the price of 3s. 5·13d. per 1,000 ft. for sixteen-candle gas. It cannot be pretended that it costs one gas company 1s. 6d. more to supply 1,000 ft. of sixteen-candle gas than it costs another. Thus as between the companies themselves there is ample proof that it is not the legitimate profit of a manufacturing business that regulates the price charged to the consumer.

As to the actual maximum price proper for the supply of a good pure gas in London, it may be more difficult to speak. The freight of coal from Sunderland, which has lately been quoted at 12s. per ton of 21 cwt., may be taken as showing the limit of extra cost as far as the supply of the chief material is concerned. The rate of wages is also higher than in most provincial towns. Still, we can obtain some light on the subject. The South Metropolitan Company paid ten per cent. to its shareholders out of its price of 2¼d. per candle per 1,000 feet. The total income of the nine gas companies is tabulated by Mr. Firth at 3,703,198*l.*; the total expenditure, exclusive of interest and capital, at 2,767,266*l.* That is equivalent to a profit of about thirty per cent. on the expenditure. If we take the 2¼d. of the South Metropolitan as representing the income earned, we shall find that the cost of producing 1,000 cubic feet of 1-candle gas is 1·93d.—say a little under 2d. At Bradford, in 1872, the price of gas was at the rate of 2d. per candle per 1,000 cubic feet, the works being in the hands of the Corporation. It does not therefore seem that there is reason to doubt that good gas can be produced in London at the price of from 2d. to 2¼d. per candle, or at a reduction of thirty-three per cent. on the price now paid by the consumer. It must be admitted that thirty-three per cent. is an altogether disproportionate profit to be enjoyed by a manufacturer, whether a private firm or an incorporated company. Still it is clear that the Registrar-General overstates the matter in assuming that it would be practicable to reduce the cost of the gas supply of London by fifty per cent.

The outfall of the sewers of London, in a week in which there is no rain, is stated by the Registrar-General at nearly 20,000 tons daily less than the water supply delivered. It is not surprising to find such an amount, which is about 1-26th part of the total supply, lost by evaporation or surface discharge. But the average outfall is stated at 628,000 tons, or 108,000 tons more than the supply furnished by the water companies; and in a wet week the outflow reached 898,000 metric tons, being 378,000 tons, or upwards of seventy per cent., more than the quantity pumped in. The difference, of course, is due to the rainfall. It is obvious from these figures how great is the cost of the dilution of the sewage by rain-water. On the old system of flushing, a heavy shower was a godsend to the sewers, and swept away sediment that had been collecting through a series of rainless days. But when 33 gallons per head of population are daily poured through the sewers, the conditions of the case are altogether altered. No extra flushing ought to be requisite. All that is done is to pollute the rain-water, which might pass innocuously into the Thames, after having done good work on roofs and pavements, and to impose on the service of the sewers from twenty to seventy per cent. more duty than it was necessary for them to perform. As the taxation imposed in order to meet the current expenses of the Metropolitan Board of Works amounts to two shillings per inhabitant per annum, it thus appears that from 4d. to 10d. per head is entailed upon the ratepayer by the fact that the system of sewers has been constructed on the principle of mixing up the storm water with the house sewage.

We have not exhausted the theme of the Report of the Registrar-General. But the topics which we have omitted are likely to be of less general interest than those on which we have remarked. The whole subject is fairly put before the world, and the result must be the advancement of sanitary and economic science.

STUDIES IN DESIGN.

THE new illustrated work on decorative design, by Dr. Dresser,* which is being brought out in twenty monthly parts, will shortly be completed. Each "part" contains a short chapter laying down principles and rules in regard to some special point or situation in the decoration of dwellings (chiefly), and three large chromo-lithograph plates, very well executed, of specimens of decorative design, illustrative of the author's principles, and intended also as suggestions for their further working out. The separate parts, each in a pretty cover, itself a good specimen of simple but suitable decoration, certainly offer a very good half-crown's worth to the subscriber.

To most of our readers Dr. Dresser's general tendencies in decorative design, as well as his capacity to give instruction on the subject, are so well known, partly from previous reviews or notices of works in these columns, that we need hardly say anything on that head here. The coloured illustrations consist of designs for ceilings and ceiling diapers, wall-papers, borders, powderings, &c. Looking at these generally, we cannot but think, while admiring the brilliancy and piquancy of many of them, and the true perception of the treatment of conventional form as based upon nature which they evince, that these designs illustrate, to some extent, a tendency to the exaggeration of certain qualities, leading to a mannerism which we have seen traces of in former books by the author, but not so much developed as here. The lines of Dr. Dresser's designs have a tendency to become too angular, stiff, and bordering on the grotesque; humour seems to predominate in them rather than elegance. The author remarks in one chapter that the aim of all true art is "repose," which is rather a sweeping assertion, and certainly not altogether a true, or at any rate, a full statement of the case; but if it were, the designs accompanying the book would hardly illustrate the principle, as their main characteristic is not repose, certainly. Balance of colour there is in most of them, though the harmonies strike us as rather *outré* sometimes, as, for instance, in the centre ornaments on Plate xl., or the curious and very heated combination at the top of Plate xxxi. But in regard to form, the lines of the designs tend in many cases to a

* Studies in Design, for House Decorators, Designers, and Manufacturers. By Christopher Dresser, Ph. D., F.L.S., F.R.B.S., &c. Cassell, Petter, & Galpin: London, Paris, and New York.

very elbowing and fidgety appearance, which is not very satisfactory to the eye. We should hardly consider "repose" the characteristic of the large ceiling design, Plate xiii.: richness there is in it, and the parts are carefully put together upon a homogeneous motive; but it is rather too pronounced for really good taste, and the large curling conventional leaves of strong crimson which form an important portion of the decoration are too heavy and obtrusive; the more so because they, as well as some other details in the design, are shaded or tinted so as to gain a certain degree of relief: had the whole been perfectly flat, and some of the stronger colours toned down or used in smaller proportions, we should surmise the result would be more satisfactory. In this and one or two other designs for ceiling decoration, we should question whether the colouring was not a little too strong for application to dwelling-rooms of the ordinary height, where the object certainly should be to raise the ceiling surface, not to bring it nearer to the eye. For other situations we are quite in favour of the use of decisive colour, and the obtaining of repose and breadth by due balance and harmony of rich tints rather than by the reduction of the colours to harmless and, at the same time, weak and ineffective neutrals and tertiaries, to which the modern French system of decoration too much inclines. The decorator who takes refuge in these neutral regions sometimes gains the credit of good taste and refined feeling, in the avoidance of glare and glitter, when the real truth perhaps is that he is afraid of the stronger tones, and has not mastered them sufficiently to use them without glare, and to make them subservient to a harmonious and subdued yet rich effect. Dr. Dresser is fully equal to this; but the one thing we complain of a little is that his recent tastes seem to have led him towards the too frequent employment, in his combinations, of certain pink and yellow tones, the latter especially, which, though no doubt harmonising, according to the principles of chromatic proportion, with their surroundings, are not to our thinking pleasant to the eye.

Of the class of designs consisting of monochrome, that is to say, of a single colour or tone relieved on a background of another (generally deeper) tone, all the specimens given by Dr. Dresser are admirable in point of style, and show a true perception of the relation between natural forms and ornament. In these designs, in which form is the predominant interest, the author seems to be truer to his artistic instincts and training than in the decorations in varied colour, in which a tendency to adopt angular and somewhat uncouth forms seems to predominate. In one of the most suggestive studies in point of colour, the centre ornament in Pl. xxv., the forms which the lines of the design assume seem to our eyes (we hope we may be pardoned) almost ugly. As a study of colour this is one of the most useful in the book; it represents the combination of colours in harmony with each other, while they at the same time have reference to, and harmonise with, a general coloured ground: a difficult problem to deal with satisfactorily. The want of grace of form in this and others is, we imagine, the result of a rather too strong effort at originality, which often leads to the determinate selection of a form on account of novelty rather than beauty. That it is from no lack of real perception of elegance of form on the part of the author is evident enough; witness the designs for small wall ornaments on Plate xxxvii., which are charming both in line and colour.

There is one point we should like to draw attention to, especially in reference to designs of one colour on a ground,—the importance of considering the forms of the interspaces as well as of the main design. If these form too regular and connected a series of lines they will, especially where the tints employed are strong and strongly contrasted, create a confusion in the eye between the real design and the ground. This is the case, for instance, with the darker of the two wall-patterns shown on Plate xxxix. This is really a diaper of red conventional buds, with a yellow centre-leaf on a black ground; but the interstices form such marked and regular lines that the first impression on the eye is that of a trellis of black lines on a red ground. The same kind of confusion appears in the design for a ceiling decoration on Plate xxxiii., which is very clever and ingenious, but in which some portions are a blue design on a white ground and others look more like a white design on a blue ground; and as the whole forms part of the same interlacing system, the eye is perplexed.

Though noting these which seem to us deficiencies in the work as a model for copying from, we readily acknowledge its general suggestiveness, the familiarity with the grouping and combination of colour which it displays, and the correct and excellent principles laid down in the remarks. We may add that the book is admirably printed and brought out in every respect.

CONCRETE AS A BUILDING MATERIAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At an ordinary general meeting of this Institute, held on Monday evening last, Sir G. G. Scott, R.A., president, in the chair, Mr. Frederick John Connell, of Oxford, was elected an associate. A letter was read from General Sir T. M. Biddulph expressing her Majesty's gracious approval of the nomination by the Institute of M. J. L. Duc as this year's Royal Gold Medallist. Mr. R. Phené Spiers read a letter from a friend in reference to the pavement in the cathedral at Sienna, to which attention was called by Mr. Hebb at the last meeting of the Institute, as reported in the *Builder* a fortnight ago (p. 320, *ante*). The letter read was to the effect that the whole of the pavement in question had been taken up with great care, and deposited for safe preservation in the museum of the city. At the same time, a faithful copy of the original pavement had been executed and laid down in the cathedral. Reference was again made to the alleged informality in appointing a chairman to preside over the special general meeting held on the 30th ult. to consider the awards of medals and prizes. The President now said that no doubt the bye-law on the point (35, sect. vii.) was somewhat ambiguous, and he suggested that it might be made more explicit, so that the question should not again arise.

Mr. Alexander Payne, associate, then read a paper "On Concrete as a Building Material." He commenced by noticing the Essay by the conductor of this journal to which the first medal of the Institute was awarded, and which appeared in the "Transactions" many years ago, and then proceeded to give a brief review of the subject as it stands at the present time, and noted the principal patents that have been taken out of late years in connexion with concrete building, which were arranged under the following heads:—Firstly, apparatus for moulding walls; secondly, various kinds of building blocks; and, thirdly, compositions for making concrete. On looking at the results of these inventions, it must, the author feared, be admitted that they had not done much in striking out a new line for the employment of concrete, though they might have improved the material. By far the most common mode of building still practised, and perhaps the best for most purposes, was the old method, described by Alberti, of placing planks on each side of the intended thickness of the wall, and pouring pebbles and mortar between, moving the boards when the compound was set. It was conceded on all hands that concrete buildings were durable, strong, dry, and not expensive; but the general outcry was that they were ugly, and the question arose whether this alleged unsightliness was owing to some inherent deficiency in the material, or to the neglect of the subject by architects? Or was it due to the endeavour to mould the material into shape and forms that had been employed in brick and stone built up in a totally different way? Mr. Payne was inclined to think that the latter causes had the most to do with it. He then proceeded to give some suggestions for the architectural employment of concrete in the future, which were divided under the following three heads, viz.:—(1.) How can the apparatus for moulding and constructing concrete walls, roofs, arches, &c., be simplified and turned to artistic account? (2.) Does not iron offer special advantages for use in connexion with concrete? (3.) What is the proper way to ornament concrete walls, arches, and roofs, in accordance with the peculiar properties and nature of the material? Under the first head, it was suggested that the apparatus for moulding concrete buildings might frequently be made a permanent part of the structure by forming a light skeleton framework of wood or iron, of ornamental design, for supporting a temporary moulding-board, and then filling up with concrete. Under the second head, it was stated that no two materials were so admirably suited to go together as iron and concrete. With the one a light skeleton framework could be made of almost any dimensions, and of great strength and lightness: and in the other we had a plastic material that could be moulded into any shape, and could be made to enclose the skeleton and give it substance and solidity; and it was well known that if iron was completely embedded and kept from the air it was entirely protected from rust and oxidation. But, more than this, iron was just the material to give to walls the tensile and building strength they lacked, and to counteract the failures that most commonly took place in brick and stone construction. As to the ornamental appearance of houses built in iron and concrete, the effect would not be unlike that of the half-timbered houses of the Middle Ages, but the ironwork would be capable of greater freedom of treatment than the ancient woodwork. Under the third head, viz., "What is the proper way to ornament concrete walls, arches, roofs, &c., with due regard to the peculiar nature of the material?" the author submitted that instead of imitating the projections of stone and brickwork, the aim in concrete work should be to obtain as large wall-spaces as possible, and as few projections, and to ornament instead by indentations. There had been no building material employed which offered such facilities for rich ornamentation by this means, at a comparatively trifling cost, as concrete. It was pointed out that most of the magnificent decorations of the Alhambra and the Mahommedan buildings of India were produced by incised ornament of this description; and there could not be a better or more suitable method for ornamenting a concrete façade. Examples were given of how this might be effected by movable dies fixed on the moulding-boards used in concrete construction. This method was in reality bringing the principle of the printing-press to bear upon the ornamentation of a building, and had its practical as well as its artistic side, by substituting letters for ornamental designs. Where permanent advertisements or records were required, or where it was desired to preserve an account of the origin or purpose of any building, why should not such account be printed in the solid wall in concrete, and be made to form part of the structure and design of the building? Could we not, in fact, in this respect, often advantageously follow the example of Assyria and Egypt, and, without going back to cuneiform characters or hieroglyphics, still usefully record on our buildings the purposes for which they were erected? It was also shown how, by the same method, a veneer of tiles, marble, or plaques of a particular shape, might be bedded on the surface of the wall, and how the stone and flint panelled work of Essex and Suffolk might, in the same way, be readily done in concrete. Plaster decorations and *sgraffito* were then referred to as being eminently suitable for the decoration of concrete; and the authorities of the South Kensington Museum were said to have rendered good service to the English public by giving practical illustrations of the beauty that might be obtained by this mode of decoration at the back of the Science and Art Schools at Kensington, and at the National Training School for Music, adjoining the Albert Hall. The author concluded by giving examples of the methods suggested for the employment of concrete, and by showing how they might be advantageously applied to domes, vaults, and other structures.

DISCUSSION.

Mr. Charles Barry said he had not used concrete at all, except for foundations, and he confessed that he should have great hesitation either in using it or in permitting its use in the methods treated of in the paper,—not on account of any doubt as to its strength, for he should have every confidence in its being used scientifically and substantially, especially if the construction of the building were to be superintended by one so conversant with the subject as the reader of the paper appeared to be. One of the most valuable of the many suggestions contained in the paper was that of using iron as a framework. Indeed, the Improved Industrial Dwellings Company, of which Sir Sydney Waterlow was chairman, had for several years past used iron in combination with cement concrete with very good effect, especially for such purposes as steps, landings, and lintels, which were rendered enormously strong by embedding small pieces of iron in concrete. But although concrete building, when thoroughly well done, was possessed of great strength and durability, yet if employed by inexperienced or unscrupulous builders, it was a material which offered greater opportunities for "scamping" than stone or brick, either by the use of bad materials, or by insufficiency of labour

in mixing, &c. It should be remembered that a badly-constructed concrete house was likely to fail much more suddenly than a badly-built brick one. A brick building generally gave sufficient warning of its intention to fall, but bad concrete buildings collapsed without having previously exhibited the slightest indication of instability. The suggestions made by Mr. Payne as to the ornamentation of concrete buildings by projections and indentations were very ingenious, but it was extremely questionable whether concrete buildings so ornamented would be cheaper than brick buildings with the same amount of ornamentation. It was to be regretted that Mr. Payne had not included in his paper some indication of the cost of producing anything like architectural effect with concrete as compared with brick or stone, but possibly sufficient experience had not been acquired in that direction to enable an accurate comparison to be drawn.

Mr. W. H. Lascelles, on the invitation of the president, then proceeded to describe the construction of his patent concrete slab cottages, &c. These erections, of one of which a considerable portion had been put up in the Institute meeting-room, consist of an inner framing of timber uprights, or studs, 3 ft. apart. To these studs the concrete slabs are fixed. They are 1 in. thick, and are formed of Portland cement and coke-breeze, upon the principle patented by Mr. Matthew Allen, and used in the industrial dwellings built for Sir Sydney Waterlow's company. The slabs are 3 ft. by 2 ft., and are moulded in wooden moulds, so as to present on the exterior surface the appearance of a number of hexagonal or other shaped tiles. The following is the mode of manufacture:—The mould is first well oiled, with any common oil; then a thin layer of Portland cement, mixed with Spanish brown (for colour), is poured into the mould, and upon this the concrete, of the ingredients before named, is placed, and after remaining for three or four days the slab can be turned out of the mould. The cost of each of these slabs, Mr. Lascelles went on to say, was only 1s. 6d., or 3d. per foot super. They were quite fire-proof and waterproof, and would permit a nail to be driven or a screw to be turned in them without cracking. It was not found that the vertical joints between the slabs admitted water. The inner surface of the slabs formed the inner surface of the wall, the wooden studs or uprights occurring every 3 ft., thus leaving the walls only 1 in. thick in the thinnest part. Notwithstanding this, Mr. Lascelles said that dwellings constructed in this manner were warmer, and generally more perfectly weather-proof, than houses built with walls of 9-in. brick-work. The wooden studs were left exposed, being stained or varnished, while the inner face of the slabs could be panelled or otherwise treated in colour. Mr. Lascelles also exhibited a sash-bar made of concrete, with a thin bar of iron embedded in it, and in another part of the room were erected the concrete mullions and transomes of a large oriel window constructed in the same manner for a house for Mr. Marcus Stone, from plans by Mr. Norman Shaw. Indeed, Mr. Lascelles said he had even gone so far as to make concrete joists (!) in the same manner, but found that they were more costly than wood. Mr. Lascelles also exhibited ceiling slabs (1 in. thick) of concrete, and combined floor-and-ceiling-slabs of the same material, the upper surface serving as the floor of one room, and the lower surface forming the ceiling of the room below. In reply to numerous questions, Mr. Lascelles stated that although the tiled slabs were three parts composed of coke-breeze, fire would not touch them, and they had, on this account, been patented as a material to be used in preference to iron for the fireproof double doors required by the Metropolitan Building Act to be provided in the walls of warehouses beyond a certain cubical capacity. The concrete slab houses built by him on the principle described were 20 per cent. cheaper than houses built in the ordinary way with brick.

Mr. Redman said there was no doubt a great deal of force in the objections urged by Mr. Barry as to the hasty or indiscriminate use of such a material as concrete for building purposes; but still, considering the great revolution which had taken place within the last twenty years by the introduction of concrete into engineering works, the experience which must have been gained from the experiments systematically carried out on a large scale on all works where concrete was largely employed must have created a large fund of information available to those who would seek it. A palpable defect in concrete was the growing or enlargement of the mass due to the "blowing" of the imperfectly burnt lime or cement, and attention had been called to this in Mr. George Godwin's paper, already referred to. This was in reality the reason of the failure of Ranger's concrete, which was well known forty years ago, and of which several houses still stand at Northfleet and Rosherville, in Kent. It failed when applied to the purposes of a large river-wall in front of Woolwich Dockyard. It was absorbent, and flaked off by the action of the atmosphere. Mr. Stoney, of Dublin, had carried out, perhaps, the most extraordinary feat on record in the use of concrete: he had deposited blocks of concrete, for the base of a wall upon the shore of the Liffey, weighing 350 tons each.

Mr. Thomas Blashill said that the author of the paper proposed to use timber as well as iron in combination with concrete; but how did he propose to provide for the expansion of the wood when the wet concrete came in contact with it, and for its subsequent shrinkage? Another point upon which information was needed was as to the manner in which it was proposed to obviate the inconvenience and unpleasantness caused by the dripping from a concrete roof of the water condensed from a heated atmosphere. He remembered the late Mr. Charles Fowler describing the annoyance which he experienced from this cause, and the evil was only obviated by lining the roof with wood. With regard to the mode of building described by Mr. Lascelles, it was almost precisely similar to the weather-tiling so largely used in Kent and elsewhere, to which it was only to be preferred in the event of its being cheaper.

Mr. Edwin Nash said that, notwithstanding the immense antiquity of concrete, there was much yet to learn respecting it. He held in his hand a piece of what he termed "Nature's concrete," which, he supposed, was about thirteen thousand years old. It was from Beckenham, in Kent, from a large field in which all the gravel had been extracted. In digging out the gravel the men came to enormous masses of this concrete,—for such it was to all appearance,—which they could not break up; these masses were, therefore, left as they were found, and now that all the gravel was removed the place presented somewhat the appearance of a field dotted with a number of haycocks. This hard substance, which was not to be distinguished from the concrete of the present day, belonged to the formation known to geologists as the Reading and Woolwich beds. It was very proper that architects should be cautious as to the use of concrete, and although he had seen some very good walls built with it, he had some misgivings as to their permanency, on account of their want of homogeneity. Now, concrete itself was a most homogeneous material under certain conditions, and homogeneity was one of the first requisites of a good building; it was doubtful, however, whether the embedding of iron in concrete would tend to promote that homogeneity, for he had found from observation that concrete, although it swelled in setting, afterwards gradually shrank if placed above ground. There was a long sea-wall built in concrete at Bognor, Sussex, in which, at nearly regular intervals of from 70 ft. to 100 ft., there were perpendicular fissures all the way up from the bottom to the top of the wall. Possibly the fissures would be found to cease in the portion of the wall underground, or in contact with moisture. This was not the only instance of the kind which could be cited.

Mr. Banks said he had had some little experience of concrete building in the North of England, and he must candidly confess that the more he knew of it the less he liked it. He thought its use was not to be justified when other materials as good and as cheap (or nearly so) were available, except when some special reason, such as the utilisation of slag or other refuse, rendered it advisable. He could corroborate what Mr. Nash had said as to shrinkage, for he had built a church and schools at Whitehaven which now showed various fissures which could only be due to shrinkage of the material. The question of utilising blast-furnace slag for concrete was not yet solved. The blast furnaces were continually discharging immense quantities of extremely valuable waste, if the expression might be allowed, and he firmly believed that hæmatite slag, when properly prepared, was better than Portland cement.

Mr. Cunningham (representing the Broomhall Tile Company) said that for two or three years past his firm had been supplying slabs for facing concrete made from the refuse of blast furnaces.

Mr. Thomas Broughton, at the request of the President, then described his patented appliances for concrete buildings, which were exhibited in the room. These appliances consist principally of slotted tubular iron standards, the weight of which is reduced to a minimum consistent with the requisite strength. Mr. Broughton also claims that after the timber has been used for the casings for concrete buildings, it can be converted and used for the interior woodwork. Old building plant and materials, such as scaffold boards, joists, slating-boards, ledged doors, &c., may be used with the same facility as new timber; also the old panels of existing apparatus, whether made in the form of ledged doors, framed wood, or iron. With a sufficient supply of boards any height of building can be carried up per day.

Mr. Giles said that as an engineer he had been a little startled at some of the propositions as to concrete building made by Mr. Payne. He thought that, as a rule, the use of bond-timbers was exploded long ago; but yet Mr. Payne was proposing to use what really amounted to the same thing, though in another form. He had used concrete largely in engineering works, and could confirm what had been said by Mr. Nash as to fissures or cracks. Another thing was that he had never found concrete to be really watertight. Its economy, as compared with brickwork was very questionable when complicated moulds or dies were used for giving it an effective appearance. The slab cottages described by Mr. Lascelles could hardly be called concrete; they were mere variations of weather-tiling.

On the motion of Mr. Charles Fowler (who explained that the roof referred to as having been constructed by his father was of tiles embedded in cement, and not of concrete properly so-called), seconded by Mr. Arthur Cates, the discussion was adjourned to Monday, the 15th of May, on which date Messrs. Norman & Hine were to have read a paper on the new Guildhall at Plymouth, but they have written to say that they shall be unable to do so.

SERIOUS POSITION OF THE BUILDING TRADES.

The London Building Trades are on the verge of difficulties, and they never suffer alone.

There are no bricks. They are hardly to be had at any price which will allow building to go on. One builder, a few weeks ago, sent in a tender for work when bricks were at 32s. per thousand. His tender was accepted; but as time was not pressing, he did not at once order his bricks. A fortnight later he found that they had risen to 40s., and ten days after could not be had at that. This state of things is greatly affecting the building trades; and as in the body politic when one member suffers all the members suffer with it, so the timber trade also is at a stand still. So with other trades. Nor is the mischief likely to end there. Should there be a panic in the building trades, the building societies and the money-lending firms will be sure to have a bad time.

Some months ago we gave builders warning of what the brickmakers had in store for them; indeed, of what they had absolutely determined on in meeting assembled; and some few of our readers, we know, made arrangements which have proved fortunate.

When it is further remembered that the London master builders are at this moment under notice from the operatives for an advance of wages, it will be admitted that things look cloudy.

The sad agitation which prevails in the provinces is made too obvious on another page of our present number.

New Mortuary for Shoreditch.—The new mortuary for the parish of St. Leonard, Shoreditch, has been completed. The building, which has been erected on a site in the rear of the church by Messrs. J. M. Brown & Sons, comprises two apartments, one being a room for *post-mortem* examinations, and the other being the dead-house. Both rooms are asphalted, and the ceilings are match-lined. The mortuary itself is 30 ft. long by 15 ft. wide, and the *post-mortem* room is about 15 ft. square. In addition to this improvement it is proposed to have the churchyard laid out in a befitting manner. The entrance to the mortuary is by way of Boundary-row, where a gateway has been constructed.

PIECE-WORK AS COMPARED WITH TIME-WORK.*

It is a happy circumstance that in this country there are opportunities for discussing every subject without dread of interference either by the despotic action of the Government or by the violence of a mob. In an especial degree does this freedom exist in the debates of the Association in whose place of assembly I am now speaking; since, owing to its comprehensive character, not even that check on outspoken thoughts is to be found which arises from the feeling that the sympathies of a large portion of the audience may be against the speaker; and thus, in the present instance, all who belong either to the class of employers or to that of the employed may rest assured that in the part they may take in the discussion they will have equal favour; the earnest desire of the Association being not to gain victory for either party, but to arrive at a result in accordance with wisdom and truth. Indeed, if I was right in the view taken in a paper which I read before this Association, about six years ago, on the "Identity of the Interests of Employers and Workpeople" (and I have neither heard nor read anything which seemed to me to contravene that view), there can be no question of victory in the matter.

The opponents of payment by piece instead of by time seem to found their opposition, in great measure, on a belief that this system tends to reduce the number of persons employed; and, as regards a large portion even of those who do find employment, to keep down their wages. But this belief I hold to be without foundation, and, in fact, to be the reverse of the truth. Its fallacy appears to be based on the assumption that the quantity of work to be executed in every kind of manufacture is fixed; as also the sum of money to be divided among the workpeople; but experience shows that this is so far from being the case that both the quantity of work and the payment for it are capable of vast and indefinite extension. Take, for example, the manufacture of cotton goods. So long as we depended on the distaff, or even the spinning-wheel, this manufacture was of small dimensions, and Manchester, its great seat, was little more than a village; but when, by the invention of Arkwright, seconded by the yet greater invention of Watt, cotton apparel could be produced at a far lower cost, the manufacture rapidly augmented; Manchester expanded into a great city, and towns, where formerly there had scarcely been an inhabitant, sprang up for the production of cotton goods. From this example, which might be indefinitely multiplied, it is evident that there is no ground whatever for regarding any article of manufacture as a fixed quantity; and that any theory founded on that supposition must be abandoned.

The questions, however, still remain whether, notwithstanding this power of unlimited expansion, piece-work does not tend to check expansion, and also to diminish the wages of a large portion of the workers. If, however, we consider the way in which piece-work is alleged, even by its opponents, to act, it will be seen that no such tendency can exist. By piece-work it is agreed, both by friends and foes, that a workman produces a larger quantity than by time-work. But this result is equivalent to working with good instead of bad machinery; the beneficial effects of which, even to the employed, are now generally admitted.

If any employer attempted to engross to himself all the profit arising from increased production, the competition for hands, by other employers, would soon compel him to increase his rate of wages; in other words, to give to his workpeople part of the benefit which piece-work yields.

It is true that any workers who refused to adopt piece-work would not only gain nothing (except, indeed, as members of the public) from its introduction, but would lose; in the same way as a woman who persisted in toiling at her spinning-wheel, in spite of Watt, Arkwright, and all other inventors, would get less and less for her pains. But this would not be a result in the nature of things, but the effect of obstinacy; and the same remark would hold good, though in a less degree, of a man who, instead of accommodating himself to the new order of things, and learning to manage a power-loom, went doggedly on at the hand-loom.

If the view just taken be correct, piece-work, frankly adopted by the workman, instead of tending to lower wages, tends to raise them; and, as in the case of machinery, by greatly diminishing the cost of the article, has the effect of enlarging its use, and therefore of multiplying the number of persons employed in its production. Nor, in my opinion, can it be successfully maintained that the greater quantity of work performed by a man paid by the piece is more exhausting than the smaller quantity done by him who is paid by time; nay, there can be little doubt that it is often less so; and that, quantity for quantity, this must almost always be the case.

In work by the piece, the certainty of remuneration in proportion to effort must supply a nervous stimulant which is wanting when the payment is by time: in fact, day-work necessarily partakes, in some degree, of the qualities which, under ordinary regulations, render prison and pauper labour so little productive; although in both instances, as in that also of serfs and slaves, the labour may, at the same time, be very irksome and wearying. Listlessness is akin to sloth; and it has been wisely said that "Sloth, like rust, consumes more than labour wears."

In support of these views, allow me to cite the opinions of some other persons; the first being that of Mr. Potter, a builder at Hampstead, distinguished alike for intelligence and honourable conduct. In a letter to me on this subject, Mr. Potter says:—

"I know many instances of ordinary workmen, and can point to four or five at this moment among our own men, who have vastly improved their own earnings, and who are much better off in every way, through their having worked by the piece instead of by time.

This benefit has not been one-sided, but has been shared in by both employers and employed. Instead of piece-work making a man a slave it does exactly the reverse, so far as our trade is concerned. To take an instance: a joiner works in the usual way by the hour; he can leave or can be dismissed from his employment at an hour's notice; if he loses an hour's time he feels it in the shape of reduced income at the end of the week; if he be a 'society' man he may have to throw up his work at a short notice, although he likes both his work and his wages, and his employer likes him. Suppose the same man working for the same master, and he undertakes the whole of the joiner's work in a new building for a given sum; if he be a really honest and clever workman he can at once organise his work and think of various labour-saving methods of doing it (not scamping). If he is unfortunate enough to be unwell for a day or so he does not feel it, as he knows he can make it up afterwards by working a little harder or longer hours. The advantage to the employer is equally great. Having an article to sell he has some certain knowledge of what the cost of it will be, and, therefore, knows at what rate he can sell it.

Unfortunately, however, in the nature of things, a great deal of the work in our trade cannot be done by the piece. But a great deal more work might be done in this way than is done; especially in the erection of new buildings.

The reason why so many of our building contractors fail is because, although they themselves are bound to work by the piece, their workmen work by the day; the consequence being that the contractor sells his productions before he knows the cost of them, and only finds out when too late that their cost has been far beyond his estimated price.

This uncertainty as to prime cost will also account, in some measure, for the strangely differing estimates for the same building. For this and some other of the evils in connexion with the labour question, well-organised piece-work affords a remedy. There are, of course, many difficulties remaining which no system of piece-work will meet; but I think it will be found that this, at least, may be said as regards my own trade, viz.,—that, so far from piece-work necessarily degrading and making a slave of the workman, as many allege, it has a directly contrary effect; and, in further proof of this, I may say that I have always found that the good, clever, and quick workman likes to work by the piece, while the thing is regarded with disfavour by the idle or inferior workman."

My next quotations are from a paper lately read at a meeting of the Society of Arts, upon tanning, by Mr. Sparke Evans, of Bristol:—

"Piece-work," Mr. Evans states, "is now adopted in some yards, which has materially increased the wages of the workman, and added much to his comfort, as he can rest or work as it suits him, without the suspicion of a master or foreman's eye ever watching him, whilst he at the same time enjoys the spring or elasticity of feeling that he is working for himself, and can do more or less according as his health or strength will allow; whilst the master enjoys exemption from the perpetual harassment of urging men to labour. After many years' observation I feel sure the man who works by the piece finds the hours of labour pass much more pleasantly than the hireling 'who watcheth for the shadow,' and moreover, feels himself less fatigued with his labour, though he has earned considerably more than if he were at day-work."*

Again Mr. Evans says:—

"As to the equivalent of labour for the wage, I have known a farmer in the winter (when a man needs more money rather than less) go to a stout young fellow working in a ditch, and say to him, 'Ned, I can't afford to give you nine shillings a week; I shall give you eight.' 'Very well, master,' was the reply; 'I can do an eight-shilling stroke as well as I can a nine,'—and we may add, he did not do a stroke over."†

Mr. Evans further remarks:—

"As this subject is now exciting such interest, allow me to add that working men generally, except where the system of long apprenticeships has curtailed the number of workers, are in favour of piece-work; it being a difficulty to convince a strong, able-bodied, industrious young countryman, who seeks higher wages in the cities, that it is his duty to restrict the amount of his labour, and consequent earnings, to the capacity of some old or infirm, weak or incompetent workman by his side."*

In truth, what seems to be desired by many opponents of piece-work would be equivalent to tying up, during part of every day, one of the arms of all good and quick workmen—a manifest absurdity.

Another authority which I will cite is that of a working man, the author of "A Glimpse at the Social Condition of the Working Classes," who observes:—

"Commerce has its own laws, and these cannot be violated with impunity; it must pay the merchants, otherwise labour will cease to be expended upon it. No combination of men can send the price of labour above its natural level. The great leading principle of trade in a free country is that all men have a right to choose the most suitable market in which to dispose of their own labour or the products of their industry; and, as a necessary corollary to this, the consumers are justified in purchasing what they may require in the market where they can be served at the cheapest rate." †

The same writer says,—

"I think that in a free country labour should be perfectly free and untrammelled, and that no man should have a right to call another man in question as to the manner in which he may dispose of his labour. The exclusive system which has been wedded to nearly all the handicraft branches of British industry, from time immemorial, has nothing to recommend it, unless it be that it was inaugurated by a people in a semi-barbarous age." ‡

So far as I can judge, there can be no more validity in the allegation that piece-work is inferior in quality to time-work than that it is more exhausting. An employer is paid by his customer, not merely according to the quantity of the article sold, but according to its quality also. It is just as necessary, therefore, that he should look after the one as the other; and, whether his men work by piece or by time, he would soon find himself in the *Gazette* if he took no pains to see whether they perform their work well. No doubt there are some kinds of work for which payment by the piece is inapplicable; but in all cases we may be quite sure that an employer, even if not actuated by higher motives, will, for his own interest, always be on the alert as regards quality. It is well known that in one large branch of our national industry piece-work has, as yet, been introduced to only a slight extent; and it is equally well known that this very branch,—agriculture,—is that in which the wages are the lowest.

Some time ago, when walking with a very intelligent agricultural friend through a field in which a man was ploughing, I called my friend's attention to the slow and listless way in which the work was going on; and his remark was that that was owing to the way in which the man was paid; and that it would be far better for him, and for the horses, and for the farmer also, if the day's work consisted of a definite task,—that is, of piece-work instead of being measured by the number of hours.

In truth, political economy teaches us that an essential means of securing high wages is to render the workman very productive; and this object must be greatly promoted by payment by the piece.

The stimulus to ingenuity and exertion given by piece-work, even so far as piece-work is now the rule in this country, is, I have no doubt, one cause of the general superiority of English workmen over those of the Continent. It is well known that the rate of wages here is considerably higher than on the Continent; and yet English manufacturers are seldom induced to transfer their establishments to the Continent in the hope of getting their work done more cheaply; because, owing to the greater energy and activity of Englishmen, their higher wages are fully compensated for by greater production; a fact fully shown by our fellow member, Mr. Brassey, in his excellent book entitled "Work and Wages."

In nothing, perhaps, has this English superiority been more manifest than in the railway work of navvies; in which, under the gang or butty system, the rule of payment according to the quantity of work done instead of by time is, I believe, almost universal; and we have the satisfaction of knowing that the example thus set to the Continental workmen has produced the happy effect of raising their wages and permanently benefiting their condition.

Here I cannot do better than give an extract from the book just referred to, recording the ex-

* By Mr. Frederic Hill; read at a meeting of the Social Science Association on the 20th ult.

* Journal of the Society of Arts of February 18th, 1876, p. 222.
† *Ibid.*

* Journal of the Society of Arts of February 18th, 1876, p. 223.
† "A Glimpse at the Social Condition of the Working Classes," p. 74.
‡ *Ibid.* p. 154.

perience of the author's admirable father, who was as much distinguished for his kindness and liberality to his workmen (sometimes numbering as many as 100,000) as for his own personal success; and whose testimony is emphatically in favour of piece-work:—

"My father," says Mr. Brassey, "always preferred putting a price upon the work, rather than paying by the day. This system was modified to suit the usual habits of the people with whom he had to deal. Piece-work could not in all cases be adopted without some complications and difficulties; but my father always looked upon day work as a losing game, and all his work was done, as far as possible, by sub-contract, which is piece-work on a somewhat larger scale. Even the scaffolding for the erection of an iron bridge, such as that over the Severn, near Coalbrook Dale, of 200 ft. span, was carried out upon the principle of sub-contract; and the same system was adopted for the excavation of shafts and adjacent lengths of tunnel. Payment by piece is beneficial alike to the master and the man. The men earn higher wages; while the master has the satisfaction of obtaining an equivalent for the wages he has paid, and completing the contract which he has undertaken with far greater rapidity. On public works the difference in the earnings of the men doing piece-work and the men working by the day were always remarkable. In the canal-working days, men working in butty-gangs would earn 4s.; while others working on the day system would not earn more than from 2s. to 3s. a day."*

To me it seems that piece-work is one of the many instances in which a friend has been mistaken for an enemy; and that great calamity would befall those who have denounced piece-work if their denunciation were carried into practical effect. The same erroneous feeling, as most of us must remember, displayed itself in a hostility, on the part of farmers and agricultural labourers, to the abolition of the corn laws, and on the part of manufacturers and workmen to the discontinuance of protection to their several articles of production, and of workmen to the use of machinery; and yet it is now felt that free trade and the employment of machinery have been of undoubted benefit to all classes of the community.

However much the continuance of any disputes between employers and employed is to be regretted, it is consolatory to remember that, for a considerable time, these have seldom been attended with violence; nothing comparable with the outrages of the Luddites sixty years ago, with the Swing fires and vitriol-throwing some twenty years later, and with the more recent murder at Sheffield; all contrasting strongly with the peacefulness and even good feeling, on both sides, manifested in many contests of the present day. The slightest act of coercion, whether by means of pickets or otherwise, is, obviously, however, so far as it goes, an interference with that personal freedom of action which is a great characteristic of our nation; and which more, perhaps, than anything else has raised this country to its present high position, has produced the general harmony that reigns among us, and has caused a large diffusion of material comfort; and the sooner all such interference ceases the better.

One ground taken in, I cannot say justification, but in palliation of coercion, is a supposed necessity for simultaneous movement in large numbers,—a necessity which, if real, would, while failing to justify coercion, yet warrant all milder means; but I maintain that this simultaneous action, instead of being a good, is an evil, tending to impede that gradual and safe adjustment which, without interference, is certain to take place. When a single workman claims higher wages than the state of the labour market will warrant, he soon finds his mistake, and can quickly withdraw his demand. So, again, if a single employer lowers wages, in similar misconception, he soon discovers his blunder by the loss of some of his men; and in like manner is led to retrace his steps. But when a large number, whether of employers or workmen, agree to move together, they become committed in a manner which makes it difficult for them to give way; and sometimes it is only after a long period of bitter feeling, stoppage of work, and loss on all sides, that hard necessity brings the dispute to an end.

While in this paper I have been obliged, for the sake of conciseness and clearness, to speak of the employers and employed as two separate classes, it is a great pleasure to me to reflect that, by means of industrial partnerships and co-operative associations, and I might include joint-stock companies, something, at any rate, has now been done towards removing all broad lines of demarcation between them; and that a large number of persons now in part belong to both classes: a process of intermingling which, aided by the increasing respect of the richer class for manual labour, and a disposition even to join in it, seems to give sure promise of continuance; until, at length, there shall be but few persons who belong wholly to one class alone.

It will be remembered that about eight years ago a committee was formed by this Association, not confined to its own members, for diffusing information on that great subject of labour and capital, to one branch of which my present paper relates, and for averting trade disputes, or, where prevention was impossible, for bringing such disputes to a speedy termination; and those who acted on that committee have the pleasing reflection that they not only issued many papers, and delivered many lectures and addresses, all tending to allay bitter feelings and to spread economical knowledge, and brought about several friendly discussions between employers and employed, but succeeded in forming several Boards of Conciliation, in preventing several strikes and at least one lock-out, and in bringing some other strikes to an end—labours in which they were much aided by the circumstance of their body including members of both classes of employers and employed, and, in addition, many men of high reputation, who, although not themselves belonging to either class, had the confidence of both. Unhappily, however, owing to the want of financial support, the committee, after working for five years, was obliged to suspend operations, which to this day it has been unable to resume. Had this been otherwise, no sooner would the late unhappy dispute at Erith have broken out, or even loomed in the distance, than a person, able to attend public meetings, fully to discuss the matter at issue, and to give wise, disinterested, and conciliatory counsel, would probably have been sent to the spot; and by his efforts there would at least have been a fair chance of bringing the dispute to an early and amicable termination.

* "Work and Wages, practically Illustrated." By Thomas Brassey, M.P., p. 204.

THE TAY BRIDGE WORKS.

Mr. A. Grothe, a member of the firm of contractors for the Tay Bridge works, lately delivered a lecture on the subject at the Kinnaird Hall, Dundee. Ex-Provost Cox, as chairman of the Tay Bridge Company, presided over a large audience. The Chairman referred to a lecture delivered about three years ago by Mr. Grothe on the same subject. Before that lecture very little was known about that great engineering work which was now growing so rapidly and assuming such gigantic proportions. Vague rumours as to its want of stability and the unlikelihood of its ever being finished were current, and easily found believers and propagators; so that at last the Tay Bridge was hardly ever mentioned, except with an incredulous smile or a shrug of the shoulders. Since that lecture, which did much to enlighten the minds of the public on the subject, steady and continuous progress had been made with the works,—at one time more, at another less, and certainly much had been done during the last year. No one now thought it wise to express doubt in the ultimate success of the Tay Bridge; and everybody was anxiously looking forward to the time when the great work would be completed, and when Dundee would be placed in its proper position in the railway system of the kingdom.

Mr. Grothe, in commencing his description of the Tay Bridge, said he should as much as possible confine himself to what had not been made known in the previous lecture. The bridge, he continued, had a good many spans, but not so many as was at first intended, the original number of eighty-nine having been reduced to eighty-five. In the first plan the centre spans were each 215 ft., but now they had been increased to 245 ft., which allowed some of the smaller ones to be left out. A great change had also been made in the structure of the bridge, necessitated by the borings turning out rather differently from what was expected. It being discovered that *rak* existed only for a short distance at each side of the river, instead of all along the river-bed nearly parallel with the water, the intermediate space being gravel, it was determined to found the piers on this latter matter. Although gravel formed a very good foundation, it did not bear so great a weight as the rock, and it was therefore found necessary to decrease the weight per square unit of surface, either by diminishing the weight itself or enlarging the surface of foundation. A plan was adopted combining both these. The foundations of the large spans were formerly intended to consist of two cylinders, each 15 ft. diameter, but this was changed to one cylinder, 31 ft. in diameter, which gave more than double the area. Instead also of carrying the piers with brickwork to the top, above high-water mark, they were constructed of cast-iron columns, braced together by cross pieces which diminished the weight of the piers some five or six hundred tons; instead, therefore, of there being a pressure of eight tons per square foot, it was only about one and a half. He would be ashamed to ask them to believe these foundations were perfectly safe, being quite sure they needed no such assurance on his part. The lecturer next exhibited the model of a caisson used in the foundation of the piers for the large spans. The building and sinking of the piers was illustrated by means of magic lantern diagrams, as also the sinking of the caisson in the bed of the river by pumping out the sand inside. At first difficulties were experienced owing to the sand getting into the valves of the pumps and destroying them, but these difficulties were obviated by a most ingenious invention, due to one of the engineers at the works, Mr. Reeves, who, assisted by another of their number, Mr. Beattie, had brought it almost to the point of perfection. By means of a model which was put in operation, the lecturer showed how the sand was pumped into a receiver, never reaching the valves at all, and how the receiver itself when filled was emptied and another substituted. The caisson having been sunk till its top was within 2 ft. of the river bed, the inside was filled with concrete, and an artificial foundation of rock for the pier was thus prepared. The temporary part of the caisson was next removed, and on the rock which had been formed a hollow structure of brickwork, built in the harbour, and floated out in a manner similar to the caisson, was placed above it and built up till above high-water mark. In its turn this was filled with concrete, and was thus made ready to receive the superstructure of ironwork to support the girders. The lecturer showed several diagrams of the work carried on in the harbour at Newport, also a model of one of the 130 ft. spans, at the same time pointing out the difference in the structure of the piers supporting these latter to those of the 245 ft. span, the one consisting of four columns, and the other of six, to ensure strength. To prevent corrosion, the pillars, on erection, were filled with cement, and the outside coated with black varnish. He alluded to it as a strange fact that corrosion of iron was much more rapid at the Tay Bridge than it would be were the river entirely fresh or entirely salt water, his theory to account for this being that between the two layers of fresh and salt water, a galvanic current was produced, which caused more rapid corrosion than would otherwise be the case. The lecturer proceeded to show models of the girders, and to explain the method of lifting them to their place.

CREOSOTE.

On the 30th ult., Mr. S. B. Boulton, of the firm of Burt, Boulton, & Haywood, entertained a large party of the students of the Institution of Civil Engineers, at the principal works belonging to his firm at Silvertown, with a view to explain the whole process of the manufacture of creosote, and of the application of that oil for the preparation of timber. Some idea of the operations of the firm may be gathered from the fact that they have four establishments in the port of London, six others at various English ports, besides seven timber-preserving works at different places on the Continent, and a depôt in Russia (at the Port of Riga) for the shipment of Baltic timber. Whereas some years ago the tar produced in the manufacture of gas was a waste substance of which it was extremely difficult to get rid, it had now become a source of considerable revenue to the gas companies. Submitted to fractional distillation, every atom of the gas tar was now converted into some useful commodity. The laboratory was the first place visited, where a series of specimens of the substances produced from tar was exhibited in the order in which they come from the still. Besides the creosote used for the preparation of timber, these specimens of hydro-carbons included carbolic acid, naphthas, the various forms of benzole, and anthracene (used for the manufacture of aniline and alizarine dyes), and lastly the pitch, which is largely used for the manufacture of patent fuel. The chemical works were next inspected, the various batteries of

stills, and the machinery for rectifying and preparing the numerous products for the market being in full operation.

The complete and elaborate apparatus for the condensation of all vapours evolved in the processes of manufacture was noticed and commented upon, and it was mentioned that this apparatus, which was specially provided for the purpose of preventing the possibility of the escape of any nuisance from the works, had also been found in practice to lead to good economical results. The timber-yards and saw-mills at Silvertown, and also those within the Victoria Docks, were visited, together with the creosoting cylinders, and the machinery used for injecting the timber. Here one of Hodson's machines for burning sawdust as fuel under a steam-boiler was successfully at work. The "water-carriage" system, as applied to the landing, transport, and stacking of sleepers, upon a plan patented by Mr. Boulton, was very interesting. The heavy sleeper blocks, instead of being carried on the backs of labourers, were thrown into the water direct from the ship's hold, from whence they were picked up by revolving chains and transferred to a series of water-troughs or small canals upon the ground level, along which they were conducted from all parts of the premises to the saw-mills, where they were sawn into sleepers, and finally stacked to a height of from 25 ft. to 30 ft., by an elevator worked by steam-power. The sleepers are kept stacked for drying for a considerable time before they are creosoted, and the firm maintains a stock of no less than from one million to a million and a half of these sleepers in this country constantly undergoing this natural process of seasoning.

TEMPLE BAR AND THE SAVOY.

Long before this tottering arch was built, chains and poles served as barriers at the western City boundary; and in 1265, Prince Edward (afterwards Edward I.), being offended with the rebellious Londoners, after the battle of Evesham, took away all their stout chains and bars, and locked them up in the Tower. It was not until the year 1670 that any permanent stone building was erected, when Sir Christopher Wren commenced the present structure, and completed it in 1672, as it is supposed, from the design of an old Roman temple. As a remnant of antiquity it is, therefore, of no great value; and constricting, as it does, the traffic of one of London's most central and busy thoroughfares, it is a matter of wonder to most people that when the arch became shaken and unsafe, the Corporate authorities should have ordered it to be propped up on temporary timber struts and braces!

Throughout the Strand and Fleet-street there is room for four lines of carriage traffic, whereas under the arch but two can pass; besides that, the side footway-gates constrict the freedom of pavement footway to half its dimensions. The open space at St. Clement Danes certainly lends dignity to the position, and now that the new Law Courts are rising in view, and recede from the frontage (giving at least 10 ft. to the street line), it is high time that the old ruin should be removed.

The statues of Charles I. and II. on the west side, and of James I. and his queen on the east (as chiselled by John Bushnell, who died in 1701), may have some attractions for City magnates, who could find room for them somewhere; but the rest of the structure is irreparable, its floral ornamentation withered, and its moulder-ing stone quoins rounded off and decaying.

There is an arch on the river's brink, sunken full half its height in the new Embankment, at the end of Buckingham-street. Its simplicity and dignity of design, together with its good, if not perfect condition, might render it worth removal; but as to the wreck of Temple Bar, it is too far decayed for reconstruction, unless the Corporation should transfer it to Cripplegate, or the Dean of Arches find room for it in the defiles of Doctors' Commons.

That one of our principal and most thronged metropolitan thoroughfares should be choked in its busiest centre is a serious grievance to all commercial men, as well as to private carriage-folks and pedestrians who wend their way to the Bank or St. Paul's; but it is also a serious blot upon that important vicinage, and an obstacle to all improvement.

The new Thames Embankment, together with other improvements now in progress or completed by the Board of Works, makes it more essential that not only the main thoroughfares be cleared but that suitable lines of intercommunication be opened between the collateral main lines; therefore no opportunity should be lost in thus providing free circulation for the millions.

Now there happens to be a large clearance going forward in the Savoy, where there is a rumour that a Royal Mint is to be erected! Here is an occasion for the opening out of a grand central junction between the Strand and the Embankment, at the shortest interval and easiest gradient. A Mint erected in this central position would darken, defile, and stop a most valuable district of the metropolis; whereas a good street through the Savoy, with terraces, and two lines of access (right and left) to the Embankment, would yield returns for the outlay, whilst it would confer immense benefits upon the whole population.

At present the Mint stands near the Tower of London; there a guard and sentinels are posted to protect a national stronghold and historic fortress; why, therefore, remove it, and re-duplicate the accompanying military station?

The continuation of plantation, with also a respectable range of effective architectural buildings along the Embankment, is yet practicable. From the west end, the Houses of Parliament lend dignity to the "rivage," then the handsome new Opera-house, and a range of gardens to Northumberland-avenue, and so onward by the not ungraceful Adelphi-terrace to Somerset House, and thence to the "beautiful gate" and gardens of the ancient Temple. Such an improvement should not be marred.

Quondam.

THE NEW BATHS AND WASH-HOUSES IN SOUTHWARK.

Active measures are in progress to carry out the erection of new baths and wash-houses in Southwark, upon which the Vestry a short time ago decided. The commissioners appointed by the Vestry of St. George's, Southwark, for carrying out the provisions of the Baths and Wash-houses Act in the parish, have resolved, with the consent of the Vestry, to make application to the Local Government Board for an order to appropriate the funds in the hands of the guardians belonging to the parish towards the purchase of a site for the erection of the intended new buildings. The commissioners are said to have negotiated for the purchase of a site eligibly situated near the centre of the parish, which it is stated can be obtained at a reasonable cost, and that in the event of the Local Government Board acceding to their application, the purchase of the site in question will be effected, and plans for the new baths at once prepared.

IMPROVEMENTS AT ST. JOHN'S CHURCH-YARD, WATERLOO ROAD.

A movement is in progress for the restoration and laying out for recreation purposes of the spacious churchyard attached to St. John's Church, Waterloo-road. This churchyard has for some years past been in a very dilapidated condition, and a meeting was recently held in the schoolroom attached to the church, for the purpose of considering and adopting the best means for remedying "its present deplorable state, and to raise the requisite funds for restoring the ground to a decent condition, and also to render it available for the resort of parishioners." There was a very numerous attendance of parishioners, and a resolution was passed to the effect that contributions be solicited from the owners and occupiers of property in the parish; also from the relatives of deceased persons buried in the churchyard, and others, for the purposes of its restoration and maintenance. A committee was also appointed to obtain plans and estimates for the projected works, and to carry out the chosen designs in the matter most conducive to the public good.

Proposed New Gaol for Bristol.—On the 5th inst., the models and plans for the proposed new gaol at Horfield, prepared at the request of the Gaol Committee by Captain Gardner, and those prepared by Mr. Josiah Thomas, city surveyor, were laid before the committee. The respective merits of the models were discussed at considerable length, and it was ultimately arranged that before making a final selection the committee should inspect the site at Horfield.

SOME OLD HOUSES AND THEIR STORIES.

CHARLES MACKLIN'S HOUSE, TAVISTOCK ROW, COVENT GARDEN.

Enduring great hardships of hunger and exposure, passing through bogs and over rugged mountains in wet, stormy weather, leaving sick and exhausted followers behind at every stage, the Irish volunteers marched to join the gathering army of dethroned King James II. With them came William M'Laughlin, the descendant of a race of ancient Irish kings, at the head of a troop of horse, with his heroic lady, her little daughter, and, in a turf kish, or rudely-made basket, their baby-boy Charles, then not quite two months old, who was destined to win that fame which rendered memorable the old house of our sketch. His mother, braving the greatest dangers and terrors, patient in suffering, strong only in her love, and solicitous only for her husband's safety, was the daughter of John O'Flanagan, of Blackcastle, in Westmeath. She girded her husband's sword to his side on the morning of the Battle of the Boyne, and shared with him the succeeding terrors of defeat and flight, until they found a safe hiding-place with the baby, in an almost dying condition, amongst daring friends at Shinglass, an obscure place in the county of Westmeath.

William M'Laughlin's estate was confiscated, and some years after, when reduced to poverty, he came with his wife and family to Dublin. Continued misfortunes broke his heart. He died in December, 1704.

Amongst those who fought on the other side, against King James, and with King William, at the Battle of the Boyne, was a worthy Irish farmer, named Luke O'Meally. Seeing the unfortunate widow struggling in poverty's misery and degradation, fighting bravely for her little ones, and enduring as patiently for them as she had endured heroically for her husband, he pitied, admired, loved, and presently,—in 1707,—married her. He made an excellent husband, a kindly indulgent, although hot-tempered, step-father; and when, soon after, he took a famous old "Orange" tavern,—the Eagle, in Werburgh-street, Dublin,—he also made a capital landlord, whom the military upholders of King William took delight in patronising.

Mrs. O'Meally, being anxious that her son Charles should not be brought up in daily contact with tavern society, and, moreover, that his creed should in manhood be the old one for which his father had fought, suffered, and, we may add, died, sent him away to a boarding-school in the suburban village of Island Bridge, kept by one Nicholson, a Scotchman. This stern old pedagogue's reign was one of terror, and there was nothing in the world he was so proud of as the servile submissiveness and abject fear with which he was regarded by his pupils generally, and which he received, or thought others received, as the outer signs of intense respect, and the profound reverence properly due to his great learning and ability.

Now Charles M'Laughlin was a frank, fearless, daring little fellow, who cared nothing for, and knew nothing of, learning; whose large dark eyes looked the schoolmaster boldly in the face, and who spoke out plainly the thought that chanced to be uppermost in his mind. Mr. Nicholson, of course, took a strong dislike to such a child. So then and there commenced a terrible battle, which lasted for years, wherein brute strength, spite, and devilish cruelty on the man's side were pitted against bravery, endurance, obstinacy, and physical weakness on the child's side. Under such circumstances cruelty never yet won, as all sorts of martyrs for all kinds of causes will testify. Over and over again Nicholson begged that this incorrigible young rascal Charles, whom he surnamed "a Molluchth" (the wicked), might be taken away. The fight, from which at first he took a savage gratification, was going against him, and he had got enough of it. But in those days schools worthy the name were extremely scarce, and Mrs. O'Meally begged so earnestly that her wild Irish boy might not be sent away, and by appealing to her son's always sensitive feelings and affections, she induced him, reluctantly, to make promises, on the strength of which Mr. Nicholson consented to try once more what he could do with him. But he was soon obliged to abandon the attempt.

In the Memoirs of Macready, to which we have before referred, it is said that at nineteen Macklin was unable to read. This is a mistake

into which Dr. Doran also falls, though he rarely errs. But Macklin certainly made little progress at school. He was chiefly occupied there in deserving, receiving, and enduring various cruel kinds of punishment, but he made great advances in some directions. As a pugilist there was not a boy in the school who dared tackle him; as a cudgel-player he was without a rival; and when he was an old man his great boyish feats as a swimmer were still talked of in the tavern-parlours of Dublin by venerable, white-headed, older men, who had seen him leaping from ships' masts, or from the old bridge over the Liffey.

Macklin retained so vivid a recollection of his Scotch schoolmaster, and the treatment he received from him, that nearly a hundred years after he first went to Island-bridge Academy, the mere sight of a Scotchman was unpleasant to him, and he could not avoid expressing his unconquerable repugnance to such a being. It became a green-room joke, always fruitful of fun, but it was once no joke to poor little Charley M'Laughlin.

Amongst the intimate friends of Mrs. Nicholson was Mrs. Pilkington, a lady with a strong taste for poetry and theatricals. She greatly admired the tall, slim figure and expressive dark eyes of Charley a Molluchth; she sympathised with and deeply pitied him; and she often pleaded for him with the stony-hearted Scotchman, saying she was sure he had good feeling, with lofty abilities, and would become a great, good man. In the year 1708, with the permission of Nicholson, the school-boys got up a dramatic entertainment. The play was "The Orphan"; and Mrs. Pilkington suggested that the female part, *Monimia*, should be played by this good-looking, good-for-nothing pet of hers, whose arch-humour, wit, and love of fun and mischief she thought so delightful. Macklin accordingly played the part,—studying it under the instructions of Mrs. Pilkington,—and on the day of the performance achieved a startling success. That event was a pregnant one. It gave birth to Macklin's earliest histrionic aspirations, and awakened an ambition which was never to sleep again. Through all the coming years of disgrace, misery, and desperate struggling, Macklin was never to speak of Mrs. Pilkington but with expressions of grateful emotion and profound esteem.

But the first fruits of this newly-awakened passion for the stage was evil. On leaving school the youth was mad to see the great London actors whose fame was so glorious in his eyes. The son of a Dublin corn-factor, older than himself, suggested running away from home. Another lad, the son of a Dublin apothecary, promised to join them. Macklin robbed his darling mother of a few pounds, which she could ill spare, and the three ran away. After sundry adventures on the road, they reached London, saw the great actors, and having soon spent all their money, were mocked and laughed at when they sought work. Who would employ wild young Irishmen, with such a perfectly unintelligible brogue? The corn-factor's miserable son, in his desperation, took to highway robbery, and was soon after hanged at Tyburn. The poor apothecary's son enlisted, and went abroad. M'Laughlin was too proud of his ancestry to disgrace it by crime, too proud to enter the army as a common soldier, and to beg he was ashamed. So he wandered about homeless and starving, until by happy chance he met in Southwark a poor little drudge of an Irish serving-wench, who had once been in the employment of his mother. She knew him directly, accosted him, wept over the sadness of his story, brought him some food, and afterwards procured him a cheap lodging at a public-house in the Borough, which had long been frequented, as it might have been before the days of Shakspeare, by strolling mummers and "drolls," who exhibited conjuring tricks, tumbling, performing animals, "pantomimes," &c. Macklin could soon sing, dance, spout, and play the "droll" with the best of them. He became a great attraction, and brought so much custom to the inn, that his landlady, setting aside her prejudices against his country and his youth, together with her regard for other people's opinions, the reproaches of friends, and the jeers of neighbours, resolved to marry him. A kind of Fleet marriage took place, and all Southwark made free and merry with the widow's union to a wild young Irish boy, fresh from his emerald isle. Then the old servant, grieving over the evil courses her former young master had fallen into, sent an account of his doings to the poor heart-broken mother in Dublin, who sent immediately to a relative in London, who was "a Spanish merchant." He, armed with the proper affidavits, properly authenticated by the seal of the Lord Mayor of Dublin, made a formal demand for the person of an "infant" in law, one Charles M'Laughlin, at the aforesaid inn in the Borough. It required the direst of legal threats to induce the woman to give up her boy-husband. She scolded, she wept, she entreated, she defied. His departure would ruin her business, and break her heart; she would not, she could not, she must not give him up. So she hid him, and said he had run away. It was all in vain, however, and Charles was sent home to his delighted mother, who clung to him in a transport of affection, without uttering a single reproach for all he had made her suffer in his absence. Between hysterical bursts of weeping and embracing, she told him how she had the brightest hopes for him, the best of friends to aid him in securing a good position; and a distant relative, an O'Kelly, who was in high favour at Court, had promised to interest himself in his behalf! Macklin used to say in later life that so great was the joy of that unhoped-for forgiveness and blessed restoration, that he often thought he could endure an age of pain once more to realise its transports.

But the great O'Kelly suddenly died, and the glowing prospects faded, and his loving and beloved mother was unfortunate in business, and Charles was glad to become "Badgeman" in Trinity College, a menial situation similar to that called at Oxford a "scout," which he retained until he was twenty-one years of age.

In the Memoirs of Macready, a story is told of Macklin when he had attained to fame, and was performing in Dublin. Properly rebuking some riotous young collegians who were stopping the performance, the rest of the audience applauded; but one of the former, thinking to cover the great actor with confusion by a contemptuous public reference to his former low condition, called out in a tone of imperious command, "Boy." Macklin knew the familiar old cry at once, and how, in response to it, he had demanded the number of the summoning collegian's room. Stepping down to the foot-lights with manly firmness and true pride, he quietly repeated in the old way the old response, "What number?" and a roar of applause from the collegians, and an audience quick to see and feel the right thing when it turned up, told him that his manly dignity and the severity of his rebuke were appreciated and understood.

Captain O'Flannagan coming to Ireland for recruits to take service with him in Germany, calls upon his sister, is ashamed of the position his nephew, a descendant of kings, holds; proposes that he should go away with him; and promises to procure the fine young fellow a commission. He would make a splendid soldier! brave, strong, high-spirited, quick-witted, he would be sure to win promotion in the wars. Once more the M'Laughlins would be gentlemen. The proud mother was delighted.

Captain O'Flannagan went to London on his way to Germany, and stayed there some little time hunting up old friends to bid them adieu, making purchases, and so on. Charles hunted up some old friends too, his scaramouch friends in the Borough, and when the uncle was ready to depart the nephew could not be found. For three days the search was prosecuted in vain, and then came a grateful and respectful letter, wherein Charles declined to follow "the drum" to Germany on the ground that he had in the meantime been "better provided for" in England,—as he might have added, although he did not, at a place of infamous repute in Clerkenwell, Hockley-in-the-Hole, where he was exhibiting himself, with a strolling company of mummers, as an acrobat, pugilist, vocalist, and droll. Alas! for the descendant of kings, and the poor Irish mother's pride in her handsome, gentlemanly son!

Mrs. O'Meally was indefatigable in her efforts to discover what had become of Charles; went here, there, and everywhere to find out, and got introductions to all kinds and degrees of people who were going into England, where they might see her darling boy. With feverish restlessness she would even accost perfect strangers who were going on board vessels, and might be travelling to London. At last the grandfather of the famous Shakspearian scholar, Malone, was thus appealed to, and his heart being touched by the mother's woe and desperation, he determined on reaching London to search out this wild, graceless run-away, and induce him, if possible, to return to Dublin. It was a most troublesome task, but at last he traced him to the Cat and Bagpipes, commonly called "The Salutation," at Hockley-in-the-Hole. He appealed to his reason in vain, to his feelings with success. When Mr. Malone returned, Charles was with him, and soon after he was once more crying in response to the familiar cry of "Boy" the old,—"What number?" in Trinity College, Dublin.

At six-and-twenty Macklin grew unbearably dissatisfied with his ignoble calling, although he was a favourite with the Collegians, and well treated by them. It was a constant reproach which he began to feel more and more keenly. The wild oats were sown, but as yet nothing had been done to further the great ambition of his life. Strong in mind and body, full of life and vigour, he resolved to plunge at once into the great battle of life and win laurels worthy the wearing of his father's son. His mother was afraid to part with him, wept, implored, but in vain. The young man parted from her resolute but sorrowful, anxious to atone for all the sorrow and anxiety he had caused her, but vowing, warrior-like, that he would return a conqueror or she should never see him again. She thought he was going to that dreaded hot-bed of vice and wickedness, London; in reality he went to Bristol, where he took lodgings "over a mean little tobacco-shop, next door but one to the theatre." As he probably had ascertained, some of the actors were also lodging in this house, strollers making a temporary stay in the town. He, of course, became acquainted with them, and soon made them friends. They introduced him to the manager, who discovered his ability, and gave him an engagement. So it came about that the posts of Bristol soon displayed rudely-printed little play-bills announcing a forthcoming performance of Shakspeare's "Richard the Third," in which a Mr. M'Laughlin would make "his first appearance on any stage," in the character of *Richmond*. On that occasion the audience discovered the novel fact that Henry VII. was an Irishman who, when Duke of Richmond, spoke with a strongly marked brogue. But Bristol in that day was full of Irishmen, and hence perhaps the curious fact was overlooked; for, despite it, the first appearance was a success, and when the company left Bristol, Macklin went with them a recognised and important member of it.

The life of a strolling player in the eighteenth century was full of hardships and adventures. James Kirkman tells many curious stories of Macklin's wanderings at this stage of his career. "Sometimes he was an architect and knocked up the stage, and seats in a barn; sometimes he wrote an opening prologue, or a farewell epilogue for the company; at others, he wrote a song, complimentary to and adulatory of the village they happened to play in, which he always adapted to some sprightly popular air and sang himself; and he often was champion and stood forward to repress the persons who were accustomed to intrude upon and be rude to the actors. His circle of acting was more enlarged than Garrick's, for in one night, he played *Antonio* and *Belvedera* in 'Venice Preserved,' *Harlequin* in the entertainment, sung three humorous songs between the acts, and indulged the audience with an Irish jig between the play and the entertainment. He often did this, or as much as this, when his allotment of the profits amounted to no more than five or six pence." All this time he was nursing his great project of rising to eminence on the London "boards"; studying character, action, and expression; striving with might and main to overcome and get rid of his terrible brogue. In this last task he was greatly assisted when in Wales by a clever and accomplished English lady, the wife of a Welsh clergyman, who amused both Macklin and the lady by the mistake he made in supposing that his curious compound of Welsh and English was in any way superior to Macklin's English with an Irish brogue. At the residence of this worthy couple he spent all his leisure while in Wales studying English pronunciation and desperately endeavouring to escape from his terrible brogue. Every blunder in pronunciation brought a correction, and so much did he benefit by this watchful supervision that he determined to abandon the strolling company he was with and pass six months of close uninterrupted study and practice with Mrs. Davis at the parsonage.

Four years after his first appearance at Bristol, when Macklin was thirty years old, he returned to that city riding upon a horse of his own, the gift of an admirer, and there he succeeded in obtaining an engagement with a regular company

of respectable actors, under the management of Mr. Watkins. At first he played such parts as *Friar Lawrence* and *Mercutio*, gradually winning a reputation which increased his earnings and enabled him to pay frequent visits to London. During one of his visits he obtained an engagement at a newly-opened theatre in Lincoln's-inn-fields, through the friends he made at a house then and long after famous as the actors' house of call, an old house of many traditional stories, which is still standing under the old sign of the "Black Jack." This was in 1730, when Macklin was forty years of age, having been born, as we have already implied, in 1690. The parts he played were small ones of no importance.

Three years after when he was playing, most probably with the same company, in Southwark Fair,—in those days even eminent actors did not think it beneath their dignity to play at either Southwark, Bartholomew, May, or any other great Fair,—the proprietor of Sadler's Wells Music House saw him strutting on the outer stage in a grand laced coat, and offered him an engagement, which he accepted. There he grew famous as *Harlequin*, and thence extended his reputation until in 1733 arose an ill wind which in its fierceness and turbulence at length blew poor patient hard-working, long-waiting Macklin some real good.

Colley Cibber at Drury-lane Theatre found things going to the bad. His play-house was so unskilfully constructed that the voices of the actors were confused by hollow reverberations, and sounded, as he said, "like the gabbling of so many people in the lofty aisles of a cathedral." Moreover, his stage-manager, the famous actor, Wilkes, made himself so offensive to his brethren, that many of them went over to the more flourishing rival house in Lincoln's-inn-fields, where Macklin was playing in a state of great discontent and despondency under the tyrannical James Quin, who contrived to make his life one of utter misery and despair.

Famous and witty, fashionable and haughty, the over-bearing, eccentric actor, Quin, had from the first hour of his meeting with Macklin taken a strong dislike to him. He dubbed him "The Wild Irishman," threw stumbling-blocks in the way of his professional advancement, made him the butt of his coarse, insulting witticisms, and treated him on all occasions with humiliating and brutal rudeness. To resent such treatment would have been ruinous to the poor but ambitious Irish actor, and it is not easy to realise the intense bitterness of Macklin's feelings or the desperate efforts whereby he prudently contrived to suppress his resentment. One night in the green-room this prudence lost its power, and a crowning act of tyranny and injustice, accompanied by a grossly insulting outrage, maddened him beyond control. Macklin had come from the stage flushed with a great triumph, the applause and laughter of a full audience ringing in his ear. Quin, irritated and jealous, sternly and coarsely ordered Macklin to make his part much less prominent. Macklin responded, asserting that the prominence he gave the part was that belonging to it, whereby no other character in the play could possibly suffer injury. Insulting remarks followed, the upshot of which was that the despised, long-suffering Irishman, suddenly losing control, gave Quin the lie direct. The green-room, as usual, was full of noblemen and great personages in full dress, wearing their swords, their silk and satin coats, vests, and breeches gleaming and glittering with spangles of gold, silver, and precious stones; their huge curling wigs redolent of perfumes, and their questionable jokes and whisperings delighting the ready ears of certain pretty actresses. Suddenly a tumult arose. The "Wild Irishman," just when everybody was laughing at him, had given the bullying tragedian the lie; and Quin, who was eating an apple, spitting the contents of his mouth into his hand, had thrown them full into the Irishman's face. Macklin's old skill as a boxer was suddenly in full play, and under its influence the great burly form of the tragedian was knocked now this way, now that, and now the other. Women shrieked, men swore, the noblemen leaped upon the side benches to be out of the way. Quin did his best to defend himself, but neither in skill nor strength was he a match for the "Wild Irishman," and he got so severely punished that an apology had to be made to the audience for his non-appearance. He went away with both eyes fast closing, and his head swollen beyond all chance of recognition. A duel was, of course, to follow, and a place,—the obelisk in Covent-garden,—was appointed, but the manager, interfering, carried off Macklin to his own house, and kept him there until Quin had most reluctantly consented to receive, and Macklin had as reluctantly consented to proffer, some kind of an apology. But Quin never forgave him.

A foolish young fellow of property and fashion, named Highmore, being stage-struck, had been induced by Colley Cibber to purchase certain shares in Drury Lane Theatre, in consideration of which he (Highmore) was to take upon himself the management. Colley Cibber's son, Theophilus, immediately on the conclusion of this arrangement opened the Little Theatre in the Haymarket, and induced all the principal actors then playing at Drury Lane to join him, leaving poor Highmore in the lurch. An actor of the period, Mr. Victor, commenting upon this transaction, said, "It appeared to me shocking that the son should immediately render void and worthless what the father had just received 2,150*l.* for as a valuable consideration," and the public feeling endorsed Victor's view. Thus distressed and deserted, the unfortunate fashionable amateur was reduced to the necessity, in the theatrical recess of 1733, of beating up for volunteers and gleaning the best performers from various strolling companies; but none, says Victor, were "of any promise, but Mr. Macklin, from Portsmouth, who soon distinguished himself." But poor Highmore was ruined, and Fleetwood reigned in his stead.

At Drury Lane, Macklin continued rising in public favour, and good houses were once more known there. He became acting-manager, and was conspicuous in that range of parts wherein Colley Cibber had long been famous, playing with the inimitable Kitty Clive. Quin was a member of the same company, and the "Wild Irishman's" success was gall and wormwood to him.

We must pass over a dreadful event, whereby the actor Hallam lost his life at the hands of Macklin, who was tried for his murder, and acquitted, to come to the year 1741. At that time Shakspeare's "Merchant of Venice" had long been an unknown play, and its place was filled by an established adaptation of it by Lord Lansdowne, called "The Jew of Venice." In this *Shylock* was an extravagant and very low comedy part, of little dramatic interest, and *Portia* was always expected to make the trial scene even more irresistibly comic than Lord Lansdowne had made it, by giving burlesque imitations of well-known and prominent barristers. It was Macklin's worthy ambition to restore Shakspeare's "Merchant of Venice," and play *Shylock* as a tragedy part. In 1741 he determined to gratify this passionate desire. Therefore the "Merchant of Venice" was announced to be performed on February 14th, from the text of Shakspeare, and was put up for rehearsal. The idea received no favour behind the scenes, but it excited considerable curiosity amongst the outside public, who in those days took a much more general and active interest in matters theatrical than the public of to-day does. Mr. Fleetwood gave a very reluctant consent to the proposed restoration, and growing more and more repentant of having done so, repeatedly and strenuously urged Macklin to give way, and withdraw Shakspeare in favour of Lansdowne. Quin said in a rage that Macklin would make them all ridiculous and unpopular, Mrs. Clive pouted at having to adopt a new reading, which cut out so much "fat" (a theatrical term implying applause and effect), and other members of the company shook their wise heads and either angrily, or scornfully, or mournfully denounced the "Wild Irishman's" scheme as "positive madness." The Lansdowne party were, it was said, busily organising a great demonstration which might result in the destruction of the theatre. The critics were already sharpening their powerful pens for a terrific onslaught, and the caricaturists were covering Macklin and his strange idea with ridicule. But Macklin remained resolute and unmoved, strongly holding Fleetwood to his promise. "The Jew of Shakspeare," said he, "is not the 'Jew of Venice'; let the public judge between them."

But he had to proceed very cautiously lest Fleetwood, growing desperate at the eleventh hour, should withdraw the permission, and substitute the favourite adaptation for the unknown original play. Hence, during rehearsal Macklin merely read *Shylock*, allowing no one to discover how he intended to act it. Quin jeered at this, and chuckling, said "He will be hissed from the stage for his arrogance and presumption."

At last the great trial of Shakspeare *v.* Lansdowne came off. No sooner were the doors of the theatre opened than the newly-enlarged house became crowded in every part. Before the curtain arose the manager appeared in the green-room full of dismal anticipations, and in great distress of mind. He found doleful actors and trembling actresses in a state of great commotion, maliciously censuring Macklin for his headstrong wilfulness and obstinacy, and darting vengeful or reproachful glances at him as he stood amongst them dressed for *Shylock*, in a costume retained to this day, but with a red cap upon his head, which, in itself, was considered offensive. He was isolated and very miserable, full of painfully suppressed excitement, but still confident and resolute. He was sure that he was right, but, as he afterwards admitted, he was by no means sure of the reception he might receive from a crowded audience, whose taste had been so long and so deplorably perverted. Walking down the stage, he looked through the hole used for that purpose in the curtain. The critics were in their places, quite filling the two front rows of the pit generally kept vacant for them, and he noted in that close-packed audience most of the more eminent and critical playgoers of his day. It was no common audience, and as he turned from that survey, not, we may be sure, without a fluttering of the heart, he said, with apparent calmness,—"Good! I shall be tried to-night by a special jury!"

An eye-witness, describing that notable night's performance, says:—"When *Shylock* and *Bassanio* entered in the third scene there was an awful, a solemn silence. A pin would have been heard had it dropped upon the stage. Nothing, Mr. Macklin has declared, affected him so much as the coolness that was observed by the audience on his entrance. He had then been for several years a great favourite with the town, and the audience had been accustomed to greet him, on his first entrance, with repeated plaudits," now "not a hand moved to encourage him," and his heart sank horribly. It is said that tears sprang into his eyes. The manager looked on white with terror, for in those days the anger of a disappointed British public was a fearful thing. We know nothing about it now. Although everything conspired to confound and fill him with dismay, by a prodigious effort Macklin mastered his emotions and spoke his first speech. "Still not a whisper could be heard in the house," says Kirkman. As the scene proceeded, the anxious actor's quick ears presently began to catch from the solemn judges of those two front formidable rows in the pit such patronising expressions as "Good!" "Very good!" "Not bad!" and "Very well indeed!" They were like drops of water on a thirst-parched tongue, and thus encouraged he grew bolder and began to lose all thought of the actor and his peril in the part he was playing.

But when the Jew, suddenly perceiving for the first time the chance there is in granting the loan for quenching the raging thirst of a revenge which is secretly poisoning the entire current of his nature, proposed, as a merry jest, his diabolical and cunningly, although quickly, devised bond, the audience was electrified. The veil was for a moment down, and the true character Macklin personated, and Shakspeare drew, was recognised at a glance. A thunder of applause broke upon the actor's delighted ears. Fleetwood heaved a sigh of relief, and Quin, who played *Antonio*, was in his turn confounded and dismayed. Burst after burst of applause succeeded as the play proceeded, until in the trial scene,—even Kitty Clive being awed into gravity,—the triumph culminated in such a storm of acclamation as shook the walls of old Drury to their very foundations. The master mind of Shakspeare was nobly vindicated, and Lansdowne sank into the neglect and contempt from which his adaptation can never again emerge. All London rang with the wonder of that glorious night's doings. Every coffee-house was full of Macklin's delighted admirers, and his fame spread like wild-fire, away even into Cloncurry in Ireland, where his dear old mother, then about eighty years old, wept with joy and delight to know her son was at length a famous man, and heard probably how the great poet, Alexander Pope, sitting in a box to witness "Macklin's *Shylock*," for so it was called, exclaimed in his enthusiasm and delight:—

"This is the Jew
That Shakspeare drew."

As the triumphant vindicator of Shakspeare stood amongst his fellows that night in the green-room, after the performance, and received their congratulations, he cried with a full heart,—

"I am not worth 50*l.* in the world; nevertheless, on this night I am Charles the Great!"

The dream of his boyhood was realised. It was long in coming, for he was then over fifty years of age, but it had come at last.

"Never," says Kirkman, "was a performer's triumph more complete, never were enemies and opponents more confounded and abashed, never was a manager more agreeably surprised. The sudden, unexpected, and happy catastrophe of that night's representation conferred on Mr. Macklin immortal fame."

In the glory of that fame shines the old house of our sketch, to which, in our imagination, we turn, one evening in the January of 1788, when Macklin, although an old man over ninety years of age, was still hale and vigorous, with a voice of stentorian power, but with rapidly declining mental faculties, and, after a temporary retirement, still on the stage! He had not long before written his famous play, "The True-born Scotchman," wherein he achieved new fame as the personator of *Sir Pertinax Macsycophant*. He comes from the door of that old house in Tavistock-row; purchases, may-be, some fruit as he goes through Covent Garden-market, where Mr. J. T. Smith once heard him say to a seller of cherries, "I *will* have my weight, give me my *weight*," as keenly and severely as if it were for Antonio's flesh he was bargaining. He is on his way to the theatre, on the stage of which he soon after once more appears, and once more in the part of *Shylock*, but now hailed with an immediate thunder of applause. The play proceeds, and presently there comes over the rugged, corded, and wrinkled face of the poor old favourite an expression of intense terror and dismay. He raises his wrinkled bony hand to his head, and just when the whole house is hushed into silent expectancy of an outbursting passionate speech, he is strangely still and silent. The audience recognise the outer signs of an inward and desperate struggle, but do not guess the cause of his emotion, until, stepping to the footlights, their old favourite entreats their pardon, pleads his great age, and piteously admits that his memory had suddenly failed him, adding that he would never again place himself in so ridiculous a position. But during the outburst of enthusiastic sympathy and applause which ensued, the old actor's memory as suddenly resumed its power, and he went through the performance with much of his old fiery energy and intellectual power.

He was 100 years old when he played the part of *Sir Pertinax* for the last time, "with a vigour and spirit that astonished every beholder;" but it was the up-leaping flash of an expiring flame. In the same year, 1789, on the 7th of May, we see the venerable father of the stage once more dressed for a farewell performance in the part of *Shylock*, for his own benefit. He stands in the green-room amongst his younger brothers and sisters in art, regarded with loving reverence and admiration, a poor old tottering nearly imbecile man. Mr. Ryder is there dressed to play the same part in the extremely probable event of Macklin's failure. He asks amiable lively Miss Pope,—she who wrote Kitty Clive's epitaph,—if she is going to play that night. "To be sure, I am, dear sir," said she; "don't you see? I am dressed for *Portia*."

Looking vacantly at her he replies,—"Ah! yes—yes; but I had forgotten"; and then, with suddenly awakened interest, asks wistfully,—"Who plays *Shylock*?"

Not a little shocked, she replies. "Who! why you, sir; you are dressed for it." Then, says Dr. Doran, "he put his hand to his forehead, and in a pathetic tone, deplored his want of memory, and then went on the stage, spoke, or tried to speak two or three speeches, struggled with himself, made one or two fruitless efforts to get clear, and then paused, collected his thoughts, and, in a few mournful words, acknowledged his inability, asked their pardon; and, under the farewell applause of a weeping audience, was led off the stage for ever."

For some little time after this he busied himself in that old house of Tavistock-row revising and preparing his dramatic works for publication, passing his evenings at the theatres, and frequently visiting certain coffee-houses and taverns in Covent Garden and St. Martin's-lane—more especially the Antelope in White Hart-yard—in which actors, artists, and authors congregated, and where Macklin was Sir Oracle, the Dr. Johnson of the stage.

From that quiet house of his in the corner he came forth to follow his accomplished and learned son to the grave in 1790. In 1795 Macklin was once more to appear upon the boards of Covent Garden Theatre on the occasion of that house being visited in state by the King and Queen, their royal highnesses the Prince and Princess of Wales, and the rest of the royal family. A short interlude had been written for the occasion, but Macklin was unable to study even the few lines he had to speak in it, and so instead of appearing on the stage he appeared in the pit, much noticed by the royal visitors.



Macklin's House.

Now, with failing sight and hearing, daily growing more feeble, unable to recognise even his most familiar friends, we see him two years after, infirm and confined to the house. He declines to take medicine, on the ground that it is no cure for old age, and waits and gradually sinks into the slumber of death. A sudden awakening gives him his old faculties, he sits up, hears, sees, talks, and thinks, just as usual. Then comes a sudden relapse, and on Tuesday morning he rises, washes, changes his linen, and retires to bed for a rest after so much exertion. Suddenly his wife hears him cry out "Let me go! let me go!" and rising to speak, she sees that he will never hear again. In uttering these words he expended his last breath. He was born on the 1st of May, 1690, and dying in February, 1797, he was consequently one hundred and seven years of age. Hot, impetuous, but humane, generous, and charitable, Macklin's life has been dealt with in many conflicting ways by his friends and enemies,—by those who were careless of facts, and others who have not scrupled to invent them; but we think the sketch here delineated will suffice to give a rude although somewhat imperfect idea of the man as he actually existed.

MR. JOHN GRAHAM LOUGH, THE SCULPTOR.

We hear with the greatest possible regret of the death of Mr. Lough, the well-known eminent sculptor. At the close of last month he entertained at dinner a number of his friends, and was as bright and gay as any; speaking with his usual enthusiasm of the Ideal in art, and lamenting its comparative neglect at the present time. A few days ago, doing some little work in his garden, he caught cold, which resulted in pneumonia, and on Saturday last, we grieve to say, he died. It is fifty years since the town was startled by his statue of Milo, produced under great difficulties. Mr. Lough will be remembered with regard by all who knew him.

DOORWAY OF THE CHURCH OF SANTA MARIA DELLE GRAZIE, MILAN.

All visitors to Milan know the church of Santa Maria delle Grazie, with its chevet and cupola joined on somewhat inartistically to the nave, and they know it the better as it is in the refectory of the more ancient convent here that Leonardo da Vinci painted the well-known "Last Supper." The Dominicans had commenced the church, and Ludovico il Moro, when he became Duke, gave them warm assistance, and, if tradition is to be believed, became also the architect.

When the church was nearly finished it became evident that the nave wanted depth, that the choir united badly with it, and that if the cupola were completed the evil would be irreparable. Leonardo having been called in at this moment to paint the frescoes in the convent, pointed out the position of things, and led to the stoppage of the works. The duke invited a competition of architects, but, according to the story, adopted the plan of none. Somehow or other, however, the choir having been knocked down, the present chevet and its remarkable cupola were built, and they constitute one of the most remarkable monuments of the Renaissance in Italy.

In 1497 the cupola was not finished, and the works were languishing for want of funds, when Beatrice d'Este died. The Dominicans obtained her body, and the grief of the duke, her husband, vented itself in a perfect shower of marble and gold to render the church a fitting place of sepulture.

The doorway represented by the accompanying engraving is at the end of the nave, the centre of what we should call the west front. The design of this doorway, as well as that of the cupola, has been ascribed to Bramante, though a comparison with known works by him scarcely justifies the ascription.

One Pere Gattico, who wrote a chronicle at the commencement of the seventeenth century, states that the duke directed the work himself, with the co-operation of several architects, including, probably, Bramante.

THE PROFESSION IN INDIA.

Sir,—The following is a *professional* card, that will serve to show you the advanced and enlightened state of architectural art in Calcutta, the capital of our Eastern Empire. I think this worth a corner in your journal:—

"Moteewoollah Mistry & Co., Jaun Bazar-street, Builders, Architects, and House-drainage Contractors, which especially they have done Calcutta Municipality, up to the end of March last 1876."

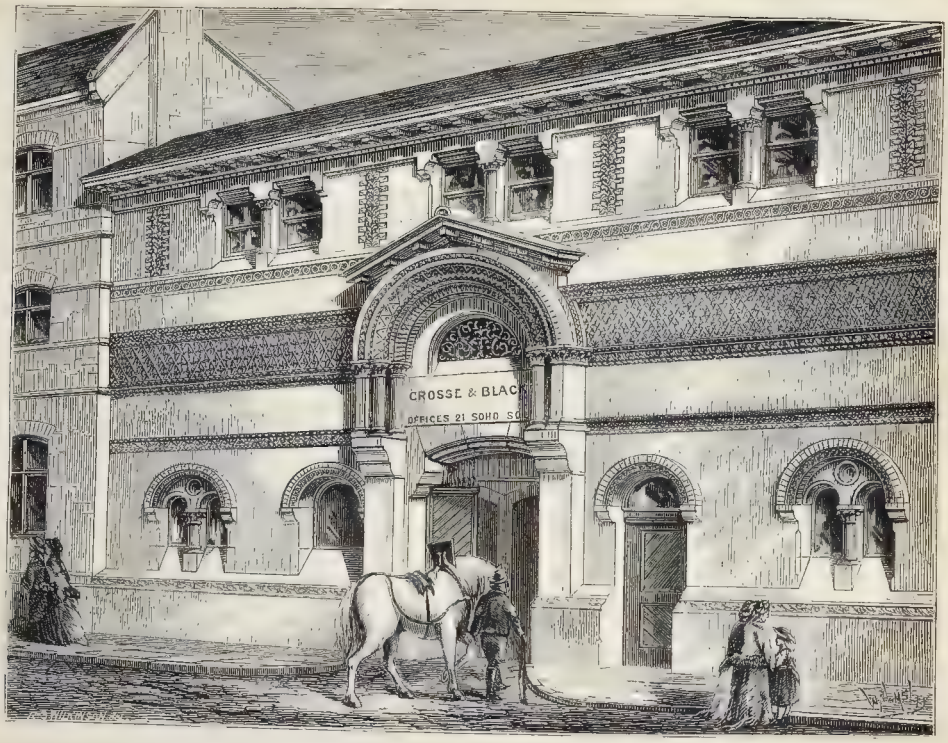
Or take this advertisement:—

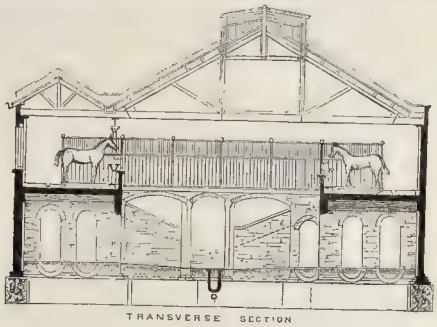
"Cog & Co., Dhurrumtollah-street, Architects, Surveyors, Builders, Engineers, and General Contractors. Contractors for the reception arrangements at Prinsep's Ghât for the landing of H.R.H. the Prince of Wales. Teak and sal timber in all sizes and quantities procurable. For sale, chalk, crowbars, &c." R. B. B.

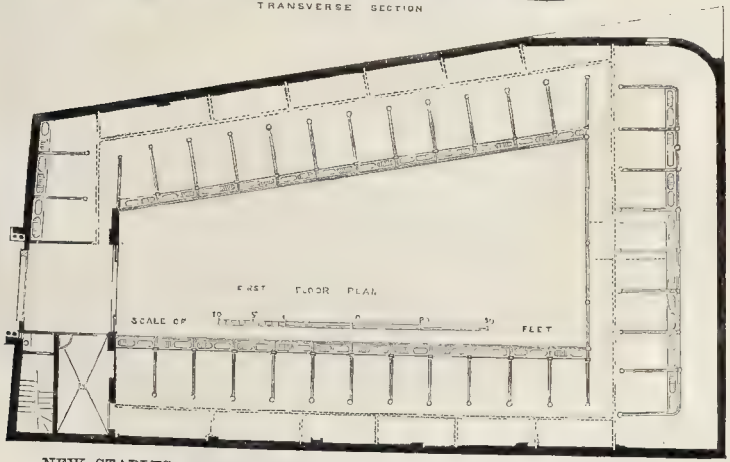
Calcutta.



DOOR OF THE CHURCH OF "SANTA MARIA DELLE GRAZIE," MILAN.—Fifteenth Century.




TRANSVERSE SECTION



NEW STABLES, CROWN STREET, SOHO.—Mr. R. L. Roumieu, Architect.

NEW STABLES, CROWN STREET, SOHO.

So much information has been recently given in our pages about Soho, and particularly about Crown-street (see vol. xxxiii., p. 882), that it is almost unnecessary to occupy space with any further observations upon the various transitions through which that street, originally called Hog-lane, has passed from the olden time, when it was a road or way through a deer-park, as shown upon an old map, engraved some time during the reign of Henry VIII., and which park most probably belonged to the adjoining wealthy monastery of St. Giles-in-the-Fields before the suppression of the religious houses, which took place about that period. In a subsequent map it is shown as a wide, half-enclosed lane, leading from Cockspur-street and Charing-cross up to the road to Reading, now Piccadilly, bending off to Holborn, and called Hog's-lane, which name the upper portion retained long after it had been built upon. The restrictions against building upon new foundations had during the protectorate been removed. During the two following reigns the then fashionable district of Soho, the Belgravia of the later Stuarts, had been erected, and houses of respectable pretension were erected along its sides. It, however, in spite of its fashionable neighbours, soon degenerated, and in Hogarth's time it is represented as inhabited much as it is at present. The site of the building we now illustrate (Messrs. Crosse & Blackwell's new stables) is as near as possible upon the spot where Hogarth painted his "Noon," with the Huguenot congregation coming out of the church of Pastor Hervé (the original founder of the National Society). The site of these stables was, until lately, occupied by a very old inn (the Plough), with its dormitories and stables, at one time standing on the skirts of London, and which, like its neighbour, the Black Horse, in Rathbone-place, had a large yard, round which there was a gallery with bedrooms, and stables underneath them. This yard had become a cow and stable yard, surrounded with semi-ruinous buildings, when the whole was pulled down, to make room for the present building. The great value which is now attached to land makes it necessary to economise space in every way, particularly surface, and the London stables are following the example set by the London houses of shooting up vertically, instead of spreading horizontally. The premises, of which a plan is given, have a central open space, the height from floor to ridge being 40 ft., round which, on the ground-floor, are recesses for eighteen vans and stabling for four horses, with store-spaces for straw and fodder, harness-rooms, and a yard for dung, water-closet, &c., with a double inclined plane, of an easy ascent, to the principal stable-floor, 13 ft. above the ground-level. On the stable-floor there are stalls for thirty-five horses, and a loose box for a sick horse, with a fodder, hay, and chaff room. In the front, towards the street, on the floor above, are the stablemen's living and bed rooms, &c., with windows looking into the open space above the stable, so that a view can be taken at any moment of the whole of the stables on the upper floor. The floors throughout, except the inclined plane, which is of binding gravel, is laid with Messrs. Wilkinson's, of Newcastle-on-Tyne, new patent gravel concrete cement, which has shown itself to be an enduring flooring for stables. This is spread upon a layer of finely-broken bricks, covering the arching. The stalls are the ordinary iron stalls, of the best forms, the divisions resting upon small stone blocks, so as to raise the cill-pieces about 3 in. above the floor-level, to allow a free ventilation through the litter. There is a large iron tank, so placed as to flow into the water-troughs, and by a hose to wash down the stalls; with a hydrant for use in case of fire. The whole area is lighted by a continuous lantern, with lights to open upon centres, to insure good ventilation, and gas is to be laid on for night.

The front is built of red brick, with stone dressings, and an admixture of Pether's ornamental bricks.

The architect is Mr. R. L. Roumieu; the builders are Messrs. Southgate, of Highgate; and the clerk of the works is Mr. Cornish. The carving was done by Mr. Frampton. The stable fittings were provided by Messrs. Andrew McLaren & Co., of Upper Thames-street.

Rochdale.—Messrs. W. & T. Wills, of London, have been commissioned to execute a colossal marble statue of the late Mayor, Mr. G. L. Ashworth, to be erected in the town by public subscription.

OPENING OF THE EAST LONDON RAILWAY TO LIVERPOOL-STREET.

The East London Railway, which was opened for traffic on Monday last throughout its entire length,—between the junction at New-cross with the London and Brighton and South-Eastern lines, and the terminus of the Great Eastern line in Liverpool-street,—is an important and valuable addition to the network of railways having their termini within the metropolis, inasmuch as it not only opens out to the East End direct and immediate communication with the London and Brighton and the South-Eastern Companies, and the various counties and districts south of the Thames which those railways intersect, but also places the London and Brighton Company in the advantageous position of having a separate and independent terminus in the City, in addition to those which it already possesses at London Bridge and Victoria. The facilities which it also offers for ready and immediate communication between the City and the Surrey and Commercial Docks renders it of additional value when regarded from a mercantile point of view.

The East London Railway—now an accomplished fact, after an expenditure of 3,200,000*l.* for the construction of only 6¼ miles length of line—has an exceptional history specially its own. It may be said to owe its origin and existence mainly, if not entirely, to the failure of the Thames Tunnel both for passenger and other traffic, and had that undertaking not been carried out, the probability is that the line just completed, and which has this week been opened for traffic, would never have been projected. It was when all hope of the tunnel ever becoming a commercial success had been abandoned that the present chairman of the East London Railway, Mr. W. Hawes, who at the time had just succeeded to the chairmanship of the Thames Tunnel Company, proposed that the tunnel should be utilised as a portion of a projected railway between the Great Eastern London terminus and the London and Brighton line at New Cross, and eventually the East London Company was formed, and after a determined opposition from several parties, who were successful against the Bill on the first Parliamentary application, the company ultimately obtained their Act in the Session of 1865, an arrangement being entered into with the Great Eastern Company (who in the same session, obtained their Metropolitan Extension Act) that the line for a mile into Liverpool-street should be common to both companies, the East London paying a certain proportion of the cost.

With regard to the line itself and its construction, we may state that, leaving the Great Eastern line, near Brick-lane, it proceeds in an open cutting by a curve in a south-easterly direction, until it arrives at what was originally intended to be called the Brick-lane, but which has been altered to the Shoreditch Station, a commodious structure, with the booking offices on the street level above the railway platforms, being reached by a staircase on either side. The line from its diversion from the Great Eastern to this point is carried on by a slight descending gradient. Passing on from the Shoreditch Station the line passes by a tunnel under the Great Eastern Company's goods and coal yard, and near the point where the line emerges from the tunnel a short fork or branch to the north-east on an ascending gradient forms a goods junction with the Great Eastern Company's depôt. Whitechapel Station is then entered. This is regarded as a principal station on the line, and from which a large amount of passenger traffic is expected. It is a large and convenient structure, 460 ft. in length, and is covered in by an arched roof consisting mainly of glass. The booking-offices are entered from the north side of Whitechapel, and are nearly on a level with the thoroughfare, and on the right side of the area in front of the booking-offices are passengers' waiting-rooms. At the rear a gallery and staircases lead down to the platforms. From the Whitechapel Station to the Shadwell Station the line is carried entirely through a tunnel, with several shafts for ventilation purposes, and after crossing under Whitechapel, skirts the London Hospital, immediately on the north-east side. With the exception of the tunnel under the London Dock basin, the heaviest portion of the engineering work was at the Shadwell Station, where the line passes immediately under the Blackwall Railway. It was found necessary to underpin seven of the piers supporting the Blackwall Viaduct to a depth of 60 ft., and this was effected without any perceptible settlement of the Blackwall Viaduct itself.

The works under the docks, including the construction of the double tunnel, have been already described in the *Builder*. It should be added that the cost of this part of the undertaking has been still further increased by the penalties which the company have had to pay to the London Dock Company in consequence of the works not having been completed within a specified time. The dock company claimed upwards of 140,000*l.* on this account, but only 45,000*l.* were awarded them. The accomplishment of the line under the docks completes the new portion which has just been opened, and joins it with the station at Wapping, whence the line is continued *viâ* the Thames Tunnel, to the Rotherhithe and Deptford-road Stations, and shortly after passing the latter station a new junction on the high level is formed with the Brighton Company's station at New Cross, with a fork to the south-west forming another junction with the South London line at Old Kent-road; whilst on the east side a junction is likewise formed with the North Kent section of the South-Eastern line, the East London Company's present low-level line to New Cross being retained for purely local traffic. The whole of the works, which are of a very substantial character, have been carried out by Messrs. Walker, from the plans of Sir John Hawkshaw, under the superintendence of Mr. W. Hunt, the resident engineer. The walls of the excavated portions of the line and open cuttings are faced with concrete. Considering the heavy portion of the tunnelling and general underground work, the line between Wapping and Liverpool-street has been executed in a short time, it being not more than three years since they were commenced, and within the last few months, in order to facilitate their completion, not less than 5,000 men have been employed at various points.

Locally, the new line will accommodate the whole of the southern and eastern districts situated between New Cross, Deptford, Rotherhithe, Wapping, St. George-in-the-East, Limehouse, Stepney, Whitechapel, Bethnal-green, and Shoreditch, in addition to affording an outlet into the country by the Brighton and South-Eastern lines, and the promoters are very sanguine as to its ultimate great success, Mr. Hawes, the chairman of the company, observing, at the inspection of the line which was made on Wednesday week, that with the Great Eastern at one end of it, and the London and Brighton line at the other, the difficulty would be not to secure traffic, but to find accommodation for the very large traffic, both in passengers, goods, and minerals, which he was confident would come upon the line.

MASTERS AND MEN.

Building Trades Dispute in the Potteries.—On the 30th ult., at Tunstall, Mr. Enoch Wedgwood, umpire in the arbitration going on in reference to the dispute in the building trade of the district, met representatives of the builders and the workmen for the purpose of having the matters in dispute laid before him. The carpenters and joiners of the Potteries and Newcastle had applied to the builders for a reduction of the hours of work—now 56½—to 54 per week; for an increase of wages from 7d. to 8d. per hour; and for an alteration in the rule as to overtime so as to prevent lost time being counted on the week before overtime payment is allowed. At present no man who has lost time during the week can claim payment for overwork until he has made up the lost time. The proposed alteration is to restrict the operation of lost time as a bar to the payment of overtime money to the day, so that, for instance, if a man loses time on Tuesday, and he makes overtime on the Wednesday, the lost time of the Tuesday shall not count as against the overtime of Wednesday, but the overtime shall be paid for in full if no time has been lost on the Wednesday. Mr. Gaskell opened the case on behaf of the operatives, remarking that the changes they asked for were quite requisite. The hours worked in the principal towns of the country were 54 per week. There had been great diversity in the hours worked in this district, and on behalf of the five hundred men he represented he asked for a uniform term of 54 hours per week. Another of the men's representatives urged that the carpenters and joiners were entitled to a share of the advantages arising from good trade, especially as there was a very great demand for their labour. It was pointed out that some masters

paid 7½d. per hour, and the operatives desired uniformity. It was further stated that it cost a man 2s. 6d. per week for the renewal and repair of tools, which really reduced the wages by so much. It appears that the present rate of wages is 1*l.* 12s. 11d. per week in the nine summer months, and 1*l.* 9s. 5½d. in the three winter months. Mr. Walley, on the part of the employers, said the men asked that their ordinary hours should be from six to five throughout the year, whether they worked indoors or not. The hours would be reduced two hours and a half a week, and the wages increased to 1*l.* 16s. per week. He pointed out the unfairness of putting outdoor work in winter on the same level as indoor work, and said the present annual earnings of a carpenter and joiner amounted to 82*l.* 9s. 4d., and the increase proposed would make the amount 93*l.* 12s., a gain to the man of 11*l.* 3s., besides the saving in time. This would be a net increase of about 15 per cent. to the present wages, and its effect upon property would be that the increased cost of building would be equal to the addition of 7½ per cent. to the rents of cottage houses. Mr. Walley referred to the other points raised, and was followed by Messrs. Gallimore and Leonard, both of whom denied, amongst other things, that the renewal of tools was equal to 2s. 6d. per week, as stated by the men. After hearing the statements of both sides, Mr. Wedgwood intimated his intention to give his early attention to the matters in question, and has since made the following award. He confirms the rules already in existence, with the exception of Rule 2, which will now read:—"The ordinary rate of wages for skilled operatives to be 7½d. per hour; superior and inferior workmen to be rated by mutual agreement with the employer." The effect of this award is to advance wages from 7d. to 7½d. per hour.

Accrington.—In October last the operative carpenters and joiners of Accrington received an advance of ½d. per hour, making 7½d. per hour. They gave notice for an advance of another ½d. to commence on the 1st of May, and also to have their hours reduced from fifty-four to forty-nine. The masters held a meeting last week, and resolved that the present state of trade will not warrant the men's demands being complied with.

Bath.—The strike among the Bath house-painters is practically settled. The employers have conceded an advance of ½d. per hour, and a large number of men have resumed work.

Bolton.—The painters of Bolton—from 150 to 200 in number—struck work on the 1st inst. for an advance of wages. Some months ago they gave notice of an increase of one penny per hour, or 4s. 6d. per week, to commence from the 1st of April. The masters offered to concede one halfpenny, but this was refused, as also was a proposition to refer the matter to arbitration. Three firms have agreed to give the advance, but the rest of the employers remain firm in their refusal.

Bristol.—The Bristol Builders' Labourers' Union have issued a notice demanding a general advance of ¼d. an hour in wages, to take effect in August. At a crowded meeting held on the 28th ult. it was determined to adhere to the terms of the notice. About 2,000 men are affected.

Coventry.—Three months ago, the secretary of the Coventry Builders' Association received three months' notice from the carpenters and joiners that, after the 31st of March, they should require their present wages of 6¾d. per hour to be increased to 7½d. per hour. The men also expressed their desire to work two hours less per week, *i.e.*, to commence work on Monday mornings at seven o'clock instead of six, and leave at twelve o'clock on Saturdays instead of one. Shortly after receiving the notice the masters expressed their willingness to increase the pay of the carpenters and joiners to 7d. per hour, but the men resolved to press for 7½d. It was expected that the matter would be settled by the 1st inst., but as this was not the case a meeting of the men took place on that date, when it was resolved to give the masters three days longer in which to settle the matter. Subsequently another meeting of Society men was held, and it was then resolved to strike at once, but as the whole of the men were not present the decision arrived at was by no means a unanimous one. On the 3rd inst. a considerable number of the men struck work. The painters and labourers have also given notice for a rise of wages,—the former 1d. and the latter ¾d. per hour. The notices have expired, but the matter is not yet settled.

Dundee.—The whole of the operative painters of Dundee are at present locked out, and there seems to be no prospect of an agreement being arrived at with employers. The cause of the dispute is a refusal to grant an increase of wages. The men, 170 or 180 in number, came out on strike on the 25th ult., as recorded in the *Builder* a fortnight ago, for an increase of ½d. per hour, making the rate 7½d. per hour. They have also demanded that the masters be bound by a new code of working rules. The masters have determined to resist the demand of the men. At a special meeting of the Painters' Protective Society, held in Buchanan's Hall, Edinburgh, on the 4th inst., it was unanimously agreed to send 20*l.* to Dundee to help to support the painters there at present locked out, and to further support them. Large numbers of men have left for Carlisle, Newcastle, Liverpool, London, and other towns.

Edinburgh.—A meeting of the Edinburgh United Operative Plasterers was held on the 24th ult., to consider the employers' reply to the resolution passed at a previous meeting to request an advance of wages to 10d. per hour. The employers offered to meet the men half way,—that is to say, to give 9½d.,—but the meeting, after considerable discussion, resolved to adhere to the former resolution, declaring for 10d. per hour. The full claims of the men have since been conceded.——An aggregate meeting of the operative house-painters of Edinburgh has also been held, to consider the employers' reply to a request made by the men for an advance on their present wages. The reply received was to the effect that the masters would not agree either to grant an advance or to meet a deputation from the men, or to submit the matter to arbitration. The meeting was adjourned without any definite resolution being come to.

Galashiels.—Owing to the strike of the Galashiels masons and hewers (who demand a rise of wages from 8d. to 8½d per hour), a large number of joiners have been thrown out of employment. At present there are no signs of a speedy settlement of the dispute.

Greenock.—On the 3rd inst. about 200 of the operative masons of Greenock struck work against a reduction in their wages of 1d. per hour (from 10d. to 9d.) proposed by their employers. The men express their determination to remain out on strike until the old rate of payment is returned to, and have received word from Dundee that the executive of their union have recognised the strike. They have a rule according to which a man who is on strike may accept 10s. as travelling money, and about forty of the Greenock masons have taken the 10s. and left the town. These men forfeit all further claim on the society during the continuance of the strike. The joiners, to the number of 160, struck work on the 5th inst., because the masters refused to give them an increase of ½d. per hour.

Huddersfield.—The lock-out of operative painters at Huddersfield has terminated. The men have agreed to accept the masters' offer of 6½d. per hour as the ordinary rate of wages. Superior and inferior workmen are to be paid as agreed on between master and man.

Hull.—The painters and joiners of Hull, who are "union men," have gone out on strike for an advance of wages and a reduction in the number of hours of labour. The painters ask for an advance of ½d. per hour, and a reduction of hours from 56½ per week to 53. The Masters' Association declined to accede to the terms, contending that the state of the trade was such that these terms could not be complied with. Many of the masters who do not belong to the Association have, however, paid the advance rather than have their work stopped at this season.

Kirkaldy.—The operative painters in the Kirkaldy district are about to agitate for a rise of wages to the extent of ½d. per hour, and also for an allowance for lodgings when working out of town.

Leith.—At a meeting of house and ship painters, held a few days ago at Leith, it was agreed to form a branch of the English General Association, which now numbers over 9,000 members.

Macclesfield.—The Macclesfield bricklayers have received an advanced of 4s. per week on summer wages, and 2s. on winter wages, and a concession of half an hour each day for breakfast in winter.

Manchester.—The operative house-painters of Manchester and Salford, 800 in number, have struck work. Six months ago the men asked for an advance of a 1d. per hour in their wages, and an increased "country allowance." The employers, on the other hand, gave notice of a reduction of ½d. per hour, but agreed to refer the matter to arbitration. The Bishop of Manchester was chosen as umpire by a representative committee of employers and employed, and the award which his lordship has given is, that the men should have an increase of ¼d. per hour on the present rate of wages. While the employers were willing to accept this decision as final, the workmen have repudiated it, and struck work at a moment's notice, thereby violating the arbitration rule and the agreement as to six months' notice of its alteration. The employers have consequently opened their shops to non-union workmen.—— The six months' notice given by the operative plumbers of Manchester, Salford, and the district to their employers, demanding an increase from 34s. to 36s. per week in their rate of wages, and a reduction of their hours of labour from 54½ to 49½ per week, expired on the 31st ult., and as the employers still refuse to make the concessions asked for, the men, acting upon the decision of an aggregate meeting of the trade, have come out on strike. There are about 700 men employed in the trade in this district, and as all alike will receive support, whether connected with the Amalgamated Society of Operative Plumbers or not, it is expected that the whole of this number will cease work unless the terms demanded are conceded. It is stated that several of the employers have already expressed their willingness to grant the application of the men.——The plasterers' hod-carriers of Manchester and Salford have come out on strike because their employers refused to grant them an increase of 1s. per week in their wages—from 27s. to 28s., and a reduction in the hours of labour of six per week—from 54½ to 48½ hours per week. The employers have decided to employ non-union men.

Newcastle and Gateshead.—Some three months ago, the painters of Newcastle and Gateshead asked for an increase of wages to the extent of 1d. per hour, and 3s. per week for staying in the country over Sunday, and at the same time giving the employers three months to reply. That period having expired on the 1st inst., the employers refused to give any increase upon the present rate. A meeting of the trade took place on the 5th inst., when about 300 operative painters were present, and it was resolved unanimously to adhere to the original resolution.

Rothesay.—The joiners of Rothesay have been out on strike for an additional halfpenny per hour, but the dispute has been terminated by the masters conceding the men's demand.

Scarborough.—The carpenters and joiners of Scarborough went out on strike on the 1st inst. They demand an advance from 7d. to 8d. per hour, but the masters decline to give more than 7½d. Messrs. Kirk & Parry, the Aquarium contractors, have agreed to concede the advance, and the Society has consented that those men belonging to it, who were employed at the Aquarium works, shall return again to their duties. The masters, as a body, however, are not disposed to yield the men their demands. Several large contracts are stopped in consequence.

Southport.—A strike of joiners commenced on the 1st inst., at Southport. The men gave the usual notice for an advance of pay to 9d. an hour from the 1st of April. Some of the masters were willing to pay that sum to the more skilled workmen whom they considered worth it, and other employers offered 8½d. per hour up to the 1st of August, when they would advance to the 9d. Neither of these proposals was accepted.

Wigan.—On the 1st inst., the whole of the bricklayers in the Wigan district struck work for an advance of wages. The men are at present paid 33s. per week in the winter, and 36s. in the summer, the hours of working being 49½. In December last they applied for an advance of 3s. per week, to come in force on Saturday, April 1st; and as this was not complied with, the whole of the men left work. The bricklayers' labourers have also given notice, asking for an increase in their wages from the 1st of May, but the strike also compels them to stop work. The labourers are now paid 24s. per week in winter and 26s. in summer, and they apply for an advance to 28s. per week the whole year round.

York.—A meeting of builders' labourers was held at York on the 31st ult., to consider whether the ½d. per hour advance offered by the masters be accepted or not. Ultimately it was unanimously resolved that the ½d. be accepted, provided that the other ½d. per hour asked for be given from the 1st of May next.

THE METROPOLITAN BUILDING ACT.

PARTY-WALLS.

Sir,—I was much interested in the article on this subject so liberally adverted to in your journal lately, especially in regard to the question of party-walls; but there is one point of considerable interest to which I find no reference. As I was a great sufferer from the want of thorough knowledge on this point thirty years ago, I take leave, as one of your constant and admiring readers, to name the subject as a warning to the public against the misfortune which befel me.

I had occasion to rebuild a house on Crown property, in one of the main streets at the west end of London, employed one of the most eminent builders, and found the party-wall thoroughly sound, but it was condemned by the district surveyor as insufficiently thick under the new Building Act. My neighbour had recently rebuilt his house, to which no such objection applied; but when I presumed I might use it in the same way, I found that between *two new houses* it was inadmissible, as in such case the law required a greater thickness of party-wall. My neighbour declined to receive notice to rebuild, or to submit to the inconvenience of my doing so. I could not blame him, for he was supported by the Crown officers and the district surveyors in his legal objection, and I had no alternative but to build a new wall on my own side, losing the valuable space it occupied. I might possibly have avoided this before I pulled the old house down, by contriving to bring my alteration under the category of a repair, but the facts are as stated, and I am glad to offer them to public notice for what they are worth.

William Banting.

*** We are disposed to think Mr. Banting must have been insufficiently advised, or that there were circumstances not mentioned in his letter.

HAMPSTEAD VESTRY-HALL COMPETITION.

The site chosen is a piece of land at the corner of the London-road and Belsize-avenue, and somewhat less than a quarter of an acre in extent, one portion of it being over a railway tunnel, and for which 2,800*l.* was given. For the building itself, which is to include a room for the vestrymen to meet in, a public hall capable of seating 800 persons, surveyor's and vestry clerk's and other offices, eight plans were received in competition from seven architects. One not being in accordance with the conditions, seven remained, and from these, three were selected by a committee for the Vestry to choose one from. The chairman expressed his opinion that the Vestry ought not to spend much more than 10,000*l.* on the hall, and Mr. T. Bate moved that the Vestry should only consider those plans which were estimated by the architects to cost not exceeding 10,000*l.* to carry out. This was carried, its effect being to throw out two of the plans recommended by the committee, and substitute others, there being but three of the seven plans within the amount stated. Mr. Hackworth moved that the plan marked "Cavendo tutus," the cost of carrying out which the architects estimated at 9,375*l.*, and Mr. Lowe, the Vestry's surveyor, at 11,220*l.*, be accepted, as being in all respects the most suitable, and especially as to cost. Mr. Maltby seconded the motion, which, after much discussion on details, was adopted unanimously, it being understood that the architects (who proved to be Messrs. Kendall & Mew, of Burlington-road, Westbourne-grove) would be called upon to make certain alterations to meet the views of the Vestry's surveyor. A premium of fifty guineas was awarded to Mr. Charles Bell, for the second best design; and one of twenty-five guineas to Mr. F. W. Hunt for the next best.

MANOR PARK CEMETERY CHURCH COMPETITION.

Sir,—As there was an error in Mr. Duncan's letter, inserted in the *Builder* of April 8th, respecting our tender, will you allow us to state that the company, having advertised for tenders to be delivered "not later than" March 1st, our tender of 2,383*l.* was the lowest sent in by that date, as the list you published indicates. The company, however, refused to give us a definite answer, either one way or the other, for more than a week, by which time we suppose the person who was acting as architect had succeeded in hunting up another tender, dated March 8th, at a lower price, which a few days after we were informed was accepted.

Whether such a method of transacting business is as straightforward and satisfactory as the company's secretary wishes to make it appear, we leave for your readers to decide. Staines & Son.

TOBIN'S (?) VENTILATION.

Sir,—The payment of royalty by the School Board for London to the patentee has raised questions of so much importance to the architectural profession that the matter ought not to be left as it now stands. I submit, therefore, the following particulars for the consideration of your readers (the patentee included):—

On the 19th of February, 1872, the late Mr. Edward Roberts read a paper before the Royal Institute of British Architects, entitled "Some Practical Hints on House Building," which paper was issued to members within a few days. After objecting to the admission of cold air in a horizontal direction, as causing draughts, and to the practice of admitting warmed air "through vertical pipes," he says,—"cold air should always be admitted vertically, and, if possible, above the shoulders of sitters. Cold air thus admitted will ascend several feet without departing from its columnar form." "Again, every kind of ventilation,—that is, inlets and outlets, cold and warm, self-acting and forced, should be always by tubes." For this purpose he recommends zinc. In his summary of conclusions, he says,—"never ventilate except by pipes."

In the discussion which followed, Mr. Seddon said that "the best position to bring fresh air into a room is about the height of the head, in a vertical column; but it is generally difficult to do this in habitable rooms," as "you cannot cut off a corner and introduce a pedestal where you like." Mr. Charles Barry agreed that cold fresh air should be admitted vertically, and Mr. Aitchison also agreed as to the employment of zinc pipes for that purpose. In his reply, Mr. Roberts reiterated his advice, and illustrated it by a sketch on the board.

Thirteen months after this (April 24th, 1873) Mr. Tobin lodged his provisional specification, and his patent was sealed on September 16th, following. He specifies the object of his invention as an apparatus for admitting air into an apartment so as "to take an upward fountain-like direction," and "without any draught," and by preference he admits it at the meeting-rails of the window-sashes. Indeed, so prominent does he make this plan that the official abstract of the patent notices this only. Then comes his alternative, "in some cases, where the above arrangements cannot be conveniently employed for admitting air, I pass a tube through into the apartment and form or turn the mouth or inlet so as to give the air as it enters the apartment an upward fountain-like direction." Also, "this tube may be carried to any required height." Later on, he says his tubes "may be so placed as to pass through statuettes,"—the same idea apparently as was more exactly expressed by Mr. Seddon's "pedestals." Finally, he claims "the arrangement and application of tubes for carrying and introducing cold atmospheric air into rooms or apartments, substantially as shown in figs. 5, 6, and 7," which figures, while they no doubt illustrate his meaning, seem to show forth equally well the plan discussed at the Institute,—even to the putting of the tubes in corners of the rooms. I ought perhaps to say that he shows also a hole in the wall, but we may hope he does not patent that.

During the next eighteen months Mr. Tobin applied the system to various buildings. The *Times* for April 12th, 1875, devoted a long article to it, noting specially that the "behaviour of the entering current will be precisely like that of the vertical column of water sent up by a fountain." In the discussion which ensued, Mr. Brudenell Carter (April 20th) solemnly assures Captain Galton that he "is mistaken in supposing that either he or any one else in England (!) has ever before adopted anything like Mr. Tobin's system," the essence of which, as he understands it, "depends upon the delivery of air in a vertical ascending column, and in the utilisation of the pressure of the atmosphere for maintaining the vertical ascent of the inflow after it is delivered." Indeed, Mr. Tobin is held up as a great discoverer, and compared to Christopher Columbus; I suppose because he was the first man to set a draft on end.

I believe that an attempt to form a company to work the patent failed, and it was generally thought that this plan,—of the general applicability of which architects thought quite as little as the patentee seems to have done,—might still, under suitable conditions, be freely applied. Mr. Tobin is, however, now encouraged to contest this point. I observe that he has a manner of first taunting his opponent and then promising some future disclosures: will he tell us plainly how he expects to support his patent in the face of such evidence as the above? Not that I suppose his patent to be other than the fruit of his own independent thought, but only that the plan was anticipated and publicly described long before its date. If he is right, it is possible that any scheme described at our meetings, and published in our Transactions (which are written "by architects for architects"), may forthwith be patented by anybody, so that no architect,—not even the one who introduced it,—can use it for the next fourteen years without paying toll to the patentee. This subject seems well worthy of the columnar form of ventilation which you can give to it. Thos. Blashill.

LOCAL SANITARY BYE-LAWS.

The attention of the Council of the Institute of Architects has been drawn to several instances in which, under the Bye-laws of Local Sanitary Authorities, *elevations*, as well as plans and sections, of new buildings are required to be submitted for approval and permanently deposited. It has been represented that this requirement is in excess of the conditions specified in the Public Health Acts of 1848 and 1875, and the Local Government Act of 1858, in all of which "plans and sections" alone are required. As the additional demand for "elevations" involves a question of copyright, the Council have been urged to memorialise the Home Secretary on this subject. With this object in view, they will be glad, they say, to receive from country members and other provincial architects any information as to cases in which the demand has been made, and under what authority.

NEW CONGREGRATIONAL CHURCH AND SCHOOL, LEYLAND, LANCASHIRE.

Immediate operations towards the erection of these buildings are about to take place on a very eligible site,—the first of many handsome gifts of Mr. J. G. McMinnies, J.P., to the trustees of this church. Seating accommodation will be provided in the church for 430 people, the vestries for the minister and choir and the organ-chamber being at the north end.

The schoolroom will be 42 ft. by 32 ft.; height of ceiling, 17 ft. Two adult class-rooms and one galleried room for infants, with the necessary spaces for hats and cloaks, will be provided, and also a boiler-room, scullery, and heating-vault in the basement. The closets in the yard will be on "Morrell's" patent ash principle. The plans have been prepared by Mr. David Grant, architect, Preston.

PRIZES OFFERED BY THE TURNERS' COMPANY.

Skilled artisans will be interested in the announcement that the Master, Wardens, and Court of Assistants of the Worshipful Company of Turners, according to their custom, propose to give this year their silver medals and the freedom of the company and of the City of London to any workman, whether master, journeyman, or apprentice in the trade in England, who may send in the best specimen of hand-turning in each of the three subjects of competition. This year the subjects of competition will be turning in wood, pottery, and diamonds. The competition in wood includes turning in both hard and soft wood. The qualities which will be considered in awarding the prize will be the following, viz.:—1. Beauty of design, symmetry of shape, utility, and general excellence of workmanship; 2. Exact copying; 3. Fitness of the work and design for the purpose proposed; 4. Ability to turn, whether circular or oval, in both classes of wood; 5. Novelty in application of turning or in design; 6. Carving and polishing are admissible. The candidate may make his own selection from the above conditions, but the one who best fulfils the largest number, including the most important qualities, will be preferred. The work must be all hand-turning, produced in the lathe without special rest or tool apparatus, and the carving must be the work of the exhibitor. Specimens must not exceed 24 in. in height, and 1 ft. in diameter.

The competition in pottery includes terra-cotta, stone, earthenware, and porcelain, but all unglazed. The conditions are to be similar to those in the wood competition; beauty of design, utility, fitness for the intended purpose, and excellence of workmanship will be considered in awarding the prizes. In addition, ornament

produced by the runner or other hand tool, and also incised work, are permitted, but they must be subsidiary to the turning. No competitor to send in more than two specimens, neither of which must exceed 18 in. in height. The bronze medal of the company will be given to the competitor second in merit, and the company's certificate of merit to the third, in each of the above subjects of competition. In addition to this, the Court has placed at the disposal of the judges a sum of 30*l.* to be distributed, according to their discretion, as money prizes, viz.:—15*l.* among the exhibitors in wood, and 15*l.* among those in pottery.

In the diamond cutting and polishing competition the Baroness Burdett-Coutts, who is a member of the company, has placed at the disposal of the Court the sum of 50*l.* to be distributed in this class among the competitors according to the discretion of the judges.

The judges will be:—In the wood competition: Mr. Charles Hutton Gregory, Mr. John Jaques, Mr. John Jones, Mr. Ridout (a silver medallist), and Mr. Thomas B. Winser. In pottery: Mr. John J. Holtzapffel, Mr. Alfred J. Copeland, and Mr. W. H. Northcott. In diamond cutting and polishing: Mr. John Hunt, Mr. L. Keller, and Professor Tennant. The Lord Mayor has consented to present the prizes on Thursday, October 12th.

CRYSTAL PALACE.

THE dramatic performances at the Crystal Palace, under the direction of Mr. Charles Wyndham, have deservedly gained so much in interest since they were first established, that the theatre in which these representations are given has become inadequate to extend to the general public that amount of accommodation which is due to an exceptionally discriminating audience. Whether it is the improving atmosphere of the Palace which diffuses itself to the theatre, or the scrupulous avoidance of all expletives which offend the ear and shock the moral sense, we know not; but certainly a clerical element is very recognisable amidst the crowd. Were the orchestra placed beneath the stage, the nuisance of the ever-moving and distracting musicians would be avoided, and the auditorium should be revised both in respect to acoustic conditions, shape, and means of accommodation. Of the dramatic staff selected by Mr. Wyndham, Mrs. Stirling is a favourite member. The "Comedy of Errors" was represented on Thursday last week, and the part of *Adriana* was sustained by Miss Helen Ashton. The setting forth of that character, though it is subordinate to the drollery of the two *Dromios*, is made susceptible of engaging deep interest by the undercurrent of love which is betrayed beneath the impetuous display of jealousy, and Miss Ashton did full justice to the opposing sentiments, especially when, after decrying her husband, *Antipholus, Luciana* replies,—

> "Who would be jealous, then, of such a one?
> No evil lost is wail'd when it is gone,"—

and she retorts in her womanly nature:—

> "Ay! but I think him better than I say,
> And yet would herein others' eyes were worse:
> Far from her nest the lapwing cries away
> My heart prays for him, though my tongue do curse."

Miss Ashton was admirably seconded by Miss Maria Davis as *Luciana*; and we need only add that the two *Dromios* were represented by Messieurs Lionel Brough and Charles Collette to show that the play was properly presented.

PIECE-WORK QUESTION.

AT the general meeting of the Iron Trades Employers' Association, recently held, the results of an inquiry ordered by the committee in consequence of various allegations by the Amalgamated Society of Engineers were submitted, and have been printed.

The report said,—"In one important respect the information gained by this inquiry is most conclusive. One of the objections to piece-work is that, by its application, weekly ratings are reduced to the lowest possible point. The replies have shown that weekly ratings are higher in districts where piece-work most obtains, than where it is never practised; and that the percentage additions on piece-work balances are highest in those shops where the weekly ratings of the men are also on the highest scale. The result of the inquiry seems, therefore, to show that the best qualified and ablest workmen are found where piece-work is the established practice in any given shop or district.

Eleven employers who have made returns as to piece-work have made no statement as to additional earnings in this respect.

The number of employers,—all being members of this Association,—who were asked to give information was 198. Of this number, 157 replied; ninety-seven stating that they practised piece-work in their shops, some in all possible departments, and some on a limited scale only; and sixty employers wrote to say that they did not practise piece-work; in some instances, because it was not adapted to their trade; in some, because of the hostility of the men: this is, however, only exceptional in its occurrence. Many of the replies state the desire the men have for piece-work, and from some important districts the returns show that the men, who have learned its value to the able and industrious mechanic, would strongly resist any proposal to limit its operations.

The information now dealt with is satisfactory, and its importance great, as it is the first attempt to submit the question to the test of facts. In the light of such a statement as is now given, it is hoped that at some future date, more complete returns may be obtained upon this subject, if it be found desirable to collect more minutely-detailed information. The present inquiry has been conducted in confidence, the name of no employer who has sent in returns has been used, or can be known to any member or officer of the Association, as the papers have been sealed up; the results as now given being all that has been required for the purposes of the Association."

THE AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

THE sixteenth annual report of the Amalgamated Society of Carpenters and Joiners has just been issued. It shows that the addition to the number of members has been 1,100, making a total of 14,917. The receipts had amounted to 36,392*l.* 0*s.* 1*d.*, and the expenditure, 22,356*l.* 3*s.* 11½*d.* The cash balance had increased from 41,264*l.* 4*s.* 6½*d.* to 55,300*l.* 0*s.* 8*d.*, being an increase of 14,045*l.* 16*s.* 1½*d.* When the buildings and other property belonging to the society had been carefully valued, the assets at the end of the year amounted to 59,735*l.* 18*s.* The savings during the year had amounted to 38½ per cent. of the entire income. The report continues: "Trade now is exceptionally good; partly so from exceptional causes. The Education Act has done much for our trade, and the numerous Board schools which have been, and are being, erected, have supplied employment for many of our members; and if only a portion of the projected alterations under the Improved Dwellings Act are carried into effect, it will greatly assist in keeping trade good for some time to come. But all this will tend to attract labour to our trade which, under different circumstances, would find employment in other branches of industry; and at some time or other a re-action must set in, as it always has done in the past. Then we shall feel the benefit of the capital which we are now accumulating, and reap the reward of making a wise provision for the hour of need. Our expenditure in unemployed benefit, which is paid to members thrown out of work through slackness of trade alone, has been remarkably light, being 2,658*l.*, or 3*s.* 6¾*d.* per member. This is the smallest amount per member which we have paid under our present rules, as the alterations of rules made in 1866 considerably increased the cost of this benefit. In compensating losses of tools by fire, water, or theft, we have expended 705*l.*; in sick benefit, 7,651*l.*; in accident benefit to permanently disabled members, 1,150*l.*; superannuation benefit, 205*l.*; funeral benefit, 1,454*l.*; benevolent grants, 690*l.*; grants to other trades, 95*l.*" The report regrets a growing feeling of dissatisfaction at what some of the members consider the unsatisfactory results of arbitration. As to the question of piecework, the report says "The public attention has recently been directed to a strike, comparatively small in its extent, but rendered important by the action theatened by the federated employers—the Erith Strike in the engineering trades. This was an attempt to resist an extension of the system of piece-work. In this struggle the men received the hearty sympathy of our members, for we, like them, object to piece-work. We are well aware that in making this avowal we are courting the disapproval of the public. We know it will be said that quantity as well as quality should be duly recognised in the remuneration of labour, and that extra strength and skill should be properly recompensed. This we all admit, and still we object to piece-work in our trade." The report gives detailed information of the position of the branches, and other particulars of interest to the trade.

OXFORD MAIN DRAINAGE.

THE construction of the outfall sewer, which has been suspended for some time on account of the floods, has been resumed.

The tunnelling under St. George's Tower and the county gaol premises is now completed. This heading being close to the river, and several feet below its bed, has been much hindered by the long-continued floods, which have also considerably increased the amount of subsoil water to be pumped out of the works generally. The crossing under the two branches of the Isis, at Pacey's Bridge, is in progress, and the heading under the Great Western Railway, near the station, will be commenced almost immediately. In the higher parts of the city the works have proceeded without intermission throughout the winter. The engineer for the works is Mr. W. H. White, A.I.C.E., and the contractors, are Mr. G. T. Acock and Mr. C. Dickinson.

A SCHOOL BOARD ARBITRATION CASE.

AT the last monthly meeting of the Diss School Board, the clerk produced Mr. Botwright's award as to the dispute between the Board and Mr. Williams, the contractor for one of the Board's schools.

It appears that the original contract for the work was 1,530*l.* 14*s.* 7*d.*, and the contractor's bill for extras, deducting 2*l.* 1*s.*, credit for old materials, amounted to 59*l.* 18*s.* 6*d.* The arbitrator, in his report, states that he found much of the work very unsatisfactory, the brickwork was very roughly built, the tiling badly done, and the valleys of the roof imperfect. He thought the architect was in error in endeavouring to keep the ridges of all the roofs at one height, as the roof of the boys' school, with 19 ft. clear width, and that of the infants' school, with 20 ft. width, rose no more than the original roof of the girls' school, which was 17 ft. in width, and the Board-room 14 ft. This he considers a serious mistake, and likely to involve great expense, as the roofs cannot long remain in their present unsatisfactory state. He does not wholly exonerate the contractor in this matter, as he should have communicated to the School Board and their architect that he found that each side of the roof would be from 2 ft. to 3 ft. shorter than in the drawings. The Arbitrator complains that in some respects the specifications are very vague, and goes on to notice the inferior workmanship and materials in the boys' and girls' cloak-room, and also remarks of the stone coping and springers that, although carried out in width according to the drawings, they should have been wider, it being an error on the contractor's part not to have seen this beforehand, and tried to have them remedied. The joiners' work in the teacher's residence is also mentioned as inferior. Generally, the arbitrator considers the building work had not sufficient supervision during its progress, and the contractor should not have been allowed to drift into what are almost irremediable mistakes and defections. The arbitrator allows a portion of the extras, which, together with the original contract, he makes amount to 1,630*l.* 18*s.* 10*d.*, and then deducts 65*l.* 3*s.* 10*d.* for defective workmanship, thus reducing it to 1,525*l.* 15*s.* Allowing 2*l.* 1*s.*, credit for old materials, and 1,148*l.* cash paid on account, he finds due to the contractor, 375*l.* 14*s.*, for which sum he certifies. As there were defects in the drawings and specifications, he considers that the cost and charges of his reference should be borne equally by the School Board and the contractor.

DIGGING OUT THE SAND.

MORRISON *v.* WRIGHT.

THIS was an action brought before Lord Chief Justice Cockburn at Kingston by the trustee of a person named Jarrett, a contractor and farmer, to recover from the defendant a sum of 600*l.*, the value of certain gravel that had been improperly disposed of by him without authority.

It appeared that the defendant had rented a small farm, consisting of a dwelling at Horsham, and ten acres of land, the rental of which was 30*l.* per annum, and 5*l.* were allowed for repairs. The landlord heard that the defendant and his family were enjoying themselves and living very extravagantly. In consequence of this Mr. Jarrett proceeded to the farm, and to his great surprise he discovered that an enormous hole had been dug in one of his fields, and that a large quantity of gravel had been taken out. He found that this gravel had been sold to various parties, and that the defendant had received from one person alone a sum of 120*l.* for gravel that he had supplied to him.

The case for the defendant was that Mr. Jarrett had given him authority to take the gravel, but all that was proved to support this suggestion was that Mr. Jarrett upon one occasion had given the defendant authority to remove some stones from one of the fields; and it was argued on behalf of the plaintiff that it was absurd to suppose that the defendant's landlord had ever given him authority to remove gravel of the value stated when he was only paying such a small rent.

The jury returned a verdict for the plaintiff—damages, 130*l.*

LIABILITY OF A CORPORATION AS TO SEWERS.

BRIERLEY AND OTHERS v. MAYOR AND CORPORATION OF ROCHDALE.

This case, tried at Liverpool on March 27th, before Mr. Justice Blackburn and a special jury, involved the question as to how far a corporation is liable for the insufficiency of its sewers to carry off water caused by an extraordinary storm of rain.

The plaintiffs were owners of a mill, situated at the corner of Holland-street and Manchester-road, in Rochdale, and this action was brought to recover damages for the flooding of their mill on August 12th last, in consequence of the alleged negligence of the defendants in constructing and managing the sewers.

The judge left two questions to the jury,—first, had the defendants neglected to put in such a sewer as a reasonable and prudent man would have placed to carry off the water which might reasonably have been anticipated to come? Secondly, if negligent, what proportion of damage was due to the negligence of the defendants, and what to other causes?

The jury found that the defendants were negligent in leaving the 18-in. and the 12-in. pipes to drain into the 20-in. by 15-in. sewer, and also in not making due provision for carrying off the surface-water coming down St. Alban's-road, without allowing it to flow across the bridge. A verdict was therefore entered for the plaintiff for an amount to be ascertained by an arbitrator.

SUSSEX MANSIONS.

The volumes of the Sussex Archæological Society clearly show that this county contains specimens of ancient domestic architecture which merit the notice of archæologists. These include Parham Manor House, Wiston, Danny, Pakyns at Hurstpierpoint, and an ancient house at Street. Parham is engraved in Dalloway's "History of Sussex," 1832. The two views show the house, with the adjacent park, and the house by itself, as modernised A.D. 1710. The hall is described to be 51 ft. by 26 ft. wide, and 24 ft. in height, with a flat roof, stuccoed in compartments, with the arms and quarterings of Queen Elizabeth. At the end is a large bay window. The gallery in the upper story is stated to be 158 ft. in length, 19 ft. wide, and 24 ft. in height, containing portraits of Mr. Robert Palmer, the builder of the house, in the reign of Queen Elizabeth, &c. The dining-room has a coved roof. Parham is engraved in Neale's "Views of Seats," 2nd S., v. 4. The original edifice, of rough stone, had an embattled parapet. In vol. ii., part 2, of this work, are three views of Wiston Place, built in the reign of Queen Elizabeth by Sir Thomas Shirley,—"a magnificent specimen of the domestic architecture of that age." View No. 2 shows the house as it was in the reign of Charles I., and view No. 3 shows it as it was A.D. 1780. The hall is stated to be a cube of 40 ft., having a groined timber roof, still extant. The dining-room has an old oak wainscot, A.D. 1576. Vol. I. of this work, A.D. 1815, p. 60, contains a view of Leythorne, "of the style prevalent in the reign of James I.; levelled with the ground A.D. 1798"; and of Halnaker, still extant, near Chichester, founded by Sir Thomas West early in the reign of Henry VIII.,—almost a solitary specimen, in this part of the county, of the castellated style peculiar to the age of the Tudors; very spacious when perfect. There was a gateway, with towers, and a large hall, with bay windows, wainscoted in a curious manner. This work, and "Britton's Sussex," 1815, contains an engraving of the remains of Cowdray House, destroyed by fire the 24th of September, 1793. It was inspected, A.D. 1782, by Dr. Sam. Johnson, who observed:—"I should like to stay here twenty-four hours. We see here how our ancestors lived." Danny is engraved in "Horsfield's Sussex," vol. i., p. 244, A.D. 1836,—an accurate view as the house is seen from the east. It was built A.D. 1595, by George Goring, esq. The "Sussex Archæological Journal" contains a more recent engraving of the house, from a photograph. The ancient mansion was rather eastward of the present house, which is built of brick, in the Elizabethan style, with deep bay windows, and is a fine specimen of architecture. The south part of the house was modernised early in the eighteenth century. Horsfield's work, vol. ii., contains a view of Parham, 1710, of the front of an ancient mansion at Burton, near Petworth; views of Rowdell Old Mansion; of Shermanbury Place Elizabethan; and of Hills, near Horsham,—a stately specimen of seventeenth-century architecture.

CHR. COOKE.

MEANS OF EGRESS FROM CHURCHES.

SIR,—Permit me to thank you for your timely and excellent article in last week's issue of the *Builder* on the "Danger of Insufficient Egress from Churches." You have earned public gratitude by calling attention to this subject, and your remarks will, I trust, awaken in architects and others concerned a sense of their responsibility in this important matter,—a responsibility which I think has been strangely overlooked by them, when it is observed how generally this defect exists in our public buildings.

I would wish also to say that, in addition to the insufficiency of the means of egress, there is often the increased danger arising from the inner doors of vestibules being hung to open only into the church,—or other public building,—instead of swinging both ways, thereby greatly enhancing the difficulty of quick escape in case of panic.

Some few years since I had ocular and painful demonstration of this, being present at an evening service in a new church then recently opened in the Kensal-green district of London, when a false alarm of fire being raised, a panic ensued, and nearly the whole of the congregation, of some five or six hundred persons, rushed to the chief one of the (I think) only two available means of egress.

The folding-doors of this opening were hung to swing into the church *only*, the consequence being that the pressure of the crowd, in their anxiety to escape, was so great against the inner side of these doors, that it was found impossible, for a considerable time, to open them. The alarm was thus greatly increased; some were injured by endeavouring to escape through the broken glass upper panels of these closed doors, others by the crush of the crowd, and one poor lady died shortly after from the fright she sustained.

Had the doors been hung to swing both ways, I believe the consequences would not have been half so serious; and if the means of egress had been more sufficient, the injurious results would have been almost *nil*.

JESSE C. HUKINS.

A SUBSTITUTE FOR SLATES.

SIR,—Having read in your paper a letter on "A Substitute for Slates," called forth by the high price of the article and the dearness of labour, I am induced to ask is there any reason for not adopting the method of house covering used in the United States and Canada? Instead of an ΛΛ roof, involving the laying of gutters front, middle, and rear, with latbing, slating, and tiling, there are beams or joists laid as if for an ordinary floor, with a fall of 1 in. in 10 ft. to the rear; strong flooring is laid on these, and then covered with what we call "tin sheets," or, more properly, sheet-iron dipped in a solution of tin. This covering is painted once a year with a matter prepared for the purpose. As to durability, I inquired and was told it lasts without repairs for fifty years. If I was building houses for myself, from the knowledge I possess (as a practical builder), irrespective of the dearness or cheapness of either method, I would adopt the American system. It has many advantages besides cheapness and durability. It answers the purpose of another floor. In the "States" it is used as a laundry, a garden, and as a place of amusement, as well as for taking meals on and sleeping on in hot weather. Be pleased to publish this, if only to elicit some farther remarks on a "Substitute for Slates."

THOS. PARKER.

NUISANCE CAUSED BY SEWAGE TANKS.

At the police-court at Stoke, on the 31st ult., before Mr. H. C. Greenwood, the stipendiary magistrate, "The Mayor, Aldermen, and Burgesses" of Newcastle (Staffordshire), as owners of certain sewage-tanks situate on the London-road, in the borough of Stoke, were summoned by the Stoke Corporation, as the Urban Sanitary Authority under the Public Health Act, 1875, for having allowed a nuisance to exist by reason of the sewage flowing into the tanks.

In support of the information it was stated that the tanks in question were constructed nearly twenty years ago, and that they were situated in what was now the municipal borough of Stoke. They were near the turnpike-road, and within about 150 yards of the Stoke workhouse. The nuisance complained of was caused by the depositing of the sewage of Newcastle in these tanks.

Edward William Howell, sanitary inspector for Stoke, said he had visited the tanks. He went there on the 21st of February, when the outlet was far worse than the inlet. There were masses of filth there. On the 5th of March he again went there, and the Lyme brook was full of foul matter. On the 10th of March he went there with the surveyor and medical officer, and again on the 21st and 22nd of March. There had been an improvement at the latter date, but still there was a nuisance.

Mr. Lynam, borough surveyor, Stoke; Mr. M. Ashwell, medical officer; and Mr. R. H. Wynne, gave corroborative evidence in support of the charge. They declared in the most positive manner that the tanks were a nuisance.

For the defence, Mr. Chapman, borough surveyor, Newcastle, said that since July last there had been no nuisance in connexion with the tanks. He was sure that since that time lime, in addition to charcoal and carbolic acid, had been used there, and there had been nothing offensive in the tanks. There were drains from the workhouse, and also the graveyard connected with the workhouse, into the canal, and the stench from the canal was worse than that from the tanks.

George Whittaker, who had lived in a cottage a short distance from the tanks nineteen years and a half, and his wife, who had lived there since she was married,—twelve years,—spoke of the canal as being a great nuisance, whilst the tanks were no nuisance to them. They declared that there had been a great improvement in the tanks since July last, whilst the canal continued to be a nuisance.

Mr. A. Leech, the mayor of Newcastle, was also called as a witness. He declared in the most emphatic manner that the Newcastle authorities had done their best to prevent any nuisance arising from the sewage tanks; and that the tanks were nearly free from offensive smells, whilst the canal was a real nuisance as the receptacle of the sewage flowing from the Spittals, the workhouse graveyard, and the houses in Stoke parish, which were just beyond the Newcastle borough boundary.

Richard Downing, foreman of the workpeople employed at the tanks, gave evidence that since July last extra precautions had been taken by the use of lime to prevent any nuisance arising.

The magistrate made an order for the abatement of the nuisance within two months, the defendants to pay the costs.

THE PAVING QUESTION.

The authorities of the London, Brighton, and South Coast Railway have been summoned before Mr. Ellison by the Lambeth Vestry to show cause why they should not pay 1,257*l.* 10*s.* for the paving of Leigham-lane, Streatham.

According to the evidence for the complainants, it appeared that the road in question was by the side of the embankment and arches of the railway, and that it was necessary that such road should be paved. It was urged that the Company, as owners of the railway, would be liable for the cost.

On the part of the Company, it was contended by Mr. Poland that the road in question was not a "new" street within the meaning of the Act, as it had but two or three houses upon it. He quoted several cases in support of his argument, and urged that a "street" would mean, according to the section of the Act, where there was a continuous line of houses.

Mr. Ellison gave judgment in the matter, and said after careful consideration he was of opinion that the place in question was not a street within the meaning of the Act. There were not houses sufficient to make it a street according to the authorities and cases quoted by Mr. Poland, and he thought the matter had been brought before the Court somewhat prematurely by the vestry on the ground that the houses might in the future be erected. Taking the whole matter into consideration, he should dismiss the summons.

THE FORM OF CHIMNEY SHAFTS.

Perhaps the following may be of use to your correspondent on this subject:—

At Messrs. Lister's works, Manningham Mills, a chimney was completed towards the close of 1873,—height, 249 ft.,—square in form, with the sides panelled and circular-headed. Inside width, 10 ft., gradually increasing towards the top to 11 ft. Built by Messrs. J. & W. Beanland, from designs by Messrs. Andrews & Pepper, Bradford.

R. M. BANCROFT.

STAINED GLASS.

Oldberrow.—The east window of the lately-restored parish church of Oldberrow has been filled with stained glass by Messrs. Hardman & Co., of Birmingham. The window represents, in its three lights, the Birth, Crucifixion, and Resurrection of our Saviour, and is the gift of Mrs. Peshall, the lady-patroness of the living.

Old Windsor.—A two-light window in the south wall of Old Windsor Parish Church has recently been filled in with stained glass in memory of Mrs. Walls, of the Hermitage, by Messrs. Clayton & Bell. The scenes represented are the raising of Jairus's daughter, and the healing of Eneas, the paralytic, at Lydda.

Enville.—The Earl of Stamford and Warrington has had erected a stained-glass window in the west end of the north aisle of Enville Church, the whole work having been designed and executed by Mr. Baguley, of Newcastle-upon-Tyne. The subject, which occupies nearly the whole space at the artist's disposal, is "The Crucifixion of our Lord"; in the centre opening is the figure of "Christ on the Cross,"

and in the side lights "Saint John and the Blessed Virgin."

Milstead.—There has lately been placed in the north side of Milstead Church a two-light stained-glass window, in memory of the late Colonel Tylden, of Crimean fame. The subjects are:—1. The two sisters, Martha and Mary, in the presence of the Master at the time when Mary puts the question to Him, "Dost thou not care that my sister hath left me to serve alone?" 2. The risen Lord appearing to Mary when she is bearing sweet spices for the anointing.

Newcastle-upon-Tyne.—A stained-glass window of six lights has been placed in the south transept of St. Nicholas's Church, to the memory of Mrs. Nichol, sister of the late Rev. Clement Moody, vicar of Newcastle. The subjects are—"The Nativity," "The Presentation in the Temple," "Christ disputing with the Doctors," "Our Lord in the House of Lazarus," "The Woman touching the Hem of Christ's Garment," and "Mary anointing the Head of Jesus." The window is the work of Mr. Baguley, of Newcastle.

Buttington.—The west window of the parish church of Buttington has been lengthened, to take the fragments of some interesting old painted glass which once filled the east window. These have been arranged by Mr. W. Done, of Shrewsbury, who has also enlarged the side-windows.

CHURCH-BUILDING NEWS.

Tuddenham.—The parish church of Tuddenham, near Mildenhall, is now in the hands of the restorer, and will shortly be presented to the parishioners in a renovated condition. The church, which is dedicated to St. Mary, consists of nave, chancel, south aisle, tower, and south porch, with a modern vestry on the north of the chancel. The general style of the church is Decorated, but the aisle is an addition of the Perpendicular period. There are also some Perpendicular windows on the south side of the chancel, but in the course of the recent operations it was discovered (according to the *Bury and Norwich Post*) that these were inserted in place of Decorated work, the old tracery of Barnack rag being degraded by employment as the quoining of the newer windows, which are of clunch. These Perpendicular windows are now being restored, but the latter style is adhered to. The great east window, of three lights, is of the Decorated period, and until now the tracery in the heading was hidden by an ugly flat roof, which has given place to one of modern construction. The south aisle is separated from the nave by four arches, supported on octagonal pillars. The staircase to the rood-loft, which is partially open, is on the south side of the chancel arch. The nave-roof is a reproduction in oak of the old one, and is of hammer-beam construction, with embattled cornice, and the hammer-beams are adorned with figures of angels, with outspread wings. The collar-beams have similar figures on both sides, beneath the apex of the roof, and where it has been possible the old carving has been utilised. There are four clearstory windows, each of two lights, on either side of the nave. The tower-arch is open to the church, but hitherto the floor has been occupied by the ringers. On the western face of the tower are three fine niches, the uppermost of which is at present blocked up. It is surmounted by some paltry battlements, probably of modern brickwork. The exterior of the church is covered with plaster, which it was at one time intended to restore. The architect engaged in the work is Mr. C. Kirk, of Sleaford, and the contractor is Mr. R. Tooley, of Bury St. Edmund's.

Thirsk.—The contract for the restoration of this church has been let to Mr. John Brown, of York. The restoration will cost between 4,000*l.* and 5,000*l.*, and has to be completed in two years. The contract embraces the re-stalling of the interior, the scraping of the inside walls, which are at present whitewashed, flooring, new pulpit, communion-rails, releading of the roof of the chancel, &c. Nothing will be done to the exterior of the building or the tower at present. While the restoration is proceeding services will be held in the chancel, which will be boarded off from the rest of the building. A great portion of the money needed is already subscribed.

Brighton.—At a Vestry meeting held in the old (St. Nicholas') church, Brighton, on the 16th ult., it was resolved unanimously "That the four pews in the chancel be removed and oak stalls for the clergy and choir be erected on the site thereof; also that the Minton tiles on the walls of the chancel be removed, and that wood panelling be placed in their stead; that a new vestry be erected on the north side of the chancel, and a covered way from it to Church-street, in accordance with plans prepared by Mr. Somers Clarke, jun., the architect employed about the same.

Tarvin.—Tarvin parish church, Cheshire, has just been re-opened, after being closed for nearly nine months for restoration. The church, which is dedicated to St. Andrew, has much that is interesting about it, both architecturally and historically. Originally it consisted of a nave and chancel with south aisle, all in the Decorated style, the tower and north aisle being added about the time of Henry VII., of Late Perpendicular character. The great feature of the church is undoubtedly the tower, the depth of its windows and doorway being about 3 ft. The interior, however, was in such a condition as to demand that the church should be re-seated and re-arranged, and restored so far as the funds would allow, and declared to be "free and open." This work was entrusted to Messrs. Kelly & Edwards, architects, of Chester, the contract being taken by Mr. Fleet, of Kelsall. With the exception of the organ and the font, everything inside the church is new. The pillars and arches, which were thickly coated with layers of paint and colour-wash, have been tooled, new floors laid throughout the church, the aisles relaid with Yorkshire flagging, open seats of pitch pine fitted up in the nave, those in the chancel being finished with tracery panels and poppy-heads, and angel figures at the ends, and the floor laid with Minton's encaustic tiles. The tower arch, which is of fine proportions, and was barbarously mutilated in the last century to accommodate a huge gallery, has been restored. The total cost of the restoration has been about 1,000*l.*

Newton.—The corner-stone of a new chancel to St. Mary's Church, Newton Moor, Cheshire, has been laid with Masonic honours by Lord de Tabley. The style of the new chancel is a simple round-arched Gothic. The work will be throughout of stone. The contract is divided between Messrs. Smithies, mason, and Wharam, joiner, working under the direction of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Tarporley.—The work of pulling down the old tower of Tarporley Church has been commenced by the contractor, Mr. James Fleet. A wooden partition has been erected to screen off the tower from the rest of the church. A committee meeting has been held since the contract was given to Mr. Fleet, at which meeting Mr. Farrimond's clerk explained that he had made a serious error in copying a letter to Mr. Fleet, and had written that the tender for the joiners' work was 127*l.*, instead of 197*l.* The contract having been signed, the committee refused to make any alteration, but promised to give the contractor 70*l.* in addition.

Tadcaster.—The contract of Messrs. Pearson & Co. for restoring the parish church is 7,221*l.*, namely, for the body of the church, 6,011*l.*; and the tower, 1,210*l.*, towards which sum there has been received or promised, for the body, 5,624*l.* 15*s.*, and for the tower, 935*l.*

Ebberston.—Special efforts are now being made to complete the restoration of the venerable old church of Ebberston, near Malton, now being carried out from plans furnished by Mr. Ewan Christian, architect to the Ecclesiastical Commissioners. Already 300*l.* have been spent over the restoration, and the vicar states that as much more is required to make the work complete.

Leek.—The chancel of St. Luke's Church, Leek, has recently been decorated. The wall beyond the altar-rail, to the height of 7 ft. on either side, is painted with a deep blue, with a diaper of vermilion and gold, lined out with a lighter blue. The lower portion of the wall behind the choristers' seats is painted on a dull red ground with diaper of lighter red and light purple, a little black being introduced. The upper portion of the wall is buff, with diaper pattern of light red and lavender. At the altar-rail on either side of the chancel there is a band of gold 7 in. wide, with decorations in vermilion and white. Round each side window there is a scroll pattern in green. The work has been carried out by Mr. Gee, of Stoke and Stafford, at the expense of a few ladies belonging to the congregation.

West Clandon.—A new church tower and restored peal of six bells have been presented to the parish of West Clandon, Surrey, by the Lady Augusta Onslow. The third, fourth, and fifth bells were out of repair, and had to be recast. This has been done by Messrs. Mears & Stainbank. The new church tower will soon be completed. The architect is Mr. J. C. Boys, of London, and the builder, Mr. James Whitburn, of Woking, who also carried out the restoration of the church.

Trefonen.—The parish church of Trefonen has been reopened, after restoration and enlargement. The old pulpit and reading-desk, &c., have been removed and several additional seats obtained; new Decorated two-light windows have been inserted on the north and south sides of the nave, a chancel arch has been put in, and a chancel terminating in a three-sided apse has been built with stone from Mr. Dumville Lees's quarry. Shelvoke stone is used for all dressings. The vestry and organ-chamber are on the north side; a low stone screen divides the nave from the chancel, which is provided with oak stalls, the rest of the chancel fittings being of the same material. The space within the altar-rails is laid with a new pavement by Maw & Son. The chancel has an open-timbered roof, covered with the Ridge-hill (Staffordshire) tiles. The windows are glazed with cathedral-tinted glass in quarries and patterns by Mr. W. Done; those in the apse will be filled with painted glass by Clayton & Bell. The walls are not plastered internally, but the walling is shown and pointed. Additional accommodation has been obtained for about eighty persons. Mr. G. Landucci executed the carving. The architect was Mr. Haycock, of Shrewsbury, and the work has been carried out by Messrs. Morris, Chaplin, & Corney, builders, of Oswestry, at a total cost of about 960*l.*

Newmarket.—The foundation-stone of a new church at Newmarket, as a memorial of the late Lord George Manners, has been laid. The church will replace the old church of All Saints, which was not only too small for the growing needs of the population, but was much dilapidated. The tower of the old church will, however, be allowed to remain and form part of the new structure. The old church stood north and south (the tower being at the south end), but the new church will run east and west. The style of architecture selected for the new memorial church,—which is being built by Mr. Robert Tooley, of Bury, from the design of Mr. W. Oldham Chambers, of Lowestoft,—is that of the transition from the Early English to the Decorated. The church, which is intended to accommodate some 600 people, consists of nave, north and south aisles, chancel, organ chapel, and vestry. The old tower, which will stand at the western angle, will be thoroughly restored, and heightened several feet. The nave is 25 ft. 6 in. in width, and the aisles are each 12 ft. 3 in. wide, making the entire width between the walls 50 ft. The chancel has an apsidal termination, and the extreme length of the church from end to end is 120 ft., of which three-fourths are given to the nave. The nave is separated from the aisles on either side by an arcade of six arches supporting the clearstory walls, in each of which four two-light windows are inserted: the arcade columns (which are only about 9 ft. in height) will be of stone, with carved capitals. The chancel is separated from the nave by a moulded arch resting on carved corbelled columns. It is intended partly to line the walls with tinted mosaic tiling specially designed for the purpose. The nave and aisles will be paved with coloured tiles, and the chancel will be laid with mosaic tesserae. The roofs are open-timbered, of varied design, and the moulded principals spring from shafts carried up behind the clearstory windows. The benches will be open, with sloping seats and backs, and with moulded ends. The whole of the woodwork, both of the roofs and benches, will be stained and varnished. The pulpit and reading-desk will be executed in wainscot, richly carved and moulded, with bases of Caen stone. The church will be lighted by means of two-light windows in the aisles and clearstory, by a four-light window at the west end, and by three two-light windows of stained glass in the apse. The external facings to the walls are being executed in flint-work, with black jointings, and the dressings throughout are of Bath stone, from the Box and Corsham quarries. There is some idea of placing a spire upon the tower, if means can be found to do so.

Summertown.—Summertown parish church has been re-opened, after enlargement. Extra accommodation has been provided by the addition of a new north aisle and the extension of the nave, from designs by Mr. G. E. Street, R.A., and a new open-timber roof has also been added. The outside of the building is of Gibraltar stone, with Bath dressings, and the inside is of Bath stone. The total cost is estimated at 2,000*l.*

DISSENTING CHURCH-BUILDING NEWS.

Illingworth.—The corner stones of a new Wesleyan chapel at Illingworth Moor have been laid. The architect is Mr. Jas. Farrar, Halifax. The contracts have been let to the following firms:—Mason work, Mr. John Hall, Halifax; joiners' work, Mr. G. Charnock, Halifax; painters, Messrs. Stringer & White, Halifax; plumbers, Messrs. Walsh & Son, Halifax; plasterer, Mr. Joshua Taylor, Ovenden. The new chapel will be in the Italian style, 66 ft. long, and 46 ft. broad, and will seat 505 persons. The interior will be of pitch-pine, varnished; the pews capped with oak, and French polished. It will be heated by hot-water apparatus, by Messrs. Walsh & Son, Halifax. A gallery will run round the entire building. There will be two commodious class-rooms, and a preacher's vestry below the back gallery.

Cupar-Fife.—The new Free Church, Cupar-Fife, for which a legacy of 7,500*l.* was left by the late Sir David Baxter, of Kilmaron, is now to be proceeded with at once. A commanding site has been purchased on the north side of Bonnygate, and at a late meeting of the Deacons' Court, the estimates were opened, when those lodged by the following contractors were accepted, viz.:—Mason work, Mr. Alex. Ramsay; joiner work, Mr. Robert Adam; slater work, Mr. Jas. Fyfe. The architects are Messrs. Douglas & Sellars, Glasgow.

Skipsea.—A new Congregational church was opened at Skipsea, Bridlington, on the 8th ult. The building has been designed by Mr. Stock, a local architect, and built by Mr. Barr, of Beeford.

Killamarsh.—A new chapel for the United Methodist Free Church is in course of erection at Killamarsh. Sittings will be provided for 250 persons, at a cost of 550*l.*

Silloth.— A new Wesleyan chapel was opened at Silloth on the 15th ult. The style is Gothic, and the west end faces the street. The material used is red brick, relieved here and there with white brick and stone dressings. Inside it measures 48 ft. by 28 ft., and will accommodate nearly 200 worshippers. The pews and the roof are of pitch-pine, varnished. The cost will be about 740*l.* The contractors were:—For bricklaying, Mr. Johnston, Silloth; for carpenter and joiner's work, Mr. Thompson, Silloth; slating, Mr. T. Nanson, Carlisle; plumbing and glazing, begun by Mr. Pearson, Wigton, and finished respectively by Mrs. Johnston and Mr. Westray, Carlisle. We learn from the *Carlisle Journal* that "the plans were drawn free of expense by a friend."

Pitt's Hill, near Tunstall.—The memorial stones of a new chapel for the Primitive Methodist body at Pitt's Hill were laid on the 20th ult. The chapel is to be erected on the site of the old building, which had become incapable of accommodating the congregation. It is estimated that the new building will seat over 700 people, and the contract has been taken by Mr. Grosvenor, of Tunstall, for 2,086*l.* The plans were prepared by Mr. A. B. Wood, architect, Tunstall.

Macclesfield.—Beech-lane Primitive Methodist Chapel was opened on the 11th ult., after additions and alterations. The ceiling has been raised some 6 ft. or 7 ft., greatly adding to the appearance of the chapel, and doubtless improving its acoustical properties. A new heating apparatus by Messrs. Trusswell & Holden, of Sheffield, has been erected. The alterations, which have entailed an outlay of 600*l.*, have been carried out by Mr. George Roylance, builder; Mr. J. W. Cope, Sunderland-street, decorator; Mr. G. D. Cope, painting and graining; gasfitting, Mr. Hampson.

Birmingham.—Extensive alterations and additions to Carr's-lane Chapel, Birmingham, have just been carried out. Under the direction of Mr. Yeoville Thomason, architect, a new brick front with stone dressings has been erected. The improvements in the interior are of a quiet character, but compared to previous decorations they will present a very marked change. The architecture of Carr's-lane Chapel in past years has been described as of a "nondescript character." The new decorations are in keeping with the style originally adopted, viz., the severe Grecian. Internally accommodation has been provided for 100 more worshippers by the removal of the organ from the back gallery to the enclosure behind the pulpit. The decorations are subdued and quiet. The Corinthian columns behind the pulpit have been repainted in a cream colour with gold capitals, and the fluted columns are well relieved by gold edges. The front gallery, which is made of oak, is also decorated with fretwork, with a maroon background. The builder is Mr. Smith, of the Crescent, and Messrs. Taylor & Parker, of the Five Ways, Broad-street, have designed and perfected the arrangements.

New Basford.—The memorial stones of a new Wesleyan Chapel have been laid at New Basford, Nottinghamshire. The site is in High Church-street, and the building, which is designed in the Gothic style, has walls of Bulwell stone, with Hollington and Bath stone dressings, and will contain sittings for 600 persons. Besides having a well-appointed interior, including a gallery in front of the orchestra and an organ loft, there are connected with the chapel a schoolroom on the basement floor, several other class-rooms, and vestry-rooms. The estimated cost is 3,500*l.* Messrs. Cargill & Son are the builders, and Mr. Ranger, London, is the architect.

SCHOOL BOARD SCHOOLS.

Weston Favell and Ibington.—The new schoolroom for these parishes, which are now united in a school district under the Education Act, 1870, was opened recently. The new building consists of a large and lofty room, with high-pitched open roof of stained pine, which has been added to the building of the old Weston School. The architect is Mr. A. Milne, of Northampton, and the work has been executed by Mr. T. Cosford.

Waunarlydd.—The enlarged and renovated day-schools at the village of Waunarlwydd, Swansea, have been re-opened. The old school was capable of accommodating 132 children, but by the extension just made it will contain 170 additional scholars. The new structure has been built by Mr. Edwards, of Waunarlwydd, Mr. Bucknell, of Sketty, being the architect.

Inkberrow.—The old schools at Inkberrow being found inadequate for the requirements of the Education Department, the Board have decided to make the requisite alterations and additions, and build a new master's residence. When completed, the schools will accommodate 160 children, providing an increased accommodation for 58 children. Mr. Ernest A. Day, of Worcester, is the architect.

Haverhill.—The foundation-stone of new Board Schools at Haverhill has been laid. Mr. F. Whitmore is the architect, and Messrs. Mason & Son are the contractors.

Feckenham.—At a recent meeting of the Feckenham School Board, the plans of Mr. Ernest A. Day, architect, of Worcester, were approved by the Board, subject to the sanction of the Education Department, for schools and residences at Crabbs-cross and Astwood-bank. The former provide accommodation for 350 children, and two residences, and the latter have accommodation for 242 children and two residences.

Baildon.—Plans for new Board Schools at Baildon, prepared by Mr. Marsden, architect, have been approved by the Education Department.

Bromsgrove.—At the last monthly meeting of the Bromsgrove School Board, tenders were opened for the erection of Dodford schools. There were five tenders, viz., Mr. T. Garnett, Malvern Link, 1,744*l.* 7s. 8d.; Mr. J. Creswell, Birmingham, 1,980*l.*; Messrs. Tilt & Fisher, Bromsgrove, 1,628*l.* 11s. 3d.; Messrs. Brazier & Weaver, Bromsgrove, 1,447*l.*; and Messrs. Cook & Harris, Bromsgrove, 1,705*l.* The tender of Messrs. Brazier & Weaver was accepted.

Cromarty.— New school buildings for the Cromarty School Board are nearly completed,—one to the west of Davidston, and the other in Cromarty,—with the required masters' dwellings, at a total cost of about 6,000*l.* The architects are Messrs. Maitland, Tain.

Kingskettle, N.B.—A new Board school for Kingskettle, Fifeshire, was opened on the 10th ult. The ground plan of the school is in the shape of the capital letter E, the front or right hand side of which forms the principal room, extending to 70 ft. in length by 25 ft. 6 in., leading off which are two classrooms, one being 21 ft. by 18 ft. 6 in., furnished with desks, and the other 18 ft. by 18 ft., fitted up with a gallery for collective teaching. These three rooms are connected with a spacious hat and cloak room lobby, which is fitted up with numbered pegs. The western portion of the building is occupied by the infant and industrial department, which consists of one large classroom, 45 ft. by 18 ft., and another smaller, 18 ft. by 18 ft., in both of which are fitted up galleries. At the two extreme corners of the front portion of the building are placed two projections, each being about 17 ft. by 10 ft., and these have been fitted up for the use of the master and mistress and other members of the teaching staff. The ceilings of all the class-rooms are 16 ft. 6 in. high, and are ventilated by means of perforated zinc. The plans were prepared by Mr. G. S. Birrel, architect, St. Andrews. The contractors for the works were:—For mason work, Messrs. Wilkie & Sons, Strathmiglo; joiner work, Mr. Peter Orphard, Kettle Bridge; slater and plaster work, Mr. James Miller, Markinch; plumber work, Mr. William Brownlee, Kingskettle. The inspector at the work was Mr. John Ogilvie, St. Andrews. The estimated cost is 3,500*l.*

Elland.—Designs for new Board schools at Elland have been prepared by Mr. C. F. L. Horsfall, of Halifax. The style adopted is Geometric Gothic. The principal façade to Castlegate will be 136 ft. in length, in one story, the outline being broken by three gables. Over the central gable rises the bell-turret, 50 ft. in height. In each gable is a large window, and the master's house is at one end of the building. In the basement are spacious covered playgrounds, and around the school are extensive open playgrounds. The boys' school will be 40 ft. by 20 ft., and will accommodate 150. The girls' school, placed at the other side, is of the same proportions. The infants' school in the centre, will be 50 ft. by 24 ft., and will accommodate 200. It has also two class-rooms and another room, 21 ft. by 16 ft., is to serve as a board-room. The total cost will be 4,000*l.*

Melrose.—New Board schools were opened at Melrose on the 15th ult. The walls are faced with red stone, with dressings; the roofs of the building are projecting, and the sky-line is broken up by gables, belfry, &c. The size of the infants' room is 30 ft. square, and the dimensions of the principal school-room are 82 ft. by 20 ft. Besides the foregoing, there are three class-rooms. In immediate proximity to these there are various offices and convenient lavatories. There are two play-sheds,—one for boys and the other for girls. The architects and the builders were the Messrs. Herbertsons, of Galashiels; the joiner work has been carried out by Mr. Thomas Brown, Melrose; the plumber work by Messrs. Common & Sons, St. Boswell's; and the plaster work by Mr. Swan, Newton.

Deskford, N.B.—New Board schools have been opened at Deskford. Accommodation is provided for 165 children. The principal building extends from east to west, with class-rooms branching north and south. These main rooms, by means of rolling doors, may be thrown into one. The architect is Mr. Millar, and the cost has been 1,182*l.*, or 7*l.* 3s. 4d. per scholar.

Fordyce, N.B.—The Fordyce School Board has accepted the following tenders for the works required in the erection of the Portsoy Public Schools, viz., mason work, Alex. Barclay & Co., Keith, 1,409*l.*; carpenter work, George Gray, Portsoy, 572*l.*; slater work, James Watson, Portsoy, 172*l.* 6s.; plaster work, Robert Hume, Buckie, 98*l.* 5s. 9d.; plumber and iron works, Wm. Duthie, Banff, 63*l.* and 93*l.* respectively.

Mexborough.—Messrs. Tacon & Rawson, of Rotherham, have been elected architects to the Mexborough School Board.

Falkirk.—The Northern Public School, Falkirk, has recently been opened by the Board. It has been erected from designs, submitted in open competition, by Mr. T. B. M'Fadzen, architect, Edinburgh. The building, which is Gothic in style, is planned on the narrow-roomed principle to accommodate 336 pupils, and consists of large schoolroom, 57 ft. long by 20 ft. wide; infant schoolroom, 30 ft. by 20 ft.; and two class-rooms, 30 ft. by 20 ft., and 21 ft. by 18 ft. respectively.

Kettlesing.—The following contracts have been entered into for the erection of a new school, master's residence, boundary walls, &c., at Kettlesing, Yorkshire, for the Felliscliffe School Board, viz.:—Mason-work, 623*l.*, Messrs. Appleton, Harrogate; joiner, 227*l.*, Mr. Grainger, Killinghall; slater, 80*l.*, Mr. Baynes, Ripon; plumber and glazier, 57*l.*, Mr. Greetham, Harrogate; plasterer, 43*l.*, Mr. Fortune, Harrogate; painter, 20*l.*, Mr. Westerman, Harrogate. The whole of the works to be completed by September next.

Sturmer.—The foundation-stone of new Board schools, at Sturmer, was laid on the 15th ult. The schools are to be built from plans prepared by Mr. F. Whitmore, the architect of the Board, and are to accommodate thirty infants. The contractors are Messrs. Arber & Son, and Gowers.

NEW HOUSE AND STUDIO FOR MR. MILLAIS, R.A., AT KENSINGTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last the Architectural Association visited the new house and studio now approaching completion at Palace-gate, Kensington, for Mr. J. E. Millais, R.A., from plans by and under the superintendence of Mr. Hardwick. The building is in the Italian style, the façades being of red brick, with Portland-stone dressings. The building comprises basement, ground-floor, drawing-room floor, and two floors above devoted to bed-rooms. The basement includes kitchen, larders, butler's pantry, and the usual offices, together with servants' rooms. The kitchen is fitted up with very complete apparatus for cooking, there being, in addition to a large range, two gas-stoves, and one or two hot-plates. A principal feature of the ground-floor is the entrance-hall, 29 ft. by 26 ft., which is approached by a projecting porch. Running across the hall will be a screen of monolithic columns of veined marble. The floor will be paved with coloured marbles of simple and subdued tones. Running round the hall and up the staircase, along the first-floor landing, and then as high as the great staircase-window, will be a dado of rouge royale and veined marble. On the ground-floor will be the children's schoolroom and nursery (29 ft. by 18 ft.), private sitting and dressing rooms, a room beneath the studio (called by Mr. Hardwick the "studio-room") for models, storage of canvasses, and so on. This room will serve as a dressing-room for the models, and is provided with closet, &c. Access to this room is obtained by means of a separate entrance provided on the south side of the building, and once in this room the studio above is reached by means of a circular iron staircase in the south-east corner. A narrow slit or gap, extending almost the entire length of the flooring at the east end of the studio, will enable canvasses of very large dimensions to be raised to or lowered from the studio; while a lofty door (similar to those used at theatres for taking in "scenery"), opening on to a private road at the side of the building, will enable Mr. Millais's largest paintings to be removed with the greatest ease by vans or otherwise. The principal staircase is of Portland stone, the length of the steps from end to end being about 6 ft. A light and graceful wrought-iron scroll, of which the full-size drawing was exhibited, will, when surmounted by a hand-rail, do duty instead of balusters. The first-floor landing is exceedingly spacious, and on the side facing the wall there will be a fountain which is being modelled by Mr. Boehm. Mr. Hardwick remarked that he had purposely made this landing a marked feature in the design, because it allowed of the rooms on the principal floor being placed *en suite* with greater effect and convenience, and prevented the "crush" which was inevitable when large numbers of visitors were endeavouring to pass each other on a constricted landing. The suite of rooms on this, the principal floor, represents a length of 145 ft. from end to end. The principal drawing-room is 29 ft. by 18 ft. The smaller drawing-room, which will be that in general use, is 26 ft. by 18 ft., and has a small square recess or alcove (projecting externally, of course), the north windows of which have an outlook straight up the Broad-walk of Kensington Gardens. The principal dining-room is 35 ft. by 22 ft. All these rooms are 15 ft. high. But the chief apartment on the first-floor is the studio, 56 ft. by 49 ft., and 24 ft. high. The ceiling of this apartment (as well as those of the dining and drawing rooms) is slightly enriched in plaster, and is fitted with three sun-burners for artificial lighting, as Mr. Millais does some of his work after dark. Mr. Hardwick said he had used three small sun-burners in preference to one large one, in order to get a well-distributed light. The studio is lighted in the day-time by three windows, two on the north and one on the south, and all of them are provided with revolving iron shutters, so that any one or two of them can be wholly or partially darkened at will, according to the effect of light or shade which the painter desires to obtain. The principal of the two north windows is 16 ft. high by 9 ft. wide, and is of thick plate-glass, divided into four equal portions by two iron sash-bars, one vertical and one horizontal. The walls have a dado in wainscot oak, and from this dado pilasters are carried up at intervals to the cornice. The walls are at present coloured a rich morone, but over this will be hung tapestry, &c. Access is gained to the studio not only from the principal floor and by the staircase for the models already spoken of, but from the servants' staircase. All the rooms, including the studio, have open fireplaces, but the studio and dining-room are also provided with hot-water coils for use in cold weather. The floors throughout are Fox & Barrett's iron and concrete fireproof construction. There is nothing noteworthy about the bed-room floors. Foreign cherry-wood is largely used for doors, window frames, and other joinery, and not only has it a very rich effect, but the mouldings obtained in it are remarkably clean and true. When we say that Messrs. Cubitt & Co. are the contractors, we need hardly add that the materials and workmanship throughout are the best of their kind. Messrs. Welton and Denny have been the foremen in charge of the works. The visitors (who did not muster in such numbers as usual), having thanked Mr. Hardwick for conducting them over the building and explaining the plans, then dispersed.

We propose shortly to give a perspective view of the house, with plans of the principal floors.

THE NEW CHURCH OF ST. AGATHA, SHOREDITCH.

After five years of hard work, the Rev. F. C. Wills has been enabled to commence the building of a new church in the above district, to take the place of the temporary mission premises. The ground-floor of the new building will be a school with room for 240 children, and the floor above a mission church capable of accommodating a congregation of 300. The cost of the building, which will be Early English in style, will amount to about 2,500*l.*, to make up which sum 1,500*l.* are still wanting. The foundation-stone was laid on Thursday, March 30th, by the Countess Cowper, the district being gaily decorated with flags and banners, and the school children presenting a very pretty appearance, with nosegays of primroses and violets. Shortly after half-past twelve o'clock the Earl and Countess Cowper arrived, and were received by the vicar. They were followed by a procession of the choir singing a hymn, the churchwardens, the architect, several members of the clergy, and Bishop Claughton, Archdeacon of London, coming last. The proceedings having been opened by prayer, the choir chanted a psalm, after which the vicar laid his hands upon the foundation-stone and uttered a prayer. Another hymn having been sung, the architect presented to Lady Cowper a silver trowel handsomely chased. Her ladyship approached the stone, in the hollow of which was placed a bottle containing gold and silver coins of the reign of Queen Victoria, a Book of Common Prayer, and copies of several newspapers, and, laying her hands upon it, pronounced these words:—"In the faith of Jesus Christ we place this foundation-stone in the Name of God the Father, God the Son, and God the Holy Ghost." This ceremony over, Bishop Claughton delivered a brief address; hymns and psalms were then sung, after which the Bishop pronounced the benediction.

OPENING OF NEW BOTANIC GARDENS AT SOUTHPORT.

Those who remember Southport not very many years ago as nothing more than one of the small sea-side resorts of Lancashire, would, on revisiting it at the present time, scarcely recognise the place as a large and well-laid-out town, with miles of streets, and handsome buildings both public and private. Within the last few years the enterprise of its inhabitants, assisted by the merchants of Manchester, Liverpool, and some of the large Yorkshire towns, has been exceptionally active. During that period a new public hall has been erected and opened; later still extensive winter gardens, baths, piers, and other public buildings have been brought into existence; and, in addition to all these, new botanic gardens and a museum have just been constructed, and were opened, with considerable ceremony, by the mayor and local authorities, on Saturday last. The gardens are situated at Churchtown, a short distance from the centre of the borough, and have been erected by the "Southport and Churchtown Botanic Gardens and Museum Company." Already about 20,000*l.* have been spent on the gardens, and a further sum of 10,000*l.* has yet to be expended. The gardens cover an area of twenty acres. One of the most prominent objects of attraction on entering the gardens is the museum, which is situated over the refreshment-rooms, access being obtained to it by a broad staircase. There are three departments in the museum, and in each the objects are well arranged. Natural history, geology, coins, medals, and curiosities are embraced, the first-named section containing a complete entomological group of the neighbourhood. The conservatory is 48 ft. high, 40 yards long, and has a breadth of 20 yards. It is surrounded by a balcony or terrace 18 ft. wide, commanding a splendid view of the surrounding country. A large fountain stands in the centre of the conservatory, and the basin is intended for aquatic plants. The fernery is at the rear of the conservatory, and is divided into a series of "fairy glens." Near the fernery are three plant-houses of considerable proportions, and a vinery divided into six compartments. The uncovered portion of the ground has been laid out with flower-beds, walks, and avenues. A serpentine lake, about a quarter of a mile long, and 60 ft. wide, runs through the grounds, being spanned at intervals with rustic bridges. Part of the ground has been reserved as a croquet lawn, and another portion has been reserved for other out-door games.

The designs for the buildings were prepared and carried out under the superintendence of Messrs. Mellor & Sutton, surveyors, of Southport. The grounds were laid out by Mr. John Shaw, of Manchester; and Mr. T. Duxfield was the contractor for the whole of the works.

SWINDON.

A sewing-factory for Messrs. J. Compton & Son, of London, is being built at New Swindon, Wilts, at a cost of 2,000*l.*, from designs by Mr. John J. Smith, architect, of New Swindon. Messrs. Langmead & Way, of London, are the builders.

A new organ-chamber has been built, and alterations, additions, and repairs have been done to the parish church of St. Mark, New Swindon, from the designs of the same architect. The builder was Mrs. Phillips, of Swindon. Further funds are required to carry out the whole of the architect's designs. The church is in the Decorated style, and was built by the Great Western Railway Company over thirty years ago, from designs by Sir G. G. Scott.

A cheese factory for the Aylesbury Dairy Company is being erected in Station-road, near the Great Western Railway goods shed. The portion called the "Cream Dairy" is a room 85 ft. in length and 30 ft. in breadth, while another room called the "Cheese Dairy" is 50 ft. by 30 ft. The two cheese-rooms on the first floor are capacious, and in one an arrangement of hot water pipes adjusts the temperature at will, to accelerate the ripening of the cheese to bring it earlier to market. The offices are very complete: the fresh-whey tank discharging when needful into another near at hand, which can quickly empty itself by glazed stoneware pipes into the stale-whey tank, 18 ft. deep across the yard, for those fetching milk for pig-rearing. The milk-situated near the carriage-entrance convenient carts will be backed from the yard on to a platform, in the floor of which there is a large cistern, into which the milk is emptied, and this communicates with a tank which discharges into a multitude of tins in the "Cream Dairy," to eventually pass to the "Cheese Dairy." Steam machinery, now being erected by Mr. Affleck, of Swindon, will do the entire work. Mr. W. H. Read is the architect, and Mr. Wiltshire is the contractor.

NOAH'S ARK.

In the smaller "Scripture History," by W. Smith, LL.D. (1870), which contains an engraving of Mount Ararat (p. 1), is the following "Note on Noah's Ark" (p. 10), viz.—"The ark was to be made of gopher (*i.e.*, cypress-wood), a kind of timber which, both for its lightness and its durability, was employed by the Phœnicians for building their vessels. The planks of the ark, after being put together, were to be protected by a coating of pitch, or rather bitumen, which was to be laid on both inside and outside, as the most effectual means of making it water-tight. The ark was to consist of a number of rooms, or 'nests,'—*i.e.*, compartments, with a view, no doubt, to a convenient distribution of the different animals and their food. These were to be arranged in three tiers, one above another, 'with lower second and third (stories) shalt thou

make it.' Means also were to be provided for letting light into the ark. The words, 'A window shalt thou make to the ark, and in a cubit shalt thou finish it above,' seem to imply a skylight, or series of skylights, a cubit wide, running the whole length of the ark, with a single compartment which could be opened at will. There was to be a door placed in the side of the ark. Of the shape of the ark nothing is said, but its dimensions are given. It was to be 300 cubits in length, 50 in breadth, and 30 in height. Taking 21 inches for the cubit, the ark would be 525 ft. in length, 87 ft. 6 in. in breadth, and 52 ft. 6 in. in height. This is very considerably larger than the largest man-of-war (1870). This huge structure was only intended to float on the water, and was not, in the proper sense of the word, a ship. It had neither mast, sail, nor rudder; it was, in fact, nothing but an enormous floating house, or oblong box rather. Two objects only were aimed at in its construction: the one, that it should have ample stowage; and the other, that it should be able to keep steady upon the water."

ARCHITECTURE IN SOUTH HOLLAND.

Sir,—Possessing a tolerable personal acquaintance with Holland and its architecture, I have perused with no little interest Mr. W. H. Brewer's recent paper, as reported in your issue of the 8th inst. Permit me, however, to take exception to one passage therein. I read, in reference to Gouda Cathedral, how the people of that quaint little city "must have been tearing down pictures from the walls, and putting pictures into the windows at the same time! —a brilliant example of consistency which has recently been copied at Exeter Cathedral." *When* and *how* has this been done at Exeter? If Mr. Brewer refers to our reredos, he forgets that, although a Cornish archdeacon certainly did do his best to get it removed, yet, not only by popular exclamation, but by the law of the land, the Cornishman's iconoclastic desires were most signally defeated.

So far as my knowledge goes, and I have every opportunity for being correctly informed upon the point, no pictures or sculptures have ever (in modern times) been torn down or removed from the Cathedral Church of St. Peter at Exeter; on the contrary, many such additions have been made.

Harry Hems.

VARIORUM.

"Report of the Sanitary Condition of the Parish of St. Mary Islington, 1874-5," by C. Meymott Tidy, M.B., shows a considerable quantity of good work done.——Lockwood & Co.'s Builders' and Contractors' Price Book for 1876 is revised and edited by Mr. Fras. T. W. Miller, Architect, with some care, apparently.——Cassell's Old and New London thus mentions a famous resident in Golden-square:—"In the centre house on the south side of this square resided, for many years, Angelica Kauffmann, one of the original members of the Royal Academy, and who lived till 1807. Of this lady a very amusing story is told illustrative of female folly and vanity. She was a great coquette, and pretended to be in love with several gentlemen at the same time. Once she professed to be enamoured of Nathaniel Dance; to the next visitor she would divulge the great secret that she was dying for Sir Joshua Reynolds. However, she was at last rightly served for her duplicity, by marrying a very handsome fellow who pretended to be 'Count Horn,' an adventurer of the type of the Duc de Roussillon of more recent times. With this alliance she was so pleased, that she made her happy conquest known to Queen Charlotte, who was much astonished that the Count should have been so long in England without coming to court! However, the real Count's arrival was some time afterwards announced at Dover; and Angelica Kauffmann's titled husband turned out to be no other than the real Count's *valet de chambre!* He was prevailed upon subsequently to accept a separate maintenance. After this man's death she married an Italian, named Zucchi, and settled in Rome, where she spent her declining years. There is a portrait of Angelica, by Sir Joshua Reynolds, engraved by Bertolozzi."

Memorial of the late Sir Edmund Beckett.—There is now being erected in St. James's Church, Doncaster, from a design by Sir Edmund Beckett, Q.C., and at the cost of the Beckett family, a reredos, as a memorial of the late Sir Edmund Beckett. The style is Geometrical Gothic, and the material is Ancaster stone, except the shafts which carry the arches, which are of Victoria marble. The work is expected to be completed and the reredos open to view on Easter Sunday. The work is being carried out by Mr. Athron, and the carving by Mr. Scrivens, under the superintendence of Mr. Teale, architect.

Miscellanea.

Association to Protect the Rights of Authors.—At the general meeting of this Association, held on March 29th, a report from the Executive Committee was read, in which the committee state that both the English "Dramatic Authors' Society" and the French "Société des Gens de Lettres" have, by formal resolutions, expressed their cordial concurrence in the objects of the Association, and their desire to co-operate with them in every way in their power. A considerable number of distinguished American authors, including the venerated name of William Cullen Bryant, have also signified their wish to become members of the Association, and will be forthwith proposed for election. Since the deputation to Mr. Disraeli, in May last, the Government has appointed a Royal Commission, of which the honorary treasurer of this Association [Mr. Edward Jenkins, M.P.] is one, but the committee regret to observe that the Commission as constituted can hardly be regarded as representing the classes most interested in these subjects. Since the formation of the Association, the Government have introduced a Bill into Parliament, which has since become law, by which the right of English playwrights to adapt French pieces, and *vice versâ*, without the consent of their authors, has been abolished. The Association now consists of eighty members, who are, in accordance with the rules, all strictly authors of works which are the subject of copyright or stage-right. As their number is increasing, the committee rightly suggest that it may be worthy of consideration, now or at some future time, whether the objects of the Association might not be extended with a view to the more complete protection of the property and rights of the authors.

A Fine Art Institute for Edinburgh.—A movement is on foot in Edinburgh for the formation of a Fine Art Institute. The *Scotsman* says that the object of the proposed Association, which is to be styled "The Albert Institute of the Fine Arts," is the encouragement of art generally, and more especially of contemporary Scottish art; and to this end it is intended to hold an autumn exhibition of water colours and a winter exhibition of painting, sculpture, and architecture, the gallery of the Institute being kept open during the remainder of the year for the exhibition and sale of works of art. There are to be three classes of members, ordinary, extraordinary, and honorary; and the funds of the Institute, after defraying working expenses, are to be applied exclusively to the promotion of art in such manner as may be determined by a council which is to comprise a certain number of professional artists. In connexion with this movement a company has been formed for the erection of an exhibition hall. Property has been purchased on the north side of Shandwick-place to the amount of about 25,000*l.*, and plans are being prepared by Mr. W. Beattie, architect, for a picture gallery with shops underneath and artists' studios behind, the whole to be named the "Albert Galleries." The exhibition gallery is intended to be rented by the Institute, and under their management will be available as a place of resort where pictures may be seen all the year round.

Wednesbury Public Buildings Competition.—At a special meeting of the Wednesbury Local Board of Health, on the 5th inst., plans for the proposed baths and free library were submitted. There were altogether nine sets, and these were reduced to three, and it was then decided to open the private letters which accompanied the selected plans. The first was from Messrs. C. Townshend & Horton, Wednesbury and London; the second from Mr. Samuel Horton, of Wednesbury; but the author of the third, which was marked with a triangle in a circle, could not be ascertained, as no letter accompanied it. These plans were selected for one principal reason: that the architects submitting them undertook their being carried out at the sum fixed upon by the Board, namely, 3,200*l.*

Metropolitan Improvements.—Mr. Edward Stanford has issued, as usual, a map of London showing the improvements contemplated by Bills deposited for the session 1876. The information thus afforded will be found valuable by many. Compared with maps of some former years, it shows that the proposed improvements are few.

The Albert Hall.—The Right Hon. Lyon Playfair, C.B., M.P., on the 7th inst., presided at a meeting of the Corporation of the Royal Albert Hall, to consider a Bill to make better provision for the maintenance of that structure. The chairman stated that, after passing the opposition of the House of Commons, there was now a Bill in the House of Lords to make better provision for the maintenance of the Hall. The Bill reserved to the seat-holders the entire power of making an assessment, if they chose, for the maintenance of the hall. The funds which the Council had at their disposal for maintaining, repairing, and furnishing the hall, and supporting the officers and servants, were derived chiefly from the receipts for letting the use of the hall upon particular occasions, and from concerts and other entertainments. Those funds had been wholly insufficient for the purpose, and the hall must soon be closed unless a fund could be provided. A majority of the members were willing that the seats should be charged at a rate not exceeding 2*l.* per annum. On the motion of Sir Henry Thring, K.C.B., seconded by Mr. Godwin, it was resolved,—"That the Bill entitled 'an Act to make better provision for the maintenance of the Royal Albert Hall,' as now submitted to the meeting, be consented to, and that the Council be authorised to consent to such alterations and amendments therein as may be found necessary during its progress through Parliament."

Carisbrooke Church.—The Rev. Robert Nutt writes to the *Hampshire Independent*:—"Whilst living at Carisbrooke as curate, it always grated on my recollection to hear Sir Francis Walsingham represented as the despoiler of Carisbrooke Church. I append an extract from Venables's 'Isle of Wight,' where it is said that 'Walsingham not only destroyed the monastic buildings, but having persuaded the parishioners that the body of the church was large enough for them, and enforced his persuasions with the bribe of 100 marks, obtained permission to pull down the chancel, which his lease bound him to keep in repair.' When I was at Melrose Abbey, about 1849 or 1850, men were pulling down walls inside it, and my companions and I inveighed against the Vandalism, as we termed it; but on making inquiries we learned that the Earl of Buchan (I think it was) was having a chapel, a modern erection compared with the Abbey, pulled down to save the Abbey walls contiguous to it, and I fancy some equally reasonable cause might be assigned for the pulling down the chancel at Carisbrooke Church."

Kilmarnock New Cemetery.—A new cemetery has been provided for Kilmarnock. The site is to the east of the town, and is 7¾ acres in extent. The superintendent's house, which forms part of the entrance gateway, contains three rooms and kitchen, with scullery, &c. It is in the Scottish Baronial style, built with quarry-faced coursers, 6 in. to 7 in. high, with polished dressings and crowstepped gables. The architect is Mr. Alexander Adamson, of Glasgow, whose plans were accepted from amongst six sets submitted in competition. Mr. Gemmill was inspector of works, and the contractors were,—Mr. Bolton for the formation of the grounds, and Mr. Ramsay for the other works.

An Association of Inspectors of Nuisances. A meeting of inspectors of nuisances was held at Birmingham on the 4th inst., for the purpose of forming an Association of Inspectors of Nuisances for the Midland Counties. Mr. Woolley, the chief inspector for Birmingham, was elected president for the year; Mr. Rees, Kidderminster, and Mr. Harris, Solihull, vice-presidents; and Mr. Allen, Aston, secretary. The objects of the Association are stated to be "to afford mutual assistance in sanitary matters, and protection from vexatious charges made against any member of the Association, arising from proceedings taken in the discharge of his duties."

Music.—A private performance of John Sebastian Bach's "Mass in B Minor" took place at Cromwell House on the 8th inst., before a very large and critical audience, including several of the principal musicians in the country, assembled at the invitation of Mr. and Mrs. C. J. Freake. Mr. Kemp was at the pianoforte; the organist was Mr. Pettit; the conductor, Mr. Otto Goldschmidt. The soloists were Madame Pauer, Miss Bentham, Mr. A. D. Coleridge, Mr. Kempton, Lady Catharine Coke, and Mr. Lionel Benson, and the choruses were sung by 120 amateurs (besides "Jenny Lind"), who have given steady practice to it for months. It was a very satisfactory performance.

Watney v. Trist and Others.—This case came before the Chancery Division of the High Court of Justice on the 6th inst. It was an action arising out of a dispute between the partners of the firm of Norton, Trist, Watney, & Co., the auctioneers, under the articles of partnership. Mr. Trist, one of the members, was empowered to admit two of his sons into the office of the firm as pupils, and accordingly did so in 1870 and 1874. Shortly afterwards he gave notice of his intention to take in a third son, Mr. G. A. Trist, but this was resisted by the other partners, who commenced the present suit to restrain him from so doing. Vice-Chancellor Malins granted an injunction up to the hearing of the cause restraining Mr. G. A. Trist from acting as pupil or clerk of the firm.

Proposed New Free Library for Manchester.—At the monthly meeting of the Manchester City Council, on the 5th inst., the Free Libraries Committee recommended that, in consequence of the unsafe condition of the building in Campfield in which the books of the Public Free Library were stored, it was desirable that a new building should be erected in a more central position than the present building. In the course of the discussion which ensued, exception was taken to a supposed disposition towards extravagant expenditure in connexion with public institutions; and it was ultimately agreed that the further consideration of the question should be postponed.

Value of Timber grown on Waste Lands. An illustration of the value of timber on waste lands in the Highlands is afforded by a sale of wood which took place on the estate of the Earl of Cawdor, in Nairnshire, the other day. In 1820 two hills on the Cawdor property, of about 300 acres in extent, and of almost no agricultural value, were planted with fir and other trees, and after successive thinnings, the sale of which realised large sums, the remainder of the wood has just been sold off for the sum of 16,000*l*. The sums realised for the wood on this waste land during the fifty years is stated to be equal per acre to the return for the best arable land in the country.

Architectural Association of Ireland.—An ordinary general meeting of the members of this Society was held on Thursday evening, the 30th ult., Mr. T. H. Longfield in the chair, when Mr. James H. Owen, M.A., delivered an extempore lecture on the "Earth-Closet System." The paper was illustrated by a series of diagrams on the blackboard. Mr. J. J. O'Callaghan gave testimony as to the value of the earth system in remote districts where there was no water carriage obtainable without enormous expense, not only in the first cost of construction, but also in subsequent repairs, where the apparatus was subject to rough treatment.

Manchester Tidal Navigation. — In a recent report by Mr. Hamilton Fulton upon this subject, he refers to the pollution of the Mersey and its tributaries, and recommends that the sewage of Manchester, Warrington, &c., should be taken to an outfall below Runcorn, and there discharged in the capacious reservoir of the estuary, and that the works connected therewith should be carried out in and simultaneously with those in Mr. Fulton's design of the proposed tidal navigation. This arrangement would, it is said, tend to diminish the outlay, and would relieve that portion of the Mersey from pollution.

An Infectious Diseases Hospital for Salford.—We learn that the proposal of the Salford Corporation to convert Wilton House and four adjoining cottages, in Cross-lane, to the purposes of a hospital for the treatment of cases of infectious diseases, has received the unqualified approval of the Local Government Board, and the application made to that authority for a loan of 5,000*l*. to defray the expense of making the necessary alterations in the building has been granted. It is expected that in the course of a few weeks the Corporation will be able to provide adequate means for isolating all cases of infectious disease.

A New Approach to the Victoria Embankment.—On the 4th inst. a new approach to the Victoria Embankment, by way of Craven-street, Strand, was completed and thrown open to the public by order of the Metropolitan Board of Works. Craven-street formerly ended in a *cul de sac* facing the river. This has now been removed, and the roadway continued to the Embankment at the junction with Northumberland-avenue.

Death of an Italian Engineer.—A telegram from Rome, dated the 5th inst., says:—"Italian engineering loses an illustrious representative in Signor Severino Grattoni, who died at Turin yesterday. His name will always be honourably associated with the Mont Cenis tunnel, an undertaking planned, under Count Cavour's auspices, by Sommeiller and Grandis, who also invented the instruments required for its completion, but were indebted to Signor Grattoni for its actual execution amid obstacles which would have baffled an engineer of inferior energy or resource."

An Aquarium and Winter Garden for Clifton.—A private meeting of influential residents in Clifton was held on the 5th inst., in furtherance of the proposed Aquarium and Winter Garden. The site suggested is an open space of ground fronting on the Pembroke-road and on the Oakfield-road. A committee was appointed to wait on the Society of Merchants, with a view to acquiring the site. The plans have been prepared by Mr. John Norton, the architect.

The Zoological Gardens, Regent's Park. The workmen in the Zoological Society's Garden are constructing a large temporary building, with an adjoining yard, intended for the reception of the Prince of Wales's living collection of Indian animals, which will be deposited there on his Royal Highness's return to this country. The spot selected for the building is at the southern end of the gardens, near the reservoir.

Memorial of Captain Sanders, R.N.—Mr. E. J. Physick, sculptor, has been commissioned to execute this work, to be erected in the Parish Church of Cheshunt. It consists of a marble mural tablet, in which the emblems of the profession of the deceased stand out in good relief. Captain Sanders, R.N., was one of the now few surviving officers present at the Battle of Trafalgar.

A New Theatre for Leeds.—It is stated that the land, with additions, at present occupied by Mr. Adams's Circus at Leeds has been purchased for the site of the new theatre. It will be constructed to accommodate over 3,000 people, and the stage will be one of the largest in the kingdom. The capital of the company is 50,000*l*. Mr. W. Corson, a local architect, is preparing the plans.

St. Mary's Aldermary.—As to your account of the intended restoration of St. Mary's Aldermary Church,—Mr. Fish is, as you have stated, a contractor for the work, but I am also contractor for it, his part being the exterior and structural work, and mine the entire wood fittings of the interior.—A. ROBINSON.

Proposed Bristol and Gloucestershire Archæological Society.—The inaugural meeting is to be held in the New Lecture Room of the Museum and Library, Queen's-road, Bristol, on Friday, April 21st, at half-past two o'clock. The Lord-Lieutenant of the county will preside, supported by the Bishop of the diocese.

A New Workhouse at Burnley.—A new workhouse, to accommodate 350 paupers, has just been opened at Burnley. A large hospital is attached. The total cost will be about 20,000*l*. The buildings have been erected from the designs and under the superintendence of Mr. Waddington, architect, Burnley.

Trade Book.—Messrs. John Bolding & Sons (South Molton-street) have issued an illustrated catalogue of plumbers', engineers', and gasfitters' brasswork and sanitary earthenware, which forms a useful and dependable price-book so far as it goes.

House Accommodation in Manufacturing Towns.—A paper, by Mr. W. Henman, on "Economic Dwellings for the Working Classes," read at the Cleveland Institution of Engineers, led to a long and useful discussion, which is reported in the *North of England Building Trade Review*.

TENDERS

For the construction of drainage works for the Hastings Urban Sanitary Authority. Mr. Wm. Andrews, borough engineer. Quantities by Messrs. Cross & Wells:—

Docwra	£4,450 0 0
Russell	4,040 0 0
Champion	3,930 0 0
Geary	3,829 0 0
Vidler	3,699 0 0
Longhurst	3,575 10 0
King	3,525 0 0
Gasson (accepted)	3,294 0 0

For sundry painting works to New-court Chapel, Holloway. Messrs. Searle, Son, & Hayes, architects:—

Pitman & Cuthbertson	£114 0 0
Wontner, Smith, & Son (accepted)	108 19 0

For the construction of engine and boiler houses, chimney-shaft, &c., at the Hastings water-works, for the Urban Sanitary Authority. Mr. Edward Easton, engineer. Quantities by Messrs. Cross & Wells:—

Womersley	£3,200 0 0
Parks	3,076 0 0
Geary	2,990 0 0
Vidler	2,963 0 0
Russell (accepted)	2,670 0 0

For painting and decorative works at Powis Lodge, Beddington-lane, Surrey. Mr. W. Newton Dunn, architect:—

Clements	£287 0 0
Kidgell	280 0 0
Pitman & Cuthbertson, (accepted)	259 0 0

For warehouse, Barbican, E.C.:—

Lawrence	£4,920 0 0
Sewell & Son	3,825 0 0
Crabb	3,796 0 0
Bangs & Co.	3,771 0 0
Moreland & Nixon	3,716 0 0
Elkington	3,690 0 0
Servener & White	3,639 0 0
Sharpington & Co.	3,633 0 0
Coleman	3,635 0 0
Ennor	3,477 0 0
Cullum	3,359 0 0
Killby	3,257 0 0

For proposed new fronts, &c., to St. James's Chapel, Westmoreland-street, W. Mr. F. C. Penrose, architect. Quantities supplied:—

Cairns	£4,118 0 0
Riches	3,847 0 0
Gould & Brand	3,697 0 0
Lee	3,677 0 0
Crisp	3,640 0 0
Hill, Higgs, & Hill	3,400 0 0

For the erection of new municipal buildings at Newbury, in the county of Berks. Mr. James H. Money, architect:—

Croxford & Co.	£5,597 0 0
James	5,492 14 0
Whiter	5,080 16 3
Hill, Higgs, & Hill	4,990 0 0
R. & W. Harrison	4,800 0 0
Clements	4,669 0 0
Elliott	4,455 19 0
Crook	4,345 0 0
Bishop	4,300 0 0

For the erection of new Board schools at Inkpen, near Hungerford, in the county of Berks, for the Inkpen School Board. Mr. James H. Money, architect:—

Bance (accepted)	£1,300 0 0

For the supply and delivery of cast and wrought iron-work, for a new sluice for the Royal Military Canal, Dymchurch, Romney Marsh. Mr. H. D. Good, engineer. Quantities supplied:—

Drury & Biggleston	£1,248 0 0
Garrett & Son	1,179 8 10
Stiff	1,028 0 0
Hanna, Donald, & Wilson*	1,016 0 0

* Accepted.

For the erection of a pair of cottages and entrance-lodge, Bittacy, Mill-hill, for Mr. Henry Eley. Mr. George Judge, jun., architect. Quantities by Mr. W. H. Brayshaw:—

Axford	£1,685 0 0
Roberts	1,594 0 0
Boyce	1,524 0 0
Doune	1,445 0 0
Titmas (accepted)	1,429 0 0

For alterations and additions to No. 9, Lincoln's-inn-fields, for Messrs. Warre, Robins, & Burges. Mr. J. W. Sanders, architect. Quantities by Mr. W. H. Brayshaw:—

Burgess (accepted)	£884 0 0

For works at Shoreditch churchyard, and burial-ground Hackney-road:—

	Churchyard.	Burial-ground.
Hare	£1,165 0 0	£427 0 0
Brown & Sons	910 0 0	320 0 0
Killby	713 0 0	283 0 0
Woods	700 0 0	276 0 0
Waldram	695 0 0	269 0 0
Sawyer*	585 0 0	248 0 0

* Accepted.

For new roofs and general repairs to Nos. 160 and 162, Great Titchfield-street. Mr. E. T. Asson, architect:—

Hatfield	£960 0 0
Ryder & Son	768 0 0
Shaw	770 0 0
Fairchild	753 0 0
Perkins	740 0 0
Cole (accepted)	600 0 0

For alterations to the Hole-in-the-Wall, Chancery-lane, for Mr. Teale. Mr. Jewhurst, architect:—

Oughtwaite & Clark	£875 0 0
Toms	860 0 0
Perkins	829 0 0

For building four cottages and outbuildings at Southgate. Mr. T. J. Hill, architect:—

Stamp & Bowtle	£1,873 0 0
Kerriss	1,722 0 0
Rist & Brown	1,466 0 0
Pilshaw	1,384 0 0
Bentley	1,350 0 0
Newby (accepted)	1,220 0 0

For model dwellings, London-road, Enfield. Mr. T. J. Hill, architect:—

Sabey & Son	£1,900 0 0

For a warehouse to be erected in Bury-street, St. Mary Axe, for Messrs. Ashton & Green. Quantities by Messrs. Batstone and Sons. Mr. H. H. Collins, architect:—

Ashby, Brothers	£4,397 0 0
Sheffield	4,387 0 0
Bangs & Co.	4,332 0 0
Morter	4,253 0 0
Watts	4,140 0 0
Abrahams	4,073 0 0

The Builder.

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Indian and Eastern Architecture.

WHATEVER be the ultimate judgment of the architects of the Western world on the works left by the builders of the East, there can be no doubt that a great and lasting debt will be owing to the author of the book before us,* for the manner in which he has brought before Western students the claims of this remarkable family of architectural monuments to the recognition and the study of all who are interested in the art as a record of the history of the artistic sympathies and associations of a very important section of the human race. It is hardly too much to say that it is to Mr. Fergusson that the great proportion of English architectural students are alone indebted for the recognition that such a thing as an Indian style of architecture existed, sufficiently extended in its geographical area and elaborate in its character to be worthy of special study as a portion of the education of "the complete architect." Earlier books had been devoted to it; and Mr. Fergusson, a good many years since, signalised the interest which a personal examination of some of the architectural remains of India had awakened in him by the publication of his volume of "Picturesque Illustrations of Indian Architecture." These and other works, however, did not, we suspect, attract much attention from those who had not previously been from other causes interested in the art and the history of India. It was the publication in the "Handbook of Architecture" of an extensive section specially devoted to Indian architecture, treated as on a standing of equal importance with the more popularly-known styles of the Classic and Mediæval eras of Europe, that first suggested to many the possibility that the buildings of such a great and ancient people might be worth attention in spite of their separation from us by distance and association; and that even their seemingly uncouth forms might appear so partly from the opposite training of the eye in the European schools of architecture. Such a conclusion ought not to be considered unreasonable by those who consider how completely all the beauty and fitness which we now see in the Mediæval buildings of Europe was hidden from the eyes of the most educated men of the Renaissance and its succeeding epochs up to the Gothic revival. Still, Mr. Fergusson's experiment at claiming a place for the Indian styles among the recognised styles of the world received much adverse criticism at first, and was regarded by many as merely an instance of the riding of his own hobby by an author who had, from special circumstances, been led to the subject. And it is probable that the author did something to excite this opposition by claiming, with the enthusiasm of a new convert, a little too much for the artistic value of the style which he has been so instrumental in introducing to us. Its interest in an archæological and illustrative point of view no candid critic could have dreamed of disputing; but the claim that Hindoo and Jaina architecture should be regarded as of equal architectural beauty with any known styles might justifiably be received in a more sceptical spirit. As far as we have observed, this claim has scarcely been urged by the author in so decisive a manner as in his earlier edition of the "Handbook," which is now superseded by the "History"; though he still returns to the charge of want of allowance for the results of education in our estimate of Indian architecture. There is no question, however, that the author has succeeded, since he first took up the subject, in very considerably influencing the opinion of architectural students in its favour, and that few will now express any surprise at seeing not merely a section, but an entire volume devoted to the elucidation of Indian and Eastern architecture, or consider such a classification of the "History of Architecture" as particularly disproportionate or onesided, especially as it is our interest to get as much as we can upon a subject from the writer who has most studied it. And even though the final judgment may, and we think will be, that there is not much in the Indian styles that can be valuable as precedent or suggestion to the Western architect, and that the author's natural bias towards a branch of study which he has so completely made his own has led him a little to exaggerate its value, there can be no question of the general truth of his remark, that the study of these Indian examples widens to a great extent our basis of architectural criticism.

> "It is only by becoming familiar with forms so utterly dissimilar from those that we have hitherto been conversant with, that we perceive how narrow is the purview that is content with one form or passing fashion. By rising to this wider range, we shall perceive that architecture is as many-sided as nature herself, and learn how few feelings and how few aspirations of the human heart and brain there are that cannot be expressed by its means. On the other hand, it is only by taking this wide survey that we appreciate how worthless any product of architectural art becomes which does not honestly represent the thoughts and feelings of those who built it, or the height of their loftiest aspirations" (p. 404).

In thus adding the Indian styles to the sum total of architectural expressions to be collated by the student, it must be admitted, however, that they cannot ever be ranged with the few great styles of the world, for one reason (among others), which our author himself furnishes us with, though he rather avoids the obvious deduction from it. All that is intellectually great in India, he observes (p. 324),—all which is written, in fact,—belongs to the Sanscrit-speaking Aryan race; all that is built belongs to other and intellectually inferior races. On the other hand, Greek architecture is the production of the most intellectual nation that ever existed as a nation, at the period of its highest culture; and the Mediæval architecture, which might, perhaps, more reasonably be compared with the Indian, was at least the work of the highest Mediæval minds; and though the temples of India may be admitted to be more astonishing in their elaboration of ornament than anything even in Mediæval architecture, the deficiency in the logic of construction (we are now referring only to pre Saracenic styles), and in the reticence and judgment in the use of ornament which is an essential characteristic of the highest architectural and ornamental art, must always prevent us from placing these styles on a level with the Greek or Gothic, or expecting that they can in an equal degree influence the practice of the art in its highest forms.

At the same time, the balance of interest for Indian architecture is preserved to some extent by the antiquity and multiplicity of its forms, the great geographical area which it covers, and the manner in which it is connected with and illustrates so important a chapter in the history of mankind as far as we know it. This very multiplicity and extent, which forms one of the difficulties in acquiring and systematising a knowledge of the subject, and condensing it into a book, is equally a difficulty in the way of giving any adequate idea of the ramifications of the subject in the extent of an article. Notwithstanding the extent of the information conveyed in Mr. Fergusson's thick volume, compiled from the results of forty years' gradual gathering together of material, he would himself be the first to admit (and indeed implies in several places) that it is not to be considered as the final possible analysis and classification of the architectural monuments of the Indian peninsula, for which there is still much information probably waiting to be acquired by further research in only partially explored districts, where he even hopes that the remains may exist which would furnish the key to the origin of some of the puzzling and so far inexplicable peculiarities of this family of buildings. But even in the present state of the study, our author specially tells us that he has been obliged to abstain from giving the multitudinous details which form the ground of his generalisations, though he hopes that the large number of additional illustrations and the extended letterpress may greatly diminish the force of the charge of dogmatism which was brought against him in reference to his earlier writing on Indian architecture. Still, to quote his own words, "No man can direct his mind for forty years to the earnest investigation of any department of knowledge, and not become acquainted with a host of particulars, and acquire a species of insight which neither time nor space, nor perhaps the resources of language will permit him to reproduce in their fulness. I possess, to give a single instance, more than 3,000 photographs of Indian buildings, with which constant use has made me as familiar as with any other object that is perpetually before my eyes; and to recapitulate all the information they convey to long-continued scrutiny would be an endless, if not indeed an

* History of Indian and Eastern Architecture. By James Fergusson, D.C.L., F.R.S., M.R.A.S., &c., forming the third volume of the new edition of the "History of Architecture." London: John Murray.

impossible undertaking. . . . . I can only ask my readers to believe that the assertions are not speculative fancies, but deductions from facts." Necessary as this position may be in the present instance, in consideration of the limits of book-making, it is obvious that an author who adopts it entrenches himself rather formidably, and even unfairly, against any assault from an opposing theory, if that were an object in the case. But on the whole, the vantage-ground for any conflict of theories is not as yet; most of us in this country are indebted to Mr. Fergusson's labours for the greater part of our information on Indian architecture, and it is only by further years of investigation in the same spirit as his own that a platform of criticism can be formed sufficiently extended for the final trial and confirmation or rejection of his classification of the subject. In the meantime, the critical insight which the author has frequently shown (though perhaps accompanied by a little too much of Macaulay's tendency to be "too sure of everything") in relation to subjects more within the range of general architectural observation, may justify us in thinking that in the main his views are more likely to be confirmed than contradicted by future investigations; and perhaps any remarks we can make here may be most to the purpose if, assuming for the present the general validity, if not absolute correctness, of Mr. Fergusson's classifications and conclusions as to facts, we attempt a short critical recapitulation of the points of the styles here illustrated, and their value or suggestiveness in an æsthetic point of view.

The introductory chapter as to classification of races and styles we must pass over with merely the remark that the subject of Indian history before the Mahommedan invasion seems to be a matter of at present hopeless confusion and bewilderment, and that those who attempt to extract any clear ideas about it from Mr. Fergusson's preface will be likely to share his doubt whether we "can ever clothe with solid flesh the skeleton of history which is all that we possess in regard to the period anterior to the advent of Buddha" (623 B.C.), and will be likely to extend their doubts and confusion of ideas down to a period considerably nearer to modern times. To say truth, it does not appear to us that the author exhibits in his ethnological remarks and classifications the same perspicuity of thought and style which characterises his purely architectural analysis. Multitudes of names unfamiliar to European ears are bandied about with a reckless disregard for the reader's feelings, which is hardly fair, considering how little information about them is vouchsafed for the benefit of those architectural readers (tolerably numerous) who do not happen to be Anglo-Indians. Speaking seriously, moreover, there seems to us a little want of logical method in the nomenclature employed to mark the classification of styles. Two divisions of the subject are headed respectively "Buddhist" and "Jaina" architecture, which are divisions based upon creed; the next chapter, "Architecture in the Himalayas," implies a topographical division, while the next two, "Dravidian" and "Chalukyan," are, if we rightly understand the rather vague explanations, divisions founded on distinctions of race or language. "Indian Saracenic architecture" comes next, which includes both creed and race as elements of the distinction; and then the headings of the following books, "Farther India" and "China" come back again to lines of topographical demarcation. The difficulty of nomenclature, in the present state of the study of Indian architecture, is no doubt a serious one, but it appears to us that a more consistent method might have been attained than that presented.

Having got over the only serious complaint that can be made about the manner of the book, let us glance, as systematically as space may permit, at its matter. The number of additional illustrations, many of them of great interest and beauty, which have been added to this enlarged treatment of the subject, conduce greatly to the reader's interest in and opportunity of following the author's critical remarks, and in some instances suggest new ideas in regard to the architectural detail and its suggestiveness in design, which the author's earlier treatise did not supply. The two maps of Hindostan, the one showing the respective distribution of Buddhist and Jaina architectural remains, and the other that of the Indo-Aryan, Dravidian, and Chalukyan remains, are an important assistance in following the classification which we have already referred to. In the first book relating to Buddhist architecture some further examples are named and illustrated of the early great circular mounds of building which are to Indian what the Pyramids are to Egyptian architecture, though springing apparently from priestly rather than from monarchical influence. The Architectural Court at South Kensington, besides Mr. Fergusson's earlier book, has made every one familiar with the characteristics of the Sanchi Tope, the most typical example of this early phase of Indian religious architecture, with its carpentry form of gate and stone "palings." The prevalence of this feature of stone palings or "rails" has been more dwelt upon and exemplified by Mr. Fergusson in this book. At present only ten or twelve examples of this form of erection are known; but, as the author observes, they belong to a class of objects so easily thrown down and buried, that there are, no doubt, other specimens existing to reward the labour of the archæologist. Of the importance and interest of these objects, in an archæological, not to say an artistic, point of view, Mr. Fergusson gives a remarkable illustration from the rail at Amravati (p. 100). The total height of the whole is about 14 ft., the circle which it encloses being 195 ft. in diameter; within this is the inner railing circle (165 ft. diameter), the space between the two being the processioo-path on days of religious festival, and the tope occupying the centre space within the inner railing. The engraving of a portion of the outer railing shows a sill and top rail and three uprights, apparently in the same plane, and as if mortised into the top and bottom rails, while three wide subsidiary bars, with very narrow interatices, run longitudinally behind the uprights, and fill up the space between the top and bottom rails. The whole surfaces of these are elaborately carved, the top and bottom rails with continuous designs, in the top rail representing a kind of undulated or serpentine roll moulding in relief on the face of the rail, and itself enriched with minute surface carving and interspersed with human figures, and on the bottom rail showing a procession of elephants, and bulls, and other animals. The other portions of the rails are mostly decorated with circular bosses in concentric rings of minute symmetrical ornament, with very rich effect. Looking at the continuous decorations of animals and men, and their evident relation to the actual processions which went round on holydays between the inner and outer railing, it is impossible to avoid thinking of the Pan-Athenaic frieze of the Parthenon, and curious to note the application of precisely the same idea in the decoration of a temple in the case of two peoples so widely diverse in associations and artistic predilections. The round bosses referred to also illustrate in a remarkably significant manner the transition from a carpentry to a stone decoration. A rail from one of the topes at Sanchi (fig. 30, p. 93) shows this kind of boss ornament, in a simpler form, placed over the intersections of the uprights and longitudinal bars, exactly where a screw or nail-head would come in joinery; these are variously decorated, and convey the idea of a large flat screw head. In a representation of a rail on the same page, from a bas relief at Amravati (for these ornamented rails become themselves features in imitative surface decoration on the buildings) the original nail-head has assumed the more elaborate form just alluded to, and its origin from a structural point is forgotten, as it covers other portions besides the intersections; and a further and later example from Gautamiputra cave shows the discs or bosses so prevalent as to have the appearance almost of a surface diaper, all recollection of its original having apparently vanished. The genesis of architectural ornament could hardly have a more pointed and significant illustration.

A highly interesting addition to the chapter of Buddhist architecture is that which has been laid open by recent excavations in the neighbourhood of Peshawur, and which the author distinguishes as the Gandhara remains. "A great deal," Mr. Fergusson observes, "remains to be done before we can speak with certainty in regard either to their age or origin; but enough is known of them to make it certain that the materials there exist for settling not only the question of the amount of influence classical art exercised on that of India, but also for solving many problems of Buddhist archæology and art." From this neighbourhood come specimens of capitals based on Corinthian capitals, though with some Indian details: and what is, perhaps, still more interesting, a tope, that of Manikyala (figured on p. 81), curiously Classic in its general treatment, having the appearance of a circular dome raised on a drum with a plinth, a cornice, and short flat pilasters at regular intervals, with capitals which, in their relation to the Classic capital, a little remind us of Saxon remains in England, though by no means so rude or shapeless as the imposts at Barnack. In this tope the outer "railing" has become incorporated with the building itself, being represented by an order of short pilasters similar to those on the centre tope, arranged on the face of a projecting basement running round the tope, like a great step round its foot, and apparently affording the place for the procession upon the top of this projection. The whole thing has far more affinity with Roman than with Indian architecture, in general feeling and appearance. Mr. Fergusson assigns this tope to the beginning of the eighth century, to which period, or thereabouts, he considers the Ghandara monasteries also belong. There are many bas-reliefs in this neighbourhood, he adds, "which, if transferred to the Lateran Museum, and labelled as 'Early Christian,' would pass muster with ninety-nine people out of one hundred who visit that collection." General Cunningham has in preparation a work to illustrate the remains in this neighbourhood. In the meantime, the investigation of its valuable teachings in archæology seems to be carried on in a sufficiently irregular and unsystematic manner, judging from a note of the author's, which we take this opportunity of giving further currency to:—

"The mode in which the excavations have recently been conducted by Government has been to send out a party of sappers in the cold weather to dig, but the officer in charge of the party has been the subaltern who happened to be in command of the company at the time. A new officer is consequently appointed every year, and no one has ever been selected because he had any experience in such matters, or any taste for such pursuits. What has been done has been done wonderfully well, considering the circumstances under which it was undertaken; but the result on the whole is, as might be expected, painfully disappointing. Quite recently, however, it is understood that General Cunningham has taken charge of the investigations, and we may consequently hope that in future these defects of arrangement will be remedied."

Let us hope so, indeed; for it is vexatious to think of such a mine being opened for the architectural explorer, and of its precious contents being wasted for want of systematic and properly instructed investigation.

The chapters on Jaina architecture acquire their new interest chiefly from additional illustrations, especially in regard to modern architecture. Of these, one is of no little interest (on p. 259) as showing a successful attempt by a modern architect of a Jaina temple to render the characteristic wriggling stone strut which is used in the style, from the impost to the centre of the beam (and which is an utterly un-masonic, and, in fact, constructively absurd feature), a real part of the construction, and that in a highly decorative manner, by filling in the triangular spandrels formed by it with tracery and ornament, and thus connecting it with the construction. We may call attention to the remarkable view of the modern temple at Ahmedabad (p. 257), as illustrating a really fine and impressive grouping of building round a quadrangle in subordination to the central and most sacred apartment. We go entirely with the author in his admiration of this as a piece of architectural composition, not only remarkably effective, but exhibiting at the same time a most defined and logical relation between plan and design; it possesses, as the author remarks, "variety without confusion, and an appropriateness of every part to the purpose for which it was intended." This quality of variety without confusion is not, however, the characteristic of later Indian styles generally, especially in regard to the application of ornament, the profusion of which, in many instances, rather astonishes the eye than satisfies the judgment; nor can we quite concur in Mr. Fergusson's remark at the close of this same chapter, or, at least, in what is evidently implied by his remark, that "few among us are aware how much education has had to do with their admiration of Classical or Mediæval art, and few consequently perceive how much their condemnation of Indian forms arises from this very want of gradual and appropriate education." We are by no means disposed to accept the conclusion unconditionally. A critically constituted mind is quite capable of viewing and comparing styles, apart from their proportionate familiarity to his mind, of allowing for the effect of such familiarity or the want of it, and it might be open to such critics to turn the tables on Mr. Fergusson, and hint that he is probably not aware how much (self) education has to do with his own admiration for the forms of Indian art.

We shall return to this interesting and elaborate work in our next, and give specimens of some of the illustrations which contribute so greatly to its value and interest.

BEAUTY.

We have invited our readers, from time to time, to consider several of those elements of beauty which consist in form, in colour, in symmetric proportion, in light and shadow, or the like; or which awaken in the mind the sentiments of strength, of grandeur, or of grace. It remains to say a few words on the more general idea of beauty.

A confessed difficulty lies at the very threshold of such an inquiry. We are at once confronted by an appeal to individual taste. A Chinese will acknowledge no overpowering emotion in the presence of the noblest relics of Grecian antiquity,—the Venus of Melos, the Cupid of the Vatican, or the Psyche of the *Museo Borbonico*. But he will rave about the "golden lilies" of a mutilated doll, with slanting eyes and a pimple in the place of a nose. Therefore, we shall be told, the emotion, amounting in some instances almost to physical pain, that stirs the cultured European on a sudden glance at the grandest relics of the Phidian age, is conventional. It is only the product of his education. The Venus of Milo is a bit of marble; and a huge bronze Kylin—an embodiment of all that man can pile together of the terrible—might stir the same emotion in us, if we had been differently trained from infancy. In arguments such as these there is enough of truth to constitute a respectable fallacy. In all phenomena that affect mankind we have to consider the external as well as the internal action. The objective, if it have any independent existence, cannot be conceived independently by the human mind. Subjective and objective are as inseparable as convex and concave. If we speak of any phenomenal action, we have to imply the mode in which that action affects the human organisation. Light is to us nothing but an abstract and most puzzling term, apart from our daily optical experience. Music is divine language to a man blessed with a musical ear; while it is an unknown tongue, or simply a noise, to the very large proportion of mankind which is destitute of that native faculty. And, therefore, with regard to beauty, which we may regard as the visible expression of the highest excellence, any appreciation of its lustre must depend on the mind in which the emotion is raised, almost as much as in the object which raises the emotion.

In treating of those forms or elements of beauty, therefore, which are represented by the sculptor, the painter, the architect, or the poet, of the present day, we must first, in consequence of the infirmity, or the limitation, of our faculties, confine ourselves within an ethnographical boundary. We must speak of what is beautiful, in the eyes, or in the heart, of an Aryan people. No doubt, even here we shall find tribes and even local lines which mark a certain demarcation of taste. No doubt, on the other hand, there are principles which are of more universal application. The negro represents the devil as white; but the negress, as a rule, admires the white man rather than the black or the dusky; even as the latter admires the white woman rather than the black.

In the most general view, then, of the subject, the beautiful may be regarded as the outward and visible clothing of the good—the most beautiful as the phenomenal representation of the most excellent. If there be anything that is perfect in goodness, it must at the same time be of perfect beauty. It may be an excellence or a beauty of so high an order as to require previous education in order to comprehend or even to admire it. In that case it will become more and more beautiful in the eyes of the observer, the higher, the purer, and the more cultivated he becomes. And thus we may well conceive that such perfect beauty as Homer attributed to the immortals lies beyond the confines of human imagination, or even of human worship; and that the loftiest artist must ever hunger after a beauty that no chisel and no pencil can represent.

A view of this kind is in itself ennobling to the mind. It comes into sharp contrast with the doctrines of asceticism. In the savage wilds of Syrian and African deserts grew up, among other weird and demoniac inspirations, the idea that beauty had in it not only the nature, but the very essence, of evil. So grotesquely false was the idea which the Anchoret formed to himself of the supreme good, that it failed to comprehend the primary conception of the natural representation of the good. We can, indeed, trace, almost step by step, the path by which the ignorant and passionate mind was led to this inverting of the truth. Whether by reaction against the primary injunctions of the monotheistic legislators, by the pressure of misery, or by any other disturbing and cankering falsehood, men were led to believe in the existence of an imaginary excellence, consisting in the disuse of the natural functions of organic life, the keeping asunder the two halves of the natural pair, and the excellence of discomfort, squalor, and misery. When this disease has once mastered the soul, the natural remedy, the vision of a gracious and beautiful woman, causes a moral convulsion. For this reason beauty, first in that, its most expressive form, and then in any minor display, affects the ascetic as water affects the sufferer from hydrophobia. And the ravings penned by some of those poor de-humanised maniacs find echo sometimes, on the lips of very smoothly-shaven and cleanly-dressed persons, with whom many of us are more or less familiar in daily life. Only what we call pitiable fanaticism in the Anchoret can hardly, by any judgment of charity, be regarded as anything but detestable hypocrisy in the man who repeats the words, but declines to follow the example, of St. Francis, St. Bernard, or St. Anthony.

It follows from the conception of beauty, as the embodiment and hieroglyphic of excellence, that there may be as many genera and orders of beauty as there are of excellence itself. If we seek for the most constant and universal characteristic, it will perhaps be found in the idea of fitness, that is to say, of the perfect adaptation of the means employed, or of the effect produced, in the attempt to clothe an idea in concrete form. Under this generalisation will be comprehended the scientifically beautiful. The mathematician will be struck with the beauty of a *formula* which to the non-mathematician is an unintelligible collocation of letters and symbols; just as the musician will enjoy the scientific excellence of some rare strain of music, which to the ordinary listener is only a new and not very agreeable tune. Passing to those applications which most closely affect the student of architectural structure or of mechanical construction, we thus justify and explain the application of the adjective beautiful, to objects that would never claim such a praise from the ignorant observer, or even from the man of artistic taste, who was ignorant of constructive science. Even here, however, while the able and experienced mechanic, who knows his own *métier*, but who is ignorant of any fine art, will produce a machine or a bridge that is admirable, and even beautiful, as to its exact distribution of material, and thus as to its fitness for its purpose, but yet, from the architect's point of view, detestably ugly (instances of which may be seen by any pilgrim up the course of the Thames), the man who is not only a skilled mechanic, but a man of cultivated taste, such as Isambard Kingdom Brunel, will give birth to a design equally admirable from the mechanical and from the æsthetic point of view.

Unless we are misled in arguing from too narrow and imperfect *data*, we should say that the mode in which perfect fitness of method to purpose is most readily recognised by the greatest number of persons, and therefore the most universally admired, and acknowledged to be beautiful, is that of motion. If we linger in the workshop of the mechanic (at which we have just been led to cast a glance), we shall be struck by the movement of any machine in which the "clearance," as it is technically called, is very small. We see a piston-rod or cross head advance, with great velocity, towards a cross piece or bearing, which it appears about to strike with destructive violence. For three parts of its limited course it rushes straight on. Then, almost imperceptibly slackening, it changes the direction of its motion at the very moment when the shock would otherwise have occurred; and moves back in the contrary sense (as the French call it), having been within the thickness of a nutshell of collision and destruction. When all the parts of a machine are duly proportioned and highly finished, those portions of the movement where very fine clearances occur, are watched, at least by the mechanic, with something of the pleasure with which we hang on the movements of a graceful dancer.

In the movements of many animals we find the most perfect illustrations of the beauty of motion; but it has to be carefully borne in mind that this is far from being the case in all animal movements. If we study the vast field of organic mechanics, we shall find in one species the rough sketch of a mechanical idea; in another, the finished development. In one animal different modes of motion, in different *media*, or under different circumstances, are provided for with almost equal facility. In others, one power or mode of action is imperfectly, or at least, ungracefully, developed, for the sake of the more perfect performance of a different and more important function. In very many cases, a single mode of action is alone contemplated; and it is generally in these cases that the movement of the creature strikes us with the highest admiration. Thus, if we take the instance of a small river fish,—a case familiar to so many of us from childhood,—nothing can be, as movement, more perfectly graceful than the dart of the dace through a river, or the playful hovering of a group of large spotted minnows at the tail of a waterfall. Lay either creature on the grass, and its convulsive leaps only betoken despair. We have here the mechanism for living and moving in and under water developed to a very high degree, and no other locomotive mechanism developed at all. If we compare with this the case of an aquatic bird, we shall see, in the latter, a combination, or rather a succession, of mechanical movements, intended to be effected under very different conditions; and in which the facility, and therefore the grace and beauty, of the less customary action is sacrificed to the greater ease of the structure for performing the more ordinary or principal functions. Thus, in the flat-billed water-birds, which find their chief sustenance in the vegetation that grows at the bottom of our streams, we have creatures which share three distinct methods or *media* of existence. They are essentially birds, that is to say, feathered, flying, creatures; and their bony framework is built on the plan common to this great class of vertebrated animals. But to obtain their food they have to dive, or at all events to reach the bottom of shallow streams, lakes, or ponds. And, as aërial animals, not water-breathers, but water-haunters, it is important for them to be able to float. Thus we see that the duck is so built as to form a very perfect float, to which the short flattened feet serve as paddles, equally effective to propel the creature over the surface of the water, or to urge it, in spite of its natural flotation, to the bottom. Thus it is, while floating or diving that the birds of the duck tribe, the *anatidæ*, appear to most advantage.

This same mechanical structure is slightly varied, according to size and to habit, in other birds of the same family. Hence, the flamingo, which is a wading duck, not requiring to dive, can walk readily on its long stilts, either in water or on land; while its long neck enables it to mow the vegetation at the bottom of the shallows which it haunts, with its inverted beak, as with a scythe. The swan, again, a larger bird than the duck, can obtain its food for the most part by reason of the length of its neck. It is thus more of a floater than of a diver. Its wings act as sails to the snowy barque, on which it bears its cygnets when newly hatched. Its motion on the water is perfect grace. In flight it is higher and stronger, and in walk far less ungraceful, than the duck; because it has not been necessary to make such careful provision for the unusual difficulty (to a bird) of diving. On the other hand both flight and walk are almost impossible to the auk. It stands like a doll, with its egg under its foot, when driven to the lofty cliffs where it incubates, by the necessity of a dry nest for its egg. It throws itself headlong into the sea when alarmed; but when once in its natural element flies beneath the surface with a movement as rapid and graceful as that of a veritable fish.

We might easily extend the list of instances of what is beautiful in movement. Nothing is more striking, in this respect, than the difference in human movements. In one man or woman every action is graceful; in another every movement is awkward, angular, jerking. Civilisation is in itself adverse to the beauty of human motion. It supplies this defect by artifice. It teaches us to dance, to walk, to ride. Uncivilised races, for the most part, are more beautiful in their natural movements than civilised races; unclad people than clothed people. Most restricted and graceless of all are those who are driven, either by the exigencies of climate or by poverty to adopt heavy, inelastic clothing, which they habitually wear. The Esquimaux look to us much like so many seals. The thick

hobnailed boot of the English rustic wastes the muscles of his calf; and produces a shuffling, shambling gait, which painfully contrasts with the elastic tread of the unshod Italian peasant. The traces of the former on the soil are like deep hoof-marks; those of the latter, when with wet feet he has left marks on the stone pitching of his mountain paths, are frequently seen as an elliptical, followed by a round, patch; the instep being so arched that the foot does not touch the ground between the ball of the toes and the heel.

Connected with beauty of movement is that which is the most subtle, and probably the most powerful, of all manifestations of beauty, namely, that of expression. The pathognomy of the human face, or the indications given, by the play of its mobile parts, of the emotions of the mind, is a subject that is rather to be apprehended by the instinct, than to be reduced to rule by the man of science. It is, of course, the great study, whether professedly or not, of the sculptor and of the painter. It is a subject of the deepest interest to the student of art. Much more is known about it (as far as our acquaintance with the matter goes) by the actor than by any other class of artists. It varies not only ethnologically, but with a secular variation. The pathognomic conceptions of the time of Phidias were not the same as those of the age of Alexander the Great; nor were these the same as those of the age of Augustus or of Hadrian. So it has been in later times. The Venetians of to-day, readily to be distinguished as they are from the Florentines, are not the Venetians of the time of Titian. The Englishmen of the time of Queen Elizabeth were far other men, in bearing and in pathognomic expression, than the Englishmen of the time of Reynolds and of Gainsborough. The English women painted by Millais hardly seem to share the nationality of some of the exquisite portraits of Reynolds, of Gainsborough, and, as we lately took occasion to remark, of Romney. An apparition among us of a face and form like that of Lady Hamilton at her spinning-wheel would cause something like a social convulsion. Now, if we run down the long gamut of art that lies between Phidias (and, no doubt, the Greek painters) and Gainsborough, we must be convinced that the great artists of all times did not invent their subjects. They raised them, may be, into a higher dignity than that of their ordinary life. They seized the highest conception,—the noblest and purest pathognomical expression of the finest physiognomic and symmetric beauty of their time,—and they stamped it in marble, in bronze, in onyx, or in pigments. But they did not conceive a Venus, or a Madonna, or a great court lady, out of their own brains. They reflected the figures that walked across the stage of their day. They reflected them, it is true, not in ill-coloured and ill-polished glass, but in that pure crystal which belongs to the optic art of genius. But the highest praise of the artist ever was that of fidelity to the life of his time.

We are thus forced to the conclusion that there has been a long, secular, pathognomic, and physiognomic change in the Aryan race that has kept pace with the changes effected in the intellectual conceptions, the moral ideas, and the social and domestic habits of the time. Placing side by side such a view of the growth and development (whether for good or for evil) of the intellectual, emotional, spiritual inner life, and of the change in pathognomic expression, no less than in arms, attire, and habitual posture, presented to us by long successions of noble historical portraitures, we cannot refuse admiration at the fidelity with which the external reflects the internal life. We see, as we could never do apart from portraiture, how the beauty (or its absence) of form, and feature, and posture (which involves movement), translates and signifies the character of the inner life. And we are impressed with the conviction that there are deeper lessons to be drawn from the study of human beauty than were imagined even by that great pioneer of pathognomic study, the venerable Lavater himself.

THE LAKE DRAINAGE OF HOLLAND.

The Netherlands Minister, speaking at the Civil Engineers' banquet, referred to the projected drainage of the Zuyder Zee. This immense work, which, it is well known, has been long in contemplation, will probably be finally determined upon forthwith; is expected to cost a total sum of about 16,000,000*l.*; will reclaim from the waters a vast area of cultivable land; and may be completed within a period of sixteen years. There have been so many examples, in Dutch history, of successful conflicts with the sea, that any failures of similar enterprises, soberly undertaken, appear improbable; but this is an undertaking upon an especially gigantic scale, though not very much more so, probably, than that which gave back the Lake of Haarlem to the land. There the cylinders of the pumping-engines employed were of almost unprecedented diameter, and the results of a day's labour were often astounding. Holland, however, added enormously to her wealth by this speculation, as she will doubtless do by its successor. Of course, the geographical constitution of the country, so to speak, is perfectly familiar to the world; it is a region wherein the rivers flow, frequently, above the level of the plains, and wherein these plains have continually been invaded from the ocean. So much being understood, it is essential only to point out the process by which the Dutch are attaining their grand triumph over the accidents of nature. To the celebrated dykes no allusion is necessary; they are historical, and described in every guide-book. But the stupendous work about to be commenced may justify, perhaps, a glance at the means by which they are accomplished. They are under the direction of a public board, whose officials are, in relays, perpetually on the watch, and several years ago they determined to empty the basin of the great Haarlem Lake, a comparatively modern formation, beneath the waves of which many a village lay. It grew into a stormy flood; naval fights were fought upon its surface, not a few wrecks were sunk in its depths, and yet the Hollanders conceived the idea of draining it dry. Its fate was decided, in fact, when in 1836, its overflow reached to the very gates of Amsterdam. The notion had been entertained before. In 1643 an engineer of North Holland had offered, with four hundred millions of florins, to raise up this huge body of water, and cast it into the sea. But he must have had the wind, not less than the windmills, under his command in order to succeed. Numerous other projects followed, but all were futile. Steam-power alone could solve the difficulty, and, in 1840, the Dutch, in their own modest manner, sent to England for the requisite machinery, such as cleared her mines down to the lowest depths; yet this was not wholly applicable to the lake of Haarlem, and it was not until eight years later that the real task was begun, when a mighty apparatus, styled by its constructors "The Leegh-Water," after the inventor, with two of lesser proportions, were set to work, and are working to this day, though simply to carry off the oozings. The edifice containing the engine is a round tower situated in the midst of the drained basin, and reared upon a forest of piles. Nothing more remarkable of its kind is to be seen anywhere in Europe. It resembles a fortress rather than any other construction in architecture. The details of the machinery itself are colossal, and include eleven pumps of a power to excite astonishment, which, in the course of thirty-nine months, disgorged a million-million cubic yards of water, and consumed enough coals to exhaust a mine. The bed of the lake thus drained, and divided into parcels of reasonable size, sold at a splendid rate, and its nakedness was speedily covered by a rich vegetation. At first, naturally, only a few cabins were erected where the sea had so often wreaked its violence upon the land; especially as it was found that not a vestige of the former habitations had survived these repeated floods; but the earlier harvests soon attracted speculators, and Haarlem vale became one of the most prolific *polders* in Holland. At the outset all was irregularity. Now, the whole space is marked out in districts, traversed by roads and canals, sprinkled with villages and churches, shaded by avenues of trees, and alive with windmills. For, although the Dutch discovered that these could not drain their lake, they retained their preference for them,—upon economical grounds,—to facilitate their domestic industry. This work accomplished, they turned to the more humble operation of emptying the basin of the Leymeer, and then arose the project, startling in its magnitude, of drying up the bottom of the Zuyder Zee. This scheme, to which the Netherlands Minister alluded the other evening, was long regarded as utopian and chimerical; but the Dutch genius in the direction of hydraulics would appear to be dauntlessly audacious, and it has been persisted in until the Government view it with approval. The great maker of mills and pumps, Leegh-Water, never doubted the matter, as a possibility, though he acknowledged the natural differences existing between the Zuyder Zee and the Haarlem Lake. The former had fixed boundaries, so that there was a definite area within which the works could be carried on; its waters, in fact, were distinctly confined and limited; the latter, on the other hand, communicates with the North Sea by a broad outlet, so that the resistance to be overcome is not to be easily computed. Nevertheless, the engineers of Holland are not to be deterred. If the Zuyder Zee, they urge, in their last statement, is in want of barriers, they will construct barriers for it; they will isolate the gulf from the outer waters by means of an insuperable dyke; they will turn aside the streams which at present contribute to keep it full; their country requires this soil, and must have it. The Dutch are not dreamers; they are exceedingly apt pupils in the mechanical arts; they are slow to resolve, but tenacious of their resolutions when once formed, and there is no reason to believe that they will be defeated in this more than in their other bold engineering enterprises.

However, the drainage of the Zuyder Zee, and its conversion into what the French call a *prairie*, is not merely an extension of the grand project carried out in respect to the Haarlem lake; it is intimately connected with the Holland ship-canal, which was designed as a direct channel between the North Sea and Amsterdam. That enterprise was to supersede, in point of magnitude and importance, the entire network of inferior canals with which the country was reticulated, and it has been in active progress for several years past. The Dutch capital, through an accident, and unfortunately for itself, was built, it has been said, on the wrong side of the kingdom, and there is some truth in the remark. No doubt, after the terrific siege of Antwerp, in the sixteenth century, it became an active and flourishing port, but the Zuyder Zee was destroying it all the time. The spacious water-bed continued to silt up in all directions; bars were formed across the navigable passages, which no amount of dredging would keep clear; sand banks rose through the open water; the mouth of the Y was practically closed; vessels had to discharge their cargoes outside, or be lifted into the port by means of camels; but it became evident, either that Amsterdam must sink, like Venice—her patrician prototype—into a commercial ruin, or open for herself fresh outlets. First, the ship-canal to the Helder was undertaken by Blanken, an engineer whose memory is held in high renown all through Holland. It was finished in 1825, and, for those days, was a considerable work, with a length of fifty-one miles, a bottom breadth of 31 ft., and a surface of 124 ft., a depth of 21 ft., and lock-gate foundations carried down to a depth at which the land of even this watery region becomes solid. The voyage from the Dutch metropolis to the sea was thus reduced to from two days and a half to three-fourths of a day. Yet this by no means answered the requirements of that merchant population which had once taken an initiative in visiting the most distant waters of the world. The outside navigation still remained dangerous, circuitous, and liable to disastrous interruptions. Therefore, another scheme, much more vast, was projected, Mr. Hawkshaw and M. Disch being the engineers. They drew a line from the inlet at which Amsterdam is seated on the Y, extending, with only three bends, to the North Sea, and intended to establish a direct communication with London, and avoiding the tedious transit by way of Rotterdam, while, at the same time it would create a valuable Harbour of Refuge at a point where one had long been imperatively needed. Of this immense addition to the national facilities for trade and navigation, the cost was originally estimated at 2,225,000*l.*; but against that total was set a handsome amount to be derived from the drainage of lands, about twenty thousand acres in extent, hitherto flowed over by the waters of the Y and the Wijkermeer, through both of which the new route passes. The former begins at Welsen and ends at Spoordam, while the latter runs a somewhat indeterminate course, farther from the sea, and nearer to Amsterdam. A nation that has executed, and still contemplates, with ever-enhanced courage, these gigantic works, may be proud of its engineering genius, no matter what share in them is allotted to the supervision of English skill.

ANTIQUE TROY, AND ITS ART TEACHINGS.

Surrounded as we now are by modernisms and "improvements," it must be at times useful and improving—and may remind us of our whereabouts—to glance for a moment at some of the thoughts and doings of the distant Past of art. Time was when but little could be seen of this, but the spirit of modern research has been at work so vigorously and persistently that the secrets so long preserved of that Past have been, step by step, revealed, in spite of all difficulties and apparent impossibilities. It would be a curious thing to find out precisely when, and by what nationality, the first efforts at ornament were made. To get even a glimpse, however dim and indistinct, of such primitive efforts at art-production, would seem to be all but impossible; but, impossible as it seems, it has, without doubt, been done,—at least approximately; and that not in one special case only, but in many. We here touch only on one particular instance of this, and a most instructive one it is. It takes us to the first beginnings of art-action. No individualised style of art or building has had greater influence over the minds and sentiments of men than the world-famous Greek; and when gazing with wonder on the perfection of work the Greek race attained to, we can hardly, every now and then, help asking for some account of its very first beginnings, and for examples of its earliest forms, and as to how it grew out of the Greek mind, and, it must needs be added, from the Greek hand.

In the first place, as all know, there are specimens of "Archaic" Greek work to be found in most museums of antiquities, coming from various notable Greek cities and towns and isolated places, the very names of many of them forgotten. But we see in these remains, in fragments of ornament, in broken columns and entablatures, and in fragments of metal work, the *archaic* work, so to phrase, it, of the old Greek artist and workman. This is more or less familiar to all who take an interest in such matters. But there is yet another phase of the inquiry which has hardly been touched on, little or nothing having been done in it. We refer to the yet older work,—the rude "ornamentation," to limit our inquiry,—that must have preceded the archaic work itself. Such rude work must have been that of a people in a yet more primitive state, and less advanced. Indeed, to produce it, the Greek, or those who lived near him, and were like him, must have been in a very rough and well-nigh savage state. The perfected Greek work of the Parthenon we can well take the measure of, and of the archaic work which must needs have preceded it, but of the work which went before that it is, in the case of the Greek, a little difficult to apprehend, or may be even to imagine it. What did the rude Greek man do when he first put his hand to art-work? Impenetrable is the mystery, says the guide-book, which hangs over the early history of the Greek. Most surely this is so, but, nevertheless, we may get a little insight, by a glance at old Troy,—a city where he did so much.

It has remained for an enthusiastic and a persevering German and his wife to find the very foundations, as he thinks, of the most famous of antique cities, and the yet older ruins on which it was built. Ilium, or Troy,—who has not heard of it, and wondered and dreamed about it, and longed to know a something absolutely certain about it, and the dates of its foundation and final destruction, both of them time-marks in the world's history? As to the chronology of Troy, we have but the general supposition of antiquity that the Trojan War occurred about 1200 B.C., and this date, with Homer's own list of its kings before the war, takes us to about 1400 B.C. for the foundation of the city. Uncertain dates these, but, still, better than none, and at least approximatively true they must be. A date is of much assistance in the effort to get at a true insight of past art, and leads at times to a knowledge of where it originally came from and what it was most likely to be influenced by when not purely and solely indigenous, and an art *per se*. Through many long centuries, therefore, we must needs look back, and carry ourselves, for a glance at old Troy town and its surroundings, and at the men in it, and at their ways of work, artistically and otherwise. Mainly the same human wants are everywhere, and all the world over, the difference lying in the artistic organisation of the different nations and individuals, and not a little in the divine character of the *materials* which nature has provided in each separate locality. The Greek did his own work in his *own* way, and this it is that makes his work yet live. It must be kept well in mind, in the effort to get at some ocular certainty on the subject of old Troy, that its great singer himself lived long after its destruction,—so long, indeed, that many have doubted of the very existence of such a place, and have considered it as the result of the mere *invention* of the poet. He could never have seen the palace of King Priam, or the Scæan Gate, or Ilium's Tower. All these had long been buried. He knew of them only by hearsay. Nothing about it can be more convincing than Homer's own testimony:—

> "We ourselves
> But hear from rumour's voice, and nothing know,
> Who were the chiefs and mighty lords of Greece,"

which is Lord Derby's accurate rendering of Homer's own express words. But with all this, it may be well concluded that he must have seen, all about him in the age in which he lived, a mode of life, and life surroundings, much of the same kind, so that it amounts to all but the same thing to us. Thus in the "Iliad" we do see the Troy of old time; and in the *débris* on the Troad ground on which the city stood, we get every now and then a glimpse of the actualities of the place,—the thick, rough stone walls, the fragments of "Classic" art in its first beginnings, its goldsmith's and its silversmith's work, fragments of its warriors' armour, and a multitude of other things common to humanity all the world over. And even more: we may here see, according to Dr. Schliemann, even evidences of the progressive decline in "civilisation" among the successive inhabitants of the hill on which the old and world-famous city stood. How very much more might be said and hinted at here, but there is one most curious and puzzling matter connected with these remarkable discoveries by Dr. Schliemann, which must not be omitted. We can but glance at it. Vast numbers of objects were found by him when excavating for the foundations of old Troy, and among them a multitude of small objects in *terra-cotta*, called "whorls," objects like large necklace-beads in shape, and with a circular hole pierced through them, as if for stringing them. Many have been the conjectures hazarded as to their precise use. Some of them are most elaborately "ornamented"; and if the use of these whorls or beads is a puzzle, not less so is the meaning of the ornamental patterns and designs incised on them. It may be explained generally that the character of the "ornamentation" on these whorls is as like as possible to that rude ornament always to be found on the common objects in use among all primitive tribes of men all the world over,—a subject well worth more attention than it has as yet received. The learned doctor says he should be right pleased and delighted if "but a clue" could be got to the meaning of but a portion of the puzzling ornament he so often and curiously gazed at. He himself hazards a number of conjectures about it, not a few of them not a little startling. May we hint at a conjecture? In the first place, it is to be noted that the drawing of all rude nations, as the Greeks and the Trojans certainly were at that time, is either the result of a combination of lines, as the zig-zag, or of short lines in a regular row, or of circles, or of dots, or of rays from a central point, and so on, in almost infinite variety; or it is the direct representation, by the simplest outlines, of the common forms of things around them, of animal life more especially.

Sometimes it is simply suggestive of the animal and vegetable life immediately around them, and close to them. Dr. Schliemann incidentally remarks, that the plain of the Troad, on which Ilium was built, swarms with insect life of all kinds; so much so, that these creatures, in numbers infinite, are to be found everywhere, and are not to be avoided or got rid of. Scorpions, the hideous centipede, spiders, beetles, flies of all kinds there are without number, and of portentous size sometimes. The Trojans of old must have had other and powerful enemies besides their glorious human ones, and these sculptured and incised "whorls" sufficiently prove it, for they are everywhere drawn on them, and their forms evidently imprinted on the minds of their artist workmen. The dangerous scorpion could not be missed, and it is seen depicted in rude and disjointed outlines perpetually, with venomous tail, legs, and forceps, and by its side what is evidently meant for the insect's egg. All is so plain, and in spite of its rudeness so lifelike, that it is difficult to see how any one could mistake it. It is really wonderful to note how lifelike animal forms are represented by the rudest people here as all the world over. Certainly the Trojans,—if this be Trojan ground,—were not behind any. Another form is that of the antelope, among four-footed larger animals, and the mode of its representation explains at a glance how the form of anything living was caught by the eye of the old artist, and rudely depicted by simple lines, and scratches, and dots. Dr. Schliemann himself here recognises the form of the antelope, and it is plain that it is so. It is the rudest of all possible drawing.

It may be noted, and it explains much that is puzzling, and is a curious instance and proof of the workman's fondness for the representation of insect life,—the insect life about him,—that some of these whorls are covered with the drawings of the disjointed legs of the insect, with the body of it in the midst, and though these have been strangely mistaken for "inscriptions," there can be no doubt as to what was intended if but the drawing of the perfect insect is just looked at. The hideous centipede was not forgotten, nor the spider, of which there are so many species; nor two and four winged flies; and other insect forms are to be seen, for which it may be hard to find life originals, but doubtless such would be found readily after thorough acquaintance with the natural history of the great Trojan plain. The whole subject is, as we have said, well worth more careful study, for, however rude the work of these Old World workmen, they have at least left behind them evidences of their skill of hand, rough as it is, and of their keenness of eyesight. Their work, such as it is, is autographic, and we may see clearly and convincingly enough that the rude artist, whose thought covered a "whorl" with some fanciful device or other, was at the same time the executant workman and draughtsman. He inscribed his name, not in written letters, it is true, but his "handwriting" is there notwithstanding; and though we, like Homer of old, "nothing know" of his name or presence, yet do we see the work he did, and the impressions of his mind and hand! He yet lives in his work.

It is to be further noticed that a detailed examination of these strange and rude renderings of animal life takes us at once, not only into the depths of a primeval time, but to the very infancy and first beginnings of art and drawing. This is a subject of some interest just now, as there can be but little doubt that our present,—though apparently so ample, and certainly costly,—apparatus for art cultivation lacks a something. There is a feeling of uneasiness and dissatisfaction at things artistic as they now are. That a something else is needed there cannot be a doubt, though no one perhaps can very clearly see what that something is. The tendency of the age is towards a mechanical production of all things. The Old World plan of work was the very reverse of it, as is here seen, on the Plains of Troy. All was handwork, however rude and uneducated it may have been; and such work must always, irrespective of its antiquity, infinitely surpass in interest any work the result only of mechanism, however perfect and ingenious, and imitative of artistic hand-work as it may be. *Eut Ilium!*—and yet is; for in the pages of the poet, and in these scattered remains of it, buried for so many ages in its dust, we may now see it, and its inhabitants, and their surroundings, and more or less their way of life,—imperfectly enough, it may be, and dimly; but there it is, and we may profit by sometimes glancing at it, and making an effort to read a little in it. The antique Greek and Trojan times, and ways of life, are gone, that is certain; but when we think of what they did for both mind and body, we may ask, even while studying these rude beginnings of art from so historic a site, are we now, in spite of art reforms, in the right road to a living result?

Expenditure on the Bridges of London.—A Parliamentary return just issued shows that during the present century the Corporation of the city of London have expended out of their Bridge Estates 1,129,816*l.* on the erection and maintenance of London Bridge, 367,486*l.* on the erection and maintenance of Blackfriars Bridge, and 119,862*l.* on the purchase and maintenance of Southwark Bridge,—making a total of 1,617,164*l.* There are debts outstanding, charged upon the Bridge Estates, in respect of rebuilding London Bridge 350,000*l.*, and in respect of rebuilding Blackfriars Bridge and the purchase of Southwark Bridge 265,000*l.*, making a total of 615,000*l.*

THE HIGH TIDES AND THE EMBANKMENT.

THE effect of the moon on the action of the tides is now generally recognised as so immediate, that whenever a more than usually high tide causes any damage the blame is in most cases attributed directly to that luminary. Londoners have within the last few months experienced a succession of high tides in the Thames, which, for their frequency and the extent of the damage they have wrought, have been unequalled. A great part of Lambeth is built on what was originally marsh land, as the names of some of its streets, such as the Upper Marsh and Lower Marsh, testify. Other portions were, till very recently, the site of basins for barges and of canals—as the name of the "New Cut" reminds us. Over this area the Thames used to have uninterrupted access, till the engineer came and reclaimed the unhealthy waste, and built a mass of houses on a foundation of piles. Walls here and embankments there served to keep out the waters, and it was only on very rare occasions that they dared to invade their ancient territory. Then it was found that the moon was the cause of all the mischief; but as her evil influences proved capable of obtaining the mastery only at very rare intervals, the population and the authorities determined to take their chance of their dwellings being flooded and their property destroyed. The precautions adopted for keeping out the water were sufficient for ordinary purposes, and when the extraordinary occurrence of an overflow took place they held up their hands in dismay, and thought evil of the moon. When the phenomenon was over, and the evil past for a season, they let fall their hands, and in time forgot all about the matter. But these intermittent invasions of the water seem now to occur periodically. The disease has become chronic, and either something very serious must be the matter with the moon, or there must be other evil influences at work.

"Whitaker's Almanac" does not lead us to suppose that there is anything amiss with that orb of night; and, so far as telescopic investigation of her features will assist us, we can discover no traces of any deviation from her usual placidity. Unfortunately, the opportunities for examination have been very few of late,—heavy clouds have obscured her face at night, as clouds and fog have hidden the sun from sight during the day. Here, however, is a probable solution of the mystery. The past autumn and winter and the present spring have been among the wettest on record. Heavy and continuous rains and snow have fallen, till the springs have become filled to overflowing. The earth is saturated, and the rivers have burst their banks and run out over the adjoining lands. The Thames, among other rivers, has suffered from this deluge, and the volume of water carried down its channel has been enormously increased. For miles along its course in the upper districts the country has been flooded by the superfluous water, and with such a continuous and augmented flow of surface drainage, meeting the regular rising of the tide, is it not likely that London should be swamped?

But this will yet hardly account for the frequency and extent of the "floods" and "high tides" in the metropolis. There have been years of heavy rainfall before 1875 6; but they used not to be so accompanied by frequent floodings of different parts of London and its suburbs. Besides, these irruptions of the tide occurred and were repeated before the prevalence of the heavy rains, so that we must look to other causes and seek other influences than those of either the moon or Aquarius and Jupiter Fluvius. These natural phenomena may have assisted in the damage, but they are not the sole or joint authors of it.

It is far more likely that the frequent inundations in Lambeth, Blackfriars, and other river-side portions of the metropolis are attributable to the work of man rather than to the works of Nature. The latter have no doubt intensified the evil, but they alone cannot be held responsible for it.

The construction of the Thames Embankment, by narrowing the channel of the river at certain portions of its course through London, must necessarily tend to throw a corresponding quantity of water on those parts of the river shore which are not so protected. The large area taken from the river-side by the Victoria, Albert, and Chelsea Embankments, is so much taken from the carrying powers of the stream, without any corresponding diminution in the volume of water to be carried. To put it in another way: suppose the river at high water, in its old condition, before the construction of the embankments; imagine the foreshore suddenly raised up perpendicularly at the existing line of the embankments. The mass of water contained between the old water-line and the present embankment-line would be forced into the narrowed channel, and a corresponding rise in the level of the water would take place. The unprotected parts of the shore would be confronted with a fuller level of water, which would overflow every breach it could find.

This is exactly what has occurred. The same volume of water has to pass through a channel, narrower, but no deeper; and where it was formerly 6 in. below the edge it is now up to the level of the old walls.

It has been proposed to continue the Embankment along the south side of the Thames, between Westminster and Waterloo Bridges. The necessity for this is quite apparent from the observations made above. Setting aside the improvement which such a work would effect, it is necessary, in order to prevent the continuance of the inundations which have taken place, and which will necessarily be repeated. If the existing design is not completed along this portion of the river-side, temporary measures should be adopted to keep out the water. It is hardly fair that local owners and occupiers should be at the expense of doing this, while the mischief is directly attributable to work undertaken by the ratepayers generally, through the Metropolitan Board of Works; and this point is an additional argument in favour of the continuation of the work.

But if this be done, it must be borne in mind that every yard taken from the present channel of the river means an addition to the general height of the body of water along its whole course, or at least as far as the tidal limit; and each step, therefore, in embanking will increase the necessity for embanking elsewhere, either permanently on the plan hitherto adopted, or by raising barricades at undefended points at the actual limit of present high water. It will not, of course, be inferred that we are advocating an extension of the existing Embankment throughout the river-front of the metropolis. The necessity for remedial measures against the floods points to the completion of the Embankment system along such parts of the shore as that between Westminster and Bankside, and between Vauxhall and Chelsea Bridges. But, if this is done, there will be the greater necessity for raising the river-side level at those points where the waste water now finds its way, or threatens to do so, but where the extension of *the* "Embankment",—using the term according to its popular acceptation,—is not required.

CHARACTERISTICS OF MEDIÆVAL AND MODERN CRAFTS AND CRAFTSMEN.

ALTHOUGH there is a wide and marked difference between the ancient guilds of trade and the modern trade unions, yet many practices which have become heart-burning questions in connexion with the latter have had their types in the former. It is somewhat strange to find that between five and six hundred years ago, in London, certain usages of trade and conditions of work and labour were enforced, bearing a striking analogy in connexion with matters in the building and other trades of to-day. In the Middle Ages, in this country, there was piece-work as well as day-work, night-time or overtime, scamping as well as skilled work, and sundry other virtues and abuses of which counterparts may be found at the present hour. We will endeavour to prove, in the course of this article, that things pointed to as grievances and innovations by workmen of the present hour, and said to have never existed prior to their fathers' time, have existed several centuries back. History, it will be shown, has not only for the nonce repeated itself, but has never for once ceased repeating itself. Combination, conspiracy, picketing, abusive language, and other direct and indirect methods of annoyance, were prevalent centuries back, in one form or another, as well as at present; but simple and summary methods of justice were adopted to abate the evil. In the civic records of the 26 Edw. I., 1298, there is an instance of the reconciliation of two master masons effected before the mayor for abusive language and other trespass. There was an agreement concluded to the effect that if either of them in future were proved guilty, on the word of two trustworthy witnesses, the offender should give 100s. towards the fabric of London Bridge, and if this fine were not paid, the chamberlain had power to levy the amount. Similar fines were exacted from time to time in the city from tradesmen and others for rioting, abusive language, cursing, &c., and the proceeds devoted to some public work. The civic records are full of cases of fines and imprisonments for selling bad food or drink; and in respect to false weights and measures, and false workmanship, or scamped work, in every reign from the thirteenth century down to what may be called our own times. Patrid food was destroyed or confiscated for other fitting uses, and articles of bad manufacture, wares, fabrics, &c., were broken up or publicly burned. In the thirteenth and succeeding centuries the hurdle, the pillory, or the stocks and other instruments of punishment were in requisition for dishonest bakers, butchers, brewers, and other producers or vendors of bad food, drink, and wares. Regrators or forestallers of the public market came in for similar punishments if they persisted in their evil doings. Even night-walking on the part of male or female, clergyman or layman, was adjudged a grievous offence in the Middle Ages, and subjected the offender to a lock-up in the Tun or in Newgate. After the ringing of the Curfew-bell, all well-disposed citizens, workmen, and apprentices were supposed to keep within doors, or go to bed.

In the charter of the Girdlers of London, 1 Edward III., 1327, it was ordained that the work of the girdlers should not be garnished with any inferior metal, such as lead, pewter, or tin, or with other than latten, copper, iron, and steel. All false work found was to be seized or burned, and the workmen punished. In the same year serious disputes and street-fights took place between the saddlers of the City on the one hand and the joiners, painters, and loriners in copper and tin on the other. Petitions were presented on either side, and the representatives of the contending parties came before the Mayor, when an agreement, after prolonged conferences, was come to. The joiners complained of certain infringements of their trade by the latter, and of practices which impoverished them. One of the sore points was, that the saddlers were in the habit of buying up the old saddles given by the lords to their palfry-men, furbishing them up and re-selling them as new ones. They agreed not to do so in future.

It appears by statements made on behalf of the Saddlers, that one stirring-stick, William de Stockwell, "Compassing mischief, did cause all the painters, joiners, loriners, and gilders to be collected together, with other workmen, in order to act by force of arms, and in affray of the said City, and then took counsel to make the saddlers aforesaid concede by compulsion that if any man of the one trade shall have cause of offence as against any one of the other trade, then, in such case, all the painters, together with all the other trades, shall no longer be bound to work, but shall close their selds (shops, warehouses, or bazaars), and that if any offence shall be found to have been committed on the one side or the other, the parties shall not be reconciled without two of each trade intervening thereon."

This is a beautiful illustration of a Mediæval resolve to "strike" work, depending on certain contingencies. We further learn that the *Copresmettes* (the coppersmiths, the loriners in copper) made an ordinance among themselves, "out of their own heads," that any strange workman of the said trade, coming to the City, should not be received on any terms until he made an oath to conceal their misdeeds. The petition goes on further to say,—"And, whereas the said painters and joiners do set every point in their trade at a fixed price, at no time has there been any certainty as to the aforesaid points in practice established; by reason whereof they are making themselves kings of the land, to the destruction of all the people of the land, and to the annihilation of the saddlers aforesaid, as to which they pray for redress."

The above heavy indictment of one class of craftsmen against another is very interesting. It will be seen by the extract that there were piece-work and fixed prices, in 1327, in the building trade, and the "kings of the land," as the joiners and painters were termed, were endeavouring to have trade matters all their own way. The loriners, and others of their companionship, denied the first points in the petition, saying that they never had done so, and never would. To the second point they made answer that no strange workman of their trade ought to work among them if he were not admitted and sworn, and so

forth, in the presence of the mayor and aldermen; and as regards setting up certain prices in their trades, they altogether denied it. In reading over their respective petitions and statements, one cannot help concluding that there were malpractices on each side, and, as in the present day, one trade desired to triumph over another, to the injury of the public.

In the articles of the Girdlers, 18 Edward III., 1344, we find several conditions laid down as to the quality of the new work produced, so that it should be good and lawful. Regarding apprentices, no man of the trade was permitted to take an apprentice unless free of the City, nor for a less term than seven years. No strange man was to be admitted to work in the trade unless he had been an apprentice of it or bought his freedom. No man was to work on Saturday or on the eve of a double feast, after Noue (noon) was rung. This was something like our half holiday, only the Mediæval feast-day was supposed to be a holy-day. No man was to keep his shop open on Sundays or on double feasts to sell his wares; no man of the trade was to set any woman to work other than his wedded wife or daughter; and no one of the said trade was to be so daring as to work by night at the said trade on the pain hereafter written." Several other articles or ordinances are mentioned, and the infringer of them or any one point of them was amerced in 40 pence for the first time, the second time half a mark, third time ten shillings, fourth time a mark, and fifth time 20 shillings, to go to the use of the Chamber. The Mayors and assistants of their time had many strange cases to hear at the Guildhall. In the articles of the cutlers of the same year we find that the London apprentices were suspected by their masters of being a very dishonest lot. No cutler was to make any common sale on Sundays, "seeing that their journeymen and apprentices have wasted and purloined the property of their masters while they have been attending at their parish churches, or elsewhere." In this trade and preceding ones mentioned there seemed to be a rank suspicion of the quality of the work executed at night, or overtime. We are told,—"Whereas many pieces of work touching the said trade which have been made by night have not been convenient or profitable to the common people as they should be, seeing that they have not been assayed by the wardens of the said trade as they ought to be, and such work has been sent privily to sell in divers counties of the realm, in deceit and to the loss of the common people, and to the prejudice and scandal of the folks of the said trade: be it ordered and granted that from henceforth every work touching the said trade shall be made by day, and not at night; that so the wardens of the said trade may conveniently make assay before it be set for sale, under the penalty of half a mark, to be paid to the said chamber." It was also wisely ordained that no one of the trade should receive the apprentice or journeyman of another, in prejudice or to the loss of his master, until his term had been fully accomplished, on pain of paying certain stated penalties. These were wholesome trade conditions, which are not very often subscribed to in the present day, either by masters or workmen. Some employers, through their agents, offer inducements to good workmen to leave their masters and come to them, and workmen betimes are only too willing "to take the ball at the hop." This species of kidnapping is dishonest, but, then, working by the hour is different from working by the piece or job, and agreeing to finish a certain piece of work for a certain price. It appears by the City records that the brewers in London in the fourteenth century were great wasters of water supplied by the conduits and public fountains. At present our brewers draw enormous quantities of water from the bowels of the earth through pumping from wells independently of water companies' supplies. It would be worth investigation to find what are the physical effects on the character of our soil, climate, and vegetation, in the London metropolis, by the existence of a deep main drainage, and numerous deep borings for water. Hundreds of the ancient wells of London are entirely dried up, and the remaining ones in use are unfit for drinking purposes. In the 19th of Edward III., 1345, there was an ordinance that brewers should not waste the water of the conduit in Chepe (Cheapside). It was shown "whereas of old a certain conduit was built in the midst of the city of London, that so the rich and middling persons therein might there have water for preparing food, and the poor for their drink: the water aforesaid was now so wasted by brewers and persons keeping brewhouses, in making malt, that in these modern times it will no longer suffice for the rich or middling or for the poor, to the common loss of the community." It was enacted that the water of the conduit should not in future be used under certain stated penalties, as also that the fishmongers should not wash their fish therewith.

In the articles of the Spurriers of the same year there were several conditions laid down regarding quality of work, hours of labour, and sundry other matters of usage and malpractice, which are very suggestive when viewed in the light of modern events. In the first place, it was enacted that no one of the trade should work longer than from the beginning of the day to the hour of the ringing of the curfew. The reason stated being "that no man can work so neatly by night as by day"; and men desiring to perform deceptive work were in the habit of working by night and using false materials in their work. The following extract is an interesting Mediæval type, having many modern examples:—"Many of the said trade are wandering about all day, without working at all at their trade, and then, when they have become drunk and frantic (enragetz), they take to their work, to the annoyance of the sick and all their neighbourhood, as well as by reason of the broils that arise between them and the strange folks (not of their trade) who are dwelling among them. And then they blow up their fires so vigorously that their forges begin all at once to blaze, to the great peril of themselves and of all the neighbourhood around. And then, too, all the neighbours are much in dread of the sparks, which so vigorously issue forth in all directions from the mouths of the chimneys of their forges." These were some of the reasons why night-work was sought to be put an end to. The Mediæval whitesmiths and blacksmiths, like those of our own time, no doubt, took their Saint Mondays or Tuesdays in addition to their Saturday half holidays, and when resuming work in the middle of the week worked overtime or night-work to make up the loss, scamping their work, or using up bad materials. The articles or ordinances of the spurriers declared against selling or exposing wares on Sundays and certain feast-days. Apprentices had to serve seven years, and there were other exclusive conditions in regard to freemen and non-freemen masters of the City taking apprentices. The spurriers, too, forbad by penalties any one of the trade enticing away or taking an apprentice, serving-man, or journeyman of another in the same trade. Work was forbidden at the trade on Saturday afternoons after a bell was rung, and from that hour until Monday morning.

In the ordinance of the trade called "Whittawyers" (probably "White Tawyers," or dressers of white leather with alum, salt, and other mixtures) 20 Edward III., 1346, there are many regulations respecting such conditions of labour and other matters similar to what we have stated in regard to other trades, penalties being enforced for their non-observance. There are, however, some special peculiarities in connexion with the regulation of this trade which we have not met with in the preceding trades. In this trade we find an interesting and early illustration of the friendly, benefit, and burial society principle of our own times. Here is an admirable example:—"If by chance any one of the said trade shall fall into poverty, whether through old age, or he cannot labour or work, and have nothing with which to help himself, he shall have every week from the said box 7d. for his support, if he be a man of good repute. And after his decease, if he have a wife, a woman of good repute, she shall have weekly for her support 7d. from the said box so long as she shall behave herself well and keep single. And if any one of the said trade shall depart this life, and have not wherewithal to be buried, he shall be buried at the expense of their common box; and when any one of the said trade shall die, all those of the said trade shall go to the Vigil, and make offering on the morrow." The Vigil was a service performed on the eve of the funeral. It was also ordained by the craft that if any one should have work in his house that he could not complete, and if, through want of assistance, such work should be in danger of being lost, those of the said trade were bound to aid him, so that the work should not be lost. There were several other valuable regulations in connexion with the trade which, considered in the light of the time they were enacted, were admirable; and even in the light of our own day, some of the rules we have mentioned are most commendable, and worthy of imitation in spirit. The faults and offences of masters, overseers, and workmen were taken cognisance of by this trade, and each were held amenable. Let us cite again:—"And if any serving-man shall conduct himself in any other manner than properly towards his master, and act rebelliously towards him, no one of the said trade shall set him to work until he shall have made amends before the Mayor and Aldermen, and before them such misprision shall be redressed." If the overseers appointed by the trade to examine the work produced and other matters appertaining were neglectful, or showed any partiality to persons for gifts, or connived at any default through act of friendship, they incurred certain penalties. Bad and scamped work was not allowed to pass, and if found on sale was seized and forfeited, and the workers fined, and no one was allowed to take for working in the said trade more than he was wont to do previously. The prices for certain kinds of work were stated.

In some things the craftsmen of the Middle Ages in London were in advance of their brethren of these days. When it is considered that the ordinances of the last trade mentioned relate to 530 years ago, surprise, indeed, may well be felt how very slow has been our progress in all that relates to the commonweal, and the friendly relations that should exist between masters and workmen. We have progressed, to be sure, in art and science and mechanical appliances, but it is beyond doubt we have retrograded in honest handicraft execution and materials.

We reserve for another paper further illustration of the ways of Mediæval and modern crafts and craftsmen.

THE PROPOSED IMPROVEMENTS IN BIRMINGHAM.

The first inquiry under the Artisans' Dwellings Act has been held in Birmingham, where the Corporation propose a very extensive scheme of improvement. It involves the sweeping away in the heart of the town of nearly 100 acres of dirty, dilapidated, ill-ventilated, and unhealthy dwellings, chiefly occupied by artisans and the poorer classes of tradespeople, to the number of 16,000, and the opening up of a new and more direct communication between the east and centre of Birmingham by carrying a new and spacious thoroughfare through the condemned districts. The estimated cost of the entire property is about two millions and three-quarters sterling, but, omitting numerous factories and dwellings which were in a fairly tenantable condition, and others which could be made so by their respective owners, the cost would be reduced to about two millions.

We have special reason to observe with interest the change of opinion in respect of the condition of Birmingham which has taken place there of late years.

On the occasion of the Birmingham Congress of the Social Science Association in 1868, Mr. Godwin gave some account, as he had done in other places on like occasions, of the very bad condition of parts of the town, and the frightful results as exhibited by the inhabitants. He described a large district, too, as one where boys and girls were growing up in such a fashion that the gaol for the former and the streets for the latter were the only possible prospect.* These statements were received with derision, and almost insult. Alderman Sadler and others termed them gross exaggerations got up for the purpose of sensationalism, the answer mainly relied on being that the average death-rate for three years was 24·28 per 1,000. Some of the local papers took the same view, and many letters were published from officials, who maintained the healthiness of the town and the errors of the complainant. They either did not, or would not, recognise the fact, as we then said, that while the average death-rate of a town was 24 there might be parts of it where that rate was 50 or more.

This has proved to be far under the mark, as the present excellent mayor (Alderman Chamberlain) and others have shown.

Dr. Alfred Hill, the borough analyst and medical officer of health, in the course of his evidence, said that the average annual death-rate for the past three years was,—in Russell-street, 55; in the Lower Priory, 62·5 per thousand; and in Bailey-street, 97!

* See "Transactions of the National Association for the Promotion of Social Science," 1868, p. 476, &c. Also the *Builder*, vol. xxvi.

Mr. Godwin's so-called exaggerated statements of 1868 pale before the descriptions given by the mayor in 1876.

Let us hope that changes are in store, not alone in Birmingham, the results of which will prove a reward to those who, for long years through good and ill repute, have laboured hard and persistently to bring them about.

TOUR IN ITALY,

WITH REFERENCE TO THE PICTORIAL ART OF POMPEII AND ROME.*

My comments are intended, principally, to draw your attention for a short time to the successful application of colour and form as exemplified in many of the interiors which I saw during a visit to Italy, and to the noble works of the great masters and exponents of pictorial art. These are points, particularly the former, which demand an attention and deserve an interest that many of you as architects would willingly grant, were it not that, full of anxiety to increase your professional knowledge and experience, and in admiration of more immediate congenial studies, they are apt to be overlooked, or perhaps seen and passed with a feeling of conscious pleasure merely.

I shall enter on my subject by laying before you a short sketch of the impressions and experiences resulting from a visit to that singularly-remarkable and perfect example of ancient life and manners which Pompeii presents in its present state. We are carried back, at a bound as it were,—not by the aid of speculative theorising, but by the presence of undeniable facts,—from the latter part of the nineteenth to the latter part of the first century of the Christian era.

It would be impossible at any time, I think, altogether to overcome the feelings of awe and veneration which inspires one while treading the now-silent streets of the once busy and crowded city. These sensations are at first oppressive, until familiarity with the scenes and objects in some measure relieves the weight, but never ceases to maintain an impressiveness peculiar to itself. This is a feeling which I am certain all true students of art must be conscious of.

I entered the city by the Nola Gate, which is a covered archway extending about 30 ft. The approach is very steep, resembling in many respects the inner gate of Edinburgh Castle. Passing through this entrance I found myself in a street, which describing a curve, and rather steep of ascent, leads to the Forum.

A striking peculiarity was the narrowness of the streets, which seemed to render it a matter of impossibility for more than one vehicle to proceed at a time. They are pavèd with large blocks of lava, and the centre spaces for the passage of conveyances exhibit evidence of heavy and constant traffic in the deep ruts, and traces of wheel-marks.

At many of the crossings the centre stepping-stone (the average number in the ordinary streets being three) is ornamented on one of its sides with a mask, from which it would seem, a stream of water flowed from a small cistern attached, into a basin placed beneath. These miniature fountains, and the gentle rippling of their waters, must have added considerably to the pleasure and enjoyment which the grateful shade of the narrow street afforded to the Pompeiian, glad to escape the glare and heat of an Italian summer day.

The domestic architecture of the city (with the exceptions which I shall shortly refer to) possesses no prominent artistic features externally; the houses are from two to three stories in height, and are almost invariably destitute of any attempt at architectural display. Here and there a pilaster or balcony might be observed, but, even they are of very simple design, and faced with stucco, which in turn is decorated in colour. The doorways show the spaces into which the supports of the crownings were fixed, and also in which the rods were placed for the curtain covering the entrance to run. These doorways would no doubt, during holiday times, be gaily ornamented with festoons of evergreens, and bright and fragrant flowers, giving an air of life and brilliancy to the somewhat heavy and sombre-looking houses.

Making my way along a street like that I have described, I reached the Forum, where, while taking a few minutes' rest, I became aware of a strange sensation of weirdness, inspired by the awesome stillness which prevailed around me. Certainly the surroundings and associations produce an influence on the mind difficult to conceive and almost impossible to describe.

In imagination looking down the long vista of centuries which separates the present scene of desolation from the bustling and active life of the once rich and prosperous city, I could fancy that I saw the streets again thronged by a race of men whose appearance betokened that they were living in a high state of civilisation and culture, having all the appliances of wealth and power at their command to stimulate their passion for luxuriousness and pleasure. This too, at a time, when the inhabitants of our own country were in a state of the most primitive barbarity.

In Pompeii you look upon the same houses on which the approving glance of a Cæsar may have been thrown. You pass under the doorway which may have admitted Cicero, and the salutation in bright mosaic greets your eye as it has done his. The "salve," or welcome, remains; and you may touch the wall his hand has touched, or sit in the seat he has occupied. Nothing bears the impress of ruin or decay. There is an air of freshness and newness pervading everything, which increases the bewildering sense of dread silence that everywhere reminds you that you are in a city of the dead.

Then, again, in the wine-shops, the jars are seen in the identical position in which they had been placed by the hands of their proprietors; the same occurs in the oil-shops, and the well-worn steps in the front of these places show with vivid distinctness the impression of foot-marks made by the wearied traveller, or idle lounger, as they halted to enjoy a refreshing beverage, or partake of the hot drinks, in the concoction of which the Pompeiians were so famous.

Exquisite mosaics, fresco paintings, marble statues, stucco cornices illuminated in colours, and richly-carved columns; and in addition to these architectural embellishments, there are numerous specimens of lamps and candelabra, whose ornamentation, gracefully modelled after the most pleasing forms of animal and vegetable life, are marvels of beauty, and were no doubt justly held in great estimation by the fortunate owners whose chambers they adorned. Even in the kitchens were to be found urns in bronze, moulds for pastry, and an endless variety of the necessary utensils employed for ordinary household purposes, all of which, in the forms of the vessels, and the shapes of the handles, exhibit singular facility, and beauty of design in general effect and detail; and finding so much profuseness of elegant forms in the parts of the house consigned to the occupation of the slaves, we may readily conjecture, with a tolerable degree of accuracy, on what might compose the requisites of the toilet of the noble Pompeiian dames; mirror handles, exquisitely chased; ivory combs, masterly in design and execution; even the hair-pins having chaste and elegant finials.

From the most important, to the most trivial article of use or ornament, all bear the stamp of thorough perfection, to the degree of putting criticism altogether out of the question.

In the decoration of the interiors of the houses of all classes, we discover a universal desire for colour and pictorial ornamentation, in conformity to the resources of the different individuals.

The house known as that of the Tragic Poet supplies us with an excellent example of the successful combination of design and colouring. It stands pre-eminent as an illustration of the extent to which the wealthy citizens carried their love and desire for pictorial art. The ceilings where preserved show a very fine treatment of foliage, interspersed with birds of gorgeous plumage, producing on the spectator quite an aërial effect; this supplies, in some measure, the deficiency which the want of windows suggested to me. The plaster cornices are richly modelled, and picked out with colours taken from the prevailing tone of the walls. The walls present a series of subjects bright in beautiful colouring and elegance of design. The floors are incrusted with slabs of marble, interwrought with mosaics, the whole having a most charming effect to the eye, and one wonders at the glow of newness possessed by the colour, which, together with the unstained marbles of the floors, gives such an aspect of freshness that they seem as if they had just come from the hands of the artist.

This description, in a greater or less degree, applies to the majority of the houses of the wealthy citizens, and frequently the works exhibit a power of thought and treatment which entitles them to rank with the very highest forms of art.

The principles peculiar to their embodiment of artistic feeling consists of graceful movement, combined with flowing lines, wherein the spirit of Grecian art breathes. The nymphs and the dancing Bacchantes, and playful fawns, all point to the origin from which the art sprung, and also recall the character of a people whose desire was to have, in realistic form, as well as in fancy, a constant atmosphere of pleasure in which to live.

Directing my steps along the street known as the Corso, all the while with mind and eye on the alert, drinking in with eagerness the wonders which were momentarily coming into view, it seemed like walking through a living city instead of a dead one. Here and there on the walls I saw the names of what I presumed would be the competing candidates for the suffrages of the inhabitants for political purposes.

The theatre is reached, and entering the pillared doorway I passed through a handsome arched passage, which appeared to be as perfect and complete as it would be at the close of the last performance. Everything is there as it was left on that awful night.

On reaching the interior of the building, which is of the usual horse-shoe form, pausing and looking around, the eye rests on the tiers of marble benches sloping from the floor upwards, resembling the seating of our medical theatres. The ends of each tier of benches are finished with grotesque masks carved in the marble, and these are in a state of such perfect preservation at this date that their grimaces of countenance seem now as a mocking defiance of time.

For completeness and beauty of simple lines I saw nothing to surpass this building.

There is evidence that the walls have been covered with marbles of rich and varied hue, specimens of which may still be seen on portions of the proscenium of the smaller theatre adjoining, which is united to the larger one by a short passage.

At a short distance from the theatre, and also within the city walls, stands the amphitheatre; and although no comparison can be made as regards extent and architectural beauty with the Colosseum of Rome, still, for detail, and for the purposes for which it was intended, it is perfect. It was seated for 10,000 spectators. On the top of the highest gallery, the places in which the poles for raising the awning were inserted are to be seen. Indeed, this building is, perhaps, the most interesting spot in the dead city; and it requires little exercise of the imagination to picture the stirring scenes which these stern, silent walls have witnessed. The present stillness, too, seems all the more startling when contrasted with the sounds of noisy tumult and fierce shouting with which excited audiences once filled these walls.

The street leading from the amphitheatre to the Forum was the handsomest in Pompeii, and was the place most resorted to by the citizens whom pleasure or business brought out of doors. In those early days it was a scene of great activity; for the Forum was the centre where gathered the commercial and literary life of the city. Placed as it was on an elevated site, this building, with its double row of elegantly-proportioned fluted columns, must have appeared magnificent as it stood relieved against the deep blue sky. The remains of these are sufficient to reveal the splendour of their noble architecture. Numerous pedestals are to be seen, on which, doubtless, were placed masterpieces of sculpture.

In the immediate vicinity, and on a still more elevated base, the Temple of Jupiter rears its graceful outlines. Part of the floor is in good preservation, and consists of black and white marble, laid in lozenge form, with a border inwrought with mosaic of various shaded marbles. The walls are treated in colour, black forming the base, and red the upper portion. The doorway is approached by a noble flight of steps with raised plinths for statues, ranged on either side.

Venus being the patron goddess of the city, the temple dedicated to her worship was the most superb of all, and most artistically treated, both in an architectural and decorative sense. I was surprised to observe here, that the columns, although of marble, and possessing a polished surface, are *all* covered over with a thick coating of plaster, which is painted about 3 ft. 6 in. up, of a bright yellow colour, and the upper part white, separated from the lower or base, by a sort of cavetto moulding, sunk in the plaster

* From a paper by Mr. Thos. Bonnar. Read at the meeting of the Edinburgh Architectural Association, on the 12th inst. Mr. R. Anderson, architect, in the chair.

strangely, but by no means in a happy manner, showing the tendency of that gay people for colour. My idea of this contradictory treatment is, that in the earthquake which had occurred about ten years before the destruction of the city, these pillars had been partially shattered, and in some instances overthrown and broken, and that for the sake of economy; and to secure uniformity of effect, plaster had been adopted to cover the defective parts.

But surely this example shows a decadence in art sentiment, which but for the sudden and complete catastrophe which buried the city, while yet art was in high perfection, might in all probability have extinguished these monuments so wonderfully preserved to us, and left no trace of the life and beauty by which they were inspired. Hence this style, so nearly being lost, was revived in Italy in the fifteenth century, and continues a source whence decorative art derives most happy results, for the beautifying of our dwellings and public places. Of course, our adaptation of its characteristics to modern requirements must be directed by the experience and progress in these matters which we have since acquired. Indeed, with the materials supplied to us by this style referred to, we are false to all the principles of art if we neglect to use them in correct and true relation to the circumstances in which they may now be required. Far from competing with or interfering in any manner with the pictorial feature, the ornamentation seemed to me to combine with the pictorial to produce the genial harmony of the whole.

But to resume, I now ask your attention to the baths, of which several important examples are to be seen. They are even now very complete, but when the citizens were going to and fro in these spacious halls, they must have presented a very magnificent spectacle, furnished as they were with rows of handsome statues, bronzes, and gay decorations.

The most striking apartment in the principal bath, which has been excavated, is the Tepidarium. The arched ceilings of this are supported on caryatides, and are appropriately decorated with emblematical subjects, very finely rendered, and with rich scroll and foliage. The walls are done in hues of crimson, and recessed by projecting pilasters; the recesses themselves being painted in imitation of porphyry. The floors are in black and white marble, with bands of other marbles. In the other parts of the building may be seen the baths constructed of white marble, and showing a remarkable instance of the high state of preservation which prevails. The only parts which exhibit traces of wear are the steps leading up to the baths, and there the marble plainly shows indications of the numerous feet by which they have been trodden. The bronze benches are, for the most part, plain, having no ornamentation, except a simple moulding, with a fillet on the upper edge, to hold the cushions with which they were furnished.

I have thus endeavoured to give you my impressions of the domestic, public, and sanitary edifices of the famous Greco-Roman city, which have been preserved for our guidance and instruction for scores of centuries, and present themselves like an open book, to the antiquary, historian, and every lover of genuine art. The city throughout produces the same impression; but everywhere is found an amount of individuality which testifies to the high state of architectural and decorative art in the seventy-ninth year of our era.

In concluding this part of my subject, I think there can be no question as to its importance as a basis of decorative art; for, in itself, no system is so perfect, or capable of such diversity of artistic application to the requirements of the present day, and it deserves thoughtful consideration.

In regard to the method of treatment in producing the result seen in Pompeii, it is usually spoken of as painting in fresco; but in no instance did I meet with an example wrought in the manner of what is known as true fresco. Although the fact of lime having been discovered in the coloured surfaces renders it possible that the plain grounds had been applied while the plaster work was wet; while admitting this, I am still of opinion that the subjects, and other decorative parts, had been done in "tempera" colour, which in turn was passed over with a coating of wax, retaining its gloss even now. This opinion I formed from witnessing the portion of a wall cleared of the *débris* in my presence, and showing the subject part retaining a gloss, while the surroundings were lustreless, as in the case of ordinary tempera painting. The divisions of the plaster are seen distinctly enough, but the spaces are so large that it would be impossible for the painter to finish one of them in a day, which is essentially necessary in working true fresco.

I now ask you to accompany me to the Modern City of Naples.

Nowhere could a greater contrast be found or imagined than that of the general aspect of Naples, compared with that of the ancient city I have just quitted. Certainly, Nature has been most lavish in showering its gifts of the beautiful on the surroundings of one of the most uninteresting cities—that is, from an art point of view—that I visited in Italy.

The cathedral, which is of Lombardo-Venetian architecture, as seen from the street, exhibits a graceful façade, surmounting a handsome flight of marble steps. The doorway is finely sculptured with figures and foliage. The interior is in the form of a Latin cross, the nave being divided by two rows of massive pillars in Oriental granite. The ceiling, particularly the dome, is gorgeously decorated with scenes from the life of the patron saint. Domenichino, Spaggioletto, and Gordoni have enriched the building with works from their pencils, which possess all the merits of refined art by which these masters are distinguished.

Leaving the cathedral, I proceeded along the principal street, the Via di Roma, and reached the Museum. This building had been from time to time variously occupied, first as a university, then as a barrack, and finally converted to its present use as a museum, to exhibit the antiquities from Herculaneum and Pompeii, as also the far-famed Farnese collection. On the right hand, off the great hall, are the galleries, which preserve many of the best specimens of painting and other works of art brought home from Pompeii and Herculaneum. These objects are of such surpassing interest that there is no reason to regret their removal from the place in which they were discovered, for they are here carefully preserved and intelligently classified. Two of the most important subjects are representations of "The Sacrifice of Iphigenia," and "The Carrying-off of Briseis from Achilles to Agamemnon." There is also a specimen of decorative art,—a frieze called the Bacchanalian garland, composed of festoon, flowers, and leaves, with two tragic masks. Above the whole is Bacchus, on a panther, with similar borders of flowers, &c. These works are wrought in brilliant colouring of mosaic.

Still keeping by the right we enter the gallery containing the white marble group—which is of colossal proportions—called the Farnesian Bull. At the opposite end of the gallery stands the Hercules of Glacon. These two works show vigorous treatment, being full of life and animation. The collection of bronzes in this museum stands unrivalled in Europe, for number, magnitude, elegance, and originality of design,—altogether a field of study in this department that cannot be surpassed.

The few features of ancient art at which we have glanced serve to show that in the state of Pagan civilisation as it then was, men were seeking in those images of the beautiful to symbolise their loftier relations and aspirations; and that, while their minds were thus lifted to higher things, they found their nobler aims restrained by the familiar objects of pleasure and materialism around them.

This appears all the more marked by contrast when we pass from these representations into the picture-gallery adjoining. Here we are in the presence of the higher embodiment of Christian art, with its peculiarities of emotional expression. Here the material is forgotten in the spiritual; and the object now is to sink the pleasures of life in the hope of attaining the celestial glories, by means of trial, suffering, and contempt of pain.*

The Royal Society of Portuguese Architects.—The Queen of Portugal has just now favoured this Society by visiting its museum, the first of the kind formed in the kingdom. Her Majesty interests herself very particularly in the progress of the fine arts. The visit is to be fitly recorded; the Queen having given orders for a portrait of herself to be prepared, which will be hung in the meeting-room of the Society. At the last meeting of the Society, the President of the Royal Institute of British Architects was elected a corresponding member.

* To be continued.

MOVEMENT IN INDIA.

Sir Salar Jung has permitted Mr. Burgess, Surveyor of the Archæological Department, Bombay, to take possession of the sculptured stones recovered during the recent excavations and repairs at the caves of Ellora. It is said to be the intention of the Department to forward a few of the finest specimens to the Indian Museum, at South Kensington, and to present the others to the Royal Asiatic Society at Bombay.

India is about to imitate England in the matter of building societies. One has been started at Coonoor, in the Madras Presidency, under the title of "The Neilgherry Building and Mutual Benefit Society." It is proposed to issue shares not exceeding 500 in number, the subscription being 10s. a month on each share. From the number of shares already taken, the movement seems likely to prove successful.

Another novelty which is about to be introduced is the skating-rink. Roller-skates are not new to India; but they failed to become popular there as here on their first introduction. Since fashion at home, however, has declared in favour of the rink, it has been determined to follow suit; and as the exercise would likely be too vigorous for the plains, the first attempt is to be made among the hills. Misquith's Hall, at Ootacamund, the *sanitarium* of Madras, is to be converted into a skating-rink for the coming season, and some enterprising caterer will probably place Simla on a level with the beautiful little summer resort of the Southern residents. What will the mild Hindoo think of it?

It is stated that among the changes in the Benares College, a chair of Physical Science is to be provided, the cost being met by reductions in the minor educational departments.

Calcutta seems likely to become a city of statues as well as of palaces. Lord Napier of Magdala is to have one, and he well deserves it; and Lord Northbrook is to have a "memorial"; while a movement is already on foot for perpetuating the honourable memory of Dr. Milman, the late Metropolitan of India. An equestrian statue to a distinguished soldier is certainly not out of place, and Lord Napier has some claim to one on account of the Abyssinian affair. But Indian generals of note are by no means rare, and if each of them who dies or retires from the office of Commander-in-Chief is to have a statue, the open spaces of Calcutta will soon be peopled with bronze representations of Western warriors on their chargers. The case will be even worse if retiring Viceroys are to be immortalised in metal or marble. It is to be hoped, therefore, that the memorials of Lord Northbrook and Bishop Milman will assume another and more practical form.

The north arm of Madras harbour is making daily progress out into the surf. Mr. May, C.E., the superintendent of the works, has forwarded to the Government an estimate, prepared by himself, of the probable cost of the undertaking, based generally on Mr. Parkes's original calculation. It amounts to Rs. 64,00,000, as against a provisional sanction of 628,000*l*. This estimate has been transmitted to Mr. Parkes for his formal approval; pending which, the Controller of Public Works Accounts will accept the document as his guide. It is calculated that the works will take five years in completion.

Trial has been made at the Municipal workshops in Bombay, of the engine, pumps, and other contrivances, erected at a cost of upwards of half a lakh of rupees, for the purpose of discharging the night-soil of Bombay with rapidity into the harbour, thence to be carried to sea by the tide. Though the machinery is not yet properly finished, the trial showed that it will answer the purpose for which it is intended.

The Madras Government has formally recognised the Neilgherry Railway project as one likely to be beneficial, and as needed, though not urgently, by the State. From the pressure upon State funds, however, for the completion of the great strategic lines in the Punjab, Scinde, and Burmah the Government of India cannot find the necessary capital for a hill railway far south, and declines to guarantee it. It has been suggested that private enterprise ought to provide the small sum of 243,000*l*., which would suffice for the purpose, if the line were constructed on the model of the ladder-railway in Ostermundingen, near Berne, in Switzerland. The chances are, however, against the project; for if it were to prove successful, as it almost certainly would, the Madras Railway would in all probability extend its rails into Ootacamund, people

would travel by the most convenient and substantial line, and the pioneers would be left with the honour, but without their capital or its equivalent.

Other eastern countries are also progressing. At Yeddo, in Japan, three military and naval schools and a school of engineers will shortly be opened. A new palace and Government offices are being constructed in the same city. The Egyptians are also reported to be making themselves very comfortable if not very useful in Berbera, the chief port on the African coast opposite to Aden. The place is being furnished with new jetties, a custom-house, a serai for travellers and traders, and a residence for the representative of the Khedive.

NEW INFIRMARY BUILDINGS AT ROTHERHITHE.

A LARGE new infirmary, together with casual wards, has just been added to the workhouse at Rotherhithe. The new buildings have been in progress during the last eighteen months, and are about to be opened for the reception of inmates. The new buildings —which, with the airing and recreation grounds, occupy an area of about two acres and a quarter in extent,—are in five blocks, consisting of the male and female wards, the administrative block, the laundry, and the casual wards. They are situated on the south-west side of the old workhouse buildings, the principal elevations facing Southwark Park, to which they have an extreme frontage of upwards of 300 ft. The male and female wards form what may be described as the wings of the structure, the administrative portion forming the central block, and containing the principal entrance, through which the wards on either side are approached by means of spacious corridors upwards of 20 ft. in width. The block containing the male wards is on the south side, and has two frontages uniform in their architectural appearance, on the north-west and south-west sides respectively, extending to a depth of 124 ft., and being 40 ft. in width. They contain two stories, 25 ft. 6 in. in height to the eaves, with gables to each elevation at the west end. Both stories have French casement windows carried down to the floors, with ventilating shafts on the face of the frontages carried up nearly to a level with the ridge. The interior dimensions of the two floors of the ward are 96 ft. by 24 ft., each floor containing thirty-two beds, or sixty-four beds on the two floors, in addition to which there are special wards with beds for eight inmates. The wards on the ground-floor are 13 ft. in height, and the floor above is 14 ft. 6 in. high. The wards are warmed by hot-water pipes. Immediately adjoining the wards, at the west end of the block on each floor, are the nurses' rooms, kitchens, sculleries, and bath-rooms. The wing at the north end, containing the female wards, is to a certain extent uniform with the south wing, but as it forms an extension of female wards already attached to the house, it is in harmony with the architectural character of the old portion of the building. This extended wing gives a total of ninety-two beds for female inmates, the aggregate number of beds in the several wards being 164.

The administrative block in the centre, which is uniform in architectural design and character with the two blocks just described, contains, on the ground-floor, the surgeon's and matron's apartments, kitchens, and other domestic offices, together with patients' waiting-rooms, surgery, dry-goods room, &c., whilst in the upper floor are the surgeon's, matron's, and nurses' bed-rooms. As already stated, the corridors on each side of the administrative block lead to the male and female wards, whilst above the corridors is an ambulatory for the use of patients, in addition to the airing and recreation ground in the large open space on either side of the administrative block.

The steam laundry, forming a separate block, is 110 ft. in length and 23 ft. in width, and contains, in addition to a spacious washhouse, a receiving-room, drying-room, iron-room, and delivery-room, together with the laundress's apartments.

The casual wards in connexion with the workhouse have been erected at the north-east boundary of the ground, and are 120 ft. in length and 36 ft. in width, having forty beds for men, eight beds for women, and four beds for women with children. The male cells are connected by small yards in the rear, in which stone-breaking is imposed upon the occupants, who are required to throw the stones when broken through an iron grating into the general stone-yard attached to the house.

The several blocks are built of stock bricks, with red Fareham brick bands and ornamental window-heads. The cost of the infirmary buildings is 14,860*l.*, and the casual wards, 2,880*l.*, involving a total outlay of 17,740*l.* They have all been erected from the designs of Mr. H. Saxon Snell, architect; Messrs. Croaker, Brothers, being the contractors. The warming apparatus for the infirmary wards, and the machinery for the steam laundry, were furnished by Messrs. Potter.

A NEW STEAM CARRIAGE.

A VEHICLE has lately made its appearance in the streets of Paris fully deserving the name of "steam carriage," for it moves freely and easily through streets and squares, turns the sharpest corners, stops, turns aside, or goes in the same pace with a row of cabs and omnibuses, along bridges and thoroughfares. This carriage is constructed by M. Bollée, civil engineer, of Mans, for his own use. It weighs, with water and store of coals, but without passengers, nearly 4 tons; with twelve passengers, about 4½ tons, which weight is distributed on the four wheels of the carriage as follows:—The two driving-wheels, of a diameter of 3·87 ft. and a thickness of 4·7 in., which are behind, have to sustain a weight of nearly 3½ tons; the front (steering) wheels, of a diameter of 3·12 ft., the remaining 1¼ ton. The latter are completely independent of each other, and may be altered at will by the driver, who here supplies the place of the coachman, for guiding the carriage. The driving-wheels, although they are on a common axle, are not keyed to it, and receive their movement each from a pair of cylinders fixed between the wheels, and driving in the first place an intermediate axle, from which the movement is transmitted by means of a chain to the respective wheel.

The cylinders have a diameter of 4 in., and a stroke of 6·3 in. They are provided with Stephenson's link-motion, and the supply of steam is regulated in such a manner that in turning a curve it may be shut off entirely from the pair of cylinders on the inner side of the curve.

The boiler, finally, which is at the end of the carriage, is constructed on Field's system, vertical, with 194 tubes of 1·06 in. outer diameter, has a diameter of 2 ft. 7½ in., and a height of 3 ft. 3 in. All the parts are of the best materials, and made as light as possible, which accounts for the slight weight of the carriage. The consumption of water (according to the *Comptes Rendus*, p. 762) is 132 gallons per hour, if fully loaded, and at a speed of 9 3 miles per hour. At that rate, the consumption of coal is 176 lb. per hour, which compares favourably with that of other street locomotives.

MILITARY WORKMEN.

WITH the exception, we believe, of a brief telegram, no notice has been taken of a fact of considerable industrial importance. It is known that some troops have been organised by the German administration so as to constitute what is termed "railway regiments," and taught both the theory and practice of all that appertains to the construction and management of railways. Military critics have, of course, applauded this prudent measure, and unanimously concurred in expressing their sense of the great services such a regiment might render in the event of a war; but a very different and wide-spread interest would have been felt by the public at large on this matter, if it had been known that these soldier artisans were to be employed for home work and during times of peace. A few weeks ago, however, the Dahme, a small rivulet which passes near Vransdorf, overflowed its banks, and the current was so violent that it broke away the girders and tympanon of the railway bridge belonging to the Berlin and Dresden line. Under such circumstances, communications could only be re-established by building a new bridge; and, instead of employing ordinary workmen, an application was made to the War-office to requisition the railway regiment. This request, made late in the evening, was granted, and in a few moments the drums beat to quarters. A special train loaded with the necessary materials was immediately despatched to the scene of the disaster, and the work of reconstruction begun by torchlight before midnight on the same evening. The work continued day and night without a moment's respite, the soldiers relieving one another at fixed hours till the bridge was completely rebuilt. The military authorities had asked for no explanations, the soldiers were on the spot with all the necessary appliances three hours after the application for help had been made; and in three days and a half they built a bridge 60 ft. long, and capable of supporting railway traffic for ten years. The bridge, when completed, was at once tested, and several heavy goods trains having crossed in safety, the ordinary traffic was re-established. We need scarcely point out that no ordinary contractor could have accomplished such a work with so much promptitude. It was excellent practice for the soldiers, and in this respect quite equal to the autumn manœuvres; but military competition with the industry of a country involves an economical problem well adapted to excite the passion of politicians. We presume, however, that a flood is looked upon in the light of an enemy invading the country, and that ordinary commercial rules are suspended during these periods of public danger.

THE WATER SUPPLY OF HASTINGS.

THE Medical Officer of Health for the Borough of Hastings, Mr. Ashenden, in his recent report to the Urban Sanitary Authority there, says:—"We have lately heard and read of complaints of the impurity of our water; *these statements are entirely false.* I have made myself acquainted with the matter in question, have inspected the sources of supply, also the reservoirs, and repeatedly analysed samples from each. In no instance have I found the water thick, turbid, or containing living organisms, or unpleasant to the taste."

The italics are his own. Such an assertion as this, in the face of the statements made in our columns by fully-qualified correspondents, goes far to make us doubt the discretion, to use a mild term, of the Hastings Medical Officer of Health. The *Medical Times and Gazette* has recently published the results of a special inquiry into the subject fully confirming the statements of our correspondents. It now seems quite evident that new sources of pure water should at once be sought.

WAREHOUSE ARCHITECTURE, GOTHENBURG.

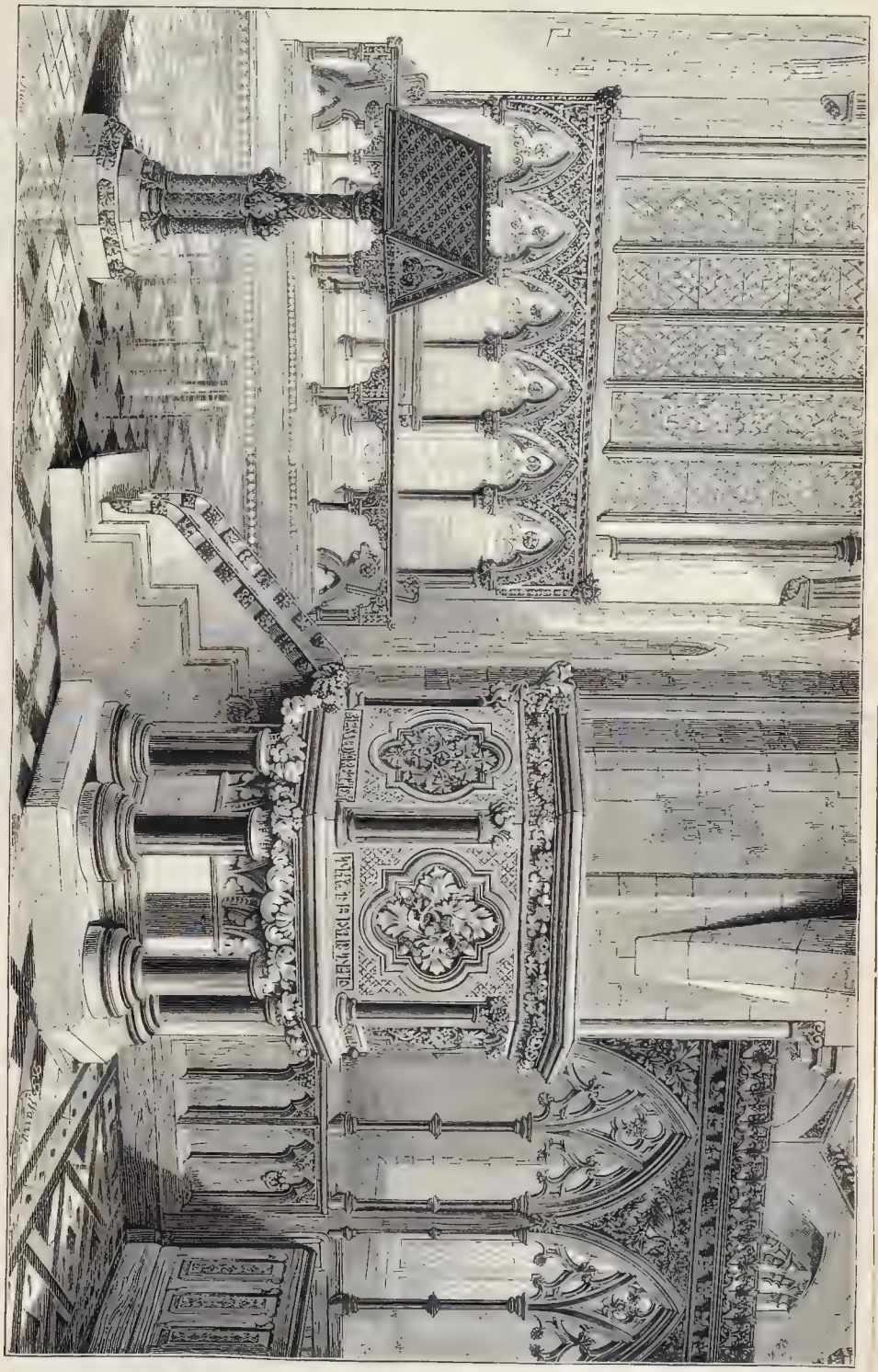
THE wealthy and still growing town of Gothenburg, the capital of the Län (district) of the same name in Southern Sweden, though as to number of inhabitants it ranks second, is by far the most important town of the northern kingdom, on account of its extremely favourable situation, which has made it the emporium of the Swedish import and export trade. So great was its importance in former times that it formed a continual apple of discord in the numerous sanguinary wars between the Danes and Swedes, many of which were carried on solely for its possession. At the present time between 3,000 and 4,000 ships frequent the port annually, its imports, consisting of colonial produce and foreign manufactures, amounting a few years ago to the value of 2,100,000*l.*, and its exports, iron, wood, and grain, to 1,600,000*l.* The traffic with the interior of Sweden is carried on partly by the Götha Canal, leading from Gothenburg by the chain of inland lakes through the mining and manufacturing districts of Sweden to Stockholm, and on the other hand by railway to the western mining country of Bergslagern, well known for its iron mines.

Among the many spacious warehouses of the port, the new building lately erected by Messrs. F. W. Hasselblad & Co., the subject of our illustration, deserves especial mention. It was finished the beginning of this year, and shortly after opened, and forms a conspicuous feature in the part of the town near St. Erik's Torg (Market). This warehouse is the largest of its kind, not only in Gothenburg, but also in the kingdom. It was erected by the Building Association of Gothenburg, a society all the working members of which are shareholders. The architect of the building is Herr A. C. Peterson.

Bournemouth.—A new Wesleyan Chapel at Spring Bourne, Bournemouth, was opened on Good Friday. The new building is 57 ft. by 37 ft., and sittings are provided for 274. It has been erected by Messrs. Squires & Kent at a cost of nearly 900*l.*



WAREHOUSE ARCHITECTURE IN GOTHENBURG, SWEDEN.—Herr A. C. Peterson, Architect.



HOLKHAM CHURCH, NORFOLK.—Mr. James K. Colling, Architect.

HOLKHAM CHURCH, NORFOLK.

This church, of which our illustration represents the pulpit, lectern, screens, and other fittings, has been lately restored by the Right Honourable the Earl of Leicester. The church was previously in a very dilapidated condition, and was almost literally covered up both externally and internally with plastering, and the chapels at the eastern ends of the north and south aisles were divided from the church by brick walls. These were removed and light and elegant open oak carved screens substituted. Portions of two of them are shown in our engraving. The spandrels are filled with conventionalised natural foliage and birds.

The seating, which is all open, is of oak with carved backs and bench-ends, with arm-rests. The plain surfaces of the bench-ends are panelled and enriched with carved foliage, arranged from nature, every panel throughout the seating being different. The reading-desk is of a similar character to the seating, having carvings of wheat and tares on one side, and barley and vetches on the other, with an admixture of flowers, such as the poppy and corn cockle, and harvest mice. The lectern is of carved oak, with a cluster of four carved columns forming the base. The pulpit is of Caen stone, with carved panels containing the oak, ivy, maple, and hawthorn; and insects, such as butterflies, caterpillars, &c. Below the panels is an inscription, "Blessed are they that hear the Word of God and keep it." The angles of the pulpit are enriched by polished red granite shafts, and the whole is supported on a cluster of polished red granite shafts, with boldly-sculptured capitals. The reredos consists of an arcade with red granite shafts, carved capitals, and foliated spandrels. The flooring is laid with Maw's tiles. The builder was Mr. Robinson Cornish, of North Walsham, Norfolk; and the architect, Mr. James K. Colling, of London.

CONCRETE FLOORING.*

There are many who maintain that concrete is not a suitable material for anything but foundations; and, in spite of the immense advances which have been made of late years in the discovery and improvement of cementing materials, there has not been (except in the case of sea-walls and heavy retaining-walls) a similar advance in concrete building, and it is still necessary for any writer on concrete to commence by proving that the material is at all suitable for ordinary building. I propose to divide my subject into the following heads:—1. Is concrete a suitable material for walls and arches? 2. Is it fireproof? 3. Is the bedding of ironwork of any description in concrete a suitable form of construction? 4. Description of the principal kinds of flooring in iron and concrete. 5. Advantages claimed for the system of concrete flooring herein advocated over others, and over brick arching.

With regard to the first head, Is concrete suitable under any circumstances for walls, arches, &c.? — Concrete, although a very favourite building material amongst the ancients (so much so, that numerous examples are to be found of its use in Egyptian and Roman buildings, both for walls and arches), and although half of our Mediæval castles are built of it, was very much out of favour with engineers and architects, and it is curious to notice how they fought against its use since its introduction in modern times. Mr. Wright and Mr. Cubitt both expressed the opinion in February, 1847, that the materials of which the Brighton and Dover walls were built (that is to say, concrete) would never stand the attacks of the sea, and that they would soon have to be renewed; and in 1851, in a paper on the Royal Border Bridge over the Tweed, built by Mr. Robert Stephenson, of masonry, but with a concrete hearting, Mr. Stephenson himself affirmed that he placed absolutely no reliance on the hearting, except as far as it gave weight and stability in the same manner as sand would if poured down a chimney. From that time to this, however, the use of concrete as a building material has been steadily gaining ground; it was at first used almost always as hearting, either encased in iron, as at the foundations of the Gravesend Pier (date 1845), or encased in masonry, as in some sea-walls built about the same time. Subsequently, it began to be commonly used as a substitute for masonry in sea works, and was, in the days even of Roman cement, a material which would be hard to replace in foundations and hydraulic works generally. Its use for works of this class was considerably increased by the discovery of Portland cement, which, as is well known, greatly exceeds any other cementing medium in strength and tenacity. To compare it with the Roman cement used thirty or forty years ago, a block composed of the Roman cement and two of sand will support only about 5½ tons per superficial foot; whereas a block of the same size composed of one of Portland cement and two of sand will support no less than 80 tons per superficial foot. The resistance of Portland cement to a cross-strain is even more extraordinary. In some experiments made on blocks of cement and stone 16 in. bearing and 4 in. by 4 in. in size, it was found that a block of Portland cement would resist a cross-strain of no less than 99 lb. per square inch, whereas Portland stone itself would only resist 80 lb. per square inch; showing that neat Portland cement is considerably stronger than even Portland stone to resist cross-strain, and it is this property that renders Portland cement concrete so peculiarly useful for floors. These experiments clearly prove that we have in Portland cement concrete a building material of great strength and value; and since the discovery of Portland cement other cementing mediums have been discovered which, though not so strong as Portland, still show extraordinary results. Amongst these we may mention Dennett's concrete, made of a sulphate of lime. Experiments have been tried with arches of considerable span, and a very slight use of this material, with excellent results.

Another cementing material which has been used for concrete walls is the patent selenitic cement, invented by General Scott. Though not so strong as Portland, it answers very well for ordinary walls and building. The work that has been done in these different materials should be quite sufficient to convince anybody that will look into the matter that we have in these concretes a building material or artificial stone which can be moulded *in situ*, and forms a stronger arch or wall than an ordinary brick one.

The next point we have to examine is how far is concrete fireproof? With regard to this we have the experience of several great fires to show that concrete is fireproof in a very extraordinary degree. I need only mention one, which took place in February, 1851, and has been quoted before as a proof on this point. It was a large provision merchant's near London Bridge; the lower floor was full of butter, cheese, and large quantities of other inflammable materials, and over it was a concrete floor; the fire broke out in the upper part of the premises, and carried all before it. The mass of burning materials fell in upon the concrete floor, and though the fire raged above at a white heat for several hours before it could be brought under, the concrete floor stood the test, and preserved the contents in the rooms below. Many other instances might be cited in which concrete has successfully withstood the attacks of fire, and as it is now very generally used in fireproof buildings I will not occupy your time further upon this head.

I next proceed to consider the suitability of employing iron in concrete floors. Against this two principal objections have been urged: first, it has been asserted that iron will soon rust, and the strength derived from it be therefore lost; and, secondly, that owing to its expansion and contraction from alterations of temperature it will tend to crack and disintegrate the concrete or material in which it is bedded rather than strengthen it. In answer to the first objection, I need only quote the fact which has been proved by direct experiment, that iron coated with cement or concrete is entirely protected from rust or oxidisation. Cement with hoop iron embedded has been taken up after lying twenty-six years, and when broken the hoop iron has been found as blue and free from corrosion as when first laid in. With regard to the expansion and contraction, as iron only expands a nine-hundreth part from a temperature of freezing to that of boiling, and as the temperature of an ordinary room rarely varies more than comparatively a few degrees, and when we take into consideration the fact that the iron is embedded in a non-conducting material like concrete, we shall be able, as is done in practice, to disregard the fact of expansion and contraction altogether.

One of the simplest systems of concrete flooring is to carry wooden joists across the floor; form a centering underneath; throw in the concrete over; level; and finish with fine cement or asphalte. This forms a sound, compact floor, but, of course, nothing is gained in strength beyond that of the wooden joists, and if they fail the whole thing goes. In Nottingham and Derby floors used to be commonly made with wooden joists, on which reeds were placed, which formed a key for the plaster ceiling underneath, and for a concrete composed of gypsum plaster, which was thrown over to a thickness of about 2 in. to 2½ in., and brought to a level surface, and made a strong and compact floor. The material expanded so much in setting that it was necessary to bed in a temporary fillet 1½ in. wide at every 10 ft., to make allowance for it. But most modern concrete floors require the use of iron girders. The more common methods are those where the girders are placed some 7 ft. or 8 ft. apart, and arches turned from girder to girder, similarly to the method in which brick arches would be employed. This method entails not only considerable cost in the ironwork, but also in ties to resist the thrust of the arches, or in a massive abutment.

Another method is to subdivide the spaces between the main girders by iron joists running transversely about 2 ft. or 3 ft. apart, to place boards underneath the joists to act as a centering, and to throw in the concrete so as to form a flat slab, with the iron joists, and so forth, bedded in it; or where the apartment to be floored over is not large, rolled iron joists, about 6 in. deep, are taken across from wall to wall, about 3 ft. apart, filled in between with concrete, and the floor is complete. This method has been employed close by us in the concrete building in Tothill-street, by Messrs. Drake, and the floors submitted to considerable tests, which they bore very well. A refinement of this method has lately been designed, I think, by Sir Henry Cole. Ornamental tiles, or slabs of terra-cotta, or other material, are placed between the iron girders, with a bearing on the lower flanges to support the concrete when thrown in; this produces a highly ornamental ceiling, and avoids the necessity of centering. An example may be seen in the roof of the covered way leading to the Science schools from Exhibition-road. A very strong floor is made by using iron plates in lieu of the tiles bolted to the girders. This forms an excellent floor when the plates are flat, as the plates, in case of great weight, could take the tensile strains in the floor, but where cambered, they appear to me to be little more than an expensive kind of centering. Sometimes a floor has been made on the same principle as the last, but with thin plates instead of girders, and still thinner plates on the underside, ⅛ in. and ¼ in. thick respectively, and has stood very well. Sometimes, again, the large joists are connected by smaller pieces of T-iron or iron bar, to give additional strength to the concrete. This is copied from the French, who for a long time had made floors without wood, their most common plan being to carry iron joists across the apartment, about 3 ft. apart, and about one-thirty-sixth of the span in depth. These are connected with interties of iron, securely fastened to the joists, and these, again, carry iron bars, about 1-in. square, parallel to the joists, and fastened to the interties with copper wire; boards are put below for a centering, and a concrete, composed of gypsum, is thrown in, and makes a capital and very strong floor. The interties and bars are not required with the cements used in England, since the concrete itself is as strong as most stones, and forms a floor of great strength without them. In the next method the girders are connected with plates of corrugated iron. This method was employed as long ago as 1849, in a lattice bridge over the Rugby and Leamington Railway, by Mr. W. Thomas Doyne, C.E., where the corrugated iron forming the platform had a clear bearing of 7 ft. 2 in. between the transverse girders. The corrugations were 9 in. wide and 3 in. deep, and to the under-side of each straps were riveted, which ran the whole width of the platform, to prevent the corrugations from spreading. The thickness of the corrugations was B. W. G. No. 12, and it was found that one of these plates alone, 7 ft. 8 in. by 3 ft., placed on supports 7 ft. 2 in. apart, bore 6 tons equally distributed over it before it broke. This method has been revived lately in a patent flooring, in which corrugated or other iron plates are shown, carried by light trussed girders, the flooring being in some instances brought to a level

* From a paper by Mr. Alexander Payne, read at the Civil and Mechanical Engineers' Society on the 30th ult.

surface with concrete, sawdust, or sand; but as little reliance is in this instance evidently put upon the concrete, it scarcely comes under the denomination of a concrete floor. All these methods present various advantages, but all necessitate a large amount of heavy ironwork. In 1873 I had to design some buildings in which a large amount of very strong flooring was required, and where the funds at disposal were not large. I sent to the makers and patentees of the forms of concrete flooring usually adopted, but found that the cost of them would be so great as to make them practically inadmissible for my building; the great cost being chiefly in the amount of iron employed in the girders and so forth. This necessitated the endeavour to find some description of vaulting or concrete flooring without any horizontal thrust (which was essential in this case, as the walls of the building were not particularly thick), and with a minimum quantity of iron so as to reduce the cost. This led me to devise and patent some methods of flooring. In the simplest method, to avoid the heavy main girders, I groined the whole of the vaulting so as to bring the whole of the weight on to the points, such as the columns instead of the long lines of girders and walls as hitherto done, and I then connected these points together by ties either longitudinally, transversely, or diagonally to neutralise the thrust. It will at once be seen that in a floor of this description the whole of the concrete is thrown into compression and the iron into tension. I have arranged that the iron ties may be concealed. The columns or supports are carried up beyond the concrete arches, and the ties inserted at such a height that they can be buried in the concrete without being seen. It is obvious that the centerings to form these vaults in a plastic material like concrete may be varied to almost any shape to suit the taste of the designer or the plan of the building. Thus they may take the form of a series of flat domes resting on supports at the four angles as shown, or they may take the shape of inverted pyramids. In all domical shapes a convenient form of resisting the thrust is by a series of concentric rings or ties bedded in the concrete, where the whole of the tendency of the domes to spread may be entirely counteracted by the ring-ties, and as before the whole of the concrete is thrown into compression and the whole of the iron into tension. A further improvement upon this is formed upon the principle of what is called fan vaulting. . . . . .

As to the difference in weight of amount of iron required by using girders or ties: supposing you have a floor divided into square spaces 15 ft. each way to cover over, to carry a weight of 3½ cwt. per superficial foot, or 37 tons on each compartment, I would vault it with very flat fan vaulting, the concentric ties being of 1 in. section, resisting approximately 20 tons, and the diagonal ones of a section equal to 2 in., and resisting approximately 40 tons; thus the pendentive over each column, and the space between them would be tied in by two ties, and could not separate without bursting the rings with a force equal to 40 tons. Theoretically, of course, there would in this case be no thrust on the columns, but to make assurance doubly sure, let us add the diagonal ties to hold these together, and resist a tension of 20 tons in each direction. Reckoning up the weight of iron here, we find approximately that 120 ft. of 1 in. ties and 45 ft. of 2 in. ties equal a little over 6 cwt.

Secondly, supposing the floor to be covered in the ordinary way, with main and cross girders. The main beams would require a section of 80 lb. weight per lineal foot, according to the usual practice, that is, 80 lb. × 15 = 1,200 lb. The cross girders would require a section of 50 lb., two to each bay. Thus, 50 × 30 = 1,500 lb., 1,200 + 1,500 = 2,700 lb., or 24 cwt., that is to say four times the weight of iron required in the former case. Thus, making all allowances for extra cost of centering and labour, this floor would not be found to cost more than one half of the former one.

In conclusion, it appears to me that we have in concrete a material the application of which is still in its infancy, and which offers great facilities on account of its plastic nature, the readiness with which it can be cast into any desired shape, and its great strength when set; and I think its treatment in conjunction with a material of such enormous tensile strength as wrought iron, which can be readily inserted wherever required, merits more consideration than it has yet received at the hands of the engineer.

THE TRAFFIC AT HYDE PARK CORNER.

Mr. Macvicar Anderson seems to be aware of one of the objections to which his proposed modification of my suggestion for the continuation of the Constitution-hill-road is exposed, inasmuch as he admits, in his letter in your recent issue, that it would cut off a considerable angle of the park. There is, however, another which, to me at least, appears even more important, for I cannot see how it is possible to make an entrance at an angle of the park, placed diagonally to the principal object, a pleasing and dignified approach. Both these objections may, however, be to a very great extent obviated by a slight modification of his plan. If instead of a straight line, the roadway were continued in a curve with 100 yards radius, it would cut off a much smaller slice of the park, and would meet Piccadilly at right angles. If, then, the screen in front of Apsley House were repeated on the opposite side of the road, and the park roadway centred on the portico of that building, an amount of dignity and uniformity would be obtained sufficient perhaps for the purpose.

To my mind, however, the objection to such an arrangement would be, that we should have a utilitarian park gateway in immediate juxtaposition to, and competing with, what had become a monumental arch, and ceased to be a gateway in any practical sense of the term; and for this reason I still prefer the straight roadway into Grosvenor-place, which is equally convenient, and in no way interferes with the effect of the Wellington Arch.

As I am writing, I may perhaps be allowed to remark that there seems to be a misconception about the necessity of a specially dignified entrance to the park at this angle. I cannot perceive any reason why this entrance should be more dignified, or indeed why it should be so much so, as those at Buckingham-gate and St. James's Palace. These two are in immediate juxtaposition with the palaces, and are parts indeed of their design. This one is essentially a park entrance, never seen in conjunction with the palace, and in no way understood to be especially a palace gate, and need not therefore be considered as more important than any other entrance to the park.

I hope nothing in the above remarks will be considered as an attempt, on my part, to depreciate Mr. Anderson's suggestion. With the modifications above suggested it offers an alternative plan of such merit as to leave little to choose between the two, and though for the reason just given I still prefer my own, I would be delighted to see his carried out, if so doing would in any way facilitate the essential improvement, which consists in isolating the Wellington arch so as to relieve the block of traffic that now exists at Hyde Park-corner.

Jas. Fergusson.

THE CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

The tenth term of this prosperous and useful institution came to a close on the 13th inst. The school opened in January, 1873, with nine students, the intended complement being fifty. An additional floor, available for the purposes of the school, has been provided in the south tower, which is 42 ft. in diameter. The number of students last term was fifty-eight.

The work of the students in the drawing office and workshops having been inspected, the company, which embraced a large number of the friends of the students, and of the school, adjourned to the lecture-theatre. Among the gentlemen present we noticed Messrs. R. Jacomb Hood, C.E., David Thomson, C.E., Ernest Benedict, the eminent Indian engineer, &c. On this occasion, Mr. Robert Rawlinson, C.E., C.B., Chief Inspector of Works, Local Government Board, presided, and presented the certificates awarded by the examiners,—Messrs. A. Ransome, Assoc. Inst.C.E., and B. Haughton, M.S.I.C., Paris.

The chairman referred to the gratifying character of the report, and expressed the satisfaction it had given him to inspect the students' work in the shops, and to notice the eminently practical character of the course they passed through, which was of much higher value than four years' privilege in a great engineering shop, even although a thousand guineas premium might be paid for it. As himself an engineer who had passed through all the grades from the lowest to his present position, he felt competent to speak of the great value of such a school, and of the important privileges enjoyed by its students. Mr. Rawlinson gave some admirably appropriate advice to the students. He asked them to disbelieve in "luck," to distrust great abilities or influential friends, and to rely for their success and advancement upon patient honest work, upon the mastering of principles, as well as acquiring manipulative skill, upon careful attention to even small details, warning them against impatience to escape from duty for external pleasures. Those who had this impatience were usually taken for the character they stamped upon themselves, and allowed to drift their own course. Their profession, he also reminded them, required a knowledge of other sciences, especially meteorology and geology, to enable them to adapt their works to the countries or districts in which they were constructed. Hundreds of thousands of pounds sterling had been lost because of the ignorance of engineers concerning the occasional rainfall in countries where they had erected bridges. They must depend very much upon themselves in working out their course. Here they had an excellent opportunity and valuable aid, of which they would do well to avail themselves.

The following is an abstract of the examiners' report, read by Mr. Stenton, superintendent of the Crystal Palace School of Arts:—

Twenty-five of the students of this school had a sufficient number of marks for lecture questions to entitle them to examination on the subject of "Steam." Nineteen of these received certificates. Highest number of marks attainable, 224:—1st. W. James, with 187 marks; 2nd. A. B. Black, 182 marks; 3rd. C. B. Penhington, 180 marks.

For work in the Drawing-office, eleven students received certificates:—1st. S. R. Lowcock; 2nd. P. Baylis and J. W. Jacomb Hood, equal.

For work in the Pattern-shop and Foundry, twelve students received certificates:—1st. L. Wilson and E. R. Royston, equal; 2nd. R. D. L. James.

For work in the Fitting-shop, nine students received certificates:—1st. F. S. Richardson; 2nd. W. James; 3rd. H. Field.

In the Civil Engineering Section, 1st Term. For general surveying and the preparation of plans, &c., for Parliament, nine students received certificates:—1st. J. Mayhew, Jun.; H. E. Read and H. S. Vogan, equal. 2nd Term:—For the calculation of strains and the preparation of general and working plans, specifications, and estimates of a railway and dock, six certificates were awarded:—1st. A. Brock; 2nd. J. Halton Preston and H. Le G. Solly, equal.

The examiners concluded their report:—"Having submitted the students in the Civil Engineering Section to a *viva voce* examination, and inspected their drawings and estimates, and having also examined in detail the drawings, patterns, and specimens of turning and fitting, and subjected other students in the school to a critical examination on steam, we consider that many of them display a most satisfactory progress, which is creditable alike to themselves and to Mr. Wilson, the principal, and the gentlemen, his assistants, who have superintended their engineering education."

On the motion of Mr. Jacomb Hood, seconded by Mr. David Thomson, thanks were voted to Mr. Wilson, the principal, the Examiners, and to Mr. Rawlinson, the chairman.

Mr. Wilson gave a satisfactory account of the positions occupied by a number of the students who had passed through the school, several of whom were in the receipt of good salaries as resident engineers on important works. He referred also to their summer outing to Sheerness and Crossness. A daily paper had given an interesting account of their visit to Chatham, but, unfortunately, they had not got so far, but the account would perhaps do for a visit they intended to make. Only five papers on the Crossness works, for which a prize had been offered, had been sent in. Mr. Haughton, the examiner, had placed them in the following order of merit:—A Brock, A. Black, S. A. Tidy, P. W. Foster, and J. W. Jacomb Hood. Mr. Haughton had reported that No. 1, if original, promised well for the writer; No. 2 was original, and meritorious; in one of the others a published account had been used freely, without acknowledgment. Mr. Wilson did not think it creditable that the number of papers was so small, every one should at least try what he could do.

The Chairman referred, in terms of high commendation, to Mr. Wilson, and as regarded the school said that he would rather take one of its students who showed ability, as a pupil, than a son of the first gentleman with no matter how high a premium.

Institution of Surveyors.—At the next meeting, April 24th, a paper will be read by Mr. W. H. Michael, entitled "The Working of the Sanitary Acts in Rural Districts."

ENGINEERING IN JAPAN.

We have before us the new Calendar of the Imperial College of Engineers at Tokei. Comparing it with the one issued last year, it shows advanced aims and a marked progress. The regulations and syllabus of study set forth are signed by the Minister of Public Works, Hirobumi Ito. The instruction appears to be given to the students wholly in English, but the study of their own language is now made an integral part of the college course.

RIVER POLLUTION.—THE CLYDE AND THE TEES.

Sir John Hawkshaw has presented his report on the pollution of the Clyde and its tributaries. He enters at great detail into the different sources of pollution, and the various methods for restoring the streams to a state of purity. The methods of disposing of solid and liquid refuse or sewage he divides into four classes,—gravitation, irrigation, filtration, and chemical treatment. For the sewage of Glasgow he considers irrigation and filtration unsuited; chemical treatment he objects to on the ground of its great expense, which he estimates would be over 80,000*l.* a year; and he therefore comes to the conclusion that it would be better to convey the sewage beyond Whiteinch to an outfall in the river on the Firth of Clyde, or in the sea. After considering various points suggested for the outfall, he fixes on that between Whiteinch and Cawland Head as the most suitable, and estimates that it would be constructed for 1,500,000*l.* A large number of places besides Glasgow and its neighbourhood would be able to take advantage of this outlet for their sewage. For other places a different method of getting rid of sewage would be necessary, and these cases can, he thinks, be dealt with by the general provisions which he proposes shall be applicable to the whole district. Much might be done by the individual action of the sanitary authorities in the different localities, although he is strongly of opinion that much time and money will be saved, and earlier and better results will be obtained, if a body be formed having jurisdiction over the whole region drained into the Clyde, and armed with authority to prevent the pollution of its water. He therefore recommends the appointment of a Board of Sanitary Commissioners, elected by the various town councils or sanitary authorities within the area, who should be invested with ample powers to deal with the pollution of the Clyde basin.

An injunction has been obtained against the Corporation of Darlington, restraining them from continuing to pollute the Tees with Darlington sewage. The injunction fixes the 1st of June, after which, if the order of the court is not complied with, it will be competent for the same authority to order the sequestration of the rates of the town.

THE CARPENTERS' TRADE IN DUBLIN.

We referred briefly a fortnight ago to a preliminary meeting held in the Mechanics' Institute, in Dublin, at which all men interested in the movement now on foot for opening all builders' shops to every legitimate carpenter in the kingdom, were requested to confer together. This meeting has been held, under the presidency of Mr. Samuel Hayes, and the following resolutions were passed:—"That the exceptional pledge,—'I solemnly declare that I will not work with any man or boy who does not hold a ticket or pass from this Council table,' which some Societies of Carpenters in Dublin maintain by the threat of 'strike-work,' is injurious to the prosperity of the country, and to the intellectual, social, and moral well-being of those who hold it; and, as its existence is calculated to bring Irish workmen into contempt in the eyes of their fellows in other parts of the kingdom, it ought to be abandoned. We, the representatives of some hundreds of Dublin house-carpenters, therefore hereby pledge ourselves to use every legitimate means for its abolition."

On the motion of Mr. Flynn, secretary to the Amalgamated Society of Carpenters and Joiners in Dublin, it was resolved that, "Being opposed to coercion in any shape, and honestly disposed to the maintenance of harmony and good-will amongst all members of trade bodies, we beg to submit to those who may be opposed to the adoption of our notions of free labour, the advisability of seriously considering our proposal to withdraw the opposition against which thousands of Irish carpenters bitterly complain."

The concluding resolution was, "That, in the event of our demand being refused by those to whom it is specially addressed, we confidently appeal to the builders of Dublin, and all companies and private persons, who may need our services."

THE SANITARY REQUIREMENTS OF A HEALTHY HOUSE.

This was the subject of a lecture given by Dr. Prall before the Maidstone Philosophical Society on the 28th ult. He remarked that legislation as to building had been confined principally to the large towns, and country districts were much neglected. If specifications and plans of all intended buildings were obliged to be submitted to some such competent authority as the county surveyor, they would not see cottages erected, as they so frequently were, in a manner which set all rules of health at defiance. During the last fourteen years he had watched the building of more than 180 cottages, and in every case where a washhouse with a sink had formed part of the structure, the sink-pipe had gone straight to the unventilated cesspool, the only protection being a useless bell-trap, more often off than on. Privies were also close at hand, with no provision made for ventilation, and there could be no wonder that in such places death had been busy. In the construction of larger houses, workmen attended to their several specialities without reference to the requirements of the general building, and the result was much inconvenience. A house depended for health principally upon a proper supply of pure air and a dry and non-malarious site, a ventilation calculated to remove impurities, a pure supply and proper removal of water, and perfect dryness of the foundation, walls, and roof. Should the foundation be improperly constructed, as soon as the artificial warmth commenced, the air, good or bad, from below, must arise. Should the soil be porous, and the subsoil water be collected from an impure area, bad air would, by evaporation and diffusion, pass freely into the house. It was necessary, therefore, to cut off the subsoil air. Even more disastrous were the damp walls of an ill-constructed dwelling. Dampness had been traced as high as 30 ft. above the ground, and to prevent this ascending dampness a double course of slates, or a course of vitrified stoneware tiles, perforated in order to ventilate the space between the ground and the joists of the floor, must be used. This would also prevent dry-rot in the timbers. The proper place to insert the dampproof course was 1 ft. or so above the ground. Where much exposed exterior walls were covered with a casing of slates, care must be taken to leave some ventilating space where the slates overlap, or while the external wet was kept out the internal wet would be kept in. Hollow walls were the best; and in drying a house ventilation as well as heat must be regarded, for large fires rendered the air of a house capable of taking up more than a natural quantity of moisture. Dr. Prall then concluded as follows:—"The object of my few remarks has been chiefly to bring before you one or two prominent defects of construction in the humble class of dwellings, and to point out how easily, by an exercise of ordinary common sense, these defects could be avoided. It seems a matter of great regret, but it is notwithstanding no less true, that the cause of our failure in making our buildings, *i.e.*, our humble buildings, examples of art, is the utter absence of a rational method in design and execution. If we did but bring to bear upon our architecture the same amount of knowledge, reflection, and common sense which is manifested in our purely engineering and naval constructions, we should possess an architecture of our own worthy of our advanced civilisation, and in harmony with our natural genius. We should recollect that the most primitive structures, if they express the rational application of means to an end, may still have a charm as being works of true art."

Iron Tiles for Malt Kilns.—Mr. J. Woods, of Wells, proposes to make the tiles for forming the floors of malt or other kilns of cast-iron, with floor surface perforated with fine holes tapering upwards from broad openings made in the under surface. The tile is also cast in one piece with the necessary projections or supports.

CONSTANT WATER SUPPLY IN THE METROPOLIS.

The official Examiner of Water says the companies that are actively moving in the matter and giving constant supply under the provisions of the Metropolis Water Act, 1871, in a portion of their districts, are the Kent, New River, and East London. The Act provides power to compel all the companies to give constant supply as and when the public authorities may see fit to demand; and any district may insist upon a constant supply when four-fifths of the district are provided with the proper fittings, in accordance with the regulations made under the above-mentioned Act.

The number of miles of streets which contain mains constantly charged, and upon which hydrants for fire purposes could at once be fixed, in each district of the metropolis, is as follows:—Kent, 80 miles; New River, 169; East London, 70; Southwark and Vauxhall, 100; West Middlesex, 70; Grand Junction, 41½; Lambeth, 90; Chelsea, 50,—making a total length of 670½ miles; and the water companies are ready to affix hydrants thereon when required by the authorities. The total number of hydrants erected is at present 2,626, of which 2,081 are for private purposes, 276 for street watering, and 269 for public use.

THE PNEUMATIC RAILWAY IN PARIS.

The "*poste atmosphérique*," for the despatch of messages between Paris and Versailles, has just been completed, and is nearly thirteen miles and a half in length. The tubes, which are made of brass, are 13 ft. long, 3½ in. in diameter, and ⅝ in. thick, are laid at a depth of 8 ft. from the surface, on a flooring of wood, and are pitched both inside and out. The route outside the walls of Paris is along the highway "No. 10." Inside the city they are suspended in the sewers. At the Bridge de l'Alma the tube bifurcates, one portion passing to the Palace de l'Élysée, the other to the Central Telegraph Office. At Versailles the terminus is in the new hall now being built on the left wing of the palace.

HOW ROADS ARE REPAIRED IN HACKNEY.

It would appear, from a leading article in the *Hackney and Kingsland Gazette* of the 5th inst., that the Hackney District Board of Works are just now pursuing what can only be characterised as a "penny-wise and pound-foolish" policy, which is anything but "economy," in road repairing. Says our contemporary:—

"A dozen yards in a given road are marked out; two or three men are sent to score the same with their picks in parallel lines some 2 ft. apart; a dozen loads of broken granite in 3-in.—more or less—cubes, are then loosely scattered on the surface; upon this, again, the contents of half-a-dozen dust-carts, being nothing more nor less than the *débris* of a score of back yards, if not actually the contents of dust-bins, are gently sown, and the repairing is done' Then comes the proud crow 'See how we save! See how we put money in thy purse! No mistake here! We mend our roads, and save labour and additional expense for contracting to cart away the parish refuse to a distant wharf.' But they do not say, or suggest, at what cost besides!"

The article from which we have quoted goes on to particularise some of the offensive constituents of the "economical" road material used at Hackney, and pertinently asks whether it will be any wonder, if in a month's time, Dr. Tripe, the medical officer of health, will have to report an unhealthy condition of the district.

Blackburn Free Library.—Blackburn possesses a free library, the exterior walls of which have lately been enriched with sculptured panels illustrative of Literature, Science, and Art, and of the trade and industry of the town. The panels, seven in number, are each 10 ft. long and 4 ft. high, and contain over 50 figures in bas-relief. One of the panels, showing the various stages in the manufacture of iron, is the gift of Mr. Briggs, the senior M.P. for the borough; another, that of Agriculture, was presented by Mr. Fielden, the late member for Blackburn; and the remainder were subscribed for by a few of the influential manufacturers of the place, in particular Mr. Alderman Thompson and Messrs. Dugdale and Fish. These panels extend across the façade and sides of the edifice, to which they give a decorative effect. The building was erected in 1875, from the plans of Mr. T. E. Collcutt, architect. The sculptured panels are the work of Mr. G. W. Seale, of Brixton.

MASTERS AND MEN.

Bristol.—The Bristol master builders have declined to accede to the request of the operative house-painters and labourers for an advance of wages. The notice of the painters expires in May, and that of the labourers in August next, and the latter body are determined to cease work if their demands are not conceded, or arbitration resorted to. The painters have not yet decided how to act, but it is anticipated that they also will strike.

Coventry.—The dispute in the Coventry building trades has been settled, the Master Builders' Association and the men having agreed to submit to the decision of Mr. Alderman Manton, as arbitrator, whose award is that from and after the 1st of May next the wages for the carpenters and joiners shall be at the rate of 7½d. per hour; that all overwork beyond 56½ hours per week, as agreed to in the printed rules, be continued to be paid as fixed by the rules; and that the rules as agreed to on the 30th March, 1872, shall still continue in force, with the exception of the change from 6⅞d. to 7½d. per hour.

Falmouth.—The Falmouth carpenters and joiners have struck. They claim 5½d. per hour, nine working hours per day, excepting Saturday half-day.

Gourock.—The masons of Gourock have followed suit with their brethren of Greenock, and are out on strike.

Manchester.—On the 12th inst. Professor Leone Levi delivered the concluding lecture of a series on "Work and Wages," at Manchester, his subject being "Strikes and Lock-outs." Summing up the course of lectures, he said the determination of wages depended not on the real or imaginary wants of the labourer, nor on the caprice or will of the master, but on the relation of the demand and supply of labour, on the state of foreign competition, and on the relation between the cost of production and the capacity of the consumer. True, the wages should be liberal,—the higher the better; yet that could not be guaranteed under any circumstances. All that could be said was that free competition was sure to secure to the labourer the highest wages which trade could afford. If there was any doubt as to what trade could afford, they might be sure that whilst wages could not be higher than would admit of a fair profit, they could not be lower than they ought to be without attracting additional capital into the business, which would of necessity produce a rise.

Nantlle.—Six hundred men employed at the Nantlle Slate Quarry, Carnarvonshire, have struck work, in consequence of the refusal of the masters to pay wages every four weeks instead of every five weeks.

PROPOSED NEW ASSIZE COURTS AT NEWCASTLE.

AT the Easter Quarter Sessions for the county of Northumberland, the Moot Hall Committee reported that on April 4th a deputation from the Newcastle Town Council met them, and produced plans, which had been prepared by Mr. Lamb, to show the extent of the accommodation proposed to be given in the new building. The committee were unable to advise the Bench that a satisfactory basis of negotiation had been presented for their consideration. If the Bench desired the committee to continue their negotiations with the Corporation of Newcastle, then they suggested that the following limitations and conditions should form a basis on which the committee should act:—1. That the money contribution of the county towards the cost of the new courts shall not exceed 10,000*l.* 2. That provision be made for securing to the county the freehold in the County Hall, and other offices to be reserved for the county business, and for transferring to those buildings the status of the Moot Hall, as part of the county of Northumberland, and also for securing to the county in perpetuity the free use of the Assize Courts. 3. That the county shall not be liable to maintain any portion of the buildings, except their own freehold. 4. That the committee have power to call in the services of an architect to advise them with regard to the plans of the proposed new buildings. On the motion of Sir Walter Trevelyan, seconded by Sir John Swinburne, the committee was empowered to continue the negotiations.

Mr. Huntley, in seconding the motion for the adoption of the report, said it was proposed to spend 8,000*l.*, and at the outside it would amount to 10,000*l.*, in altering the Moot Hall Courts. It was extremely improbable they would spend 15,000*l.* If the plans the committee had seen were carried into operation the county would get a much worse thing than they would get by the expenditure of 8,000*l.* on the Moot Hall. The estimate laid before them by the committee and architect of the Newcastle Corporation was 50,000*l.*, and if the county gave 15,000*l.* in money, it would leave 35,000*l.*, towards which there would be the Moot Hall and ground attached to it. He thought 10,000*l.* and the Moot Hall would be a good contribution from the county.

Mr. Cuthbert moved, as an amendment, that the county offer 15,000*l.* This was seconded by Sir Walter Trevelyan, and carried by 14 to 7; and the report, subject to this amendment, was adopted.

PROPOSED NEW TOWN-HALL FOR LINCOLN.

AT the last meeting of the Lincoln Town Council, Alderman Maltby brought forward the subject of the desirability of erecting a new town-hall for the city. Having discussed the question of ways and means, and shown that 13,000*l.* would be available for the purpose, he adverted to the question of site, remarking that a better or more favourable site could not be obtained than that where the City Prison now stood. It had excellent approaches to it, and was in the most central part of the town. He believed that on this site there would be ample room, not only for a town-hall, but also for a school of art, there being no less than 9,000 square yards of land. There was a great need of new premises for the School of Art, and this matter ought to receive great attention at the hands of the Council, for no institution of a public nature was more deserving of consideration or more important for the city; and it was likely that the patrons of the School of Art would, if the Corporation erected a town-hall to provide the necessary accommodation, raise a large sum of money towards decorating the hall.

Alderman Ruston confirmed a great deal of what had been said by Alderman Maltby, but said that the Council would be deceiving themselves if they thought that such a building as they required could be erected for 13,000*l.*, except in the plainest brick and stucco; but, without falling into any elaborate failure, such as occurred at Rochdale, where they began with the intention of spending 20,000*l.*, and ended by spending 120,000*l.*, they might secure a very good building such as they wanted without extravagance on the one hand or meanness on the other. They would have to look at 25,000*l.*, and perhaps a little more.

Ultimately it was resolved,—"That in the opinion of this Council the time has arrived when it is absolutely necessary that a town-hall should be built. That the following gentlemen form a committee to procure plans and to report to this Council the best way of carrying out the above object:—The Mayor, Aldermen Ruston and Maltby, and Councillors J. Maltby, Glasier, Dickinson, Shepherd, Warrener, and Squire."

SURVEYORSHIP ITEMS.

Kelso.—Mr. Thomas Boyd, New Etal, has been elected road-surveyor to the trustees of the Kelso district of roads. There were thirty-four candidates.

Newark.—A special meeting of the Newark Urban Sanitary Authority was held on the 7th inst. to elect a surveyor for the borough, in the place of Mr. C. Baily, resigned. The clerk stated that there were thirteen applicants for the office, viz.:—Mr. G. Sheppard, Newark; Mr. Bennett, Newark; Mr. J. Brown, Engineer's Office, London and North-Western Railway; Mr. G. N. Single, London; Mr. A. K. Balls, Reading; Mr. G. Robinson, Bridgnorth; Mr. N. A. Dawson, Peterborough; Mr. P. H. Davison, C.E., Windsor; Mr. J. H. Duckinfield, Rochdale; Mr. Howard, London; Mr. A. Woodhouse, Southampton; and Mr. G. Dickenson, Barrow-in-Furness. Mr. Sheppard was elected.

Prestbury.—At a meeting of the Prestbury (Cheshire) Highway Board on the 11th inst., an application from Mr. Carswell, surveyor to the Board, was discussed. It was moved that the application be complied with by granting an increase of 50*l.* per annum. An amendment to the effect that the increase should be only 25*l.* was carried by 11 to 9. The salary as increased is 225*l.*

Warwick.—At the monthly meeting of the Warwick Town Council, on the 11th inst., the General Purposes Committee reported that Mr. Broughton, the assistant surveyor, had resigned his office. Mr. E. Pritchard, C.E., had also requested to be allowed to resign the appointment of Surveyor. The committee accepted Mr. Pritchard's resignation.

Southampton.—Mr. W. B. G. Bennett, assistant surveyor of Widnes, was on the 19th inst. unanimously elected assistant surveyor of Southampton. There were thirty-seven applicants.

COMPETITIONS.

Derby Free Library and Museum.—We learn from a Derby paper that no fewer than fifty sets of designs have been sent in in competition for the free library and museum which is to be presented to the town by Mr. Bass, M.P. The whole of the designs are on exhibition in the Guildhall.

Board Schools at Elmore.—The designs of Mr. E. Axten, architect, Gloucester, have been accepted in competition for new Board Schools at Elmore.

CHARLES MACKLIN.

SIR,—In the very interesting notice of Charles Macklin in your last number, it is written, "In the Memoirs of Macready it is said that at nineteen Macklin was unable to read. This is a mistake into which Dr. Doran also falls." Macready says in his Memoirs, not that Macklin was unable, but that "*it was said* of him that at nineteen he could not read" (vol. i., p. 29). In "Their Majesties' Servants," vol. ii., pp. 253-4, what *I* state of Macklin is this: "I have somewhere read that at five-and-thirty Macklin could not read perfectly, but that is a fable, or at eight or nine he could hardly have played *Monimia* in private theatricals at the house of the good Ulster lady, who looked after him more carefully than the priest (his uncle) and more tenderly than nature."

The question of Macklin's age was finally settled seventeen years ago. His tombstone gave his age at his death as 107 years; but when the last sweeping alterations were made at St. Paul's, Covent Garden, in 1859, the plate on the great actor's coffin was examined, and thereon it was stated that he died "aged ninety-seven years." The latter record is likely to be the more correct one; but the old error still prevails.

JOHN DORAN.

WALL PAINTINGS IN NEW ZEALAND.

SIR,—The wall-paintings said, in your issue for April 8 (p. 349), to have been recently discovered in New Zealand, would be something marvellous, indeed, if they prove to be of great antiquity.

No remains of buildings, monuments, drawings, symbols, or hieroglyphics of any kind, have, I believe, hitherto been found.

In the year 1833, during my sojourn of more than eight months in these islands (about seven years before the first colonists landed), I saw nothing whatever leading to the supposition that the former race of New Zealanders had been more intelligent.

These paintings may prove to have been done by some whaleboat's crew whilst ashore in the locality for wood and water. Many men on board the whaleships in the South Seas show remarkable skill in drawing and carving upon whalebone and ivory various devices,—the deities in the heathen mythology being especial favourites.

R. H.

THE LONDON BUILDING TRADE.

THE following is a copy of the resolutions of the Central Association of Master Builders of London, upon the subject of the masons' and labourers' application for an increase in wages, to take place in the months of May and June next respectively:—

Resolved, That, in reference to the application, dated 26th of November, 1875, from the operative masons of London, requesting an advance of wages of 1d. per hour, the committee of the London Builders' Association is of opinion that the present state of the building trade does not warrant an increase of wages.

Resolved,—That in reference to the application from the Committee of Labourers employed in the Building Trade of London, the Committee of the Association of Master Builders of London is of opinion that the present state of trade does not warrant any increase on the wages now paid.

THE LATE MR. JOHN AIRD.

We announce with regret the death of Mr. John Aird, sen. (head of the well-known firm of John Aird & Sons), which took place on the 9th inst. in London. We learn from the *Elgin Courant* that Mr. Aird was a native of Ross-shire, but left Scotland when a mere boy. When a young man, he was employed in the construction of the Phœnix Gasworks in London. His superior knowledge, skill, and character attracted notice, and he was, after a time, placed in charge of some departments of the work, and then entrusted with contracts on his own account. Ultimately he left the gas company, and, when contractors were asked to estimate for works that he saw his way to undertake, the young man from the far North competed for them, and, having his early friend, Mr. Munro, formerly engineer to the Phœnix Gas Company, to stand by him until he became better known, he got into business. At first his transactions were on a small scale, but, as it became known that his fixed principle was to execute whatever was entrusted to him in the most substantial and perfect manner, the sphere of his operations rapidly extended. From one point to another his business rose to be one of the largest in the kingdom. He took gas and water into Berlin, where he laid down some eighty miles of pipes, and so satisfactorily did he carry through these works that the Government presented him with a testimonial and the freedom of the city. He took water also into Amsterdam, a work of very great difficulty, and had large contracts in Rotterdam, Schiedam, Hamburg, Archangel, Singapore, Copenhagen, and other places. At Copenhagen he carried a tunnel under an arm of the Baltic, 70 ft. below it, and lost a large sum of money by it, as it turned out to be of sulphurous stone, in which the men could work only an hour or two a day. But he never failed to finish what he undertook, whatever it cost, and thus he was often preferred to others when estimates came to be considered, though he was not the lowest offerer. In Ottawa and in places in America extensive contracts were entered into by Messrs. John Aird & Sons (for when his large family grew up Mr. Aird took two of his sons into partnership, and they have in recent years chiefly conducted the business). Friendships led them to undertake one or two small contracts in Scotland. The Buckie Waterworks were executed by them. To the village of Urquhart and to Innes House Messrs. John Aird & Sons brought water from Lochnabo. Gas and water works they erected without number. In London they had a large share of the works going on. At Christmas, 1874, a reckoning was made of the people in their employment in various parts of the world, and they were found to be considerably over 30,000. The strength of the firm of John Aird & Sons was brought into special notice by the money crisis of 1867. Sir Morton Peto, Betts, & Co., who had then perhaps the largest contracts of any firm in the world, succumbed under the monetary pressure of that time, and Messrs. John Aird & Sons, in the great majority of cases took up their contracts, and finished them. Mr. Aird, who was seventy years of age at the time of his death, is spoken of in the highest terms for his amiability and good-heartedness.

THE WATTS MEMORIAL HALL, SOUTHAMPTON.

The Watts Memorial Hall, a commodious block of school-buildings facing Vincent's-walk, at the rear of Above-Bar Chapel, Southampton, dedicated to the memory of Dr. Isaac Watts (who was born in Southampton, in a house still standing, which forms part of a quadrangle known as Hampton-court, French-street), was opened on the 10th inst. It was at the Chapel Above-Bar that Isaac Watts, senior, acted in the office of deacon for forty-eight years; and it was there that the poet himself was baptised. The new school-buildings completely cover the site of Watts's garden at the rear of the chapel—a plot of ground conveyed to the deacons of the chapel in perpetuity—and they form an appropriate and lasting memorial of the poet in his native town on the very spot where he thought and worshipped. The architect of the buildings is Mr. H. J. Paull, of Manchester, and the builder is Mr. H. I. Sanders, of Southampton. The style of the buildings is Free Italian, and the total cost is about 6,000*l.* The large central hall will accommodate 1,000 persons. Mr. W. F. Siddall acted as clerk of works.

PIECE-WORK.

Sir,—I have read the article in your paper by Mr. F. Hill, but I do not find therein, and have failed to find in the various papers and letters which have come under my notice, any reference to one of the most important points in the controversy, viz., the quality of the work produced under the system of piece-work. I should premise that I am connected with a firm who manufacture a most special class of work in metals, fully two-thirds being what is usually termed by workmen "odd work," and we have the reputation of making the highest quality of goods known in the trade. Up to about seven years ago we never attempted piece-work, fearing to endanger the quality and the estimation in which our work was held, and also on account of the difficulty we considered we should have in arranging prices with the workpeople. Ultimately we found that it was simply impossible to obtain a profit under the system of day-work, and that the workmen seemed to get less and less inclined to make any exertion or apply intelligence to their work. We had little difficulty in making the change, and, greatly to our surprise and pleasure, we very soon found great advantages every way. The workmen got more money and were better satisfied. The mistakes made by them in setting out work, &c., were avoided, and the quality of the work was much improved. Of course a reasonable amount of overlooking was necessary, but not more than before, as every man was interested to get his work done quickly and well enough to pass, and to entitle him to the best paid and higher classes of work in future. We, however, recognised these principles: (1) That our workmen are entitled to do well at the prices fixed, providing they work steadily; (2) that their interests are identical with our own, and they must not be suffered to wait for work, or have to stand idle through any negligence of ours or even through errors of their own. The whole of our work, even the most intricate, is made piece-work, either by estimate at first or agreement when finished, and our experience tells us that it is "better to pay any price a man chooses to ask rather than have any work done day-work." The men soon find it is to their interest to be reasonable, and we never find any difficulty in their meeting us when trade is not good.

I trust this may throw some light on the application of piece-work to any class of work.

Birmingham. F. S.

Sir,—Will you kindly grant me a little space in your valuable columns, that I, as a journeyman, also secretary of a trade-union lodge, and representative to the London Trades Council, may express my views upon this all-important subject, and lay the matter a little more clearly before the public? At the same time, let me say that I am fully aware that whatever I may here write that is not in accordance with the views adopted by trade-unions generally, I shall be carpeted for; but let me add that I cannot be bound by party opinions. If I see that my fellow working men are being led in a wrong direction, it is my duty to them to tell them so, and I shall do it. Now to the point. All writers and speakers who are not really working men seem either to forget or not to know that there are two kinds of piece-work,—one is individual piecework, the other is piece-work by the gang, or what is known in London as sub-contract. Now I made it my business to attend two large meetings at the Artisans' Institute, St. Martin's-lane, where this question was thoroughly sifted, and the conclusion I came to in the end of the discussion was this, that piece-work, where the individual alone is concerned, is desirable,—is beneficial; that it encourages skill and attention to work; that it is an inducement to the young in those trades to make themselves thoroughly acquainted with every method whereby they can produce a large amount of work,—not scamping, as one writer has it. But that sub-contract work, where one man takes the work, and then pays those who work for him at the daily rate of wages, is tyrannical and unjust, and I think that the public will agree with me when I say that trade-unions should protect their members from such tyranny.

But cannot this state of things be altered, and piece-work still be retained? I say, yes; and it is a subject worthy the attention of the master builders of London when they meet in conference. Let them, instead of letting their work to a sub-contractor, select butty-gangs, with a competent leader. "Let every man reap where he himself has sown," I think is right; not for one man to live upon the over-exertion of others. "A fair day's work for a fair day's wage" is right and good; but when a man does a day and a half's work in one day, and reaps no benefit therefrom, then it amounts to tyranny, and should be discountenanced by all. Mr. Brassey's system was referred to by one gentleman. I worked under Mr. Brassey the first day I went to work at Ludlow tunnel, on the Shrewsbury and Hereford line, and many other places since, so know somewhat of his method. Sub-contract was a favourite method of his, and was carried out as I have stated above; but he had also a butty-gang system in tunnels. Under the sub-contractor the bricklayer would get about 30*s.* per week; under the butty-gang system he would get from 3*l.* to 4*l.* per week. Yet it would cost Mr. Brassey just the same sum total for the same amount of work. In the one instance, the man reaps no benefit from his skill; in the other, he does. Then I ask the public, which is just to us as working men?

But now I would say a word to the men themselves, and I would urge them not to be led by those whom they have placed in position, who live upon the agitations they can arouse, and oftentimes care little about the welfare of those whom they profess to serve. Let each man carefully weigh the matter in his own mind. Look more to yourselves, I would urge upon all. You place yourselves in a false position when you follow after those who tell you that you should sacrifice your own interests for the sake of the weak and the idle. With these few remarks, which I hope will give a little more light on this subject of piece-work, I conclude.

John P. Morris, M.U.O.B.

SERIOUS POSITION OF THE BUILDING TRADES.

Sir,—As one of the largest holders of Bricks at the present time, and as agent for some of the largest brickmakers, I desire that it should be known to my numerous customers that I did not attend the meeting mentioned in your issue of the 15th inst., neither have I joined any clique whatever.

My connexions have felt no serious inconvenience from the rise in prices, as they had been advised that prices must inevitably rise very considerably in spring, owing to that inexorable commercial "law of supply and demand."

William Thomas Wiseman.

CONCRETE ROOFS.

Sir,—Will one of your readers kindly tell me a safe and simple method of making a concrete roof to a villa 32 ft. by 32 ft.? The greatest span between internal and external walls is 16 ft. by 17 ft., and in some cases but 10 ft. by 12 ft.

I have been told that a suitable roof could be formed by using 1½-inch iron gas-pipes 3 ft. apart, ledged upon the outer walls, and covered with concrete 6 in. in thickness, the concrete being composed of one of Portland and six of core. M. D.

CHURCH-BUILDING NEWS.

Woking.—It has been resolved to apply for a faculty for carrying out certain alterations at the parish church, Woking. The works, which will cost about 600*l.*, include the removal of the pulpit and desk to the north chancel arch, the rearrangement of the seats in the church and chancel, &c.

Gainsborough.—All Saints' Church, Gainsborough, has been reopened, on the completion of the permanent decoration of the apse. The work has been carried out by Mr. Knowles, of York. The ceiling has been painted a pale blue grey, and a portion stencilled around the base just above the cornice. The latter is given a warm brown, with the trusses and rosettes picked out in red, grey, and gold, and the mouldings are stencilled with a pattern of similar style. The entablature is painted a dull blue, and is further adorned with a text round the whole of the apse. The pilasters are thrown into one long panel, which is filled in with an entwined ornament in buff on a deep grey and blue ground, the capitals and base mouldings being tinted in dull green and red, the latter being further enriched with gilt. In the wall spaces beyond the pilasters, the upper part is diapered on the buff ground with a lozenge-shaped panel, each being alternately filled with a Maltese cross and a conventional rose, in grey and chocolate. The spaces are further ornamented with *fleurs de lis* and roses in gold, green, and tan colour, on a deep red ground. The masonry in the centre of the apse is painted in green, black, and chocolate, relieved with ornaments in gold, buff, and grey, to form a suitable counterpoise of colour for the setting off of the oil painting of the Last Supper,

which stands immediately above the altar. The cost has been 120*l.*

Buttington.—The parish church of Buttington has been re-opened, after restoration. The gallery, internal vestry, pews, pulpit, &c., have been removed, the roofs re-slated, a vestry built out on the north side of the chancel, the nave warmed and fitted with convenient open pitch-pine seats, and the chancel with stalls. The new pulpit is of pitch-pine, and the lectern and other fittings are of oak. Maw's encaustic tiles are laid in the chancel. The cost has been about 653*l.* The work has been carried out by Mr. Price, of Shrewsbury, under the directions of the architect, Mr. Haycock.

Litchurch. — A new north aisle to St. James's Church, Litchurch, Derby, was opened by the Bishop of Lichfield on the 15th ult. The church is now complete, with the exception of the tower and spire.

Kingston.—The foundation-stone of the new church of St. Paul, Kingston, has been laid. The cost, including site, will be about 7,000*l.* Messrs. Todd & Sanders are the contractors, and Mr. C. L. Luck, of Surbiton-hill, is the architect.

Derby.—The ancient parish church of All Saints, Derby, was re-opened on the 15th ult., after restoration at a cost of 4,500*l.* The interior of the church has been considerably altered. The old-fashioned pews have been removed, and replaced by open benches, constructed as far as possible of the material obtained from the old pews. The wooden enclosure which blocked up the end of the north aisle (formerly used as a vestry) has been removed, and in lieu of it a spacious vestry has been erected at the east end of the church, with robing-room, and connected with the church by lobbies, one of which forms an entrance to the church from Full-street. By permission of the Duke of Devonshire, a portion of the iron railing enclosing the Devonshire Chapel has been removed, also the Consistory Court in the north aisle, thus affording additional space for seats, and opening out to view the monuments in those parts of the church. The ornamental ironwork at the east end of the church has been retained, and used to form the two sides of the screen round the communion space, the whole being re-gilt and restored. The mural monuments throughout the church, which are of very great interest to the town and county generally, have been cleansed and restored. The whole of the interior of the church has been coloured and decorated in keeping with the character of the building. One of the most important parts of the work has been the covering of the floor of the church with a bed of concrete, 7 in. deep. This was rendered necessary by reason of the unhealthy condition of the floor of the church, owing to the numerous interments which have taken place within the walls of the building. With the exception of the memorial window to the Prince Consort, the whole of the windows, sixteen in number, have been filled with ornamental stained glass, the gift of various benefactors in town and county. The new pulpit, shortly to be fixed, is the gift of Mr. Abraham Woodiwiss. By the alteration, at least 500 additional sittings have been provided. The work has been done by Mr. Edwin Thompson, contractor, of Derby, from plans and specifications prepared by Mr. Julian Young, of Derby, architect.

Peak Forest.—The foundation-stone of a new church at Peak Forest, near Buxton, has been laid by Lord Edward Cavendish. The new building is to supersede the old parish church, erected during the days of the Commonwealth, and is to cost about 3,300*l.*, the greater part of which is to be defrayed by the Duke of Devonshire. Accommodation will be provided for 300 persons. The building is to be of stone obtained from the local limestone quarries, with dressings of gritstone. The Gothic style has been adopted by the architect, Mr. Henry Cockbain, of Middleton, near Manchester. The builders are Messrs. Hill, of Tideswell.

Preston.—The parish church of Preston, near Ipswich, was reopened on the 6th inst., after restoration at a cost of from 800*l.* to 900*l.* Prior to the commencement of the works the walls were much out of the perpendicular, and on the north side it has been found necessary to pull down the nave wall entirely, while on the other side partial rebuilding had to be resorted to. The roof of the chancel has been entirely renewed. Externally, almost the whole of the walls have been stripped of their coat of plaster, and refaced with flint and pebbles. The tower has also been taken down and rebuilt from the level of the belfry-stage. The whole of the works were carried out by Mr. W. Wagstaff, builder, of Preston, under the superintendence of Mr. John M. K. Hahn, of London, the contract having been 779*l.*, in addition to which there are a few extras. The pulpit is the work of Mr. Chinnock, of Ipswich.

Gateshead.—St. Mary's Church, Gateshead, was re-opened for public worship in November last; but the formal reopening did not take place until the 3rd inst. The work has been done under the superintendence of Messrs. Austin, Johnson, & Hicks, architects, Newcastle, by Mr. Hudspeth, Newcastle. It was originally estimated that the restoration would cost 3,200*l.*; but various causes have tended to augment that sum to 5,000*l.*

Worcester.—The foundation-stone of the new church of St. Mary Magdalene, Sansome-walk, Worcester, was laid on the 3rd inst. The church will be rectangular in form, and will have a nave 72 ft. long by 26 ft. 10 in. The north and south aisles will be of the same length as the nave, and will each be 8 ft. 3 in. in width. The chancel is to be 35 ft. long by 22 ft. 6 in. wide, with an aisle 22 ft. 4 in. by 10 ft. 6 in. The nave-arcades will consist of four bays, and the aisle windows, of single lights, will have trefoil heads, while the clearstory windows, of three lights, will have small and simple tracery in the heads. The west end, fronting Sansome-walk, will have two two-light windows with traceried heads, and what is known as a wheel-window above. The large window above the east end will consist of five lancet-lights. For the time being, until the funds will admit of a tower and spire being erected, a bell-cot will be constructed over the chancel-arch. The style is Early English. The external walls will be faced with Ombersley stone, with Bath stone dressings and bands; while the internal walls will be faced with Cradley stone, close punched on the face, also with Bath stone dressings. The roof will be open-timbered and stained, and is intended to be covered with Whitland Abbey green slate. The vestries and tower and spire are not included in the present contract; but when the last-named are erected it is intended that they shall reach an altitude of 145 ft. The church will be fitted with open sittings for 600 persons. Mr. Frederick Preedy, of London, is the architect, and the clerk of the works is Mr. Lewis Sheppard. The contractors are Messrs. Collins & Cullis, of Tewkesbury.

Hucknall Torkard.—The foundation-stone of a new church on the Nottingham-road, Hucknall Torkard, was laid by the Bishop of Lincoln on the 5th inst. The new church will be built by Mr. Jelly, of Nottingham, from designs prepared by Messrs. Bakewell & Bromley. The style of architecture will be Early French, and when the church is fully completed sittings will be provided for 500 persons. Meanwhile the promoters of the church are content to build the nave and a temporary chancel, and thus sittings will be available for from 250 to 300 people. Eventually the congregation hope to be able to add a tower and spire, but for the present a bell-turret will take the place of these. The church will be built of Lincoln stone, with Bath stone facings.

Ashbourn.—The chancel of Ashbourn Church, Derbyshire, is about to undergo thorough restoration, under the superintendence of Sir Gilbert Scott. A contract for the execution of the whole of the work, except the painted glass, has been signed by Messrs. Collins & Cullis, of Tewkesbury. During the restoration the chancel will be partitioned off from the rest of the church, and the Communion-table will be removed to the eastern arch of the tower. The entire cost will be defrayed by Mr. G. H. Errington, of Lexden Park, Essex, lay impropriator of the parish.

Westmill.—The parish church of Westmill, Herts, was re-opened on the 6th inst., after restoration. The works have chiefly consisted of a general repair of the fabric of the church, with the addition of an organ-chamber and vestry on the north side of the chancel, and a new porch on the south side of the nave. All the roofs have been stripped and repaired, the plastered ceiling of the nave removed, and the rafters exposed to view, the timbers being renewed, as far as was necessary, in oak; new king-posts and braces are added to the principals, and all the substantial repairs have been executed without interfering with the original character of the roof. The roofs of the north aisle, organ-chamber, and porch are new and of stained deal. Bath stone is used for the entrance doorway, new windows, and all other dressings, and new stone copings finished with appropriate saddle stones and crosses have been added to the east gables of the nave and chancel. The work has been carried out by Mr. Gibbons, of Buntingford, from plans and specifications prepared by Mr. J. H. Christian, architect, London. The cost has been 1,500*l.*

Bridge of Allan.—The Established Church at this Scottish watering-place has again become too small, and a large addition for 300 sittings is about to be made, according to plans by Mr. R. Baldie, architect, at an estimated cost of 1,800*l.*

Netherhampton.—At the quarterly meeting of the Salisbury Diocesan Church Building Association, held on the 4th inst., a grant of 100*l.* was made towards restoring and making extensive alterations in the church at Netherhampton, near Wilton, Wilts. The works are to be carried out under Mr. Butterfield.

DISSENTING CHURCH-BUILDING NEWS.

Maidstone.—A new Congregational Church in West Borough, Maidstone, was opened on the 4th inst. The style is Gothic, and the external walls are of Kentish rag with Bath stone dressings. There is a tower 85 ft. in height. The internal walls are plastered with selenitic mortar, while the roof, which forms a semi-polygon of five sides, is of wood. The semicircular moulded ribs spring from Bath stone shafts, with moulded caps and corbels. The internal dressings are of Bath stone. The glazing, which is the work of Mr. Hyles, of Week-street, is of various tints, the windows being of alternate colours. The fittings are of red deal, stained and varnished, while the pulpit is semicircular in form and surrounded by sittings, the inclosure forming a space for the Communion-table. Behind the pulpit is the organ, while at the opposite end of the church is a gallery. The architect is Mr. Fertwee, of Chelmsford, while the contractor is Mr. Avard, of Maidstone. Grundy's patent heating apparatus has been introduced. Sittings are provided for 475 persons, and the work of furnishing was entrusted to Messrs. Baker & Son, of Maidstone.

Edinburgh.—A new church for the Catholic Apostolic congregation in Edinburgh was consecrated on the 5th inst. with the ritual of the communion. The building, designed by Mr. R. Anderson in the Norman Gothic style of architecture, has cost about 17,000*l.* as it stands, and (according to the *Scotsman*) that sum will be nearly doubled before the great west tower and other subsidiary works are completed.

Newbury.—A new chapel in St. Bartholomew-street, Newbury, for the Primitive Methodist connexion, was commenced last week. The contractor is Mr. Lock, of Burghfield, whose tender was 2,750*l.* The tenders of the remaining competitors were as follows:—Whiter, Newbury, 4,040*l.*; Sargent, Newbury, 4,031*l.*; Dove, Oxford, 3,590*l.*; S. Elliott, Newbury, 3,530*l.*; James, Newbury, 3,103*l.* 19*s.* In addition to the chapel, a school and class-rooms and minister's house will be built, the same being included in the above tenders.

Brighton.—A new Primitive Methodist Church is about to be commenced at Viaduct-terrace, Brighton. It is to be a Gothic structure, with a frontage of 46 ft. and a length of 60 ft. Attached to it will be a commodious schoolroom. Messrs. Goldsmith & Lawdy are the architects, and the contractor is Mr. J. Barnes, the amount of whose tender was 1,194*l.*

Birmingham.—On the 9th inst., a new Catholic Apostolic Church, situate in Summer-hill-terrace, Birmingham, was opened. The building, which will seat about 400 persons, is in the Gothic style, and the exterior is faced with brown bricks, the tracery of the windows being of terra-cotta. The facings of the interior are of white bricks, with brown brick bands. The caps and bases of the pillars, together with the corbels, are of terra-cotta. The edifice is not yet completed, as a chapter-house and school have yet to be added. The total cost will be about 10,000*l.* The architect is Mr. J. A. Chatwin, and the contractor Mr. B. N. Smith.

Preston (Sussex). — A new Congregational Church is to be built at Preston, at a cost of about 2,500*l.* Mr. J. C. Gibbins, of Brighton, has prepared the plans.

Grays.—The foundation stones of a new Primitive Methodist chapel, at East Thurrock, near Grays, Essex, have been laid. Mr. Sallings, of Stanford-le Hope, is the builder.

Woolston.—A new Presbyterian Church at Woolston, near Southampton, was opened on the 7th inst. The building is in the form of a cross,

there being a nave and transepts and raised chancel. The architect is Mr. Barker; the builders, Messrs. Bailey & Son, Southampton; and the clerk of works, Mr. Buckingham. The church has an open-timbered roof. Internally the walls are of stone and white bricks, with grey points, the exterior being of red bricks, with grey points. The length is 80 ft., including the chancel; the width, 31 ft. 6 in.; and from end to end of the transepts, 62 ft. The church will seat 500. There will be a tower and spire, in all about 90 ft. high.

Folkestone.—It is proposed to enlarge the Congregational Church at Folkestone, by the addition of an apse. The work has been contracted for by Mr. George Prebble. The outside will be formed of Kentish rag stone, with Bath dressings, whilst the inside will be lined with Gothic panelling and ornamental tiling. The cost will be 558*l.*

Denton.—The foundation-stone of a new Congregational Chapel at Denton was laid on Good Friday. The site is a plot of land on the Stockport-road, and adjoins the old chapel. The building is to accommodate 700 persons, and will be Byzantine in style, executed in red brick, with white facings and other ornamental work. The portico is to consist of three arches. The whole of the woodwork is to be of pitch pine. The total cost, including the land and the charge for converting the old chapel into a school-house, is estimated at 6,000*l.* The contractors are Messrs. J. Robinson & Son, Hyde; and the architects, Messrs. Solomons & Ely, Manchester.

Sheffield.—A new Wesleyan Chapel is about to be erected at the corner of Burngreave and Christchurch roads, the chapel at Bridgehouses having been purchased by the Manchester, Sheffield, and Lincolnshire Railway Company. The style will be Gothic, and the trustees have commissioned Mr. Ellison, of Liverpool, to prepare plans. The chapel is to seat 1,000 persons and to have a tower and spire, and the estimated cost is 9,600*l.*

Ockbrook.—The Moravian Chapel at Ockbrook has been re-opened, after alterations to such an extent as almost to amount to entire re-building. The work has been carried out by Messrs. Robert Dennett & Co., of Nottingham, from designs by Messrs. C. S. & A. J. Nelson, architects, Leeds. It will seat about 350, and will cost on its completion about 1,500*l.* It is stated by a local paper that the stone plinth of the font has before seen service in the construction of Dale Abbey.

Foleshill.—A new Wesleyan Chapel in Lockhurst-lane, Foleshill, was opened on the 12th inst. The chapel provides accommodation on the ground-floor for 220 adults, and there is a gallery opposite the pulpit which accommodates about 100. The structure is faced with pressed bricks, and a little variety is given by the introduction of a few bands of blue brick and Bath stone. There is a school-room beneath the chapel of nearly the same superficial area as the chapel; there are separate entrances for boys and girls, and one of the staircases communicates with the chapel. The school-room provides accommodation for 250 children. There is a class-room attached for the convenience of senior scholars. The total cost of the building is upwards of 1,400*l.* The architects are Messrs. George & Isaac Steane, and the contractor was Mr. Charles Heywood.

SCHOOL-BUILDING NEWS.

Stourport.—New Wesleyan Schools, the gift of Mr. T. J. Baldwin, ironfounder, Stourport, were opened in the town on the 6th ult. The schools have been erected from designs by Mr. J. J. Baldwin, architect, Stourport, the builders being Messrs. J. Shepherd & T. Rowley, also of Stourport. The style is Domestic Gothic, and the large room is 50 ft. long by 25 ft. wide, and is estimated to accommodate 300 children. The materials used are red bricks, with Bath stone and white brick dressings. The interior is plastered, and the roof has been left open up to the collar beams. The woodwork is of pitch pine, stained and varnished, and the whole has a light and pleasing appearance. The total cost is about 1,000*l.*

Bredon.—The committee for building new National Schools at Bredon, Worcestershire, have succeeded in collecting sufficient money to enable them to commence building. The architects, Messrs. Yeates & Jones, of Worcester, have furnished drawings which have met with the approval of the Education Department, and a contract has been entered into with Messrs. Walker & Wilkes, of Bredon, to build the school for 400*l.* The building will be of Bredon Hill stone, rough-axed, with Bath stone dressings.

York.—A new Wesleyan Sunday School has just been opened at Melbourne-terrace, York, in connexion with the new chapel now in course of erection. The new building (as also the chapel) is from designs by Mr. E. Taylor, architect, York, and will accommodate upwards of 400 scholars.

Edinburgh.—To provide additional facilities for teaching, and further accommodation for the increasing number of pupils who have made application for admission into George Watson's School for Young Ladies, the governors have resolved to greatly enlarge the existing buildings in George-square, Edinburgh. With this view, it is intended that during the recess the present class-room accommodation shall be enlarged by the space at present occupied by store and other small rooms, the passages being at the same time widened and the lighting improved. A new play-room, with glass roof, will also be provided; and all the sanitary appliances will be placed outside the school, in a building overlooking the back lane. On the vacant ground to the east of the school a new building, three stories in height, is to be erected. The elevation to George-square will be in the Italian style; and between the old and new buildings a new entrance is to be constructed, consisting of a porch and hall, from which a staircase will lead to the upper flats. On the area-floor of the new building there will be a large play-room and five dressing-rooms; on the street-floor three large class-rooms, each measuring about 29 ft. by 19 ft.; and upstairs a large hall, lighted from both sides, the dimensions of which will be 58 ft. long, 32 ft. wide, and 18 ft. or 19 ft. high. When these alterations and additions are completed there will be accommodation for 200 additional scholars.

JAPANESE BRICKS IN THE LONDON MARKET.

The threatened disturbance in the building trade owing to the scarcity of bricks, to which we referred last week, is likely (according to the daily papers) to be speedily obviated. It is stated that last week a cargo of bricks of Japanese manufacture was placed, as an experiment, on the London market, the result being that the cargo was instantly bought up, and large orders for future supplies were given by several leading contractors and West-end builders. The bricks are said to be very considerably harder than those of home production, whilst for ornamental facings, patterns of every description are manufactured. The prices realised for these bricks are not quoted, and it is right that we should state that some of our correspondents having business relations with Japan write to us to say that they are unaware of Japanese bricks having been shipped to this country, at all events to such an extent as to have any appreciable effect on the market.

STATUES.

A commencement has been made with the digging out of the foundations for the Livingstone statue, Edinburgh, which is to be erected on a site in East Princes-street Gardens, to the east of the Scott Monument. The statue itself has just been cast in bronze by Masefield & Co., Chelsea, and is expected to be ready for placing on its pedestal in June next.

Mr. Williamson is now executing in his studio at Esher, for her Majesty the Queen, full-length statues in marble of Prince Albert Victor and Prince George, for the Royal Palace at Osborne. The recumbent monumental figure in marble of Dean Milman has just been completed by Mr. Williamson, and will shortly be placed in St. Paul's Cathedral.

The Carmichael statue for Dundee, designed by Mr. John Hutchison, R.S.A., has been cast in bronze by Messrs. Masefield & Co., Chelsea, and is now in the artist's studio, pending the erection of the granite pedestal. The statue represents the quaint old engineer in sitting posture, with one arm leaning upon a steam cylinder, and at the other side a model of the fan blast, with the invention of which his name is associated.

Three hitherto vacant niches in the vestibule of the College of Physicians, Trafalgar-square, have just been filled with statues by Mr. Henry Weekes, R.A. Immediately over the doorway is placed that of Linacre, who projected the foundation of the college, and was its first president. On either side are placed those of Harvey, the discoverer of the circulation of the blood, and Sydenham, the eminent physician and writer on physic, who flourished during the reigns of Charles II. and James II.

CONTRACTOR AND SUB-CONTRACTOR.

PEXTON *v.* PEACOCK.

In this case, heard at the Court of Record, York, on the 14th inst., the plaintiff, Mr. J. R. Pexton, joiner and undertaker, claimed 387*l.* 13s. 8d., for extra work alleged to have been done by him under a sub-contract to the defendant, Mr. W. Peacock, who was the contractor for building the Pavilion Hotel, Scarborough, and adjacent houses. The action arose out of a contract entered into between the two parties in the year 1869, which was the year in which the Pavilion Hotel was commenced, and Peacock had accepted Pexton's tender for the joinery work, for the completion of which a number of extra things were requisite, amounting to (including labour) the amount claimed. After a hearing of 5¼ hours, the jury returned a verdict in favour of the plaintiff for 340*l.*, with costs.

Books Received.

The Law of Fixtures; to which is added the Law of Dilapidations, Ecclesiastical and Lay. By Standish Grove Grady, Barrister-at-Law. London: Wildy & Sons. 1876.

We have simply to mention the publication of a third edition of Mr. Grady's now well and creditably known work, and to say that the author has paid proper attention to the great changes brought about by the passing of the Ecclesiastical Dilapidation Act of 1871. He considers that the surveyors under that Act are paid too highly, and thinks when a gentleman is employed to do all the work in a district, if he is to be paid by fees, there would be grounds for asking him to do the work on a much less scale than that on which he would be disposed to do it in an isolated case; and there would be much greater reason for asking him to do the work at a fixed salary, and the expenses then could be easily apportioned to the income of the incumbent. It does appear, he says, an enormous charge to which to subject the clergy of a diocese,—that of Lincoln, for instance, where the clergy are computed to pay, as is asserted, every five years, 33,165*l.*, and the whole Church of England, 360,000*l.* What do the surveyors themselves say?

Edinburgh Architectural Association Sketch Book. Vol. I., Part I.

The Edinburgh Architectural Association have determined on the publication of a sketch-book, and have issued the first part. It includes one print in colour, Library Ceiling decorated in Colour, sixteenth century (Munraw House, East Lothian), and five sheets of measured and other sketches. It is a very creditable first part.

VARIORUM.

Under the title, "A Popular Summary o Public Health and Local Government Law" (Stevens & Son, Chancery-lane), Mr. George F. Chambers, Barrister-at-Law, has provided a cheap abstract of Statute Law for popular use. It would be pleasanter reading if certain abbreviations to save space had not been used.——The April number of the *Quarterly* includes an interesting and instructive article on Plate and Plate Buyers. "Many things are cunning," said Sophocles; "but nothing is more cunning than man." And this is certainly the case, as the reviewer proves, with our modern plate-forgers, many of whose works are admirable, only they are not antique.——May's "British and Irish Press Guide" is an advertiser's dictionary and handbook.

New Offices for the Greenwich District Board of Works.—The foundation-stone of new offices for the Greenwich District Board of Works was laid on the 11th inst. by Mr. Thomas Norfolk, the chairman of the Board. The site of the new buildings, of which Mr. Waller is the architect, is near the Greenwich Railway Station.

Miscellanea.

The Wells in Marylebone.—Dr. Whitmore, in his monthly report on the health of the parish of St. Marylebone, says, as to water from surface wells:—"The dangerous condition of the water taken from the pump at the corner of Great Portland-street and Chapel-street furnishes additional evidence of the fact that all the superficial springs in the parish are more or less polluted with sewage, and it is certain that there are no means of purifying them. With but one or two other exceptions, all the pumps in the parish under the control of the Vestry have been removed long ago, and it is to be hoped that those which remain will speedily follow; but there are still no inconsiderable number of private pumps situated in stables and other parts of owners' premises, which draw their water from similar sources, such water in a great many cases being used for drinking and domestic purposes. It is useless to explain to the owners of these pumps the risk and danger they incur from drinking this water; they at once point to its clear, cool, and sparkling condition as evidences of its purity, and refer triumphantly to the circumstance that for many years they and their families have drunk it, without having experienced the slightest ill effects from doing so. All this is no doubt true, and is confirmatory of a fact which now appears to be pretty clearly established, viz., such diseases as fever or cholera will not be produced by the drinking of polluted water, unless the matter by which the water is polluted contains the specific germs of those diseases. But at any time sewage matter containing zymotic poison may percolate into a surface well, and, although it may be infinitesimal in amount, it will suffice to produce zymotic disease, and an outbreak under such conditions may become very widespread and very fatal."

The Toll Bridges on the Thames.—A Bill has been printed bearing the names of Mr. Alderman McArthur, Sir J. C. Lawrence, Mr. Forsyth, Sir Henry Peek, Sir Trevor Lawrence, and Sir Charles Russell, which provides "for throwing open for the free use of the public the present toll bridges connecting the counties of Middlesex and Surrey across the river Thames." The preamble states that the tolls on the bridges are estimated at 75,000*l.*, and that the amount of compensation required would be 1,500,000*l.* The Bill proposes to give power to the Commissioners, who are to be appointed to carry out the Act, to borrow money from the Public Works Loan Commissioners and the Metropolitan Board, and to create Metropolitan Consolidated Stock. The sum to be raised by borrowing will involve an annual charge for interest of about 52,500*l.* A rate of ¼d. in the pound, to be levied upon the counties of Middlesex and Surrey, and upon the district under the jurisdiction of the Metropolitan Board, which lies outside those counties, is estimated to produce 64,773*l.*, and the excess of this sum over the annual charge for interest is to be appropriated to the repayment of the principal, which it is estimated will be accomplished in fifty years. The bridges to be freed from toll are Hammersmith Suspension Bridge, Fulham (otherwise Putney) Bridge, Wandsworth Bridge, Battersea Bridge, Albert Bridge, Chelsea Suspension Bridge, Vauxhall Bridge, Lambeth Bridge, Waterloo Bridge, and the foot-bridges at Charing-cross and Cannon-street railway stations.

The Durham Records.—At the monthly meeting of the Newcastle Society of Antiquaries on the 5th inst., Mr. R. Carr-Ellison in the chair, Mr. W. H. D. Longstaffe said that some years ago a considerable number of the Durham records were taken to London, and the Society petitioned against the removal. The whole of the records could not be seen without the permission of the Ecclesiastical Commissioners. He had received a letter from Mr. Grove, London, who had been retained by Mr. Carr, Witton Gilbert, to undertake an investigation on which he had been engaged for six years, and he could not see the Durham records. Mr. Grove asked the Society to aid him with their influence in bringing the question of the suppression of those records before the public. It was proposed to try the whole question by moving for a rule *nisi* for the production of the records, which he (Mr. Longstaffe) contended were public documents. It was resolved that the secretary draw up a petition upon the subject, and present it for confirmation at the next meeting of the Society.

The Drainage of the Thames Valley.—Last November an inquiry was held by Lieut.-Colonel Cox, R.E., one of the Local Government Board inspectors, upon an application made by the Surbiton Improvement Commission to form, by the compulsory powers of the Public Health Act, one large district for the carrying out of an efficient system of sewerage in the Thames Valley. The scheme suggested was that proposed by Sir Joseph Bazalgette, and would have included the area lying between Eton on the west, Croydon on the east, Ealing on the north, and Epsom on the south; this area being at present under the control of thirty different sanitary authorities. The inquiry lasted five days, after which the inspector was occupied some time in obtaining returns and statistics. Col. Cox's report has now been sent to the various bodies concerned. It is adverse to the application of the Surbiton Improvement Commission, the inspector remarking that, though there are difficulties existing throughout the district, he does not think they are so great as to require for their solution quite so heroic a treatment as that proposed. Colonel Cox suggests that the combination of districts between Hampton and the western boundary of the metropolitan district should receive the aid of the Board on application being made.

A Custom in the Sheffield Building Trade Overruled.—At the Sheffield town-hall, on the 3rd inst., before the stipendiary magistrate, Messrs. Fosdike, joiners and builders, were summoned by Redman F. Walker and John W. Turner, for wages due to them. From the evidence it appeared that, on Tuesday, the 14th ult., the complainants applied to the defendants for work, and it was given them. On the Saturday, at one o'clock, they went for their wages, and were paid, as they asked, at the rate of 8d. per hour. They resumed work on the following Monday morning, and on the Tuesday afternoon they gave notice of their intention to leave, as they were going from the town. When they asked for their wages, amounting to 12s. each, on the Tuesday evening, the defendants told them their pay-day was on Saturday, and they would not be paid before. Witnesses were called to prove that it was the custom of the trade in Sheffield to give and take a two hours' notice, and that that custom was agreed to at a meeting of the masters and men. The stipendiary magistrate characterised as "utter rubbish" a statement that men who gave and took two hours' notice could be put to much inconvenience, and said there was no proof that the defendants had agreed to such a custom, or were even aware that it prevailed. The wages would, of course, have to be paid; but he should refuse costs.

A Foreman of Cement Works Suffocated.—A sad occurrence, by which a foreman named Keeble lost his life through suffocation, took place at Messrs. Pattrick & Son's cement works, Dovercourt, on the 30th ult. One of a row of twelve kilns was about to be cleared ready for relighting. A lad named Bull, a labourer named Hempstead, and the deceased, got in one after another, and, finding that they did not return, Mr. Pattrick was communicated with, and measures were taken to release them, when it was found that after getting in they had all been overcome by the gases emanating from the next kiln, which was alight, the heat from which had caused the intermediate walls to crack, so that the fumes came through. The coroner's jury returned a verdict of "Accidental death," expressing their belief that it was entirely owing to the desire to save the life of a fellow-being that the deceased lost his own life. They also expressed their high appreciation of the bravery displayed by Mr. Pattrick and the man Hempstead, who, it transpired, went down after the lad Bull, fastened a rope round him by which he was drawn out, but before he could escape himself he was overcome by the gas.

Testing Safety-Lamps.—At a meeting of the Académie des Sciences, M. Daubre stated that in the petroleum mines of Alsace the miners were obliged to test their safety-lamps before going down the pits. This was done in the following manner:—At the bottom of an open jar is placed a small quantity of petroleum spirit, the vapour of which, mingling with the air in the jar, forms an explosive mixture. The lamp is plunged into this mixture, and the slightest defect in the lamp is proved by a slight explosion. It is desirable that some such system of testing should be adopted in our collieries.

"Model Dwellings for the Rich."—The *Observer*, at the close of a leading article on the subject of the paper thus headed, reported in our columns, says:—"Perhaps the fact that 'houses in flats' are understood in Edinburgh, Glasgow, and Aberdeen, may render not altogether superfluous a suggestion that some of the Scotch residents in London should embrace such an opportunity as Northumberland-avenue offers of obtaining the sort of accommodation which their friends and relatives in the north find suited to their requirements. Tall houses must be built there, and their upper floors might be divided into residences planned upon a modification of the Scotch and Continental principles. Each horizontal dwelling, so say Mr. T. R. Smith and Mr. W. H. White,—the architects, whose paper before the Society of Arts has furnished the occasion for our remarks,—could be divided into three sections,—the living-rooms, the service-rooms, and the sleeping-rooms,—each served by its own corridor. All the living-rooms, both of day and night occupation, could be made to face the street, only the corridors and service sections being lighted from the back of the house or the courtyard. The London Scotchmen might thus provide themselves with Scotch dwellings in the heart of London; and, in doing so, might set an example which is certain to be tardily followed by the great mass of its actual population."

Brussels Life-Saving and Sanitary Exhibition, 1876.—A meeting of the London Executive Committee was held at the Society of Arts, on the 13th inst. The secretary reported continued satisfactory progress in connexion with the Exhibition generally. Upon the suggestion of the chairman (Lord Alfred Churchill) the names of Lord Robert Montague, Mr. Reginald Yorke, M.P., Mr. Alderman Finnis, president of the Royal Society for the Protection of Life from Fire, Mr. Danby Seymour, and Mr. Joseph Sloper were added to the committee. The question of the exhibition of the collections offered by various public departments having been further considered, as also the means for defraying the expenses that would arise in connexion therewith, certain steps were recommended, which it was believed would result in the committee being placed in a position to complete the necessary arrangements.

The Prince of Wales's Indian Presents. Rooms are being specially prepared at the India Museum, Exhibition-road, South Kensington, for the reception of the numerous and costly presents received by the Prince of Wales during his recent tour through India. Mr. Moore, the deputy-superintendent of the museum, has charge of the arrangements, which are now in an advanced state. The rooms will be decorated in green, scarlet, and gold, so as to harmonise with the character of the exhibition, which will be open for public inspection about the middle of May. Amongst the presents are a splendid variety of jewels, a fine collection of Indian-made pipes, saddlery, scimitars, and other antique weapons. The exhibition will remain at South Kensington till November, when the collection will be removed to the Bethnal-green Museum, so that the inhabitants of East London may have an opportunity of seeing the Royal presents.

Royal Italian Opera.—On Thursday night Madlle. Zaré Thalberg appeared as *Zerlina*, in Auber's ever-welcome "Fra Diavolo," and a very charming representative she was. At the same time, one cannot help thinking what she might be two years hence if she were not "forced" too much, as it is greatly to be feared she will be. Madlle. Thalberg is evidently very well taught, and certainly does credit to her instructor; and in the second act she received a well-merited *encore*. Signor De Sanctis was not heard to advantage as the *Marquis*, for which part he has few qualifications. His acting is crude, and his singing inexpressive. The great success of the evening was undoubtedly the *Beppo* of Signor Tagliafico, who was well supported by Signor Capponi as the other brigand, and we have no hesitation in saying that a more capital piece of acting would be with difficulty found on any stage.

London Bridge.—The Library Committee has accepted the offer made by Mr. C. G. Colleton Rennie, grandson of the designer of London Bridge, to lend for exhibition several alternative designs for London Bridge, and the original design for the present bridge, made by his grandfather in 1817, and some drawings of the alteration of the approaches. These will be exhibited in the museum with Cooke's views of London Bridge, &c.—*City Press.*

Sewerage and Waterworks, Droitwich.—A special meeting of this Council was held at the Court Chamber last week for the purpose of passing a resolution asking for the sanction of the Local Government Board to the borrowing by the Corporation of the proposed loan for carrying out the work of water supply and sewerage in the borough; to receive a report from the Streets and Sanitary Committee, recommending the appointment of Mr. E. Pritchard, C.E., of Warwick, as the engineer to whom the work of water supply should be entrusted; to receive reports from the Medical Officer of Health; and to make a rate to meet the expenses of the borough during the current six months. On the motion of the Mayor, seconded by Alderman Roden, the report was adopted, and Mr. Pritchard was appointed engineer for carrying out the works.

Important to Sanitary Officers.—The question of the right of a sanitary officer to a fee for attending petty sessions in cases of prosecution under the Sanitary Act has been answered in the negative by the Local Government Board. All they admit is the consideration of travelling expenses, as stated by them in a letter in reply to the Nenagh Sanitary Authority. In this reply they refer the question to the order of 9th September, 1874, paragraph 2, "executive duties," under which sanitary officers are required to attend and assist in all proceedings in which their attendance or assistance may be required by the executive officer; and, the additional salaries allowed, the question of travelling expenses might become a matter of consideration of the Sanitary Authority under special circumstances.

New Memorial Pulpits.—The new pulpit which is to form part of the memorial to the late Rev. A. Hackman, in St. Paul's Church, Oxford, has been fixed. The base is of Caen stone, and the pulpit, which is hexagonal, is constructed of open ironwork. The work was entrusted to a London firm, and the fixing was executed by Messrs. Wyatt & Son, of Oxford.——Sir Gilbert Scott (according to a Salisbury paper) has prepared an amended design for Archdeacon Hony's memorial pulpit, to be placed in Salisbury Cathedral. It will present some carved figures in Tisbury stone; this and polished Purbeck marble are the materials which it is intended to use.

A Tunnel under the Thames at Woolwich.—The proposal to construct a subway under the Thames at Woolwich, which originated in October, 1873, consequent on the upsetting of a skiff in the fog, and the loss of nine lives, is, it is said, about to be carried into effect, and the necessary capital, 70,000*l.*, is stated to have been subscribed. The tunnel will be for foot-passengers only, but wide enough for five persons to walk abreast. A subway which would have admitted carriages as well has been thought very desirable, as there is no way for vehicles across the river below London Bridge, but the estimated cost exceeded 350,000*l.*, and it was thought impracticable to raise the amount.

The Gray's Inn "Rookeries."—At the last meeting of the Holborn District Board of Works, held on the 10th inst., a communication from Mr. D. Cubitt Nichols, architect, was read, notifying that he had been appointed by the Home Secretary to inquire into the improvement scheme of the Holborn Board of Works referring to an area east of Gray's-inn-road. He intended to hold a public inquiry in the Board-room on Thursday, 27th inst., to inquire into the correctness of the official representation to the Metropolitan Board of Works, into the sufficiency of the scheme, and into any local objection that might be made.

The Record Office, Fetter-lane.—The *Athenæum* says that some hopes had been entertained that this year we should have seen the commencement of the new wing of the Record Office, which is to run southwards in a line nearly parallel with Fetter-lane. The Treasury, however, finding the estimates for '76–77 attaining such large figures, have deferred the matter for another twelve months.

British Archæological Association.—At the last meeting, the hon. secretary announced that the arrangements for the autumn congress were almost complete. It will be held in Cornwall, under the presidency of Lord Mount Edgcumb, with two excursion centres,—one at Penzance and the other at Bodmin, where local committees are already formed.

A House Agent's Commission.—An action was brought in the Exchequer Division of the High Court of Judicature on the 12th inst. by a house-agent named Bilt, to recover upwards of 20*l.*, being the amount of the commission for the sale of the house No. 92, George-street, Portman-square, for 850*l.*, according to an alleged agreement made with the defendant, whose name is James, the then owner of the same. The defendant denied having made any agreement to pay commission, and lodged 5*l.* into court as a settlement of the plaintiff's claim. After hearing the evidence on both sides, the judge decided that the weight of evidence was in favour of defendant, and gave judgment accordingly, with costs.

New Offices for the Town Clerk, Sheffield. Plans have been prepared by Messrs. Flockton & Abbott for the offices of the Town Clerk of Sheffield, to be erected in the Hartshead, and the contracts have been let. The building will be of brick, with stone quoins, and will present to the street an elevation of three stories. Besides the offices necessary for the Town Clerk and his assistants, there will be a committee-room, and a private room for the Mayor, with strong-rooms for the stowage of important documents, and store-rooms. On the top story will be a residence for the office-keeper. The building will be set back to range with the north side of Watson's-walk.

Health and Rent.—Mr. North, in a recent report to the Urban Sanitary Authority of York, shrewdly remarks:—"People ought to know, and in time will learn, that wholesome houses are the most profitable to their owners. Apart from the question of cost which sickness entails on the community (for every sickness is a loss to the country, if not in the form of poor-rates, in the diminution of profitable industry), people do not like to leave comfortable houses, and for this reason rents are more secure. But men do 'dit' incessantly from unwholesome ones, and I suspect much rent is forgotten in their migrations."

Dock Extension at Hull.—It is stated that the Hull Dock Company have purchased, with a view of dock extension, the Citadel site, which was the property of the Crown. This site is both convenient and easily accessible for the construction of a dock. There is in front of it about the greatest depth of water of any portion of the foreshore, and the value of this site for dock purposes can scarcely be over-estimated. The Dock Company have now, by this purchase, the ownership of all the land available for dock purposes from the east end of the Victoria Dock to a point considerably westward of the Albert Dock.

Death of Mr. S. F. Lynn, A.R.H.A.—Mr. Samuel Ferris Lynn, sculptor, and Associate of the Royal Hibernian Academy, died at Belfast on the 5th inst., at the age of 40. He was a pupil and assistant of the late J. H. Foley, and studied at the Belfast School of Art and Royal Academy, London, winning the travelling studentship of the latter body about three years after entering. Mr. Lynn had been intended in early life for an architect, and was for a short time a pupil of Mr. (now Sir Charles) Lanyon.

Berkshire Archæological and Architectural Society.—A general meeting of the above Society was held on Thursday evening, the 6th inst., at St. Lawrence's Church Institute, Reading, when nine new members, one lady member, and one associate, were elected; and a paper on "Roods and Chancel Screens" was read by Mr. C. C. Rolfe, who treated the subject in a full and descriptive manner, and referred to the mention by local historians of those formerly existing in the Reading and neighbouring churches.

The St. James's Co-operative Benefit Building Society, having in three months completed its share-list, it is stated, with 1,050 members, a second society, on the same principles of alternate ballot and sale, advancing 400*l.* for ten years without interest by the subscription of 1s. 6d. per week, has been established at the Craven Chapel Lecture Hall, Marshall-street, and we are told that shares to the value of 120,000*l.* have been already subscribed for.

Glazing.—Mr. Rendle is now covering several of the ridge-and-furrow roofs at Paddington Station for the Great Western Railway Company under his system, and they have already passed safely through some heavy gales and storms of wind and rain.

Presentation.—On Tuesday last, Mr. Andrew Robertson (manager of the works for Messrs. Lucas Brothers, the contractors), on the completion of the Aquarium, was presented by Mr. Greenman, the clerk of the works, on behalf of the officials of the Society and foremen engaged under him, with a silver cigar-case, with an inscription testifying to the esteem and respect which they felt for him for his conduct to all during his stay amongst them. The architect also presented him with a silver cruet-stand in appreciation of his services.

Watney v. Trist and Others.—In reference to this case, which was noticed in a paragraph in last week's *Builder* (p. 374), Mr. George Trist writes,—"Mr. T. W. Trist was introduced as a pupil in 1865, not 1870, and was taken into partnership at Lady-day, 1874. The introduction of G. A. Trist was not opposed by the other members of the firm, as stated, but by Mr. Watney alone."

Proposed Science and Art Department, Dublin.—Mr. T. N. Deane writes to warn his fellow-citizens against any opposition to the Government scheme which might tend to wreck the scheme. He says,—"I close this letter with the hope that every facility will be given towards the formation of a great school of art, and that the handsomest offer made by any Government to Ireland may not be cast aside from technical objections."

Arbitration Case.—In the arbitration case between the Lancashire and Yorkshire Railway Company and the trustees in the estate of Joseph Crabtree, deceased, the arbitrator, Mr. Richard Southwaite, has awarded 2,225*l.* for the land, beerhouse, four cottages, and warp-dressing room in Chandos-street, Wakefield-road, Bradford, required by the Railway Company for extension of station premises, &c.

Exhibition of Painted China.—It is stated that Messrs. Howell & James intend to hold, during the coming season, an exhibition of painted china plaques, of strictly original design, and that Messrs. E. W. Cooke, R.A., and E. J. Poynter, A.R.A., the director of art at the South Kensington Museum, have consented to act as judges. A variety of prizes, ranging from 20*l.* down to 5*l.*, is offered as an inducement to exhibitors.

The Great Northern Railway Terminus, Dublin.—The Great Northern Railway Company of Ireland have determined to erect new offices and make other improvements at the Amiens-street terminus in Dublin. These alterations and improvements are to be carried out under the direction of Mr. John Lanyon, architect, who has been instructed to prepare plans for their execution.

Old Elms in Ringmer Churchyard.—It has at length been found necessary to top the ancient elms at Ringmer Church, Sussex, in consequence of the decay of the old trunks, which are 26 ft. in circumference and quite hollow, rendering the position of the large limbs above insecure. An entry in the parish register shows that these venerable trees were planted in 1607, and are thus 269 years old.

Discovery of a Roman Temple at Lille. In excavating for the foundations of a large building in the Place de Roubaix, remains have been recently discovered which are supposed to be those of a Roman temple to Apollo. The work has been suspended in order that the Commission of History for the department may superintend its future progress.

The late Mr. J. Gibson's Bequest.—Mr. Benjamin Gibson again writes to the papers to ask how the 40,000*l.* have been used which the late John Gibson left to the Royal Academy by his will nearly ten years ago. He would also be glad to know when the three rooms in Burlington House, for the collected models of the sculptor's works, will be open to the public.

TENDERS

For restoration, &c., of Milton Church. Messrs. Law & Sons, architects:—

Marsh	£2,040 0 0
Ashlin	1,980 0 0
Roberts	1,937 10 0
Young	1,890 0 0
Gee (accepted)	1,885 0 0

For farm buildings, at Tutnell, Bromsgrove, for Mr. John Moore. Mr. John Cotton, architect:—

Wall	£380 15 0
Fisher	317 0 0
Harris & Cook	300 0 0
Read	295 0 0
Brazier & Weaver (accepted)	260 0 0

For villa residence, in the Stanmore-road, Edgbaston, Birmingham, for Mr. Ambrose Tidmarsh. Mr. John Cotton, architect. Quantities supplied:—

Partridge	£900	0	0
Matthews & Son	849	0	0
Corbett	827	10	0
Davies, Brothers	826	10	0
Thomas & Baxter	757	0	0
Hughes	750	0	0

For detached residence, Hollington Park, St. Leonard's, for Capt. Beckett, R.N. Mr. W. L. Vernon, architect. Quantities supplied:—

Howell & Son	£2,364	0	0

For hotel, near railway station, Warrior-square, St. Leonard's-on-Sea, for Mrs. Campbell. Mr. W. L. Vernon, architect. Quantities supplied:—

Bridgeland	£2,355	0	0

For public institution and school of art, Claremont, Hastings, for Mr. T. Brassey, M.P. Mr. W. L. Vernon, architect. Quantities supplied:—

Geary	£7,261	0	0
H. & C. Hughes	6,927	17	0
Rodda	6,700	0	0
Womersley	6,660	0	0
Howell & Son	6,633	0	0
Parks	6,590	0	0
Wood (too late)	6,434	0	0
Vidler	6,076	0	0

For printing works and assembly-room, &c., Claremont, Hastings, for Mr. F. J. Parsons. Mr. W. L. Vernon, architect. Quantities supplied:—

Geary	£3,140	0	0
Rodda	2,920	0	0
Womersley	2,900	0	0
Howell & Son	2,886	0	0
Parks	2,848	0	0
H. & C. Hughes	2,803	15	9
Wood (too late)	2,713	0	0
Vidler*	2,598	0	0

* Less 90*l.* for old materials.

Accepted for the erection of Batley Carr Board Schools, to accommodate 700 children, for the Batley School Board. Messrs. Sheard & Hanstock, architects:—

Brier, Sons, & Wilson (masons)	£1,790	0	0
Garthwaite & Blackburn (joiners)	1,716	16	0
Brooke & Co. (plumbers)	393	0	0
Rawsthorne (slater)	510	0	0
Morton (plasterer)	370	0	0
Bagshaw & Sons (ironfounders)	218	0	0
Kershaw (painter)	88	10	0

For the erection of a new brewery, chimney-shaft, malting, offices, and residence for the Trent Valley Brewery Company, Lichfield. Mr. G. Scamell, architect. Quantities supplied by Messrs. Curtis & Son:—

Lovatt	£32,850	0	0
Cubitt	30,500	0	0
Garlick	30,200	0	0
Horsman	28,500	0	0
Dakin*	24,246	0	0

* Accepted, subject to reduction.

For new School Board schools, for 253 children, at the Lickey-end, Bromsgrove. Mr. John Cotton, architect. Quantities supplied:—

Collins & Cullis	£2,798	0	0
Nelson	2,679	0	0
Tilt & Fisher	2,685	0	0
Brazier & Weaver	2,659	0	0
Smallwood	2,565	0	0
Read	2,493	0	0
After revision:—			
Read	2,843	0	0
Smallwood	2,565	0	0
Brazier & Weaver (accepted)	2,500	0	0

For ventilation of sewers, Leamington.* Mr. R. Dawson, borough surveyor:—

Clarke & Co.	£1,030	0	0
Mills	923	0	0
Meddows, Brothers (accepted)	847	15	0

For alterations and additions to 26, Crutched-friars, for Mr. H. Nissen. Messrs. Ellis & Poole, architects:—

Merritt & Ashby	£2,075	0	0
Sparks	1,995	0	0
Perkins & Co.	1,799	0	0
Little	1,798	0	0
Kirk	1,777	0	0

For alterations and additions to No. 111, Adelaide-road, N.W.:

Gould & Brand (accepted)	£320	0	0

For the erection of a shop and warehouse, Worship-street:

Crabb (accepted)	£2,200	0	0

For new warehouse, in Market-street, Bermondsey, for the directors of the Leather Warehouse Company. Messrs. George Elkington & Son, architects. Quantities supplied by the architects:—

Colls & Sons	£17,277	0	0
Brass	15,293	0	0
Newman & Mann	15,216	0	0
Rider	14,693	0	0
Kilby	14,600	0	0
Coleman	14,389	0	0

For new warehouse, in New-street, Cloth-fair, for Messrs. Tubbs & Lewis. Mr. John Collier, architect. Quantities supplied by Mr. W. H. Barber:—

Lawrence	£1,637	0	0
Hart	1,567	0	0
Scrivener & White	1,545	0	0
Stephenson	1,540	0	0
Newman & Mann	1,536	0	0
Mark	1,497	0	0
Aitchison & Walker	1,390	0	0
Coleman	1,370	0	0

For business premises, at Wood-green, for Messrs. Bell, Allen, & Bradbook. Mr. F. T. Mercer, architect. Quantities supplied:—

Holding & Son	£3,735	0	0
Allen	3,690	8	6
Seed	3,241	10	0
Moore (accepted)	3,236	0	0

For rebuilding Nos. 59, 60, and 61, Haymarket. Mr. John Wimble, architect. Quantities supplied by Mr. William Wimble:—

Hill, Higgs, & Hill	£11,714	0	0
Lawrence	11,346	0	0
M'Lachlan	11,345	0	0
Fish	11,250	0	0
Dove, Brothers	11,235	0	0
Scrivener & White	10,993	0	0
Ashby & Horner	10,620	0	0
Killby	10,481	0	0
Newman & Mann (accepted)	10,328	0	0
Coleman	10,059	0	0

TO CORRESPONDENTS.

Erratum. The reredos in Lady Chapel, Winchester Cathedral (p. 349, *ante*), was designed by Mr. Clarke; Mr. Hitch only executed the work.

W. E. R.—T. D.—A. M.—E.—S. & H.—E. P.—C. F.—J.—E. A.—C. M. D.—H. F. S.—R. & Son.—G. E.—H. J. P.—N. H.—A. & H.—J. L.—T. W. & Co.—Mr. S.—G.—C. G.—J. D. & Son.—M. Brothers.—P. & Co.—R. Y.

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The Builder.

VOL. XXXIV. No. 1734. SATURDAY, APRIL 29, 1876.

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The Royal Academy.



OUR remarks in detail this week must be directed to the drawings in the architectural room; but a general glance round the pictures first enables us here just to note that Mr. Leighton exhibits a remarkable illustration of a Greek religious festival, in a painting on a much larger scale than those he has recently been accustomed to send to Burlington House; that Mr. Millais has painted what will probably take rank as the finest landscape he has yet produced, in favour of which his efforts in portraiture seem to have been relegated to the second place on this occasion; that Mr. Alma Tadema has almost surpassed himself in works which must receive due notice hereafter; that Mr. Leslie has a very pleasing picture with some novelty of humour and subject about it; that Mr. Brett and Mr. H. Moore develop each his peculiar genius in paintings on a large scale, and equal to most, if not all, of their previous productions; that the four new associates, Messrs. Long, Eyre Crowe, Storey, and Oakes, fully justify their election, the two first-named gentlemen in an eminent degree; that both Mr. Poynter and Mr. Armitage contribute large and highly-finished life-size subjects from classic legend, the "Atalanta" of the former being one of the most important works he has exhibited for some little time; and that other well-known names are adequately represented. If it be thought that some one or two of these have done less than was expected of them, on the other hand there will be found to be, we think, a compensating balance in the fact that some who have not hitherto attained so much eminence have surpassed any of their previous achievements. These, however, are matters for further discrimination; but we may say that the 1876 exhibition is a good one. The sculpture-room causes some melancholy reflections, certainly; but even here we are cheered by the sight of Stevens's group of "Valour and Cowardice" for the Wellington monument, a production which takes us back to the great age of Italian art, and certainly reduces to comparative commonplace all its surroundings: sad that we should have to speak of its gifted author in the past tense.

The architectural drawings fill the same space as usual, and strike us as being on the average of considerable, perhaps more than usual, interest. The central place is occupied by two drawings, illustrating revived cathedral architecture, in execution and in proposition respectively. The first, Mr. Street's "Nave of Bristol Cathedral" (1,055), will probably rank as one of the most successful of his works in ecclesiastical architecture. Without lacking specialty of treatment, it is in keeping with the style and feeling of the older portion of the structure, the peculiarities of which, in regard to internal design and construction, have been carried out in the new portion with consistency in general design and with sufficient variation of detail to give a separate interest to it. This is not, perhaps, fully apparent in the drawings here, which are rather small (they consist of ground plan, elevation, and section), but will be admitted by those who have examined the work itself; and the west elevation sufficiently justifies itself on the drawing. Next to this hangs the Cathedral in proposition, the west front of Mr. Carpenter's design for a proposed cathedral for Manchester, an interior perspective view of which we published not long since. The front is a rich and graceful, though we should hardly call it a powerful, composition, of rather Late Gothic design, flanked by two towers, and with three large western entrances, with gable-heads over, and the tympanums filled with sculpture; a range of windows over these, continued across the whole front, and repeated in the towers, is of value in binding together and giving breadth to the whole composition. Whether such a building, so completely a reproduction of Mediæval architecture, and of a specially Mediæval class of edifice, is worth carrying out at an immense expense in the present day,—whether, if carried out, it would not be found, too late, to be a mistake in more ways than one,—we cannot just now attempt to discuss here.

If we look round the remainder of the specimens of ecclesiastical architecture in the room, we find the merits of drawing and design pretty much as usual. Nothing at present seems, on the whole, to be taking the place of revived Gothic for church architecture; the methods of using it, or the particular style in vogue, change a little, but for the present Transitional French Gothic seems to keep its place in the estimation of the leading practitioners of church architecture. Mr. Tasker's interior of a Roman Catholic church at Barking-road, in course of erection (988) is noteworthy as an admirable piece of perspective drawing in the curves of the vaulting ribs; the architecture is of a simple and severe transitional type, and the walls are decorated with figure subjects which in the drawing are delineated in red ink, the rest being in black, with a rather odd effect. Mr. Brooks's "Side Chapel of St. Chad's Church, Haggerstone" (984), is another capital pen-and-ink drawing of a very solid massive little bit of internal architecture, presenting, however, no features that we are not perfectly familiar with. There is more specialty of design in the same architect's exterior view of the "Church of the Ascension, Wandsworth" (1088); the upper portion of the tower, with its round angle-turrets and the slated spire rising from it, is very fine, but the lower portion of the tower seems to us most unhappy, the small thin buttresses, with gableted heads, looking almost like rain-spouts. The body of the church is treated in an ultra-severe style, with plain circular-headed windows, but is not unpleasing; a little wall diaper in the gable and in a band lower down serves to carry off the plainness of the whole; but, with all our respect for massiveness and solidity rather than florid ornamentation, we cannot but think that the author of these works, and one or two others of his brethren in the building art, have fully illustrated the possibility of carrying these qualities to an extreme, to the exclusion of every other source of effect. Mr. Truefitt's "Tower and Spire in course of Erection at St. George's, Tufnell Park" (998), is a drawing that every one is likely to look twice at, for the strong originality of design and manner it displays. We do not understand why the tower portion is shaded dark and the spire left light, a treatment which conveys the idea of the former being old and the latter a new addition to it, which, we presume, is not the case. There is a remarkable look of power about the whole thing; but we do not think the architect's treatment of the base of the spire, with its large, heavy lucarne gables and pinnacles, is very fortunate. The interior view of "The Church of St. Peter-upon-Cornhill, as refitted from the Designs of Mr. J. D. Wyatt" (998), shows a satisfactory effect as far as the design of the woodwork goes, but certainly does not commend itself to us in the matter of colour: the effect is heavy and dingy. The interior of Mr. Pearson's "Wentworth Church, Yorkshire" (1,007), is a capital water-colour drawing of a design which it is scarcely possible to distinguish from genuine Late Gothic, and that is almost all one can say about it, except that one little detail, in the midst of all this pure Gothic work, grates on the eye; the quatrefoil band, namely, under the clearstory windows, which is represented as if formed with a flat fillet and a square sinking, instead of a moulding or chamfer; it may be only a defect in the drawing, but it catches the attention at once. Next to this we come to the gorgeously gilded and decorated Byzantine-like interior of the "Chapel of the Hospital for Sick Children, Great Ormond-street" (1,008), drawn and coloured by Mr. Haig for its architect, Mr. E. M. Barry. As a piece of rich decorative effect this is very successful, if a little over-pronounced; but as the chapel for a children's hospital, we must frankly own that it jars on our feelings. We should think nothing could be more fitting than to make the chapel of these poor little invalids as attractive, as beautiful in their eyes, as possible; but then we would prefer to see at the same time an air of more simplicity and homeliness about it, as in keeping with the associations of the children of the poor. The next church interior we come to, rather oddly labelled "from a suggestion and design by Messrs. Scott & Hyde, for the completion of St. Bartholomew's Church at Brighton" (1,011), though at first glance a somewhat heavy brick interior, has interest and merit from its unity of idea and the thorough "keeping" in the whole treatment,

even to the long gilt chandelier stalks depending from triangular brackets fixed high up on the walls. There is almost always a certain satisfaction to be got out of a design where a definite aim seems to be kept in view, even though it be plain and unpretending in character. The distinction between such a design and a mere "regulation" building may be noted in comparing this with the design for an Independent Chapel (1,023). Mr. Deshon's "Interior of the New Church at East Teignmouth" (1,024) is in a good solid style, with a sufficiently massive open-timber roof, with turned wooden tie-beams, which, if a tie is used at all, we like much better than iron tie-rods, which look as if they wished to elude our notice, and cannot. Mr. Sedding's "St. Clement's Church, near Bournemouth" (1,028), consists mainly, in this drawing at least, in a finely-treated tower, with plain lower stages and an ornate upper stage, pierced with windows; it partakes of Late Decorated style; perhaps the effect is scarcely improved by the short stumpy spire or conical roof rising from within the parapet.

In a design for a "Church at Milton, Worcestershire" (1,049), Sir G. G. Scott shows considerable novelty in the method of changing from the square tower to an octagon spire; the treatment of this portion of the design is one of the most graceful things to be seen in the architecture room, but can hardly be very well realised from description unaccompanied by a drawing. The interior view of the same church (1,060) does not take us so much; it has no originality, and we have little fancy for wooden groins and vaults, which involve a very unarchitectural use of material to produce but a poor effect after all. Mr. J. O. Scott's design for a Byzantine church (1,061) "to be erected at Notting-hill for the Greek community," is (which with such conservative clients it must needs have been) merely a reproduction of a well-known form of church, in a style which lends itself far more to internal than to external effect. Of Mr. Champion's restoration of St. Peter-in-the-East, Oxford (1,064), one can only praise the drawing, as it is impossible to learn from it precisely what has been done and left undone in the way of "restoring,"—a common difficulty in judging projects of this class, which we are disposed to say ought, when practicable, to be accompanied by a drawing showing the work in its unrestored state, to be of any real use. The same difficulty applies to the two village churches (1,074) "about to be restored" by the same architect, where we presume the drawings represent the intended restoration, but are not even told that. The left-hand drawing, "St. Peter, Repps-cum-Bastwick, Norfolk," shows a very picturesque little church, with its slated spire rising from behind the parapet of a simple octagonal tower. Messrs. J. & J. Belcher's "Catholic and Apostolic Church, Camberwell" (1,069), may claim the merit of solidity of style, though not very attractive; and there is a new kind of effect in the roofing in the interior of the Parish Church of Slough, by Mr. J. O. Scott, where the lower part of the roof has a wooden ceiling in two cants, while the upper part is open above the collar-beam level; the result does not seem very satisfactory, and the eye is piqued, as it were, at not being able to follow the half invisible construction of the roof behind the ceiled portion. It may do as an experiment once in a way.

In going over the earlier numbers of the churches, we were nearly overlooking an important design for the "Church of the English Martyrs" (991), now erecting on Tower-hill, from designs by Messrs. C. Welby & P. Pugin: this is exhibited in a drawing which is at once plan, section, and view, in a manner not common with English draughtsmen, though familiar enough in the illustrated publications of Viollet-le-Duc and other French architects: it affords a good deal of information about the constructive design of a building in a small space, but is scarcely the best method of showing the effect of the completed edifice. The church is in a style of Gothic little practised now, and having more affinity with the Mediæval cathedral style than the modern parish church style, as might be expected perhaps from the traditions connected with the names of its architects. The finest point in it seems to be, as far as we can judge from this drawing, the treatment of the large and richly traceried west window, with the St. Andrew cross worked into the design of the window-head.

We must defer our remarks in regard to the rest of the architectural drawings.

THE NEW CHURCH OF ST. NICHOLAS, GUILDFORD.

THE Church of St. Nicholas, Guildford, which was consecrated, on the 20th current, by the Bishop of Winchester, is a building that possesses unusual claims on the interest of the inhabitants of the vicinity, as well as on all students and lovers of architecture. The noble new structure covers the site of what was the new Church of St. Nicholas in 1836, together with a portion of the then surrounding burial-ground. The interest of the spot is enhanced, and the ability of the architect was exercised to the full, by the fact that the ancient mortuary chapel of the More family was attached to the south aisle of the edifice, and not only had to be preserved intact, but to be introduced, in some manner, into the architectural arrangements of the new and enlarged building. The best guide, with which we are acquainted, that the architect could have taken under the circumstances, is the private entrance for the Abbot of Westminster into the abbey, which, our readers will remember, forms a distinct and separate portion of the south transept. That feature of the abbey is divided by a wall running north and south. To the east of this wall the transept is open to the church, and forms that solemn sanctuary of art known as Poets' Corner, where the sculpture of the last century has attained its apogee in the Argyle monument, and where are inscribed the names of men whose memories will be famous so long as English remains a spoken language. To the west of this wall lies the abbot's passage, which is closed by a doorway leading into the south aisle of the abbey, so that the processions from chapter-house and cloisters might arrive at the very choir of the minster without passing through a crowded nave. Of course, we only compare small things with great, in referring in this way to the peculiar features of our great national minster as a guide to the arrangement of a parish church and a private mortuary chapel. But the architectural interest of the problem to be solved is so great, that it is well to bring under the attention of the student the best instance of the solution of a somewhat similar question, in those days when architecture was at once sumptuous, vital, and devout.

The original Church of St. Nicholas was of very ancient date. Tradition connects it with Saxon times. We regret to be unable to speak, either from personal knowledge or from authentic record, of the reasons for this attribution. But that the Parish Church of St. Mary, in the same bright and thriving county town, includes some of the very earliest work now extant in England there can be no doubt. Guildford is mentioned in the will of King Alfred; and, in spite of the arguments, which have been based on a very hasty philological theory, against the existence of any Saxon ecclesiastical work in England, we hope to show that the tower of St. Mary's, even if it cannot certainly be carried back to the date of Alfred himself, must be considerably earlier than the reign of the Confessor. In 1796 the church of St. Nicholas was thoroughly repaired. Before that date it had been so subject to flooding from the neighbouring stream of the Wey, that it was at times unserviceable for weeks together. In 1836, a new church, the third so far as we know, was erected on the same site, in what has been irreverently called the Churchwarden Gothic style of that time. A heavy gallery, containing the organ, darkened and oppressed this church. Damp from the foundation ascended to the roof, and the timbers were in such a state that, though they had been patched and strengthened, catastrophe was imminent. The materials of this church were chalk, stone, and flints, with the adornment, as it was then unfortunately considered, of a coating of stucco. A portion of the tower of the church repaired in 1796, was left standing in 1836, the rest of the old building being destroyed. In the course of the destruction it was discovered that a stone column, of thirteenth-century work, had been built into the wall at a subsequent date, probably during the fifteenth century; so that relics of three previous churches, and traditions of yet older buildings, are associated with the noble new church. The capital of this old column was at a level of only some 4 ft. above the floor of the new church.

The founder of the new church of St. Nicholas was the late lamented rector, the Rev. J. S. B. Monsell, LL.D., who, shortly after his appointment to the living, in 1870, commenced raising the funds for a more commodious place of worship than the church of 1836 proved to be. St. Nicholas is the third new church with which the indefatigable zeal of Dr. Monsell has enriched our ecclesiastical architecture. Besides being the mover and designer of the new edifice, Dr. Monsell and his family have been munificent contributors to the building fund. The stained glass in the eastern windows was prepared under Dr. Monsell's express instructions, and at his cost. The subjects are the Annunciation, the Salutation, the Nativity, the Baptism, the Marriage at Cana, the Agony in the Garden, the Bearing of the Cross, the Crucifixion, the Entombment, the Resurrection, the Angel at the Sepulchre, the *Noli me tangere*, the Ascension, the Descent of the Holy Ghost, and the Stoning of Stephen. A brass lectern (which is prevented from standing in its appropriate place by the unfortunate introduction of a dwarf wall, separating the chancel from the nave, which is one of the very few serious blunders in the church) is also the gift of the Monsell family. It was executed by Messrs. Hart & Son, of massive brass, with emblems of St. Nicholas and St. Catherine,—a ruined chapel under decoration to the latter saint being one of the picturesque features of the immediate vicinity. Windows and lectern are said to have cost 1,000*l*. The pulpit has been executed by Mr. Earp, of alabaster and marble, with *relievi* on three sides, representing the teaching of Moses, of John the Baptist, and of Our Lord: it is a rich and elegant work—resembling the pulpit of Carlisle Cathedral, and was presented to the church as a memorial of the late Dr. Hatchard, the predecessor of Dr. Mousell in the living, by Mrs. Hatchard and some friends. The font corresponds in style and material with the pulpit, and is from the graceful chisel of the same artist. It is composed of a massive block of alabaster supported by five marble columns, and panelled with alto-relievi, representing subjects from Scripture.

The More Chapel, or Loseley Chapel, to which we before alluded, contains the monuments of many members of the ancient family of More, to whom the estate and fine Elizabethan hall of Loseley, adjoining to the parish of St. Nicholas, originally belonged. Sir Thomas More, the famous Chancellor, was a member of this house. The property fell by marriage to the family of Molyneux, the present owners, who take the prefix of the name of More. The chapel is divided from the church by a dwarf wall, surmounted by an arcade with twin marble shafts. It might have been preferable to see these shafts brought down to the floor of the church, and protected by a brass or iron *grille*. But private tastes have to be consulted in these matters. As it is, the glimpse at the interior of the chapel, with its ancient arms and effigies, adds very much to the pictorial effect of the interior of the church. As the screen or north wall of the chapel approaches the line of the nave, the south aisle has been treated in a very unusual manner, in order to correspond with the requirements of the plan. Instead of being provided, like the north aisle, with a lean-to roof, it is divided into arches, or coved portions, running at right angles to the nave, and springing from the columns which bear the clearstory, and the roof of the nave. The effect, pictorially considered, is as happy as it is novel; but great fears were entertained that the acoustic qualities of the building would be injured by the arrangement. It is satisfactory to be able to say that these fears have proved to be unfounded. A soft sweet organ by Willis,—the erection of which, including the unloading of the vans which brought it from London, was a great *tour de force*, having been entirely completed during the three days preceding the consecration,—fills the whole edifice with its mellow notes, and every syllable of the service can be distinctly heard in every corner of the church.

The new church of St. Nicholas has been completed, so far as it is yet completed, by other hands than those which laid the foundations. Literally speaking, indeed, the same dignified prelate who presided at the laying of the foundation-stone rather more than twelve months ago officiated at the consecration on the 20th. But not only the Rector of the parish and founder of the church, but the squire of the parish, Mr. James More-Molyneux, of Loseley Park, and the architect who designed the new church, Mr. S. S. Teulon, have been succeeded by other men since the new structure was first designed. It was the original wish of Dr. Monsell, indeed, to build an entirely new church, on a site which he offered to present to the parish for that purpose. But the feeling of the greater part of the parishioners,

including the Molyneux family, was so strongly in favour of retaining the ancient site, that Dr. Monsell readily yielded to the wish. Architecturally speaking, we think this retention of site is matter for satisfaction. The design of Mr. Teulon was made for the independent site. It has consequently required modifications, and has been carried out by Mr. Christian, the executor of the deceased architect, in a manner that reflects great credit on that gentleman. The builders are Messrs. Goddard & Sons, of Farnham. It has not been possible to speak with any certitude as to the success attained by Mr. Christian until the church had been subjected to the ordeal of the performance of divine service. Up to the very last, great doubts were entertained as to the acoustic properties of the building, and echoes were detected until the place was fairly filled. The church appears to be singularly sensitive to musical pitch, and a deep voice, however soft, is much more distinctly audible than one pitched on a higher key. But at a moderately slow speed of speaking audition is perfect; and it may be considered as an incidental property of great value in a building if it tends to enforce on the clergy a slow, distinct, and reverent mode of utterance, by instantly avenging itself, by a reproving resonance, on any approach to nasal twang.

The total length of nave, chancel (which is under a central tower, as yet incomplete), and apse is 118 ft.; the width of the nave and aisles, 61 ft. The lofty nave, ceiled with polished fir, and leading to the stone groins of the chancel and apse, is singularly fine, and the Bishop of Winchester, as well as others of the very eminent clergymen who have taken part in the services of the week, seemed irresistibly impelled to allude in their sermons to the great beauty of the interior. There are a few defects, which it is possible, and would be well, to remedy. The chancel wall is entirely inconsistent either with the true principles of architectural design, or with the symbolism of the Anglican Church, as understood by all those of its members who do not repudiate the name of Protestant. The absence of a west door, and the very imperfect means of egress afforded by the two doors at the west end of the north and south walls, remarkably resemble the very arrangement which was condemned in the pages of the *Builder* a few weeks since (vide *Builder*, April 8th, 1876). The vestibule is extremely inconvenient, owing to the intermixture of the two streams of traffic from the north aisle and from the nave. It is also descended into by a step,—a very objectionable arrangement, and descended from, or ascended to, by an external flight of steps, so ill-constructed that it is to be hoped that they are merely temporary. With these remarks, which are due to the students of ecclesiastical architecture, we are glad to exhaust our criticism of a very beautiful and commodious church. It is built externally of Bargate stone, with Bath stone dressings and slated roofs. The interior is lined with pale-coloured bricks, the dressings being of Bath stone, the columns supporting the main arcades being of grey Robin Hood stone, and the columns of the chancel arches, and More Chapel arcades, of polished serpentine or veined marble. Of the stained fir roofs of the nave and aisles, and of the groined brick roof, with stone quoins, of the chancel and apse, we have spoken. The county of Surrey has gained a noble addition to her architectural wealth in the new church of St. Nicholas, Guildford.

Reverting to the subject before referred to of the antiquity of the churches of this town, an account of the Church of St. Mary, at Guildford, by Mr. J. H. Parker, is given in the *Archæological Journal*, vol. xxix., p. 170. In this the writer, founding his opinion on the argument that the use of the word *timberen* in Anglo-Saxon implies that the Anglo-Saxon people were accustomed to build in wood only, before the time of the Conqueror, in England, brings down the date of the tower, which is the oldest portion of the church, to about 1050. There are reasons, however, of which Mr. Parker has taken no heed, for an earlier date.

However prevalent among the Saxon settlers in this country was the use, natural to a naval people, of wood for building purposes, there is no doubt that masonry was constructed in England by the Romans. For a building of such importance as a church in a Royal Manor, as in the case of Guildford, which was bequeathed by King Alfred to his nephew Ethelwald, it is rather proper to seek for indications of its age on the spot, than to start with the assumption of late date.

A very remarkable indication exists, which, although it is referred to in the article in question, is far from being brought fully into daylight.

The central tower, admittedly of very early date, is built of chalk and flint. Its walls are of considerable thickness, with flat pilaster strips on the outside.

The north and south walls of this tower, at a period subsequent to their erection, have been pierced by semicircular-headed openings, with imposts and rude arch stones, which Mr. Parker says are evidently of the time of Henry I., or about the year 1100. This perforation no doubt was coincident with the building of a chancel to the east, and of a north and south transept, to which these arches gave access. In executing this work two windows were interfered with, and the lower part of them, apparently, filled up. They are of a rude loop-hole form, and splayed both within and without. That a church should have been so profoundly modified, within fifty years of its erection, is extremely improbable. Even if we date the round-headed arches so late as 1100, we have the indication of a far more remote antiquity for the walls containing the splayed windows.

Further enlargement was effected in the reign of Henry II. To this date are attributed the pointed arches of the nave, which spring from a square abacus, forming part of a scalloped capital, on a round column. Apses, or rather chapels, were at the same time added to the north and south aisles; and the round-headed windows in the chancel, which correspond with the arches in the tower wall, were then filled up, to allow of the extension of the chancel. We must not be seduced by the interest of the subject into a description of this fine old church, which is a sort of summary or abstract of the work of the great church-building epochs in this country, as an account will be found in the volume we have already quoted. But we think it would be a pity that any theory, which is not founded on distinct architectural facts, should be allowed to obscure the evidence that so ancient a Christian building bears, ineffaceably imprinted on its walls, of its hoary antiquity.

St. Mary's Church has suffered from a cruel piece of barbarism. On either side of the chancel, or original lady-chapel, is a side chapel, and the east ends of the three were originally curved. The lady-chapel, however, has been shortened, in order to allow of the widening of Quarry-street, the road running by the church, and a new window,—constructed, however, on a consistent design,—has been supplied to this truncated apse, thus at once shortening and flattening the central part of the choir. It is true that the street was very narrow, and that property of value must have been destroyed in order to widen it on the east side. But this can afford no adequate excuse for the mutilation of a beautiful and ancient piece of architecture.

Reverting to the Church of St. Nicholas, there is another point on which considerable criticism has been offered, and on which there is good reason to believe that the architect will prove to be fully justified in having the courage of his own opinion. This is the choice of bricks for the lining of the church. There is no doubt that during the progress of the building, and even to some extent to the present moment, the brickwork assumed a greenish and sickly hue, that bid fair to ruin the effect which the form of the interior was calculated to produce. The building was long unroofed, and exposed to a rainfall of unusual depth. The walls must have become saturated with water, and the ordinary efflorescence of salts that deforms all new brickwork for a time was thus no doubt augmented. In some places both the walls and the brick vaulting are still dark with damp. But a portion of the work, which has been protected from the heavy rain, and has had a fair chance of becoming properly dry, that is to say, the south-east pier of the central tower, has assumed a pale creamy tint that is agreeable to the eye, and that perfectly harmonises with the Bath dressing. There is thus good reason to suppose that the brick work, being now thoroughly protected from the rain, and dried, not only by the heating-apparatus and by the heat radiating from the gas-lamps, but still more effectively by the repeated presence of large congregations, will rapidly and thoroughly dry, and that the tint of the church will be such as fully to justify the choice of material.

A large and respectable body of worshippers crowded the new church on its opening. Sixty clergymen, including two bishops, in full canonicals, and a surpliced choir of nearly forty voices, were present, as well as the mayor and corporation of Guildford in their civic robes. The scene was almost more such as might have been expected in one of the ancient cities of the Low Countries,—Ghent or Liége,—than in an English county town. Much of the building in the neighbourhood is of the seventeenth, and even of the sixteenth century; and very few parts of England can so richly furnish materials for the sketching portfolio of an architectural student. Fortunately, many of the finest examples of Jacobean or Tudor architecture bear their dates legibly inscribed. On the road from Epsom to Guildford, at the village of Merrow, about two miles from the latter town, is a very fine gabled house, dated 1615, which was probably either the hall or the rectory of the parish, but which is now occupied as an inn. In another direction, between Shalford and Albury, is a perfect gem, a timbered house of 1583, with date repeated over and over again on the timbers. It is an ancient manor-house, originally a hunting-box of King John, and rebuilt in the year we have cited. It formerly surrounded a quadrangle, but all but one wing was pulled down about a century back. The doorway is of oak, very low in the arch, and the interior, as far as the visitor can see, is entirely panelled in old carved oak, the presses and corner-cupboards being to match. It is said that much of the more ancient woodwork was utilised by the builders of the sixteenth century. The black curved beams, contrasting with the whitewashed walls, the heavily-mullioned windows, and the stories projecting each over the one below, make this ancient manor-house a rare study for the artist and the draughtsman. It was surrounded by a moat, of which more than a trace remains. The kitchen garden-wall, looking on the moat, is pierced for purposes of military defence. Another wall of this garden is composed of squared blocks of stone, unlike any used elsewhere in the building, evidently very old,—and a relic, there is very little doubt, of the ancient seat of the brother of Richard Cœur de Lion.

SOCIETY OF PAINTERS IN WATER-COLOURS.

Many large and elaborate drawings are, as usual, hung round the walls of the Society's rooms in Pall-mall East, yet to the judicious observer we venture to think that the cream of the eighty-sixth exhibition will be found among the smaller works on screens 3 and 4. For here, among others, are placed the only two important drawings bearing the name of Alfred W. Hunt,—"Llyn Coryn," and "Clouds, with a South-west Wind over Carnedd Dafydd" (269, 277),—drawings in which, as in others by the same hand, the mere manipulation of brush and colour seems forgotten in the mist and breeze and movement and magical light of Nature. Look at the stream in the second-named drawing, and the distant hills showing in such aërial softness against the evening sky. Here are the two finest, because the freest and most boldly-handled, drawings of Mr. Naftel (251, 259). Here Mrs. Allingham appeals to us in a drawing as full of true pathos as of excellent, though unlaboured, workmanship, showing a poor old rustic, "Past Work" (250), seated under a tree on a tombstone, with the touching motto from Carlyle,—"For us was thy back so bent." Here Mr. Boyce is at his best in portraying an "Old Farmhouse at Hambledon, Surrey" (262), and the garden full of divers vegetations deftly handled, and spring trees in half foliage, which stands out so glitteringly against the background of thick hedge, and a distant faintly-clouded sky behind. Here Mr. Dodgson shows two of his best pieces of work (248, 263); the second number especially, "A Summer Morning, Coast of Gower," one of the best and most solid and powerful little things in the room; and in a contrary style Mr. J. W. North here distinguishes himself by a brilliant little drawing of a "Maison de Campagne, Algiers" (247), a square white house flaring in the sun amid a patch of brilliant and heated foliage. Here Mr. Walter Duncan, one of our younger water-colour artists who happily shows a feeling for something beyond mere commonplace in figure subjects, gives us something like real feeling and passion in the female figure playing the harp in his small drawing of "The Duet" (254), together with fine and broad handling and forcible colour in the costume; not to mention his other still smaller drawing of

"The Lily" (255), gathered by a girl who lies full length on the grass, foreshortened, to reach it, while her younger companion waits for the prize. Here, also, Mr. Prescot Hewett, honorary member, in a small drawing "not for sale" (281), reminds us of the essential qualities of water-colour, and of Cotman's way of displaying them Have we said enough? These two screens are worth a look, at all events.

Going round the room generally, we should hardly call this one of the strongest exhibitions we have seen here; but there are interesting points in it. An old member, Mr. Hale, has come out in a new manner, which, though in a double sense a "manner," is a very good one, and illustrated in two or three very fine harmonious compositions from old Bristol, with its heaps of houses of various shapes and hues rising above the stream laden with coasting craft. The particular style of execution employed is one which results in a very granulated-looking texture, rich withal in surface and tone, and an entire loss of outline or line of any kind; the best specimen is perhaps "The Queen of the West" (174), with the new St. Mary Redcliff spire rising over the group of old houses. Then it is gratifying to find that a really clever artist like Mr. Clarence Whaite is not after all going to sink into a mannerist. His "October on the Welsh Hills" (63) still retains the combination of tones to which he seemed to have limited himself; but in his fine drawing of the "Finding of Taliesin" (170) he has broken these fetters, and again in the evening scene entitled "Going Home" (167), and in "Midsummer" (197), a very fine study of heavy massed foliage under a bright sun, only marred by the rather commonplace figures of the ladies under the awning, and their companion who is inconsiderate enough to plunge up to the neck in the water, clothes and all, apparently. Mr. E. Radford, another recent member, on the other hand, seems to us to show no advance beyond the mere power of manipulation which he displayed at first; the interest of his drawings is only very second rate. Mrs. Allingham holds her own wonderfully well, as in her portrait of her husband (44), an excellent likeness and a really artistic work, and her very interesting-looking though plain young lady in white enjoying "Spring Days" (238) under the trees. Some of Mr. C. Davidson's drawings are beautiful; especially "At Reigate, Autumn" (32), and "Gatton Park, early Spring" (57), the latter glinting with spring light and freshness. Mr. A. P. Newton is largely represented; but he seems to have lost a little of his old poetry in rendering the mass and distance of mountain scenery; "Solitude" (93), however, is fine, and in "Lost in the Wood" (69) he is somewhat out of his usual beat,' and gives us a very fine and brilliant effect of sunlight through masses of foliage and on great moss-covered trunks. Sir John Gilbert's "Joan of Arc" (68) is simply a brilliantly and freely painted head, of little character, but contrasting favourably, on the whole, with Mr. Carl Haag's "Head of a Nubian Warrior" (62), a very highly-finished thing, redolent of mere labour and cleverness of manipulation. Mr. Boyce gives a charming study of a barren sandhill "Near Tenby" (86), which smells of the sea breeze; but he has out-Boyced himself for once in his drawing of the "Ancient House at Stokesay" (96), where aërial tint and perspective are lost in the attempt to make out detail too much and too equally all over the picture. Have what tones you will, the church tower must stand out more clearly and decisively from the bank some little distance behind it than is the case here. Miss Montalba's drawings are, we fear, manner, manner,—very original and taking at first, but looking much less original now that we seem to know the trick of it. Mr. Alfred D. Fripp is at his very best in "Dinner-time at the Purbeck Quarries" (128): to be sure we have seen all the figures many a time; they are quite old friends; but they are such very good friends, and the whole scene is so atmospheric and sun-lit. Then, for sea scenes, Mr. H. Moore has a fine seething sea, No. 102, where a distant vessel is "fast on a reef"; and he has come to find a different colour in sea-water from that tone which we had begun to associate necessarily with his pictures. Mr. Powell is disappointing; it looks as if he had done the best he could, and is going no further; the "Liverpool Trader" (172) looks almost like a portrait of a ship done to order for her owners, with as much sea as the painter could put in for the money. Mr. Albert Goodwin's versatility, on the other hand, is more marked than ever. Look at the "Street of the Coppersmiths, Cairo" (144), a capital brilliant study of detail (metal work, &c.) in strong light; then at the fine drawing where a river is flowing "through the city, seaward" (187), past a delightful old picturesque brick and stone wall, half overhung with trees; and then at "The Siren Sea" (179), a shallow cove where the rocks are reflected in the calm, treacherous water through which the gleam of the seaweed is seen, a piece of a wrecked ship's framework in the foreground, and in the background the small glistening figure of the siren, seated on a pebble beach whose grey and green tones are given with exquisite truth and refinement. This latter is one of the most remarkable things, in feeling and execution, in the room; and no uninitiated visitor would think of attributing all three, or any two of them, to the same artist. Such a total freedom from manner is in itself remarkable, at a time when nearly every artist, in water-colour especially, has his own peculiar trick by which he is at once recognised.

We have indicated pretty well what there is of interest in the Exhibition. Of figure subjects there is not much to speak of beyond what we have mentioned, except Mr. Marks's "Student and Sportsman" (98), where one monk looks up from his books to see a fine salmon held up by a robust brother, *not*, evidently, "a fisher of men." The work is in the artist's best and most delicate vein of humour.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the meeting on the 19th of April, Mr. S. Cuming, F.S.A. Scot., V.P., in the chair, Dr. Kendrick sent for examination Roman fictile objects discovered at Long Bank, near Winderspool, the site of the ancient Condate. Some were very similar to Arezzo ware, one having a large figure of Hercules, and there being others with the head of Minerva, &c., and a fragment of rough cast ware, made probably in the locality, but similar to that made at Caister. Mrs. Bailey sent an ancient knife, the handle being of iron, inlaid with copper and silver, and having a carved ivory blade. It was found on Tower-hill, and is remarkable for having the rose and marguerites,—the cognisance of Margaret of Anjou, and is of the date when she was a prisoner at the tower. In continuation of an interesting exhibition of arms of Asiatic and Savage tribes, resembling those of early date in Europe, Mr. Cecil Brent, F.S.A., produced a fine stirrup-hilted dagger, and Mr. Adams, F.S.A., another of later date, both being very similar to the Mediæval anelaces. Mr. Brent also exhibited a beautiful Arabic creee, having an inscription invoking the protection of Allah in battle, and a Dyak sword, almost identical with those of Roman date. Mr. Loftus Brock, F.S.A., exhibited an ancient hour-glass stand and a silver spur from Cannon-street.

Mr. De Gray Birch, F.R.S.L., described an impression of an ancient seal of the city of London, having a gigantic figure of St. Paul standing over the City and holding a flag containing its arms. Mr. Adams exhibited a small portrait of Herr Meister Jacob Breissart, of Bruges, dated 1553. The chairman read a paper on "Wig Curlers," and made allusion to the discovery of upwards of 2,000 of these singular little articles in repairing St. Bartholomew's, Smithfield, in 1857.

KEBLE COLLEGE CHAPEL, OXFORD.

The chapel for Keble College, built at the cost of the late Mr. W. Gibbs, of Tyntesfield (some say 50,000*l*), from the designs of Mr. Butterfield, was opened, though not consecrated, on Tuesday last. The chapel, the foundation-stone of which was laid by its donor in 1873, stands at the north-east corner of the principal quadrangle of the college, with its north side abutting on Keble-terrace. Its internal dimensions are 124 ft. long by 35 ft. broad, with an organ-transept 23 ft. by 14 ft. The height externally from the ground to the lead roof is 90 ft. In addition to a western entrance there is a southern one from the quadrangle, by a porch which is carried up to the height of the main building, and is surmounted by a figure of St. Michael and the Dragon. The windows are at a great height from the ground, for the sake of the interior treatment of the walls, which are divided into two stages beneath the inside window-cills, the lower one being an arcade, and the upper one a line of large panels filled with mosaic subjects. The ceiling is vaulted, and springs from large dark marble shafts, and is painted throughout, with some relief of gilding. The principal features of the decoration of the interior are painted glass in the windows and mosaics in panels on the walls. These bring out the relationship of the Old to the New Testament, and show the process of God's actual revelation of Himself in God. The histories of Noah, Abraham, Joseph, Moses, in twelve of the side panels of the western half of the chapel, with the figures of the twelve minor prophets in the four windows above, and of the four greater prophets, with David, Solomon, Samuel, and Elijah, in the west window, refer to the earlier dispensation. A series of events from the New Testament, represented in mosaic, is placed in panels in the eastern half of the chapel. The series is continued up to the present time by a mosaic panel beneath the east window, which represents our Lord as He revealed Himself after His ascension to St. John in the Isle of Patmos. Christian saints in mosaic panels on either side support the figure of our Lord. At the west end of the chapel is depicted in three mosaics the Second Coming of our Lord to judgment. The interior floors and fittings are of oak and walnut. A large organ, presented by Mr. Gibbs, fills the south transept. A brass lectern, with a figure of St. Mark, stands in the middle of the choir, and cross standards and altar candlesticks are placed in the sanctuary. The library and dining-hall adjoining are divided from one another by a staircase building, lighted by a large oriel window, by which they will both be reached. The story beneath is arranged for kitchens and other offices. The library when complete will measure 86 ft. by 35 ft., and the dining-hall 137 ft. by 35 ft. They will be built of brick and stone, and will agree in general character with the other college buildings. We may find another opportunity to speak of the building critically.

LONDON INTERNATIONAL (?) EXHIBITION.

Since the International Exhibitions held of late years at Kensington collapsed (as we prophesied they would do under any attempt to keep them up annually), the Belgian committee have endeavoured to keep the thing going under their own auspices, and got together last year a collection of works of art which occupied in a melancholy manner a small portion of the long galleries of the Exhibition building, and among which, as far as we can recal, there was not a thing worth exhibiting, or looking at when exhibited. This year the same exhibition is held in the more suitable area of the ground-floor rooms at 9, Conduit-street, which are completely filled, and where there are some nice works. A very fine Bossuet is to be seen, "Le Portique d'Octavie, Rome" (37); the small landscapes of Von Poschinger are good; Gilardi's "Girl Tatting" (5), Bauerle's "Winter" (15), a study of a child's head; landscapes by Tscharner, Van Starkenborgh, Heymans, Rosseels, and others, may be mentioned; two small works by Ballerini, &c. There are one or two bits of clever sculpture, but nearly all Italian, and in that tawdry style of costume-cutting by which modern Italian sculptors have done so much to degrade the art. Still, it is rather a pretty little exhibition, and we only protest against the keeping up of the title, "London International Exhibition," and the attempt to confound this little commercial enterprise with the International Exhibitions which were supported by the English Government.

The Copyright Question.—The Queen has been pleased to issue a new Commission, appointing the Right Hon. John James Robert Manners (commonly called Lord John James Robert Manners), the Right Hon. William Reginald, Earl of Devon; Sir Charles Lawrence Young, bart.; Sir Henry Thurstan Holland, bart., C.M.G.; Sir John Rose, bart., K.C.M.G.; Sir Henry Drummond Wolff, K.C.M.G.; Sir Louis Mallett, knt., C.M.G.; Sir Julius Benedict, knt.; Farrer Herschell, esq., one of her Majesty's counsel; Edward Jenkins, esq.; James Fitzjames Stephen, esq., one of her Majesty's counsel; William Smith, esq., Doctor of Civil Law; James Anthony Froude, esq.; Anthony Trollope, esq.; and Frederick Daldy, esq., to be her Majesty's Commissioners to make inquiry with regard to the laws and regulations relating to home, colonial, and international copyright.

WALL-PAPERS.

On the whole, although it may not be the cleanest or the healthiest way always of lining a room, we may regard the accepted and habitual wall-paper as a boon to those who seek adornment of colour for their apartments at little cost. It is not to be recommended, certainly, where cleanliness and healthfulness are things in a general way difficult of attainment; not for the houses of the poorest classes, that is to say, and in crowded town tenements. But where circumstances are different; where there is probability of general cleaning and other sanitary processes regularly going on, papering is a substitute not to be despised for those who have not a little private fortune to spend on the decoration of the rooms where their daily lives are mostly passed. It may be thought, surprising, in fact, that we should speak in an apologetic tone at all with reference to so usual and respectable a way of producing a decorative effect. But it should always be distinctly understood that, from an art point of view, mechanically-stamped paper patterns, pasted on to the wall, can only be regarded as a compromise or an expedient for supplying the place of more permanent and thoughtful decorative work, produced independently of mechanical assistance. As a means of making a room "look nice" in a short time and at a moderate expense, they are invaluable; but, compared with painted decoration, with constructive polychromy of any kind, or with the grand oak wainscot linings of our Late Gothic and Renaissance mansions, paper at its best is but a paltry expedient. Indeed, in an art point of view, hanging "stuffs," like the old tapestries, are superior to papers, since they give a better and richer effect in regard to texture, and are a more honest method of decoration, not passing themselves off for anything permanent or inherent in the wall surface, which is certainly the object of wall-papering, of which it is a *sine qud non* that it should be laid as flat, and with as complete a dissembling of the joinings, as possible. Almost every consideration except appearance, however, is manifestly against the tapestry system, which, practically considered, was, in fact, a semi-barbaric device, inimical to healthfulness and convenience.

Papering being, however, for the many such a necessary resource in decoration, it is of some interest to see what is coming in and going out in its fashions, partly as an indication of taste generally, partly as bearing on the question of what wall-paper design in particular ought to be. The precise type of effect which should be looked for in wall-paper is not very easy always to hit. It should be perfectly flat in appearance, for every reason: a wall ought to look flat, and not as if in different planes or uneven on the surface, and an ornament produced by mechanical impression ought not to aim at any delineations of objects in relief, because these, when produced by such a process, must necessarily be coarse and imperfect. A paper should not be too ambitious in design, because it must look like what it is, a surface ornament for producing a general decorative effect, as a background to furniture and pictures, and therefore not to intrude itself too much. But it should, nevertheless, present agreeable forms for the eye to follow in a general view, and some little more minute detail to show on a closer inspection. On this principle some of the best designed papers are those which have a smaller diaper design filling up the interstices of the main design, and acting as a background to it. This is only carrying a step further the principle on which the whole paper is designed: the paper itself forms a diaper background to the room and its furniture, and the sub-design forms a similar background to the main one. Whenever purely decorative work is placed so that, though it may not generally be looked at closely, any one can look at it so without difficulty, there should always be something further to interest the eye on such a closer inspection. A paper should have a distinct design, based upon a distinct motive, and not appear to be accidentally sketched in: and this same rule ought, on the whole, to exclude any direct imitation of natural forms, which must appear as treated with thought and in a manner fitted to their place in an artificial design. It should be borne in mind always that, while a very small or very feebly-tinted design will generally have a poor effect, anything over-large in scale or over-strong in tints has a direct tendency to reduce the apparent size of an apartment, and to bring all the walls too close to the eye. Where a quiet effect is specially sought for, a design in two shades of the same tone or colour is generally the best in effect. Where a richer effect is desired, it should be sought rather in rich secondary or tertiary tones, with small points of positive colour or of gilding. The kind of diffused bloom of colour which is one of the best possible effects in a carpet, produced by the mingling of various rich and bright tints in equal force, is much less attainable in a paper, in consequence of the much harder effect produced by stamped colour on a smooth surface, than by woven colour on a rough texture.

It is only within a comparatively few years that wall-papers have become a matter for consideration, on really artistic grounds, to the present generation. The infusion of something like a pure and good taste in regard to this class of work was due, like so many other improvements in ornamental art, to Owen Jones in the first instance more than to any one else. He almost invented a style of paper of his own, in which purely natural forms were entirely discarded, and strong colour (as a rule) was little used; probably from the feeling we have expressed above, that it cannot so advantageously be used in paper-work. Owen Jones's favourite type of paper design might be described as consisting of abstract ornamental forms based upon principles of natural growths, but totally devoid of imitative character. These designs showed great subtlety, ingenuity, and refinement of line; and they kept strictly within the bounds proper to mechanically-produced ornament. Many of them came into most extensive use, not only in papers of the best class, but in cheaper ones; for Owen Jones, like a true artist, was not above giving his mind to designing simple and inexpensive things with care and thought. The class of design which he created a taste for, and even popularised, has fallen a good deal into disuse now; but we saw with pleasure the other day, among the "new patterns" of a paper-staining firm eminent for its efforts in bringing out artistic designs, a fine one by Owen Jones, in his best style, hitherto "unpublished," as one may say, and coming as one of the new and certainly one of the best and most artistic papers of "the season," and one which offers a wholesome contrast to the style even of some of the best papers at present in fashion.

The style of Owen Jones was succeeded, with those who take an interest in paper designs on artistic grounds, by one which has been chiefly connected with the name of a decorating firm, also well known in stained glass, and not without ramifications into poetry, in connexion with one of its members. This, which was at first patronised mainly by architects and by a certain class of *dilettanti*, and through them brought to the notice of that vacillating fancy called "public taste," was a style richer in colour, somewhat nearer to nature, and less conventional in detail. Some of the papers in this style were very charming, both in their design and their colour effect, the latter especially, and attempted more in this way than Owen Jones had aimed at. It can hardly be said, however, that they had what may be called the intellectual or abstract character of Jones's designs; but they were sufficiently conventionalised in principle, and supplied the growing demand for warmer and richer colour in papers. Fascinating as they were at first, we cannot but think, however, that this was a style of paper of which the eye or the taste sooner tires than of the Owen Jones style, and it is pretty certain that less thought goes to the making of it. This style of wall-paper, partly under the natural result of progress by which an idea is worked to its limits, partly under the recent influence of Japanese taste, has developed into a type of wall-paper of almost naturalistic detail, which seems, for the last two or three seasons, becoming more and more pronounced. The favourite effect now in the richest and most expensive class of papers is that of a thick network of foliage only slightly conventionalised in some details of form and in colour, but in general composition designed as much as possible with the straggling irregularity of natural growth, producing the appearance of a leafy grove all round the room, with (as a favourite effect) the glimmering through it at artificially irregular interspaces, of richly coloured or gilded fruit-like forms. In the earlier papers of something the same type that we have just been alluding to, flowers and not fruit formed the salient point of colour; delicately tinted flowers flattened into geometric circles, with radiating petals. We cannot consider the "fruity" taste as an improvement, nor can we praise the prevalent fashion in the matter of thoughtful design. This class of paper looks very well and powerful when seen at a distance, as when it is introduced in the beautifully-composed interior scenes we see at the Prince of Wales's or the Court Theatre. The colour effect is undoubtedly very rich; in regard to general richness and harmonious force of tone these papers are sometimes remarkable, and equally so for the splendid execution now bestowed upon them. But they want the interest of carefully and thoughtfully considered form and line and general construction; once get the trick of the colouring and combination, and the design really presents no difficulty at all, for the paper in fact almost designs itself. And, seen in a more restricted area than that of the theatre, we confess these foliage papers appear to us far too pronounced in effect, and too large and coarse in detail, for truly refined taste. Other types of design of more or less Japanese origin have been imported into our wall-papers, with varying result. What may be called the Japanese "key-pattern," a style of ornamental detail analogous to the Greek ornament so called, has been made the foundation of some very good papers, a trifle heavy, perhaps, in effect, but withal perfectly satisfying to the most fastidious taste, and possessing a distinctly architectural character which renders them exceedingly suitable for rooms where architectural severity of style is especially desired. Another Japanese adaptation which is among the "novelties of the season" is of a very opposite character, and consists of a reticulation of jagged bare sprays wandering over the paper, upon which, at studiously irregular intervals, sit birds of the size and semblance of sparrows, except as to colour. This latter quality is varied, and we are assured that one of the things that have "taken" most with purchasers of papers is a variety of this one, in which the branches are a sort of neutral grey and the birds red. This is not very promising for the improvement of taste, and the design, if we mistake not, originated with an artist who should have known better. However, we are now in the midst of a Japanese worship, and everything that can be traced to that sacred source is right. We should be very glad if this were the worst of it. Our last remarks have been rather in view of the productions of firms which make it a special object to meet the tastes of those who may claim, on some grounds, to represent the more artistic section of the community. But if we glance at the papers which are offered now for the mass of purchasers who wish to furnish "handsomely," but who seldom give much thought to good or bad principles of design—who take what is offered them, in fact,—we are astonished and cast down at seeing what it is that is being offered to them. After all the influence of Owen Jones,—after all that of some of his successors in the field who, if not showing so pure a taste, evinced at least a desire for and a knowledge of artistic effect and artistic principle,—we see, to our dismay, all the old vulgarities of knops and festoons of flowers scattered in bunches over the paper, coming into full popularity again. We have seen them displayed as the latest enticements in the windows of furnishing and upholstering and decorating firms of the first reputation,—firms of whom it is blindly considered that to go to them is to have the right thing done; and we can only once more lament and wonder over the marvellous vitality of vulgar and tawdry tastes among English tradesmen and their customers.

If such papers as these are utterly unmeaning as well as in bad taste, we have also to take account of the opposite possibility, already hinted at, of putting too much meaning into a wall-paper, and thus obtruding it beyond its proper place as a decorative background. It is possible that little bits of symbolism might well be incorporated in a paper design, and that such an idea might furnish hints for real novelty of treatment; but it must be a very abstract and unobtrusive symbolism. We saw the other day a lithographed design, which has been shown about (we understand the paper itself has not so far been made, though accepted by a large firm), in which an attempt was made to embody in this form some of Chaucer's fresh and charming fancy about the daisy; the paper being formed of chains of daisies in wreath shape, with full blossoms on a larger scale at intervals, and a quotation or motto (the same quotation) from the poet between each wreath: a dado of similar symbolism and a frieze of symbolic figures to come, Caryatide-fashion, under the cornice of the room. Clever idea, no doubt;

original, and so on; but this is an instance of attempting too much with a paper. No one of fastidious taste in such matters would have such a paper on his walls. The figure is worth other treatment than to be repeated in successive identical groups round a wall, stamped so many on each piece, in mechanical succession. There is no sense, either, in printing a quotation or a motto a hundred times over round the wall of a room as a piece of decoration. Letters and inscriptions are valuable not for their decorative effect, but for their intellectual meaning; and for that, one printing is enough and all the rest are superfluous. If such subjects are expressed in a wall-paper, they should rather be shadowed forth in a purely abstract manner; figures should not be degraded to the condition of mere decorative work for repetition *ad libitum*; and inscriptions, if introduced, should be written once for all, say as a frieze ornament, and not absurdly repeated to no purpose or meaning.

Looking to the other extreme, of exceedingly simple papers, we find among the new papers of the year some nice sensible and tasteful geometrical patterns; of nearly all of which it may be said, however, that a little more refinement in regard to the forms and outlines employed, a little more attempt at originality in these, and in the method of combining them, might have turned some papers that are just fairly good and tasteful into very original and artistic designs, at just the same cost of production, unless we consider the probable additional fee paid to a designer who would have been able thus to modify them. A danger to be guarded against, by the way, in small geometrical designs, is that of falling into such a collocation of light and dark tints as, when the paper is fixed up, shall give the appearance of alternate relief and shadow,—a result which sometimes appears when it was least intended, and is always bad. The designer must be careful also to avoid combinations which, though one or two sections of the design may seem perfectly pleasing, will present an appearance of hard or defined continuous lines when viewed *en masse*. A geometrical diaper should always suggest the notion of spaces, and never of continuous lines, unless it be ostensibly based on something like a trellis form with crossing lines and ornament in the interspaces. This, however, is generally unsatisfactory, producing a too hard and precise effect. In general, when there is much difference in depth of tone between the design and the ground, the effect of the interspaces should be considered; these have sometimes an awkward and annoying trick of catching the eye, and presenting themselves as the design, with a very bad and even irritating result. The mere "powdering" of a paper with a small ornamental feature does not seem to us worth much; there is too little evidence or appearance of design in it: it may be gracefully and effectively used for parts of a paper, to relieve and contrast the more intricate portions.

A special feature of recent papers is that the desire for "surface," so prevalent nowadays, has led to the custom of printing many of the better class of designs on ribbed and granulated papers. The superiority of effect over the smooth paper is unquestionable; there is sometimes, however, difficulty in getting these thicker and tougher papers to set with the desired flatness and evenness, and they hold dust more; still, they set off a good pattern far better than the smooth surfaces.

The worst and most hopeless of contemporary wall papers seem to be not so much the cheapest as those created for the wants of a medium class of purchasers, who can afford something a little above the lowest prices, and whose great aim seems to be to get something as startling as possible for their money. The style of paper produced in England to meet the wants of this class is something so frightful, in regard to idea and colour, that it is impossible to do it adequate justice in any words we could use; and we can only quit a subject which, from this point of view, becomes painful.

Crystal Palace District Cemetery, Elmers-end.—This new cemetery was opened on Saturday last, and the ceremony of consecrating a portion of the ground was performed by the Bishop of Dover. Some time since we gave a description of the designs for the chapels and lodges. Mr. A. G. Hennell, of Bedford-row, is the architect, and the grounds were also laid out under his direction. The contractors for the buildings were Messrs. Willson Bros.

SANITARY PROGRESS IN INDIA.

Captain Douglas Galton read a paper on this subject at the Society of Arts on the 21st inst., Mr. Edwin Chadwick, C.B., in the chair.

Captain Galton began by showing that the climate of India, although not absolutely healthy, was by no means so inimical to European constitutions as was generally supposed. The enormous death-rate in India was mainly caused by the total disregard of all sanitary precautions. The barracks were ill-ventilated, the cities were undrained, and the soldiers were permitted and encouraged to use alcoholic liquors. The report of the Royal Commission on the Sanitary State of the Indian Army made revelations which were almost incredible, and the alterations which that report suggested had produced the best results. In old times the death-rate of the army of India averaged 69 per 1,000; in 1873 it was 7·85 per 1,000. If the old average had been maintained, the recruiting for the large army we maintained in India ever since the mutiny would have exhausted the population of England. The investigations into the state of the army were followed by an examination of the sanitary conditions under which the native population lived. In Delhi the troops suffered from the "Delhi ulcer," in consequence of the total contamination of the drinking-water. In Peshawur the sources of water-supply were merely foul ditches, and a similar state of things existed in Meean Meer. Even in Simla, the sanitarium of India, the water was hourly liable to disgusting pollution. The same description would serve for all the native towns and villages in British India. A totally different state of things prevailed in Burmah, where the dwellings were raised from the ground, and well ventilated, and in which might be seen swarms of plump, healthy-looking children, and vivacious and manly inhabitants. The results obtained by the census and by registration showed that the natives were gradually becoming alive to the necessity of sanitary precautions. Vaccination was being generally submitted to, and the result was a great decrease in the number of deaths from small-pox. Fever was a steady decimator of the people of India, cholera only ravaging the country at intervals. In Bengal alone there were 56,876 deaths from cholera in the year 1874. It was all due to preventible causes, principally bad drainage, and in many cases these causes were in process of removal. Dispensaries and hospitals had been established, there being at present 800 of those institutions supported by the Government of India. Cholera prevailed in the deltas of the great rivers, and sometimes swept over large districts with dreadful rapidity, notwithstanding the strictest quarantine. The only certain preventive of cholera would be found in the strictest attention to sanitary regulations. The lecturer, in conclusion, exhorted the Government to such further sanitary legislation for India as would compel the removal of all known causes of cholera and fever.

In the discussion which followed, Dr. Boycott thought that in many matters the sanitary conditions of Indian life were superior to those of England. Dr. Burns said that much of the mortality and sickness among the English soldiers in India arose from the defective sites chosen for cantonments. In Poonah, the barracks had, at the suggestion of the clergy, been all built facing the east, thus exposing them to the malaria of the city of Poonah, and leaving the sea-breeze behind them. Worse than this, the latrines were so placed as to contaminate the drinking-water used by the soldiers. Mr. Sen, a native of India, feared that the sanitary reform of India would be a gigantic work, and thought that at present all the care of the Government was lavished on the army, leaving the poor natives to their own resources.

REGISTRATION AND CLASSIFICATION OF HOUSE PROPERTY.

Mr. John Cowan, builder, at the request of the Architectural Section of the Glasgow Philosophical Society, read to the members in the Corporation Galleries a paper on the "Registration and Classification of House Property in large Cities." Mr. John Honeyman, president, occupied the chair.

Mr. Cowan stated that when, in the course of a recent paper on "Timber considered as a Building Material," he mooted the proposal to classify tenement property in large cities and towns after the fashion of Lloyd's Register in regard to ships, he was not prepared to expect for his suggestion the degree of favour with which it was received. He went on to say,—The movable character of ships is a feature which renders them in very many respects no parallel to house property, which is fixed to the soil so completely that the purchase of the ground carries with it, unless otherwise arranged, everything standing on it, a *centro usque ad cœlum*, as the lawyers say. Without following the analogy of ship registration, therefore, I shall only take hints from it as often as they can be of use for my present purpose, and alter the system in other respects to suit the case in hand. The fixity of house property renders it of local importance only; hence I propose that a register be kept in each town for that town only. The elevation and general appearance of a building being patent to the eye, I think the register should record more particularly those facts which are lost, or are at least hidden by the very completion of the property. Whether by-and-by the system should become compulsory, I would leave experience of its working to determine, and would make it a voluntary one at the outset. Proceeding on these fundamental principles, I shall now describe the system in detail as it might be organised in Glasgow. For convenience, the register might be called "So-and-so's register of house property," and a property might be said to be classed at So-and-so's. A committee would be appointed which might be made up in the following way,—say three by the Institute of Architects, two by the legal profession, two by the Merchants' House, two by the master masons, two by the master wrights, and two by the house-factors,—thirteen in all. The committee would appoint a sufficient number of surveyors to overtake the work required in a systematic and complete manner; also a secretary, who would also act as treasurer. The committee would meet at stated intervals, and would be paid for attendance only by dividing a certain sum among those present; the secretary and surveyors would be paid by salaries. The committee should draw up a carefully considered code of rules, defining the requirements of the different classes. They should, on receiving the last reports of surveyors, proceed to compare the reports with the standards set up, and classify accordingly. No member of committee should on any account be present at the classification of a property in which he possesses the most remote interest. The registrar would record the following facts in regard to property entered in it. 1st. Situation, street, and number. 2nd. Proprietor's name. 3rd. Nature of tenement; dwelling-houses, or houses and shops, together with the number of stories, and capacity of dwellings or shops. 4th. When built. 5th. Character of foundation; nature of soil, forced or otherwise; particulars of drainage, with the amount of fall to sewers, and construction of the latter; what provision is made to prevent damp rising in the walls; and also method adopted for the ventilation and preservation of the basement floors. 6th. Walls.—Front wall—Nature of stone and mode of building, also character of mortar; state if strapped; size of and lathed stone or cast-iron piers, also section of lintels over openings in the case of shops. Back wall—Rubble or otherwise, if pointed, and with what; also, whether lathed. Gables—Mean or private; whether of stone or brick; if vents have fireclay linings or otherwise; how hearths are supported, on brick arches or wooden boxing. 7th. Partitions—Whether brick or lath and plaster; thickness and composition of bearing partitions; also those into which stair steps are inserted. 8th. Stairs—If stone; hanging or otherwise; nature and thickness of newel, if any. 9th. Carpenter work—Kind of wood used; scantling and divide of joisting; length of bearings of ditto. How protected from decay in walls, or contact with vents; nature of deafening, and quality of lath. 10th. Roof—Scantling and quality of timbers and sarking; how constructed; kind of slate used, and how protected at eaves, ridges, and skews. 11th. Character of Plumber Work—Size and weight of supply and discharge pipes; particulars of closets, basins, baths, and cisterns; size and kind of pipes for gas; also particulars of bell-hanging. 12th. Description and quality of plaster work; also, marbles or tiles, if any. 13th. Particulars of Furnishing—Thickness and quality of floors; description of doors, shutters, and fittings, with kind of wood used; description of make, hanging

and glazing of windows; also, quality of ironmongery. 14th. Particulars of painting. 15th. Date of entry in register. 16th. Classification. The classification might be as follows:—A 1 applicable to *new* properties, duly inspected by the committee's surveyors while in course of erection, and found to conform to the committee's rules in regard to construction and material. Also, properties built previously to the introduction of this system, and which are found after careful examination to warrant the assumption that had they enjoyed the benefit of this system when building they would have reached the highest class. But in this case it should be A 1 ten years ago, or whatever time had elapsed between the erection and classification. A 2, both of the foregoing species, but inferior to A 1. B 1 meaning new properties erected after the establishment of the system, but not under survey, and on examination are found inferior to the two previous classes. B 2 meaning the same description of property, but inferior to B 1. Surveyor should visit properties while in course of erection, at the following stages:—1st, When founded, when he would answer queries 1, 2, 3, 4, and 5. 2nd, When walls and partitions are up, but before ceiling joists are laid, when he would answer Nos. 6, 7, and 9. 3rd. When roof is on and slated, and building ready for the plasterer, when he would fill up Nos. 8, 10, and 11. 4th. When plaster is finished, and previously to floors being laid, and answer No. 12. 5th and last. When the building is finished, when he would fill in Nos. 13 and 14. Proper schedules would be furnished to the surveyor to be filled up at each visit, and these would be filed by the secretary. A fee of 10s. 6d. would be charged for each visit except the last, which would be charged double to cover the expense of classification by committee and entry in register. The sum divided among committee would be 10s. 6d. for each property classified at meeting. The fee charged for inspecting and classifying property not built under survey would be 3*l*. 3s. The register would be open to the public for inspection on payment of 5s., and an extract would be furnished by the secretary for 10s. 6d. Copies (printed) of the rules and requirements of the system could be had of the secretary on payment of 2s. 6d. If these fees or the fees charged at first were found not to maintain the system, they could be increased at discretion. Similar systems would, let us suppose, be current in all large towns in the kingdom, and any proprietor dissatisfied with the classification of the committee, would have power to ask the secretary to transmit the surveyor's reports to any other town of equal importance, or with two-thirds the population of Glasgow to be reclassified by way of appeal on payment of 21s. for the reclassifying. In case of such appeals from other towns, half the fee to go to the committee, and the other half to the general fund. The minor details, and the general working out of the system, I shall not further enter upon at present, as these could be easily adjusted when the proposal takes practical shape. The system would not interfere on the one hand with the Dean of Guild regulations, nor on the other with the existing and much-admired system of land registration in Scotland, which has been found to work so well for a very long period. It would rather be the natural supplement to these. The land registers tell us who owns the land, and what burdens of debt, feu-duty, ground annual, or building or other restrictions affect it, and the system I am advocating would tell us with certainty the sort of building erected on the ground, and complete the information which a buyer requires before judiciously deciding to purchase. I do not need to tell you that there are tricks in the building trade by which a very inferior tenement is made to look, and often to sell, as well as one which has cost 25 per cent. more. The new system, while it would be open to all buildings, would be mainly applicable to tenement property, and a part of the register might be set aside for extramural buildings, the proprietors of which wished the benefit of the system.

After the reading of the paper a discussion took place upon it. All the gentlemen who spoke expressed themselves as highly pleased that Mr. Cowan should have taken up the subject, and all concurred in the opinion that the classification would be of immense advantage, and that, subject to some modification in detail, the scheme was perfectly practicable.

A committee was appointed to consider the best means or giving effect to the proposal, and after the usual complimentary votes the meeting separated.

SANITARY AND EDUCATIONAL EXHIBITION, BRIGHTON.

At the last meeting of Council (Social Science Association), the committee of the Exhibition of Sanitary and Educational Appliances and Apparatus held at Brighton finally reported. The proceeds of the Exhibition amounted to 433*l*. 18s. 1d., and the expenditure to 408*l*. 16s., the balance of 25*l*. 2s. 1d., being very properly presented to Mr. Robinson, the secretary to the committee, for his services. The committee congratulated the council upon the success of the Exhibition, and the Council passed a vote of thanks to the committee for their services. The committee has since issued a "Descriptive Report" of the various exhibits. The Exhibition afforded excellent means of observation and inquiry. Nearly all the articles shown were such as contributed more or less to domestic comfort, and to the promotion of health and longevity. The committee state in the preface to the report that:—

"The main intention of the Association in giving direct encouragement to such exhibitions is not so much to bring together a collection of useful and interesting objects, as to afford to inventors and manufacturers good opportunities of explaining the merit of their respective works to the public. No less valuable to the public is the opportunity of getting information at the best sources, and a descriptive record of the several objects exhibited, and a list of the exhibitors with their several addresses, as contained in this report, will readily afford such information for the convenience of all persons who choose to avail themselves of it.

It has not been the intention of the committee to institute any comparison of merits as among different inventors or manufacturers of articles similar in their nature or construction, or to imply such by priority or order of insertion, but rather to draw attention to all objects deemed worthy of notice by reason of their novelty, economy, or excellence. . . . .

Regarding the Exhibition in the light of a display of ingenious and useful inventions, illustrative of the various departments of Household Economy and Public Health, and as explanatory of the principles which should prevail in carrying out the work of sanitary reform, it realised every expectation, and proved, as it is designed its successors shall do, a most useful adjunct and supplement to the ordinary proceedings of the congress."

A short descriptive account is given of each exhibit, showing its leading characteristic and adaptation to use. In this way the report contains a large amount of useful information.

It is proposed to hold a similar Exhibition in Liverpool in connexion with the Annual Congress to be held in that town in the autumn. Manufacturers and inventors should make a note of this.

HULL DOCKS.

The foundation-stone of a new dock at Hull, the first of two which are now in course of construction on the western foreshore, has been laid. The two new docks now in process of construction will give an addition of 18 acres of water space and 7,170 lineal feet of quay space. That of which the foundation-stone was laid is 8 acres in extent, and the quay space will be 3,170 lineal feet, and at average spring tides there will be a depth of water of 28 ft. 2 in. on its sill. The dock will be approached by a channel 60 ft. wide, leading from the Albert Dock. The second dock, which it was at first intended to devote exclusively to the fish trade, will be constructed immediately to the westward, and it will have a separate entrance from the Humber 50 ft. wide. This dock will have a water area of 10 acres, and there will be 4,000 lineal feet of quay space. Both these docks are to some extent constructed on what was once a portion of the Humber, by the construction of a sea-wall, the intervening land between the river and the dock quays being formed of the soil excavated from the docks. The docks at present in use at Hull number six, the largest, the Albert Dock, having a water area of 23 acres. The next in size is the Victoria Dock, which is now 20 acres, having been considerably enlarged in 1863. The Queen's Dock is 9 acres, and the Prince's Dock over 6 acres in extent, the Humber Dock 7 acres, and the Railway Dock 2 acres. The Railway Dock, a very small but exceedingly convenient dock, was opened on the 4th of December, 1846. The Victoria Dock, which is to the eastward of the town, was opened with great ceremony on the 3rd of July, 1850. This dock is almost exclusively devoted to the timber trade, and communicating with it are very extensive timber ponds, in which heavy timber is kept afloat. The quays and the adjacent land are occupied with deals and sawn wood. The last constructed dock, which may be reckoned among the finest works of the kind in the kingdom, was the Albert Dock. This fine dock was opened on the 22nd of July, 1869, by the Prince of Wales. The dock system of Hull will not be considered complete when the two new docks are opened, and the Dock Company, having confidence in the continued development of trade if proper facilities are offered, have just purchased from the Woods and Forests a tract of land known as the Citadel site—viz., the site which a few years ago was occupied by the Hull Citadel, when Hull was a garrison town.

THE KELVIN GROVE MUSEUM, GLASGOW.

The extensive additions which have been for some time in progress at this Museum (situated on the banks of the Kelvin, within the grounds of the West-end Park) having been completed, they were on the 18th inst. formally handed over to the Glasgow Corporation. We learn from the *Scotsman* that for some time past the marks of public favour bestowed upon the institution, in contributions and in the increasing number of visitors, suggested an extension of the Museum buildings. A few gentlemen therefore started a subscription list, and in a short time such a sum was realised as warranted an addition being proceeded with. At first it was proposed to erect a building about 85 ft. in length, and costing about 5,000*l*. The committee, however, extended their original plans, and the buildings as now completed have cost a sum of 8,300*l*., exclusive of 700*l*. granted by the Parks Committee. The main building consists of a hall 115 ft. long and 40 ft. wide; with a gallery 13 ft. wide at the ends, and 9 ft. at the sides. To the west, and connected with the hall, is an aquarium, 40 ft. long by 20 ft. wide. It is intended in the meantime that the hall and galleries be set apart for specimens, from the crude to the perfected state, of the productions of the various industries carried on in Glasgow. The aquarium has fourteen cases fitted up round the east, south, and west sides, and two large central cases are being finished. These are intended for specimens of the various fresh-water fish found in the Scottish lochs and rivers. The committee have also erected a spacious new entrance-hall and flights of stairs connecting the buildings. There is also a separate entrance to the new hall for evening visitors. The British Association have been offered the use of the new hall and galleries for the exhibition of their specimens of arts and manufactures at their forthcoming meeting in Glasgow, and the Executive Committee of the Association propose to erect an additional gallery above the aquarium, and, as an acknowledgment of the courtesy shown them, will present the same to the city.

INDIAN AND EASTERN ARCHITECTURE.

We must pass over shortly the chapter devoted by Mr. Fergusson* to the architectural remains of Kashmir and Nepal, under the heading "Architecture in the Himalayas," though these comparatively restricted areas contain monuments of a certain special and peculiar interest. The remains of architecture in Kashmir are notable, among other things, for the frequent recurrence of those repetitions or imitations of Classic architectural features, in clumsy and corrupted forms, the appearance of which in styles and localities far removed from the country of their origination has now nearly ceased to be matter for surprise to architectural students, though such re-appearances of Classic types furnish continually fresh testimony to the widespread and pervading influence of Greek art. In Kashmir this Classic influence is very strongly shown. "Nowhere do we find any trace of the bracket capital of the Hindus, nor of the changes from square to octagon, or to the polygon of sixteen sides, and so on. Now that we have become so familiar with the extent of the Classic influence that prevailed in Ghandara, we have no difficulty in understanding whence these *quasi*-Grecian forms were derived, nor why they should be found so prevalent in this valley." This classical influence, though fainter and more remote than in Ghandara, is impressed, Mr. Fergusson tells us, on all the Kashmir buildings down to the time when the local style perished under the influence of Mahommedanism in the fourteenth century; and the cut which he gives of the capital of a column from Srinagar, showing a coarse form of the egg-and-tongue ornament on a fluted shaft, and with an added capital or impost super-imposed in a decidedly Roman fashion, is remarkable enough in its in-

* See p. 375, *ante*.

dications of architectural relationship. Another peculiarity, pointing in quite a different direction, is the trefoil-headed arch, which is everywhere prevalent, and for which Mr. Fergusson suggests the section of the three-aisled Buddhist caves as an origin, but without, to our thinking, much probability, more especially as the historic links to connect Kashmirian with Buddhist architecture are so far wanting. The affinity of the form, and of its method of employment, to what we know so well in Gothic architecture, is striking. The date of these Kashmirian edifices is at present placed as pre-Mahommedan, or at least previously to any known Saracenic influence in India; otherwise, one would be tempted to regard this feature as a confirmation of the old theory of the Saracenic origin of Gothic architecture, and consider the two as both springing from a Saracenic suggestion. At all events, it is clear that Kashmirian architecture is full of suggestions, all interesting, some of them novel, in regard to the relations of styles, and that a separate and thorough study and illustration of its monuments would be well worth undertaking.

A similar kind of interest seems to attach to the buildings of Nepal, which are mostly comparatively modern, but so numerous in comparison with the area covered as to have given rise to the saying, that in Nepal there are "more temples than houses, and more idols than men," and of which the author observes that their chief value lies in their ethnographic meaning, and that from this point of view they present, when fully mastered, "a complete microcosm of India as it was in the seventh century"; but as æsthetic considerations predominate over ethnographic in the scheme of the work, the chapter on Nepal is confined to illustrating the principal styles of buildings and indicating the modes in which they are divided among the different races. Among the points of special interest touched upon we may call attention to the note of the existence, in the districts of Kuld, Kangra, and Kumaon, between Kashmir and Nepal, of a great number of temples built of timber (chiefly Deodar pine), which have only hitherto been illustrated by photographs taken with a "picturesque" object merely, and are waiting for further and more systematic illustration. Some extraordinary monoliths which stand in a row before a temple at Dinapur are illustrated (fig. 175), of which no explanation is attempted, but which we imagine all who are learned in such symbolisms would unhesitatingly pronounce to be of phallic origin or intention. We may draw attention also to the capital of a temple at Orissa given on page 317, as the author characterises it as "perhaps the only suggestion that Indian architecture offers for European use"; the suggestion being for a new method of effecting the transition from the circular column to the square abacus; though we think Mr. Fergusson quite overrates its value in this sense.

The "Architecture of the Hindus" has disappeared, as a heading, from Mr. Fergusson's grouping of the subject, and now appears under the three heads of "Dravidian," "Chalukyan," and "Indo-Aryan"; at least we gather that these are regarded as sections of what was originally comprised under the more general title.* The Dravidian style we are to regard as that of a people of the same race with the builders of the Jaina temples, but holding a different religion and consequently building in a different style. "Its limits practically are those of the Madras Presidency, or, to speak more correctly, they are identical with the spread of the people speaking Tamil, or any of the cognate tongues." Why not then call it the Tamil style, if the distinction is to be philological after all? though this method of distinguishing philologically a style formerly distinguished, like others in the book, by creed, is another element in the confusion of nomenclature to which we have before referred. Waiving that point, however, we proceed to note one or two of the points which seem to be brought out, in this new edition of the history, in a new light, or with new illustration. It is to the Dravidian style that the now well-known "raths" at Mahavellipore belong, and which represent probably the oldest form of Dravidian architecture, which in all its more ancient manifestations is a rock-cut style. What the author has to tell us about these rock-cut temples is, however, mainly what we are already indebted to him for: our attention is more directed to the remarks *à propos* of the built monuments of the style, which are mostly of comparatively modern date, the great building age in this Southern Hindû style being the sixteenth and seventeenth centuries. Of the temples of this later structural style there is an immense abundance, so much so, our author remarks, as to puzzle any one acquainted only with the present resources of the province where they are found. Considered in this light, he says:—

"The greatest wonder is how such a people could ever have conceived, much less carried out, such vast undertakings as these, and that so recently that some of the greatest and boldest were only interrupted by our wars with the French little more than a century ago. The cause of this, however, is not far to seek. Ever since we took possession of the country our countrymen have been actuated by the most beneficent intentions of protecting the poor against the oppression of the rich. By every means we have sought to secure the ryot in his holding, and that he should not be called on to pay more than his fair share of the produce of his land; while to the landowner we have offered a secure title to what belonged to him, and a fixed income in money in lieu of his portion of the produce. To a people, however, in the state of civilisation to which India has reached, a secure title and a fixed income only means the power of borrowing, on the occasion of a marriage, a funeral, or some great family festival, ten times more than the borrower can ever pay, and our courts as inevitably give the lender the power of foreclosing his mortgage, and selling the property. During the centuries in which this communistic process has been going on the landed aristocracy have gradually disappeared. All the wealth of the country has passed into the hands of the money-lenders of the cities, and by them been dissipated in frivolities. If the aim of the Government is to reduce the whole population to the condition of peasant proprietors, occupying the land without capital, and consequently on the verge of starvation, they have certainly succeeded. . . . . Before we interfered the condition of things was totally different. The practical proprietorship of the land was then in the hands of a few princes or feudal lords, who derived from it immense revenues they had no means of spending, except in works of ostentation."

It is certainly interesting to find here, in a country so far remote, the same influence of the feudal spirit in promoting architecture, which we see so notably illustrated in the history of Mediæval Europe. But the artistic results were very different; and here we are glad to find Mr. Fergusson holding the balance of criticism between the Hindu and the Gothic architect with a calm and impartial judgment with which some of his more enthusiatic comments upon the architecture of the Indian peninsula scarcely coincide. He discriminates explicitly between the "vast, but stable" erections of the Mediæval builder, "suited for the accommodation of great multitudes to witness a lofty ritual," and the dark cubical cell which was the *sanctum sanctorum* of the Hindu architect, who wished for nothing, in an architectural point of view, but opportunities for the display of his powers of ornamentation, and even here could find in his religion of fetishism no inspiration towards anything lofty or intellectually great. "What they had to offer to their gods was a tribute of labour, and they offered it without stint. To cut a chain of fifty links out of a block of granite and suspend it between two pillars, was with them a triumph of art. To hollow deep cornices out of the hardest basalt, and to leave all the framings, as if of the most delicate woodwork, standing free, was with them a worthy object of ambition." For such mere licentiousness of ornament the author expresses his contempt, in this place, very much in the same kind of language which we have already used in our previous article; but the barometer of his architectural criticism seems to be affected by different influences at different times; and sometimes, like an architectural Balaam, when we rather expect him to curse the people who built this or that piece of grotesque, behold, he blesses them altogether. And in reference to the remarks just quoted, it should not be forgotten, after all, that it is to the "Dravidian" architects that we owe those gate-pyramids or *gopuras* (which Mr. Fergusson not inaptly compares to the *pylons* of the Egyptian temples) which to many form the most striking reminiscence in connexion with the architecture of India, and which certainly are not destitute of a certain grandeur and dignity, independently of their ornamental elaboration. As a specimen of the characteristics of the Dravidian style in detail, we give the engraving of one of the compound pillars at Vellore, which not only shows, in spite of its incongruous detail, a remarkable elegance and richness of effect, but is interesting also as a repetition, in another architectural language, of the Gothic architect's practice of obtaining lightness and gracefulness of effect by the combination of a light shaft with the solid pier which really constitutes the support of the superstructure. The application of a similar feature is shown in the view and section of the porch of the temple of Chillambaram on page 353. The remarkable and interesting temple at Vellore, we are told, "is situated in the fort occupied by the British, and has, consequently, been utilised as a store. Walls have been built within its piers, and whitewash and fittings have reduced it to the condition which we think appropriate for the noblest works of art in India." In regard to the details of this temple, of which other illustrations are given, we may notice the difficulty started by Mr. Fergusson as to how forms that are so unlike lithic forms anywhere else could ever have been elaborated in stone at all; "and yet they are not wooden, and show no trace of a wooden derivation"; and the suggestion which Mr. Fergusson makes is, that they are derived from terra-cotta forms. There is evidence, he tells us, that the art of producing ornamental features, and even statues, in burnt clay, has long been practised in the South; "and if we adopt the theory that it was used for many ornamental purposes before wood or stone, it will account for much that is unintelligible in the arts of the South." This is a suggestion which, further carried out on the basis of a more complete investigation of this class of remains, may prove a very valuable one. Certainly, the details of the column we engrave seem very well adapted to terra-cotta. We regret that we have not space to reproduce the two large illustrations (pp. 376-7) of details of the *gopura* at Tarputry, which give some idea of the extraordinary profusion of ornamental work and carving in some of these structures. To one other suggestion we must draw attention. Reference has already been made to the resemblance between the gate-pyramids and the *pylons* of Egypt; but the author proceeds to draw the parallel further:—

"The courts with pillars and cloisters are common to both, and very similar in arrangement and extent. The great mantapas and halls of 1,000 columns reproduce the hypostyle halls, both in purpose and effect, with almost minute accuracy. The absence of any central tower or sanctuary is almost universal in Egypt, and only conspicuously violated in one instance in India. Their mode of aggregation, and the amount of labour bestowed upon them for labour's sake, is only too characteristic of both styles. There are, besides, many similarities that will occur to any one familiar with both styles."

"Is all this accidental?" asks Mr. Fergusson. It is probably beyond our power now to answer the question with anything beyond guesswork and probabilities, seeing how far removed from investigation must be the historical period when (if ever) Egypt and India had such relations as would account for something like a community of architectural feeling; but the question itself is calculated to set one considering, perhaps "too curiously," as to the possibilities of the earlier history of the two countries, and the remarkable manner in which ethnographical history may be petrified for ages in ancient buildings, to be revivified by the light turned upon them by modern criticism.

What Mr. Fergusson has classed as the Chalukyan style is the least known of the Hindu styles, a knowledge of it being chiefly attainable at present through stray photographs; but in some respects it must be, even judging from what we see in the illustrations in this volume, one of the most remarkable and interesting. Its most distinctive monuments are temples with extensive many-pillared porches, recalling the arrangement of the Jaina temples, more nearly so, in fact, to our thinking, than Mr. Fergusson seems inclined to admit; but the most striking peculiarity about these erections is the wild profusion and intricacy of ornament which they display; and the predominance of strongly-marked horizontal lines does something to ordinate this chaos of ornament, and imparts to these buildings a more distinctly architectural spirit (to the eye of the Western critic) than is to be found in the more jumbled outlines of the Dravidian buildings. The most remarkable of these, the Temple at Hullabid, is illustrated in a small general view (p. 400), and by an engraving from a larger-scale photograph of a portion of the building. The general view shows a well-grouped mass of building, with a "west front" marked by two great pyramidal towers, differing from the Dravidian *gopuras* in being square on plan, as well as in their detail. The larger-scale illustration shows the basement of the design as consisting of no less than nine horizontal bands of sculpture and carved ornament, divided by strong mouldings and hollows, the sculpture representing processions of elephants, bulls, men on horseback, &c. Over this strongly-defined base, which occupies more than one-third the height of the building up to the main cornice, come a series of large statues, and over these a strong horizontal string-course,

* We may notice, as a literary oversight to be corrected in a future edition, that the introductory chapters on "Chalukyan" and "Indo-Aryan" architecture commence with the same identical sentence,—"Of the three styles into which Hindu architecture naturally divides itself," &c.

and an "order" of pilasters carrying brackets, which lead up to the main cornice. This upper portion is clumsy in detail, but nothing could be richer and more effective than the basement, and the general grouping of the parts over it is in admirable proportion, and the whole is certainly not without its suggestiveness to the architectural designer in any part of the world. The author, in a passage of very eloquent criticism, contrasts this building, in which no two parts are alike in detail,—on whose walls "all that is wild in human faith, or warm in human feeling, is found portrayed,"—with the recondite, restrained, and intellectual art of the Parthenon; considering them, not inaptly, as representing the two extreme poles of architectural expression.* One of the most interesting and valuable structures of the Hullabid group, Mr. Fergusson notes, is getting gradually destroyed by trees growing into and over it, and he repeats the appeal,—made over and over again in his pages, but we fear in vain,—for the expenditure of a small sum by our Government in preserving it from obliteration. Before turning from this phase of Hindu architecture, we commend to the reader's attention the remarkable gateway at Worangul (p. 392), one of four which at once recal the gateways of the Sanchi Tope in general design, though with the difference of centuries between them in the development and elaboration of ornament, and the comparative obliteration of wooden forms, in the Chalukyan example.

The third Hindu style which Mr. Fergusson discriminates, that which prevailed among the Hindus of Northern India from the seventh century to the present day, he calls "Indo-Aryan," as conterminous, as far as can be ascertained, with the geographical distribution of the original Aryan or Sanscrit-speaking population of India, though there is (as the reader need not be told who bears in mind what has been previously said in regard to the non-building character of the Aryans) no architecture belonging to this people; and we confess it appears to us that the grouping of the monuments described as "Indo-Aryan" seems rather like an attempt to bring under one descriptive title, for purposes of classification, an immense number of widely-spread buildings, which scarcely admit of so distinct a demarcation. Mr. Fergusson seems, in fact, to be a sort of Linnæus to Indian architecture, and to be engaged in classifying it for purposes of study; but, besides that the indications of family and species are very multifarious and difficult to reduce to heads, his nomenclature (unlike that of Linnæus) is composed on constantly varying principles, and it seems scarcely possible that it can be accepted without a great deal of revision and alteration when (if ever) this immense field of architectural remains comes to be more fully explored. The most distinguishing feature of the style as classified here is the square tower, with curvilinear outline and a large bulb-like finial, which forms the crowning object in the remarkable pile of building, the Temple of Kandarya Mahadeo, of which we reproduce the illustration. This feature is found not only as the central object of an extended building, as in this case, but occurs also as a separate and isolated object. We called it "square" on plan, but in fact the central square form, marked by the four angles, is nearly obliterated in many cases by the adding of projections on each cardinal face, one upon another, from the angle to the centre, until the centre of each face almost appears the angle, and the plan is changed, in regard to its original lines, from a square to a rhomboid. Mr. Fergusson gives (p. 411) a comparative view of one of these towers (*devalas*) and of a Dravidian "rath," as illustrating the radical differences of the two styles; and it is highly interesting to compare with this the drawing of a modern *devala* on the following page, and notice how the same form of design has been developed with altered detail, and also how similar in its nature is the distinction between ancient and modern work to that which we have before our own eyes in comparing ancient and modern Gothic. But then in the restored elevation of the "black pagoda at Kanaruc" (p. 222), which, as far as we can understand (for the author is by no means clear here), is given as a characteristic form of Jaina building,* occurs this same form, which is at all events mentioned on the preceding page as "characteristic both of Hindu and Jaina architecture in the North of India"; and, if so, what becomes of the classification? As to the feature itself, it is sufficiently remarkable, and one to the origin of which Mr. Fergusson avers that he has given more thought than to any other feature of Indian architecture, but with no result; and he can only come to the conclusion that its origin was purely æsthetic, and that its genesis may yet be indicated by the discovery of older temples in regions at present unexplored. As it is, this feature of Indian architecture meets us continually in its complete form, with nothing to show through what stages it reached that form, and it must for the present remain in the category of unexplained puzzles, like the Irish round towers, to which (with that broad view of his subject which makes his writing so suggestive), Mr. Fergusson compares the Bengal devalas, remarking, also, that both these features in architecture "appear on the stage at about the same date, and both then complete and perfect in all their details." We can only add that we do not believe in the "purely æsthetic" origin of the Indian structure any more than the Irish one. We may add a word in regard to the illustration of a quite recent specimen of this style, the "tomb of Scindiah's mother," at Gualior (figured on p. 462), where the old curvilinear outline has given way to a straight-sided tapering form, more resembling the Mediæval spire,—a defalcation which Mr. Fergusson so pathetically laments that we wonder he does not call once more upon the English Government to use their influence in checking it. Yet, in concluding his notice of modern civil architecture in Northern India, the author comments on the inherent taste and love of beauty which enables a people "who are destitute of political independence, of knowledge, or power, to erect, even at the present day, buildings which will bear comparison with the best of those erected in Europe in the Middle Ages." He admits that personal inspection of these buildings is necessary in order to realise this; but we should like to know whether personal inspection has brought a single person besides Mr. Fergusson to the same conclusion. For the present, we must class such a remark among those unexpected outbursts of zeal for some special style which we constantly stumble upon in Mr. Fergusson's writings, and which interfere so much with their value from the standpoint of judicial criticism.

We have not space left at present to touch upon the Saracenic architecture of India, and its relation to the native styles, as treated by Mr. Fergusson; we may perhaps return to the subject on another occasion. We give further publication, however, to two of the most beautiful of the numerous illustrations of this part of the subject, that of the traceried window in a desecrated mosque at Ahmedabad, and two of the carved pillars from the Kiosk at Futtehpore Sikri; these latter, with their exquisitely wrought profusion of ornament entirely subordinate to symmetrical and well-designed general form, are to our eyes, we confess, a relief after the *outré* outline and spirit of Hindu architectural detail. We take leave, however, of Mr. Fergusson's work for the present with a renewed expression of appreciation of his labours in endeavouring to realise what he tells us has been with him the "long-cherished dream" of popularising and rendering intelligible the principles of Indian architecture.

* The order in which the animal forms are introduced in the friezes has evidently some meaning: always the lowest are elephant (or elephant-headed beings), the next lions, the next horses, the next oxen, and the fifth and highest birds. One cannot but be reminded, in looking at these bands of sculpture, of Tennyson's picturesque description of Arthur's cattle in one of the later *Idylls*, with its successive bands of sculpture representing the gradual suppression of beasts under the progressive civilisation of man.

* In the original "Handbook of Architecture" this illustration is appended to the chapter on "Northern Hindu Architecture"; in the present volume it is introduced into the "Jaina" chapter, but whether as belonging to that branch of architecture or not is not clearly stated. If we have misrepresented the author's meaning, we must be excused, on the plea that he is somewhat deficient in perspicuity in this and some other passages.

THE HUNGARIAN NATIONAL THEATRE AT BUDA-PEST.

If the erection of public buildings in Buda-Pest continues at the same rate as hitherto, the capital of the Hungarian kingdom ought soon to be one of the handsomest cities of the globe. In a recent number we gave an engraving of the new Opera-house in course of construction, and we now present our readers with the illustration of another stately edifice, lately completed there. The new theatre for the representation of pure national drama and popular farce (*Volkstheater*, "people's theatre," the Germans call it), was opened a few weeks ago for the first time, to an audience including the *élite* of society in the Hungarian capital; the court being present, together with the dignitaries of state and of the twin-city, men of letters and science, artists, and others. On the morning of the opening day the leading journals heralded the event as one highly important from a political point of view, and which would form a boundary-stone in the history of Hungarian nationality. This is, however, the fashion in Hungary. Everything concerning the Magyar nation more closely is looked upon as a matter of state, whether it be an important law or a native actor. There is, no doubt, much sense in this method; and, as far as the theatre is concerned, its political importance cannot be denied. The maxim that the theatre is an essential agent in popular education is incontestable, nor will the importance of the stage as an efficient means of ennobling and popularising a language be gainsaid by sensible persons. As a matter of fact, the erection of the new theatre was caused by political motives, and the manner of its origin throws an interesting light on the public life of Hungary. It may be asserted, having regard to existing facts, that the Hungarian National Theatre just opened has been literally created by the pen of a few young authors. The small but active coterie of young Hungary started the idea of a national theatre some years ago in the few journals at their disposition; spirited articles and invocations were written and disseminated; the national patriotism of the people was appealed to; and, as the sequence proved, not unsuccessfully. The collections in the country yielded a handsome sum; the city of Pest granted a site, which was sold very advantageously for half a million of florins. From the proceeds a much cheaper piece of ground was bought, and thus the means for building the new theatre were procured out of nothing. The literates who started the project may point with pride to the result; but the impoverished country has again proved that it spends the last penny if the aim is the advancement of national purposes.

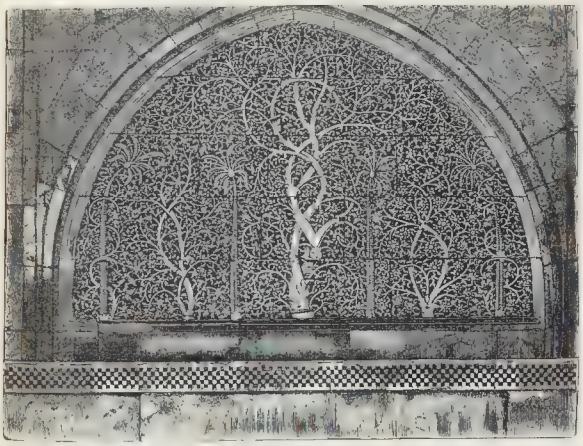
Thus much towards the history of the handsome theatre, the object of our illustration. Building operations were commenced in April, 1874, and in about eighteen months the edifice was completed. It was designed by a Vienna architect, Herr Fellner, jun. (the same who furnished the plans for the new Stadttheater of Vienna), and is erected in the Italian Renaissance style, free on all four sides, with its principal façade towards Kerepesch-street, one of the most frequented thoroughfares of the city. The substructure is of freestone, the principal façade having a pediment borne by six Corinthian columns, and surmounted by a group, Apollo and two genii. The sides, where are the carriage approaches, are embellished by strongly projecting risalites; and the fourth façade, towards the Ring-street, is also handsome in style. The entrance for the general public is from Kerepesch-street, through three doors opening into a spacious vestibule, from which are entered the pit and stalls, while to the right and left broad stairs lead to the galleries.

The auditory is arranged comfortably, and decorated handsomely, three Vienna theatres, the Opéra Comique, the Stadttheater, and the Theater an der Wien, having served as models. It holds 2,100 persons, distributed into 49 private boxes, 1,360 places for sitting, and 480 for standing. Acoustic and perspective qualities are excellent, thanks to the construction of the auditory in the form of an amphitheatre. There is not a place in the whole house from which every word spoken on the stage cannot be distinctly heard, or every gesture cannot be seen. As to ventilation, warming, and lighting, the latest improvements have been introduced, we are told.

The stage has seven rows of side scenes, and is, including the back stage, 120 ft. broad, and 82 ft. long. Round the stage, in six stories, are the dressing-rooms, the store and other rooms. Over the back stage are a large ballet-room, and a spacious painters' room.

Gift of a Recreation Ground for Reading. A special meeting of the Reading Town Council was convened for Tuesday last, the 25th inst., for the purpose of receiving from Alderman Palmer the gift of a large portion of the King's Meadow, which he has presented to the town for the purpose of recreation. By this generous act the area of the recreation-ground will be increased by as large an extent as already exists.

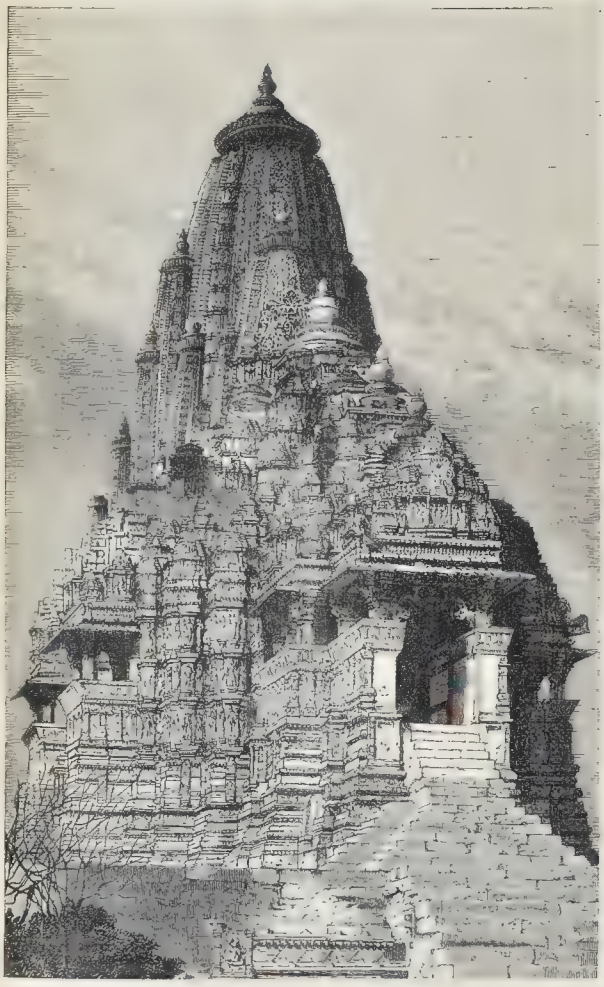
INDIAN ARCHITECTURE.



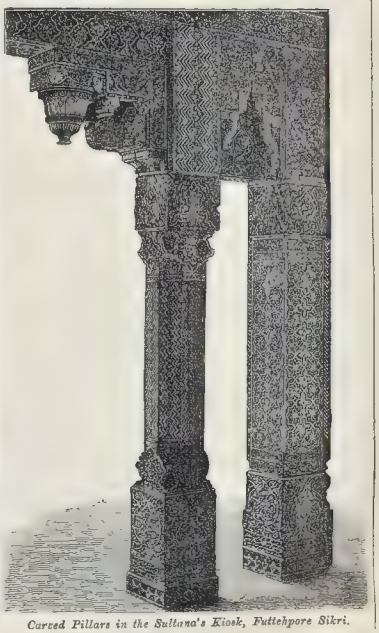
Window in Mosque at Ahmedabad.



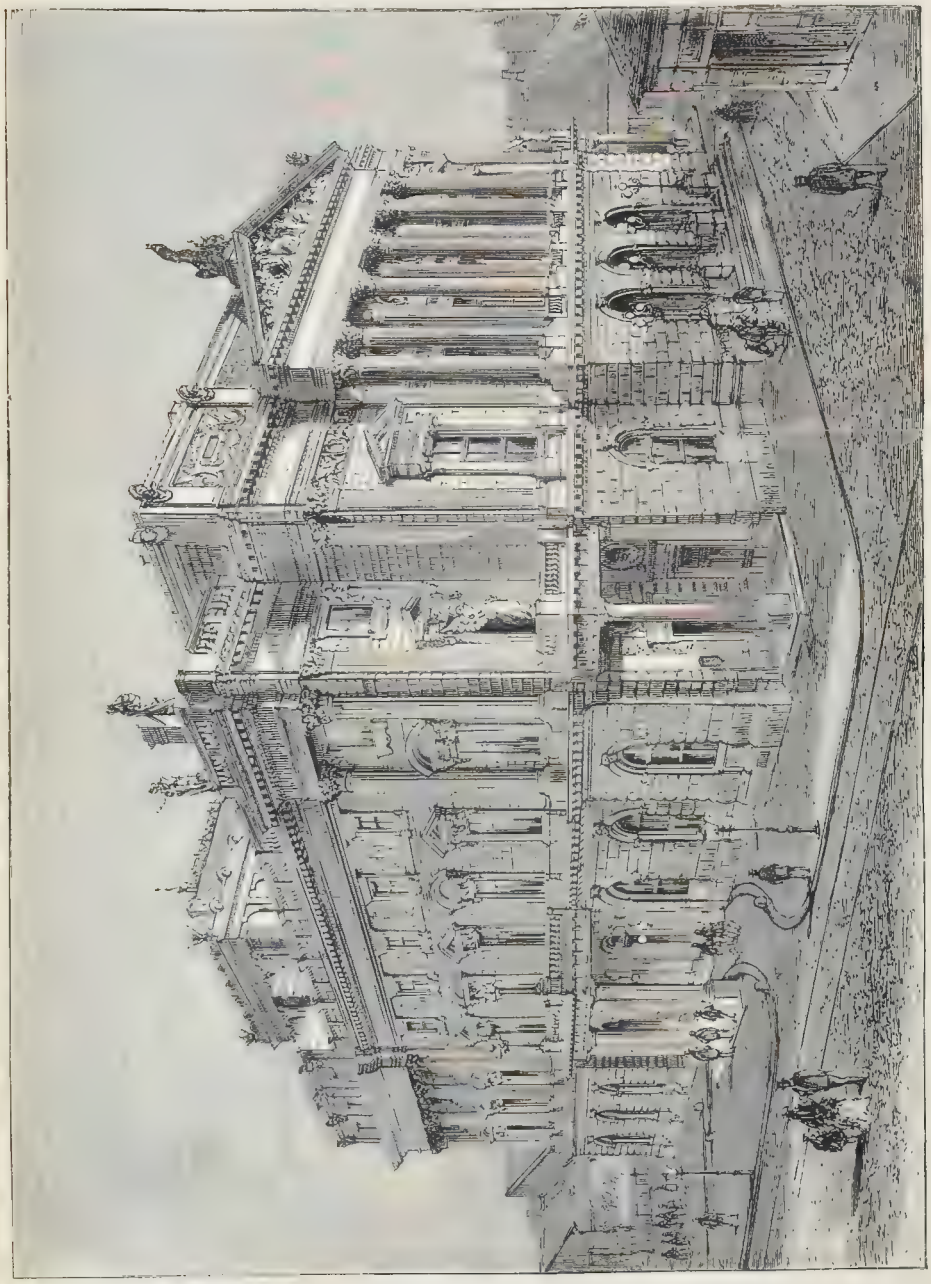
Compound Pillar at Vellore.



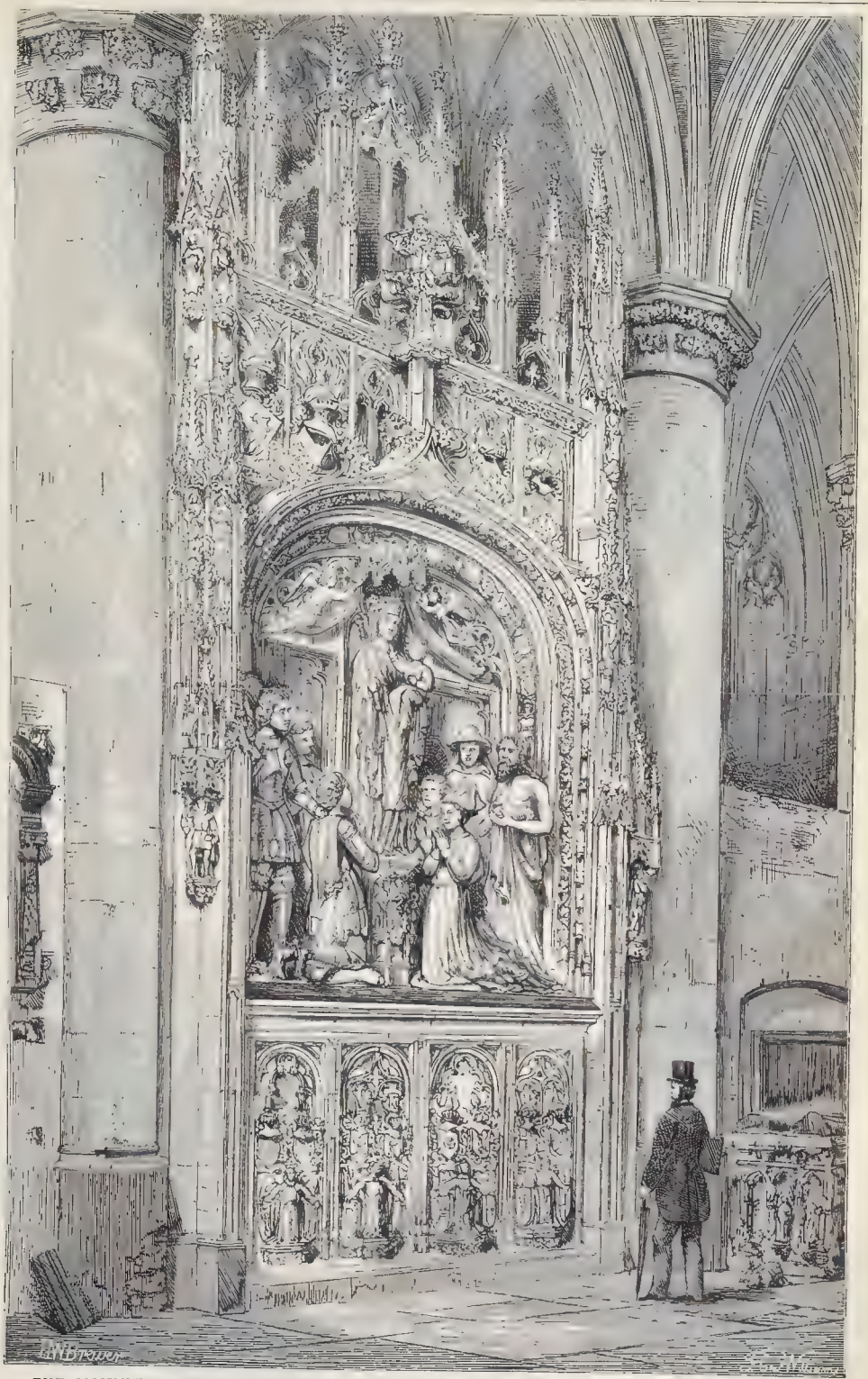
Temple of Kandarya Mahadeo, Khajurâho.



Carved Pillars in the Sultana's Kiosk, Futtehpore Sikri.



HUNGARIAN NATIONAL THEATRE, BUDA-PEST.—Herr Fellner, Jun., Architect.



THE MONUMENT OF ENGLEBERT III. AND JOHN OF NASSAU: BREDA CATHEDRAL, HOLLAND.
End of Fifteenth Century.

THE MONUMENT OF ENGLEBERT III.

BREDA CATHEDRAL, HOLLAND.

The family monument of Englebert III. and John of Nassau, of which we give an illustration, is without doubt the most remarkable of all the sepulchral remains in Holland, and has few rivals in Europe. This noble monument is placed in the north aisle of the choir of the former cathedral in Breda, with its back against the solid screen-wall, dividing the choir from its aisles. It is adorned with a great deal of sculpture of very remarkable excellence. The larger figures are rather above life-size, and are most masterly works, both for expression, "pose," and delicate finish. They represent John of Nassau and his wife, and Englebert III. and his wife, Count and Countess of Breda, together with their patron Saints, St. John the Baptist, St. Englebertus, St. Jerome, and St. George. In the centre is a statue of the Madonna,—this is modern, as the ancient one had been destroyed in the seventeenth century.

It is not possible to give the exact date of this monument. It might have been erected during the lives of Englebert III. or John of Nassau, or any time after their deaths. It is, however, undoubtedly a work of the very end of the fifteenth century. Unlike the other tombs in this church, it has escaped mutilation in a very wonderful way: it was probably respected because William of Orange was descended from the Nassau family, and what little restoration was required, which consisted chiefly in replacing the statue of the Madonna, has been admirably carried out under the direction of Mr. Cuypers, at the expense of the present Royal Family of Holland. There are many other interesting monuments in this church, and it contains two of the finest Flemish brasses in existence, but everything is in the most terrible state of filth, ruin, and neglect; in fact, the condition of the church is a national disgrace. The nave alone is used by the colonists, to whom it belongs, and the only use made of the noble choir and transepts, as far as we could discover, was to air the linen of the pastor and his family, as a very extensive line of very clean linen was suspended from one end to the other of the transepts. There was a very suspicious look in the choir, strongly suggesting the idea that the "wash" had absolutely taken place in this part of the sacred edifice!

We have described the noble tower of this church, and also the remarkable choir-stalls, in a former number. The new Roman Catholic cathedral at Breda,—the only other religious edifice of any importance in Breda,—has also been illustrated in this journal.

In our illustration the iron *grille* which protects the lower portion of the tomb is omitted, for the purpose of showing the original arrangement of that portion of the monument.

THE ART-UNION OF LONDON DISTRIBUTION.

The fortieth general meeting of the members of the Art-Union of London was held at Willis's Rooms, St. James's, on Tuesday last, for the purpose of receiving the Council's report, and for the distribution of the amount subscribed for the purchase of works of art for the year 1876. In the absence of the President (Lord Houghton) the chair was taken by Mr. George Godwin, F.R.S., one of the vice-presidents.

The report of the council, which was read by Mr. Edmund E. Antrobus, F.S.A., included the following passages:—

"To the local secretaries and agents, who, both at home and in the colonies, and foreign countries, represent the society, the Art-Union is, as always, greatly indebted. It is quite as much to the energy and tact displayed by these gentlemen, in recruiting the list of members, as to the character of the work to be given for the year, that the amount of the subscription-list is to be attributed.

In Barcelona, where commerce is so eagerly pursued that it might be supposed little room would be left for art, Mr. Jackson, our energetic representative, has, in five years, sent in upwards of 500*l*. Religious subjects, such as Hilton's 'Crucifixion,' and the 'Entry into Jerusalem,' and 'Christ led to Crucifixion,' have been there largely demanded.

The extent to which the Society's operations have been carried on in Australia and New Zealand is very remarkable; to Mr. Hawkes, of Adelaide, who is probably present on this occasion, a large amount of gratitude is due, he having contributed, by the admirably organised plan of sub-agencies in South Australia, 5,332*l*. to the funds of the Society. This gentleman having left Adelaide, has been succeeded by Mr. Fk. Wright, J.P., who has sent in above 640*l*. for the present year. The amount of subscriptions altogether received from Australia and New Zealand reaches no less a sum than 28,800*l*.

To Mr. Grindley, of Liverpool, who this year raised the list from 93 to 284; to Mr. Hassé, of Leeds; Messrs. Mawson & Co., of Newcastle; Mr. Sinclair, of Dundee; Mr. Jones, of Merthyr, thanks are due; in fact, the number of those of whom appreciative mention should be made is limited only by want of time.

During the past year four vacancies have occurred in the Council, by the deaths of Dr. Dickson and Mr. Broadwater; and the retirement, caused by impaired health, of Sir Digby Wyatt and Mr. Henry Baker. Dr. Dickson was one of the oldest members of the Council, and for many years a regular attendant at the meetings. He rendered especially valuable aid in the early days of the Society, by enlisting the services, as local secretaries, of a large number of gentlemen, in various parts, both of this and other countries, who took an interest in the advancement of art, of whom many are still actively employed in co-operating with the Council in the above capacity. By the retirement from active life of Sir Digby Wyatt the world of art has lost one of its brightest ornaments. His writings, not only on his particular branch of art, architecture, but on art in general, were numerous, and of the highest value. By his lectures as Slade Professor of Art in the University of Cambridge he added largely to his reputation.

To fill the vacancies thus caused, Mr. P. Cunliffe Owen, C.B., and Mr. George Hoperaft have been elected.

It will be remembered that, as the result of a competition for two premiums of 35*l*. and 15*l*., for designs for painting on pottery, two years ago, the first prize was awarded to Mr. R. Abraham. A tazza in porcelain, bearing the design thus acquired, has been admirably produced by Messrs. Copeland, and twenty of them will form part of the prizes to be allotted to-day.

Tazzas in cloisonné enamel, of original design by Mr. A. Gray, who obtained prizes for work of this kind at South Kensington and the Society of Arts, and carried out by Messrs. Elkington, being the first example of such work produced in England, will also be allotted to-day.

The accounts of the year have been audited by three members of the finance committee and by Mr. T. A. Somers Scott, of the Admiralty, and Mr. A. Le Cren, of the London and Westminster Bank.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report:—

Amount of subscriptions		£20,932	5 6
Allotted for prizes	£8,774 0 0		
Set apart towards providing works of art for accumulated payments	495 0 0		
For print of the year, almanack, exhibition, report, &c., and reserve	9,357 7 4		
		18,626	7 4
Agents' commission and charges, advertisements, printing, postage, &c.		2,305	18 2
		£20,932	5 6

The amount to be expended on prizes will be thus allotted:—

30 works at	£10	each.
30 "	15	"
20 "	20	"
20 "	25	"
20 "	30	"
20 "	35	"
14 "	40	"
12 "	45	"
10 "	50	"
6 "	60	"
6 "	75	"
4 "	100	"
2 "	150	"
1 work at	200	"
1 "	300	"

To these will be added:—

10 Bronze Statuettes, 'Cimabûé.'
30 China Tazzas.
1 Bronze 'Nelson' Column.
4 Bronze Townley Vases.
40 Enamel Tazzas.
40 Porcelain Statuettes, 'Net-mending.'
100 Statuettes, 'Whittington.'
160 Folios of Autotypes from the Society's Prints.
90 Volumes of Landscapes after E. W. Cooke, R.A.
30 Silver Medals of J. M. W. Turner, R.A.

These, with the prizes given to unsuccessful members of ten years' standing, will raise the total number of prizes to 951.

The reserved fund now amounts to 19,283*l*.

The engraving provided, according to our annual custom, for the coming year, differs widely in subject from those lately issued. The battles of Waterloo and Trafalgar, two of the most important, and most glorious, events in English history, possessed keen interest for all English-speaking people. The subject of the coming year's print addresses a far larger circle, it strikes a chord to which the soul of all Christendom must respond,—leading up as it does to one of the most important epochs of the Saviour's life on earth, the first occasion, namely, on which he appeared as something beyond 'the carpenter's son,' dwelling under a lowly roof in Nazareth. At the close of the scene selected by the artist for his picture, it is recorded, as the first instance of any peculiarity in the child's nature, that he was found 'sitting in the midst of the doctors, both hearing them and asking them questions.'

It was the custom of the Jews to repair, every year, to Jerusalem to be present at the great Feast of the Passover in the Temple, and hither, accordingly, came Joseph and Mary, and 'the child Jesus,' then twelve years old. It may be fairly assumed that this was the first time he had thus accompanied his parents in their annual visit, being previously thought too young to bear the fatigue of the journey—and to enter into the meaning of the ceremonial in which they came to join. The country being much infested by robbers, the people dwelling far from Jerusalem used to travel in large bands for mutual protection; and hence, the parents of Jesus, returning to Nazareth at the termination of the feast, not finding the child with them, would probably suppose that he was with some of their relatives and friends, and would not seriously regard his absence, until the time came for encamping for the night. On the next day they sought him 'amongst their kinsfolk and acquaintances,' and, not finding him, returned, on the third day, to Jerusalem 'seeking him.' It is this point in the narrative that the picture represents. Weary with the long journey over the hot plains of Palestine, Mary, resting her hand on the margin of the well, asks the women, who have come to fill their water-jars, for any tidings of her son, while Joseph, leaning on his staff, goes forward to prosecute the search. The figure of Mary is unsurpassed in loveliness and grace—the anxious inquiry expressed in her countenance, and the weariness of travel, are admirably rendered—and it will compare not unfavourably with the conceptions of Raffaelle himself. The subject has been most skilfully and effectively translated into black and white by Mr. Jeens.

The original oil-painting, for which the Society paid Mr. Armitage 400*l*., will be the chief prize in the distribution of next year.

The Art-Union has now completed the fortieth year of its existence, and it may be well to note in this place some two or three points which mark the progress of the arts in England since its establishment. Several are still members of the Council who were instrumental in laying down the first timbers of the vessel; its voyage has been an eminently prosperous one; though threatened at times with perils which required no small amount of firmness and judgment to weather; and it is not too much to claim for it the dissemination of a very large amount of appreciation of the beauties of art amongst those to whom it was previously a thing unknown, and, we hope, a better knowledge of the principles on which the excellence of works of art depend.

Forty years ago the enjoyment of works in sculpture, in painting, and engraving was confined to a few, and the public exhibitions of such works were small in number; and though many people used to visit the exhibition of the Royal Academy, it was, to a great extent, because it was the fashion. Any one who happens to overhear the remarks of visitors at any of the now numerous exhibitions, cannot fail to be struck by the greater critical insight they show into what constitutes the beauties or defects of a picture, than used formerly to be met with.

During the period of its existence the Society has distributed about 6,000 works in oil, water-colour, or sculpture, selected by the prizeholders for themselves from the public exhibitions, and besides the impressions of the annual print, issued in tens of thousands, there have been distributed copies of works of acknowledged excellence, some the production of modern artists,—others copied from antique examples,—in bronze or iron, 1,914; in parian, 8,953; in fictile ivory, 1,155; besides thirty copies each in silver, and many hundreds in bronze of the twenty-three medals produced for the Society.

Sir Digby Wyatt, in one of his Cambridge lectures, relates that Pamphilus, one of the most famous artists of Greece, in the time of Philip of Macedon, obtained, first at Sicyon, and afterwards throughout all Greece, the establishment of academies in which the children of freed men, evincing an aptitude for arts, were carefully taught.

Since the establishment of art-schools in this country, under the control of the Science and Art Department of the Privy Council, the progress in the education of the people in this direction has been remarkable, and in the last report of the Council it is stated that in the night-classes the number of students amounted to 21,861, and in the elementary schools 290,425 children were instructed. The total number of persons taught drawing, painting, or modelling amounting, in 1874, to 345,382.

An evidence of the capacity of our English art-students to launch into new modes of production may be cited in what has been called 'Lambeth Faïence.' A most interesting collection of original works in pottery designed by the directors and students of the Lambeth school of art has been for some time on view at Messrs. Howell & James's Gallery, in Regent-street.

The idea of educating the students in designing pottery arose with Messrs. Doulton, of Lambeth, who, admiring the industry and talent of the pupils under the able tuition of Mr. Sparkes, gave them free permission to visit their pottery and watch the work from the time it left the wheel till its final removal from the kilns. The pupils eagerly availed themselves of this permission, and they profited so thoroughly by the opportunity, that they now, in their own kilns, bake the productions of their own hands as skilfully as practised workmen, and have produced some vases, plaques, jugs, and ornaments that would not have disgraced the best days of Derby or Chelsea. At this carefully-managed school, in an obscure part of London, there has, indeed, suddenly sprung up a new and important branch of art, that will soon enable us to claim a rank among the inventors of pottery, and prevent the constant recurrence to the trite types of Henry II. and Palissy. The French, who look on the English workman as slow in receiving new ideas, would be astonished to see how quickly young inexperienced girls and rough workmen have learned the difficult and tedious processes of pottery.

A symptom of the improved state of art in England may be discovered in the fact that, last year, for the first time, the Royal Academy considered the works produced by its students, in competition for medals and other rewards, to be of such a degree of merit as to deserve public exhibition. These were, consequently, on view in the galleries of the Academy, and many were of undoubted excellence.

The Council, always anxious to give encouragement to rising talent, thought the statuette, by Mr. W. H. Thornycroft, of 'A warrior bearing from the battle-field a wounded youth,' to which the gold medal was awarded, so good, that, they have entered into a negotiation with the author for its purchase, and a reduced copy in bronze is being prepared, and will be included in the list of prizes of a future year.

There are several other subjects on which, did time permit, remarks might be appropriately made in this report.

The great Exhibition at Philadelphia promises to be one of the most extensive and important of these undertakings hitherto attempted.

But a short time since France was supposed to be so utterly broken in strength and resources that many years must elapse ere she could recover from the depth of misery in which the war had left her; but so great is the recuperative power of that great country, so self-denying and saving are her citizens, that, already recovering from the payment of an enormous idemnity, she finds herself in a position to invite the world to hold a great Exhibition in Paris in 1878."

The Chairman, in moving the adoption of the report, said he greatly regretted the absence of Lord Houghton, the president, but after having given the Art-Union of London such aid as was in his (the Chairman's) power during half a lifetime, it was not for him to decline the invitation which had been given him, however suddenly, to

take the chair upon that occasion. He must congratulate the meeting most heartily upon the remarkable report which had just been read, showing as it did the most extraordinary subscription of close upon 21,000*l.* To those three or four gentlemen who remained of the original founders of the Association the report must be especially gratifying, as it not only proved the soundness of their views and the wisdom of the arrangements they then made, but evinced the great favour with which the public had viewed their labours. There was no occasion now to apologise for or to "justify" the Art-Union of London, although there had been times when such justification appeared to be necessary. The Society had spread a taste for art far and wide, and had given the means of refined enjoyment to hundreds of thousands of persons. It had established a sort of holy brotherhood of art, extending all over the world. These were not mere words, but positive facts, in proof of which he might refer to its latest acts,—the distribution of those two noble prints of the noblest pictures painted in England in modern times ("The Meeting of Wellington and Blucher after the Battle of Waterloo," and "The Death of Nelson"), which had been hung, through the organisation of the society, in palace or cottage, in almost every country in the world where English men and women were congregated together. Now, the organisation which brought all this about was no trifle, and entailed much anxious labour on the part of the Council and officers. Each of these prints occupied seven or eight years in engraving, and cost thousands of pounds, and it should be recollected that when the orders for these works were given, the Council had not one sixpence of the money which was ultimately to be paid by the subscribers who were to receive the prints. It was true that lately, by means of the wise arrangements of the charter, the reserve fund now rendered the Council free from any responsibility. But in earlier times, when the Council gave large commissions in advance, they had no security that the public would subscribe for the prints when ready for issue. He need scarcely say that if the prints lately issued by the Art-Union were issued by an ordinary publisher, four or five guineas at the least would be the price asked for each, yet, by association, every subscriber of a guinea was able to obtain a copy, and, moreover, there was a surplus of 8,000*l.* or 9,000*l.* to be devoted to the purchase of pictures and other works of art to be drawn for, each subscriber having an equal chance of obtaining a prize. A more striking instance of the power of co-operation could scarcely be mentioned. The report had referred to the advantage, necessarily, of pure pleasure, over the debased, and he had a very strong notion that in this country the value of the provision of means for amusement and for delight was scarcely sufficiently recognised; certainly the value of art was not recognised by our Governments as it should be. There were many of our towns the dulness and gloom of which were past belief, and in which there were few opportunities for pure enjoyment; and human nature was such that if it had not pure enjoyments it sank to those of a debasing kind. It could hardly be questioned that what were called "the ruling classes" as a rule failed to recognise the exercise of art as a part of the requirements of the nation. Indeed, the ignorance often displayed even by educated men on art matters was something extraordinary. There were many points in the report which would serve as texts for observations, but inasmuch as the drawing for the prizes would take some time, he would conclude by again congratulating the meeting upon the success of the Society's operations for the past year, and by moving the adoption of the report.

Professor Donaldson, in seconding the motion for the adoption of the report, said he also must congratulate the meeting on the fact that the members had this year subscribed the large sum of 21,000*l.* for the promotion of art, and when it was remembered that the previous year's subscription was a little above 18,000*l.*, the increase upon that large sum was very gratifying, and showed that the print of "The Meeting of Wellington and Blucher," issued last year, had met with the approval of the public, whose satisfaction would be still further increased by the issue of the plate for this year, "The Death of Nelson," several thousand of which had already been delivered to the subscribers. He had no doubt whatever that the confidence now felt by the public in the society would continue to be maintained, and that future years' operations would be attended with still greater success. The Council had been strengthened by the accession of Mr. Samuel Smiles, the author of "Self-Help," whose good advice might be profitably borne in mind by all young men who were striving to attain excellence in their respective walks of life; and, more recently, by the accession of Mr. Cunliffe Owen, the director of the South Kensington Museum, who was respected throughout Europe for his knowledge of art matters. One of the most valuable as well as one of the most recent of his acts had been the issue of a series of penny handbooks to the Kensington Museum. These handbooks, which were thirteen in number, were beautifully illustrated, and were eminently calculated to impart to the visitors to the museum much valuable information on art subjects. He would advise those who were fortunate enough to obtain the privilege in the prize drawing to select such objects of art as would not only be pleasing to themselves and in accordance with their own tastes, but which would be valuable heirlooms for their descendants.

The motion for the adoption of the report was then put, and carried unanimously.

Mr. James Hopgood moved the following resolution:—"That the warm thanks of the meeting be given to Mr. Lewis Pocock and Mr. Edmund E. Antrobus for their continued efforts for the advancement of the prosperity of this society; and to Mr. Watson, for the able assistance he has rendered them in the discharge of their anxious duties."

Mr. J. W. Butterworth seconded the motion, which was carried unanimously.

Mr. Godwin having to leave before the end of the proceedings, the chair was taken by Mr. Samuel Smiles, a vote of thanks being (on the motion of Sir Walter Stirling) accorded to Mr. Godwin. The drawing for the prizes then proceeded, and at the close of the meeting votes of thanks were tendered to the scrutineers and to the ladies who had assisted in the prize-drawing, and to Mr. Smiles for presiding over the after-part of the meeting.

The following is a list of the principal prize-holders:—

300*l.*—Thomas, R. G., Unlay, S.A.

200*l.*—Stiles, H., jun., Wood-green.

150*l.*—Baker, J. T., Tunbridge; Bass, Mrs., Burton-on-Trent.

100*l.*—Careless, R, Chippenham; Esst, J., Silchester-road; James, G., Morley's Hotel; Smith, J., Swaffham.

75*l.* Brauug, A., Crefeld; Barton, F., Croydon; Lauit, A., Angaston, S.A.; Morgan, Mrs., Camden-road; Reu all, G. A., Old Broad-street; Stokes, H., Lombard-street.

60*l.*—Abbott, E., San Francisco; Calland, J., Cheltenham; Lloyd, Mrs., Chiswick; Miles, Sarah, Newport, Mon.; Robinson, Mrs. A., Cambridge; Taylor, A., Ca par.

50*l.*—Barrett, G., Bromley; Calvert, F., Camberwell; Cooper, F. W., Akroyd; Fuchs, F. W., Frankfort; Patterson, A., Longton; Shears, J., Woking; Taylor, T., Newport Pagnell; Warner, Gen. D. B., St. John; Wilson, Rev. Dr., Dundee; Wormull, A., 31, Stamford-street.

45*l.*—Blackburn, A. L., Port Elizabeth; Bourne, —, Kinlet; Cresswell, O., 50, Pall-mall; Dodgson, G., Adelaide; Evans, F., Abbey-road; Mason, J., Hull; Mills, Edw., 4, Whitehall-place; Myers, W., Skipton; Nunn, T. W., Lamb's Conduit-street; Robinson, G. A., Hobart-town; Taylor, W. Stratford; Wright, A., Ngaszaki.

40*l.*—Anthony, J., Adelaide; Brymer, W., Cornhill; Edwards, J., Eastbourne; Green, G., Hendon; Godfrey, Robt., Fleet-street; Hawkes, J., Ely; Joly, F., Smyrna; Jones, R. P., Abergele; Killer, J. E., Knaresboro'; Menshausen, —, Berlin; Smyth, F., Birmingham; Symes, B. B., Ottawa; Terrett, C., Norfolk-terrace; Wood, A. P., Beeston.

35*l.*—Air, A. C., Kennington-park-road; Barcelona, 7*s*; Boultbee, Rear-Admiral E. M., Hants; Curtis, R. L., Plaistow; Drake, E., Hornsey; Durham, J., Great George-street; Edwards, W., Great Sutton-street; Gerson, F., Frankfort; Hesaa, E., Tacna; Hewlett, —, Broad-street-hill; Jackson, Ed., Kentish-town; Mackenzie, R., jun., West Smithfield; Mills, G., Chigwell; Pratt, Mrs. S., Hugh-street, S.W.; Rayner, N., Fetter-lane; Solomon, S., Cape-town; Williams, A., Liverpool; Williams, C., Haverstock-hill; Wing, T., Upper Tooting; Wright, A., Newport, Monmouthshire.

30*l.*—Barcelona, 9; Bowman, G. C., Greymouth; Chandler, R. D., San Francisco; Collett, T. W., Leadenhall-street; De Carvalho, J., jun., Lisbon; Ebbage, W., Halesworth; Foster, F., 50, Baring-street; Garcia, J., Derby; Godfrey, G. W., Fleet-street; Harris, S., Oxford; Hawkins, J. J., Manchester; Kitchen, H. H., Bow; Lemon, J., Quebec; Manuel, Mrs., Chelsea College; Milbourn, T., Bishopsgate-street Within; Moore, E. W., Colesbill; Rorke, J., Parliament-street; Vinter, C. A., Cambridge; Watson, W. W., Glasgow, Way, Hon. J. S., Adelaide.

25*l.*—Allan, G. W., Addington-road, Bow; Barcelona, 9*l*; Bedwell, Miss A., Chilworth-street, W.; Brooks, H., Darlington; Campling, J., Lamb's Conduit-street; Cartwright, W. J., Bordeaux; Callis, Rev. H., Maidstone; Davies, Robt., Port Elizabeth; Davis, N. N., Kilburn; Feodick, P., Rochester-square; Hawkins, H., Preston; Hick, C., Kippax; Leonard, J. H., Campden-hill-gardens; Maddox, J., Hampstead-road; Norman, N. D., Unlay, S.A.; Pincott, F. R., Geelong; Roumieu, R. L., Lancaster-place; Smith, A., Lanark; Swan, J. Lincoln; Toole, H., Dublin.

20*l.*—Anstey, T., Coventry; Blackman, —, Sydney; Carpenter, Rev. J., Bournemouth; Davidson, A., Geelong; Desbois, D., Grays-inn-passage; Dunn, E. H., Blackheath; Embrough, A., Highgate-road; Fallows, F., Middlesbrough; Harris, T., Douglas, Isle of Man; Hawkins, J., Manchester; Horn, W., Nottingham; Mitchell, H., Wigton; Morrison, G., Roehampton; Rein, F. C., Strand; Sewell, W. H., Buckhurst hill; Sheppard, —, St. Paul's Churchyard; Strugnell, G. F., Oxford-street; Thomas, A., Hall-green; Tindall, J., Hastings; Turner, G. R., Langley Mills.

15*l.*—Austin, F. C., Ketchowla, S.A.; Bailey, E., Yorktown; Beard, F., Wanstead; Blane, T., Blackpool; Crockford, F., Sydenham; Elliott, G., Deniliquin; Evill, H., Ladbroke-road; French, G., Peckham; Giles, —, Southgate; Gooch, J. H., Hoddesdon; Green, W. J., Sydney; Guy, H. J., Portsmouth; Hoeningbaus, R., Crefeld; Jones, A., Euston Station; Jones, W. E., Union Bank; Lickfold, C., Hoxton; Messenger, S., Birmingham; Parry, T., Oxford-terrace; Pitts, —, Clapham-road; Sandeman, Mrs, Slough; Smith, J., Whitcombe-street; Sumner, Rev. J., Tring; Weatherley, A., Hornsey-road; Wetherby, W. P., Dalston; Whittington, W., Neath; Wilson, Sir J. M., Hobart Town; Wincer, T., Walsall; Wiltshire, H. H., Denmark-hill; Woodgate, A., Charles-street; Wright, C., Maidstone.

10*l.*—Abraham, H., West Brompton-road; Arrowsmith, J., Bristol; Bain, W. S., Cheltenham; Bennett, R., King William-street; Brinton, W. J., Birmingham; Cock, A. H., Stourport; Copeman, C., Liverpool; Cragge, T., Gateshead; Daziaro, Lower Richmond-road; Davidson, J. W., Newbattle; Davison, H., Oxford-gardens; Dymond, J., Brierley; Gradon, J. G., Durham; James, G., Morley's Hotel; James, J. P., Natal; Josephs, E., New Bond-street; Habershon, W., Bloomsbury-square; Hearne, J., Bristol; Holt, C. W., East Croydon; Killinge, J. H., Oakham; Kirlew, D., Beckenham; Kbyl, C., Aarhuus; Leng & Co., Strand; M'Gaw, J., Hay, New South Wales; Melvin, W., Aberdeen; Mitchell, W., Newcastle-on-Tyne; Roberts, E., Portmadoc; Taylor, C., Tottenham; Thurston, R., Strand; Waghorne, A., Glasgow.

A bronze Statuette, "Cimabüé."—Birch, C., Monmouth-road; Boristo, G. R., St. Colomb; Levy & Co., Hull; Lousby, P., Stockwell-road; McQueen, Mrs. J. H., Goldhawk-road; Morris, R., Sutton; Spreadbam, B., Moffat; Theobald, J. H., Great St. Helen's; Thomson, J., Belfast; Woodrough, J., Euston-road.

A copy in bronze of the Nelson Column.—Morris, H. M., Swansea.

Copy in bronze of the Townley Vase.—Bailey, J. H., Oldham; Bonner, A., Gloucester; Courtney, R. A. St. John's; East, John, Litchester-road.

A China Tazza.—Adams, J., Southampton; Ashton, J., Adelaide; Beard, N. F., Millwall; Bell, J., Victoria; Bell, T. C., Caversham-road; Birchall, —, Kidderminster; Bristowe, R. H., Stock Exchange; Bulk, C. P., Adelaide; Clark, Major-Gen., Uckfield; Cockburn, J., jun., Kensington; Ewens, B., Gloucester; Hobson, T., Tokenhouse-yard; Kennemeyer, H., Barghersdorp; Knox, Samuel, Natal; Lewis, P., Cornhill; Oldham, —, Melton Mowbray; Peacock, T. F., Mornington-crescent; Peel, F. W., Regent-street; Pilkington, J., Leyburn; Pokorny, A., Fish-street-hill; Smith, C. F., Liverpool; Sneed, T., Walsall; Straight, H. G., Tales-hill; Stevens, W., Brewer-road; Stubbs, T., Liverpool; Tatham, R. G., Poplar; Warburton, W., Wrexham; Ware, C. W., Crystal Palace; Wilcox, C., Stony Stratford; Williams, J., Bodfary.

ONYX AS A DECORATIVE MATERIAL.

MR. EASSIE, C.E., lately read a paper at the Society of Arts "On the so-called Deposits of Onyx near Mexico, and their Value as a Decorative Material in this Country." There were exhibited on the table many beautiful specimens of the onyx of Mexico, which, it was stated by the author of the paper, had brought him, after careful comparison with similar materials from other lands, to the conclusion that there had been discovered for the use of the nineteenth and succeeding centuries a material which had never been eclipsed in point of natural magnificence. After an elaborate description of the precious stone called onyx as a stalagmitic deposit, the paper said that a material similar to that which was exhibited on the table had been used as a decorative material from the very earliest times, of which fact many historical instances were given in the paper, as well as a description of the nature and manner of dealing with the stone in bygone ages. The paper then quoted a variety of statistics in reference to the quantities and the prices of the onyx that was used. The reader of the paper remarked that the application of this substance had not hitherto been very extended, owing to the fact of its recent introduction to Europe. After enumerating a few of the functions out of many in architecture which such a material as onyx might well perform, Mr. Eassie, in conclusion, said that "the true position of this beautiful stranger amongst us is to heighten the duller charms of our own natural materials, and to relieve us from the abominable iteration of marble slabs, here, there, and everywhere,—pillars of granite to right of you, pillars to the left of you, and tiled walls and floors, upstairs and downstairs, and in my lady's chamber."

Eastbourne Pier.—The directors of the Eastbourne Pier Company have accepted the tender of Messrs. Phillips & Son, of Westminster, for the execution of the works in connexion with the widening of the pier, as resolved upon at the extraordinary meeting of the shareholders held a short time since. The contract price is 2,400*l.* The works will be proceeded with at once.

TOUR IN ITALY,

WITH REFERENCE TO THE PICTORIAL ART OF POMPEII AND ROME.*

I found that the few days I had spent in Rome, previously to visiting Naples and its neighbourhood, were of great use to me, as I acquired a knowledge of various points in the decorative styles of a similar period, which gave me an opportunity of comparing notes between the systems of ancient Rome and Pompeii.

On my return to Rome I studied with much care and interest the examples of decorative art as seen in the remains of the Baths of Titus, the decorated (underground) apartments in the palace of the Cæsars, and the frescoes found in the catacombs, now preserved in the Palace of the Lateran, all of which are of great importance in an artistic sense, apart from their historical or antiquarian associations. The decorations of the baths and the underground chambers alluded to are of the very highest order of Grecian art, and from the spacious dimensions of the places in which they are executed, they not only exhibit a greater effect of grandeur and magnificence, but they also show a superiority of design and artistic performance much above anything of the kind I witnessed in Pompeii. And it adds to their interest when we know that they were the source from which Raffaelle obtained the ideas which, when elaborated and matured by his genius, he brought under the notice of his munificent patron, Leo X, and advised the adoption of this mode of decoration as being the most suggestive and appropriate, and being cordially approved of, it was applied for the embellishment of the loggias of the Vatican,—the most gorgeous and complete palace in the world in point of ornamentation and internal arrangement.

Here we can see how Raffaelle rendered this system of decoration, in its relation to the highest style of pictorial art, consistent and serviceable. His grand Scriptural subjects are introduced as centre-pieces, from which radiate in the most pleasing and graceful manner the beautiful forms and rich colouring of the Greco-Roman period. Indeed, Raffaelle found the harmony of the decorative and pictorial so perfect that, in these loggias and other examples we have of his work, we see the system carried out with the energy and success which this great master imparted to all his works.

The magnitude and strength of ancient Rome can be best realised in the presence of such works as the Cloaca Maxima and the Mamertine Prison. They were constructed six centuries before the Christian era. There is also at the mouth of the Cloaca Maxima, on the left bank of the Tiber, the remains of a quay, built about the same time. It was used for landing the huge blocks of marble employed in the construction of the palaces of the early rulers of the city. The first two structures referred to,—that is, the Cloaca Maxima and the prison,—being underground, may to that circumstance owe their present state of preservation, as the destructive ravages of the ruthless invader have levelled many a stately monument and noble building, and caused more devastation than even the unsparing hand of Time; but being out of sight, these works have passed unharmed through the general ruin and desolation which it has more than once been the fate of the city to endure.

The Cloaca Maxima is built in the massive style of the Etruscans. Large blocks of lava are laid in courses, and the solidity of the work is amply testified by its immunity from the effects of earthquake and natural decay. And I venture to observe that in Rome there is no object of antiquity more suggestive of the wisdom and skill of its builders than this. It performs the same functions now, and in as complete a manner, as it did twenty-four centuries ago. Volumes of water rush onward through it and fall into the Tiber, just the same as when Imperial Rome was at the apex of power. All the additional demands on its capabilities and capacity, arising from increase of population and other causes, have been fully met. The Mamertine Prison is also rendered interesting from its great antiquity. It is alluded to by Juvenal, who, when describing the happy state of Rome, mentions it as the only prison required. In construction, these dungeons resemble in some measure one or two examples in this country, such as are met with at Crichton Castle and elsewhere. The chambers are placed one over the other, the under one being of an arched shape, and the only means of ingress and egress consists of an aperture in the centre of the roof, through which the unhappy victims were precipitated. Both places are without light, as they are cut out of the solid rock; and the walls are formed of large blocks of masonry laid on each other without lime or cement. St. Peter is said to have been confined in the lower cell; and a pillar is pointed out as the one to which he was chained.

Immediately on emerging from those dark abodes of despotic cruelty, we come upon all that remains of the magnificent Forum Romanum. It was here that those mighty in war and wise in council met for consultation and advice; and on this spot the laws and literature which we even now enjoy had their birthplace. It is with no ordinary feelings of emotion that one looks on these monuments of a people whose arms laid under tribute every nation in the then known world. Their grandeur testifies with silent eloquence to the greatness of their founders. The very pavement is invested with a degree of veneration; for upon these stones the sandalled feet of the Cæsars have doubtless trodden, and perchance the brave but defeated chieftain of our own race may have passed along in the triumphal procession of his conquerors. The ruts made by the chariot-wheels of these mighty warriors seem to take us back to the time when, in the place of the silent ruins now visible, the splendid architectural features of the Forum were surrounded on every side by beautiful temples, and busy with the passing forms of the noble and learned of Rome. In the immediate vicinity are the ruins of the temples dedicated to the deities of their mythology, and the Forums of Cæsar, Augustus, and others, all sacred from their association with the past. If anything could add to the classic celebrity of the scene, it is the romantic shade of the Tarpeian Rock. The wonderful cluster of magnificent buildings surrounding the Capitoline Hill afford ample evidence of the height to which art in Rome had reached. Their beauty of design and chaste harmony of detail prove the perfection which had been acquired when these edifices were erected. This fact is all the more apparent when, on leaving the Forum, we wend our way towards that monument of Rome's power and grandeur, the Colosseum, which, as an example of architectural magnificence, alike in conception and execution, stands unrivalled. The building appears to be in excellent preservation, except those portions which have been destroyed by the removal of the materials, which were taken to construct the palaces in the neighbourhood. In the interior, in consequence of the accumulation of water in the arena, it has been found necessary to erect arched vaults, so that the original floor is quite hidden from sight.

In the presence of the Colosseum you are conscious that, notwithstanding its extent and beauty, it has been the turning-point from which the downward career of Rome may be traced. It certainly marked a debasing tendency in the sentiments of the Roman people to subvert the efforts of such noble genius as is here displayed for the purpose of producing a building for the brutalising and inhuman exhibitions therein represented. As it now stands, the Colosseum remains as a monument of the dead past, and an unhappy memorial of the thousands who found a tomb within its faded walls.

We now turn to one of the most handsome and perfect examples of Greco-Roman architecture in existence. When we stand before the Pantheon we are enabled to realise the complete embodiment of ancient thought. If these reflections occur while looking at the exterior of the Pantheon, how much deeper is the impression conveyed when we enter the sacred edifice and behold the wonderful harmony of its proportions. It is, indeed, difficult to conceive the fact of its remote antiquity compared with its present aspect. The niches now forming the recesses for altars of the Romish faith were originally filled with statues of the gods and goddesses of the pre-Christian era, supplying perfect examples of Grecian sculpture. This was an art in which the Greeks excelled. They clothed their ideal forms with the God-like, and gave a beauty and individuality to all their productions, embodying an intellectual expressiveness well fitted to excite the religious sentiment and reverence of the people, the ceiling being formed by a dome of the most elegant proportions, in the apex of which there is a circular aperture 28 ft. in diameter. This is the only source for the admission of light, but being open to the heavens, it also admits the heavy rains which, as I formerly observed, are peculiar to Southern Italy. Consequently, the pavement at times assumes the appearance of a miniature lake. The floor is paved with porphyry, laid in alternate squares, with variously coloured marbles, mosaiced alternately in squares and circular slabs. There is a slight fall towards the centre, in which is placed an opening for carrying off the water. It is worthy of remark that, notwithstanding the wear to which it has been subjected by the successive generations of Pagan and Christian worshippers who have assembled here, the marbles of the floor are as firm and compact as when originally laid in their places. The walls are covered with marble. The cornice is of the same material, beautifully wrought in scroll work. Four columns of Giallo-Antico marble define the recesses in which the altars are placed; they also support a gallery which passes round the building.

The Pantheon acquires, if possible, additional interest from the fact of its having been selected as his last resting-place by the immortal Raffaelle, whose remains are placed under the third altar to the left of the entrance. This altar was endowed by him, and is adorned by a statue of the Madonna designed by himself, but executed by his companion, Lorenzo Lotto.

Having indicated in this slight sketch the manner in which the ancient Romans embellished their temples, I shall now pass to the style adopted for the display of their luxuriousness in the architecture and decoration of those splendid resorts of amusement and pleasure for which they were also famous. We have a magnificent example of this in the Baths of Caracalla. The circumstance of their being capable of affording ample accommodation for sixteen hundred persons enables us to form some idea of their extraordinary extent. The floors are paved with rich mosaics, executed in marble. The roofs have fallen to the ground, but portions are raised sufficiently to show that they were wrought in white and black marbles, with handsome designs, also in mosaics. The walls are treated in a similar style. The great hall must have been of singularly noble proportions, and presented a magnificent spectacle, with its rows of marble columns, between which were placed statues on pedestals. And the character of these sculptures may be inferred, when we learn that the famous "Farnese Bull," "Hercules," "Flora," and others,—which I have already described in connexion with the collection in Naples, of which they now form part—were discovered here, as were also numerous bas reliefs and other art treasures, all of which assist in conveying to our minds a perception of the vast wealth of the Romans; and with reference to this I cannot refrain quoting the words in which the historian Ammianus Marcellinus graphically describes contemporary scenes he witnessed. Speaking of them he says:—"The nobles measure their rank and consequence according to the loftiness of their chariots, and the weighty magnificence of their dress. Their long robes of silk and purple float in the wind, and as they are agitated by art or accident, they occasionally discover the undergarments, the rich tunics embroidered with figures of various animals. Followed by a train of fifty servants, and tearing up the pavement, they move along the streets with the same impetuous speed as if they travelled with post horses; and the example of the senators is boldly imitated by the matrons and ladies, whose covered carriages are continually driving round the immense space of the city and suburbs. Whenever these persons of high distinction condescend to visit the public baths, they assume on their entrance a tone of loud and insolent command, and appropriate to their own use the conveniences which were designed for the Roman public. If in these places of mixed and general resort they meet any of the infamous ministers of their pleasure, they express their affection by a tender embrace, while they proudly decline the salutations of their fellow citizens, who are not permitted to aspire above the honour of kissing their hands or their knees. As soon as they have indulged themselves in the refreshment of the bath, they resume their rings and other ensigns of dignity," and so on.

I now come to the period when, in consequence of the rise and spread of Christianity, and the extinction of Paganism in Rome, the ancient temples fell into disuse, those only being retained which were found suitable for conversion to the requirements of the changed circumstances. And it is to the fact of its early adaptation to the purposes of the new faith that the Pantheon owes its present state of high

* By Mr. Thomas Bonnar. See p. 382, *ante*.

preservation; for, like all zealous converts, the enthusiastic disciples of the now dominant religion were, by the strange inconsistency which prevails on such occasions, as sincerely anxious to obliterate and destroy the emblems of their former belief, as they had hitherto devoutly respected and venerated them. They earnestly sought to banish all traces which could be identified with their former mode of worship, and so render it impossible to be revived. The basilica was adopted as the earliest type of ecclesiastical architecture by the fathers of the Church.

In Rome there are five great and eight lesser churches, built in the basilica form, and although all partake of a similarity of design, yet there is in each sufficient distinctness and variety of detail to make them individually interesting and, instructive studies to the architectural student. Indeed, they are perfect museums of art, and like beautiful thoughts, they become absorbed by the mind, suggesting matter for pleasurable and profitable meditation, even when far distant from them. * * * *

On entering the church of San Pietro in Vincoli I experienced sensations of real pleasure. Here a harmony of purpose is carried throughout, producing a feeling of repose, and inspiring sentiments of deep religious veneration, unbroken by even the most trifling jarring effects. But, overlooking architectural and other attractions, I hastened with eager step to seek the great masterpiece of the great master, the statue of Moses, by Michelangelo. It occupies a position just behind the last column to the right, adjoining the altar. A feeling of joyful surprise was followed by an emotion of awe as I gazed on this sublime conception. Nothing in marble preserved to us possesses such an amount of physical and intellectual power as this famous statue embodies. Michelangelo in this work realises the idea of a God-like man,—one worthy of being divinely commissioned to reveal the laws of God to men.

Of course, the great centre of interest and attraction to the visitor in Rome is the Church of St. Peter. It was the third day after my arrival that I enjoyed the much-longed-for gratification of standing under the shadow of the great St. Peter's. You enter its noble portico, the leathern screen is drawn aside, and you stand within the walls of that temple of temples. Here is the fountain-head of Christian idealism, the centre from which ecclesiastical power radiated throughout the civilised world, and in the face of all difference of creed must always command a certain amount of reverent respect, independent altogether of its artistic merit. To almost every one both the outer form and interior features of St. Peter's are more or less familiar, from pictorial representation and graphic description; but no description can convey to the mind the perfect harmony and completeness of design which, in gigantic scale, is here carried out.

Michelangelo boasted that he would crown St. Peter's with the Pantheon; and he has succeeded in not only fulfilling his promise, in making the cupola of St. Peter's an exact counterpart of the Pantheon, but also in enlarging its extent. The diameter of the dome is 139 ft., and the height from floor to roof is 405 ft.; and although of such enormous magnitude, every detail is so thoughtfully and carefully managed that there is no sense of harshness in any of the parts. Another peculiarity of the building is worth noting. I refer to the equable temperature maintained at all seasons in the interior. In the heat of summer and the depth of winter it is the same; although there are no artificial means adopted to attain this end. I suppose this arises from the immense space being once filled by a volume of air, it would be a long time before external influences would affect it; and the ventilation seems to be as perfect as everything else is in connexion with this building.

Leaving St. Peter's, and proceeding towards the Vatican, you soon reach the entrance of the grand staircase leading to the famous palace of the Popes. Passing up the noble staircase, we reach the door of the Sistine Chapel. On entering this celebrated chapel we have another grand example of the gigantesque in art. We are instinctively conscious that the same mind and hand which conceived and fashioned the representation of the god-like figure of Moses, and whose immortal genius had reared the noble temple we had just left, was also present here. The ceiling is painted with scenes from Scriptural history, commencing at the Creation and extending to the Prophetical period. Each of these subjects bears undeniable evidence of the power which produced them, as they embody an expression of thought and dignity of sentiment peculiar to the great master. The carved part of the ceiling is divided into triangular compartments, into which are introduced paintings representing the Prophets and Sibyls. These possess a supernatural power of intelligence; in particular, the noble heads and figures of the prophets exhibit a stateliness of mien, which is subtly enhanced by graceful and grandly-drawn drapery; and as a contrast to these figures, and in proof of his remarkable versatility of execution, we look with pleasure on the charming ideal of Eve, universally acknowledged to be one of the most perfect representations of the female form ever produced. These subjects, in combination with the groups of Cupids, full of playful action, which are arranged with great architectural skill between the windows, suggest at times a softness and tenderness of treatment worthy of Raffaelle. On the end wall is painted the famous allegorical picture of "The Last Judgment," which, though painted in his sixtieth year, manifests a vividness of imagination and vigour of handling which show no trace of diminishing energy either of thought or execution. Such a literal view of a matter of this kind is inconsistent with the present state of religious thought, and this painting should therefore be taken from the point of view, mentally, which inspired the artist. But, apart from this altogether, as a study of minutely perfect anatomical drawing and delineation of action, together with its historical interest, it is a source of invaluable instruction to the art student. It is to the work on the ceiling, however, to which we must look for a true reflection of the great painter's genius. The side walls are divided into panels, the upper part of which contains pictures by eminent artists of the fifteenth century, such as Perugino and others of the same school. The lower part is at present covered by a painted imitation of tapestry. But it was originally intended to decorate them with red tapestry from designs by Raffaelle, the cartoons for which are now at Kensington. The saying of Michelangelo, that fresco painting was the true medium which a man should employ, while easel painting might suit women, is amply verified by the examples we have in this chapel. Fresco painting necessarily demands great rapidity of thought as well as quickness of execution. And these causes, combined with the limited choice of pigments at the painter's disposal, render a large amount of artistic knowledge essential for its successful accomplishment. In oil painting defects can be easily corrected; but not so in fresco, which, when once wrought cannot be retouched or altered, owing to the peculiar preparation of the surface, and also owing to the circumstance of the work being performed on the plaster while the latter is in a moist condition. This method, therefore, not only required correctness of eye and facility of manipulation, but it likewise entailed laborious and steady application on the part of the artist; for the subject once commenced could not be left off until completed. These facts, I think, are sufficient to entitle this process to assume the highest rank in the order of art decoration. And, but for the durability of the process, not only would the works have perished themselves, but, what is of more importance, the gradual expansion and growth of art, of which they are the basis, could not have existed, and the sacred and spiritual art life and power of which they continued the teachers must in consequence have disappeared.

Raffaelle was profoundly impressed by the works of these early masters. Of this,—and the advantages derived from the fuller development of technical knowledge,—we have the fruits in the splendid "Stanzio Raffaelle" in the Vatican. Here we have the very highest forms of art executed with a skill and knowledge hitherto unknown in the annals of painting. His celebrated subject, "The School of Athens," exhibits a power, breadth, and variety of design and achievement which the fullest description would fail to convey, and which I shall not therefore attempt in this short paper to describe. Indeed, the finest engravings of it fail to express a true idea of its wonderful merits. In the beautiful loggias decorated by Raffaelle we find a display of playful fancy in combination with architectural forms. There are figures, charming groups of Cupids, animals, and flowers, full of suggestive life and action; but all under the control of a master hand, and forming a basis on which to rear the true principles of mural decorative art. There is strict relation to architecture, and correct application of form and colour, producing an harmonious result. Everything is kept in subordination to the end in view, which is a union of pleasurable architective and artistic adaptation. It is gratifying to know that during this great man's short career he devoted so great a part of his life in designing and executing the lovely forms which adorn the roofs and walls of those places. And it is also pleasant to think that many of his pupils now claiming high places in the annals of art,—men like Udina, Romano, Vaga, and others,—should have followed in the footsteps of their exalted master, and bequeathed to us the high evidence of their skill and handiwork in the numerous examples which the palaces throughout Italy possess,—works which have gained for them lasting and honourable distinction.

To sum up these observations, I will humbly express my opinion that this characteristic mode of decoration, in its simple, natural, leafy elegance of curvature, with creations of animate and inanimate forms at command, in the hands of a competent artist, may be as consistently and artistically adapted to the embellishing of our own public buildings and private houses as it was in those palmy days of its existence in Italy. And I may be allowed to add that it is pleasing to know that there are indications of its speedy revival in that country which has obtained the lofty pre-eminence of being acknowledged as the birthplace and cradle of artistic life.

On entering the Church of Saint Maria della Pace, I beheld, in the decoration of the ceiling, another instance of Raffaelle's genius. He has here successfully rivalled in design and colour, the work of his famous contemporary, as this ceiling partakes much of the style adopted by Michelangelo in the Sistine Chapel. Figures of angels are seen hovering in the ideal clouds, their draperies flowing with graceful naturalness in the breezy atmosphere. The Sibyls also are painted with a dexterity and power, conveying in a high degree an expressiveness of inspiration. An apparent feature in this work, taken in contrast with his earlier works, is the fulness and roundness embodied in the figures, and the great brilliancy of colour, which throws a glow of richness over the whole composition, that time has been able neither to diminish nor efface. For Chigi, the wealthy Roman banker, on whose commission the last-mentioned work was performed, Raffaelle also executed, in the Chigi Palace, the celebrated fresco of the "Triumph of Galatea," which is distinguished by all the fulness and vigour of colour, expression, and action for which he stands pre-eminent.

I shall now, in a few brief sentences, call attention to the decorative features displayed in the embellishment of one or two of the great Roman palaces.

In the banqueting-hall of the Palace Farnesina, a brilliant and joyous scene is presented to our view. Here, in the delineation of the "Triumph of Psyche," we have evidence of the keen appreciation of appropriateness which Raffaelle carries into all his subjects. In the Church religious thought is impressed on all his work, while here, in the hall of feasting, we have none of the sorrows of Psyche obtruding themselves on our view; but, instead, the disposition to pleasure is assisted by scenes of animation and vivacity. In the rendering of the figures of Venus and Psyche, models of beauty and grace are depicted, which seem to inhale the inspiring air of the mountains, which, under the deep blue canopy of heaven, echoed with the songs of Homer and Ovid. They appear to live and move in an atmosphere of romance, which suggests the idea of their having been touched by the fire of the poet from whose exquisite fancy the charming idealistic creations arose. Several of the adjoining apartments contain treasures of art by the same hand, all exhibiting in fullest vigour the rare qualities with which the artist was so highly gifted. In the whole of Raffaelle's works we are at once struck by the clearness with which his intentions and sentiments are made apparent to the spectator. His meaning has neither dubiety nor obscurity, for in his style there prevails an amount of decision which renders it at once distinct and obvious.

The Palace of the Farnese furnishes an example of the period subsequent to Raffaelle. It contains a gallery decorated in fresco by Annabello Caracci, the subject symbolising earthly and celestial loves, and is a fine specimen of the Bolognese school, which evinced an ambition to attain to all the qualities of excellence that distinguished the masters who preceded them, and blending all in artistic unity. In the Carracois and many of their followers this

reaches great perfection, limited in scope, however, by the rules and principles of their school, which considered the ideal a secondary object. But although it had acquired, by the efforts of its originators, such a high position in art, this type, in the hands of inferior artists, soon began to show signs of feebleness and speedily languished. For while retaining an element of religious thought, a grossness of expression gradually crept in, and a tendency towards producing effect is plainly discernible, this being accomplished at the expense of all the true principles, pure emotions, and the beautiful symmetrical drawing which had hitherto distinguished the practice of art in the sixteenth century.

Altogether, I think the frescoes of Raffaelle and the Carraccis are the best and most striking illustrations existing of mural decorative art, as wrought in the fifteenth and sixteenth centuries, both in respect of the true poetic ideal in conception, and the powerful and refined and beautiful manner of execution.

In the Palace of the Rospilliosi I saw Guido's masterpiece, "Aurora," which is so well known from the engraving of it by Raffaelle Morgen. It is a splendid example of the skilful handling of luminous colouring and richness of poetic expression. The triumph of light is suggested, which in its onward career swiftly dispels the darkness enveloping the lovely landscape, so charmingly represented, as extending beneath, veiled in the haze of an intermediate light. It is an admirable interpretation of the victorious advance of the Goddess of Day.

In concluding these short sketches of a few of the more interesting examples of decorative art in Rome, without going into detail, I will merely refer to the delightful work of Giulio Romano seen in the Villa Madonna. It is in the style of the Vatican loggia, and is executed in a most masterly manner.

I have no intention of attempting to enumerate the contents of the picture-galleries of the Roman princes: that would be an effort quite as much beyond my power, if not more so, as the description of the Vatican sculptures referred to in a former part of this paper.

It is needless to say more. But I am convinced that art is steadily gaining ground in this country, and that it will ere long occupy its deservedly high and proper place amongst us. And I know of few themes which should more earnestly animate the ambition of all of us, than that of ardently aiding in its hearty and healthy development.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

The ninth meeting of the district Committee for the Midlands, of the Association of Municipal and Sanitary Engineers and Surveyors was held on Wednesday morning, April 19th, at the Court House, Warwick. The Mayor (Alderman Nelson) presided, and there were also present Mr. G. W. J. Repton and Mr. A. W. Peel, the members of Parliament for the borough; Mr. E. Pritchard, C.E., vice-president of the Association; Dr. Wilson, medical officer of health for Mid-Warwickshire; Dr. Swete, F.G.S., medical officer for Droitwich; Alderman S. T. Wackrill (mayor of Leamington); Aldermen Tibbits, M.D., and Glover, Warwick; Councillor Smith, Alderman Roden, M.D., Droitwich; Major Lempriere, R.E., Warwick; Messrs. T. Lloyd, Warwick; J. C. Mellis, C.E., Kenilworth; W. Boon, Coventry; J. W. Kirshaw, F.G.S.; A. J. Ingram, J. Boddington, R. C. Heath, R. Dodd, F. Davis, A. Fairlie, T. Green, T. Warren, E. Marshall, Smethwick; and the following members of the Association:—Messrs. F. Ashmead, Bristol; E. J. Purnell, Coventry; R. Davidson, Leamington; T. T. Aller, Stratford-on-Avon; G. Cole, Hereford; G. F. Smith, Milverton; B. H. Valle, Stow-on-the-Wold; C. Jones, Ealing; and J. W. Fereday, Wednesbury. Letters of apology for non-attendance were received from Lord Brooke, Professor Acland, the Mayor of Stratford, Dr. Nason, and many members of the Association.

Mr. E. Pritchard, C.E., vice-president, and engineer of the works now in course of construction at Haseley, then read an extremely interesting paper "On the Warwick Water Supply." A number of large and carefully-executed diagrams and sections which had been made by the author of the paper were used by him to explain the various works referred to. The first portion of the paper dealt with the works at present existing, and the plans for supplying the town with water which preceded the construction of the works on the banks of the Avon.

The reading of the paper was postponed at one point, and after Mr. Pritchard had explained the plans of the works at Haseley, the party proceeded in various conveyances to the spot. Here a careful inspection of the works in course of construction was made, and the object sought to be gained was detailed by Mr. Pritchard.

Dr. Wilson said the subject of the Warwick Waterworks, new and old, was not new to him; but he confessed he had listened with a great deal of interest to Mr. Pritchard's paper, and with no small amount of pleasure to the lucid description which he gave of the works. He need not enter into details; but, as medical officer of health of the borough, he might make a few remarks. In the first place, he wished to compliment Mr. Pritchard and the town of Warwick on the prospect of having a full and abundant supply of good water. As Mr. Pritchard had pointed out, the present supply was abominably filthy, and scarcely fit to drink. He was, at the outset, satisfied that the scheme for obtaining water from the Haseley brook was a very good scheme; but it appeared that it necessitated a large amount of storage, in order to get the supply in dry seasons, and to improve the quality of the water. But it now seemed to him that there had been tapped a supply of water in the drift over the red marl, which, although not rendering them altogether independent of the brook supply, would be little, if at all, affected by the rainfall from season to season. Dr. Wilson proposed a vote of thanks to Mr. Pritchard for the able paper he had read, and for the display of drawings with which he had illustrated it.

Mr. C. Jones (Ealing), in seconding the motion, expressed his satisfaction at what he had heard and seen on his visit to Warwick. He was sure it must be pleasurable to all of them to hear a paper, like the one just read, with which they could not find fault. The remarks of Dr. Wilson with reference to the dangers resulting from an intermittent supply of water would commend themselves to every mind, and the subject was one of the most important they could impress upon their Town Councils, if they desired to decrease the labours of their medical friends. He was also pleased to hear that polluted water would not be allowed to run down to the sewer outfall in such large quantities.

The vote of thanks was then put to the meeting and carried.

The company adjourned to the Warwick Arms Hotel to dinner.

The Mayor of Warwick (Alderman Nelson) presided, and a number of speeches were made.

MASTERS AND MEN.

Australia.—The *Sydney Morning Herald* says: "Our public and private works are nearly at a standstill for want of labour, and it has been stated upon undeniable authority that 10,000 men could find ready employment on our railways alone. There is work for all, and workmen are getting higher wages in New South Wales than they can obtain in England. Navvies are particularly in request, and so much are they wanted that the Government have had to extend the contract time for some of our railway contractors. The Government purpose spending something like 2,000,000*l.* in constructing public works,—public works that they would commence immediately if they could get the men to construct them." In the adjoining colony of Victoria the demand for labour does not appear to be so great, but it is stated that for ordinary labouring men there is a fair amount of work offering, different trades varying in regard to their demand. Navvies employed on the Government railways get 9d. per hour.

Barnard Castle.—The operative painters employed at the Bowes Museum, Barnard Castle, have struck work. The men demand an additional 1d. per hour, and 1s. per week "consideration money" when employed in the country. The contractor refuses to accede to the request, and the work is at a standstill in consequence.

Bodmin.—The masons who were on strike at the new Military Centre have resumed work at their former prices, the contractors having withdrawn their demands for a reduction. The day labourers have succeeded in obtaining an increase of one farthing an hour *per diem*.

Bradford.—In November last the operative masons, bricklayers, and labourers of Bradford gave their employers notice that after the 1st of May next they would require 3s. per week advance in their wages. About three weeks ago a deputation from the Association of Master Masons met a deputation from the men, when the former offered an advance of 1s. per week. The men's representatives thereupon called a general meeting of the men on the 12th inst., when a resolution was passed to the effect that nothing under 3s. would be accepted. On hearing this the masters sent word that if the men refused to concede anything there would most likely be a strike. A meeting of the masters was held on the 19th inst., but the decision come to has not been made known.

Bromsgrove.—A meeting of masters and men in the carpentry and joinery trades of Bromsgrove was held on the 15th inst., under the presidency of Mr. B. H. Sanders, to consider the present rate of wages in Bromsgrove. There was a good attendance of both masters and men. A demand had been made by the men of 7d. per hour for their work, 56½ hours to constitute the week's work; but Mr. M. Wright, on behalf of the masters, said they were unable to comply with this demand, but were willing to pay 6d. per hour, which the men declined to accept. A compromise was suggested, it being confessed that the men were not paid like men in other towns; but still it was thought a sudden rise from 5½d. to 7d. per hour would injure the trade, and would be unjust to those masters who had contracts on hand based upon the present prices. After discussion, the masters accepted the offer of the men to work till Midsummer at 6½d. per hour, on the understanding that 7d. per hour be paid after that period.

Doncaster.—It appears that the masons and joiners at Doncaster have applied to the masters for an advance of wages of 3s. per week, coupled with a reduction of working hours averaging four hours and a half per week. The *Doncaster Gazette* understands that the employers are willing to concede the money advance, but demur to a reduction of the hours of labour. On the 19th inst. deputations of the joiners and masons met the master builders. The latter offered to pay 7½d. per hour, and to agree to a reduction of two hours per week, the men to work fifty-two instead of the forty-nine hours and a half per week demanded. The joiners agree to these terms, but the masons could not give any definite reply until they had laid the proposition before a general meeting of the operatives.

London.—At a meeting of delegates of the London building trade labourers, held on the 19th inst., dissatisfaction was expressed at the reply of the Master Builders' Association, as given in last week's *Builder* (p. 392), and Mr. Kenny, the secretary, was directed to forward to the Masters' Association the following resolution, which was unanimously agreed to:—"That in the opinion of this meeting a deputation of three be appointed to wait on the Committee of the Central Association of Master Builders of London, with the view of at once settling the question of the wages of labourers. We further pledge ourselves to abide by the decision of the said conference; but in case the Masters' Committee refuse to grant an interview to our deputation, we are ready and willing to submit the question to the Capital and Labour Committee of the Social Science Association to arbitrate upon."

Newcastle and Gateshead.—The painters employed in Newcastle, Gateshead, and district, came out on strike on the 17th inst., for an advance of wages. Three months ago they gave notice to their employers for an advance of 1d. per hour, and an additional sum if they remained in the country at the end of a week; but the masters refused to comply with the request.

Perth.—The house-painters of Perth, after a strike of three hours' duration, on the 17th inst. obtained an advance of 1s. per week on their wages while employed in the country.

Scarborough.—All the master carpenters and joiners in Scarborough have agreed to a resolution "to make no further estimates or contracts whatever until the present dispute of wages with the workmen is settled." As stated in the *Builder* a fortnight ago, the men demand an advance from 7d. to 8d. per hour, but the masters decline to give more than 7½d.

Sheepbridge.—The whole of the carpenters, fitters, and smiths employed in the works of the Sheepbridge Coal and Iron Company, Derbyshire, have just received notice of a reduction of 12½ per cent.

Wigan.—The strike of the Wigan bricklayers

for an advance in their wages of 3s. per week still continues. The masters are making strenuous exertions to fill the places with non-union men from other towns, and have been so far moderately successful.

York.—The operative painters of York have resolved to ask their employers for an increase of 1d. per hour. The present rate of wages in the city is 6d. per hour.

THE PROFITS ON THE BERMONDSEY BATHS AND WASH-HOUSES.

THE persistent statements which have recently been made by members of several metropolitan vestries and others, when opposing the establishment of baths and wash-houses, that these institutions entail a loss, and increase the local rates, received an emphatic and conclusive contradiction at the meeting of the Bermondsey Vestry last week. A report was read from the Commissioners of the Baths and Wash-houses, stating that this was the twenty-third year of their existence in the parish, and that they were glad to be able to report that, notwithstanding a very long winter, the establishment had continued in favour, and was fully appreciated by the inhabitants. The result of the year's working was that they were enabled this year to contribute, out of the surplus money in the hands of their treasurer, the sum of 300*l.* in aid of the poor rates. Several members congratulated the vestry upon the success which had attended their efforts in establishing the baths and wash-houses, and expressed the opinion that they would in future prove a still more fruitful source of income than they had yet been.

IMPORTANT SALE OF PROPERTY AT THE WEST END.

THE LATE MR. WYNN ELLIS'S ESTATES.

ON Tuesday last the valuable leasehold estates belonging to the late Mr. Wynn Ellis, situated at the West End, were submitted to public competition at the Auction Mart, Tokenhouse-yard, by Messrs. Toplis & Harding, auctioneers. The property was in twenty-five lots, and consisted of several leading business premises in the great West-End thoroughfares, including Regent-street, Piccadilly, New Bond-street, Oxford-street, and Edgware-road, together with mansions in Grosvenor-place, Mayfair, Belgrave-square, and Hyde Park. The particulars stated that the property produced a gross rental of 5,200*l.* per annum, and it further appeared that the aggregate ground-rents in respect of the several properties amounted to the sum of 493*l.*, leaving the net rental at 4,702*l.* The properties were described as being held direct from the Crown, the Duke of Westminster, the Duke of Portland, Lord Portland, the Corporation of the City of London, and others. Before submitting the property the auctioneer stated that the whole of it was for absolute sale.

The first lot offered was the perpetually renewable lease, from the corporation of the city of London, of business premises in New Bond-street, situated between Brook-street and Grosvenor-street, ground-rent, 6*l.*, and let on lease for 325*l.* a year; the property was knocked down for 8,600*l.* The next lot was a leasehold property in Oxford-street, held from Lord Portman, at a ground-rent of 12*l.* a year, and let at 250*l.*; it realised 3,600*l.* Lot 3, consisted of three houses and shops in Oxford-street, held from the Duke of Westminster for an unexpired term of five years, at a ground-rent of 100*l.*, and let for 335*l.* per annum; sold for 1,030*l.* Lot 4 consisted of business premises in Regent-street and the corner of Jermyn-street, held under a lease from the Crown at a ground-rent of 8*l.*-11s. per annum, and let on lease for 109*l.* 10s.; sold for 2,250*l.* Lot 5, a house and shop in the Quadrant, Regent-street, held from the Crown, and free from ground-rent, which was held with other property; this property was let on lease for 250*l.* a year, and was sold for 5,980*l.* Lot 6, a house and shop in Piccadilly, held from the Crown, free of ground-rent, and let at 280*l.* per annum; sold for 4,900*l.* Lot 7, a house and shop in Piccadilly, adjoining the last lot—held from the Crown at a ground-rent of 103*l.* 16s. 8d., and let on lease for 666*l.* per annum; sold for 8,150*l.* Lot 8, a mansion in Grosvenor-place, held for an unexpired term of thirteen years, at a ground-rent of 52*l.*, and let on lease for 280*l.* per annum; sold for 2,080*l.* Lot 9. This lot was described as a noble town mansion in Curzon-street, Mayfair, nearly equal to freehold, being held for 860 years at the nominal ground-rent of 19*l.* 19s., and let for 320*l.* per annum; sold for 6,600*l.* Lot 10, a town residence in Chapel-street, Belgrave-square, held from the Duke of Westminster at the low ground-rent of 4*l.*, and let on lease at 130*l.* per annum; sold for 1,820*l.* Lot 11, a town residence in Great Cumberland-place, Hyde Park, held from Lord Portland at a ground-rent of 32*l.*, and let for 340*l.* per annum; sold for 2,880*l.* The next lot was described as a town residence in Hyde Park-square, at the corner of Hyde Park-street, held for an unexpired term of fifty-eight years, at a ground-rent of 18*l.*, and let for 285*l.* It was sold for 5,040*l.* The remaining lots consisted of business premises and houses in Berners-street, Oxford-street; Edgware-road, Marylebone; Nottingham-place, Marylebone; Motcomb-street, Belgrave-square; Claverton-street, Pimlico; and Mount-street, Grosvenor-square. Also the leasehold town residence, in Cadogan-place, Belgrave-square, lately occupied by Mr. Wynn Ellis himself, at a rental of 170*l.* The remainder of the lease, which has only a few years to run, was sold for 420*l.* The entire proceeds of the day's sale amounted to 71,210*l.*

COPIES OF TURNER'S DRAWINGS.

IT is pretty generally known that there is a large number of drawings by Turner at the National Gallery, part of his bequest, which can be seen only by special application. Mr. Ruskin has applied himself to train a copyist, and has succeeded, he says, "in enabling him to produce fac-similes so close as to look like replicas,—fac-similes which I must sign with my own name and his, in the very work of them, to prevent their being sold for real Turner vignettes."

We have seen a number of these copies at 148, New Bond-street, and failed to get much pleasure out of them. We are compelled to say, we feel with the *Times*, that "they produce an impression singularly unlike that derived from seeing the real works of Turner. In some of the vignettes the copyist may be said to have caught something of the flush of rainbow-tinted light, which is Turner's own; but generally the work is stiff, feeble, and wanting, as it must be, in native feeling and inspiration."

It occurs to us to ask, moreover, under what circumstances this contemplated wholesale production of fac-similes is permitted. Mr. Ruskin is so conscientious a man that we have no doubt it is all perfectly right and proper; but as no such proceeding is allowed in respect of other works in the collection belonging to the nation, the question forces itself upon us.

MACKLIN'S AGE.

THE writer of the article on Macklin's House says:—Permit me to thank Dr. Doran for, and to reply to, his courteous letter. An edition of "Their Majesties' Servants," published in 1865 (p. 311), states:—"I have somewhere read that at five-and-thirty Macklin could not read perfectly, but at eight or nine he played *Monimia*," &c. Having read of clever actors unable to read or write who committed their parts to memory by hearing others read them, I did not accept the latter statement as necessarily casting doubt upon the former.

With regard to Macready's Memoirs, I have always considered those who repeat a statement without the expression of a doubt as sanctioning it, if not directly, indirectly.

The age of Macklin was a subject of controversy when he was alive. It is common to regard extraordinary things incredulously now, and it was so then, when disproving or demonstrating facts were to be obtained with comparative ease. Yet the extraordinary age of Macklin for some few years previously to his death was not denied; and the remarkable facts associated with the first months of his existence, calculated to impress upon many memories the date of his birth, appear to have been well known in Dublin when he was quite a young man. Moreover, none of those numerous personal friends who were familiar with him in his old age, including those who wrote of him at the time of his death, considered it necessary to support with any special evidence the statement of his singularly great age. They treat it as an accepted indisputable fact.

I have in an old magazine—upon which I cannot just now place my hand—some explanatory reference to the coffin-plate of Macklin contradicting the tomb-stone inscription; and it may be remembered that Mr. J. T. Smith (who is not, however, the most reliable authority), in his well-known work "Nollekens and his Times," has the following:—

"It is a very remarkable fact, that when he (Macklin) died, the persons who conducted his funeral differed widely as to his age; and the coffin-plate was, on that account, left blank, though many persons had been applied to in order to ascertain the period of his birth. My amiable friend, the late Thomas Grignon, attended the funeral, and just as the men were lowering the coffin into the vault, a letter, containing a copy of the register of his birth, was put into the hand of the chief mourner, who immediately took out his pen-knife and scratched upon the blank space 107."

Mr. James Thomas Kirkman, of the Honourable Society of Lincoln's Inn, who had access to Macklin's papers after his death, for the purpose of preparing a biographical account of him, and attended his funeral, says:—

"Mr. Charles Macklin was born on the 1st of May, 1690, and died at the advanced age of 107 years, two months, and ten days." This gentleman gives the names of those who attended the funeral as mourners; they were twelve in number, but that of Thomas Grignon is not amongst them. Mr. Kirkman records a conversation which he had with Macklin in 1796—the year preceding that of his death—of which the following is part:—

"*Query.*—I understand you were at Drury-lane Theatre last night?

Ans.—Yes, sir; I was there.

Q.—Yes, sir, the newspapers of this morning take notice of it——.

A.—Do they!

Q.—Yes, sir. The paragraph runs thus:—'Amongst the numerous visitors at Drury-lane Theatre last night, we observed the Duke of Queensbury and the veteran Macklin, whose ages, together, amount to one hundred and ninety-six.'

Mr. Macklin.—The Duke of who?

A.—The Duke of Queensbury, sir.

Mr. Macklin.—I don't know the man. The Duke of Queensbury! The Duke of Queensbury! Oh, ay, I remember him now very well. The Duke of Queensbury old? Why, sir, I might be his father! ha! ha! ha!"

It would not be difficult to multiply pieces of evidence from various sources in great number, all tending to support the statement as to Macklin's wonderful age.

There are many reasons why the evidence of the tombstone should be preferred to that of the coffin-plate; and I think they will suggest themselves to most of your readers.

I am sorely tempted to go on quoting, but refrain. I am proud to have interested an author like Dr. Doran, from whose works I have often derived pleasure and profit.

"TO ARCHITECTS AND OTHERS."

SIR,—Such is the heading of an advertisement appearing in last week's *Builder*, seeking "plans for erection of school buildings, with residence," in accordance with School Board requirements.

I presume this may be taken as an indication of the present value set upon special architectural training by the general public. An architect appears to be simply a limning machine for producing plans to order, and is held to be no better fitted for the task, so far at least as *professional* training goes, than "others." Very naturally, in the case referred to, the Board "do not bind themselves to accept any of the plans furnished, but the *person* whose plans may be accepted will be paid a reasonable charge for the same."

Now, if the Board needed dress-coats or official robes, one can hardly imagine them addressing themselves to others than tailors for providing these, as how faulty soever the fit of regular craftsmen of the needle occasionally may be, "others," — to wit, hair-dressers, market-gardeners, or the like,—could hardly be expected to succeed better, even though willing to try at half price, or at any remuneration which the Board, having first approved the garments, might deem reasonable.

Special training is all right in the tailoring business, the public appreciates its utility there: how comes it, then, that the virtue of a speciality in architecture is so ignored? Is apprenticeship to our craft all a hoax, or is there too small a

proportion of it, of the proper quality, to leaven sensibly the lump of empiricism that is covered by the style of "architect"? A profession so easy of access may readily have its ranks crowded with unqualified and unprincipled practitioners whose ignorant bungling,—not to say dishonourable conduct,— can bring discredit on the entire corps, in the judgment of a public possessing no ready test of individual qualification to apply, and too busy or too careless to discriminate for itself between just and worthless pretensions.

A recognised position is surely as fairly due to the constructor of a nation's buildings, as to the conductor of its law suits or the adviser in its diseases, but can only be the result of recognised skill; and the best means of promoting the skill, and of testing it where existing, may worthily claim serious attention at the approaching Conference of Architects.

If a College of Architecture, with compulsory examinations and diploma, be really impracticable (though I confess I see no reason for this which might not equally have weighed against establishing the colleges of surgeons and physicians)—if the architectural profession must always be an open one for all comers,—then by all means let the public, whose health, comfort, and purse suffer doubtless thereby, get some set-off, and, as in the case of patent medicine vendors, publicans, auctioneers, and pawn-brokers, let a licence on payment of a smart duty be granted to each architectural practitioner.

The Chancellor of the Exchequer needs a hint as to this source of revenue from a very numerous class following an inviting and lucrative pursuit, who, as their education has cost (or at least need have cost) them nil, ought not to feel a payment of a dozen guineas or so annually any hardship, seeing that solicitors are similarly taxed after long years of expensive pupilage and hard examinations. But if the trifling impost should deter some adventurer who now turns to architecture as a cheap refuge in lieu of other calling, or even if it should haply retain for a few brief years longer, in the subordinate position of assistant, some rashly aspiring pupil newly released from his articles, but still fast bound in chains of ignorance and inexperience, to whom incurring expense may seem more formidable than incurring responsibility, neither public nor profession would suffer much thereby, in the opinion at least of

A Country Fellow R.I.B.A.

BRISTOL CATHEDRAL.

The Restoration Committee, "feeling" (as they say) "that what has been done in the matter of the porch may be repeated in respect of any other portion of the work, which, like the porch, has been freely treated on the responsibility of the architect, and thus having no security whatever to what extent their work may be further mutilated, have felt themselves obliged to discontinue their labours."

No one appears now to defend the figures that were set up; the complaint of the Restoration Committee seems to be narrowed to this, that the Dean and Chapter should have objected earlier, and should have adopted milder means to obtain the removal of the images. It has been an unpleasant affair, and has doubtless caused pain to some worthy people. For all that, if it should tend to check the use of quiet Romanising measures now going on throughout the country, under the guise of artistic decoration, the great body of English people will give hearty thanks to Dean Elliott.

HAMPSTEAD VESTRY HALL.

Sir,—May I ask a little space in your paper for the consideration of a few facts connected with this recent competition, not, I fear, that the result can be altered by any statement of mine, for that, apparently, was a foregone conclusion from the first, but because such a course as that recently taken ought to be widely exposed, and to state that if those of the competitors who were treated as I was will join with me, we will take counsel's opinion and see whether the Vestry cannot be made legally liable for the costs and time involved in the preparation of the designs.

When the architects were invited to compete a very full and elaborate list of detailed requirements was contained in the instructions, and it was merely added the Vestry did not consider the cost should exceed 10,000*l.*

But what is the course adopted by the Vestry? Absolutely to exclude from consideration four out of the seven plans because the designers were honest enough to state that a sum for execution not much in excess of the above amount was absolutely necessary for a building containing their requirements and of proper character.

Starting with this injustice by throwing aside the consideration of such plans altogether, and this under the chairmanship of a man accustomed to public work and who ought to have known better, the Vestry next proceeded to adopt as the approved design what I venture to affirm no capable judge will deny is the *worst* of the whole number sent in, not only as respects design, execution of the drawings and arrangement, but absolutely inconsistent with the instructions in several particulars.

The injustice, however, does not stop at this point. Having settled to give the work to "Cavendo Tutus" (a Hampstead firm, and nearly allied officially with the district), it is then agreed to give the remaining premiums, not over the whole of the other designs, but to those who had conformed to the impossible condition of an honest and properly-constructed building, and keeping the cost under 10,000*l.* It should be added, that it was openly stated in the vestry that the accepted design would require various alterations in execution, and the local surveyor estimated that it could not be executed for less than over 11,000*l.* It ought also to be stated that, by a strange coincidence, the second premium was allotted to a design emanating from a Hampstead architect.

Now, sir, after this plain, unvarnished tale, what are we to think of the sense of honour, fairness, or justice of the vestry of Hampstead, or rather that majority who so acted, who can allow men to be at all the trouble and expense of preparing designs with no real intention of considering them at all; who are lowering by their conduct the respect which should be entertained for public men; and who are justifying, from their chairman downwards, those charges which are freely and often made against the vestries of the metropolis?

A Competitor.

CONCRETE ROOFS.

Sir,—Your querist "M.D.," in last week's issue, should make the roof of pyramidal form, average thickness 6 in., with one or two bands of wrought iron near the base to prevent chance of thrust on the walls. Architectus.

KILN FLOORS.

Sir,—In your issue of Saturday last you say "Mr. J. Woods proposes to make malt-kiln tiles of cast-iron, with fine holes tapering upwards from broad openings." This is exactly as they have been made of clay in the Buckley district for at least 100 years, so that there is nothing new in the shape, at any rate; and as to the material, I am told that iron has been tried before, but not with satisfactory results. Most people allow that sweeter bread is made in brick ovens than in iron ones, and the same applies to drying or firing malt. John M. Gibson.

ACTION BY A CONTRACTOR AGAINST A LOCAL BOARD.

DEPOSITS ON BILLS OF QUANTITIES.

Isaac Anwell, Liverpool, contractor, brought an action (tried at the Wigan County Court) against the Pemberton Local Board for 5*l.* 5s., the amount deposited with the defendants' clerk pending the receipt from plaintiff of a *bond fide* tender for the construction of the Pemberton Waterworks, which tender was delivered in due course as required by the said defendants.

Mr. Wood appeared for the plaintiff, and Mr. Barlow for the defendants.

At the outset, Mr. Barlow objected to the case proceeding, inasmuch as the usual month's notice given to local authorities of the intention to take proceedings had not been given the defendants.

His Honour sustained the objection; but, on his Honour's suggestion, Mr. Barlow consented to the case being tried on its merits.

In opening the case, Mr. Wood said that in December last the defendants advertised for tenders for the execution of the Pemberton sewerage and waterworks, and the plaintiff agreed to tender for the works. Each contractor was required to deposit 5*l.* 5s., or 10*l.* 10s. if they desired to tender for both works, with the clerk, pending the receipt of a *bond fide* tender, and it was also stipulated that the bills of quantities "should" be returned with the tenders. Plaintiff forwarded tenders, and along with the tender for the sewerage works he sent the bills of quantities, but he did not send the bills of quantities along with his tender for the waterworks. The Local Board at once gave him the 5*l.* 5s. deposited on account of the sewerage works, but they refused to give him his deposit on account of the waterworks until he delivered up the bills of quantities, which he refused. Plaintiff alleged that according to the custom in existence among contractors, the Local Board had no right to the bills of quantities. The word "should" conveyed the idea that it was optional whether they should give them up or not.

His Honour said he took quite a different view of the question, and asked why the plaintiff had forwarded the bills of quantities of the sewerage works?

Plaintiff: It was a mistake on my part.

For the defence, Mr. Barlow contended that plaintiff had no right to claim the money, as he had failed to comply with the conditions laid down by the Local Board.

The Judge took the same view, and nonsuited the plaintiff, and allowed the defendants' costs.

THE BRISTOL ARCHÆOLOGICAL SOCIETY.

The Earl of Ducie presided over the inaugural meeting of the Bristol and Gloucestershire Archæological Society in the Lecture Theatre of the Bristol Museum and Library, on the 21st inst. There was a large attendance.

The Secretary (Dr. Hallett) read the report of the Provisional Committee, which remarked that history and archæology, whether as regarded knowledge, method, or culture, might be said to have taken a new departure, and, to use an ordinary expression, the spirit of history appeared to be one of the leading spirits of the age. The organising expenses had been considerable, but would be covered by the entrance fees, with a very handsome surplus.

The Bishop of Gloucester and Bristol proposed the adoption of the report.

Sir William Guise seconded the motion, which was supported by Mr. G. T. Clark, of Dowlais, and carried unanimously.

On the motion of Earl Ducie, seconded by Mr. W. K. Watt, M.P., Sir William Guise was elected president of the Society, and the first general meeting was fixed to be held at Gloucester. Other speakers afterwards addressed the meeting.

SURVEYORSHIP ITEMS.

Tredegar.—At a meeting of the Tredegar Local Board, on the 19th inst., Mr. John Williams, of Llantrissant, was elected surveyor to the Board, at a salary of 150*l.* per annum. There were twelve candidates.

Winchester.—Mr. J. H. Duckinfield has been appointed assistant surveyor to the Winchester Urban Sanitary Authority.

COMPETITIONS.

Clayton Hospital and Wakefield General Dispensary.—On the 1st of March twenty-one designs were submitted for the proposed new hospital and dispensary. Three out of the number were selected, and the committee have given their award in favour of Mr. W. Bakewell, of Leeds, and two premiums of 50*l.* each to Mr. G. G. Hoskins.

Derby Free Library.—With reference to the statement made in last week's *Builder* (p. 392), on the authority of a Derby paper, that the designs are "on exhibition" in the Guildhall, we have been requested to say that while it is true that they are arranged in the Guildhall, "as yet they are *only on view to the committee.*"

SCHOOL-BUILDING NEWS.

Wyke.—On the 1st inst. a new infants' school in connexion with Wyke Church was formally opened by a tea and entertainment being given. The school is situated at Storr-hill, and has been built to supplement the accommodation afforded by the National School. The large room is 44 ft. by 22 ft., with class-room, 18 ft. by 14 ft., and lavatory. Accommodation is provided for 160 infants, and the cost has been 810*l.* The architect of the building is Mr. W. H. Howorth, of Hipperholme; and the contractors for the mason's work were Messrs. Holdsworth Brothers, of Wyke.

Birmingham.—The memorial-stones of a new Sunday school in connexion with Palmer-street Congregational Chapel, Birmingham, were laid on the 10th inst. The site of the school is at the corner of Watery-lane and St. Andrew-street. The cost of the building, with the necessary fittings, is estimated at 2,500*l.* The style is Gothic, and the materials used will be brick, with stone dressings. The school will consist of central hall 50 ft. by 30 ft., with class-rooms at each side. Eight of the class-rooms will be on the ground-floor, their dimensions being 12 ft. by 9 ft. Six of the rooms will be above, and are reached from the gallery which runs round three

sides of the hall. There are to be separate entrances for boys and girls. The hall will be warmed by a heating apparatus. A library will be added, and infants to the number of 150 will be provided for in a detached school. The main school will accommodate 500 children. The whole of the internal woodwork will be of stained and varnished deal. Mr. George Ingall is the architect, and the contractor is Mr. Walter Brooks.

Brighouse. — The old chapel and schools belonging to the United Methodist Free Church at Brighouse having been felt to be inadequate to the present requirements of that body at Brighouse, it has been determined to build a new chapel and Sunday-school on a site in Bethel-street. The plans have been prepared by Mr. Rogerson, architect, Brighouse. The school will be two stories high, providing accommodation for 800 scholars, and having the large assembly-room upstairs, with eight class-rooms below, and an infants' class-room, a lecture-room, and two tea-rooms. The cost will be 6,100*l.* The contracts have been let to Messrs. L. & W. Crowther, masons; Mr. William Helliwell, joiner; Mr. George Shaw, plasterer, Mirfield; Mr. J. Marshall, plumber; Mr. D. Smithies, slater; and Messrs. Hirst & Barraclough, painters. Two memorial stones of the schools were laid on the 15th inst.

King Cross.—The Methodist New Connexion school at King Cross, Yorkshire, is approaching completion. The class-rooms are on the ground floor, and the large room in the upper story. Messrs. Leeming & Leeming are the architects, Mr. Culpan was the mason, and Mr. Dyson the joiner.

Eckington.—New Wesleyan schools have just been completed at Eckington. They will accommodate 700 children, and have cost 2,000*l.* Mr. Kent, of Chesterfield, is the architect, and Mr. Fidler, of Eckington, was the contractor. The woodwork has been executed by Mr. G. Stevenson, Eckington.

Poole.—On the 11th inst. the foundation-stone was laid of a building to be used as a church and Sunday school, and to be named St. Aldhelm's. The site is near the Bourne Valley Pottery, in the parish of Parkstone. The building will be in the plain Gothic style, and the work of its construction has been entrusted to Mr. F. Knight, of Westbourne. It is to be 65 ft. long by 19 ft. wide, and seating accommodation will be provided for about 150 persons. The estimated cost. is 1,200*l.*

STAINED GLASS.

Ashbourn.—The large fourteenth-century east window of Ashbourn Church, Derbyshire, and such of the earlier windows as have not already been completed, are to be filled in with painted glass. The execution of the work has been entrusted to Messrs. Hardman, of Birmingham.

Westmill.—A new stained-glass window has just been put in the tower of Westmill Church, Herts, by Messrs. Barlison & Gryll, to the memory of Mr. Robert Hyde Greg, of Coles; the subject is,—Our Lord conversing with the sisters of Bethany.

Farnsfield.—A stained-glass window has been placed in the parish church of Farnsfield, in memory of the late vicar, the Rev. H. R. Wilkins. The window is the work of Messrs. Clayton & Bell. There is an upper detached trefoil window, which is filled with the hand, the lamb, and the dove, as emblems of the sacred Trinity. The main light consists of a double lancet. In these severally are placed the figures of St. Peter and St. Andrew.

Huish Episcopi.—A new stained glass window has been placed in the east window of the church of St. Mary, Huish Episcopi, by Mr. H. Charles Lane, of Middleton, Sussex, in memory of several relatives. In the centre is the crucifix, on the right being figures of St. Peter and St. John, and the two Marys on the left side. It was supplied by Messrs. Clayton & Bell.

Bottesford.—A window in the north side of the chancel of St. Mary's Church, Bottesford, has just been filled with stained glass, in memory of the late Mr. Richard Norman, second son of the rector of the parish. The subject of the painting is Abraham offering up his son Isaac. In the left compartment is represented Abraham with the fire in his hand, accompanied by his son Isaac, bearing the wood for the burnt offering. In the right compartment Isaac is represented bound on the altar upon the wood. The uplifted hand of Abraham, armed with the knife to slay the victim, is arrested by the angel of the Lord; behind is the ram caught in a thicket by his horns. In the centre above the representation is a portrait of the deceased, and beneath, two angels are represented supporting a scroll, on which is inscribed a text.

Keynsham.—The tower window of the parish church of Keynsham has been filled with stained glass. The window consists of four lights, with tracery, and is of the Perpendicular order. In the centre lights are figures of John the Baptist (to whom the church is dedicated), and our Lord as the Good Shepherd. In the outer lights Moses and Elijah are depicted. In the ornamental portion of the window there is canopy work with grisaille basements. The tracery is filled with angels, one of whom holds an inscribed scroll. The window is by Messrs. Joseph Bell & Son, of College-green, Bristol, and is the gift of Mrs. Warry, of Keynsham.

Bradford.—The east window of St. Mark's Church, Bradford, which is reputed the largest in the town, has just been filled with painted glass from a design obtained by a competition of artists, and carried out, at a cost of 400*l.*, by Mr. Barnett, of Newcastle-on-Tyne. Mr. B. Hammond, of Manningham, is the donor of this window. The figures introduced are all of life size. In the arrangement of the painted glass of this large church the architects (Messrs. Walford & Pollard) have persistently discarded all canopy or tabernacle work, allowing the figures to occupy the entire space of each light; and in this large window of Mr. Barnett's two subjects (the Lord's Supper and our Lord's Commission to His Apostles) are made to extend across the whole window.

Eye.—A stained-glass window has been presented to Eye Church, Suffolk, by Mrs. Rampling, as a memorial of her late husband, Mr. Horace Rampling. The subject is the Ascension. The window is the work of Messrs. Heaton, Butler, & Bayne.

Buxton.—A stained-glass window has been placed in the new baptistery of St. John's Church, Buxton, by Messrs. Ballantine & Sons, of Edinburgh. It represents Christ receiving and blessing little children. Beneath the window is a tablet to the memory of the late Dr. Dickson, carved by Mr. Ash, of Buxton.

Woolwich.—A stained-glass window has just been placed in the north-east corner of St. George's Garrison Church, to the memory of the late Colonel Milward. The window, which is at the further end of the left gallery, represents the Passover.

Ashford.—The five lights of the middle division of the large window at the east end of the chancel of Ashford parish church have been filled in, by Messrs. Lavers & Barraud, with a design in stained glass representing the Ascension of Our Lord, in memory of Mary J. Field and George Whitlock.

Long Sutton.—The large chancel window of the parish church, which was for several years partly filled with stained glass in memory of the late Mr. John Bailey, is now completed by the Vicar, the Rev. Edward Leigh Bennett, assisted by the subscriptions of a few parishioners. The two compartments of the window now finished illustrate a series of subjects portraying the leading incidents in the life of Our Saviour, and are by Messrs. Ward & Hughes.

Hebden Bridge.—The windows of the chancel of St. James's Church, Hebden Bridge, have just been filled with stained glass, by Messrs. Heaton, Butler, & Bayne. A life-size figure of Our Lord upon His cross occupies the centre light of the triplet window in the east wall. The figure has a light back-ground broken into squares, filled in with the sacred monogram, the cross, the crown, &c. In the dexter light stand figures of St. Mary and St. John, and in the sinister light those of St. Peter and St. James. Towards the head of each of the outer lancet-lights are placed figures of angels with censers, one in each hand. At the foot of the window are three medallions, filled in respectively with the martyrdom of St. John the Baptist, the Agony in the Garden, and Our Lord's lament over Jerusalem. In the south wall are two two-light windows. The first is charged with the subjects of the Transfiguration, the request of St. James and St. John, Our Lord by the Sea of Tiberias, and St. James and St. John reproved by Our Lord. The subjects of the other windows are the raising of Jairus's daughter, and the calling of St. James and St. John.

Lincoln.—A three-light stained-glass window for the south aisle of St. Martin's Church, Lincoln, has just been fixed by Messrs. Ward & Hughes. The subject is the Baptism of Christ.

Uxbridge.—The stained-glass window which has been placed in the chancel of St. Margaret's Church, Uxbridge, to the memory of the late Rev. Charles Parker Price, for many years vicar of the parish, was disclosed to view on Easter Sunday. The centre light contains a representation of the Crucifixion, and the left and right respectively the Bearing of the Cross and the Appearance of Our Saviour to Mary Magdalene in the Garden. The work was entrusted to Messrs. Fassnidge & Son, of St. Andrew's, who obtained the design from Sir G. Gilbert Scott. The total cost was over 200*l.*

Stone.—A new stained-glass window has just been placed in the parish church of Stone, near Dartford, in memory of the late Rev. C. A. James, who was at one time curate of the parish, and who died through an illness contracted near Lake Nyanza, in Africa, where he was exploring. The window, which is the result of public subscription, was executed by Mr. Wailes, of Newcastle, and represents scenes in the life of our Lord.

Holford.—The east window of the recently restored chancel of Holford Church has just been filled with stained glass. The centre light represents the Crucifixion, the Magdalene kneeling at the foot of the cross; in the northern light are the mother of Our Lord and the two Marys and the centurion; and in the southern light St. John, St. Peter, Joseph of Arimathæa, and two Roman soldiers. This part of the work was executed by Messrs. Lavers, Barraud, & Westlake, of London. The two small windows at the sides are filled with quarried glass from Messrs. Powell & Son's

Books Received.

Solid Geometry. By PERCIVAL FROST, M.A. A new edition, revised and enlarged, of the treatise by Frost and Wolstenholme. Vol. I. London: Macmillan & Co. 1875.

THE author has included in the first volume those portions of solid geometry which are useful in the study of physical subjects, reserving for a second volume those parts which are chiefly interesting as pure geometry. To the understanding of this book the student should bring a complete knowledge of all the ordinary processes adopted in the case of plane geometry.

Practical Plane Geometry. By E. S. BURCHETT. London and Glasgow: William Collins, Sons, & Co. 1876.

HERE are some three or four hundred geometric figures drawn, and if, in the title, "practical" means graphical, then the subject is fully treated. The problems are not demonstrated analytically. A few useful geometric figures are applied in illustration of the design of encaustic tile patterns and of window tracery.

Progressive Lessons in Applied Science. Part III. Trigonometry, Vision, Surveying Instruments. By EDWARD SANG, F.R.S.E. London and New York: E. & F. N. Spon. 1875.

THIS is a book of principles, and deserves attentive study. The author follows a mixed method of demonstration, partly algebraical and partly arithmetical, and by diagrams, and extends his research to the border of physical science. A study of the lessons on vision and on surveying instruments will be a very useful introduction to books which define practice more than principles.

The Principles and Practice of Levelling. By F. W. SIMMS, F.G.S., M. Inst. C.E. London: Lockwood & Co., 7, Stationers' Hall-court. 1875.

THIS is the sixth edition of a well-known book, to which are added practical examples for setting out railway curves by Mr. Henry Law, and the field practice of laying out circular curves by Mr. John C. Trautwine. The figure of the earth, the general principles of levelling, and of the construction of levelling instruments, are first described; then the practice of levelling, computation of earthwork, road-making, setting out widths for cuttings and embankments, and setting out railway curves, with tables of the radii and ordinates of curves, and of long chords, and a complete set of tables of lines and tangents; with seven plates containing a general plan and section, a working section, curves, and cross sections of the Highgate Archway-road.

Miscellanea.

Cowhouses.—In towns where the Public Health Act is enforced the Local Authority will not permit houses of any description to be erected unless the plans are first submitted and approved by them. The width and height of each room and the sanitary and ventilation requirements are strictly adhered to. Is it not equally necessary to protect the sanitary condition of animals who contribute produce so essentially necessary to the well-being of the rising population? Spacious, well-drained, and ventilated cowhouses improve the health and condition of the cattle, and to a great extent prevent those diseases among them which afflicted the country and caused the high price of meat. If the Government would bring in a short Bill empowering Local Authorities in every parish and district to enforce sanitary measures in farm buildings, by a thorough inspection of the premises, and restrictions as to the character of the buildings, we should hear less of epidemics among cattle, and the production would be increased in quantity and quality.—Henry Gartside.

The British Museum.—A Parliamentary paper relating to the British Museum states that the total number of persons admitted last year to view the general collections (exclusive of readers) was 523,317, including 3,514 admitted on Monday and Saturday evenings, from six to eight o'clock, from the 8th of May to the 15th of August. The number of visits to the reading-room for the purpose of study or research was 105,310, giving an average of 360 daily, and each reader consulted on an average thirteen volumes per diem. There were added to the library during the year, 36,786 volumes and pamphlets, of which 1,731 were presented, 7,223 received in pursuance of the laws of English copyright, 539 received under the international copyright treaties, and 27,293 acquired by purchase. In the department of prints and drawings, 12,861 acquisitions have been made during the year, the most important of which were obtained by purchase at the sale of the Galichon collection in Paris.

Exhibition of Costumes.—A novel exhibition has been opened to the public at the Alexandra Palace. It would seem that the Palace Company, having offered prizes for the best costumes in certain specific classes of ladies' dresses, and Sir Edward Lee, the manager of the company, to whom the matter was entrusted, having called to his aid the services of Mr. D. A. Lorie, many of the leading West End and City firms, as well as others in the provinces, have given support to the project, and have contributed valuable materials that are calculated to make the display incidental to it an interesting one. The exhibition is, it may be observed, confined to British firms, and the object of the promoters is to give prizes for the most elegant productions, that will combine good taste with economy. The judges are Madame Stéphanie Roper, Court costumier, Somerset-street, Portman-square; Messrs. T. & H. Sutton, of St. Paul's-churchyard, wholesale costumiers; and Messrs. Sélincourt & Coleman, Cannon-street.

Ossett Waterworks.—On Monday evening, the 24th inst., the Ossett Local Board met for the first time since the election. Mr. M. Patterson, C.E., of Dewsbury, attended, and it was decided that the following tenders should be accepted, subject to certain conditions as to security:—Contract No. 1.— Construction of covered reservoir at Gawthorpe, Mr. Isaac Marsh, Castleford. Contract No. 2.—Cast-iron pillars and girders for above, Messrs. W. & J. Cardwell, Dewsbury. Contract No. 3.—10-in. cast-iron pipes, Messrs. Shillito & Harrison, Wakefield. Contract No. 4.—Cast-iron pipes, 9 in. and under, Messrs. Warner, Walduck, & Co., London. Contract No. 6.—Sluice-valves, hydrants, &c., Messrs. Blakeborough & Sons, Brighouse. It is now ascertained that the whole of the works will be let for about 15,500*l.*, or 400*l.* below the engineer's estimate.

Another Arbitration Case at Bradford.—Mr. H. A. Hunt, of London, surveyor under the Board of Trade, who recently sat at Bradford to assess the value of three shops in Westgate, with warehouses, buildings, and 1,041 yards of land, belonging to the Governors of Bradford Grammar School, and required by the corporation for street improvements, has awarded the owners 7,200*l.*

Society for the Encouragement of the Fine Arts.—On the 20th inst., a lecture upon "The Functions of Art Criticism" was delivered by Mr. George Fraser, before this Society. The chair was taken by Dr. John S. Phené. The lecturer stated that, broadly, the chief function of art criticism was to guide and develop the public taste, and rather to encourage the appreciation of great work than the condemnation of poor work. He sketched briefly what he considered the present hopeful condition of musical and literary taste in this country, attributing it to the familiarity which all classes are able to enjoy with the masterpieces of the greatest poets and musicians, and the consequently wide understanding of the principles upon which musical and literary criticism are based; and in conclusion he showed that the chief obstacle in the way of making strict art-criticism effective in its function of improving the artistic taste of the country was the limited nature of the facilities for becoming acquainted with the great works of the old masters. A discussion ensued.

Fall of Floor, Portsmouth.—A very lamentable accident occurred, on the 26th inst., at the new offices which the Portsmouth Gas Company are erecting in the Commercial-road, Landport. The floors are constructed of concrete between iron girders; and at about a quarter to eight in the morning a party of six men were on the basement removing the shores which were supporting the ground floor. A number of them had been taken away, when, without a moment's warning, a considerable portion of the floor gave way, burying five of the workmen. The site being in the most frequented part of the town, plenty of assistance was at once at hand, and on the men being extracted, two,—Mr. Fish, clerk of the works, and John Stickland, a labourer, who had only commenced working on these premises an hour before,—were dead, and three others,—named Cleaves, Cassingham, and Carpenter,—were seriously injured. We shall be anxious to learn the precise construction of the floor.

Street Cleansing and Watering at Westminster.—At a meeting of the Westminster District Board of Works, held on the 21st inst., the Streets Cleansing Committee submitted tenders for street cleansing, watering, and dusting, for a period of one, two, and three years, from the 8th of July next. There were five tenders, and the committee recommended the acceptance of Messrs. Cookson's tender for 8,800*l.* per year for a term of three years. Complaints were made of the high prices contained in the tenders. The chairman said the Board drew them on themselves by not taking the work of the district under their own management, and he hoped that before long they would be in a position to do it. After an explanation from the surveyor of the increase in the amounts, and a statement that the contract could be terminated after due notice, the recommendation was adopted.

The High Wycombe Free Library and Institute.—The new buildings for the High Wycombe Free Library and Institute were opened on the 18th inst. Mr. J. H. Raffety, of Wycombe, is the architect, and Messrs. Silver & Son, of Maidenhead, were engaged as contractors. The buildings are substantial and commodious, and are well suited to the purposes for which they have been designed. They consist of two large rooms and a recreation-ground, and there are committee-rooms set apart for the transaction of business. The lower story will be used as a free library, and the upper part of the building will be devoted exclusively to the purposes of the combined institutes. For this boon the town is mainly indebted to Mr. J. O. Griffits, Q.C., Recorder of Reading, who is a native of Wycombe.

A New (?) Cement.—The following recipe is asserted to produce a cement of very superior character for uniting stone, and resisting the action of water. It becomes as hard as stone, is unchangeable in the air, and resists the action of acids. It is made by mixing together 19 lb. of sulphur and 42 lb. of pulverised stoneware and glass. The mixture is exposed to gentle heat until the sulphur melts, when the mass is stirred until it has become thoroughly homogeneous, and is then run into moulds, and permitted to cool. When required for use, it is heated to 248° Fahrenheit, at which temperature it melts, and may be employed in the usual manner. At 230° Fahrenheit it becomes as hard as stone, and preserves its solidity in boiling water.

The Royal Academy and Art Education in England and France.—On Tuesday, the 9th proximo, Sir Charles Dilke will call attention to the position of art education in England, and to the constitution of the Royal Academy of Arts and its neglect to carry out the reforms unanimously recommended by a royal commission; and will move an address to her Majesty, praying that there be laid before Parliament a copy of a late report on the direction of the fine arts in France, made by M. Edouard Charton to the French Ministry of Public Instruction; and also praying that she will cause her representatives at the European Courts to report on the present attitude of the State towards the fine arts in the various countries of Europe.

Whitechapel and the Artisans' Dwellings Act.—Mr. Daniel Cubitt-Nichols, under the authority of the Home Secretary, on the 21st inst., held an inquiry respecting a scheme promoted by the Metropolitan Board of Works under the Artisans and Labourers' Dwellings Act, with reference to the Whitechapel and Limehouse districts. Mr. Grantham, M.P., who appeared for the Metropolitan Board, stated that the area proposed to be affected comprised about 6¾ acres of land, on which were crowded at the present time 444 dwellings, containing 4,350 occupants. The net cost of the improvement scheme was estimated at 54,400*l.* A large amount of evidence was given in favour of the scheme.

New Tweed Warehouse, Galashiels.—For some time past a new tweed warehouse has been in course of erection on the Back-road, Galashiels, for Messrs. Munro, Laidlaw, & Co. The building is upon quite a new plan for tweed warehouses in Galashiels, having a frontage of 35 ft., and running back toward the houses in Stirling-street for 40 ft. It is built of freestone, with polished belt, and is three stories in height. The architect is Mr. Alexander Wilson, and the mason and joiner work is being executed by Mr. Main and Mr. Wilson respectively.

New Temperance Hall at Guildford.—A new Temperance hall was opened at Guildford on Easter Monday. It is Gothic in style, and the large, or main, hall, is capable of seating 350 persons. It has convenient entrance lobbies, and there is a smaller hall or club-room which will accommodate 120 persons, and a library which will hold from ten to twenty. There is also a kitchen, and all the necessary arrangements for holding tea or other meetings. Mr. Wonnacott, of Farnham, was the architect, and Mr. Swayne the builder. The total cost is about 1,900*l.*

Tree Roots Choking Drains.—A correspondent of a country paper says:—"A cure for this evil is coal-tar. I have had recourse to it with entire success. In using it I mixed it with sawdust to the consistency of ordinary building mortar. A layer of this was spread on the bottom of the drain; on this the drain-pipes were set, and then carefully covered all over with the tar-mortar. If the work is carefully performed, and the mortar applied in sufficient quantity,—say 1½ in. thick all round,—I can guarantee success."

Kent Archæological Society.—It is announced that the council of this Society have determined to hold their annual meeting for 1876 at Gravesend, when, beyond the usual excursions into the neighbourhood for the purpose of visiting and examining such archæological objects of interest as abound in the vicinity, a temporary museum will be formed, and the congress continued over the space of two days. The month of July has been selected for this purpose.

New Life-boat Station at Seabrook, near Hythe.—Miss Hannah de Rothschild has just presented a new life-boat to the united boroughs of Hythe, Sandgate, and Folkestone. The boat-house has been erected from the plans and specifications of Mr. C. H. Cooke, honorary architect to the Institution, on a convenient site, about midway between Hythe and Sandgate, the ground being readily granted by the War Department.

The Richmond Water Supply.—At a meeting of the Richmond select vestry, on the 18th inst., a communication was read from the public Works Loan Commissioners, stating that they had resolved to lend the Local Urban Sanitary Authority 28,000*l.*, on the security of the rates, for the purpose of making an artesian well, opposition to which has now been withdrawn by the Southwark and Vauxhall Waterworks Company.

Rink at Aldershott.—A rink 170 ft. in length and 54 ft. in breadth has been opened in Aldershott. The architect was Mr. F. Eggar; the builder, Mr. Seabright. The floor was entrusted to Mr. W. Hirst, the manager of the Brunswick Rock Asphalte Company (Limited), and during the week there has been abundance of testimony to the fact that it is performed in a satisfactory manner.

Fall of Vaulting, Rouen.—Part of the vaulting in the transept of the ancient church of St. Gervais, Rouen, has fallen, and four persons have been injured. The vaulting was damaged by a storm last month, and was undergoing repair. The disaster is attributed to the incomplete setting of the cement used.

Brussels Exhibition, 1876. -It is officially announced that his Majesty the King of the Belgians will in person, on the 25th of June next, open the exhibition of hygienic and other means and appliances for the saving and protection of life.

The French Universal Exhibition. — A competition is invited for the design of the building intended to be erected. Sketches only are asked for, and the premiums are small.

TENDERS

For the erection of a warehouse at the corner of Little Alie-street and Lambeth-street, Whitechapel. Mr. Frederick C. Notley, architect. Quantities supplied by Mr. W. Barrett:—

Moreland & Nixon	£2,935 0 0
Peters	2,925 0 0
Lawrance	2,805 0 0
Greenwood & Sons	2,420 0 0
Newman & Mann	2,418 0 0
Macey	2,384 0 0
Morter	2,297 0 0

For the erection of a pair of villa residences at Wandsworth-common. Mr. Frederick C. Notley, architect:—

Hayworth (accepted)	£1,750 0 0

For farm premises, Bleston. Mr. R. W. Johnson, architect:—

Barnes	£3,050 0 0
Herbert	2,045 0 0
Neale & Son	1,990 10 0
Halliday & Cave	1,889 12 0

For Somerby Board Schools. Mr. R. W. Johnson, architect:—

Barnes	£1,841 0 0
Kitchen & Tidd	1,558 0 0
Neale	1,550 0 0
Hayes	1,500 0 0

For two cottages, Kettering. Mr. R. W. Johnson, architect:—

Henson	£457 0 0
Wilson	433 0 0
Bellamy	420 0 0
Barlow	410 0 0
Sharman	390 0 0

For new sewers, &c., in Rockingham-road estate, Kettering. Mr. R. W. Johnson, surveyor:—

Payne & Son	£713 0 0
Henson	780 0 0
Barlow	740 0 0
Gibbons	580 0 0

For Alton water-works. Messrs. Gotto & Beesley, engineers:—

Contract No. 1.—For cast-iron pipes:—

T. Read & Co.	£1,047 0 9

Contract No. 2.—For well, pumping establishment, reservoir, and main-laying:—

Bugbird	£3,480 0 0

Contract No. 3.—For engines, boilers, and pumps:—

Hetherington & Parker	£1,047 10 0

For two houses at Morley-road, Lewisham, for Mr. Edward Phillips. Mr. Wm. C. Banks, architect. Quantities supplied by Mr. R. W. Griffiths:—

Eaton	£2,800 0 0
Faulkner	2,637 0 0
Parnacott	2,575 0 0
Rider & Son	2,568 0 0
Sharpe & Everard	2,540 0 0
Hammond	2,294 0 0
Marrige	2,250 0 0
Staines & Son	2,173 0 0
Barnes	1,876 0 0

For new billiard-room, &c., to the Duke of Gloucester tavern, Hoxton. Mr. Wm. C. Banks, architect:—

Parnacott	£375 0 0
Steed	350 0 0
Sharp & Everard	337 0 0

For air-tight show-case to shop-front, Nos. 65 and 66, Houndsditch. Mr. Wm. C. Banks, architect.:—

Drew	£161 0 0
Smith, Brothers	148 0 0
Yeo	133 0 0
Somerville & Smith	127 15 0

For alterations to the Sir George Osborn's Head, Old Montague-street, Whitechapel, for Mr. D. Zuschlag. Mr. J. G. Needham, architect:—

Cole	£595 0 0
Judd & Hawkings	497 0 0
Lall (accepted)	318 0 0

For alterations to the Victory, Kingsland-road, for Mr. H. Wooder. Mr. J. G. Needham, architect:—

Cole (accepted).

For a homestead on Tar Farm, South Leigh, Oxfordshire, for Mr. James Mason. Mr. William Eve, architect:—

Dover	£3,300 0 0
Wilkins	2,978 0 0
Bartlett (accepted)	2,750 0 0

For a homestead on Green Farm, Eynesham, Oxfordshire, for Mr. James Mason. Mr. William Eve, architect:—

Bartlett	£2,575 0 0
Wilkins	2,316 0 0
Dover (accepted)	2,235 0 0

For a Farm-house on Tar Farm, South Leigh, Oxfordshire, for Mr. James Mason. Mr. William Eve, architect:—

Dover	£2,000 0 0
Bartlett	1,960 0 0
Wilkins	1,803 0 0
Snell	1,741 0 0

For Board School at Darenth, near Dartford, Kent, for School Board for Darenth. Mr. William Eve, architect:—

Lockyer	£520 0 0
Blake (provisionally accepted)	475 0 0

For the erection of villa and stables at Buckhurst-hill, for Mr. Thos. King. Drawings by the National Co-operative Builders and Contractors' Society (Limited). Mr. Thos. F. M'Cormick, manager:—

National Co-operative Builders' Society (accepted)	£1,400 0 0

For the erection of a cottage in the Half-acre, Brentford. Mr. John. W. Smithies, architect:—

Barnes	£336 11 0
Beauchamp (accepted)	359 0 0

For the erection of the first portion of annular brick-kilns, Burton-road, Lincoln, for Messrs. Swan, Brothers, & Bourne. Messrs. Godden & Son, architects. Quantities supplied:—

Bass	£1,754 15 0
Clipsham	995 0 0
Martin & Sims (accepted)	678 0 0
Taylor	602 6 0

For two houses and shops at Croydon:—

Ridge & Kingsland, accepted.

For alterations and additions to a house and stabling, with entrance-lodge, at Chislehurst, for Mr. J. C. Schroeter. Mr. Joseph S. Moye, architect:—

Punnett & Sons	£2,895 0 0
Adcock	2,847 0 0
Grover (accepted)	2,548 0 0

For restorations, &c., at Fadworth Court, Surrey, for Mr. W. G. Heathcote. Quantities not supplied:—

	Cr. Lead.	Front.
Hards	£5,055 ..... £93	..... £478
Batchelor	3,681 100	 448
Sharpington & Co.	3,536 130	 615
Jarrat	3,520 50	 600

For sinking well, constructing a pumping establishment and reservoir, and for laying and jointing water-mains, at Alton, Hampshire. Messrs. Gotto & Beesley, engineers:—

Lefevre	£4,306 0 0
Young & Co.	4,244 0 0
Bugbird (accepted)	3,480 0 0
Goodenough	3,438 0 0
Coker	3,075 0 0
Sibsey	2,800 0 0

Accepted for rebuilding Hicklane Mills, Batley, Yorkshire, for Messrs. Michael Sheard & Sons:—

Brier, Sons, & Wilson (masons)	£6,923 19 7
Bagshaw & Sons (ironfounders)	4,293 7 6
Willans (carpenter and joiner)	2,190 11 1
Rawsthorne (slater)	459 0 0
Morton (plasterer)	226 11 0

TO CORRESPONDENTS.

F. C. M.—F. E. M—C. S.—M. L.—G. & B.—H. W.—F. T.—F. B.—J. B. W. C.—E. & W.—J. M. O.—W. W. L.—F. H.—E. T.—J. G. N.—W. E.—T. F. M'C.—W. C. B.—Dr. D.—J. W. B.—A. G. H.—T. C. C.—J. R. F. A.—E. G. E.—E. S.—J. B. W. B.—J. P.—E. P. A.

Labourer (the solid column would be greatly the stronger. But the same quantity of metal formed into a hollow column, and therefore of large diameter, would be stronger still). F. J. W. (write to the secretary for particulars).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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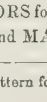
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The Recent Check to the Increase of London.

THE subject of the growth and extension of the metropolis is one that cannot fail to pre-occupy the architect, no less than the sanitary reformer. It is one that has repeatedly been discussed in our pages. From time to time we have taken occasion to mark the rapidity with which the great city is extending its streets and squares; to calculate what length of street, if reduced to a single line, is built per year or per week: and to indicate, on the map of Middlesex, where the outskirts of London may be expected to lie in ten, in twenty, or in thirty years. In most of the calculations which either we ourselves or other writers on the subject have recently made, the rate of increase of population, and thus of accommodation, has been taken at the allowance of a duplication of the population in the period of forty years. Indeed, a disposition was shown, on the face of the statistical returns on the last occasion that we took to investigate them with reference to this subject, rather to an increase than to a reduction in that portentous rate of growth.

We are now in possession of information which shows that a sensible check has been interposed on this rate of increase. It may not be the case that the extreme point has been touched. It may, or may not, be the case that the check is anything more than temporary. But the subject is so important to all concerned in building, that it will well repay the trouble of analysis.

The highest rate of activity attained by the builder in London was about the years 1862 to 1864. In two years, then, according to the report of the Commissioner of Police for the Metropolis, no fewer than 35,163 new houses were built, being at the rate of 17,581 per annum. These houses formed 825 new streets, and ten new squares, giving a total length of 164 miles of streets and squares,—or eighty-two miles per annum. We regret that the numbers that we have before us are not given for each year. Two or three years are lumped together, so that it is not possible to detect which year was actually the most busy. From 1864 to 1867 the number of houses built was 48,565. This gives an average of 16,155 per annum. The year 1867-1868 is given alone. The number for this year was 15,963. It is thus evident that the extreme point of activity was attained between 1862 and 1867, although we cannot as yet put the finger on the exact year. But when we remember the mirk May of the year 1866, and the terrible financial earthquake that shook city and country with the fate of the house of Overend, Gurney, & Co., we think some light is thrown on the reason of the movement which becomes apparent from an analysis of the figures tabulated by the Commissioner of Police. Up to 1865, so far as the figures before us go, the increase of the metropolis was not only steady, but, on the whole, was slightly increasing from year to year. The advance, as measured by house-building, from 1849 to 1866 was enormous. The annual increase may be said to have doubled. From 1849 to 1854, a period of five years, 40,743 new houses were built in London. This gives an annual rate of 8,148 houses. From 1854 to 1862 there was a decline in activity. The annual rate sank to 6,618,—the total number for the six years in question being 52,949. We have seen how large was the increase in the three following years. Thus, while, as before remarked, we are not able to detect the exact *maxima* and *minima*, we cannot doubt that the extreme activity of the builder, as compared with his greatest slackness, has been as three to one within a period of ten years. And we may fairly consider that at least 18,000 houses have been added to London in a single year of great commercial activity.

Since February, 1870, at which time a difference appears to have been made in the manner of keeping the accounts, there has been a steady decrease in the number of houses annually added to the metropolis. The number for 1867-8 was 15,963. That for the next two years is perplexed by the change of month above mentioned. In 1871 8,693 houses were built. Greater activity was evinced in 1872, possibly in anticipation of some stringent measures for protecting the public health as likely to be passed in that year's session. In this exceptional year 11,179 houses were built. In 1873 the number was 7,687, and in 1874 it was 7,764. The number of 3,542 houses are tabulated as "now being built"; but as the month during which the enumeration was made is not stated, we do not gain so much light from these figures as might otherwise be the case. The total number of houses built from 1849 to 1874,—that is to say in a quarter of a century,—is 270,327, giving an average of 10,813 per annum. In 1869 the number of houses in London is returned by the Registrar-General at 400,778, the density of population being then 7·8 persons per house. Unless an enumeration of the empty houses be added to that of the total number of houses, we fail to obtain that exactitude of statistics which is desirable. The last return of the total number of houses for 1875 was 518,558, which, compared with the estimated population in the middle of 1875, amounting to 3,445,160, gives a density of 6·6 souls per house. A question, however, is always likely to arise as to the different purposes for which estimates are made, as the returns may possibly be affected from that cause. Thus the numbers of houses returned by the Registrar-General in this instance are those which are supplied with water by the water companies. It does not follow that this represents the actual house accommodation of the metropolis. Nor is it altogether likely that between 1869 and 1875 there should have been such a change in the habits and condition of the Londoners as to reduce a density of 7·8 to a density of 6·6 persons per house. We can only deal, however, with the figures before us. They show that while, during the past twenty-five years, an average annual number of 10,800 houses have been added to London, a rate that at one time was raised to 18,000, and at another fell to 6,000, the annual addition at the present time, gradually diminishing since 1869, is about 7 750.

Another comparison may be made, which, if not absolutely conclusive, yet is of some value as bearing on the subject of the permanent rate of increase. The addition to the number of houses in London for the last year, reported by the Commissioners of Police is, as before mentioned, 7,764. The addition to the population of London in the last year reported by the Registrar-General is 44,459. The years are not identical, but the average will not be very materially affected by that fact. We have seen that the figures before us give a density of 6 6 persons per house as an average for the metropolis. But the comparison of the supply and demand for a year, or of the number of new houses with the number of new inhabitants, gives a density of only 5·7 souls per house. It therefore seems that, notwithstanding a decrease in the activity of the house-builder of about 25 per cent. as compared with an average of twenty-five years, the increase of accommodation is still in excess of the increase of persons to be accommodated.

It is no doubt the case, that the houses recently added to the metropolis are, as a rule, larger and better than those of earlier date. But this remark rather applies to reconstruction within London itself than to the enlargement of the City by addition to its outskirts. It is impossible to leave or to enter London by either of the great railway routes without becoming painfully aware of the miserable rubbish that is being piled up under the name of house-building. In all those solid and substantial structures which are being raised in the better-known parts of the metropolis it is plain that accommodation is given for a larger number of inhabitants than was the case in the smaller houses that have been pulled down. There is thus a double movement in progress, which it is highly important correctly to gauge. Where the Artisans' Dwellings Improvement Act is brought into operation, as in the case reported a few days ago with reference to the Whitechapel District Board of Works, the number of inhabitants per house must be expected to decrease; on the other hand, where larger buildings replace smaller ones, that proportion will increase. Two modes must be adopted for gauging accommodation: one is that of the accommodation measured on the plan; another, that afforded by the cubic contents of the house. In the more costly and permanent structures which are everywhere dis-

placing the old cottage and small house building of the earlier part of the present century, much more house-room is afforded on the same acreage. Therefore, while the houses themselves are made incomparably more healthy for the occupants, there is at the same time a tendency to bring more inhabitants on to an acre of land, which has a contrary influence. The area as to which the inquiry referred to took place was stated at 6¾ acres, on which stood 444 dwellings, containing 4,350 occupants. This allowed nearly ten occupants per dwelling, and 644 inhabitants to the acre. If we subtract 20 per cent. from the acreage for streets, yards, &c., we find that each house covered on the average something close upon sixty superficial yards, giving only about six yards of area per inhabitant. In some of the courts the density is so great that Dr. Liddle says it allows only 3½ square yards for each person, as compared with 26 square yards, the average for the whole district. It is thus evident that in speaking of the average number of occupants per house, we are hardly aware what is meant, unless we also know the area occupied by the house, and, not only the area, but the number of floors. For it must be supposed that hardly less than three stories can be allowed even to the miserable dwellings in question. And although the height of each story may be, and probably is, cramped to the most necessitous and disastrous extent, still this correction will increase our six yards to 18 yards, and the 3½ yards of Dr. Liddle to 10½ yards. But even with this correction the density is something appalling. The average density of the population of the London of the Registrar-General for 1875 was 44 persons per acre, having risen from 25 persons per acre in 1841. The density of the population of England and Wales is such as to give 1·71 acres of land per head (taking the figures for 1869). Thus the density of the Whitechapel district in question is eleven hundred times as great as that of the average of England and Wales. Small wonder that the death-rate was as high as 41 per 1,000. In the Peabody-buildings, in 1874, it was 17·4 per 1,000, although in these buildings the density per acre of land is of course very considerable.

It is hardly possible to hold to the dry details of statistics when drawing the veil from a scene of degradation and misery such as that described by the Whitechapel medical officer, and often visited by ourselves. But it is not our present purpose to dwell on this aspect of the question. What we chiefly wish now to bring out is, first that the number of persons per house is not a sufficient guide to the inquirer, unless we know better the area and the cubic contents of the house in question; and, secondly, that, while making a very great improvement in house accommodation, in which, by raising more lofty structures, and substituting six or eight planes of abode for the two or three of old London, we are, to some extent, running into one evil while trying to avoid another; and increasing the density of our population per acre, at the same time that we are providing a more adequate amount of space for the daily living-rooms of the individual.

The question, then, will arise, whether the check that we have seen to have been given to the very rapid increase of London arises merely from financial causes, or whether it furnishes any indication that the pressure of population upon area has become so intolerable as to have become to some extent its own corrective. That something of this nature must, sooner or later, be the case, there is every reason to anticipate. In the City proper, or, at all events, in those portions of the City which are the very *foci* of the business of Europe, an action of that kind has long set in. The night population of the City is very small in proportion to its day population. Crowding like honey-bees into a dense mass, during the few hours of business, the merchants, bankers, brokers, and thousands of business men of London rush off into purer air to dine (their ancestors would have called it supping) and to sleep. The possibility exists that this action may spread over other parts of the metropolis. It is not, however, so simple a matter. Much depends on the nature of the daily occupation. Where night is turned into day, as it is in the Houses of Parliament, the distribution of the senators over a reasonable area, when the work is done, is out of the question. Members of Parliament must sleep within a cab-drive of the House; and any artificial and unhealthy occupation, such as debating by gas-light eminently is, has a tendency to aggravate its own evil by accumulating subsidiary evils around it. For every man who must sleep five nights out of the week, for six or eight months out of the year, within a limited range from the clock-tower of the Westminster Palace, how many servants, tradesmen, tradesmen's servants, and so on, in every ramification, are chained to the same area?

One element in the problem that is thus dimly sketched out for solution is, of course, the accommodation afforded by the metropolitan railways. In this respect we regret to see that a spirit of red tape has been allowed to obstruct that freedom of action which is at once essential to the proper conduct of an immense passenger traffic, and most conducive to the real interest of the passengers themselves. It is probable—indeed we suppose that we ought to say it is certain—that the officials of the Government have only carried out the actual law. But this is not all that the country has a right to expect from its public servants. The Board of Trade has interfered, to a certain extent, with the control of the railway proprietors over their own lines. It is, there can be no doubt, wise and right, in the interest of the public, that a power of this nature should be attributed to her Majesty's ministers. But that prime condition of the public interest should not be lost sight of. In the recent trial there was too much of the appearance of the Government, on the one hand, striving to screw the utmost farthing out of the companies—entirely without regard to the public convenience—and of the companies, on the other hand, threatening to inconvenience the public by way of retaliating on the Government. Both courses would be reprehensible; but by far the heavier blame lies at the door of the Administration. For the encouragement of third-class traffic, such traffic has been exempted from the duty on passengers. But, in order to protect, as it was supposed, the third-class passenger, and to study his convenience, the proviso was introduced in the Act of Parliament that such duty-free trains should stop at every station. In the enormous third-class traffic which has grown upon the Metropolitan Railways, it has become of essential importance that third-class trains, running from a central station like Moorgate-street to some place outside the dense parts of London, should run direct, and should not waste the time of the passengers by unnecessary stoppages on the way. Such trains were duly organised; when lo! in steps the tax-gatherer, and demands his five per cent. on their receipts. Now this proceeding, however it may be according to the letter of the Act of Parliament, is in plain violation of its spirit, and contrary to public policy. It was therefore the duty of the Board of Trade, so soon as they found where the shoe thus unexpectedly pinched, to propose a Bill to set the matter right; or, at least, so far to untie their own hands as to give to their own consent to the running of such trains the force of a protective warrant against the imposition of the tax.

We are not entering into the subject either of the propriety of the tax itself, or of the propriety of the exemption. But, things being as they are, it is utterly indefensible that a company should be taxed 5 per cent. on the earnings of a train simply because they run it more rapidly, and more conveniently to the passengers, than they were originally compelled to do. And the case is of great importance as bearing on our present inquiry. The question of choice of residence for a working man is evidently one that is much wider now than was the case ten or twenty years ago. As regards the welfare of the great body of inhabitants of London,—not the working classes alone, but all permanent indwellers in the metropolis,—it is essential that the greatest possible freedom should be given to that choice. If by means of railway accommodation, provided at the cost of two-thirds of a million sterling per mile, a body of working men can be taken home into fresh country air at night, and brought back to the centres of their occupation, refreshed and invigorated, betimes in the morning; and if the reduced cost of rent in the country, as compared to that in London, is such as to enable the workman to pay for this luxury—and a precious and most desirable luxury it is,—it is the duty of every man who cares a pin for the welfare of his fellows to do all that he can to farther such a movement. To strike the cost of such conveyance with a tax may be law, but it is neither justice, mercy, nor common-sense. Robert Stephenson, who knew well what the working man was, used to say that he hoped to see the time when no working man would be able to afford to walk. Such may now be said to be the case, and it is an evil bit of official red-tapeism that comes in to check the facilities afforded for the transport of the workman.

In the cases of two great divisions of the busy inhabitants of London, the City men of business proper, and the workmen who show a tendency to mass in colonies, we can thus trace the operation of causes likely to check the immediate increase of London proper. To what extent these causes may act is as yet in the future. What will be the effect of surrounding an area covered with streets and squares with a ring of less dense abode, but still of urban rather than of rural physiognomy, has also yet to be seen. Private opinions, and even individual energy, can do but little in such matters. Great social movements, changes in class habit, displacement of centres of habitation, follow laws which we may attempt to discern, but which we have little power to modify. What we can do, and what we ought to do, is to prevent the natural course of things from being checked or distorted by artificial interference. If the workmen wish to go into the suburbs, and if the railway companies are ready to take them there, evil will betide the man who steps in with a red tape barrier.

It should be remembered that another cause, on which we have not touched, may have much to do with the check that the returns of the Commissioners of the Police show to have taken place in the building of London. The falling off from more than 16,000 to less than 8,000 houses built in a year has been coincident with a systematic attempt to prevent the workman from doing more than a fixed quantity of work. Into that we have not now space to enter. But we cannot fail to remark that a policy which is based on the idea that the demand for houses, or for any other produce of labour, is a fixed quantity, independent of the facility with which the demand is met, is a miserable fallacy. The good salesman will empty his shelves, while the surly or lazy salesman will drive customers from his shop. Nor is it only that the latter will change their market. They will buy less than they intended, as in the other case they will buy more. So even in householding there is an elasticity which can be encouraged or repressed by the conduct of the builder. People will stay in lodgings or take houses, will live together or set up establishments of their own, very much as they may be induced or otherwise by good and tempting accommodation. It is even possible that the strikes in the building trade, acting on this elasticity, have been the main cause of the decline in the number of houses annually built. As to that we reserve judgment. But when we see how the diminished number of new houses is accompanied by a diminished number of inmates per house, it is evident that some very powerful cause or causes have been at work to check the increase of London. And it is abundantly clear that any idea that a certain amount of building must go on, and that, therefore, men may ask as much wages, and work as short time as they like, secure of steady employment, is a delusion inconsistent with common sense.

ARCHITECTURE AT THE ROYAL ACADEMY.*

Among public buildings illustrated in Gallery IX., we are bound to give the first mention to the drawing of the new Opera House on the Thames Embankment (1086), as certainly the largest and most important recent public building, though any detailed description is unnecessary at present, as we gave an illustration of it some little time since. It would be gratifying if one could find in this large building, to be placed on what may truly be called one of the finest sites in Europe, and claiming specially to be the "national" home of lyric drama, something like a new architectural treatment of a great theatre; but we are bound to say that this is not the case, although it has been considerably improved in some respects since we published the first design. The main external treatment is still too obviously traceable to the Paris Opera House. The best point in the exterior is the treatment of the flat block of building which intervenes between the stage and the auditorium portion.

For the rest, civil architecture is not strong in the present collection, if we except the presence of a perspective view of the Natural History Museum at South Kensington, which has been illustrated in our pages, and has now arrived at a stage at which it deserves comment

* See p. 399, *ante*.

rather in reference to the building itself than to a water-colour view of it. It promises to be a fine structure. Among smaller works of a more or less public character is the interior of the ball-room at the Star and Garter Hotel, Richmond (978), which, as our readers will remember, for we have given a view of it, is a handsome room, with some originality in the treatment of detail, not in the most refined manner. The "Warehouse," in Chandos-street (990), designed by Mr. Meeson, has also been illustrated in our pages. We next come to a design of some specialty of purpose and interest, that by Mr. R. P. Spiers, for a memorial tower in Locke Park, Barnsley. There is something new in this, which is a design Classical in detail, and consisting of a circular tower, the lower portion of which is surrounded by a circular columned loggia, with a flat roof and balustrade round, giving a base to the whole. Whilst the general idea is original and suitable for the purpose, the details seem to us out of proportion; for instance, the exceedingly heavy cornice and frieze at the top completely over-weights the pilasters beneath it; a solid wall beneath would have given a very different effect. We cannot but observe also that it is extremely unfortunate, to say the least, that a drawing by the architectural instructor of the Academy, and hung on the line, should show such inaccuracies in the perspective, many of the curves being completely broken-backed, and as if put in anyhow. Mr. Spiers has made so many capital drawings of other people's work, ancient and modern, that it seems extraordinary he should have done so little justice to his own. Mr. Bickerdike's "School Buildings, Westminster-bridge-road" (1,031), is a specimen of a building picturesquely treated, and in which the picturesque element seems to grow naturally out of the requirements and arrangement of the interior; it is in geometrical Gothic style, a "mode" which is now almost becoming a rarity. "Lincoln County Hospital" (1032), by Mr. Graham, is a fine pen-perspective of a pronounced Queen Anne building, with all those rude quaintnesses of manner, long strips of brick pilaster, &c., the interest of which is purely sentimental, and which make the whole a sort of travesty of architecture, demanded by the fashion of the day only. The revival of "Classic" in one shape or another we have long expected and foretold; but this kind of thing is a mere reproduction of a debased treatment of Classic with a mixture of the remnant of Gothic feeling, a style destitute of logic and refinement, the taste for which is giving rise to buildings which will be wondered at in a score of years hence. However, there is evidently no stemming the tide at present. Mr. Tasker's "Monastery at Highgate" (1,018) is gloomy and prison-like enough in aspect to form a fitting object for the invectives of Mr. Newdegate; its suggestions in regard to style seem to come from the Spanish peninsula; there is character and originality in the building, with its heavy overhanging roof, though it is delineated in a rather bald and scratchy drawing. The drawing of the Holborn Viaduct Station and Hotel by Mr. Isaacs (1,075) exhibits some very good treatment of old and well-known features; it is a Classic building with pilasters running through two stories, but the windows and panels between the pilasters are so designed as to appear to belong to their situation, and there is a more homogeneous effect about the whole than one generally sees in designs of this type; the attic story, with its short coupled fluted columns, is elegant also. Mr. Aitchison's elevation for "proposed Founders' Hall, St. Swithin's-lane" (1,083), is, we presume brick and terra-cotta, but the flat heavy red tint of the drawing hardly realises the effect; there is a good deal of refinement about the design, which is Italian in feeling, with a continuous bas-relief in terra-cotta carried across at about half the height; the foliated or scroll ornaments beneath the first-floor windows and on each side of the dormers seem rather too large in scale, for that class of ornament. Mr. J. O. Scott exhibits drawings of design submitted in competition for the Examination Schools at Oxford (1,085—92), the "Waiting Hall" is a good vaulted interior; the quadrangle is a satisfactory reproduction of late Gothic. Mr. Hicks's Masonic Hall at Redruth (1,077) is "nineteenth-century Gothic" both in its faults and its merits, the latter predominating; the treatment of the porch is good and effective. We must not pass over the "Chauncey Hare Townshend Schools" (1,018) now being erected at Westminster from the designs of Messrs. E. Scott & Hyde, a building which, though not strikingly original, is in remarkably good taste, and looks precisely like what it is meant for.

Among domestic buildings, of which there are a good many specimens, "Queen Anne" has it all her own way; in fact, there is very little else. The most important exceptions are the two buildings of Mr. Norman Shaw, "Wispers, near Midhurst" (1,045), and "Pierrepoint, Surrey" (1,065). Mr. Shaw is fortunate in pretty often getting that most suggestive kind of site, the side of a hill, to exercise his taste for the picturesque on. "Midhurst" is a charming example of this; a house situated on the side of a wooded hill, the lower front (shown in the drawing) giving the opportunity for getting a good solid basement of masonry, on the top of which the architect plays with his design as he pleases, in that studied and curious irregularity the spirit of which he has so thoroughly mastered. Still, in despite of the advantage of site in this building, we are not sure that Pierrepoint, in its flat garden ground, is not an even better instance of its author's talent in evolving the picturesque out of simple materials. The long side of the house next to us, with its simple repeated vertical timber framing, its over-hanging gabled story, and the seemingly accidental break in the line by which half the front is put at a slightly different angle to the other half, is quite a study of quiet homelike repose of effect. The bit on the right, too, the solid mass of wall flanked by three thick buttresses, and pierced only by the two windows between the upper part of the buttresses, is what, if we found it in an old building, we should infallibly take out our sketch-book for. It is a difficult, rather a curious question, whether this picturesque-making of Mr. Shaw's is a true art or a pleasant "sham." Were the old houses which have the same sort of charm and picturesque suggestion,—were they put together at all with the deliberate intention of being picturesque, or is this quality merely the result of a natural and unsophisticated method of putting a building together almost irrespective of appearance, or, at least, symmetry, and just as the materials and the nature of the site seemed to suggest? Some of the critics who are most listened to in the present day would say that undoubtedly the latter was the true state of the case; but it is difficult to be quite so sure of that. If this method of building produces such pleasing effect now, it may be stretching a point too far to say that the ancient English houses in a somewhat similar style were not deliberately intended to please the eyes of those who built them, or that they were no more to their builders than the modern brick street house is to its builder and its tenant,—a place to live in, and nothing else. In regard to this question, how far this modern picturesque is a real pleasure, how far it is merely one of association, Mr. Shaw's designs suggest an annual puzzle to the critic, at the same time that his drawings, as drawings, are certainly an annual pleasure.

Among the one or two other domestic designs which are not Queen Anne, two houses by Mr. Sulman, both in the *quasi*-cottage style (1,000, 1,005), are very pleasing,—red brick houses in a Domestic Gothic style, with black and white work in the gables; No. 1,005 looks exactly like an old English country-house or farmhouse, even to the green moss-covered roofs, which go to help the effect, and show the dwelling as it would be when time has toned down the rawness of a new building. The landscape is very agreeably treated here, and the drawing in general has a feeling and tone superior to the ordinary "architectural draughtsman's" style. Of the Queen Anne houses which abound, it is difficult to say anything special, as they all seem made up out of the same sets of features, variously arranged. In Mr. Robinson's design for the northern block of houses on the Hans-place estate (1,025), the ground story is the most characteristic portion, with the line of the stone balcony carried straight across, and supported in the recessed portion of the front by heavy stone corbels. Mr. J. J. Stevenson's design for houses partly on the same estate (1,029) has much the same characteristics, put together with rather more aim at irregularity and picturesqueness of effect. Messrs. Batterbury & Huxley send four elevations of a house with studio attached at Haverstock-hill (1,326), in which they have succeeded to a curious degree in imparting the look of a model or a piece of furniture to the design of a house. What there is in this to repay the labour of drawing which has been bestowed upon it we entirely fail to see; though we approve of geometrical drawings being sent to the architectural room, and for that reason as well as others approve of Mr. Gibson's section and elevation of staircase at Dobroyd Castle (1,041), in which, however, the style of the masonic part of the detail does not commend itself so much to us as the management of other parts,—the ceiling and lantern, for example. "Additions made and contemplated at Wilmshurst, near Uckfield," by Mr. S. J. Nicholl (1,058), is a very pretty and rather original bit of building; the open recess or alcove with the central arch has a very nice effect.

Among the not very numerous drawings of decorative work it is a pleasure to mention those of Mr. Aitchison, who seems to have established himself as a designer in this kind of work, and whose productions are always marked by delicacy and refinement of feeling both in regard to colour and design, and are totally free from that tendency to over-pronounced effects and angular jerky lines which is so common in decorative work at present. His principal drawings represent decoration of a drawing-room at Brighton, and a large drawing-room at a house at Prince's-gate (1003, 1009); the former room is divided into lengths by a soffit across the ceiling, the larger portion being treated with a wainscot of a dark neutral grey picked out with white, and the wall above with a light conventional foliage design in large panels: as a piece of harmonious and yet slightly piquant contrast this is very effective. The larger drawing-room design has a black (ebonised?) dado, with panels broken up by conventional foliage, a gold paper over, and a "classical" frieze of arabesques, griffins, &c.; a little old-fashioned this last, but the effect of the whole is admirable. The same architect exhibits also two pieces of simple decoration for rooms for H.R.H. the Princess Louise. Mr. W. Clausen, in a beautiful coloured drawing (1,022) shows a proposed decoration of a dining-room, in heavy panelled wood wainscoting, with figures of "the Months" in long panels on a gold ground; which figures are designed with much spirit and variety of pose and character. Mr. Talbert sends a very fine perspective pen drawing of a staircase, in which the form of the heavy wood angle newels is repeated, as a portion of the (apparently) stone piers of the open gallery at the top, which seems a little questionable; the general effect is rich and massive, notably the elaborate carving in the wooden wall lining to the right. Mr. Poley's decoration for a dining-room (1,032) and Mr. Campbell's design for billiard-room decoration (1,034) both seem very good, but, as we have before observed, flat geometrical drawings in pen and ink only, without any hint of colour, are not the best method of exhibiting or testing the merit of a decorative design, however fashionable they may be among draughtsmen at present. The drawings for stained-glass windows for Clarence House, by Mr. F. Smith, are well-designed figure subjects in themselves, but not in the true style for stained glass; the colour is not agreeable, the designs are too pictorial, and the leadings are not shown.

Of the drawings illustrative of existing architecture, the most important certainly is the fine water-colour drawing representing part of the arcade of the large courtyard in the palace of Tiroomal Naik, at Madura (980), by Mr. Chisholm, who is restoring it, and, as will be remembered, read a highly interesting paper on the subject to empty benches at the Institute a short time since. The drawing shows well the remarkable semi-Saracenic detail of the building, and the effect of the details under the glare of the Indian sun. It is remarkable how curiously some of the details remind us of Gothic work: for example, the foliage ornament in the second arch from the left-hand of the drawing, which has very much the appearance of a bit of oak-leaf ornament of the Late Decorated period of English Gothic. Mr. J. Crowther's drawing of the tombs of the abbots in Westminster Abbey (979) deserves high praise for its broad style and handling, and the truth of tone in the rendering of the venerable old masonry and sculpture. Mr. Spiers's small drawing of part of San Giovanni, Siena (989), has a tone and individuality of its own. Mr. Langham's drawing of the Old Hall at Kirby, Northamptonshire, is a most carefully-finished pen-drawing of a most interesting and picturesque bit of Jacobean work; the pediment over the gateway especially, with its row of decorative wall-shafts, is curious and effective, and looks like a Gothic notion in decoration re-appearing in another style. The Old Hall at Gainsborough, Lancashire, by Mr. Codd, is a very

odd and quaint jumble of manners and styles in an old tumble-down bit of building. On the whole, the illustrative department of the Architectural Room is by no means the least interesting portion of the collection.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual general meeting held last Monday for the purpose of receiving the report of the Council, together with the balance-sheet of receipts and disbursements for the year 1875, was attended by a comparatively large number of Fellows. According to the phraseology of the notice-paper convening the meeting, not only "the president, council, and secretaries," but *also* the "honorary officers of the Institute and examiners under the Metropolitan Building Act" were to be elected for the ensuing year of office. Necessarily the Associates, who have no power to vote, or even interfere in the affairs of an election, were very sparsely represented, although several members of the junior class are older and better known than some of the recently appointed office-bearers. The proceedings of the evening were both lively and harmonious. The minutes of last year's meeting were read in a subdued tone by the secretary amid a sustained conversation of gentlemen too glad to see each other again to be desirous of hearing a long account of the little that was effected at the preceding annual gathering. The vitality shown this year to be still in existence among the general body may, perhaps, induce them to do next year what the Council has long done for them. For several sessions the election of officers has consisted in the acceptance by a small number of members of certain names suggested by the Council. The method of their election is so hedged in by convenient and plausible restrictions as to render opposition difficult if not impossible, without resorting to the procedure, somewhat alien to English custom, of a cabal. The independent addition by Mr. Wyatt Papworth and Mr. G. W. Mayhew, of one name to what is known as the "house-list," afforded an opportunity of choosing between two at least of those gentlemen who submitted to the amiable infliction of a ballot. Suffice it, that during the proceedings, Mr. Charles Barry took the chair of the Institute, vacated by Sir Gilbert Scott, R.A. The bye-law which enacts that one of the three vice-presidents must retire every year, enabled Mr. Talbot Bury to succeed to the vacant post. Messrs. Anderson, Brooks, Cates, Chambers, Cundy, Hansard, Phipps, Knowles, Plumbe, Pullan, Seddon, and Mr. James Edmeston were elected Town members of Council. Of the Country members who sat on the Council of the past session, not one had attended a single meeting, and this fact disqualifies them from continuance in office. Their places are now taken by three practitioners from Dublin, Glasgow, and Gloucester respectively. The auditors—a Fellow and an Associate—for the year just commenced are Mr. Alfred Strong and Mr. Meeson.

The Report of the Council having been taken as read, gave an opportunity for comment, although its judicious wording afforded none for opposition, before it was unanimously adopted. The unusual retirement of so many as eleven members raised a very natural question, the reply to which was evaded with characteristic caution. The losses occasioned by the deaths of others are also unusual; but a possible explanation of both is easy to give. In the roll of foreign corresponding members the death of Henri Labrouste, member of the Institute of France, leaves a vacancy difficult to fill. That of Sir Gardner Wilkinson, F.R.S, causes an almost similar void in the list of honorary members. The paragraph in the Report which alludes to the award of the Queen's medal to M. Duc, architect for the Palais de Justice, Paris, records an incident as just as it is popular, and needs no reference in addition to that already made within the rooms of the Institute and more fully treated in our pages.

The balance-sheet elicited some amusing criticism from Professor Kerr; and the innocent hope, hidden in a modest foot-note, that the accumulated interest on the "Travelling Fund," which is now about 20*l.*, would soon cover the annual money prize of 50*l.* for the Soane Medallion, was treated by the Professor as a fair specimen of official capacity for complicated calculations. The repayment of 190*l.* to the Library fund was passed over without either suggestion or sympathy. The fact is, that one of the best technical libraries in the kingdom, like many other similar things in it, is maintained by voluntary contributions, although a portion of the fund devoted to it is nominally compulsory. A bye-law says that "All members, whether Associates or Fellows, are expected within twelve months after their election, to deliver an original paper to the Council on some subject connected with architecture, or to make a donation to the library or collection." Some other method of supplying the library with books lies conveniently open for the members' suggestion. The recent experience of the Sessional Papers Committee shows that there is not any extraordinary difficulty in obtaining papers if they be but sought for in the right way with a little personal zeal. Nor have this committee confined themselves to merely seeking for papers. From their discussions have emanated several suggestions for the better conduct of the ordinary meetings; but the Council to whom these suggestions are officially presented by the secretary have been compelled to shelve them, in consequence of the press of more important business. For our own part, and for the sake of the authors also, we cannot but regret that these papers should appear in our columns in the form under which they are perforce printed. Only a certain abridgment of each is permitted; and often a valuable contribution to professional literature, indistinctly heard at an Institute meeting and rendered unintelligible in a too condensed shape, is completely forgotten before the "Transactions" are sufficiently "purified" and corrected to admit of distribution among the members.

The foreign correspondence of the Institute of British Architects offers promise of possible improvement. It was once the strong point of the Society; but donors are less liberal than of yore, and the titles of foreign books have been seldom communicated to the meetings this year, doubtless because the donations are less numerous than in the previous session. In the list for 1875 the corresponding members were largely composed of names whose owners' continued existence was sometimes taken for granted. Until very recently it was attempted to persuade British architects that although Prussia was in Germany, Saxony and Bavaria were distinct kingdoms; and that "in erring reason's spite," three Italians remained faithful to them in the States of the Papal Church! Slight as such errors are, they afford a handle to those who delight to find fault. A committee composed of men who have travelled, and who travel, has already been suggested as likely to give desired assistance to Mr. Cockerell in the future labours of his post. Many would covet the honour of serving on such a committee. The several members might take special duties connected with different parts of the Continent; and, by keeping up a constant supply of information, become a means of intercommunication between the English profession and its foreign colleagues. Nor should the list of honorary members be allowed to remain in its present scanty condition. A number of archæologists and engineer-officers at present hard at work in India should be invited to swell it; while the addition of gentlemen of the medical and other scientific professions, whose labours often lead them to the confines of practical architecture, could not fail to produce mutually satisfactory results.

The question of the Architectural Examination was touched upon by Mr. Dawson. It appears that in the course of an entire session the Examination committee have decided to "shortly take the matter in hand." The receipts show five students at a guinea a head, and the amount derived from fees of candidates and examination rules is 45*l.* The whole cost is more than 100*l.*; and it is argued that an examination which is supposed to lead to the acquisition of a diploma, and yet does not pay its expenses, ought not to be relegated to the domain of charity. Nevertheless, it is worth a little speculative expenditure. It has cost some pains in the present century to redeem the profession of architects from the slur attached to it in the last. Addison meant no satire when he wrote in imitation of Martial,—

> "If of dull parts the stripling you suspect,
> A herald make him, or an architect."

When fools were sent to sea, and rogues learnt discipline in the ranks of the army, dullards were said to be fit stuff with which to solve architectural problems. It is worth some little application on the part of young men to show themselves worthy to belong to a craft which the technical writers of every age have delighted to honour. Attention to the wishes of the students themselves and some certain assurance in the prospective advantages of examination would, we are convinced, be followed by increasing success.

The delicate matter of the secretaryship was once more calmly discussed last Monday, at an early period of the evening. A short time ago some feeling was naturally evoked by the attempt of a special committee to destroy the original charter. But this document was suddenly discovered to be so elastic that the present paid secretary was said by witty opponents to hold office in defiance of it. It is now no secret that one of the sub-committees appointed to propose measures for the improvement of the Institute has received a carefully prepared series of suggestions from a Fellow, one of which advocates the reappointment of a second honorary secretary in accordance with the provisions of the charter. This does not imply any alteration in the salary or even functions of the present paid officer. It simply tends to deprive him of the permanent vote which he now holds as an *ex officio* member of the Council,—a distinction enjoyed by no other member, from the president downwards. The protest just made, amid applause, by another member,—a tried supporter of Professor Donaldson,—is of a similar description. Preceded by an assurance that immediate action would not be taken, it was ultimately withdrawn on the promise being given that it would be considered by the sub-committee specially engaged in the discussion of such matters. The protest was levelled at the present mode of administration. This mode, not from any fault, any want or excess of zeal on the part of the secretary, but rather, from the reticence of the general body is said to partake of a too personal or individual character. Honorary officers, whose work, if properly done, is laborious, seem glad to have been relieved first of trouble and then of responsibility by a valued assistant, who in spite of himself has become almost a managing director. Never, however, has the secretary's legitimate work been better done than at the present moment. He may justly complain of having too much thrust upon him; and at times he is compelled, when a meeting of certain committees is requested by some of the members, to decline or defer the duty of calling it. While there seems to be no disavowal, on the part of anybody, of the services rendered by Mr. Eastlake, a conviction gains ground that the re-appointment of a second honorary officer would be beneficial both to the Council and the general body of members.

It would be ungracious to close a notice which registers the departure of one and the advent of another president without some mention of the former, even did he enjoy a reputation far less deservedly brilliant than that of Sir Gilbert Scott. It is gratifying to remember that he entered office under the weight of physical suffering, and that he leaves it in excellent health. During the last two years he has rarely missed taking the chair at the ordinary meetings. Seldom speaking at the beginning of a discussion, he always had something new and to the point to say when at its close the subject seemed exhausted. We trust that Sir Gilbert's portrait, well and faithfully painted, will soon help to adorn the walls of the Institute; and that he himself will long continue in various ways to assist and instruct his less gifted brethren at their periodical *réunions* in Conduit-street.

ROYAL ACADEMY CLUB.

THE annual dinner of the Royal Academy Club was held at Greenwich on Monday last under the presidency of Professor E. M. Barry, and nearly sixty of the members and their friends were present, including Mr. E. B. Stephens (its active secretary), Mr. Frith, Mr. Horsley, Mr. Charles Landseer, Mr. Ansdell, Mr. Durham, Mr. Calder Marshall, Mr. H. S. Marks, Mr. Dobson, Mr. T. S. Cooper, Mr. T. Faed, Mr. Lumbe Stocks, Mr. T. Hills, Mr. Val. Prinsep, Mr. Fildes, Mr. Godwin, Mr. Waterlow, Professor Parkins, and others. The chairman, in proposing the customary toast, "Honour and Glory to the next Exhibition," interested his hearers with the intelligence that the clause of the Chantrey bequest, which calls upon the Council to spend annually a considerable sum of money on the works of a painter or sculptor, to be afterwards placed in the National Gallery, will be brought into operation next season. Mr. Fildes replied for the exhibitors not members of the Academy modestly and well, and several other agreeable speeches were made.

TELEGRAPH CONSTRUCTION.

So many things occur which remind us how much we are dependent on the working of the electric telegraph that, although few of us may be able to conceive its mode of action truly, we find it interesting to acquire some little knowledge of the subject beyond what we can understand from seeing the instruments and the wires, and talking vaguely about "the electric fluid"; and there is no book more instructive on the subject than that which forms one of Messrs. Longman's Text-Books of Science.* Whether electricity be a fluid or a force, whether it be a form of matter or a form of energy, the authors do not discuss; the terms used are rendered independent of theory. The nature of electricity is not known, nor is it, say the authors, necessary to the telegraphist that it should be known by him. Electricity is as universal in its effects as are heat and light. We are cognisant of its existence, but we do not know its particular form any more than we know that of heat or of light; and we can measure its quantity no more definitely; we have a fierce heat or a gentle warmth; a brilliant or a moderate light; and we have an amount of electricity which fuses metal or gives pleasure to our sense of touch; and so there is electric quantity, but it is a quantity of relative magnitude only, as in light when we say that a gas-jet is equal to a given number of sperm candles, or that a temperature is of a given number of degrees. Electricity is transmitted through bodies, with more or less ease as they are better or worse conductors, and is capable of doing work by overcoming obstacles to its progress, and the amount of work done with a given electro-motive force depends upon the resistance to be overcome, and resistance implies that quality of a conductor, in virtue of which it prevents more than a certain amount of work being done in a given time by a given electro-motive force. Those bodies,—as glass, ebonite, or air—which offer great resistance to the passage of electricity are called insulators, while those which offer very little resistance—as the metals or water—are called conductors; but the difference in the terms is one of degree only. That function of electricity which determines its motion from one point to another is called its potential; and it is somewhat analogous to an excess of heat in one part of a body over the degree of heat in another part; thus, if one end of an iron rod, of equal temperature throughout, be placed in the fire, the heat travels along the rod with a force in some measure proportionate to the difference of temperature between the two ends of the rod; and the difference of potential between two points determines the amount of the electro-motive force; and what is called a current is an apparent transference of electricity from one point to another to produce equalisation of potential. A current always is supposed to flow from the point of higher potential to that of lower potential. The former point is taken to be positive to the latter point; and, *vice versâ*, the lower point is taken to be negative to the higher point; and the current is supposed to flow from the body positively charged to that negatively charged. The potential of the earth is assumed to be zero, so that when we speak of the potential of a body we really speak of the difference between its potential and that of the earth. This does not assume that the earth has no potential;—different portions of the earth's surface have different potentials at different times. A circuit is the whole path along which the electricity is supposed to flow along the material conveying it, whether that be earth, air, water, or matter in any form. If we stretch a wire horizontally above-ground, and connect its two ends with the earth, then the whole path from one end of the wire to the other and back again through the earth is the circuit, and this circuit may either have a current of electricity flowing through it, or it may be free from all current. In the latter case the circuit is said to be open, in the former case to be closed. The earth is considered simply as a part of the circuit, offering a certain resistance to the flow of electricity through it, and whatever offers resistance to the passage of the electricity, whether it be the battery which generates the current, or the apparatus which renders it evident to the senses, or the line-wire, or the earth, is the circuit. The various kinds of batteries and instruments are described, with relays, recorders, and telegraphic apparatus, with the systems of working; the sixth and seventh chapters being devoted to construction; after which the authors treat of faults, testing, and commercial telegraphy.

It appears that roads and railways are preferred to canals as overground telegraph lines, and that it is not easy to say whether the road or the rail is preferable, but that either is preferable to underground or covered wires, for not only is the first cost less, but faults occurring upon them can be far more readily traced and rectified.

The telegraph-poles used in England are generally of larch, 5 in. diameter at the top for the minor lines and 6 in. for the trunk lines, except terminals, which are of squared timber. The larch and Scottish fir are felled in October and November, and are required to possess the natural butts. The age of the tree when cut ranges from twenty-five to fifty years, and varies according to the soil upon which it is grown. Its average life as a telegraph-pole—if it has undergone no preparation to prevent decay—is stated to be about seven years, but varying according to the nature of its parent soil as well as of that to which it has been transferred. The wet rot to which it is subject is of two kinds, chemical and mechanical. Under the influence of heat and moisture the albuminous and nitrogenous materials of the sap ferment, and decompose the cellulin and ligain, and by a gradual process of oxidation the pole slowly rots away. But it is to the mechanical kind of wet rot that the decay is mostly due. The varying conditions of moisture and temperature are mostly felt at the ground level, between wind and water. To prevent this poles are subject to various processes before being planted; that of charring consists in gently roasting the butt end of the pole, after having been well seasoned, for a length of about 6 ft., over a slow fire, and removing it immediately the surface becomes well blackened without being burnt. The object is to expel whatever sap remains, to kill whatever animal or vegetable life may be present, to prevent absorption of moisture by destroying the external pores of the wood and substituting an impervious covering in their place, and finally to surround that portion most liable to decay with a powerful antiseptic in the shape of charcoal. The bottom of the pole, as well as the portion which has been charred, should then be well coated with a mixture of three parts of Stockholm tar to seven parts of gas tar well boiled, and three parts of slaked lime added, care being taken to scrape off, before the tar is put on, any part of the wood which may have been burnt during the process of charring. Various other means of preventing decay are mentioned in the little book under notice, and their success described. It appears that several poles which were erected between Fareham and Portsmouth in 1848–49 were examined in 1874 and found, to all appearance, to be in as good a state of preservation as on the day when they were first planted. This is a remarkable instance, but it accords with nearly all the evidence we have of the result of the particular process named. In countries where wood is extremely perishable, either from natural decay or from the attacks of the white ant, and preservative processes, on account of their expense, cannot be introduced, as well as where the means of transport are limited, iron uprights are used. The tubular pole invented by Messrs. Siemens, Brothers, is usually employed, and as a general rule its cost may be set down at about three times that of wooden posts of the same strength. Another pattern is that known as Hamilton's standard; and another, again, is that introduced by Mr. Oppenheimer, of Manchester, the especial feature of which is the cast-iron base, which is formed so as to be driven forcibly into the ground by a descending weight. The riband iron post of Messrs. Lee & Rogers, of Manchester, is another form.

The wire mostly employed in England for telegraph-work is, it is said, of the quality of soft iron wire known as "best best." There appear to be some ridiculous names of iron wire, as there are of plates and bars; there are best, best best, and extra best best; and charcoal wire, the best of all. Surely the makers or the merchants, or whoever gave these names to wire and other forms of manufactured iron, cannot reflect with any pleasure upon the occasions which have given rise to these pretended superlatives and super-superlatives, ridiculous as they are in every other sense than that of enabling manufacturers to gain some temporary advantage over the public and over each other.

It would appear that "best" wire is not good enough for telegraph purposes, for, in testing the strength, the scale begins with "best best," and goes on to include the two higher qualities; the three tables of strength given by the authors embracing all the kinds and all thicknesses of wire employed in telegraphy.

The material from which most of the insulators employed at the present day in England are formed is brown earthenware. It does not insulate so highly as porcelain, nor can it be so perfectly glazed, but it is produced with greater uniformity of quality, and its manufacture can be more thoroughly relied upon, and it possesses the further advantage of cheapness over porcelain, ebonite, or glass. The form of the insulator appears to be very important, and is drawn and described by the authors.

In digging a hole for a telegraph-pole its length must lie in the direction of the wires, and not across it, the object being to get the solid earth as much as possible to resist the lateral strain of the wires. Earth-borers have of late years been introduced, whereby no more ground is removed than is required for the insertion of the pole, but several disadvantages which they have are enumerated.

The depth to which poles are set in the ground is about one-fifth of their length; but the depth should never be less than 4 ft., and need not be more than 6 ft., in good solid earth, no matter what their length may be. In made ground they are planted 1 ft. deeper. The authors lay great stress upon the importance of punning the earth round the poles, and of sufficient time being given for this to be well done, for upon the punning and ramming of the poles being carried out as they ought to be, depend, to a large extent, the stability and good working of the line when once erected. The poles being erected, and stayed or strutted, the wire is stretched. The maximum tension with which wires are drawn is one-third of their breaking-strain. When this tension is employed, it is found that the dip will be about 24 in. in a span of 100 yards, and this is accepted as the standard by which all the wires are regulated, the temperature of the air being taken at 60° Fahrenheit. The dip for any other span may be calculated from the known property of the curve the wire assumes, which is that the dip of any span varies as the square of the distance between its supports; thus, the dip in a span of 80 yards would be 15½ in., for,

$$100^2 : 80^2 :: 24 : 15\tfrac{1}{2}.$$

After describing the operations of binding the wires, jointing, terminating, and connecting the overhead wires with the earth, the various operations required in laying wires underground in pipes are described.

* Telegraphy. By W. H. Preece, C.E., and J. Sivewright, M.A. London: Longmans, Green, & Co. 1876.

DESIGN AND CONSTRUCTION OF DOCK WALLS.*

THE stability of a dock wall really depends upon its resistance to the thrust of the earth behind it more than upon its resistance to the pressure of water within the dock, and that is greatest when the dock is empty, and the wall is thus practically a retaining wall, and its dimensions must be determined with respect to its stability as a retaining wall under similar conditions of earth-thrust, although to a retaining wall a certain form is sometimes given which would not be the best for a dock wall; for, as Mr. Allen, the author of the book before us, says, "Dock walls may be said to occupy a situation intermediate between masonry dams and retaining walls, the former being built to support a pressure of water, and the latter to resist a thrust of earth. A dock wall has to perform both these functions." No doubt, in the case of an extension of the dock, whether that may be an increase of area or the making of a new lock—and these have been no very unusual circumstances of the growth of trade—it is of some advantage that the dock wall should be of such a form as to admit of its being temporarily shored up without difficulty; but otherwise a dock wall does not differ in its circumstances of stability from a retaining wall, the condition of the earth at the back being supposed to be the same in both cases.

It is well, however, and especially for the young engineer, to calculate the stability of the the wall under the pressure of water on the face as well as under the earth-thrust from behind.

The author's theories of stability are founded on successful examples in practice, and therefore

* Theory and Practice in the Design and Construction of Dock Walls. By J. Romilly Allen, Assoc. Inst. C.E. London and New York: E. & F. N. Spon. 1876.

may be relied upon; and it is not the results he arrives at, but his method, to which we wish to point attention. His proposition is that, "if a mass of fluid be at rest, any portion may be supposed to become rigid without affecting its equilibrium or the pressure of the surrounding fluid; for any portion of a fluid may be contemplated as a separate body, surrounded by fluid, which presses perpendicularly at all points, and its solidification will introduce no change in the pressures upon it, and therefore no change in the pressure at any other point of the fluid." Every one will agree with that statement, but not, we think, with this, that "This last proposition enables the laws of statics to be applied to cases of the equilibrium of fluids," and that "thus the pressure of water against the sloping face of a dock-wall is determined by imagining the prism of fluid lying vertically over the face to become solid, and then calculating the effect produced by its weight on the principle of the inclined plane without friction," and that "the pressure of water is thus reduced to a question of statics."

It is of the essence of the proposition that the rigid body be surrounded by fluid, whereas the author treats it as a solid resting, without friction, on the face or batter of the wall,—that is to say, that the wedge-shaped mass of water which lies between a vertical plane and the face of the wall is considered as a solid, the lower edge of the plane coinciding with the foot of the batter, or slope of the wall, and the upper edge with the surface of the water; and there is not supposed to be any water-space, however small, between the solid wedge and the face of the wall, whereas, the proposition, which in itself is true, assumes that there is such space, even though it should be merely a film of water, intervening between the two solid bodies; without this the pressure on the face of the wall would not be the same in the two cases, and, with it, the pressure would not be a statical pressure.

In one respect, indeed, a dock wall differs from an ordinary retaining wall, for it is always built in a low situation, and therefore difficult of drainage, and unless this be well provided for, the earth at the back of the wall becomes saturated with water, which increases the thrust on the back of the wall. Of the earth-thrust the author says:—"The tenacity of earth is so uncertain an element that it is neglected, and the body merely considered as a granular mass having friction between its particles. By a granular mass is meant a collection of very small solids more or less of the same size and shape, such, for instance, as a heap of sand or pile of shot. If dry sand be poured out of a vessel with a spout on to a flat surface it will form a conical heap, the sides of which will make a particular angle with the horizontal, and it will be found that the steepness of this slope can never be increased beyond a certain limit, however judiciously the sand be poured, or however carefully it is heaped up afterwards. This slope is called the angle of repose of the material of which the granular mass is composed, and varies for different substances, scarcely in any case exceeding 45°, and sometimes as low as 20°." It was, it is pointed out by the author, at first thought that the earth-thrust was produced by the whole wedge of earth between the back of the wall and the natural slope, or the slope of the angle of repose; but M. De Coulomb and M. De Prony proved mathematically that when a retaining wall gives way the earth does not break away along the line of natural slope, but along a plane of rupture half way between the back of the wall and the angle of repose, so that the earth-thrust is due to only half the wedge of earth between the back of the wall and the natural slope.

The maximum thrust, however, is found when the earth at the back is assumed to be so penetrated with water, either through the wall from the dock, or from the land side for want of proper drainage, as to be semi-fluid, and when it is treated as a fluid of the specific gravity of the earth; and it is the greatest possible thrust which should be calculated upon. It is possible, and is nothing more than ordinary practice, to make such provisions in the execution of the work as to prevent the earth at the back of the wall ever becoming semi-fluid, or anything approaching it; and to make it certain that the angle of repose of the earth may always be considerable. If it be thirty degrees, the pressure on the back of the wall is reduced to one-third of the greatest possible pressure; that, namely, of a fluid mass of the specific gravity of the earth; and according to the provisions which the engineer can or is willing to make in the execution of the work, the thickness of the wall must be calculated upon a condition of earth-thrust between these two extremes.

The weight of the wall exerts its own pressure upon the foundation, and the earth-thrust is also transmitted to the foundation of the wall. The point where the resultant of these pressures meets the base of the wall is called the centre of pressure. This must, in every case, be within the base, otherwise the pressure at the back would overturn the wall, and the stability is proportionate to the horizontal distance between the centre of gravity of the wall and the centre of pressure. Mr. Allen says the practice of English engineers in this respect is to make this distance one-fourth of the width of the wall at the base, and that the practice of the French engineers is to make it three-eighths. This is a very wide difference, and is an instance of how little mere figures can be relied upon unless their significance be duly considered, and all the circumstances be taken into account. The one is half more than the other, or 50 per cent. more, and so by the French practice there would appear to be a great saving of materials; or, is it that they are satisfied with a smaller margin of stability for safety than we are?

The author gives an instance of a dock wall at the Liverpool Docks, designed and constructed by Mr. Lyster, the height of which above the level which the author calls the "datum line"—perhaps the level of low-water mark of spring tides—is 27 ft.; its thickness at top being 6ft. 6in., and at the above-named level 12ft. 6in., the mean thickness being 9 ft. 10 in., which is considerably more than one-third of its height—more nearly 1-2·75ths of its height. In order to judge whether our practice of one-fourth, or the French practice of three-eighths, is preferable, we should know the form of the materials, whether of squared stone or rubble, or how much of each goes to make the wall, or whether the same form of materials—as brickwork—is used in both countries under the difference named in point of stability, and more particularly, perhaps, as to the nature of the lime or cement used. As, however, a second volume is to appear, devoted to the practice on the subject, these and other points may be stated; and in cases of this kind the best way is to give examples of successful construction with the least quantity of materials, and show how, by attention to details throughout, the quantity of materials used has been reduced to a minimum; for, granted only plenty of money and materials, we should have but little need of books on the construction of engineering works, but might go on for some time longer by rule of thumb.

FROM PHILADELPHIA.

IT is almost a foregone conclusion that the Centennial Exhibition will not be ready in all its departments by the opening-day, although great efforts are being made in that direction. The main building is a perfect chaos of cases and partially-erected exhibits. The materials of this huge structure have been purchased by the Pennsylvania Railway Company, for constructing depôts. The rule which limits the height of enclosures to 15 ft. has been in many instances greatly exceeded, much to the detriment of the appearance of the interior. The Permanent Art Gallery, or Memorial Hall, will be the South Kensington Museum of the States. Large purchases are to be made from the exhibits of the various nations,—such an opportunity will never occur again,—to be arranged there at the close of the Exhibition. The horticultural and machinery halls will also be permanent.

The following important circular relative to the system of awards has been issued from the offices of the United States Centennial Commission: 1st. Awards shall be based upon written reports attested by the signatures of their authors. 2nd. The judges will be selected for their known qualifications and character, and will be experts in departments to which they will be respectively assigned. The foreign members of this body will be appointed by the commission of each country and in conformity with the distribution and allotment to each, which will be hereafter announced. The judges from the United States will be appointed by the Centennial Commission. 3rd. The sum of 600 dollars will be paid to each of the United States judges for personal expenses. 4th. Reports and awards shall be based upon inherent and comparative merit. The elements of merit shall be held to include considerations relating to originality, invention, discovery, utility, quality, skill, workmanship, fitness for the purposes intended, adaptation to public wants, economy, and cost. 5th. Each report will be delivered to the Centennial Commission as soon as completed, for final award and publication. 6th. Awards will be finally decreed by the United States Centennial Commission, in compliance with the Act of Congress, and will consist of a diploma with a uniform bronze medal, and a special report of the judges on the subject of the award. 7th. Each exhibitor will have the right to produce and publish the report awarded to him, but the United States Centennial Commission reserves the right to publish and dispose of all reports in the manner it thinks best for public information, and also to embody and distribute the reports as records of the Exhibition.

Congress has refused permission to the artists whose works have been purchased by the Government for the adornment of the Capitol and other public buildings to exhibit their performances at the Centennial. An American contemporary has the following:—"It is not too much to say that, with less than half a dozen exceptions, the paintings and statuary belonging to the General Government, and paid for out of the public treasury, are utterly beneath contempt." . . . . "We see no way however of making the Government patronage other than detrimental to the true interests of the fine arts in this country, unless the utter worthlessness of the purchases already made is demonstrated in such a manner as to be evident to the meanest capacity." In a country where it is possible for colossal fortunes to be made in a few months by men without any education a true appreciation of art can hardly be expected.

Many earnest and zealous men are striving to effect the same change here as that which took place in the tastes of the English people after the Exhibition of 1851, and to educate and encourage their own designers instead of depending on English and French products for their home manufactures. The majority of visitors to the Exhibition, while admiring the great engineering skill and adaptation shown, are loud in their complaints of the architecture and colouring.

A census of the inhabitants of the city was taken last week. The number reported was 817,000, showing an increase of 143,000 since 1870. From the annual report of the Board of Health, just issued, the number of deaths amounted to 17,805, an increase over the previous year of 2,537.

The water-supply is pumped direct from the River Schuylkill without any filtering. During rainy seasons it is of the consistency of pea-soup. The river is, moreover, considerably polluted above the pumping stations, but the authorities are constructing a large sewer to take the drainage of Manayauk—a manufacturing town six miles above—to a point below the inlet of the waterworks. A household filter, although very requisite, is rarely if ever seen. The city drainage runs into the river. The sewer-inlets are of cast-iron, let vertically into the risers of pavements. Being open, perfect ventilation is insured. Last week night-soil carts were abolished, and the public are dependent on the different odourless removal companies for the emptying of cesspools. The method employed is pneumatic, and has the reputation of working well without any offensive odour. Air-tight vessels on wheels carry off the soil.

The roads, as well as those at New York, are a disgrace to a civilised nation. The Emperor of Brazil is reported to have exclaimed,—"Ah, I see, Centennial; never cleaned or repaired for a century!" Horse-cars run through the principal streets, the rails making a smooth track for carriages. Telegraph-posts disfigure the thoroughfares; but trees are liberally planted along the side-walks.

"The Society of the Sons of St. George, established in Philadelphia for the Advice and Assistance of Englishmen in Distress" will open their new building on St. George's Day. Upon the following day the society will celebrate their 104th anniversary by a banquet. Built of white marble, Classic in style, it is a creditable memorial of the liberality of English residents. Upon its erection and decoration 30,000*l.* have been spent.

The hall, 100 ft. by 50 ft., and 33 ft. high, occupies the upper part of the building. At the north end is the platform. Above this stands the magnificent portrait of the Queen painted by Thomas Sully. To the right and left are niches, one of which will contain a copy of the statue of St. George in South Kensington. The ceiling, supported by pilasters with Ionic capitals,

is painted in fresco. The subjects are Love and Peace (England and America) holding a wreath of olive-branches, with Britannia blessing the union, while Columbia presides over charity and industry. In the vestibule, on the ground-floor, are figures of the Muses. The pediment in front of the building will be capped with a casting of St. George and the Dragon, to be made in England. Mr. J. H. Windrim, architect of the United States Government Building, is the architect: Mr. George Watson, the builder; and Mr. John Gibson, the painter.

The new public buildings, as well as the Post-office, are at a standstill for want of funds.

The building known as the Colosseum has been lately removed from the Broadway, New York, to add to the attractions of the Centennial. It is being erected in Broad-street. Constructed of iron in section, bolted together, and covered with corrugated plate, this was a very easy matter, though attended with considerable expense in removal. The monster representations, "London by Day," "London by Night," and "Paris by Night," will be exhibited. These were purchased and brought from the Royal Colosseum, London.

The new building of the Pennsylvania Academy of Fine Arts will be opened on April 22nd. It cost, exclusive of the ground, 50,000*l*. The Academy was started in 1805. Benjamin West, a native Pennsylvanian, was a honorary member. His pictures, "Death on the Pale Horse," and "Christ Healing the Sick," are among the art treasures.

April 17th.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

As the various annual exhibitions come round, it is not easy to fulfil the duty of characterising them on each re-opening without the appearance of repeating very much the same remarks that had been made in our columns the previous season; but in regard to none is there so great a difficulty in this respect as in speaking of the exhibition in Pall-mall. Each of the regular contributors appears to select a particular effect and repeat it with unvarying precision. In some cases this is really getting past a joke. Is Mr. Bonvier for ever going to paint the same mincing and tripping girl? Will Mr. Chase never let us have one year, for a change, without that eternal "Terrace at Haddon Hall"? Or is he bound under some spell, or engaged on payment of an annuity, to go on painting it for the term of his natural life? Have Mr Mogford and Mr. Warren laid in an extra stock of yellows between them, which they are under engagement to work off within a certain term of years? And if these things are not so, what is the explanation of this perpetual, almost mechanical, repetition of the same conventional effects?

There are also those who please us by a repetition of excellence, without mannerism, among whom is Mr. Collier, whose drawings, since he became a *habitué*, have been a constant source of pleasure to the critic. "The Valley of the Arun" and "The Weald of Surrey" (43, 149) are equal to any of this artist's previous contributions; the latter is especially fine; and though Mr. Collier has a marked style to which he is faithful, it does not impress us as "vain repetition,"—and why not? Because this artist goes to nature to see what her effect is, instead of sitting down to manufacture an effect of his own and call it nature. In regard to style of manipulation, also, these drawings are models of true water-colour art. Mr. Syer, whose drawings are always marked by true artistic feeling, and often by no little power, sends a large and fine work, under the title "Autumn afternoon in Wales" (75), as well as other smaller drawings, and Mr. Orrock shows the same fine qualities in the depiction of atmospheric effect for which his drawings in previous exhibitions have been noteworthy; that of "Charnwood Forest" (124) is a very fine drawing, which should have taken the place of some one or two of the works which occupy "the line." A better place also was due to so fine and poetic a work as that of Mr. Holloway, depicting "The Joyless Winter Day" (117) with no little force of handling and originality of feeling. The drawings of Mr. Wimperis will, as usual, repay attention; "A Windy Corner" (50) is admirable. Our old acquaintance Mr. Hine is at his best again in his beautiful scenes "in the Downs," so true to nature in their delicate variations of light and colour and detail that we can never quarrel with their author for restricting himself to a class of scenery which he so perfectly interprets. Most of Mr. S. H. Mole's landscapes will repay attention, and Mr. Leitch's "Souvenir of the 'Sandy Coll'" (27) is a fine piece of stormy effect.

If we come to figure pictures, scarcely any can be said to be so thoroughly original and remarkable as the studies, not of human, but of animal figures by Mr. Wolf, who has gained such a strong insight into the characteristic action and manner of different animals. Ordinary animal pictures, compared with his, are like the stuffed skins in a museum compared with the living creatures in the Zoological Gardens. Two pictures of Ptarmigan, in autumn and in winter plumage, illustrate his mastery of minute detail in the plumage and gait of the birds; "A Moonlight Ramble" (25), a solitary bear coming along over a waste of snow, is even better. Of figure subjects proper, Mr. Linton's "His Eminence the Cardinal" (189), in reality a scene from "Richelieu," is disappointing. The artist has never done anything better in execution, seldom anything so uninteresting in subject and treatment. Mr. Cattermole's "James I. examining a Witch" (113), on the other hand, is in his best vein in every way. The spirit and expression of the whole scene are capitally conveyed. Mr. Staniland's scenes are very well intended, but only one, "The Twine-walk, Lowestoft" (76), has originality and character; the others are very artificial and theatrical in sentiment. Mr. Carrick's "Preparing Bait" (57) is one of those pictures which trace their ideal to J. C. Hook; it is an able work, though a little questionable in the colouring of the rocks and seaweed; at least, we have never seen such colours under such circumstances, but will not assert that the artist may not. Mr. Hugh Carter, again, draws his inspiration from Israels; his "Left Alone" (32) is very good. By Herr Israels himself there is one sketchy but fine drawing, "Going Home" (235). The best by far of Mr. Absolon's contributions is the interior of a Brittany cottage (197). Mr. C. Green's "Country Circus" (159) is *ad captandum vulgus*, though well worked out in regard to the audience figures. Over the vulgarity of other works here, such as "Taking the Cream off," let us draw a veil; we should be curious to know what sort of persons buy such things; but there evidently is a demand. Mr. Towneley Green's small drawing, "Her First Offer" (61), has fine qualities of colour and genuine humour and expression. We may mention two very interesting and admirable architectural subjects, that by Mr. Simpson of a "Pillar in one of the Rock-cut Caves at Ellora" (231), and Mr. Wyld's "Street in Algiers in 1833" (51), in which the short columns and large capitals of a rude Romanesque type are puzzling enough, and suggest that the ground-level must have been much raised since they were built. Among things which are out of the regular track is Mr. A. C. Gow's small and carefully studied group of French soldiers of the Napoleon era at Phalsbourg "On the road to the Frontier" (68), a scene which at once recals the novels of Erckmann-Chatrian, by whose pages it was probably suggested.

THE SOCIETY OF FRENCH ARTISTS.

THE twelfth annual exhibition of this Society contains some very fine works. We welcome the presence of a large Corot, an attraction we had scarcely hoped to find again in these rooms at present, the works of the artist having been "withdrawn from circulation" by purchasers. The one exhibited is a very fine forest scene, or rather the skirts of a forest, in an evening light; the title, "Biblis" (92), refers to the prostrate figure seen at the verge of the forest, and lamented after, apparently, by some other personages near the foreground; the figures, as usual, just help the feeling of the scene without being in any way obtrusive. Opposite to this hangs a remarkably fine work by Pierre Billet, "Haymakers Resting" (44), a treatment of a humble theme with almost classic repose and elevation of style. Very fine is the figure of the girl in the centre of the group, with the orange-tinted handkerchief round her head, and equally remarkable for its charm that of the figure lying beside her, with the pleasant face half in shadow and half caught by the sun; the other two figures are equally natural and fine in pose. The landscape may be a little dingy and deficient in air. Billet's single figures, "Girl Washing" (38), and the interior with a "Peasant Girl" sewing (79), are equally good; not mere studies of figures, but painted thoughts, which set the beholder thinking. A feature in this year's exhibition is the number of paintings and studies of ballet-girls and their performances, by Degas, who seems to have made this phase of life his subject. Of the three pictures from rehearsal life in the upstairs room, "Preliminary Steps" (127) is perhaps the best. The artist relies for his effect purely on truthfulness in rendering, with almost pitiless realism, the actual facts and character of the scene and personages, the awkward and careful attention of the girl who goes through a step before the repulsive-looking old instructor, the scraggy forms and lean backs of others who stand nearer the spectator; one seated on a table is evidently trying to get a "twist" out of her back which she has got in some evolution. "The Rehearsal" is almost equally good. It is almost needless to add there is nothing in these pictures of the vulgar glitter and display to which many artists would inevitably be led by such a subject; it is treated entirely from an artist's point of view; there is no attempt even at realism of texture. The small studies in black and white of these and other subjects are arranged on the staircase, and are worth attention. As we have got to the upstairs room we may notice the clever work of Pille, "Reading the Proclamation of the 24th of February, 1793, in Brittany" (128); the stolidity with which the proclamation is received by these out-of-the-way rustics, the somewhat more comprehensive interest in the faces of one or two who are apparently old soldiers, and the supercilious indifference of the young gentleman in the background, form together a very characteristic study. In this room, also, are some of Mr. Whistler's curious dreams in colour, of which "A Nocturne in Blue and Gold" (147) is noteworthy for the actual sparkle of the lights in the craft on the twilight sea. "A Winter Fog" (149), by the same artist, is an admirably studied piece of effect. There is another large Corot, but not nearly equal to the downstairs one.

Returning to the lower room, we may notice a picture in which Millet outdoes Whistler in the latter artist's own way, in the remarkable little picture of a "Starry Night," which is wonderfully successful in realising the effect intended, and strikes one the more by comparison with the "Sawing Wood" (91), by the same painter, an admirable specimen of his other style in depicting, with simple force, the pathos and dignity of sturdy, patient labour. Mr. Legros sends one or two noticeable portraits,—that of "M. Poulet-Malassis, Homme de Lettres," a very expressive though simple and matter-of-fact painting of a sad and thoughtful face; and the full-length likeness of "The Rt. Hon. Lord Emly" (103) in uniform, a picture in which at least the painter has shirked nothing, for scarlet coat, silver lace epaulettes, &c., are depicted in their brightest and most glittering reality, and are only kept in their place by the close and conscientious care bestowed on the modelling of the rather strongly-marked features. The solid merit and unpretentious masculine style of M. Legros's work impresses one more the more one sees of it. Somewhat the same characteristics belong to a study of a peasant girl's head, by Jules Breton (117); and it is instructive to contrast with this kind of work the mere *chic* of such a picture as "An Interruption" (177), by Madrazo (though the face here is far more pleasing than some of his young women,—we can hardly say ladies), or even the highly-finished painting of the very pretty girl, by Jacquet, "The Young Handmaiden" (116), whose fresh, young face is certainly a pleasant enough object, but the whole thing is mere paint without character or style. Manet's "Le Canotiers" (102) is bad in another direction, and a piece of sheer vulgarity, artistically speaking, which we are sorry to meet with in this gallery.

There are two works in the finest style of Theodore Rousseau, of which "Autumn in the Forest of Fontainebleau" (72) is the more striking subject, but we suspect more thought and labour went to the making of the great heavy foliaged tree in the other (No. 62), which the eye seems to penetrate into little by little as we study it. Mdme. Cazin sends one of her best works in "The old Seaport near Boulogne" (155), a desolate shore scene in which we do not know whether to admire most the truthful tone and detail or the sentiment of sadness and loneliness which pervades the whole. Among smaller things Fantin's bouquet of dahlias, &c. (40), and his white roses with their green leaves in a glass (111) are superb in their way; two street scenes by Lépine (39, 46) are admirable; and the little female figure called "Chloe" (22), by Lefevre, a miniature repetition (if we mistake not) of a larger picture that adorned "the Salon" recently, is quite perfect.

AN EXHIBITION OF COSTUMES.

The Alexandra Palace Company are rather clever in originating new ideas in the way of public attraction and edification in art matters, but not always so successful in carrying them out. Some little time ago they hit upon the notion of an exhibition of glass-work; an excellent idea, which was so mismanaged as to become a complete *fiasco*. During last week they held an exhibition of ladies' costumes, offering prizes for the best designs for dresses of various classes; but here just the same kind of mistake has been made, the judges being persons in the trade, who no doubt acted perfectly fairly according to their lights, but whose ideas, of course, did not travel beyond the requirements of fashion as at present existing. Consequently there was no stimulus towards the suggestion of new and better methods of designing dress, and the awards were evidently given to what fell in best with the acquired tastes of the judges, not for what was really the best designed and most artistic. Had the prizes been awarded by a committee of artists the result would, in some cases, have been quite opposite to what it actually was.

This is a pity, for the idea of a costume exhibition was a very good one; and even as it was, the collection was very pretty, and attracted the interest of a large number of visitors, nearly as large a proportion of gentlemen as ladies. The dresses were divided into classes ("Promenade" costumes, "Reception" costumes, "Dinner" dresses, &c.), and first and second prizes given in each department. Unfortunately, a showy and striking *ensemble* seems to have been more aimed at and better rewarded than really good qualities of design. The first prize for a bridal costume was taken by Messrs. Dickins & Jones, and on the whole justly, for theirs was the most effective dress of the class; but there is, in the existing state of taste, little more scope for really artistic design in a bridal dress than in a bride-cake; the object in both cases is to produce as pretty, showy, glittering effect, and to make the article look as costly as possible. Some of the promenade and dinner dresses were in very good taste; a promenade dress, entitled the "Eva," by the Regent-street firm already mentioned (described as "Silk and wool broché") was exceedingly picturesque, and much superior to the one by the same makers which obtained the first prize in this class. So in the dinner-dress department, the award of the first and second prizes should have been reversed, had we been the judges. The most artistic and effective of the more expensive costumes was a "carriage dress" by Messrs. Green & Edwards, which obtained, and justly in this case, the prize for "the best novelty"; this was a dress with velvet body and very rich damask skirt, the looping of the body in front forming an oblique line from the throat and bosom to the left side of the waist. The whole effect, both of texture, tone, and line, was remarkably good, and such as a painter would really covet in a picture, which could not be said for some others of the premiated specimens. The collection furnished examples of the truth of what we urged a little while since in some remarks *apropos* of Mr. Planché's work on costume, that really good effect is attainable in ladies' dress without extravagant expense in costly and *recherché* material. For instance, the prettiest dress in the room, next to the one just mentioned, was, to our thinking, a yachting costume by Messrs. Redfern, of Cowes, made of "washing linen," and certainly not expensive; it is not our business to advertise prices, suffice it to say that this was a more artistic-looking dress than many that were to be seen at four or five times the cost. Of course, a special character is aimed at in a yachting costume, and a too ornamental or showy appearance would be out of place; but it is worth remark that this very condition leads to a much more artistic treatment of material, a much more definite and carefully-arranged design in the line and fall of the costume, than we generally find in connexion with the more expensive and showy system of bows and other additions, of the kind which we should include under the general term "fuz-buz," which ladies seem to think a necessary element of a handsome costume. The same firm, who devote themselves to yachting costume, took, however, the first prize from all comers for the best dress "for a young lady of ten years," by what they termed the "fish-wife" costume, which, though too "pronounced" for really good taste, was certainly the most effective thing of this class. Indeed, considering that the competition was, as we understood, very keen for this prize, and for that for a dress for a child of five, we were really surprised at the common-place nature of most of these specimens of young people's dresses.

We should very well like to see such a competition as this repeated in due time, but with the award of the prizes left to a committee of artists, pictorial and decorative. The result would in all probability open the eyes both of costumiers and their fair customers a good deal in regard to the constituents of really good taste in dress.

MORE MOTTOES FROM OLD HOUSES.

In Cumberland—the land of the Dacres and Howards—there are a few more mottoes of the kind noticed in a former number of this journal as having been placed by our forefathers over their house-doors, windows, and mantelpieces. One of these is to be seen in the front of the grand old pele-tower now incorporated in the Elizabethan mansion known as Clibburn Hall. This tower was the fortified seat of the Cliburne family from the reign of Edward III. In 1567, Richard Cliburne enlarged his dwelling by adding two long wings to it, so as to make it as convenient as the new Elizabethan mansions his friends were building on all sides of him, and over one of his new doorways his mason placed a large square slab, bearing his shield, his initials, R. C, and this inscription:—"Rychard Clebûn thus they me cawl, wch in my tyme hath bealded ys hall. The yeare of oure lord God, who lyst for to neum 1567. R. D., mayson." By-and-by some farther alterations were made which covered in this new doorway, when the stone thus inscribed was taken out of its first place and inserted in the western face of the old tower, whence it still looks down upon the Elizabethan courtyard and out upon the Cumberland skies. We have reason to know that Richard Cliburne did not compose this inscription; he only copied or adapted a neighbour's superior originality. This neighbour was Christopher Crackenthorpe, who, besides his estate in Cumberland, was possessed of property in Westmoreland, on which he had built himself a mansion-house in the fashion of the day, called Newbiggen Hall. Over a doorway in Newbiggen Hall we may still see the lines Richard Cliburne had in his mind whilst his mason, R. D., was sitting at his new work. They run thus:—

> "Christopher Crackenthorpe thus ye me calle
> Whye in my tyme dyde bylde this halle,
> The yer of oure lorde who lyst to se
> A.M. fyve hundred thyrty and three."

Still on this land of sheep-pastures, green and grey fells, huge boulders, huge standing stones, and countless cairns, we come to another example. It is in Penrith. A century after R. D. looked upon his work admiringly, a William Robinson appears to have acquired a competence in London, and then, with his heart full of memories of the placid lakes and stony hills of his native county, returned to Penrith to enjoy it. He gave a rent of 10*l.* yearly to the grammar school, and 20*l.* yearly towards a girls' school, the town records tell us; and he caused to be carved on the front of his house this short and condensed legend:—"*Ex sumptibus Dn. Wil. Robinson civis Lond. Anno* 1670." Near Cockermouth, too, stands an old mansion that was built by the Swinburnes in 1581. It is now used as a farmhouse. Over the door is the following inscription:—

> "John Swynburn, esquire: and Elizabeth, his wyfe:
> Did make cost of this work in the daies of ther lyfe.
> Ano Dom. 1581. Ano. Reg. 23."

There is yet another old mansion that has come down from the pleasant pomp and circumstance of being the residence of a family of Cumberland gentry to the usages of a farmhouse. Dalston Hall sees no more coming and going of hunting and hawking parties, no merry wives on its terraces, no sweet Anne Pages in its sunny portals, but there is a word for us from those old times carved above an upper window that recalls them vividly. This inscription is in old English characters, and simply records that "*John Dalston, Elsabet wiphe, mad ys bylyng.*" Again, at Eamont Bridge, on the Westmoreland side of the bridge, on the lintel of a small house is sculptured "*Omne solum forti patria est.*"

We have met with an example, too, in Ireland. The house that was thus embellished was the residence of one of the leading merchants in the town of Galway, named Lynch. He belonged to a family whose name occurs as many as ninety-four times either as mayor, or provost, or portreve of Galway between the years 1274 and 1654; and which is still more remarkable for the spartan virtue of one of its members. This was James Lynch, mayor, or warden of Galway in 1493. He traded largely with Spain for wine, and on one occasion sent his only son to that country to purchase a cargo. Unhappily, this young man failed in his trust and spent his father's money upon his own pleasures. He procured the wine, however, from a Spanish grower upon credit, with the understanding that his nephew should accompany the cargo and bring back the price of it. When the good ship neared the Irish coast young Lynch began to fear his father's anger, and believing that the crew would keep silent, he threw the young stranger overboard, and thus arrived with the cargo and without any drawback to it. He was welcomed home with the keenest of receptions, and soon settled down as prosperously as the rest of his family. But, just as he was about to marry the beautiful daughter of a merchant as wealthy as the Lynches themselves, one of the seamen found himself dying suddenly, and, in a fit of terrified remorse, sent for the mayor and told him of the guilt of his son. Young Lynch was tried and found guilty, and upon his father devolved the fearfully painful duty of pronouncing sentence of death upon him. When the day for his execution arrived a great turbulent crowd gathered before Lynch's house and endeavoured to rescue him; but his unhappy father, after urging the people to allow the law to take effect peaceably, without effect, closed his door, and, with his prisoner safe, ascended a winding stair that led to a window that looked out upon the street and down upon the excited crowd below. With his own hands, he fixed the rope that was round his son's neck to a staple projecting from the wall, and then, after a long and fond embrace, pushed him from his hold. His friends below looked up and saw his dying agonies with awe, and then thinking of the father's magnanimity, grief, and loss, slowly and quietly dispersed, appalled. The old merchant shut himself up in his house and remained mourning all the rest of his days. His sorrow was commemorated in an inscription placed over his doorway on a stone carved with a skull and cross-bones:—*Remember Deaths. Vaniti of vaniti and al is but vaniti.* In these days of improvements his house, with the winding stair and the window that was such a terrible centre in this peculiar phase of Lynch law, have been pulled down. A church, dedicated to St. Nicholas, stands near the site, and into the north wall of the churchyard have been set two of the doorways and several of the windows of the old place. In this same wall, within 10 ft. of the site of the tragedy, is placed, for preservation, the stone carved and inscribed as above mentioned.

In Wales, the practice appears to have been almost as common as in England, although, for the same reasons, examples are equally scarce in both countries. The Wynnes of Wynnestay had a distich allusive of the name of the house carved upon one of their towers,—Wynne stay, or rest satisfied with the good things Providence has so liberally showered upon you,—

> "Cui domus est victusque decens, cui patria dulcis,
> Sunt satis hæc vitæ, cætera cura labor."

Those who wend their way among the vales and ravines, the streams, the crags, and hills of this country, all thickly studded with memorials of pre-historic antiquity, will frequently come upon substantial-looking square stone houses, now occupied by farmers, but originally the residences of the gentry of the country. In one, the careful eye will note an inscription on the lintel; in another over the mantelpiece; in a third, perhaps, on a beam in the ceiling of the principal chamber. Sometimes the inscriptions are in Welsh, as in the instance over the fireplace in the hall at Newton, Brecon; but more frequently they are in Latin. Sometimes, only initials and dates are given; and they are not always intelligible, partly because of their abbreviations, and partly on account of their worn condition. There is one of these old substantial houses of decayed fortunes at Penmorfa, now used as an inn, called Bwlch y Pedwan. It is a grey old place, sunny and serene-looking, dwarfed by the grey hills that tower beside it. On the centre beam of the largest chamber on the ground-floor are carved the following letters and date:—S^{r} I° I. 1664. A Sir John Owen lies buried in the church close by, and these letters are supposed to represent him, by the presen

tenant of the homely quarters, though in an unsatisfactory and indistinct kind of way.

We may add, though Shakspeare does not add to our store of incriptions, he appears to glance at the fashion he saw spreading around him of increasing house accommodation in the following passages:—

"When we mean to build
We first survey the plot, then draw the model;
And when we see the figure of the house,
Then must we rate the cost of the erection:
Which, if we find outweighs ability,
What do we then but draw anew the model
In fewer offices; or, at least, desist
To build at all?

* * * * *

We survey
The plot of situation, and the model;
Consent upon a sure foundation;
Question surveyors; know our own estate,
How able such a work to undergo.

* * * * *

Like one, that draws the model of a house
Beyond his power to build it; who, half through,
Gives o'er, and leaves his part created cost
A naked subject to the weeping clouds,
And waste for churlish winter's tyranny."

INDIA, AND OUR INTEREST IN IT.

NEVER, perhaps, was the "East,"—to use that very general term,—of greater interest to the "West" than it now is, and it would be not a little difficult to say whereabouts that interest chiefly centres itself. There is the very *land* of the East first of all, then there are the specialised people who have dwelt and who yet dwell in it; and then, again, there is the *history* of it, going back so far as to be beyond record. And then there is the immediate *present* of it, by no means the least remarkable of the phases which it has seen. How much does the West, we may usefully just now ask, owe to the East, and can the debt be repaid, and how? It is to be feared that but very little indeed has as yet been thought of all this. How different, we often think, would the state of this England be if but the East, and the Eastern man, and his mode of thought and work in this world never had existence, or had he never been heard of beyond his own borders! It would be, indeed, a difficult thing to sum up with any approach to accuracy what and how much we do owe to Eastern thought and inventiveness, and, may we not add, mysticism.

The East, as we have said, is so wide a term that but a little of it at a time can be glanced at. Volumes have been written about Egypt, and the Holy Land, and the home of the Arab, and other places essentially Eastern, and yet the subject matter of them is not exhausted,—hardly, indeed, commenced, if we look a little below the outward show of it. A single Eastern country, or rather congeries of countries, a single empire, will furnish matter for a few thoughts on this fertile theme,—our possession, India.

It is often enough said how curious an anomaly it is that the history of so great an empire as that of India, the possession of which we view with so much pride, and guard so jealously, is generally regarded with so little of living and abiding interest. Yet, how very great it is as compared with so many things, small enough sometimes, which do excite an interest all absorbing at least for the moment. This surely should not be, for India is one of the most wonderful spots on the earth's surface, in well-nigh all ways,—the country itself, and its natural features, its inhabitants, and their individuality, and their history, and, not least, the peculiar fine art of these strange people, as formed and modified by their equally specialised religion, to say nothing of the hoar antiquity of it all, stretching, as it does, far, far beyond the dates of recorded history. We must confine ourselves to matters artistic.

But a word first as to the country itself, and the materials it furnishes for art, found everywhere to be influenced in no small degree by the materials nature provides on the spot in which it grows up. We might add climate, too, here, as a modifying influence in art production. Change the climate and the natural materials of a country, the people of it remaining the same, how unlike and how different must the resultant art, and building, and consequent architecture of such a country be. Even "style," which comes from the mental organisation of a race, must needs change,—a curious, though somewhat remote, subject of inquiry.

India may be said to be the world in miniature, for there are in it vast plains stretching for many hundreds of miles without interruption or pause. And there are mountains the highest in the world, and by the side of which the famous European Alps get to be thought small. The long and interminable range of the Himalayas, the abode of snow, and which divide India from Northern Asia, are indeed notable every way. Out of them, and springing from their huge glaciers, rise the great rivers which would always seem to have exercised so strange a spell on the native mind, and to have been regarded with such religious awe and veneration, and to have consequently influenced in no small degree the temple building. The rivers of the Hindoo were not, it is certain, made for nought, nor was ever opportunity missed of turning them to artistic account. Looking, therefore, to the great natural features of this vast country, may it not well be asked which of the primitive forces works in the strongest way in the moulding of the rough materials into form,—the minds of the rude and primitive people, or the nature amidst which such people live as moulding their very minds to act upon it? In such a country, and surrounded by aspects and forces of nature so vast and so powerful, it is impossible that it could be otherwise than that the minds of the men who dwell in it should be wonderfully influenced by it.

But in this place, as a matter of course, it is in an art and architectural view that India becomes of so paramount an interest, for in it may be seen yet going on a really primeval condition of things. Up to this present it has barely been noticed, if indeed at all. It is in the "outlandish" districts, and away from the ordinary routes, that such is to be found, although it is not wholly absent elsewhere. Given the materials, and that instinctive idea of putting them together, and the hard necessities of the case,—then the very rudest, and as we are apt to term them, the most ignorant of people, are found to provide themselves with house shelter, and other constructional needs, in a way not a little ingenious, and to the purpose, and at times singularly artistic and picturesque. We have had opportunity of seeing some photographs lately of this Hindoo work, exhibiting some skill of this kind while in actual process of construction. It is a little calculated to upset our notions of architectural invention and designing, for they are built up evidently without reference to architectural style, as that term is commonly understood, yet do they more or less evidence style, *i.e.* the style of architecture peculiar to the race of men who design and build them. We may cite an instance or two in proof of this from house or common hut building, and from rude bridge-building, the latter as much of a necessity here as the hut building itself. Both evidence how little there is that is new under the sun, for things here and all round us which look so new and of to-day have their precedent in distant India of thousands of years back.

Bridge-building in the "hill districts" is a necessity, for the water-courses and streams are so many and so steep and so rapid that by no other means can they be crossed, and it might well puzzle, to look at them, an acute engineer how to accomplish the work in the cheapest and most direct way. On a heap of *débris* on either side of the torrent, a stout and broad plank, or planks, are placed at a slight incline; on these, other planks are fixed, so as to overlap those beneath them. On these, again, are others, until a sufficient number are laid so as to meet each other from the opposite banks. In this simple way a bridge is built over a mountain torrent by rude men, who know nothing of our learned ways of doing such things, and certainly without a thought of "designing" anything architectural or picturesque, or in a national style of art; and yet are these effective structures, rude as they are, singularly picturesque, and have a certain "Hindoo" architectural look about them, growing, as it were, almost out of the earth they rest on. Some of these are without handrail of any kind, and present simply a narrow plank, over which you must needs pass across the raging torrent beneath. Nothing can be simpler than these bridges, or more purely constructional, or more devoid of what we should term art; and yet, as we have said, they seem to belong to the country, and have a special Hindoo look about them. They might have been invented in the mound-building age of the world, and were so, perhaps. They are worth a little study, though so rude and primitive.

Then there is *house* and hut building, "designing" perhaps we can hardly call it, for it would seem to be managed through a sort of instinct, so absolutely necessary for its purpose is everything in it. There are, as may be supposed throughout so vast an extent of country, a number of house-building ideas characteristic of each locality more or less. Nothing in the way of house-building can be simpler. Mere earth, or "mud," composes the low walls of such a dwelling; and this sometimes mixed with small stones, or fragments of granite, is found to resist the rains for many years, and is easily renewed. The flat roof, too, as simple as the walls, is "terraced" with this mud, and is found to turn the rain well. Art, too, at times comes in here,—art-writing, in a strange way, and truly autographic; for the builder and owner of the hut himself, puts his mark, if not his name, on the walls of it. Stripes of colour, like the houses of Italy in the antique times, ornament them, and odd-looking ornaments every here and there are to be found. These houses have neither chimneys nor windows, all the light entering in at the ever-open door. All Hindoo houses are not like this; we give the simplest possible and the most commonly to be met with. Millions of human beings under the burning sun live in such huts, sleeping on the bare earth: the primæval man yet lives, it is quite certain. We might go on to almost any length, and tell of other kinds of house building, stranger even than these. It might be useful to compare in detail an Indian "hut" with some of our London dwellings in out-of-the-way places.

We have thus glanced for a brief moment at Indian art and architecture in anticipation of what is, as we are assured, to be exhibited to the public on the return from India of the Prince of Wales. Many things of surpassing interest he will surely have acquired, attractive to everybody; but many things there will be, doubtless, of a less striking kind, but may be more instructive to those who look a little deeper. We trust everything will be "on view" for a time, even small photographs and native drawings. His Royal Highness has seen very much that is strange and new, not only to himself, but to all, and has had opportunities far beyond what has been hitherto possible. We here plead for the smaller and less striking objects. It is wonderful how much insight into the ways of a strange country is to be got from the sight of what might be thought commonplace and insignificant,—more so at times than from the large and more imposing. Many things we could here name which would go far to prove this. It is for the most part only incidentally and by accident that we meet with accounts of the inner life of a strange people in common books of travel, and thus get to see a something. But more than this is needed sometimes; and to get to the secret of the matter, we need to see into the lower life of a distant and strange country, and into its more familiar and common things. We know as it is but very little indeed of this, but it is worth the knowing. Millions of men and women live, and work, and think in their own way at the feet of those huge mountains and endless rivers of whom we know simply nothing! But we *may owe them* a something.

THE ART REVIVAL OF THE ELEVENTH CENTURY.*

IN the eleventh century the great revival began, and what is called Christian art dates from that period; but this revival began in the West, and not in the East, and from that time Rome has always been half a century behind the rest of Europe. The Mediæval architecture of Rome would not bear comparison for a moment with the magnificent cathedrals of the West of Europe, in England and France, and Germany, and Belgium and Holland, and others further north. "Necessity is the mother of invention," and in Rome the builders had such an abundance of materials ready for use, that they had only to adapt them to their wants, and had no need for invention. Marble columns were as common in Rome as oak posts in England, and it is no wonder that they contrived to use these beautiful columns, and make their buildings to suit them. But to return to the earlier period.

It is very interesting to trace the gradual progress of the fine arts in Rome, and to see how far the Romans themselves had advanced before the conquest of Greece, which changed all their ideas. It is evident that they had introduced the arch, which they have used both in the Tabularium and in the Emporium, the only two buildings of any importance of the early part of the time of the Roman Republic that remain to

* From a lecture by Mr. J. H. Parker, C.B., on the "Connexion between Archæology and the Fine Arts," delivered at the British Academy of Arts, Rome.

us. With the arch they used concrete walls, and began to place on the surface of the wall the elegant ornament called *reticulated work*, to give it a flat, smooth surface. In the Emporium we have the beginning of this; the work there was called by Vitruvius *opus incertum*, or irregular work: it had not then reached the regular form of the network called the *opus reticulatum*, which began in the time of Sylla, and goes on to the end of the first century, and a little beyond it to the time of Hadrian. Sculpture and painting are not my subjects; architecture alone has occupied all the time I have been able to give to the study, but I cannot close my eyes, and it is easy to see the very rude character of the early sculpture of the Romans, such as the bas-relief of Curtius leaping into the gulf, found on the edge of that gulf in the Forum Romanum. This piece of sculpture, supposed to be about two centuries before the Christian era, is, I believe, the earliest piece of Roman sculpture that we have remaining; but of the earlier period of Etruscan sculpture we have abundance, and often very good, and these must be long before the Christian era. The gigantic lions' heads on the bank of the Tiber, in the upper part of the port of Rome, must be of about 180 B.C., and are very much of the Etruscan character, just before the period of the introduction of Greek art. The paintings in the Etruscan tombs, and still more on their vases, are also very remarkable, and often very fine; they are sometimes rude, and partaking of the Egyptian character, as at Veii. In other instances the drawings are very fine and good; the series now being exhibited by Prince Torlonia in the new museum in the Collegio Romano are good instances, and are said to be three centuries before the Christian era.

The remarkably fine collection of objects of ancient art found near Naples by Castellani could have had nothing to do with Etruria; this and other similar discoveries have induced the archæologists to abandon the name of Etruscan for ancient art, which was not confined to Etruria, but extended all over Italy, and especially in the southern part called Magna Græcia. The name of Italo-Greek is now given to these objects. It must be remembered that after the inhabitants of Veii were transferred to Rome the Romans must have been half Etruscan. Some of the objects belong to an earlier period than the time of the Grecian Republics, and there is a mixture of the Egyptian character in them. The massive character of Egyptian architecture, and their rude and stiff drawing, is well known. The fine collection in the Egyptian museums in the Vatican and in the Capitol enable those who are interested in the subject to study it. Of Assyrian art we have fine examples in the British Museum. Of the art of the Persian Empire we know little, but these great empires of the early part of the world's history are too remote to be of much general interest. The history of modern art begins in Rome; the earliest Christian art was an imitation of the Roman from the remains they had left in all the provinces of the old Roman Empire, which are the kingdoms of the middle ages and of modern times. The remains left by the Romans often show that they had possession of large districts of which we have no other record. Archæology is better evidence than written history, in the early period, before the use of writing. The influence of Roman art was not confined to Europe and the Western Empire, it spread over the Eastern Empire also. After the seat of empire was transferred to Byzantium, because that was a more central position than Rome, they retained their hold for many centuries over a great part of the Eastern Empire, and in the West they retained the command of the Mediterranean by their police galleys down to the eleventh century. But Roman art declined very rapidly after the third century; the convenient but bad habit of using old materials ruined their art.

At the beginning of the eleventh century, when Christian art began, there were no masons, and the art of cutting stone was lost; it was reproduced by copying the remains the Romans had left, and sometimes by getting artists from Rome, more frequently by getting drawings made by the bishops who went to Rome for their palls (or the priests who accompanied them, for the clergy were the only educated people at that time), and imitating them as well as they could. But as "Necessity is the mother of invention," the difficulties in the way of energetic people only stimulated them to greater exertion, and our magnificent Mediæval cathedral-churches and castles and houses are the result of this necessity. The Romans and the Italians (not having felt this necessity) followed the new style reluctantly and slowly; for this reason the buildings in Italy of the Middle Ages are always half a century behind the style of corresponding buildings in the West.

There had been a great temporary revival in Rome and Italy in the time of Charles the Great, but it did not last. An immense number of churches were built or rebuilt at that time, but after the ninth century there are none at all for at least a century, though perhaps not always exactly at the same time in all other countries. Arches and vaulting are the great peculiarity of Roman architecture; if that had been *continuous* (as some great scholars think, and as written history *by itself* would make it appear), the art of building vaults would not have been lost; yet it is certain that the builders of the west of Europe, in the North of France, and in England, did not venture to build a vault over a space of 20 ft. wide before the middle of the twelfth century, nor do we know of any vaults of such dimensions in Italy during the tenth or eleventh century; the strictly classical portico of the church of St. Giorgio in Velabro, with an inscription upon it recording its erection in the middle of the thirteenth century, at the same time as Salisbury Cathedral, Westminster Abbey, and a host of the magnificent buildings in England and France, seems at first sight quite incredible to the English or French archæologists. As the other arts always followed architecture very rapidly, the sculpture of the end of the twelfth and of the thirteenth centuries in England and France is superior to any in Italy of the same period. This was the opinion of Mr. Cookerell (who resided long in Italy, and was an enthusiastic admirer of Italian art), as he states in his work on the sculpture on the west front of Wells Cathedral, which is of the early part of the thirteenth century, that there was nothing in Italy at that period to compare with this. Roman art lingered longer in Aquitaine than in any other part of Europe, and the first sculptors in the north of France came from Aquitaine at the end of the eleventh century. This happens to be just at the time that the ports in the Mediterranean there had thrown off the Roman dominion.

One of the earliest examples of architectural sculpture of the transition from the Romanesque, or debased Roman, to the magnificent Gothic style of the thirteenth century, is at Carcassonne, in Aquitaine, almost on the shore of the Mediterranean, and it represents a palm-leaf, a proof that the sculptor had come from the East, probably from Byzantium. In Perigueux and Perigord there are many churches of the eleventh and twelfth centuries of the character called Byzantine, of which the distinguished feature is the cupola, or what we commonly call the dome in England, from the Italian name of a cathedral church, *Duomo*. But for many centuries of the Middle Ages there was no communication between Aquitaine, in the south of France, and Normandy and other parts of the north. It was not until the time of Henry II., or the later half of the twelfth century, that the communication, of persons and ideas, began, by that king holding his court at Angiers, and calling on the nobles and bishops of the south and of the north, including England, to meet there; all the educated classes of his great dominions there became personally acquainted, and freely communicated their ideas to each other. At that time the dominions of the English Crown included all the western part of France, from the Channel to the Mediterranean, not by right of conquest, but by hereditary succession from his father and mother. Several varieties of the Romanesque style had been developed in different provinces of that wide extent of territory, each derived from some one Roman building, and developing the peculiarities of it, as has been shown by M. De Caumont in his valuable works. Thus the architecture of each province is traced back to Rome as the centre. With the architecture comes necessarily the sculpture and the painting. All parts of the old Roman Empire must go back to Rome for the origin of their fine arts; even Greece and the East had become Romanised, and though the fine arts began there earlier, they must still be traced through Rome.

Conversazione.—Mr. George Robert Stephenson, the president of the Institution of Civil Engineers, will give a *conversazione*, on Thursday, the 1st of June, in the Galleries containing the "Loan Collection of Scientific Apparatus" at South Kensington.

CLEARING THE ATMOSPHERE.

On the motion of the Duke of Northumberland, an address has been presented by the House of Lords to the Queen, praying for the appointment of a Royal Commission "to inquire into the working and management of works and manufactories from which sulphurous acid, sulphuretted hydrogen, and ammoniacal or other vapours and gases are given off, to ascertain the effect produced thereby on animal and vegetable life, and report on the means to be adopted for the prevention of injury thereto arising from the exhalations of such acids, vapours, and gases."

As in the pollution of rivers, so in the defilement of the atmosphere, the destructive powers of man have exceeded his conservative tendencies; and while increasing trade and extended manufactures have added manifold to the waste products which, thrown in small quantities into the stream or upon the air, would be almost inappreciable, hardly any precautions have been adopted to prevent the evils arising from an excessive use, or abuse, of air and water as common sewers and scavengers.

Not that science has not provided ready means of utilising, or at any rate neutralising, the many new "waste products" which our many new industries are creating; but as the miner or manufacturer has been brought up to the belief that the readiest means of ridding himself of his "matter out of place" is to throw it in a heap in the nearest vacant spot, he is unwilling to bother himself about any new method of turning it to account which will necessitate his storing it or altering his accustomed plans. He says, probably, that he has quite enough to attend to in his legitimate business, without adding to his undertaking by creating a new trade; and although it may be absolutely proved to him that his refuse may be turned to profitable account, he declines to take the trouble, preferring to pour it forth into the nearest stream or into the atmosphere, forgetting or ignoring that he is thereby injuring others by his neglect.

Manufacturers now claim, in many cases, a prescriptive right to pollute streams, and these vested interests stand in the way of those who would endeavour to force them by legislation to divert their waste matters from the rivers. But a prescriptive right to pollute the atmosphere, which cannot by any legal enactments be declared to be, in any locality, or in the most limited sense, subject to proprietary rights, cannot be recognised. The right of every individual to the free access of air has often been asserted in legal judgments, as recorded in these columns, and the enjoyment of pure air by all persons and classes is a principle recognised at common law. But the principles of common law are, unfortunately, very difficult of enforcement. "The common law of the country affirms the right of every owner of land to make use of the water of the river or stream passing through his property, but it prohibits the employment of the water in such a manner as will render it unfit for the use of those lower down the stream. This common law right," however, says Major-General Sir William Denison, in his Report on the Pollution of Rivers, "exists now but in name; the cost of enforcing it by legal process is so excessive as, practically, to leave complainants without redress."

And if this is so in the case of polluted water, much more so is it in the instance of polluted air. It would be a most difficult thing to prove that a particular chimney was the cause of injury inflicted at a distance of many hundred yards, especially where other chimneys exist, which are, *primâ facie*, equally guilty, and the impossibility of any individual attacking the Cyclops of a whole manufacturing town in the courts of law is self-evident. And it must be remembered that every chimney, even of our private residences, contributes its quota to the defilement of the air, and in large cities the aggregation of these small contributions is sufficient to create a considerable and appreciable effect, though each, singly, may be practically harmless; and under such circumstances it would be difficult to draw a line between the injury to the air effected by the combination of the minor nuisances, and that caused by a larger and more dangerous factory chimney.

Smoke Nuisance Acts have been passed giving power to individuals, by a more easy process than is otherwise afforded, to compel the owners of chimneys of a disagreeable tendency to prevent nuisances therefrom. These special enactments do not afford relief against those persons whose occupations injure the air in such

away, by other means than by actual smoke, as to do injury to the complainant's health, or property, or comfort; and even if they did, such remedies are costly; and while the rich can avoid the evil and expense both, by removing into the open "country" to live—submitting to breathe a polluted atmosphere for a few hours a week, while they have the alternative of keeping out of it as much as possible—the poor are forced to live, night and day, amid the exhalations of factories and works whose breath is the blast of death and not the breath of life, since they cannot afford to pay the price of war against the evil, and are equally unable to run away from it.

In the interests of the poor, then, it is necessary that measures should be adopted to enforce the purification of the air. In passing the Alkali Acts, the Legislature recognised the necessity, and compelled the owners of chemical works to condense their gases and convert them into solids. This they have done, in some instances to their profit, in others to the injury of the public in another way, by turning the matters thus condensed into the streams instead of into the air.

But legislation has not kept pace with commercial industry, and the good work inaugurated by the late Earl of Derby has not been extended, while the production of noxious gases has gone on increasing in others besides alkali works. In fact, nearly all our large manufacturing centres are rapidly becoming uninhabitable. First the immediate neighbourhood and then the suburbs have been attacked, and the area conquered by the foul gases has gone on extending till whole tracts of country are deprived of vegetable life, and of the means of supporting animal life. The districts of which Newcastle, Birmingham, Wolverhampton, and Burslem are the centres, and many others, are at the mercy of a more or less perfectly invisible enemy which overhangs them, and smothers them with its life-destroying properties. Man and a few domesticated animals are the only beings capable of withstanding the effects. Sheep and cattle and birds cannot exist. And man does not remain unscathed. We have already alluded to the proved deterioration of the human race in certain of our manufacturing districts, and that this decadence is owing to the want of pure air there can be little doubt. What child can be expected to develop into a well-grown man, who is nursed in an atmosphere not of oxygen, but of sulphuretted hydrogen? What beings can be expected to remain in healthy action for three score years and ten who are designed to breathe the pure air of heaven, but made to inhale volumes of ammoniacal vapour? It is time the powers of injury possessed by the tall chimneys which overshadow all our large towns were curtailed. Education is being brought within the reach of all, but it is useless to expect the *mens sana* if we ignore the requirements for the existence of the *corpus sanum*.

AMERICAN ARCHITECTS AND THE STATE.

THE New York Chapter of the American Institute of Architects has presented a memorial to the Legislature of New York, protesting energetically against the adoption of certain designs of the Advisory Board for the completion of the Albany Capitol. The memorial urges that the design, as amended by the Board, is "an agglomeration of incongruous forms," Renaissance and Romanesque, inharmonious in detail, and that, if it is carried out, these faults will be as obvious to the public as they are now to architects. It speaks of the towers and dome as being discordant in character, the colour decoration as destructive of repose and dignity, and the new work in general as extravagantly rich and expensive in parts, and meagre to baldness in others.

The memorial thus concludes,—"The New York Chapter of the American Institute of Architects, in the general interest of the public and of its art-education, as well as of the profession which it represents, feels itself called upon to urge you to sanction no design for the completion of the Capitol building which is not harmonious, in character and style, with the work already executed; or if the work is so faulty in construction, or so bad in design, that it is, in your opinion, impossible to complete the structure in harmony with it, so as to make a good and suitable Capitol building, this Chapter submits that the common interests of the public and of the art of architecture demand that the façades should be removed and sold, and that the work should be commenced anew."

FINSBURY PRINTING AND STATIONERY WORKS.

THE gradual increase of the business long carried on by Messrs. Waterlow & Sons having rendered more convenient premises than those hitherto occupied a matter of necessity, the firm a few years ago acquired the freehold of the ground formerly occupied by some fifty houses and shops known as Finsbury Market. This ground, measuring 166 ft. from east to west, and 152 ft. from north to south, is bounded on its several sides by North-street, South-street, East-street, and Clifton-street, thus furnishing a space well suited to the purpose for which it was required. Upon this site a large factory has been erected, comprising a well-lighted basement, with five stories above.

From the accompanying plans it will be seen that the four frontages are occupied by continuous buildings, 50 ft. in depth, leaving a central courtyard, a quadrangle, 65 ft. by 52 ft. This is covered over above the level of the main roofs by a structure of iron and glass, so constructed as to afford complete protection from the weather, and at the same time to secure light and ventilation; the general effect of this arrangement being to obtain for every room in the establishment an unusual degree of lightness. Ornamentation has not been greatly studied in the erection, but care has been taken to ensure the comfort of those employed by the firm; and seeing that the building furnishes working room for some 2,000 persons, this consideration is of no slight moment.

The courtyard is provided with two entrances, one in East-street, and the other—which is the principal one — in Clifton-street, where the general offices are situated. From this courtyard access is obtained to six large rooms, the total area of which is over 19,000 square feet. On the basement six similar rooms extend over the entire site; and here will be found the store-rooms, lavatories, &c. (the sanitary arrangements throughout being most complete and excellent); while still lower, beneath the central portion of the basement, is a tank, constructed to hold 30,000 gallons of water, other tanks being placed on the staircases, and two more, very large and of cast iron, on the roof. Two fireproof and enclosed staircases, situated near the centre of the two ends of the quadrangle, and opening out on to fireproof balconies, provide access to the several rooms on each of the upper floors. At the rear of each staircase a brick shaft extends from the basement to the top of the building, up which all main pipes for gas, water, and steam are carried, as also the cast-iron soil-pipes for the several w.c.'s, lavatories, and so on, which are arranged on each balcony and on the roofs. Behind the eastern staircase the main furnace-shaft is erected, and stands independent of the walls of the building. This is 105 feet high above the basement floor-line. At each angle of the balconies powerful lifts are placed, one at each corner—three of them being worked by steam and one by hand power.

The six floors (including the basement) comprised in the building give a total available area of about 130,000 square feet; but by an admirable arrangement of party walls immediate communication from one room to another is avoided, the access in all cases being by means of the balconies; consequently, each section is divided into six separate and independent fireproof buildings, while each floor is also fitted with firecock and hose at convenient points. The general impression derived from an inspection of the premises as a whole is that everything has been planned and contrived to afford the utmost facility for carrying on the various processes connected with the business.

Taking the several portions of the establishment in detail, we note in the basement the store-rooms for paper, lithographic stones, the wetting and drying rooms, rooms devoted to powerful hydraulic presses and cutting machines, a smith's shop, the boiler-rooms, and large steam-printing machines, other fine specimens of which are also to be met with in two large rooms on the ground floor, there being seventy or eighty machines of this class. The smith's shop is of itself a matter for surprise, being equal in capacity to many engineering establishments, although simply occupied with the manufacture and repairs of the machinery on the premises.

Leaving the basement for the ground floor, we note, in addition to the machine-rooms already mentioned, the shipping, country, and general offices, which abut on the western or principal entrance in Clifton-street.

On the first floor is located the binding department, the several rooms being occupied by folders, stitchers, vellum-workers, gold-finishers, edge marblers, and the like; steam and other machinery and powerful hydraulic presses, all duly fitted with the latest improvements, being employed to supplement the hand labour.

Four large rooms on the second floor furnish the necessary space for the lithographic department, a staff of artists and draughtsmen being constantly employed in preparing designs; while the lithographic printing branch turns out the varied kinds of work, from the cheapest to the most elaborate, every needful appliance being duly provided. A specialty of this department is the peculiar process known as vegetable printing, which is chiefly applied to the production of bankers' cheques, its main excellence consisting in the absolute impossibility for any alteration to be made in the printed matter without detection ensuing. Some idea of the extent of this department may be formed from the fact that in one room alone are no fewer than seventeen of the largest steam-machines. On this floor are also carried on the varied processes appertaining to machine-ruling, type-paging, and other minor kinds of letterpress printing. In this department several patents belonging to the firm are brought into requisition.

On the third floor the manufacture of envelopes goes on at a surprising rate; the different branches including envelope-cutting, the preparation of the adhesive matter, gumming, folding, embossing plain and in colours, in cameo and relief, and black bordering, in most or all of which hand labour is largely supplemented by costly and intricate machinery. This department is supplemented by the die-sinking branch, in which official seals, coats of arms, crests, and other special designs are produced.

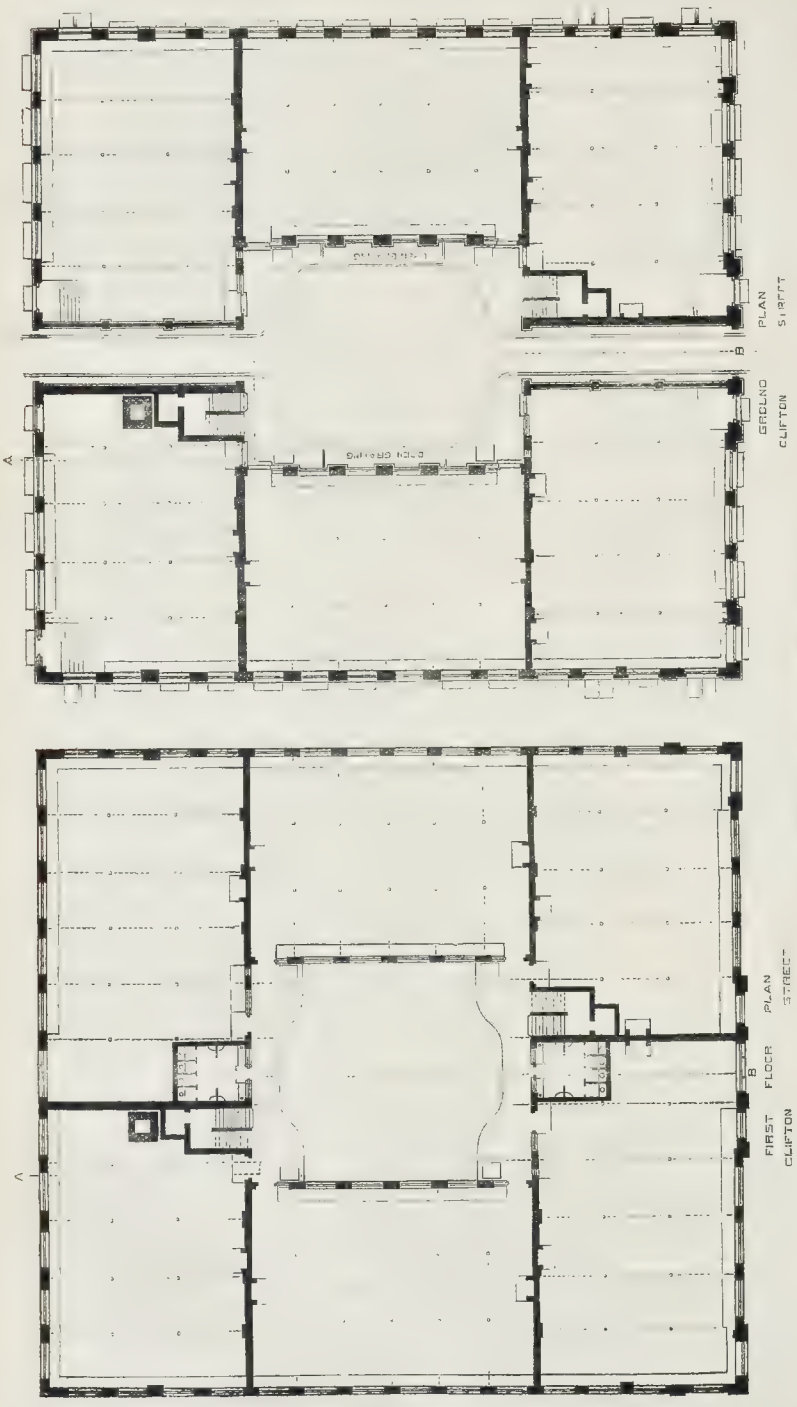
The fourth and fifth floors are occupied by the composing and press staffs. The general arrangements here furnish a remarkable contrast to the provision usually made for compositors. Accommodation is provided for about 300 compositors, with their frames, imposing-tables, and other paraphernalia. A hand-press room, and a stowage room for standing formes, constitute necessary appendages to this department.

The immense machinery called into use throughout the establishment is driven by engines amounting to 85 horse-power, these including a pair of Tangye's horizontal of 50 horse-power. The boilers, which are by Messrs. Horton & Son, of Southwark, are of 106 horse-power. Two well-appointed kitchens are located in different parts of the building for the accommodation of those employed; and the structure is warmed throughout with hot-water supplied from the basement, upon a system of utilising the exhaust steam, and patented by Messrs. Herring & Son, of Chertsey.

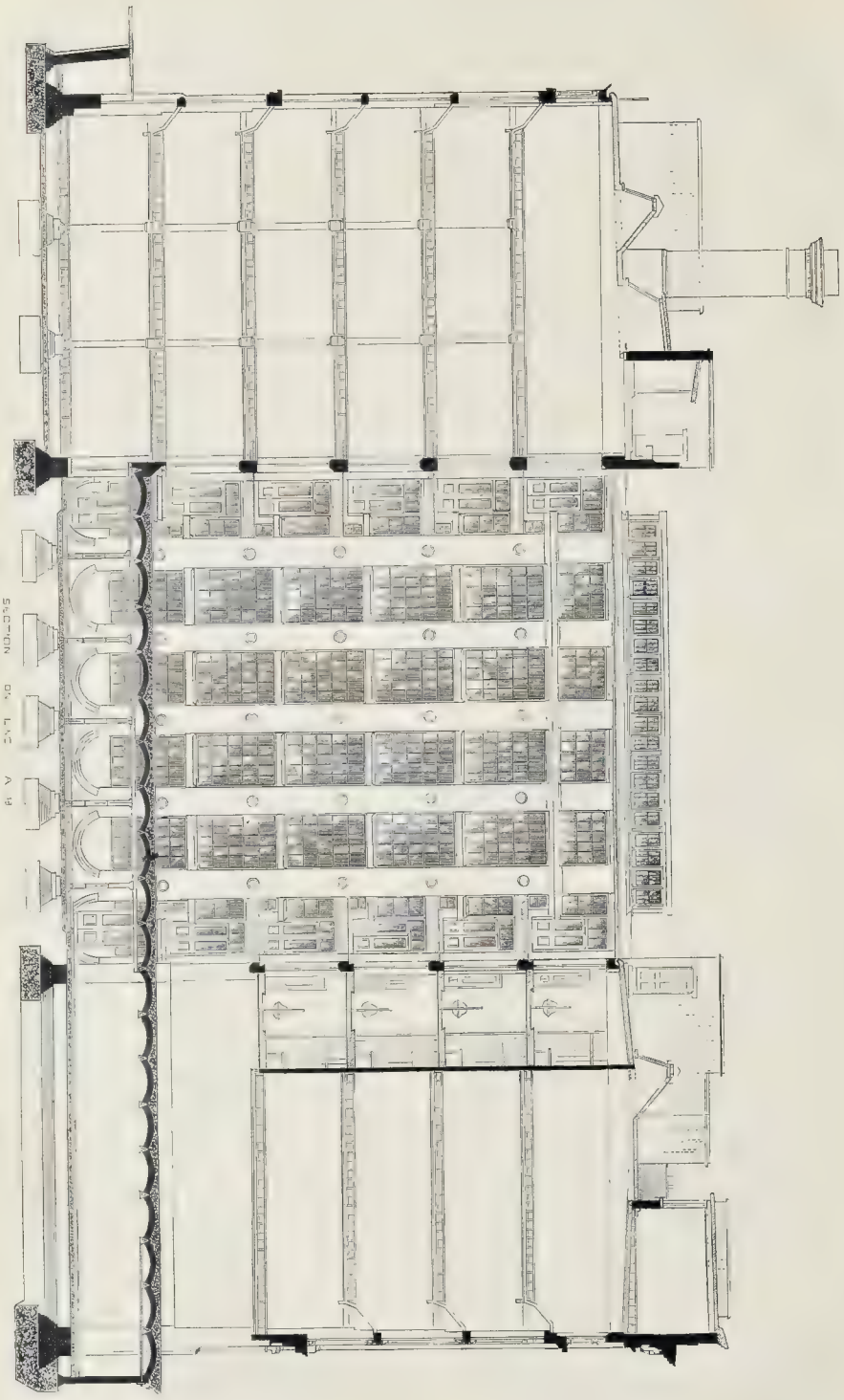
The entire building was erected in little more than a year. The walls are constructed entirely of Beart's perforated bricks. The window-heads and sills, and nearly the whole of the ornamental portions of the building, are formed in concrete; and throughout there are many specialties in the mode of construction. The whole was designed and has been erected under the personal superintendence of the architect, Mr. William Ward Lee, of Finsbury-circus. The contractors for the whole of the building works were Messrs. Holland & Hannen; the wrought and cast iron works being supplied and partly fixed by Messrs. R. Moreland & Son. The amount of the contract for the erection of the building was 44,209*l.* This amount was exclusive of the cost of all fittings and trade adaptations, and all machinery. Mr. J. Moth acted as foreman to the contractors, to the entire satisfaction of the architect and of Messrs. Waterlow & Sons. Mr. Hammond, their clerk of the works, gave material assistance from his knowledge of their special trade requirements.

It is worthy of note that, notwithstanding the large area occupied by these premises, some portions of the business are still carried on elsewhere.

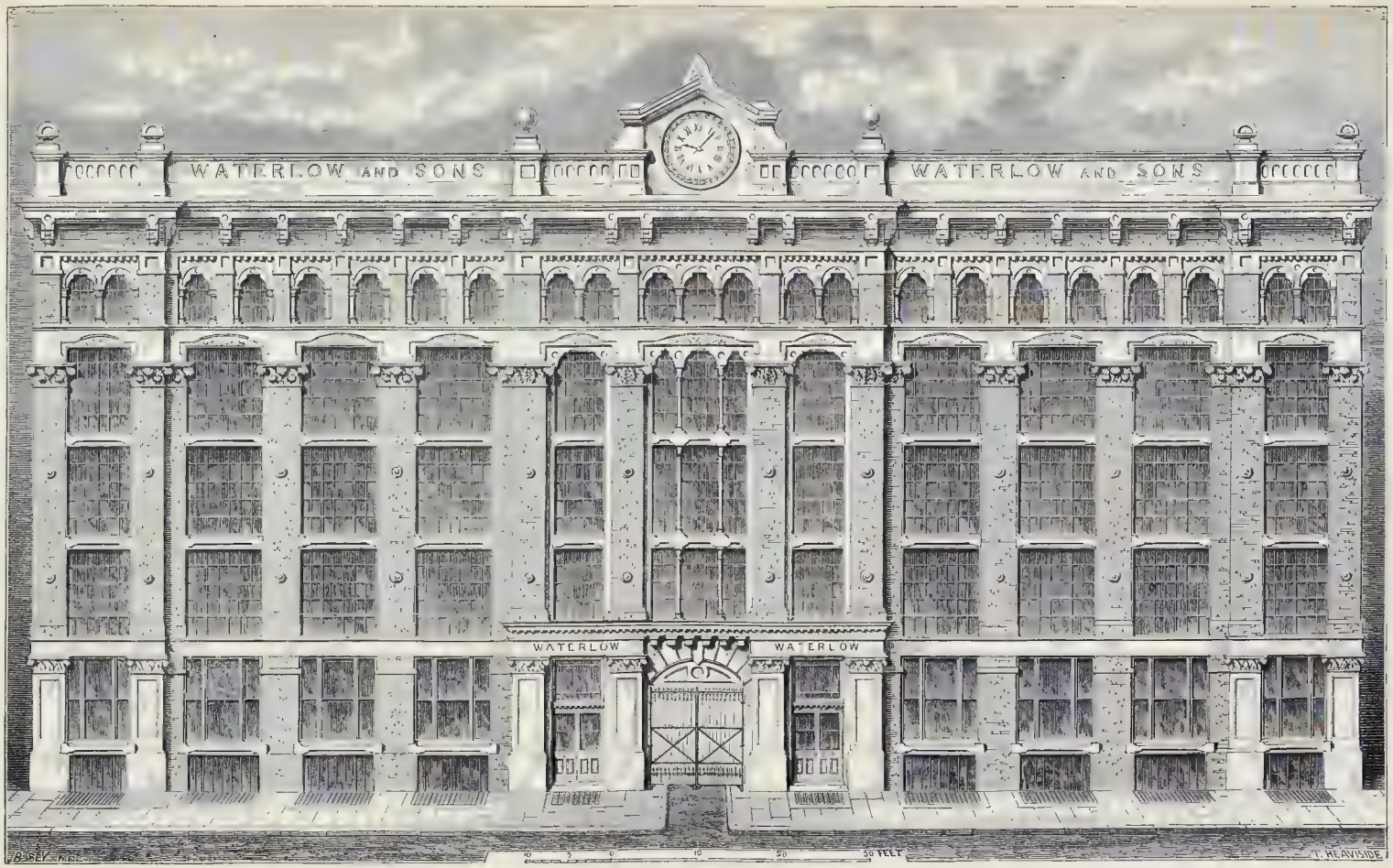
Builders' Benevolent Institution.—The committee of this charity have passed the accounts of the annual ball held last January. The balance-sheet shows a profit of 90*l.*, which has been added to the relief fund. A unanimous vote of thanks was given to the honorary secretary, Mr. John T. Bolding.



FINSBURY PRINTING AND STATIONERY WORKS.—*Plans.*



FINSBURY PRINTING AND STATIONERY WORKS.—*Section.*



LONDON BUSINESS PREMISES: THE WORKS OF MESSRS. WATERLOW & SONS, FINSBURY.——Mr. William Ward Lee, Architect.

SOUL IN ART.

BY W. PETTIT GRIFFITH, F.S.A.

"A work of art is not a thing inanimated: life exists really in it. It is that sentiment which is found everywhere, and cannot be assigned anywhere. The ancients have excelled in the art of animating their works, only because they possessed that general and complete instruction which sound studies give."—*M. Fould.*

THERE are two kinds of immortality, viz., the celestial and the terrestrial: the former relates to the spiritual and immortal part of man, and the latter constitutes the life and vital principle. My object is to treat only of the life hinted at by M. Fould, which exists in nature and all beautiful works of art, and not

"To search forbidden deeps, where mystery lies
Not to be solved, and useless if it might.
Mysteries are food for angels; they digest
With ease, and find them nutriment."—*Cowper.*

The unenviable immortality claimed by spiritualists, "proved by facts!" maintained by some of the clergy and persons of diseased imaginations, influencing weak minds, only tends to superstitious blindness, of which true immortality knows nothing.

Plato has discoursed of the soul spiritual, and Addison, humorously, but not instructively, enters into the imaginary immortality of men who live in fame and reputation. The general has been considered as the soul of an army, and the common soldiers the body of it; in like manner the architect and the artist may be compared to the soul, and the workmen and materials to the body.

In the present age, facts are required rather than the verbiage of those who

"Ape the great with empty eloquence."—*Plato.*

The Scriptural injunction to "read, mark, learn, and inwardly digest," is worthy of deep meditation, as the food for the mind needs digestion as much as food for the body, and even prior to Christian times we were admonished by Horace to

"Make the Greek authors our supreme delight:
Read them by day, and study them by night."

And in more recent times, Southey, whose library was his world, says:—

"My days among the dead are passed;
Around me I behold,
Where'er these casual eyes are cast
The mighty minds of old:
My never-failing friends are they
With whom I converse night and day."

The following quotation clearly points the difference between a terrestrial and a celestial crown. In many places in Scripture where the word "crown" occurs, it means a garland. Of this there is a striking instance in the text, 1 Peter v. 4, "And when the Chief Shepherd shall appear, ye shall receive a crown of glory that fadeth not away." In the Greek text, the expression is, an amaranthine crown, or, as it may be rendered, "an evergreen garland." And the same Greek word for crown is also used in the passage, 1 Cor. ix. 25, where St. Paul alludes to the exertions of the athletes in the Stadium:—"Now they do it to obtain a corruptible crown," that is, a garland made of leaves, which would soon wither.

All those works of every kind which portray truthfully the subject they treat of will remain guides for future generations. Education is generally conducted by three channels, viz.:—1. Truth itself, uncoloured; 2. Possible or probable truth; 3. Perverted truth.

1. Of truth itself, we have the Holy Scriptures, Shakspeare's works, all works on science, natural history, most of the British poets, English classics, &c.

2. Possible or probable truth, as illustrated by Sir Walter Scott's works, Miss Mitford's, Ainsworth's, &c., and a large class of moral and religious works.

3. Perverted truth, Lord Byron's works, Milton's, &c., and a large class of works of fiction, such as fairy tales and exaggerated novels.

Of course, truth itself should be powerfully enforced and maintained; then, as an auxiliary, possible or probable truth may be entertained, but perverted truth must be peremptorily shunned.

It has been urged that truth is the very soul of all art, and whenever it is discarded, art at once becomes dead and corruptible.

The fanciful hypotheses, interesting and poetical as they are, relating to the symbolic indications of the immortality of the soul, are, singularly enough, based upon earthly objects. Inwood, in 1834,* alludes to an Egyptian mummy as resembling a chrysalis, under the impression of its awaiting in that state its period of entering and rising to another existence.

The gross absurdity, in an enlightened age, of employing the names of pagan divinities to designate heavenly bodies is self-evident. Now, as

"Night ope's the noblest scenes, and sheds an awe,
Which gives those venerable scenes full weight,
And deep reception in the entender'd heart,"

the best and surest index to another existence, requiring no puerile earthly symbols,—such as mummies, butterflies, serpents, or the oak, vine, ivy, &c.,—is a free view of the whole hemisphere, without moon or cloud, and without any obstacle from below,—the mountains being nature's monuments, their heaven-pointing elevations convey the spirit onward towards eternity. To see the planets, one after another, light up their lamps; the stars advancing in their glittering train, and thousands of luminaries shining forth in successive splendours, form the surest and most impressive means of conveying to the mind a tangible idea of immortality,—

"Even silent night proclaims my soul immortal!"
Young.

It is deeply to be lamented that the foregoing beautiful panorama, so eminently calculated to guide the mind to grasp an unerring notion of immortality, is completely marred by a false system of education. In early days, when natural science was scarcely known, and when it occupied months, and even years, to spread knowledge, it was natural that man should have recourse to an earthly nomenclature, using the most unnatural arbitrary terms to designate the heavenly bodies. A teacher taking advantage of a beautiful evening gives his pupils an astronomical lecture; he commences by pointing out, to the astonishment of his beginners, a great and little bear, dragon, hounds, goose, wagon and horses, plough, goat, sculptor's shop, &c., and he then poisons their minds with heathen mythology, a knowledge of which they would be better without, and directs attention to the planets by designating them as Venus, Jupiter, Mars, &c., forgetting that

"All truth is from the sempiternal source
Of light divine. But Egypt, Greece, and Rome
Drew from the stream below."—*Cowper.*

Confirmed by Byron, who says:—

——"He who studies fervently the skies,
Turns oftener to his stars than to his book."

It is to be hoped that the time will come when the whole system of teaching astronomy will be reconstructed, either by a numerical or other arrangement; for Nature, with all her wildness, has

"Varieties too regular for chance."

The most beautiful objects in nature and art should be closely studied, as the living soul can learn nothing from soulless specimens, which are by far too numerous in the art-world,—

"Better for man
Were he and Nature more familiar friends!"

The human soul was originally formed with a self-directing power, to turn its attention to whatever it thinks proper, good or bad. The first impressions were wholly derived from nature, and more or less ever afterwards. The lamp in our street is only analogous to the glow-worm in the hedge, and the chandelier in our rooms is identical with Nature's contrivances, only artistically treated. Dr. Buchanan says that the birds that build hanging nests are at Cape Cormorin numerous. At night, each of their little habitations is lighted up, as if to see company. The sagacious little bird fastens a bit of clay to the top of the nest, and then picks up a fire-fly, and sticks it on the clay to illuminate the dwelling, which consists of two rooms. Sometimes there are three or four fire-flies, and their blaze of light in the little cell dazzles the eyes of the bats, which often kill the young of these birds. These insects impart no imaginary light: when Sir Thomas Cavendish and Sir Robert Dudley landed in the West Indies, they saw in the evening a number of moving lights in the woods, which, though only fire-flies, were supposed by them to be Spaniards advancing by torchlight, and they immediately took to their ships.

The term inanimate, often applied to inferior works of art, at once pronounces their soulless nature. The sculptures of Phidias and the floral carvings of the Middle Ages form a contrast to the above, life existing really in them; they are, therefore, immortal. All the great arts require a subtle and speculative research into the law of Nature, which accounts for the Greeks possessing that loftiness of thought and perfect mastery over every subject, derived from such source as this. Pericles possessed, in addition to the above acquirements, a great natural genius.

The most eminent artists always affected to insert their names in their works, in order to partake of the immortality they gave others. Phidias not being permitted to put his name upon the pedestal of his Minerva at Athens, cut his portrait upon the goddess's shield. Myton, to immortalise his name, put it in almost imperceptible characters on one of the thighs of the statue of Apollo. Pliny relates, that two Lacedæmonian architects,—Saurus and Batrachus,—without reward, built temples in Rome, flattering themselves that they might affix their names upon them; this being absolutely refused, it being considered *infra dig.* to be associated with simple workmen, the architects sculptured, by way of ornament, lizards and frogs upon the bases and capitals of all the columns. The name of Saurus implying the lizard, and Batrachus the frog.

The action of breathing in antique sculpture * was represented in the first state of earlier Greek art by a heaving breast with the lips closed, as in the Apollo of Tenea. A further advance was marked by the opening of the mouth, which, however, was done in an imperfect manner, chiefly by protruding the under-lip. Phidias and his followers continued both these modes of expression with characteristic finish and grandeur. Those works in which the influence of Praxiteles is visible, on the other hand, show only a very slight expansion of the breast, while the protruded underlip entirely disappears. This agrees perfectly with that graceful *laissé-aller* which forms a chief characteristic of the works of this excellent school. In the next state of development, as introduced by Lysippos, the action of breathing leaves no impression on the lower part of the body, while its surface, showing the veins, skin, muscles, is rendered with exquisite life-like accuracy. In the time of Alexander the closed lips occur again, but seemingly only in portrait busts, while the statues of gods and heroes preserved their classical traditions.

The lifeless representations in the infancy of art by the Egyptians, who always exhibited the figure with its weight equally poised upon both legs, so that its position was regularly and rigidly erect, may be contrasted with the ease, grace, elegance, and dignity of attitude and gesture which are so much admired in the life-like Greek statues. Socrates said that an excellent statuary must represent the actions of the soul by the motions of the body.

An art, however excellent in itself, may be abused; for instance, the nudity of sculptural figures, and representations contrary to modesty indulged in by the Greeks. These abuses committed by the so-called Pagans are not so grave as many perpetrated by scientific and learned Christians. Some years since a surgeon incautiously asserted that he had dissected numerous human bodies, and had never discovered a soul! Of course, he regretted it, and the book was withdrawn. Charles Lamb (Elia) foolishly stated that "a garden was the prison, till man, with Promethean felicity and boldness, luckily sinned himself out of it."

These random remarks prove Hamlet's assertion, that—

"Words without thoughts never to heaven go."

There is, says Dean Sherlock, a great difference and distinction between soul and body, which men who are sunk into flesh and sense are apt to forget; nay, to lose the very notion and belief of it. All their delights are fleshly. They know no other pleasures but what their five senses furnish them with. They cannot raise their thoughts above this body, nor entertain any noble design, and therefore they imagine that they are no more than flesh and blood, a little organised and animated clay; and it is no great wonder that men who feel the workings and motions of no higher principle of life within them but flesh and sense, should imagine that they are nothing but flesh themselves.

The vitality ever constant in the works of nature, and perceived by an educated eye, should be embodied in works of art. Virgil in Æneid, book vi., was alive to this sentiment, when he says,—

"Others shall best inspire the mimic brass,
Or out of marble carve a living face."

And again says,—

"In living sculpture might be seen
The mad affection of the Cretan queen."

Hervey † also alludes to life in art, when he says

* Of the Resources of Design in the Architecture of Greece.

* Helbig, in the "Grenzboten," No. 50.
† Meditations and Contemplations.

"a piece of statuary that seems, amidst all the recommendations of exact proportion and graceful attitude, to soften into flesh, and almost breathe with life."

A close examination and study of nature is required to successfully animate works of art. If animal forms be selected and introduced, a knowledge of anatomy and the varied movements must be obtained; and if vegetable forms be used, the trunks and branches of trees ought to be freely handled, avoiding formal or straight lines. In all the varieties of foliage the disposition of the stems and veins ought to be closely observed and portrayed, not tamely, but in a spirited manner indicating life. Thus a well-disciplined mind soon distinguishes between a spiritless inanimate production and a carefully-studied object in which all the laws culled from nature are embodied.

The most prominent characteristic of nature is an overflowing and exhaustless vital energy; that of art is spiritual unity, harmony, and symmetry. It is the province of the architect to unite art and nature. From nature intellect desires richness, comprehensiveness, and living energy, while art frames harmonious regulations, and points out the laws of the beautiful. Nature is a book, and every page rich with sacred hints. To an attentive mind the garden turns preacher, and its blooming tenants are so many lively sermons.

Without educated reason nature would stray and fluctuate without end or intention, or become perfectly disjointed and out of frame. All things are made subservient to man, and he receives use and benefit from them all.

Sagacity in animals varies. Oysters and some other shell-fish are considered to have but a small sensation. Some animals have a sharper sensation than men: horses, dogs, beavers, foxes, ants, bees, apes, have surprising sagacity, and approach toward reason. It is not, however, the want of speech that hinders them from reasoning, as some pretend. Parrots can easily be taught to speak, but not to reason. The difference, then, between these animals and men consists in the latter having immortal souls capable of religion, and of knowing Scriptural views; whilst animals confine all their knowledge, designs, and cares to temporal happiness, the preservation of their bodies, and propagation of their species.

Although genius, or a natural gift, cannot be imparted to an artist by man, still art can be taught; assertions to the contrary must exercise a depressing influence on all students in Government and other schools of art. The Bible says that "there is a spirit in man, and the inspiration of God giveth understanding": consequently all can be taught, although every one may not be inspired; but that is no argument for not teaching art. Mere enthusiasm will carry an artist but a little way, still students ought not to be discouraged, even *ex cathedrâ*, by such declarations as "we hear so much nowadays of natural laws, averages, and systems, by the side of which mere individual efforts are futile as a fly on the wheel of some vast engine."

Therefore, let no student in architecture, painting, or sculpture be discouraged by the "emphatic" declaration of one professor, that "art cannot be taught," or by the denouncement of a Royal Academic professor against "mere individual efforts." The lives of such men as Michelangelo and Sir Joshua Reynolds eminently prove the value of personal exertion in a right direction by studying the works of Nature, and not by ignoring them. "Nature is the art of God, and must for ever be unrivalled by the sons of men."

Sir Joshua Reynolds says that a comprehensive and critical knowledge of the works of nature is the only source of beauty and grandeur, and that that power which enables the artist to conceive his subject with dignity may be said to belong to general education. Whatever sublime ideas may fill his mind, he can put in practice only what he knows, and communicate those ideas by visible representation.

Plato treats this subject with great perspicuity, as to whether virtue and music and the other arts can be taught. He wisely says that the man's son who happened to have the best natural talent would rise to distinction, and the man's son who had no such natural talent would be undistinguished; and further, that all would be sufficiently taught compared with those who are untaught, and who know nothing, but who may be considered as savages.

Locke says, that of all the men we meet with, nine parts of ten are what they are, good or evil, useful or not, by their education.

The art of painting was originally sought to reflect the divinity that is in nature, and its early office was that of adorning the sacred edifices of the Christian faith, and placing the mysteries of religion more clearly before the eyes of untutored men than could be effected by words alone; it, however, ere long became frivolous and unmeaning, and degenerated into uninteresting and commonplace generalities.

Painting statues of a flesh colour, with artificial eyes, red eyebrows, red and brown hair, &c., may be attractive and useful in the barber's shop, and painting green vine-leaves and grapes on the capitals of public-house columns may be in accordance with popular notions of nature, but very far from the purpose of this paper, in portraying life in art.

Painting ought never to be employed in lieu of sculpture in a building. Sculpture more successfully embodies the ever-springing life, the inexhaustible strength of nature, and gives the simplest imitation of material forms; but painting will mistake her own peculiar province, if, instead of following the track of the old masters, she diverges from it to pursue the objects more peculiarly appertaining to sculpture, which must result only in vain, delusive attempts, or in producing a feeble and sickly shadow of the antique; painting must be painting, and nothing else.

The strokes of the chisel animate marble and brass, and the mixture of colours portray nature to the life. Sculpture and painting were consecrated to the memory of great men to express their glorious actions, so that by perpetuating the remembrance, inspired at the same time an ardent desire of living artists to imitate them.

In former times the history of nations, and the principles of science, were often marked in inscriptions, or superscriptions on altars, columns, marbles, and coins.

Without sculpture and painting an edifice would be an inanimate production,—

> "'Tis not timber, lead, and stone,
> An architect requires alone
> To finish a fine building:
> The palace were but half complete
> If he could possibly forget
> The carving and the gilding."
> *Cowper.*

The great interest attached to Jerusalem, its temples, and history, and so carefully recorded in the Scriptures, and all works of art, is of only a transient nature, compared with the immortality of the New Jerusalem, wherein are no temples, neither sun, nor moon, but the light of everlasting intelligence.

Sir Thomas Browne said that the world was made to be inhabited by beasts, but studied and contemplated by man; he believed that the whole frame of a beast perishes, and is left in the same state after death as before it was materialled into life; and that the souls of men know nothing contrary, nor corruption; that they subsist beyond the body, and outlive death by the privilege of their proper natures, and without a miracle.

In conclusion, notwithstanding the infinite perishableness of the whole material world, in which nothing is eternal except reason, and the creative power revealed in it, if the soul in art be continued from generation to generation, it must be immortal; it now exists, and will exist throughout all time. Denon, in a conversation with Napoleon in the Louvre, alluding to a picture as being immortal, Napoleon inquired how long it would last. "Perhaps 500 years," was Denon's reply, "and, if a statue, 5,000 years." "And this," said Napoleon, "you call immortality!"

The folly of connecting immortality with marble monuments, tablets, &c., has been wisely pointed out by Cowley,—

> "Here lies the great:—false marble, where?
> Nothing but poor sordid dust lies here."

Engrave not with hammer and chisel on outward tables of stone, but inwards, on the tables of our hearts. What a poor substitute for memorable actions is polished alabaster, or the mimicry of sculptured marble! Let all write on the minds of their countrymen, and be remembered with applause, as long as the nation lasts, without artificial expedients to perpetuate good deeds.

The Scriptures say, that all who "were honoured in their generations, and were the glory of their times, have left a name behind them, that their praises might be reported;" "and some there be, who have no memorial, who are perished as though they had never been, and are become as though they had never been born."

Marble tablets endure for only a few years; brass, copper, stone, all corrode and decay; books, with all care, become worm-eaten, and succumb to the elements, verifying Scripture,—"The dust shall return to the earth as it was, and the spirit shall return to God, who gave it." The only endurable tablet to engrave upon is the human mind, which alone is immortal. Thus the great importance of education. Educate and elevate the mind from generation to generation, not merely with the knowledge of to-day, but that of all times. Thus thought and imagination, matured by scientific knowledge, can alone discern eternity through the light of stars, the real everlasting flowers, inextinguishable and unfading, although invisible by day.

THE SILK-GROWING INDUSTRY IN AUSTRALIA AND NEW ZEALAND.

On the 26th ult., at the Society of Arts, Mrs. Bladen Neill read a paper on this subject, the Duke of Manchester in the chair.

We have already given some account of this lady's endeavours to obtain aid in England for the experiment which is being made in Australia. Mrs. Neill said,—Several years ago, while on board one of the steamers of the Peninsular and Oriental Company, I had the fortune to meet with a French gentleman who was on his way to Japan to purchase silkworm eggs, or "grain." At that time the silk-growing industries of the South of Europe were suffering greatly from the diseased state of the "grain," and a tremendous impetus was thus given to the importation from Japan of healthy grain, to supply the silk-growers of Italy and France. The Frenchman had made several enterprising journeys to various countries in search of healthy grain, and in the course of his wanderings he had visited some parts of Australia, and he expressed a very strong opinion that the cultivation of the mulberry and the growing of silk ought to do very well there. The experiment had certainly been tried in several parts of Australia long before I determined to take it up, but it had not been worked out to the point for making it become a national industry; and it was this latter view which the suggestions of my French *compagnon de voyage* led me to attempt. All the world knew that Japan had developed an enormous and most profitable trade in the export of silkworm eggs to Europe, and I could not see why the British colonies should not do the same. I subsequently started a plantation of mulberry trees on my own property on the Murray River in New South Wales, and in course of time a number of ladies in Melbourne and other parts of Victoria, encouraged by my success, formed the "Victorian Ladies' Sericicultural Company, Limited." In connexion with this company I made a journey to the silk-growing districts of Southern Europe, and through my instrumentality the famous race of silkworms cultivated by M. Roland, of Orbe, was introduced into Australia. It is unnecessary for my present purpose to detail the method adopted by M. Roland in his celebrated magnanerie; suffice it to say that the effect of his system has resulted, for many years past, in the production of a race of silkworms which has remained healthy while the breeds of other silk-growers in the South of Europe have for years suffered terribly from the disease to which the silkworm is liable. Thus we have been fortunate, in Australia, to secure the introduction of the best known system of treating the silkworm, so as to get a healthy and vigorous race, and this may fairly be credited to me as a valuable commercial result. The best kinds of mulberry trees have been introduced into Australia in larger quantities than formerly was the case, and the planting of the trees has, through the agency of our company, been widely spread throughout the colonies to which I refer. We have established a silk farm and plantation at Mount Alexander, about seventy miles from Melbourne, and have obtained a Government grant of 1,000 acres of land there for this purpose. We have also opened up in Italy an assured market for as many cocoons and silkworm eggs as our means may enable us to grow, and among the results already achieved in this movement I look upon the Italian market as a very great step indeed, because it is the evidence of local prejudices against our produce having been overcome in Italy, and of the good opinion of acute and critical judges in that country having been secured. I have already published in the *Journal of the Society of Arts* the certificates from Italian experts which substantiate these remarks, and I have the original certificates in my possession, which thus conclusively prove that the quality of the Australian

cocoons and "grain" is so high as to justify us in trying to extend the industry which produces them. Good business prospects are thus open to us in Italy,—the largest silk market in the world,—but we want capital to enable us to take full advantage of such an opening. But I do not propose to begin with an export trade in grain; it will be sufficient to begin by developing our export of cocoons to Italy, where the trained labour of that country will prepare the silk for our English buyers. I have always thought, and I am still strongly of opinion, that in course of time our own women and girls, and particularly those of the educated classes, will be able to undertake even the reeling and other processes of the silk business, which for centuries have been specialities in Italy and the South of France; but, although I should like to see this attempted at once in England on a large scale, I do not here propose it. We must be content to let the thing grow.

But it is not only in Italy that our Australian silk produce has earned high commendation. Various articles of clothing, stuff, and woven fabrics have been made for experimental purposes here in England; and I take this opportunity to ask our noble chairman to accept, as a specimen of our work, a pair of socks, made by gentlewomen who are working with me, out of silk "refuse" from the sunny land of Victoria.

Some of the manufactured goods of which I now exhibit samples have been kindly worked up from our silk by Messrs. Brocklehurst, and Messrs. Potts, Wright, & Co., of Macclesfield, and I take this opportunity of acknowledging the deep gratitude of myself and my lady-coadjutors for the assistance we have received from these gentlemen. When I am asked for results from my recent exertions in England, I think it will be almost in itself sufficient to point to this proof of the estimation in which our present movement is held by the accredited representatives of the silk trade of Macclesfield, and I hope it will be influentially taken up.

I think I have said enough to show that this business has in it the making of a solid thing. Thus far, what has been done has been effected with much struggling and difficulty by a handful of women, and with very insufficient means. We believe that it must be carried through on a large scale, and we want the assistance of practical men and money. We want, above all, to largely increase our mulberry plantations in Australia, and we are open to enter into any reasonable undertaking to indemnify those who may advance the capital required for the purpose. So far as I am able to understand matters of this nature, the most feasible scheme appears to be to raise a company here, with, say, 50,000 shares of 1*l.* each, the price of the shares being intentionally kept as small as possible to enable women to join in the enterprise, because we always keep prominently in view the fact that the rearing of silk-worms, even on a large commercial scale, is eminently a woman's work, without reckoning the various collateral industries which we hope may eventually grow out of it, in working up the refuse silk in various forms. The leaf season lasts in many parts nearly ten months, in others eight and nine months. Numerous educations can be made annually, which will largely increase the profits. The limits of the time allowed to me here will, I fear, prevent me from going into the details of the commercial aspect of such a company as I propose, but I have with me, in writing, a calculation based upon experience of the cost of silk culture in Australia, and of the estimated labour profits. The very important question of labour remains only to be mentioned, and it may, perhaps, surprise you all to hear that an education of 12 ounces of grain (eggs) with the rapid Cavalloni system, can be made at considerably less cost in Australia than in Italy, and I say this from practical experience, having resided on a large estate near Verona last season, where I studied the cost of everything connected with silk-growing.

An Australian silk-growers' depôt has been started at 7, Charles-street, Grosvenor-square. This depôt will be a boon to small silk-growers, who will thus be able to dispose of their produce to the best possible advantage. Useful articles, such as socks, stockings, &c., made by gentlewomen, will be sold, and ladies are invited to visit the depôt, where also they can obtain full particulars of the Victorian Ladies' Association.

In the course of the discussion which followed, Mr. W. C. Brocklehurst (M.P. for Macclesfield) said he would like to make a few remarks on this question from a practical point of view, being largely engaged in the silk manufacture. He should be happy at any time to carry out any suggestions made by Mrs. Neill. It was well known that the silk manufacture was introduced into this country by Protestant refugees from France, who settled in Spitalfields, and afterwards spread to Macclesfield, Congleton, Derby, Manchester, and other places. Up to 1860 the trade was very flourishing, but then, in consequence of Mr. Cobden's French treaty, the protective duties were abolished, smuggled silks were no longer in fashion, and what was of more consequence, the trade became much depressed, though he must confess at the same time that the treaty was very beneficial to the country at large. About the same time, however, there appeared that mysterious silkworm disease of which no one knew the nature, and for which there was no remedy. The effect was to diminish the supply of silk, and therefore the silk trade in England had not been so flourishing as it was prior to 1860; though, according to the census of 1861, there were still more than 100,000 persons directly engaged in it. He had tested practically the specimens brought forward by Mrs. Neill, and had seen letters from different people connected with the trade, in which they said that this silk was as good as, if not better than, the best silk produced in Europe in its most palmy days. He found on referring to the Blue Books, that in 1861 the import of silk was 8,710,000 lb., of which 4,096,000 lb. were re-exported, leaving 4,600,000 lb. for home consumption, whilst in 1874 the import had fallen to 5,911,000 lb., of which 2,741,000 lb. were re-exported, leaving only 3,170,000 lb. for home consumption. Of course, it became a serious question how this falling off was to be remedied, and he could only say that the best method seemed to be by encouraging in every possible way the production in Australia. He did not say the cocoons produced could be brought here to be reeled, because probably the cost of labour would be too high, but they might be sent to France and Italy for that purpose, and afterwards manufactured in England. Another important point was the deterioration in the quality. The reelers in India, China, and Japan had taken advantage of the scarcity, and had endeavoured to produce quantity rather than quality, so that at the present moment there was no good silk to be had, but only bad European and worse Asiatic, the consequence of which was that ladies complained that silk dresses did not wear nearly so well as they used to; they turned to other fabrics, and silk to a great extent had gone out of fashion. If they could get good silk from Australia, it would be the means of bringing the trade back again, and they would again see ladies walking in silk attire, in which he thought they looked better than in anything else. Owing to this deterioration also there had been malpractices introduced into the manufacture and dyeing of silk, and a lady's dress would consist of one-fourth its weight of silk and three-fourths of something else, which in the course of a few weeks' wear caused it to come to pieces. The next question was, how were they to get this Australian silk? and though he had listened with great interest to Mrs. Neill's remarks, he had not heard any very practical suggestions on this head. However, he thought if that lady would condescend to accept the aid of three or four practical men, it might easily be accomplished. A company might be formed in this country connected with the Governments in the colonies, and the cocoons and seed might be sent to Italy, to France, and even to Broussa in Asia, where it might be reeled, and the "dead bodies," which were in reality the refuse, might very well be brought here and worked up profitably by those ladies of whom Mrs. Neill had spoken so feelingly. The idea was that a company should be formed with a capital of 50,000*l.*, of which one-fourth should be called up, and this would be amply sufficient for the experiment. Mr. Clayton, the manager of the Government silk farm in Western Australia, wrote to say that the Government had placed in his hands sufficient funds to carry on the operations, and that the Colonial Secretary, the Hon. Mr. Barlee, had promised a reward of 500*l.* to the person who produced the first bale of silk in that colony.

Lord Alfred Churchill believed the day was not far distant when there would be hundreds of thousands of spindles in England spinning Australian silk, and they would then look back to the present evening as one of the greatest importance, and of the most happy augury for the trade of this country; but in order to do this, the commercial element must be separated from the philanthropic. He entirely agreed with all Mrs. Neill had said as to the desirability of aiding the ladies of this country, but that was a separate question, and must not be looked upon as the reason for supporting silk culture in Australia.

DYNAMITE: ITS IMPORTANCE AND DANGEROUS NATURE.

UNDER this title, a pamphlet has been published by Captain Isidor Trausl, of the Austrian Engineers, which gives a short history of all explosive substances that have come into use within recent times, by the side of the old powder. Few branches of engineering have, until quite recently, proved of such stability as that of explosive substances. The powder used in the last Franco-German war, the blasting material which served in the tunnelling of Mont Cenis, were of almost the same composition as the explosive substances which came into general use during the great conflicts of the fifteenth century, as that powder with which Martin Weigold in 1613 made his first experiments in the mines of Saxony. The old gun and rifle powder answered pretty nearly all requirements of the artillerist and the rifleman until the time when, in the train of the American civil war, that mad duel between guns and armour plates began which led to the gigantic calibres of modern times.

But what has been neglected by centuries of stagnation seems now to be retrieved by rapid progress, greatly affecting a series of branches of civil and military engineering. Although hardly ten years ago black powder was the exclusive motive force applied for blasting purposes, at the present day already a great portion of its former province has been alienated from it. It was tried at first, though to no purpose, to supply the ingredients of the old powder by more efficacious materials. Well-combined charges in size, shape, nature of surface, density, and hardness of the single grains of powder were soon found, however, to satisfy all the increased requirements which were made on the motive power of gunpowder. Since then powder has continued to be exclusively applied in propelling projectiles, and all explosive substances invented lately have been used only either for torpedoes or for mining and other peaceful purposes. In 1838, M. Pelouze discovered that cotton may be changed into an explosive substance; and in 1846 Schönbein, who had found a practical method for such a change, brought to public notice the invention of gun-cotton. But when, in 1865, a large gun-cotton magazine near Vienna was blown up, its use began to decline. Almost at the same time that Schönbein published his invention, a young Italian professor of chemistry, Sobrero, discovered in the lavatory of Pelouze, at Paris, the most fearful explosive known, nitro-glycerine. On account of its dangerous nature and the difficulty of igniting it at pleasure, however, it found no practical utilisation until the Swedish engineer, Alfred Nobel, discovered in 1867 a means of imparting to nitro-glycerine a more suitable form for manipulating it, by impregnating a porous infusorial earth with about 75 per cent. of it, and at the same time of depriving it of part of its dangerous property.

This new explosive, named dynamite by Nobel, obtained within a few years an extraordinary extension. In the twenty dynamite manufactories under the supervision of the inventor, there were produced, in 1867, 220 cwt., which production rose, in 1868, to 1,560 cwt.; 1869, 3,700; 1870, 8,480; 1871, 15,700; 1872, 27,000; 1873, 41,000; 1874, 62,400; and in 1875, to 80,000 cwt. The consumption of dynamite will, in 1876, probably exceed 100,000 cwt., a quantity which in explosive force is equal to a quarter of a million cwt. of ordinary gunpowder. The relative magnitude of this number will be made clear to the uninitiated when we say that the total manufacture of gunpowder by the four great military states of the Continent amounts to about half a million cwt. The proportions of the different effects of known explosives to each other may best be illustrated by stating that, if we reckon the explosive force of ordinary powder, as 1, that of the better description of gunpowder prepared with a larger quantity of saltpetre and charcoal made of water-elder, will be represented by 3; lithofracteur by 5, and dynamite by 6 to 7.

The author of the pamphlet is of opinion that the transport of explosive substances, provided the necessary precautionary measures are taken, will also have to be permitted on German railways, as this, for instance, is already the case in Austria, since all prohibitory obstacles have had

the result of clandestine transport of explosives and more frequent accidents. According to his view, dynamite in a frozen state (it freezes at + 8° C.) is much less dangerous than ordinary gunpowder, as it, in case of ignition by fire, flashes away in small quantities, but does not explode.

THE DHU HEARTACH LIGHTHOUSE.

THE INSTITUTION OF CIVIL ENGINEERS.

At a recent meeting a paper was read descriptive of "The Dhu Heartach Lighthouse," by Mr. David Alan Stevenson, B.Sc. The paper showed that this lighthouse tower, the erection of which had been recently completed by the Commissioners of Northern Lighthouses, occupied an important position with regard to the navigation of the west coast of Scotland. The rock was fourteen miles from the Shore Station at Isle Earraid, in Mull, the nearest land. The main rock was a mass of trap, 240 ft. long and 130 ft. broad, with a rounded top rising to 35 ft. above high-water spring tides, and it was surrounded on all sides by deep water. The tower was a parabolic frustum surmounted by a plain cavetto, abacus, and parapet, the upper course of which was 107½ ft. above the foundation. The diameter of the tower at the base was 36 ft., that of the top being 16 ft. The doorway was 32 ft. above the foundation, and there were six compartments, affording accommodation equal to 5,500 cubic feet. The whole weight of the tower was 3,115 tons, of which 1,840 were contained in the solid base. The tower was constructed of grey granite, of excellent quality, quarried in the immediate vicinity of the Shore Station.

Authority to begin the works was obtained in March, 1867, and, short as the season's work necessarily was, the excavation of the foundation was begun, and the first tier of the malleable iron barrack for the accommodation of the workmen, deemed necessary on account of the difficulty of landing, was erected. The winter of 1867 was employed in building the attending steamer, lighters, cranes, and other plant. Landings were effected on thirty-eight days in 1868, during which the barrack was completed, and three-fourths of the foundation excavated. The shore works at Earraid were vigorously carried on, the quarries fully opened out, part of the foundation course was dressed, and the dwelling-houses were far advanced. In 1869 landings were effected on sixty days. On the 24th of June the first stones were landed. Part of the third course had been completed when a gale arose, on the 8th and 9th of July, which tore up fourteen stones, each weighing two tons, which had been laid in Portland cement and joggled: eleven of them were washed off the rock into deep water, and this at a level of 35½ ft. above high water. Other proofs of the extreme violence of the sea at Dhu Heartach were recorded in the paper. A description was given of a submarine valley, or funnel-shaped track, to the westward of Dhu Heartach, which the author suggested might account for the abnormal sea at this situation. By the end of this season the fifth course had been completed. On shore, dwellings for five families had been finished, and seventeen courses of the tower were dressed. The stones were built dry on a fitting platform, and then transferred to lighters, and towed out to the rock. The lighters carried sixteen tons, and the steamer took out two at a time. Three hours were occupied on the journey out, but on exceptionally fine days two trips were made. On the rock the tramway and all the cranes were worked by steam, the stones being built in as soon as they were landed, in case a gale should spring up. Square ribbon, cast and malleable iron joggles, were used in various parts of the work. The number of days on which landings could be made in 1870 was sixty-two, and by the end of this season the thirty-first course was finished. The works ashore were pushed on, and contracts for the lantern and apparatus were entered into. In 1871, landings on thirty-seven days were effected, the masonry of the tower was completed, as also the whole of the dwelling-houses at Earraid.

The fitting up of the lantern, optical apparatus, fog-bell, and internal fittings were executed in 1872. Two Portland cement beacons at Earraid were erected. The light, which was 145 ft. above the sea, giving a range of eighteen nautical miles, was exhibited on November 1st. The apparatus was first order dioptric, showing a white light, except over an arc of seven points, which was red. The fog-bell was made distinctive from that of Skerryvore. In addition to the lighthouse, the works included nine dwelling-houses, for the lightkeepers and crews of the attending steamers. The cost might be approximately apportioned thus:—

Tower, lantern, apparatus, and fog-bell machinery...	£65,784	9	7
Shore establishment	10,300	0	0
	£76,084	9	7

BACH'S MASS IN B MINOR.

We may go a little out of our way to chronicle an event of no small importance in the sister art of music; the introduction to an English audience for the first time of one of the greatest productions of sacred music, which has had to wait nearly a century and a half for public recognition and performance in this country. Its production now is due to the disinterested labours of Mr. Otto Goldschmidt, and of a choir of enthusiastic and painstaking amateurs, who have been diligently rehearsing for some months back, and whose performances at a special private rehearsal at Cromwell House (where, through the kindness of Mrs. C. J. Freake, all the previous rehearsals had taken place), we referred to in a note a week or two since. As there was some little doubt felt and expressed on that occasion as to the entire success of the public performance, it is the more gratifying to be able to record that the first public performance of the Mass on the 26th ult. was recognised as a splendid success by probably one of the most cultivated and critical, as well as one of the largest audiences ever assembled in St. James's Hall. The great difficulties of the chorus part of the work were gone through admirably by the choir; and the effect produced by some of the movements, especially the concluding chorus of the Creed, was overwhelming. The solo singers were Mdme. Lemmens-Sherrington, Mdme. Patey, Mr. Cummings, and Sig. Federici, who all did full justice to the music. The second performance will take place on Monday evening, the 8th.

RATES LEVIED IN LONDON.

The Registrar General, in his last annual summary, says on this subject,—"The rates levied in the metropolis for 1875 are not yet published. But the Statistical Department of the Board of Trade has kindly supplied a return of the rates for the year 1874 of great interest. It shows that the rates levied for education by the Metropolitan School Board were 105,951*l.*; by the Metropolitan Board of Works, 345,817*l.*; by the Local District Boards, 1,338,525*l.*; by the Vestries for the relief of the poor, 1,613,201*l.*; under the Metropolitan Police Act the chief portion of 602,028*l.* was levied; and by the Corporation and Commissioner of Sewers for the City of London 213,507*l.* were raised. The coal and wine dues levied within the metropolis amounted to 314,422*l.*

But the most formidable rates are levied for those two most useful and now indispensable articles, water and light: for these, the Gas Companies levy 2,981,389*l.* for gas and meters; the Water Companies 1,131,034*l.* for water; making in the aggregate 4,112,023*l.* Their paid-up capital is set down at 20,667,555*l.*,* the profits or the excess of revenue over expenditure at 1,627,454*l.*† Assuming that there could be no saving by consolidation or improved plant,—as the Metropolitan Board borrows money at 3½ per cent., and could certainly borrow, on the securities they offer, 20,000,000*l.* at 4 per cent.,—the ratepayers might be supplied by them with gas and water at half the present cost; for 800,000*l.* instead of 1,600 000*l.* a year in round numbers. Thus 9d. in the pound of rateable value will pay expenses and 4 per cent. on capital; the other 9d., making 18d. in the pound, twenty-two enterprising companies have acquired the power to levy for an indefinite time.

* Of this capital, however, 3,965,297*l.* is loan capital borrowed at rates of interest varying from 4 to 5 per cent. and in one case only to 6 per cent. per annum; not therefore entitled to dividends.

† The following is the detailed return of revenue and expenditure:—

Total paid-up Capital, Revenue, and Expenditure of the Metropolitan Gas and Water Companies for the financial Year ended in 1874.

	Total paid-up Capital.	Total Revenue.	Revenue from Gas and Meter, or from Water Rents.	Total Expenditure.
	£	£	£	£
Gas Companies ...	19,616,493	3,703,209	2 981,389	2,767,274
Water Companies	10,051,062	1,137,148	1,131,034	455,620

N.B.—Large sums are cleared by the sale of coke and other products.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

My excuse for not answering your correspondent "Meter" before is that I have been engaged in making and setting up "an instrument for the identification of persons, and for measuring the proportions of the human frame" in the forthcoming exhibition of scientific instruments at South Kensington. In answer to the very pertinent question of your correspondent, as to how or by what method the Greeks obtained the canon of proportions of the human figure, handed down to us by Vitruvius (*Builder*, March 11, 1876, p. 249), I infer from a statement made in chapter i., book iii., that they measured a great many individuals, and taking the average of these measures, when that average was found to be some aliquot part of the whole, to be the normal proportion the part measured should bear to the whole figure.

In the Library of Venice there is a pen-and-ink drawing by Leonardo da Vinci in illustration of the proportions of the human figure, handed down to us by Vitruvius, with a translation in Italian of the Latin text. It represents a man standing in a square, with his arms extended horizontally, touching with the extremity of his fingers the two vertical lines, while the upper horizontal of the square touches his head, and the lower the soles of his feet. With this figure is combined another in illustration of a statement in the text of Vitruvius; and besides this, in Leonardo's drawing are other horizontal proportional measures given, which do not occur in any copy of Vitruvius I have been able to consult. When the time comes I should be very happy to show "Meter" the measuring instrument in the South Kensington Exhibition.

Joseph Bonomi.

THE "STIFF" MEMORIAL ALMSHOUSES ROUGHAM, NORFOLK.

On the 20th of April, Mr. James Stiff, of Lambeth, laid the memorial stone of six almshouses for aged and deserving widows, which he had determined to found and endow, at a cost of 2,500*l.* The inscription on the stone is as follows:—"These almshouses were founded by James Stiff, esq., in grateful recognition of a long and successful business career. This memorial stone was laid on the fiftieth anniversary of the founder's leaving his native village of Rougham. April 20th, 1876." The erection of the houses, from designs by Mr. John Taylor, of London, has been entrusted to Mr. John Watson, builder, of Bury St. Edmunds. The material used is red brick, with string-courses, &c., of terra-cotta, from Mr. Stiff's potteries, at Lambeth.

THE PAVING QUESTION.

Mr. Davis, agent to Sir Thomas Gabriel, was summoned (at Hammersmith Police-court) by Mr. Jones, clerk of the Fulham District Board of Works, who sought to recover the sum of 69*l.* 11s. 1d., being the apportioned expenses in respect of several houses in Elm-grove, Hammersmith, which had been repaired under the compulsory powers of the Act.

Mr. Chapman, who defended, said it was a private road belonging to Sir Thomas Gabriel, who had kept it up at a considerable expense, therefore the Board had no right to step in.

Mr. Jones said there was a thoroughfare in the street to a public footpath through an opening in a wall. The Board pulled down the wall, but they had put it up again.

Mr. Davis was examined, and said he had known the road since 1846. At one time there was a door in the wall, and each tenant was provided with a key. The door was taken away about twenty years ago. Sir Thomas was applied to some years ago to dedicate the road to the public, but he refused.

Mr. Ingham decided it was a new street, and made an order for the payment of the money, subject to a case.

Fairford Windows.—Correspondents direct attention to the fact that "restoration" of some of these remarkable windows is being commenced in a way which threatens injury.

THE ASSESSMENT OF ECCLESIASTICAL DILAPIDATIONS.

THE following "case and opinion" have been made public by Archdeacon Denison, the counsel consulted being Mr. J. Parker Deane and Mr. Walter G. F. Phillimore:—Two cases of assessment of "dilapidations" have recently arisen in the diocese of Bath and Wells which have caused a widespread feeling of surprise and alarm among the clergy at large—surprise because the thing chiefly marking the character of these assessments is a new and strange thing in the history of dilapidations; alarm because if allowed to stand it becomes a precedent for establishing the rule of an arbitrary and wholly unlimited liability as against the outgoing incumbent. The cases are those of Axbridge and Paulton. In the case of Axbridge the surveyor ordered a window to be restored and a reredos to be removed which was put up (as far as can be ascertained) about the year 1722, and left untouched by successive incumbents from that time to the present. The following is an extract from the bishop's order:—"Repair and make good the four-light window in east wall with the tracery in head of same, filling the opening with glazed and leaded quarry lights as originally, and removing *ex necessitate* the Corinthian columns and entablature in the interior, with woodwork at sides now partly decayed." The outgoing incumbent objected (though not formally to the bishop) to being called upon to pay for restoring to its original condition a window which had been blocked up by the erection of the reredos some 150 years ago, and which it must be presumed was legally placed there; but the diocesan surveyor supports his report on which the bishop's order is based by the following quotation from the judgment of Mr. Justice Bayley in the case of Wise *v.* Metcalf, about the year 1829:—"Upon the whole we are of opinion the incumbent was bound to maintain the parsonage and also the chancel, and keep them in good and substantial repair, restoring and rebuilding when necessary, according to the original form, without addition or modern improvement. The opinion of counsel has been asked whether it is reasonable to put the construction for which the surveyor and bishop contend upon the words 'restoring and rebuilding when necessary according to the original form' taken with their context. In this case the late incumbent had nothing to do with the illegal destruction of the window which he was called upon to restore, and it is contended that the words 'when necessary' cannot be construed to go beyond necessary substantial repairs, and cannot be made to include restoration of what the outgoing incumbent had had no hand in removing."

In the Paulton case the order of the Bishop had not yet been received, but the surveyor reports as works necessary to be done (*inter alia*) the making of a fence to a glebe field, which from time immemorial has been in common with other property, and never had any such fence when it became glebe, about sixty years since; and also the repairing a gate leading to the same, which has never been repaired by any vicar, but always by the owner of the estate adjoining the glebe field, and with which it has always been in common; also the placing of well-harness to all wells on the glebe land where such have hitherto been put up at the charge, not of the glebe-owner, but of the tenant; also the pointing of walls on the vicarage premises which were never pointed before.

DISPUTE AS TO AN ARBITRATOR'S AWARD.

ROBINSON *v.* ROBINSON.

THIS action came before the Common Pleas Division of the High Court of Judicature on the 26th ult.

Mr. Gully said that this was an action to recover in respect of certain repairs done to a public-house, and the question being one of account it was referred, under the Common Law Procedure Act of 1854, to arbitration. The arbitrator decided in favour of the defendant, with costs, but the present motion was to set aside the award, upon the ground that it had not been arrived at in accordance with a provision in one of the Judicature Acts. This provision said that the referee should sit *de die in diem*, whilst the arbitrator, in spite of the protests of the plaintiff, adjourned over several days.

Mr. Justice Brett.—You say that the award, though right, should be set aside, because the arbitrator had not sat from day to day?

Mr. Gully.—There was a month between the plaintiff's evidence and the award; and he feared that this evidence had lost its weight with the arbitrator. If the objection were not taken in this way, how could it be taken?

Lord Coleridge said that the rule on which the motion was founded was framed to get rid of one of the greatest scandals of the profession, the interminable nature of arbitrations. No doubt upon the mere *ex parte* statement it would appear that there had been misconduct on the part of the arbitrator; but still the plaintiff had chosen to take his chance of what the award would be. The ground he now relied on might possibly have been a good ground for removing the arbitration, but not for setting aside the award. There was, however, a question whether the arbitrator was right in allowing the defendant seven guineas for costs, and unless the defendant should consent to forego these costs, there would be a rule to send the case back to the arbitrator.

THE EVIDENCE OF "EXPERTS."

CORPORATION OF BIRMINGHAM *v.* ALLEN AND OTHERS.

IN this case, which came before the Master of the Rolls on the 25th ult., Mr. Chitty, Q.C., and Mr. Phipson Beale (instructed by the Town Clerk of Birmingham) moved to restrain Messrs. Allen & Holden from continuing their mining operations at West Bromwich, so as to endanger the large gasworks there belonging to the Corporation.

The form of the notice of motion was "to restrain the defendants from working their mines of coal or other minerals lying near the plaintiffs' land in such manner as to cause subsidence or alteration of the surface of the plaintiffs' land." A plan was made an exhibit to one of the affidavits showing a line beyond which the workings should not, in the opinion of the plaintiffs' witnesses, be allowed to go; and it had been arranged that the defendants should undertake until next motion-day not to work beyond the line, the plaintiffs giving the usual undertakings to be answerable in damages.

Mr. Ince, Q.C., for the defendants, said that he had offered to give that undertaking till the hearing, foreseeing from the nature of the evidence that there must be a conflict between the skilled witnesses.

The Master of the Rolls: There always is.

Mr. Ince said the defendants were only mine-owners under adjacent land. It was no use hearing such a case on interlocutory application, where there was the old story of three experts on one side and three on the other.

Mr. Chitty would not object if the defendants would undertake, in the terms of the notice of motion, to the matter standing over until the hearing.

Mr. Ince could not do that, but suggested that the motion should stand over for a week on the terms arranged, the parties to settle upon some line of stoppage in the meantime.

His Lordship thought that course would be best, as it would give the mining surveyors of the two parties the opportunity of agreeing. It might be well worth the defendants' while to abstain from working a little more than they might be ultimately bound to abstain from working.

Mr. Chitty remarked that all the Corporation desired was to protect their gasworks.

Mr. Ince said if there was any likelihood of the matter being arranged it would be useless incurring the expenses of getting the evidence of a number of experts. Objection must not, however, be made next week that the defendants had not filed affidavits.

Mr. Chitty said if no agreement were come to within a week he would apply for another week within which to file affidavits.

His Lordship, in conclusion, said in all these cases the Court was in great difficulty with regard to the evidence of experts. Even when they were examined in court there was no certainty, and if experts were sent to the spot they might take one view or another. There seemed to be two kinds of experts,—one taking a strong view with regard to obstructions to light, and the other having decided opinions upon obstructions to buildings.

Mr. Chitty said there were apparently two schools of them.

His Lordship said it seemed to be so, and that was the reason he did not send them to make examinations in light and air cases. He might, however, do so in mining cases.

LEGAL.

Smith v. Beeston.—In this case, heard in the Lord Mayor's Court, last week, the plaintiff sought to recover 20*l.*, balance of commission for the introduction of persons for the occupancy by buildings of certain land. In answer to Mr. Kemp, who appeared for him, he said that he was an agent for the sale of bricks and timber. In consequence of an advertisement in the *Builder*, he called upon the defendant, to whom he afterwards introduced Mr. Swinford and Mr. Lyons, who took several lots of the land the defendant had to let. He was to receive commission on the introductions. The defendant, an architect and surveyor, was called, and stated, through Mr. Frere, his counsel, that what plaintiff had claimed was in excess of the amount agreed upon as commission. The jury found for the defendant.

Contravention of the Liverpool Sanitary Act.—At the Liverpool Police-court, on the 26th ult., Mr. Evan Roberts, builder and contractor, Tennyson-street, appeared in answer to a summons taken out by the Health Committee, charging him with having, on the 6th ult, caused a house to be built in High Park-street contrary to the provisions of the Liverpool Sanitary Act, 1846, by making an attic-room which was of less dimensions than those specified for attic-rooms in the Act. It appeared from the evidence of Mr. Deacon, the borough engineer, and of Mr. Goldstraw, district building surveyor, that the 20th section of the Act in question required that the attic should be at least 14 ft. wide, and 12 ft. high from the floor to the ridge-tree, whereas it was only 12 ft. 11 in. wide, and 8 ft. 3 in. high. The plans for the building of the houses were passed showing no attics; and during the progress of the work the building surveyor, seeing that attics were being added, informed the contractor, who was the defendant, that they were too small, and would not be allowed. The defendant said he could not help it, as he was simply acting under the instructions of Mr. Richard Owens, the architect. Mr. Owens and the defendant were both spoken to on the subject, but they took no notice of what was said to them, and completed the attics. For the defendant it was contended that the attic as built was far healthier than the one required by the Act. The magistrate (Mr. Raffles) said that in spite of that he would be obliged to convict, as the terms of the Act were so clear and distinct that he could not depart from them. Mr. Atkinson, deputy town clerk, in answer to Mr. Raffles, said that the penalty under the Act would not exceed 5*l.* The modified penalty of 40*s.* and costs was imposed.

SURVEYORSHIP ITEMS.

Bilston.—At a meeting of the Bilston Township Commissioners, on the 19th ult., the Streets and Sewers Committee reported that thirty-six applications had been received for the office of surveyor, from which number the committee had selected Messrs. Lloyd, Greenwood, Baker, and Dennis, as being the most promising candidates, and recommended the Board to appoint one of them. The report was passed, and on a vote being taken, Mr. Llewellyn Lloyd, of Reading, was appointed surveyor to the Board, at a salary of 200*l.* a year. At the same meeting, Mr. Baker moved that the minutes of the meeting of the Board held on the 17th February, adopting the recommendation of the Streets and Sewers Committee to pay the late surveyor (Mr. Taylor) 2½ per cent. for making plans, &c., for the formation of three new streets, be rescinded. He called attention to the terms of Mr. Taylor's engagement, which were that he should do the work required of him by the Board for the sum of 120*l.* per annum, and asked whether that work did not include the preparation of plans. He also referred to a letter from the contractor who did the work in the three streets, in which he stated that the surveyor had also demanded 2½ per cent. from him, but that the payment of such a commission to a public surveyor was unjust and unusual. Several members expressed their opinion that the surveyor had acted improperly in seeking for a commission both from the Board and the contractor, and the consideration of the subject was adjourned.

Maidenhead.—The borough surveyor of Maidenhead has signified his intention of resigning his office on the 24th of June. Judging from a report of the proceedings at a late meeting of the town council, the relations subsisting between the parties have been anything but harmonious for some time past.

Breconshire.—Mr. Chick, of Hereford, architect and county surveyor, has been appointed by the Brecon County Rate Assessment Committee to value the whole of the mansions in Breconshire, for the purpose of arriving at a new estimate of the rateable value of property in that county.

COMPETITIONS.

King's Lynn.—The corporation of this borough having decided upon utilising the White Friars' Field for building purposes, notices were issued to architects inviting plans for the laying out of the field, and offered a premium of 10*l.* 10*s.* for the best. Several plans were accordingly sent in to the committee, who accepted that of Messrs. Adams & Son, of King's Lynn and Wisbech. The plan deals with the entire area of the field, and provides for a number of cottages and villa residences.

Walsall New Cottage Hospital.—At a special meeting of the general committee of the Walsall Cottage Hospital, on the 27th ult., in accordance with the recommendations of the building committee three sets of plans for the new cottage hospital buildings were accepted, subject to their being in accordance with the instructions supplied to the architects, particularly as to cost, the three premiums of 50*l.*, 20*l.*, and 10*l.* being awarded in the following order:—First, Messrs. Henman, Harrison, & Perrott, London; 2nd, Mr. F. E. T. Bailey, Walsall; 3rd, Messrs. R. Chamberlain, Walsall, & Rogers, London.

Rugeley Town-hall and Market.—The nine sets of designs sent in for the new Town and Market Hall at Rugeley were on view in the Town-hall during last week. On Tuesday last, the 2nd inst., the Local Board met to further consider the merits of the plans.

Huyton-cum-Roby Drainage Scheme.—In reply to the advertisement of the Huyton parochial committee offering premiums of 100*l*., 50*l*., and 25*l* respectively for the three best plans for the drainage and disposal of the sewage of the district, sixteen plans were sent in. At a special meeting of the committee on the 18th ult. the first premium was awarded to Messrs. Gotto & Beesley, of Westminster; the second premium to Mr. R. Vawser, of Warrington; and the third premium to Mr. T. Mellard Reade, of Liverpool.

Sevenoaks Drainage.—At a meeting of the Sevenoaks Local Board on the 1st inst., the report of Mr. Rogers Field, C.E., who had been called in to advise the Board as to the merits of the plans submitted for draining the district, was read, and his award was as follows:—1st. 100*l*., "Sanitas, No. 1," Mr. T. Hennell, Delahay-street, Westminster. 2nd. 50*l*., "Vanitas Vanitatum," Messrs. Dudley & Cadet, of Gresham House, Old Broad-street, London. 3rd. 30*l*., "Commodus," Mr. W. D. Campbell, Box Grove-road, Guildford. Mr. Field stated that the two first were nearly on a par, and both of them good.

HAMPSTEAD VESTRY-HALL COMPETITION.

Sir,—While inspecting the drawings for the above, prior to the decision of the Vestry, my attention was called to a gentleman in the room very busy with a two-foot rule, pointing out the merits (?) of the design marked "Cavendo Tutus" to all comers. Upon speaking to him, I discovered he was a vestryman, and he stated to me that he knew whose design it was, and had seen it prior to its being sent in, and he also knew the author of the design to which was finally awarded the second premium. "Cavendo Tutus" appears to have ignored all the conditions,—the large hall showing to hold about 400 people, if I mistake not, instead of 800, as required.

By a strange coincidence, the author of the second design turns out to be the same gentleman whose designs for the Hampstead Cemetery were accepted; Mr. I'Anson, the referee, having placed his design last.

It would almost appear from this that, as your correspondent stated in your last issue, it was a "foregone conclusion."

Hampstead is doing bravely in competitions

Not a Competitor.

CHURCH-BUILDING NEWS.

Old Hill.—Trinity Church, Old Hill (a populous district in the parish of Rowley Regis), was consecrated on the 19th ult. It is built to accommodate 1,000 worshippers, and comprises a nave 96 ft. long in a single span of 38 ft.), north and south transepts, and a small chancel, and north and south porches. On the north side of the chancel is a spacious organ-chamber, for which Messrs. Brindley & Foster are building an organ, and at the south-east angle will be the tower, at present in progress of erection, which will have a total height of 110 ft., and will contain a heavy peal of eight bells, by Messrs. Taylor, of Loughborough, and a clock, by Joyce, of Whitechurch. The church is in the Early Decorated style, with a slight French feeling in treatment, the principal features being the large traceried windows in the transepts and chancel, and the lofty chancel-arch supported upon enriched corbels. The roof is open-timbered. The pulpit is of Caen and Penkridge stone, with alabaster shafts, and the font is of similar materials. The whole of the works have been carried out by Mr. R. Thompson, builder, of Kidderminster, under the superintendence of Edward Howells, clerk of works. The pulpit and font are constructed and carved by Mr. W. Forsyth, of Worcester, and the architect is Mr. J. T. Meredith, of Kidderminster. The total cost will approach 11,500*l*.

Inworth (near Kelvedon).—An offer has been made by a land-owner in the parish of Inworth to restore the ancient and interesting parish church, dating, it is said, from the era of the Norman Conquest. The condition, however, upon which the offer is made is, that the small sum of 150*l*. be raised between the rector and his friends towards the restoration of the chancel. The plans for the chancel and nave have been prepared, and the work is ready to be proceeded with, under the direction of the Diocesan Architect, Mr. Joseph Clarke, F.S.A., as soon as a guarantee for the payment of the conditional sum of money is given. The tower, which fell in the middle of the last century, has been replaced by a wooden bell-cote; and the plans embrace its re-erection.

Stoke (near Guildford).—An iron church, for a new district to be called St. Saviour's, and situate in the Woodbridge-road, has been opened. The site was given by the Earl of Onslow. The church contains 300 sittings, and has its entrance at the east end, the chancel being at the west end. The warming is effected by hot-air pipes, and the lighting at night by means of three gas coronas depending from the ceiling, each supplied with eighteen jets. The roof of the church is of stained woodwork, matching with the seats and wall panelling. Mr. C. Mead, of London, was the builder, and Messrs. Jones & Willis supplied the interior fittings, the cost of the whole work being about 700*l*.

Murton.—On the 18th ult. the memorial stone of a new church at Murton, Dalton-le-Dale, to be dedicated to the Holy Trinity, was laid by the Rev. E. H. Shipperdson. The buildings were commenced a short time ago, and the walls have already attained a considerable height. When finished the structure will consist of a nave with a south porch and two transepts. The chancel will not be built at present, but provision will be made for it, a north aisle, and an organ-chamber, while one of the transepts will be used as a temporary vestry. The church will afford accommodation for about 400 persons, and will have an open timbered roof, with the ceiling plastered between the moulded ribs. The building is in the Early English style. The architect is Mr. C. H. Fowler, of Durham; and the contractors for the whole of the buildings, are Messrs. R. Robson & Son, also of that city.

Hollingbourne.—The restoration of the parish church of Hollingbourne, Kent, has now made considerable progress. The pillars and arches have been scraped and cleaned; a new floor has been laid down, with air-pipes for thorough ventilation placed beneath, and the oak beams of the roof have been scraped, and cleaned with oil. The whole of the nave is now re-seated in British oak, the work having been executed by Messrs. Franklin & Son, of Deddington, Oxon, from the plans of Mr. G. Gilbert Scott. Mr. Scott designed a different pattern for each aisle, in order to hide the width of the nave, which is 11 ft. more than its length. The north aisle leading up to the Culpepper chantry has oak finials at the end of each seat. The raised portion at the east end of this aisle, which was formerly a chapelry with a side altar, is the only portion of the design not completed, Mr. George Duppa (a parishioner) objecting to his square pew (for which there is a faculty) being removed. The architect had proposed replacing the old oak screen, which has been destroyed, and seating the inclosed portion with oak stalls, which would have added greatly to the design. The vicar still hopes to see the stone mullions of the windows in the nave restored, and the windows re-glazed and leaded. The architect's design also included the organ, with illuminated pipes, being corbelled on the west wall of the nave, where there is no arch leading into the tower, and which consequently presents a rather bare appearance, now that the unsightly gallery where the organ formerly stood has been taken down.

Murston.—A further step towards the completion of Murston Church, Kent, has been taken in the erection of chancel seats, the gift of the rector, which were first used on Easter Sunday. The seats are by Messrs. Rattee & Kett, the wood and stone carvers, of Cambridge, and are of solid English oak. The seats consist of six stalls on the south side, with carved divisions, and two benches on each side of the chancel for the men and boys of the choir, terminated by solid bench-ends with elaborately carved poppy-heads. Accommodation is thus gained for sixteen choirmen and twenty boys, forty-two seats in all.

Holford.—St. Mary's Church, Holford, has been reopened, after restoration under the direction of Mr. Norton, architect. There is an open roof, which is entirely new. The floor is paved with encaustic tiles, and the seats are of carved oak. Above the altar-table is a reredos of alabaster, there being in the centre an inlaid cross of Devonshire marble, in the right panel the passion-flower. The altar-cloth is of crimson cloth and velvet, the passion-flowers and white lilies being worked on the velvet by Mrs. Prentice. Messrs. Davis & Son, of Taunton, carried out the instructions of the architect.

Ridge.—The tower of the old parish church of Ridge, near Hertford, is now being restored under the superintendence of Mr. Chapple, clerk to the St. Alban's Abbey Restoration. The church belongs to the fourteenth century. The cost of the work is mated at 1,800*l*.

Kelvedon.—It has been resolved to restore the parish church of Kelvedon, at a cost of about 2,000*l*., from plans by Mr. A. W. Blomfield, architect.

Blewbury.—The first portion of the restoration of Blewbury Church, Oxon, comprising the nave and west tower, has been completed. On removing the old roof of the nave, the timbers were found to be in such a rotten condition that, with the exception of one wall-plate, none could be used again. The present roof is, therefore, entirely new, and is of oak, modelled exactly after the original plan, panelled, and covered with Broseley tiles, surmounted by a crest. The floor is laid with Godwin's tiles, wooden blocks being placed under the seats. The western end of the south aisle is arranged as a baptistery, in which the ancient font is replaced, surrounded with encaustic tiles of a rich pattern. The pulpit stands upon a stone base, and is framed in oak with walnut panels, on which are carved the emblems of the four Evangelists. The whole church has also been thoroughly drained. It is warmed with two of Musgrave's slow combustion stoves. It is for the present seated with chairs. The Ecclesiastical Commissioners, as lay rectors, have promised to restore the chancel.

Thirsk.—The work of restoring the parish church has now fairly begun. A start has been made to take the lead from the roof, and the whitewash of generations is being scraped from off the interior of the building. Traces of painted figures which once decorated the walls have been met with in the nave.

Walton (Liverpool).—The foundation-stone of the new church of St. John the Evangelist, Walton, was laid on the 17th ult by Lord Skelmersdale. The new church has been planned with a view to its being carried out in separate portions as the funds permit. In the first instance it is proposed to open a building consisting of three bays of the naves and aisles, the chancel, organ-chamber, and temporary vestry, and accommodating about 600 worshippers. The promoters then hope to be in a position to proceed with the permanent clergy and choristers' vestries, and to complete the nave and aisles to the west end. The building will then contain its full complement of sittings, namely, 950, of which 500 will be free and unappropriated. Lastly, the tower and spire will be completed when the Building Committee are financially strong enough for the undertaking. In designing the building the architects, Messrs. Aldridge & Deacon, have used a free adaptation of Thirteenth-century Gothic, and have endeavoured to depend for effect more upon proportion and outline than on elaboration of detail. The length of the complete nave is 94 ft. 6 in. by 33 ft. 6 in. in width. The chancel is 31 ft. in length by 25 ft. in width, and each side is 16 ft. wide.

Bridgnorth.—The church of St. Mary Magdalene, Bridgnorth, was re-opened on Easter Tuesday, after considerable alterations and improvements, including an extension of the former inadequate chancel. These additions were commenced in the spring of 1875, when Mr. W. O. Foster contributed 1,000*l*.; Mr. W. H. Foster, M.P., 500*l*.; and Messrs. J. Pritchard, A. F. Sparkes, and T. M. Southwell, 100*l*. each. Numerous donations have also been received to beautify the edifice, of which Telford was the original architect. The presents to the church include the chancel stained-glass windows, three in number, executed by Messrs. Wailes, of Newcastle-on-Tyne, under the superintendence of Messrs. Weaver & Whiting, commemorating incidents in the life of St. Mary Magdalene. The lectern, a brass eagle, value fifty guineas, has been purchased. The new chancel is fitted with choir-seats of oak, and to it has been removed the organ, which was formerly in the gallery. The church was erected in 1792. The new alterations have been carried out by Messrs. Wall & Hook, of Brimscombe, under the superintendence of Mr. A. W. Blomfield, architect.

Aintree (near Liverpool).—The foundation-stone of the new church of St. Peter's, Aintree, was laid on the 17th ult. by the Bishop of Chester. The present church was originally used as a cock-pit, and was converted into a place of worship about the year 1846, being licensed by the Bishop. It has accommodation for about 230 people. The new church is to accommodate about 550 people, 180 free sittings being provided. The designs are by Mr. A. P. Bell, Manchester, who has selected the style of the thirteenth century. The church will consist of nave and chancel with north and south aisles,

the chancel terminating in a five-sided apse. The whole of the external treatment, with the internal arches, strings, mouldings, &c., will be executed in red sandstone. The church will be roofed with red Staffordshire tiles, with ornamental ridge of special design.

DISSENTING CHURCH-BUILDING NEWS.

Eckington. — The Wesleyan Methodists of Eckington have just erected a memorial chapel, given by Mrs. George Wells and family, in memory of the late Mr. George Wells. The style of the new edifice is Grecian. The building stands 20 ft. back from the road, and at the summit of a large flight of broad stone steps stretching the whole width of the building. The façade is worked entirely in dressed stone of a light tint, and consists of columns and pilasters, with carved caps, surmounted by a moulded entablature, which is again surmounted by a balustrade and vases, the whole rising to a height of 40 ft. The main entrance under the portico is by a wide and lofty archway, with deeply-moulded archivolt, the entrances to the galleries being at either end of the portico, and surmounted by foliated trusses bearing a cornice. In the interior, the pews, which will accommodate 700 persons, are arranged in the amphitheatre style, with gallery round the entire building, and a recess at the back of the pulpit for the organ and choir. The architect is Mr. John H. Kent, of Chesterfield, and the contractor Mr. James Fidler, of Eckington. The cost of the chapel and ground will be about 5,000*l.*

Old Shildon.—On the 17th ult. the foundation stone of a new Wesleyan Chapel was laid at Old Shildon by Mr. J. W. Pease, M.P. The chapel will seat nearly 900 persons, and is estimated to cost 4,000*l.*

Sudbury.—A new Mission Chapel was opened at Sudbury on the 17th ult. The building is of red brick, with white facings and string-courses; the interior is fitted up with a raised dais and benches, and it will accommodate 150 people. The architect was Mr. Pertwee, of Chelmsford; and Messrs. Jennings & Brown, of Sudbury, were the contractors. The cost was 400*l.*

Northwich.—A new chapel and schools for the Primitive Methodists is in course of erection on a site adjoining Witton-street, from a design by the Rev. William Wray, of Manchester. The style is Classic. The block of buildings, including chapel, school, and class-rooms, covers an area of 108 ft. by 58 ft. and will be built of brick. The roof will be covered with slate, with ornamental crest at the ridge. The school will be 54 ft. 6 in. long, 29 ft. wide, and 16 ft. high inside. The front of the chapel will be in Witton-street. The front gable and wings will be faced with red stocks set in Flemish bond and tuck pointed; it will be 48 ft. 6 in. wide, and 47 ft. high from ground level to apex stone. It will be relieved with dressed stone plinth, bases, shafts, and carved capitals to the entrance-doors, moulded strings, dentil frieze to gable and wings, label mould with carved terminations, quatrefoil piercing for ventilation, and massive moulded coping and apex stone. The inside dimensions of chapel, including orchestra, are 62 ft. long 37 ft. 6 in. wide and 29 ft. high from floor to ceiling, and sittings are provided for 530 persons. The cost will be 2,700*l.*, exclusive of site. Mr. James Holt, of Dunham Massey, is the contractor, and he has sub-let the brickwork to Mr. W. Lambert, of Altrincham, and the stonework to Messrs. G. & R. Rathbone, of Northwich.

Southport.—The foundation stone of a new Congregational Church was laid at Southport on the 10th ult., the site selected being in Upper Portland-street. The new edifice will cost about 4,500*l.*, and will accommodate upwards of 600 worshippers. The style of architecture adopted is Early English.

Piddletrenthide. — A new Baptist Chapel at Piddletrenthide was opened on Easter Monday. The chapel is built of flints and stone, stuccoed on the outside. It will seat about 210 persons; and has at one end a school-room 24 ft. by 12 ft., with folding doors, so that it can be thrown into the chapel if required, and when the partition is removed will seat 80 additional. The chapel is 42 ft. long and 26 ft. broad. The roof is ceiled and divided into panels by stained timbers. The builder was Mr. Charles Young, of Puddletown, and the cost has been 550*l.*

Barnton.—A new Wesleyan Chapel at Barnton, Cheshire, was opened on Good Friday. The style is English Gothic of the Geometrical period. The materials used are red bricks, with other colours sparingly introduced in bands, and Manley stone dressings. At the entrance-end of the chapel is a gallery for the organ and choir, and immediately in front, elevated a few feet from the ground-floor, is a rostrum of mottled pitch pine. At the opposite end is a school-room with heating apparatus by Messrs. Rogerson & Co., underneath. Over the school is a children's gallery, with an arch opening to the chapel. Accommodation is provided for 350 persons. The cost, including land, is about 1,400*l.* Mr. H. J. Bennett, of Northwich, acted as honorary architect, Mr. W. Leicester, of Northwich, being the builder.

Margate.—The memorial stones of a new Wesleyan Chapel at Cliftonville, Margate, were laid on the 25th ult. Messrs. Bushell & Sons are the builders, the amount of whose contract is 4,087*l.* The chapel is to accommodate 800 persons.

Woore.—The foundation-stone of a new Wesleyan chapel at Woore, near Newcastle, Staffordshire, was laid out on the 10th ult. The cost of the chapel, which is Gothic in style, will be 780*l.* Mr. Ellams, of Silverdale, is the builder.

Evenwood.—The foundation-stone of a new Wesleyan chapel at Evenwood, Durham, was laid on the 18th ult. by Mr. J. W. Pease, M.P. The new building will be of stone, in the Gothic style, and will accommodate 230 people. There will also be a schoolroom adjoining, which will accommodate 100 children. The total cost is estimated at 900*l.*

LONDON SCHOOL BOARD.

THREE more schools were lately publicly opened by the Board in various parts of the metropolis. One is situated at Sydenham-hill, at the back of the Lecture-hall, affording accommodation for 582 children; the amount of the contract being 5,703*l.* It is in two blocks, one of two stories for the boys and girls, the other of one story for the infants. The playgrounds are large, and the situation very open and healthy. The contractor was Mr. R. Lonergan, of Plumstead; the clerk of works being Mr. Ashford. Another school is situated in Bonner-street, Bethnal-green, at the corner of Green-street. It is a three-storied building, with a covered playground on the ground-floor for girls and infants; the latter having school and class-rooms in a separate block. The schools will hold 814 children; and the contract price was 9,098*l.* The builder was Mr. Sergeant, of Hackney; clerk of works, Mr. W. D. Gough. The playgrounds here also are ample. A third school is placed at the angle of Nightingale-street and Copland-street, Maryle-bone, near Portman-market. Owing to the peculiarities of the site, it is planned in the form of a hollow square, having on the ground-floor a covered playground for infants, and on the flat roofs (which are laid with patent asphalte, and protected by brick piers and stout iron railing) similar accommodation for the older children; the playground for the girls being covered with a stout iron and zinc roof. The sanitary conveniences are also at the top, free access being obtained by a double staircase at each end of the building. The number of children is 829; the contract price, 9,942*l.* Messrs. Kirk & Randall, of Woolwich, were the contractors; and Mr. Nicols was clerk of works. All of these schools are plain substantial buildings in the style of Queen Anne; the two first being enriched on the principal fronts with some carved panels in brick, executed by Mr. McCulloch. The buildings are all from the designs of Mr. E. R. Robson, the architect to the Board.

SCHOOL BOARD SCHOOLS.

Buckie, N.B.—New Board schools have been built and opened at Buckie, on the road leading from the Square to Nether Buckie. The style is Early English. The principal feature of the front or north elevation is a square tower in the centre, which divides the building into two wings, and rises to a height of about 60 ft. Accommodation is provided for 600 children. Mr. James Perry is the architect; the contractors for the work being,—Mason, Mr. Alex. Clark, Portgordon; carpenter, Mr. Wm. M'Beth, Buckie; slater, Mr. George Macdonald, Portsoy; plumber, Mr. Wm. M'Rae, Cullen; plasterer, Mr. Robert Hume, Buckie; ironmonger, Mr. Alex. Hendry, Buckie; and painter, Mr. John Geddes, Buckie. The total cost has been 3,391*l.* 12s. 4d.

Camelon, N.B.—The Camelon Public School, the third which the Falkirk Parish School Board has provided, was opened recently. Mr. M'Fadzen, of Edinburgh, is the architect.

Kilsyth.—The Kilsyth "Burgh Academy," which has just been erected by the Kilsyth Burgh School Board from plans prepared by Messrs. James Thomson & Son, architects, Airdrie, was publicly opened on the 5th ult. The building is intended to provide for the accommodation of 600 children, and consists of seven rooms. The largest of these, which occupies the centre of the building, is intended for an infants' schoolroom; its dimensions are 51 ft. by 30 ft. There are two other principal rooms, 61 ft. by 20 ft.; and two class-rooms 24 ft. by 20 ft. There are also two private rooms for the head male and female teachers respectively, and above these are situated stationery store-rooms. The building is in the Italian style. The contractors for the work were,—mason work, John Glen, Kilsyth; joiner work, ex-Bailie Shanks, Airdrie; slater and plaster work, David Logan, Kilsyth; plumber work, John Paterson, Brunswick-lane, Glasgow; painter work, G. A. Clark, Bathgate. The total cost of the school is about 8*l.* per scholar.

Hornsey.—At a meeting of the Hornsey School Board, on the 4th ult., the Works Committee reported that Mr. Chatfeild Clarke, the Board's architect, had laid before them his plans for the proposed new school at Crouch-end. The school is designed for 240 infants, 180 boys, and 180 girls. The plans met with the general approval of the committee, and they were adopted by the Board, subject to the approval of the Education Department.

Bridgend.—A new public school for Bridgend, Alness, has been opened by the Ross-skeen School Board. The style is Romanesque. The mixed class-room, 50 ft. by 20 ft., occupies the centre of the building, while at each end are the class-room and infants' department, which run parallel to each other, the teacher's house being attached to the western block. The whole interior fittings and furnishings are of pitch-pine, varnished. The class-room measures 33 ft. by 18 ft.; and the infant department 36 ft. by 18 ft. The architects were the Messrs. Maitland, Tain; and the contractors were,—builder, Mr. Urquhart, Ferrintosh; carpenter, Mr. A. Mackay, Barbaraville; painter, Mr. Urquhart, Invergordon; plasterer, Mr. Munro, Tain; plumber, Mr. Meikle, Tain; and slater, Mr. W. Ross, Alness.

Longcroft, N.B. — Longcroft Public School, which has just been erected by the Denny School Board, from plans prepared by Mr. T. B. M'Fadzen, Edinburgh, has been opened. It is fitted to accommodate 250 children, and consists of a principal schoolroom and four class-rooms.

Offham.—The new Board school at Offham was opened on the 3rd ult. Mr. George Rack, of Maidstone, is the architect, and Mr. Thomas Love, of Larkfield, the builder.

MASTERS AND MEN.

Carlisle.—The Carlisle operative joiners have agreed to accept the offer made by the masters of ½d. per hour advance, the increase to commence from the 1st inst. The men asked for an increase from 6¾d. to 7½d. an hour, and their pay will now be 7¼d. an hour.

Sheffield.—The whole of the Sheffield painters ceased working on the 29th ult., having struck for an advance of 1d. per hour. Subsequently they consented to resume work at an advance of ½d. an hour.

Barnsley.—The masons, bricklayers, labourers, quarrymen, painters, and paper-hangers of Barnsley are all on strike for advanced wages.

Devonport.—Mr. Puleston, M.P., has informed the skilled labourers of Devonport Dockyard that the Admiralty have acceded to their request in an important manner affecting their pensions. Skilled labourers who have been employed at the rate of 3s. 3d. per day for a period of three years are for the future to have their pensions scaled accordingly. Hitherto there has been no distinction between those receiving 3s. 3d. per day and others in receipt of 2s. 9d., all being pensioned on the lower scale.

Warrington.—On the 28th ult., at a meeting of the various building trades of Warrington, the employers granted the following concessions to the men, thus averting the strike which was to have taken place on Monday last, viz.:—Carpenters and joiners, ¾d. per hour increase, making the rate of payment 8d. per hour; bricklayers'

wages are increased from 8d. to 9d. per hour, the week's labour to consist of 54½ hours; the bricklayers' labourers' wages are increased to 6d. per hour. The stonemasons and their employers have not yet come to terms, but it is said to be probable that a satisfactory arrangement will be arrived at.

Wigan.—At a meeting of the master bricklayers of Wigan last week, it was decided to offer their men,—who are out on strike for an advance of 3s. per week in their wages, making 36s. in winter and 39s. in summer,—9d. per hour, an advance of 1s. 1½d. per week of forty-nine hours and a half.

Stirling.—It is stated that the master painters of Stirling have agreed to a rise in their operatives' wages from 6½d. to 7d. per hour, and 9½d. per hour for overtime, the rise taking effect on Monday last.

Lanarkshire.—On the 24th ult. a meeting of the master builders in the districts of Motherwell, Hamilton, Wishaw, Holytown, and Bellshill took place at Motherwell to consider the high rate of wages paid to masons in Lanarkshire. It was agreed that a reduction of ½d. per hour be intimated to the men.

Greenock. — The strike of masons still continues, but the majority of the men have obtained work elsewhere. The masters express their determination to stand out, and the men are said to have been greatly "put about" by the Central Executive Committee not approving of the strike. The new asylum and poorhouse at Smithson and other prominent new buildings are being kept back, and the strike, it is anticipated, will lead to some complications with regard to contracts. Of 200 joiners on strike, only forty-seven answered to their names at the "house of call" on the 25th ult. The shippainters in two of the ship-building yards struck work in order that they might be put on a par with the house-painters in regard to wages. The difference is an eighth of a penny an hour; the house-painters have 8d. an hour, and the shippainters 7½d. The painters in the ship-building yards have since resolved to return to work on the old terms. Two masons, named M'Donald and Livingstone, on the 26th ult, raised an action against Messrs. Coghill & Sons, contractors for the new asylum, for payment of ½d. per hour of wages extra to what the pursuers had received. After proof, the sheriff gave decree for the sum sued for.

Edinburgh.—At a general meeting of the Edinburgh and Leith Master Builders' Association, held on the 21st ult., it was unanimously resolved to authorise the president and secretary to sign the agreement submitted by the United Operative Masons' Association, to the effect "That the rate of wages be 9d. per hour from 1st May, 1876, till 1st May, 1877." It was further resolved to direct the special attention of the members of both associations to the following clause:—"That neither of the contracting parties shall either directly or indirectly take any action whereby the wages agreed to may be either augmented or reduced, any violation on the part of employer or operative to be immediately reported to the secretaries of the respective associations." At a joint meeting of the Edinburgh and Leith Lodges of the United Operative Masons' Association, held on the 24th ult, a letter from the Master Builders' Association, agreeing to the terms of the operatives, was read. A resolution was moved and unanimously carried, thanking the Master Builders' Association, "and those employers who are not in that body," for so promptly complying with the terms, viz., an agreement for the next twelve months at 9d. per hour.—— A crowded meeting of the Edinburgh joiners was held in St. Mary's Hall on the 21st ult., for the purpose of hearing the result of the voting by ballot in connexion with the demand for a rise of wages from 8d. to 8½d. per hour, the masters, it was reported, having declined to comply therewith. The voting returns showed a considerable majority over the two-thirds required by rule. After the reports had been considered, the following resolution was unanimously passed:—"That this meeting having heard the result of the voting papers, consider the same to be satisfactory, and resolve that all the warnings be given in on Friday, 28th inst., if the advance asked is not conceded." At a subsequent period of the evening an aggregate meeting of the trade was held in the same place, when the following resolution was unanimously adopted:—"That this meeting endorses the resolution already passed at the joint meeting of the four Edinburgh branches, and pledges itself to act along with them in the present movement." After an interchange of opinion, the following was also unanimously agreed to:—"That copies of the foregoing resolutions be forwarded to the employers."

Nottingham.—The painters of Nottingham have struck for 1d. an hour extra wages. They now get 7d. an hour.

Eccles.—About 300 painters in the district of Eccles, Patricroft, Worsley, Swinton, and Pendlebury struck work on the 25th ult. The men originally demanded an advance of 1d. per hour; but owing to the action taken by those on strike in Manchester, they now express their willingness to accept an increase of ½d. This the masters decline to give, but are willing to concede an advance of ¼d., which the men refuse to receive, and hence the strike. The masters are, however, willing to base any future decision on the action of the master painters of Manchester.

Swansea. — The whole of the masons of Swansea who are "society" men held a meeting last week, and passed a resolution expressing their determination to strike on Monday last, unless their demand of 6d. per day increased wages were conceded. The whole of the masters positively state that in the present depressed condition of trade it is utterly impossible to comply with this unreasonable demand. Wages are now 33s. per week for five and a half days' work.

CINERARY URNS.

SIR,—Will you kindly allow me to inquire if any of your archæological readers have any knowledge as to the process of manufacture used in the construction of the cinerary urns frequently found in the walls of our old abbeys, &c., or be what process 'h- notorious "Flint Jack" so successfully imitated the ancient ware? It is obvious they were not made on the potter's wheel, nor is it probable that Jack could have worked a wheel.

FELDSPAR.

Books Received.

Problems in Stone-cutting. By S. EDWARD WARREN, C.E. New York: John Wiley & Son. 1875. London: Trübner & Co.

IN this treatise on Stone-cutting, most of the following subjects are elaborately illustrated by diagrams, to which scales and dimensions are attached, viz., wall and buttresses, piers, arches, wing walls, groins, arched corners, niches, domes, fan vaults, circular and elliptical staircases, &c., arranged in four classes, thus: (1.) Plain-sided structures; (2.) Structures containing developable surfaces; (3.) Structures containing warped surfaces; (4.) Structures containing double-curved surfaces. There are ten folding plates, illustrating the text relating to subjects ranging from the most simple, as a straight-battering wall, to the most elaborate circular work. We recommend the book to the attention of students of engineering and architecture.

VARIORUM.

A WRITER in the new number of *Cassell's Family Magazine* says pertinently: — "The successful engineer must not be the man who decides upon following engineering as a profession simply because it is a respectable occupation, or a lucrative calling, and at the same time possesses no real taste for it. The probability is that such a man will be disappointed, and find it anything but lucrative. Many a man has entered the Bar, actuated by such motives alone, and has become a member of the briefless family; and if a man expects to become an engineer by mere book study, apart from natural choice and natural talent, he will be mistaken. It must be remembered that special occasions call forth special efforts, and bring into prominence special talents; and true as this is, whether viewed politically or socially, in no branch of science, and in no walk of life does this become of more telling force than in engineering. The encroachments of the sea, or the inundations caused by the overflow of rivers, have from remote periods been causes for calling forth engineering talents; the draining of marsh-land, the conveyance of water, the necessity for improving the means of transit and facilitating locomotion—these and many other requirements may be assigned as the causes for the appearance of men of natural talent and force of will to cope with the necessities of the occasion, and we may safely assert that many an engineer of eminence in his day would never have been known had not some great necessity arisen to point his energies, and to give him ground for his operations. Again, some new discovery, the result of accident, or maybe of inductive reasoning, crude and comparatively useless in its germ, has directed general attention to the subje t, and quickly has appeared an army of aspirants to honour, armed with a consciousness of their ability to cope with the subject, to develope and improve it. Such a discovery has been the electric telegraph; but certainly neither in ancient nor modern times has any idea presented itself to the human mind which from small beginnings has grown to such gigantic proportions as the railway system; and equally certain is it that no branch of engineering has called forth such a marvellous amount of engineering talent, or of so varied a character; for, whilst the civil engineer has been occupied with the improvement of the permanent way and the means of overcoming the physical obstacles which have presented themselves to his progress, in the crossing of valleys and rivers, and the penetration of mountains, the mechanical engineer has been no less engaged in the improvement of the engine, and the result of this combination of talent is the present railway system of the world."—— A German electrician, M. Siemens, has just shown us that by suspending a little instrument over the sea we can measure the depths below accurately within a fathom. You need no sounding-line, no lead, no plummet, nor apparatus of any description, beyond a tiny instrument, which is hung over the side of a boat, so that its image is reflected upon the surface of the waves, and this proclaims the mighty depths below in the twinkling of an eye. Magic and necromancy are nothing in the presence of this wonderful little indicator, which tells how far it is to the bottom of the sea before the question can well be asked, and it is called the bathometer. How is it done? is the cry, and the question is answered so pithily in the *London and Provincial Illustrated Newspaper* that we cannot do better than quote it:—"All bodies are affected by gravitation, as everybody knows, and a pound weight placed upon the earth is attracted more powerfully than one 100 ft. above the earth; in fact, to speak popularly, a pound weight is heavier close to the ground than it is suspended high up in the sky. Generally speaking, we cannot ascertain the difference or variation in gravitation by means of weights and scales, for the simple reason that these are affected by gravitation also. M. Siemens, however, has contrived a balance that is not affected by gravitation, the balance consisting of two light spiral wires, and thus he can ascertain how an object becomes heavier the closer it gets to the earth. A column of mercury is the body chosen by M. Siemens, and this being hung upon the balance has a greater strain upon the springs, the heavier it grows, or, in other words, the nearer it gets to the earth. Placed on the seashore, this instrument marks 0 on the scale, for the weight is then bearing its hardest on the springs. Take it in a boat, however, where the water is a mile deep, or, in other words, where the earth is a mile away, and the gravitation at once growing less, there is less strain upon the springs, and the indicator moves to a corresponding degree. Having the earth below you is all the same to the instrument, whether this is up in a balloon or in a boat floating upon the sea; for water does not affect gravitation much more than air does. The instrument works, therefore, on a very simple principle, although its practical elaboration required much skill and forethought. As a fact, it may be mentioned that soundings taken with this instrument, which is termed a 'bathometer,' agree very closely with those taken by the ordinary sounding-line."—— The *Journal of Amusement* says:—"We want a roof—a Sunday shelter, and nothing would be easier than to erect one in all open places of Sunday resort. Perhaps if we assisted non-churchgoers to come out of their courts and alleys, and learn a lesson from Nature, we might find they sought those places of worship which, unfortunately, are not as full on a Sunday as they ought to be. Our brain-workers, too, would derive a still larger benefit. Our mortality would be less, and our morality would be greater. Questions of this sort are what we want discussed in Parliament. Members are not in the habit of giving up their Sundays in order to see how the day is passed in Soho, Shoreditch, Leather-lane, Bethnal-green, Bermondsey, and similar districts, or something would have been done ere this to make the Sunday a day of health and happiness to the poor, as, thank God! it now is to the rich."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—Your advertisement columns this week contain an announcement of a general conference of architects to be held under the auspices of the Royal Institute of British Architects during the week commencing the 12th of June next. The programme is in course of preparation, and will include a list of meetings at which short papers will be read and discussions take place on "Improved Dwellings and Artisans Dwellings Act," "General Building Regulations for the United Kingdom," the "Registration and Classification of Houses," and on "Greek Art." Visits will be paid to Westminster Abbey and to some buildings illustrative of the subjects of the papers, and the Institute dinner will close the proceedings on the 16th of June.

The committee hope that as many architects as are able will attend and take part in the conference, and as it is impossible to invite every architect individually, we shall be obliged if you will allow us through the medium of your journal to say that we shall be happy to forward programmes and cards of admission to architects on application to

ALFRED STRONG, F.R.I.B.A.,
J. DOUGLASS MATHEWS, F.R.I.B.A.,
Hon. Secs., Conference Committee

Miscellanea.

The late Mr. Earl.—A correspondent writes with reference to the death of Mr. Thomas Earl, the sculptor:—"Mr. Earl was born in Hull, in 1810, and died at his residence, No. 1, Vincent-street, Ovington-square, on the 28th of April, of so-termed valvular disease of the heart, but really of a broken heart. He gained the gold medal and book for the best historical group in 1839, and was twelve or fourteen years with Sir Francis Chantrey, as designer and modeller, while it is well known that the equestrian statue of George IV. at Trafalgar-square was Earl's work, in Chantrey's employ and studio. For above thirty years Earl exhibited, whenever he had a chance, most artistic works, notably 'Sin Triumphant,' 'L'Allegro,' 'Hyacinthus,' 'Ophelia,' 'Titania,' 'Miranda,' while his bust of her Majesty, now in his gallery, shows how powerful he was in portrait busts. Yet his works were frequently rejected by the Royal Academy, and he lay down quietly to die, and did die, without a murmur or a pain, on finding that his last work, on which he had been employed three years, 'Alexander the Great,' was rejected by the Royal Academy this year."

The City Architect's Salary.—At a meeting of the Court of Common Council, on the 27th ult., the Officers and Clerks' Committee, reporting on the reference of the 10th of February, 1876, on the letter of Mr. Horace Jones, architect and surveyor, soliciting a reconsideration of his salary, and also upon the terms of his appointment, recommended that his salary should be increased from 1,500*l.* to 2,250*l.* a year, the same to embrace his remuneration for the performance of the duties of his office, and for all works, whether ordinary, special, or exceptional, carried out by him, such increase of salary to date from Midsummer, 1873; and further recommending that the terms of his appointment be altered accordingly. Mr. Roberts suggested that the consideration of the report be postponed, as it would probably lead to a protracted debate; and this suggestion was approved. Mr. Fricker has given notice of the following amendment:—"To agree with the committee in their report, excepting that the salary be 2,000*l.* a-year, to date from Christmas, 1875."

Higher Education for Sheffield.—A writer in the *Sheffield Independent* says that Mr. Alderman Firth's liberal design to furnish the town with a commodious and handsome building for the promotion of the higher education in connexion with our universities, is being matured. The plan embraces class-rooms of various size, which may also be used as lecture-rooms where the numbers attending are likely to be under 200, and of a principal lecture-room, capable of seating 600 hearers, 55 ft. square, 30 ft. high, and well lighted from the two sides. Other rooms provide for various needful adjuncts of the scheme. There will be what may be called a sustentation fund provided by an investment of 5,000*l.*, and a second investment of similar amount to be devoted to scholarships. The property will be vested in trustees, the management being in the hands of an elected council.

Institution of Surveyors.—At the next meeting, to be held on Monday evening, May 8, a discussion will take place upon the paper read by Mr. W. H. Michael, at the last meeting, entitled "The Working of the Sanitary Acts in Rural Districts."

Overhead Telegraph Wires in London.—In the House of Commons, on the 24th ult., Mr. Anderson asked the Postmaster-General if his attention had been called to a letter published lately in which Sir John Hawkshaw stated that suspended telegraph-wires were safe only for about twelve years; if he had heard that several fatal accidents had occurred from fractured wires falling into crowded streets; and if he would arrange gradually to alter all wires in cities and towns to underground ones or have the suspended ones carried, where practicable, in such a way as to cross streets at right angles, or make the distance between the supports at least 7 ft. less than the elevation, or in some other way reduce the risk. Lord J. Manners, in reply, said there were only two fatal accidents in London during the seventeen years since the telegraph wires were placed overhead, and one of these occurred twelve years ago. It was intended to substitute as far as possible underground for overhead wires, and to carry those which would have to be carried overhead at right angles as far as was practicable.

Paving Works at Whitechapel.—The Whitechapel District Board of Works, at its last meeting, proceeded to open and consider tenders for the execution of certain paving works which it had been previously determined to carry out in Commercial-street, Royal Mint-street, and Church-street, Mile-end New Town. These were based upon a schedule of prices prepared by the surveyor, and were announced as follows:—Messrs. E. & H. Beevers, 8 per cent. above; Nowell & Robson, 7 per cent. above; J. Mowlem & Co., 6½ per cent. above; J. S. Gabriel, 5 per cent. under; and J. J. Griffiths, 2½ per cent. above. After some discussion, in the course of which it was stated that the contract would amount to from 15,000*l.* to 20,000*l.*, it was resolved that the tender of Mr. Gabriel be accepted.

The Victoria (Philosophical) Institute.—A meeting of this Institute was held on Monday, at its rooms, 10, Adelphi-terrace. After the election of new members, of whom fifty were announced as having been admitted during the past four months, it was stated that Professor Birks would deliver the Annual Address for 1876, and that the next three meetings, by kind permission, were to be held at the house of the Society of Arts. A paper on "The Metaphysics of Scripture" was then read by Professor Challis, F.R.S., in which he took into account that department of metaphysics which comes after, and is intimately related to, natural science, his object being to inquire, in this limited sense, whether the basis of metaphysics could be said to exist in the teaching of Scripture. Many took part in the discussion.

London and Middlesex Archæological Society.—The general meeting of this society will be held at the Tower of London on this Friday, the 5th of May. The several points of interest will be described as follows:—The White Tower, by the Rev. Thomas Hugo; St. John's Chapel, Mr. Alfred White, F.S.A.; the Beauchamp Tower, Mr. Charles Baily; the Traitors' Gate, the Bloody Tower, and the Undercroft of the Wakefield Tower, Mr. George Lambert, F.S.A.; the Jewels, Professor Tennant; and St. Peter's Church, Mr. G. H. Birch.

Price of Horses.—Last week twenty-five harness-horses, forming the cab stock of Mr. Dawkins, of Islington, were brought to Mr. Rymill's hammer, at his Repository, Barbican, when the animals, many of which were purchased for coach-work, realised an average of 46*l.* 4*s.* per head. At the same time and place fifty-one English dray and cart horses, the property of Mr. Frederick Wiggins, the contractor, of Goswell-road, were sold at prices reaching an average of 74*l.* 1*s.* each. This does not indicate any fall in the price of useful horses.

Fine Arts Exhibition at Paris.—The Fine Arts Exhibition was opened on the 1st inst. Works are exhibited by about fifteen English painters, including Messrs. Wyld, Orchardson, Bates, Mitchell, &c., and twenty-six American painters, among whom are Messrs. Leland, Lippincott, Parker, Baird, Pearce, Knight, Ramsay, Tait, Ward, Cole Bacon, Healy, and the sculptor Bartlett.

Value of Property at the West End.—The London Crystal Palace Bazaar, Oxford-circus, was sold by auction, by Messrs. Farebrother, Ellis, Clark, & Co., on the 25th ult., and was purchased by Mr. Peter Robinson for the sum of 15,600*l.*

The National Byron Memorial.—At a meeting of the committee, held on Monday, it was resolved to hold the question of material for monument in abeyance until evidence shall be taken as to the probable effect of the climate on marble. Artists will be permitted to furnish sketch-models not exceeding 2 ft. in size, and an application will be made to the proper authorities for a room in the South Kensington Museum, wherein the several designs may be publicly exhibited. Money is still wanted.

Highgate Archway.—The Highgate Archway-road carriage and foot tolls ceased on the 29th ult., and the road has now become a free, untolled public highway. This removal is according to the provisions of the Holyhead Road Act, 1861, by which the Government accepted a composition of 9,000*l.*, payable by instalments, in satisfaction of a debt of 13,000*l.* and interest advanced towards the making of the road to the Highgate Archway Company.

The Rejected Architectural Drawings.—The curator of the Museum of Building Appliances writes to us offering an arrangement for the exhibition, at so much a square foot of wall space, of the architectural drawings rejected at the Royal Academy. As it seems to be simply a commercial project, we must leave him to take his own means to make it known.

Knightsbridge Barracks.—The *Morning Post* states that the plans for the reconstruction of the cavalry barracks at Knightsbridge, by Mr. T. H. Wyatt, are now on view in the Tea-room of the House of Commons. The front to the Knightsbridge-road is to be of red brick with stone dressings. The "back front" facing the park will be a little more ornamental.

Reduction in Screws.—One of the Birmingham manufacturing companies, on the 26th ult., made a reduction in the price of wood screws amounting to 12½ per cent. on the net.

TENDERS

For Taraden Bridge, near Benenden, Kent. Mr. Martin Bulmer, architect:—

Chesman	£187 10 0
Bridge	154 0 0
Shoebridge	143 0 0
Ames (accepted)	129 10 0

For rebuilding Shalmesford Bridge, near Canterbury, Kent. Mr. Martin Bulmer, architect:—

Matthews	£1,284 15 0
Gaskin	1,097 0 0
Cozens	1,080 0 0
Ames	1,075 0 0
Wilson	1,051 0 0
Bugbird	1,033 13 0
J. & T. Judges (accepted)	947 0 0

For repairs to the houses, &c., Licensed Victuallers' Asylum, Old Kent-road, London. Mr. W. F. Potter, architect:—

Webb	£186 0 0
Eaton	170 0 0
Hersee	126 10 0
Blott	120 0 0
Ormston	109 10 0
Hayworth (accepted)	97 0 0

For six marble tablets to be fixed in the chapel of the same Asylum:—

Houghton	£39 0 0
Bird	33 15 0
Gallia & Co.	30 10 0
Cook	29 8 0
Cain	27 0 0
Hersee	24 0 0
Blott	24 0 0
Wilkins & Sons (accepted)	19 17 6
Dorey	17 17 0

For repairing and painting works at The Sweep, Lavender-hill, Clapham, for Mr. Thomas Dives. Mr. W. Newton Dunn, architect:—

Pitman & Cuthbertson	£315 0 0
Clements (accepted)	297 0 0

For alterations and additions to No. 89, High Holborn, for Messrs. G. Houghton & Son. Mr. John Butler, architect:—

Hoare & Son (accepted)	£1,289 0 0

For new south wing and laundry at Leyton House, Essex. Mr. J. George Hall, architect:—

	Wing.	Laundry.
Turner	£2,250	£350
Bangé	2,216	352
Simpson & Co.	2,049	321
Reed	1,997	311

For new buildings and fence at the Canterbury Cemetery, for the Burial Board:—

	Buildings.	Iron Fence.
Cozens	£4,400 0	£937 10
Naylar	4,378 0	996 0
Gaskin	4,350 0	929 0
Wilson	4,311 0	950 0

For alterations and additions in forming picture-galleries at No. 53, Pall Mall, for Mr. William Cox. Mr. Thomas Dudley, architect. Quantities supplied by Messrs. J. & A. S. Ball:—

Bywaters	£938 0 0
Curtis	933 0 0
Newman & Mann	895 0 0
Callum	820 0 0
Stairs	696 0 0

For constructing the Marine Town Esplanade, Sheerness:—

Gaskin	£3,697	8	11½
Hall	3,587	12	6
Geere (accepted)	2,925	0	0

For draining and roadmaking on the estate of Messrs. Bryan & Meadows, on the Rockingham-road:—

J. & G. Henson	£780	0	0
Barlow	740	0	0
Payne & Son	713	0	0
Gibbins (accepted)	680	0	0

For new Wesleyan Chapel, Northampton. Mr. S. J. Newman, architect:—

Croxford & Co.	£3,400	0	0
Poole	2,955	0	0
Hall	2,494	16	0
Watkin (accepted)	2,393	0	0

For alterations, repairs, &c., to the Pembroke Castle, Bemerton-street, Caledonian-road, for Mr. C. Howland. Messrs. Bird & Walters, architects. Quantities supplied:—

Kelly, Bros.	£1,850	0	0
Nightingale	1,756	0	0
Newman & Mann	1,740	0	0
Lawrence	1,730	0	0
Williams & Son	1,717	0	0
Anley	1,630	0	0
Brown	1,630	0	0
Hockley	1,495	0	0

For alterations, additions, and repairs to Greenwich-road Congregational Church. Messrs. Searle, Son, & Hayes, architects. Quantities supplied by Mr. C. H. Searle:—

Newman & Mann	£2,395	0	0
Williams & Son	2,320	0	0
Dove, Bros.	2,245	0	0
Colls & Sons	2,177	0	0
Roberts & Sons	2,668	0	0
Sharpington & Maxwell	1,589	0	0

For the erection of Congregational Church, East End, Finchley, Middlesex. Messrs. J. Tarring & Son, architects. Quantities supplied by the architects:—

Tarrant & Sons	£8,785	0	0
Newman & Mann	8,675	0	0
Dove, Bros.	8,435	0	0
Brass	8,434	0	0
Roberts, Bros.	8,347	0	0
Browne & Robinson	8,346	0	0
Perry & Co.	8,215	0	0

For proposed new building and alterations to present building for out-patients department at the German Hospital, Dalston. Mr. E. A. Gruning, architect. Quantities supplied by Messrs. Williams & Gritten:—

Lidstone	£7,110	0	0
Perkins	6,520	0	0
Brass	6,113	0	0
Shurmur	6,057	0	0
Conder	6,033	0	0
Merritt & Ashby	6,030	0	0
Lawrence	5,969	0	0
Ennor	5,891	0	0
Newman & Mann	5,795	0	0
Carter	5,700	0	0

For warehouse and factory, Tower-street, London-fields. Mr. J. B. Walton, architect. Quantities by Mr. F. Lee:—

		Credit for Old Materials.
Patman & Fotheringham	£5,998	£200
Taylor	5,720	185
Bangs & Co.	5,680	250
Hobson	5,576	200
Ennor	5,456	3 0
Jarvis	5,280	300
Newman & Mann	5,106	155

For new mission-room, and dwelling-house adjoining, in Cherry Garden-street, Bermondsey, for the Rev. Brookes Deedes. Mr. R. Hesketh, architect. Quantities by Messrs. Franklin & Andrews:—

Lugg	£4,650	0	0
Kent	4,514	0	0
Bulmer	4,484	0	0
Downes	4,403	0	0
Coleman	4,403	0	0
Almond	3,925	0	0
Newman & Mann (accepted)	3,934	0	0

For new premises, King Edward-street, Newgate-street, for the Vicar and Churchwardens of Christchurch Parish. Mr. Thomas Renton, architect. Quantities supplied:—

Fitch & Sons	£1,938	0	0
Oliver	1,928	0	0
Pritchard	1,912	0	0
Nightingale	1,780	0	0
Newman & Mann	1,745	0	0
Morter	1,678	0	0

For new warehouse, Golden-lane, for Mr. J. K. Farlow. Mr. R. P. Notley, architect. Quantities supplied by Messrs. Linsdell & Gifford:—

McLachlan	£3,311	0	0
Adamson & Sons	3,283	0	0
Morter	3,243	0	0
Hart	3,240	0	0
Rudkin	3,190	0	0
Falkner	3,185	0	0
Bangs & Co.	3,139	0	0
Greenwood & Sons	3,130	0	0
Newman & Mann	3,124	0	0
Brass	2,989	0	0
Browne & Robinson	2,885	0	0

For the erection of farm buildings and cottages at Wood Lee, near Egham, Surrey, for Mr. J. K. Farlow. Mr. R. P. Notley, architect. Quantities supplied by Messrs. Linsdell & Gifford:—

	Farm Buildings.	Cottages.
Falkner	£1,700	£730
Newman & Mann	1,686	733
Greenwood & Sons	1,627	711
Browne & Robinson	1,616	696
Bangs & Co.	1,389	687
Pithers	1,286	761
Adamson & Sons	1,373	666
Odes	1,173	535

For works, 24, Albert Embankment. Mr. C. Young, architect:—

Greenwood & Sons (accepted).

For alterations and additions to the Kent Penitentiary, Stone, Dartford. Mr. A. R. Barker, architect. Quantities by Mr. J. O. Abbott:—

For new Laundry Wing, Alteration to House, &c.

Jackson & Shaw	£3,400	0	0
Downs & Co.	3,398	0	0
Brass	3,226	0	0
Naylar	3,085	0	0
Blake	3,054	0	0
Gumbrell	2,995	0	0
Foster	2,900	0	0

For new Road and Fencing, as per plan.

Downs & Co.	£92	0	0
Jackson & Shaw	90	0	0
Foster	90	0	0
Brass	72	0	0
Blake	66	0	0
Naylar	65	0	0
Gumbrell	65	0	0

For the erection of corn-mill for the Midland Federal Co-operative Corn-mill Company (Limited). Mr. T. Hind, architect. Quantities supplied:—

Major	£3,957	0	0
Gilbert & Piper	3,800	0	0
Kellett	3,698	0	0
Bass & Hodgkin (accepted)	3,624	0	0

For the erection of skating-rink, New Chester-road, Rock Ferry, Cheshire. Messrs. Troughton & Prescott, architects. Quantities supplied:—

Smith	£1,823	16	0
Anwell	1,632	9	0
Williams	1,470	12	0
Davies (accepted)	1,460	0	0

Blackfriars.—Messrs. Newman & Mann's tender has been accepted for reinstating the fire damage to the warehouse and other premises in the Broadway, Blackfriars, burnt down in February last.

Great Northern Railway.—The Directors of this company have accepted the tender of Mr. Joseph Firbank, of Newport, Mon., for the additional tunnels at King's-cross, the new station in York-road, and the lines in connexion therewith. The works are to be pushed on forthwith.

TO CORRESPONDENTS.

We are compelled to postpone a number of communications.

Pictures at the Royal Academy will be reviewed at some length next week.

Dr P (sketches shall appear).—J. P (cancelled, having appeared elsewhere).—C. C. O. (there was a vessel so propelled, though not on the Regent's Canal. We have no precise particulars of it).—F. & H. C. (we are compelled to decline recommending).—P. & C.—J. D. H.—W. P.—C. S.—T. J.—J. D.—S. R.—Sir E. L.—H. B. W.—O. S.—W. G. S.—B. M.—J. J. & Son.—W. H.—C. W.—G. T.—T. A.—S. S & Sons.—W. T. M.—J. H.—R. M. Y.—Mr. G.—Messrs. H.—T. H.—J. S. K.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Bath Stone Office,
Corsham, Wilts.

Dear Sir,

Westwood Ground Stone.

The want of a Ground Stone superior to the Box Ground, has long been recognised, and we are now in a position to meet that want.

Our Quarries at Westwood are producing a Ground Stone of excellent quality, which surpasses the Box Ground in the following particulars.

Evenness of Texture, *It is free from hard bars and soft clayey beds.*

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Shapeliness. *The rock being naturally sound it is not necessary to cut it into a variety of shapes inorder to remove vents. The blocks are therefore square and shapely, and can be converted with the smallest waste.*

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Your commands will always oblige, yours truly,

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The Builder.

VOL. XXXIV. No. 1736. SATURDAY, MAY 13, 1876.

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Royal Academy Pictures.

FEW will doubt that the two central pictures of the year are Mr. Leighton's "Daphnephoria" (241), and Mr. Poynter's "Atalanta's Race" (943); and thus, after a considerable preponderance of the scale in favour of subjects of romantic or pathetic feeling for some three or four years past, we are this year brought back again to neo-Greek art and ideal classic figures. Mr. Leighton's picture, indeed, is one of the most thoroughly Pagan or pre-Christian works we have ever seen in modern painting. In front of a thick grove of trees, which occupy a great part of the canvas (and which, by the way, are not quite so fresh and living in tone as we should desire to see them) come the members of the procession held every ninth year at Thebes, in commemoration of a victory over a rival city, and in honour of Apollo, to whom it was owing. First marches a youth with a dark purple scarf round his loins, carrying a great golden symbol of the sun, followed by the priest of Apollo, in full raiment, carrying laurel-branches; then some naked youths carrying martial trophies, then the figures who compose the bulk of the procession, the female singers, young girls and women in flowing robes girt beneath the bosom, forming with their various tones a beautiful harmony of delicately contrasted colour: the whole of this bevy of Greek beauties, of a very full-blown type, are in full song, their lips wide apart to give breath to the hymn led by the harp-player in front, who turns back a moment to give them fresh encouragement. In the distance below is seen the town of Thebes, bright in the sunshine. Nothing could be more harmonious and delightful to the eye than the assemblage of colour, nothing more perfect than the delineation of some of the figures,—for example, the youth with his back to the spectator in the front group; nothing more gay, light-hearted, sensuous, more utterly devoid of the sentiment we now call religious, than the whole group who pass along the marble pavement, besprinkled with laurel-branches. But stay,—what is that thin, melancholy face in the background, belonging to a bystander, who, with his head leaned on his hand, watches the gay group of women with a sad, thoughtful expression? The figure may easily be missed, but its presence, whether intentionally or not on the part of the artist, makes all the difference in the feeling of the work.

Mr. Poynter's "Atalanta" is a picture on a larger scale and in a very different manner. The scene is the marble-paved "public place," with the base of a temple forming the background, on the steps and between the pillars of which an eager crowd of on-lookers are cheering and encouraging the racing suitor, who has just thrown the second of the golden apples, and half turns his head as he runs to see the result. Atalanta has stopped herself suddenly, with the left foot planted sideways across her course, and stoops, with open hand, to pick up the tempting toy. The double action of the figure, checked suddenly in her career, and yet with the onward impetus still apparent, is admirably given, as well as the foreshortening of the body in one of the most difficult of positions; but is not Atalanta very exceptionally tall? The height to which the figure would rise if she stood upright it is almost alarming to reckon up. Milanion is a grand figure in the full strength of manhood. He scarcely seems, however, to be putting forth his full power or running his fastest; indeed, the excitement and intensity of interest seem confined to the spectators, most of whom are evidently in favour of the suitor, and already flourish palms and garlands in the air in anticipation of his victory. The anxiety, again, of one or two who are of Atalanta's party, their indignant impatience at her apparent folly in stopping, are expressed in an equally lively manner. These groups, however, are quite in the background, and the attention is chiefly demanded by the two principal figures, which, whether quite attaining the ideal of the supposed action or not, have qualities that must add to the artist's reputation with artists; while the whole is evidently the principal centre of attraction with the general body of visitors. By the way, it is rather absurd to refer the story in the catalogue to Morris's "Earthly Paradise," as if the legend of Atalanta were no older than Mr. Morris. Another point we may remark on is that, as the legend is an old one of pre-historic Greece, the architecture should have been Early Doric. The bases of the columns belong to a late Greek style.

From Greek to Roman our next glance takes us, and we are still treading on marble in Mr. Alma Tadema's picture of the "Audience at Agrippa's" (249), and the best painted marble of the three; for Mr. Tadema has served his apprenticeship with marble very thoroughly. But in every sense this, though small, is one of the most remarkable works the artist has produced. He makes us live the Roman life over again; the men and women who go up and down the palace steps and along the colonnade which stretches from us, the officials or under-secretaries at the table at the entrance, become realities to us; we can fancy what their life and ideas and tempers may have been, can realise something of the distinction between their life and ours, instead of regarding them merely as models dressed up in togas. This faculty of revivifying Roman society could only result from long and persevering study of all the records and remains which give us the clue to this life of a past age, and enable the artist by degrees to live it over again. A picture by the same artist which will have many admirers is that of a Bacchante who has flung herself down, "After the Dance" (927), in apparently somewhat vinous slumber, her thyrsus with its bright ribbon thrown beside her, her form relieved against the dark skin of some animal which forms her couch. There is a remarkable flush and voluptuous languor about the whole thing quite in keeping with the subject, and giving it an individuality of character quite beyond that of a mere nude study. This can hardly be said of Mr. Armitage's "Phryne" (909), on the opposite side of the same room. Apelles, we are reminded in a note, painted his "Venus Anadyomene" after he had seen Phryne bathing on the seashore. Passing over the question whether he had any business to see Phryne under the circumstances (which can hardly be decided now), it is evident that Apelles, like a true artist, turned this prosaic circumstance to a poetic account, and idealised Phryne into Venus. Mr. Armitage prefers to paint merely Phryne. It would have been more to the purpose, since the Venus Anadyomene has perished, and is but a tradition, if the modern painter had aimed at restoring the ideal of Apelles. As it is, we have merely a well-painted but not very beautiful body, with nothing either spiritual or *spirituel* about it. We do not care for Phryne; she might have made her toilet undisturbed for us. No doubt her flesh is remarkably like flesh; has been worked up with the most realistic finish; but,—*cui bono?*

Going to No. 1 Gallery, we notice first the able work of Mr. Eyre Crowe, again, it may be observed, a Greek subject, "The Rehearsal" of the "Birds" of Aristophanes, representing the scene where the two visitors from Athens are taken for bird-catchers and repelled with violent gestures by the actor whose assumed gesticulation and rage contrast amusingly with the cool critical look of the poet sitting by, manuscript in hand, to correct the performance where necessary. In the background are seen the Chorus with birds' masks and wings, the humour of their appearance being further intensified by the introduction of the raven which sits on the curtain-pole, apparently puzzled and inquisitive at the doings of his human imitators. The picture is a success in every way; more so than the same artist's "Darning-day at the Red Maids' School, Bristol" (146), which is not so successful in the interest of the figures as some other works of Mr. Crowe's in the same style; and the building occupies so large a portion of the picture that its detail should have been more finished. Mr. Goodall's large picture "An Intruder on the Bedouins' Pasture" (14) does not interest us much, and illustrates his tendency to canvasses larger than his subject at all demands; we turn with more pleasure to his smaller work "Sheep-washing near the Pyramids of Geezeh" (585), which is very bright and atmospheric in effect; its excellences belong, however, rather to landscape, which just now we are postponing. Mr. Prinsep's "À Bientôt" (31) is a great improvement on his "Minuet" of last year; a young man in green dress bows over the hand of a young lady in white, who is just about to ascend a staircase; the action and expression of the two

figures are full of character, old-fashioned gallantry on the one part, and stately but not unkind demeanour on the other; the combination of colour is very bright and pleasant to the eye. Of two social subjects, or pictures with a moral, in the same gallery, we can make nothing of Mr. Macbeth's "Lincolnshire Gang" (46), which does not tell its story even with the help of the long note appended in the catalogue; Mr. Barnard's "Saturday Night" (62), the other work referred to, is a street scene obvious enough in its point and intention, and contains a good deal that is both humorous and true to nature, with a clever treatment of effects of artificial lighting, but a tone and manner in colouring which to our eyes is most repelling, not to say coarse. A small work by Mr. S. Lucas, the interior of an "upper room" where sits a poor youth who has been "fleeced" (19) at play over night is very good; all the incidents aid the story—the cold early morning sky, the empty punch-bowl, the wasted candle, as well as the figure of the luckless victim with his head bowed on the table. "For the King and the Cause" (1,333), by the same artist, depicting the results of a single combat in which a Royalist has fallen by the hand of a "Parliament man," is a work of considerable interest.

Mr. Hodgson has rather changed his ground this year, scarcely to immediate advantage, though one is always glad to see a good artist desirous to avoid remaining in one groove. Instead of his street and shop scenes of African life, he has selected subjects in which his able treatment of Algerian figures can be combined, more or less, with landscape. His "Temple of Diana at Zaghouan" (84) includes a humorous repetition of the story of Actæon, represented by an English sportsman, who, coming down to the stream with his dog, disturbs a dusky Diana up to her knees in the water, the centre of a group of amateur washerwomen; her nearest companion endeavours, laughingly, to screen her too much uncovered bust. In "Following the Plough" (301), we have a single man driving a bullock-team in a plough, followed, in his turn, by sundry storks, who seem desirous to make the best of anything the ploughshare may turn up. In both these there is of course a good deal to admire; but it would be incorrect to say that they are equal in vivacity or interest to the works the artist has sent for two or three years back; still, the new vein thus opened may lead to more. Mr. Waller humorously illustrates "The Way of the World" (90) somewhat in Mr. Orchardson's vein, by the fate of an unfortunate delinquent placed in the stocks, and become the object of hissing to a flock of geese. Mr. Marks is hardly at his best in his illustration of "Journeys end in lovers meeting," where he depicts landscape more fully than is his wont, with very bright and fresh treatment of the foregrounnd detail; but the figures have not much of interest. "The Apothecary" (156: he of "Romeo and Juliet") gives him an opportunity for that brilliant and studied delineation of odds and ends which he has made very successful lately; and here the figure is not, to our thinking, the best, or at least the most important part of the sum total of oddities. Mr. P. R. Morris has taken a leaf out of Mr. Boughton's book in "Sigh no more, Ladies" (126), a pretty but somewhat weak painting; but he has made a genuine success on somewhat new ground, in his interesting and pleasing picture of "The Sailor's Wedding" (280), where the wedding party struggle against a strong breeze along the margin of a boisterous sea; the characters have been studied and portrayed with true insight and sympathy: the sturdy sailor a (capital specimen of his class), the bride, a pretty and refined-looking young woman, though with an appearance quite in keeping with her supposed position in life; the "best man" and his cheerful-looking companion; the little bridesmaid whose hat blows off, and the weather-beaten old couple bringing up the rear, form a group with whom we at once feel the kindly sympathy which the artist must have felt when he painted them; for it is a pleasant feature in Mr. Morris's best works that he always has something for our feeling as well as our mere judgment to take interest in. The sea is not the strongest part of the work perhaps; but it will bear comparison with all but the work of our one or two specially gifted sea-painters. The success and progress of Mr. Morris in his art has been rapid and genuine, and gives promise of more to come. In all that makes the art best worth having, how far superior is such a work as this to Tissot's "On the Thames" (113), where the cleverest and most realistic finish is bestowed on the delineation of that odious type of dressy vapid girl who seems to be the only style of London young lady whom the French painter finds worthy of his brush. Let us be thankful that there is more even in the "fashionable" London girl than Mr. Tissot shows us.

We may mention, in Gallery II., the best work yet sent by Mr. J. N. Waterhouse, who appears to be a steadily advancing artist; "After the Dance" (91), contains a good deal of excellent work, and the artist is partially escaping from the mannerism of tone in his draperies, &c., which threatened to be a stumbling-block in his way. Mrs. Ward's "Visit of Mrs. Fry to Newgate" (170) will appeal to the sympathies of many; the disorderly scene in the court-yard is, perhaps, scarcely so vividly shown or so prominent in the picture as the quotation appended would lead us to expect, but it is terrible enough. It is a picture with an excellent purpose.

Going on to Gallery III., we hold up the hands of dismay before a representation of "Dinner-time at Penshurst, in 1665," by a painter who writes R.A. ("if they do these things in the green tree," &c.), and turn the eyes of amusement and interest to Mr. Cope's picture of the Council of the Academy (160), and their assistants, engaged in the task of selecting pictures for the exhibition. This is a spirited and well-painted picture, containing some very good portraits. From the note appended, describing the *modus operandi*, we take this to be, however, a kind of *ad captandum* appeal for favour on behalf of an institution which has been much reviled. It will scarcely silence all objectors, however, if, for instance, it be true, as we have heard, that on the present occasion the Council have performed the feat of rejecting two important landscapes by an artist who is incapable of painting anything which the Academy could have a right to reject on the question of merit. When one considers this, and looks at some things that are on the walls, one cannot but feel indignant. The Academy have driven away Legros; they have now probably driven away another artist whose works are an honour to any exhibition: we mean Mr. Alfred W. Hunt, one of the few artists, by the way, of whom we know nothing personally.

Mr. Leslie takes us back to good old days, in the title of his principal work, "My Duty towards my Neighbour" (169), which seems to be a puzzle to the young lady who is attempting to repeat it to her fair instructress; a very fine, curly-haired lad, in a rather picturesque dress, listens critically behind. The little child is rather wooden and inexpressive in face, otherwise the picture is in the artist's best mood, and likely to be a general favourite. Mr. Poole's "Meeting of Oberon and Titania" (175) is not a fortunate specimen of his powers; the fairy figures are drawn with a curious carelessness about form; the effect of light on Oberon and his queen is unhappily suggestive of lime-light turned on them from the side-scenes. Mr. Lewis's two Cairo pictures (187, 222) exhibit his usual brilliant characteristics in colour and detail, but (whether intentionally or not) without the brightness and glitter of reflected light with which he has so often astonished our eyes; we are not mentioning this as a defect, but only as a slight change in manner which may or may not have its reason. The Cairo auctioneer we consider the best work, or, at least, the most complete and pointed in grouping and effect; in the larger one it is doubtful, by the way, whether the court-yard and horses, figures, &c., below the level of the principal part of the picture, really keep their distance; to our eyes there is a little confusion of aërial perspective here. Mr. Calderon's best contribution is "The Nest" (192), searched for amid its bower of green leaves by a young woman, while a little, bright-haired child, with his back to us, looks earnestly on; the glitter on the grass and daisies repeats the effect shown in "Great Sport" in a previous year. Mr. Yeames is clever, though not quite telling his story, in "The Last Bit of Scandal" (233), a return from a rout in early morning, in the sedan-chair time; and Mr. Pettie (to step to a very opposite subject) sends a life-size repetition of the braggart warrior we saw before in "Terms to the besieged" (259); the subject was worth neither the labour nor the canvas. The artist is shown to much more advantage in the "Step" (433) executed by a little girl for the amusement of one of the most kindly and venerable of grand-mothers. Mr. Albert Moore sends one little work, "Beads" (258), so dainty in colour and execution as to make us wish there were more subject in it, and then that we had half a dozen instead of one. But it is undeniable that Mr. Moore repeats himself too much.

Mr. Frith's contributions attract a good deal of attention from the majority of visitors; his scene from the "Vicar of Wakefield" (250), where young Squire Thornhill, on his first visit, is setting the little boys to box, is humorous and bright in regard to the attitudes and expressions of the two lads, one of whom is full of fun and mischief; we cannot recognise Squire Thornhill in the round-faced young man behind them, nor can we believe poor Mrs. Primrose, blockhead as she was, to have been so outrageously vulgar as the artist represents her. "Below the Doge's Palace, 1,460" (350) represents the attempt of an imprisoned woman to attract the compassion of a monk whom she addresses through the grated window.

Mr. G. A. Storey is hardly at his best in "My Lady Belle" (265), which, in fact, has not enough of interest for the size of the canvas, and would have told better as a half or quarter size figure: "The Dancing Lesson" (121) is the class of work which has won the artist his position. Mr. Orchardson is at his best, or more than his best, this year; his works exhibit the peculiar humour and the originality of tone and treatment which have usually marked them, and he has taken more trouble to fill up his backgrounds with details that add effect and interest to the whole, instead of the bare mass of floor or wall which we too often find covering the larger part of the canvas; in every respect "The Bill of Sale" (264) and "The Old Soldier" (892), are calculated to better his reputation. There is pathos in Mr. F. Holl's sad funeral procession of "Her First-born" (286), but a pathos which somehow does not impress us as very real, or as anything more than an effort after effect on the part of the artist. Mr. Riviere gives a good study of ducks, under the title, "A Stern Chase is always a Long Chase" (313), and ditto of dogs (496), the herdman's dogs in the "Odyssey," alarmed at the approach of Pallas Athene. We share the dismay of the dogs, and wish the artist would let goddesses alone. Mr. Wallis has left this year the Venetian subjects in which he has recently displayed such brilliant ability, and scarcely gives us anything of compensating excellence and interest. There is something new and original in "Outside a Prison in Southern Italy" (322), where a girl plays a violin to the listeners through a grated window; but the interest is certainly in the incident rather than in its treatment; and we can hardly see that the artist's other works this year are up to the standard which he previously reached. A good many small works of merit we must necessarily pass over. Mr. Millais's group of children, two of whom have come to see another who is "Getting Better" (387), is admirable in character, the lad especially; to his more important works we must return hereafter. Not far from this is the largest work of Mr. Prinsep, "Linen Gatherers" (411), belonging to a class of subjects which this artist has recently taken up, and which seems to us to owe its original inspiration to Mason. This represents girls coming down by groups or singly from the high downs with the linen that has been bleaching there; the subject and intention of the work arouse one's sympathy, but we scarcely feel that the painter has given us the whole of it; his own sympathy with it seems to be imperfect, and the feeling which is aimed at is not reached: in execution the figures are excellent, the tones of the landscape rather conventional. Mr. Hennessey's "En Fête, Normandy," continues with some brilliancy of treatment the class of work with which his name has been associated for a year or two back; the picture is hard, but not uninteresting. We may contrast this picture of Normandy peasant life, on its bright side, with Mr. Aumonier's beautiful and thoughtful work, "Toilers of the Field" (207), in which a band of rustics go forth to their work by the margin of a wide shallow stream, and through a landscape with a quiet melancholy pervading it, which harmonises with the subject in a way that is suggestive of not a little reflection. This, however, is pushed up on high, while Mr. Hennessey's far more prosaic work is on the line; a contrast not creditable to the judgment and feeling of somebody.

Two comparatively young painters are represented by works which, for their ambition in scale and aim, challenge the attention of every visitor. Mr. Long's "Bethesda" (891) will not

injure the reputation he acquired by his brilliant effort last year; but perhaps will hardly enhance it. A good deal of the success of the work lies in its effectiveness rather than in any deeper feeling. The reflection of the group in the stagnant water, the appearance of utter stagnation conveyed by the bubbles which stand on the surface, and the feather which lies, hardly wet, upon the water, are sure to strike every one. The figures themselves are admirably drawn, arranged,—everything of that sort,—but they do not impress us with any great sympathy, any strong realisation of the longing for relief which is intended to be expressed. The work is that of a painter whose executive ability is at present in advance of his mental conception. A much deeper, truer pathos is embodied in Mr. Fildes's almost heart-rending work, "The Widower" (476). We may say at once that we think the painting would have produced equal effect, and been more satisfactory to the judgment, had it been half the scale. In painting such a subject life-size an amount of space and trouble has to be devoted to the depiction in detail of objects which hardly help the total effect, and which, as far as they bear upon it, could be equally well represented on a smaller scale. Look at the grand and pathetic effects which Israels produces, for instance, in treating the same class of subject on quite a small scale. Apart from this, Mr. Fildes's picture is an unmistakable success. The interest is centred on the figure of a poor "navvy," his boots still covered with the clay of his day-labour, seated in his home with a sick child in his arms, at whom he gazes with a look of helpless affection, not knowing what to do with the poor motherless thing. The eldest daughter, about fifteen, looks on with a face almost haggard with fruitless sympathy and anxiety; the little ones kick about the floor and amuse themselves as they please, unconscious of the domestic tragedy that is going on. Perhaps we may question the desirability of too often bringing forward this tearful side of human life in painting; may doubt whether there is not a sacred character in such grief which scarcely bears dragging to the light. We make no complaint of it in the present instance, however, in consideration of the genuine feeling with which the subject is treated, saddening as the effect of the picture is.

Among other figure subjects, we may mention Mr. Boughton's "A Surrey Pastoral" (562), in which, however, the figures do not at all remind us of anything we know of in English peasant life; Mr. Dixon's "Miles from Home" (522), a police-station interior, where a very small child is seated on a bench waiting while her case is considered by the guardians of the public peace (there is a good deal of character in this work); "Seaside Enjoyment" (974), by Mr. Ormsby, a new name in the Academy, whose work has a good deal of quiet humour; Mr. Croft's "Morning of the Battle of Waterloo" (1,253) on the French side, the men rousing themselves from their bivouac, one or two yawning, only half awake, while in the back-ground, at a table, sits that figure in the grey coat and cocked hat which will be remembered for ever in history; this is a very good battle-scene, with a good deal of reality about it; there is M. Philippoteaux's "Charge of the Heavy Cavalry at Balaclava" (1,332) also, very disappointing to those who remember his admirable picture last year; and Mr. Marcus Stone's "Appeal for Mercy" (1,326), made by a hapless "aristocrat" lady to a couple of members of the Committee of Safety; but this, to say truth, misses its mark, and scarcely interests our feelings. We are glad to see one of the students' paintings of this year, "Elijah, Ahab, and Jezebel" (1,253) hung, one which it was thought by many deserved a prize rather than "the honourable mention" it received, and which is, perhaps, hung here as a compensation.

"Sharpening a Skate, Friesland" (586), by Mr. Bisschop (whose name, though honourably known elsewhere, is new at the Academy), is an interesting and able work which might well have claimed a better position: a young lady in fur cap and blue-sleeved dress waits while her skate is ground by the man whose help-mate turns the grindstone, the two figures strongly relieved against a white wall in full light. The colour is harmonious, the style broad and forcible, but with sufficient attention to detail in every part.

Of the portraits of this year, that by Mr. Millais, of the Duchess of Westminster (329), must in one sense rank as the most important. It is certainly one of the richest in effect, and of the most highly-finished and powerful works of the class, in regard to the painting of the rich and elaborate accessories, that have been seen in the Academy; but it hardly belongs to the order of portraiture in which the intellectual interest is predominant. This praise may rather be given to the same artist's portrait of Lord Lytton (240), a three-quarter length of a tall, thin, erect figure, every inch the diplomatist and the gentleman, and in the pose of which, though exceedingly simple and unaffected, there is a great deal of character. The companion portrait, in size and scale, of Mrs. Schlesinger (248), is a great favourite with visitors; but here, again, attention is compelled rather to the remarkably successful painting of the blue velvet dress than to the countenance. Mr. Onless has not quite come up to the standard of his last year's performance, but his portrait of Mr. Bouverie (77) is a notable specimen of force and originality in the treatment of a head, as regards both colour and expression. In his larger portraits of Baron Amphlett and Sir A. Milne (425, 445) the artist has had the difficulty, as in one sense it is, of dealing with official costumes of a power and brightness of colour which must always tend to compete too much with the countenance, if realistically represented. The aim at bringing the whole into harmony has been more successful perhaps with the uniform of the admiral than with the scarlet robes of the judge. Mr. Leighton's head of Captain Richard F. Burton, "Her Majesty's Consul at Trieste" (128), is doubly interesting as a most forcibly-treated likeness of a very characteristic head, and as representing the artist in a manner so unlike what we usually connect with his name, the character and associations of his sitter having apparently drawn him for a moment aside from his Greek and Southern sympathies of style and feeling. Mr. G. F. Watts's three works have not the striking character of some which he has given us, but there is very refined expression and drawing in the portrait "The Bishop of Ely" (181), great breadth of treatment in that of Mr. Macnamara, "The Surgeon to the Westminster Hospital" (1,275), while the small picture called "By the Sea, a Study" (161), which we may class with the portraits, a quarter-length of a young girl in a straw hat holding a shell, about which she seems to address some inquiry as she turns her sweet blue eyes up to you, is one of the most tenderly painted things in the exhibition, both in its delicate harmony of colour and in the expression of the face, which has quite a story written in it. In strong contrast to this are the portraits by Mr. Pettie and Mr. Orchardson, of whom the former has taken to painting figures in the costumes of different periods, of which No. 886 is a clever but very theatrical specimen; while Mr. Orchardson makes a hit, certainly, in a way, by his portrait of a girl with unkempt hair in a coarse blueish dress with a yellow-clad doll in her lap, a picture which fidgets and annoys one at the same time that its cleverness and a certain force in it are undeniable. Then Mr. Boughton paints "Master Graham Pettie in the Costume of the Seventeenth Century" (34), with which the young gentleman looks rather discontented, and Mr. Richmond paints "Miss Charlotte H. Richmond" (373) in a singularly ungainly costume, but with considerable richness and refinement of colour. Mr. R. Herdman sends a characteristic and powerfully-painted head of "Thomas Carlyle," Mr. Richmond a rather hardly-painted likeness of "The Hon. Miss Labouchere" (1,277), in a Japanese style of dress which is more striking than beautiful; and M. Fantin, of floral fame, interests every one more or less by coming out as a portrait-painter in a very highly-finished, straightforward, matter-of-fact portrait of "Mr. and Mrs. Edwin Edwards" (86), the general tone of which is anything but agreeable, though it attests strongly the manipulative power so strikingly shown by the artist in a very different class of subject. Altogether there is no lack of originality and variety in the portraits of the year, with a too great prevalence of attempt at effect rather than repose and expression, even on the part of such a generally "repose-ful" painter as Mr. Sant (whom we were almost forgetting), whose likeness of Mdlle. Thalberg seems to us a trifle theatrical; but, on the other hand, his likeness of the Misses Siemens (197) is, though not altogether perfect in colour, thoroughly natural and refined, and the countenance of the younger (?) lady very happily and expressively given.

Mr. Hook's best works are among those of which one cannot say whether the figures or the scenery (one cannot exactly say landscape) are of the most interest and excellence, and this is emphatically the case with his principal work this year, "Crabbers" (234), which is one of the old out-at-sea subjects, representing a boat pulled by one man, a capital specimen of the best style of south-coast fisherman, while his mate assists a gigantic crab through the narrow opening of the basket. Perhaps what strikes one most of all in this work is the remarkable manner in which the motion of the boat over the water is realised, in a way that could only result from long and close observation,—the double motion, the spring upward and sideways from the stroke of the sea, and the "send" of the boat forward from the oar at the same instant, are so real that one almost seems to be on board of the craft. Needless to add, how fresh and "open-air" are the tone and swing of the water. The rest of the artist's contributions are in a quieter vein; but in "Seaside Ducks" (44) and "Hard Lines" (498) one is struck by an exquisite refinement in the tones of the grey sea (less blue than is usual with the painter) and the varied lights on the green folds and breaks of the cliffs. Whilst on sea subjects let us also dispose of the large sea-picture of the year, Mr. H. Moore's coast scene, under the title "A Lifeboat" (455), one of those white, wrathful seas of his which one hears hissing and roaring as one contemplates the canvas, though we have to allow, nevertheless, for the painter's own way of looking at the matter, for this is not the real tone and colour of sea water; Mr. Moore concentrates his efforts on giving us its sound and motion, and he has power enough to compel us for the moment to look with his eyes, and see the sea thus and in no other way: let us give all honour to the artist's peculiar power, while we recognise its limitation. A seaside piece of Mr. Orchardson's, "Flotsam and Jetsam" (208), where a worn gaunt-looking woman, her garments blowing wildly in the wind, hauls up some piece of spoil out of the waves, should be looked at, the rather as such a subject is a new effort with this artist; there is a melancholy desolation about it which is impressive.

Among landscapes properly so called, no doubt but that "Over the Hills and Far Away," by Mr. Millais (106), is the central work of the year, so far as great ability and conscientious workmanship can render it so. As in most of the artist's previous landscapes, an elaborate study of foreground detail is what makes the most effective portion of the picture; but in this case the distance has more tenderness and sentiment, and to our thinking more truth of effect than in previous works, while the foreground, for richness of tone and brilliancy of laboured detail, outdoes every former effort. The scene is a Scotch moorland in a hilly district; the half-swampy nature of the ground, with its partial pools and knots of rushes, is so real that we can fancy it soaking under our feet; the perspective of the ground where the dip hides it from further view is complete; the dark hill on the left just getting into the light at the foot where it joins the plain is very beautifully given; the distance and expanse of the sunlit plain, small as is the space it covers on the canvas, is remarkable. The picture is one which grows upon the eye, and of which all the excellence is not apprehended at the first glance, though its basis is that of materialism rather than sentiment, no doubt.

We hazarded a hope last year that Mr. Brett would not be tempted to repeat too often the triumph of sea-painting in bright calm, which had formed his *pièce de résistance* for two or three years. We have our wish, and like many other people in such a case are not as content as we ought to be. In one of his large works this year, "Sir Thomas's Tower" (532), the artist is still on his beloved sea-shore, with flat spits of sand and ripples of shallow water, but this time we are looking from the shore coastwards, to a mighty barrier of piled-up crag, with attendant rocks in the foreground: the latter are painted with the artist's usual force and realism; somehow the mass of crag behind does not impress us; it seems neither one thing nor the other, neither strikingly realistic nor strikingly picturesque,—neither Brett nor Turner, but something between the two. The other scene, entitled with a half-playful vagueness, "A certain Trout Stream" (365), has more of the artist's peculiar power: this is a scene in the glare of the hottest summer-day; the foliage is almost startling in its vivid and bright tones; in the foreground are some of those moss and lichen-covered boulders which Mr. Brett paints *con amore*, and equally successful is the look of the brown fore-ground water, with its peculiar

"wobble" just below the small cataract; filling up the distance are hills in a haze of heat, with ultramarine shadows: this last bit of the painting puzzles the judgment, and comes nearer to looking like a cooked effect than anything we have seen lately from this artist. Nevertheless, this is a painting of power and force, and we cannot but recognise the artist's wisdom in shaking himself free from the temptation to repeat one successful effect *ad infinitum*, which is such a besetting sin with many who have once found such an effect.

After these works we may look round the landscapes in order of numbering, noting first that the two pictures by Mr. Oakes are not equal to what might once have been expected of that artist in virtue of the truthful and conscientious character of some earlier works; both these (6 and 36) are more or less mannered and painted for the popular eye; the strong light on the bank in the first is a pretty well-worn receipt of the artist's, and the dark shadow on the left in the latter has no reasonable or sufficient explanation save to throw out with an artificial brilliancy the lights on the sea. This is not, with whatever merits, a style of painting to see on the line. Mr. Linnell, sen., shows his usual merits and his usual effect in "The Hollow Tree" (51); it is a testimony to the real truth and artistic sentiment of the veteran artist's one landscape effect, that one can bear to see it so often without being really tired of it. Mr. Macallum's "Shearing Wraick in the Sound of Harris" (98: *N.B.*—What is "wraick," and where is the Sound of Harris?) savours rather of manner too, but may be true to local colour. The landscapes of Mr. H. W. B. Davis are of those which daily-paper critics are much taken with, and are popular with general spectators, nor do we say they should not be; they are very solidly painted, and "Early Summer" (168) is a fine view over a grandly-timbered park, the cool dark green of the foreground in shadow very pleasant to the eye. "The Rustling Leaves" (550) has similar merits, and very successful realism of tone and surface in the foreground; but our mind's ear does not hear the leaves rustle; in both pictures the foliage seems too hard and metallic for that. In short, these are good pictures in a conventional style. A landscape by Mr. Wells (not a very common event), "Harvest Weather: Afternoon on Holmbury Hill" (281), has what many landscapes here want, a distinct speciality of composition and motive; perhaps it will not bear looking into very much (indeed, it is out of reach in that way), but there is something in it. Then we come to Mr. Vicat Cole, whose large landscape, "The Day's Decline" (308), belongs intellectually to the same class of work as those of Mr. Davis, though more completely, perhaps, answering its aim: as a piece of picture-making this is very successful, and has more refinement of feeling than we sometimes see in works of this class; moreover, the materials are admirably put together to produce a pleasingly-grouped composition. Mr. MacWhinter's "Spindrift" (427: a glossary should really be appended to the catalogue) is a scene on that same solitary, bleak, sea-dyke road where some sheep got "Astray" last year, and along which now a horse and cart make their way; this is a satisfactory picture made out of a simple subject, the unity of effect and feeling in it impress us more than some more ambitious works. Mr. Hemy's "Red Autumn" (440) is in the more subtle beauties of landscape-painting one of the best to be seen here; a brown, shallow stream in the foreground, a dank bank and hedge to the left, and filling up the distance, over the tree-tops, a hill with pervading reddish tints against a coldly gleaming sunlight behind; there is a great deal of feeling in this picture, which grows upon the attentive observer. Above it Mr. Leader, in his "English Hayfield" (441), exhibits a degree of freshness of open-air effect, under a bright though cloudy sky, which is an agreeable change from his usually artificial and mechanical style.

In the next room we meet with two works dealing with specialties of subject. Mr. Poingdestre's "Marble Quarries at Carrara" (460) seems to us just to fail from want of sufficient vividness in colour; the dull greyish tone which pervades it may be true, but does not make a very successful picture. Beneath hangs a small work by Mr. Aumonier, "Water-lilies" (462), which is very original in subject and treatment, and one of the most delicate and charming pieces of colour in the exhibition. The calm stream with the water-lilies forms the foreground, the varied green tones of the broad leaves half in and half out of the water, with the white blossoms, form a delicious combination of tints; two swans in the stream continue to heighten the cool, pure effect; a level field beyond, with a hay-cart loading, and belts of trees in the rear of it, complete this very charming and poetic work. In strongest possible contrast is Mr. Farquharson's thoughtful work, "The Crofter's Team" (471), a horse and an ox harnessed to the same plough, and pulling heavily through the stiff clay which gives the prevailing tone to the scene in the uncertain light of late evening. "A Scotch Hill-side" (483), by Mr. Fisher, is a landscape of no little power, very real in the foreground (a steep bank in high light), very fine in the dark half-purple half-green mass of hill on the other side of the ravine: the author of this ought to do something in landscape. We must not pass over Mr. Edward Fahey's "He never Came," a picture which represents a desolate-looking nook, with a half-green stagnant pool, backed by thick clumps of trees, and a ruinous old house to the right; the figure of a girl waits in the foreground. At first sight this is a very effective picture, with a distinct aim pervading it, but a want of attention to local colour is apparent: the trees are a nondescript green, and the building a nondescript grey, and clever and effective as the work is, it is a "made" effect. Mr. MacWhirter's "Lady of the Woods" (511) is a bright and charming study of a birch-tree in full sunlight. Mr. Peter Graham combines a capitally-executed study of Highland cattle, with a portentous rain-storm effect, in "Moorland Rovers" (885), but he is not doing what was once hoped for from him. Mr. Richmond's large and extraordinary painting, "Near Via Reggio, where Shelley's Body was Found" (945), is either very good or very bad: it is an extraordinary effect, and we cannot say that it is not real; it is at least painted with no little force.

Some remarks on this year's sculpture we defer.

BYLAND ABBEY.

AN effort is being made to remove the rubbish beneath which the ruins of this abbey are covered, and the consent of the owner of the remains having been obtained, an examination of the site has been made by Mr. E. Sharpe, of Lancaster, who has advised as to the best means of carrying out the object in view. The Yorkshire Archæological Association has taken the matter in hand, and an appeal is being made for funds to enable them to do for Byland what has already been done by their owners to the ruins of Fountains Abbey and Jervaulx Abbey.

Byland Abbey—"Bella Landa"—lies in a broad valley about two miles north-east of the village of Coxwold, in Yorkshire, and eight miles east of Thirsk.

"It was," says a report by Mr. Sharpe, "an affiliation of Furness. Its early history was written by Philip, the third abbot, in the year 1197, in the second year of his abbacy; this history is given entire by Dugdale in his notice of Byland Abbey ('Monasticon,' vol. v., p. 349; No. VII.); but although it gives an interesting account of the troubles and wanderings of the twelve Furness monks with their principal, who colonised Byland, and whose names are all handed down in this chronicle, it is only indirectly that we derive from it any knowledge of the year in which the Abbey Church, the magnificence of which is attested by the remains that still exist, was commenced. It appears that the colony left Furness in the year 1134: that they first went to Calder; but driven out there, they fled into Yorkshire, where they were hospitably entertained by the mother of Roger de Mowbray, who became ultimately their chief benefactor; and settled them first at a place called Hood, in the parish of Hokingham, where they remained four years; afterwards at Byland-on-the-Moor; or Old Byland,—four miles north of the former place; and subsequently at a place called Stockyng, where, Abbot Philip tells us, they built a stone church, a cloister, and other edifices. They remained there thirty years, during which time their possessions so greatly increased that they determined to commence on a fresh site, which had previously been given to them by Sir Thomas de Colvil, a church that should surpass in size and in its general character all existing churches of the order, with conventual buildings on a proportionate scale.

That this church was not commenced until some time after the year 1150, when Roger de Mowbray obtained from Roger, Bishop of York, the promise to take the abbey under his protection, on its freedom from the persecution and claims of the abbots of Furness and Stockyng, is obvious from Abbot Philip's detailed account of the pains taken by the monks subsequent to this date to clear off timber and to drain the land where they intended to place their new convent. That it must have been commenced and advanced to the point which enabled them to hold their services in it before A.D. 1177, is also certain from the fact, that, on the 31st of October in that year the monks migrated from Stockyug to the new site, which is very accurately described in Abbot Philip's account as lying between Whiteker and the foot of the mountain of Cambe, close to Burtoft and Berselyva. That it was, moreover, finished, so far as the structure itself was concerned, before 1197, the year in which Abbot Philip wrote, is also evident from the terms in which he refers to it."

The date of the abbey is probably 1170; but it is not possible to fix this with any accuracy. Great interest, however, attaches to the circumstance that it is probably the first of the Cistercian churches in which the pointed arch occurs.

The ruins are at present covered, at least the lower parts, beneath heaps of earth and rubbish. Mr. Sharpe, having obtained the sanction of Major Stapylton, the owner, proposes that these heaps should be systematically examined; the rubbish being carted away to an adjoining available vacant spot, and careful search made for relics of the ancient ornamentation of the abbey. It is more than probable that sufficient portions may be recovered to enable a general idea of the internal decoration of the edifice to be obtained. It is to be hoped that sufficient funds will be forthcoming to enable the scheme to be fairly carried out.

SOME NEW SKATING RINKS.

Chelsea.—On the 29th ult. a real ice skating-rink, called the Glaciarium, was opened at the Old Clock House, Chelsea. The rink has been designed by Mr. John Gamgee, who says that it was in the course of experiments on the production of artificial cold for the preservation of meat that the process occurred to him by means of which he would now engage to put down twelve square miles of ice. Mr. Gamgee simply condenses sulphurous acid under pressure. This on being released produces intense cold, which is transmitted to a tank filled with uncongealable liquid—glycerine and water. The liquid, rendered much cooler than the ice, circulates through pipes laid on the floor of the rink, and covered with two or three inches of water. The intense cold of the liquid passing through the pipes keeps the water constantly frozen, and the result is a perfect sheet of ice, on which Mr. Gamgee would guarantee good skating even under a Bombay sun.

Bradford.—The "Bradford Roller Skating Company" are erecting a new rink in Valley-parade,—a new road immediately opposite the Volunteer Barracks, in Manningham-lane. The skating surface will be 200 ft. in length and upwards of 80 ft. in width, and will be formed of the "Limmer" asphalte. Only a portion of this surface,—140 ft. by 50 ft.,—will be covered, access to the uncovered portion being given by folding doors at the end of the building. The contract for the building is in the hands of Messrs. Taylor & Parsons. The excavators' and masons' work has been let to Mr. Albert Chandler. The whole of the works are being carried out from designs prepared by Mr. T. Sington, architect, Manchester. The entire cost of the land and building will be about 7,000*l.*

Bridlington Quay.—The promenade skating-rink, erected for Mr. J. M. Wilson at a cost of upwards of 2,000*l.*, has been opened to the public. The building is of brick, with cement front and slated dome roof, and top lights. There are raised seats around the building, a gallery at one end, and an orchestra at the other, so that it will be easily converted into a concert or ball room. The building was designed by Mr. Earnshaw, architect, and the work has been carried out by Mr. W. Moody, builder.

Wimbledon.—The Hill-side Skating-rink, recently opened, occupies a site between the Wimbledon College and the Swan Hotel. It is laid with concrete by Messrs. Greene & King, of New Bond-street, and is 150 ft. long by 55 ft. broad. The rink is open, but it is proposed to erect a smaller rink, covered in for use in the winter or in wet weather, should the present one prove a success.

THE PLANES OF LIFE AND OF MOVEMENT IN LONDON.

THE investigation into which we have recently entered as to the diminished activity of the work of the builder in London leads naturally to the consideration of the various efforts that have been made, or that are now proposed, for the increase of the lodging capacity of the metropolis, by multiplying the number of horizontal planes on which human beings either dwell or move from place to place. In point of fact, and apart from any theoretic views, a very great change in this respect is in course of operation. We may, indeed, carry back the commencement of this change to the unknown period when the simple hut of the dweller by the banks of the Thames was replaced by a slightly less rude building, furnished with a loft, used for the purpose of rest or of store. And as to the different planes of movement, we may date their origin from the time when a rude wooden bridge was first stretched athwart the watery highway which formed the primary High-street of London. In later times we may trace a fresh impulse in this respect, leaving its traces not only in the erection of successive bridges, each more convenient or more stately than its predecessor, but, still more notably, in the descent to that yet lower route which the genius and perseverance of Sir Mark Brunel bored under the bed of the river. No lion of London used so much to excite the wonder and admiration of foreign visitors as did that costly engineering work on its first completion. Following on the opening of the Thames Tunnel, the extension of the London and Birmingham Railway next made necessary the scientific solution of important questions of relative planes of movement. As the crossing of streets and highways on the level by the locomotive was from the first regarded as inadmissible, the prolongation of the London and Birmingham line from the terminus provided by the first Act of Parliament passed for its authorisation to Euston-square demanded great and mature consideration. The Regent's Canal had to be crossed, leaving a height below the railway bridge sufficient to allow of the uninterrupted passage of the barges. This involved the construction of an iron bridge, designed by Sir Charles, then Mr. Charles, Fox, under the direction of Mr. Robert Stephenson, the elegance and mechanical beauty of which marked a new era in our iron structures. Within a distance so short as to necessitate the use of an incline dropping at the rate of 1 ft. in a chain, the great metropolitan thoroughfares of Park-street and the Hampstead-road had to be passed under. For these viaducts a new design was also adopted, consisting of square pillars, supporting cast-iron girders across the railway, with brick arches in cement turned from girder to girder. The level to which the railway was thus depressed, notwithstanding the raising, by a few inches, of the Hampstead-road, ran so closely to that of the sewers of the district, that a special survey of their structures was required, and some reconstruction of sewers had to be carried out before the line was finally brought nearly to the level of the roadway north of Euston-square. Almost all the difficulties which have been experienced by later engineers in the construction of the great works which now pierce and cross London had to be considered, at least in principle, by the engineers of this pioneer railway; not forgetting the tunnel through the London clay that forms the once rural knoll of Primrose-hill. No fluviatile bridge has encountered the difficulties that failed to appal the engineers of the Thames Tunnel. No plan has exceeded in simple fitness for conveying a great traffic in an entirely novel manner that of what was called, in 1834, the Euston Extension of the London and Birmingham Railway.

The Greenwich Line, with its long row of brick arches, which presented the first sketch of the viaduct proper through London, may be referred to the year 1835; Colonel Landmann, in that year, being the engineer of the line. Thus it is now fully forty years since the first essays at those great engineering works which have done so much to render London accessible to the country and to the suburban residents were made. Very much has been added to the costly nature of the work since that time. The great improvements in the manufacture of iron have enabled later engineers to substitute hideous beams, of low cost, and great merit of contrivance as to strength, although strikingly deficient in any architectural merit, for such graceful structures as Fox's Regent's Canal Bridge. The Metropolitan Railway has followed Mr. Stephenson's plan of making open cut galleries or trenches, lining them with brickwork, and then filling in the earth around the arch; thus combining a section very like that of the London and Birmingham tunnels, with a mode of execution such as that which was adopted for the Park-street and Hampstead-road galleries. But in all these matters there has only been a development, however costly, and however well designed, of the principles that were introduced, and successfully applied, on the one hand by Sir Mark Brunel, and on the other hand by Mr. Robert Stephenson and his assistants, in the first third of the present century.

It was on another feature of the railway system that Isambard Brunel, the son of Sir Mark, impressed the stamp of his taste as well as of his genius. Hitherto we have regarded only the work of the engineer. Architecture, strictly speaking, was not represented on our early railways. When an architect was consulted, as in the case of the Euston station, it was for some isolated feature of the works, which thus often presented an incongruous contrast with the purely engineering structures beside which they were placed. Thus the original Euston station presented only the development by Mr. Stephenson of two ideas: those of shed-roof and of platform. Iron was adopted for the roof, but rather as a cheap and fire-proof material than as an architectural material properly so called. The Euston roofs were very cheap. Iron and slate were put together in the simplest form, with the sole addition of glass skylights, so as to cover an adequate space at the least possible cost per square. And by way of architectural adornment, the large portal reared by Mr. Hardwick stood for a long time as much out of its proper element as a fish out of water. It had no relationship to the engineering arrangements of the station. It had no connexion with roof or platform, or even with carriage approach. It was a huge symbol, of which the due significance has only lately become manifest. For many years it might have been pointed at as a signal and costly proof that architecture was an art unrequired by the busy commerce of the day, and only involving a waste of money from the economic point of view. It is only within the past few years that the good taste of Mr. Hardwick has been justified, and that we have obtained a clear proof that a noble architectural feature, however incongruous it may at first appear, has only to be allowed fair play in order to produce the effect intended by its designer. Penned in by the station buildings, the great portal of Euston station long looked like a gigantic mistake; but with the vista recently opened, the great gateway obtained the association that was needful to bring out the meaning of the design. No less than the statue of the able and honourable man that stands before it, it may now claim to be considered among the chief monuments and ornaments of London.

Isambard Brunel, however, was the first to show us that architecture and engineering were twin sisters, and that they were more admirable in harmony than apart. His own cultivated taste, and his knowledge of Continental art, especially of Italian styles, enabled him to give to his stations the new feature of the verandah roof. To this he added at Swindon a style of decoration then very rare in England, and produced an arrangement somewhat superior in its convenience, and incomparably superior in its effect, to the iron shed-roofs of his friend and rival, Stephenson. For many years the Great Western Station at Paddington was merely a mass of temporary wooden sheds,—much like one of those that still hold a place at Reading. The reason of this delay was the fact that Paddington was only regarded, at first, as a temporary station. The Great Western and the North-Western lines approach very near to one another at Wormwood Scrubs. It was at one time intended to effect a junction at this point; and in obtaining powers for the Euston-square Extension, before referred to, the London and North-Western Railway provided for the purchase of enough land to bring the Great Western traffic alongside of their own to the Euston terminus. It is probably to the advantage of the public that this arrangement fell through. The gauge question, so far as memory serves us, was the great bone of contention. At all events by the time that the working drawings of the Euston Extension were prepared, in the winter of 1835–6, Mr. Stephenson only provided for the accommodation of four lines of 4 ft. 8½ in. gauge way from Camden-town to the Euston terminus.

More than one project for the prolongation of the Great Western line from Paddington towards the heart of London having been arrested by the magnitude of the expense which they involved, Mr. Brunel at last commenced the erection, on what had been acquired as a temporary terminus, of an iron station roof, which was the first attempt at the combination of architectural effect with engineering utility. The Great Western station still remains, in the opinion of many competent judges, the noblest structure of the kind that we possess. In comfort for the passengers, which ought to be one of the first objects of the engineer, as well as of the architect, it is unexcelled, if not altogether unequalled. In this respect it presents as striking a contrast to the discomfort provided for those who have the misfortune of wishing to take tickets at Charing-cross or at Cannon-street, as do the shapeless and enormous bulks of those two stations, seen from without, to the more architectural outline of the Paddington Station. It is a marvellous instance of how much the English public will tolerate, that is afforded by the ticket arrangements at Charing-cross and at Cannon-street. That the ticket issuer should be snugly ensconced in an inner chamber, provided only with the minute peep-hole that we have borrowed from the French railway stations, and which they, in their turn, borrowed from the French bankers, is perhaps not matter for complaint. But that outside this pigeon-hole, in the spot where intending passengers are forced to *faire la queue*, and wait their turn for attention, should be an open passage, swept by a fierce and murderous blast, is a disgrace to our civilisation. When the wind is northerly, we cannot hesitate to say that for a delicate person,—for any one liable to bronchitis, to pulmonary affection, to catarrh, — above all, for any young mother with an infant in her arms, to be compelled to take a ticket at either of these stations, is an almost certain cause of sickness, and a very possible cause of death. Out of the medical staff of the metropolis we have no doubt that, if the numbers could be summed up, an appreciable number of practitioners may be regarded as supported by this artificial and unnecessary cause of disease. Its protracted continuance is the more unpardonable, because a simple screen would protect the passenger, without annoying any one. We only wish that every director, engineer, and manager connected with all the lines using either of these terminal stations was obliged daily, and in his proper person, to take a ticket at the ticket-holes in question. In that case the evil would be remedied within a week. We invite the serious attention of all concerned to the importance of taking a simple and inexpensive sanitary precaution, which, there is little doubt, would save not a few lives in the course of a year.

In the immediate neighbourhood of these enormous and unsightly roofs we can see the various planes of movement now provided for the Londoner in full activity. Highest in level is the viaduct system of the South-Eastern and its allied railways, giving its hand to the South-Western lines at Waterloo, running on lofty arches, and crossing the Thames by noble bridges. The ordinary street traffic, approaching the level of the rails in the stations themselves, glides down the descent towards the river, passes under the arches of the railway viaduct, and skirts the Thames on the surface of the Embankment. Below this runs the line of the Metropolitan District Railway; while the broad surface of the Thames itself supplies a fourth parallel line of transit, varying as to its level according to the rise or fall of the tide. For gas, water, and sewerage yet a fifth line of level has in some instances to be taken. Sir John Rennie, when he threw a land arch over Thames-street, may be said first to have inaugurated this harmonious co-ordination of different planes of level for the traffic of the metropolis. It was a bold and happy idea, when first started; and it is one without the development of which London would at this moment be simply impassable.

With all this costly and admirable provision for the facilitation of the daily intercourse of London, the tendency to agglomerate, to mass, and to crowd together, becomes yearly more powerful. The more accessible the heart of business, or of fashion, or of any of the other elements of which London is the centre, is made, the more precious does every foot of ground become. The reclamation of the 37 acres saved from the river-bank and mud by the 6,640 ft. of Northern Embankment of the Thames, which

cost 395*l.* per yard run, amounted to 23,400*l.* per acre. But in July, 1872, the site of St. Mildred's Church, in the Poultry, was sold for the sum of 46,105*l.*, being upwards of 20*l.* per foot superficial. No wonder, then, that wherever we see new buildings going on in London, we find floor rising above floor. We have not yet arrived at the stage of rearing that multitude of towers which characterised the Mediæval cities of Italy, but we are certainly tending that way. One of the most striking instances of the mode in which the increasing value of area is driving the architect to develop the castellated, or at all events the towering, form of building, may be seen by a glance over the still open area of the Green Park. Spires and towers of churches no longer rise in solitary beauty towards heaven. Their most aspiring companion, from this point of view, is the great hotel at the Victoria Station, which shows a lofty castellated outline almost recalling to the memory that of the old palace of the Popes at Avignon.

This gradual rise, story after story, of public buildings, emulated as it is, in some instances, by the builders of private houses, is intimately connected with the question, which has attracted of late much attention (both in our own columns and elsewhere) of the construction of private houses of more massive and solid structure than our actual wont, and in which the division of ownership, or at least of occupancy, shall be in horizontal rather than in vertical planes. We have no hesitation in confessing that our feelings, and to some extent our judgment, have long militated against this suggested change. Neither are we of opinion that certain well-known efforts to introduce into London the system of flats have altogether tended to remove our objections. But it is impossible to close the eyes to a march of events such as we have attempted to sketch. For a long time the sturdy sense of independence which found expression in the well-known phrase "Every Englishman's house is his castle," has kept the great bulk of our London population in three or four story houses, while our neighbours in Paris, with a population of 1,851,800, against the 3,254,260 of London, have long ago ascended *au huitième*. As far, however, as either independence or actual defensibility of a private residence goes, there is no doubt that a lofty and solid structure, arranged in separate floors, is fully equal to a nest of small low houses. The points which seem to claim the most serious attention, as tending to determine, not our opinions, but the course of building operations in the future, are mainly three,—these are, the sanitary question, the question of quiet and freedom from disturbance, and the question of accessibility.

It will not be possible in the few lines for which we have space, to exhaust these three separate branches of inquiry. Still we may be permitted to glance at them. As to the sanitary question, no doubt anything that tends to bring more residents on to an acre of ground tends, other things being equal, to raise the death-rate. At the same time the facts which we have recently cited (p. 424, *ante*) amply prove that it is rather the crowding of many persons into rooms, or into cubical space, than their actual numbers per acre of ground, that is the real source of danger. No doubt it is desirable to have, for sanitary purposes, as few persons resident on an acre as may well be. No doubt the old rule of Queen Elizabeth's time, that every new cottage should be surrounded by four acres of ground was charming, from one point of view. But the millennium has not yet begun. Our best advice will not deter people from crowding. If the houses are low, small, and paltry, they will still, in certain situations, be densely packed. By giving better accommodation we may, it is true, make room for a few more residents per acre. But we shall at the same time give more cubical space to every resident; and thus the good that will be effected by a more palatial style of building (for which only the system of flats will allow us to pay) will far overbalance the attendant evil, serious though the latter must be admitted to be.

As to quiet, it is essentially a question for the architect. Those persons who, being themselves of a nervous temperament, happen to live between two neighbours of strong musical tastes, and whose ears are tortured at all hours of day and night by remorseless pianos, which, through the readily-conducting partition walls, sound always out of tune, out of time, out of reason, and become simply intolerable nuisances and torments, would gladly compound, in many instances, for the patter of children's feet overhead, even if that patter seems to them to be pounding. By adequate care, we think that noise may be, and probably will be better, arrested by horizontal partitions than by vertical; at all events, by that kind of horizontal partition which is proper for the style of building under discussion, than by that kind of vertical partition which actually prevails, as a rule, in London. As to quiet, therefore—provided always that competent architects be consulted—we think the balance will not turn against the separate floors.

As to accessibility, we must take advice from actual experience. There is no doubt that the use of the hydraulic lift is as yet in its infancy. There can be no doubt of its applicability as an immense saving of human labour. It is true that science informs us that in no way can a man perform so much labour as by walking upstairs. If his weight be used as a counterpoise, he can raise, we think, four times as much weight to a given height in this as in any other manner. But a certain concentration of duty is necessary in order to take advantage of any mechanical power. In a great house, and great household, one or more lifts may be advantageously employed. In a small household the economy of labour will not be so apparent; and yet it may be much needed. If, then, this economy be effected, not by repeated liftings of each individual of a family from floor to floor throughout sixteen or eighteen hours of the twenty-four, but by once or twice lifting each member of the household to the plane on which he passes the greater portion of the day, free from any up and down stairs work at all, it is evident that the saving of personal fatigue will be very great. At a time when it is becoming daily more and more difficult to secure that personal service on which we have become perhaps too dependent, this consideration has very great weight. In some of the large blocks of buildings in the United States, as many as three lifts are sometimes to be found. We cannot but think that for flats of a moderate size, a central lift, with rising and falling motions to counterbalance one another, communicating by speaking-tubes between the porter and every floor, and, if preferred, with a staircase running round the lift turret for use in case of need or of preference, would soon become, not only an admissible, but a favourite mode of ingress and egress to our dwellings. As far, then, as we have had space to enter into detail, we think that neither sanitary considerations, love of quiet, nor fatigue in ascending to considerable height, are likely to deter occupants from availing themselves of accommodation of the nature contemplated.

ON STYLE AND PROPORTION IN GOTHIC ARCHITECTURE*

I WISH to call your attention to the general want of pure style, and its concomitant quality, correct proportion, in Gothic architecture as at present practised, defects which seem to me to arise either from a mistake about true principles, or from a want of leisure to carry them out. No doubt there are some among you who feel inclined to exclaim, "Were not the true principles of Gothic architecture discovered years ago, and enunciated by Pugin and others? Have they not been acted upon ever since? Have we not developed the capabilities of the style, and made immense progress in it? Has it not, in fact, become the fashionable style of the day, and been adopted most successfully in our public buildings?" To this I would reply by endeavouring to show that for the most part there is a misconception about true principles, and that if there has been a movement at all in the art it has been retrograde instead of progressive. It is true that we possess innumerable buildings in various styles of so-called Gothic. We have, for instance, *International Gothic*, a jumble of English, French, and Italian details, for our places of worship. We have *Victorian* Gothic, the chief characteristics of which are granite columns, cabbage-leaf capitals, arches and mouldings of all imaginable forms, for our clubhouses, theatres, and music-halls; we have *Builders' Gothic*, with its thin clustered columns, dog-tooth and other ornaments, for our shop-fronts and warehouses; we have *Engineers' Gothic*, with its cast-iron columns and wrought-iron groining, for our railway stations and bridges, and so on *ad infinitum*,—that is to say, we have been driven by the fickle breeze of fashion into the turgid sea of eclecticism, because we have abandoned the sheet-anchor of true principles.

Let us briefly consider what the guiding principles of modern Gothic should be. It has been asserted with truth that the principle upon which the Mediæval architects worked was, *to employ the best construction which the materials at their disposal allowed, and to decorate the constructive forms in the most appropriate manner.* This, in the abstract, is the principle of all good architecture, at all periods of the history of the art; for what is architecture but the art, or rather the science, of building in the best manner with the best materials? Thus there is, or should be, a sort of architecture most suitable for iron, another for wood, another for concrete, another for brick and marble; but these are independent of what we term the styles,—that is to say, of Greek, Roman, Italian, and Gothic, which are imitations of the buildings of different nations and ages. As soon as we begin to employ these a new principle, the imitative, steps in. When they are used, architecture becomes an imitative or fine art. Now no one will contend that Gothic pure is the best suited for all the multifarious requirements of the present day. In the large public edifices of this gloomy city we require as much light and air as possible; and roofs of immense span which cannot be obtained if we use only the lancet windows, groined roofs, small openings, mullions and transoms of any pure Gothic style. If a Mediæval architect were living now, and had to design a railway station, acting on the principle I have just mentioned, he would put aside his former notions and adopt cast-iron construction and elliptical roofs in place of lancet windows and stone vaulting. Thus Gothic architecture is purely an imitative art, suitable only for churches, dwelling-houses, and smaller edifices. If employed in large public buildings it has to be tortured and twisted into all sorts of conceivable forms to adapt it to modern requirements, unless we are content to forego the utilitarian spirit of the day, and to sacrifice some of our comforts and luxuries for the sake of making our edifices fine works of art, and this sacrifice is often made and worth making. In all imitative art it is the object of the artist to render exactly the character of the subject he imitates; for instance, when a painter copies a flower, he studies the twirl of the stem and the droop of the leaves, in such a manner that he can at will reproduce a group of similar flowers, all possessing the characteristics of the original model. He does not attempt to improve upon nature by imparting the rigidity of the thistle to the leaf of the rose or lily of the valley, or by joining oak leaves to the flower of the crocus. So the architect, when about to design a church in the style of a certain period, should study the characteristics of the buildings of that period until he becomes thoroughly imbued with the spirit of that style, and able to reproduce without actual copyism. He should not, any more than the painter, endeavour to improve upon his models by engrafting the full-blown Perpendicular on to the budding Early English for the sake of a little variety. I have tried to prove that the principle of the Mediæval architects is not that of our Gothic; that theirs was scientific, ours should be artistic. If we persist in using Gothic forms of all dates and styles, and picturesque bits of our own invention in the same building, together with Italian proportions, let us be fair and call our architecture by the right name,—the Pseudo-False Gothic, or, what it might be more properly called, the Eclectic style. This may seem to some of you a rather narrow view to take of the noble art of architecture, to fetter it by confining it to some of the numerous styles or schools. But it is quite the reverse: it is simply bringing common sense to bear upon the subject, liberating us from the tyranny of schools. Common sense teaches us to build in the manner best suited for the object in view. For instance, pure Greek architecture is only fitted for a limited sort of building, where skylight and but few external openings are required, such as museums, picture galleries, porticoes, and such like, which can be designed without any sacrifice of the character of pure Greek architecture; Roman and its adaptation in Italian and Renaissance, as practised, for instance, in Venice, is adapted for palaces, clubs, warehouses, &c.; Gothic for churches, colleges, country and town houses, and so forth. So that, if guided by common sense, we should select that style which will be most appropriate to the end in view. But there have arisen of late years structures to which none of these are applicable,—Railway stations, Crystal Palaces, shop-fronts, aquaria, and rinks. Do not let us caricature any of the known styles by adapting them to these pur-

* By Mr. R. Popplewell Pullan. Read at a meeting of the Architectural Association on Friday, the 5th inst.

poses. What would you think of the taste of the man who designed a rink in the ecclesiastical style? Surely there is sufficient invention left us to enable us to put together our materials in an ornamental manner; to invent a style which shall not be a monstrous combination of all the known modes of ornamentation, of which the principles are utterly opposed to one another. Though sufficiently eclectic in taste to admire any building that has the true character of any known style, except the hybrid Elizabethan, or that negation of style known by the name of "another good queen," as a work of art evidencing skill and talent in the designer, I am bitterly opposed to that eclecticism which prevails in many of our large public buildings, and which is the architectural vice of the age, and take every opportunity of protesting against it, especially when it usurps the rank and title of Gothic; for Gothic is our sole national and sole ecclesiastical architecture, and is our only national style, because no other style worth the name has ever been developed in England; it is our only ecclesiastical style, since it is acknowledged on all sides, even by those who have no affection for the word "ecclesia," that it is the most appropriate for places of worship; it is, in fact, associated in our minds with the idea of worship, because it is the style of the noble cathedrals, abbeys, and parish churches which adorn our native land. Let us, therefore, endeavour to keep it from degradation.

It may be asked, To what purpose is all this protestation? Are not our churches and other Gothic buildings sufficiently pure to satisfy critics, and have we not to deal with a public uninformed in art matters, which does not require the extreme severity which you advocate? Is it true that critics are easily satisfied now-a-days, but outside the profession there is scarcely any one qualified to be a critic. It is, however, no less true that there are but few churches in London that are perfectly pure in style, and that would stand the test of a proper criticism, in which all the details are in keeping with the spirit of the style. This you can prove yourselves if you will take Rickman, the Glossary, or some other handbook with you on the occasion of the periodical visits of the Association to the public buildings of the metropolis. Criticise contemporary works and take notes: you will find the custom immensely useful in future practice. The result will be that you will find in many churches anachronisms such as these,—lancet windows, plate tracery, and flowing tracery side by side; four-centred arches and geometrical tracery in others; detached colonnettes and columns in Third Pointed buildings, and mouldings of all periods intermingled; and should you find the details correct you will frequently find the proportions deficient, for it must be remembered that each style had a characteristic proportion, and that it is as erroneous to build an Early English on the proportions of a Perpendicular church as it is to place a lancet and a Late Perpendicular window in juxtaposition. But more about proportions presently. It is true that you have to deal with a public utterly uninformed on the subject of Gothic architecture, or we should not see our cathedrals, colleges, and parish churches ruined by incorrect restorations. But the public will soon become more enlightened on such matters. Before long it is to be hoped the rudiments of architectural criticism will be taught in our schools and colleges, then woe be to the man who palms off an eclectic for a true Gothic building. Let us not descend to the low level of public taste, but endeavour to improve it. Let us put perfection before us, so that we may at least attain to some excellence. It is for you, the architects of the future, to remedy this state of things. The older members of the profession have, for the most part, got into grooves from which it is difficult to oust them. But you have great opportunities. Your happy idea of studying the churches of France, under the guidance of a distinguished archæologist, has enabled you to trace the progress of the Norman style from its birth in the crypt of Bayeux to its culmination in the spires of St. Étienne at Caen; to mark the influence of the East in the domes of Angoulême and its neighbouring churches. Elsewhere you have seen the full development of the best period of art, as at Amiens, Laon, and Rheims; and you may perhaps be able to study the influence of classical models at Toulouse, Arles, and Autun. Thus you have studied style in the best school, therefore it will be the less excusable if you join the eclectics and mix all the styles together. Early French Gothic is suited for our churches on account of the simple beauty of its mouldings; and it has been used with success by some of our best church architects. Employ that if you will, or even Italian Gothic (though that is inferior), but do not mix English, French, and Italian together, and call the composition good Gothic architecture. Now I ask all those amongst you who have been struck by the fitness and beauty of these grand French churches, and who are, in some degree, possessed with a love and admiration for Gothic art, to join me in protesting against eclecticism, and to combine to form a Purist school of Gothic architecture. I have heard a Purist school spoken of, but if it exists, where are its works? where its professors? where its writings? and where its scholars? In a pamphlet published a few years ago I remarked that if "Webb, Glynne, Willis, Whewell, Williams, Parker, Bloxam, and others were to have combined for the advancement of correct architecture, the Purist school (which they would have formed) would have triumphed, and our churches, instead of being mixtures of all things rich and rare, would have been harmonious compositions, recalling the best productions of the Middle Ages." But it is too late for this combination now. Some of these eminent men have passed off the stage of life. There was also a chance of forming such a school when the Ecclesiological Society existed, as it constantly held the whip over offending architects, and tried hard to keep them in the right path, but it died before its work was completed, and we have lapsed into the errors it exposed. But you, for the most part, have life before you; you have opportunities for educating your taste which others have not had; you have seen buildings and books which your predecessors have not seen. I know it is much more difficult to design in correct style than in the haphazard manner, as it requires some years of study and observation to be thoroughly imbued with Gothic feeling, and, moreover, a passion for that kind of art. If any one here has such a passion, let him nourish it, although it is opposed to the restless utilitarian spirit of the day. This reminds me of what I said at the beginning of the lecture,—that sometimes those who understood true principles had not leisure to carry them out.

We live too fast for the patient perfecting of fine art architecture. We, for the most part, manufacture our churches. Those about to build a place of worship generally go to the firm most in vogue. Acting in the true commercial spirit of the age, they naturally wish to get as much prayer and praise out of the smallest possible space, at the smallest possible cost; they inspect the stock patterns, select their style for their price, possibly bargain that a little more ornament may be thrown into the bargain, and in due course of time are presented with "a neat thing in churches" at a reasonable price per sitting, and the job is done. Or should they by any chance go to an architect who possesses a certain amount of talent and originality, and who ventures to exercise his judgment in the choir subjects for decoration,—statues, for instance,—they pounce down upon him, and declare they will have nothing more nor less than is in the bond. The Mediæval builders did not act in this commercial spirit; they erected churches which in some way corresponded with the wealth of their community or the size of their town. They did not stint the congregation as to space; they did not feel much concern if there was praying-room for a few hundred more than the inhabitants. They burnt with a noble ambition to erect temples worthy of their destination, trusting that if they could not finish them their successors would do so. It is no disgrace to their memory if they were often too sanguine in this respect, and if they commenced cathedrals which their successors could not finish. To us it is a matter of congratulation; for it is to this ambition that we are indebted for those colossal fragments of Mediæval architecture which tower above the mean buildings of modern times in many Continental cities; such are the choir of Beauvais, the solitary spire of Strasbourg, the giant tower of Mechlin,—grand monuments of the spirit of the age which produced them. I cannot advise, however, an exact imitation of this spirit. It would not answer if you were to overshoot the mark and leave your churches unfinished in order that others might have the satisfaction of completing them; you would inevitably be considered mad, and would lose your practice; but what I would advise is a careful study of the spirit of the style they practised, and an imitation of it down to the smallest details, and especially of the proportions which characterise the building of each successive period.

This brings me to the second part of the lecture—Geometrical Proportion. Many architects belonging to the so-called Gothic school scout the idea of proportion altogether. They say that it is useless to design a building on paper according to strict geometrical rules, as the foreshortening in perspective and the difference of planes will destroy the proportion in execution. But, on the contrary, we know that Greek and Roman buildings are equally satisfactory to the eye in drawing and in execution. We may depend upon it there is no good architecture without good proportion, for without proper proportion architecture is merely indifferent building. I am convinced that all the best buildings of the best Gothic period, such as Sainte Chapelle, Amiens, and the Cathedral of Lausanne, were designed on certain principles of proportion, and have ascertained that this was the case as to the latter building by measurement. This fact has attracted the attention of many eminent architects and writers on architecture. The first to call attention to it was Cesar Cesariano, the translator of Vitruvius, who proves clearly that Milan Cathedral was designed on the lines of a combination of squares and triangles.

This idea was developed by Kerrick in a paper in the 19th volume of "Archæologia," who applied the form of the *vesica piscis* to many ancient examples with great success,—to the plans of Bath Abbey Church; Croyland, Lincoln, Hereford, and other cathedrals and churches. Hawkins, in his book on Gothic Architecture—published in 1813—recapitulated the evidence in favour of the system of proportion. Professor Cockerell, in a paper read at the Winchester meeting of the Archæological Institute, showed that the *vesica* gave William of Wykeham the guiding lines for the plans of his chapels at Winchester; All Souls', New College, and Magdalen, Oxford; but he found that the equilateral triangle did not apply to the sections of all these chapels. In the 7th volume of the same Institute there is a valuable paper by Mr. Penrose on the proportions of Lincoln Cathedral, which he proves to have been originally designed on the system of squares called *parequadrato*. But Viollet-le-Duc in his Essay shows conclusively that triangles of various forms characterise generally the buildings of successive periods. In the round-arched styles, the rectangle was used; in Early Pointed, what he terms the Egyptian one, in which a perpendicular line drawn from the apex equals 2½ parts to 4 parts of the base; in later periods the equilateral triangle together with the Egyptian. He applies his system to many of the churches he had opportunities of measuring when engaged in the work of restoration. In the church of St. Sernin, at Toulouse, a noble Romanesque edifice, with double aisles, the interior of which strikes every one who enters it, on account of its fine proportions, he found that on dividing the ground-line into forty parts, five of them gave the half width of the nave, two the thickness of the pier, four the width of the inner aisle, two the thickness of the second pier, four the width of the outer aisle, two the thickness of the wall, and one the projection of the buttress. An Egyptian triangle springing from the outer base-line gives the springing of the vault of the nave, and the abacus of the arches of the aisle. An equilateral triangle, rising from the centre of the piers of the arch, meets this in the centre of the arch and gives the length of the nave arches. In the Sainte Chapelle he shows that two equilaterals give the slope of the arch over the windows; another based on the window-sill gives the springing of the groins; and that others govern the entire composition internally and externally. He applies the same principle to Amiens, Notre Dame de Paris, and Bourges Cathedral, which latter he asserts was designed upon the lines of rectangles, and that this proportion was here adduced from Romanesque traditions, which prevailed for a longer period in that part than elsewhere in France. Whether he be correct in all the details of his system, does not affect the fact which he has established, viz., that all the best buildings were designed upon certain principles of geometrical proportion. Even if this fact itself were doubtful, there is no reason why we should not design on geometrical lines; for not only should we produce results more pleasing to the eye, but we should find the whole process of designing made easy, if by drawing a series of equilateral or other triangles we obtained fixed points for the positions of doors,

windows, vaulting, and so on. In this manner even those who have no eye for proportion could produce excellent designs if they were masters of detail. In order to show you how this system may be applied, I must have recourse to a design in which it is thoroughly carried out. More than twenty years ago,—ten years before Viollet-le-Duc's Essay was published,—I had occasion to make a design for a cathedral in the French style of the first half of the thirteenth century, the period in which the Sainte Chapelle was designed (the building of it was commenced in 1250). My first object was to ascertain what were the leading proportions in buildings of that period. All the systems which I have described have reference to what may be called the *occult* proportions,—that is, to the angles upon which the construction was based. I call them occult proportions because, supposing a building were designed upon equilateral triangles, the bases of which did not come within the scope of the vision of the spectator, the beauty of form afforded by the triangle would not be perceptible. My wish was to ascertain the *visible* proportion, such as the height of the nave or the aisles in relation to their breadth. On comparing the sections of contemporary buildings, such as Sainte Chapelle, Westminster Abbey, and Amiens, &c., I noticed the prevalence of a certain triangle, which seemed to afford governing lines for the whole; it is shown on the sections which I have prepared. In that of the Sainte Chapelle, one triangle of this description embraces the two lower sides of the wall springing from the centre, and the apex of the main rib. In Amiens, two similar triangles give the height and width of the nave. In the section of Westminster Abbey, which I have had enlarged for the purpose, you see the application of similar triangles. In this case the base is on the ground, not above the lines of bases, as in Viollet-le-Duc's theory. Having thus discovered what I call the *generating* triangle, I applied it in the manner shown in the drawings. To refer to the plan. The width of the nave being given, two triangles, based on the centre line of the wall, give the extent of the transepts, and a third, the centre of the *chevet* of the Lady Chapel; another on the aisle wall gives the projection of the baptistery; two others the length of the nave between the baptistery and transepts; their points of intersection the centres of the columns. The column being made of suitable size, similar triangles give the position of the vaulting shafts. The projections of the buttresses and minor details are obtained in a similar manner. In the transverse and longitudinal section the same sort of triangulation governs the whole. The east elevation affords a complete illustration of my system. I applied the same system to every detail, and to all the furniture of the edifice.

What I have endeavoured to show is that, by the adoption of the system of triangulation throughout the whole building, a beauty and unity of proportion can be attained which can be produced in no other way. Whether the result is satisfactory to the eye in this particular instance I must leave you to decide. As it is difficult to illustrate such a subject by ordinary lecture drawings, I have had a series of transparencies made to exhibit the general proportions of each part of the building, and though this will not give the details very clearly, they will, I think, show well the outlines and forms of the processes. The system can be applied to small as well as to large buildings, and as I approved of it in the case of this cathedral, even to the simplest piece of furniture, I am convinced that, if you try it, you will find that you will make far more satisfactory progress than those who design in a hap-hazard undecided manner, by what Viollet-le-Duc terms a series of *tâtonnements*, however picturesque some parts of their designs may be. In conclusion, I can only express a hope that some amongst you at least have been converted to the belief that pure style and correct proportion are essential to perfect Gothic architecture.

Brighton Improvements.—The General Purposes Committee of the Corporation of Brighton have appointed a committee, consisting of the Mayor (chairman), Aldermen Cox, Ireland, and Reeves, and Councillor Payne, to consider the offer made for the Medina-road, on which to construct the Palace of the Cliff, the designs for which were made by Mr. Archibald D. Dawnay. The cost is estimated at 100,000*l*.

THE RESTORATIONS AT THE CHURCH OF ST. ANDREW UNDERSHAFT.

DURING the last twelve months very extensive alterations have been in progress at the Church of St. Andrew Undershaft, Leadenhall-street, one of the oldest of the City churches, and the works having at length been completed, the church has been re-opened. The works just completed have involved an entire re-arrangement and re-modelling of the interior of the edifice. Several structural alterations have been made, the most extensive and costly of which is the formation of a new and much-enlarged chancel and sanctuary. This has been effected by bringing the chancel area forward into what was formerly the body of the church to the extent of about 22 ft. beyond the old communion-rails, and it now occupies the space bounded by two of the nave arcades, being separated from the nave by a newly-erected stone screen. The floor of the chancel and sanctuary is 4 ft. above that of the nave, the chancel being approached by two steps, and the sanctuary by a further flight of three steps. The chancel floor is paved with encaustic tiles, relieved at intervening spaces by diamond-shaped white polished marble, whilst the floor of the sanctuary is laid with mosaics. The chancel is enclosed on each side by a stone screen between the arcades, uniform with that in front which divides it from the nave. It is fitted with clergy and choir stalls in carved oak. The organ has been erected on the south side of the chancel, having been removed from the gallery at the west end, which has altogether been cleared away. This gallery, together with the organ, blocked up the west window, and their removal has admitted of the mullions and general stonework of this window being restored, and the stained-glass window, formerly over the chancel at the east end, containing full-length representations of Edward VI., Queen Elizabeth, and other monarchs, has been placed there. In lieu of the old stained-glass window just named, a new one has been placed at the east end, presented by the Rev. Mr. Blomfield, the rector, the cost of which is stated to be nearly 1,000*l*. The upper portion of the window represents the Ascension, and the lower portion the Crucifixion; and on the wall under the window, on each side and immediately over the altar-table, a reredos has been formed by the introduction of paintings containing full-length figures of the Prophets, Evangelists, and other Scriptural characters. The stained-glass window and paintings have been furnished by Messrs. Heaton, Butler, & Bayne. The pulpit has been lowered, and removed to the south-east side of the church, where it now stands on a stone pedestal. The alterations in the body of the church include the removal of the old-fashioned high-backed pews, and the substitution for them of low open benches, made of the same old oak which formed the pews. They have all been stained and polished. The aisles of the church have been paved with red and black tiles, and the mural decorations consist of each side of the upper portions of the chancel being coloured, with Scriptural figures introduced, the walls of the main body of the edifice and the nave arcades being coloured in a light neutral tint.

The body of the church was restored under the superintendence of Mr. E. Christian, acting for the Charity Commissioners, and the new chancel was designed by Mr. A. Blomfield, architect, brother of the rector; and the contractor is Mr. Eonor, of Commercial-road East.

THE PHILADELPHIA EXHIBITION.

THE gallery over the south entrance is reserved for the exhibits of English stained glass. The light is very strong, and the manufactures in many instances show glass only suited to our own climate.

Heaton, Butler, & Bayne exhibit both ecclesiastical and domestic glass. "St. Timothy," "The Agony in the Garden," and "Christ Bearing the Cross," are light in treatment; for their position the figures and details are well drawn. The Four Seasons—Night and Morning,—the latter very coarse in details of figure. "O Lancelot, get thee home to thine own land," has little positive colour, and is a beautiful specimen of domestic work.

Cox & Sons fill one of the large windows. Among their exhibits, "The Sermon on the Mount," three lights, seems especially adapted for the situation both in colour and treatment. "The Crucifixion" and "The Adoration of the Magi," are too transparent for the aspect. A small panel, after Holman Hunt's "Light of the World," is a copy of the large window placed in St. Luke's Church, Philadelphia.

The domestic glass illustrates selections from the British poets, with one panel "Spring."

Messrs. Gibbs & Moore show two grisaille lights, with medallions, containing sacred monograms, and the signs of the Four Evangelists. The figures and drapery of the two lights, "Birth" and "Presentation of Christ," are well studied and rich in colour.

On the north side of the building is the "Last Supper," by the same firm, painted on a new material introduced by them, being easily fixed, and impervious to damp. There is also a frame of well-executed hand-painted tiles. Messrs. Hardman's exhibit is not yet in position.

Messrs. Barnard, Bishop, & Barnard, of the Norfolk Ironworks, Norwich, have erected an ornamental pavilion of cast and wrought iron, manufactured from the designs of Mr. Thomas Jeckyll, of London. The structure,—35 ft. by 18 ft., and 35 ft. high,—is of two stories, Japanese in style, intended for use as a garden pavilion or summer-house. The roof is covered with curved zinc tiles. Surrounding the buildings are railings of wrought iron, divided into panels, with centre sunflowers, 11 in. in diameter.

Light columns, elaborately treated, in two heights, support the structure. The brackets springing from these columns carrying the verandah have enriched spandrels, beautifully cast in low relief, with flower and bird subjects. No two subjects being alike. The upper brackets under the roof are similar, but bolder in their decoration. Panels of floral and geometrical patterns are placed in the soffits between the brackets.

The gutters and cresting are ornamented with studies from the rose, honeysuckle, hydranges, &c. The transoms connecting the columns are of open key pattern, with medallions of birds, fishes, and geometrical design; the upper transoms have open fish-scale panels. Wrought-iron railings, arranged in straight lines, enclose the balcony. The ceilings were to have been constructed of cast-iron panels, in bas-relief, but these and the ornamental cast-iron staircase to the balcony story are not included in the present exhibit. Embroidered tapestry, designed by Mr. Jeckyll, has taken the place of the panelled ceiling. Art-metal work and ornamental stores of every description are here shown.

New Jersey State Building.—This is specially designed as a temporary erection, and is admirably adapted for the purpose. Built of timber framing, the lower story filled in with ornamental boarding with the upper story, and roofs covered with native tiles, it can be easily taken down and re-erected on another site. The chimney is built of specimens of fancy bricks manufactured in this state arranged in patterns. It is a pity that the new tiles will not have time to "tone" down before the close of the Exhibition, as at present the red is very glaring. The architect is Mr. Carl Pfeiffer, of New York.

Ohio State Building.—The lower story is of native stone supplied by the principal merchants of the State, with their names painted on each respective exhibit. The upper story and side pavilion are framed and filled in with wood. The chimney is of brick. Galvanised iron roofing. The chimney-top and coping of the principal gable are supported by various firms who make iron work their specialty. The architects are Messrs. Heard & Sons, of Cleveland, Ohio.

SCHOOL CHURCH, RIPON.

THE foundation stone of a new Sunday School, to be built entirely at the cost of Mr. J. S. Hurst, J.P., of Copt Hewick Hall, was laid at Copt Hewick by that gentleman on the 20th of April, at a special service used for the occasion.

The new building will consist of nave, apsidal chancel, and south porch. The walls will be of brick, relieved by strings of pressed red and blue Staffordshire bricks. Moulded and splayed bricks are used for the windows. The roof is open-timbered, dressed for varnishing, with collar-beams and spandrels, supported on moulded and cut corbels. The porch is open-timbered, stained and varnished, filled in with panelling.

Sliding doors, with Gothic-headed panelling divide nave and chancel, which will only be opened during divine service. The windows are glazed with cathedral and matted glass.

The contractors are Messrs. Trees & Son, of Ripon; and the architects are Messrs. Lewis & Brodrick, of Ripon and Thirsk.

THE SUPPLY OF DEAL.

AT an official request, M. Broillard has compiled a Report, which we shall do little more than paraphrase, on the pine, or deal, supplies at present available in France. It has been published for the information of the world, as was the same writer's most masterly exposition with reference to the oak,—a wood less appreciated by the French than by some other nations of Europe. In the true French manner, nevertheless, he begins by generalising. "France," he recites, as though he were his own chorus, "possesses the beech, the birch, and so forth; but, above all, the resinous pine, and it is this which, they say, is in danger of being exhausted." Well, those who have lost their way among the woods that seem to march, like invading armies, upon and up the dark slopes of the Pyrenees, may not share in that opinion; but we are dealing now with authentic testimony. The pine, it almost says, is to the Frenchman of the South almost what the palm is to the Arab. Its straight and lofty stem is a material upon which the most ingenious of craftsmen can work; and it is this substance that really supplies half the modern house-decoration, dyed or not, in France. At any rate, it is among the most prominent objects in every Industrial Exhibition, though naturalists have contrived, as they usually do, to introduce a confusion, and confound the fir-tree with the larch. The French pride themselves, and justly, upon the uses to which they put the simple Northern tree. The cedar, says the Report, comes to them from the Atlas ranges, from the Lebanon, and from the Himalayas. They receive similar tributes from Araucania and Central America; they get even wood without foliage and without shadow from those Central American forests, and China is their last resort. Yet, none of these can answer the demand of common want and commerce,—deal. It is the wood of the North, and the wood for daily use of the world. Therefore, this Report and M. Broillard's comments upon it are exceptionally valuable. And one main reason is that the material is resinous. In certain countries, says our official French informant, "England, for example," all domestic utensils are made in deal. In Holland, and throughout the Low Countries, in addition to ship-building and house-building, every domestic utensil, every dairy pail, every milkmaid's yoke, every kitchen bowl and platter, is contrived from this plastic wood. In the year 1871, 25,000 square yards of it were exported from Sweden alone to Australia. The dockyards in the interior valleys of France rely for their merchant hulls upon deal exclusively, as do the manufacturers of furniture, when their customers cannot afford to pay for oak, ebony, or other costly woods. Ships, bridges, piers, railway foundations, telegraph posts, canal-borders, and all else kindred to these undertakings, depend upon it, and the result is that the consumption has been increased fivefold within the last twenty-five years. The question is put by the Commission, Why is this demand so universal? We must not enter upon the domain of natural history, or M. Broillard might lead us a long way; but the other points are important. Why are prices, in this market,—as far, at least, as the French forester is concerned,—so formidably upon the increase? It needs not to insist upon the several species, the French, the Spanish, the Greek, and the South American; the Himalayan, the Siberian, and the Japanese. The one quality now in process of exhaustion is the pine, or deal-wood, of the North,—that which is, in fact, principally known to commerce and to manufacture. It is a tree which flourishes, as is well known, at various heights, though always in the neighbourhood of mountains, which modern cupidity is doing its worst to disforest, as it has done the lower oak-lands of Europe. Now, this is a produce of the earth which should, by all means, be gratefully treated. It trespasses upon not half the space occupied by the oak; it grows more rapidly, and is of more multifarious use; and its other qualities are excellent. It is, as a wood, of the simplest possible structure; it is durable and elastic; it is light, and its very bark possesses a distinctive value; it is cheap, though likely to become dear if the present rate of waste goes on; and it can be machined in large dimensions, suitable for every purpose of wooden architecture, by land or sea. Moreover, says the French statement, it is good for damp, and good also for dry, weather, though less adapted for vertical supports than for horizontal planking, or similar auxilary service, as it were. That is to say, great weights will crush it; and this is certainly true, as the deal-merchants of the Baltic and the Black Forest have, over and over again, admitted. The common deal, in truth, while, of course, inferior to the oak, has less sap than its congener of the Pyrenees, grows in rings, expands most in the summer-time,—a circumstance which gives it a feeble constitution, and sinks into power, often under the action of the saw. For these reasons, the wood, as a rule, is rejected by turners. Yet it is none the less useful, or less sought after, on that account. Some qualities, indeed, we are told,—such as those in the forests of Herival, of Bosson, of Arc, and of Moplin,—are in great request for ships' masts, and many an American clipper arriving in European waters with damaged Canadian spars replaces them from the slopes of the Jura. And it is remarkable how the Americans, with their exhaustless native growths, manage to carry back with them the fine sawing-machines, the milking-pails, the billiard-tables, and the cleanly art-furniture specimens of Europe. But the sawing of this resinous European wood usually assumes the shape of planks, varying from a thickness of 4 in. to 2 in., though these measurements differ in the French from those in the English timber markets, and are altogether capricious when applied to wainscotings or floorings. The "saw-country" is in the close neighbourhood of the forest. Every rapid stream has its hundreds of mills; the entire vicinity is full of the rasping sound and the resinous scent; whole families are at work twelve or fifteen hours in the day; each, perhaps, delivers about 30,000 rough-hewn planks annually. In a year, sometimes, a whole forest disappears. And it is this fact which accounts for the seriousness of M. Broillard's remonstrance. There are, he says, mountains of sawdust, perpetually rising, of which modern machinery makes use. But is the supply inexhaustible? Steam has come to the assistance of the rivers, and the destructive process will become more rapid and remorseless, year after year. These masses of half-shaped timber, in rough or in smooth, are hurled down upon the current of the nearest river, like the rafts of the Black Forest, some stripped, and some in bark, and the substance of many a goodly tree is actually sold, upon the spot of its growth, for tenpence. The "white sap" is dearer than the "red sap"; but both appear doomed to extermination. We have a hint of this in a recent Swedish proclamation, which announces that pine boards, for the dockyard service, need not be of such large dimensions as formerly. "Thus," says the Report, "the Northern plank is now smaller than the French." But the ravage continues, although it must be said that a more provident spirit has been exhibited of late. Thus, when a big tree, for masting a ship or other similar use, is about to be felled, it is scrupulously topped, both in order to prevent danger to itself and to spare the younger growths around. Then the giant, cleared of all encumbrance, is hoisted upon a four-wheeled trolly, drawn by six bullocks, and driven by two wagoners; and, after a long journey, is converted into spars, wheelwrights' material, cask-staves, or furniture, as the case may be. It commands, in the market, as a rule, almost exactly half the price which is commanded by oak. But its cost is increasing. The nobler heights and dimensions have long threatened to disappear, and the medium sizes scarcely approach to a third of their value. And, as the more accessible districts are cleared, and the woodcutters have to work up among the mountains, the dearer and dearer becomes the market in deal. It is now, in many places, worth a guinea the square yard, whereas, sixty years ago, it would not command a tenth of that amount. We are speaking, no doubt, of first qualities, and upon the authority of M. Broillard's statement. Between 1830 and 1870 the price of this wood, in France, at any rate, for all purposes, was doubled. The tree takes forty years, at least, to attain maturity, and it is ruthlessly cut down, by "hungry generations," at half that age. What wonder, then, if an alarm be raised concerning our deal supply—because the protest applies to the north and south, not less than to the centre, of Europe? How much of it is hewed into billets, and sold for fuel? How much reduced to charcoal? It is killed for the sake of its turpentine, and its very bark, invaluable to the tanner, is wantonly wasted, in thousands of tons together. Yet the Thuringian woodsmen, who understand these things, call this "The Bread Tree," on account of its importance above all others of which they know. The French—let us hope before it is too late,—have recognised these truths, and are endeavouring to atone for past ruin and neglect. They are positively beginning to cultivate the pine, or deal tree, to graft it with the beech, and, with a peculiarity of phrase belonging essentially to themselves, to "educate" the forest. The pine-wood, they assure us, after having treated it most barbarously for half a century past, is a peculiarly delicate creation; it is a garden, and every tree is a flower. May it be hoped that no such rubbish will come out of Norway, although the official statement contains some ominous assertions relative to the deal-markets in that region. In fact, this perpetual hacking and hewing must bring on a crisis, at one time or another. Anywhere, a pine forest is the growth of, at least, 150 years, and many hills of the Pyrenees, now barren, desolate, and rainless, cannot be expected to recover their verdure in less than two or three centuries. France is feeling the effects of her prodigality in a way which few of her economists, belonging to a past age, anticipated. In 1873, her importations of deal from Sweden, Norway, Switzerland, and Germany, were enormous, and millions of money were paid to foreigners which might have gone to the account of her own "woods and forests" had they been honestly preserved. Purchases were made,—though on an insignificant scale,—in Italy, Turkey, and Austria; while Belgium did not allow a square inch of her native timber to pass the French frontier. Of course, France had at the same time an export trade, but nothing to speak of, in deal. But the main point is the probable diminution of the supply. "*En Suède*," says the French writer, "*on coupe tout ce qu'il est possible de couper*,"—"they cut all that can possibly be cut,"—but a new law has just come into operation which forbids the hewing of trees under a given age and size. Even those woodlands of the North, travellers assure us, are beginning to look like so many raw plantations. The flower of the country is withering, and our importations must gradually come from longer distances, at a greater cost. It is true that the mighty forest of Russia, stretching from Lake Onega to the Ural, is, as yet, in a comparatively virgin condition; but what can satisfy the ever-enhanced wants of modern industry? Russia is an empire of wood, wooden in a thousand different senses, and, at the present rate, even its vast resources of forest and timber may fail before the engulphing avidity of the times. Meanwhile, the French Report, if slightly exaggerated, points to some facts deserving, perhaps, of consideration.

LEAD IN ITS RELATIONS TO WATER SUPPLY.

TREATING, some time ago, of lead in its relations to architecture, we promised to recur to the subject in connexion with water supply, which is undoubtedly one of its most important aspects. In this article, accordingly, we have put together a few brief and imperfect notes on the chemical reactions of lead; and some other particulars.

The conclusion at which we had arrived was that lead is in every respect a superior roofing material to either zinc or galvanised iron. We may add copper which is still used under certain circumstances, and for these reasons:—The physical qualities of lead render the *working* of it easier than of any other metal; its chemical properties supply greater resistance to the action of the atmosphere; and, lastly, being among the metals the greatest non-conductor of electricity, it affords the highest security and protection to a building during the occurrence of a lightning storm. In some cities of South America,—chiefly, we believe, in Chili and Peru,—where sheet copper has been extensively used as a covering for platforms as well as ordinary flashings and aprons, the copper-clad roofs have repeatedly been found highly dangerous under such circumstances. The most of them sustained severe damage; while, in fact, the slate or lead roofs escaped uninjured. Since lead is also very low in the scale or series of heat-conducting metals, it follows that there is less expansion and contraction with changes of temperature. It likewise interposes to that extent a greater barrier to the action of the sun's rays on the interior of a building. Even slates, as we all know (small "Welsh Ladies," for example), in our own climate, to go no further

sometimes render the upper stories so hot as to be almost uninhabitable; whereas a lead roof,—partly, of course, owing to its greater solidity of construction,—exercises a much greater modifying influence. We will not press this point, however, as we have already noticed that the great expense of lead has gradually forced us to adopt a combination of slates and lead, which, if not the noblest form of our modern roof, is still, under certain limits, the most substantial, and may be made the most picturesque. Those who have studied the drawings of the Mediæval Dutch and German cathedrals and churches which have appeared in our pages need not be indoctrinated on the latter point at least; for, although it is a pity, it is true that our highest lessons in this style of art must still be derived from Continental sources.

A good deal might still be said with regard to the artistic treatment, but we need not enlarge further upon the application of lead to roof-work. The beautiful engrailed work of some old roofs: the fish-scale work, the curious projecting gutters, the rain-water pipes, the rain-water heads, spouts, gargoyles, and finials,—all these, we are afraid, must now be consigned to the portfolio of the archæologist; since lead as a material is gradually being superseded by cast and malleable iron. For the covering of domes, cupolas, and other curved surfaces, lead is undoubtedly the proper metal; although even in these cases zinc has of late years also been applied with successful results. We may again insist here on what we previously pointed out, that lead imperatively demands the very highest skill and craftsmanship on the part of the plumber; and that it is the poorest of all economy to punish the lead-work of a roof in order perhaps to elaborate a plastered front, or add to the weight of a projecting cornice!

So much, then, with regard to lead as applied to the outside of a building. When we come to speak of its uses *inside* we must alter our eulogistic tone considerably. There can be no doubt but those physical and chemical properties we have mentioned which recommend the metal so pre-eminently for roofing and other exterior purposes also bring it to the front in the case of interior fittings,—that is to say, whenever it is intended to confine or convey water, or gas, or soil, or steam. Lead, in point of fact, occupies a foremost place in the economy of what we may briefly describe as domestic engineering. The reciprocal action of lead on copper, iron, tin, and zinc, involves questions with which the construction of every modern mansion, or building of any note, is more or less concerned. There are, for example, the *modus operandi* of hot-air pipes, hot-water pipes, steam pipes, and so forth, in which the merely mechanical principles of junction and the relative pressure on the tubes exercise the greatest influence on the safety and stability of the building.

It is almost impossible, indeed, to fit up an ordinary system of hot-water pipes, or even a kitchen boiler with a hot-water cistern at the top of the house in which lead pipes are not in some form or other made use of, and in which these principles do not come into play. It is hardly necessary to add that the utmost carefulness is requisite in the construction, and the most constant watchfulness in the practical operation of all such apparatus. The junction of lead with iron pipes in a hot-water system is often attended with danger; on this account alone that the expansion and contraction of the two metals, as well as their chemical affinities, are unequal. We have seen, for instance, a 1-in. lead pipe united at right angles by a soldered joint to a malleable iron pipe, which joint burst so repeatedly and so dangerously that the iron pipe had to be cut at the junction and a triangular brass socket soldered to lead and screwed to iron. We have also observed in several large breweries, where pipes of unusual calibre are employed that the joints of the huge brass stop-cocks with which they were furnished invariably gave way at the point where the different ratios of expansion might be supposed to converge, or even perhaps where a certain slow but sure electrical action had supervened. Another question of great importance in this connexion, is the action of frost on lead pipes, which, however, we have so frequently treated, that the whole causes and consequences of this phenomenon must be familiar to our readers. We will only repeat here, in the same tone of warning that we have so often had occasion to use, that a frozen water-pipe may signify either a burst boiler in the kitchen or a deluge over the drawing-room ceiling, or both and may often lead, and has repeatedly led, to serious and even fatal accidents.*

We may as well indicate here that however useful and convenient lead may be found with regard to interior fittings there are certain purposes, we may mention, to which it may be grossly misapplied. For example, there is one domestic use to which lead should never be put to under any circumstances,—that is, the lining of a kitchen sink. Those who remember the old-fashioned form of leaden sinks will recall the amount of trouble and annoyance which they gave to all good housekeepers. Constantly cracking at the bottom, or the junction of the soil-pipe, they were never thoroughly water-tight, and were thus the everlasting cause of damage from leakage. This was more particularly the case with respect to tenemented houses where the kitchen sinks overtopped each other in several stories, and where a leaky sink at the top of the house was the prolific cause of injury to the floors beneath. The introduction of iron for this purpose, and better still of stout glazed earthenware was a great boon to our kitchen-maids, and an important improvement in our household sanitary economy. Equally obnoxious, far more so indeed, is the application of lead to urinals, and, as we have even seen, to water-closet pans, of which disgusting nuisances there are still too many in existence,—particularly, as we remember, in the regions of Newcastle-upon-Tyne, and other northern towns. And the same objection applies *à fortiori* to soil-pipes of water-closets, which if not properly laid with a due inclination to the drain, and, above all things, properly ventilated, will sooner or later corrode at the joints, burst, and allow the poisonous sewer gases to escape into the atmosphere of the house, especially and most probably into the bedrooms during the night. We have, however, already touched more than once upon this startling subject, and pointed out the necessary precautions and remedies. But we may further insist here on the impropriety of that bad architectural practice,—still too frequent, we are afraid,—which plans a water-closet soil-pipe to be carried through lobbies and stair-landings, or even rooms; the plain consequence being, that these soil-pipes, lying at a dead level and often improperly flushed, just constitute a permanent and seething receptacle to soil in a state of putrefaction. We may also point out an error of a similar character which is often committed, and that is the burying of a leaden pipe in a wall covered with damp plaster, or in a ground track impregnated with lime, or perhaps filled in with lime rubbish. No substance exercises a greater corroding influence on lead than lime, as some of our readers know to their cost, and this is one case where corrosion is followed by evil consequences. The strongest of all objections, however, we can have to lead is its application to the lining of cisterns and to supply-pipes, properly so called. This at once opens up one of the most serious and important questions of the sanitary economy of the present day. And although the subject may be well known, and even hackneyed, to some of our professional readers, and besides somewhat too "toxicological" for our pages, our general readers will excuse another slight discursion on account of the importance of the subject, which can never, we fear, become stale. We refer, of course, to the poisonous action of lead upon water.

The subject was first scientifically investigated in this country during the earlier half of the present century by Dr. Sir R. Christison, professor of Materia Medica in the University of Edinburgh, whose researches have been generally confirmed by Dr. Alfred Taylor, of Guy's Hospital, Dr. Dalton, of Dublin, and many other medico-legal authorities whose works we have consulted. The French toxicologists, the celebrated Orfilla and Tanquerel, generally coincide in the conclusions at which these authors have arrived; and the German analysts and physiological chemists, Müller, Liebig, Virchow, and others of that school, likewise record their adherence.

But it is very remarkable that this form of mineral poison was not unknown to the architects and physicians of antiquity. For the action of water upon lead has been the subject of observation for many ages. Vitruvius absolutely forbids the use of this metal for conducting water, because "cerusse" (*i.e.*, white lead) was formed on it; which he very properly held was hurtful to the human body.* Galen also condemns the use of leaden pipes because he was quite aware that water transmitted through such channels contracted a certain sort of *muddiness* from the lead; the consequences of which were, that those who drank such water were subject to dysentery. Indeed, if we trace, as Dr. Christison tells us, the sciences of architecture, chemistry, and medicine downwards from these periods, nothing more will be found than a repetition of the sentiments of Vitruvius and Galen but a few particular facts in support of them till we arrive at the close of the last century.†

Within our brief limits it would, of course, be impossible to convey even a meagre outline of the laborious experiments and masterly inductions of these celebrated chemists; but the following *resumé* may help, perhaps, to make the subject more intelligible.

In order to ascertain the true chemical action of lead upon water, we must first of all look to the action of lead upon air. Whenever a fresh-cut surface of lead is exposed to the air it gets tarnished, a circumstance which is due to the strong affinity of the metal for oxygen. There arises a thin coating of the hydrated oxide of lead, which is easily transformed to the *carbonate*, which again seems to form the permanent crust. The opinion which many persons entertain that the dark crust of lead is a mere deposit of its oxide, is therefore incorrect. If lead were to oxidise continuously by contact with air,—like a particle of sodium in a basin of water,—we should have very little indeed to say of its history, and still less, we are afraid, of its architectural relations. The formation of the carbonate of lead is always accelerated by moisture, and probably by the presence of an unusual proportion of carbonic acid in the atmosphere; but, not to enter into minutiæ, in whatsoever way it may be formed this carbonate of lead, in all its forms and combinations, is a deadly poison.

When water passes through leaden pipes, or is stored in a leaden cistern, a similar chemical reaction occurs. Water, which is composed of oxygen and hydrogen, and almost invariably charged with carbonic acid, plays the same part, *mutatis mutandis*, in the process that air does, with this additional and aggravating circumstance that water *dissolves* the carbonate (which of course the air, or at least the dry air, cannot do), and according to the nature, extent, and duration of the necessary conditions holds this poison in solution.

These conditions, however, are so modified by a wise provision of nature that in the vast bulk of our natural supplies of water the antidote to the poison accompanies it and neutralises it. Whenever water contains lime, soda, potash, or other mineral salt, it deposits a crust of that salt on the surface of the lead in the form of *an insoluble carbonate*; and so protects its surface from the chemical action which invariably occurs when the water is pure. The conclusion at which we arrive here accordingly is a fact which should always hold a prominent place in our sanitary aphorisms:—*The purer the water the greater the danger of lead poison.* We will not enter upon the wide topic of the physiological influences of the poison. We need only mention that the symptoms which follow are first of all "lead colic," which is by far the most frequent form of disease; secondly, "lead rheumatism"; thirdly, "lead palsy or paralysis"; and finally, "disease of the brain," which is the least common, but the saddest of all the forms of lead poisoning. It is also proper to point out that the poison may be introduced into the system by being *absorbed* through the skin, and *inhaled* through the lungs, as well as being *imbibed* by the stomach; and with two or three short illustrations of these separate classes we will conclude our exposition.

1. In the first place, with regard to the poison entering the system through the stomach a whole catalogue of cases may be found in the authorities we have cited. It is perhaps sufficient to recall to the recollection of our readers the celebrated case of the Ex-Royal Family of France during their residence at Claremont, of which full details (of that and numerous others) will be found in Dr. Taylor's work;‡ and was copiously commented upon in our own columns at the time.

The water at Claremont was of exceptional purity; it acted on the leaden pipes, and the result was that no less than *thirteen* persons were

* See, among other references to this subject, an article in our volume for 1874, in which certain simple precautions are pointed out.

* Vitruv. de Architectura, l. viii., c. 7.
† See the Treatise on Prisons, ed. 1845, p. 526, *et seq.*
‡ The Principles of Med. Jurisprudence, vol. i., p. 298.

attacked with severe colic (including several members of the Royal Family), and, as far as we remember, two of the grooms died. Dr. Christison mentions a similar case which occurred at a gentleman's residence in Dumfriesshire, whose family were constantly ill, and to whom his professional services were called in. He immediately discovered symptoms of lead poisoning, which led him to examine the water; and he actually discovered that the lead supply-pipe, nearly a mile in length, which conducted the water from a very pure spring (proceeding out of rock, by the way) to the house was almost corroded to nothing throughout its entire length! We will explain presently what Dr. Christison did to avert the evil; but we may mention a case here, on the same authority, which is no doubt still common enough; and that is where a series of water-barrels, at a country house, fitted up to collect and store the rain water from the roof, which had been newly covered with a lead platform, gutters, and ridges, became so impregnated with lead that the whole family suffered from severe colic in consequence. We may add also that the danger is not confined to leaden pipes and cisterns, with their corresponding apparatus of water supply. It exists to a large extent in our ordinary cooking utensils! That vile practice, as Dr. Taylor justly calls it, which has sprang up of late years of substituting for pure block tin an alloy of tin and lead in the lining of our cast-iron pots is an extremely dangerous one, as we have before pointed out, and calls loudly for the sternest repression. And not only metallic pots, but earthenware vessels are also liable to the same fatal objection, simply arising from their *glaze*, which is always composed of lead in some form. Vinegar, or pickles, or any acid solution will produce the acetate of lead when preserved in such a vessel. Everybody knows, or ought to know, that boiling fat will melt and even dissolve lead; and cases are on record, such as a whole family being nearly poisoned, from eating the fat or dripping of meat which had been baked in a newly-glazed earthenware dish. The whole of this subject, which we cannot at this moment pursue farther, has been recently investigated with great ability by a modern French chemist, Monsieur Gobez *; and our readers who wish to arrive at the newest and most authentic conclusions with respect to the poisons of lead introduced into the system through the stomach should consult that author's valuable papers, which are published in the *Annales de Hygiène* for the year 1869.

2. Our second division relates to the process of absorbing the poison through the skin. The commonest form of the disease in this case is "painter's colic," which is certainly also one of the worst forms of the chronic poisoning of lead. Dr. Taylor gives numerous instances of the baleful effects of lead on the systems of lead-smelters, white-lead workers, painters, and even plumbers. We have often recorded and described such cases, and need not repeat them. The symptoms are unfortunately too well known, and are described with great minuteness in most of the dictionaries and encyclopedias, under the head of "Lead Palsy" or "Paralysis." We may add here that lead is more injurious to the system than other metallic compounds, on account of its being a *cumulative* as well as an irritant poison.

3. But lead colic and paralysis may also be produced by inhalation; hence our next division relates to the absorption of lead through the lungs. Not painters and lead workers alone suffer from this insidious cause; but every symptom of the disease has been known to occur in the case of persons who have, for example, slept in newly-painted rooms. "I have, myself," says Dr. Taylor, "suffered from a severe attack of colic as a result of sitting in a room, for a few hours a day, in which a large surface of canvas for an oil painting had been covered with white lead and drying oil." Another case mentioned by the same authority is that of a military officer, who was fond of painting in oil colours, and who worked for some time in a studio 8 ft. square, which had a large stove in it. The consequences were that he was attacked with "wrist-drop," and soon afterwards with paralysis in both legs. His servant, who ground his colours and washed his brushes, had also a severe attack. "In these instances," continues Dr. Taylor, "the emanations of lead must have reached the blood through the lungs; although chemists may doubtless be found who will prove by ingeniously devised experiments that there could be no lead in the air of the room; and who—coupling their results with the fact that few artists are known to suffer from such symptoms—will therefore contend that lead was not the cause. The symptoms, however, were of that character which is peculiar to lead poisoning; and as the insidious effects completely disappeared on the removal of the patient to another atmosphere, I think there could have been no doubt whatever about the cause." *

It follows from all this that the atmosphere of a room tainted or impregnated with lead is as dangerous as the well known poisonous atmosphere induced by the celebrated green flock and gold papers which we have so often denounced, the colouring basis of which was found in numerous cases to be arsenic.†

Having said so much about the poison of lead, it now remains that we should add something concerning the remedies; but here we must necessarily be very brief. It is not our business, of course, to grapple with the therapeutics of the subject; for the treatment of the diseases we have mentioned belong to the province of the physician. Our vocation—not less important, as we hold,—with regard to this and similar subjects lies more in the direction of *prevention* than of cure. Nevertheless, since we are treading as it were on the very threshold of the subject, we may venture to interpose a few words on behalf of suffering humanity.

First of all, let us say a single word with regard to its *detection*. To discover the fumes of carbonate of lead in the atmosphere of a room is rather a difficult and delicate operation (although perfectly certain and reliable), but the detection of its solution in water is one of the simplest processes in the whole range of analytical chemistry. We cannot go into details: it may be enough to say that with the simple apparatus of a watch-glass and a test-tube, together with a few drops of hydrochloric acid and of sulphuretted hydrogen in solution, it is quite sufficient to detect even the thousandth part of a grain in a gallon of water.

The symptoms in the human system are also easy of diagnosis or *distinguishment;* and it is only necessary that we should state here that the treatment of the disease in its various stages is entitled to rank amongst the greatest triumphs of our medical practice in the present century. Sulphur, sulphuric acid, sulphate of soda, sulphate of magnesia, sulphuretted baths, sulphur in some form or other, it is curious to know, is the grand antidote to the poison of lead. Its action, of course, like that of any other antidote, is to neutralise the active influences of the poison in the blood.

But the real fact of the matter is that preventive measures are, after all, the most beneficial; and exercise the most potent and potential influences for good. For example, in the case of white-lead manufacturers, where the poison enters the system chiefly through the skin, it has been found that *personal cleanliness* exercises a surprising effect on the health of the operatives. Painters, plumbers, lead-smelters, and other artisans who neglect to wash their hands before meals, little know the damage they are doing to their constitutions. Indeed, to give a specific instance, there was a large and celebrated *plomb-blanc* manufactory in the South of France, which was at one time notorious for its lead palsy. The proprietors, acting under the highest medical advice from Paris, at length adopted and rigorously enforced a system of sanitary precautions, which eventually put a stop to the disease, and very nearly extirpated it altogether! These measures were simple enough, and ought to be widely known. In the first place, the workmen were compelled at every meal-hour to wash their hands in hot water and potash, and also to *use the nail-brush*. Secondly, they had hot or tepid baths every evening before leaving the works. In the third place, a frequent change of clean *linen* garments was supplied to them; and finally, some supervision was exercised over the lead-workers' food, and the condition of their homes.‡

The laws of prevention,—which are more in our way, as we have hinted,—also operate quite as vigorously in the case of the lead poisons being inhaled through the lungs. In the particular instance quoted above of the officer's studio, ventilation immediately suggests itself as the most thorough-going and effectual remedy. We will not speak of the size of the room,—(8 ft. square!), which must be nearly incredible to persons who do not reside in London, and is certainly discreditable to the officer's common sense, and for this simple reason, that any size of room under the same conditions may have had its atmosphere poisoned, burnt up, and destroyed in a similar fashion. Given a hot stove, closed windows, a street-door, a blocked-up chimney-place, plenty of white lead and oil of turpentine, two or three argand gas-burners, and two or three pairs of human lungs, and it needs no ghost come from the grave to tell us the result of the problem. The Black-hole in Calcutta was hardly so bad. On the other hand, give us an open fireplace and two or three of Arnot's valves, or Banner's ventilators, or a system of hot-water pipes, or hot air entering from the surbase, and passing through the cornice of the ceiling, or a movable skylight hung on pulleys, or, in short, any method whatsoever (and the simpler the better) of providing an ever-changing supply of fresh air, and we will "stake our critical sagacity," as Lord Jeffrey used to say, that there will be no lead palsy or paralysis superinduced in such an apartment. As to artists, as a class, not suffering from the effects of lead paint, we are not so sure of that as Dr. Taylor seems to be. The symptoms of lead colic we are assured are frequent enough; and even palsy is not uncommon. Indeed, we have no hesitation in saying (and we speak from long experience, and extensive observation) that many a hard-working artist in oil colours,—particularly those who work much by gas-light,—has his valuable life abridged, and his days shortened, by the vile atmosphere of his studio. We ought to mention here that water-colours are, of course, quite innocuous in their handling; and although the idea is rather of a comical character, we have heard it repeatedly asserted that smoking tobacco, which most artists do in inordinate quantity, is also preventive or remedial of a poisoned atmosphere! We would not, however, stake our sagacity on this knotty point, unless we were in a position to prove (which, as at present advised, we are not) that a *narcotic* poison is counteractive of an *irritant* one.

When we revert to the poison introduced into the system through the stomach, we shall find the same beneficent principles still hold good. We have mentioned, in the case of leaden supply-pipes and water-cisterns, that Nature herself, in the vast bulk of potable waters, provides the remedy in the form of depositing over the surface of the lead an insoluble salt, most commonly a carbonate of lime. In the case at Dumfries-shire, where, as we have mentioned, Dr. Christison was called in, that eminent physician skilfully availed himself of this natural law to counteract the action of the water on the leaden supply-pipe, which conducting a very pure spring, was nearly eaten away. He had a new supply-pipe laid down, filled with water, and corked up at both ends for several months until the insoluble coating was deposited so thick that no danger could be apprehended. But this case occurred thirty years ago, and since then we have had the invention of coating leaden pipes over their inside surface with block tin,—a metal which, it is well known, has no poisonous re-actions; though objections of another kind have been taken to the arrangement. Such tinned lead pipes have, we believe, been laid down at Claremont and many other mansions throughout the country where the necessity for their application was found to exist, and always, we are informed, with the most successful results.

There are various reasons also in operation at this moment which render the use of leaden supply-pipes more dangerous than it was before. The most important of these, perhaps, is the additional quantity of lake water we are bringing into use (as in Glasgow), and of rain water which we are compelled to store (as in Edinburgh). Both of these waters are pre-eminently pure; and the evil consequences we have sufficiently indicated. Thirty years ago the Edinburgh and Glasgow waters contained sufficient mineral salts to render their passage through lead pipes quite innocuous. But we question very gravely whether this can be said at the present moment. Commending the subject to the consideration of the able public analysts of both cities, we will only further remark that sooner or later lead in all its forms must be removed altogether from the regions of our

* Cited by Dr. Taylor in confirmation of his own views, vol. i., p. 298.

* Principles of Med. Jurisprudence, vol. i., p. 302.

† The reader will find some account of this arsenical poison in our previous volumes.

‡ This highly suggestive and philanthropical case is mentioned by most of the medico-legal writers. For a full account of it see the *Revue des Mondes*, vol. xxii., p. 316. See also Dr. Besse's "Manual of Toxicology," 8vo., 1875, p. 261.

water supply. It contains most unquestionably a constant and most serious element of danger. Iron, tin, zinc, earthenware, concrete (why not?), vulcanite, or even, as Vitruvius suggested, *leather!*—each and all of these are better than lead. None, of course, are so easy to work as lead; but our plumbers must learn to march with the times, and rise to the occasion, or otherwise we are afraid another race of mechanics will gradually supersede them in relation to the public health.

PUBLIC WORKS AT BRUSSELS.

PRELIMINARY measures towards the realisation of improvements, long debated by the municipal administration of Brussels, have at last been adopted. A scheme known as the Project Bordiau, from the name of its originator, was discussed in 1874, and finally approved in January, 1875, by the local authorities. The Royal assent, however, was only obtained in the ensuing December, and the works are to begin by the excavation of some 150,000 cubic mètres, preparatory to the reconstruction and transformation of the north-eastern portion of the Quartier Léopold. According to the scheme, the Plaine des Manœuvres will be sold for building purposes, and another drilling-ground, more conveniently situated, will be opened on the 1st of January, 1877. The plan was evidently well conceived, for it did not give rise to any opposition, and was almost unanimously approved by the landlords whose property will be affected, though there will be expropriation over an area of about 200 acres. The compensation to be paid has also been satisfactorily arranged by two experts representing the rival interests,—the one being appointed by the municipal administration, and the other elected by the proprietors interested in the matter. These latter were convoked to a general meeting at the Hôtel de Ville for the purpose of selecting a suitable representative. The first new street to be built will run from the rondpoind de la Rue de la Loi to the Chaussée de Louvain. This and the other new streets will be made by contract, subject to such modification as the municipal council may suggest as the works progress.

CORTILE OF THE PALAZZO VECCHIO, FLORENCE.

EACH of the columns in the great court of the Palazzo Vecchio has a different ornamentation, and the result of the whole, as shown by the accompanying engraving, is sufficiently interesting. These are attributable to Michelozzo (who lived from about 1402 to about 1470), and are examples of the Italian Renaissance. In the middle of the court is a fountain designed by Vasari, and which includes a fine statuettte in bronze. The highly ornamented aspect of this Cortile, with its garlands and festoons, contrasts singularly with the heavy, sombre character of the exterior of the Palazzo, with its lofty tower, and which was originally the seat of the Government of the Florentine Republic. Between the period at which Arnolpho di Lapo designed the building and Michelozzo adorned the Cortile, more than a century and a half had elapsed. A full description of this palace is given by Rastrelli:—"Illustrazione Storica del Palazzo della Signoria detto Palazzo Vecchio, Florence, 1794."

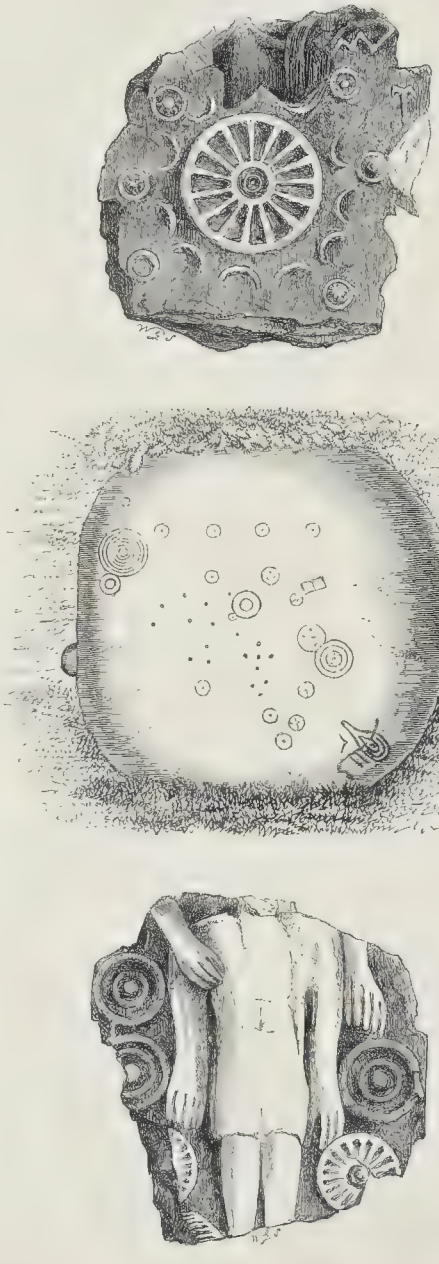
INCISED STONES.

IN anticipation of the paper on Brittany which I am to read before the British Archæological Association, and which will be fully announced, I beg to send you illustrations of some very remarkable objects which appear free from the vagueness apparent on the incised stones in this country. The incisions on the stone at Pleucadeuc, near Rochefort en Terre, are unmistakably astronomical. The tenon, if I may so term the projection on the west side of the stone, appears to have connected it with another hemispherical tablet now lost, and, as the great luminary is placed in the direction of setting,—*i.e.*, on the north-west of the stone,—an entirely opposite arrangement may have been on the other.

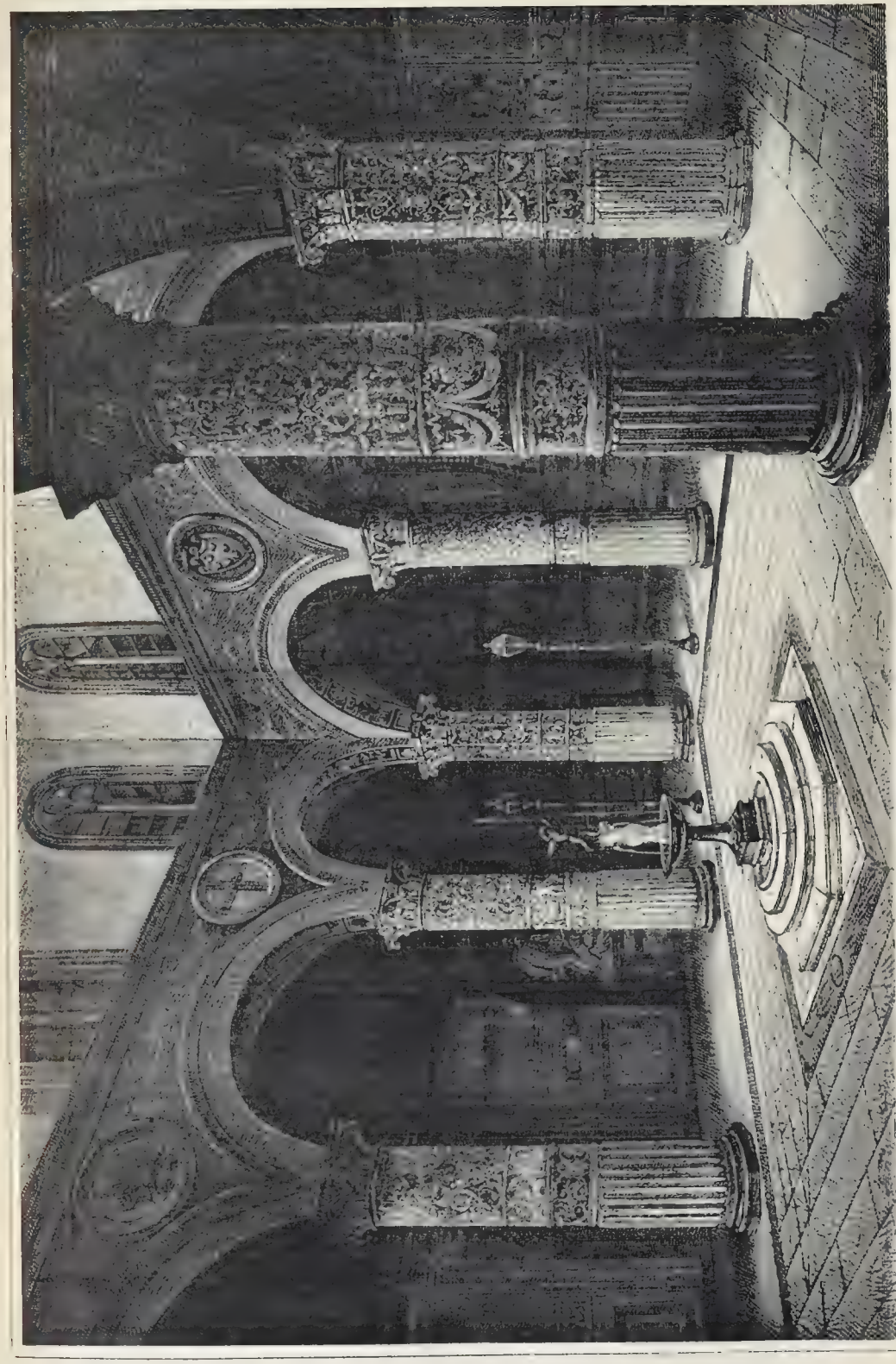
I will not go into a description of the planetarium, which speaks for itself, except to say that the object, in the form of a bisected oblong near the centre of the stone, has the appearance of being of a much later date. The stone is mentioned by a mere notice of its site by M. Cayot Délandre, and other French antiquaries. It is situated in a district where *débris* of the side monuments of the old stone age cover many square miles, and from which (the Morbihan) have been disinterred fragments of terra cotta bearing curious emblematic devices of Sabian worship, in which the moon takes a more prominent place, almost, than the sun, and which appear rather Asiatic than Roman, as seen in the illustrations. The character on the right of one of the fragments (the first), is the often-repeated figure in the incisions in the chambers of Loc Mariaquer, and appears in all its varieties to represent the T tau.

Some of your readers who propose to be present at the delivery of my paper may prefer considering these examples beforehand.

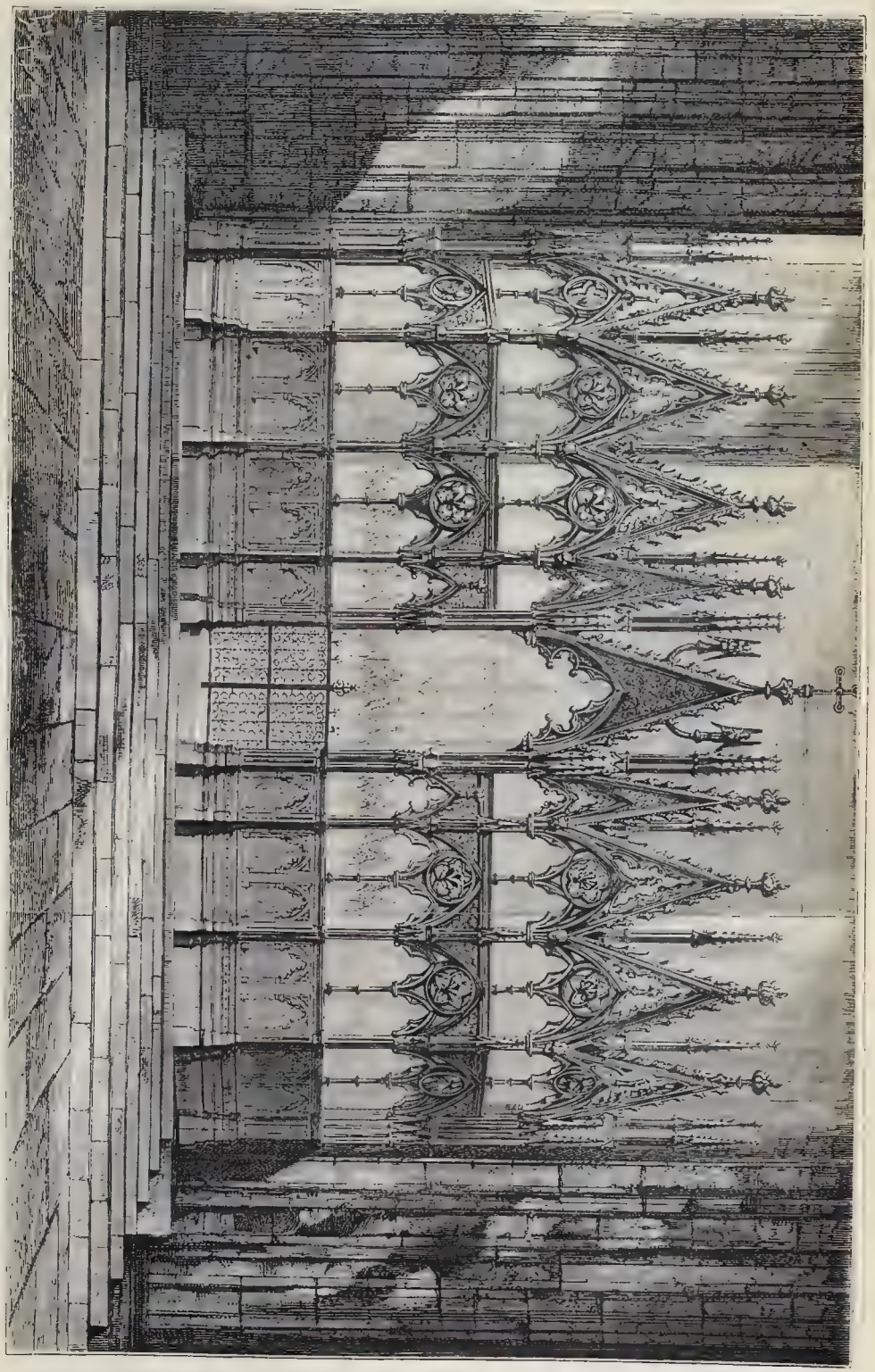
JOHN S. PHENÉ.



ANCIENT INCISED AND SCULPTURED STONES, BRITTANY.



COURTYARD OF THE PALAZZO VECCHIO, FLORENCE.



CHANCEL SCREEN, EXETER CATHEDRAL.—Sir Gilbert Scott, R.A., Architect.

CHANCEL SCREEN, EXETER CATHEDRAL.

IN our last volume we illustrated the new choir-stalls, lately erected in Exeter Cathedral, by Messrs. Farmer & Brindley, from the designs of Sir Gilbert Scott, architect.* We now give a view of the chancel screen there, which has been executed by the same carvers.

THE HEALTH AND SEWAGE OF TOWNS.

CONFERENCE AT THE SOCIETY OF ARTS.

THE first of a proposed annual series of conferences on the health and sewage of towns commenced on Tuesday last, the Right Hon. James Stansfeld, M.P., in the chair. The conference commenced at 11 a.m., adjourned at 1.30 p.m. for luncheon, resumed at 2 p.m., and sat until 5 p.m. The programme included papers and discussions on: Firstly, water-carried sewage systems, sub-divided into (*a*) sewage farms, with or without precipitation or subsidence, profit and loss, and influence on health; (*b*) effluent waters: subsidence, precipitation, filtration; (*c*) disposal of sewage; (*d*) discharge into the sea; (*e*) under no special treatment: effect upon health. Secondly, dry systems: pails, pans, boxes, earth, ash, and other closets; their influence on health, cost, &c. Thirdly, foreign systems: Captain Liernur's and other systems, and the suggestions they offer.

The Chairman, in opening the proceedings, said he had been distinctly informed that it was not intended to discuss new and untried schemes or new scientific theories in reference to the disposal of sewage. The object of these annual conferences,—for it was intended that they should be annual,—was to take stock of the experience of different localities in regard to different systems which had been already carried out. They had first to deal with water-carried sewage, next with the dry systems, and lastly with foreign systems. The system of water-carried sewage struck one as that which was best adapted for large and dense populations. It seemed to recommend itself by a certain mechanical completeness and by a certain decency. It would not do to assume that if every house had well-constructed closets and pipes which were kept in good order, and if the pipes were properly connected with the public sewer, that would be a solution of the problem before them. Besides all that, there was the question of the condition in which the sewage was discharged at the outfall, and the necessity of treating it there in such a manner that in its collective form it would not be injurious to the health of the population. In the progress of modern civilisation they had created by their own handiwork insidious dangers in the shape of sewer gases which were entirely the product of the modern system of disposing of sewage, and which, coming back to the house through the sewers and drains, were a source of diseases which were almost unknown before. They could not expect to have a safe and effective system of water-carried sewage unless the sanitary authority in charge of that system was in charge also of the condition of the pipes and drains within the house itself. The dry systems had many things to recommend them. In the first place, they did not involve a large outlay of capital. They were somewhat troublesome in their working from year to year; but they had the advantage of giving a very speedy sign if there was any neglect, and that sign, though unpleasant, was not so insidious or dangerous as the imperfections of the water-carried system; resulting in the creation and introduction of sewer gases into the houses of the people. Such conferences as that would enable those who attended to compare notes as to the merits and defects of different systems under varying conditions as regarded population, and would tend to check extravagant expenditure. In concluding, the right hon. gentleman said he thought that there should be an inquiry department formed in connexion with the Local Government Board, which might be consulted on sewage questions by sanitary authorities, and suggested that until that had been done a similar department should, if possible, be originated by the Society of Arts. He also expressed his regret that the engineers connected with the Board were unable to attend the conference in consequence of being then engaged in preparing their reports on the sewage schemes.

* Vol. xxxiii., p. 975.

The following papers were read and discussed on Tuesday:—

The Wrexham Sewage Farm.

Hafod-y-Wern Farm, Wrexham, was hired from the Wrexham Local Board in February, 1872, by the present occupier, Col. A. Jones, V.C., having for two years previously been under the management of the Local Board, and although some steps had been taken to level part of the land, it had suffered considerably from neglect and mismanagement during these two years, which resulted in a considerable loss, and made the Board anxious to get rid of their charge.

The farm has a gross acreage of 84 acres, from which, after deducting 2 acres for roads, tanks, &c., there remain 82 acres available for cultivation. On taking possession of the farm, Colonel Jones was assured by every one that the land was saturated with sewage, that a larger extent was required for irrigation, and that the grass produced was rank, and unfit for cattle. Subsequent experience, however, has proved to him that these statements were incorrect. One grave defect in the previous management of the farm was the public nuisance caused by the use of a wide, deep, and uneven ditch for a sewage carrier, running as it did immediately beside a public footpath which traverses the whole extent of the farm; for this was at once substituted a 12-inch sanitary pipe in the adjoining field, with a syphon across a road, and slide junctions at intervals for letting out sewage as required, thus removing all cause of nuisance.

About two acres of this farm were prepared and used as filter-beds, on the Merthyr plan, during the first year; but it has subsequently been found unnecessary to waste any of the liquid sewage by such means, as it can always be used to greater advantage in wide irrigation.

The greater part of the sludge is sold to neighbouring farmers, at a rough estimate of 1s. 6d. per ton, after about three weeks' air-drying by the side of the tank, but the remainder is carted and spread upon adjacent land which lies above the level of the sewer-mouth. Colonel Jones's experience coincides with the analytical relative values commonly assigned to sludge and liquid sewage, and he finds, as might have been expected, that the latter produces its best results upon a good root of Italian rye-grass. This has yielded seven or eight crops per annum, with a nearly constant net profit of 15*l.* per acre over the whole area in Italian rye-glass, which has expanded each year with the market for this new commodity, from 3 acres in the first up to 17 acres in the fourth year from its introduction to the notice of Wrexham horsekeepers. . . . .

As a proof of Colonel Jones's confidence in the advantages of sewage irrigation, it may be added that he recently offered to take a lease of the West Derby Farm (200 acres, with sewage from a population of about 20,000) at the usual rent of adjoining land, proposing to occupy his spare time in superintending this new farm, in addition to the one which he has now got into pretty regular working order at Wrexham, although the two places are separated by about thirty miles of railway.

The Beddington Sewage Farm.

The following paper was submitted by Dr. Alfred Carpenter:—

It will be interesting to this Conference to know the actual cost which the Beddington Sewage Farm has entailed during the past ten years upon the ratepayers of the parish of Croydon. I obtained the information as to the actual figures from the accounts which have been year by year published, according to law, by the Local Board of Health, and which accounts have been audited by the Government auditor. They show receipts and expenditure only, and are not a correct view as to profit and loss, such as an accountant would draw out, but they show the real burden which has been entailed upon the parish of Croydon by the utilisation of the sewage upon land. There will not be much difficulty in apportioning the items to their proper position in the matter.

The first portion of the farm was laid out as a sewage farm in the year 1860; it was taken on lease by the Board when they were in great straits and under heavy penalties; the then leaseowner was paid out at some cost, and the land laid down for the purposes of irrigation in the cheapest possible way. It was then leased for a term of years to Mr. Marriage. The accounts as published commence with a simple statement of receipts from Mr. Marriage, and of rents paid to the ground landlord. How Mr. Marriage fared cannot be shown, but if his evidence, as given to the Commissioners appointed to investigate the subject of the utilisation of sewage, is to be considered as correct, he was not dissatisfied with the result. In addition to these simple sums, there is a charge on the one side of wages paid to a herd of foremen employed by the Board, who made a daily report as to the condition of the effluent water at the outfall, and also the costs incurred in straining the sewage of its more solid matter before it passed on the land. On the other side is placed to the credit of the Local Board the sum which accrued by the sale of the solid manure thus obtained.

The year 1871 shows a great increase in the amounts. The rapid growth of the town of Croydon soon made the 300 acres which were used for the purpose quite unable to cope with the quantity of sewage which reached the outfall. It became necessary for the Board to acquire extra land. The negotiations for this purpose were conducted as such negotiations generally are when the negotiators are bidding for popular favour. The shadow is grasped instead of the substance, and the interests of the parish were sacrificed. Everything connected with this negotiation was publicly known, the owners of the property knew the position of the Board, and, with their own agents among the members of the Board, they knew how much rent it was possible for them to get, without any reference to the real value of the land. The Board, advised by their engineer, declined to deal with Mr. Marriage, but leased the whole of the farm to a company, which was ostensibly got up for the purpose of taking it over, and was called the Croydon Sewage Farming Company. Arrangements were made that the company should pay rent in advance, on somewhat corresponding terms with those under which Mr. Marriage held the land, which appeared to make the Board stand in the position of receiver of rents, paying them over at the end of each quarter to the ground landlords. The company paid no valuation for going in beyond sums for ordinary fixtures and small matters left in the land by Mr. Marriage. The company commenced their work with a real capital of 1,500*l.* (the nominal being 10,000*l.*), sufficient to pay the first quarter's rent. They borrowed money of their bankers to pay their wages' sheets instead of making calls, paid handsome sums to their directors, clerks, managers, and other advisers; then 15 per cent. dividend on their first year's work, nothing whatever on the second, and collapsed altogether on their third. The Board had then to step in and become the actual managers of the farm, after it had been allowed to get into a ruinous condition by those who were totally incompetent to look after so large an interest. Good fortune, however, even now did not forsake them, for while they paid no valuation on going into the land, the lease had been so drawn that when it ended they were to receive a valuation according to the custom of the country, and under that clause the arbitrators and umpire again saddled the Croydon ratepayers with an enormous sum as valuation; and in the payments for 1874 figures the sum of 5,238*l.* paid to the receivers of the farming company,—a large portion of which ought never to have been paid at all,—consisting of items for rye-grass cultivation, rents, and fallows, which were not paid for when the company took possession. However, the substantial shareholders in the company were some of the inhabitants of Croydon, and they got back a large part of that which they had invested, notwithstanding the heavy items with which the management has been weighted. The tables show that the receipts which have been obtained by the Local Board, amount to the aggregate sum of 39,317*l.* 14s. 3d., whilst on the other side the payments have been 50,605*l.* 13s. 4d. This total shows a balance against the ratepayers of 10,891*l.* 19s. 1d.; this item, however may be fairly reduced by the sum of 5,450*l.* 2s. 7d., which was the valuation of the stock, produce, and fixtures on the farm, on the 25th of last March, according to a valuation made by the farm manager, and which is on the basis of that allowed to the company. This table gives, therefore, an average loss of 500*l.* a year. I have appended the details of the past two years, from which it will be seen that a local board labours under very great disadvantages in carrying on a business like a farm. The wages sheet alone will prove this, for there is no one whose pecuniary interest it is to keep down the expenses. Idle hands are retained, and every man's

hand is against the Local Board, and in favour of the private individual, whilst the managers themselves, as soon as they become aware of the work that is before them, make violent enemies of those men whom they have prevented from fattening on the rates. But they make few active friends among the better class of the community, who decline to take part in local politics. The result is that at the next election the management is changed, and most of the advantages of former experience are lost. Still, notwithstanding all the disadvantages of the case, and taking the last year as a guide, it will be seen that the balance against the parish upon the working of the farm is 2,317*l.* 13s. 8d., but against that may be set off the increase in the value of stock upon the farms, which amounts to the sum of 775*l.*, leaving a charge upon the rates of about 1,542*l.*; this amounts to the sum of a little more than one penny in the pound upon the rating of the parish.

It is right to mention that no account is taken of the purchase of sixty-five acres of the land in question, which is now the freehold of the Local Board. For this land 8,000*l.* were paid, and a rental should be charged on account of it. Nothing is charged in the accounts for expenses incurred in laying out the land in the first instance, which cost 4,010*l.*; and no account is taken of the first outlay for sewers. These would have to be made under any system of sewerage, and should not be taken account of in weighing the pecuniary merits of a sewage farm. If, however, it would be thought right to charge for laying out the land, and a rental for the freehold, a further sum of 750*l.* a year must be added, raising the total cost of the farm to a rate of something under 1¾d. in the pound upon the rateable value of the parish. Against this, however, may be put, as a set-off, the fact that there are expenses which have been incurred in the first years of the farm of the character of unexhausted improvements, which will, year by year, be adding to the income, whilst the expenditure will not again recur. I should have said that the land is leased for twenty-one years from 1871; long before that time is out I trust the utilisation of sewage will be so understood as to render it unnecessary for a renewal of the leases upon the present onerous and unsatisfactory basis. If the whole of the land had been obtained on the same terms as were the fifty-six acres before alluded to, the whole of the sewage of Croydon would have been utilised without any cost at all to the inhabitants of Croydon; and even now, if the farm could be managed in a satisfactory manner, the receipts would be quite equal to the payments, notwithstanding the rental of 10*l.* an acre, which has to be paid for a large portion of the land.

One word, in conclusion, as to the effect upon the health of the district in which the farm is situated. The last return of vital statistics shows that 26 deaths and 60 births have been registered as occurring in the sub-district during the past half-year. This fact bears a most important relation to the working of the farm. The neighbourhood is yearly increasing in population, rateable value, and general health, notwithstanding the fact that during the past year the farm has had to provide for and utilise the sewage of a very large number of persons who have suffered from typhoid fever,—a fever which has been mainly induced in Croydon through an interference with the water-supply of the district. The births in Croydon itself for the month ending April 29th last have been 96, whilst the deaths have numbered 35, and typhoid is now entirely absent from the list. The farm has, however, utilised and rendered innocuous all the typhoid excreta from nearly 1,000 cases which have reached it since January, 1875, without the least injury to the inhabitants of the sub-district itself; but that part which was retained in badly-constructed sewers in Croydon, and had an opportunity given it to change the form of its elements, produced much mischief to those who had the misfortune to live upon the lines of the badly-constructed and imperfectly-ventilated sewers. My own impression is still, that the sooner sewage is conveyed to the country and at once utilised the better for the town. The receipts and vital statistics now published, I think, prove that it is also no drawback to the land itself. There is one other point worth mentioning, as decreasing the value received from the farm,—the great amount of water which has had to be dealt with during the past year has decreased returns. Excessive flushing of sewer and heavy rainfalls, much of which still passes into the Croydon sewers, have taxed the land to the uttermost. This year will see an improvement in that direction; a large part of the surface-water will be abstracted from the sewers and sent into its proper channels. The market gardening also has been given up in consequence of the impossibility of a local board dealing properly with such grounds. I look, however, to the accounts for the year now commencing as likely to give a better idea of what a sewage farm will be able to do under present management than any that has as yet preceded it.

Notes on the Eton Sewage Farm.

Eton, with an urban sanitary district of about 3,500, including the school, was the first town on the upper Thames which diverted its sewage from the river. It is drained on the separate system, viz., the exclusion of all surface and storm waters from that of the sewage; this exclusion has been successfully effected, although the exclusion of subsoil waters, owing to broken pipes or imperfect joints, has not been quite so successful, as in the case of subsoil water being raised by floods, an addition of about one-fourth the time required for pumping is necessary.

The receiving tank is situated about 1,000 yards below the nearest houses in the district, 600 yards above the tank is an outlet to the river for use only in cases of absolute necessity, but which is not now required, as the engines and pumping machinery are in duplicate. The rising main that carries the sewage to the farm is 1¼ mile in length, about 80,000 gallons being pumped through daily, taking on an average from five to seven hours, which time is divided between the morning and the afternoon.

The farm, consisting of about 40 acres, of which some 30 acres only are laid out for irrigation, is situated at a distance of half a mile from the river; the soil is very light, with a depth from 1 ft. to 3 ft. of vegetable mould (irregular from levelling), overlying fine alluvial gravel and sand, the upper surface about 10 ft. to 12 ft. above the ordinary level of the river; one-third of the land laid out for irrigation is cropped with rye grass, one-third with root crops, and the remaining third with cereals; this last, however, not being irrigated; thus it will be seen about 20 acres only are irrigated in each year.

The Rev. C. Wolley Dod, chairman of the Eton Local Board, to whom the Conference is indebted for these notes, states that the system has now been in succesful operation for six years, yielding an annual profit from the working of the farm of about 120*l.*, equal to a rental of 3*l.* per acre. Milk (fed on the sewage grass) is said to be of very good quality.

At a depth of about 8 ft., more or less, the subsoil water is reached, yet under no circumstances is there ever one drop of effluent water from the land. Agricultural pipes laid some 4 ft. deep in a road across the middle of the farm never run a drop; in fact, everything put on the land, even in the wettest weather, is absorbed at once: a whole day's pumping of 80,000 gallons has been run upon a space of about 3 square chains, when all disappeared in less than an hour after pumping had ceased.

It is found very difficult to distribute the sewage evenly; in winter, when no growth has taken place, as also in summer, with the root crops a large proportion of the sewage must escape root action, and descend to the subsoil unpurified, except by filtration through the soil and gravel. What then becomes of it is a problem of great importance, although in the comparatively small quantity dealt with at the Eton farm, on so large a surface, the question hardly arises; yet as towns in the Thames valley seem to be for the most part adopting the system of sewage irrigation, and in consequence of the disappointing results financially of sewage farming, will probably be disposed to put as large a quantity of sewage as possible on a small surface of land.

We gather, therefore, from the above-mentioned facts, taking the population of the district in rough numbers at 3,000, that 1 square chain will absorb the sewage of 1,000 people, thus giving with sufficient pumping-power an absorbing capacity of 10,000 gallons per acre in six hours, or 40,000 in the twenty-four hours; but of course this could not last.

The subsoil water is generally presumed to flow in a course more or less parallel to the river, although no positive proof of this is obtainable. It is stated in a paper on the subject by Mr. Menzies, that at Old Windsor he found the subsoil water moving parallel with the river at the rate of about half a mile in the twenty-four hours but his experiments, he also mentions, were made when the river was rising rapidly. The question is an important one, whether the sewage, after sinking vertically to the subsoil water, at a depth of 8 ft., continues to sink, or at once begins to flow horizontally. The permeable strata underneath are of unknown depth. The alluvial drift is estimated in the Ordnance Geological Report at from 30 ft. to 60 ft., immediately below which comes the chalk.

Last year attempts were made at Eton to trace the course of the upper subsoil water; holes were dug on the farm to the subsoil, and filled with sewage, into which was put chloride of lithium. Samples of the water from the neighbouring wells, examined with the spectroscope, gave no result; holes were then dug within a few yards of the first holes, but the subsoil water from these showed no trace of lithium; it is possible, however, that the chloride of lithium may have been converted into the oxide or carbonate, and so remained fixed. The experience at Eton, therefore, rather leads one to suppose that the width and depth of the volume of subsoil water all round the farm is so great, that the effect of the sewage, so far as analytical tests are concerned, would be lost almost directly, and that samples of the subsoil water taken on the line of its flow, 100 yards above and 100 yards below the farm, would not show any appreciable difference.

Mr. Whitehouse, the surveyor to the Local Board of Eton, said, in reply to a question by the chairman, that the statements in the foregoing paper were correct.

Precipitation Processes at Coventry, Nuneaton, and Kenilworth.

Mr. J. C. Melliss, C.E., described the treatment of sewage according to the processes of the General Sewage and Manure Company (Limited), at Coventry, Nuneaton, and Kenilworth. It appears that previously to the construction of the present works, the whole of this sewage was, in an undefecated state, cast into the river Sherburne, at a spot a mile from the town. It rendered this stream black and disgusting, and a terrible nuisance to the neighbourhood, as well as a great source of danger to health, inasmuch as the sewage, at some few miles' distance, found its way into the source of the water-supply to the town of Warwick. All this has now been remedied; the river Sherburne has been so purified that fishes have returned to its waters, the Corporation of Coventry has been relieved from litigation and annoyance over its sewage, and, with the surrounding landed proprietors, is perfectly satisfied with the results obtained.

The following brief account of the operations will explain the works and various processes by which this has been accomplished.

In selecting the site, advantage has been taken of a small fall (about 6 ft.) in the nature of the ground, to avoid the costly expedient of pumping the sewage, and to work it throughout by gravitation. A narrow strip of comparatively valueless land along the border of the Sherburne, in extent about thirteen acres, has been thoroughly drained, embanked against the rising of the river during floods, and made available for the whole of the works. The sewage is subjected to four processes, viz.:—1. Strained; 2. Chemically treated and precipitated; Effluent water filtered; 4. Precipitate or sludge, dried and disposed of.

The straining is effected by means of mechanical strainers, known as "Latham's Solid Sewage Extractors." The solids thus removed form a rich manure, which, at the present time, is used in the orchard adjacent to the buildings of the works. The strained sewage thus free from all its grosser contents, and, therefore, in a better condition for chemical treatment, next passes through a block of buildings, where it receives continuously an addition of a solution of sulphate of alumina, manufactured and prepared in a cheap way at the works, which contain all the necessary appliances for this purpose. The sewage next receives a small addition of milk of lime, and, after the addition of each chemical, the whole mixture is thoroughly agitated. The mixture then passes on to the precipitating tanks, of which there are four, three being in use at the same time, while a fourth is being cleaned out daily. Precipitation takes place in these tanks while the effluent water flows in a thin sheet from the surface, first, over weirs extending quite across the tanks; and, secondly, over weirs which extend halfway across each tank.

An arrangement of sluices and valves exists at the end of each tank for drawing off the water from the precipitate or sludge when the tank has to be emptied.

The effluent water is conveyed from the tanks by a culvert and open carriers to filtering-beds, of which there are three, each three acres in extent; the water then percolates through a depth of 5 ft. of earth, and is afterwards discharged through three 15-in. mains into the river. This water is clear, bright, and of a good standard of purity, and, according to analysis by Dr. Voelcker, contains in each imperial gallon, 45·22 grains of solid matter, and only ·630 of a grain of free (saline) ammonia, and ·042 of a grain of organic (albuminoid) ammonia.

The filter-beds are used intermittently, and are cropped with osiers and rye-grass. The latter is pleasing to the eye, and assists in keeping the beds in good condition.

The sludge or deposit found on the bottoms of the precipitating tanks, after the water is drained off, contains about 85 per cent. of moisture, and amounts during 24 hours to about 25 tons. It is one of the chief characteristics of this process that scarcely any solid matter is permitted to enter with the chemicals. The sludge, therefore, is almost entirely derived from the sewage, and is thus reduced to a minimum bulk. This fact renders it much less difficult, and less costly to dispose of than the large quantities of sludge which result from the lime and other precipitation processes, which require large quantities of chemicals with their solid portions to enter the sewage.

The sludge is swept from the bottoms of the precipitating-tanks into underground chambers placed below their level, in which simple arrangements exist for drawing off supernatant water; it is then elevated by ordinary chain and bucket elevators, and passed through Milburn's continuous sludge-filters, which, without the application of heat, remove about 20 per cent. of moisture, and reduce its bulk to about 10 tons per day. The sludge in this somewhat stiff condition, containing about 65 per cent. of moisture, is next subjected to a comparatively small amount of heat in Milburn's sludge-drying machines, which remove a further 5 per cent. of moisture. It is a remarkable fact that this sludge thus treated, and having been once subjected to heat, continues afterwards, when placed in heaps, to part with its moisture until it retains only nine or ten per cent.

By these means the daily precipitate at Coventry is converted into about 4½ tons of a dry manure. This manure, according to analysis by Dr. Voelcker, contains, in addition to other fertilising agents, 1·67 per cent. of ammonia, and 3·75 per cent. of phosphate of lime, and may be valued according to chemical values at 35s. or 40s. per ton.

The whole of the sludge is not, however, reduced to a dry condition in the manner just described. Some portion of it is, after passing the non-heating continuous filter, fortified and dried by the addition of chemicals and fertilising agents; thus producing a good manure which is brought up to an average value of 5*l.* or 6*l.* per ton, and competes well with the best artificial manures produced in this country. A considerable quantity of the sludge is also, in the stiff and semi-dry state in which it comes from the non-heating continuous filter, bought and carted away by the landowners in the neighbourhood. By these several modes the whole of the sludge can be disposed of, partly by local and inland arrangements, and partly by exportation; and thus is avoided the one great difficulty of all other precipitation processes.

The sale of sewage manures has undoubtedly been slow and gradual, they did not at once find a ready sale; but now that the price demanded is a fair one, and confidence in their value, so long disturbed by exaggerated statements, is restored, there is every reason to believe that the whole of the sludge can be utilised and sold.

The cost of purifying the entire sewage of Coventry, in the manner thus described, inclusive of rent of land and interest on capital, and without deducting any receipts for sale of manure, is about 1s. 7d. per head of the population, per annum. Taking, however, into account the chemical value of the manure produced, the cost would be about 2d. per head per annum. In either case, the primary cost of purifying sewage at Coventry is considerably less than that of disposing of it by irrigation. There are many instances which prove this, but the following will at present suffice. The sewage of Warwick and Leamington is disposed of by irrigation; neither of these towns has a manufacturing population, and consequently a sewage less costly to purify than that of Coventry, but in the former town the cost appears to be 3s., and in the latter, exclusive of the privilege of putting the sewage on to 1,000 acres of Lord Warwick's land, about 1s. 6½d. per head of the population, per annum. In other places the cost appears to be as follows:—Banbury, 1s. 7d.; Northampton, 1s. 8½d.; Tunbridge Wells, 5s. 3d.; Croydon, 2s. 1½d.; Merthyr Tydvil, 1s. 8¾d.; Norwich, 3s. 6d.; Eton, 5s. 1½d., per head of the population, per annum.*

The success attending the purification of the Coventry sewage is testified to by those having property along the banks of the river, tenants of Lord Leigh, lord-lieutenant of the county, and others, as published correspondence shows. It is also strikingly evidenced by the fact that two manufacturers at Kenilworth (one a tanner, discharging 5,000 gallons, and the other a fellmonger, discharging 50,000 gallons of refuse daily into the Finham brook, which, like the Sherburne, is one of the tributaries of the River Avon), have taken a licence of this company, and are now erecting the necessary works to purify, at their own expense, their refuse by the same processes as are used at Coventry. The cost of purifying the tanner's refuse will be about 10d., and that of the fellmonger's about 2s. 6d. per day, leaving altogether out of consideration the value of the precipitated matter.

Coventry, its Drainage and Sanitary Condition.

The following paper, by Mr. E. A. Purnell' City Surveyor of Coventry, was taken as read:—In the year 1850, Coventry, like many other places, was compelled to take steps to improve its sanitary condition; the first step was to have a good survey made of the city, which was done by the Ordnance surveyors; and upon its completion, the late Mr. Ranger, C.E., was engaged to devise a scheme of sewage which was completed in 1854, the outfall being into a small river called the Sherburne, about one mile from the town. As the private drainage works developed themselves, great complaints began to be made about the foul state of the river, and in 1857 it was decided that filtering-tanks should be constructed, which was done, at a cost (including four acres of land) of about 4,000*l.* In 1858 these tanks were completed and used, the sewage passing through vertical filters, composed of coarse gravel, about 3 ft. in thickness; in addition to this, the lime process was adopted, but after being tried for some considerable time it was abandoned, not much benefit to the river being derived from it. As the present drainage increased, so did the complaints about the effluent water, and in 1865 a meeting of the landowners along the course of the Sherburne, below the outfall works, was held at the King's Head Hotel, Coventry, and a request made from them to the Corporation requiring an abatement of the nuisance. Things went on in the same unsatisfactory condition until 1868, when the Corporation purchased about 267 acres of land for the purposes of irrigation; this land adjoined the outfall, but the greater portion of it is hilly, and the sewage would have had to be pumped to a height of 150 ft. Mr. Thomas Hawksley, C.E., was employed by the Corporation to report upon the cost of laying out the land as a sewage-farm, but his estimate was so high that the Corporation shrank from embarking in so serious an undertaking, and matters still remained as they were. In 1869 the Corporation advertised the farm and sewage to be let on lease, unavailingly; for, although several applications were made, nothing came of them. In 1870 proceedings were threatened by the landholders adjoining the river, and the Corporation entered into negotiations with the Peat Engineering Company, and also the A B C Company; but, after long correspondence, they were abandoned by both companies. At this time Dr. Anderson commenced experiments at the works, and in 1872, the General Sewage and Manure Company, having arranged with the doctor for his patents, made arrangements with the Corporation for a concession of the sewage to the company for twenty years. In 1873 the works were commenced, and in April, 1874, they were completed. A detailed description of the buildings, and mode of manipulating the sewage, will be found in the *Builder* of the 26th of February last.

The works have now been in operation for two years, and during that time no complaints have been made by the landowners; in fact, the company's operations have had a most beneficial effect upon the river. With respect to the financial results, I am unable to give any information, as, although the company have placed their books at my disposal at any time, I have been unable to avail myself of their offer.

A few facts concerning Coventry may not be uninteresting. The population of the city is 40,000; rateable value, 101,000*l.*; cost of sewage, 33,000*l.*; number of water-closets, 4,510; number of privies, 800; and the effluent sewage, as ascertained from gaugings, extending over a period of fifteen months, was 1,800 gallons per day; this quantity, in consequence of building operations, and a great improvement in the city, no doubt amounts now to 2,000,000 gallons per day.

The city is supplied with water from artesian wells, sunk in the new red sandstone, four in number; one of 410 ft., one of 300 ft., and two of 75 ft. in depth. Thus water rises in a tank, 100 ft. in diameter, and 16 ft. in depth, and is pumped to a height of 140 ft. into a service reservoir, commanding the highest part of the city. The number of houses supplied is 8,419, and the average quantity of water 700,000 gallons; no charge is made for water-closets. The cost of the water-works was about 36,000*l.*

We propose, next week, to notice some other papers read before the Conference, as well as to give a condensed report of the discussions which ensued on the foregoing and succeeding papers.

* These figures are obtained from a return of sewage purification compiled by the Corporation of Rochdale, the published accounts of local Boards, and other public documents.

VALUE OF SHARES IN THE NEW RIVER COMPANY.

AN unusually large company of capitalists and others were present at the Auction Mart, Token-house-yard, on Friday, the occasion being the sale, by Messrs. Fox & Bousfield, of twenty-one shares in the New River Company, known to be one of the most prosperous water companies in the metropolis. The property consisted of one fully paid-up 100*l.* share, and twenty 100*l.* shares, on which 60*l.* are paid. The latter were divided into ten lots of two shares each. The particulars stated that the company was the most valuable trading corporation in the world, with a revenue which had the security of Consols. The dividend last Christmas was ten per cent. on water rents, in addition to which there was a further dividend from the rents of land and houses belonging to the company, and the revenue was constantly increasing, which rendered an augmented dividend a matter of certainty. In order to set before them the continually-increasing revenue of the company, the auctioneer stated that the income seventeen years ago was 150,000*l.*, and that last year it was 258,000*l.* A gentleman present inquired if a call of 10*l.* per share was not about to be made. The auctioneer replied in the affirmative, but observed that it only served to prove the increasing value of the property. The call was required for the execution of new works which were now in course of construction, in order to furnish the additional water supply, in constant demand; and it must be borne in mind that while the call was made at par the shareholders had a certainty of receiving ten per cent. dividend upon the amount. He believed there would soon be a still further call, and he was certain the shareholders would be glad to pay it. The shares were then submitted for sale, the first lot offered being the 100*l.* share fully paid up. The first bid was 200*l.*, the biddings following upon each other in rapid succession until 300*l.* was reached, at which sum the lot sold, being 200 per cent. premium. The next ten lots in two shares each, of 100*l.* and 60*l.* paid, were offered in succession, and realised 235*l.* and 240*l.* per share each, representing a premium somewhat higher than that realised by the first lot. The purchaser of the first two shares offered to take the whole of the remaining lots at 235*l.* per share, but this proposal the auctioneer was unable to accept.

Society for the Encouragement of the Fine Arts.—A *conversazione* was held on the 11th of May at the Picture Galleries, South Kensington Museum. A morning meeting, on Thursday, the 8th of June, will be held at Dorchester House, Park-lane, W., by permission of Mr. Holford, between the hours of eleven and two.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting on the 2nd of May, the paper read was on "Fascine Work at the Outfalls of the Fen Rivers, and Reclamation of the Foreshore," by Mr. W. H. Wheeler, C.E.

It was stated that the four rivers which take the drainage of the Fens of Lincolnshire and Cambridgeshire, and the lands bordering thereon, discharged into an estuary filled with large beds of shifting sands, and that in order to secure an outfall for these rivers it had been necessary to train their channels through the sands. The most economical way of accomplishing this had been by means of training walls, constructed of fascines and clay and chalk. Very beneficial results had followed from this training and straightening of the outfalls, and the low-water mark had been lowered several feet. The advantage of confining the rivers to one course was shown by the fact that when in the trained portion of the channels there was a depth of 10 ft. at low water, below it there would be a depth of only from 2 ft. to 3 ft. The faggots used for building the training walls or jetties were made from thorns cut from the hedges, tied together with tarred string. The length of each faggot was 6 ft., and its girth 3 ft. These were thrown into the water from barges and weighted with clay, layer after layer being thus placed, until the jetty was brought up to half-tide level. The depth of water in which these jetties had been built varied from 10 ft. to 20 ft., the top being about 6 ft. above low water. The base of a jetty 16 ft. high was 22 ft. wide, and the top 13 ft. The cost per lineal foot for the work done on the Witham averaged 19s. 3d., or 1s. 8d. per cubic yard, the details of which were given. The thorns and clay together formed such a compact mass, that the jetty was able to withstand the force of both the ebb and tidal currents, and was a cheap and effective means of carrying out the training of these rivers.

After the formation of the jetties, the sand and silt accumulated at the back, and ultimately grew into green marsh. The accretion of land was gradually taking place all along the foreshore of the Wash, but to a much greater extent on the Lincolnshire than on the Norfolk coast. The process of accretion was very slow, unless assisted by artificial means. A marsh, under favourable circumstances, would reach a stage fit for enclosure in about thirty-five or forty years. The process of accretion might be hastened by placing faggots across the foreshore to break the force of the water and so assist in the deposit of warp, and by inoculating the ground with sods cut from the adjoining marshes. The value of the salt marshes for feeding sheep before enclosure was from 5s. to 6s. an acre, and the value of the freehold 20*l.* The cost of enclosure was from 15*l.* to 20*l.* an acre, and the value of the land after enclosure from 50*l.* to 60*l.*

VENTILATION.

SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held on the 1st of May, in the Society's Hall, 6, Westminster-chambers, Victoria-street, Mr. V. Pendred, president, in the chair, the first paper read was "On Flues and Ventilation," by Mr. A. H. C. Trewman.

The second paper read was "On the Ventilation of Buildings," by Mr. J. W. Pearse, and in which the author described some of the leading appliances for that purpose. He first referred to the vertical system of ventilation revived by Mr. Tobin, in which fresh air is admitted into the room by vertical pipes communicating with the outer air and reaching nearly to the ceiling. In this system holes or slots in the lower rail of the upper window-sash are, in some cases, substituted for the vertical pipes. Mr. James Livesey, the author observed, purified the air before allowing it to enter the room, by causing it to be deflected on to the surface of a tray of water, which also had the effect of cooling it. Mr. John Currall, in his system, makes an aperture in the lower part of the window for the admission of fresh air, and another in the upper part for the escape of foul air. When there is a chimney in the room he introduces the fresh air by an aperture in the lower part of the door, and takes off the vitiated air by a ventilator in the chimney breast. Mr. M. J. Landan has designed a ventilating cowl, terminating at the top in a series of horizontal annular plates. The wind blowing across the plates induces a current up the shaft. Fresh air is admitted by a horizontal pipe closed at the outer end, but provided with annular plates and fixed in an outer wall. For extracting foul air from buildings or drains, Mr. E. G. Banner has invented a swivelling cowl, which has a bell-mouth, and is always directed towards the wind by a vane. The shaft is continued by a bend inside the tail of the cowl and swivelling with it. There is an annular space between the two tubes in which the air entering the bell-mouth is compressed, its subsequent expansion inducing a current up the shaft.

METROPOLITAN COWSHEDS AND DAIRIES.

The following are the chief points in the proposed bye-laws for the regulation of the metropolitan cowsheds and dairies, which are now under the consideration of a sub-committee of the Society of Medical Officers of Health. The proposed rules were drawn up by Dr. T. O. Dudfield, M.O.H. for Kensington, whose labours in regard to the slaughter-house regulations have been considerable:—

Every cowshed shall be properly lighted and ventilated by louvred lights. The inner walls, doors, and woodwork shall be covered with hard, smooth, impervious material to the height of 5 ft. from the floor. The trough-manger shall be of impervious material, and sloped to allow of being easily cleansed. An impervious water-tank, closely covered, and provided with overflow-pipes unconnected with any drain, and the water procured from a water company where practicable. A proper place shall be provided for the storage of fodder, and where grains are used the receptacle shall be in two partitions to allow of cleansing, and shall be also properly drained. A properly covered place for the reception of dung shall be provided, made of cement, and thoroughly drained. No alteration shall be made in respect to paving, drainage, and ventilation, without the consent of the Local Sanitary Authority. No water-closet, privy, cesspool, or urinal, shall be within, or communicate directly with, a cowshed, and no inhabited room or workshop shall, on any pretext, be situated over it.

The space for each cow shall not be less than 800 cubic feet; single stalls shall not be less than 4 ft. in width, and double stalls 7 ft. 6 in.

In estimating the cubic space, no height of the shed in excess of 16 ft. shall be taken into account. The sheds shall be kept in good repair, and thoroughly cleansed at all times, and limewashed every three months at stated times. The dung to be removed daily in properly-constructed vehicles. No fowls or any other animals but cattle to be kept in the sheds. The other provisions are for the purpose of preventing the spread of infectious disease among cattle, and of prohibiting all persons who suffer from such diseases being employed in the cowsheds; the separation and quarantine of unhealthy cows, the storage of milk, and cleansing of the vessels which have been used; and provide that the sanitary authorities shall be duly informed in the case of foot-and-mouth and other contagious diseases.

The foregoing rules are to apply to the existing dairies. For newly-erected sheds and dairies, more stringent rules in the matter of isolation of the building, the providing of infirmaries and quarantine sheds for sick cattle, and depositing plans of proposed buildings with the authorities; the use of concrete flooring, and impervious material for lining the walls, is insisted upon.

Whether the foregoing regulations be adopted in their entirety or not, there can be no two opinions as to the urgent necessity which exists for the better regulation of the London and suburban dairies. As a conveyer of the germs of contagion, milk stands almost unrivalled.

UTILISING THE TIDE.

The tide, though a very bad master, is capable, like fire and the other great powers of nature, of being transformed into a most useful servant. That comparatively little use is made of it at present, every one will allow. Beyond floating barges and pleasure-boats up rivers, and helping larger vessels out of dock or harbour, the uses to which the tide has hitherto been put by man are very inconsiderable indeed. Yet its power is immense. This may be readily seen from the fact that for every square yard of tidal surface, a rise or fall of 1 ft. represents the rise or fall through half the distance of 5 cwt. Moreover, the power of the tide is as the square of the height to which it rises (measured from the preceding low-water line). Thus the rise of a square mile of tidal water 1 ft. in six hours is equivalent to the work of an engine of seventy-three horse-power; but the rise of a square mile of tidal surface 20 ft. in the same time, is equivalent to the work of an engine of 29,200 horse-power, because not only is the distance accomplished twenty times as great, but twenty times as much water is raised. Now the rise of the tide at London Dock varies from 19·39 to 22·82 ft., and at Sheerness, from 22·96 to 25·63 ft.; and between these two spots are miles and miles of tidal surface which are made little or no use of at all, except for purposes of navigation. What a waste of power is here! It is true, plans have been proposed, and in part adopted, for utilising the force of tidal streams. Mills with ordinary undershot water-wheels have been mounted on barges, so as to preserve the same degree of immersion, and so as to swing round as the current is reversed. But if this plan were adopted to any extent in such a river as the Thames, not only would navigation be seriously interfered with, but the dreaded floods would be rendered all the more probable. Any scheme which proposes to utilise the tidal force of the Thames must at least be devoid of these two faults. And that scheme is most likely to meet with approval which, whilst in no way interfering with navigation, actually lessens the probability of floods.

Embankments or river-walls of gigantic strength are things not unheard of on the banks of the Thames. To suggest therefore a river-wall standing some 25 ft. out of the water when at its lowest, need not excite surprise. The wall, however, must be strong enough to resist the pressure of the water as it mounts to the summit, and must be independent of any backing of earth for at least the last fourth of its height. For behind this portion it is proposed to make an extensive reservoir, to be filled by the tide every time it rises. The tide is to pour into this reservoir through flood-gates so constructed as to allow of ingress only. A second reservoir of equal size with the first, but occupying the lowest fourth of the tide's height, is to be constructed to receive the impounded water from the upper reservoir, and to return it to the river (when the tide is down) by flood-gates allowing of egress only. The scheme thus includes two reservoirs, one emptying into the other, with a clear fall between the two of half the tide's height. It will no doubt be easy to regulate the flow, so as to cause equal quantities of water to pass down in equal times, and to spread the whole over the time which elapses between one tide and another. And, what is of greatest importance, the water in falling may be made to turn any number of wheels (breast wheels or overshot) that may be deemed sufficient. Now by this method, we utilise only one eighth of the tide's force for any given area; for we gather into the upper reservoir only one fourth of the bulk of water raised, and we make use of it only during its descent. But it can be proved by experiment to be the least costly method that can be adopted in order to produce a given result, especially where land is cheap, as in the quarters of Kent and Essex adjacent to the Thames. Nor is the result a mean one if properly regarded. D. B.

UTILISATION OF SLAG.

An important process for the utilisation of slag has (according to the *Mining Journal*) recently been introduced on the Continent. The slag is reduced to a fine state of division, in which it becomes capable of a great variety of uses in addition to those for which it was originally supposed to be adapted: The channel through which the molten slag flows from the furnace is made, in this arrangement, to terminate in a running stream of water leading into a pit or excavation. On striking the water the lava stream of slag is blown and broken into a sort of fine porous gravel, which the flow of the water then bears along into the pit. Meanwhile the iron grains contained in the slag, which previously were separated by crushing, are now sorted out by this water process, sinking to the bottom by their weight instead of being carried on with the rest. The slag sand accumulating to the pit is charged thence into wagons or railway cars by means of an endless chain and buckets driven by an engine run by hot gases from the furnace. Thus treated the artificial sand or granulated slag is said to be not merely easier and cheaper to get rid of, but applicable to a number of valuable uses. One of these is for casting sand, pigs made in such a bed coming

out exceedingly bright. For this purpose the material is now very largely used in some parts of France, Belgium, and Prussia. The next step was a natural outgrowth of the last—to use the finer portions, separated by sifting, to sand the moulds for fine castings; thus employed, it is found cleaner and better than common sand, and the castings are improved. Another use to which this artificial or metallic gravel is put is that for ballasting railroad tracks, for which it is very serviceable. Being also very porous, packing well, and holding but little wet, this slag-sand forms a valuable concrete-like mortar, and not only this, but is capable of being used for cement. This is regarded, in fact, as its most important speciality, it being found that first-class cement can be thus obtained from almost any slag at a very small cost. Other uses for this substance are likewise mentioned, such as employing it upon land for the lime and silica contained, manufacturing fire-brick, &c., and enamelled bricks of different colours may be manufactured cheaply from this hitherto waste material, and this being the case its industrial value, under the hand of wise improvement, is likely to be very great.

ST. PAUL'S, CHEAPSIDE, AND LUDGATE-HILL.

A NOBLE monument of church architecture, St. Paul's, stands yet in its integrity, as erected by Sir Christopher Wren, on a plot of 2 acres and over 6 perches, according to an ancient registration. The whole area was inclosed by William the Conqueror, A.D. 1087; and at that period contained St. Gregory's Chapel, which stood on the east end, St. Paul's Cross, a hall, chapter-house, and various buildings; assemblies and wardmotes having been held there, although then outside the City precincts, which were immediately adjacent,—the statute of Magna Charta having been signed and proclaimed there. Outside the boundary on the east side stood St. Paul's school, and on the north the chapter-house. The inclosure is a scalene triangle, obtunded at the point next Ludgate-hill, and streets with houses of business surround the whole precincts.

Sir Christopher Wren laid out a plan of streets diverging from the east end towards the Bank and to London Bridge, evidently intending the north side as a continuation in nearly a straight line of the main thoroughfare to the Bank.

The first church built in the reign of Ethelred was destroyed by fire anno 1087; again, in the reign of Stephen, another fire ruined the then existing structure; and, lastly, the Great Fire of London demolished the large and imposing Gothic church which had been built in 1562,—thus making way for the genius of Sir Christopher Wren to found the present cathedral, of which the first stone was laid January 21, 1675, and the portals opened for service, December 2, 1697. Soon after, the commissioners projected the plan for an enceinture of massive iron railings, with six pairs of gates and heavy stone battlements, against which Wren most anxiously protested. This was in the year 1718, when in the eighty-sixth year of his age and in the forty-ninth of his professional career. Notwithstanding which the present railing, or rather "ironical fortification," was erected, and the great architect dismissed!

Viewing the rich and elaborately finished cathedral from either of the north or south sides, any observer must be struck with the incongruity of a hideous and meandering fence, which mars the effect of the finest architecture. The street on the south side descends towards Cannon-street, and the battlement or parapet walls stand 8 ft. higher than the pavement, the railing of 8 ft. in height being superimposed! On the north side, on the contrary, the pavement and footway are on the proper level, and a range of about thirty houses, but not in a straight line, borders a footway varying in width from 6 ft. to 14 ft. The driftway on this side also varies, being barely 8 ft. wide opposite the grand portal and steps, and varying from 24 ft. to 18 ft., and even to 15 ft. in its continuation from Ludgate-hill to Cheapside.

Comparison with any of the grand Continental buildings or cathedrals, which stand upon open plateaux, unobstructed by Gothish rails or fences, will at once demonstrate how our valued and splendid metropolitan temple is defiled and degraded by its surroundings.

Now the way to redeem and rectify so palpable an error is easy, and is perfectly under the control of the dean and chapter, who have already evidenced a regard for public interests by opening out the west end, next Ludgate-hill. Along the north side there is ample space for a grand thoroughfare, at least 40 ft. wide (besides footways) throughout its whole extent. The railing should be removed from the north-west angle, as far as the grand portal and circular steps, and foot pavement laid next the church, guarded by granite pillars and iron chains, as on the west.

From the portal to Cheapside eastward, there is ample scope of ground to practicate a driftway, say of 25 ft. additional width, leaving the four majestic plane trees standing on an interval of a 3 ft. reserve, between the old and the projected new thoroughfare, — this would give dignity to St. Paul's, whilst it would confer great advantages upon the trade of London, and the whole migrating community.

In the portion of this proposed line of enlargement lying west of the portal and steps there is no tombstone nor other intervention; but on the portion extending from the entrance to Cheapside there are three cist tombs, and perhaps a dozen flat and worn-out (hardly legible) grave-stones, the remains whereof might be removed into a suitable mortuary vault, to be interned in some unoccupied portion of the churchyard, no longer used for the sepulture of deceased citizens.

The first object in opening the line of thoroughfare herein indicated would be to "make straight the way"; the second, to curtail the route by 140 yards, the distance between Cannon-street and Cheapside being of that extent, which would be saved by opening out the north side in a direct line from Ludgate-hill.

An object not to be contemned would be the advantage gained by shops and business houses along the line; and having consulted several, the projector of this plan, who previously had (through the *Builder*) given his suggestions for the opening out of the western end, so far as the statue of Queen Anne, can with confidence state the majority of the residential proprietors are favourable to these suggestions.

By opening out this, the greatest, most central and thronged thoroughfare of London, the traffic might be divided, all wagons and loaded vans being restricted to the old route on the south side, and the noise of *roulage* might be wholly averted by adopting the new wood pavement; thus quiet could be assured for the divine services of our grand cathedral, and a free drive, with additional footway on the church side, secured for the public. QUONDAM.

HASTINGS WATER SUPPLY.

SIR,—In your issue a fortnight since an article appeared touching upon the above, and after leaning to the opinions expressed by "fully qualified correspondents," doubted the "discretion" of my assertions, which were published in my last annual report to the Town Council. The opinions of several of the "fully qualified (?)" correspondents are palpably indicative of a very "mushroom" knowledge of the "water" subject as a whole; and, as regards my own assertions, they were based upon evidence, the result of several examinations of the water, during the past winter months. The samples were brought to me officially, direct from the springs and reservoirs, having been collected in the usual careful and orthodox manner. In each instance the water was clear and pure. I have, of course, heard many complaints, and seen many bad samples produced for my inspection, which were procured from private houses. The impurities were in each case attributable to dirty cisterns, or some removable cause. All our water is "soft" and "chalybeate," therefore hydrated sesquioxide of iron is soon deposited on exposure, even in a small cistern. For this reason, among others, I advocated a constant service of spring water obtainable from our present water-shed, which service would do away with the objectionable deposit. I should be sorry to see our present "soft water supply" exchanged for a hard water. I have no doubt that more elaborate filter-beds and covered reservoirs will destroy and prevent the growth of any living organisms which are so rapidly generated in warm weather, even in distilled and the purest hard water. At all events, the public may rest assured that everything is being done by the Town Council to provide for the increasing demands of the borough.

CHAS. ASHENDEN,
Medical Officer of Health and
Public Analyst for the Borough of Hastings.

THE CONSTRUCTION OF THE BALL-ROOM IN FRONT OF GUILDHALL FOR THE PRINCE OF WALES FESTIVITIES.

DURING the last week or ten days upwards of 200 workmen have been actively employed in the construction of the new ball-room on the open area in front of Guildhall, for the festivities which are to be held on Friday next, the 19th inst., to celebrate the Prince of Wales's return from India. The structure is being erected, and entirely completed, including the interior decorations, by Messrs. Simmonds Brothers, of Newton-street, Holborn. The ground-floor portion of the structure embraces the whole of the area in front of Guildhall, and extends southwards along King-street, to the north side of Gresham-street, where is the main entrance. It is nearly 20 ft. in height, and strong logs of timber, formed into columns, support the ball-room floor above. The ball-room is 150 ft. in length, by 60 ft. in width, independently of two side wings, that on the south-east side overhanging Guildhall-buildings, and that on the south-west side extending in the direction of the adjoining churchyard. These wings are 40 ft. by 30 ft. The central portion of the ball-room has a clear span of 40 ft., with corridors on either side, 10 ft. in width. The latter are covered in by a lean-to roof on each side, whilst the central portion has a lofty clear-story. The ground-floor contains the crush-room and reception-room, and four staircases, 6 ft. in width, lead from the reception-room to the ball-room above. The elevation of the main entrance facing King-street, is castellated, and will be painted and decorated, as well as the whole of the interior, the walls of the reception-room and ball-room being ornamented with large mirrors. The structure is being erected under the direction of the City Architect.

RAILWAY BRIDGE, STEPNEY.

ENGINEERING operations of a somewhat complex character have been carried on at the bridge which bears the Blackwall Extension Railway over the Commercial-road at Stepney. These operations consist in the removal piecemeal of the old iron girder bridge and the substitution, piece by piece, of a new one without interfering with the railway traffic, which at that point is of a very heavy character. The construction of the new bridge will enable one footway of the Commercial-road to be widened about 18 in., the new abutment having been set back to that extent, and the old one cut away to line with it. The bridge is on the skew, and the main girders will not both be the same length; one will be 137 ft. and the other 135 ft. 3 in. long, and both 13 ft. 4 in. deep measured over the flanges and centre cover plates. The bridge will be 43 ft. wide, centre to centre, of main girders, and the cross-girders will be placed 8 ft. 8 in. apart and be carried on the bottom flanges of the main girders. Both main and cross girders are of the ordinary plate type. The rails will be carried on four strong wrought-iron rail-bearers, and near the main girders there will be platform-bearers, also of wrought iron. The contractors for the bridge are Messrs. A. Handyside & Co., of London and Derby, who designed the timber framing and its platform, the trestles having been arranged and placed in position by Mr. Langley, the engineer to the railway company. The work is under the control of Mr. E. Matheson, of the above-named firm, Mr. Norman Garrard being the contractors' engineer.

DANGER IN EARTHENWARE SYPHON TRAPS.

As any sanitary matter affecting the health of the community must be worthy of recording, may I be allowed to state that I have found several cases of glazed earthenware traps,—traps only in name, not in reality; for on close examination they did not dip sufficiently, and the foul gases had free escape. The public, and even our profession, take for granted that such things are made from a mould that is unerring. But I record my experience, as it involves serious results. ARTHUR LOADER.

Shaftesbury.—A discovery has been made here on the site of the ancient abbey of a stone cist or coffin having features and attributes of an interesting character.

PICTURE-MADNESS.

At Christie's, on Saturday last, a picture 59½ in. by 45 in., called a portrait of Georgiana, Duchess of Devonshire, by Gainsborough, was sold for 10,605*l.*, the largest sum ever given for a picture in those rooms. In 1839 this same picture was bought by a Mrs. Magennis for 50*l.*, and was sold by her to Mr. Wynn-Ellis for 65*l.* The oddest part of the incident is that some qualified persons deny that it is the work of Gainsborough at all. At the same sale a picture called the Temple of Jupiter in Egina, by J. M. W. Turner, was sold for 2,100*l.*, though some very good judges maintain stoutly that Turner was not the painter of it; and even those who believe in the correctness of the ascribed authorship admit that it is a poor example of the master.

WORCESTER GUILDHALL.

Sir Gilbert Scott, R.A., has reported strongly recommending the maintenance of the present Guildhall, and says all the municipal requirements may be met by additions at a moderate cost. Sir Gilbert says the building "is a genuine specimen of a style which has done special credit to the English school of architecture, which owed its development in a high degree to our distinguished architect, Sir Christopher Wren, and which is at the present moment honoured and cultivated by a large class of our best architects under the name of the style of 'Queen Anne.'" He considers that the building has very high merits of its own, independently of its history or its style, and says he has rarely passed by it without being struck by its dignified and almost august aspect, and without being strongly impressed with its incalculable superiority to the majority of buildings of our own day. Mr. Waterhouse, the architect specially consulted by the Council, in his Report, strongly recommends the preservation of the front, as "a very interesting piece of work of our forefathers."

THE PRIZES AT THE BELFAST ARCHITECTURAL ASSOCIATION.

At the closing meeting and *conversazione* of this Association, the Mayor in the chair, Mr. Robert M. Young, hon. secretary, read the report of the committee.

The report of the examiners was then read, and in it the prizes were awarded as follows:—

No. 1 Class—Two First Prizes—Thomas Duff, T. M. C. Johnstone.
No. 2 Class—1st prize, J. J. Phillips; 2nd prize, James M'Cammond.
No. 3 Class—1st prize, J. J. Phillips; 2nd prize, F. W. Lockwood.
No. 4 Class—Prize, J. M'Donnell.
No. 5 Class—1st prize, W. J. Gilliland.
No. 6 Class—1st prize, W. J. Gilliland; 2nd prize, T. M. C. Johnstone.
No. 7 Class—Prize, Mr. Alexander Anderson.
No. 8 Class—Prize, T. M. C. Johnstone.
The Vere Foster Prizes—1st prize, T. M. C. Johnstone; 2nd prize, E. Braddel; 3rd prize, F. F. D. Clarke.

Mr. Samuel P. Close moved, and Mr. Mackenzie seconded, the adoption of the reports.

Mr. Lockwood moved as an amendment that the adjudication in Classes 1, 3, and 5 be allowed to stand over until the committee could have a consultation with the eminent men who kindly acted as judges on the occasion.

Mr. Gilliland seconded the amendment.

The amendment, on being put to the house, was lost, and the reports were adopted.

The Mayor then distributed the prizes, and when he was doing so a large portion of the assemblage either applauded or hissed the successful competitors as they came forward.

Mr. Lockwood declined to receive his prize, as, he said, it did not justly belong to him.

On the motion of Mr. Watt, seconded by Mr. Vinnycombe, and supported by Mr. Lockwood, a vote of thanks was passed amid applause to Mr. Turner, Mr. Lynn, and Dr. Moore, who had kindly acted as judges. What does it all mean?

The Shakspeare Memorial.—At the annual meeting of the Stratford-on-Avon Shakspeare Club on the 25th ult. it was announced that Mr. Charles Flower, chairman of the Memorial Association, in addition to his previous handsome donation, has just given 100*l.* in furtherance of the memorial project. It is understood that the erection of the structure will be commenced when the design is settled.

A BRAVE WORKMAN.

We have much pleasure in recording an act of courageous self-control and presence of mind which may be compared with advantage to the honours won by deeds of daring on the field of battle. Two workmen were engaged fixing a lightning conductor on the summit of the steeple at Ville-sur-Ourthe, in Belgium. To accomplish this somewhat difficult and delicate task it was necessary that one of the workmen should stand on the shoulders of his companion. While in this position, a violent gust of wind made him spill some molten lead, which fell on the hand and forearm of his friend. Notwithstanding the sudden intensity of the pain thus inflicted, the victim of this accident had the courage to remain motionless while the lead burnt its way into his flesh. He knew that the slightest movement might suffice to precipitate his companion from a height of 70 ft. into the street below, and he bravely endured the pain rather than imperil the life of his fellow-worker. M. A. Karis, slater, at Anthisne, is the hero of this brave deed, and his name is worthy of public record.

THE CHARGES OF THE NEW RIVER COMPANY.

Major Wieland, the owner of very extensive premises in Queen Victoria-street, was summoned by the Commissioners of Sewers, at Guildhall, before Alderman Carter and Sir F. Wyatt Truscott, for having on his premises a well for domestic purposes, which was impure and totally unfit for such purposes.

Mr. Baylis, for the Commissioners of Sewers, said that Major Wieland was the owner of very extensive premises in Queen Victoria-street, and had sunk a well to supply them with water. That water had been analysed by Dr. Saunders, and it was found to be entirely unfit for domestic purposes. Major Wieland had applied to him for a postponement of the summons, on the ground that he was anxious to have the water analysed on his own behalf, and Mr. Baylis thought the request so reasonable that he could not resist it.

Major Wieland said that he formerly had water from the New River Company, but their charge for it was tremendous. On two houses they charged him 40*l.* a year each, and on another 82*l.* a year. From the construction of the building very little water was required for domestic and drinking purposes. He had, therefore, endeavoured to supply his premises with water independently of the company.

Alderman Carter said he was glad to hear it; the price the New River Company charged for water was outrageous.

Major Wieland said he had sunk a well, and put up a small steam-engine at an expense of 400*l.*, and had placed up a large filter, with all the modern improvements, for the water to be drunk. If that were not sufficient, he would adopt any suggestion Dr. Sedgwick Saunders might make, and would use any filter he might recommend. If he were compelled to use the water of the New River Company, it would make a difference to him of 1,000*l.* a year.

Alderman Carter said that he sincerely hoped he would not be compelled to do that. The charges of the New River Company, he repeated, were unbearable. Major Wieland has since found that the water is too impure for use.

MIDDLESBROUGH WORKHOUSE COMPETITION.

At the last meeting of Middlesbrough Board of Guardians the chairman explained the circumstances under which the Board were placed with regard to the new workhouse question. As they would be aware, specifications were issued of what the Local Government Board advised them would be required for the workhouse, and they advertised for plans for the same. Prizes were offered,—one of 100*l.* as a first; another of 50*l.*, as a second,—with the stipulation that every set of plans sent in should be accompanied with the estimate of some respectable firm, who would undertake to carry out the erection of the building, according to the specifications, to the Board's satisfaction. A building committee was appointed, the plans were carefully gone through, and it was decided to call in a professional man (Mr. T. Roger Smith, of London) to assist them in selecting the best set of plans. The report had been received, and the committee, on the motion of Mr. Gilkes, seconded by Mr. W. Bulmer, decided in favour of the plan marked "Alpha," for the first prize, and that entitled "Economy" for the second. The letters bearing the above mottoes were opened, and the design "Alpha" was found to have been submitted by Messrs. Perkin & Sons, architects, of East Parade, Leeds. The other letter was from Mr. Frederick Augustus Dovey, of 4, Kingston Parade, London, and of Manchester. The committee recommended the confirmation of these proceedings by the Board, that Mr. Roger Smith be written to and thanked for his assistance, and that the public be allowed to see the designs at the Workmen's Hall, during the afternoons of one week, from Friday, the 5th inst. Mr. Whitwell then moved the adoption of the minutes of the building committee. Mr. Moses seconded the motion, and it was carried.

The contractor's estimate on Messrs. Perkin's plan for carrying out the work was 28,450*l.*

The plans are to be laid before the Local Government Board at once.

COMPETITIONS.

New Church at Esclusham, near Wrexham.—Twenty-three sets of drawings were submitted under motto in the above competition from London, provincial, and local architects. The committee came to a decision on the 4th inst., when the plans of Mr. J. E. Lash, of Caxton Buildings, Wrexham, were selected, and the work will probably be commenced immediately. The building is cruciform on plan, having nave, chancel, north and south transepts, organ-chamber, and vestry, with heating apparatus under the latter. The principal entrance is at the west end. The seats are arranged to accommodate 350 worshippers. The style is the Geometrical.*

Rugeley Town-hall and Market.—At the monthly meeting of the Rugeley Local Board on the 2nd inst., considerable time was occupied in further examining the plans of the new hall and buildings, and the opinion of the meeting was taken upon each plan separately, which eventually reduced the number from 9 to 3,—viz., "Omega," by Mr. W. A. Bonney, of Rugeley; "Forward," by Mr. Foulks, of Birmingham; "Experientia Docet," by Mr. Dodd, of Reading. The meeting then further discussed the three plans, and concurred generally in selecting "Forward" as the most meritorious, subject to the same not exceeding the sum named (6,500*l.*), to include the clock tower, but the meeting postponed their final decision to a future meeting.

ARCHITECTS' RIGHT TO RETAIN DRAWINGS.

In the case of Holmes *v.* Haig, in the Glasgow Sheriffs' Court, the plaintiff, a builder, sued Mr. Haig, architect, to recover the working drawings and calculations for the erection of a block of houses erected by the plaintiff, and for which defendant had been paid. Mr. Haig pleaded the custom of trade that an architect should retain his drawings, and some evidence was given. The sheriff found that the custom of trade had not been proved, and ordered the instant delivery of drawings to the plaintiff.

The New Seamen and Marines' Orphan Home, Landport, Portsmouth.—This home was opened on the 20th ult. by H.R.H. the Duke of Edinburgh. The new building comprises commodious offices, with washing-house, ironing-room, &c., a drying-ground, leading to a playground, with a small garden. On the first-floor at the north end is the girls' school-room, of the same size as the dining-room below, with a class-room 24 ft. 9 in. by 15 ft. 3 in., sick dormitory, said to be well ventilated, 28 ft. by 22 ft., with nurses' room, bath-room, and lavatory. Another dormitory, 30 ft. by 22 ft.; another 40 ft. 6 in. by 15 ft. 3 in.; another to the south, 60 ft. by 22 ft., with matron's rooms attached, clothes-closets, and well-supplied bath-room, lavatories, &c. The upper-floor consists of nearly the same, except that a dormitory takes the place of the school-room below, and there is a convalescent dormitory over the class-room. The architect is Mr. Thomas Dashwood, of Ryde, and the builder was Mr. Ward. The cost has been about 8,000*l.*

* The authors of the designs with the mottoes, "Spe" and "Bona Fide," not having sent their names and addresses, their drawings could not be returned.

THE GENERAL UNION OF CARPENTERS AND JOINERS.

The forty-eighth annual report of the General Union of Carpenters and Joiners has just been issued. In it the secretary remarks:—It is with thankfulness that I have to record that, with very few exceptions, the building trade is in a very prosperous condition,—scarcely a man with a strong arm and willing heart has had to complain of want of employment. According to figures given we have 146 lodges with an aggregate number of 10,885 members, or an addition of five lodges and 1,184 members since our last annual issue. Now, I cannot help thinking that upon no previous occasion in the history of our society has there been greater cause for congratulation. We have our superannuation benefit to provide for. We distribute our thousands and tens of thousands in relieving our sick and suffering members, and those of us who may have the misfortune of being out of work; any of our members who unfortunately, by fire or other cause, are deprived of their tools, are compensated to the full value of them out of our funds. Those of our unfortunate brethen who, in their journey through life, are, from accidents or other causes, prevented from following their trade for a livelihood, we solace by placing a sum of money at their disposal, which by careful management may give them one more start in life. And we bury our members and their deceased wives with respectability. Our total income from all sources reaches the sum of 23,000*l.* 19s. 0½d., but owing to the re-arrangement in the time of closing our accounts, it is extremely difficult to give the exact proportionate increased income: still it is very perceptible that the income of the society is considerably above the ratio of previous years. The total expenditure of the society during the same period is 16,099*l.* 4s. 1½d. We have expended 1,251*l.* 9s. in endeavouring to compensate those of our members who have been out of employment. In endeavouring to relieve those of our members whom ill-health has unfortunately prevented from following their employment, in superannuating those who from old age are placed in a similar position, and in obtaining the necessary certificates, &c., 5,642*l.* 19s. 6d. have been absorbed. To carry out the system of insurance for loss of tools, the total outlay only amounts to the very small sum of 462*l.* 3s. 11½d. The next outlay is that occasioned by strikes; under this head 374*l.* 0s. 3d. have been expended. 850*l.* have been paid to those of our members who have, from accidents or other equally melancholy causes, been rendered unable to follow their usual vocations. We have lost during the past seventeen months 121 members and 86 members' wives, and the total amount of our funds expended for this purpose is 1,604*l.* 2,995*l.* 11s. 7d. have been devoted to the payment of the different officers of the society, and 2,918*l.* 19s. 10d. for rents of meeting-rooms, printing, and other necessary expenses to carry on the effective working of the union. Owing to the comparative exemption from prolonged strikes or extremely heavy calls upon the resources of our society, the natural consequence is a large augmentation of our accumulated capital, which now reaches 16,501*l.* 14s. 9½d., being an addition of 6,985*l.* 18s. 2½d. since the last annual report was issued.

MASTERS AND MEN.

Altrincham.—The bricklayers of Altrincham have applied for an increase of wages, the bricklayers asking for an advance of 1d. per hour and their labourers for an advance of ½d. In May, 1873, a code of working rules was drawn up, signed by six employers and six operatives, providing against strikes, and for the submitting of all disputes to arbitration. Three months ago, notice of an advance was served in accordance with the rules; and the employers, after consideration, offered the bricklayers 8½d. per hour, a ½d. per hour of an advance, and the balance in six months, or in case they refused this, to submit the whole matter to arbitration. To the labourers they offered 6½d. per hour, an advance of ½d. on their present rate, which is the rate of wages paid in Manchester. Up to the present time no arrangement has been come to. About 100 men will be affected.——The brickmakers have recently had a reduction of two hours per day, and on the 1st of June they will receive an advance of 1s. 3d. per 1,000 for making.

Bridlington.—The masons employed at the Cemetery works are now on strike. They have been in receipt of 32s. a week of 55½ hours, and now demand 1s. a week advance, and a reduction of time to 49½ hours. The contractor (Mr. Brown) has, it is said, expressed his willingness to give the advanced wage, but declines to agree to the shortened time.

Halifax.—A meeting of the masons' labourers of Halifax has been held, to take into consideration the proposal of the masters. It was decided to accept nothing short of 24s. per week, which will be an increase of 2s. on the present wages.

Oxford.—The operative carpenters and joiners of Oxford lately made a demand of an extra penny per hour, and an intimation was given to the employers that a strike would be the result if it was not acceded to. The advance has been granted.

Woolwich.—The bricklayers, carpenters, and labourers employed in the building trades in the Woolwich district are out on strike. They demand a rise of wages from 8d. to 9d. an hour for bricklayers, carpenters, &c., and from 5d. to 6d. for the hodmen and other labourers, with the total abolition of piece-work. The masters have met together and offered an increase to 8½d. per hour for mechanics, and 5½d. for labourers, but decline to abolish piece-work. The workmen reject these terms, and state that they will listen to no proposal which does not place them on an equality in the matter of wages with the workmen of the London district. The master builders are taking steps to have joiners' work done in the country, where prices are lower, or on the Continent.——Mr. Balguy, the magistrate at Woolwich Police Court, was engaged for a considerable time on the 5th inst. in hearing a complaint preferred against two carpenters, named Foweraker and Simons, by Messrs. Kirk & Randall, for leaving work which they had contracted to complete. The defendants left their work, with a number of other men, omitting to finish certain work which they were performing under a written specification. The magistrate decided that they had broken their contract, and ordered them to pay 5*l.* damages and 19s. costs.

North Shields.—On the 1st inst. the stonemasons at North Shields struck work, they wanting extra wages, and to be paid for walking to jobs.

Walsall.—The notice given by the plasterers, carpenters, and bricklayers at Walsall for an advance of 1d. per hour in wages terminated on the 29th ult., by which time the plasterers had accepted an advance of ½d., making the rate of pay in their case 8d. per hour. The carpenters and bricklayers were at first offered an advance of ½d. per hour, to date from the 1st of May, and another ½d. on the 1st of January, and subsequently the second ½d. was offered for the 1st of October; but the modified offer was refused as decidedly as the original one had been, and the matter stood over. On the 1st inst. the carpenters met to consider the question, and resolved to remain out for the 1d., to raise their wages to 8d. per hour. The bricklayers also held a meeting, and appointed a deputation to wait upon the employers; and arrangements were come to whereby the men returned to work at once with an advance of ½d. per hour, another ½d. to be conceded on the 1st of September, when they also will be receiving 8d. per hour. The non-society carpenters have returned to work on the masters' terms,—namely, an advance of ½d. per hour, and another advance of ½d. in September next. This is expected to lead to the return of the union carpenters to work and the end of the dispute.

CASES UNDER THE EMPLOYERS AND WORKMEN ACT.

On the 27th ult. a prosecution was instituted in connexion with a strike against piecework among the carpenters of Woolwich. Three of their number, named Richard Blundell, Peter Cowie, and Mark Chesterman, were summoned before Mr. Patteson, at Woolwich Police-court, under the Employers and Workmen Act, for neglecting their work without lawful excuse, whereby their employers, Messrs. Kirk & Randall, had suffered damages laid at 10*l.* Mr. Edwin Hughes, solicitor, appeared for the prosecution, and the defendants were represented by Mr. Oppenheim, barrister, instructed by Messrs. Shaen & Roscoe, solicitors to the Amalgamated Society.

Mr. Edwin Hughes, solicitor, appeared for the prosecution, and the defendants were represented by Mr. Oppenheim, barrister, instructed by Messrs. Shaen & Roscoe, solicitors to the Amalgamated Society. Mr. Hughes said that Messrs. Kirk & Randall were contractors, having several Board schools and other large works on hand. The defendants and other workmen had made certain contracts with the firm, but before they were complete the workmen absented themselves, and the firm were put to serious loss. The Act, however, limited the damages to 10*l.*, and the complainants now claimed that amount of the defendants. Evidence was given that the three defendants agreed to make certain window-sashes for 30*l.*, and received three weeks' wages, when they left their work on the night before Good Friday, and had not since returned. The work had since been at a standstill. Mr. Oppenheim, for the defence, contended that the carpenters were engaged by the hour, and liable to be dismissed without notice. They were, therefore, at liberty to leave when they pleased, and this supposed contract, which they did not sign, was in no way binding. Mr. Patteson dismissed the summons against Cowie and Chesterman, believing that they were working under Blundell's orders, but he was satisfied that Blundell had broken his contract, and ordered him to pay the damages claimed, 10*l.*

On the 28th ult., at the Greenwich Police Court, George Collins, a painter and paperhanger, appeared to a summons to show cause why an order should not be made upon him to pay a sum of 4*l.* to James Lavell, for discontinuing a contract entered into for work, and which he refused to return and finish.

Mr. Carttar attended in support of the summons, and having stated that the complainant is a licensed victualler, and that the unfinished work was the repapering and repairing of a room on an agreement for 9*l.*, of which 5*l.* had been paid, a question arose as to whether proceedings before a magistrate could legally be taken, Mr. Carttar contending that the complainant stood in the position of an employer, and defendant as an artificer.

Mr. Patteson ruled that the recently passed Act was only an extension of the provisions of the former Act by giving magistrates the power of hearing and determining disputes between employers and employed, where the compensation sought to be obtained did not exceed 10*l.* The provision in the old Act defined that there should be a relationship between the master and the workman, such as a master builder and a journeyman in branches of such trade. The matter in dispute between the parties in this case was purely the business of the County Court judge, and he should dismiss the summons.

The defendant said he had not refused to complete the work, but had been ordered off the premises. He then instructed a surveyor to estimate the value of what he had done, but the surveyor was not allowed to go into the room. It was his intention to take proceedings in the county court, making a claim, after deducting the money already paid, and as he had lost a day in attending to the summons he asked that an order should be made upon the complainant to pay him for the loss of time.

Mr. Patteson said he had no power to make such an order.

DETAINING TOOLS.

At the Clerkenwell Police-court, on the 1st inst., John Wilkinson, a plasterer, was summoned for detaining two tubs, two bankers, one sarry, and two pails, the property of Joseph Purchall, also a plasterer. It was stated that the complainant purchased the tools in question in November, 1874. At that time he undertook the management of the plasterers' work for Mr. Wix, a builder, at some buildings in the Finsbury Park-road, and took the tools there. Complainant had the taking on, paying, and discharging of the men in his line, and amongst the rest of the men he, on the 27th of March, 1875, employed the defendant as a journeyman at 8½d. an hour, and he was so employed until the following August, when complainant discharged him. In the beginning of December last he lent defendant some tools, which were not returned, and upon complainant going to defendant upon some buildings where he was at work in the Blackstock-road he saw the tools he had lent defendant. Complainant said he wanted them. Defendant replied that he had not done with them yet, and then said complainant should not have them at all: hence the present summons.

For the defence it was submitted that in May, 1875, the complainant and defendant entered into a partnership in the work and the tools, and it was agreed defendant should pay complainant 30s. for his share of the tools, which he had done, paying 5s. per week for four weeks, and afterwards the balance, 10s., down; and in this he was corroborated by complainant's own book, which showed they had received the same amount of wages weekly. In cross-examination defendant said he had no agreement in writing of the partnership, or receipts for the money he had paid.

The Magistrate said there was no evidence of a partnership, and the defendant must give up the things at once, with 2s. costs, or pay their value, 23s.

THE STATE OF EUSTON SQUARE.

Sir,—Please give me a corner of your valuable paper to point out in what an extraordinary condition one of the gardens belonging to Euston-square is at the present time. I mean the garden on the left-hand side of the Euston-road, in going from King's-cross to Hampstead-road, and near to Gordon and Tavistock squares. I was somewhat amazed the other day, in passing by this place, to find in what a very untidy state it is, presenting more the appearance of a wilderness than anything else. This square is filled with heaps of gravel, rubbish, and I know not what besides. Here and there a broken garden-seat may be seen. It is a most strange thing how a place of this description can be allowed to exist in close proximity to so good a neighbourhood. It presents a very striking contrast to the square on the opposite side, which is kept in very good order. Nathaniel Waterall.

Proposed New Workhouse Laundry at Hackney.—At the last meeting of the Hackney Board of Guardians, Dr. Millar, in pursuance of notice, moved that Messrs. Lee & Smith be instructed to prepare without delay specifications for the construction of a laundry for the use of the infirmary according to plans already drawn. The motion was rejected by fourteen to five.

CONCRETE FACING.

Sir,—We note in your report of "Concrete as a Building Material," published April 15th, that you state "Mr. Cunningham (representing the Broomhall Tile Company) said that for two or three years past his firm had been supplying slabs for facing concrete made from the refuse of blast furnaces," instead of which it should read, "Mr. Cunningham (representing the Broomhall Tile Company) said that for years past his firm have been supplying red and white blocks for facing concrete made of brick earth, the blocks doing away with the necessity of machines for raising the concrete, and that buildings erected with them may be seen at Mortlake and elsewhere."

For the Company,—C. S. G.

CHURCH-BUILDING NEWS.

Haslingfield.—The parish church of Haslingfield, Cambridgeshire, was re-opened for service on the 18th ult., after partial restoration under the superintendence of Mr. W. M. Fawcett, architect, Cambridge. The work of restoration so far has been chiefly confined to the chancel, the roof of which has been thoroughly repaired. There is a new east window, and the gable wall, which was in a dangerous state, has been rebuilt. The outer face of each wall has been renewed, and the inner surface re-plastered. The floor has been raised and re-formed. The windows have been filled with stained glass. The vicar (the Rev. G. C. Clements) has with his own hands executed the colouring of the roof, and the gilding, &c., on the altar and reredos. The colouring on the roof is designed with crosses on the different panels over the sanctuary, forming one larger one with the Agnus Dei in the centre. The remainder is filled up with the quaint designs of the clog almanack. The organ-chamber is entirely new. The roofs of the aisles have been thoroughly repaired, and the curious tracery-work in the spandrels is carefully preserved. The nave roof is new. The whole of the interior face of the walls has been made good and re-plastered, the floor re-laid, and some of the seating re-fitted, chairs making up the deficiency. The pulpit, more than 400 years old, has been preserved, and the font-cover, of Jacobean work, has been coloured by the vicar and re-hung. Much remains to be done.

Stuntney.—Stuntney Church, in the Isle of Ely, was re-opened on Easter Tuesday, after partial rebuilding. With the exception of the chancel, indeed, the whole of the church has been rebuilt, and is more than double the size of the old building, which had become thoroughly dilapidated and quite inadequate for the congregation. The old church contained some interesting specimens of Norman work, which have been preserved and reintroduced in the new structure. Mr. R. R. Rowe, of Cambridge, is the architect.

Marston Meysey.—The new church at Marston Meysey was consecrated on the 19th ult. The church that has been displaced to make room for the new structure, and to supply materials for it, was not a very old building, having been erected 228 years ago. Mr. Harrison, architect, who examined the church in 1844, stated that two principal causes of the ruined state of the walls appeared to be the paucity of the mortar used at its erection and the unseasoned condition of the oak timber of the roof, which had sagged under the weight of the stone tiles, and thrust out the walls, which had also settled in every direction. A plan was prepared by Mr. Harrison in 1845 for the rebuilding of the church, but nothing came of it. Two buttresses on the north side and a porch on the south have preserved the building from actual collapse, but it has long been in a very discreditable condition. About two years ago the present vicar, the Rev. W. H. Ranken, determined to make an effort to raise the amount of money requisite for a new church, and applied to Mr. James Brooks to supply a design for a new building. Mr. Brooks's design has now been carried into effect. The building consists of a nave, with south door, chancel, and small vestry, the style being Early English. A prominent feature of the church is the stone-groined roof in the chancel. In the east wall are three lancet windows. There are also lancet windows in the north and south walls, and in the west wall there is a window of somewhat greater width, above which is a circular window. The chancel is separated from the nave by a dwarf screen of Bath stone and red Mansfield, of which material the pulpit is also composed. The font is of yellow and red Mansfield, with a base of Painswick stone, above which is a piece of Forest of Dean. The walls of the church show rock-faced stone instead of being plastered. The nave is intended to seat 104 persons, and ten can sit in the chancel. The builder is Mr. Charles Brown, of Tetbury.

Fridaybridge.—In the offertory at Friday-bridge Church, in the Isle of Ely, on Easter Sunday, there was included a carved oak faldstool, or Litany desk, worked from a design by Mr. W. Smith, architect, London, intended to replace a provisional one of stained deal on the step leading from the nave into the chancel. It was given by a resident. A lady and gentleman, residents, intend to present carved oak sedilia for the south side of the sanctuary, within the altar rails, to replace the bonded triplet of rush-bottomed chairs that has hitherto done service there.

Sandhurst.—The parish church of Sandhurst was re-opened on the 20th ult., after restoration. The Church had suffered so much from dilapidation and neglect that a large outlay was necessary. A great part of the chancel and the north porch have been entirely rebuilt, a parapet has been added to the north and south aisles, nearly the whole of the windows have been restored and re-glazed, two piers have been replaced, and the remaining piers made perfect. The belfry has been thrown open to the church, and open seats have been substituted for the old-fashioned pews. The floors have been laid with Godwin's tiles, and a heating apparatus has been fixed. The whole of the works have been carried out under the direction of Mr. R. Herbert Carpenter, architect.

Sevenoaks.—At a meeting held at Sevenoaks on the 22nd ult., it was resolved to appoint a committee to consider the question of the restoration of the parish church of St. Nicholas, and also to increase the present inadequate church-accommodation of St. John's district, with power to obtain estimates of the cost of carrying out those objects, and to report to a general meeting. The committee have decided upon calling in to their assistance Mr. Ewan Christian.

SCHOOL BOARD SCHOOLS.

Stainforth.—New Board schools at Stainforth, near Thorne, were opened on the 10th ult. The schools are on the east side of the road leading to Thorne, and are built of red bricks with stone dressings. They consist of mixed school, infants' school, board-room, class-room, cloak-room, lavatory, &c. The master's residence is at the east end of the building. The rooms are well lighted and lofty. The mixed school is fitted with patent desks and seats, which may be made into tables, &c., if required; the infants' school has a gallery. There are three playgrounds,—boys', girls', and infants',—the last a covered one. Mr. Enoch Meggitt, of Thorne, builder, was the contractor for the whole of the work, which was completed from the designs of Mr. J. Smith, of Hatfield.

Brighton.—At a recent meeting of the Brighton School Board, the common seal of the Board was affixed to the contract with Mr. G. R. Lockyer for the erection of the Boyce's-street Infants' School, and for other works in connexion with the Middle-street School; and it was resolved to apply to the Education Department for permission to borrow 3,000*l.* on account of the works, viz., 2,550*l.* for cost of buildings and fittings (amount of tender), 200*l.* for architect's commission and expenses of superintendence, and 250*l.* for contingent expenses; and Mr. Ransom, clerk of the works at the Pelham-street School, was engaged at an additional salary to superintend the building of the Infants' School in Boyce's-street.

Cockermouth.—A new Board school was opened at Cockermouth on the 8th ult. The building has been erected from designs (selected in competition) prepared by Mr. Spaull, of Shrewsbury. The cost has been 1,535*l.* The tenders accepted by the Board were those of Mr. Thomas Swinburn for building and slating, 1,050*l.*; Mr. P. Robinson, for wood work, 345*l.*; Mr. Henry Fisher, for ironmongery, glazing, &c., 115*l.*; and Mr. Joseph Waller for plastering, 25*l.*; making a total of 1,535*l.*, which, with the cost of the land, amounted to 1,668*l.*

Duthil, N.B.—The School Board of Duthil and Rothiemurchus opened two new schools on the 12th ult., one at Duthil and the other at Deshar. The two buildings contain exactly the same accommodation, and are similar in arrangement. The accommodation consists of a schoolroom, 45 ft. long by 22 ft. wide; a class-room, 20 ft. by 16 ft., seated to accommodate together 120 children. The rooms are well lighted, and are warmed and ventilated by Manchester grates. The seating is on the dual system. The accommodation of the teachers' houses consists of parlour, kitchen, scullery, pantry, three bedrooms, closet, and outhouses. Mr. Mackenzie, of Elgin, was architect of both schools. The contractors for the Deshar School were:—Mason, Wm. Grant, Grantown; carpenter, Chas. Ross, Grantown; slater, D. Cattanach, Newtonmore; plasterer, W. Duffus, Grantown; plumbers, Hunter & Wink, Nairn. For the Duthil School:—Mason, John Clark, Grantown; carpenter, D. Fraser, Carr Bridge; slater, J. Winchester, Grantown; plasterer, G. Grant, Grantown; plumbers, Hunter & Wink, Nairn. The cost of the Duthil School was 1,059*l.*, and that of the Deshar school, 1,012*l.*

Books Received.

Art-foliage for Sculpture and Decoration. 2nd Series. By J. K. Colling. London: 150, Hampstead-road.

We have received Part I. of a second series of Mr. J. K. Colling's illustrative work on "Art-foliage," which is, in fact, a new book. The work published under this title in 1865 made a success, and was soon sold off, and it has been thought better, instead of producing a second edition, to publish a new work with the same scope, but with new illustrations, having specially for their object the suggestion of foliage design, suitable for wood, stone, and terra-cotta. Part I., which is now published, deals chiefly with designs for wood-work, which are of a type slightly conventionalised, though hardly so much so as many, ourselves included, think desirable for architectural ornament. The feeling of the design is, in general, that of Late Decorated ornament. The drawings are very ably and clearly executed and lithographed, and the book in general very well got up. There are to be two more "Parts," each containing, like this one, twenty plates, and a fourth Part containing fourteen plates and descriptive letterpress of the whole, giving the natural sources whence the ornament is derived. We may take an opportunity of characterising the work more at length when it is before us in its complete form.

VARIORUM.

Engineering gives the following description of "A Steam Navvy":—"No small amount of curiosity has been excited in the district of Bellshill, near Motherwell, within the last few days by the arrival and operations of an American steam 'excavator,' now in good working order in a deep cutting, a little to the west of the village, on the new line of railway in course of construction for the North British Railway Company, by Mr. Young, railway contractor. The 'Navvy' is a powerful-looking machine, and employs only three men to work it,—an engineer, fireman, and craneman,—but other four men are needed to shift the wagons to and from the 'drop.' It is capable of filling a wagon in a minute, and does the labour of sixty hands. It is mounted on four wheels on iron rails at the mouth of the cutting, and from the jib of the crane a strong iron bucket is suspended by chains, to which four teeth are attached, projecting about a foot from the mouth of the bucket. The teeth tear up the face of the cutting, beginning at the bottom and filling the bucket."——A few words as to Fern Culture:—"There are few places where even the poorest cannot obtain ferns. Flowers that are cultivated,—and our garden-flowers require cultivation for their proper development,—are often beyond the reach of the poor: and no one brings the roots of wild-flowers into our towns. If they were brought hither, they would pine away, perhaps more quickly than our garden flowers; and they at least would not thrive any better in the absence of that one vitalising element,—sun. But ferns that grow in wild woods and open plains are in the free right of all who choose to gather them. They are gathered sometimes, and brought into our towns and cities by itinerant vendors; but you seldom see them in the dwellings of the poor. They, nevertheless, might be there. If there were a demand, the poor purveyors of the poor would soon bring a supply from the free, wild country where they grow; and there would be that demand if the poor knew more about these exquisite plants. Ferns will grow where flowering plants would perish. They require moisture and shade,—not stagnant, but percolating moisture. Place them where you will,—on the floor, on the table of a dimly-lighted room, in the sunless window-sill, in a shady corner,—anywhere,—and they will grow and develop, unrolling their charming fronds, and exhibiting their sweet feathery forms with all their natural grace, in the presence of squalor and misery."—*The Fern Paradise.* By Francis George Heath.

Miscellanea.

Asserted Discovery near Pesth.—Reports are published of the discovery by two Hungarian shepherds of a Roman palace buried in the earth, and preserved with a completeness which throws Pompeii into the shade. It is said (according to the *American Architect*) that the shepherds, while digging in the village of Ivan Egerszeg, near Pesth, came upon a square curb of masonry covered by a flat stone. Lifting the stone, they found that the curb was the mouth of a deep shaft, a yard square, which communicated with a hall below. Letting themselves down by ropes, they reached a large square hall with painted walls, which communicated with a series of rooms fully furnished, some containing chairs, tables, and benches, and some beds and wardrobes; the latter filled with armour and ornaments. An account said to have been submitted to the Hungarian Parliament states that the rooms belong to a palace built during the Roman occupation of Pannonia, which lasted from the time of Tiberius to the fifth century. It is said that the palace, which is built of stone and brick in two stories, is very large, covering acres of ground, and is buried under 60 ft. of earth, on which grows a forest of heavy timber. It is to be hoped this story is true.

The Erith Strike.—The men on strike against piecework at Erith have now been out five months, and are still being maintained by their fellow-workmen throughout the kingdom. Several of them, however, have abandoned the struggle and left the neighbourhood, and the remainder are now greatly concerned at the desertion of six of their number, who have gone in to work again on the employers' conditions. Two of these were members of the strike committee, and the whole are pattern-makers, a class of workmen whose places it has been difficult to fill; but the "knobsticks," as the new hands are designated, have protested against any more re-engagements, and even threatened a strike themselves rather than suffer themselves to be supplanted. The strike committee, regarding the re-engagements as a withdrawal of the lock-out notice, have requested an interview with the firm to settle the dispute; but Messrs. Eastons & Anderson, after conferring with the Employers' Association, have declined any negotiation while the declaration against piece-work exists, believing that such a principle would, if carried out, ruin the trade of the country irretrievably.

Norfolk and Norwich Hospital.—It has been resolved to greatly enlarge this hospital, from plans prepared by Mr. Boardman, the estimated outlay being 25,000*l.* Dr. Beverley, one of the medical staff, protested against the adoption of the plans, because he considered they preferred the convenience of the administration to the safety of the patients, made no provision for the accommodation and sleeping of the nurses out of the main building when off duty, now considered by most authorities as essential alike for the nurse as for the patient, and associated wards, offices, kitchens, bedrooms, chapel, &c., contrary to the expressed opinions of all hospital authorities. They were plans with sanitary arrangements and appliances by no means up to the age in which we lived, in which hygiene was sacrificed to convenience, and which ignored the fact pointed out by Mr. Erichsen, who said, "There is one remarkable circumstance connected with the age of hospitals, viz., that new buildings added on to old ones become more unhealthy than the original buildings." Dr. Beverley would have preferred to provide the proposed increased accommodation by a system of isolated wards of one story each, and disconnected from the main building.

The Proposed Public Offices at Tipton The intention to erect public buildings in Owen-street, Tipton, has recently been the subject of much controversy, and there has been a strong opposition on the part of some of the ratepayers. At the inquiry recently held by Major Tulloch, a considerable amount of evidence, *pro* and *con.*, was tendered. It included statements as to the bad condition of the proposed site through mining operations, and these appeared to have had some weight, as the opinion of the Local Board upon the matter was subsequently asked for. Counter statements, however, were obtained from eminent mining authorities, and forwarded to the Local Government Board, who have now sanctioned the borrowing of 5,000*l.* to erect public offices upon the site in Owen-street.

Profitable Sewage Irrigation at Wolverhampton.—At the quarterly meeting of the Wolverhampton Town Council held on Monday last, the 8th inst., a report was submitted by the Sewerage Committee respecting the farming operations at the Barnhurst Estate, from which it appeared that though the past year generally has been unfavourable to successful farming, owing to the extraordinary and frequent falls of rain, the floods causing great damage to the grain crops, decreasing the yield and injuring the quality, yet the balance-sheet shows a profit on the year's working of 1,048*l.* 16*s.* 5*d.*, equal to 84*s.* 7*d.* per acre on the 248 acres of land under cultivation, or an increase of 52 per cent. on last year's experience. In conclusion, the committee draw attention to the great damage sustained to crops through acids being allowed to run into the sewers from manufactories in the borough.

The Technical Education Movement.—Mr. Mundella's Bill for the promotion of technical education is not yet in type; but the *Scotsman* understands that it will embrace the following points:—(1) That the power of deciding upon the establishment of free libraries shall be vested in the local authorities; (2) that the rate for a free library pure and simple shall not exceed 1*d.* in the pound, but that if museums and technical instruction are added, the maximum may be 2*d.*; (3) that the second 1*d.* may be expended wholly on that particular kind of technical instruction which is best adapted for each neighbourhood. Mr. Mundella will also propose as a supplemental measure that assistance from the British Museum, the National Gallery, and other great national bodies shall be rendered to the local institutions throughout the country.

The Guildhall Museum.—There has been lately placed in the Free Museum, Guildhall, a fine white marble fireplace, with carved wood at the top, of artistic workmanship. This was formerly in the old mansion in Lime-street where Sir Thomas Abney, knt., kept his mayoralty in 1700–1, originally the town residence of Sir John Scrope, fifth Baron Scrope, of Bolton, who died in 1498. Rebuilt by Richard Langton at the beginning of the seventeenth century. Presented by the Fishmongers' Company, 1875. A curious addition has been lately made to the collection of antiquities in this place, in the shape of a map of the world constructed by order of Prince Henry of Portugal, by Fra Mauro, of the Camaldolese Convent, Venice, A.D. 1459. This was presented to the Corporation by Baron Heath, F.R.S., F.S.A., Consul-General of Italy.

St. Peter's Working Men's Institute, Macclesfield.—This new building, situate in Windmill-street, Macclesfield, was opened on the 18th ult. It is a two-story edifice, built in brick, and is Gothic in style. It has a spacious entrance-hall; on the ground-floor are class-room, cloak-room, smoke-room, and boiler-house, in which are every requisite for supplying tea and coffee. The upper story consists of a spacious lecture-room, lofty and well lighted, approached by two flights of stairs, joining on the same landing, a staircase leading to the platform from the other end of the building. It is heated by Harlow's heating-apparatus. The cost will be about 900*l.*, exclusive of the land and furniture, which is about 250*l.* more. The architect of the building is Mr. Jabez Wright, and the builders Messrs. Burrows & Moseley.

James Watt's Room at Heathfield.—The *Birmingham Post* states with great regret that the workshop of James Watt, at Heathfield Hall, has been dismantled, and that its contents are now, or will shortly be, removed to a distant home. Until within a very few days past this "classic garret" at Heathfield and its fittings have been carefully kept in the state in which they were left when the hand and eye of the master were last withdrawn from them, now nearly sixty years ago, and to-day the only accurate memorial which we have of them in that condition is a drawing of the interior of the room, which was made by the late Mr. W. C. Aitken, and which is in the possession of Mr. Samuel Timmins.

Burning of a Theatre at Rouen.—The Theatre of Arts, Rouen, was burnt through the stage curtain coming in contact with a gas jet. The fire speedily extended to all the friezes and scenes, a thick smoke enveloping the entire stage. The theatre was built in 1774, and was recently purchased by the municipality. Nothing is left of the structure but the façade and a portion of the principal staircase, and the loss is estimated at 2,000,000 francs.

Whitewash.—The following recipe for whitewash is recommended by the American Treasury Department to all lighthouse keepers, and is thought the best for all out-buildings of wood, brick, or stone:—Slake about one-half bushel unslaked lime with boiling water, keeping it covered during the process. Strain it, and add a peck of salt dissolved in warm water, three pounds of ground rice put into boiling water and boiled to a thin paste, one half-pound of powdered Spanish whiting, and one pound of clear glue dissolved in warm water; mix them well together, and let the mixture stand for several days. Keep the wash thus prepared in a kettle or portable furnace, and when used put it on as hot as possible, with either painter's or whitewash brushes.

Davenport's Patent Fasteners for Doors and Gates.—This is an ingenious little invention patented by Mr. M. Davenport, of 40, Wilson-street, Finsbury. It is an improved latch, and where fitted on gates or doors, a horseman passing through the former need not dismount, as he has only to pull the gate to with his hunting-whip and the catch fastens; or, a passenger in a railway or other carriage, or in an omnibus, has only to draw the door close and it is fastened. It closes upward, and is kept in position when closed by the weight of the handle. By raising the handle the latch opens, and by letting it go it is again closed. From its solidity and the absence of springs it is not liable to get out of order. It ought to come speedily into general use.

New Business Premises, Ludgate-hill.—The new premises on the south side of Ludgate-hill, belonging to Messrs. Samuel Brothers, have been opened. The structure is of seven stories, and each floor has an area of over 4,000 square feet. The shop and show-rooms occupy over 10,000 square feet on the ground, first, and second floors. The whole of the works in connexion with the adaptation of the premises to the requirements of Messrs. Samuel's business have been performed by Messrs. Browne & Robinson, builders, under the superintendence of Messrs. N. S. Joseph & Pearson, architects.

The Sanitary State of South Kensington Museum.—In the House of Commons, on the 5th inst., Lord Sandon, in reply to Mr. Torrens, admitted that the Art Library at South Kensington was in a crowded and unhealthy state. It was, however, a temporary room, and what improvements could be made had been made. The Educational Library, where the health of two attendants who had been removed to the Consumption Hospital had suffered, had now been transferred to another room. The general plan for completing South Kensington Museum had been agreed upon, and the first work to be undertaken would be the Art Educational Library.

Paintings at the Agricultural Hall, Islington.—A very curious series of paintings, illustrating the coronation of Charles X. of France, which took place in the Cathedral of Rheims on the 29th of May, 1825, are now set up for exhibition in the Agricultural Hall. The pictures are life-size, and the portraits, in many cases, remarkable. They differ considerably in degree of merit as works of art, but two or three of them are remarkable even in that respect. It appears that they were rolled up and put out of sight during troublous times, but that they should have got out of France seems odd, as they were probably national property.

Northern Counties Association of Medical Officers of Health.—At the spring quarterly meeting of this association, held at Hexham the other day, the president (Dr. Elliot, Carlisle), delivered an opening address, after which a paper on the drainage of mansions and houses of the upper classes was read by Dr. Fox; one on the compulsory registration of disease and deaths, by Dr. Maclagan; and one on the habitual breathing of a vitiated atmosphere as a predisposing cause of disease, by Dr. Jackson, Hexham. Discussions followed.

Edwards's Patent Self-acting Sash Fastening.—The arrangement of this fastener is very ingenious. It is unlocked by simply pressing a knob, the bolt is then held back by the catch on upper sash, allowing the window to be opened. The inventor claims as its advantages that it is self-acting, perfectly secure, and cannot possibly be opened from the outside, and we agree with him that it effectually tightens the sash, thereby preventing draught, admission of dust, and rattling of the window.

Rendle's Patent System of Glazing.—We understand that this system of glazing, of which we have before spoken approvingly, was tested on the 2nd inst., by her Majesty's War Department, &c., under the direction of Lieut.-Col. Scratchley, R.E., inspector of works. A skylight, 12 ft. square, was inserted in the roof of a railway-shed, at the Royal Arsenal at Woolwich, and a heavy stream of water was poured on it from a hose attached to the fire-main. It stood this very severe test admirably, we are informed, no leakage whatever being observable.

Silwood Park, Sunninghill, Berks.—The foundation-stone of the new mansion, proposed to be erected on the site of the old one, for Mr. Charles P. Stewart, Lord of the Manor of Sunninghill, was laid by Mrs. Charles P. Stewart, on the 25th April last. The workmen were afterwards entertained at dinner at the One Tun Inn. The architect for the new building is Mr. A. Waterhouse. The works will be carried out by Mr. W. Hearn, of Bayswater, London. The clerk of works is Mr. Robert Leigh Corlett.

Shutters.—Messrs. Clark & Co., of Rathbone-place, who have made self-coiling, revolving shutters a speciality, have sent us a little trade-book which shows their construction and application. These shutters are very widely used. It also illustrates the "Lifts" made by Messrs. Clark & Co.

Association of Municipal and Sanitary Engineers and Surveyors.—Arrangements have been made for an inspection of the Manchester Corporation Reservoirs and Waterworks by the members of this Association, on Friday, the 19th of May.

The Road to Russia.—Messrs. Henry Head & Co., of Gracechurch-street, have been appointed agents in the United Kingdom to the Nadejda Transport Company of St. Petersburg and the principal towns of Russia, for the purposes of through traffic.

Loan Collection of Scientific Apparatus. The collection is a remarkable one, and will have attention. It will be visited by her Majesty the Queen on this, Saturday, the 13th, and opened to the public on Monday.

Architecture in the Paris Salon.—The Section of Architecture consists of only seventy-six frames.

TENDERS

For a dwelling-house on the Monks-road, Lincoln, for Mr. Fambrins. Messrs. Drury & Mortimer, architects. Quantities supplied:—

Pearson	£1,296 12 0
Oller & Elsey	1,069 12 0
Martin & Sims	1,069 0 0
Brooks	950 0 0
Taylor & Brown	949 0 0
Sharpe	898 0 0
Harrison	891 9 4
Kent	889 0 0
Goodbarne	875 0 0
Crosby & Sons	872 0 0
Cowen	779 0 0
Slingsby	739 0 0
Chambers (accepted)	729 10 0

For the erection of a parsonage-house at Bracebridge, Lincoln, for the Rev. C. C. Ellison. Messrs. Goddard & Son, architects. Quantities supplied:—

Knight	£1,349 0 0
Barnes & Wright	1,345 0 0
Hobson & Taylor	1,340 0 0
Martin & Sims	1,326 0 0
Brooks	1,325 0 0
Oller & Elsey (accepted)	1,239 0 0

For bar-fittings, &c., at the Black Prince, Walworth-road, for Mr. George Cox. Mr. John Viney, architect:—

Fittings.	
Taylor	£254 10 0
Pewtering.	
Heath	99 0 0
Embossing, &c.	
Gibbs	121 4 3

For alterations and additions to the Bull and Ram, Old-street, for Mr. F. Guyer. Mr. John Viney, architect:—

Beale	£1,108 0 0
Stamp & Bowtle	937 0 0
Axley	876 0 0
Eaton	750 0 0

For building two semi-detached houses, Brownswood Park, for Mr. J. Newton. Mr. J. Viney, architect:—

Sutton (accepted)	£1,850 0 0

For alterations to the George the Fourth, Old-street, for Mr. E. J. Butt. Mr. John Viney, architect:—

Lewis	230 0 0

For erection of house for Mr. J. Sully, Bromley, Kent. Messrs. Kittle & Ashdowne, architects:—

Emmett	£1,075 0 0
Payne & Balding	970 0 0
Copping	720 0 0

For congregational church, Romford. Mr. E. C. Allam, architect. Quantities by Messrs. Stones & Son:—

	Contract No. 1.	Contract No. 2. Spire.
Shurmur	£4,398	£549
Boyce	4,092	696
Manley & Rogers	3,860	475
Gregory	3,859	398
Staines & Son	3,687	446
Stoner	3,676	349
Blackmore	3,177	340
Niblett (total)	£4,500	

For alterations at the Mamby Arms, Water-lane, Stratford, for Mr. Kemp. Mr. Edward Brown, architect:—

Marr (accepted)	£450 0 0

For sundry alterations and additions to 140, Westminster Bridge-road, for the Lambeth Baths and Washhouses Company, Limited. Mr. S. C. McMurdie, architect:—

Downs & Company	£760 0 0
William Downs	727 0 0
Sharpington & Cole	700 0 0
Gammon & Son	700 0 0
Andrew	681 0 0
Cullum	679 0 0

For works at Wapping, for the Thames Steam Ferry Company, Limited. Mr. Alexander R. Stenning, architect:—

Lee & Sons (accepted)	£10,917 0 0

For alterations and additions to Manor Villa, Tonbridge Wells. Mr. Alexander R. Stenning, architect:—

Garnham (accepted)	£325 0 0

For alterations and additions to St. Stephens's Schools, Lewisham. Mr. Alexander R. Stenning, architect:—

Jerrard	£475 0 0
Sabey & Son (accepted)	430 0 0

For erecting hydraulic crane at St. Katherine's Wharf, for the General Steam Navigation Company (exclusive of mason's and builder's work. Mr. Alexander R. Stenning, architect:—

Moreland & Son	£777 0 0
Armstrong & Co. (accepted)	690 0 0

For alterations and additions to Oakwood, Redhill, Surrey, for Mr Vincent Nicholl. Mr. Alexander R. Stenning, architect:—

Woodward (accepted).

For stable buildings and foundations of proposed villa residence at Addison-road, Kensington, for Mr. R. King Pierce. Mr. D. Anton, architect:—

Robert & E. Smith (accepted)	£970 0 0

For drainage works at the Camberwell Cemetery, Forest-hill:—

Harrison	£557 0 0
Groves	551 0 0
Minard	515 0 0
C. & S. Fisher	498 0 0
Wainwright	496 10 0
Johnston	495 0 0
Faulkner	495 0 0
Woodhams	455 0 0
Harris (accepted)	449 0 0

For painting and decorative works at The Harts, Woodford, for Mr. James Spicer, J. P. Mr. Rowland Plumbe, architect:—

Horne	£1,140 0 0
Wontner Smith	648 18 0
Wood	599 0 0
Pitman & Cuthbertson	598 0 0
Egan	585 0 0
Phillips & Son	474 5 0

For the erection of boys', girls', and infants' schoolrooms, at Sandwich, Kent, for the U. D. School Board. Mr. John Greene Hall, architect:—

Matthews	£3,231 0 0
Lucas and Featherstone	2,745 0 0
Gaskin	2,740 0 0
W. & T. Denne	2,725 0 0
Naylar (accepted)	2,696 0 0

For two lodges at Bisley, Surrey, for the Committee of the Refuges for Homeless and Destitute Children. Messrs. E. Habershon & Brook, architects:—

Howe & White	£850 0 0
Stamp & Bowtle	847 0 0
Aitchison & Walker	809 0 0
Haynes	775 0 0
Brass	770 0 0

For the erection of residence at Market Harborough. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Patterson	£2,450 0 0
Clark	2,323 0 0
Hobson	2,299 0 0
Mattock	2,230 0 0
Palmer	2,235 0 0
Hall (accepted)	1,880 0 0

For additions to a warehouse, High Holborn. Mr. John Butler, architect. Quantities by Mr. Henry Lovegrove:—

Yardley	£1,800 0 0
Servenser & White	1,654 0 0
Howard	1,587 0 0
Lsthey, Brothers	1,575 0 0
Macey	1,519 0 0
Bishop & Hooper	1,379 0 0
Hoare & Son (accepted)	1,289 0 0

For the erection of school buildings and fences at Beckrow, for the Mildenhall School Board. Mr. H. Lovegrove, architect:—

	Schools.	Fences.
Ruse & Son (accepted)	£784	£132

For the erection of school buildings at Cross Bank, for the Mildenhall School Board. Mr. Henry Lovegrove, architect:—

	Schools.	Fences.
Ruse & Son (accepted)	£545	£132

(N.B. Provision of 5*d.* for concrete, &c. in tender.)

For the construction of buildings for the Llandrindod Wells Freehold Land and Building Company. Messrs. Powell, Bell, & Swettenham, architects:—

Morgan	£13,600 0 0
Williams & Son	12,484 0 0
Stephens & Bastow	9,240 0 0
Sholl & Jones	8,700 0 0

For House at Gosden Hill Farm, Send, Surrey, for the Earl of Onslow. Messrs. E. W. Lower & Son, Architects. Quantities supplied by Mr. H. Moon, jun.:—

Goddard & Sons	£2,328 0 0
Mitchell, Brothers	2,199 15 0
Nye	2,061 0 0
Pink	2,055 0 0
Colls & Sons	1,925 0 0
Whitburn (accepted)	1,880 0 0

For shop and residence for Mr. Ward, fish and ice merchant, Winchester. Mr. T. Micklam, architect. Quantities supplied:—

Macklin	£928 0 0
Ayling & Bell	874 0 0
Fielder	853 0 0
Beavis (accepted)	849 0 0
Redding & Abley (withdrawn)	772 10 0

For building a house at the corner of York-road and Simpson-street, Battersea, for Mr. R. Winders. Henry John Hansom, architect. Quantities by Mr. Henry Smith:—

Baker	£1,160 0 0
Lathey, Brothers	1,153 0 0
Gregory	1,147 0 0
Mallett	1,120 0 0
Smith	1,100 0 0
Beale	1,048 0 0
Appleton & Turtle	835 0 0
Parsons	795 0 0

For rebuilding cellars, &c., for Messrs. Daun & Valentin, London. Messrs. George & Peto, architects:—

Payne & Balding	£4,410 0 0
Ashby, Brothers	3,826 0 0
Manley & Rogers	3,717 0 0
Tongue	3,644 0 0
Perkins	3,393 0 0

For rebuilding Cosch and Horses, Orpington, Kent, for Messrs. John Fox & Sons. Mr. G. H. Pierre Harris, architect:—

Tredwell	£1,070 0 0
Arnaud	996 0 0
Payne & Balding (accepted)	982 0 0

For new municipal buildings for the borough of Newbury:—

Crook (accepted)	£4,345 0 0

For Metropolitan Artisans' and Labourers' Dwellings, Battersea Park, Blocks A and B. Mr. Charles Barry, architect. Quantities supplied by Messrs. Strudwick, Selby, & Rogers:—

Downs & Co., accepted.

In last week's impression, in the list of tenders for the new works and alterations at the German Hospital, Dalston, the lowest tender is written as from Carter 5,700*l.*, whereas it should have been Larter, 5,700*l.*

TO CORRESPONDENTS.

A Smoky Chimney—A country rector says he is anxious to know a cheap and effective cure for a terribly bad smoky chimney at his parish school house. It can scarcely be necessary to tell him that such an annoyance can be remedied with certainty only by one who studies it on the spot.)

T. M—L. & Son.—P. B. & S.—H. L—E. S.—A. R.—H. J. H.—N W.—A. L—M. & Sons.—D. B—C. W.—C. P. H—W. L. & G. T.—Observer.—Mr. S—R. E. F.—J. S. K.—H. W.—B. F.—G. M—T. B. (shall hear)—A. S (under our mark)—H. H (next week).—J. T. R. (next week).—A pile of correspondence is unavoidably postponed.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

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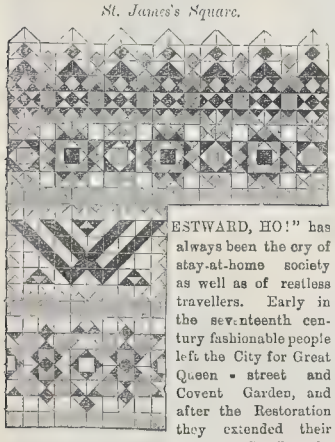
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St. James's Square.



"EASTWARD, HO!" has always been the cry of stay-at-home society as well as of restless travellers. Early in the seventeenth century fashionable people left the City for Great Queen-street and Covent Garden, and after the Restoration they extended their flight to St. James's. Of late years they have gone still further west, and judges who in the early part of the present century were contented to live in Bedford and Russell squares now congregate in South Kensington. In spite, however, of this continued westward movement St. James's-square still remains the most aristocratic square in London. It may be objected that clubs, banks, and insurance offices have obtained a footing there, and that we have forgotten Grosvenor and the Belgravian squares, but we adhere to our assertion that no other square can boast of having as residents members of every grade in the peerage. In St. James's-square there are now living three dukes, one marquis, two earls, one countess, one viscount, one bishop, one baron, and if this is not sufficient to prove our point, we can throw in a baronet and a general to complete the list.

We have the authority of the Prime Minister for saying that "St. James's-square may be looked upon as our Fanbourg St. Germain, and a great patrician residing there dwells in the heart of that free and noble life of which he ought to be a part"; and Dr. Johnson considered that the doggerel written by a porter of the Duke of Leeds contained an enumeration of all the advantages that wealth can give,—

> "She shall have all that's fine and fair,
> And the best of silk and satin shall wear;
> And ride in a coach to take the air,
> And have a house in St. James's-square."

The site of the square was originally a portion of St. James's Fields, upon the southern edge of which the game of pall-mall had been formerly played. Even in the year 1662 the place was not much frequented, and in August Henry Jermyn chose it as the scene of a duel to take place at eleven o'clock in the morning. In 1663, however, according to the French traveller Monconys, the Earl of St. Alban's, to whom the land belonged, proposed to commence building, and among the State Papers is a warrant dated September 23, 1664, "for a grant to Baptist May and Abraham Cowley, on nomination of the Earl of St. Alban's, of several parcels of ground in Pall-mall, described, on rental of 80*l.* for building thereon a square of thirteen or fourteen houses; also of the common highway lying between the houses in South Pall-mall-street and St. James's Park-wall on rental of 40*l.*, with proviso of erecting no building thereon that should cause annoyance to the inhabitants. The said grant is made because persons were unwilling to build such great houses on any terms save that of inheritance, and the former leases were only for years!" In spite of these preparations the square was not habitable until 1676, and among the *Additional MSS.* in the British Museum are copies of several assignments of pieces of ground dated 1675. One is to Nicholas Barbon, Doctor of Physick, and another to the Earl of Kent, and in these indentures the square is referred to as "the intended piazza." This use of the Italian word in its correct meaning is curious, as the arcades at the Piazza in Covent-garden gave rise to the popular notion that a piazza must needs be an arcade, and the arcades of the old Royal Exchange were, in consequence, called the Piazzas. In the Rent Roll of the Earl of St. Alban's (1676) the square is invariably described as the Piazza; but this name did not last long. Although the square was inhabited from the first by many of the most distinguished families in the kingdom, the centre was allowed to remain in a most disgraceful state until 1726, when an Act of Parliament was passed in order to allow the inhabitants to enclose it with railings. Macaulay vividly describes the appearance of this dunghill and dustheap of the parish in his celebrated chapter on the state of London at the period of the Revolution. "St. James's-square was a receptacle for all the offal and cinders, for all the dead cats and dead dogs of Westminster. At one time a cudgel-player kept the ring there. At another time an impudent squatter settled himself there, and built a shed for rubbish under the windows of the gilded saloons, in which the first magnates of the realm, Norfolks, Ormonds, Kents, and Pembrokes gave banquets and balls. It was not till these nuisances had lasted through a whole generation, and till much had been written about them, that the inhabitants applied to Parliament for permission to put up rails and plant trees." There is a curious history connected with the statue of William III., that now stands in the middle of the square, which is worth a passing notice here. In 1724, one Samuel Travers left a sum of money to be spent on the erection of a statue, and when the adornment of the centre of the square was completed in 1727 a pedestal of 15 ft. square intended for such statue arose out of the water. But time went on and the statue being forgotten, a small fountain was made to issue from the pedestal. Travers's overlooked bequest was in course of time found in the list of unclaimed dividends, and the representation of the third William was cast in brass and set up in 1808; the horse being modelled by Bacon from a favourite animal belonging to the third George.

Mr. Peter Cunningham obtained the following list of the inhabitants of the square in 1676 from the Rate-books of the parish of St. Martin's-in-the-Fields:—"Marquis of Blandford, Lady Newburgh, Countess of Warwick, Earl of Oxford, Earl of Clarendon, Sir Cyrill Wich, Lawrence Hyde, Sir Ffoulk Lucy, Lady Purbeck, Sir Allen Apsley, Madam Churchill, Madam Davis."

The so-called Marquis of Blandford was the nephew of the great Turenne, and his real name was Lewis de Duras, Marquis of Blanquefort; he was naturalised in England, created Baron Duras, of Holdenby, and afterwards succeeded his father-in-law as Earl of Feversham. Dryden praises him under the name of "Helon" in "Absalom and Achitophel," but Swift calls him "a very dull old fellow."

The Earl of Clarendon was the eldest son of the great Lord Chancellor, and Lawrence Hyde, who was afterwards created Earl of Rochester, was the second son of the same. Sir Cyril Wyche was the second son of Sir Peter Wyche, English ambassador at Constantinople, in which city he was born. He was President of the Royal Society in 1683, and married the niece of John Evelyn.

The Earl of Oxford was Aubrey de Vere, the twentieth and last earl of that family, after whom the Horse Guards were called the "Oxford Blues." His only claim to notice is his rascally conduct towards an actress, known by her stage name of Roxalana, whom he deceived by a false marriage. He went to Mrs. Davenport's lodgings with a trumpeter and kettle-drummer, intended to represent a clergyman and a trustworthy witness, and the lady did not find out their true characters until some time afterwards.

The two ladies at the end of the list were the respective mistresses of the king and the Duke of York. Madam Davis, better known as Moll Davis, the actress and dancer, captivated the king at the Duke's playhouse, and charmed Pepys so much that he set down in his Diary that she danced "beyond everything in the world." Arabella Churchill was sister of the Duke of Marlborough and mother of the Duke of Berwick. She afterwards married Colonel Charles Godfrey. A few years later another mistress of the Duke of York and another mistress of Charles II. were living in the square. In January, 1685-6, when Catherine Sedley was created Countess of Dorchester, and sent from court, a handsome house was furnished for her here and a seat taken for her in the newly-consecrated Church of St. Ann, Soho. Nell Gwyn lived in St. James's-square before she moved to a house on the south side of Pall Mall. Her house was taken down when the Army and Navy Club was built, and her looking-glass is preserved in the visitors' dining-room.

Cunningham's list of the inhabitants in 1677 differs slightly from that of 1676. The new names are those of Sir John Benet; Mr. Shaw; Mr. Bearbone; John Aunger; the French Ambassador; Mr. John Hervey; Earl of St. Alban's

and Earl of Essex. We have already mentioned Dr. Nicholas Barbone as the purchaser of a house in the square. He was a great projector, and published a treatise in 1696 on the expediency of coining the new money lighter, in answer to Locke. He was at one time the possessor of Osterley Park, in Middlesex. The French Ambassador was Antoine Courtin, who shares with the better known Barillon the discredit of having bribed the English statesmen. In 1677 Courtin wrote to the French court, urging that money should be sent to him to distribute among the members of Parliament, because Spain and the emperor had sent money to bribe on the other side.

The Earl of St. Alban's, to whom the land belonged, lived in a large house in the fields, which was made to form a part of the new square. This house had an entrance also from the Haymarket, and was sometimes described as being situated in that street. Its name was retained in that of St. Alban's-street, one of a nest of small streets which were cleared away to make room for the building of Waterloo-place and Regent-street. The hereditary Prince of Tuscany, afterwards Cosmo III., whose travels in England are so often referred to in Macaulay's History of England, was lent this house in 1669. On the evening of May 31, Charles II. and his brother, the Duke of York, were entertained at supper by the Prince, who, before leaving the country, exhibited some fireworks in St. James's Fields, and distributed among the crowds who flocked to the place several casks of Italian wine and beer. Another exhibition of fireworks which attracted a large crowd of people took place in St. James's-square, in November, 1695, before the Earl of Romney's house. On this occasion William III. supped with the Earl in order to be able to see the great sight, and his guards encompassed the square. Two years afterwards some more fireworks were shown before the king in commemoration of the peace. These fireworks were designed by Sir Martin Beckman, and consisted of "1,000 sky-rockets, from 4 lb. to 6 lb. weight, 200 balloons, 2,400 pumps, with stars, 1,000 cones, 7,000 reports, 15,000 swarms, 400 light balls, 22 rocket-chests, each containing 60 rockets, from one to four pounders." In the old newspaper, the *Postman*, for August 28 to 31, 1703, the following advertisement appeared: "There was one of the trees growing in St. James's-square, over against the Right Hon. the Earl of Romney's house, cut down and carryed away on Saturday night last: whosoever shall give notice to his lordship's porter of the person or persons that did the same, so as he or they may be apprehended, shall have two guineas reward." In the same year (1697) that the Earl of Romney exhibited his fireworks, the Dutch Ambassador made a bonfire of 140 pitch-barrels before his house, and opened two hogsheads of wine, which were kept continually running among the common people. This was on the thanksgiving-day appointed by the States-General for the peace.

In Mackay's curious journey through England (1724) there is a later list of inhabitants than those given by Cunningham:—"The late Duke of Ormond had a noble palace, now purchased, and finely adorned, by the Duke of Chandos; the Duke of Roxburgh another; the Duke of Norfolk a third, at present inhabited by the Venetian Ambassador. The Earl of Pembroke, the Earl of Portland's, now the Duke of Norfolk's, who gave 10,000*l.* for it. The Earl of Stafford, the Lord Cornwallis, the Duke of Kent, the Lord Ossulston, the Lord Ashburnham, the Lord Harvey, have each their fine palaces in this square; the Countess of Northampton, Sir John Germain, and Count Bothmar have also theirs; all worthy the curiosity of a stranger, especially the Duke of Kent's gallery and the Earl of Portland's apartments." In 1734 there were living in the square four dukes (Norfolk, Southampton, Kent, and Chandos), eight earls (Pembroke, Essex, Chesterfield, Stafford, Bristol, Bredalbane, Tankerville, and Wilmington), one baron (Lord Bathurst), and a prime minister (Sir Robert Walpole). Among the celebrated persons who have lived in the square and the position of whose houses we cannot identify, we may mention Henry Bennet, Earl of Arlington, the statesman, who afterwards lived in the house which stood on the site of the present Buckingham Palace; the treacherous Earl of Sunderland, the prime minister who was called by Queen Anne "the subtillest workingest villain that is on the face of the earth"; the Earl of Pembroke, president of the Royal Society, who collected "statues, dirty gods, and coins"; George Fitzroy, Duke of Northumberland, a natural son of Charles II. by the Duchess of Cleveland; the Marquis of Halifax, the celebrated Trimmer, praised by Macaulay in the most glowing terms; Charles Sackville, Earl of Dorset, better known as Lord Buckhurst, and the writer of the famous song commencing,—

> "To all you ladies now at land
> We men at sea indite;"

Sir Joseph Williamson, Secretary of State and president of the Royal Society; the Duke of Hamilton, who was killed in a duel with Lord Mohun in the year 1712; the Earl of Macclesfield, president of the Royal Society, and the principal agent in carrying through the House of Lords the Bill for the Reformation of the Calendar, in a house which was built by his father, Lord Chancellor Macclesfield; the great Earl of Chatham; Warren Hastings; and the eminent diplomatist, William Eden, first Lord Auckland.

One of the houses in the square was inhabited for a time by Mrs. Cormack, but her name does not appear in the rate-books of St. James's parish. She gave a masquerade ball, about the time that Coutts, the banker, was married to Miss Mellon, and Sir Elijah Impey, the Indian judge, went to it in the character of Coutts, dressed half in sables as a widower, and half in white as a bridegroom. On this occasion Impey delivered "The Merry Mourner's Address to the Ladies," commencing,—

> "A tender bridegroom, and a widower true,
> I come prepared to whimper or to woo;
> Conflicting passions at eternal strife,
> 'Twixt a new married and new buried wife;"

and ending,—

> "Take then which side you please,—if neither suit
> I've pleased myself, however, *coûte qui coûte*."

As each of the houses has a history, we will now note down a few particulars of them in the order they are numbered.

No. 1, at the corner of Charles-street, which is now occupied as the chief West-end branch of the London and Westminster Bank, was formerly inhabited by the Earl of Dartmouth and by Lord Grantham, who, in 1833, succeeded as Earl De Grey.

No. 2, the family mansion of Viscount Falmouth, was formerly occupied by the brave Admiral Boscawen, the third son of the first Lord Falmouth. He converted some French cannon, which he had captured in the action under Lord Anson, off Cape Finisterre, into street-posts, and these five posts are still to be seen in their old position.

No. 3 was the family mansion of the Duke of Leeds, and the house referred to in the lines quoted at the beginning of this article. Here Mr. Henry G. Bohn found in the year 1850 some manuscripts which he thought threw some light upon the authorship of "Junius's Letters."

No. 4 was the town house of the late Earl De Grey, which contained his fine gallery of pictures. It was here that for several years the Earl gave, as president of the Royal Institute of British Architects, his large and charming *soirées*, which no one who assisted at them will forget. The house is admirably planned for such entertainments.

No. 5 is the mansion of the Earl of Strafford, and an Earl of Strafford lived in it more than a century and a half ago. Among the manuscripts in the British Museum (Add. MS. 22,254) is one which contains a full account of the alterations made in the house in 1712 and 1713. The carpenter's work by one Wellbeloved cost 60*l.* 11*s.* 11½*d.*, and Thomas Combes's bill for plaster-work amounted to 47*l.* 5*s.* 10½*d.* The glazier's bill was 14*l.* 19*s.* 6*d.*, and the bill for painting was 57*l.* 4*s.* 2*d.* In 1748-9 the tradesmen sent the Earl estimates for finishing his house which had been newly-rebuilt. That for masonry amounted to 842*l.*, that for plaster-work to 630*l.*, and the joiner's estimate was 3,430*l.*

No. 6 has belonged to the family of the Marquis of Bristol (its present owner) from the first building of the square, John Hervey having lived in it in 1677. The holders of the two peerages of Bristol and Strafford have been next-door neighbours for many years, and in the MS. referred to above we find an agreement between Lord Hervey and the Earl of Strafford about the party-walls between the two houses. Here lived John Lord Hervey, the "Sporus" of Pope, and the husband of the beautiful Molly Lepell; and here died his son Augustus, the third Earl of Bristol, and the first husband of the notorious Miss Chudleigh, afterwards Duchess of Kingston.

No. 7 was originally joined to the corner house of York-street, the door of which is in that street. This large mansion was at one time occupied by the French Ambassador, then the Earl of Romney had it, and after him it came into the possession of Lord Cornwallis. The next occupant was the Spanish Ambassador, and the Castle of Castile is still to be seen on the chapel in York-street, which was the place of worship attached to the embassy. This chapel was afterwards let to several congregations, and in 1817 the doctrines of Swedenborg were taught in it. It has since been used for the Church of England service, and filled by Mr. Stopford Brooke's fashionable congregation. During the last few months, however, it has been closed, and its minister has moved elsewhere.

No. 7A is on the opposite corner of York-street, and here for several years lived the great Duke of Ormonde, whose name is retained in Ormonde-yard, built on the mews of the house. In 1719 this mansion was sold for 7,500*l.* to the magnificent Duke of Chandos, who built Canons and a portion of the north side of Cavendish-square.

No. 8 was for some years the scene of the brilliant festivities presided over by the Earl and Countess of Blessington. The Earl was living here in 1821, when he was assisting the elder Charles Mathews in obtaining patrons for the proposed monument to Shakspeare at Stratford. He died in May, 1829, and the house was then given up. Dr. Dionysius Lardner, the projector of "Lardner's Cyclopædia," lived in this house in 1834, 1835, and 1836, and the late Earl of Derby, K.G., when Lord Stanley, was here in 1850.

No. 9 was the residence for several years of Alexander Davison, the prize agent to Lord Nelson, after the victory of the Nile; and here the great sailor and Lady Hamilton often met. Davison was an army clothier, and in 1795 he became agent for the barrack-stores. In 1798 he began to manufacture the articles in demand himself, and charge them to Government in the names of his *employés*, false vouchers being drawn out. This practice he continued till a change of administration occurred in 1801, after which he sent in the goods he manufactured without charging his commission. When called to account he made a correction of 15,479*l.*, but this was not considered a sufficient reparation, and he was tried at the Court of Queen's Bench before Lord Ellenborough and a special jury, when he was sentenced to two years' imprisonment for malversation of funds. In spite of these troubles, Davison continued to reside in this house until the year 1818, and he died in Brighton in 1829, aged 79 years. At the beginning of the century he commissioned certain of the chief British artists to paint for him pictures illustrative of historical subjects, with the aim of encouraging the talents of native artists, and bringing them fairly in contrast with those of foreign schools. He placed the matter in the hands of Valentine Green, keeper of the British Institution, and nine pictures illustrating incidents in English history were painted by James Northcote, R.A.; David Wilkie, R.A.; Henry Tresham, R.A.; Robert Smirke, R.A.; John Singleton Copley, R.A. ("Death of the Earl of Chatham," and "Offer of the Crown to Lady Jane Grey"); Arthur William Devis; and Benjamin West, P.R.A. ("Sir Philip Sidney rejecting the Water"). Each picture contained the portrait of the artist. In 1807 Davison printed a "Descriptive Catalogue of the Series of Pictures formed on Subjects selected from the History of England, painted by British Artists for Alexander Davison, Esquire, MDCCCVI., in the Order in which they are arranged at his House in St. James's-square."

Hugh, fourth Duke of Northumberland, succeeded Davison, and Hudson Gurney, the grandson of David Barclay, the banker, and for half a century the head of the great Norwich family of Gurneys, lived in the house from 1824 to his death in 1864.

No. 10. "Ada! sole daughter of my house and heart," the daughter of Lord Byron and wife of Lord King, afterwards Earl of Lovelace, lived in this house in 1836.

No. 11 is famous as the place where the magnificent library of John, third Duke of Roxburgh, was preserved. In the dining-room of the house, Evans, the auctioneer, sold it off in May and July, 1812, during forty-two days. It was at this sale that the first edition of Boccaccio's "Decameron," printed by Valdarfer, at Venice, in 1471, "the most notorious book in existence," was sold for the unprecedented sum of 2,250*l.*, after a spirited contest between Earl

Spencer and the Marquis of Blandford, the latter carrying off the prize. Seven years afterwards, when the book was resold, Lord Spencer bought it for 918*l.* 15*s.*

Lord Chief Justice Ellenborough bought the house for 18,000*l.*, and died in it on the 13th of December, 1818. The celebrated statesman William Windham next occupied it, and the club which is at present in possession is named after him.

No. 12, which is now filled with the 80,000 volumes belonging to that most useful institution, the London Library, was formerly the residence of the brave soldier Sir Jeffrey Amherst, Lord Amherst, commander-in-chief.

No. 13, known as Lichfield House, is remarkable for its handsome stone front, which was suggested by "Athenian" Stuart and designed by Brettingham. Among the Additional MSS. in the British Museum (No. 22,254) is Brettingham's receipt for 400*l.*, dated March 26, 1751, "in full for my trouble, drawings, and attendance in his lordship's [Anson] building business in St. James's-square, and all other demands." In the same place we find that 439*l.* 18*s.* 7*d.* was paid for this house before it was rebuilt for the two years 1748–50, which amount was made up as follows:—Rent, 200*l.*; ground-rent, 26*l.* 10*s.* 4*d.*; repairs, 75*l.* 13*s.* 6*d.*; taxes, 137*l.* 14*s.* 9*d.*

On the 20th of June, 1815, when the house was in the possession of Mr. and Mrs. Boehm, the first public announcement of the victory of Waterloo was made from the balcony by the Prince Regent. Soon afterwards the house was rented by the Duke of Bedford, of the Earl of Lichfield, and the notorious Lichfield House compact between the Whigs and O'Connell was formed here in 1835.

No. 14. Sir Philip Francis, to whom the letters of Junius have been attributed, lived in this house from 1791 till 1818, the year of his death.

No. 15. Lord Chancellor Thurlow lived here in the years 1796–1800. Now Nos. 14 and 15 are occupied by the East India United Service Club.

No. 16, the corner house of King-street, was once the residence of the statesman Lord Castlereagh, Marquis of Londonderry, and from hence his body was conveyed to Westminster Abbey for burial.

No. 17, at the opposite corner of King-street, which is now the family mansion of the Duke of Cleveland, was the residence of Lord Grenville, Pitt's leader of the House of Lords from 1789 to 1794.

No. 19 was the town residence of the Bishops of Winchester, but Bishop Wilberforce was the last to fill it. It is now to be sold in order to assist in the endowment of a new see.

The south side of the square is chiefly occupied by the backs of houses in Pall-mall; but an architectural character has been given to it by the erection of the "New Carlton Club," from the designs of Mr. David Brandon.

No. 21, Norfolk House, has long been the town mansion of the Dukes of Norfolk. When Frederick Prince of Wales was ordered to quit St. James's Palace by the king, he rented this house for a period.

On May 24, 1738, George III. was born in the buildings on the north side of the inner court, as was also Edward Duke of York on March 24, 1739. The present building which fronts the square was erected, in 1742, by Brettingham, and the portico was added in 1842. The old house, which we have already referred to as St. Alban's House, still stands at the back of the inner courtyard.

No. 22 has been the town residence of the Bishops of London since the year 1771, when it was purchased for the see. It was very old and dilapidated, and an Act of Parliament was accordingly passed, in 1819, to enable the Bishop to borrow 10,000*l.* for the purpose of rebuilding it.

No. 23, the town-house of the late and present Earls of Derby, brings us back to Charles-street, on the north side of which we started with No. 1 in our perambulation "all round the square."

We are disposed to think our readers will agree with us that the proposition with which we commenced this article has been proved, viz.,—that more distinguished people have lived, and are living, in this square than in any other part of London of the same extent.

Association of Municipal and Sanitary Engineers and Surveyors.—The annual meeting will be held at the Institution of Civil Engineers, Great George-street, Westminster, on the 6th and 7th of July next.

THE PICTURESQUE.

THE love of Nature in her wilder aspects is of modern growth. The towering cloud-capped mountain, the roaring cataract dashing headlong over precipitous rugged rocks, the dark and mysterious depths of the forest, were sources of dread rather than of pleasure to the traveller of old. The feeling of superstitious awe and of fear for personal safety predominated so strongly as to supersede all softer emotions. The traveller wending his way through the valley was more intent upon the look out for the possible band of robbers who might be lurking behind the next mass of rock than upon the study of effects of light and shade produced by the passing clouds; his great desire was to gain the other side of the unbridged swiftly-flowing stream; the cataract was an obstacle to be overcome, not an object for admiration; the dark recesses of the forest, the haunt of wild beasts, the abode of demons, were places to be avoided even during the sultry heat of noonday.

Thorough enjoyment of a contemplative nature can only be secured under a sense of security. A certain zest may doubtless be obtained by a little danger being added to the experiences of one who has hitherto dwelt in safety; it is to him a novelty, which would cease to be pleasing if prolonged.

Places where there is real danger are rarely visited for the mere pleasure of looking at them; there is generally another object in view, philanthropic or scientific; or it may be the love of adventure; these may all indeed be allied with the love of the picturesque, but are rivals thereto.

In ancient poetry it is the cultivated scene, the fields waving with corn, the vineyards heavy with bunches of purple grapes, the formal garden adorned with statues, vases, and trimmed hedges, that are the objects of the poet's admiration. Nature in subjection to rule, not nature in unbridled freedom, the work of man rather than that of the Creator, the artificial rather than the natural, was what met with the most hearty sympathy. The artificial held so strongly that attempts were even made to reproduce the works of nature; artificial hills, cascades, and caverns were produced in the demesnes of the wealthy, and the ravages of time were imitated in artificial ruins; and these trifles appear to have elicited greater admiration than what they were meant to represent. A marked change has of late taken place in this respect, and upon nothing has it had a greater effect than upon architecture.

The charm of an architectural work does not depend entirely upon itself; it is in a great measure dependent upon its surroundings, and the expression it gives to or acquires from the landscape. The architecture of the Greeks is unsurpassed in elegance and refinement of proportion and detail; but it is one-sided and somewhat monotonous; it wants variety, and although it satisfies the æsthetic sense, it does not fill the heart and enlist the warmer sentiments. It is highly refined,—as near perfection as the work of man can be; but our sympathies are not readily enlisted in favour of absolute perfection; we are apt to look upon it with reserve; to consider it rather cold and forbidding; we have more sympathy with what has some faults which have their counterpart in our own nature.

The element of the picturesque is not a marked characteristic of Greek architecture. A Greek temple perched upon a rock is undoubtedly a picturesque object; but it retains a look of artificiality unless in a state of ruin. It does not seem to belong to the scene, and to be an integral part thereof; but rather as if it had been placed there as an ornament, to be removed at pleasure. It owes its beauty to contrast, not to harmony with the landscape. It is not rooted to the soil, and does not spring from amongst the crevices and irregularities of the rock as does the Mediæval church or castle, which often looks like a product of nature, where the eye finds it difficult to detect where the natural features end and the artificial begin.

It is useless to claim for a building the same direct sympathy which is called forth by a painting or statue in which the human element predominates, where action is represented which awakens the deepest interest, where the element of mystery may charm the imagination, where the scene of a tragic history may be graphically displayed. But we may associate with a building the most pleasing recollections. It may have no particular history of its own, but it may contain charming surprises of unexpected quaintness, it may form an integral part of a lovely scene, it may, indeed, be the object which gives point and character to the landscape, without which we would pass the spot regardless of its other beauties, which have been enhanced in value and brought into combination by this work of man.

The wants of civilised man have become very complicated in these our days, and these our wants must necessarily be met in a variety of ways. Men are not now content to walk along a beaten track, but will take erratic courses, and the architect is not free from the prevailing influences. He takes flight wherever there is an opportunity, and wandering at will, up hill and down dale, now on the highway, then o'er the common, many and varied views are spread out before him; he stumbles upon quiet nooks, where beauty hides herself, which, had he kept in the beaten track, would never have delighted his eyes. There is an elasticity in the closely-cropped turf, a bracing energy in the pure air, a sense of freedom which produces a feeling of elation, which may lead to his doing what,—although it may not be wrong,—may be very undignified. There are still dangers in the way; although there is no fear of robber or demon, he may find himself involved in the intricacies of a morass, or tottering upon the verge of a precipice.

Every scene has its special beauty if not marred by man's work. It is with a feeling of pain nigh to agony that we have revisited what was once a lovely vale, down which meandered a brawling brook bordered by rushes and forget-me-nots, to find planted there a huge factory vomiting forth clouds of smoke, and pouring forth into the once pellucid current a stream of filthy discoloured matter. This is an extreme, though by no means a rare, case; but there are others where the intention has been to carry out an improvement and to produce a pleasing effect, and where the result has been the reverse. One of the chief aims of the modern architect should be to master this problem; if he does so he is, in no mean sense, an artist: he must have the eye of an artist, a fine perception of the fitness of things, a feeling for harmony, and a keen sympathy with nature. If so endowed he not only produces artistic work, but themes for artists.

A landscape-painter cannot give the true spirit of a scene he has never cast eyes upon, nor yet can an architect design a building in harmony with the surroundings of a site he is unacquainted with. His design may itself be good, but if misplaced it will appear ugly; and, on the other hand, a design exhibiting no special powers or beauty, *per se*, may in combination with other objects be a worthy and beautiful item in the composition. In certain circumstances the architect may find it expedient to rely upon the effect of contrast between the leading lines of his building and those of the surrounding objects; in others he may place his reliance upon the harmony between his creation and the scene in which it is placed; and in other and rare instances he may feel called upon to make his work predominate so as to subdue, as it were, to its influence everything around. But this last is a dangerous experiment, only to be undertaken by those strong in resources. The safest course is to strive for harmony of effect, so that in character, sentiment, and colour the building may appear amalgamated with the surroundings rather than form a striking object claiming attention; it may withal be the key to the general expression of the composition, the one object which has made the scene picturesque and a subject for the pencil. Far happier are such results, much more to the credit of the architect in the long run than those produced by brusque self-assertion which thrusts itself into prominence. The most ambitious efforts of man compete in vain with the sublimer products of Nature. St. Peter's itself would appear but as a toy if perched on the Matterhorn. In the presence of such objects man's humbler efforts are the most acceptable; they should appear as the mere trimmings upon the drapery of Nature, the smaller ornaments she uses occasionally. On the other hand, when the natural features of a scene are not upon a gigantic scale, but yet possess a certain ruggedness of character, the architect should give some force and prominence to his work. The Mediæval castle is more in keeping with a rocky site than a circular temple, which again is in complete harmony with a landscape where gentle undulations prevail. Where Nature is least assertive, man may be

most so; in a flat landscape the tall spire which cuts up against the sky may dominate with fine effect over every natural feature; it may arise from amidst a thick mass of foliage, or overtop a long row of poplars, and be the one object which enlivens the prevailing monotony. A tower, again, is more appropriate to a scene composed of hill and dale, and it may be of no great altitude if it possess sufficient bulk.

Picturesqueness is more allied to irregularity than to symmetry; but irregularity is not of necessity an imperfection: it is, on the contrary, a frequent source of the most subtle beauty. A human face, which is perfect in contour, may be less attractive than one in which there is not a graceful line. Although an architect may not be a master of detail, although he may lack the power to stamp his designs with the impress of genius, he may be imbued with true artistic feeling, and produce works which have a charm of their own, and which are a source of delight to the traveller in search of the picturesque.

AN ARCHITECTURAL HOMILY.

"The soil of Attica produced at once the most delicious fruits and the most violent poisons."

That we are "heirs to all the ages" is especially true as regards architecture. The works themselves are real estate still existing, although in some instances in a state of dilapidation. They are legacies of which all may be beneficiaries, and many there be who have taken the benefit of the succession in these later times. There is so much to choose from, so greatly improved is the facility for attaining variety, that it is not to be wondered at that unity of aim does not exist amongst the claimants. With this *embarras des richesses* at command, the architect is apt to be spoiled, and become extravagant in his notions and proceedings; he desires to do too much and exhausts his energies, or lavishes his means on one single object. A judicious investment in several useful undertakings is the safest course to follow, keeping in reserve a considerable portion of the power which might otherwise be needlessly expended.

If a Classical building—a Greek temple especially—is examined with anything like perspicacity, it will be seen that the architect has done what he desired to do, and no more. Thought, skill, and taste of the highest order are there, but they are restrained and kept within compass. We feel sure that it would have been an easy matter for the architect to have exceeded the limits he had prescribed for himself, and to have indulged in a luxurious extravagance, but he refrains from doing so; his object is not to excite surprise and wonder, but to satisfy a refined taste engendered by the highest culture. Workmanship of the most exquisite description is produced, not simply for its own sake, but as conducive to the great result. Restrained power is everywhere evident, elaboration nowhere obtrudes itself; nothing is in excess, everything is in perfect harmony; the product is the outcome of the highest aspirations of the Pagan world. What has been aimed at has been achieved, and the designer is complacent and contented.

But "Time's noblest offspring is its past." The aspirations of the Classic architect were not warmed by the glow of an all-embracing creed of love and true devotion; his works consequently do not display that freedom of idea and wealth of imagery which characterise the works produced by those animated by the hope of a future and holier existence. The work of the Mediævalist is the outward expression of his most cherished hopes; he looked upon this world but as his temporary abode, a fleeting scene soon to be changed for a more glorious reality. Hence arose a feeling of restlessness and discontent with the already existing "love of change which is grounded on the difference between anticipation and reality." Thus it is that Classic architecture produces the impression of repose, Gothic of unrest; the one seems to cling to the earth, the other to soar heavenwards. They abound in contrasts. The stability of the Greek temple is due to the trabeated style of construction, and simple downward pressure, the expression of repose to the prevailing horozontality of the leading lines. The arch, which is the main element in the construction of the Christian Church, "never sleeps," the leading lines are vertical, the composition rather tends towards irregularity than exactness of symmetry. Every effort is made to encourage the expression of upward aspiration. Multiciplicity and variety rather than simplicity are sought for, not variety of parts in an individual building merely, but variety in the form and detail of each separate building, so that each should have a marked character of its own. The impatient restlessness and vigour were such that no pause in the race was permitted, no time was allowed to ponder over and refine upon what had been done, but ever the aspiration after something better led onwards towards the goal. The languid grace of the Classicist was superseded by a nervous vigour, but this vigour was not wanting in refinement.

The Greek architect concentrated his effects, the Mediævalist dispersed his; the eye rests upon the group in the pediment, it wanders from figure to figure on the Gothic façade. The Greek sculptures are strongly pronounced, they form a prominent element in the composition, they exhibit the acme of grace and freedom of action, fulfilling their mission with easy complacency. The Mediæval saints do not obtrude themselves upon our notice; they are crude, stiff, and conventional, and must be sought for amidst a luxuriance of foliation. In the one case the human element is strongly pronounced, in the other it is subordinated; in the one the foliation is conventionally treated, and is repeated throughout; in the other it is more naturalistic, and is ever varied. The Greek temple is complete, finished at every point; any addition to it would destroy its proportions, and disturb the sense of harmony which pervades it. The Christian church, even when complete as to its several parts, may be altered and added to almost indefinitely without producing a feeling of incongruity. There were no difficult constructive problems to solve in the building of a Greek temple; in this respect the simplicity of the style is remarkable; on the other hand, such difficulties abound in the construction of cathedrals and churches. In plan and section the multiplicity and variety of parts, and the necessities of an arcuated and voluted style, were productive of serious difficulties, difficulties which were not always overcome, and which were sometimes got over in a perfunctory and crude manner.

These two styles of architecture, so strongly contrasted, form the bases upon which future excellence must be reared; they are the styles most worthy of imitation, but not imitation of a servile description; not by copying and reproducing what has been done before, but by doing as the designers would have done had they been placed in the same circumstances as ourselves.

The scope of architectural thought is now wider than heretofore. The number and variety of structures upon which the architect can exercise his talents are greatly increased, and to each of these a distinctive character may be given appropriate to, and in keeping with, the object for which it is designed. "Nothing," it has been said, "is denied to well-directed efforts." Are our efforts well directed? Is there not a great amount of useless labour bestowed upon the attempt to "reanimate dead bones"? Is there not amongst us too great a love of display,—a strutting about in "foreign costumes or plumes borrowed from those who were artists, not only in form but in spirit"? It is the absence of this spirit which is the bane of our art,—the servile, heartless homage paid to precedent which is destructive to originality. The only true art is that which gives expression to the spirit of the times. "It is the genius of the hour which always sets his ineffaceable seal on the work, and gives it an inexpressible charm for the imagination."

As "heirs of all the ages," we should not only enjoy our estate, but do something towards its improvement. We may do so by assiduously cultivating the refined ideas of the Greek, and engrafting upon them the vigorous power of the Mediævalist.

"How is the artist to guard himself from the corruption of his time which on every side assails him? By despising its decisions. Let him look upwards to his dignity and his mission, not downwards to his happiness and his wants. Free alike from the vain activity that longs to impress its traces on the fleeting instant, and from the discontented enthusiasm that measures by the scale of perfection the meagre product of reality, let him leave to common sense, which is here at home, the province of the actual, while he strives from the *union of the possible with the necessary to bring out the ideal.*" These last are the words of Schiller, no mere dreamer, but a man of rare energy and originality, who himself put the precept he enunciated into practice.

ALTERATIONS IN CHURCHYARDS.

At the Consistory Court, before Dr. Tristram, an application has been made to the Bishop of London by the vicar and churchwardens of Isleworth for a faculty to make certain alterations in the churchyard with respect to family vaults and tombstones, in order to provide a new entrance to the church for the convenience of the public. The petition stated that in pursuance of an advertisement in the *Times* on the 2nd of December, a vestry meeting was held, and it was resolved that the proposed alterations should be carried out by a faculty, and the expense was estimated at about 100*l*. The vicar attended before the Chancellor, and gave evidence in support of the application. There were four family vaults to be lowered, and a number of tombstones in an upright position to be placed on the ground. No bodies were to be removed, and the relations of two of the families buried had given their consent. Part of the churchyard was closed for burials, and the other portion would be in about a year. Many of the tombstones were in a dilapidated condition, and the churchwardens would put them in proper order if permitted. The Chancellor, in granting the application for a faculty, limited the time to twelve months for repairs of tombstones. The law as to monuments and tombstones should be known. There was no power to order their removal, as inscriptions thereon were admissible in courts of law, and title to property sometimes depended upon them. The vicar undertook to preserve the inscriptions as far as possible. The tombstones were in a neglected condition. Order accordingly.

ABANDONMENT OF THE SAVOY MINT PROJECT.

At the meeting of the Metropolitan Board of Works, on the 12th inst., the Works Committee submitted a letter from the Chancellor of the Duchy of Lancaster, proposing a modification of the agreement between the Board and the Duchy of November 20th, 1874, by the construction of an additional new road along the boundary separating the properties of the Board and the Duchy, and recommended that the modification be approved and accepted by the Board, subject to the proposed new road being made of the width of 40 ft., the Board and the Duchy each giving up 20 ft. on either side of their boundaries. Mr. Richardson said the Board had received an official communication from the Government to the effect that they had given up the idea of building a new mint upon the Embankment. The Duchy of Lancaster had proposed that a new road should be made from the Strand to the Embankment, and as it would be a great improvement to the property both of the Board and the Duchy of Lancaster, the committee recommended that the offer should be accepted. The recommendation was agreed to.

NEW WATERWORKS AT BATH.

On the 10th inst. the Mayor and Corporation celebrated the completion of the new city waterworks. The works were commenced in 1870, and their execution has altogether, with the purchasing of land, and the paying of compensation for loss of springs and water power, cost 100,000*l*. The system adopted has been to collect a large number of springs in the valleys below Marshfield, and conduct the water, by means of mains, a distance of eight miles to the city, where there is pressure sufficient to throw water, in case of fire, as high as the highest houses in the centre of the city, and to force an adequate supply for domestic use nearly up to the highest portions of the city. The springs are not caught at the surface, but have been traced to the spot at which they escape from the oolitic rock. A supply has thus been obtained so constant that only small reservoirs for storage are required. The yield of the new springs, together with that of the old works, furnish an average supply of thirty gallons per head per diem for the 60,000 inhabitants of Bath. The works were carried out by Mr. Alfred Mitchell, city engineer.

Windsor Drainage.—Mr. Harrison, inspector of the Local Government Board, held an inquiry at Windsor, on the 9th inst., with reference to an application of the sanitary authority for a second loan of 10,000*l*. for drainage purposes.

SCULPTURE AT THE ACADEMY.

It is two or three years since the north-east niche (usually the place of honour) in the octagon hall at the Royal Academy Rooms was occupied by a group of sculpture which, however it might be criticised in regard to purity of style, fairly bore down everything else by its vigour and energy of conception. If, while admiring the wild power of "La Danse," one was tempted to regret that a French artist should thus triumph over the English contributors to the Sculpture Gallery, and that his triumph, too, should be achieved by a work not quite in keeping with the serenity and repose which should characterise the highest efforts of the art, both our patriotic and artistic sympathies are gladdened by finding the same place occupied this year by a work as remarkable for energy and vigour as that of Carpeaux, while it is far greater and more truly sculpturesque in style, and possesses a moral grandeur and suggestiveness of which the brilliant French sculptor's work, it must be admitted, was quite destitute. The group of "Valour and Cowardice" (1,427), to which we have already alluded as part of the late A. Stevens's design for the Wellington monument, has this in common with Carpeaux's work, that both belong to the purely ideal or abstract class of representation to which especially the art of sculpture is suited, and which is so sadly neglected at present, and that both were designed as adjuncts to an architectural background, since the main design of the Wellington Memorial is essentially architectural. In another respect, the contrast between the two groups is striking enough, in regard to their object. The one was part of the decoration for a temple of Pleasure, the monument of a reign of unprincipled luxury; the other, which stands at Burlington House now, is to assist in commemorating a hero, the motto of whose life was "Duty." In this case at least the higher motive has given rise to the higher and finer work of art.

"Valour and Cowardice" forms one of the two side groups which flank the upper part of the pedestal of the Wellington monument, eventually to be crowned, we hope, by an equestrian portrait statue, and of which not long ago we published an engraving. The corresponding position on the opposite side is to be occupied by figures of "Truth and Falsehood." In the group we now refer to, "Valour" is represented by a strong and noble-looking, fully-draped female figure, who sits, the right hand leaning on a club, the left arm holding a shield, looking round towards the left, as if in calm and undisturbed readiness to meet an attack. Beneath her feet crouches "Cowardice," a nude male figure, cowering low down beneath the shield, which covers his back and head, and from under which he peers with a countenance expressive of alarm, reminding one a little of the first stage of "fear" as depicted in Bell's "Anatomy of Expression." The figures are most successfully combined into one group, and the mechanical, as well as the artistic unity of the whole, is enhanced by the treatment of the drapery of the upper figure, which falls on and spreads over the shield of the other. Will any one be disposed to complain that the sculptor should have represented "Valour" as a woman, and "Cowardice" as a man? As these abstract qualities have to be made visible to the eye, however, no doubt the nobler appearance and expression are more easily attained through the female form; but, apart from that, if we consider the work as representing the highest attributes of moral courage, we take it that woman is not without reasonable, perhaps even unanswerable claims to the higher position. As to the sculpture itself, there may be, from a side view, a little want of weight and substance in the torso of the female figure (perhaps because it is slightly flattened against the architectural pedestal behind it). It would be hard to name any other questionable point: in greatness of style, in the large and grand treatment of the figures, in the whole conception and intention of the group, this production is not merely an honour to English art, it is one of the very, very few modern works one ever sees which recal something of the greatness of style of the zenith of Italian art, and it is hardly too much to say that were this work presented as a newly-discovered group by Michelangelo, it would be judged to be fully worthy of the fame of the great Florentine.

The recumbent effigy of the duke, for the same monument, can hardly be adequately seen as placed in the inner sculpture gallery; it is pretty evident, however, that the artist regarded this as a kind of conventional appendage to a monumental design, to be treated simply and unpretendingly, while the expressive power of the sculptor was bestowed rather on the accessory figures. Another fine monumental work is the model for the colossal bronze statue of Lord Lawrence by Mr. Woolner, erected in front of the Government House at Calcutta. It is in the simplicity and dignity of this figure that its effect consists, there is no attempt at any specially striking treatment. A cloak hung, with a natural appearance enough, over the left shoulder, supplies that breadth of surface and mass which modern costume in its simple form denies to the sculptor. Mr. Woolner's other contributions are on a much smaller scale, but of hardly less importance. His diploma work, a small alto-relief of "Achilles and Pallas shouting from the Trenches" (1,417), shows real greatness of style on a minute scale; Achilles, a strong, square-built, nude figure, stands with full front to the spectator, his hair blowing in the wind, the shield of Pallas, who stands on his left, forming a kind of nimbus at the back of his head. There seems a slight oversight in representing Pallas as mute and with closed lips, seeing that Homer distinctly says that the goddess joined her voice with his, and one would suppose that she should have been shouting also. Besides this there are several portrait works of Mr. Woolner's, of which the most interesting, perhaps, is the bust of Kingsley, for Westminster Abbey, and treated in a bold and monumental style suitable for such a situation and surroundings. The alto-relief statuette of "Sir Cowasjee Jehanger Readimoney" (1,422) is also a good specimen of portrait sculpture, somewhat after the bold simple manner of Flaxman; in both this and the "Achilles" it may be noticed how bold and free is the treatment of the marble, quite without the polished-up appearance of which certain Italian sculptors have set a fashion but too quickly caught up by many of our own artists.

Among other works in the Central Hall two, by a comparatively young artist, the "Eros" and "Persephone" of Mr. Simonds, show at least a gratifying tendency towards ideal subject on the part of an artist who last year exhibited one of those costumed figures with buttons, fur edgings, and what not, cut out in marble, which reduce the sculptor's art to mere *mécanique*. Of the two, "Eros" is the best as a figure; in the "Persephone" it appears to us that the curve outwards of the right hip is quite unaccounted for in a figure in motion, and that it is a treatment of the limbs which only belongs to a standing attitude, with the body thrown on one side and resting on one foot, and cannot occur to this extent in a figure walking straight forwards. The "Eros" does not come up to the ideal indicated in the quotation appended from "Love's Labour Lost"; the figure is a nude study, in fact, rather than an ideal work, but it shows a good intention. Mr. Marshall is not strongly represented in "From Stone to Life" (1,414), the statue of Pygmalion in the act of awakening to life; the surprised expression of the face is intended to be given without overstepping the repose proper to sculpture, but it would be difficult for any one to guess the purport or action of the figure without explanation. Are the legs a trifle short? Mr. Armstead's "Religion" (1,439), to be executed in bronze for a fountain at King's College, Cambridge, is rather prosaic in idea; a seated figure holding on her knee a model of King's College Chapel! This is hardly a very broad or adequate manner of expressing religion; nor is the figure by any means equal to the fine companion figure of "Philosophy," exhibited last year. The two large figures of Baxter and Priestley, recently erected in Kidderminster and Birmingham respectively, are represented by their plaster models; Baxter is much the more successful as a statue, and from the nature of the costume offers a better object for sculpture; but neither rises above the level of respectable productions: they do not bring home to us the individuality of the men. A figure of "The Diver" (illustrating Schiller) (1,426) is an unfortunate instance, though well executed, of the misuse of sculpture, which cannot be made satisfactorily to represent such out-of-the-way and momentary action as in this figure shooting head foremost, with its feet sticking up in the air. It is an able work, though the position is a mistake. A really clever thing is Count d'Epinay's "Spartan Boy" (1,443) with the fox under his cloak attacking him; the attempted laugh of the lips that are quivering with pain, and the spasmodic contortion of the toe from the same cause, tell the story almost without a title; and the figure is modelled with equal care and spirit. The "Berceuse" of Dalou (1,441), one of the best we have had here of his realistic studies of modern figures, represents a mother singing her baby to sleep in her arms; the costume is treated with a more sculpturesque breadth of manner than in some others of the artist's similar subjects; the modelling and pose of the mother's head are charming in every point of view except the full front face, where the open mouth is not pleasing: the child is perfect in attitude and the characteristic details of infantine form; even the back view of its little head is quite a study.

We notice with pleasure, at either side of one door of the central hall, two of the studies submitted for the Academy medal for sculpture this year, those of Mr. Webber and Mr. H. Thornycroft. The subject, it may be remembered, was "a warrior bearing a wounded youth from the battle-field"; the opinion which we expressed, at the time of the exhibition of the students' works, of the high merit of the sculpture designs, seems to be a general one. We are glad to find that the Council of the Art Union of London propose to endorse the decision of the Academy by producing Mr. Thornycroft's design in bronze for prizes. Among the line of busts in the vestibule, which always reminds one of so many pins' heads in a row, are one or two of distinctive artistic character: Miss Foley's medallion bust, in low relief, of "Mary Howitt" (1,348), for example, a finely modelled face of regular and strongly marked features, with a contrast of surface given by the lace hood over head and shoulders, the texture of which is roughly but sufficiently indicated in the marble. Mr. Boehm's terra-cotta bust of the "Earl of Shaftesbury" (1,364) has spirit and character; there is force of style in Mr. E. Davis's bust of the late Bishop Thirlwall (1,358), to be placed in the "Abbey," as also in Mr. Schota's medallion portrait (1,356) of a feminine head with, however, very bold and masculine features. Mr. Bell's large figure of "Peace contemplating the Map of the World" (1,347—she is not getting much satisfaction out of her contemplations at present, we should think) is intended for the centre niche in the great hall of the Foreign Office; it is a figure with a good deal of placid—rather too placid—feeling; will it have a side view as well as a front view in its intended position? The side view is the best, but a "niche," in the ordinary understanding of the word, would not allow of this. Among the best things in the vestibule are the small terra-cotta panels in alto-relief, by Mr. Tinworth (1,380–1; 1,391–2), who exhibited some similar works, but hardly equal to these, last year; the scene of "Paul and Barnabas at Lystra" is full of spirit, the small heads (the figures are barely 2 in. high) very expressive; so is also that of "Judas" coming and throwing down the thirty pieces of silver before the priesthood. A "Young Dante," by an Italian sculptor, is, as Mr. Sala said of his own farce the other day, an "awful warning." Mr. Joseph Durham exhibits a design for a bronze drinking-fountain, far superior to what is generally used for such purposes, but scarcely up to his own mark.

The sculpture-gallery, beyond the octagon, contains the usual quota of busts, out of which some good ones may be picked. There is a characteristic and highly recognisable likeness of "Le terrible Cole" (1,453), by Mr. Boehm. The only other we feel moved to mention is an ideal bust by Mr. Lawler, "Mater Dolorosa" (1,468), a very beautiful head, drooped sideways, beneath overhanging drapery, which casts a shadow on the face. This "gallery" is not an encouraging room to contemplate, in fact; but, on the other hand, it may be asked, what sculptor would wish to send any important work to be placed in such a bare, uninviting room as this? Surely a little judiciously-applied colour, a little drapery, and other such accompaniments, would better set off the sculpture, and prove a little more attractive-looking than these bare and dingy walls. In our opinion, sculpture requires coloured accessories to give it its full effect, to throw out by contrast the forms of the pure cold marble, as well as to correct the chilling effect on the eye which must always result from the collection of a number of sculptured works in one apartment with no such correcting or balancing influence. If the sculptors who are Academicians would procure some change in this respect, they would greatly enhance the effect of their own works, besides rendering the sculpture-room more attractive to visitors.

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THE PHILADELPHIA EXHIBITION, AND A SOMETHING TO LOOK FOR.

THE opening, auspicious as it was, of the Philadelphia Great Exhibition, on the very centenary day of the existence of the Great Republic, again calls attention to the precise nature of these international shows, and to the precise work they do, and are expected to do. As far as the mere novelty and freshness go, no Exhibition can well compare with our own famous one of 1851,—at least, to English people. Everything was then, or seemed to be, *new* and striking,—the building, its decoration, and its contents, and more than all, perhaps, the additional charm that was felt in it from the fact of the Royal patronage accorded to it, and from the intimate personal interest taken in it by the ever-to-be-lamented Prince Consort. It would be obviously impossible to repeat or rival such a novelty as this was, all things thus helping and aiding it. But the question may come yet whether it would not be possible to hint at an Exhibition somewhat better calculated in some ways to do the work which at present the world most stands in need of. We are here referring to the artistic outcome of it. Perchance a few words may be of interest and use just now.

In the first place, it must strike all who have ever looked or thought for a moment about such matters, both principles and things, that there is a most vital and inherent difference between the art-production of to-day, pretty nearly the same all the world over, and the art of past times, wherever we may go to look for it, or in whatever style and character it may have been. The absence of machinery in days gone by, the absence of our now all but universal "division of labour," the little knowledge in past days which one nation had of others, even when close together, and a whole multitude of other differences, made the past of art-production altogether different from the present. Everything would seem to have been wanting, and the wonder really is, if our modern system of doing things is a progress, and the right one, how it is that the ancients have left anything at all worth the looking at or the thinking about. We have often fancied ourselves in antique Athens or old Imperial Rome, and wondered what sort of "Great Exhibition" either of those world-famous cities would or could have held or could have conceived; and what the wise men of Athens would have urged upon the attention of the "schools;" supposing, for a moment, the idea possible in any sense of practical realisation. Had such a gathering of the objects of the then known world occurred, what sort of show could it have been, and how could it have been divided, and what would its "sections" have been, and how utilised? About much of this we may speculate with not a little certainty. The Greek himself, the Athenian, must have reserved a section for his own special work, that is certain; and we can judge of what that must needs have been with some accuracy. It was *sui generis*, pure Greek work,—unborrowed, and essentially the Greek's own. We should have seen specimens of his architecture, his sculpture, his painting, and house furniture, and woven fabrics; the things of his public and his home life. None of these wonderful objects, by the way, could have been shut up in "glass cases," a matter of more import than many may think. What would the world now not give for a sight of this section of the antique world's show, with all things in it "hand-made" work, and thus to so great an extent impressed with the artistic individuality of the working artists who produced them? We must have seen the old Greek, as it were, at his bench or his loom at work, and as writing on the material he was moulding into form. We might have seen, perchance, the great Phidias himself, and the Jove starting from the marble block as the work of his hand.

Well, this Greek section, being thus a thing apart, and thus powerfully impressed with the individuality of the Greek mind and hand, we may fancy ourselves looking into the Egyptian section of this antique exhibition. And what could this, then, have been? Why, even stranger than the Greek, and older in aspect, and far more unlike the things of the then present. All about us original, and purely and solely from Egypt; unborrowed most surely from any source, and coming as plainly and vividly from the brains and hands of Egyptian workmen and artists as did the Greek from Greek. There could be no mistake about it. There is no "influence" to be detected anywhere or in any special object. If there be merits those merits are Egyptian; if there be defects, why those deficiencies are Egyptian too. It is like the seeing into another world,—a world of colossal forms and strange imaginings. As unlike the Greek as the Memnon is unlike the Theseus. All this to the Greek would, indeed, have been a something *new*; but how was he best to make *use* of it, being, as he was, so thoroughly up to his own special work,—his, as we now term it, all but *perfect* work, as far as the word perfect applies to things human. In the Philadelphia show what would be thought by its national artist contributors of a newly-sculptured form of purely Greek workmanship, and fresh from the artist-workman's hand, its essential merit lying in the fact of its being Greek, and Greek only? The antique Greek did not *borrow* from the Egyptian, or from any other art-source.

We might thus go on and pass into the Assyrian section of the old Athenian show, and thence to the Persian, and then again to still more remote individualities,—to ancient India,—a world in itself; and then perhaps to spots in this earth's surface, where the humanity on them would seem to have almost sprung out of the very earth itself, as a something apart and away from the rest of the world, so separated, and distinct, and individualised are they, with languages, arts, modes of life, and beliefs, altogether their own. Each one complete in itself, and, where admitting of improvement or progress, if that most modern of words at all applies to them, it sprang up from their own inherent art-consciousness and art-instincts,—a growth, in the true sense of that word. A subject well worth further development and analysis, by the way. How different, therefore, would an "antique" exhibition in Athens or Rome have been from the present show in Philadelphia. All things were and are the reverse of each other. In the antique all was hand-work. In the modern display almost everything in it will be found to be the result, either of machinery or the result of that "division of labour" which now goes by the name of "manufacture." In the antique collection, the work was the work of men who knew nothing of any art but their own, *e.g.*, the Greek, and never dreamed of borrowing a form or idea, still less of directly copying the forms of a past art, either about them or more distant from them. In the modern vast gathering of all kinds of objects, useful and ornamental, there perhaps will hardly be found one that has not been more or less "influenced," at least by some art foreign to the artist or artists who produced it. Large numbers of the things to be looked at so curiously will be direct and literal copies of the art of the past, professing to be naught else. It would be difficult to exaggerate the significance of these differences, whether it be thought that such differences in the *modus [operandi* be an improvement, as respects the modern system or no, over the antique. We must needs suppose that modern and new Philadelphia in this year of grace, with all its added advantages and means, must be able to do infinitely better work, all ways, than could the old world,—so far off in time and means. And yet are the *facts* of the case patent enough. The hitherto unrivalled Greek must hold its own even in Philadelphia!—modern and new as it is. These facts are, as we think, well worth the consideration of those who trust too much in the potency of these Great Exhibitions.

We would, by way of help, venture to hint at one or two matters which might be found useful—at any rate suggestive—in any *future* Exhibition in this country, at least. Of course, we are not to forget the tendency of the age all through what is somewhat loosely called the civilised world, to induce, all the world over, a sort of cosmopolitan uniformity, with a desire to impart to others, all the world over, the improved ideas, artistic and otherwise, we ourselves hold so tenaciously and prize so highly. This is well, doubtless; but it is not to be forgotten that all the world is not alike,—the soil, the climate, and the humanity differ essentially and inherently. It is not the least among the wonders of creative skill that human nature, though it be everywhere akin, is yet in detail diverse and unlike,—as much so, indeed, as can well be imagined possible. In the old world this was to be seen plainly enough, and the results of it were and are patent enough; but to look at a modern show, exhibiting results, we might almost imagine that there existed but one type of the *genus homo*, so much do the results of the human action resemble each other, from whatever quarter they may happen to come. A sort of machine-made and universally applicable *pattern* is everywhere about us, and certainly pervades these world shows. If, then, there ever be here another "Great Exhibition," would it not be possible—nay, desirable—to ask from the foreign exhibitor, not so much the results of his power over and with machinery, made for him perchance, but as much as may be of his own art language, and of his personal power over the materials he moulds into form?

A thought more and we must needs pause, though there be so much more that might interest, even while glancing thus generally at matters. Look for a moment at the vast means and well nigh boundless extent of the New World, even as represented in this Philadelphia display: may we not ask, and may be not in vain ask, for a something from the place itself? In the past, as we have noted, each separated nationality could have offered to the world's gaze an art, and architecture, and a material mode of life and life's surroundings all its own, and peculiar to itself, each one individual in interest. The place might be small, like Greece, or of indefinite extent, like Assyria, but it was always equal to its own work, and would proclaim its capability to do its own work in its own way. And surely there must have been an advantage in this exertion of individual artistic power and national action. We own this now in the results of it, and by the way in which we prize it when we pick up fragments of it. It is to be feared that but little, if anything, of this will be found in this American show. But yet ought not the *new world* to give birth to a new art, to a something different from the old and well-worn world? *Copies* are but poor things at the very best, even when direct, and done on the spot, and from the original work—but how very poor the work then must be, and needs must be, when all the original inspirations are remote, all made for other times, and for other peoples, and may be for quite other purposes! It would be a right curious thing to go through this Philadelphia display, and search, as narrowly as may be, for some sign, however small it may be, of purely original and national thought, and work, and art.

SALONICA.

THE city of Salonica, the scene of the recent sad display of Mohamedan fanaticism, owes its former and present importance to its spacious roadstead, offering convenient and safe anchorage, and to its being the converging-point of the high-roads leading into the interior. It formed the natural staple-place on the most north-western bay of the Greek Archipelago for the traffic of the Macedonian and Pæonian highlands. From very ancient times the town of Therma flourished here, which also gave its former name to the bay; but it rose to still greater importance when, in 315 B.C., Cassander founded in its place a new city, which he called Thessalonica, in honour of his wife, a sister of Alexander the Great. It soon became the principal emporium of Macedonia, and has since then always maintained its rank. At the present day it is the most important port, next to Constantinople, of European Turkey. In the time of the Romans, about 148 B.C., a great road, the Via Egnatia, was constructed from Dyrrhachium (modern Durazzo), on the Adriatic, to Byzantium, the centre and principal bulwark of which was Thessalonica. Its course at the present day forms the only straight line within the walls of the modern city of Salonica, the old pavement lying buried deep under the *débris* of centuries. There stands still at its eastern exit from the city a Roman triumphal arch, rich with reliefs, from the time of the Constantines. Another principal road leads to the north, along the marshy deposits of the Vardar, the ancient Axios—the railway built by Baron Hirsch takes the same route—emerging from the defiles of this river, the Iron-gate of Macedonia (Demirkapu), to the corn-yielding Pæonia, where it branches on the one side towards Albania, on the other towards Servia. At present the railway goes only as far as Mitrovitza, but has already developed an active traffic.

The numerous ruins which have been laid bare from time to time in the city by excavations, as well as the columns which, originally forming part of temples, were used in the construction of the churches which now serve as mosques, bear testimony to the importance of the city in the time of the Romans. St. Paul, as we know, founded here a Christian community; an antique marble pulpit beside the church formerly dedicated to St. Sophia is still pointed out as

the place where the Apostle preached. Here also rose the basilica with five naves over the sepulchre of St. Demetrius, martyred A.D. 306, during the last persecution of the Christians under Galerius. Of greater age is the original mother-church, a round edifice with costly mosaics in gold, as also the present mosque of Eske Dyums, a building supported on Ionic columns, which originally was a temple dedicated to Aphrodite, and then a church. But the ground upon which the modern city stands is steeped in blood. We need only call to the mind of our readers the fearful vengeance wreaked by the orders of the Emperor Theodosius in 390 A.D. on the citizens, who had risen in rebellion against him; about 8 000, according to others, 15 000, were crowded into the circus (in the south-east of the city), and there mercilessly massacred by the imperial soldiers. The military importance of the city made it the subject of repeated attacks in several wars, until it was taken in 1430 by Sultan Murad II. For a long time, until almost recently, the walls and towers remained as a proof of the Byzantine style of fortification; now they are in a state of dilapidation, or have been razed, the citadel being a heap of ruins. From this commanding point the eye ranges as far as the mountains of the peninsula of Chalcidice, and towards the south-west, on the verge of the horizon, tower the mountains of Greece, Olympus and Ossa.

The Jewish population of the city is the lever of all mercantile activity in the port. We are informed that the Jews were already settled here at the time of the Apostles, but they greatly increased during the period of their cruel persecutions in Spain, when large numbers found refuge in Salonica. They form at the present time about two-thirds of the entire population, estimated, somewhat highly, at 100 000; Mussulmans and Christians forming the remaining third. The Jewish element is so preponderant that a ship which has to load on a Saturday finds it difficult to get hands willing to work on that day. There are numerous tanneries and dyeing-works in the city; the country round supplies wine, corn, bees-wax, cotton, silk, and tobacco. The goods are carried principally by the Austrian Lloyd, the French Messageries, and several other lines. The Turks in Salonica, with the exception of the governor and his surroundings, make a miserably poor impression. They live in one of the most wretched quarters of this indescribably dirty city.

ORNAMENTATION OF THE TRANSITIONAL PERIOD.

NUMBER II. of the Second Part of Mr. Sharpe's work on "The Ornamentation of the Transitional Period," which is now published, contains piercapitals, doorways, and arcades; the examples of the capital illustrating the variations of treatment of this feature from the period when it still retained the general character of the Norman style, though with variations in detail, to that when, as in the last example given in the book (from Inner Porch, St. Mary Redcliff), the detail, except for the square abacus and some trifling peculiarities of the impost mouldings, could not be termed anything but Early English.

The experimental and tentative character which belongs to the work of this period is illustrated very well in this volume. The two capitals in Plate I., from Irthington Church, present side by side a scalloped capital, with a generally Norman aspect, while the adjoining example from the same church is decorated with a flat conventional leaf, repeated with great regularity, a broad and a narrow leaf alternately, in a style quite out of keeping with Gothic feeling, as usually defined. Curiously enough, both these capitals are left unfinished at one angle; at least, we presume the drawings show them as they exist. In the two capitals from Canterbury (Pl. 12, 13), the reminiscence of the Classic acanthus-leaf is plainly shown; in one case this quasi-Classic leaf occurs on the centre or main capital, while those of the three-quarter shafts adjoining it display pure Gothic forms. The occasional tendency to experiment with a repetition of foliage ornament, the same leaf repeated all round the capital, is illustrated in examples from Whaplode and Moreton, which are among ideas tried and condemned, for they never appear in full Early English Gothic. The band round the shaft, which is so effective a feature, and is always at the same time so judiciously and sparingly used in Early English work, occurs in profusion in the doorway of Easton Church (Pl. 18), where there are three rings round each of the six jamb-shafts, in a height of apparently about 8 ft. The character and effect of this is much more like that of modern Gothic, in which there is such a tendency to divide the larger lines of design and construction into sections in this kind of way, and it is curious that the progress from this over-use of the band to the Early English use of it is the reverse of what we generally find in architecture, where almost invariably a feature at first used sparingly, is afterwards multiplied and exaggerated. The doorway from Durham Castle, on the next page, is perhaps one of the wildest examples extant of the variation and enrichment of the characteristic forms of ornament which originally belong to the pure Norman style; we scarcely know our old acquaintance, the zigzag, again under such altered conditions and combinations; and one order of the archivolt mouldings presents the most extraordinary appearance in a regular series of slight projections from the general plane, round which projections the whole of the mouldings are worked, as if for the mere pleasure of working mitres. The engraving of part of the triforium arcade from the north transept of Ripon is a very fine example of some of the best features of this formative and suggestive period of Gothic architecture.

The lithographed drawings have been carefully shaded, and show perfectly what they are intended to show, but we cannot help observing the change in style and manner of execution between this and previous numbers, which, we fear, must be taken as indicating that the author of the work, who adds to his architectural and archæological learning the repute of one of the most admirable draughtsmen of architectural detail living, has been prevented, from want of time or otherwise, from giving to the book as much of his own handiwork or his own personal influence on the style of the illustration as he has given to former works. The illustrations are quite adequate to their purpose, but we miss the style and touch which used to characterise Mr. Sharpe's illustrations; the shading is sometimes overdone and often scratchy in execution, which never used to be the case; and we feel compelled to call the author's attention to defects in the perspective of some of the details; the base of the pier from Fountains (Pl. 4), for instance, which is very bad, and some other unsatisfactory details, such as might hardly be noticed, only that the execution of the illustrations to Mr. Sharpe's previous publications has been so completely a model of workmanship that one is desirous to see the same high standard kept up.

CONCRETE AS A BUILDING MATERIAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, held on Monday evening last, Mr. Charles Barry, president, in the chair, Mr. Edward M. Forster, of Duke-street, Manchester-square, was elected an Associate.

The discussion on Mr. A. Payne's paper, "On Concrete as a Building Material," was resumed.

Mr. Lascelles said that at the last meeting Mr. Whichcord had asked him whether iron embedded in concrete was affected by heat. In reply, he might quote the testimony of Mr. Matthew Allen, which was to the effect that in a fire in a warehouse in Finsbury, everything except the concrete lintels gave way. In each of these lintels was embedded a piece of iron 3 in. by ½ in. The proportions of the ingredients of the concrete were 1 of cement to 6 of breeze. The lintels were formed in position by means of a rough boxing of wood. Mr. Blashill, at the previous meeting, had spoken of the deposition of moisture on the surface of concrete, but that was a thing impossible on concrete properly so-called. He considered that concrete had a very important future before it, and with this material he was endeavouring to solve the great cottage problem. He was trying to produce a cottage which could be let at a moderate rental, and that could only be done by minimising the material or by devising some new mode of construction. The reduction of the thickness of the walls from 9 in. to 1 in. or 1½ in. was, he was persuaded, a step in the right direction. He hoped to succeed in building good four-roomed cottages for 100*l.* each, and if so it would be a great triumph for concrete.

Mr. P. Brannon, C.E., said that in 1872 he had addressed himself energetically to the question, and succeeding in producing a material which, while capable of resisting a great compressive strain, also possessed great tensile strength. Of that material he had made window-frames similar to the one exhibited by Mr. Lascelles at the last meeting. He (Mr. Brannon) had demonstrated that the best possible fireproof doors were to be made of his patent stone-felt. This material had been used in rendering fireproof that portion of the dome of St. Paul's Cathedral to which the public have access, and Mr. Penrose, the architect to the Dean and Chapter, had satisfied himself of the thorough efficiency of the material to resist fire. This was the material which should be prescribed by the Building Act for fireproof doors. Iron doors were not fireproof; for at high temperatures they would melt, and at a low temperature they would twist and bend. It was a mistake to use quartzose material and flint for concrete, for such materials would not withstand heat.

Mr. Cates said he had been with Mr. Brannon that afternoon to see the concrete doors fitted up by that gentleman at the King-street picture-galleries. They were six-panelled doors, and produced a hard metallic ring when knocked. They appeared to be as homogeneous and as likely to resist fire as Mr. Brannon had stated, and the application of this material was deserving of the fullest consideration at the hands of the profession, because it must be admitted that unless in the most expensive form, iron doors were exceedingly unsatisfactory, regarded as means for preventing the spread of fire.

Mr. Drake said he was glad that Mr. Payne had commenced his paper with the assumption that the constructive value of concrete was fully recognised, and that he had sought to suggest means for its architectural treatment. From this aspect of the subject the discussion had somewhat strayed. He believed that almost, if not quite, all the instances brought forward of the failure of concrete were samples of the old-fashioned lime concrete, which was a subject quite apart from Portland cement concrete. As to shrinkage, he knew of no instance of it in all his experience. He knew that cracks had appeared in concrete, but these were the result of settlement in the foundations, and were not due to any tendency to shrinkage inherent in the material. He had built as many as forty cottages in a row, with a continuous frontage of 15 ft. or 16 ft. per cottage, and at other times he had built fifteen, twenty, twenty-five, or thirty, of such cottages in a row; but had never known a single crack to occur. At the last meeting of the Institute it seemed to be laid down as a law of nature that concrete *must* crack, just as iron would expand or contract. Mr. Payne had suggested in his paper that, in order to simplify the apparatus used in concrete building it might be advisable to make the guiding parts or standards integral parts of the finished structure; but that would be not only unnecessary, but exceedingly costly. Embedding iron inside the concrete was quite another matter, and it had been done to a considerable extent, and with great success, by Mr. Matthew Allen and others. It had been said, in the course of the discussion at the previous meeting, that concrete was a material which would give "scamping" builders an opportunity for exercising their talents. But there was no more difficulty in preventing "scamping" in concrete than in any other material. The quality of the cement and other materials specified should be sternly insisted upon. As a matter of fact most concrete buildings were constructed by professed concrete builders, who were too jealous of their own reputation to use bad materials, and who took the precaution of having a guarantee with all cement supplied to them. As to the chapel at Whitehaven, referred to by Mr. Banks as exhibiting cracks owing to shrinkage, from inquiries he had made he was satisfied that such cracks were due to the unequal settlement of the building.

Mr. Banks maintained that the cracks were due to shrinkage, and not to settlement.

Mr. Tall said he had studied the subject of concrete building for twenty-one years, and he agreed with Mr. Drake as to cracks. Mr. Goodwin had built nine large concrete warehouses in London, close to Blackfriars Bridge, and there was not a crack to be seen in any of them. The first of these warehouses was erected under a license from the Metropolitan Board of Works, who specified that no material should be used which would not pass through a 2-in. mesh. Mr. Tall, however, was satisfied that by "packing" the wall with larger pieces of stone the construction was stronger, and he proceeded to

carry out the work in that manner, and for this he was summoned three times by the Metropolitan Board of Works, who were eventually obliged to admit that he was right in stating that the work which was "packed" with large pieces of stone was stronger than that made with small pieces of material. As to the question of materials, he considered that burnt ballast was one of the best possible aggregates. In the first place it was very plentiful, and was stronger than gravel ballast. Next in order of value came "clinkers" from furnaces. The harder the ballast was burnt the better. One peculiarity of concrete made with this material was that a nail could be driven into it, and it could be cut in the same manner as Portland stone. It might also be cast in any form. Slag was also a very good material for concrete, provided that it contained sufficient breeze. He had made a floor of this material 19 ft. by 13 ft., without any iron joists. This was his first attempt in that direction, and was very successful, and he next made a floor, 40 ft. by 16 ft., also without iron. It was 4½ in. thick at the crown, and 11 in. thick at the springing, flat at the top. To the floor above he gave a springing of 18 in., but built 9 in. walls, and 6½ in. cross-walls upon it, and it still stood without crack or blemish. Some people went so far as to say that seven parts of ballast to one of cement was amply sufficient for all practical purposes, but he could not agree with them, as the proportions would vary according to the treatment.

Mr. C. F. Hayward remarked that, as there was still a considerable amount of doubt as to the strength of concrete, clerks of the works should be scrupulously exact in seeing that the terms of the specification were complied with. But while concrete building needed considerable looking after, so did all building.

Mr. Rowland Plumbe said that five years ago he built a terrace of model dwellings in concrete, consisting of seven houses, the front wall of which was continuous. The materials used were six of burnt ballast to one of Portland cement, and the result had been very satisfactory. The buildings were put up by one of the concrete patentees, and he had every reason to be satisfied with the result. He had lately seen the buildings, and they appeared to be quite free from cracks. During the course of the works he had made several experiments to test the strength of the material, and had found it impossible, by leaning his back against a wall, to kick a hole through a 2½-in. partition-wall, 10 ft. long and 6 ft. high. He thought, however, that concrete was not sufficiently impervious to make a dry house unless coated with plaster, and that being the case, the architectural treatment of concrete involved the question of the architectural treatment of plaster. Whenever plaster was used for facing concrete walls, it should be simply treated with incised lines or ornament, and should never be made to appear like stone. As to the relative cost of concrete and brick buildings, he had sometimes found, on inviting tenders, that instead of concrete buildings being ten per cent. cheaper than brick, the tenders were ten per cent. in excess of those sent in for ordinary materials.

Mr. Dawson pointed out that the concrete which had escaped unharmed in the fire at Sir Sydney Waterlow's buildings was made of breeze, a material which had already been burnt, and which was therefore incapable of being burnt again. It was important, therefore, in using concrete in buildings where fire was likely to occur, not to use materials which would be calcined by the heat.

Lord Elcho said he took a very great interest in the subject of concrete, particularly in reference to its capabilities for cottage-building; for cottages built with the ordinary materials cost from 15 per cent. to 20 per cent. more at the present day than they cost a few years ago. He had personally examined and tested a concrete bridge being erected by Mr. Brannon over the River Axe, Devonshire, for Sir Walter Trevelyan, and had been astonished at the resistance it offered to the impact of heavy weights. He had also examined the fireproof concrete doors of the King-street Galleries, and they were apparently the very thing required for our national picture-galleries and museums.

Major Seddon, R.E., said he had used concrete very largely for barracks, both for walls, floors, and roofs, and was thoroughly convinced of its constructive value. From his experience he did not think that contractors were desirous of "scamping" concrete work; they were rather disposed to be careful, for it was a material they were rather shy of unless they were professed concrete builders. When concrete buildings erected by general contractors failed it was generally from ignorance of the nature of the material, and not from wilful "scamping." Contractors were not alive to the necessity of the cement being fresh burned. He had made an experimental slab 14 ft. 6 in. square by 6 in. thick, and after twenty-one days' setting, it had been supported at the edges on brick walls and tested by eighty-four men marching, "doubling," and "doubling out of time,"—a very severe test,—over it, without any sign of failure being visible. This same block or slab had afterwards failed with 10½ tons of dead weight placed upon it in the centre, which, by mathematical calculation, he had ascertained to be about one ton more than the live load, so that had there been twelve more men engaged in the test the slab would probably have given way under them. As to iron, he preferred to use it outside his concrete, and not embedded in it, for it was impossible to tell what the iron was doing when it was hidden from view. This slab was composed of one of Portland cement and four of brick ballast, gauged to a 1-in. mesh, and kept well watered for seven days. He had another slab made, 6 in. thick, 14 ft. 6 in. long by 6 ft. 9 in. broad. This slab was subjected to the marching and "doubling" tests of forty-five men, which did not affect it; it was then loaded with dead weight in the centre, and when fifteen tons was upon it, or 3 cwt. per foot super., it began sensibly to bend. With thirty-two tons upon it, or 6·53 cwt. per foot super., it cracked slightly. It was then loaded up to 42½ tons, or 8·8 cwt. per foot super., but the cracks did not increase, for the compressive strength of the material came into play at this point, the outside edges of the slab being tilted up to the extent of ¾ in. This material made a perfectly impervious roof. He could not positively affirm that concrete had not a slight tendency to shrink, and therefore to crack; such a condition might be dependent upon some alteration of the form of the particles consequent on crystallisation.

On the motion of Mr. Roger Smith, seconded by Mr. Aitchison, the discussion was adjourned to Monday, the 29th inst.

NEW SEWAGE WORKS AT WIMBLEDON.

For some time past a plot of land, about fifty acres in extent, has been in course of preparation by the Wimbledon Local Board, for the purpose of disposing of and otherwise utilising the sewage within the parish, and the works are now almost completed, and will shortly be in operation. The sewage works are situated on the south side of the railway, lying between Wimbledon and the Tooting Cemetery, and immediately adjoining the ground upon which the new cemetery for Wimbledon is now in course of formation. The area of land which is intended to receive the sewage has been laid out in contour beds, each bed being supplied with a separate system of pipe-carriers, with a regulating valve to regulate an exact flow to such beds. In connexion with the filtration area, provision has been made for dealing with a large quantity of storm-water, and one filter-bed has been constructed upwards of an acre in extent, and composed entirely of burnt-clay ballast, and thoroughly underdrained. This filter-bed will be used only in times of storms. The system of dealing with the sewage is a combined chemical and intermittent filtration process, which is stated to be one entirely new and novel. Under this process the sewage in the first instance passes through chloride of magnesium lime, and after five hours' subsidence the water is conveyed upon the land along the pipe-carriers already named. On a small scale, it is said that this system of dealing with sewage has been in daily operation for the last five years, with satisfactory results, the consequence being, as we are informed, that many towns have recently adopted it, including Edmonton, Tottenham, Taunton, Aldershott, and several other places. The effluent water is stated to have been frequently analysed by the chemists attached to the Lea Conservancy, and other chemists, and its purity to have been such as to admit of its free entry into any running stream without fear of pollution. The author or inventor of the process is Mr. W. J. Rowell, the surveyor to the Wimbledon Local Board, under whose superintendence the works have been carried out, the contractors being Messrs. Neave & Son.

The engine-house and other buildings on the works, containing the machinery for dealing with and pumping the sewage, are neat and substantial structures. The engine-house forms the central portion of the main block, and is approached through a lofty Gothic doorway, the elevation being surmounted by a gable. The boiler-house and tank-house are on each side of the engine-house, and are likewise surmounted by gables. On the right and left of the central block are the engineer's residence and that of the keeper of the sewage farm, both being uniform in their external appearance with the first-named portions of the buildings. The materials used in the buildings are white brick, with red brick dressings and bands.

THE HEALTH AND SEWAGE OF TOWNS.

CONFERENCE AT THE SOCIETY OF ARTS.

In continuation of our report of this Conference, to which we devoted considerable space last week, we may say that

Mr. Humphreys, surveyor to the Local Sanitary Authority at Cheltenham, stated that the sewage of the town did not contain manufacturing refuse, and was dealt with by subsidence, separation of sludge, and irrigation on grass lands, the sludge being mixed with ashes and sold for manure. There were about 10,000 water-closets in use, and the sewers had an average fall to the outfall of about 8 ft. to the mile. The expense of the works was about 18,000*l.*, which included the purchase of the land. The sludge, when mixed with the town's ashes, sold for 2*s.* per cubic yard.

Dr. Wright, Medical Officer of Health for Cheltenham, said that since the works had been carried out there had been a marked improvement in the health of the locality, and no nuisance had been caused by the works.

The Chairman (Mr. Staunfeld, M.P.) said that Cheltenham afforded perhaps a rather unusual example of the success of the water-carriage system, the water-closets and drain-pipes within the houses, as well as the drains and sewers in the streets, being under the control of the town authorities. It further appeared that the annual loss in working the sewage farm of 130 acres was only 130*l.*, while the loss accruing from the sale of the sludge was only 100*l.* per annum. This gave a total loss of only 230*l.*, which was very small for a town of 40,000 inhabitants.

In reference to Dr. Carpenter's paper on the Beddington Sewage Farm, which we gave in last week's *Builder*,

Mr. Edwin Chadwick, C.B., asked whether the sewage of Croydon was delivered "fresh" at the outfall?

Dr. Carpenter said that in theory it was so, but there were a great many badly-constructed sewers, in which the sewage remained until it became black and rotten. In reply to a further question, he said that the effluent water passed off the farm into the river Wandle, but he by no means considered that sewage effluent should be regarded as fit for drinking purposes.

The papers on Eton and Wrexham, the substance of which we gave last week, were next considered. In the course of the discussion which ensued,

Colonel Jones expressed his unqualified opinion that sewage irrigation could only be fairly tested where the "separate" system was in vogue. Not only was the sewage less diluted, but it was a fixed quantity under the separate system. No farmer would care to irrigate with sewage if he were compelled to put on to his land a great deal more moisture than he wanted,—storm-water, in fact, as well as sewage.

In reference to Blackburn, Mr. Bryan, surveyor, said the water-carried sewage of the town did not contain any manufacturing refuse; the solid matter was retained in settling-tanks, the effluent water being used for irrigation. There was a sewage farm of 300 or 400 acres, upon which there was a loss of 700*l.* or 800*l.* a year. In answer to questions by Sir Henry Cole, he admitted that this loss was partly due to the exorbitant price paid for the land. As for sewer ventilation, charcoal trays had been used in the gratings, but they were found not to answer. The gratings were much better left open, without obstructions of any kind, so as to allow of a free circulation of air into and through the sewers. [The same opinion was expressed by several subsequent speakers.]

At this stage of the proceedings an interesting discussion arose as to whether the germs of typhoid could pass through the earth's strata

from one polluted well or spring to another. Mr. Adam Scott asserted, on the authority of a communication in *Nature*, that in Switzerland the typhoid poison had passed from a well which had got contaminated to another well a mile distant.

Professor Wanklyn contended that such a thing was impossible, and that the simultaneous appearance of typhoid in the two villages was due to less occult causes.

Mr. Hall, borough surveyor, Canterbury, described the means of dealing with the sewage of Canterbury by means of precipitating tanks and filter-beds of gravel, which he claimed to have been fairly successful in preventing the pollution of the river. It was objected by one or two speakers that the filter-beds at Canterbury were merely "screens," and that the sewage was not sufficiently purified before being discharged into the river.

Mr. Melliss's paper on the Coventry Sewage Works was next discussed. In answer to a question, Mr. Mellis said that about 1s. per year per annum would cover the cost of treating the sewage of towns in the manner followed at Coventry.

Mr. Lemon, borough surveyor of Southampton, remarked that it was stated in Mr. Melliss's paper that the value of the sludge produced at Coventry was worth from 40s. to 45s. per ton. Was that the sum which farmers would be found to give for it, or was it merely a fancy price set upon it as the result of chemical analysis? It should be remembered that the value of sewage manure was generally very much overstated by chemists.

Mr. Mellis, in reply, said it was Dr. Voelcker's value.

The second day's proceedings commenced by a reference to Hertford. Mr. W. Keith, secretary to the Phosphate Sewage Company, stated that the sewage of the town of Hertford had been continually treated by his company's process for about eighteen months, and the condition of producing a good effluent water had been so far fulfilled that the Corporation had officially certified to the satisfactory character of the effluent water discharged. The special advantages of the process were the production of water of the description indicated, and of a manure the sale of which went far towards defraying the cost of purification, and which, in some cases, actually covered the cost.

Mr. Grindle, engineer to the Corporation of Hertford, stated that the Phosphate Sewage Company had agreed to treat the sewage of the town for 300*l.* a year, repaying as rental 100*l.* a year for the use of the works, which were the property of the Corporation.

Alderman Tatham, chairman of the Streets and Sewage Committee, Leeds, read the following paper on

Leeds Sewage Treatment.

Prior to the year 1842, no general system of sewers existed in Leeds: what drains there were being mostly old and inefficient, having been constructed from time to time in various places, mostly to meet the necessities or convenience of private inhabitants; and for many years the River Aire and its tributaries had been becoming more and more polluted from the increased quantity which they received of fæcal and liquid matter from dwelling-houses, and of refuse from manufactories.

At this time, 1842, the present sewerage system was commenced, replacing old and inefficient sewers with new and efficient, or providing such where none previously existed. The original idea was to collect all the domestic sewage into one culvert at the lowest part of the borough, and there manufacture it into manure, and realise a large profit. The former part of this idea has been carried out, and the most populous parts of the borough sewered, at a cost of 280,000*l.*; but instead of realising the contemplated profit, the sewage was allowed to pass away into the River Aire at Knostrop, without any attempt at purification or recovery of value therefrom.

Other towns above Leeds, on the same streams, pursued the same plan of turning their sewage into the nearest water-course, the consequence being that the river became nothing better than an open sewer, unfit for domestic or manufacturing purposes, and of this the landowners and others below naturally complained.

When a proposal was made to extend the drainage of Leeds by adding another district which had become so populous as to require further drainage facilities, the landowners below Leeds combined, and on November 18th, 1869, obtained an injunction from the Court of Chancery, restraining the Corporation from "causing or permitting the sewage of the borough of Leeds, or any part thereof, to flow or pass through their main sewer, or any other outfall, into the river Aire, unless and until the same shall be sufficiently purified and deodorised as not to be or create a nuisance, or become injurious to the public health," and "to be a perpetual injunction."

The committee of the Leeds Corporation, having charge of these matters, had had this question under their anxious consideration for two years before the date of this injunction, and had appointed in November, 1867, a special committee to consider the whole subject and to report.

This committee accordingly inspected every feasible plan which they heard was in operation at any place, including:—

1. *Worksop.*—Precipitation by lime system.
2. *Croydon.*—Irrigation.
3. *London.*—A portion irrigation at Lodge Farm, Barking; the rest pumped into the Thames.
4. *Hertford.*—Chloride of lime.
5. *Rugby.*—Irrigation.
6. *Bradford.*—Holden's process, lignites, clay, and lime. H. A. Bonnewell's patent.
7. *Harrogate.*—Irrigation.
8. *Leicester.*—Lime process.
9. *Birmingham.*—Subsiding tanks.
10. *Coventry.* — Filtration; not successful; then about to commence irrigation.
11. *Leamington.*—A B C process.
12. *Stroud.*—Sulphated clay.

This refers to 1869-70; since then, some of these places have adopted other modes, as,—

Hertford.—Phosphate sewage.

Birmingham.—The lime process, with manufacture of portion of the sludge into cement by General Scott's process.

Coventry.—Sulphate of alumina. Dr. Anderson's process.

Bradford.—Lime and filtration through coke.

Subsoil drainage and earth-closets had the attention of the committee, but were dismissed as not likely to meet their requirements; whilst for irrigation, the sewage would have to be pumped to a considerable height, or carried about twenty-five miles towards the Humber before sufficient suitable land could be obtained. The great outlay involved by either of these processes led the committee unanimously to the conclusion that some system of precipitation was the best adapted to the wants of Leeds. Of these, none appeared to offer the same advantages as that of the Native Guano Company, known as the A B C process, and although the report of the Rivers Pollution Commissioners of the 4th of July, 1870, was very unfavourable, the committee at that time knew of no other mode which offered any better prospect of success,—the company saying they could purify the sewage, and make the manure, at 2*l.* per ton, whilst the commissioners valued it at 32*s.* If this could be realised, the committee saw that the cost would in a large degree be covered, and they looked, by the help of further inventions and experience, to be able to reduce the cost, still keep up the value of the manure, and effect their great primary object, the purification of the sewage. These expectations have been more than realised; for if a market can be found for the manure at even 20*s.* per ton, the total cost of working on this system will be covered.

Eventually an agreement was made with the Native Guano Company, the Corporation undertaking to erect works to treat 2,000,000 gallons daily as an experiment, the company to work the process with a stipulated share of the proceeds.

This was done, and the company carried on the work at the experimental tank for a considerable time. The effluent water produced was watched with much interest, and analysed by Dr. Frankland and others. Dr. Frankland's report was that in this effluent the polluting power was "only slightly beyond the limits proposed by the Rivers Pollution Commissioners," and this standard, it is known, is very high. A fish lived and thrived in the effluent above three months, whilst another, similarly treated, and placed in a glass globe, but supplied with the town's water, died about two weeks before, thus proving to the committee, notwithstanding the Commissioners' report, that the A B C process would suffice for the purifying of the Leeds sewage, and that the effluent could be no nuisance to the inhabitants below Leeds.

After our experience with the trial tank, the committee resolved, whilst not binding themselves to the A B C, to construct works sufficient to deal with the entire flow of sewage (now between 12,000,000 and 14,000,000 gallons daily) by precipitation, such works being adapted for any precipitation process. These works have been constructed at a cost, including 25 acres of land, trial works, workmen's cottages, &c., of about 60,000*l.*

The Native Guano Company not being able, in the face of all the opposition they encountered (official, professional, and otherwise), to sell their manure, on which their success depended, were compelled to discontinue working the process, and terms were arranged between the company and the Corporation, annulling the contract between them.

The establishment of the value of the native guano being of vital importance to the company, they published numerous testimonials as to its value, but these failed to create a demand. The committee, to satisfy themselves as far as they could on this point, made trials on six half-acre plots in various dressings, the result showing an advantage of 9*s.* 1*d.* on the produce of hay for two seasons, on the plot, in favour of the native guano at 3*l.* 10*s.* per ton, the value claimed for it by the company, over Peruvian guano at 15*l.* per ton, whilst the quality of the hay was the best of any, though calculated all at the same price. (See two reports herewith.)

As the experimental tanks, &c., were at liberty during the construction of the permanent works, the committee advertised, inviting any one who had a better system to propose than the A B C, to test it at the trial tanks, and several responded to the request.

1st. General Scott—Purification by lime and manufacture of sludge into cement.
2nd. Councillor R. W. Moore, for a friend of his.
3rd. Silvester Fulda—Glauber's salt.
4th. Jackson & Watson, of Great Ayton.
5th. R. Goodall—Estimating cost of material, 7*s.* 6*d.* per million gallons.
6th. W. Prange, Liverpool — Whitthread's process.
7th. Phosphate Sewage Co.
8th. Waterson & Co.
9th. Bailes & Crowther, Armley, near Leeds.
10th. John Hanson, Dewsbury.

Of the 2nd, 4th, 6th, 7th, and 8th, it may be said the plans proposed were not tested, the promoters either not foreseeing a successful issue, or not being willing to bear the cost of a trial; and of the others, that they offered, in the opinion of the committee, no advantages over the A B C process.

1st. General Scott did not propose to do more than convert the residuum into cement without loss, the Corporation bearing all the cost of purifying the sewage.

3rd. S. Fulda's effluent was not satisfactory, and he did not fully reveal his process.

5th. R. Goodall proposed to purify the sewage at a cost of 7*s.* 6*d.* per million gallons for material, but it proved to be 4*l.* 6*s.* 6*d.* on the experimental tanks, but reduced to 53*s.* 4*d.* on the large works, where he experimented at his own request for some months. The Clarifying and Utilisation of Sewage Company, Limited, now represents this process.

9th. Bailes and Crowther's was not successful.

10th. Hanson's process as first used was not successful in discharging the colour when the sewage was impregnated with dye-water, but by subsequent experiments, and using a fresh ingredient which he calls hæmasite, he finds he can purify the sewage, at a cost for about twenty-two tons per day for ingredients, of 14*s.* 6*d.* per hour for the total daily flow of 12 to 14 million gallons, being about 29*s.* per million gallons, or 17*l.* 8*s.* per day, or 6,200*l.* a year. The A B C being about twenty-four tons, 18*s.* 3$\frac{3}{4}$*d.* per hour, or 22*l.* 1*s.* per day, equal to 8,043*l.* a year.

Against the advantage of Hanson's reduced cost, there is no off-set for value of residuum, no price for it having yet been established; the inventor claims that it is of equal or greater value than the native guano.

To determine the value of the native guano as far as possible by actual experiments, quantities varying from half a ton to five tons were given to agriculturists, farmers, market gardeners, and others, on condition that reports should be furnished to the committee of the results obtained in each case. Sixty of such reports have been received up to this time, and of these forty are favourable, having been tried on grass, turnips, and other root crops and garden produce.

The values given vary from 7*s.* to 80*s.* per ton

only nine give a money estimate; the average appears to be 37s. per ton. Twenty were unfavourable; tried on grain, grass, turnips, &c., but only in four cases on garden and general produce; the estimated value is from nothing to 27s. 6d. per ton.

From these returns it would appear that the native guano is best adapted for garden produce. Many of the farmers remark that the season was unfavourable, being too dry.

The position in which we stand in Leeds at the present time may be thus summarised:—

There is no difficulty in purifying sewage by precipitation, so as to render it admissible into a running stream, especially one like the river Aire, below Leeds, without causing a nuisance, or being injurious to public health; but this is done at a cost. Whether or not this cost can be covered, or a profit made by the sale of the residuum, remains to be seen. The best prospect we have of such return is from the A B C process. We have at present to choose between this and Hanson's; if his residuum is of equal value with the native guano, and will sell as readily, his would have the advantage; or, if the Native Guano Company can reduce the cost of their ingredients and working to that of Hanson's, they will have the preference, unless Hanson's residuum sells as well as that of the native guano: but if both can be reduced to the same cost, and have the same return for residuum, then the preference will be for that producing the best effluent, and if these be alike, the two processes will be of equal merit.

Although this may be taken as the position with us to-day, we are in hopes that further inventions and discoveries may be made, and that the vexed question of the profitable treatment of towns' sewage may, in the course of time, receive a successful solution.

Mr. Thompson then introduced the case of Leicester, with regard to which he said that the water-carriage system had entailed an average cost of from 1,500*l.* to 2,000*l.* a year. The system had been in operation for twenty-two years.

Mr. Rawlinson, C.B., chief engineer-inspector of the Local Government Board, was introduced at this stage of the meeting, and said he had been lately engaged in collecting the most recent information with regard to the different modes of dealing with sewage, and his preliminary report was then before the Local Government Board. He might state, broadly, that in his opinion the question of dealing with sewage had better, at the outset, not be considered as one of profit to the town, but as one of getting rid of that which was injurious to human life in the cheapest and most effectual manner. There were many places, in Lancashire and Yorkshire, for instance, where irrigation would be impracticable, for two reasons: firstly, the difficulty of obtaining land, and secondly, there was a great objection to depriving the district of its water. The manufacturing towns of the district were thickly studded all along the banks of the rivers, and it was a necessity for them that they should have water, dirty or clean,—and there were many manufacturing purposes for which dirty water could be used, although clean water would be preferable. How the rivers were to be cleansed was the great question which had to be solved, for it was quite clear that manufacturing industries could not be greatly extended if the present rate of pollution went on. The pollution was due to various causes, and any one who cared to read the reports of the Rivers Pollution Commissioners, and to look at the deductions which might be drawn from those reports, would see that proper regulations duly carried out in the manufacturing districts would very largely reduce the present amount of pollution, without injury to the interests of manufacturers. But he should tremble for the manufacturing industries of the country if rigid chemical standards of purity were to be set up, and manufacturers were told to produce an effluent of a particular degree of purity. In legislation, nothing more injurious could be done than to enact a law which could not be obeyed. On the other hand, the restrictions might be very stringent if they were confined to certain things. Our rivers were much abused, for instance, by the casting in of solids, and this practice was to a great extent responsible for the disastrous floods with which the country had been visited of late years, and entailing immense loss of property. Reverting to the subject of sewage, he knew of no mode by which a town could be pecuniarily benefited by dealing with its sewage, not even irrigation, when all the expenses were capitalised. But he thought it was unquestionable that where irrigation could be properly carried out it was the most economical manner of dealing with sewage. The alarm manifested by residents in the neighbourhood of sewage farms was totally groundless. Sewage farms need not be swamps, and it certainly was not true that their produce was unwholesome. Where land could not be had for irrigation, precipitation would be the cheapest and best method of dealing with the sewage; but by no possible process yet known could a town deal with its sewage at a profit. Chemists might declare that a particular sludge or deposit was worth so much per ton, chemically speaking; but its worth was to be measured by what it would fetch in the market. So far as he could see at present, towns must be content to clarify their sewage-water, and to pay for the cost of the process.

In a subsequent portion of the proceedings, Mr. Crookes, F.C.S., spoke on the chemical aspect of the question. He agreed with Mr. Rawlinson in deprecating the setting-up of an arbitrary standard of purity for effluent water. The simple test he would impose would be, that everything which was thrown into a river should be better than the river at the point where it was thrown in. By this means the rivers would gradually become purified. The manufacturers and others up the stream would, of course, have to work to a higher standard of purity than those below, and in course of time the stream would become as pure below as it formerly was above.

Mr. R. Brewer spoke of what had been attempted at Richmond in regard to the disposal of sewage, and said it was high time that the Legislature interposed for the purpose of insisting on some general scheme being carried out for all the parishes in the Thames Valley.

Mr. Adam Scott said that, in view of the extent to which typhoid fever had prevailed in Edinburgh and Glasgow, an open and exhaustive inquiry into the question of "flushing" could not be too soon undertaken.

Sir Henry Cole maintained that every person who intended to occupy a house should insist upon having a certificate assuring him that the internal drains were in a proper condition.

The Conference was brought to a close on Thursday, the 11th inst.

REFORM IN THE ROYAL ACADEMY.

THE best friends of the Royal Academy, equally with its critics, must admit that thanks are due to Sir Charles Dilke for the clear, temperate, and able manner in which he laid before the House of Commons objections that have been urged against parts of the constitution of the Academy, and wishes that have been expressed for alterations and improvements. Further, all must desire that the information he sought to obtain should be forthwith made accessible. What Sir Charles Dilke moved for was, that an humble address be presented to her Majesty, praying that she will be graciously pleased to cause to be laid before Parliament a copy of a late report on the direction of the fine arts in France, made by M. Edouard Charton to the French Ministry of Public Instruction; and also praying that she will be graciously pleased to cause her representatives at the European Courts to report on the present attitude of the State towards the fine arts in the various countries of Europe.

The motion, after debate, was withdrawn, but we trust steps will be taken to bring it forward again, without that reference to the Academy which Sir Charles very usefully made, in which case the Government could scarcely refuse compliance. As to the changes and improvements which may be recommended to the Council of the Academy, we will make an opportunity to speak. An increase in the number of the Associates is in progress, but this step will be altogether unsatisfactory unless the number of Academicians be also made larger.

Proposed Market Hall for Holywell.—In consequence of an application to the Local Government Board, made by the Holywell Local Board, for sanction to borrow 5,000*l.* for the purpose of erecting a market-hall, Mr. Robert Morgan, C.E., has attended at the offices of the Local Board to hold an inquiry into the subject. Several members of the Board and ratepayers attended the inquiry, but no opposition was raised.

NEW PUBLIC HALLS.

Staindrop.—The Scarth Memorial Hall at Staindrop, near Darlington, was opened on the 18th ult. by Mr. J. W. Pease, M.P. The gentleman whose memory is perpetuated by the erection of this memorial, for many years occupied the position of head agent to his Grace the Duke of Cleveland, on whose Raby estate the village of Staindrop stands. The building has been erected from the designs of Messrs. Ross & Lamb, of Darlington. It is a substantial stone erection, and comprises a hall 57 ft. in length, 32 ft. in width, and 23 ft. in height, with gallery, platform, and vestibule, and is capable of accommodating about 400 persons. The ceiling of the hall is wagon-headed in shape, and formed into panels by the principal roof timbers, which are moulded and exposed to view. There is a cloak-room, on each side of the entrance, 10 ft. 3 in. long and 8 ft. 9 in. wide. Behind the hall is placed the club-room which is 25 ft. long, 12 ft. 6 in. wide, and 11 ft. 9 in. high, available as a retiring-room in connexion with the hall; and above that is the reading-room and library of similar dimensions. The hall will be used for concerts, lectures, social gatherings, Foresters' anniversaries, the Freemasons' Lodge, &c.

Tuebrook.—The "Derby Hall," erected by the Conservatives of Tuebrook, was opened on the 26th ult. It has been built from plans by Mr. John M'Fall, foreman to Messrs. R. Barker & Sons, builders, West Derby. The builders were Messrs. R. Barker & Sons, and their tender amounted to 1,750*l.* The style is described as "a modernised Doric." The front of the building in West Derby-road is in white Runbon bricks, with redstone dressings. The ground-floor consists of entrance-hall, store-rooms, kitchen, &c., and rooms which are especially adapted for the requirements of Masonic meetings. There is also on this floor a front room, intended in the design for the Conservative Working Men's Association. The large hall, on the upper floor, is 21 ft. high, 75 ft. in length, and over 34 ft. wide. At the end of the hall, over the principal entrance, there is a gallery running from side to side, and there is also another smaller gallery or balcony at the other end over the platform.

Camberwell. — The Surrey Masonic Hall, Camberwell New-road (which has been already described in the *Builder*), was consecrated to Masonry in July, 1875, but it was only on the 18th ult. that the main portion of the building was completed, including a hall 95 ft. long, 40 ft. wide, and 35 ft. high, in which great gatherings of the Craft can at all times take place, although when not so engaged it can be used for other purposes. Mr. E. Clark is the architect, and Mr. John Oliver the builder.

Horfield (Bristol).—At a meeting held at Horfield, on the 27th ult., to consider the steps to be taken for the erection of a public hall within the parish, Mr. Kent presented the report of the committee, which stated the original tender for the proposed hall was 3,999*l.* The committee felt great difficulty would be experienced in obtaining so large a sum, and consequently they had modified the plans and obtained an amended tender, which amounted to the sum of 2,460*l.* The original size of the hall would not be interfered with, and there would be two waiting-rooms, 24 ft. by 24 ft., which, at any time, could be thrown into one. The portions of the original scheme which the committee had decided to omit were the shop and dwelling-house, together with the suite of offices.

Reading.—For some years past the working population of the east end of the town of Reading has been very rapidly increasing, and, till recently, no attempt has been made to provide a suitable lecture-hall or reading-room. A short time ago, however, the Victoria Hall Company was formed, with a capital of 3,000*l.*, in 600 shares of 5*l.* each. A site has been obtained opposite Victoria-square, and near King's-road, on which it is proposed to build a hall to seat 400 to 500 persons, and which may be used for concerts, lectures, &c., a large club-room, and a suite of class or committee rooms, and a manager's residence.

Appointment of Inspector of Nuisances for Warwick.—At the meeting of the Rural Sanitary Authority of the Warwick Union, held on the 6th inst., Mr. Trepass was appointed inspector of nuisances. The salary is 200*l.* per annum, which includes travelling expenses, and the appointment is for three years. The inspector has to prepare any plans which the Authority may direct.

SOME OLD HOUSES AND THEIR STORIES.

THE HOUSE IN WHICH JOHN SELDEN WAS BORN.

We go back to the year 1584. Raleigh had newly discovered Virginia; the Jesuits were darkly plotting all over Europe to restore England to Popery, and dethrone "good Queen Bess"; Elizabeth had made the mere presence of Romish priests in England high treason, and the concealing, aiding, or abetting of them felony.

It was the time of a sternly paternal government, when the law multiplied crimes with wonderful facility, and caused felons to abound in the land. Twelve persons assembling to discuss politics or religion, with a view to change, thereby became felons; and any one person subscribing to any fund being raised for such political or religious purposes, in any way, became a felon too. The wives, sons, or daughters of men who assembled for these purposes were accounted felons, if they voluntarily sent them even food. It was felony if, seeing any such meeting, you failed to let the proper authorities know thereof. It was felony to repeat rumours affecting the reputations of great people, or, in other words, to be "horrible false messengers of prelates, dukes, earls, and other noble personages, or great officers of State," to say nothing of "her Sovereign Lady the Queen." The working-man's wages were regulated by law, and it was felony to endeavour to alter or refuse to accept them. The law regulated the kind of clothing he was to wear, and would not permit his employer under any circumstance to give his workmen higher wages than were allotted them by law. The law allowed no labourer to move from one locality to another without a magistrate's permission; and it punished even the tailors if they made to order "any guards, welts, or great ruffles, upon any coat, doublet, jerkin, hosen, or any other apparel made for any servant at husbandry, day labourer, journeyman, or 'prentice." The law punished those who did not attend the Established Church regularly, or did not conduct themselves with the strictest propriety when in church, and in many other ways thrust its meddlesome fingers into everybody's private pie, until it became hateful, a pest and a nuisance, keeping the public mind in a constant state of fretfulness, uncertainty, dread, and irritation, boding ill for some future time, which was even then with shuddering dread foreseen and warningly spoken of.

Mr. Tyldsley, of Burnham, in a letter preserved in the Public Record Office, addressed to Mr. Secretary Cecil, who was afterwards Lord Burleigh, says:—"I do not see any man earnestly bent to put the laws in execution. But every man letteth them slip and pass forth. . . . . And this one thing be you most sure of, that as much evil as can be invented by the devilish wit of them that be naught is spoken and murmured against you"; and he goes on to speak of those who attributed these vexatious laws to the influence of the great all-powerful Mr. Secretary Cecil, adding "I do know all this to be true, for I do hear it among their servants, and belike they have heard it from their masters at one time or another. And further," adds he, "when I was last at London, there was then a business in hand touching what wages watermen should take, going from one place to another, which thing was much cried out upon. And they said Mr. Cecil was the doer of all that matter too; therefore, for God's sake, sir, be you ware."

Mr. Tyldsley forcibly illustrates what he had keenly observed beneath the seeming surface of prosperity and content, despite the forcible suppression of public opinion, by the following story:—

"Four days have not yet passed since one of my men said to me, putting on a bold face the while, 'Sir, would to God ye would not meddle so much as ye do, nor be so earnest, for,' said he, 'if ye heard so much as I do hear, ye would marvel, for even they that do speak you most fairest, and flatter you to your face, do name you behind your back, to be a cruel and extreme man, with a great deal more that I shall not rehearse. And they say,' said he, 'that all these doings is along of Mr. Secretary Cecil.'"

Lastly, Mr. Tyldsley prays Cecil, this nominal secretary, who in secret was all but a king, to bear with his over-boldness in mentioning such things, and to be "most sure that he had not written his letter without the sorrow of his heart and the tears of his eyes."

If that thoughtful, observant, far-seeing man could only have looked forward as clearly and surely as we can now look backward, it would indeed have deepened the sorrow of his heart, embittered the tears of his eyes, made him far more desperately earnest than he was in imploringly warning the great legislator of his day against "cruel and extreme" laws,—against laws which were well meaning enough in their intentions, but fell into the mistake (not altogether unknown even in these enlightened days) of regarding grown-up men and women as if they were infants in the nursery unable to feed, clothe, or even properly amuse themselves, and prone to fall if left to run alone.

The little cloud Tyldsley's letter speaks of, arising in the deceitful calm of those prosperous times, was seen by the old house of our present sketch which still stands at Salvington, in Sussex, near West Tarring and Worthing, where it is known as the Lacies.

Within its humble walls in the wintry cold of a December night or day—the sixteenth—in the said year, 1584, was born one who was to witness the spreading abroad of that cloud and the bursting forth of a terrible storm thus brooding dark and silent in its small beginnings. When the whole surface of the land was to be converted into one vast battle-field deluged with blood, and every town and city and village were to be full of ruined homes, helpless widows, starving orphans, and blighted fortunes, he, in the strength of a gigantic intellect, and the generous self-devotion of a noble nature, was to aid greatly in preserving this desolated country from utter destruction. To earn the heart-felt thanks of an admiring posterity,—who never cared to ascertain and have now quite forgotten who their benefactor's father was.

There is a tradition which tells us that this father of one whom no less a man than Grotius of Delft called "the glory of England," in other words, John Selden, was a wandering fiddler. It may have been so. In those days the glory of the old wandering scholars and minstrels had departed, but they were still immensely popular and well paid. They were by law "vagrom men," in constant terror of the stocks and the whipping-post, who visited alehouses and fairs, where, to mean, common people, they fiddled and sang songs concerning Clym of the Clough, Robin Hood, Little John, Friar Tuck, and Randle, Earl of Chester, "Scarlock, George-a-Green, and Mutch the Miller's Son," or matters more pregnant with current interest and dangerous. They were, apart from the law, "roaring boys" who brought news when news was scarce, and whispered secret stories of evil doings in high places, and were much praised, petted, and protected by the populace generally. Even the great secretary Cecil sometimes patronised them, and one Mat Nash,—great in a famous ballad called "Hunt's Up,"—he rewarded so liberally that the wanderer was enabled to settle down in a house of his own, a retired and comparatively prosperous gentleman, with no more fear of the scourge than Shakspeare then had. This Mat Nash was once imprisoned with another of his tribe, Delone, a bold vagrant who had impiously dared to compose a song reflecting in a time of famine upon the Queen's Government and laws, which Nash as wickedly had dared to sing. Delone boldly defied the lion even in his den, and probably suffered fearfully in purse and person, but Nash was penitent, and, aided by Cecil, escaped with a reprimand.

These wandering fiddlers were men of no small consequence. In the reign of James I. we find some of them were prosecuted for singing songs reflecting on the unpopular Duke of Buckingham,—he who employed English ships against the hapless Huguenots, and was proud of his actions when he ruined a friend or seduced a woman. The judges dared not read the ballads in court "lest the scandals should spread"; but they had copies made for every lord and judge who was present, and the Attorney-general, instead of reading the obnoxious verses aloud, merely repeated the first and final lines of each to identify them, handing his copy after doing so to the fiddlers at the bar that they might also identify them. The fiddlers were fined 200*l.*, and, in addition, were sentenced to stand in the pillory, and to be afterwards whipped. So singularly covert and unsatisfactory a way of conducting a public trial created general discontent amongst the people, and was sure to attract the attention of a patriotic lawyer like John Selden, who, if he were indeed the son of a fiddler, doubtless took special interest in and long preserved in memory a law case so singular and significant as that of "The Fiddlers of Staines."

John Selden was five years old when the great Spanish invasion ended in the destruction of the "Invincible Armada." At an early age he was sent to the West-street Grammar School, in the ancient Saxon town of Chichester, where he saw Bishop Seffrid's fine cathedral, and probably heard many stories of its distinguished bishops; of Wareham and the great Charter King John signed at Runnymede; of Reginald Pecocke, the early Welsh reformer; of the renowned statesmen, Moleyns and Arundel; of Patrick, the commentator; Maltby, the critic; and others famous for learning, patriotism, or piety. Chichester, then famous for its malt and its needles, was rich in stories of natives who had done bravely or wisely, or suffered heroically for their creed or country; and Selden wandering as a boy under the lofty elm-trees which then stood in rows within its old stone walls, and overshadowed nearly the whole place, probably meditated on these things, which may have had much to do with the bent of his mind and the formation of his character. A flourishing and ancient city, famous in trade, standing in the midst of a fruitful and opulent country, sheltered on the north by a long ridge of adjoining hills, with the English Channel on its south and the Isle of Wight in the distance, Chichester was a pleasant, picturesque, healthy, and deeply interesting place to live in, and it must have been with deep feelings of regret that any one with Selden's tastes and feelings quitted such a locality as he did to complete his education and prepare to study law at Oxford.

It is said that he went to Hart Hall, then an ancient hostel, afterwards known as Hartford and Hertford,—which was not converted into a college until September, 1740,—and became a scholar of the university. There, as at Chichester, he must have heard much in praise of Bishop Pecocke, in connexion with one Vincent Clement, whom Anthony à Wood calls "an insolent doctor of Oxford," and whom the learned doctors and students of the Mendicant order (chiefly found in Oxford) abused far and wide as a pestilent, devilish heretic and pagan. But times had changed since then, and Selden heard Pecocke lauded even there, where a grand procession of the whole university, with the chancellor (Thomas Chandler) to head it, had witnessed the burning of Bishop Pecocke's books at Quatrevois.

Learning was not yet held in high esteem, and the university scholars with whom Selden found companions, friends, and associates, were mostly so poor that, like homeless vagrants, wandering fiddlers, pedlars, and such like personages, they were glad to receive the usual licence to go about begging for food. We read how they wandered out in threes and fours, singing doleful appeals to the charitable in much the same way as frozen-out gardeners now sing, and others who are "all the way from Manchester" and "have got no work to do-o-o." It was with reference to this their well-known and ancient custom, that Sir Thomas More, ex-Chancellor of the Exchequer, said to his children, when poverty stared him in the face, if New Inn failed to shelter them, "then," said he, "we will next year descend to Oxford fare, wherewith many great, learned, and ancient fathers be continually conversant, which if our power stretch not to maintain neither, then may we, like poor scholars of Oxford, go a-begging with our bags and wallets, and sing 'Salve Regina!' at rich men's doors."

Selden, probably, often went a begging with the rest, and doubtless he also took part of one kind or another with the turbulent riots and quarrels between the students of medicine and those of law which often led to bloodshed, and affrighted the city from its propriety. These were old enemies in the university, and fought bitterly, as did also the southern with the northern scholars, in one of which contests the principal of Hart Hall's predecessor had lost his life. The beggars, indeed, were rather given to fighting as an exciting amusement, and pretexts or excuses for it were, therefore, easily discovered. Selden left Oxford early in the seventeenth century, and came to London, living in chambers belonging to Clifford's Inn, from whence he was afterwards removed to the Temple. He was a devoted and most hard-working student. In 1610 he published his "Jani Anglorum Facies Altera," and in 1612 appeared the result of his friendship with Shakspeare's friend, Michael Drayton, in the shape of notes and illustrations on the first eighteen songs of the "Polyolbion." In the following year his verses in Greek, Latin, and English upon Brown's "Britannia's Pastorals" appeared, and won him a place in Sir John Suckling's "Session of the Poets." In 1614 his

"Titles of Honour" appeared, which Bishop Nicholson, as we may suggest to our present Prime Minister, describes as a work which "ought to be first perused, for the gaining a general notion of the distinction of a degree from an *emperor* down to a country gentleman." In 1616 he published "Notes on Fortescue's 'De Laudibus Legum Angliæ,'" and so year after year he went on producing great literary works until his "History of Tithes" roused the anger of the clergy, through them that of King James I., and so brought him before the Privy Council. This occurred in the year which saw Sir Francis Bacon made Lord Chancellor, great religious troubles arising in Scotland and Ireland, and the publication of that famous royal Book of Sports, whence also troubles arose. It was the year, moreover, in which a barrister of the Middle Temple, Mr. Williams, was cruelly done to death at Charing-cross, for writing a book which gave the King offence. Selden—a young man on the threshold of life—consented to express sorrow for the offence he had given to the clergy, but he refused to withdraw any of his charges against them. He still held that they were ignorant, lazy, and had no better titles to respect and reverence than those they derived from their beards, their titles, and their costumes.

The third Parliament of King James was that which originated parties of Court and Chancery, and first licensed public-houses. It was a sternly severe one, determined to vindicate the majesty of law. It convicted even the great Lord Chancellor Bacon, Viscount of St. Alban's, of accepting bribes from suitors in his own court, and it condemned him to pay a fine of 40,000*l.*; to be imprisoned during the king's pleasure; to be incapable of holding any office, or of sitting in Parliament; and never to come within the verge of the Court. This was alarming in many quarters wherein official corruption was destroying all regard or hope for honesty and justice. Selden, although not a member of this Parliament, had been sent for to advise and consult with it, and his counsel had much to do with the striking of so terrible a blow. The king resolved to check such doings. War commenced. Displeased with the justice-loving, law-upholding M.P.s, who claimed liberty of speech as their undoubted right, James accused several of them, on mere suspicion, of opposing the royal measures. They were sent to prison: some to the Tower, some to the Fleet, and with them Mr. Selden. But the king, some few weeks after, thought it wise to release them. Then, for the first time since the Reformation, Lords and Commons united to oppose the royal will, which, says Hallam, "must be reckoned an evident sign of the change that was at work in the spirit of the nation, and by which no rank could be wholly unaffected. . . . The struggle which was to be fought out in the battle-field, twenty years afterwards, had already begun . . .; it was a contest for first principles,—whether England should be a constitutional monarchy or a despotism."

From this time we find Mr. Selden vigorously opposing the royal aims at despotic government, determined that no tax should be levied but by consent of Parliament, no man imprisoned but by legal process, &c. In March, 1629, when Charles I. reigned, he was again sent to prison. The Parliament of which Selden was a member was dissolved by the king, who issued a proclamation, wherein he declared that he should account it presumption in any who dared to prescribe to their king the time for calling another. Selden was offered his release on bail if he would repent of his "undutiful" conduct and promise to be a good child, and do in future as he was told. He, in common with his brethren in misfortune, were men. They refused, and were recommitted to prison, there to remain during their monarch's pleasure.

But we cannot follow incidents marking the career of a man whose memory this old house helps to freshen and preserve. Space forbids, although it is good to think of such men and what they did for us; to remember, especially in the face of any unconstitutional doings, that what they suffered and fought for it is our duty to guard jealously, uphold fearlessly, and hand down to our children, if not improved, undeteriorated.

In the wild, turbulent, whirlwind times of strife and civil war which followed when fanatical zeal degenerated into unreasoning savageness and cruelty, John Selden became wonderfully conspicuous. He was almost the only man whose passions were under the control of his reason. Both his friends and his foes admitted this. He fought for the right unmixed with wrong, and denounced the latter, however intimately it was associated with the former. With him wrong was wrong, although right had part with it, and he upheld the latter, prudently or imprudently, at the risk of being charged with supporting the former. Some thought he wavered; many accused him of half-heartedness and cowardice, charges which are revived against him to this hour. They were wrong; he merely loved justice for good's sake and God's; fearless of persecution and misrepresentation, he strove with dignity and calmness, firm, resolute, and brave, to support the right, independent of party and wherever he found it.

Calmly dispassionate, even where his feelings were most strongly worked upon, the intellect and science of the scholar, and the love of law for right's dear sake, always preserved him pure from the excesses of his friends. Hence they regarded him suspiciously, hence he failed as a man to secure their thorough sympathies. Therefore we know so little about John Selden's private life, and apart from the "Table-talk" of his grateful amanuensis, so little of his private character.

Yet Selden had many intimate personal friends, of which Camden, Spelmen, Sir Robert Cotton, Drayton, and rare Ben Jonson, who called him "the monarch of letters," were some, together with Butler, the author of "Hudibras," and many other men, the most learned and lofty of their age. Amongst even these many were puzzled to account for his impartiality. The celebrated Oriental scholar, Thomas Hyde, used to say that he valued nothing higher than the friendship of Mr. Selden, which he was proud to admit he had enjoyed even from his younger days, and that his, Selden's, society was always a delight to him. But he condemns, as "wickedness," his staying in London and sitting in Parliament after the rebellion had broken out. He strove to excuse it on the ground that even the best men have infirmities, and John Selden's were fear and love of safety (!)—faults which he fondly but foolishly argued "were weighed down with wonderful and prodigious abilities and excellences in the other scale." Another Hyde, Edward the great Lord Clarendon, spoke of his old foe with enthusiastic admiration, noting his learning as "stupendous," and saying of his character that it was one which it was impossible to flatter, confessing that to "transmit any expression equal to his merit and virtue" was an impossibility.

But we really must conclude. The reader will ere this have observed that our subjects are apt to run away with us. We go back to Salvington for another parting glance at the old house. There is no record of Selden's having re-visited it after going to Oxford in 1598. The front of the house has been rebuilt, but the gable end towards the road through the village is still as it was when the fiddler's son first saw it, and is a fair specimen of the domestic architecture of the sixteenth century. The lower room is one of goodly size, but *very* low, and over its doorway is a famous lintel-stone on which appears a Latin distich, said to have been composed and carved by Selden when he was ten years of age. It runs thus:—

"*Gratus, honeste, mihi, non clandar unio cedebis,*
Fur abeas, non sum facta soluta tibi."

Selden loved liberty, his country, art, and nature, and it was said of one of his works, written in explanation of the Arundelian marbles: "Should mankind refuse the praise due to Selden the stones would speak for him." He died on the 30th of November, 1654, when he had nearly completed his seventieth year.



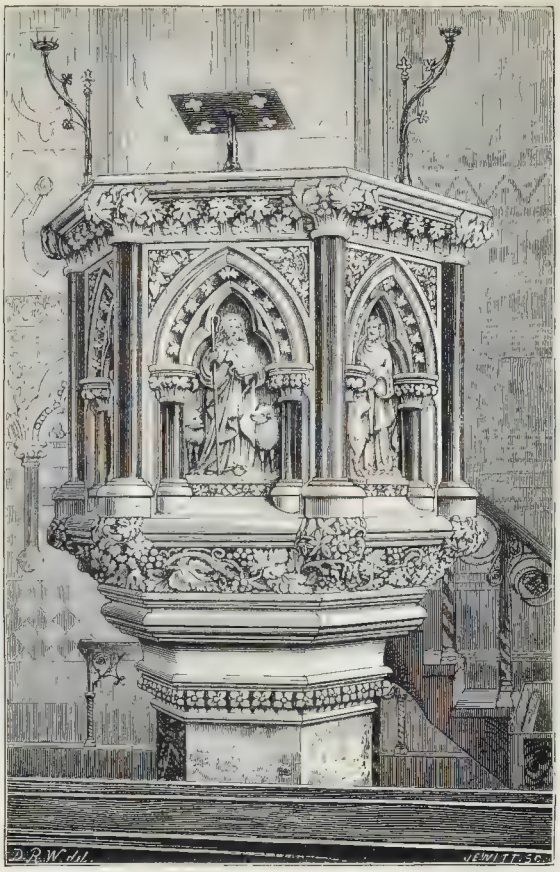
The Birthplace of Selden, Salvington, Sussex.

PULPIT, ST. MARY'S CHURCH, SEYMOUR-STREET, EUSTON-SQUARE.

THIS pulpit is executed in Caen stone, with polished Devonshire marble shafts at the angles, and the shaft of the lower portion is of polished Cumberland alabaster. The niches are filled in with figures executed in Derbyshire alabaster, the centre contains Our Lord Jesus Christ as the Good Shepherd, and on either side the four Evangelists. The stairs are of oak, with metal-work by Messrs. Jones & Willis. The pulpit was executed by Mr. Underwood, sculptor, of Camden-town; and the architect was Mr. James K. Colling.

The church has also been fitted up with new open benches in pitch pine, a reading-desk of oak, and a reredos in Caen stone with marble inlay. The walls also have been decorated by painting; two of the side windows have been altered, and quatrefoil tracery added in the heads, and the windows filled in with tinted glass in Geometrical patterns. These are intended to be continued throughout as soon as the necessary funds can be obtained.

New Police Courts at Leigh.—The new police-courts for the Leigh petty sessional division of the county were used for the first time on the 1st instant. The buildings, which are situate in Church-street, include a residence for the superintendent of police for the Warrington division of the county of Lancaster, and have cost 5,000*l.* The architects were Messrs. F. & G. Holmes, of Liverpool, and the contractors Messrs. Boardman, of Leigh.



PULPIT, ST. MARY'S CHURCH, SEYMOUR STREET, EUSTON SQUARE.



THE GREAT DOLWILYM CROMLECH, CARMARTHEN, WALES.



INTERIOR OF THE PROPOSED CHURCH OF THE SACRED HEART, MONTMARTRE, PARIS: LOOKING TOWARDS THE SANCTUARY.—Designed by M. Abadie, Architect.

THE GREAT DOLWILYM CROMLECH.

DURING the Carmarthen meeting of the Cambrian Archæological Association, a visit was paid to Llanboidy, to inspect the magnificent cromlech here illustrated. Till now no view of this grand prehistoric structure has been published that in any way does justice to the grandeur of its aspect. A very small cut is given in "The Families of Wales," and it is also illustrated in one of the volumes of the "Archæologia Cambrensis," but to a small scale, and not from the point of view chosen by us. Although Dolwilym is one of the most perfect and interesting cromlechs in Wales, yet, strange to say, it is one of the least known, and, as far as we are aware, nothing has been written of any moment regarding it, further than what has been given by the Rev. E. L. Barnwell, in his paper "On South Wales Cromlechs," in the "Archæologia Cambrensis." Our illustration is positively exact, and is a precise reproduction by Mr. Worthington G. Smith, from a careful camera-lucida drawing made last autumn. The Dolwilym Cromlech stands on a steep side of the bank of the deep and narrow valley of the river Tâf, on the grounds of Mr. Protheroe, at the northern extremity of the parish of Llanboidy, in Carmarthenshire. Originally it consisted of five, or rather six, stones, although only four now remain. The fifth, missing, would, if present, fill up the void at the south-west angle in front of the picture; and in all probability, says Mr. Barnwell, there was a second small stone at the eastern end, as the one now there could not, from its shortness, have closed that entrance. The tallest upright stone is 4 ft. 4 in. high, and the gigantic cap-stone measures 11 ft. 6 in. by 8 ft. 10 in. The inner sides of the upright stones are smooth and regular, while the lower face of the cap-stone, contrary to the more usual practice, is extremely rough and rugged. There are several scattered stones, some of great size, in the immediate neighbourhood of the cromlech, and these latter appear to form broken circles of large diameter, the dolmen being erected in the centre. Dolwilym has two recognised names, one of which is Bwrdd Arthur (Arthur's Table,—there is hardly a monument of the kind that is not assigned to Arthur), and the other Gwal y Vilast (the Couch of the Greyhound Bitch). Of this animal there are many records scattered over Wales.

When the chambers formed by the upright stones of cromlechs are examined for the first time, unquestionable evidence of burial is invariably found; it may therefore reasonably be inferred that as all cromlechs are so much alike in general design they have all been constructed over places of burial. It is also generally supposed that the interstices of the stones were originally filled up with rubble-work, and the whole structure covered with a mound of earth. The labour of erecting some of the dolmens found in this country must have been immense, and the honours of cromlech burial must have been extended to a very limited class, a class belonging to a past time so remote that, as far as present knowledge goes, no date can be assigned to it.

THE INTENDED CHURCH ON MONTMARTRE.

WE give in our present number an interior view of the proposed church of the "Sacré-Cœur," now being built on the summit of the hill of Montmartre, and which was some little time ago the subject of a large competition of architects, into which one or two English architects adventured themselves rather spiritedly than wisely. We published, at the time of the competition, a page of small exterior perspective views of some of the principal designs submitted, including the selected one, which is by M. Abadie.

The style of the selected design might be described as founded on the North Italian or Lombard Gothic, with modern French treatment of some of the detail, and not without reminiscences in the exterior design of Byzantine feeling. The project of erecting an important church on this site is an old one, but has been interrupted by the vicissitudes which have befallen Paris. The associations of the site are various enough, and little in keeping with those which generally cluster round a place selected for an important sacred edifice. Montmartre has been in part a place of amusement; an observatory tower of gimcrack construction, rejoicing in the name of the "Tour de Solférino," together with its refreshment buffets and beer-shops, is among the objects which "achieve to disappear," in order to make way for the great new building. On part of the plateau which forms a natural pedestal for the church at the top of the eminence, there was stationed during the siege an apparatus for the production of electric light to guide the troops on the occasion of sorties. It was in the garden of a cottage situated on this site that the double murder of Generals Thomas and Lecomte was perpetrated, and the place and memorials of which deed are also happily obliterated by the re-arrangement of the ground in connexion with the new structure. Other far more ancient and perhaps less authentic tragedies and martyrdoms have marked the spot. It was here, according to tradition, that St. Denis, apostle of France and Bishop of Paris, was beheaded along with his companions, St. Eleuthère and St. Rustique, whose names are preserved in those of two streets a little further from the site, on the slope of Menilmontant. "It were to be wished," says a pious French contemporary, in speaking of the projected work, "that these names should be now given to the two main streets which will lead to the future basilica,"—"*On réalisera ainsi par un symbole vivant la doctrine de l'Église, que nous arrivons à Dieu par l'entremise des saints.*" Indeed, the question of the site for this church seems to have considerably exercised the ecclesiastical French mind, as a matter of sentiment and association. Another proposition, entertained for some time was, that it should be built on the site of the great International Exposition held under the late Emperor, in order that Paris might kneel and worship on the same ground on which she had formerly taken pleasure in the display of her riches and splendour. And truly, though the idea be somewhat simple and old-fashioned, there is a certain fitness in it. Certainly, Paris might have been supposed to owe a penance, if ever a city did, for those days of thoughtless and unprincipled splendour; and bitterly enough she has paid it.

However, Montmartre is the site finally fixed upon, and the building is commenced; and, considering it from an architectural point of view, it will probably be as fine and effective a position as any architect could desire for an important edifice; and it seems probable that in regard to its general external contour and composition, the building will not be unworthy of the situation. The exterior design, in fact, shows a good deal of originality and of picturesque as well as architectural character. Some fear was entertained lest the site should have been undermined by old quarries or other former disturbances of the ground, but no difficulty of the kind has been encountered, and the new church on Montmartre reposes, at least, on a secure material foundation. What may be the ultimate fate or destination of the building amid the continual "settlements" of the moral and social foundations in France, it is less easy to conjecture.

The project seems to have excited a good deal of public interest, as may be surmised from the fact that more than 2,000,000 of francs (80,000*l.*) have been raised by subscription for the work.

MOVEMENT IN INDIA.

THE obstreperous surf of Madras is already beginning to show its effects on the new harbour works, and the papers received by last mail record that one night recently a portion of the newly-made groyne was completely washed away, the stones being scattered by the waves to a great distance. To prevent the recurrence of such an accident, the work of reconstruction is now being carried on without intermission day and night, and an incessant stream of stones is being poured into the sea. Much sand has already silted into the sheltered recess made by the shore end of the breakwater; but the engineers consider that when the current changes (and the currents annually do) this will be eaten out again.

It has been decided to extend the cotton manufacture to Mooltan, and a company has been formed which is about to erect large spinning-mills and other works there.

The piece-work question has extended to India, and some of the railway companies are declining to enter into new contracts with their time-expired men; but offer them enough to do if they will only work on the reasonable persistence for a fair wage. The artisans will have no cause to complain if plenty of work is provided for them, and may defy the competition of any number of natives or Eurasians who may enter the lists against them. European skill and energy will always tell on behalf of those who are willing to work, and the sooner India is rid of the loafers who have been discharged from railway and other works, and who now gain a livelihood by sponging on their compatriots, the better. If there is work to do, and these gentry will not do it, there will no longer be the same excuse for treating them with consideration, but the law may be enforced against them, and they may be shipped off to their own country.

The Duke of Buckingham having left Madras for Ootacamund, vigorous efforts were being made to complete the new Council Chamber for use during the protracted stay of the Government among the hills. The new building, which contrasts very favourably with the old one and is adjacent to it, has been designed by Capt. J. L. L. Morant, the executive engineer of the district. The actual council-room is said to be a handsome apartment, and the edifice has some pretensions to architectural effect, being surrounded by graceful verandahs and decorated with a clock tower. Waiting and luncheon rooms are provided, as are also apartments for clerks, peons, and other attendants on duty; and the entrance is so arranged that carriages deliver their passengers under shelter, which is a great advantage in such a climate.

It has been finally decided that the memorial of Lord Northbrook, the late Viceroy, shall be in the form of a statue. It is proposed that the memorial to the late Bishop Milman shall be the establishment of a bishopric at Lahore, the necessary endowment being raised by public subscription. The sub-division of the diocese, and the formation of such a bishopric, were objects which Dr. Milman had at heart; he succumbed to overwork, and the Punjab was the scene of his last labours; therefore the project will probably commend itself to his friends and admirers both in India and England. A large sum has been raised for a memorial of the late Mr. Thwaites, principal of the Hughli College. In this instance, also, two birds are to be killed with one stone, and a scholarship is preferred to an effigy.

The Calcutta Fine Arts School has been opened under the auspices of Sir Richard Temple, Lieutenant-Governor of Bengal. It is hoped that this is but a beginning, and that affiliated institutions will shortly be set on foot in many of the large Indian cities, as there seems to be a growing desire to cultivate art work.

The Chutteesguhr State Railway, which is now being rapidly pushed on to completion, will connect Rajpore with Nagpore, and it is believed the line will eventually be extended to Calcutta *vid* Sambulpore,—at least, such is the present anticipation. If the extension were carried out Calcutta would be brought 450 miles nearer Bombay than by the present route *vid* Allahabad.

The natives of Orissa have added another deity to the Hindoo Pantheon, in the person of the Coal God. A mine having been discovered in one of the tributary states, the simple inhabitants have been more than amazed at seeing the black-stones on fire, and have, without hesitation, attributed their inflammability to supernatural agency. Consequently, we are told that milk, cakes, and clarified butter, are thrown in large quantities into the den of the subterranean deity to ward off his malevolence. If the miners are at all shrewd, they ought to be able to put a stop to this throwing process, and see to it that the gifts to the altar are presented in more seemly form.

Mr. Rice, the director of Public Instruction in Mysore, has recently been engaged in studying some inscriptions carved on recently-discovered metallic plates which set forth a grant of land to some Brahmins in that district and incidentally mention the "Sarpayaga," or great sacrifice to root out the serpent race from India as having taken place 3,000 B.C., a date much more remote than has ever yet been assigned to it, and which would upset the chronology of the Hindoo mythology altogether.

It is intended to pay far more attention than hitherto has been paid to the valuable sandal-wood plantations of the Government, both in Madras and British Burmah, and officers have been appointed to investigate their condition thoroughly, and convert them into more profitable sources of public revenue. Orders have been issued to discontinue the practice of accepting tenders, and to sell cut-wood by auction,—a combination having been discovered among the sandal-wood traders.

The Ahmedabad College Scheme has proved a failure for want of funds, and its promoters recently applied to Sir Madhava Rao to help them to make up the deficit. The Prime Minister

of the young Gaekwar, it is said, expressed his willingness to do so if the site of the building were transferred from Ahmedabad to Baroda, but it has not yet been determined as to whether his offer shall be accepted or refused.

During the year the greatest activity will be shown in completing the Indus Valley Railway, for which a grant has been made of 100,000*l*. As soon as the railway is finished the connexion of Scinde with Bombay will be served, and the province will be added to the Punjaub.

Last month, Colonel Willoughby Osborne, at the request of the Begum, laid the foundation of a free hospital in the city of Bhopal, in commemoration of the visit of the Prince of Wales to India. The site is said to be an excellent one, healthy and convenient, and the building is to be a two-storied one, one wing being devoted to the reception of males and the other of females. Its estimated cost is about 3,000*l*., and the Begum has expressed her intention of having a duly-qualified lady doctor at the head of the female department. In Bhopal, which is admirably administered, the females of the family rule. The ceremony was witnessed by Sadik Noosain, the husband of the Begum, and the principal nobles.

It is likely that an exhibition of Kattywar arts and manufactures will be opened in December next. The native chiefs not only sympathise with the scheme and are urging its importance on their people, but are themselves subscribing liberally in order to render it successful.

The chiefs of the Punjaub have commissioned Mr. J. Adams Acton, of Bombay, to execute a bust or a statue of Lord Napier of Magdala, according to the amount which may hereafter be subscribed.

The Government of India have desired the Chief Commissioner of Mysore to adopt such steps as he may deem expedient in preparing a list of objects possessing antiquarian interest in the province of Mysore and Coorg, and the work has been assigned to Mr. B. L. Rice, director of Public Instruction.

THE NEW LAW COURTS.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last the members of the Architectural Association mustered in strong force at the works of the new Law Courts, which are now sufficiently advanced to be of interest to the visitor. The architect, Mr. G. E. Street, R.A., was present, and was at some pains to thoroughly explain the plans, after which he accompanied the members over the works. As will be known to most of our readers, the works have been in hand for a little more than two years, the contractors, Messrs. Bull, of Southhampton, having, in February, 1874, signed a contract whereby they undertook to complete the works in six years and a half for 680,000*l*., the concrete foundations having previously been laid by Messrs. Dove Brothers. One stipulation of the contract is that the eastern block of office buildings shall be completed by August, 1877. This block of buildings is, therefore, in a more forward condition than any other portion of the works, having already reached the second story. This block of offices is being executed in red brick with Portland stone dressings, partly for economy, and partly because the architect is fond of good brickwork. The bricks are "purpose-made," and measure 7 in. by 5 in. by 2 in., there being five courses to the foot, including the mortar joints. The block of offices is provided in the basement with a series of strong rooms for the safe storage of documents and records, and will communicate with the Law Courts proper by covered corridors on the ground and first floors. These offices will be occupied by Masters in Chancery, Commissioners of Lunacy, and other officials whose functions are more or less inscrutable to those who are not "learned in the law." The rooms devoted to the principals or heads of departments are emphasised externally by larger and more elaborately-treated window openings than those devoted to clerks and minor officials, and this distinction in fenestration is preserved, both on the eastern side of the block, facing towards Chancery-lane, and on the western side of the block, which looks on to the great quadrangle which will intervene between the "office-block" and the "courts block." We may here note that the whole of the floors are to be of what is known as "fire-proof" construction,—*i.e.*, iron and concrete, and Mr. Street maintains that there will not be a room in the structure which will not be well lighted, notwithstanding the statements of some of his critics a few years ago. Although the block of offices is being faced with red brick, as stated, the whole of the external walls of the block in which the courts will be contained will be of Portland stone. The court-block consists, roughly speaking, of a large square surrounding the central hall, which is the chief feature of the design, architecturally speaking. This central hall will be 230 ft. long by 48 ft. wide, and will be groined in stone. It will have a number of what may be called shallow transepts on either side, these recesses giving access to staircases, by which the court-floor will be reached. These staircases will only be used by those having business in the courts, special entrances being provided for the "lounging" portion of the public. Abutting on and approached by the various corridors, the courts are arranged round the central hall, each court being provided with such adjuncts as rooms for judges, jurymen, witnesses, barristers, &c. Between the central hall and the courts, and in other needful situations, small areas for lighting and ventilation, lined with white glazed bricks, are provided. Of the central hall, only the substructure is as yet completed. In this substructure, which will be vaulted in brick, will be placed the heating apparatus. The ground-floor level of the central hall will be about on a level with the Strand; but, owing to a rather considerable rise in the ground northwards, the floor of the hall will be some distance below the level of Carey-street. The court-floor will be on a level with Carey-street; or, in other words, it will be on the first floor if approached from the Strand. Mr. Street expressed his regret that the central turret of the great hall had had to be expunged from the design, in obedience to the mandate of a First Commissioner of Works, and thereby effecting a saving of 10,000*l*., for it had to be provided for by carrying up massive masonry buttressing from the basement. This feature could not now be restored; but it was hoped that when the time came some relief to the expanse of the roof of the hall might be obtained by an addition in the shape of a lead *flèche*.

ARCHITECTURAL ASSOCIATION OF IRELAND.

FRENCH AND ENGLISH CATHEDRALS.

AT an ordinary general meeting of the above Association, on the 27th ult., the President, Mr. T. Drew, in the chair, Mr. C. H. Brien read a paper on "Two Cathedrals — Canterbury and Amiens." After a brief account of the history of the two cathedrals and some of their peculiarities the reader went on to say:—

Like the town-halls and belfries of Belgium, the cathedrals of France mark a period of greater freedom and of a healthier national life, of greater interest and of more liberal aid than in the monastic and feudal times, on the part of king and people. Most of the great cathedrals were either commenced simultaneously or were pressed on to completion so rapidly, that little advantage could be taken of mistakes or doubts. At Paris, it is true, there is evidence of a change of mind, and at Beauvais it became necessary to construct a pier between those first proposed, to render a lofty clearstory possible. There are some particulars which may be here summarised.

In England:—

1. The cathedral is often square-ended at the east, or has considerable projection in this direction, as at Westminster and Canterbury. The western end has a great window, as at Canterbury.

2. The porches are not so charged with sculpture as in France. There is a peculiar porch at Canterbury, and the west fronts of Wells and Peterborough are also exceptional.

3. The central tower, greater projection of transept, chapter-house, and proportion, length to height, are characteristic.

4. The nave is isolated from the choir, and frequently not used for service. The chapels of the apse (for the original purpose) disused.

5. There is less distinct separation of clergy and laity; the pulpit is differently placed, and the altar of lower elevation.

6. The organ stood on the choir screen most frequently, since the Reformation.

France:—

1. The chevet and its chapels generally show; externally at Amiens there is a lady chapel; at Paris, Rheims, &c., this holds good; at Cologne also.

2. The western front, and most frequently the transepts, contain great circular windows. It is so at Amiens. They are generally dissimilar and of great beauty.

3. The proportions of the nave walls seem to be normally thus: a line beneath the triforium divides the space into two; of the remainder the triforium has one, the clearstory two.

4. The organ in most French cathedrals and churches is at the west end.

The last point to be considered is the relation of these and similar buildings to the requirements of the ritual for which they are now used,—at Canterbury, the services of the Church of England; at Amiens, that for which it was originally designed. Take St. Peter's, Geneva, or the Cathedral of Glasgow, and you find the Calvinistic form of worship using a structure designed for a more imposing ritual; and at Heidelberg an old church actually divided between two sects by a separating wall, which allots its apse to one whose form of service is best adapted to its use. Throughout Germany, the mode of administering the sacrament in the Lutheran Church favours the ancient position of the altar and the use of the baldachino to give it dignity: the east end is, therefore, appropriately designed; while at Geneva the communion-table stands in front of the pulpit and against the southern wall of the nave, and the apse, like the basilica and the chapter-house, would best subserve the purposes of the consistory.

At Canterbury, as at Westminster, Classic St. Paul's, and until recently at our own Christ's Church and St. Patrick's, you find the nave unused for service, and the organ-screen blocked the view completely. Latterly, in some instances, as at St. Paul's and Westminster, the nave has become a separate church, and the difficulty is overcome by using it for special services, at which a large number of worshippers attend. At Glasgow the nave is not used for service. At Geneva, owing to its smaller dimensions, the entire building is availed of. You find thus an acknowledgment of unsuitability. Looking over the plans of buildings used from the earliest times for Christian services, you will be impressed by the changes of structure which the changes in ritual necessitated, even although we confine ourselves to the western branch of the church alone, and exclude, for instance, the peculiar plan which the Greek Church favours. If you look at the plan of San Clemente at Rome, as given by Fergusson, you can trace some of these alterations, and the German churches and the French and English supply the rest, until we gain the period when the simpler rituals and the growing importance of the sermon changed, as it were, some of the altered and enlarged structures back again to something like what seems to have been the more ancient and more simple forms.

We are now in a position to compare the two buildings we have been studying. Such a comparison may be conveniently instituted under the following general heads:—

1. The differences as to position and structure which they display.

2. Their relation to the history of architecture, locally and generally.

3. Their connexion with the political and religious influences of either country, more generally of the time in which they were erected.

4. The way in which they fulfil at present the requirements of dissimilar rituals. This question, of course, applies principally to the English cathedral.

As respects the sites on which they have been erected, Canterbury stands within a spacious inclosure, with grassy slopes and green trees, and quiet cloister. It is well displayed on three sides, and associated with the remnants of the ancient monastery, and with modest ecclesiastical residences. Amiens is not thus isolated, but in the midst of a city surrounded by houses which it boldly dominates, with no small picturesqueness of effect in tower and *flèche* and buttress. The first has characteristics in which, of English cathedrals, it is not alone. The long low nave and choir,—compared with Amiens and the other great French cathedrals,—the distinctly marked transepts, great central tower, and now corresponding western ones. Amiens, short and lofty, with great unbroken height of roof, the western towers unfinished, yet pleasingly crowned, its noble western portals and bewildering forest of flying buttresses, its eastern end is well displayed to the open space behind.

We have seen that Canterbury was connected

with Normandy by its king and its archbishop, and that there is no difficulty in tracing the influence of the imported plan and style. Amiens, like Paris, Rheims, and Chartres, was perfected in that thirteenth century which helped to carry the architectural glory of the time of Philip Augustus down to that of St. Louis; and we like to trace its history from the Pointed arches of St. Denis, Notre Dame, Paris, Rheims, and Chartres, on through to the St. Chapelle and St. Ouen, at Rouen. If you will look at the plans you will see some of these changes, the simpler west front and absence of marked transept of the Cathedral of Notre Dame, Paris. The increase of width at the choir of Rheims, and the portals, marked the transept and dissimilar spires of Chartres, while at St. Ouen we have a central tower of late development, and a combination of circular window and glazed gallery, which, with its structural surprises, seems to have reached the limit of that masonic skill and elaboration of parts which gave us the Friburg spire, the upper part of the tower at Antwerp, the fine tracery of Henry VII.'s Chapel at Westminster, and the elaborate buttresses, lofty piers, and clearstory of Amiens,—the minute panelling of the Tudors,—the perpendicular windows of Canterbury, and the great windows of the chapels of the chevet at Amiens, designed for the gratification of an increasing love of the display of painted glass; and the fretted vaults taking the place in England of the painted ceilings in France and the mosaics of Italy.

The ancient basilica, as at Rome, is familiar to us all as not only the earliest type of a building used for Christian purposes, but as also the first example of that adaptation of a structure to other uses which we have been just considering. The basilica was a building with a semicircular end, where sat the quæstor and his assessors, with an altar for oblations in front. This part, when transferred to the Christians, became the seats of the presbyters; and a president being necessary, one of them to this extent became chief, and the Christian altar took the place of the pagan. I speak of the first three centuries of our era. It seems almost certain that not only did no great separation of apse or choir prevail, but that even the distinction of clergy and laity was not maintained. Then came the separation, still traceable in this church of the fifth century,—the bishop's throne and the presbyters' seats, the altar, the enclosed choir, with the ambours for epistle and gospel, and the atrium, with its fountain. You can follow in Germany the round building for baptism and sepulture in the western apse,—the atrium reduced to the narthex; in France and elsewhere, the chevet with its chapels, its numerous altars; in Italy, the separate baptistery, as at Pisa, and the separate bell-tower; in England, the chapter-house, as I have said, and as seen at Canterbury, taking the place and fulfilling some of the offices of the basilican apse, and the synods of the church transferred from the ancient place of assembly to a separate building.

These and similar changes were of course not accomplished without political convulsions, in which the cathedrals were not the only sharers. The very names of the men whose bones lie within the precincts of Canterbury, whose statues now adorn the south-western porch, or whose works are immediately associated with it, are typical and household words,—St. Augustine, Canute, and the Black Prince, the murdered Becket, Cranmer, and Laud, the Commonwealth, the Reformation, the shattered glory of Becket's window, and the simple ritual which is still found in the premier cathedral of England.

The chairman said that he did not consider the cathedral at Amiens a success, taking into consideration its great mass and extravagance, it was so attenuated. Nothing could exceed the grace of the sculpture at Amiens and Chartres. He considered the Peterborough portal a sham, and the other English portals mentioned, though fine, did not approach the French ones. He did not think there was any theory as to ritual to be deduced from the elevation of the altar, as the differences throughout England in this respect were very striking. The planning of cathedrals should not be sacrificed for the sake of seeing and hearing. He had a great respect for M. Viollet le Duc's restorations, but did not think, excepting him, that there was an architect in France capable of restoring. The system at present carried on by Government-paid officials called architects was hurtful to the feelings of every one who had the remotest taste for archæology. He did not think the screen in Canterbury a subject for comparison with French sculpture.

Mr. J. J. O'Callaghan, in proposing a vote of thanks, agreed with the chairman as to his remarks in regard to the growing utilitarianism, as exemplified in some of our modern buildings. A spirit more opposed to the success of architecture of this kind could not be conceived. The large nave was used for particular services, such as high mass, and all other chapels and portions of the buildings were always utilised. Speaking of Amiens, he said it was with feelings of the greatest pleasure that he stood at the west end, looking towards the gorgeous choir, surrounded by the magnificent fittings, and he had never regretted the height of the vaulting. He was not sure that he was sorry the towers had not been completed. As far as he had seen of French restorations, he rather liked them than otherwise.

Mr. J. L. Robinson seconded the vote of thanks, which was carried unanimously.

The chairman, at the conclusion of the meeting, drew the attention of the members to the prizes offered by the Royal Institute of British Architects, and said he did not see any reason why some of them should not be won by members of the Association.

DEATH OF AN EMINENT CONTRACTOR.

A PAINFUL gloom has just been thrown over the town of Liverpool by the sudden and unexpected death of the mayor of the borough, Lieut.-Colonel Thomson, on Saturday last, from a severe attack of bronchitis, caught last week in London whilst on business connected with the corporation. The deceased had for several years been well known as one of the largest railway and general contractors in the country, having executed extensive works of this character not only in the United Kingdom, but also in Russia, Spain, and other Continental and foreign countries. Like the late Mr. Brassey, Mr. Peter Thomson, the deceased (Colonel, at his death, of the largest regiment of Artillery Volunteers in the country, consisting exclusively of artisans), was of humble origin. He was a native of the village of Forgue, near Huntley, in Aberdeenshire, where his father was a builder in a small way, and to whom the deceased served his apprenticeship as a mason. About the age of 22 he came to England, and sometime afterwards he and his elder brother entered into partnership as contractors, the name of the firm being George Thomson & Co. Amongst the railways and other public works which the firm—and subsequently Mr. Peter Thomson himself on the death of his brother—constructed in England and Wales, in addition to large contracts abroad, were several of the lines belonging to the London and North-Western, the Midland, the Great Western, and the Lancashire and Yorkshire Companies, the aggregate length of the railways so constructed by the deceased and his brother being upwards of 600 miles. Some of these lines involved a large outlay in consequence of the rocky character of the country through which they pass. Amongst these are those portions of the Midland Company's lines through Darley-dale to Rowsley and Bakewell, in Derbyshire, and that from Matlock to Buxton, in constructing which they carried a tunnel under Haddon Hall in order to avoid destroying that picturesque and historical old mansion. The firm also constructed several large railway stations in different parts of the country, including the new Central Station at Leeds, and the building of a railway upon arches through that town for the North-Eastern Company; likewise the erection of a new station, grain warehouses, and other building operations in Wakefield; new stations at Halifax and Bradford; the Exchange Station at Liverpool, and also the enlargement of the Lime-street Station of the London and North-Western Company in that town. But the works constructed by the deceased were by no means confined to those in connexion with railways. He deepened the great float at Birkenhead, 150 acres in extent, for the Mersey Docks and Harbour Board, and some idea of the magnitude of this contract, and the difficult nature of the work, may be estimated from the fact that it kept employed for three years about 46,000 men and 240 horses, and that from two to three million cubic yards of excavations were made. He likewise constructed the Carriers' Dock and the Canada Half-tide Dock at the north end of Liverpool, together with several reservoirs and other works in connexion with waterworks at Liverpool and other places. After having realised a colossal fortune the deceased retired from business a few years ago on becoming a director of the Lancashire and Yorkshire Railway Company, being succeeded by his chief manager, Mr. William Dransfield, who now continues the business under the firm of Dransfield & Co. The deceased permanently took up his residence at West Derby, near Liverpool, in 1849, where he built himself a large palatial mansion, called Layfield Priory, situated on an estate of upwards of 100 acres in extent. The great practical knowledge which he possessed caused him to be frequently consulted on difficult points connected with his profession by some of the most eminent engineers, including Sir John Hawkshaw, Mr. George Robert Stephenson, and others. He was a member of the Institution of Civil Engineers, and was a guest at the dinner of that body, when in London, only a fortnight ago.

The deceased as mayor had in contemplation the holding of a series of festivities, which were to include among others, a banquet to representatives of science, literature, and art.

KRUPP AT PHILADELPHIA.

THE catalogue of the objects exhibited at Philadelphia by the Essen establishment of Herr Krupp has just been published. It is of especial interest on account of the heavy ordnance sent to the Centennial Exhibition. Although in number behind those shown at Vienna in 1873, nearly all the guns sent to Philadelphia by Herr Krupp are of an entirely different construction. Besides the new 35½-centimètre gun for coast defence—the latest of Krupp's monster creations—the firm exhibits one of the long 24-centimètre guns shown already at Vienna; but, besides these, an entirely new 8-centimètre gun and a 6-centimètre mountain gun, both recently introduced in the German army; also the saddles and harness for the latter gun, as well as an especially well-finished field-gun with carriage of the above kind, and a series of projectiles. According to the catalogue, the new German field-guns excel in their effect anything hitherto produced by other countries. Not less interesting and important are the effectiveness and construction of the new mountain-guns. It may be expected that the new 1,000-pounder sent to America, which latter country is at present left far behind in the race of construction of ordnance, will attract some attention. To be noted are also the two ship's engine-beams sent over to Philadelphia. One of them weighs 13,500 kilogrammes, made from a crucible steel block weighing 30,000 kilogrammes by the 50-ton steam-hammer. It is destined, with its three cranks, for an engine of 2,500 horse-power of a vessel now building for the German navy. As far as we know, those beams, of which the other, weighing 9,000 kilogrammes, is for a Transatlantic steamer, are a new branch of industry of the establishment, which did not exhibit anything in that line at Vienna.

We see from statistics appended to the catalogue, similar to those published in 1873, that Krupp's establishment at Essen employs at present 15,500 people, including 5,000 puddlers, and that, notwithstanding the bad state of business in Germany generally, no decrease,—in some branches even an increase,—is perceptible. Thus, since 1873, the number of cupola and puddling furnaces has been increased by nineteen, that of boilers by fifty-eight, that of steam-hammers by seven, and that of steam-engines by eight, of which one of 1,000 horse-power. The network of rails laid down in the extensive works has increased in the same proportion, and consists now of 39·92 kilomètres of the usual gauge, and 18 kilomètres of a narrow gauge, upon which run twenty-four engines. To the many institutions and buildings for the use and recreation of the workmen already in existence, four elementary schools with twenty-one classes and four industrial schools for women and girls have, within the last few years, been added. Another sign of the extension of the immense works since 1873 is, that Herr Krupp now owns four steamers of 1,700 tons each, which are principally employed in carrying iron ore from the mines on the north coast of Spain near Bilbao, now the property of the Essen manufacturer.

Proposed Convalescent Hospital for Salford.—The Salford Corporation has been offered by a gentleman, who at present does not wish his name to be made public, a site and buildings outside the borough for a convalescent hospital. The value of the gift is estimated at upwards of 20,000*l.*

SALE OF THE SURPLUS PROPERTY OF THE EAST LONDON RAILWAY COMPANY.

A SALE of the surplus lands and buildings belonging to the East London Railway Company took place at the Auction Mart, Tokenhouse-yard, on the 9th inst., Messrs. Farebrother & Co. being the auctioneers. The property, which was in fifty-three lots, consisted of twelve lots of freehold building land in Wapping, near the London Docks, which was purchased by the company, and cleared of the low-class dwellings standing upon it, in order to admit of the construction of that portion of the railway in the neighbourhood of the London Docks, which has just been opened for traffic. Other portions of the property offered are in Rotherhithe and Deptford.

The first lot was a block of land immediately opposite the Wapping station, containing 17,000 superficial feet, the estimated value of which, as stated by the auctioneer, was 17,000*l.*, or 1*l.* per foot, but as the highest bid was 5,900*l.* the property was withdrawn, as were also the next eleven lots, all situated in the same neighbourhood, and for which the biddings were about at the same rate as for the first lot. The aggregate estimated value of this portion of the property was about 70,000*l.*

The property next submitted consisted of twenty-three lots of freehold building land at Deptford, situate between the East London line and the London and Greenwich section of the South-Eastern Company, and which the East London Company have laid out for the erection of about 800 houses of an ornamental character, with gardens attached, for the artisan class. The streets are laid out at right angles, and have all been sewered by the railway company, and already about 200 houses have been erected, and several others are at present in progress. The auctioneer, in introducing this part of the property, observed that it might appropriately be described as a model village, and its almost immediate proximity to Southwark Park increased its value for building purposes. Ten of the lots, which contain a frontage of 96 ft., and 65 ft. in depth, were sold at prices ranging from 280*l.* to 410*l.* The remaining lots were bought in.

The next and concluding portion of the property comprised in the day's sale consisted of sixteen leasehold houses in Milton-court-road, Deptford, and let to weekly tenants at 18*l.* 4*s.* per annum including taxes. An inquiry from a gentleman present whether there was reasonable security for the rents of such a class of property being paid, elicited from the auctioneer an interesting reply as to the management and treatment of cottage property; he expressed his belief, from experience, that if the owners of such property would treat their tenants well by keeping the property in order, and not put too high a rent upon it, there was not a better paying class of houses than those occupied by weekly tenants. His firm received 5,000*l.* a year in rents for such property, and they had never lost more than 250*l.* a year. The three first lots were knocked down at 150*l.* per house, and the purchaser availed himself of the auctioneer's offer to purchase the whole of the remaining lots at that sum, the aggregate purchase-money being 2,400*l.* on this part of the property, and upwards of 7,000*l.* on the entire day's sale.

SANITARY CONFERENCE.

AT the conference of medical officers of health, and members of the Social Science Association, held under the presidency of Lord Aberdare, and which followed the recent Sewage Conference, the following resolutions were passed:—

"1. That the existing division of the country into urban and rural districts does not enable local authorities to fulfil their obligations in the most effective manner.

2. That the same sanitary laws be applied to the whole area of the country without distinction.

3. That in any reconstruction of local areas it is desirable to keep in view the advisability of securing one subdivision of the country for sanitary and other purposes, such subdivision to be as far as possible on the lines of the existing municipalities, unions, and counties.

4. That, in the opinion of this Conference, it is desirable that a Commission be appointed to consider and readjust, with the concurrence of the Local Government Board, the boundaries of the existing districts to be hereafter formed.

5. That the appointment of a County Board, consisting of elected members and partly of others, nominated by the Court of Quarter Sessions, is desirable.

6. That the duty of such County Boards, so far as they relate to sanitary matters, should be to exercise a control over the salaries and dismissals of the officers of the Local Boards not being municipal boroughs, to hear appeals from one portion of a district against the decision of their Board as to the incidence of expenditure for works of only partial advantage, and to undertake the conduct and supervision of such works as from their nature and expense cannot be undertaken by separate Local Boards.

7. That the powers and machinery at present possessed by local sanitary authorities are inadequate to the purposes for which they are intended; especially but not solely, in respect of means for preventing the spread of disease both from the want of early information of its existence and also of the means of checking its progress from want of power to prevent the erection of houses on unhealthy and improper sites and to secure in certain cases due provision of water, and from want of means to acquire with sufficient facility and economy land for public purposes.

8. That the incidence of taxation for sanitary and other purposes of local government should, as nearly as possible, be proportined to the direct benefit accruing to the several parts of the districts.

9. It is desirable that the officers of sanitary authorities should, so far as practicable, be restricted from other than the official duties for which they are specially engaged, and that in order to promote this object it is essential that the area of suspension should be made as large as can be efficiently worked.

10. That a health officer or assistant should, where it is practicable, be appointed to every local government district or combination of districts.

11. That the several officers should be in communication with each other and with the health officer especially attached to the County Board.

12. That the salaries be such as to insure the services of first-class members of the medical profession, devoting themselves entirely to health-service of the country.

13. That in future it is desirable to appoint, at least to the higher offices, men who have passed an examination in state medicine.

14. That the above regulations are equally desirable in the cases of surveyors and inspectors of nuisances so far as they are applicable.

15. That, in the opinion of this meeting, the powers of the Public Health and other Sanitary Acts which are of a permissive character should, as far as practicable, be made compulsory.

SUBSIDENCE AT THE NEW WORKS OF THE EAST LONDON RAILWAY.

AT the meeting last week of the guardians of St. George's-in-the-East, the surveyor reported with reference to the effect produced by the new works of the East London Railway on the workhouse buildings. He stated that although the under-pinning of the building had been duly carried out, there were indications that some slight subsidence was going on towards the railway tunnel. The subsidence had increased during the last six months, and, although in the present state it gave no cause for alarm, he hesitated to advise any claim being closed with the railway company. This was agreed to.

Street Improvements at Warrington.—The Warrington Town Council has decided, by a large majority, to carry out at once a scheme of improvement, the largest and most costly which has ever occupied the attention of the Council. It is proposed to widen Bridge-street—the principal thoroughfare, and most inconveniently narrow—from Bridge-foot to Friar's-green, and eventually to the top of Bridge-street. This improvement alone, it is estimated, will cost 45,000*l.* It is also proposed to open Wilson Patten-street to Bridge-street, which will materially relieve the pressure of traffic in the latter thoroughfare. It is in contemplation, too, by the Corporation to purchase the gasworks from the company, and a scheme is also on foot for enlarging the present market at a cost of 20,000*l.*

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

ANNIVERSARY DINNER.

MR. E. M. BARRY, R.A., presided at the anniversary dinner of this Institution, which was held at Willis's Rooms, St. James's, on the 12th inst. About 120 members and friends were present, including Mr. E. J. Reed, M.P., Mr. George Plucknett, F.S.A. (Governor of the Institution), Mr. Charles Barry (President of the Royal Institute of British Architects), Mr. C. F. Hayward, F.S.A., Mr. Cundy, Mr. Rogers, &c. The Institution was established in 1842, and has, during its existence, been the means of relieving thirty-one pensioners, many of whom have received small annuities for some years past. At the present time there are twenty pensioners on the books, who collectively received during the year ending December 31st last the sum of 239*l.* 4*s.*

The usual loyal and patriotic toasts were enthusiastically received, Mr. E. J. Reed, M.P., whose name, as the former Chief Constructor of the Navy, was coupled with the toast of "The Army, Navy, and Volunteers," making a humorous speech, in which he compared the difficulties of naval architects with the difficulties of those who build on *terra firma*. He remarked that it was no easy problem to build a vessel which should serve, not only as a fighting-ship, but as a residence, and sometimes (as in the case of the *Serapis* and some other vessels of late) as a menagerie. The mere building of a vessel like the *Inflexible* was only a portion of the problem which the naval architect of the present day had to solve. When built, she had to be driven at the rate of a quarter of a mile in a single minute, and must be capable, when running at that speed, of being slackened and turned completely round and driven off in the opposite direction in something like a couple of minutes. This was no light feat to accomplish, taking into account the enormous mass and weight (say 10,000 tons) of a large ironclad. As showing the extent to which mechanical means are supplanting seamanship for the manœuvring of such vessels, Mr. Reed stated that the *Inflexible* would be worked by something like forty separate steam engines.

The chairman, in proposing the toast of the evening, "Prosperity to the Provident Institution of Builders' Foremen and Clerks of Works," said:—In my professional life I have had a good deal to do with builders' foremen and clerks of works, and I may say at once that my intercourse with both classes has been of the most satisfactory description. When I was a good deal younger than I am now, I was very glad of their aid and assistance, and if I can be of the slightest aid and assistance to them at any time I can only say that it will give me the most sincere pleasure. This society, I think, deserves our warmest support, for it embodies that great principle which we in England so much prize,—the principle of "self-help." It is an institution of the classes indicated for improving their own status and position, for rendering assistance to the unfortunate, and for making provision for the widows and orphans of deceased members. I think the enumeration of these objects is enough to make us all wish it, most heartily, success. I am told by the secretary that since the institution was established, in 1842, the sum of 4,092*l.* 16*s.* has been paid in pensions to aged and infirm members and their widows and orphans. During the same period the sum of 595*l.* was paid for the purpose of temporarily assisting afflicted and distressed members, to console them in their troubles and anxieties, and to enable them by-and-by to recover their strength and energy, and to return to the assistance of their less fortunate brethren in the future. The number of pensioners at present on the list is twenty,—not a very large number, as it seems to me: I hope it may tell of the prosperity of the classes in question, but I am afraid it speaks of a small balance at the bank. There was received, during the year 1875, the sum of 235*l.*, and I shall be glad if the Secretary is next year able to announce that a larger sum has been received in 1876. The number of honorary members is now 52, and of ordinary members 79, numbers which, however large, do not quite so fully represent the classes as I should wish to see. I think we are all interested, as practical men, in the condition and the success of the English trades, at any rate so far as they relate to building; and I look upon the builders' foremen and clerks of works as the very aristocracy of those trades. We are very

glad indeed to see them in a flourishing condition, for we know that their ranks are never closed to deserving merit, wherever it comes from. It was my task a few years ago to carry out a large work in masonry for the English Government in one of our colonies. I very much wanted a good clerk of the works, and applied in my need, as I have often since applied, to your excellent Governor and my old friend, Mr. Plucknett. Mr. Plucknett was kind enough to recommend to me a young mason then in his employ, receiving weekly wages and working at the banker. That young man went out for me as clerk of the works. He carried out that building not only to my satisfaction, but so to the satisfaction of the Government that he has remained in that colony ever since in the Government employ, and it was only the other day that I had the great satisfaction of signing his paper, and writing to the secretary of the Institution of Civil Engineers to recommend him as a member of that honourable Institution. Now that is an instance of what a man may do if he chooses. The working classes of this country have greatly improved their position of late years. They have obtained higher wages; they have obtained more leisure. I am not disposed to say one word, except to rejoice that they should raise their status in any legitimate manner, but as an architect I am particularly anxious that, while the position of the workman is improved, the quality of his work shall not diminish. We are often told that the work of to-day is not what the work of yesterday used to be. We go over the length and breadth of the land and see marvellous masonry, carpentry, and ironwork in our cathedrals and churches, and plaster ceilings in Elizabethan houses,—kinds of work which it taxes us very much indeed to rival in the present day. I cannot but think that in order to rival it we require a very great extension of education, and particularly of that technical kind which is so invaluable to the craftsman. I am also one of those who think that the mere question of healthy houses for artisans is no insignificant element in the bringing about of a better position for the workman. It is not enough to give a man more money and more leisure unless we give him a place where he may devote them to culture and improvement. Both these points are pressing upon us nowadays, and they are matters upon which we may fairly ask the State to give us some assistance. But we must not ask too much. We must show a disposition to help ourselves before expecting others to help us. It is greatly to be desired that the great trade societies of the country should give their aid and assistance to these objects. If they turn their attention entirely to economical questions, such as the rate of wages, &c., we will ask of them that where there is a fair day's wage there shall be a fair day's work, and that they should exert themselves to see that the work of to-day loses nothing by comparison with the work of antiquity. We shall ask them to endeavour to make the workman proud of his work, for in no other way will work be got to be thoroughly done. We find the best work of its kind in England, and we know that in English workmen of the present day are to be traced those great characteristics of the English workman of old,—perseverance and skill. I cannot but think that the establishment of societies such as this may help to perpetuate those characteristics, by showing that there is no limit in this country to the success which may be obtained by any man who thoroughly and heartily does the work which is placed before him. It only remains for me, after thanking you for the indulgence with which you have listened to these remarks, to propose to you, "Prosperity to the Provident Institution of Builders' Foremen and Clerks of Works."

The toast was enthusiastically received, and the secretary (Mr. Bedford) announced a list of subscriptions and donations amounting to 152*l.* 4*s.* 6*d.*

The remaining toasts were, "The Chairman" (proposed by Mr. E. J. Reed, M.P.); "The Governor, Trustees, Patrons, Donors, and Subscribers," coupled with the name of Mr. Plucknett, the governor; "The Architects," proposed by Mr. Rogers, and coupled with the name of Mr. Charles Barry, president of the Royal Institute of British Architects; "The Builders," proposed by Mr. Cundy, and associated with the name of Mr. White (Scrivener & White), who, in responding, said he was sorry the Institution was not more warmly supported by the building trade, but the mode in which its affairs were conducted only needed to be better known to greatly increase its supporters; "The Stewards," coupled with the name of Mr. Fraser; and "The Ladies," proposed by Mr. C. F. Hayward, and responded to by Mr. Samuel Hill. Mr. Turner acted as toastmaster, and during the evening a selection of vocal music was given under the direction of Mr. K. C. Richardson, assisted by Madame Thaddeus Wells, Madame Alice Barnett, and Mr. C. A. White, Mr. William Miller presiding at the pianoforte. Altogether the gathering was a very successful one.

GLASS IN THE CHAPEL OF KEBLE COLLEGE, OXFORD.

ATTENTION having been directed to the Memorial Chapel erected to the memory of the late Rev. John Keble, author of the "Christian Year," an account of the stained glass and mosaic decorations which it contains may not be inappropriate. The munificent donor, the late Mr. William Gibbs, of Tyntesfield, near Bristol, spared no expense in having these, as also the entire building, carried out in the completest manner possible, the whole forming a memorial worthy of the great Christian poet. The artist is Mr. Alexander Gibbs, of 38, Bedford-square, and 21, Bloomsbury-street. This is, we believe, the first work of any magnitude that has been carried out in England in mosaic, it being usual to send the work for execution to Venice; but the artist, in receiving the commission, resolved to have the work done in England, so that the necessary personal supervision might be given. For this purpose Mr. A. Gibbs sent to Venice, and kept at a considerable expense the service of the chemist to the late Signor Radi, of Murano. Under his directions the necessary furnaces and appliances for the manufacture have been erected. Venetian artists were also engaged to carry out the principal portions of the mosaic work, the numerous designs and cartoons being executed under the artist's own hand. The decorations of the chapel consist, so far as the mosaic is concerned, of twenty-nine large panels, three of these at the west end forming one subject—that of the Last Judgment. In the upper part of the centre panel our Lord is shown enthroned, with the apostles, attended by angels bearing the emblems of His Passion, the Cross, the Crown of Thorns, the Spear, the Sponge, and the nails. In the lower part of the centre panel, St. Michael, with the scales and sword, divides the saved from the condemned. The panel on the right hand of our Lord shows the saved accompanied by angels, who point the way through the gates of Heaven, while on the left are the condemned, chained to each other in groups, passing into torment, while above in each panel is an angel sounding the trumpet of the Resurrection. At the base of the centre panel are the words "Hereafter ye shall see the Son of Man sitting on the right-hand of Power, and coming in the clouds of Heaven." Facing this under the large east window is a large quatrefoil panel from the Apocalypse, flanked by two panels with standing groups of saints. The treatment shows Our Lord as He appeared to St. John in the Island of Patmos, surrounded by the seven golden candlesticks, typical of the seven churches of Asia, while round His extended right-hand are the seven stars, symbolical of the chief ministers. On the south side of the chapel, as you enter from the west door, are mosaics arranged in groups of panels. The first one is a standing group of saints with their appropriate emblems; following which is a set of three, with incidents from the history of Noah. The centre panel, representing Noah's Sacrifice, shows the patriarch surrounded by his sons and their wives, worshipping God in front of the altar he had erected, while in the background is the Ark, symbolical of the Church, the rainbow inclosing the whole. On either side are subjects showing, in the one, Noah and his sons planning and building the Ark; in the other, the entry of the animals, as also Noah and his family, into the Ark, which in each case is designed to represent "The Church." The three panels next these illustrate the history of Joseph. In one is shown Joseph dreaming in the field of his future supremacy over his brothers; the dreams are shown as visions at the top of the subject. The centre panel shows Joseph being sold by his brethren for twenty pieces of silver; and the remaining one is Joseph as ruler recognising his brethren and forgiving them. Following this, as a single panel, is the Resurrection of our Lord. Angels with censers adore Him as he steps triumphant from the tomb, while the dismayed soldiers shrink on either side. Next in order to this panel are two, containing standing figures of saints, which in each case turn towards the chancel. Facing these on the north side are two other panels with standing saints, turned as the last to the chancel. Facing the Resurrection is the Crucifixion of our Lord. The Magdalen is shown kneeling in grief at the foot of the Cross, whilst the Divine Mother and St. John stand on either side. Slightly in the background are two soldiers with spears, and one with the sponge; two angels in attitude of devotion, one bearing the chalice, are introduced in the upper part of the subject. Then comes a group of three panels, from the life of Moses, Moses and the Brazen Serpent as a type of Christ, being in the centre; in the base is shown the people bitten by the fiery serpents, while Moses directs their attention to the Brazen Serpent. In the side panels are shown, Moses as the Lawgiver, with the tablets in his hand, coming down from the Mount, while the people kneel in awe at his feet; and in the other Moses is pictured striking the rock that the people may have water at Meribah. Three panels succeed these, which tell the story of Abraham, as, in the centre, the sacrifice of his only son Isaac on Mount Moriah. Abraham and Isaac occupy the centre, while at the base of the mountain are shown Abraham's servants with the ass; the ram in the right-hand corner is seen caught by the horns in a bramble, while an angel, staying Abraham's hand, calls his attention to it. The side panels are occupied respectively with the meeting between Melchisedec and Abram, who, accompanied by his soldiers, is offering titles to Melchisedec after the release of Lot. In the right-hand panel the patriarch is entertaining the angels. The list of subjects on the north side closes with one remaining panel, showing Old Testament saints.

By the arrangement of these it will be seen that the Old Testament subjects as types of Christ occupy the western portion of the church, while the chancel half is devoted to the New Testament subjects as anti-types of our Lord. In the north transept there remain three panels, forming one bay, filled in the centre with the nativity of our Lord. Joseph and Mary are shown standing in devotional attitudes over the infant Jesus, while worshipping shepherds surround the crib in the foreground; an ox and ass are introduced to point the stable in which the divine Infant lies.

The large five-light stained-glass east window is filled as an Ascension. The treatment of design here, as indeed in the whole work, is rather severe. Our Lord, in a vesica, occupies the upper half of the centre opening, standing and kneeling figures of the Apostles and Blessed Virgin filling the remaining four openings, while in the tracery are angels holding scrolls bearing the inscriptions, "This same Jesus which is taken up from you into Heaven, shall so come in like manner as ye have seen him go into Heaven." The glass used is in every instance of the very best quality, and great attention has been paid throughout the whole work, both in mosaic and glass, to secure a harmonious balance of colour. The west window, on account of the flood of light to which all west windows are subject, has been treated in a slightly richer key of colour. It is filled with eight figures, the window (a five-light) having in three centre openings, two figures, and in each side opening one figure, all being seated; these are, the four greater prophets,—Isaiah, Jeremiah, Ezekiel, and Daniel; the kings David and Solomon; and Samuel and Elijah, these figures referring, as do the mosaics, to the earlier dispensations. The four three-light nave windows are filled with the twelve minor prophets, two windows being on the north side and two on the south. The figures stand in niches, while above and below is grisaille glass, similar in character to that in York Minster. In the chancel we have four two-light windows, the two on the north side contain the figures of the four great Latin fathers of the Church,—St. Jerome, St. Ambrose, St. Gregory, and St. Augustine. On the south side the corresponding windows contain the figures of the four great Greek fathers,—St. Chrysostom, St. Basil, St. Athanasius, and St. Gregory Nazianzen. The glass of the chancel is of the same tone as that in the east window, and goes well with the spirit of the mosaic. In the transept are two three-light windows, which are occupied in the centre of each respectively, figures of SS. Peter and Paul, with the evangelists Matthew and Mark in the one, and in the other Luke and John.

The whole of the work has been carried out at the artist's new studios in Bloomsbury-street.

Mr. Gibbs, under the same architect (Mr. Butterfield), lately placed a large wall decoration in encaustic tiles on the north wall of All Saints' Church, Margaret-street, to the memory of the late Rev. Upton Richards, first vicar of the church.

THE PROPOSED TOWN-HALL, HASTINGS.

At a meeting of the Hastings Town Council, on the 5th inst., the following report of the Special Committee on the new Town-hall was read and adopted:—

The letter from Messrs. Cross, Wells, Jeffery, & Skiller, re the new Town-hall, which was referred to this Committee from the last Council meeting, and which stated that Messrs. Howell & Son were at the present time willing to undertake the building of the Town-hall, &c., for the sums following, viz.:—Foundations, 4,480*l.*, superstructure, 18,823*l.*, was read, and Messrs. Jeffery, Skiller, and Wells, three of the architects, then attend to explain the reason of the tender being reduced by 2,792*l.*, when the following alterations and reductions which have been made by them were read over, viz.:—

1. Substituting clamp bricks for kiln bricks.
2. Reducing the height of large hall and Police Court to that originally shown in competition plans.
3. Reducing amount of Bath stone.
4. Substitution of bricks in cement for iron columns under large hall
5. Reducing number of iron doors to safe.
6. Substituting Bangor slates for Whitney (*sic*) ["Whitland"] Abber slates.
7. Substituting slates for lead on turrets, and reducing size of turrets.
8. Omitting moulded nosings to steps of grand staircase.
9. Substituting Keene's cement for stone in window dressings of large hall.

And the committee having fully considered the matter and viewed the detailed plans, estimates, &c., recommend the Council as follows:—

1st. To accept and agree to the alterations and reductions numbered 1—8 inclusive, but to let those numbered respectively 7, 8, and 9, remain as originally put.

2nd. To accept the tender of Messrs. Howell & Son to do the works for the price mentioned in the letter of Messrs. Cross, Wells, Jeffery, & Skiller, the Council paying them (Messrs. Howell & Son) the extra cost caused by the alterations, &c., numbered respectively 7, 8, and 9, not being allowed. The acceptance of the tender being subject to the consent of the Lords Commissioners of her Majesty's Treasury to the borrowing of the money for erecting the buildings, &c., being obtained.

3rd. That the town clerk be forthwith instructed to take the necessary steps to obtain such consent

4th. That the resolution passed at the Council meeting, held on the 1st of January, 1875, limiting the amount to be expended on the new Town-hall to 20,000*l.*, be rescinded; and that the Council authorise the expenditure of a sum in accordance with the acceptance of the above tender.

5th. That the premiums awarded in the competition be now paid, the first of 100*l.* to Messrs. Cross, Jeffery, Skiller, & Wells, and the second of 50*l.* to Mr. E. Heffer, of Liverpool; the third, of 25*l.*, having been ordered to be paid to Messrs. Lee & Smith at the last Council meeting.

We shall give illustrations of the design in an early number.

THE IRRIGATION OF INDIA.

On the 5th inst., at a meeting of the Indian section of the Society of Arts, a paper entitled "Irrigation Works in India, with especial reference to their Remunerativeness," was read by Mr. W. T. Thornton, C.B. The lecturer said that in India the State had, within the last forty years, done a very great deal for irrigation, and that by the works constructed water could be distributed over very large tracts of country. According to the latest official accounts the total of the capital which had been hitherto laid out on irrigation works in various provinces by the British rulers of India was no less than 13,260,295*l.*, of which 6,612,742*l.* were obtained from ordinary income, and 6,647,553*l.* consisted of borrowed money. With regard to the revenue from these irrigation works the statistics varied considerably, many provinces returning a large per-centage on the capital outlay, while other works were carried on at a loss, as the canals did not pay their working expenses. For the whole of India, however, the net revenue of irrigation works was stated as 1,021,430*l.*, or 7·7 per cent. out of total expenditure. The figures of this total expenditure were somewhat open to revision, as they did not take into account the sums expended in many cases by native rulers on ancient canals, and the interest which had accrued on the amounts expended during the time occupied in constructing the works. He considered, therefore, that in considering the question, it was fair to add to the official total of outlay a million and a half for loss of interest during construction, two millions as the extra cost in connexion with the older works, and 400,000*l.* for compensation to landowners and capitalisation of land revenue sacrificed, and these sums would bring up the total expenditure to (roughly speaking) 17,210,000*l.* From this, however, a very important deduction was to be made on account of incomplete and partially-abandoned works, and this (amounting with interest to 3,640,000*l.*) brought the total amount down to 13,570,000*l.* Upon this sum the total revenue of 1,020,000*l.* gave a return of 7·5 per cent., and this favourable result had, he thought, been fairly arrived at. Independent of this profit on the investment of capital, the benefits derived from irrigation on the recurrence of drought or famine in some provinces was incalculable.

THE RECONSTRUCTION OF THE PARIS WINE DOCKS.

Connoisseurs are engaged in a bitter controversy concerning the preservation of wine. A portion of the great wine docks at Bercy are to be rebuilt, enlarged, or improved, and the committee appointed by the Paris Municipal Council to attend to this matter have held frequent sittings of late. According to the project generally approved by the members of the administration, each new building is to consist of two store-rooms, one on the level of the earth, and the other above. A rail running along an arcade built for this purpose will give easy access to the stores kept on the first floor. The wine growers and dealers are, however, almost unanimously opposed to this system of two stories. Should the difficulties of access be overcome, they maintain that the wines, especially the Burgundy, cannot be well preserved when placed so far above the earth. They eschew all elaborate schemes, and simply demand two rough walls separated from each other by a space of 13 mètres, and covered over by an ordinary roof. Such a construction is not calculated to suit the Parisians, ever ready to seize any opportunity to augment the beauty of their town; but those who are most interested in the preservation of wine maintain persistently that wine must not be carried too high above its native earth. What is the evidence as to any evil result from so storing wine?

PERMANENT CIRCUS IN LIVERPOOL.

A permanent circus is to be erected in Liverpool at the top of Brunswick-road, opposite the Necropolis in the West Derby-road, for Mr. Charles Hengler. This is a very central position, nearly the centre of Liverpool, taking the map as our guide. Over 400 'buses pass the site every day. It will be the largest circus in England, holding about 4,000 persons. It will be 100 ft. wide, 140 ft. long, with a gallery over the front end and two sides, carried out with ornamental fronts and carton pierre ornaments. The ceiling will be an arched one, with a new style of sunlight. The gallery entrance and pit exit will be in Walker-street. The pit entrance and the box and parterre entrance will be in West Derby-road. There will also be five shops in this road one story high. The stables will be built of brick and stone, with all the newest ornamental iron stable fittings, ventilated and detached from the circus. A dozen stables and coachhouse-yard will also be provided in Walker-street for the convenience of gentlemen driving to the circus, so that horses and men will be provided with shelter immediately on arrival at the building. The above works have been designed by Mr. J. Robinson, architect, who has carried out many permanent circuses in England for the same proprietor. The contract has been let to Mr. Samuel Campbell, of Liverpool. The works will cost over 12,000*l.*

Floods in the River Ouse.—A few days ago the Mayor (Mr. J. T. Hobson) and several of the Corporation of Bedford who had been appointed inspectors, met and went down the river as far as Barford Sluices and up to Biddenham and Bromham Mill, visiting on their way the mills, sluices, and locks, accompanied by Mr. Grantham, C.E., Inspector under the Drainage Acts under the Inclosure Commissioners, who has been called in by the Corporation to inquire into and examine the state of the river as to the works necessary to prevent floods, and to advise them in a preliminary report as to the legislative or other means which should be most expedient to be adopted. It is hoped, as a result of this inspection, that the town of Bedford can be relieved and due regard paid to the several interests, such as those of navigation, millowners, and the proprietors and occupiers of the lands on the banks of the river both above and below the town.

THE STATE OF THE BUILDING TRADE IN BRISTOL.

The building trade is at present in a somewhat unsettled state in Bristol. Business is not very brisk, and most of the operatives in the various departments are agitating for increased wages. Some months ago the stonemasons gave notice of a rise of ½d. per hour, making 8d., to begin about the middle of June next. The Master Builders' Association have taken the matter into their consideration, and decided that the demand was not justified by the state of trade, and at the same time suggested some very reasonable modifications of the masons' rules, as to walking-time, apprentices, and piece-work. The men, however, indignantly rejected the alterations, which the representatives announced were out of all character with the progress of their society. There the matter rested till Thursday night, when a general meeting of the building trade was held, and, after considerable discussion, it was decided to let things take their course.

The builders' labourers have also applied for an increase in the rate of pay, and demand ½d. an hour addition, making 5½d., to begin early in August. About twelve months ago they made a similar demand, and the arbitrator who settled the dispute gave them ½d. per hour increase during the winter months. This request the Employers' Association have refused to accede to.

The stone sawyers have just applied for a rise of 1s. per 100 ft. The application led to a good deal of inquiry amongst the builders, and it is stated that the prices at present paid vary greatly, some of them being extravagantly high. The Association is now engaged in drawing up a scale for the guidance of the trade generally.

The painters who struck on Monday week at two shops for an advance of 1d. per hour, raising the wages from 6½d. to 7½d., and the remainder throughout the city (numbering 400 or 500) who were locked out on the 8th inst. are still out of work. The busy season for painting work has just commenced, and the lock-out is rather awkward for the contractors and decorators; but the masters say they will not give in.

NEW PUBLIC PARKS IN THE PROVINCES.

Rotherham.—Rotherham is now possessed of a public park and recreation grounds known as "Boston Castle Park." It consists of twenty acres of land at the top of a hill, which, being 300 ft. above the town, and 400 ft. above the sea level, is perhaps the highest point in the borough. On the west side of the hill there is an umbrageous wood. From the centre of the park a large quantity of red sandstone has been quarried, and the precipitous and rugged escarpment that has been left, and the sheltered plot of green sward below, and which is intended for the use of the votaries of croquet, are not altogether void of the features of romantic scenery. To Mr. Alderman Guest is due the credit of first drawing attention to this spot as an appropriate place, for many reasons, to be formed into a people's park. However, it was some time before he induced others to acquiesce in his view; but in May, 1873, a memorial, signed by a large number of the inhabitants, was presented to the Town Council, asking that steps should be taken to lease Boston Castle grounds. The wish so expressed was acceded to, and the land was soon after obtained on lease for forty years, from the Earl of Effingham, at a yearly rental of 50*l.* The park has not yet been formally opened, but it has already become a popular place of resort.

Salford.—With a desire to provide more extensive means of recreation for the people, the corporation of Salford some three or four years ago decided to form three new parks in different parts of the borough,—one at Higher Broughton, another at Pendleton, and a third in Ordsal Ward. The two first-mentioned, which are rapidly approaching completion, will be thrown open at Whitsuntide next, and the third will be finished for the summer of next year. The new park at Broughton stands on the site known as the "Gravel Pits," and is bounded by Great Clowes-street, Great Cheetham-street, Grecian-street, and a new thoroughfare to be called Vavasour-street. It is the largest of the three parks which are being constructed, and covers an area of sixteen acres. Originally the land presented a very flat surface, but by excavations which have been carried on it has been rendered undulating in appearance. The work of laying

out the park was commenced in September, 1874. The land is inclosed on all sides by iron railings. The principal entrance will be in Great Clowes-street. In the lower portion of the ground an ornamental lake has been formed, which will be spanned in the centre by an iron girder bridge. The arrangement of the flower-beds and the terraces had been executed under the direction of Mr. Henry Moore, the head-gardener at Peel Park. The park at Pendleton is situate at the end of Seedley-road, Pendleton, and extends to a locality well known as the "Land of Nod." The park covers from twelve to thirteen acres of land, purchased at a cost of 5,000*l.* in March, 1873. A number of cottages, standing in the "Land of Nod," which detracted from the appearance of the park, were also bought by the Corporation, and having since been demolished, the land upon which they stood has been added to that acquired. The park has a good situation, having a slope to the south, and being well sheltered by trees. In the lower portion the land is naturally undulating. A lake similar to that in the Broughton Park has been constructed. The land has been laid out by Mr. Moore. There will be several entrances to the park. Ordsal Hall Park is not so favourably situated as those in Broughton and Pendleton; but, being in one of the most thickly-populated districts in the borough, will probably be the most largely frequented. It consists of fifteen acres of land, which was purchased from Lord Egerton of Tatton. Up to the present comparatively little has been done towards its completion, but now that the parks in Broughton and Pendleton are nearly finished, the Corporation will be able to devote more attention to it than has hitherto been possible, in order that it may be opened next year.

NEW PUBLIC BATHS.

Attercliffe.—At the last meeting of the Sheffield Town Council, Mr. Eaton referred to a motion passed by the Health Committee, that inasmuch as the amount of the tenders for the erection of public baths at Attercliffe greatly exceeded the sum authorised to be borrowed by the Council, with the consent of the Local Government Board, the Borough Surveyor be instructed to prepare new plans, including one swimming-bath instead of two, in order to reduce the cost below the amount of the original estimate. Mr. Nadin said it had been estimated that the baths would cost 8,500*l.*, but the amount was really 11,000*l.*, and with furniture, &c., the cost would be increased to 12,000*l.* The committee had thought it would be best to build one large bath and slipper baths above, which might be erected under 8,500*l.*, including furniture and fixtures.

Maidstone.—Meetings have been held in Maidstone in furtherance of a scheme for the erection of new swimming-baths. Plans have been prepared by Mr. E. W. Stephens, architect, showing that the proposed bath is to be 110 yards in length, and 33 yards wide. It will be erected near the Artichoke Inn, in the Ashford-road. A supply of pure water, after filtration by a bed of charcoal, can be obtained from the river Len.

Guildford.—The Urban Sanitary Authority of Guildford, having decided not to adopt the Baths and Washhouses Act, application was made to the Earl of Onslow for a site on land belonging to his lordship, near the river. His lordship gave his approval to a portion of the field at the rear of the gas-works, and abutting on the river being used for the purpose, subject to the consent of the lessee, who expressed his willingness to let half an acre for the projected bath. Mr. Henry Moon, of Guildford and Godalming, surveyor, one of the committee, prepared a preliminary plan for a bath on this site, and the committee were satisfied that a bath of large size, and in all respects suitable, could be constructed at a cost of between 600*l.* and 900*l.* A company has been formed for the erection of the baths.

VARNISHED PAPER ON WALLS.

SIR,—Will one of your numerous readers inform me the best way to strip varnished paper from walls? I have tried hot lime, soda, pearl-ash, and Portland cement, but with all it is a tedious job. A COUNTRY PAINTER.

Somerset Archæological Society.—This society will visit Bath on July 25th. Mr. Parker, Dr. Freeman, and others are expected to be present. The local secretary, the Rev. W. Hunt, is appointed to make arrangements for the excursionists.

ARCHITECTURE AT THE ROYAL ACADEMY.

SIR,—At four o'clock one afternoon, when all the rest of the Academy was crammed by a fashionable and eager crowd, there was not *one* single person, save myself, anywhere near the display of architectural drawings in Gallery IX. A little throng were bent over the miniatures upon the opposite side, but otherwise the gallery was entirely empty. This afforded so curious a contrast to the animated scene in every other corner of the building that I am tempted to record it. The why and the wherefore of this neglect would appear to be a problem which might be advantageously solved. A large percentage of those who visit the Academy may be reasonably supposed to love or admire art; then, loving that, why do they eschew architecture in so marked a manner? H. H.

FEES TO FOREMEN.

ALTHOUGH a great reform has taken place of late years in the building trades, and the relations existing between employers and employed have been established on a firmer basis, there are still occasions when the privileges of each are tampered with and abused. By means of many trade societies and combinations established throughout the country, these abuses are brought to light, thoroughly investigated, and finally abolished. So perfectly is this done, that the chances of any evil arising to the detriment of employers or employed would seem impossible. Evils do arise, however, which escape exposure for a time, and too much light cannot be thrown on them for their abolition when discovered.

For some years past a system has been gradually springing up in many large firms where the carrying out of labour is chiefly entrusted to a number of overlookers or foremen, by which black mail is levied on certain of those who are under them, in return for which they promise them constant employment, and the overlooking of any faults in their work caused by either carelessness or inability.

Although emigration has greatly diminished the amount of skilled labour which was, as it were, lying idle in this country, there is still a great surplus left, and although vast building operations, and so forth, to the improvement of the country, are continually being carried on, the demand is still unequal to the supply. In small firms, where the employer is constantly looking after his men, and knows each individual one by sight, such an evil as buying employment is impossible, as he himself regulates his men according to their ability and worth to the work he has in hand. In large firms, where several hundreds of men are employed, this is impossible, and every opportunity is thus thrown in the way of those who are appointed to act as overlookers for their employers, to study their own interests and desires. The rule is for a man wishing to procure a job in many of these latter firms to get an introduction to the foreman of his particular trade, and offer him a certain fee for his interest in procuring him employment, the sum varying in accordance with the benefit to be received. The offer is generally accepted, and if he happens to be a good workman, so much the better; he rapidly gains favour with the foreman, whom he takes care to propitiate by various little favours that he might require,—such as doing little jobs privately for him, in return for which he is kept on as a constant hand. In the majority of cases the hands thus employed know little or nothing about the work, and in consequence pay all the greater for their emolument.

A certain amount of labour is necessary, however, to satisfy the employer, and to make up for his outlay of capital; and for this reason numbers of hands are taken on at busy times (principally in the summer), who are worked to the full extent of their powers to make up for the unskilled and inefficient members, who lead a charmed life,—and of whom it is not cared to complain about,—afterwards to be discharged, perhaps at the commencement of a long winter, at a moment's notice, unless they have been initiated into the mystery. Many refuse the offer, if thrown open to them, trusting to their skill and good name in their trade to gain them fresh employment sooner than buy over those who merely hold a corporal position over them.

The evil of this system cannot be made too apparent, giving rise, as it does, to bad workmanship, favouritism, jealousy, and bad feeling amongst a class where nothing but goodwill and unanimity should exist. Sometimes, however, an exposure is made.

Some few months ago a large employer in the south-western part of the metropolis was informed by one of his *employés* that he was discharged for not making the foreman a small acknowledgment, as several of his fellow-workmen had done. Knowing the man to be a good workman, he caused inquiries to be made, which resulted in a gross system of bribery and imposition being detected on the part of several hitherto supposed trustworthy men. He immediately discharged them and got fresh hands in their place, who I trust profited by the lesson thus taught them.

This is only one instance meeting with a sharp remedy. Others are still going on. A great fault lies somewhere. Perhaps if the employers would look more into the doings of their men the evil might be alleviated; instead of being satisfied with a good return for capital invested—no matter by what means it has been got together. A. B.

NEW BANKING PREMISES.

Birmingham.—The new premises of the Birmingham Joint Stock Banking Company in New-street are completed. The building is constructed throughout of Portland stone, is Early Italian Renaissance in design, three stories, or about 80 ft. high, with a frontage of 32 ft. The lower story, forming the front of the bank, is divided into three bays by polished red Aberdeen columns, 19 ft. long, supporting the central pediment over the entrance and cornice. These columns weigh between five and six tons each, and stand upon a Cornish gray base. Two figures, representing Manufacture and Agriculture, as symbolised by Birmingham and Warwickshire, stand out prominently on the pediment. The floors have been made by Messrs. Dennett & Co., on their fireproof principle. The whole of the ironwork is from the works of the Horseley Iron Company, Tipton. The total cost will be about 8,000*l.* The architect is Mr. F. B. Osborn; the builders are Messrs. Barker & Son, of Handsworth; and the carving has been done by Mr. John Roddis, of Aston-road.

Dorchester.—Messrs. Eliot & Co.'s new banking premises are to be erected by Mr. Gregory. The site of the building is in High West-street.

Fordingbridge.—The Wilts and Dorset Banking Company have erected at Fordingbridge a new building for the purposes of their business. The architects are Messrs. Kemp-Welch & Reynolds, of Salisbury and Bournemouth; and the contractors Messrs. Carly & Tuck, of Ringwood.

SOME NEW SKATING RINKS.

Margate.—The prospectus has been issued of the Margate Skating-rink, Concert-hall, Swimming Baths, and Aquarium Company (Limited), with a capital of 50,000*l.*, in 10,000 shares of 5*l.* each. The company had acquired, for a term of 99 years, from the Marquis of Conyngham, the foreshore extending from near the Pier Hotel to the Fort Point, and thence to the Second Point, a frontage exceeding 370 ft. to the sea, at a rent of 50*l.* a year. Upon this it is proposed to erect the buildings indicated. Mr. Bedborough is the architect to the company.

Ipswich.—A new skating-rink and drill-hall has been opened at Ipswich. It is described in a local journal as "a noticeable building, more because of its unusual shape than its architectural pretensions." With a view to economy, walls have been avoided, with the exception of one end, the arched roof springs immediately from the ground on either side, forming both walls and roof. The space thus covered in is about 160 ft. long by 60 ft. wide, and the area of smooth surface which will be available for rinking will be 150 ft. by 50 ft., the remaining space at the sides being enclosed by the pillars which support the principals of the roof, the intervals between the pillars forming recesses, where seats will be provided. The arched roof reaches a little over 25 ft. in height at the ridge. The entire work of erecting the hall, except the asphalte surface of the rink floor, has been done by Messrs. E. & E. C. Gibbons, builders, under the superintendence of Mr. Thomas Miller, C.E. The original contract was 800*l.*, but there have been "extras."

The Hastings Borough Surveyor.—The salary of Mr. Meadows, borough surveyor, has been increased, by a unanimous vote of the town council, 100*l.* per annum.

CHURCH-BUILDING NEWS.

Whitstable. The parish church, which, for the past eleven months has been undergoing restoration, was reopened on Easter Sunday. The works carried out comprise the rebuilding of the chancel, at the expense of the lay impropriator, Mrs. T. S. Clarke; the reconstruction of the south wall of the nave and the roof, the rebuilding of the wall of the north aisle from the porch eastwards, and the erection of a spacious vestry at the north-east end of the church, in lieu of the small lean-to structure which formerly disfigured the angle formed by the tower and the south wall. The walls (formerly of rubble) are built of Kentish rag stone, with Bath stone dressings.

Upchurch.—On the 20th ult. the parish church of Upchurch, in the Sittingbourne Deanery, was re-opened, after thorough restoration under the direction of Mr. Blomfield. Every ancient feature has, we are told, been carefully preserved. The "three-decker" pulpit and square pews, which blocked up the chancel, and other obstructions in the tower and side chapels, have been removed, and for the first time for many years the proportions of this church (which dates from 1.300) have been fully displayed. The late vicar had previously restored the south aisle, and the font and organ were erected in his time. The present vicar, the Rev. Beauchamp St. John Tyrwhitt, has raised the funds for the present work, and All Souls' College have restored the chancel. The distinctive feature is the elevated altar dais, now paved in mosaic, and its ancient bread steps with three sedilia. The chancel, two steps below this, but above the nave, has been paved with tiles, relieved by medallions of more ornamental tiles. The chief ornament is a long cross, surrounded by blue and white tiles, which marks the family vault of the Packmans. This decoration of her father's tomb was done at the expense of Mrs. Dodd, of Rainham. Another cross in blue marks the vault of the late vicar's, Mr. Woodruff's, children. The stalls are of oak, with carved poppy-heads; and they and the prayer-desks have pierced tracery of Japanese wood. The reseating has been done in pitch pine, and the pavement made good throughout. Messrs. Dove, Brothers, of Islington, were the contractors.

St. Mary's, Newington (Surrey).—The new parish church was consecrated on May 1st, by the Bishop of London. Mr. James Fowler, Louth, Lincolnshire, is the architect, and Messrs. W. Downs & Co., Southwark, are the contractors. We have already illustrated it.

Nuneaton.—The foundation-stone of the new nave of Nuneaton Abbey was laid on the 26th ult. by Lord Leigh, with Masonic honours. The foundations and some ruins of the piers of the central tower are all that is now remaining of this fine old abbey. It is proposed by the building committee to commence the restoration by rebuilding in the first place a portion of the nave on the old foundation. Mr. Rolfe, architect, Reading, has been called in to design and superintend the works. The building committee propose to carry out the work bit by bit as funds are forthcoming, in the best and most substantial manner, but unless a very considerable sum is raised there is said to be little hope of completing the work in this generation.

Berriew.—The parish church of Berriew was reopened on the 26th ult., after restoration. The old church, now completely recast, was erected in 1803. As altered, the church now consists of a nave, with north and south aisles. The old walls have been retained as far as possible, but altered where necessary to suit the new high-pitched open-timbered roof of the nave, and the lean-to aisle roofs, and strengthened with buttresses. A chancel has been built, with vestry and organ-chamber on the north side, the latter has arches opening into the chancel and north nave aisle. The tower has been raised and provided with new windows, and has now a wooden spire or capping covered with Staffordshire tiles. Welshpool stone has been used for the new walling, and Shelvoke and Bath for the dressings. New sporting and downpipes and drainage are provided throughout. The windows have been glazed with thick cathedral tinted glass, in quarries and patterns, by Mr. W. Done, who also executed the new glass required for the east window. The architect was Mr. Haycock, of Shrewsbury, and the work has been carried out by Messrs. Fisher & Dyson, of Huddersfield. The total cost is about 3,500*l.* Mr. G. Landucci executed the carving. The accommodation provided in the church is for rather over 400 persons.

Horton.—The restoration of the old Norman church of this parish has been commenced, and has been entrusted to Messrs. Fassnidge & Son, contractors, Uxbridge. Upon the removal of the unsightly pews, it was discovered that the massive chalk pillars had been to a great extent undermined by intra-mural interments, now no longer permitted. The nave roof was also found to be in a dilapidated condition.

Brighton.—The designs of Mr. Blomfield have been under consideration, with regard to the alteration of the Chapel Royal, Brighton, and it is proposed they shall be carried out. The estimated cost is about 2,000*l.*; and the improvements will include re-seating, and the removal of the gallery over the communion-table.

Winstone.—Winstone parish church, Gloucester, has been re-opened, after restoration under the direction of Messrs. Waller & Sons, architects, Gloucester. The chancel being in a very dilapidated condition, was almost entirely rebuilt, the whole of the old work possessing any interest being reinstated in its old positions. A new west doorway has been put to the tower, and the door has been put in good order. One peculiarity of the church is that there is no east window in it, and never has been one. The work of restoration has cost between 800*l.* and 900*l.* The contractors were Mr. Cambridge and Mr. Chamberlain, who divided the masonry and carpentering work between them.

DISSENTING CHURCH-BUILDING NEWS.

Northampton. — The Wesleyan chapel in Grafton-street, Northampton, has for some time past been found insufficient for the requirements of the connexion, and it has been decided to pull down the present edifice, as also several cottages between it and Grafton-square, and to build a new chapel on the site thus secured. It will face Regent-square, and will be in a plain Italian style. The front will be of pressed brick, with Bath stone dressings. There will be a basement story, which will provide accommodation for an infants' school-room, and five vestries, together with heating apparatus for warming the building with hot air. On the ground floor accommodation will be for 419 adults. On the gallery floor there will be accommodation for 306 adults and 87 children, making a total of 812. Mr. S. J. Newman is the architect, and Mr. James Watkin the builder, the amount of the contract being 2,308*l.*

Wood Green.—The foundation-stone has been laid of a new Baptist Chapel in the Finsbury-road, Wood Green, by Mr. John Edwards. The architect is Mr. Banister Fletcher.

Ipswich.—The new Baptist Chapel, in the London-road, Ipswich, has been opened. It stands about 20 ft. back from the road, and will accommodate about 1,000 persons. The area is benched with benches of pitch-pine, varnished. Warmth is provided for by hot-water pipes. There is no baptistery provided in the chapel; there being one in the old chapel, which is available for use still. The entire outlay is about 5,300*l.* The architect was Mr. Brightwen Binyon, Messrs. E. & E. C. Gibbons were the builders; Messrs. Stearn & Son did the gasfitting, varnishing, &c.; and the hot-water apparatus was supplied by Messrs. Thomas & Coleman, Cornhill, Ipswich.

SCHOOL BOARD SCHOOLS.

Combs (Suffolk).—New school buildings, comprising mixed and infant schools, with master's residence, have just been opened. The walls are faced with white bricks, with red bands and arches. The roofs are slated, and inside are open to the collar, with plastered ceilings and wrought principals and purlins. The contract, amounting to about 1,700*l.*, has been carried out by Messrs. Andrews & Crowe, of Stowmarket, under the superintendence of Mr. Henry Lovegrove, architect.

Brighton.—The new schools erected by the Brighton School Board, in Pelham-street, are now ready for opening. The extreme length of the ground occupied is 186 ft., and the greatest width 93 ft., which includes the play-grounds. Facing Pelham-street the frontage of the building is 120 ft. The style is Domestic Gothic, the plans being drawn up by Mr. Simpson, the architect to the Board. Brick is chiefly used; but by the free introduction of Doulting stone for the coping, sills, gables, &c., a pleasing finish is given to the whole. In the brickwork, too, relief is afforded by herring-bone patterns in colour, and by bands and lacing courses of red kiln brick. Red kiln and white Suffolk bricks are also used for the arches of the openings, the spandrels being filled in with designs in colour. Other striking features outwardly are a central tower and spire, the open woodwork of which is of oak, surmounted by a gilt vane; and the carved stone pinnacles to the gables. The entrance to the boys' school, which is built to accommodate 300 pupils, is at the north front from Cheapside. Here a flight of stone steps leads up to a school-room, 60 ft. long, 23 ft. wide, and 22 ft. high, which runs east and west, with four large windows looking south, and two west. Besides the schoolroom proper, there are three class-rooms, with an out-look to the north, east, and south respectively, each about 20 ft. square. The approach to the girls' school, which is at the south end, corresponds to that of the boys'. The schoolroom, facing west, and with three large windows on the same side, is about 42 ft. long by 22 ft. wide, accommodation for 200 scholars only having to be provided. The space devoted to the infants, for whom provision is made to the number of 250, is on the ground-floor. The schoolroom is like the letter L in shape, being about 16 ft. high, some 40 ft. by 20 ft. at its longest side, and 26 ft. square, more or less, at its shortest. Two class-rooms front south-east and south-west respectively. A babies' room, 20 ft. square, is also provided. The work has been carried out by Mr. John Bruton, builder, Hampton-street, under the superintendence of Mr. G. Wickham, acting on his behalf, and with Mr. Thomas Ransom as clerk of the works.

Fort William and Banavie, N.B.—The two new Board Schools of Fort William and Banavie were lately opened by Mr. Lochiel, M.P. The architect of both was Mr. Ross, of Inverness. The Fort-William school, which affords accommodation for upwards of 200 children, cost, with schoolmaster's house, play-sheds, &c., 3,000*l.*; and the Banavie school and master's house, 1,400*l.*

STAINED GLASS.

Ramsgate.—A stained-glass window has just been placed in St. George's Church, Ramsgate, to the memory of the late Miss Hardy. The window, which is by Messrs. Lavers, Barraud, & Westlake, is in the north aisle, the third from the west, and consists of two cinquefoil-headed lights. The most westerly represents the women coming to the sepulchre on the morning of the Resurrection. The lower part of the window is filled in with small designs, the principal of which is a shield with the letters "I.H.S." in antique form. The most easterly of the lights represents the appearance of our Blessed Lord to the women on their return from the sepulchre. The lower part of this light is filled in like the other, but the shield contains the Greek letters "X. P. C."

Hoarcross.—Several of the windows of the new Church of the Holy Angels, Hoarcross, have been filled with stained glass. The east window of the chantry chapel is of three lights, and it has the Crucifixion in the centre light, with St. Mary and St. John on either side, and below is the subject of the Resurrection of Our Lord. The side windows are filled with figures of warrior saints. The stained glass throughout the church has been executed by Messrs. Burlison & Grylls, of London.

Buckingham.—A window in memory of the Rev. A. N. West has just been placed in the parish church, Buckingham. The subjects are,—St. Philip baptising the Ethiopian Eunuch, with the inscription, "What doth hinder me?" in one light; and in the other, St. Paul's vision of the man of Macedonia, with the inscription, "Come over and help us." The window, which is the third in the north aisle, is by Messrs. Clayton & Bell.

COMPETITIONS.

Lakenheath School Board.—Thirteen sets of plans for new schools in the village of Lakenheath, comprising a mixed school, infants' school, class-rooms, and master's residence, were submitted in competition, and at the last meeting of the Board those submitted by Mr. H. Lovegrove, of Budge-row, Cannon-street, were unanimously selected. The estimated cost is 1,750*l.*, exclusive of fencing the site one acre in extent.

SASH FASTENERS AND SASH LINE.

HOPKINSON'S patent guarded lever sash-fastener, mentioned by us with approval some time ago, has been improved by the addition of a "holdfast plate," to prevent thieves forcing it off the window with a jemmy. The fastener has been invented for more than three years, and is getting into general use.

Hookham's steel ribbon sash-line is another successful invention. It is made in lengths of 100 ft., and, according to the strength required, is formed of two or more such lengths of thin watch-spring steel about ¼ in. wide, and has an outside binding of copper wire for the entire length. The mode of forming a knot for the line is very simple, and easily done, but it is absolutely necessary it should be done properly.

LEAD STEALING.

SIR,—We are erecting some new houses in Mandeville-place, Manchester-square, and for a long time have been missing lead to such an extent that the assistance of the police was called in, and the following is the result.

It will be seen from the evidence of Detective Murphy, D division, that he saw the two plumbers, E. Stacey and E. Pearce, leave the job, evidently carrying a great weight. He followed them to 73, Cleveland-street, which is a plumber's, kept by a Robert Aldridge, into whose shop they went. The officer followed them in, and asked them what they wanted; when Stacey, who had the most courage, said they came there to borrow some metal. The officer then told them he should take them into custody for stealing this lead, which was on the scale quite warm, when Stacey tried to escape by the parlour door, but was brought back and threatened by the officer that he would use his truncheon, which had the desired effect of quieting Stacey. While looking for a constable to assist him, the man Pearce took off a very broad belt, and threw it into the fireplace, which the officer picked up. He then asked Stacey if he had a belt on. He replied, "No." They were taken to the station, and, when searched, Stacey was found to be wearing a belt made expressly for the purpose of carrying lead. The foreman, Mr. John M'Coghlan, suspected them; and that day the man Stacey came to his office for a roll of pipe, from which they had taken 46 lb. Stacey had a piece weighing 25 lb., while Pearce had 21 lb., with nails driven into it to assist in carrying it, all new pipe, cut into lengths, so as to be beat without being separated.

The prisoners pleaded guilty to stealing it, and were each sentenced to three months' hard labour last Saturday, May 13th. BRAID & CO.

Books Received.

The Churchwarden's Guide. Edited by W. G. BROOKE, M.A., Barrister-at-Law. London: Knight & Co.

EIGHT editions of this book having been sold, we need say little more than that the ninth, now before us, has been revised and improved by Mr. W. G. Brooke. There are so many rocks ahead nowadays on which a churchwarden may strike, that those who, for the first time, accept the office will find the price of this "Guide" a good investment.

Miscellanea.

German Labour in Scotland.—We are told that a number of master builders in Greenock are making inquiries as to whether they can obtain the services of German masons to supply the places vacant in consequence of the present strike in the building trade, and that a reply has been received that hundreds of German masons can be sent over to Greenock, on very short notice, at wages averaging about 7d. per hour, the rate demanded by the masons who have struck work being 10d. per hour. The employers intend coming to a decision on the subject this week, and in the meantime they are endeavouring to provide lodging accommodation for 300 Germans, should it be considered necessary to engage them. Sad work!

Second St. James's Co-operative Benefit Building Society.—This society, which was formed a month since at the Craven Chapel Lecture-hall, Marshall-street, Golden-square, on the principle of alternate ballot and sale, advancing 400*l.* for ten years by the payment of 3s. 6d. per week, has met with such marked success that the directors are enabled to announce two appropriations, one by ballot, and the by sale, to take place on Thursday next, May 25th. The public are invited to hear the principles explained. We are told shares to the value of 200,000*l.* have been taken up.

Large Sheer Legs.—Sir William Armstrong & Co. have just erected the largest sheer legs in the world at the Elswick Works. They will be wrought with hydraulic machinery, and able to take a dead lift of 100 tons.

The Late Mr. John Forster's Mansion at Kensington.—By direction of the late Mr. John Forster's executors, his freehold mansion at Kensington, known as Palace-gate House, was offered for sale, by auction, at the Mart, Token-house yard, by Mr. James Beal. After stating that Mr. Forster had given 4,000*l.* for the site, the auctioneer invited biddings, when 10,000*l.* were offered, followed by an advance to 12,000*l.*, and the property was rapidly run up to 17,200*l.*, when the biddings slackened. There being no further advance the property was withdrawn. It was subsequently stated in the room that the sum which the vendors require for the property is from 18,500*l.* to 19,000*l.* The house was built by Messrs. Cubitt & Co.

The late Mr. David Bryce, R.S.A.—Scottish art, and especially Scottish architectural art, has sustained a severe loss in the death of Mr. David Bryce, R.S.A., which event occurred on the 7th instant, at his residence, George-street, Edinburgh. Although Mr. Bryce had been in failing health for some time past, he was able to attend to business for two or three hours each day, and up till the 2nd instant he regularly took walking or carriage exercise. On the 3rd instant, however, he was seized with cold, which developed into bronchitis, and under this malady he succumbed.

Bricklayers.—A meeting is to be held at the Artisans' Institute, 29, Castle-street, Upper St. Martin's-lane, on Monday, the 22nd of May, 1876, at 7.30 for 8 p.m., "To consider what Bricklayers are, and what they may be." A correspondent says this is a step towards the initiation of a movement, taking its rise from the discussion in the columns of the *Builder*, upon the subject of education of bricklayers. It is hoped that clerks of works and leading foremen, being bricklayers by trade, will attend.

The Fine Arts at Florence.—The College of Professors in the Academy of the Fine Arts of Florence, which may be esteemed the Athens of Italy, have just nominated to the distinction of honorary academicians, J. E. Boëhm, Frederick Leighton, and Elizabeth Thompson (of London), and the distinguished painter, Bernardo Amiconi, resident in London. This last-named artist has now in the Royal Hibernian Academy, Dublin, a picture, "How Sweet!" which was in the exhibition of the Royal Academy.

Society for the Encouragement of the Fine Arts.—This society held its third *conversazione* of the present session on the 11th inst., in the picture-galleries, South Kensington Museum (by permission of the Lords of the Council on Education). A large company assembled shortly after eight o'clock, and were received by Mr. James Edmeston, the chairman of the Council.

Fatal Accident at a Church.—A new church is being built at Ford, Devonport. On Monday in last week the contractor, Mr. Lang, of Moricetown, was standing with some of his men at the top of one of the arches, when it gave way, and five of them fell to the ground. Three of the men were much injured, and Mr. Lang was taken up insensible, and died soon after.

Retrospective Exhibition of the Industrial Arts, Brussels.—This exhibition, now in course of formation, will be opened on the 1st of August next. Its object is to diffuse good models, and it will include reproductions by various processes of objects of ancient industrial art. The Secretary is M. Mignot-Delstanche, Brussels.

Miss Thompson's "Balaclava."—This, the most recent work of Miss Elizabeth Thompson, is at the same time her finest production, and will tend materially to consolidate that fame which she justly acquired by "The Roll Call." It is now on view at 148, New Bond-street, and well deserves a visit.

Victoria Hospital, Gough House, Chelsea. The Victoria Hospital for Sick Children will be reopened, after extensive alterations and repairs, on the 20th of May, on which occasion the Princess Louise of Lorne has consented to be present.

TENDERS

For the erection of a Home at Parsons-green, Fulham, for the London Female Preventive and Reformatory Institution. Mr. W. P. Griffith, architect. Quantities not supplied:—

Smith	£2,589 0 0
Hockly	2,180 0 0
Nixon	2,150 0 0
Lidstone	2,070 0 0
Pocock	1,975 0 0
Carter	1,750 0 0

For new bay window and decorations to 5, Fellows-road, Haverstock-hill, for Mr. Edmund Lloyd. Mr. W. P. Griffith, architect:—

Hockley	£225 0 0
Lawrence	179 0 0
Lidstone	196 0 0

For police station, stabling, &c., at Patcham, near Brighton. Mr. H. Card, architect. Quantities by Mr. E. H. Nunn:—

Turner	£2,920 0 0
Newnham	2,758 0 0
Nash & Co.	2,588 0 0
Bruton	2,550 0 0
Barnes	2,415 0 0
Howard	2,400 0 0
Wells	2,315 0 0
Steer	2,150 0 0
Deacon	2,145 0 0
Anscombe (accepted)	2,043 0 0

For SS Mary and Michael Schools, Commercial-road, E. Messrs. John Young & Son, architects. Quantities by Messrs. Arding, Bond, & Buzzard:—

	Infant School.	Middle School.
Robbins	£1,200 0 0	£1,970 0 0
Little	915 0 0	1,599 0 0
Bayes, Brothers	900 0 0	1,589 0 0
Lawrence	965 0 0	1,575 0 0
Enor	970 0 0	1,550 0 0

For two houses in the Granville-road, Leicester. Mr. A. Hardy, architect. Quantities by Mr. Geo. Jackson:—

Bland & Son	£3,572 5 0
Billington	3,314 0 0
Bass & Hodgkins	3,245 2 0
Kellett	3,095 0 0
Gilbert & Pipes	3,009 0 0
Stork (accepted)	2,903 15 0

For additions to Taunton Trade School, Southampton. Mr. R. Crichton, architect:—

Dyer	£1,056 0 0
Crook	976 0 0
Bostock	947 0 0

For new large room at Sudbury, Middlesex:—

Larke	£2,376 0 0
Macey	2,094 0 0
Greenwood	2,078 0 0
Bangs & Co.	1,995 0 0
Enor	1,890 0 0
Lascelles	1,798 0 0

For three houses at Peckham Rye, for Mr. J. Wolsey. Mr. W. A. Murphy, architect:—

Brightmore	£994 0 0
Judd & Hawkings	919 0 0
Parker & Evans	749 0 0
Richardson	735 0 0
Colebrook	659 0 0

For completion of eleven houses, Oaklands-grove, Shepherd's-bush, for Mr. Henry Cowlard. Mr. John Wallis Chapman, architect:—

Judd & Hawkings	£4,927 0 0
List	3,849 10 0
Moy & Giles	3,7 8 0 0
Elks	3,300 0 0
Dexter	2,979 0 0

For Board offices for Ealing Local Board. Mr. Charle Jones, architect:—

Bray	£5,7 0 0 0
Judd & Hawkings	4,914 0 0
N blett & Son	4,820 0 0
Waters	4,410 0 0
Nye	4,360 0 0
Adamson	4,328 0 0

For the erection of three warehouses in Dorset-street, E.C., for Messrs. Ward, Lock, & Tyler. Messrs. Spalding & Knight, architects. Quantities by Mr. G. Fleetwood:—

Kelly	£12,780 0 0
Grimwood	11,998 0 0
Gammon	11,666 0 0
Foster	11,140 0 0
L. H. & R. Roberts	11,080 0 0
Dove, Brothers	10,395 0 0
Grover	10,145 0 0
Downs	10,103 0 0
Shepherd	9,851 0 0
Morter	9,643 0 0
Nightingale (accepted)	9,589 0 0

For blocks of buildings adjoining Battersea Park, for the Metropolitan Artisans and Labourers Dwellings Association. Mr. Charles Barry, architect. Quantities by Messrs. Strudwick, Selby, & Rogers:—

	Block A.	Laundry A.	Block B.	Laundry B.
Allen	£22,730	£1,300	£14,830	£1,240
Trollope & Sons	22,730	1,285	13,770	1,190
Brass	21,797	1,292	13,937	1,179
Holland & Hannen	22,000	1,240	13,050	1,142
Perry & Co.	21,324	1,210	12,852	1,138
Baker & Sons	21,230	1,210	12,990	1,116
Peto, Brothers	21,009	1,284	12,879	1,169
Patrick	20,973	1,160	13,790	1,047
Macey	20,706	1,151	12,559	1,068
Browne & Robinson	20,426	1,170	12,564	1,073
Downs & Co.	19,180	1,100	12,090	1,040

For the erection of Pumps, &c., at Guildford Water Works:—

Powis & Co.	£731 0 0
Buchan	688 11 8
Botterill & Co.	668 0 0
Tilley	637 10 0
Mason	592 0 0
Filmer & Mason (accepted)	470 0 0
Gimson & Co	453 4 0

For pulling down and rebuilding the Pewter Platter, Leather-lane. Mr. Dixon, architect. Quantities by Mr. Kirkby:—

Pritchard	£2,515 0 0
Godden	2,425 0 0
Hockly	2,400 0 0
Way	2,150 0 0

For garden wall and repairs at Mill-hill, Barnes, for Mr. W. Taylor :—
Sale (accepted) £113 5 8

For the erection of new schools for the London School Board. Mr. E. R. Robson, architect :—
Leipsic-road, Camberwell. Quantities by Mr. W. H. Barber :—

Perry & Co.	£8,935	0	0
Downs & Co.	8,709	0	0
Tyerman	8,505	0	0
Thompson	8,423	0	0
Hook & Oldrey	8,409	0	0
Brass	8,368	0	0
Pritchard	8,139	0	0
Merritt & Ashby	8,103	0	0
Jerraid	7,993	0	0
Nightingale	7,871	0	0

Coal-yard, Drury-lane. Quantities by Mr. John Nicholls :—

Downs & Co.	£7,697	0	0
Perry & Co.	7,278	0	0
Roberts	7,277	0	0
Brass	7,239	0	0
Hook & Oldrey	7,134	0	0
Grover	7,129	0	0
Williams & Son	7,094	0	0
Boyce	6,984	0	0
Nightingale	6,983	0	0
Kirk & Randall	6,914	0	0
Pritchard	6,755	0	0

Langdon-road, Highgate. Quantities by Messrs. Northcroft, Son, & Neighbour :—

Boyce	£6,753	0	0
Roberts	6,451	0	0
Williams & Son	6,416	0	0
Downs	6,378	0	0
Lawrence	6,364	0	0
Hobson	6,325	0	0
Pritchard	6,226	0	0
Hook & Oldrey	6,222	0	0
Nightingale	6,185	0	0
Wall, Brothers	6,099	0	0
Grover	6,094	0	0

Hollydale-road, Nunhead. Quantities by Mr. W. H. Barber :—

Crockett	£9,323	10	0
Perry & Co.	9,280	0	0
Tyerman	9,150	0	0
Downs	9,110	0	0
Pritchard	8,873	0	0
Hook & Oldrey	8,730	0	0
Ennor	8,624	0	0
Brass	8,583	0	0
Nightingale	8,484	0	0
Kirk & Randall	8,431	0	0

Webber-row, Westminster Bridge-road. Quantities by Messrs. Northcroft, Son, & Neighbour :—

Crocket	£5,711	0	0
Kirk & Randall	5,710	0	0
Downs	5,549	0	0
Brass	5,445	0	0
Tyerman	5,400	0	0
Pritchard	5,328	0	0
Nightingale	5,242	0	0
Hook & Oldrey	5,200	0	0
Jarraid	5,182	0	0

Addington-street, Westminster Bridge-road. Quantities by Messrs. Gardiner, Son, & Theobald :—

Downs	£8,575	0	0
Perry & Co.	7,893	0	0
Hook & Oldrey	7,790	0	0
Crocket	7,652	0	0
Lonergan	7,638	0	0
Brass	7,633	0	0
Kirk & Randall	7,466	0	0
Nightingale	7,373	0	0
Pritchard	7,259	0	0

For new Wesleyan school, Wandsworth-road. Mr. Jas. Weir, architect. Quantities by Mr. C. G. Maylard :—

Nightingale	£1,970	0	0
Gammon & Sons	1,970	0	0
Lathey Brothers	1,950	0	0
Dove Brothers	1,915	0	0
Spinks	1,895	0	0
Adamson & Sons	1,835	0	0
Gregory	1,777	0	0
Turtle & Appleton	1,670	0	0

For enlarging All Saints Church at Hockesill, Bishops Stortford, Herts. Mr. G. E. Pritchett, architect :—

Gibbons	£3,790	0	0
Glasscock	3,775	0	0
Brown	3,534	0	0
Tooley	3,450	0	0

For completing certain works at Thirfield Church, Royston, Herts. Mr. G. E. Pritchett, architect :—

Bullen	£2,430	0	0
Gibbons	2,150	0	0
Brown	1,994	0	0
Carter	1,970	0	0
Savell	1,950	0	0

For rebuilding the Ship and Blue Ball, Boundary-street, Shoreditch, for Mr. Lake. Messrs. Francis, architects :—

Banks	£1,348	0	0
Sheffield	1,247	0	0
Shurmer	1,197	0	0
Hearle	1,183	0	0
Marr (accepted)	1,174	0	0

For alterations to the Cock, Mare-street, Hackney, including pewtering and gasfitting, for Mr. Thomas Hare. Mr. C. Chapman, architect :—
Marr (accepted) £530 0 0

For new bar fittings, including pewtering and gasfitting, at the Crooked Billet, Cable-street, Shadwell, for Mr. G. Absell :—
Marr (accepted) £700 0 0

For forming a skating rink, with necessary offices, &c., for the Enfield Skating Rink Company, Limited, Enfield. Messrs. Ebbetts & Cobb, architects :—

	No. 1.	No. 2.
Patman	£663 0 0	£708 0 0
Steel, Brothers	536 18 0	583 18 0

For rebuilding No. 1, Green-lane, High-street, Battersea, for Mr. James J. Morgan (Contract No. 3). Messrs. Ebbetts & Cobb, architects :—

Eborall	£570	0	0
Steel, Brothers	510	0	0

For alterations to the Marlborough Head, Pelham-street. Brick-lane, for Messrs. Truman, Hanbury, & Buxton, Mr. W. E. Williams, architect :—

Palmer	£439	0	0
Hunt	447	0	0
Marr (accepted)	419	0	0

For rebuilding No. 42, Cornhill. Mr. Benjamin Tabberer, architect. Quantities by Messrs. Franklin & Andrews :—

Palmer & Son	£5,313	0	0
Downs	5,237	0	0
Larke	5,192	0	0
Merritt & Ashby	5,005	0	0
Staines & Son	4,943	0	0
Crabb	4,910	0	0
Brass	4,895	0	0
Braid & Co.	4,893	0	0
Robinson	4,887	0	0
Cohen	4,842	0	0
Lawrence	4,815	0	0
Mark (accepted)	4,790	0	0

For shop and premises, Dulwich-road, for Mr. Sholl. Messrs. Hammack & Lambert, architects :—

Haydon	£2,400	0	0
Johnson	2,195	0	0
Peacock	2,167	0	0
Macey (accepted)	2,155	0	0

For tavern, Kellett-road, Brixton. Messrs. Hammack & Lambert, architects :—
Macey (accepted) £2,270 0 0

For repairing a portion of the Brooke-road, Upper Clapton :—

Dunmore	£375	0	0 !
Richardson	240	0	0
Keeble	225	0	0
Killingback	224	0	0
Bloomfield	215	0	0
Jackson (accepted)	155	0	0 !

TO CORRESPONDENTS.

Erratum.—Mr Paull writes to say he is joint architect with the gentleman named of the schools in Westminster-road, mentioned in our notice of architectural works in the Academy Exhibition. We but followed the catalogue.

H. L. (the power to recover from B would depend upon the exact terms of agreement with him. Take advice).—"Lord John" (the contents of the block in question are but 5½ parts of a cube inch).—H. M.—R. M.—J. A.—J. B. & Son.—C. S.—M. L.—R. W.—J. W.—C. & W.—Mr. P.—G. T. C.—C. V.—C. F.—J. F. W.—C. G. M.—K. M.—A. G. H.—S.—P. N.—E. S.—B. & Co.—L. & Co.—C. B.—A. F.—S.—B, C.—F. B.—J. T.—B. T.—H. & O.—W. C.—H. J. J.—A. B.—R. & M. (next week).—A. A. L. (next week).—J. T. & Son (we cannot make any such pledge,—M. T. (too late for consideration this week).—C. C. H. (ditto)

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Bath Stone Office,
Corsham, Wilts.

Dear Sir,

Westwood Ground Stone.

The want of a Ground Stone superior to the Box Ground, has long been recognised, and we are now in a position to meet that want.

Our Quarries at Westwood are producing a Ground Stone of excellent quality, which surpasses the Box Ground in the following particulars.

Evenness of Texture, *It is free from hard bars and soft clayey beds.*

Soundness, *It can be relied on not to open venty.*

Shapeliness. *The rock being naturally sound it is not necessary to cut it into a variety of shapes inorder to remove vents. The blocks are therefore square and shapely, and can be converted with the smallest waste.*

Depth in Bed. *Blocks five and six feet deep are readily obtained.*

The Quarries have been worked in a primitive manner for upwards of a century, and the local buildings in which the stone has been used furnish ample evidence of its durability and effective appearance.

The cost of obtaining the Westwood Stone is more than that of Box Stone, and it is therefore necessary for us to charge two pence per foot cube extra for it. At this price it is the cheapest as well as the most satisfactory Ground Stone in the market. We have recently opened quarries on Combe Down, which are producing stone of excellent quality. We continue to supply Corsham Down, Corsham Ridge, Box Ground, and Dressed Stone.

Your commands will always oblige, yours truly,

RANDELL, SAUNDERS, & Co., Limited.

The Builder.

VOL. XXXIV. No. 1738. SATURDAY, MAY 27, 1876.

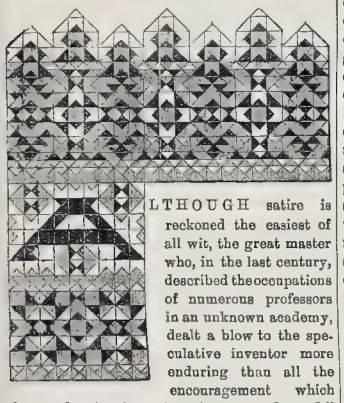
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Concrete as a Building Material.



ALTHOUGH satire is reckoned the easiest of all wit, the great master who, in the last century, described the occupations of numerous professors in an unknown academy, dealt a blow to the speculative inventor more enduring than all the encouragement which those who "nature to advantage dressed" have succeeded in giving him. Innate opposition to change,—the mental *cui bono* of the many,—is always strengthened by remembrance that a Laputan "projector," who had been eight years in attempting to supply artificial sunshine at a reasonable rate, expected to succeed after another eight years' experience. How many people spend life in seeking to attain utterly useless results, is a fit subject for the satirist; but as in all things, high and low, many are called and few chosen, so invention obeys the natural law of survival. If the labours of only one inventor in a thousand accrue to the public advantage, and receive public attention, it may be considered certain that the remaining 999 have more or less assisted in his success. Inventions, and even discoveries, however, are not generally made by those who first thought or found them out, paradoxical as the remark may appear. "That man," said Sydney Smith, "is not the discoverer of any art who first says the thing; but he who says it so long and so loud, and so clearly, that he compels mankind to hear him. . . . . Many persons broke stone before Macadam; but Macadam felt the discovery more strongly, stated it more clearly, persevered in it with greater tenacity, wielded his hammer, in short, with greater force than other men, and finally succeeded in bringing his plan into general use." Few technical historians hesitate to admit the truth of a dictum worth remembering by the many devotees of chronic invention. Successive attempts to supplant a natural by an artificial production are thrust forward on the plea of economy in the one, or the difficulty of obtaining the other. One of the oldest of building substances is a natural agglomeration easily accounted for. Easily imitated, the imitation is known in England as "concrete," and in France as "*béton*." In an artistic point of view, its most dangerous competitor is still the original work of nature herself, and that even in countries where her work is rare and deficient. Its most unreasonable critic is not Time, but man. He expects the work of his own hand to surpass in quality that of his Maker. No one ever knew a quarry of natural concrete to be wholly homogeneous, or undivided by horizontal joints, or composed of blocks entirely without blemishes or cracks. But if a wall of artificial concrete 100 yards long display fissures, or bulge out, or contract in substance, the composition is pronounced faulty, and therefore worthless. There are few ordinary building-stones which are not porous, yet if concrete of modern workmanship suck in moisture, neither architect nor builder will have anything to do with it. In the very face of the elements attempts are made to form stone similar to that which was formed in the depths of the earth. Quarrymen know full well that until the stone which they extract has been exposed for a certain time to the sun, and with calcareous stone until a certain chemical action is produced upon its surface by natural heat, it is useless as a building material. Yet man, after simply combining nature's ingredients, expects to compose a homogeneous mass against which atmospheric influence shall be powerless; and often without deigning to submit his composition to those several processes to which nature has humbly submitted her own.

In any discussion upon this subject it is desirable to separate refined concrete,—such as Ransome's Siliceous Stone, and the Patent Victoria Stone in England, and Coignet's "Bétons agglomérés" in France,—from ordinary concrete. The former is a work of art, scientifically prepared, in the almost strict observance of natural laws; the latter is the production to a certain extent of unskilled labour, and it is composed of fixed proportions of prescribed materials. The argument in favour of the one is that it is cheaper than real stone; the arguments in favour of the other are that it is cheaper, and can be made more durable than the best brickwork. More than thirteen years ago Professor Kerr, in a careful paper on "Artificial Stone," repeated what had been advanced in an Institute Prize Essay, written in 1835, that as regards the principle of concrete few can have any doubts. "The process," said the essayist, "is the natural one by which a large portion of the rocks constituting the crust of this our momentary residence has been formed." In the more recent words of the Professor, "Concrete, however used, is *technically* artificial stone; but if it be not (and it too frequently is not *practically* so) a sound, solid, hard, stone-like mass, it is worse than useless." He further argued, and with great force, that as sandstone is nothing more than a concrete of sand,—the cementitious element in it being flint-like, clay-like, or lime-like, according to circumstances,—and as ordinary limestone is carbonate of lime with no sand at all, prepared concrete of the finest description is stone artificially produced. In this form concrete recommends itself to every architect deprived, as Englishmen are, over the larger part of their island, of stone formations. Its only risk, from an æsthetic point of view, of being termed a building sham, runs in the fact that natural stone must be cut, while artificial stone is shaped in a mould.

Ordinary concrete, originally prepared with lime, and now improved by the substitution of Portland cement, is the substance which has occupied professional attention in several meetings of the Royal Institute of British Architects*; but the recent discussions thereon have not been conducted in a way likely to lead to any practical or, indeed, useful result. Patentees and inventors have been allowed to give a loose description of their opposition wares and the means of applying them. The majority of those who have turned their attention to concrete as a material suitable for the superstructure of buildings display a unanimity of disagreement in many of the constructive points which vitally affect its use. Would-be converts to the desirability of its general adoption as a building material are, therefore, left in a maze of perplexity, and cheerfully accept the assurance of Mr. Alexander Payne, who fears that inventors "have not yet done much in striking out a new line for the employment of concrete,—though they have improved the material,—and that by far the most common mode of building still practised is the old method described by Alberti." This was given in the prize essay to which allusion has been already made, as follows:—"Walls formed wholly by concretion were made, like the earthen walls of Spain and Africa, by placing planks at the distance apart of the intended thickness of the walls; between these were poured pebbles, or broken stones, and mortar, and there they were so retained until hardened to a mass." That British architects should be now discussing the feasibility of doing what was actually accomplished in Europe during the early years of the fifteenth century is only a subject of congratulation if but something definite can be got out of the discussion. In June, 1871, Mr. Wonnacott, treating of Portland cement concrete, said that "concrete walls are not found in practice to be weather-proof unless rendered externally in cement, and not waterproof unless trowelled to a smooth surface and kept from extremes of temperature." He also doubted if such concrete were a non-conductor of heat, adding that he knew it was not a non-conductor of sound, and that its advantage over brickwork consisted in offering a better key for the plaster covering. In fine, according to Mr. Wonnacott, "concrete offers great facilities for warming and ventilation. Heated air is readily conveyed through flues, formed in the body of the walls, and admitted into the several rooms through the skirtings." At the same meeting Mr. A. W. Blomfield, architect of a justly-celebrated concrete church at Oxford, said, "In respect of strength and durability, my experience has led me to put the greatest possible faith in carefully-compounded Portland cement concrete. I do not think that its capabilities in the way of fireproof building,

* The discussion upon "Concrete as a Building Material" will be resumed on Monday evening, the 29th inst., at eight o'clock.

without any adventitious aid of iron girders or other supports, over considerable areas, has ever yet been properly tested." In these two last quotations may be said to lie the gist of the matter. Inventors who propose to surpass the powers of nature should remember that she hides her concrete formations; and they must consent, at least for the present, to conceal their imitative efforts in the interior of buildings. If as yet they have only succeeded in providing a substance easy of application to the internal structure of dwelling-houses, they merit the immediate attention of London householders, than whom, perhaps, none in any European capital have greater cause of complaint against the building fraternity.

The common-sense technical view,—that is, the view taken by ordinary architects and builders,—of the application of concrete to the external superstructure of houses is not based upon doubts as to possibility or even economy. At the bottom of most consciences lingers a half regret,—would that it were impossible! There exists, and there always has existed, a love for buildings constructed of stone, and of combinations of brick and stone. There is an undoubted prejudice against the look and even the feel of Portland cement. If, indeed, the realisation of some sanitary Utopia depended only upon the general acceptation of concrete fronts, the growing artistic feeling of the people would experience a sensation of revolt. Nevertheless, everything points to the probability of its general adoption in many situations in cheap tenements, such as those projected under the provisions of the Artisans' Improved Dwellings Act. The contemplated scarcity of bricks may give an impetus to its extended use and inevitable development; and a strike, similar to that of the Paris carpenters in 1840, which resulted in the effectual introduction of iron floors, may be advantageously repeated in this country, in order to hasten the exclusion, not only of naked timbers, but also of naked iron, from every public and private building. In Paris, a fire-resisting concrete floor has long passed the period of discussion; its use is almost traditional; its application familiar to all, and the right of every one. But the French possess plaster, and they seem to do what they like with it. In London, concrete in floors remains a tug of debate, and the speciality of inventors, who do not seem to do what they like with it. The absolute necessity for its invariable use in the insides of houses is overlooked in attempts, often abortive, to employ it in the outsides of them, and that though the English possess a native cement of extraordinary power. In Paris, it is the rule to form concrete floors in different blocks of private residences, as well as in public buildings; in London it is the rule not to do so, either in mansion, villa, or street of houses. There can be no doubt that the economical application of ordinary concrete, such as ordinary workmen can prepare, to the internal distribution of ordinary buildings would afford a great benefit to the public generally, especially in the centre of the metropolis.

The original and legitimate place of lime or cement concrete in the construction not only of foundations, but of vaults, roofs, and floors, remains uncontrovertible; and it is of the utmost importance that these should be, if not fireproof, at least, fire-resisting. It is, therefore, not asking too much of inventors to pause before making statements in direct contradiction of each other. We are told that Portland cement concrete expands and contracts, and that it does neither of these things; that while iron doors twist under the action of fire into every conceivable shape, concrete lintels survive flame and resist heat, and that concrete is not fire-proof. One inventor wants to subvert the art of the joiner and do all in concrete; but let him be content to supersede that of the carpenter. Another puts together cement tiles upon a wood framing, and calls it concrete construction. Of the facts elicited last Monday fortnight, Mr. Brannon's account of cottages which he had purposely fired several times—the concrete remaining each time harder than the last—was of value. Tois gentlemen, from experience he had had in Derbyshire, stated that iron slag, ground with selenitic lime, was equal to Portland cement concrete; and many people doubtless incline to his opinion. A similar utilisation of slag in the composition of rough concrete cottages and buildings connected with ironworks, calls for the attention of those who build in parts of the country where refuse from the blast furnaces abounds in hideous and hitherto useless heaps. Mr. Tall's statistics relating to the floors and roofs he had built entirely without any iron joists, or even ties were most suggestive. Indeed, the certainty that naked iron is even more dangerous in a fire than hard wood, and the doubts whether iron ought to be embedded in any kind of material whatever, tend to sensibly reduce its employment in the gross construction of ordinary buildings.

The method of constructing floors, roofs, partitions, and even external walls, in iron and concrete, is theoretically wrong if the fixed rule in building be to avoid an admixture of materials. To all practical intents and purposes, however, the French have been right for five-and-thirty years. Their notion is, that the concrete—formed of *platras*, broken brick, or tile "run" in plaster—introduced between wood or iron joists and rafters, not only gives homogeneity, but adds strength. In Paris, architects live and die,—Paris itself has been demolished and rebuilt, without, in round phrases, the fixing of a framed iron girder. Entire façades have been carried upon lintels (of from 7 ft. to 10 ft. bearing) composed of two rolled-iron joists connected by wrought-iron collars, the interstices being filled with hollow brick and cement, or *platras*, run in plaster, and the whole enveloped in a covering of plaster. Whether such lintels be stronger with, whether they would be equally strong without, the admixture of brick or *platras*, cement, or plaster, may remain an open question; but that they would not be equally fire-resisting in their naked condition is certain. In Paris, the iron skeleton is filled and enveloped as a precaution against the effects of fire and the passage of sound. In London, certain patentees undertake to provide floors of the same description with a filling of the more extravagant and infinitely stronger concrete made with cement. But it is impossible not to suspect that by the careful insertion of iron rods or ties, floors of almost any area, and within a maximum thickness of 12 in., could be constructed of such concrete. To this end the attention of inventors cannot be too urgently directed. The almost imminent introduction of a reformed Building Act for the metropolis must lead to compulsory modifications in the present mode of constructing "fireproof" buildings. So-called "fireproof" warehouses, hospitals, and other similar works in London, are now known to be so only in name; naked iron in the midst of the flames is regarded by firemen with more dread than even resinous wood; naked iron in a damp atmosphere depends for sheer existence upon periodical coats of paint; and naked iron under a tropical sky, where Englishmen too often use it, is a chronic source of accident from unavoidable contraction and expansion and electrical effects. As it has been before explained, the French architect has cheap gypsum at his command, and with it he has long counteracted the treacherous proclivities of iron. His London brethren, at a vast expense, and for an equally long time, have resorted to heavy and cumbersome blocks of fireclay as the best and only ready envelope for it. But in the face of cut-and-dried rules of theory, the practice, successfully tried abroad, of entirely covering iron with some kind of concrete, is a wise and profitable precaution, by the exercise of which the French capital enjoys, in quiet times, comparative immunity from incendiary disaster.

The ordinary dwelling-houses of the metropolis call for the concrete-maker even more desperately than the sham fireproof building which they often surround. The soil on which they rest is fœtid—permeated with new drains or old cesspools. The speculators—and every one connected with houses and land in London comes under that title—cause this fœtid earth to be dug into to a certain depth. Brick piers are then planted at intervals, and wood beams are laid upon them; and, crosswise, upon the latter are fixed deal boards, so jointed that often between the lowest rooms of the house and the soil there is only a void of a few feet, sometimes even inches. In the centre of Paris it would be difficult to find any basements inhabited during the day (never occupied at night) which approach in this dangerous respect the lowest stories of many first-class London residences. Where a house in new Paris does not rest upon vaulted cellars, a certain thickness of *béton*—composed of pebbles, sand, and hydraulic lime—generally covers the whole surface of the soil. Upon this *béton* there is sometimes a covering of bitumen; and sometimes floor-boards are bedded in the bitumen itself. To prolong a comparison between the freehold houses of Paris and the leasehold houses of London is to repeat what has been over and over again condemned in our pages. In none of the great cities of Europe, except perhaps those of Holland, are floor joists and boards such as are daily constructed in London, to be found. The joists, 8 in. or 9 in. deep by 2 in. thick, are covered at top with rough boards gaping at the joints, and at bottom with strips of wood embedded in a coarse mixture of inflammable mortar. The inner space between the coat of ceiling and the covering of planks is hollow—a place where gas-pipes are laid insidiously, half concealed. In central London, in the increasing number of new houses, which are let as offices and even residential chambers, such is the kind of flooring forming the horizontal party-wall between distinct tenements. Neighbours ignorant of each other's faces, but not of each other's existence, participate in every sound; and the slightest motion on the part of either is communicated through a combination of carpentry disregarded by the Metropolitan Building Act, on the insular plea that the house, being inclosed between vertical party-walls, must necessarily be occupied by a single family or group of persons prepared to share in common the risks of habitation. Each floor-structure resembles the other; and the ignition by fire of one implies with logical certainty the destruction of that above it. Many of the partitions and the roof consist of inflammable posts and rafters, thin laths, and coverings of lime and hair, under and behind which are hollow spaces. No part of Western Europe contains so complicated and extensive an area of loose building as the centre of the English metropolis offers to the concrete enthusiast.

Vacant building land is now happily to be seen in several parts of the town. The construction of the Victoria-Embankment has necessarily led to the formation of new approaches to it. One of the conditions imposed upon the purchasers of land bordering Northumberland Avenue is that the fronts of all the new houses shall be built of granite, marble, or stone; and, according to the provisions of the Act of Parliament under which the new street was made, the designs of these fronts must first be approved by the Royal Institute of British Architects. It must not, however, be supposed that such a specification of materials for the one external street wall, and such artistic precautions, ensure equally good or substantial internal construction. There is nothing in the clauses of the Metropolitan Building Act to prevent the several horizontal divisions of a dwelling-house behind these solid fronts from being constructed with naked fir and deal; yet it may be taken as certain that no new house in Northumberland Avenue will be exclusively occupied by a single family or group of persons living in common. On the contrary, it will be let by floors, or even rooms; and, provided it has been arranged on the old-fashioned London system, enormous pains will be taken in constructing the two vertical party-walls inclosing it on each side; but the horizontal divisions between six or seven stories of distinct tenements superposed will consist of the flimsiest wood. Surely, the innovator who can show British architects how to make horizontal party-walls, even as imperfect as those to which the Parisians are thoroughly accustomed, will earn at least the right of never again being compared with a "projector" of Lagado.

THE LOAN EXHIBITION OF SCIENTIFIC APPARATUS, SOUTH KENSINGTON.

The long galleries on the west side of the Horticultural Gardens, which held, not long since, the successive international collections of generally mediocre sculpture and painting, and of art-work of various kinds, good and bad, are now occupied by a collection of objects of entirely different nature and interest. The south and west galleries on the ground floor, and part of the west galleries on the first floor, are filled with a collection of contrivances, perplexing in their number and variety, all designed either to shorten and relieve human labour, or to advance human knowledge, by assisting the hand, eye, and brain in investigation, and in stating the results of investigation. Under these heads it is possible to generalise everything which could be included in such a collection. The difficulty in rendering these things really interesting to visitors is that, especially to those little acquainted with the use of such apparatus, the value and the peculiar *modus operandi* of the apparatus exhibited are scarcely rendered evident except by

seeing them in use. The mere spectacle of a set of instruments ranged on a table tells little to the unitiated eye. The promoters of the exhibition have done their very best to remedy this drawback, by providing not only a very full and tolerably well classified catalogue, but a Hand-book containing essays by men of eminence in their respective departments, giving something of the outlines and present position of the branch of scientific research which each class of apparatus is designed to aid, and the principles upon which the apparatus is designed. These essays are very well calculated to teach people to think on the subjects treated of, and to give that amount of general information which is all that the section of the public not engaged in scientific pursuits can for the most part hope to acquire; and perhaps this handbook will be the part of the scheme which is most likely to have the educational influence which we presume is intended. In other ways, we very much doubt the exhibition exercising such an influence. The different classes of apparatus are not arranged in any such consecutive manner as to afford, what might in some cases at least have been afforded, an illustration of the progressive development of special methods of investigation, and of the progressive improvement of the instruments employed. Old instruments and new, instruments on different and varying principles, seem scattered about without much plan, and what appears to be a systematic classification in the catalogue has not its counterpart in the arrangement. There is difficulty also in finding the numbers referred to in the catalogue, owing to the partial irregularity in the placing of the articles, or even finding in which case an article described is to be seen. Few, we imagine, will take take the trouble to hunt up things under these circumstances, and our impression is that the exhibition will not much attract those for whose edification it is intended, and that the bulk of visitors to it will consist of those who already possess special scientific knowledge, not those who come to acquire it, and who would find difficulty in gaining their object if they did, for the reasons just mentioned. A lecture on a scientific apparatus, with the objects treated of present and in working order, and exhibited by a proficient who can handle them so as to exemplify their special achievements, has always an interest for a general audience, though it may be surmised that many in such a case do not learn as much as they imagine. But it is difficult to interest a popular concourse in a mere range of dead instruments, as one may call them. The Hand-book, however, is of real value, and we recommend all who wish to derive any real information from the exhibition to purchase it and digest some of its contents before making any attempt at more particular examination of the objects to be seen.

We can only here indicate generally the nature and extent of the subjects illustrated in this large collection. It is to be understood that although efforts have been made to obtain a representation of scientific apparatus and improvements from every source independently of country, there is no intention of giving to this exhibition anything like an "international" character in the sense in which the word has usually been understood in reference to exhibitions. It is not, that is to say, an occasion for one country to exhibit its special excellences in rivalry with another; the principle is merely that the best modern invention or improvement in any branch of scientific apparatus, from whatever part of the world, was to be illustrated; and to some extent at least this has been accomplished. The great result probably will be that specialists of the various countries will see where they are behind others, and can make improvements. Returning to the immediate subject of remark, we may observe that the apparatus exhibited are classed under the following sections:—

1. Arithmetic.
2. Geometry.
3. Measurement.
4. Kinematics, Statics, and Dynamics.
5. Molecular Physics.
6. Sound.
7. Light.
8. Heat.
9. Magnetism.
10. Electricity.
11. Astronomy.
12. Applied Mechanics.
13. Chemistry.
14. Meteorology.
15. Geography.
16. Geology and Mining.
17. Mineralogy, Crystallography.
18. Biology.
19. Educational Appliances.
20. Photographs, &c., illustrating Italian Science.
21. Miscellaneous.

Under the last rather vague term come some few things (books, plans of foreign laboratories, &c.), which could not well be included under any of the other classes. "Educational Appliances" includes whatever is intended simply for purposes of demonstration, and a rather curious list it makes in the catalogue, more extensive and various than would be supposed. Atlases, geometrical figures, and appliances for demonstrating various facts in the laws of force and motion, &c., are, of course, what one would expect to find under this head; but it is hard to see how two stuffed birds (No. 4,152 in catalogue) are to be classed as "educational appliances"; the article next in order, "Model of the Digestive Organs of a Goose," may have a personal interest for some other stuffed bipeds, in the height of the dining-out season, no doubt.

Mr. Clerk Maxwell's general article on scientific apparatus, which is prefixed as a kind of introductory chapter to the handbook, is a very able *resumé* of the objects to be attained by such apparatus, and the end to be kept in view in their construction. The importance of the mere putting together of instruments for delicate operations, the care that has to be exercised to avoid unequal strains, is a point which probably few who have not habitually to do with such instruments, or have not acquired the habit of reflecting on the mechanical conditions of construction, in the least appreciate. Any one can understand, for instance, that the grinding of the metal reflector for a large reflecting telescope is a matter requiring great care and nicety, so as to ensure not only a perfectly polished surface, but one perfectly true and uniform in plane and angle, the slightest inaccuracy resulting in a distorted image. But it would perhaps occur to few not professedly scientific people, that when this true surface was obtained, an almost equally delicate operation remained in providing for the fixing of the reflector so that it should have always a uniform bearing which ever way the telescope was turned, without which precaution it would distort itself, after fixing, by its own weight. Yet this was one of the greatest difficulties experienced on the first making of very large reflecting telescopes, and the means of adequately meeting it engaged the attention and invention both of eminent makers and eminent astronomers. It is this kind of difficulty which is stated in general terms by Mr. Maxwell. "The fundamental principle is, that the construction of the instrument should be adapted to the use that is to be made of it, and in particular that the parts intended to be fixed should not be liable to become displaced; that the parts which ought to be movable should not be liable to stick fast; that parts which have to be observed should not be covered up and kept in the dark; and that pieces intended to have a definite form should not be disfigured by warping, straining, or wearing." And therefore it is necessary, in putting an instrument together, to consider carefully the strains and stresses which will be brought to bear on each part. And in regard to this a guiding axiom to be kept in mind is that "a rigid body has six degrees of freedom." The materials of which instruments are formed are not absolutely rigid. "Hence, if a solid piece is constrained in more than six ways, it will be subject to internal stress, and will become strained or distorted, and this in a manner which, without the most exact microscopical measurements, it would be impossible to specify." Upon due provision against such distortion depends much of the accuracy and value of many observations; an accuracy which is, however, never complete, unless by accident, as it is now a recognised fact that accuracy, in the mathematical sense of the word, is impossible, and the results from the best and most carefully-made instruments have to be corrected for known errors, such correction being a systematised part of scientific observation. Some of the various principles which have been employed to reduce these inevitable inaccuracies to a minimum are briefly touched upon in Mr. Maxwell's essay, and this subject alone would form a most suggestive basis upon which to examine the special merits of some of the numerous appliances exhibited here, with the view of judging (so far as a minute inspection is possible) how far and how nearly they really perform that which it is their object to perform.

Among curiosities of the exhibition we may mention that the "Rocket" locomotive and Newton's little reflecting telescope are among the objects to be seen; two, perhaps, of the most interesting specimens of work in existence, in regard to their history and associations.

A COLLECTION OF ORIENTAL WORK.

MESSRS. JACKSON & GRAHAM, the well-known furnishers and decorators, of Oxford-street, have just added to their establishment a special department for the display and sale of works chiefly of Japanese ornamental art, including also Chinese and other work; by far the larger portion, however, being Japanese. The collection includes some of the finest specimens of lacquer work we have ever seen, chiefly applied to writing-cases and such articles. In addition to lacquer-work and *cloisonné* enamel, and other among the now well-known branches of Japanese art-work, are some curious and (in this country) almost unique examples of some kinds of manufacture not practised at present in Japan, and of which there are few specimens to be found. The collection, for which Messrs. Jackson & Graham have employed special agents for a year past, has been made with the view of representing, so far as possible, every style of Japanese art, and it is well worth the attention of those who wish to pick up what is unquestionably rare and genuine, as well as beautiful, in this remarkable class of work, the merit of which, within certain limits, can hardly be exaggerated.

The peculiar and wayward fancy of the Japanese art-workman is well illustrated in many things in the collection; in the little water-bottles, for mixing the Indian ink, for instance, which form part of the writing-case fittings; these take all kinds of fanciful and unexpected forms; and so with other articles of practical use. This kind of treatment would partake of affectation if employed in English work; in Japanese work it is always pleasing, because the offspring of a genuine and native humour.

Among the leading items in the collection are two elephants cut in dark grey jade, with tusks of white jade, and mounted on enamelled stands, which formed part of the ornaments of the Summer Palace of Pekin, of the destruction of which so much has been said.

THE GLACIARIUM; WOOD-WORKING MACHINERY.

SOCIETY OF ENGINEERS.

ON Monday last, the members of this Society had an interesting out-door tour in Chelsea, where they visited the Glaciarium, or skating-rink of real ice, that has been opened experimentally by Mr. Gamgee, of refrigeratory fame. The rink is in area rather limited, and the evolutionists upon the ice are hence circumscribed and hindered in the graceful display they might otherwise make. The walls are lofty, and divided into four bays on the sides and three on the ends, the lower parts of which are adorned with views of Alpine, glacial, or frozen regions, real or imaginary. The rink has an open-timber roof, and has its natural and artificial light from a height somewhat above the wall-heads. There is a gallery at each end for spectators, and no visitor is allowed on any pretext to pass upon the ice unless properly shod, *i.e.*, with skates. Mr. Gamgee gave an interesting explanation of the manner in which the ice is prepared, and a description of the machinery in use for the purpose, which, when changed from the ether process, for which it had been designed, and adapted to the use of sulphurous acid, SO_2, would, he felt sure, revolutionise the art and practice of refrigeration. The visitors, unusually numerous, appeared much pleased and interested.

The visitors next proceeded to the extensive, recently remodelled and enlarged, wood-working machinery factory of Messrs. A. Ransome & Co., where they were received by the heads of the firm and their manager. The progress through the works followed pretty closely the process of manufacture, commencing with the partners' rooms and the general offices, in which orders are first received and finally dealt with, passing from the drawing-office to the pattern-shop, and thence to the smiths' shop, turnery, and the large fitting-shop, plentifully supplied with modern machine tools of the best descriptions.

The inspection terminated, and the interest of the visitors culminated, in the large "trial-shop," in which a variety of completed machines, waiting delivery to those by whom they had been ordered, were also ready for being shown in operation. The trial-shop has its own engine, with steam kept up, so that any of the machines in it may be put in motion at pleasure. Several machines were in succession shown at work, those exciting most interest being the novelties for cask-making. One series of machines saw and joint the staves; joint, dowel, and turn the ends; set up, truss, and groove the staves; and another was also being designed for making the wooden hoops. The machines perform their work very clean, and with great rapidity. The length of time spent at the Stanley works prevented the visitors from doing more than scant justice to the Oakley works of Messrs. S. W. Worssam & Co., next visited, where also some very effective wood-working machines were shown. The members and their friends brought the pleasant and interesting proceedings of the afternoon to a close by dining together in the Cannon-street Terminus Hotel. Mr. Nursey, the secretary, did duty efficiently as conductor.

GUILDHALL LIBRARY.

AN interesting, and, indeed, important experiment is about to be tried in the Library of the Guildhall, London. In December last, petitions from warehousemen and householders, carrying on business within the City of London, and their *employés* and others, praying the Court to extend to them the advantages and benefits of the Guildhall Library, by throwing it open every evening during the week, were referred to the Library Committee. On the 23rd of March the committee brought up a report recommending that, as an experiment, the library should be opened to the public for twelve months, on every evening during the week, except Saturday, until nine p.m., and closed on Saturday at two p.m. Also submitting sundry recommendations as to additional staff required and other expenses to be incurred consequent thereon, at a cost not exceeding 1,060*l.*, exclusive of gas and warming, the cost of which would be about 500*l.* more. This report passed the Court of Common Council intact, and the time fixed for the evening opening is now definitely settled for Midsummer day, the 24th proximo. It is to be hoped that the experiment will prove a sufficient success to warrant the continuance for a permanence of the heavy additional expense which the opening in the evening necessarily occasions.

The late chairman of the Library Committee, Mr. John Symonds, forwarded this matter very warmly, and at a dinner given not long ago, under the presidency of Mr. Reginald Hanson, F.S.A., the present chairman of the committee, a testimonial was presented to Mr. Symonds, consisting of a drawing-room clock and a pair of vases, in recognition of their esteem and regard, and their high appreciation of the value of his services during last year.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-fifth election of pensioners on the funds of this Institution was held on Thursday last, at Willis's Rooms, St. James's, Mr. George Plucknett (treasurer), in the chair, in the unavoidable absence of Mr. John Aird, jun., President. There were vacancies for three pensioners,—two men and one woman. The male candidates were:—Evan Jones, aged 67, plasterer (fifth application); William Stribling, 74, carpenter and builder (fourth application); and Henry Atkins, 72, builder (second application). The female applicants were Harriet Thorpe, aged 60, widow of an eleven years' subscriber to the Institution; Eleanor Winter, 60, widow of Charles Winter, builder; and Susannah Webb, 60, widow of Thomas Webb, builder,—all being candidates for the first time. Messrs. Thomas Stirling and Matthew Hall acted as scrutineers, and at the close of the poll reported that the successful candidates were William Stribling, 4,127 votes; Evan Jones, 3,141; and Mrs. Thorpe, 1,335. Votes of thanks to the chairman and the scrutineers brought the proceedings to a close. We may note that a courteous secretary to the Institution has been found in the person of Major Brutton, who, as announced in our report of the annual dinner in November last, has been appointed in the room of the late Mr. A. G. Harris.

BUILDING FOR THE PARIS INTERNATIONAL EXHIBITION, 1878.

THE commissioners appointed to examine the various projects (ninety-four in number) have selected twelve, each of the authors of which will receive, for the first six 3,000 francs, the three following 2,000 francs, and the remaining three 1,000 francs. A select committee will meet in a few days to ratify the choice of the above, and appoint an architect to carry out the construction, and he will select from the designs chosen the most salient points calculated to give beauty and commodity to the building. From our personal inspection of the designs, we should think it not unlikely that the architect will borrow largely from those exhibited by Messrs. Davioud & Bourdais, on account of their simplicity and lightness.

MASTERS AND MEN.

Cardiff.—A strike of painters took place on Monday last, the 22nd inst., at Cardiff, owing to demands which the masters refused to concede.

Bristol.—The strike and lock-out amongst the house-painters and decorators of Bristol still continues. Out of the 700 men who have been locked out, about 250 men have obtained work in other towns, whilst small bodies of the non-society men have formed co-operative companies, and are obtaining work from private sources. The men are determined not to resume work unless their demands of one penny per hour are conceded.

Bradford.—The strike of night-soil men in Bradford has had a speedy termination. The situations vacant by the strike of the twenty or thirty "throwers out" were all filled up on the 17th inst., and several applicants had to be turned away. All the "throwers out" are now working according to the new scale of 1s. 6d. per ashpit.

Swansea.—The practical result of the late strike of operative masons in Swansea, for an advance of 6d. per day wages, has been the formation of a masters' association for the whole of South Wales and Monmouthshire. At a general meeting of employers it was unanimously resolved to establish "a properly constituted association, having for its object a desire to protect themselves against unreasonable demands, especially when times are, as at present, in such a prostrate condition, and which, by co-operation, may be averted; to protect themselves against all impositions; and for the welfare and furtherance of trade in general."

Hafodywern, near Carnarvon.—A serious disturbance has taken place at the Hafodywern Slate Quarry, Bettws, Garmon, some five miles from Carnarvon. The manager, it appears, had adopted an exceptional rule by paying the men by the hour, the general custom at other quarries being, in the case of quarrymen, payment by the bargain or piece, and for labourers, by the ton. The men refused to work upon such terms, and a number of Cornishmen and strangers, fifty-four altogether, were imported to replace them. On the 12th inst., during the absence of Mr. Wilson, the chief manager, four men waited upon Mr. Lane, the agent, and, representing themselves as a deputation from some 500 men, who were standing on the hill above the quarry, complained of the mode of payment. Mr. Lane replied that the system was practically in accordance with that in force at other quarries; but, whilst the point was being discussed, the men on the hill went to the upper working of the quarry, and drove the Cornishmen from the level. Several of the Cornishmen were hurt by the stones and other missiles which were freely used; Mr. Lane and his son were badly kicked; and Mr. Andrew Bealth, engineer of the quarry, and one of the shareholders, after being knocked down with a stone and brutally kicked, was dragged some distance on a wagon, and pitched out on a heap of iron pipes. Mr. Bealth is confined to his bed, and it is feared that he has sustained severe internal injuries.

Leicester.—The strike of Leicester painters which has continued for five weeks, has been brought to a termination. The men came out for an advance from 6¾d. to 8d. per hour, which was resisted by the masters, who offered 7d., or an advance, at the same rate as at Birmingham, of ¼d. per hour, which alike met with a refusal on the part of the men. The matter was referred to arbitration, the arbitrator being Alderman William Winterton, J.P., who on Saturday gave in his award of 7¼d., or an advance of ½d. per hour. This has been unanimously approved by the association, and the men have resumed work.

Mexborough.—For a week or two the masons of Mexborough have been on strike for an advance of 1d. per hour. The masters stoutly resisted this, but as there are many new buildings in course of erection at Mexborough and Swinton, a compromise has been effected. The men have agreed to resume work at ¼d. per hour advance.

Oxford.—In consequence of the advance of 1d. per hour not having been conceded by the whole of the masters, some of the carpenters of the city are on strike.

Carnarvon.—The annual conference of the North Wales quarrymen was held at Carnarvon on the 20th inst., Mr. John Lloyd Jones presiding. The report stated that the number of members was 7,460, and the funds in hand 3,094*l.*, an increase of nearly 2,000*l.* The increase in the wages paid at the several slate quarries in North Wales for the year was stated to be upwards of 150,000*l.* Papers on subjects connected with colliery life were read, and the proceedings closed with a public meeting, at which Mr. Morgan Lloyd, M.P., was the chief speaker.

Willenhall.—An important change has just been initiated in the lock trade at Willenhall. The lockmakers have by a large majority resolved to abolish the system of "hiring" which has for a very long period prevailed in the trade. By this system a workman engages himself to an employer for a term of years, in consideration of a loan of money—ranging from 5*l.* to 20*l.*—to be repaid by weekly instalments. It is stated that owing to the scarcity of skilled workpeople, employers have lately been outbidding each other in the offer of loans, and not only has the trade become disorganised, but the social effects of the system upon the workpeople themselves and their wives and families have been unsatisfactory. Mr. Isaac Spooner, the stipendiary magistrate for South Staffordshire, has repeatedly condemned the system as being little short of "white slavery."

Macclesfield.—A meeting of the master painters of Macclesfield was held on the 15th inst., to take into consideration the application of the operatives for an advance of wages. After considering the application it was unanimously resolved not to advance upon the offer already made of 6¾d. per hour, which places the men in as good a relative position as they have ever occupied towards Manchester and the surrounding towns, their present offer being 60 per cent. more for ordinary hands and nearly 100 per cent. for extra skilled labour than was paid thirty years ago. It was further resolved that the shops remain open until Tuesday morning, the 23rd inst., for the men to return to work, when if those terms were not accepted, the employers would advertise and adopt every lawful means to fill their places.

London.—The Council of the London Builders' Labourers' Amalgamated Union issued, on the 17th inst., an address to the officers and members of the builders', contractors', and general labourers' societies throughout the United Kingdom, in which they draw attention to the fact that,—

"The master builders and contractors throughout the country have allied themselves to the National Federated Association of Employers of Labour, which enables them at any time to take advantage of our present disorganised and helpless condition, isolated as our societies are in various towns and districts."

The Council then say,—

"With a view of remedying this deplorable state of isolation, and to consolidate and strengthen our position in the future, we have received urgent applications from provincial towns on the subject of federations which have induced the Union of London to instruct their general secretary (Mr. P. Kenny) to issue an appeal to the societies to send representatives to a congress of delegates, to be held on Monday, August 7th, for the purpose of discussing and arranging the plan of a national federation."

Douglas (Isle of Man).—The Douglas (Isle of Man) masons have struck work for an advance of 4s. (to 28s.) a week, the masters having only granted 27s. The joiners lately obtained 27s.

The Cathedral Dispute in Bristol.—Canons Norris and Wade, who objected to the resolution of the Dean and Chapter directing the peremptory removal of the statuary of the north porch, have resolved to appeal to the Visitor, who is the Bishop of the diocese, to hold a visitation under an old statute, and hear arguments of counsel on either side with regard to the legality of the removal of the figures. Counsel has been retained, and proctors are actively engaged in getting up the case.

IN AMERICA FOR THE FIRST TIME.

IT is worth going away for a long journey, as it makes you so keenly alive to the great kindness of your friends which your proposed undertaking invokes, and the good wishes on their part that it inspires. Fortified with this feeling I made my way to Liverpool the day before the steamer started. At the hotel there I could not help remarking the change in manners and customs that has been produced in a comparatively few years. At the next table was a party dining, who partook of light red wine and Perrier-Jouet champagne. Before the days of free trade they would have been drinking of brandied sherry and black port; but then it was thought right to impose heavy duties on French wine because we fought that nation, and to give privileges to Spain and Portugal, who took our money from us, which they never repaid. Every young man who now takes his pint of "fiz" would have been thought an enemy to his country, and on the high-road to ruin, though for all that he may be "ganging the same gate," if his means are not proportionate to his tastes. On board I soon found the difference between personal assertion and personal experience. Many Americans have told me that they would rather cross the Atlantic twice than the British Channel once. I have never been on the Zuyder Zee, but if that ever rolled like the Atlantic, then the immortal Van Dunk was perfectly justified in refusing to take water only in the quantity suggested by the lines that have been so beautifully harmonised by our national composer,—

> "That a rose supplies
> When a dew-drop lies
> On its leaf in a summer morning."

After the rolling, pitching, befogging that I experienced, and even though I am assured it was a good passage, I will never hear the "little white streak" depreciated without a strong protest. It is only just, however, to acknowledge the thoughtful care that is taken on the Atlantic steamers to ensure the comfort and safety of the passengers. Another experience of the same sort was the assertion of a lady, who has just published a book upon America, that an American always carries a revolver in a pocket made for the purpose in his trousers. If this playful custom exists, I have not yet discovered it, thus far.

On the voyage, the great object of interest outside the ordinary amusements was the exhibition and explanation of the "radiometer," the instrument illustrating the discovery of Professor Crookes, that light has a motive power. It was shown by Mr. Hicks, of Hatton-garden, who was proceeding to Philadelphia to have it placed in his case of mathematical and scientific instruments, for which he has patents, and which will form one of the most interesting collections at the "Centennial."

But there is always a yearning for the undiscovered that may yet satisfy men's needs. "Could you not," said one of the officers, who had been distinguished for great pluck on more than one occasion, "invent a light that could be seen in a fog?" This is a query I repeat to the readers of the *Builder*. Can any one supply the one need that would remove the only anxiety that a sailor seems to feel in making this voyage?

The first impression of New York was most favourable. I spoke to the Custom-house officer who came on board, and told him that it was my first visit. He replied, "Well, when you are on shore, you shall have as little trouble as possible, and we will start you pleasantly." And then I crossed by the ferry to the Island of Manhattan: so called, from the abbreviated name given to it by the Indians, as I found by a local history in the room of the hotel. When Henry Hudson, on the 3rd of September, 1609, entered the river to which his name is given, he made a bargain with the Indians for land, and the negotiations were lubricated by a plentiful supply of "fire water," and the natives ever afterwards called it "*Mana hactanienks*,"—the place where they all got drunk.

Every stranger, on visiting New York, must have a strong opinion that it is the worst-paved city in the universe. This opinion will be modified on visiting Philadelphia. There are two sides to every question. On asking one of "Young America" (the representatives of which are very much like those of "Young England" both in dress, manners, and tastes) why he and his friends did not start some Hansom cabs, he replied that they had done so, but the bad pavement had crippled the horses and disabled the cabs. I then made inquiries about the paving, and found that it was as great a problem as the drainage of great towns with us; that he who could solve it would be not only a great benefactor to his species, but also attain the "mighty dollar." The extremes of temperature that New York experiences render any permanent roadway quite an impossibility. They have tried stone, wood, and asphalte: they all seem to share the same fate, and leave the streets in a series of furrows, over which it is torture to be conveyed. The only resource is the street-cars, which, running on a tramway, give an easy and pleasant conveyance; but as these are not limited to carry a certain number, they are crowded beyond endurance; and I have over and over again been astonished to see numbers of fashionably-dressed ladies jammed in with reeking niggers and fusty mechanics and labourers. Here, at Philadelphia, they have started a number of comfortable wagonettes, to convey visitors to the Exhibition. I tried one, and soon found the origin and necessity of the American expression, "Hold on." "Over the stones it rattled my bones," and I felt so dislocated that I was inclined to ask the men who were putting up a plaster cast of some extinct animal, whether they would kindly go over my limbs, and see which were out of place. If I come back whole, it must be due to no other cause than the strength of the ligatures with which Nature has blessed me. Here, then, is a future for some coming McAdam, to make a road that will endure in spite of zero in winter and 100° in the shade in summer. As to how the multitude will get to the building to-morrow I am puzzled, as it is raining in torrents, and I am afraid the "cobbles" will be looser than ever. Having seen a great many interiors in New York, I can confirm what was lately stated in the *Builder* with regard to the comfort, convenience, and elegance of the private houses; the only exception that I could take would be to the warming apparatus, which too frequently gives the owners a facility of making the house much too warm, and creating a danger when one has to face the hard dry cold without. The picture-galleries which are attached to some of the houses are specimens of what ingenuity and taste can do to make a temple for the owner's household gods. I have seen the choice collections of Mr. John Taylor Johnstone, Mr. Belmont, and Mr. Marshall O. Roberts. The clubs of New York are the perfection of management, and the privilege the members have of putting down the name of a visitor during his short stay far exceeds anything of which our hospitality can boast in London.

I visited the Law Courts, and heard one of the numerous cases of which we can show a good return, the malversation of directors. The principal director and delinquent was the very counterpart of a gentleman that I had heard tried before I left England. His brown wig, his coolness, and his "cheek," all proved that Nature frequently casts her knaves in the same mould.

I also went to the Egyptian building, on approaching which I knew, by the ragged, crying women, that I was near a police-court. This is the Tombs,—a court and a place of detention. Two magistrates were sitting in petty sessions. Those who appeared for the prisoner were of the same stamp as may be seen in England; but that most unlike our proceeding was calling the prisoner to the stand, administering an oath, and taking his version of the affair. I afterwards visited the cells with a warder, who seemed the personification of benevolence and mild speaking. Without any morbid sentiment about prison discipline, I cannot assent to the propriety of placing two, three, or even four persons to share the same cell and the same bed. There were two burglars, who had been convicted and sentenced, one to ten, the other to four, years' imprisonment, both in the same cell, which was, doubtless, most agreeable, thus enabling them to review their past and prepare for their future. But what is to be said of punishment or reformation? Perhaps reformation for crime has to be classed with smaller domestic vices, which may be illustrated by the reply a lady made to me when we were speaking of a young lady whose parents objected to her marrying a man who was given to intemperance. "No doubt," I said, "she thinks she will be able to reform him." "No man can be reformed who has one thousand dollars a day," was the answer.

The Masonic Hall is a building of great importance. A stranger in the land, I "worked in" to the Copestone Lodge, No. 641, and very rigid the work was. After I had passed the portals I was most cordially received. There are eight lodge-rooms in the building, and they are all occupied every night in the week, and as there are no banquets or suppers, this constant attention to work must arise from pure love and enthusiasm for the craft. Yesterday morning I started for the opening of the Centennial. I managed to secure a place in a wagonette, which was a great piece of good fortune, seeing that the street-cars were loaded or packed with a freight of fifty or sixty.

Besides the invited guests, every citizen was admitted who could pay 50 cents in one bill. The number admitted it is very difficult to estimate. One paper this morning says that some defect in the turnstiles makes the number an estimate only, and then goes on to say that there must have been from 150,000 to 250,000, a tolerable margin. I had a favoured place on the platform not far from the president, and as the mass congregated there to hear the speeches and the music, and though the citizens were densely packed, I should say the smaller estimate far exceeded the number present. When a march by Wagner had ceased, Bishop Simpson made a long prayer amidst many cries of "Down with umbrellas!" which had been opened in consequence of the intense heat of the sun's rays. Not a single awning having been erected, the poor conductor of the concert was obliged to put on his hat for protection. The impatience during the prayer was shown by a gentleman next to me, who exclaimed: "Well, if every one is going to *spread himself* in this way we shan't get done to-day."

He finished, and there was more music, the vocal part of which was very good. Mr. Whitney, of Boston, obtained a well-deserved encore for a bass solo in the cantata. Before the president spoke the citizens who had been swaying to and fro only restrained by a rope and a few policemen, broke down the barrier, and the confusion was intense. The platform on which I was had to be cleared in order to prepare an avenue down which the procession was to pass, and I with hundreds of others sought refuge in the fine-art department of the memorial building. I went into the English division, and I was immediately at home with many old familiar friends. The pictures are well hung, and have a very good light. I walked round to see which pictures attracted the most attention. The greatest crowds by far were in front of "The Marriage of the Prince of Wales," by Frith, lent by her Majesty. Next to this, I should say "The Casual Ward," by S. L. Fildes, lent by Mr. T. Taylor, attracted the greatest attention. Very many were looking at Frith's "Railway Station," but railway stations in America are so different from those in England, that the gazers did not seem to understand it; just as they passed by as a thing most incomprehensible "The Three Jolly Postboys,"—a genus not known on this side of the Atlantic. There were small and quiet admiring groups about the other gems accordingly as they appealed to the sentiments. "Early Days," by Millais, lent by Mr. C. P. Matthews, inspiring bright hopes, or in the contrast of depressing sorrow in the picture of "The Village Funeral," by Holl, lent by Mr. J. Akroyd. There was one which I had not seen before, "The Five Sisters of York," by Mrs. Louise Jopling, a picture of rare merit. The sister with the blue eyes and the golden hair shows that the artist has studied Millais with great effect. The owners who have thus "loaned" their household gods deserve a large tribute of gratitude for the risks they have run; but it will be gratifying to them to hear that in the transit not a glass was broken, nor the slightest portion even of a frame injured.

After this I went into the grounds, which I found in the most terrible disorder,—grass all trampled out of existence, paths which had been saturated with the previous day's rain converted into quagmires, with thousands of "footprints" to record the celebration.

The President had proceeded through the building, and declared the Exhibition open. The majestic driving-engine, erected by Mr. Geo. H. Corliss, of Providence, U.S., was doing its work, but there was very little ready to be driven. The Walter Press, of the *Times*, was, of course, one of the first to start, and attracted an immense assemblage of spectators. In the afternoon the rain fell very heavily, and the grounds, which before were bad, became terrible in clay sloppiness. There was no cessation of the rain, and I was compelled to walk, seeing hundreds, nay thousands, of poor draggled women taking shelter, waiting for a chance of getting a place

in a "street car"; and thus ended the opening of what was little opened. It will take a long time to complete the Exhibition, and then perhaps there will not be much to show, as many exhibitors expressed to me their dread that their products would all be destroyed by the manipulation which the Americans seem to claim as their right. F. S. A.

THE WORKS AT THE BRITISH MUSEUM.

THE great institution at Bloomsbury is, in many respects, so valuable that the nation never grudges any expenditure really required for its enlargement and enrichment. The latter process cannot, of course, go on under the existing system without the former; but there are two sets of opinion to consult. There are those who regard the Museum as a place for popular show, and for the amusement of Easter, Whitsuntide, and Christmas holiday-makers. These have, by a variety of arguments, advocated the retention of all the collections, zoological and others, included under the head of Natural History, which, without being ornamental, are undoubtedly instructive and curious. There are others, however, who insist, with equal emphasis, upon the removal of these departments to South Kensington, where, indeed, an addition to the ever-expanding group of structures is already being prepared for their reception. That the transfer will take place by degrees is possible, since the space now marked out could not accommodate that vast array of stuffed animals and crowded cases in which so much of science is illustrated, for the eye of the multitude, in the heart and centre of London. But it has, to all appearance, been resolved upon, though we may not have heard the last of the Parliamentary discussion on the subject. There is certainly force in the objection that these cabinets, upon which Cockneys and country cousins so love to gaze, will, for the future, be placed at a distance inconvenient to many; but day by day the tendency increases to seek for pleasure beyond the denser thoroughfares of the metropolis. If the change, moreover, be an objectionable one, the choice simply lies between it, and allowing treasures of priceless worth and incomparable beauty to moulder invisibly in the sheds or cellarage of a building no longer capacious enough for their display. The whole multifarious dead menagerie must, then, be swept away in order that the edifice may become a kind of British Vatican, in a special sense, of Art and Archæology. In this case, there can be no appeal to the intentions of the founder. His original suggestions have, over and over again, been swamped, his plan improved out of sight; and the question is now a purely national one, though to judge from the acts of the trustees, from time to time, it would seem as if they regarded the Museum as a sort of corporate property, if not a private estate, privileged with large allowances by the House of Commons, but with the control over which the public have nothing to do. Extensive alterations are now going on which, in many respects, appear likely to be improvements, in that Temple of all the Styles, from its roof almost to its foundations, and what their ultimate cost may be it is impossible to tell. Already, the first calculations have been out-grown in a proportion of nearly two-thirds, and it is certain that the estimate of last year will be altogether inadequate to carry out the architect's designs. In fact, it is not yet absolutely settled at what point the dilapidations and restorations stop, since there are frequent consultations of the trustees, and the vote of last session was, practically, only one on account. The official statements are exceedingly vague, but these are purposely so, because an obvious,—indeed, an avowed,—disinclination exists that the matter should be canvassed at all outside of the Bloomsbury gates. It is impossible, for example, to elicit a word concerning the Natural History collections, but their disposal was a foregone conclusion, long ago. If, however, the trustees are exercising a legitimate power, we are far from denying that they are exercising it in an apparently judicious manner. The quadrupeds, birds, insects, and reptiles, in the course of a few years, would fill the place to bursting, and even now an immense wealth lies hidden, if not decaying. But the new scheme cannot be expected to receive its full development in less than at least a year,—that is, if all the expansions contemplated, though not laid down on the actual plans, are to be carried out. So far, a considerable proportion of the underground labyrinth, involving very essential arrangements, has been temporarily demolished, and huge timber frameworks and palisadings occupy its place, the reasons alleged being the number of complaints, and certain sanitary obstacles to be overcome. Instead of the present approach to the reading-room, the finest in Europe, though possessing too much of an ephemeral character, and not belonging to the original design, a lobby of half the length is to be substituted, entered through a new Antiquity hall, to be fitted up for the reception, it was hoped, of some, at any rate, of those marbles which have so long been mouldering in those pent-houses of pitch-and-pine, that contain an unknown opulence of unique treasures. It would be a satisfaction to see them decently sheltered and systematically exhibited, anyhow. Yet the most cursory investigation shows that these neglected riches are not to be taken in, and the ground for their exclusion is that they are in course of restoration or repair. Then why create a workshop, in the shape of a scarcely-waterproof series of black sheds, against one of the few modern façades of any magnificence in the metropolis? Surely, the work might be conducted elsewhere, leaving the grand columnar portico free from an excrescence that threatens to be permanent. To continue, however, with reference to the improvements. That in the basement, to be rather incongruously mixed up with lavatories and their appendages, is designed for relics of architecture and sculpture,—unless, indeed, some fresh inspiration seizes the trustees; but very many of these are, as yet, unpacked, so that the abandoned accumulations of the last few years, which we saw the other day in a state of indescribable chaos in the shanties outside the building, will be left in that condition still, except when some unhappy specimen of restoration, worse almost than any mutilation, is added to the interior galleries, which we are bound to say are generally superb. The other new room above this, which is to supersede half of the long approach, with its offices, to the reading-room,—a corridor painted and decorated at lavish cost a short time ago,—will, according to present intentions, front on one side, to the flank of the really noble staircase,—which is, happily, to be spared, though its removal was suggested,—and, on the other, along the wall of the equally noble King's Library, and will again be devoted to marbles, yet still without relieving the structure from that offensive hoarding in front. This will necessitate the removal of the two *conciergeries*, as they may be termed, and of the ladies' room, with regard to the successor of which great dissatisfaction is expressed, and we cannot but look upon the arrangement as temporary. A comfortable chamber for the purpose was prepared, with a female attendant, when the new reading-room was opened in 1857. It was to be for the exclusive use of lady readers. Two or three years ago, the female art-students were admitted, causing much inconvenience by crowding, and a memorial against the change was submitted last year to the principal librarian. Nothing was done; but matters have been made infinitely worse now; for both classes have been turned into an out-of-the-way passage at the side of the staircase, and which, unquestionably, is not suited to its objects. There is to be a third improvement on the upper and highest floor,—the British Museum, imposing though it be, is a building of only two stories,—and this, also, will be assigned to antiquities. It would, of course, have necessitated the disturbance of a great range of natural history cabinets, had not their removal been simultaneously determined upon; but Bloomsbury begins to breathe at last, and the trustees feel that they have a clear field before them. That they are in earnest is indubitable. Their architect, contractor, clerk of the works, draughtsmen, and workmen, constitute a perfect invasion, and it must be long before peace is restored in that erudite region. But it might be well, before the process has gone too far for criticism, were a question or two put in the House of Commons upon the subject. The public, which supplies the money, has a right to know how it is about to be expended, and there can be no conceivable reason for any mystery in the matter.

There are few topics, not imperial in their nature, upon which more has been written and said than this of the British Museum. Its annals have passed their centenary, and endless have been the commissions, committees, reports, representations, petitions, and pamphlets relating to it. The destinies of our public structures, indeed, are often strange. "The new House of Commons," wrote an architect, several years ago, "surrounded by hall and corridors big enough for the manœuvres of brigades, cannot pack its members." The Museum, to a certainty, cannot pack its treasures. It was contracted for originally at 290,000*l.*; whereas its cost stood, a quarter of a century ago, at 700,000*l.* The architect had, virtually, no exact design; the portico and columns were not contemplated; one gallery was thrown out here, and another there; excavations were made, and walled and arched in; the inner quadrangle was converted into a reading-room, for the use of which,—though it is flagrantly abused,—men of letters cannot be too grateful; and it seems a pity that monuments, so recently disinterred from the dust of Mesopotamia, should continue to be concealed in the dark, or condemned to subterranean galleries. There may be some truth in the suggestion that many of the antiquities are too ponderous to be placed, with safety, on any of the upper floors. The collection, however, downstairs, beyond the Roman corridor, failed to attract, through the gloominess of the vault in which it is stowed away, even when the contiguous crypt was occupied, to their loss, by a series of refreshment contractors. The public would not dine in that darkness, much less wander among ancient marbles. But where is the relief to be looked for? Among the foundations partly, as it appears; for, although the removal of the natural history collection, and the construction of two new rooms above the ground level, will place a considerable area at the disposal of the trustees, the whole of it will be rapidly overrun. Immense additions are being constantly made by travellers, in the hope that they will be cherished as items in the national property. It is clear that they cannot all be got rid of underground. The first suggestion that occurs is the incorporation of the two wing buildings, now inhabited by functionaries who might surely be housed elsewhere. This would give an extension of at least four large and lofty galleries, and confer an air of completeness on the structure which it is at present far from possessing. These rows of official lodgings are altogether out of harmony with the edifices upon the legitimate purposes of which they encroach. As it is, the works in progress are only nibblings at an enormous mass of overloading. In other directions than that of the official residences, there is little chance of expansion. We could not possibly abolish the grand forecourt, and build up to a line with the street. Elsewhere, incalculable ground-rents, increasing in value, block the Museum; so that, after the alterations actually going forward, the expulsion of the zoology, and the taking in of "the Panizzi Palaces," other processes of weeding may be expected, though the idea is a doubtful one of purging the library of the tons upon tons of trash,—not belonging, in any sense, to literature,—which it indubitably contains. In this respect, the trustees are bound by regulations, and very little discretion is permitted them. Even here "Room! Room!" is the cry, though it may be purchased too dearly. The real integrity of the institution must be preserved, whatever else is sacrificed. The country is proud,—which gives it a right to be jealous,—of the British Museum.

PROPOSED SUBWAY NEAR THE TOWER.

PROBABLY no more important suggested improvement affecting the metropolitan area is contemplated than that now under the consideration of the corporation for the formation of a new communication east of London Bridge. Originating in the desire simply to relieve the over-crowded traffic on the bridge, it became evident that, for the traffic of the large population below bridge, to which this overcrowding is chiefly due, some more direct means of communication was required than the circuitous route by London Bridge, and after much discussion it was finally resolved to reconsider the question on this basis. The consideration of a work of this nature involves many questions beyond those relating to the immediate wants of to-day, and no doubt this subject will be approached in the liberal and far-seeing spirit which has characterised the later works of the corporation. Only fifty years ago it was a question, in a committee similar to that now sitting, whether it would be sufficient to retain the old bridge or build the present bridge. Within this comparatively short time London has more than doubled its area; the south-east has become a populous manufacturing district, and the north-east one of the most crowded shipping centres in the

kingdom. In less than twenty years the new bridge had become unequal to the traffic, and, had other outlets not presented themselves, the consideration of a new route would long since have become compulsory. Changes are now taking place with still greater rapidity; should, therefore, the proposed route offer facilities likely to induce traffic, a traffic equal to that of London Bridge may be developed in a much shorter period of time.

Among the various schemes (chiefly for intermittent traffic) submitted to the corporation is one by Mr. J. Keith, C.E. Mr. Keith assumes a heavy immediate and ultimate traffic, for the reason, as he points out, that in the line suggested, with the new street now in course of formation from Oxford-street to Shoreditch, the proposed crossing will form part of a continuous route from the extreme west of London to the heart of the southern districts, and will also form the connecting-link in an inner circle of main thoroughfares from Westminster Bridge, by Oxford-street, Shoreditch, and New Kent-road, to Westminster Bridge; it in consequence becomes the most direct line south or north-east for the whole of the metropolitan area outside this circle. Immediate relief is thus provided, not only for London Bridge, but for the equally overcrowded central districts of the City, and an impetus is given to improvement over an extended thoroughfare which, judging from recent experience, will materially alter the character and appearance of a large section of a most valuable area of the metropolis.

To avoid long inclines and high lift, unsuited to the heavy traffic characteristic of the district, or interruption by river traffic still more unsuited to a traffic of the assumed dimensions, Mr. Keith proposes a subway. Unlike the Thames Tunnel, the roadway of which is contracted and at a great depth below the surface, this subway would be a spacious arched-over street, 300 yards long, 55 ft. wide, that is, with two 10-ft. footpaths and a carriage-way equal in width to that of London Bridge, and 35 ft. high at entrance, the roof at which would open immediately on the surface. In construction, a double iron shell, the inner of which would be thoroughly dry, and in appearance an imposing underground hall with clear daylight view from end to end; therefore well ventilated; equally capable of ornamental treatment with an overground hall, and by a mode proposed it is believed that it may be lighted by daylight throughout. The entrances, which are treated architecturally, would be approached by handsome open streets, with easy inclines ranging from 1 in 40 to 1 in 70, commencing near Leman-street, on one side, and terminating at the New Kent-road end of Bermondsey, on the other. The sides of these streets would be utilised for shops, warehouses, and such like.

By the mode of procedure proposed, which it is stated has been endorsed by eminently practical men, it is believed this work might be carried out with rapidity, without obstruction to river traffic, and at less cost per square yard of roadway of section from side to side of river than by any other form of construction.

Carried out in the spirit of the design, this would probably be the handsomest subway known, worthy alike of the richest city and most influential Corporation, and if shown to be practicable within the limits stated, would, no doubt, as far as traffic is concerned, solve the question of below-bridge communication.

OLYMPIA.

A LARGE audience was assembled at the Royal Institution on Friday, 19th inst., to hear a lecture from Mr. Newton on the excavations going on at Olympia, and the discoveries that have been and may be expected to be made there. Commencing with a few words as to the geographical position of the site, once one of the most famous and frequented in all the world, now somewhat less known (for he had been asked several times in the past week, by educated persons, where Olympia was), Mr. Newton gave a short sketch, by way of refreshing the recollection of his hearers, of the nature of the prizes and contests at the Olympic games, drawing attention to the extraordinary and, as it must appear to us, disproportionate enthusiasm called forth by successes which might be compared to those of a Captain Webb, a Sayers, a University boat's crew, in the present day,—events which did not certainly evoke the enthusiasm of a nation, or become the theme of the leading lyric poets of the day. But what lay behind this enthusiasm was not merely the immense importance attached by the Greeks to the culture of the body, but also the fact that such observances and games were regarded in the light of religious rites, as things pleasing to the gods; and this was illustrated by the nature of the Pindaric odes themselves, which were never taken up with merely singing the praises and personal achievements of the victor, but always went back to the history of his nation and to the praise of the gods who had befriended it and him, and to whom the honour of victory was due. The point of these remarks, as bearing upon the subject of the lecture, was that the small plain of Olympia, included in the angle formed by the junction of the Alpheus and the Cladeus, was no mere race-course or exercising ground, but a sacred place, and one therefore where it was not surprising that we should find artistic remains of the highest value and interest, and in great profusion.

In fact, the probability was, that a greater number of important works of art had been collected on this site, in the great days of Greece, than had ever been simultaneously collected on any other spot. Not only was there here the great temple of Jupiter Olympius, but we had the evidence of Pausanias, who minutely describes the temple, as to the immense number of statues, those of victors in the games and others, which formerly occupied the site. That many of these treasures had utterly disappeared there could be no doubt; for it was probable that, after the suppression of the games in the third century, the plunder and demolition of the statuary would at once begin, much of the attack upon them being probably a kind of crusade carried on by Christians against these memorials and witnesses of a great pagan festival. During the centuries that had elapsed the ground level had been raised 13 ft. or 14 ft., and the excavation of the objects, which it no doubt contained in abundance, was, therefore, no light undertaking. After mentioning the names of one or two English explorers who had from time to time visited and investigated the site, Mr. Newton described, by reference to a plan, the parts of the temple which had been discovered *in situ* during the excavations recently undertaken by the Germans, and gave a restored plan and elevation of the temple, which was probably approximately correct, but must be further tested by future discoveries. But as to the sculptured remains already discovered, there was a point in regard to them that was curious, and suggested a good deal. It was known through Pausanias, who was careful in transcribing names of the artists from inscriptions, that the sculpture of the two pediments of the Temple of Jupiter was the work of two able and eminent Greek artists. Fragments had been discovered and put together, as already described in our pages, in sufficient quantity to identify one of these pediment groups as one of those described by Pausanias, and representing two charioteers, one on either side of the central figure of Jupiter Olympius, while the extreme angles were filled up by figures representing the two rivers which skirted two sides of the plain. Thus the disposition of the plain itself, the temple of the god as the central object, the racers on either side, and the two rivers forming the boundaries, was repeated, as it were, conventionally or symbolically, on the temple itself; and the position of the two river-gods in the angles furnished another exemplification of the similar arrangement and idea in one of the pediments of the Parthenon. But the significant fact about this sculpture was, that though attributed on pretty safe authority to eminent sculptors, and though the general design had a greatness of style which fully bore out such an idea, the execution and detail were, without doubt, in the judgment of other critics besides himself, coarse and inferior. What was to be inferred from this? Mr. Newton was of opinion that this group furnished a clear proof that works of sculpture were not always executed in ancient Greece by the sculptor who gave the design, and, as it might be said, inspired the work; that sculpture was "put out" for execution in this and (by analogy) in other cases; and that here we had the idea of the eminent artist carried out by the provincial carver. Adjoining the place where this pediment sculpture was discovered was found a single statue, wanting the head and arms, but in sufficient preservation to show that it was the production of the highest art of Greece; and though, no doubt, an immense quantity of what had been there was for ever lost or destroyed, there was every reason to believe that further investigation would lead to the discovery of many more relics of sculpture of equal artistic value with this. A circumstance that gave a great deal of archæological and historical interest to the excavations at Olympia also was the large quantity of bronze inscriptions that were found, which had formed descriptive tablets in connexion with the statues of victors in the games, and from which much curious and some valuable information might be expected. In concluding a very concise and well-arranged lecture, Mr. Newton said a few hearty words in recognition of the spirit and enterprise shown by the German excavators and their Government, to whom we were indebted for laying open these memorials of the great age of Greece, and suggested the desirability of England evincing sympathy with these labours by affording practical assistance, at least in the way of subscription towards the expenditure incurred in carrying them out,—a suggestion which met with the entire concurrence of those present, and which, as readers of the *Builder* need hardly be informed, we fully endorse.

In regard to the remarks offered by Mr. Newton with reference to the poor execution of the pediment sculpture discovered, and his deductions therefrom, we may remind the reader of some rather similar remarks made by Mr. Leighton recently, at the meeting of the Institute at which Mr. Fergusson's paper on the Erechtheum was read, and briefly reported in our columns at the time, relative to the slight variations, not only of execution, but of details of design, in the female figures forming the columns of the well-known porch; which figures, nevertheless, all follow one general design, and are evidently carved from one model. Such incidents as these are of the highest interest in their bearing upon our knowledge of what the process and principle of the Greek sculptor's art really was.

THE LATE MR. DAVID BRYCE, R.S.A.

MR. DAVID BRYCE, the eminent Scottish architect, who died in Edinburgh on the 7th inst., was the last of a school of architects whose influence was such that in all probability they will not be succeeded by a similar class. The profession was not in his earliest days crowded by a host of aspirants jostling each other in the race, but was confined to a few men of mark, each of whom was characterised by a peculiar excellence.

Mr. Bryce was born in 1803, his father having been a builder in good practice in Edinburgh. He was educated in the High School of that city, and having, at an early age, exhibited an aptitude for drawing, he entered the office of the late Mr. Burn, whose partner he afterwards became, a connexion which continued till 1844, when Mr. Burn left for London. After this, Mr. Bryce carried on the business on his own account until a few years ago, when he assumed Mr. Robert Anderson as a partner,—an arrangement which only subsisted for about twelve months, when Mr. Anderson retired from the connexion, since which Mr. Bryce has continued his business in conjunction with his nephew, Mr. John Bryce, who is carrying out the works his uncle had in hand.

The works of Mr. Bryce are distinguished by two leading features,—adaptability to circumstances and position, and propriety of plan and arrangement. Imbued with true artistic feeling, Mr. Bryce was ever careful as to the *ensemble* of his works, and to their fitness for the position they were to occupy, and harmony with the surroundings. When he had a work on hand where anything like scope was allowed to his powers, he wrought upon it as a painter does upon a canvas on his easel, recurring to it again and again, altering proportions, and rearranging the grouping of masses, and in doing this he did not hesitate occasionally to obliterate what had cost much labour.

Perhaps no man in the kingdom has altered more mansion-houses than Mr. Bryce. Many an inconvenient, comfortless dwelling has been by him converted into one of the most comfortable residences, and many a tame, uninteresting, common-place mansion rendered a picturesque feature in the landscape. One source of his success in carrying out such alterations was that he allowed no obstacle to stand in his way, and he was permitted to do what other men would not have dared to suggest; indeed, the alterations were often so extensive as to amount to nearly an entire reconstruction, leaving hardly a scrap of what had formerly existed.

Mr. Bryce was cosmopolitan in style. He has designed buildings of almost every description, and in the most various phases of architecture; but it was in the adaptation of the Scottish Baronial style to modern wants that he was most at home. He may, indeed, be said to have revived the style, and in many of the most picturesque spots in Scotland examples of his handiwork appear. Whatever differences of opinion may exist as to the propriety of using such a style for a modern dwelling, it cannot be denied that it harmonises wonderfully with the Highland scenery, and common sense was not ignored by Mr. Bryce for the sake of style; for the residences designed by him are models of comfort within. Mr. Bryce did not, however, confine himself to this style whilst designing a mansion house; for, upon occasion, he used the Elizabethan, Jacobean, Palladian, and Renaissance styles, all with considerable freedom of treatment.

In public buildings for large towns, such as banks and insurance offices, he invariably adopted either the Palladian or Italian manner, and these are invariably characterised by breadth and solidity of treatment rather than by beauty and delicacy of detail. It was in ecclesiastical architecture that Mr. Bryce was least successful. When Gothic was the style he adopted the influence of the baronial style was seen in the effort to produce picturesque effects, which led to the use of impure and misplaced detail, and an oversight of the proprieties of ecclesiastical sentiment. When, however, he used Gothic for other purposes, he was more successful, as he invariably chose the later phases of the style, which are somewhat allied to the Scottish Baronial. His finest work in this manner is the Fettes College, a building rich in detail, beautifully proportioned, well balanced, and picturesque in arrangement.

Either because his time was so much occupied, or for other reasons, Mr. Bryce declined to enter into competitions. The only instance in which he departed from this rule was in the case of the competition for the Edinburgh Albert Memorial, which he did under pressure. The design he then produced was a characteristic one, being a suggestion for a peel tower for Edinburgh Castle, in a vaulted chamber on the ground-floor of which was to be placed a marble statue of the Prince.

The extent and variety of Mr. Bryce's practice were such that entry to his office was eagerly sought after by young men desiring to study the architectural profession, and many of the most successful architects in Scotland and elsewhere have been his pupils and assistants.

Mr. Bryce was Grand Architect for Scotland, a member of the Royal Scottish Academy, a Fellow of the Royal Society of Scotland, and a Fellow of the Royal Institute of British Architects. He was a man of varied acquirements, and although somewhat rough in manner, he was of a warm genial nature, and his company was much sought after by a large circle of friends. He died at the age of seventy-three, and, although vigorous in intellect to the last, the state of his health had for some years past required him to abstain from over-exertion and excitement. He leaves several works in an unfinished state, the most important of which are the Royal Infirmary and the Union Bank of Edinburgh. The drawings for the former are made, and the façade of the latter is completed, except as to a few accessories.

Amongst his most important works are the following:—

Public Buildings.—1843: Life Assurance Company's Office, Edinburgh (Italian). 1846: Exchange Bank, Edinburgh (Italian); Western Bank, Edinburgh (Italian); Western Bank, Glasgow (Italian); British Linen Company's Bank, Edinburgh (Palladian). 1847: Edinburgh and Glasgow Bank, Edinburgh (Palladian); Edinburgh Subscription Library (Italian). 1850: Surgical Hospital, Edinburgh (Italian). 1853: Standard Assurance Office, Edinburgh (Italian); Dundee Exchange (French Gothic); Fettes College, Edinburgh (French Gothic); Standard Assurance, Dublin; Sheriff Courts, Edinburgh (Italian). 1864. Bank of Scotland, Edinburgh (Italian). 1865: Scottish Widows' Fund Office, Glasgow (Italian). 1872: *Courant and Daily Reciev* Offices, Edinburgh (Scottish); Edinburgh Royal Infirmary (Scottish). 1873: Lanark Infirmary (Scottish). 1874: Union Bank, Edinburgh (Italian). 1876: Sheriff Courts, Kirkwall (Italian).

Churches.—1840: St. Mark's, Edinburgh (Italian Renaissance). 1843: Episcopal Church, Dalkeith (Early English); Langholm Parish Church (Gothic). 1856: Congregationalist, Dundee (Gothic). 1858: Falkland Parish Church (Gothic). 1862: Dalkeith Parish Church restoration (Gothic). 1867: Crossgates Parish Church. 1865: St. Andrew's, Canongate, Edinburgh (Norman); Alyth Episcopal (Gothic); Free Tolbooth, Edinburgh (Gothic); Carnwarth (Gothic); West Coats, Edinburgh (Gothic); Free St George's (Italian); St. Mungo's, Dumfriesshire (Gothic).

Mansions.—1841: Bowerhouses, for Mr. Dudgeon. 1842: Lasear, for Mr. Ronald. 1844: Carradale,* for Mr. R. Campbell. 1845: Liny* (additions), for Mr. J. B. Hamilton; Cloth,* for General Low; Armadale; Strattendry. 1847: Incharnie,* for Mrs. Ayton; Currattis*; Glenesk*; Ardarrock*; Balfour,* for Mr. D. Balfour; Tollcross. 1848: Allanbank; Guthry Castle. 1849: Cameron Bridge House; Dargavil. 1850: Clifton Hall* (addition), for Sir A. Gibson Maitland, bart.; Portmore (Elizabethan), for Mr. W. F. Mackenzie; Stronvar,* for Mr. D. Carnegy; Sunderland Hall; Coats Hall,* for Mr. G. Napier; Ormiston Hall,* for Mr. D. Wilkie. 1851: Kinnaghame,* for Mr. A. Campbell Swinton; Gilton,* for Mr. R. W. Borrows; Akergill Tower,* for Sir G. Dunbar; Latheron Wheel (additions), for Hon. B. Dunbar. 1852: Panmure (French Renaissance), for Earl of Dalhousie. 1853: Balcaskie* (additions), for Sir R. Anstruther, bart.; Balgregie; Balfour House (additions), for Mr. C. D. Bethune; Mauladen,* for Hon. W. Maul. 1853: Craigneil; Crossb; Eastend (French), for Mr. T. Carmichael; Muckcross Abbey (addition), for Mr. H. Herbert. 1854: Harrigg* (addition), for Lord Campbell; Kincaid Castle (French), almost entirely new, for Earl of Southesk; The Glen,* for Mr. Charles Tennant; Birkhill,* for Mr. Wedderburn. 1855: Armadale Castle; Oakley,* for Mr. John Sligo. 1856: Torresay Castle,* for Mr. J. Campbell. 1857: Woodcroft,* for Col. Davidson; Pendrich,* for Lord Dess; Capenoch* (addition), for Mr. T. Gladstone; Craigends,* for Mr. A. Cunningham. 1858: Eastburgh (French), for Mr. D. Carnegy; Belladrum (addition—Italian), for Mr. J. Merry; Hircock,* for Major Home. 1859: Cullen House (addition), for the Earl of Seafield; Inverardoch (French), for Mr. J. Campbell; Braukrigg* (addition), for Mr. A. Gilmore; Kous,* for the Duke of Portland; Maulslie,* for Mr. J. Gosser; Fotheringhame,* for Mr. T. F. Fotheringhame. 1860: Craigflower* (addition), for Sir J. Colville. 1861: Craigleith* (addition), for Mr. Wolf Murray; Ford Castle (addition), for the Marchioness of Waterford. 1862: Langton (Elizabethan), for the Marquis of Bredalbane; Silverknowe,* for Mr. J. H. Mackenzie. 1864: Lone Castle* (addition), for Mr. J. Somerville; Dunira,* for Sir David Dundas, bart. 1865: Auchtiardal*; Ballikinrain,* for Mr. A. Orr Ewing, M.P.; Fin Castle Harris,* for the Earl of Dunmore. 1866: Invergarry, for Mr. Ed. Ellice, M.P.; Halheatus (addition), for Mr. J. Johnston; Ormiston, Belfast, for Mr. J. Combe; Castlemilk,* for Mr. R. Jardin. 1867: Langlee* (addition), for Mr. C. Scott. 1869: Blair Castle* (addition), for the Duke of Atholl; Meiklour (French—large addition), for the Marchioness of Lansdown; Broadstone,* for Mr. J. Birkmyre. 1870: Cortachy* (addition), for the Earl of Airlie; Edary, for Mr. J. Fox Tarret; Glenapp,* for Mr. J. Hunter. 1872: Trunsland, for Col. Borroughs; Logan House* (addition), for Mr. J. McDonall; Gaals,* for Major Scott; Lincluden (now in course of erection).

General.—Mausoleum for the Duke of Hamilton; Monument, in Edinburgh, to Miss Catherine Sinclair.

* Those marked thus * are Scottish Baronial in style.

THE THAMES TOLL BRIDGES BILL IN COMMITTEE.

THE Bill introduced into Parliament by Mr. McArthur, M.P. for Lambeth, the object of which is to abolish the tolls upon the Thames bridges by imposing a tax of five-eighths of a penny over an extensive area around the metropolis, has been before a select committee of the House of Commons during the past and present weeks, and evidence has been given on the subject by a large number of witnesses interested.

Amongst the principal witnesses examined on behalf of the promoters of the Bill was Mr. F. H. Fowler, architect, chairman of the Metropolitan Free Bridges Association. He stated before the committee that so strong was the feeling in regard to the freeing of the bridges, that one of the petitions presented to the Metropolitan Board in favour of it was so numerously signed that it had to be carried in by three men. Throughout the whole of South London, more especially, as well as on the part of those residing north of the Thames, there was a very strong feeling indeed in favour of freeing the bridges, particularly since the progress that had taken place in pulling down long lengths of streets and houses on the northern side of the Thames to make room for railways, stations, and street improvements. Over Southwark Bridge the traffic had greatly increased, whereas it had stood still in the case of Waterloo Bridge, and Waterloo-road had been in a state of stagnation for years, although it was the great leading thoroughfare from the north to the Waterloo Station. It was the axis of the metropolis. In one direction it went right up to the north of London, and in the other direction right down to Surrey. It was one of those lines of communication that ought never to be impeded by a toll bridge. With regard to Vauxhall and Fulham and Battersea Bridges, Battersea Park, constructed at a large expense for the benefit of the people, was cut off, as it were, from their enjoyment. Alluding to the clauses in the Bill providing for raising the sum requisite for purchasing the bridge toll rights and freeing the bridges, he said that both the last and present Governments, having objected to take the coal and wine duties as the basis upon which to raise the money required, the Free Bridges Association had brought in the Bill now before the Committee. As a matter of justice it was thought that the area of taxation for paying for the bridges should be as extensive as possible. The ratepayers of the metropolis proper contributed by means of the county rates to keep up bridges outside, which many of them had never seen, and the proportion which the metropolis paid towards the county rates was very large compared to the total amount. As the cost of keeping up the existing bridges outside the metropolitan area was mainly paid by people in the metropolis, there were good grounds why the area contemplated in this Bill should be as wide as possible. Bridges that had been lately freed outside the metropolitan area had been freed by taxes to which all throughout the metropolis equally contributed.

Mr. Mitchell, overseer of Lambeth, gave evidence as to the great burthen inflicted upon that parish by the toll bridges. In the year 1861 the population was 162,000, and in 1871 it amounted to 208,302, and since 1871 there had been a further increase, according to a calculation he had made, of 25,000, showing a present population of more than 233,000. The working classes formed a large proportion of the population, and on this class the tolls on the bridge pressed heavily. The rateable value of the parish in 1871 was 848,250*l.*, whilst last year, 1875, it was 1,064,000*l.*, which was a proof of its rapid increase. There were 33,000 rateable houses in the parish, and of that number about 18,000 were rated under 25*l.* A large number of those rated above 25*l.* were sub-let, clerks in offices, and others, who were not in a position to pay the full amount, letting off a portion of their tenements. The length of the parish was seven miles, and it contained upwards of 4,000 statute acres. It extended from the Thames at Waterloo Bridge southward to Croydon parish. Many persons complained of the hardship of paying toll, and it bore heavily on those whose work was on the north side of the river, and who lived on the south side. With the view of showing one evil of the bridge tolls, the witness adverted to the break in the line of tramway to Victoria over Vauxhall Bridge. Passengers had now to submit to the inconvenience of getting out of the trams at the Vauxhall end of the bridge, and stepping into an omnibus to take them over the bridge, when they had again to change into another tram on the Pimlico side. If the bridge were freed from toll this obstruction might be remedied. With respect to the gradient, he admitted it was rather steep, but the Tramway Company did not think the gradient would cause any difficulty. Should the bridge be considered too narrow for two lines of tramway, the traffic could easily be worked with one, as it was in the Harleyford-road, near the Kennington Oval, at present. A great number of the passengers over Vauxhall Bridge not only came from Vauxhall, but from Peckham, New-cross, and Greenwich.

Several other witnesses were examined in favour of the Bill, including Sir Henry Peek, M.P. for Mid Surrey; Mr. Blythe, hon. solicitor to the Free Bridges Association; Mr. Applegarth, the secretary; together with other gentlemen connected with the Corporation and the Metropolitan Board of Works, Mr. Baxter, the chairman of the Law and City Courts Committee of the Corporation, incidentally stating in his evidence that the Corporation was largely in debt with reference to the Holborn Viaduct improvements, and that that was one reason why they were strongly opposed to the continuance of coal and wine duties for the freeing of the bridges, for they wanted these duties for the purpose of redeeming themselves from the Holborn Viaduct liabilities.

The chairmen and officers of the several bridge companies have also been examined before the committee, and objected to the Bill on the ground that it does not provide for compensation to the bridge officers and servants.

DIFFICULTIES IN PHILADELPHIA.

WE are sorry to hear, and from more than one correspondent, that the English exhibitors and commissioners are at loggerheads, and that the results may be disagreeable. Mr. Jopling has resigned. Fault is found with Professor Archer, and great regret is expressed that Mr. P. Cunliffe Owen was led to retire. "Had he been here," the cry is, "this would not have happened." We trust that the disputants, for the sake of their common country, will be mutually tolerant and forbearing.

Position of the Fine Arts Abroad.—Some of our readers will be glad to hear, as we are, that Sir Charles Dilke has now obtained the papers he asked for (see p. 484, *ante*), as an unopposed return.

THE SOCIETY OF ARTS CONFERENCE ON THE HEALTH AND SEWAGE OF TOWNS.

The conference, or rather proposed series of conferences, on sanitary measures, inaugurated on the 9th of May by the Society of Arts (as reported in our pages), is the indication of a serious and persistent effort to throw light on this important subject. No one could have been present in the theatre,—or great room of the Institution,—without being impressed with the sense of earnestness, evinced not only by the presence of the numerous body of men who filled the hall, but by the whole tone of the proceedings. If we permit ourselves to make any remarks which may appear at all of a critical nature, they must not be attributed to any wish to depreciate or to undervalue a praiseworthy movement, which promises to be of no little utility. It is to aid, rather than to hinder, the good work attempted by the Council of the Society of Arts that we wish to say a few words as to the object and the conduct of the meeting.

It was very well that the right honourable chairman should have had such an occasion of showing that the subject of sanitary reform had engaged his serious attention, and that in those points as to which we have had frequently to contest the wisdom of his official action, he shows good signs of re-consideration. Mr. Stansfeld's opening speech showed that one of the great anomalies of Parliamentary government is not without a certain compensation. It is, no doubt, as has often been remarked, a sad waste of power to place at the head of each great public department, on each change of Ministry, a man devoid of special training for the duties of that department. It may be thought even a greater waste of power to remove him (as the oscillation of the pendulum of party usually does) at the end of the four or five years which may have educated him to the level of his functions. But the compensation to which we refer lies in the fact,—very fully illustrated on Tuesday, the 9th inst., that the cool winds of opposition so invigorate the faculties which might be thought to wither and fade in the hotbed of office, as often to give, in an opposition member, a new servant to the country. The ex-minister, who still pursues the subject which it was his duty as minister to learn, brings to his task a knowledge which no outsider can acquire. And when freed, by irresponsibility of position, from those checks and hindrances which it is not prudent, or even possible, always publicly to explain, such a statesman may be enabled, by a double experience, to suggest very valuable measures.

Besides bringing before the meeting the subject and order of the business of the day, the chairman made one or two references to his own views and efforts when at the head of the Local Government Board which were not devoid of much interest to our readers. He stated that it had been his wish to establish a special sub-department in the office, and that he had been prevented from doing so by the humble and prosaic reason that there was not, in the building at Whitehall, a spare room available for the purpose; a reason that now, happily, no longer exists with reference to the noble premises occupied in the new block of buildings in Parliament-street. This sub-department was to be an inquiry office; a room into which any one interested in sanitary matters might enter, to put any question, and to receive such information, whether by reference to books, returns, reports, or other matters, as it was within the power of the department to afford.

In this projected scheme, it will at once be admitted by our readers, Mr. Stansfeld very faithfully echoed the consistent and urgent pleading of the *Builder* since the first establishment of the Local Government Board. But, as is the case with all echoes, there is only a partial repetition. As to the room, and its inmate, we hold it to be an admirable idea. Mr. Stansfeld even suggested that it might be carried out at the building in John-street. But the project is only a part of what is required. Our contention all along has been that the Local Government Board itself ought to be a great inquiry office. That has been the gist of many an argument of ours. From the very nature of the functions of the Board knowledge of what is going on, in all parts of the country, in sanitary work, must accumulate and concentrate thence. What the country needs is that this knowledge should also emanate and circulate there. Now, the proposal to establish a special sub-department for the purpose of disseminating such intelligence shows a perfect accord in principle between the proposer and ourselves. The difference, then, has been not one of principle, but one of the application of principle. The cause why the necessity did not seem so pressing within as without the offices at Whitehall may have been the over-work, or rather the under-handing, of the establishment. One thing, however, is pretty clear, and that is that if the additional room had been at the disposal of the President of the Local Government Board, or if the simple expedient of hiring a room in Great George-street for the purpose had occurred to him, our wishes would have been necessarily complied with. The Respondent at the Inquiry Office (whatever might have been the title of the officer in question) would have found himself compelled to be something more than a mere literary index. He would have had constantly to reply to the question, "What are our neighbours doing?" He would have had to make himself acquainted with the peculiarities of every locality in which sanitary works were authorised; with the schemes of such works; with the outlay on the same; and with the result, both sanitary and financial. All this he must himself have learned, in order to reply to the questions of the public. But it is just this we have all along urged, namely, that it was one of the prime duties of the Local Government Board to supply. It follows that, if there had been but one more room at the disposal of the President of the Local Government Board, the action of that department would have been exactly that which was called for by the *Builder*. On how small a matter may the efficient conduct of a great National service depend!

On one expression that fell from the chairman of the meeting we must speak with reserve. He called the Local Government Board "the Home Office of the future." This may or may not be the case. The phrase, however, expresses a definite policy, and however we may differ as to the aim of that policy, or as to the steps by which it was attempted to carry it out, we must remember that a settled aim is a very different thing from drifting. One of the great points insisted on at the conference was that rash and hasty expenditure should be checked. Our own opinion is, that the creation of a numerous class of entirely independent authorities was an error. Within the past week or two we have had a very striking illustration of the truth of this view. The Surbiton authorities have applied to the Local Government Board for an order to form a united district, comprising about 170 square miles lying between Ealing, Eton, Croydon, and Epsom, which is now under the divided rule of no less than thirty local sanitary authorities. Throughout this area, closely suburban as it is, and covering only about one-thirtieth part of the area of the Thames basin, doubt and difficulty reign unchecked. Even since the report of Colonel Cox, to which we have to refer, has been printed, the Conservators of the Thames have given notice to three of the authorities in question, whose districts border on the river, not to drain into the Thames. Different schemes are under trial in several of the localities. On one thing only did all these authorities agree,—and that was, in the refusal to agree with Surbiton. Ealing and Acton denied the competency of the Local Government Board to take any action in the matter, as the application had been made by one local authority alone, that of Surbiton, and the Act of Parliament required a concurrent application. That objection was not held to be good by the Local Government Board. None the less was the opposition successful. Some centralising, compressing power is needful to make these independent authorities combine, even in self-defence. It remains to be seen whether the action of the Thames Conservancy will have this effect. At all events, at the very moment when Mr. Stansfeld takes occasion for explaining that the policy of the measure of 1872 was founded on the expectation that local government would so far replace any other mode of government that the Local Government Board would become "the Home Office of the future," we are furnished with a very costly proof that no unity of action or combined intelligence of plans is to be expected from these little independent units, and that however desirable it may be for their common and individual interests that they should unite, they obstinately refuse so to do.

Some of the facts elicited during the discussion (or rather the series of questions, as no argumentative speaking was permitted by the rules of the Conference) were of great importance. The arrangement of the Beddington Farm was stated to consist in the discharge of the sewage through brick carriers on to the surface of the several plots of land. The liquid, to use Dr. Carpenter's expression, "filtered through the grass." The theoretic action then consisted in percolating the surface-soil to a depth of not more than 12 in., after which the effluent water was caught by a catch-water drain, and conveyed to another plot of land, over which it was distributed in the same manner. In case, however, of over-supply of sewage, of neglect on the part of the men employed, or of the soil being less absorbent than usual, owing to rain or any other cause, Dr. Carpenter admitted that the effluent matter might flow from the farm without having been through the ground at all, but only having "filtered through the grass." The absolute need of the passage through the soil is a point on which we have always insisted. Dr. Carpenter, however, gave the idea that he attached much more importance to the action of the roots of plants and the functions of vegetation generally than to the oxidising action of the soil. It would be matter of regret to many supporters of the plan advocated by Dr. Carpenter if the matter were placed on this footing. As far as the absorption of nitrogen goes, the plant is no doubt the natural chemist to whose operations we have to look. But the absorption of the nitrogen (in which Mr. Hope intimated an opinion that great waste took place) is one of the least important sanitary functions which have to be discharged in the purification of sewage. The destruction of the albuminous refuse is the great desideratum. This refuse is entirely unfit to form the food of plants, being in fact effete matter which has passed through the state of animal or vegetable tissue. It has lost its oxygen, and cannot be assimilated by any organic action until it has been recombined with a proper dose of oxygen. This, in point of fact, whether performed more or less rapidly, by one method or by another, is nothing less than burning. In large gravel or sand filters, such as those at Swansea, the distribution of the fluid over a very minutely divided surface, bringing it in thin layers in contact with the oxygen of the atmosphere, effects this object. In other methods, such as in that of General Scott, it is only necessary to evaporate the water, and the albuminous refuse will serve as a fuel, and afford sufficient heat for its own combustion. In the cases where the sewage is merely turned into the sea, as in that of the metropolitan sewage, it is left to the constant agitation of winds and tides to oxygenate the diluted matter,—a mode of action which of course has its limits, and limits which it may be very dangerous to approach too closely. But in each and all of these cases the action is that of inorganic chemistry. It is one in which vegetation can take no part; it is the destruction of that refuse which is injurious to vegetable as well as to animal life. The great problem to be solved in any mode of utilising sewage is the separation of the ammonia, the nitrates, and the phosphates, which form the proper food of vegetables, from the effete albuminous matter which is their poison. When sewage is turned directly on land, it is only by passing through the soil that this can be effected. Dr. Carpenter admitted that he should not allow the effluent water from the Beddington farm to be used for domestic purposes. He observed that it was possible that diluted, but otherwise unpurified, sewage might escape into the Wandle. The absolute destruction of the poisonous matter is, there can be no doubt, a more important object to effect than the utilisation of the chemical elements that are of value. It is thus certain that very much consideration has yet to be given to this part of the subject.

For the rest, the two points in which the proceedings of the Health Conference are weakest are these:—Want of time, and want of systematic cross-examination. No one could be present at such a meeting without being made aware of the value of the information communicated, and of the opportunity offered for putting questions. But the time required for an exhaustive examination of each case is so great, that a couple of days devoted to the subject could make but little impression on the work to be done. The whole of the first sitting, or the first day up to lunch-time, was occupied by the address of the President (which no one could have wished to be shortened), and with the account of two places, Cheltenham and Croydon; and as to these, while there was a great amount of information, both communicated in the first instance and elicited by questions, there was a manifest want of that kind of contradictory cross-examination which is conducted by counsel

in a court of law, or before a Parliamentary Committee. It may seem almost paradoxical to say that the harmony and accord evinced by the meeting militated against obtaining the best results from its work; and yet to a certain extent such must undeniably be the case. It has to be remembered that we have as yet made but little progress in determining the laws of the subject. The very fact that so many different modes of removing and of disinfecting sewage are before the world, and that as yet there is no accord as to what is undeniably the course most proper to follow, shows that much has yet to be fought out. It is our object that such contention should be scientific. But the result can only be attained by a certain amount of opposition. This element the very harmony and good feeling of the meeting made conspicuous by its absence; and so far there is something yet to be desired.

Mr. Stansfeld told the meeting that he had called at the Local Government Office, and expressed a wish that that Department should be represented at the Conference by some of the engineering inspectors. The Department expressed sympathy with the objects of the Conference, but it was explained that the attendance of any of the inspectors was difficult. We may remind our readers, however, that Mr. Rawlinson did afterwards attend, and made some remarks, reported by us last week.

We trust, however, that the idea of an Inquiry Office will not be suffered to fall to the ground. It very little matters in what manner this important object be at first attempted, so that it really be efficiently accomplished. In matters of engineering, and in matters of chemistry, difference of opinion is only another name for want of knowledge. No one has any difference of opinion as to a known process,—it is only when the *rationale* of a process is not understood that any doubt or difference arises as to the conception formed of it by competent men. The sanitary difficulty is one that tends eminently to settle itself, so only that we listen to experience, store up facts, co-ordinate, and explain them. No individual, and no body of individuals can fulfil this function with the ease, thoroughness, and lucidity with which the Local Government Board can provide for the discharge of that duty. Having all along insisted on this fact, it is now very satisfactory to find the late president of the Board expressing the same opinion. We have before said that we owe gratitude to the Society of Arts. Every fresh contribution to our knowledge is of value, and the proceedings of the recent conference have afforded many such contributions. But we must not lose sight of the necessity of an exhaustive, contradictory, and systematic investigation and summary of all that has been done, as well as of all that is doing in the matter, and we trust that the good effects of the meeting will be felt, not only by those who took part in its proceedings, but by the country at large, and by the Local Government Board in particular.

THE BERLIN NATIONAL GALLERY.

"THE new National Gallery in all its details and considered as a whole may be looked upon as a triumph of German art. Architecture, sculpture, and painting have here contended, and poured out their most beautiful and richest gifts, as if to prove to our own age and to posterity that the German people are not only able to win victories in the field, but are the equals of other nations also in the gentler arts of peace."

It is thus that the Germans themselves somewhat proudly speak of their new National Gallery in Berlin, the portals of which were opened on March 22 of this year. It was one of the favourite projects of Friedrich Wilhelm IV. to make Berlin a centre of artistic creation, and thus hide the harsh outlines of the military state beneath the many-hued folds of the Muses. The inscription, "To German Art," may be seen far and wide, near the Royal Castle in Berlin, towering in golden letters over the group of buildings which is to serve as a hall of fame for the producers of art from all parts of the once more united German Empire. This Corinthian building was planned already by the late King of Prussia, to whose brother, the first German Emperor from the house of the Hohenzollerns, however, it was left to carry out the designs.

King Friedrich Wilhelm III. had, with the erection of the old Museum in the Lustgarten—a legacy of Schinkel's, and one of the finest architectural ornaments of Berlin,—already made a beginning in the execution of those constructions which, in accordance with the desire of Friedrich Wilhelm IV. and the plans of the architect Stüler, were to unite, in the centre of the city, but "far from the noisy traffic," all the buildings devoted to the arts and sciences, and which were to be in connexion with the building of the cathedral and its "Campo Santo," and thus form a meeting-place for the highest intellectual interests of the people. In 1841 the buildings situate behind the Museum on the so-called Packhofsinsel were purchased, amongst them the residence of the well-known Frau Sarah Levy, in whose *salons* congregated the Humboldts and the Grimms, Boeckh, Schadow, Varnhagen, Rahel Henriette Herz, and many other celebrities of that time. But the plan seemed very little advanced with the purchase. The following years, we might almost say decennials, were very little favourable for the execution of the plans of ideal art. The waves of political events rose too high to give full scope to the requirements and claims of art, and when at last, after the halls of the new Museum had been opened for over ten years, the building of the National Gallery was commenced in earnest, the first intention of erecting it in a secluded locality had been long frustrated. Opposite to the site, the new Exchange had risen out of the ground, the Friedrichsbrücke had been widened, Berlin had increased in a manner quite unexpected, and life near the Castle, Museum, National Gallery, and Exchange had become almost the loudest and busiest of the capital.

Building operations were begun at the commencement of 1866, but they were repeatedly interrupted by the war of that year, and again by the campaign of 1870-71, as well as by strikes. The architect Stüler had died in the meantime, and the direction of the work was confided to a commission, of which only two, the architects Erbkam and Strack, survive its completion. The building is a pseudo-peripteros (a structure surrounded by a facing of columns) in the Greek style, Renaissance forms, however, being also introduced. On a basement, 40 ft. high, of grey granite, rise two stories of red sandstone, the roof being supported by fluted Corinthian columns. The principal front, of 100 ft. long, has a portico of columns, and is ornamented by a frieze in relief by Moritz Schulz, on which are represented, three-quarter size, figures of the most celebrated German artists. The tympanum of the portico, which is to receive an equestrian statue of Friedrich Wilhelm IV., has been sculptured by Wittig. Flights of steps lead up to the principal front, at the foot of which are two groups by M. Schulz, representing Sculpture and Painting, while at the top are two female figures, the "Purpose of Art," by Calandrelli, and "Creating Sculpture," by Moser. The side fronts of the building, 200 ft. long, are intersected by attached Corinthian columns; these rest upon a sober substructure, and are crowned by a rich entablature, with the names of artists inscribed in large gold letters. A half-round apse, in the same style of architecture as that just described, closes in the building at the rear. The whole building, to provide a proper light for its many rooms, has been set back towards the new Museum, and in the midst of the colonnades either already existing or still to be erected. The space thus created between the latter and the new National Gallery will be made into ornamental grounds, in which marble statuary will be placed.

The interior of the building is gained by two principal entrances, one leading by a carriage-approach, between granite columns, to the first principal story, the other over the geometrical staircase already mentioned to the second story. The former conducts to the lower vestibule, in which columns of white Carrara marble support a ceiling formed of bays of natural-coloured zinc, here for the first time applied for this purpose, the floor and breast-wall being of the same stone, polished, which contrasts effectively with the walls of brown glazed stucco. On both sides of the vestibule are the cloak-rooms. Over the entrance to the rooms is, in high relief, the figure of Germania protecting the arts, and raising her hands over the genii of Architecture, Painting, and Sculpture.

A transverse gallery is first entered, in which a door on the right leads to the principal picture-rooms; on the left, to the rooms containing sculpture. The transverse gallery itself has a surprising effect, with its columns of black Belgian marble, its walls of yellow *stucco lustro*, and its vaulted ceiling painted richly in gold and red, to which representations from the "Nibelungen Saga," by Ewald, of Berlin, form a favourable contrast. This gallery is to receive the larger works of sculpture. The walls of the picture-galleries, to the right, are covered with red tapestry, its floor is inlaid with oak panels, and its ceiling is in white and dull gold. The lighting is in accordance with Magnus's principle, the paintings being hung in a sloping direction. On the left is the gallery devoted to sculpture. This also is most richly executed. Corinthian columns, of red Belgian marble, with base and capital of Carrara marble, support the vaulted ceiling, of a grey colour, adorned with mosaics, the walls being of dark green *stucco-lustro*, and the floor of Mettlach tiles. In the window-niches are relief medallions, by Landgrebe, from the history of Greek sculpture. Throughout the whole arrangement of the interior one distinguishing feature strikes the observer: all entrance-halls are as richly decorated as art can make them, while the rooms destined for the reception of art-treasures are kept in a more sober and quiet style, so as not to interfere with their effect.

From the lower entrance-hall broad stairs of polished white Carrara marble lead to the second principal story, and first to the upper vestibule, which may also be reached by the great stairs from outside. The upper hall is similar to the lower, but the columns are of the Ionic order, a frieze containing illustrations from German history, executed by the sculptor Geyer, filling the space over the stairs. Through this we enter a hall with a dome-shaped ceiling, lighted from above, the cupola of which is painted with the signs of the zodiac, by A. von Heyden. The four entrances are flanked by eight projecting columns of black, green, and white veined marble; they support each a muse modelled in gypsum by Calandrelli and Brodwolf. Four niches are to receive sculptures. Over the entrances are paintings, also by A. von Heyden, representing Architecture, Sculpture, Painting, and Music. Over the side entrances are two reliefs, in which the portraits of Strack and Erbkam, the surviving architects of the National Gallery, may be distinguished. From this exceedingly beautiful space the first principal gallery is entered; it is lighted from above, and kept very sober, as it contains the Cornelius cartoons on Scriptural subjects, which were destined for the Campo Santo and the Cathedral. In the second room, kept in the same style, and decorated in a similar manner, are cartoons of the same master, the subjects of which are taken from Greek mythology.

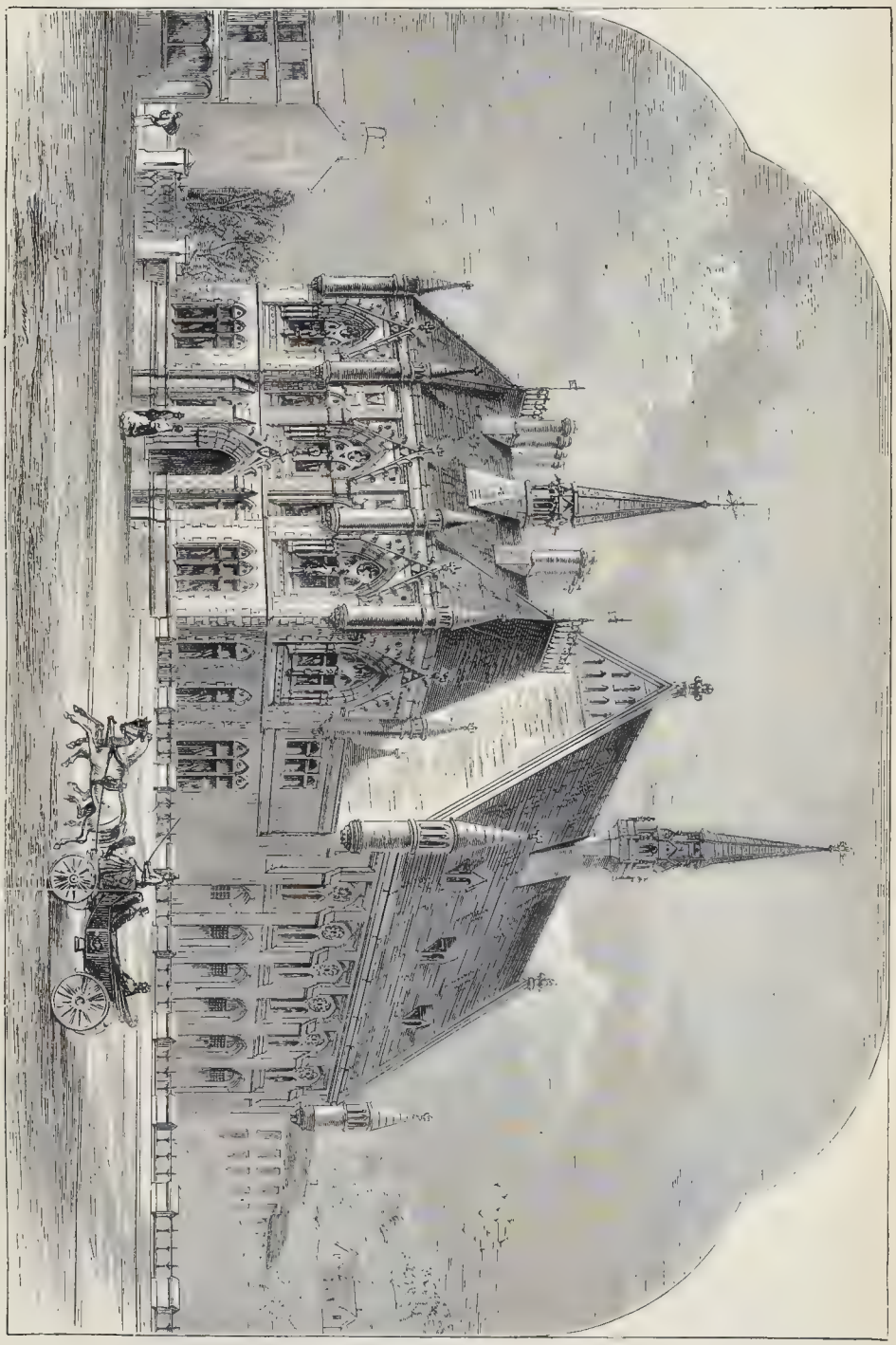
The story above this contains the same number of galleries, arranged in a similar manner. All these rooms have inlaid floors, walls covered with different-coloured tapestries, and simple ceilings. Looking from the corridors on both sides of the great gallery in this story, an effective view is obtained of the whole.

The several stories are connected further by two smaller staircases; a lift also supplies ready communication between them. The warming of the building is effected by hot-water apparatus from the basement, in which are also the apartments of the staff, offices, packing and store rooms.

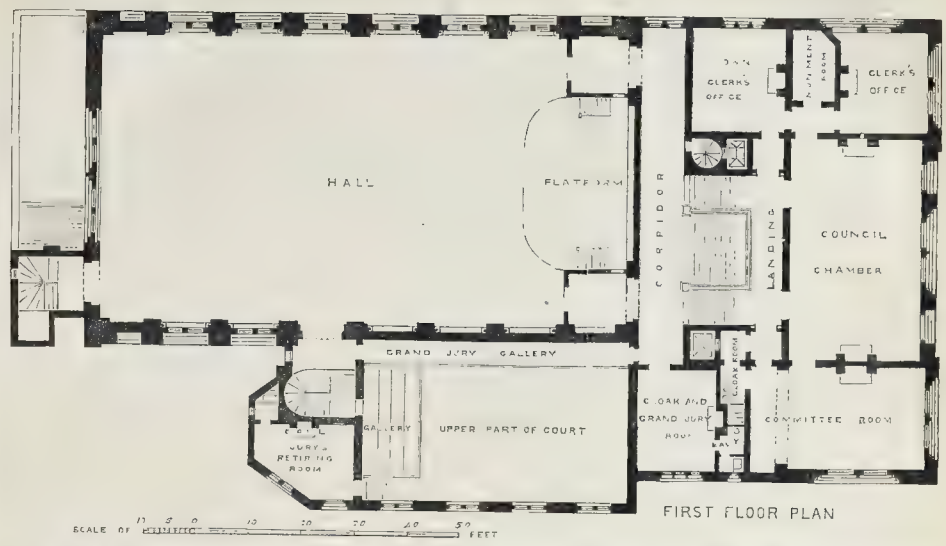
This, in short, is a hasty sketch of the throughout richly-executed home for German art, of which we give an illustration. But still greater plans are yet in preparation. The space in the old and new Museums no longer suffices for all the art-treasures acquired from time to time. The picture-gallery in the Schinkel Museum has grown to such dimensions by fresh acquisitions that a separate building for them has become indispensable. The space thus gained would give room for the collection of antiquities now crowded together in the *souterrain* of the Schinkel Museum, and would also provide accommodation for the sculptures which will soon begin to arrive from the excavations at Olympia. The rooms in the new Museum are also no longer sufficient for its ethnographical collections. The latter have increased to such an extent that the Government has the intention of erecting an especial Ethnographical Museum. But the greatest change will be effected by the construction of the new railway through Berlin. To describe, however, in detail all these vast plans would take up too much of our limited space at present, and must be left to a future article. But we may be permitted to add that it seems as if the plans which Friedrich Wilhelm IV. once matured for the transformation of the centre of Berlin will at last be carried into execution, but in a far grander manner than he ever contemplated. We shall give other illustrations.

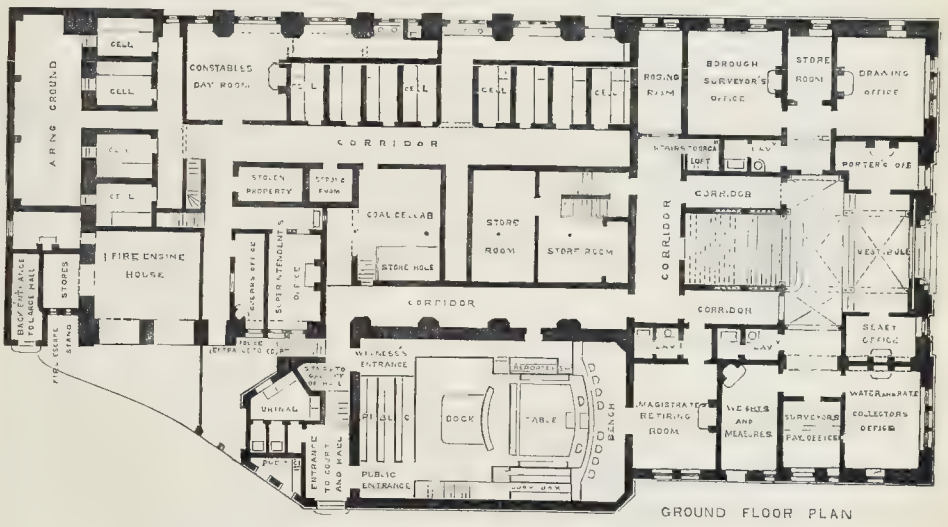


THE BERLIN NATIONAL GALLERY: STAIRCASE.



PROPOSED TOWN HALL, HASTINGS.—Messrs. Cross & Wells, Architects.





HASTINGS TOWN HALL.

INTENDED TOWN-HALL, HASTINGS.

OUR readers do not require to be told of the numerous discussions which have occurred on this subject, or of the position we felt compelled to take originally in respect of the designs selected by the committee. The Town Council, however, have now definitely arranged to carry out the design submitted by Messrs. Cross & Wells and Messrs. Jeffery & Skiller, as stated in our last issue, and we do not intend to reopen the question. We give in our present number a view of the intended building and plans of the principal floors, accompanied by the architects' own descriptive particulars; and we sincerely hope that the new Town-hall when erected will be found to satisfy fully the expectations of the inhabitants.

Entrances, Staircases, and Corridors.—Upon reference to the ground-plan it will be seen that the principal entrance from Meadow-road is approached through a deeply-recessed archway, fitted with ornamental sliding iron gates, and opening into a groined vestibule, thus communicating by three arched openings with an inner hall, in which will be constructed the principal staircase leading to the large hall and superior offices of the Corporation. On either side of the entrance vestibule there are short corridors or lobbies for access to such of the municipal offices as are placed on the ground-floor. At the end of the inner hall is a corridor giving direct communication with the intended entrances from Station-road, and there are branch corridors and passages communicating with other parts of the building.

Municipal Offices.—Entering from Meadow-road, on the north side of the vestibule will be found the offices of the borough surveyor, his clerk's office and store-room, and an office for the hall porter on the south side. There are offices for the rate-collector, inspector of weights and measures, workmen's pay-office, and a spare office, and there are lavatories, &c., for the accommodation of each suite of offices.

The council-chamber and committee-room are placed on the upper floor, adjoining which are the offices of the town clerk, a muniment-room, and the necessary lavatory accommodation.

The Large Hall will be raised 11 ft. above the general level of the ground-floor, and will be approached from three separate entrances by short flights of stairs. The principal entrances will be from Meadow-road, by the grand staircase before described. There will be a secondary entrance and staircases from Station-road, opening into the middle of the hall; another at the extreme end, communicating direct with the back seats; and there will be a private entrance and stairs leading direct on to the platform. Annexed to the hall will be corridors connecting the several entrances one with another, and for the purpose of affording ready access and egress to the largest number of people the hall would contain without obstructions to other occupations. The performers' or lecturer's platform will be at the east end, with private retiring-rooms underneath, below the hall floor, and an organ-loft behind. Level with the hall will be

found cloak-rooms for ladies and gentlemen, with lavatories, &c., attached. The council-chamber and Corporation committee-room are so arranged that they may be used *en suite* with the large hall on the occasion of any great entertainment.

The Police Court, as will be seen upon reference to the drawings, is placed on the ground-floor, at the east end of which is the Magistrates' Bench, communicating with their retiring-room, and at the opposite or west end are placed the jury-room and a gallery for accommodation of the public. A grand-jury room is also provided at the level and approached from the half landing of the principal stairs, with communication to a grand jury's gallery, which is placed on the north side of the court; and there will be communication with the police cells and police station.

On the north side of the main staircase will be found the barristers' robing-room, and the waiting-room for witnesses will be found close to the public entrances to the court.

The Police Station is approached from Station-road. The police offices consist of superintendent's office, clerk's office, office for night charges, constable's day-room, lamp-room, room for stolen property, and residential accommodation over the fire brigade department for a married constable.

Police Cells for night charges are placed on the north side of the police station with covered area adjoining for light and ventilation. The detention cells are placed on the west side of the police station, and will be in two tiers, one above the other, to suit the irregularity of the levels of the site, and to admit of spaces being found for an airing-yard for prisoners, and if necessary, a drill-ground for constables. It is intended to fit up all the cells with doors, windows, benches, closets, &c., in accordance with modern improvements and the latest Government requirements. In conjunction with the cells are prisoners' lavatories and an airing-ground.

The Fire Brigade Department is approached from Station-road, and comprises engine-house for two engines, firemen's room, firemen's store-room, and a pent-house for the escape ladder.

In completing the description of the several arrangements, the architects remark that underneath the large hall will be found accommodation for coals, store-room for chairs, and other necessary conveniences. A chamber for the heating apparatus is provided, and there is a "public convenience" at Station-road adjoining the open yards.

The large hall, police court, cells, staircases, and corridors will be heated by hot water apparatus, and the municipal police and fire brigade department by open fire-places. The ventilation will be as much as possible by natural means, supplemented by inlet and exhausting shafts.

The exterior is to be faced with local blue stone with Bath (Box Ground) window and door dressings, and Portland stone cills, weatherings, and other exposed projections. The several staircases are to be of Green Moor stone.

The tender of Messrs. Howell & Son has been accepted, subject to the reductions detailed in the committee's report printed in our last number.

SOME MODERN IMPROVEMENTS IN HOUSE BUILDING.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on Friday, the 19th inst., Mr. John S. Quilter, president, in the chair, Mr. A. G. Hansford was elected a member. A vote of thanks was tendered to Mr. Street, R.A., for accompanying the members over the works of the new Law Courts a fortnight ago. Mr. H. H. Stannus gave notice that at the meeting of the Association to be held on the 2nd proximo he should submit a resolution or resolutions on the desirability of codifying or re-arranging the rules of the Association. He remarked that these rules had been added to or amended year by year in accordance with growing needs. Like all piecemeal legislation, they were heterogeneous and unsatisfactory, and the sooner they were codified the better it would be for the welfare of the Association. Mr. Phené Spiers, in reply to a question put by the President as to the arrangements for this year's Architectural Examination, said that at a meeting of the committee held in October last it was thought advisable that the examination should be held annually, the examiners agreeing to give their services free. At present the subject was in abeyance, and nothing had been done, possibly owing to the time devoted to the discussion of the recent scheme for the re-organisation of the Institute.

Mr. J. Douglass Mathews then read a paper on "Some Modern Improvements in House Building." He said:—I propose this evening to depart somewhat from the subject advertised in the syllabus, and refer to some of the modern improvements in house-building, believing that instead of describing a few of the most recent improvements possibly hardly tried, it would be more profitable to consider the relative merits and demerits of certain materials and improvements that have stood the test of time to a greater or less degree, and with which we all have some acquaintance,—in the hope that, in the discussion that will follow this paper, members will give the result of their experience; and, with a view to prevent the subject becoming too wide, I propose to limit the paper to those improvements that pertain to house-building.

It may be assumed that the objects of inventors in introducing new materials and modes of workmanship for house-building may be classed as follows:—1. To promote health and comfort. 2. To cheapen the cost of building. 3. To save labour in the work of the household. The first is necessary to render a house truly a home, and the advance in scientific knowledge naturally conduces to improvements, especially in reference to sanitation. The second is a matter of considerable importance in these days when the cost of labour, and consequently the production of all hand-made articles, is materially increased. The third is rendered especially desirable, now that domestic service is so little sought by those who, in the natural course of things, are fitted for this work. In order to systematise the paper, I propose to consider the subject as far as possible in the order of the trades engaged in house-building, and without further preface proceed to commence with the foundations.

It is generally admitted that in all foundations, except rock, firm gravel, or compact sand, a layer of concrete should be thrown in trenches, the extremely uncertain nature of clay especially requiring it. Much alteration is now made in the admixture and manner of using this material. Formerly, ballast and stone, or chalk-lime, were used in the proportion of three or at most four to one, and the concrete thrown from a stage 7 ft. high; *now*, recent experiments show that good burnt ballast, broken bricks not exceeding about 2 in. square, and a little sand used with the ballast, may be used in the proportion of five, and some say as much as eight parts, to one of good fresh ground or selenitic lime, and that the concrete sets much better in bulk if it is shovelled into the trenches in layers not exceeding 1 ft. in thickness, instead of being thrown from a stage. In all cases where there is any water, blue lias lime should be used, or Portland cement. A great safeguard to prevent damp rising, and to render a house warm and healthy, is to spread a layer of Portland cement concrete, about 4 in. thick, over the whole site, especially on a clay site or one of made ground. The prevention of damp rising in the walls is a matter requiring careful attention. The plan of using a double course of slates, with three layers of cement, is good if the workman can be trusted to make the beds perfect, and to break the joints of the slates; but in case of settlement the slates will break and the wet find its way up the wall. A strong coating of tar and sand is a good damp course, but the same objection in case of settlement applies to this. Engert's asphalted felt damp course is, I think, as good as any; it is cheap, easy of laying, and will accommodate itself to settlement, but care must be taken to properly lap each sheet. Taylor's stoneware perforated damp course is advantageous, being perfectly damp-proof, and affording at the same time ventilation under the floor, as well as acting as a good bonding course near the base of the wall; but its cost will, I fear, prevent its general use in house-building. The means of keeping a basement dry is a problem that is difficult to solve. The usual plan of a so-called dry area is at all times unsatisfactory; often the covering gets broken and the rain enters, or the area becomes wet instead of dry, thereby causing a damp atmosphere outside the wall, which in time draws through it, and occasions the wall to be constantly wet. If dry areas are used they should have a field drain-pipe laid in the bottom, connected with the main drain, a strong covering not likely to get broken, proper air-gratings used to ensure a current of air all round; and, in case of ties, the ends of the bricks should be coated with tar. A good plan would be to build a hollow wall with a space of about 2 in. tied in with vitrified bricks, and liquid tar and sand poured in to fill up the cavity between the two walls. It would be more satisfactory in all cases if cement were used for rendering the inside of basement walls instead of plaster, or, better still, asphalte.

The great demand for bricks in the metroplis, and the frequent transformation of suburban brickfields into "eligible building land," cause at times great scarceness, and, by reason of land or water carriage, always considerable increase in the price compared with that formerly. The adoption of some other, or at any rate additional, material for the construction of walls is, therefore, forced upon us, and this material appears to be concrete, which, I believe, may be considered the building material of the future. Of its use in former times, and its advantage as a building material for modern dwellings, I have had occasion to speak before in this room, and its extended use during the last ten years affords us the opportunity of finding out its merits and defects. The introduction of Portland cement and selenitic lime has done much to enable this material to be used in a way that it never could have been had ordinary lime only been available; but it may be a question whether, notwithstanding the increased strength and consequent decrease in the thickness of walls obtained by the cement, it is desirable to risk its use in such small thickness as some suggest and adopt, as the whole strength of a concrete wall is dependent wholly upon its homogeneity, which may be disturbed by imperfect foundations or other causes. The methods adopted for its use hitherto have been principally in the monolithic form, by constructing temporary trenches by means of sliding uprights and boards, and filling in about 2 ft. each day. One of the advantages claimed for this process is, that, as the scaffold is supported by the wall built the previous day, should there be any fault in the cement or in the admixture of the concrete, it is at once found out. The chief drawback is the expense of the apparatus, which, however, would be greatly reduced in proportion to its extended use. To obviate this expense an apparatus has been patented whereby the boards used for the roofs or scaffolding may serve as temporary trenches, and the uprights to support them made to slide as telescopes, instead of being set up so frequently, as by the other plan; but this method has not the advantage of proving bad work so readily as the other, and in concrete building, more, perhaps, than in anything else, good work is an absolute necessity. There is no doubt that the only way to use concrete as an economical material, and as one cheaper than bricks, is in the monolithic form; but I cannot help thinking that it would be safer, if not more lasting, to use it as a filling or core, the wall being built in such a way that proper bond may be preserved, as, for instance, by cement blocks cast hollow. Terra cotta might be also used for the facing only, trusting to the concrete for the strength of the wall. A system of this kind has lately been introduced by Mr. Sellars, of Birkenhead, the blocks being formed of a concrete composed of sand, stone, and Portland cement, and each block bonded to the other by means of a kind of beaded tongue and groove. Tiles L-shaped, and of the size and texture of an ordinary brick, are made, which are built in courses as bricks on the outer and inner face of the wall, and concrete filled between. Ordinary bricks have been used as an outer and inner face, with bonding bricks or courses at intervals, and the cavity filled in with concrete, but these methods are all more or less expensive, and can only be cheaper than ordinary brickwork where great thickness is required for strength or appearance. In passing through Staffordshire and other iron counties, one cannot but be struck with the apparent waste, not to say defacement, of the country by the mountains of scoriæ from the furnaces, for which little or no use has yet been found, but in the economy of nature this cannot be intended to remain long without a purpose. Why may not this be used in the manufacture of hollow blocks such as I have mentioned? The answer, doubtless, would be that, when exposed, the weather would act on some of the ingredients, and disintegrate, and finally perish them. If this is so, is there no system of indurating or water-proofing, such as Ransome or Szerelmey *has* invented, or as some equally enterprising person *could* invent? This method would admit of considerable variety of architectural treatment, as the blocks could be cast with any ornament, sunk or

otherwise, and would have the advantage over a cemented front of being truthful in appearance, on account of the building being erected course by course. Whilst speaking of architectural treatment I may remark that some of Soane's or the Adams' buildings may be studied with advantage in ornamenting concrete, as flat or slightly projecting features are far more suitable than heavy ones; and for this purpose sgraffito has been used with very good effect in some recent buildings,—an example which will no doubt be largely followed. One great impediment to the extended use of concrete by architects is the necessity for cementing the external face. But I believe this arises a great deal from prejudice, as the value of cement as a material is admitted on all hands; and, had it not been used largely as a cloak to hide bad work and materials, and in a manner to imitate stone, I venture to think it would have been considered a fair and legitimate method of facing and ornamenting buildings.

The necessity of adopting some new material for a general roof-covering is almost as great as for walling,—at any rate, if the supply of slates continues as short and the price as high as at present. For general purposes there is no better material than slate, chiefly on account of its lightness, and the comparatively flat pitch at which a roof can be constructed, both of which tend to lessen the cost of the timbers of the roof. For appearance and comfort, tiles are preferable, but they require a sharper pitch in the roof, and, being much heavier than slate, are more expensive both in original cost, in labour in laying, and in the strength of roof-timbers. A lighter roof is formed by the Broomhall tiles, which also have the advantage of being fixed easily; but the price is too high for general use. Recently the Somerset tiles—such as the corrugated, Roman, &c.,—have been much used about London, and, as the price is very little more than the ordinary pantile, and the labour in laying the same, they have been largely in demand for covering small houses. If a superior tile were made, of a better and more uniform colour, they would doubtless be greatly used. These tiles require torching on the inside after laying, and their chief defect is the very small lap to each tile. They are very porous; but I believe a coat of tar on the inside is a great improvement. A tile has lately been introduced, called the bonding roll roofing tile, which, according to the description, has the advantages of breaking joint, and thus preventing wind-stripping, a perfect bed, the corners not cut, and the ease with which the new tiles can be inserted. The price is moderate, and if the colour is good, it appears to me to be likely to supply the demand now created. The designs for the tile ridges are much improved, and the cleverly-modelled finials and terminals lately introduced add wonderfully to the effect of the roof.

Before considering the construction of floors I may remark generally on the difficulty of getting well-seasoned timber. In no way is the effect of competition shown more strikingly than in this: timber is, in many cases, brought direct from the dock to the ground, cut up and used at once in the building, shrinkage ensues, and cracks in plastering of partitions, ceilings, and sometimes in brickwork, are the necessary result. Formerly a builder would keep timber for years in his yard before use; but, except with large firms, capital is too valuable to allow of its lying idle in the shape of timber stacks.

There are many advantages in the use of a concrete or iron floor; and here, again, I would say that I believe concrete is capable of further development. The system of fireproof flooring has been much cheapened by the use of rolled joists, filled between with slabs of concrete; but the cost, however economically used, compares unfavourably with an ordinary wooden floor, chiefly on account of the boards and joists. Homan's or Phillips's plan of laying iron joists 2 ft. 6 in. apart, filled in between with concrete, and rendered doubly secure by the use of light T bars, varying from 2 in. to 12 in. apart, makes a good and economical floor. A plan adopted by Messrs. Moreland is to lay strong iron joists or girders about 8 ft. distant, with light iron bowstring girders about 2 ft. 6 in. apart. The concrete passing through the interstices of the iron truss forms one continuous slab from wall to wall. The most inexpensive mode of forming concrete floors that I have seen is that invented by Mr. Allen, and used in the Waterlow dwellings, which consists of rolled iron joists about 6 ft. or 8 ft. apart, with a wrought-iron bar, about 3 in. deep, laid on top; this is drilled for, and light iron rods, about ½ in. diameter, run from one to the other, and the whole is encased in concrete 6 in. deep. In each of the foregoing the ordinary wooden floor is laid above with shallow joists. Mr. Lascelles has recently patented a plan by which concrete is used in slabs or tiles, and when used for a floor the tiles are laid on iron or wooden joists the width of the tile apart. The slabs being faced on both sides serve for floor and ceiling at the same time. I believe in some concrete houses the floors have been finished with Portland cement, and a fillet laid round the room flush with the floor for the purpose of nailing the carpets. If wooden borders are required, parqueterie or ordinary wood could be laid round, of the width required, and the moderate price at which this material can now be obtained, compared with the effect produced, is a great inducement to its use. If an entire wooden floor were needed, wooden blocks or bricks about 1½ in. thick (introduced by Mr. W. White), similar to those often used in schools and churches, make an excellent floor. In all basement floors the use of the solid blocks, properly Burnetised, is recommended, because their use does away with the need of ventilation under the floors, which is often very imperfect, and it also saves at least 12 in. in the height of the walls all round.

A substitute for the wood-framed quarter partitions is much to be desired. It is impossible to divide all the rooms on the upper stories in the same manner as below, and therefore brick walls cannot be carried through the house. To meet the difficulty, partitions must be used, and these are best formed as a truss, throwing the weight on the walls rather than on the floor. If these partitions are formed of timber, shrinkage is sure to take place, and with it cracks in the plastering of walls and ceilings, which, to say the least, is unsightly. A truss formed of iron and the partitions built in hollow bricks or concrete blocks would answer the purpose if cost were not an object. Wherever partitions are set one above another, or on brick walls, it is best to use nogged rather than quarter partitions.

One of the advantages of railway conveyance is the increased facility for procuring stone. This is proved by its almost universal use in dressings, even in small houses. The stone to be adopted must, of course, depend on the locality, and before building care should be taken to ascertain the relative advantages and disadvantages of the local stone.

Two or three kinds of artificial stone are manufactured, and which are really concrete. Ransome's Patent Concrete Stone, which has been the longest in use, has for a time, at least, I believe, ceased to be made in London. This, however, I think, arises more from the difficulty of overcoming the prejudice which exists with all new materials than from faults in manufacture. A stone of a somewhat similar nature, called the "Patent Victorian Stone," has been more successful, probably because the manufacturers laid themselves out more for the practical than the artistic. Much of the paving, sinks, &c., made by this company, some years ago, have stood the test of time well, and in cases where repetition of an article is required it competes successfully with natural stone. Another artificial stone, which is concrete composed of coal breeze and Portland cement, is made by Mr. Matthew Allen, who claims for it extreme durability, and recommends its use in steps, paving, &c.; and, being a moulded material, the cost is much less than stone.

Terra cotta as an ornamental material has not found favour to the extent its strength and durability demand, but for ordinary work this is scarcely to be wondered at, as the expense of modelling, moulds, &c., in addition to the actual casting, is very great, so that even with a fair amount of repetition its cost exceeds that of stone, and this, added to the uncertainty in delivery and risk of imperfect castings, causes it to find but little favour with the ordinary house-builder.

The introduction of selenitic lime is a great advantage to plasterers, as its quickness in drying enables each coat to be followed on almost immediately, thereby saving much labour in shifting scaffolds, &c. Whether it fulfils all the advantages claimed for it, is a matter which my own experience will not allow me to say, but having adopted it on several occasions I am satisfied with the result.

The use of carton pierre has largely increased as an ornamental material to supersede plaster, and the castings are as a rule sharp and well executed; the lightness of the material, and the ease in fixing are also advantages in its favour, but, like all cast materials, it requires care in fixing, because, being in short lengths, the lines are not always perfectly true.

It is somewhat remarkable that no substitute has been found for the ordinary plaster ceiling. Two materials more opposed to each other than timber and plaster could hardly be found—the one almost naturally deflecting, and the other as surely cracking. Possibly the chief, if not the only, reason for its continued use is that plaster is in a great measure fire-proof. If some such material as carton pierre could be made fire-proof it might be screwed up to the ceiling in slabs, and, if necessary, the joint covered by an ornamental moulding or rib to form panels. Since writing the foregoing, I find that a system has lately been patented which in a great measure meets my suggestions. Mr. Hitchins forms slabs about a yard square, prepared in a somewhat similar manner to carton pierre, and secured with zinc nails to the joists; the slab being rough has a setting coat either in plaster or Parian cement laid on in the usual manner, after it is fixed, which effectually conceals the joists. The edges of the slabs being bevelled, each one forms a kind of dovetail into the others. A ceiling by this means is very quickly and cleanly put up, and the cost is very little beyond that of ordinary plaster.

The substitution of cement for wood skirtings is an advantage, preventing a harbour for vermin and a run for rats and mice, and, if used with a concrete-floor, these undesirable domestic pests would be almost exterminated.

Notwithstanding the enormous increase in the cost of almost every building material during the last few years, the ordinary joiner's work proves in a great measure an exception; this is accounted for by the admirable machinery which has from time to time been invented for saving manual labour, and which has now arrived at that state of perfection that a door may be prepared in every part, even to the sand-papering, by machinery, excepting only the wedging and pinning together and mitreing the mouldings. The circular band-saw affords great facilities for executing ornamental fret and curved work, at a very moderate price. Machinery being now so generally used, joiners' work should be specially designed for its manufacture in this manner, as handwork, such as special mouldings, greatly increases the cost without in the ordinary way producing a corresponding effect, and especially as the cost of making a special plane for working mouldings to design is in most cases almost nominal.

In no part of the inside of a house has more care been of late bestowed than in the design of the staircase, and, it must be admitted, with satisfactory results, the newels and balusters affording a good opportunity for architectural treatment; but it is worthy of remark that the too frequent use of sinkings and multiplication of small mouldings, although effective in drawing, and possibly in execution, should be avoided, as they form capital receptacles for the accumulation of dust, which in a short time becomes a cake of mud.

The introduction of hand-painted tiles has been the means of causing the stereotyped marble chimney-pieces to be in a great measure superseded, and the admirable way in which they have been used in connexion with wood has given an opportunity for design that will not readily be given up. Some excellent printed tiles have been made, well drawn and extremely moderate in price, and well adapted for chimney-pieces and wall linings. In connexion with chimney-pieces tile hearths may be mentioned as an improvement not only in appearance, but also on account of their cleanliness.

Much attention has been given of late to the design and manufacture of stoves. Instead of being limited to the two or three descriptions of the well-known register, we have now a large variety of stoves, all claiming advantages, either in economy, in heat, or in saving of coals. The wasteful way in which we Englishmen use coals is admitted on all hands, and when, a winter or two ago, the price of coals became so enormous as to produce almost a famine, the direction of stove manufacturers was naturally led to devise some plan for their more economical use. Without attempting to describe all or any of the improved stoves, they may be classed under three heads:—First, those that warm the air admitted from without and deliver it in an upper room or other portion of the house. Second, those that provide means for delivering the warmed air in one or more parts of the room in addition to the fireplace. Third,—Those that by polished surfaces reflect the heat, or by fire-clumps or other

substances retain the heat. All these descriptions make use of the ordinary open fire, and for the purpose of house-warming, as well as for comfort, it is not probable that this form will be speedily abandoned. At the same time, notwithstanding the improvements and the economy resulting from the use of the heated air at the back of the stove, which was formerly lost, a considerable portion passes up the chimney without being available for the purpose of the house, and there does not appear to be any means of remedying this, unless the smoke is again passed through the fire, as is the case with the smoke-consuming apparatus fitted to boiler furnaces. The introduction of air from the outside of the house to supply the stove is advocated, and doubtless for the comfort of the inmates it is better that the fire should be fed in this manner rather than by the air in the room; but I believe this plan increases, rather than diminishes, the quantity of coals consumed. The extended use of kitcheners is fast superseding the open fire-ranges, although the latter have advantages that will commend them to some people; but the conveniences possessed by the close ranges give great facilities for cooking in a small space. It is somewhat surprising that the independent cooking-ranges, such as are in almost universal use abroad, are so little adopted. Several kinds have lately been introduced to stand in a chimney-opening without any setting. The front and sides, as well as the top, are available for cooking purposes, and the cost is much less than the ordinary range, whilst the saving in fuel is considerable. Possibly, now that the culinary art is being taken up as an accomplishment for ladies, and as part of the higher class education for girls in Board-schools, we shall have corresponding improvements in kitchen-ranges.

We now pass on to the plumber, and in this trade probably more than any other have the inventors and patentees been hard at work. The recent regulations of the Board of Trade, requiring the Metropolitan Water Companies to furnish a constant instead of an intermittent water-supply within a certain number (I believe now about nine) years has occasioned an entire alteration in the system of water-fittings to houses. From the time the regulations were issued, all new buildings were to be furnished with pipes and fittings suitable for a constant supply, although for the time being the supply is continued as heretofore. The chief end gained will be, that instead of water being rendered impure by storage in a cistern, it will be drawn direct from the main, and except for a supply in case of emergency, cisterns may be altogether dispensed with. The service-pipes being always charged, must, of necessity, be very strong, and therefore the heaviest pipes that are made are used, although, where ¾-inch pipe was formerly used, ½-in. will now be sufficient. The ordinary bib-cocks are not suitable for high-pressure, because with a full way, the weight of water would be too great for convenient use. Screw-down high-pressure cocks are substituted; and although these prevent the force of water at once, they are open to many objections, chiefly from the slow process of turning the water on and off, which, in nine cases out of ten, to save trouble, is left running, and thus occasions a considerable waste. Possibly some day we shall have an improved high-pressure cock invented that will remedy these objections. Another great alteration is, that all closets must be fitted with a water-waste preventer, so called, or, in other words, a means of storing two gallons of water to discharge into the water-closet pan, without taking the supply direct from the cistern or main. There are so many water-waste preventers now in use that it is desirable to find what is generally used in the particular district, and to adopt it, as, so long as the water companies enjoy their monopoly, they can require any fitting they may please to be used, and refuse to lay on the water until it has been altered. In some of these preventers I believe it is imperative that two gallons of water should be discharged every time the closet is used. This in some cases is a waste of water, and in others not sufficient, especially as the flush is so feeble, by reason of the preventer being fixed so near the apparatus. The use of these preventers does away with the expense of a regulator-closet, which is an advantage, and the simpler and less complicated the water-closet apparatus the better for use.

Earth-closets have now been adopted for some years, and where the soil can be made use of in the garden or fields, they are advantageous. The chief objection to them—viz., the mixture of the liquid with the solid matter,—has been met by an improved arrangement to carry off the liquid by a pipe into a pit, where it is filtered, and runs into an overflow drain, or, what is better, is used for irrigation.

The increased use of baths has created work for plumbers, and the advantages of them in houses are very great. The waste-pipe, if not properly connected, is, however, often a source of evil to the inmates, and in all cases should be taken outside the wall, and turned into a cesspool or gully, so that no direct communication is made with the drain. The most expensive part of a bath is the supply of hot water, and this is accomplished by two or three methods, the simplest being by a gas-stove, or a batten of gas under the bath; but this is by no means an economical plan, as, although the first cost is comparatively trifling, the consumption of gas for this purpose soon amounts to the extra cost of providing a hot-water apparatus. Another plan is, to fix a stove, with boiler, in the bath-room, which is attended with extra trouble; but the plan most economical and easy of use is a wrought-iron boiler fixed at the back of the kitchen-range, and pipes laid to a hot-water cistern in the bath-room. Although the original cost of this plan is the greatest, its first expense is also its last, as the kitchen fire is utilised for heating the boiler.

When opportunity offers, a coil of hot-water pipes should be fixed in the hall or staircase, communicating with the flow-pipe, and the extra expense is very trifling. The advantage of heat in the staircase and passages is almost incalculable; the air entering the rooms, being warmed, produces an equable temperature over the whole house, and the chances of catching cold by coming directly out of a warm room into an air very little above the temperature of the external air is greatly reduced. It is a great convenience in every house to have a supply of soft water for washing; and even in London, where the atmosphere is much purer than formerly, I believe this is practicable. The expense in forming a water-proof tank underground, and laying special drains, has prevented the utilisation of rain-water in small houses, but if the greater part of the water from the roof were collected into a cistern inside the house, the cost would be very trifling.

The use of zinc as a roof-covering has lately become far more general than formerly, and when properly laid it has proved itself a useful material and is much cheaper than lead. The ready way in which it can be shaped, and the many uses to which it is capable of being applied, will doubtless greatly increase its demand.

A word or two on drains naturally follows the plumber's work, and on this subject I regret so little advance has been made towards perfection. The glazed earthenware socket-pipe is very well adapted to its purpose if care in the method of laying could be ensured, but the work is usually entrusted to a workman often little better than a labourer, with whom rests the responsibility of laying each pipe to a uniform fall—that the bottom of the trenches are not soft, that the pipes are carefully jointed all round (in nine cases out of ten neglected at the bottom, causing them to drop after they are laid), and that all connexions of soil and other pipes are securely made, and above all that the drains are properly trapped. All these things are most important, but their position makes it difficult to properly superintend them, and as they are very soon hidden out of sight after they are laid, everything depends on the care and integrity of the workman. A great deal of the complaint of bad smells arises in houses which are supposed to be properly drained, by their faulty laying and connexions, and naturally occasions dissatisfaction to all concerned. How to remedy this I know not, except by employing a responsible and independent person whose sole duty it is to do work of this kind, and in case of failure subject to a heavy fine. This is perhaps a novel idea, but as so much of health and possibly life is due to the perfectness of the drains some such plan is desirable, especially as the houses in which the least care is bestowed are often tenanted by persons to whom the want of it proves most fatal. Drains should be kept as far as possible out of the house, and no pipes except the soil-pipe connected with them (and I believe there is a plan whereby this may be prevented, but I do not know the details). All waste-pipes should be carried outside the house into a trapped gully. A ventilating-pipe should be connected with the soil-pipe, and carried well above the roof of the house and clear of all windows; and although this is not altogether effectual, it is a great easement to the drains.

The almost universal use of gas in houses requires special provision, and much of the outcry for increased ventilation arises from its use: so long as rooms were of a moderate height, and candles or oil were the only means of illumination, there was no urgent need for ventilation, but now that the temperature of rooms is so increased by reason of the gas, some method of getting rid of the superfluous heat as well as the impure air should be provided. If instead of the lights branching out from the chandelier they turned inwards from a ring under a kind of glass trumpet-mouth tube communicating with a ventilator, much benefit would arise. As this, however, would alter the style of gasfitting, there would doubtless be an objection to its use; failing this, a hopper in the depth of the floor over a perforated ceiling-flower, and a ventilating-pipe carried into the flue of the room above, produces a manifest improvement in the comfort of the room. Rickett's ventilating burner is a very good proof of my suggestion, as wherever it is used it gives great satisfaction. I dare not go further into the subject of ventilation, this being a topic sufficient for a special paper, which I trust some one will favour us with during the next session.

A great outcry was raised by some architects against the use of plate glass, and although it seriously affects a design, its advantages are so great that the public are not at all likely to dispense with its use, nor to be content with it in small squares, divided by very heavy sash bars. As a kind of compromise, plate glass is by some used in the lower portion of a window, and painted or tinted glass in ornamental designs in the upper. This arrangement has caused the subject of ornamental glazing to be taken up, and instead of the matted or embossed glass formerly universally used, a good effect is produced by glazing in tinted glass in ornamental patterns, or by slightly painting the glass in such a manner that its transparency is not lost.

A process has lately been invented to render glass non-fragile, and many things are promised by its use, but as the manufacture of toughened glass is in its infancy, very little has, I believe, yet been done of service to the house-builder.

The decorative treatment of iron has been well developed recently. Much of the wrought-iron work is really artistic, and the designs for cast iron are, as a rule, adapted to the material rather than as formerly producing in cast iron a design only fitted for wrought iron. Notwithstanding the favour in which graining has been held for a long time, public taste seems now to incline towards ornamental painting, and the effect produced by a room artistically decorated is very pleasing, and far less monotonous to the eye than the repetition of graining. The use of varnish gives the work painted in this way all the advantages that formerly only belonged to grained work.

Design in paper-hangings has lately shown great improvement; instead of patterns of leaves and flowers, and watered satins served up with a few alterations and different colours year by year, some of the best designers in our professier have turned their attention to the subject, and the appreciation of their designs is proved by the fact that old-fashioned patterns are fast giving place to the modern ones. One of the greatest improvements is the use of the dado and frieze as a means of decoration, and as a commonsense way of papering a living-room and staircase, and with ordinary care in the selection of colour, either in complement or contrast, the effect cannot be other than satisfactory. And now, Mr. President and gentlemen, I have worked through the several trades in house-building. I am aware there is much more that I might have brought forward, but I fear I have already tired you with so much detail; but, as I expressed at the commencement of the paper, my object was to elicit the opinion and experience of those present on the improvements in house-building generally. I now leave the matter in your hands, thanking you for the attention and patience with which you have been pleased to favour me.

A discussion ensued, to which we will return.

Artisans' Institute, Castle-street.—The annual meeting of this Institute will be held at the Mansion House, on Monday, the 29th inst., by permission of the Lord Mayor, who will take the chair at three p.m. There is to be a *soirée* at the Institute on Saturday, June 3rd.

NEW CIRCUS IN BRISTOL.

MR. JAMES NEWSOME has opened a circus in the newly-erected wooden building, Park-row, opposite the New Theatre Royal. This structure, which has only taken five weeks in erection, stands on a site belonging to Mr. Alderman Edwards. The architect is Mr. J. H. Hurst, and its design has been under his consideration for some time, but he has hitherto been unable to find an opportunity for carrying it into execution. The building has eight sides, and each of these goes direct from the top deep into the ground, thus giving a very solid foundation. From every one of the eight sides are transept-like projections, and the seating runs up them to the furthermost point, the consequence being no obstruction to those present having a complete view of the arena. Advantage is taken of this mode of construction to obtain stable accommodation for a large number of horses, dressing-rooms, and other conveniences. In the surplus height over the stables and seats there is left space for hay and straw, and a few extra dressing-rooms are contrived. The contractor is Mr. G. Keeley, of Blackburn, and the whole of the timber used has been supplied from the yard of Messrs. Jones & Nash, Canons'-marsh. Messrs. Legg & Company, Bromsgrove-street, Birmingham, are the decorators of the interior. The entrance-lobby from Park-row is 30 ft. long by 10 ft. wide and 15 ft. high. The lighting has been carried out by Mr. John Palmer, of the Promenade, Clifton, the gaselier in the centre having 3,000 glass drops; and there are Prince of Wales's plumes in gas jets at the sides. It is stated that about 3,000 spectators can be accommodated in this building.

FROM DUNDEE.

SOME offices recently erected for the firm of Don Brothers, Baist, & Co., merchants and manufacturers, are the most extensive of their kind in Dundee. They combine offices for the works of the firm and for commercial purposes. The latter are entered at a circular corner, and are approached by a spacious staircase leading to a vestibule, from which there are doors to the commercial office and to the rooms of Mr. John Don. Adjoining this is the mill office, and attached to it, Mr. Baist's rooms, with staircase giving access to the works. On the ground-floor are manager's and drawing offices, dining-rooms for the male and female workers, store-rooms, and mill lodge. The buildings have been heated by Messrs. Combe, of Glasgow, on the combined systems of hot water and hot air, and are ventilated in connexion with that arrangement. The entire works have been carried out from the designs and under the superintendence of Messrs. James Maclaren & George Shaw Aitken, architects, Dundee.

THE INHABITED HOUSE DUTY: "FLATS."

A CASE of some importance, calling in question a decision of the Court of Exchequer, to which we alluded some months ago, has just been heard in the Court of Appeal of the Supreme Court of Judicature. The facts are briefly as follow:—The respondents, the Mutual Tontine Westminster Association (Limited), possess several blocks of houses in Victoria-street, which are let in flats or suites to different tenants. A common door gives entrance to several of these suites, which are otherwise let apart as separate residences. The Crown contended that each suite should be assessed as a separate "house," for the purpose of the Inhabited House Duty; while the owners resisted the claim, on the ground that only each portion of the blocks having a separate street-entrance should be charged. The Court of Exchequer at the time decided in favour of the Association; but the Crown, by the Attorney-General, has carried the point to the Court of Appeal. The Court gave judgment to the effect that the buildings, and not the suites, should be assessed. The Court laid down that the rule of construction, to give the words in a document their ordinary signification, must be observed here, and the onus is cast on the party to show that they are used in another sense. The 6th rule of Schedule B, 48 Geo. III., c. 55, says that "when any house shall be let in different stories, tenements, lodgings, or landings, and shall be inhabited by two or more persons or families, the same shall nevertheless be subject to and shall in like manner be charged to the said duties as if such house or tenement was inhabited by one person or family only, and the landlord or owner shall be deemed the occupier of such dwelling-house and shall be charged to the said duties." This rule was held exactly to meet the present case. Internally the blocks consist of tenements; externally they are houses. The argument that in other Acts of Parliament these tenements are described to be houses was held to be inadmissible, as the present Act (48 Geo. III.) was the only one to be continued. Under these circumstances the Court affirmed the decision of the Court of Exchequer.

ALDERMAN THOMAS PROCTOR, OF BRISTOL.

BRISTOL has lost one of its worthiest sons, acute, far-seeing, wealthy, and good. Our readers have often seen his name. As the originator, in his earlier life, of the movement for preserving the Church of St. Mary Redcliff, then little better than a ruin, and for years the persistent supporter of the works under all difficulties, as the donor of a drinking-fountain on Clifton Downs, and more recently as having presented to Bristol a mansion for the occupation of the mayor for the time being, he has been often spoken of, and justly praised. Not long ago he converted, at his sole cost, the dusty highway of Coronation-road, by the New-cut, into a bright boulevard on the river side, accommodated with seats, and shaded with trees, the charming verdure of which is at this moment a most fitting monument of his kindly thoughtfulness. At Fishponds, where he had property, and where the young population abound, seeing the want of a playground for boys and girls, he provided a field and a covered shed for juvenile games, capable of affording shelter for 500 children. In these and many other good deeds of which less is known, Mr. Proctor had the earnest co-operation of an admirable wife. At the funeral, which took place on the 19th, the mayor and corporation, with large crowds of the citizens, were present, and we shall not be exaggerating if we say that respect for his character, and regret for his loss, are felt throughout the whole of Bristol, and beyond.

THE SEWAGE FARM AT CROYDON.

SIR,—It is stated in a paper read by Dr. Alfred Carpenter, of Croydon, at the Conference on the Health and Sewage of Towns, and published in your issue of the 13th of May, that the engineer of the Croydon Local Board, at the expiration of the lease of the Sewage Farm at Croydon, advised the Local Board to have no dealings with Mr. Marriage with reference to the Sewage Farm.

Will you allow me to state that I was the engineer of the Local Board at that time, and that the statement in question is entirely without foundation?

The assertion that the Croydon Irrigation and Farming Company commenced their works with a real capital of 1,500*l.* (nominal capital being 10,000*l.*), and that they borrowed money from their bankers, is equally incorrect. Upwards of 800 10*l.* shares were subscribed for in the company, the whole of which were, from time to time, fully paid up. Dr. Carpenter also states that "the lease had been so drawn" that "while they (the company) paid no valuation on going into the land," beyond fixtures and a few small matters left in the ground by Mr. Marriage, "when it ended they were to receive a valuation according to the custom of the country, and under that clause the arbitrators and umpire again saddled the Croydon ratepayers with an enormous sum as valuation; and in the payments for 1874 figures the sum of 5,238*l.* paid to the receivers of the Farming Company." I should state that every farthing of the valuation which was paid by the Local Board to Mr. Marriage and other tenants, when they left the farm, was repaid by the Farming Company, and the Farming Company did not go out under the terms of the lease, but under a special agreement entered into between the Local Board and the Company. The latter, instead of going out under the terms of the lease, were to be paid for their growing crops, and live and dead farming stock, and were mulcted in a fine of 500*l.* on surrendering the lease. (This fine, by the way, figures as a profit on sewage farming in Dr. Carpenter's return.) The 5,238*l.* represented very much more than an ordinary farm valuation. In fact, it represented, at that time, the whole of the capital necessary to stock the farm.

In conclusion, I would add that, instead of receiving back a large proportion of the capital, every shareholder in the Farm Company lost 8*l.* out of every 10*l.* share; and during the three years the company held the sewage-farm at Croydon, they lost upwards of 6,000*l.* The state of the Sewage Farm, when given up by the company, was not in that "ruinous condition" described by Dr. Carpenter, if this expression applies to the absolute condition of the farm; if, however, it applies to the process of culture carried on, it would be a correct statement; but I cannot readily believe the latter, as Dr. Carpenter, acting as chairman of the present committee of management of the Sewage Farm, has insisted on continuing the same ruinous policy of culture to within a few months of the present time. It is no longer necessary to make out a case as to the advisability of the application of sewage to land, as this mode of dealing with sewage is now generally admitted to be the only satisfactory mode of getting an effluent of a high standard of purity, and therefore it is not necessary to put forth exaggerated statements as to profit or loss incurred in performing what is the absolute duty of the authorities of all towns who have to deal with sewage that needs to be thoroughly purified before being turned into the pure fresh-water courses of the country.

BALDWIN LATHAM, C.E.,
Mem. Inst. C.E., &c.

JARRAH.

SIR,—Your issue of the 4th December, 1875, contains an article on the destruction of timber used in the construction of jetties, wharfs, piers, and other marine works, by the "teredo," and other insects; also a description of the various processes adopted by several firms for the purpose of forcing certain chemicals into the fibres of the wood to enable it to resist the attack of these insects.

I therefore desire to draw your attention to "jarrah"; 'a timber that possesses, naturally, the power of resisting the attacks of insects of all kinds, which has been proved by use for a period of forty years where the "teredo" abounds; and also by analysis made by Professor Abel, who reported "that from analysis he found the wood contained a pungent acid which he designated 'Jarrah Tannic Acid,' and which is destructive to insect life, the tannin at the same time preserving the timber from decay."'

A printed report as to the qualities of "Western Australian Jarrah," compiled and published by the Government of that colony, shows that the officers of the Public Works Department of that colony have removed round piles, after being thirty-five years in use, from localities swarming with teredo, and found them perfectly sound. Also that ships which have been running for sixteen and twenty years, not coppered, were perfectly sound and free from the attacks of insects. Also copy of report of a select committee of the Legislative Council of the Colony of South Australia, on the "Port Bridge," the piles of which are "jarrah," the struts and braces of other timber; these, in the language of the report, "were found to be riddled with the 'teredo' and other marine insects, the iron rusted away, while the 'jarrah' piles remained unscathed and as sound as on the day they were driven."

This company has erected large saw-mills at Geographe Bay, Western Australia; also laid down a railway there to the Darling Ranges, on which the true "jarrah" grows, and are able to supply the timber in any quantity.

JOHN DITCHBURN,
Manager Western Australian Timber Co. (Limit.),
Ballarat, Victoria, Australia.

The New Waterworks at Warrenpoint (Ireland).—The Warrenpoint waterworks were formally opened on the 22nd ult., when Mr. Barton, C.E., presented a drinking-fountain to the inhabitants. The reservoir, which covers nearly seven acres in extent, is capable of containing three months' supply for a population of about 5,000. It is situated about a mile outside the town, on the north side, and is fully 120 ft. above the level of the town, so that the pressure is sufficient to drive the water over the highest house in town. The works will cost 5,000*l.* Mr. Bower, C.E., was the engineer. Messrs. Mahon & M'Murray, Newry, had the contract for making the reservoir.

"ACADEMY NOTES."

SIR,—A shilling pamphlet, under the above title, which is undergoing apparently a considerable sale at railway bookstalls, and an annual recurrence of which is threatened, appears to be, however well intended, very far short of its professions, and, in fact, a pernicious and delusive shilling's-worth. The publication includes some very commonplace remarks on some of the leading pictures, garnished with minute and scratchy illustrations purporting to show their subject and character. Some of these are from sketches furnished by the artists themselves, who are hardly consulting their own interests or their own artistic dignity in lending their names to this kind of travesty of their works. The critical notions of the writer may be gauged by the fact that he characterises Mr. Macbeth's picture of "A Lincolnshire Gang" as "a fit companion in sentiment to Mason's Harvest Moon," and, further, as "earnest work in the style of the late F. Walker." If Mr. Blackburn had, as one may suppose, a grudge against the painter of "The Lincolnshire Gang," it was scarcely Christian or charitable to carry it as far as this. There is more of the same sort. If this kind of publication really gratifies the British public, it is a new and painful indication of the mental attitude of that entity, in regard to art. The work is "published by special permission,"—of the Council of the Royal Academy, I presume. As Meg Merrilies said of the laird, "We wussed them ill, but no sic a doonfa' as that." The idea of an illustrated memorandum of the annual exhibitions is not a bad one in itself; but, if done at all, it ought to be done much better than this. S.

OWNERSHIP OF ARCHITECTS' DRAWINGS.

THE present may perhaps be considered an opportune moment to remind members of the architectural profession of a very simple method of retaining the ownership of their drawings. On every drawing that leaves the office there should be affixed a printed notice (just above where the principal intends to sign his name) to this effect:—"This drawing is my property, and must be returned to me before I sign the final certificate." The case mentioned in your number for the 13th inst. would seem to make it safer to substitute the words "on demand" for the last clause. Although I often have a serious fight with my clients as to ownership, I have my own way in the matter, because I make it a condition preceding the execution of the work. AUGUSTUS FREERE.

UTILISATION OF THE TIDE.

SIR,—As an old subscriber, on whose bookshelves stand twenty volumes of the *Builder*, I take the liberty of making a few observations on the article "Utilising the Tide," written by your contributor "D. B." in last Saturday's issue, who evidently is of opinion that he is the pioneer in this gigantic attempt at utilisation. I perfectly agree with "D. B." that the power of the tide is immense, its rise at Bristol dock-gates being 20·2 to 31·5 ft.; but that his method of treatment is the proper one, I think we can satisfactorily show is not the case, as at the termination of his article he says, "Now, by this method we utilise only one-eighth of the tide's force for any given area, for we gather into the upper reservoir only one-fourth of the water raised," &c. On February 2nd, 1875, I took out provisional protection, and on July 22nd, 1875, completed the patent of an invention for obtaining motive power from the action of the tide. The mode of action, as far as embankments, river-walls, and reservoirs are concerned, is precisely that described by "D. B.," save and except I place a water-wheel in the sluice or passage between the river and the reservoir, no more than one reservoir being required for each wheel, which said wheel is made to float on two air-tight cylinders placed in the embankment or river-wall, and consequently rises and falls with the tide, works both ways, as long as there is any motion in the water in or out of the reservoir; is easily geared or floated perfectly clear; has always the same grip of the water, and the gates can be closed in case of repairs.

JNO. F. WILKINSON.

*** Mr. B. Carr refers to a model for effecting the same purpose exhibited by him at the Workmen's Exhibition in Islington, 1873. Our own pages contain several propositions of the kind.

BRITTANY AND BRITAIN.

A LECTURE on the subject of the parallel antiquities of the two sections of Bretagne, was delivered at the rooms of the Institute of Architects, on the 17th inst., by Dr. Phené, before the British Archæological Association.

The lecturer drew, from a large number of sources in the more ancient Greek literature, statements which, while they have always been admitted as historical data, have never been carefully applied to the subject of archæology, still less to the archæology of Britain. Viewed with the light thus thrown on the subject, by quotations from Herodotus, Pausanias, Strabo, Diodorus Siculus, Hesychius, and others, the connexion of Phœnicia, not only with the British Islands, or Cassiterides, but more particularly with the geographical district now known as Brittany, became, he maintained, very prominent, and was supported by the peculiarity in the special class of stone monuments which marked the early settlers on the Gaulish coast, and which concentrated in Brittany, being only slightly exhibited in Britain. The highway from the grand seat of civilisation of the West, Massilia (Marseilles) up to Dariorigum (Vannes) was defined by these and other special evidences, consisting of devices on terra cotta and on incised stones, illustrated in the *Builder* of May 13, 1876, but more particularly by human features on stone celts, which are found along that route in particular, and which by their marked Nubian features, further supported the lecturer's suggestion that a tribe of nomades, which he identified with the Basque people, had come through Nubia to Libya, and crossed to the coasts of Spain and Gaul; and while they had not amalgamated with their Gallic neighbours, had aided their stone constructions by introducing a semi-Egyptian style, and instructing in the movement and erection of the immense stones still abounding in Armorica. That these stones were worshipped with Egyptian worship he thought clear from a special censure of this act by a council of the Church at Tours in the sixth century. They appeared to have succeeded ruder and earlier monolithic Pharoi, and the lecturer considered they had been erected when, after the destruction of Carthage, the Phœnician traffic was transferred to the Veneti, an ancient Phœnician colony. The Dracontium, of Karnac, which the lecturer considered was erected by these people, was identified with the Karneia, a festival in honour of Apollo, who, it is asserted, derived his title of Karneios from the Keltic people. During this festival the people of the north of Africa, and the Greeks, lived in tents; the festival was propitiatory, to avert pestilence. All this was still kept up at Karnac, the festival of St. Kornély, the modern Karneios, being held within a few days of the old Africo-Greek festival; during which the people live in tents, as the Spartans did, and the festival is held specially to avert pestilence from cattle, the cattle being led in procession through the town several times, and blessed by the bishop. These people appeared, from the evidence, to have effected a combination in matters of traffic and commerce with the Phœnicians, and to have been the carriers of Phœnician maritime traffic overland, after it was brought from Britain to the coast of Gaul.

Religious customs and sacrificial ceremonies were traced along the same route, and shown to be identical with those practised in Carthage, and afterwards in Gaul and Britain.

The Drainage of Ayr.—Sir John Hawkshaw has delivered his report on the drainage of Ayr. He proposes that a pipe should be laid along the beach from the southern limit of the burgh, intercepting all the present outfalls from that direction, leading from opposite the Barracks to Harbour-street, and thence to a point about 130 yards below the New Bridge, where it is proposed it should cross the river. The main sewage pipe for the northern part of the burgh is proposed to be laid from the end of the Old Bridge, where it will receive the sewage of Wallacetown; thence along River-street and Darlington-road, at which latter place it will receive the sewage from the southern part of the burgh; then along the North Quay as far as to York-street; and, following the line of York-street, the entire sewage of the burgh will be discharged by a circular pipe 4 ft. in diameter, at a distance of about 500 yards below the new dock works, by an outfall on the fore-shore near low-water mark. Sir John estimates the total cost of the works at 20,000*l.*

RICHMOND NEW WATERWORKS.

TURNING THE FIRST SOD.

ON Monday, the 15th inst., at eleven a.m., the officials from her Majesty's Office of Works attended by appointment in Richmond Park to meet the engineers (Messrs. Russ & Minns) and the contractor (Mr. Bugbird); and the site of the intended reservoir having been duly staked out, the "first sod" was turned by her Majesty's representative, and possession of the ground given to the contractor, whose men at once set to work, and already the spot shows unmistakable signs that "the works have begun." Workmen may also be seen at the late "Old Brewery Premises" in Water-lane (purchased by the vestry as the site for the artesian well) preparing the building and ground for the well-sinkers (Messrs. Baker & Sons), and it is understood "advices have been received" that the first freight of 14-in. pipes is about to leave the foundry of Messrs. Hopkins, Gilkes, & Co., at Middlesbrough.

COMPETITIONS.

St. Mary Abbotts, Kensington, New Board-room for Guardians.—In this competition, Mr. A. Williams, Messrs. Harston, and Messrs. Edward Power & Wheeler were invited to compete, and the guardians selected the design submitted by Messrs. Power & Wheeler, at an estimated cost of 1,400*l.*

St. Andrew's Presbyterian Church, Upper Norwood.—Mr. Barker, Mr. Alexander, Messrs. Edward Power & Wheeler, and Mr. C. Bell, were invited by the Building Committee to submit designs for this church, together with lecture-room, &c. The designs submitted by "Presbyter" were selected, the authors being Messrs. Power & Wheeler. The estimated cost is 6,180*l.*

Northampton Board Schools.—Twenty-three sets of plans were submitted in competition for the new schools proposed to be erected by the Northampton School Board on the Kettering-road. Mr. T. Roger Smith, who was requested by the Board to act as professional referee, has presented his report, which concludes as follows:—"I beg to recommend 'Justitia' as, in my opinion, the best design; 'Utility' (No. 2), as the second best design; 'Institutio' as the third; and 'Caretaker' is, in my opinion, equal with 'Institutio.'"

Leeds Model Lodging-houses.—The *Yorkshire Post* states that in the competition for these model lodging-houses the premiums have been awarded to the following architects:—Messrs. Perkin & Son, Leeds, first premium; and Mr. C. D. Swale, Leeds, and Mr. Leek, Hunslet, divided the second and third premiums, their designs being considered of equal merit.

Kidderminster New Cemetery.—At a meeting of the Kidderminster Burial Board, on the 15th inst., the principal business was the examination and selection of architects' plans for the erection of chapel, lodges, fences, entrance-gates, and the laying out of the ground purchased by the Board for elementary purposes. The clerk said he had received eighteen applications for "instructions to architects," but there were only three competing architects. The chairman then proceeded to read the architects' descriptions of the plans. Mr. J. Jackson, of Bradford, only competed for the chapel and lodge, which he estimated would cost 2,000*l.*; 1,500*l.* for the chapel, and 500*l.* for the lodge. As this did not comply with the terms of the advertisement, the plans were placed on one side without much examination. Messrs. Baker & Mayne, architects, of Church-street, Kidderminster, presented five drawings of the proposed erections. Their estimated expenses were for laying out the grounds, including the erection of an iron bridge, 108 ft. long and 30 ft. wide, calculated to carry twenty tons, with drainage of the land, 1,300*l.* The cost of entrance-gates, boundary fences, &c., 2,000*l.* They presented an alternative plan of the fences, viz., plain wrought-iron railings, which would cost 1,250*l.*, instead of 2,000*l.* The cost of erecting the chapel and lodge would be 2,000*l.* An architect, who signed himself "Golgotha," and proved to be Mr. Meredith, of the Bank-buildings, Kidderminster, presented five plans. The estimated cost of erecting the chapel and lodge according to his plans would be 1,500*l.* The laying out of the grounds, draining the same, forming roads, &c., would be 2,400*l.*; and for the erection of walls fences, with four entrance-gates, he estimated the cost would be 2,200*l.*, so far as the buildings were concerned, but the grounds were not so picturesquely laid out as in the designs

submitted by Messrs. Baker & Mayne. A long discussion took place, and after a sitting of nearly three hours, the plans prepared by Mr. Meredith were accepted.

Grimsby and District Hospital.—The Committee of the Grimsby and District Hospital have selected the plans for this building sent in by Messrs. Smith & Brodrick, architects, of Hull, and the tender of Messrs. Logan & Hemingway, contractors, of Grimsby, which accompanied the plans, has been also accepted. The works are to be proceeded with at once.

Huyton Sewerage.—At the first meeting for the year of the Huyton Parochial Authority, a principal item of business was the consideration of the question of appointing the engineer, and fixing on the plan—out of sixteen which had been received—for the intended sewerage and sewage disposal scheme. The one which had been awarded the first prize, 100*l.*, appeared to meet with the most general approval, and a deputation was appointed to wait upon Mr. Beesley, one of the members of the firm of Gotto & Beesley, of Westminster, who are the authors of the plan, before deciding the matter. The estimated cost of this scheme is 5,680*l.*, including three acres of land.

Horton Park, Bradford.—The *Bradford Observer* of the 18th inst. states that the offer by the Recreation Grounds Committee of the Bradford Town Council of two premiums of 100 guineas and 50 guineas respectively for the first and second best designs for the laying out of Horton Park brought into the field twenty-eight competitors, and, after careful consideration, the committee decided to recommend to the Council the design bearing the motto "Toujours prêt" as being deserving of the first premium, and that with the motto "Italian" as having earned the second. It is generally understood (says the *Observer*) that Mr. William Gay, landscape-gardener, of Bradford, is the author of the first design. The set of drawings which has been awarded the second prize, marked "Italian," has for its special feature a circular promenade, which surrounds the sheet of water in the middle of the park. The total estimated cost of this scheme is put down at 12,911*l.* The name of the author has not transpired.

Derby New Free Library.—A special meeting of the Derby Town Council was held on the 17th inst. for the purpose of examining the two designs selected by the Free Library Committee from amongst those sent in in competition. The chairman of the Free Library Committee moved that the proceedings of that committee in awarding the first premium of 60*l.* to Mr. R. K. Freeman, of Bolton, and the second premium of 30*l.* to Mr. C. J. Maycock, of Manchester, be approved. A desire had been expressed on the part of several members of the committee to award a third prize to a very meritorious design; but as this did not come within the scope of the advertisement issued by the committee, he did not think he should be justified in submitting such a proposal to the council. The motion was carried, after considerable discussion, in the course of which Mr. Alderman Clarke said he thought it was a positive injustice to those architects who had kept their plans anything near to the sum of 5,000*l.* mentioned in the committee's advertisement that the first premium should be awarded to a plan which he was credibly informed could not be carried out for less than 10,000*l.* Mr. Stenson said that having twice gone through the various sets of designs sent in by competing architects, he believed those selected by the committee to be of a very practical and useful nature. The estimate for carrying them out, he believed, was 7,300*l.*, and looking at the present price of materials and labour, he thought they might safely put the total cost, including fittings, &c., at 11,000*l.* or 12,000*l.* [Laughter, and a voice, "Don't be extravagant."] Well, say 10,000*l.* He hoped the committee would see the desirability of keeping the cost of the building within the 8,000*l.* offered by Mr. Bass for the erection of the building. The Chairman of the Free Library Committee, in reply, said the committee had determined not to carry out Mr. Freeman's plans in their entirety, unless it was found that the builders' estimates for carrying them out came within the amount given by Mr. Bass. It was perfectly true, as suggested by Mr. Alderman Clarke, that some few of the designs sent in were accompanied by the assurance that they could be carried out for something like 5,000*l.*; but not one of these possessed the very eminent qualification insisted upon by the committee in their instructions, that there should be a sufficient supervision over the two buildings,—the Free Library and Museum,—without largely increasing the working staff of the institution. If architects who had sent in plans approximating in their probable cost to the sum of 5,000*l.* mentioned in the advertisement had failed to comply with other requirements insisted on by the committee, they could not complain if a preference had been given to plans which did meet those requirements.

NEW MASONIC HALL AT GALASHIELS.

THE foundation-stone was laid on the 12th inst. The scheme having been in its more recent progress taken up by the R.W.M., Brother A. Thomson, reached a few months ago a stage which warranted the procuring of building plans from Messrs. Hall & Murray, Galashiels. These plans, which are now being put into execution on a site at the corner of Templar-terrace and the new street which it is intended shall run through part of Gala Park, are of a character that will, besides admitting of the erection of a thoroughly suitable hall, enable the Masonic brethren to provide themselves with this luxury at a very little real expense. With an object of this kind in view, the architects have designed a commodious block of buildings, containing, in addition to the requisite lodge accommodation, so placed as not materially to add to the expense of the whole, workmen's dwelling-houses sufficient for ten families, with shop premises on the ground-floor. Externally the elevation, showing in style an adaptation of the Scottish baronial, is two stories in height, with a large attic-flat, and in its east and north fronts (which measure in length respectively 65 ft. and 72 ft.) has somewhat of a pronounced character. The total cost of the work about the tower is estimated at 3,000*l.*

BECKENHAM, KENT.

CHRIST CHURCH, Beckenham, which will accommodate 750 persons, was consecrated by the Archbishop of Canterbury on Saturday last. It has a nave 30 ft. in clear span, each aisle being 12 ft. wide, and the distance from centre to centre of the arcade columns is 17 ft. The chancel is 24 ft. wide. There is a vestry on the north side, and an organ-chamber on the south side; a north porch, and a south-western tower and spire (approaching completion), 117 ft. 6 in. high, serving as a second entrance, while a west doorway is provided as an additional exit. The walls are faced with white Suffolk bricks, with bands of seconds Malms sparingly used. Bath stone is chiefly used for the masonry, but the nave piers are monoliths of polished dark shap granite. The roofs are slated, and the floors laid with Maw's tiles by Messrs. W. B. Simpson & Sons. The heating apparatus of hot-water pipes in trenches is by Messrs. Herring & Sons, of Chertsey. The carving to the capitals, and the pulpit and font, are by Messrs. Farmer & Brindley. The contractors are Messrs. E. B. Gammon & Sons, of Lambeth; and the works have been carried out from the designs and under the superintendence of Messrs. Blashill & Haywood, of Old Jewry-chambers, at a cost of about 6,500*l.*

SURVEYORSHIP ITEMS.

Warwick.—At the meeting of the Warwick Town Council, on the 9th inst., it was stated that there were fifty-one applications for the office of surveyor, exactly the same number as on the occasion of the appointment in May, 1870, of Mr. Pritchard, who has just resigned. The following are the selected candidates, from amongst whom the final selection will be made:—Mr. G. Lewis, Saint Pancras; Mr. E. Frost, Hanley; Mr. R. Richardson, Cleator Moor; Mr. J. Eayres, Llanelly; and Mr. B. H. Inch, Croydon.

Newport (Isle of Wight).—The Committee of Highway Commissioners appointed to consider the applications and testimonials of the candidates for the vacant surveyorship of the East Medene, met at the Guildhall, Newport, on the 17th inst. There were seventy-one applicants, and the names of six selected by the committee will be submitted to a general meeting of the Highway Board.

Merthyr Tydvil.—Mr. H. Williams has been appointed assistant-surveyor to the Merthyr Tydvil Urban Sanitary Authority.

Ossett-cum-Gawthorpe.—Mr. J. H. Duckinfield has been appointed surveyor and inspector of nuisances to the Ossett-cum-Gawthorpe Urban Sanitary Authority, *vice* Exley, resigned.

THE NEW STREET AT CHARING CROSS.

SIR,—Will you allow me to invite your attention to what seems to me a serious public injury proposed to be perpetrated by the Metropolitan Board of Works in connexion with their new street at Charing-cross. At a cost of something between half and three-quarters of a million they are carrying out an important public work, and yet as a result it will (unless prevented) be accomplished at the cost of a serious and irremediable public inconvenience. I allude to the narrowing of the footway on the northern frontage facing Trafalgar-square.

Architecturally, a wide and handsome footway is desirable, but for the convenience of the crowded traffic it is essential. Yet, although taking credit to themselves for two footways 15 ft. in width to Northumberland-avenue, when they deal with the far more important and thronged frontage towards the square they propose to reduce that, and have set it out so that at one point it will be actually under 10 ft. in width. If you walk round that way you will see, and yet hardly credit what you see. It must be borne in mind that the line of the existing palings is stated to be 3 ft. in front of the actual building frontage.

Z.

THE GREAT DOLWILYM CROMLECH.

THIS beautiful prehistoric structure, illustrated in last week's *Builder*, is not now for the first time made known to the public. An engraving of it which may be pronounced quite accurate, as being a facsimile of a good photograph, was published in 1872, in Dr. Nicholas's "Annals and Antiquities of Wales" (vol. i., p. 222), and this was the first notice taken of this interesting relic, as far as known, in modern literature. The photograph was supplied by Miss Protheroe, of Dolwilym, and by her request engraved for the work. The Cambrian Archæological Association has at last found out the cromlech, and produced a sketch of it, which must be admitted to be original, if not "positively exact."

T. N.

VICTORIA HOSPITAL FOR SICK CHILDREN, QUEEN'S-ROAD, CHELSEA.

ON the 20th inst. the Princess Louise of Lorne re-opened this hospital, after the execution of various works and additions, which include the entire re-arrangement of the interior to form four large wards, and one separation ward; new wings, in which are placed bath-rooms, ward sculleries, and so forth; new stone staircase; and an improved west elevation. Each of the large wards will accommodate fifteen beds. Those on the ground-floor are 15 ft. high; those on first floor are 11 ft. 6 in. high (being 1 ft. higher than formerly).

The new works have cost about 3,000*l.*, and have been executed by Mr. Walter Nash, of Newland's-terrace, Kensington. The architect is Mr. John J. Thomson, of Durham-place, Chelsea.

VEGETATION IN CEMENT WORK.

SIR,—I should feel greatly obliged to any of your readers who would favour me with an opinion as to the cause of, and suggest a remedy for, a remarkable and persistent oozing through painted cement work of a species of vegetation or fungi. The cement is on the outside of a country-house situate in a park, and with trees within 30 ft. or 40 ft. The spots appear at first from 2 in. to 3 in. in diameter, and of a light greyish colour; as they enlarge they deepen in colour, and form a large mass by meeting, and it then has the appearance of a very fine moss. Repeated coats of paint fail to kill it, as after three or four months it shows again; there are some small pieces of cement here and there it will not touch.

W. W.

DAMAGES RECOVERABLE BY WORKMEN FOR PERSONAL INJURIES.

HOOD *v.* BROWN.

THIS case (heard in the Common Pleas Division of the High Court of Judicature on Monday last, the 22nd inst., before Mr. Justice Lindley and a special jury) was an action to recover damages for serious personal injuries.

The plaintiff, a young man, was a working plumber, and the defendant was a contractor who had undertaken to do a good deal of work at the brewery of Messrs. Reid & Co., in Liquorpond-street. On November 19th, the plaintiff was employed there, under a Mr. Smeaton, to do some

Plumbing work, when a plank gave way under him, and he fell a distance of something like 50 ft. He broke his right leg. He was still suffering from the injury, and it was said that even if he got better the limb must be permanently shortened.

The case for the plaintiff was that the plank was unsound, and the scaffold not properly constructed; but, on the other hand, it was said that the materials of which the scaffold was constructed were exceptionally good, and that the structure was properly built. It was added that the plank broke in consequence of the plaintiff having dropped from a height upon it, a thing which he ought by no means to have done. There were also some points of law raised for the defendant.

After a very long trial a settlement was arrived at. It was agreed that a juror should be withdrawn, and that the plaintiff should be paid 100*l.*, in addition to a sum for costs.

CASE UNDER THE METROPOLITAN BUILDING ACT.

WOODEN BUILDINGS.

At the Hampstead Police-court, on the 9th inst., Mr. William Harman, builder, of St. John's Wood, appeared to answer a summons taken out by Mr. H. E. Kendall, district surveyor of Hampstead, charging him with neglecting to comply with a notice from Mr. Kendall, dated the 24th of April, with respect to a wooden building erected in Willow-road, Lower-heath, contrary to the provisions of the Metropolitan Building Acts.

It appeared that defendant was the builder of a wooden shed on a piece of garden ground in the Willow-road, beyond the general line of frontage. The shed was for use as a refreshment-stall. A few days before Easter Mr. Kendall, in his rounds, observed this building, which he considered objectionable, as it was of wood, and not of stone or brick and incombustible material. Further than that, it being beyond the general line of frontage, Mr. Kendal. could not have sanctioned it, even had it been of proper material. Direct application to the Metropolitan Board of Works would have been necessary. Mr. Kendall spoke to defendant about it, but, on the latter promising that if he allowed it to remain two or three days, so as to be available for the Easter holidays, he would then pull it down, Mr. Kendall consented. However, some days afterwards defendant, accompanied by Mr. Warrington, by whom he was employed, went to Mr. Kendall's Hampstead office, and, in his absence, induced the housekeeper to receive and give a receipt for 15s. as "surveyor's fee for the erection of a wooden building in Willow-road," defendant, or the gentleman with him, only at that time filling up the form of application for consent. Mr. Kendall, even had he given his consent, would not have been entitled to this fee until a month after the building was roofed in, and, on hearing what had been done, he immediately sent the money back, with a letter and a formal notice to pull down the building. Defendant returned the money and the notice, accompanied by an impudent letter.

Defendant on oath denied receiving that notice, but the evidence appeared conclusive on the point.

The Bench ordered the defendant to take down the building within forty-eight hours, and to pay full costs.

SYPHON TRAPS.

Sir,—Your correspondent, "Arthur Loader," is quite correct when he says that syphon traps frequently do not act as traps. I have long been convinced of this, and for years have discarded them altogether. Even where the dip is sufficient they have so many disadvantages, that a drain is better without them than with them. They choke with dirt, are difficult to get at, check the current, and are in every way unsatisfactory. The gully-trap is the best for all purposes, but there are so many of these that are not what they profess to be that some four or five years ago I designed one for our own use, which has given us every satisfaction.

F. Smith.

MEMORIAL TABLETS IN LONDON.

Tablets have been set up, by the care of the Society of Arts, during the past month, on houses formerly lived in by the following distinguished men:—

Samuel Johnson—17, Gough-square, Fleet-street.

Edmund Burke, 37, Gerrard-street, Soho.

George Canning—37, Conduit-street.

Michael Faraday—2, Blandford-street, Portman-square.

David Garrick—5, Adelphi-terrace.

Horatio Nelson—147, New Bond-street.

Mrs. Siddons—27, Upper Baker-street.

The following is a list of tablets previously erected:—

John Dryden—43, Gerrard-street, Soho.

John Flaxman—7, Buckingham-street, Fitzroy-square.

George Handel—25, Brook-street.

Benjamin Franklin—7, Craven-street.

Sir Joshua Reynolds—47, Leicester-square.

Lord Byron—16, Holles-street, Cavendish-square.

Napoleon III.—3a, King-street, St. James's.

The Civil Engineers' Conversazione, on Thursday, the 1st of June, is to take place in the South Kensington Museum itself, instead of, as at first intended, in the galleries devoted to the scientific apparatus exhibition.

Miscellanea.

Discovery of Wall-Paintings at Baunton Church.—During the restoration of the little church at Baunton, which is now being carried out at the cost of Mr. T. W. C. Master, of Cirencester, a number of wall paintings have been uncovered by the careful removal of the coating of whitewash, and the utmost pains are said to have been taken by those employed to preserve every bit of colour wherever found. Among the pictures disclosed to view is a large and interesting painting, in a panel on the north wall, of St. Christopher, to whom the church is dedicated. The child and the ball are obliterated, but the gilt cross remains, with the gilding upon it, in very good preservation. The river is full of fish, and a figure on the opposite bank is engaged in fishing, apparently with satisfactory results, seeing he has got two on his lines, and a good basket beside him. The back-ground on the left is a hilly landscape, with groves of palm. The outline of the hills is well defined, and many towers, pinnacles, and steeples rise above the hill tops. On the right is some ecclesiastical building, and many boats are seen on the river. There is an inscription on the upper margin of the panel in black letter, with red capitals. Over the chancel arch, which is small, semi-circular, and almost destitute of ornament or mouldings, is the figure of the Saviour led to execution by two Roman soldiers. The Saviour carries the cross, and a rope is round His waist, with one soldier in front and one behind urging Him forward. The nimbus is clearly seen, and the roadway plainly marked, with lines undulating. Over the right-hand it is so much destroyed, that at present nothing can be seen to make out its intent.

Canterbury Cathedral.—At a meeting held at Lambeth Palace on the 5th inst., under the presidency of the Archbishop of Canterbury, the Dean referred to the steps which had been taken by his predecessors to keep the cathedral in a proper state of repair, and called upon Sir Gilbert Scott to state the result of his explorations, and his suggestions for the restoration. Sir G. Scott at some length entered into the result of his examination, and stated his proposal was to bring matters back as nearly as possible to the state they were in at the time of Prior de Estria in 1304, and to remove the Renaissance stalls, not for the purpose of showing sham architecture, but to expose the beautiful work of the fourteenth century, which they now concealed. Mr. Beresford Hope moved,—"That this meeting, having heard Sir Gilbert Scott's explanations and plans for the refitting of the choir of Canterbury Cathedral, undertakes to co-operate with the Dean and Chapter to raise the necessary funds." Mr. Butler-Johnstone, M.P., seconded the motion, and suggested that it would be undignified to commence the restoration until a substantial portion of the 16,000*l.* required had been obtained. The Dean stated that the amount promised towards the restoration is 3,000*l.*

Obituary.—The death is announced of Mr. James May, C.E., a native of Clonaharry, near Inverness. After being trained with the Messrs. Gibb, of Aberdeen, Mr. May was connected with the Aberdeen Railway, and also the Edinburgh and Glasgow. He was engaged for twenty years at the Alderney Harbour works, and subsequently two years at the Alexandra Harbour extension. The deceased sailed twelve months ago for Madras, having received an appointment from the Indian Government to superintend the important harbour works intended to be carried out on that exposed and hazardous coast. He had only entered upon his new duty, and was engaged in making the necessary preparations, when he was attacked by fever, and was carried off at the comparatively early age of fifty-seven.——Mr. William Butcher, a well-known land surveyor and auctioneer, died at Norwich on the 19th inst., in his 82nd year.——The death is announced of Mr. Benjamin Burleigh, C.E., the architect to the North-Eastern Railway Company, which took place on the 25th ult. The deceased gentleman, who, at the time of his death was in his fifty-sixth year, had only been in the service of the company about three years, having succeeded Mr. Prosser.

Ventilation.—We have received a long communication from Mr. Tobin; but as it replies to statements not made in our pages, and does not reply to those that have been made there, we cannot afford space for it.

Compensation to Workmen for Accidents. At the monthly meeting of the Birmingham Trades Council, on the 3rd inst., a petition to Parliament in favour of the Compensation to Workmen's Bill was unanimously adopted, on the proposition of Mr. Skelton:—"That numerous accidents annually occur, causing death or injury to the person, through defective machinery, with other appliances used in trade, or through some default of persons in the same employment other than the person or persons injured, and without any default or neglect on their own part. That the person or persons so injured through no neglect or default of their own have, by the existing interpretation of the law, been unable to recover damages for the injuries received, or their family compensated in case of death. We therefore pray your honourable House to pass this session the Bill to amend the law relating to the liability of employers for injuries negligently caused by persons in their employment now before your honourable House."

The Iron Trade and the Foreign Office.—It was recently announced that in order to meet the arguments of those foreign iron producers who are agitating for protective duties upon the English iron as a necessity of their trade, the British Government had directed inquiries to be made as to the actual condition of the English iron trade in its various manufacturing centres. The Foreign Office inquiries have been addressed to the various iron-making firms in South Staffordshire, but out of 104 manufacturers of wrought-iron in this district only 39 firms have been at the trouble to reply. Unless the makers of wrought-iron respond more readily, it is to be feared that part of the information asked for cannot be furnished in time for Government purposes. As the inquiry is undertaken solely in the interests of English iron manufacturers, it is to be hoped they will see the desirability of sending in their replies without further delay.

"Garraway's."—The Exchange Tavern and Dining-rooms, No. 2, Change-alley, Cornhill, so well known for two hundred years as "Garraway's Coffee House," and until a few years ago a noted place for the sale of houses, land, &c., was offered for sale by public auction, at the Auction Mart, on the 3rd inst., by Messrs. Edwin Fox & Bousfield. The property comprised the freehold premises in which the business of the tavern is carried on, containing an area of about 1,042 superficial feet. The fixtures, trade fittings, and utensils of trade to be taken by the purchaser at a valuation. The auctioneer estimated the annual value of the property in the event of the trade fittings, &c., being taken out, and 500*l.* expended on improving the property and adapting it to a public company, at 1,500*l.* per annum. The biddings went up to 23,500*l.*, on which the property was bought in at 25,000*l.*

Lighting Reform at Winchester.—At the last meeting of the Winchester Town Council, the Mayor moved "that the General Purposes Committee be authorised to accept the offer of Messrs. Bayley & Co., of Poole, to light the street-lamps at a cost of 3*l.* 5*s.* per lamp. Mr. Warren urged that the contract should provide for lighting the lamps every night, the offer being that the lamps should be burnt ten hours per night, except four nights at the full moon, by reducing the time to nine hours and a half. The Council would have saved 210*l.* last year at the rate now proposed. After remarks from Alderman Forder, who thought the Town hall and other public buildings should be lighted upon the new principle, the motion was unanimously adopted.

The Directors of the London, Brighton, and South Coast Railway Company have accepted the tender of Mr. Joseph Firbank, of Newport, Monmouthshire, for the new line from Preston to Cliftonville. This line will form a direct cut for the express trains from London to Worthing, Shoreham, and Portsmouth, without going into the Brighton Terminus. The works, which comprise a tunnel 600 yards long, and an extensive cutting through the chalk, &c., are to be pushed on with immediately, and finished as quickly as possible.

Lawless House-building at North Shields. The *Shields Gazette* has a leading article in reference to the proceedings at the last meeting of the Borough of Tynemouth Corporation. According to Councillor Baker, "houses are sometimes half and sometimes wholly built" before official sanction is given for the work; and yet it would seem that in not a single instance has the wrongdoer been punished.

An Industrial Dwellings Company for Derby.—A meeting of gentlemen favourable to the formation of an association having for its object the erection of improved dwellings for the artisan and labouring classes was held in the Grand Jury-room, Town-hall, Derby, on the 8th inst. Resolutions were unanimously passed approving of the formation of an association to be called the Midland Industrial Dwellings and Sanitary Association, Limited, with a capital of 100,000*l.*, in shares of 5*l.* each, and also requesting certain gentlemen to act as directors and vice-presidents.

The Mersey Dock Board.—It has been settled by arbitration that the sum of 310,000*l.* is to be paid to the Liverpool Corporation by the Mersey Docks and Harbour Board for a piece of land which has been acquired by the Board from the Corporation. This is at the rate of 2*l.* 17*s.* 7*d.* per yard. The *Liverpool Post* states that, with the exception of the Duke's Warehouse and the George's Pierhead, the Docks and Harbour Board are now the proprietors of all the land on the Liverpool side of the river from one end of the town to the other.

New Buildings at Kew Gardens.—We learn that under the superintendence of Her Majesty's Office of Works some new buildings and extensions are about to be made at the Royal Botanical Gardens at Kew, for the reception of specimens of plants and flowers, and that for this purpose the west wing of the Herbarium, adjoining the entrance to the gardens, is about to be demolished. Preparatory to the old building being removed and the works commenced the materials were publicly sold last week by Messrs. Dawson & Co., of Norfolk-street, Strand.

Ely Cathedral.—At a meeting of the sub-committee, held at Cambridge on the 5th inst., the plans of Sir Gilbert Scott for restoring the exterior of the octagon and lantern, at a cost of about 3,000*l.*, were approved for submission to the general committee on the 7th proximo. It was stated that about 500*l.* are still required to enable the whole of this work to be completed.

The Walker Art Gallery, Liverpool.—The general committee appointed to make arrangements for the opening of the Walker Art Gallery, Liverpool, have issued a circular asking for pictures for the loan exhibition which is proposed to be held at the inauguration of the building. It is proposed that the exhibition shall open during the month of September, and remain open to the public for about two months.

The Restoration of Steetley Chapel.—Mr. Pearson, A.R.A., has undertaken to prepare the plans for the restoration of this valuable and picturesque relic, which is to be utilised as a church. We mentioned the proposal some months since, and a vigorous protest against it was made by a correspondent.

Wiltshire Archæological and Natural History Society.—At a committee meeting of this Society held at the Museum in Devizes, a few days since, it was definitely fixed to hold the annual meeting for this year at Salisbury, in the early part of the month of August, under the leadership of the new president of the Society, Sir John Lubbock.

Worcester Market Cross.—It has been suggested that Worcester Market Cross should be restored as a memorial of the late Lord Lyttelton.

TENDERS

For the erection of a detached house and stabling on the Manor Park Estate, Caterham Valley, Surrey. Mr. Richard Martin, architect. Quantities supplied by Mr. John Glenn:—

	House.	Stabling.
Blott	£4,850	£640
Newman & Mann	4,775	635
Langmead & Way	4,705	620
Willson, Brothers	4,690	610
Bangs & Co.	4,639	660
Patman & Fotheringham	4,635	630
Cooper	4,480	608
Ward	4,171	574
Jarrett (accepted)	3,925	560

For taking down and rebuilding schools, Wood-street Chapel, Walthamstow. Mr. J. H. Swan, architect. Quantities by Mr. Macfee:—

Wells	£2,370 0 0
Reed	2,330 0 0
Turner	2,260 0 0
Fuller	2,143 0 0
Tubby	2,050 0 0
Morter	1,957 0 0
Tarrant	1,948 0 0
Deards (accepted)	1,898 0 0
Read	1,763 0 0

For new Almshouses, Worcester. Mr. Aston Webb, architect. Quantities by Messrs. Selby & Rogers:—

	Six Blocks.	Five Blocks.
Treasure & Son	£5,095	£4,295
Nixon & Son	3,890	3,290
Kendrick	3,827	3,227
Collins & Cullis	3,757	3,125
Dixon	3,690	2,980

Amended and reduced tender for the five blocks:—
Dixon (accepted) £2,862 0 0

For house, shop, and workshops, Rose Mount, Oxton, for Mr. W. Male. Mr. C. W. Harvey, architect. Quantities by Messrs. Selby & Rogers:—

Forde	£1,983 0 0
Bleakley	1,911 0 0
Cubbins	1,860 0 0
Povall	1,786 0 0
Hughes	1,583 0 0

For stables, &c., at Letts' Wharf, Lambeth, for the Commissioners of Sewers of the City of London. Mr. W. Haywood, architect. Quantities by Mr. D. Cubitt Nichols:—

Mowlem & Co.	£16,500 0 0
Downs	15,920 0 0
Gammon	15,706 0 0
Maraland	15,570 0 0
Linzell	15,550 0 0
Waldram & Co.	15,310 0 0
Wilson, Brothers	14,970 0 0
Chappell	14,939 0 0
Stevenson	14,352 0 0
Little	14,340 0 0
Bracher & Son	13,600 0 0
Perry & Co. (accepted)	13,379 0 0

For alterations to the Three Colts public-house, Cambridge-road, Mile-end, for Mr. Harwood. Mr. W. Munday, architect:—

Forrest	£924 0 0
Wood	893 0 0
Judd & Hawkings	769 0 0
Saunders	750 0 0
Hearle & Son	623 0 0
Stamp & Bowtle	593 0 0

For pulling down three houses and building two on the site, for Mr. Tyler. Mr. J. Harris, architect:—

Killby	£1,459 0 0
Wood	1,344 0 0
Judd & Hawkings	1,313 0 0

For the erection of stabling and conversion of house into a warehouse, at Brentford, for Messrs. Carter, Paterson, & Co. Mr. Wm. Eve, architect:—

Barnes	£1,130 0 0
Brunsden	935 0 0
Sheffield	854 0 0
Nye	823 0 0
Sweet (accepted)	782 0 0

For alterations at 72, Marine-parade, Brighton, for Mr. J. W. Williams. Mr. A. R. Farr, architect:—

Anscombe	£765 0 0
Garrett Brothers	745 0 0
Howard (accepted)	725 10 0

For the restoration of parish church, River, near Dover. Mr. B. J. Reeve, architect. Quantities supplied:—

Bourne	£734 0 0
Moody	714 14 0
Butler	699 0 0
Matthews (too late)	655 0 0
Brooks & Slade	650 0 0
Prebble	599 0 0
Webster	587 0 0
R. & D. Baker	580 0 0
Richardson & Son	543 0 0
Humphrey	533 0 0
Holdom (accepted)	516 0 0
Dowle	484 5 0

For villa residence and front boundary wall in Leonard-road, Folkestone. Mr. B. J. Reeve, architect. Quantities supplied:—

Brooks & Slade	£1,057 0 0
Webster	1,050 0 0
Prebble	1,014 0 0
R. & D. Baker	998 0 0
Holdom	977 0 0
Dunk (accepted)	968 0 0

For stable, coach-house, hen-house, walls, and entrance-gates to East Cliffe Lodge, Folkestone. Mr. B. J. Reeve, architect. Quantities supplied:—

Dunk	£227 0 0
Holdom (accepted)	200 0 0

For drainage works, Trowbridge, Wilts:—

Cowdry & Sons	£1,415 18 6
Greenwood & Dovenor	1,395 0 0
Haines	1,350 0 0
Botterill & Co.	1,323 0 0
Brook & Bruce	1,218 0 0
Bugbird	1,151 0 0
Sibsey	1,070 0 0

For two warehouses in Rutland-street, Leicester. Mr. A. Hardy, architect. Quantities by Mr. G. Jackson:—

Lindley	£6,486 0 0
Loveday	6,450 0 0
Bland & Son	6,229 10 0
Billington	6,045 0 0
Barnett	6,005 0 0
Kellett	5,945 0 0
Bass & Hodgkins	5,875 0 0
Stark	5,870 0 0
Hall	5,865 0 0
Gilbert & Pipe (accepted)	5,841 0 0

For (R.C.) church, presbytery, and schools, Market Harborough. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Parnell & Son	£5,761 0 0
Bayes Bros. & Allen	5,497 0 0
Stamp & Bowtle	5,389 0 0
Jennings	5,345 0 0
S. & W. Pettinson	5,000 0 0
Halliday & Cave (accepted)	4,900 0 0
Margetts	4,658 0 0
Conquest	4,651 0 0
Bassett	4,438 0 0

For the erection of a residence and offices at Redlands, Reading, for Mr. C. J. Andrews, J.P. Mr. W. Ravenscroft, architect. Quantities by Mr. H. Cooper:—

Timewell*	£5,530 0 0
Silver & Son	4,870 0 0
George Bros. (too late)	4,540 0 0
Hill, Higgs, & Hill	4,415 0 0
Battley	4,400 0 0
Woodbridge	4,370 0 0
Searle	4,305 19 0
Nye	4,299 0 0
Staines & Son	4,244 0 0
Jarrett	4,100 0 0
Deacon	4,095 0 0
Rider & Son (accepted)	3,787 0 0
Croxford & Co.	3,571 0 0

* We are asked to say that Mr. Timewell's estimate, but for a mistake in the figures, would have been 4,830*l.*

For house to be built at Bromley, Kent, for Mr. W. Barnard. Mr. H. T. Gordon, architect:—

Browne & Robinson	£3,303 0 0
Manley & Rogers	3,160 0 0
Little	3,064 0 0
Williams & Son	3,030 0 0
Kerry	2,973 0 0
Shapley	2,875 0 0
Crabb	2,845 0 0

For schools, Bredon, Worcestershire, for Mr. Chas. S. Hudson. Messrs. Yeates & Jones, architects. Quantities supplied:—

Warner	£480 0 0
Collins & Cullis	470 0 0
Beard	465 0 0
Williams & Buckle	430 10 0
Walker & Wilkes*	430 0 0

* Accepted after slight alteration in construction.

For alterations and additions to schools, Pheasant-street, Worcester, for the St. Martin's Schools Committee. Messrs. Yeates & Jones, architects. Quantities supplied:—

Kenderick	£341 13 0
Beard	324 0 0
Bourne	309 0 0
Dixon (accepted)	280 0 0

For cricket pavilion, Boughton, Worcester, for the Worcester County Cricket Club. Messrs. Yeates & Jones, architects. Quantities supplied:—

Warner	£468 0 0
Kenderick	440 10 0
Bourne	426 0 0
Dixon (accepted)	385 0 0

Accepted for warehouse, for Mr. E. Awmack, Broad-street, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Bricklayer, Slater, Mason, &c.

Searle	£232 7 7

Carpenter and Joiner.

Sheppard	291 7 0

Plumber, Painter, and Glazier.

Gocher	73 0 0

Accepted for additions to corn stores, Reading, for Mr. E. G. Oakshott. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Turney	£450 0 0

Accepted for new branch bank, Reading, for the London and County Banking Company. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Wheeler Bros.	£4,535 0 0

Accepted for first portion of work for new premises for Mr. Joseph Long, London-street, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Bricklayer, Mason, Carpenter, &c.

Filewood	£1,689 0 0

Smiths and Founders.

Hart & Son	158 18 0

Plumber, Painter, and Glazier.

Harris	283 0 0

Accepted for new drying building, Reading, for Messrs. Sutton & Sons. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Higgs	£397 0 0

For rebuilding Nos. 35, 36, 37, and 38, Great Marlborough-street, W., for Messrs. Metzler & Co. Messrs. Lee Bros. & Pain, architects. Quantities supplied:—

Trollope & Sons	£22,840 0 0
Simpson & Sons	22,830 0 0
Jackson & Shaw	21,355 0 0
Brass	21,259 0 0
Bywaters (accepted)	20,996 0 0

For the erection of Emmanuel (iron) Church, Wimbledon, exclusive of foundations and warming. Mr. T. S. Archer, architect:—

Kent	£2,000 0 0
Townsend (accepted)	1,890 0 0

For the erection of plant houses at Kelsey Manor, Beckenham. Mr. T. S. Archer, architect:—

Messenger (accepted)	£630 0 0

For alterations and additions to Raymead, Hendon Park, Hendon. Mr. T. S. Archer, architect:—

Meadows (accepted)	£248 0 0

For the erection of a house for Mr. F. W. W. Topham, Hampstead. Mr. T. K. Green, architect:—

	House.	Conservatory.
Longmire & Burge	£2,490 0 0	— —
Newman & Mann	2,334 0 0	£90 0 0
Baker	2,329 0 0	86 0 0
Browne & Robinson	2,280 0 0	65 0 0
Scrivener & White	2,275 0 0	82 0 0
Shepherd	2,195 0 0	57 0 0
Manley & Rogers	2,190 0 0	77 0 0
Benstead & Sons	2,185 0 0	69 0 0

For the erection of a warehouse, Old-street, E.C. Mr. R. J. Worley, architect:—

Falkner	£1,197 0 0
Catlen (too late)	1,060 0 0
Rudkin	1,020 0 0
Smyth	997 0 0
W. & F. Croaker	927 0 0
Beeton (withdrawn)	675 0 0

For the erection of stabling, Hall-street, City-road. Mr. R. J. Worley, architect:—
Beeton (accepted) £1,000 0 0

For engines, boilers, pumps, tanks, &c., at Aylesbury Sewage Works, for the Native Guano Company. Contract No. 2. Messrs. T. & C. Hawksley, engineers:—
Wurr & Lewis accepted.

For five villa residences at Stockwell End, Tettenhall, for Mr. G. H. Ferry. Mr. J. R. Veall, architect:—
Lovatt (reduced estimate, accepted) £6,650 0 0

For restoration of parish church, Nolton, Pembrokeshire. Mr. E. H. Lingen Barker, architect:—

Evans	£503	8	5
Thomas	495	0	0
James	479	10	0
Lloyd & Roberts	394	17	0
Jones & Jenkins	373	15	0

For billiard-room, stock-rooms, and other works at the Angel Hotel, Salisbury, for Messrs. George Gale & Co., Mr. F. Bath, architect. Quantities by the architect:—

Harris	£950	0	0
Tryhorn	934	10	0
Young	922	0	0
Harris & Dolman (accepted)	891	18	5

For new tavern in Merton-road, Tooting, Surrey, for Messrs. Thorne. Mr. Lynes, architect:—

	House.			Stable.		
Richards	£2,510	0	0	£458	0	0
Ellis	2,249	0	0	399	0	0
Tully	2,220	0	0	386	0	0
Parsons	2,170	0	0	375	0	0
Lathey Bros.	2,063	0	0	347	0	0
Kirk	1,977	0	0	356	0	0

For alterations and additions at New Cross Cottage, Oatlands Park, Surrey, for Mr. G. T. Woodroffe. Mr. J. Jeffkins, architect:—

Brown & Sons	£1,165	0	0
Lee	850	0	0

For additions to house, Oatlands Park, Surrey, for Mr. Edward Weatherby. Mr. J. Jeffkins, architect:—

Lee	£990	0	0
Brown & Sons	810	0	0

For rebuilding the Surrey Hall Hotel, Clewer, near Windsor, for Mr. Pennicott. Mr. W. Sim, architect. Quantities by Messrs. Herring & Shayler:—

Browne & Robinson	£2,639	0	0
Revell	2,532	0	0
Hollis	2,294	0	0
Carless	2,271	0	0
Pocock	2,270	0	0
Ebbs	2,175	0	0
Deacon	2,143	0	0
George	2,041	0	0

For new vestry at Immanuel Church, Streatham. Messrs. George & Peto, architects. Quantities by Messrs. Stoner & Sons:—

Bassett	£636	0	0
Mason	629	0	0
Deacon (accepted)	579	0	0

For farm buildings and cottage, at Sparks Farm, Cuckfield, Sussex, for Mr. W. Sergison. Mr. Holloway, architect:—

	Farm Buildings.			Cottage.		
Anscomb	£590	0	0	£395	0	0
Deacon	585	0	0	428	0	0
Norris	544	7	0	365	0	0
Knight	520	0	0	355	0	0

For mahogany fittings, painter's and decorator's work, to completion of York-road, Battersea, Branch of the West London Commercial Bank. Mr. C. Stimpson, architect:—

Smith	£397	14	0
Luff & Co.	318	0	0
Turtle & Appleton (accepted)	292	0	0

TO CORRESPONDENTS.

W. G. S.—W. C.—F. W.—L.—J. D.—S. S.—H. H.—C. G. W.—W. G.—C. J.—Rev. E. H.—J. S.—J. H. B.—S. S.—H. P.—G. J.—H. C. S.—Mr. E.—T. B.—F & W.—J. H.—W. R. G.—C. S. F.—J. L. H. S.—R. P.—J. T.—H. H. S.—M. D.—R. & S—J. K—Mr. V.—E. L. B.—T. B. D.—J. L.—F. B.—L. Bros.—W.—J. J.—W. P.—G. L. W.—P. C. (No).—R. & M. (next week).—J. T. 'compelled uniformly to decline).—T. D (send us decision).

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The ANNUAL MEETING of this Institute will be held at the MANSION HOUSE, on MONDAY, the 29th inst. by kind permission of the Right Hon. the Lord Mayor, who will take the Chair at THREE p.m. The following Noblemen and Gentlemen among other Friends of Industrial Education, intend being present:—The Earl of Rosebery, Earl Fortescue, Sir John Lubbock, bart. M.P.; Sir Harcourt Johnstone, bart. M.P.; Right Hon. Cowper-Temple, M.P.; Samuel Morley, esq. M.P.; Thomas Brassey, esq. M.P.; William McArthur, esq. M.P.; Major-Gen. Marriott, C.S.I.; Professor Leone Levi; Professor James Stuart, M.A. (Cambridge); Professor Kennedy, (Univ. Coll.); Hodgson Pratt, esq.
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[CONTRACTS—*continued from* p. ii.
TO STEAM JOINERY PROPRIETORS. WANTED ESTIMATES for first-class JOINERS' WORK.—Address, in the first instance, to No. 450, Office of "The Builder."

TO BUILDERS.—TENDERS are required for the RESTORATION of the PARISH CHURCH of Birt's Norton, near Tewkesbury, Worcestershire. The plans, specification, and conditions of contract can be seen at the Rectory, Birt's Norton, from MAY 18th to JUNE 1st inclusive, and Tenders to be sent by post to the undersigned on the 1st of JUNE. The Architects will reply to any inquiries addressed to them. No pledge is given to accept the lowest or any Tender.
T. D. BARRY & SONS, Architects,
Liverpool.

GRAINING.—ESTIMATE WANTED, for WORK required to be done at once.—Apply to S. BARNETT, Builder, 15, Gore-crescent, Victoria Park, E.

BURSLEM LOCAL BOARD.—NEW MARKET HALL, SHOPS, and OFFICES.—The Burslem Local Board are prepared to receive TENDERS for the following WORKS:—
CONTRACT No 1.—The Erection of a Covered Vegetable Market, Six Shops, Offices, and other Works.
CONTRACT No. 2.—The Construction of an Iron Roof, with Wrought-iron Arched Principals, Purlins, &c. and Cast-iron Columns.
The drawings, specification, and conditions of contract can be inspected, and forms of Tender, with bills of quantities, obtained on application at the Office on and after the 24th instant, on payment of 2l. 2s. which sum will be returned on receipt of a bond fide Tender. Sealed Tenders, addressed to the Chairman of the Markets Committee, and endorsed "Tender for Market Hall, Contract No ," must be sent to me at or before THREE p.m. on the 8th day of JUNE next. The Board do not bind themselves to accept the lowest or any Tender.—By order,
E. M. RICHARDS, Surveyor to the Board.
Surveyor's Office, Town-hall, Burslem, May 12th, 1876.

MINSTER-IN-SHEPPEY SCHOOL BOARD. To BUILDERS. The Minster in Sheppey School Board are prepared to receive TENDERS for the ERECTION of Two Sets of SCHOOL BUILDINGS at Minster Village and Sheerness. Persons desirous of Tendering may inspect the drawings, specifications, and quantities at the Office of the Board, Trinity-road, Sheerness. Tenders to be delivered at the Office of the Board, on or before WEDNESDAY, the 7th day of JUNE, 1876, and not later than SIX o'clock in the evening of that day. The Board do not bind themselves to accept any Tender nor to pay any expense connected with any.—By order, EDWARD FELKIN, Clerk to the Board.
Trinity-road, Sheerness, May 24, 1876.

TO BUILDERS and CONTRACTORS.—The Northamptonshire Banking Company are prepared to receive TENDERS for the ERECTION of NEW BANK PREMISES, at Kettering. Plans and specifications may be seen, and bills of quantities obtained, on application to the Architect, Mr. E. W. JOHNSON, George-street, Kettering, on and after WEDNESDAY next, the 31st day of MAY. The lowest or any Tender not necessarily accepted.

KENT.—To BUILDERS. Persons willing to TENDER for the ERECTION of a CHAPEL at the Kent County Prisons, Maidstone, may see the plans and specification of the proposed works, and obtain all necessary particulars, at the Office of the County Surveyor, West Borough, Maidstone, between the hours of TEN and FIVE. Sealed Tenders are to be delivered at the Office of the Clerk of the Peace, Sessions House, Maidstone, on or before WEDNESDAY, JUNE 21st, 1876 endorsed "Tender for Building Chapel." The Justices do not bind themselves to accept either the lowest or any other Tender, and security will be required for the proper performance of the contract.
F. RUSSELL, Clerk of the Peace for Kent.
Maidstone, May 25th, 1876.

KENT.—To CONTRACTORS and BUILDERS. Persons willing to TENDER for PULLING DOWN a BRIDGE known as Old Bridge, and to rebuild at Hadden-Hough, near Tonbridge, and RE-BUILDING the same, may see the plans and specification of the proposed Works, and obtain all necessary particulars, at the Office of the County Surveyor, West Borough, Maidstone, between the hours of TEN and FIVE. Sealed Tenders are to be delivered at the Office of the Clerk of the Peace, Sessions House, Maidstone, on or before WEDNESDAY, JUNE 21st, 1876 endorsed "Tender for Rebuilding Old Bridge." The Justices do not bind themselves to accept either the lowest or any other Tender, and security will be required for the proper performance of the Contract.
F. RUSSELL, Clerk of the Peace for Kent.
Maidstone, May 25th, 1876.

DARTFORD SCHOOL BOARD.—To BUILDERS and CONTRACTORS.—The Dartford School Board is prepared to receive TENDERS for the ERECTION of NEW SCHOOLS, to accommodate 333 children, on the proposed site in Heath-street, Dartford. Plans and specification may be seen, and bills of quantities obtained, between the hours of TEN a.m. and FIVE p.m. at the Office of the Board (No. 68, High-street, Dartford), and at the Office of Mr. W. H. POWELL, Architect, No. 13, Mecklenburgh-square, London, W.C. (from whom all further information may be obtained), on and after MONDAY, the 29th MAY inst. Tenders sealed, and endorsed "Tenders for New Schools, Heath-street, Dartford," must be delivered to me, the undersigned, at or before TWO o'clock on THURSDAY, the 8th day of JUNE next. The Board does not bind itself to accept the lowest or any Tender.
J. RICKETT, Clerk to the Board.
Dartford, 10th May, 1876.

GREENWICH DISTRICT.—To PAVING CONTRACTORS.—The Board of Works for the Greenwich District is prepared to receive TENDERS for PAVING the FOOTWAYS of Kelsey road and Upper Crandell road, from Wickham-road to Breakspeare road, in the parish of St. Paul, Deptford, with 2½ inch tooled York Stone and Purbeck Kerb, and for MAKING UP 2½ inch tooled York Stone and Kentish Rag-stone, and Paving the Channels with Aberdeen Granite Cubes; and for Paving the Footways of the portion of the Keelsey-road in the parish of St. Paul, Deptford, extending from Norman Lodge, southwards, to the boundary of the parish, with 3 inch Tooled York Stone and Aberdeen Granite Kerb, and for making up the Roadway with Guernsey Granite, and Paving the Channels with Aberdeen Granite Cubes, and other Works, according to specifications.
The specifications and plans can be seen, and particulars obtained, at the Offices of the Board, in Crooms-hill, Greenwich, between TEN and FOUR o'clock (on SATURDAYS between TEN and ONE). A separate Tender must be sent in for the Works in each street, sealed up and endorsed with the name of the street to which it refers, and all Tenders must be sent in to the Board's Offices, as above, before FOUR p.m. on WEDNESDAY, the 14th JUNE next, and parties Tendering, or their Agents, should attend at the said Offices at HALF PAST SEVEN p.m. on that day. The Board does not bind itself to accept the lowest or any Tender.
J. SPENCER, Clerk of the Board.
Greenwich, May 25th, 1876.

ASTON and HANDSWORTH COMBINED SEWERS.—To CONTRACTORS.—The Manor of Aston Local Board hereby give notice that they are desirous of receiving TENDERS from competent persons willing to enter into a contract for the CONSTRUCTION of the following Works:—
Contract No. 1, comprising 6,040 feet run or thereabouts of BRICK-BARREL SEWER, 4 feet 6 inches diameter; 1,267 feet run or thereabouts of Brick barrel Sewer, 3 feet diameter; 4,777 feet run or thereabouts of 3 feet 9 inches by 3 feet 9 inches Egg-shaped Brick Sewer; 8,660 feet run or thereabouts of 2 feet 8 inches by 4 feet Egg-shaped Brick Sewer; 195 feet run or thereabouts of treble row of cast-iron Pipe Sewer, 2 feet 6 inches diameter; together with Manholes, Lamp-holes, Ventilators, Gullies, Storm-overflows, Bell-mouthed Junction, Bridges, Fencing Under, Making up Roads, Curbing and Channelling, and other works incidental to the above.
The plans, sections, and drawings may be seen at the Office of Mr. WILLIAM HUMBER, the Engineer, No. 20, Abingdon-street, Westminster, London, and at the Offices of the Board, Six Ways, Aston-juxta-Birmingham, on and after the 29th day of MAY instant, between the hours of TEN a.m. and FOUR p.m. and on SATURDAYS between the hours of TEN a.m. and ONE p.m. where copies of the specification, conditions, schedule, bills of quantities, and form of Tender may be obtained upon application and payment of five guineas, which said sum will be returned upon the receipt of the said specification, conditions, schedule, bills of quantities, and form of Tender being delivered in, and signed, the same being a bond fide Tender. Tender being delivered in, and signed, the same being a bond fide Tender. Tender must be delivered, sealed and endorsed "Combined Sewerage Works, Contract No. 1," to sealed and endorsed "Combined Sewerage Works, Contract No. 1," to be delivered at the Office of the Board on or before TWELVE o'clock at Noon on MONDAY, the 21st day of JUNE next. The Board do not bind themselves to accept the lowest or any Tender.
JOSEPH ANSELL, Clerk to the Board.
Wordsley-place, Wilton-road, Six Ways, Aston Manor, Warwickshire, May 24th, 1876.

WOOD PAVING.—To LOCAL BOARDS, VESTRIES, CORPORATIONS, and OTHERS.—For particulars as to WOOD PAVING, laid complete by the Cheapest and Best Method, apply to JOSEPH & GABRIEL, Greliner's Wharf, Belvedere-road, Lambeth, where Estimates for same may be had on application.

The Builder.

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American Interiors.

DOUBTLESS the appearance of a work intended as an illustration of some of the best and most tastefully furnished rooms in American residences, not only as a record of what has been done, but as a model of what should be done, will be of some interest to those who are desirous to know what is the progress of taste in these matters on the other side of the Atlantic; the more so as in architecture, both external and internal, America is of course largely indebted to Europe, and to England especially, not only necessarily, but in a great degree intentionally. This latter is the case with the work before us, which professedly aims at reviving in America some of the old English taste in furniture and room decoration which has been so much cultivated among ourselves of late.

The folio volume produced with this intent* is what may be called a rather "tall" book. It is, to do it every justice, beautifully printed and got up, on thick cream-laid paper, with wide margins, and with a handsome binding, and altogether aims at being itself an *objet de luxe*. The author, in a preface dated from the "Household Art Rooms, Boston," states that his aim is, by giving a few models of tasteful interior decoration, to assist in creating a revolt against the vulgar, the meretricious, and the commonplace, "which have long afflicted us," and bringing about a happier state of things, in which "the Beautiful married to the Useful shall make life truer, finer, happier." Many more equally worthy illustrations might have been given, but for the "magnificent distances" of the American Continent, which place the good examples of household art in Baltimore, New Orleans, San Francisco, and elsewhere, out of easy reach. This reminds us of the remark of an eminent English comedian, who visited America not long since, and who, on being asked if he were not greatly impressed with the size of the country, replied that he had certainly observed that the principal towns were an immense distance apart, but that he could not see the advantage of it.

To return, however, to American Interiors: we are rather puzzled to find the table of contents ranged or divided thus:—

"The Home.
The Dining-room.
The Library," &c.

whereby the impression is conveyed that "the home" is an expression applied specially to some part of the house other than the dining-room and the library. In fact, however, we find the title only applies to a short introductory remark, occupying half a page, on the blessings that may be expected to ensue from rendering homes more attractive. It should appear from this exordium (which should have been entitled "Home" in the abstract, rather than "the Home,"—at least it would be so in English) that 'the state of American society is deplorable, and will be till the influence of the Household Art Rooms at Boston can be brought to bear upon it. "We have tried all sorts of panaceas,—free trade, free press, free schools, free and ignorant suffrage: they avail not. Vice, crime, folly, and discontent riot abroad. Whenever a man's home becomes to him the most attractive place upon earth, he will not leave it to seek either the grog-shop, the gambling-room, or the ring,"—which we must presume, therefore, are at present the places in which the typical American is to be looked for. To achieve this desirable end of making home attractive, and bringing back the American from his grog and gambling saloon, Mr. Wyllys Elliott provides twenty-two illustrations of the interiors of dining-rooms, libraries, and other rooms, in some American houses (whose inhabitants, we suppose, have been already "plucked from the burning"), in order, by pointing out the right combinations of floor-stains, wall decorations, and furniture, to lead his unfortunate and debased countrymen to a higher state of moral being.

It will not be supposed that we for a moment underrate the importance of household order, and fitness, and beauty, in making home life attractive and happy. We have been working at this for years. But nothing is gained by thus over-weighting a subject, and putting forth the writer's own specialty as the one thing needful to set society all right. It must be remembered, too, that the relation between the inhabitant and the habitation may be looked at from two sides, when we get away from the very poor; and that a well-ordered and tastefully-furnished house is generally an effect as well as a cause of moral refinement. And it is undeniable that very beautiful lives have been led in very ugly or worse than ugly dwellings.

So much for the philosophy of the "Boston Household Art Rooms." When the author can get down from his high horse, he speaks much more to the point. He follows with a history of the dining-room as it existed in different stages of European domestic life, illustrated by cuts from old drawings and book illustrations. This is not badly done; and as the author observes at the commencement that "the history of the dinner may be made the history of man, for all life centres there," we may thank him also for what he has omitted, and for not attempting to work out in its entirety this very extensive theory of the position of the dinner-table in the scheme of creation. There are, however, some odd mistakes, which indicate that students of these matters in Boston, at least, are not quite "posted up" in the history and nomenclature of European styles of design. In the time of Henry VIII., we are told, the forms and styles of the Italian Renaissance had penetrated to England, "and a style of architecture and decoration grew up there suited to its domestic life, which we now know as the Tudor Gothic." To our English readers the blunder is, of course, obvious; for the information of American readers we may observe that the Tudor-Gothic style is not a mixture of the Italian Renaissance with the indigenous style of England, but is simply the last phase of English Gothic in its rich and ornamental but weak decadence. It was not until the reign of Elizabeth that the fusion of Renaissance with the remains of Gothic feeling produced the mixed style which we call the Elizabethan. It is true that Elizabeth was a Tudor, but the name Tudor is not applied to the style of her reign. The Library Interior, designed by Messrs. Ware & Van Brunt, and referred to by our author as an illustration of Tudor Gothic, is, in fact, very late Elizabethan, with hardly a reminiscence of Gothic about it; and as it is called Elizabethan in the description appended to the view, we presume the author regards the terms "Tudor" and "Elizabethan" as synonymous, and that in this idea part of his mistake has originated.

The first interior drawn and described is the library of Mr. Longfellow, belonging to what is in America an old house, built about 1740. There is nothing particularly observable in the room, which has not much style about it of any kind, but may be termed Classic in virtue of two Corinthian columns standing out from one side of the room, and forming a kind of architectural framework to one of the book-cases. These said columns are execrably drawn, out of perspective and out of all proper proportion, and are described in the letterpress as "Ionic." Among the accessories of the room is mentioned a full-length picture of "Listz," whoever he may be; we presume Lizst to be the name intended. Of the Library of Mr. Donald G. Mitchell, another of the illustrations, it is profoundly observed that a more "noticeable" room might no doubt have been made, "for our ideas are larger than our purses, so much as the heavenly is grander than the earthly." If Mr. Elliott's ideas (in literary expression) are not larger than his purse, he must be very well off indeed; but he is, we are glad to find, more sober as a designer than a writer, or is kept in wholesome check by that

* The Book of American Interiors. Prepared by Charles Wyllys Elliott, from existing Houses: with preliminary Essays and Letterpress Description. Illustrated in Heliotype. Boston: Osgood & Co. London: Marcus Ward & Co.

very restriction of purse-power in his clients. His own arrangement of a private library, shown in the fourth illustration, is good and tasteful, and he draws attention to the attempt made to construct furniture on true principles; "that the grain of the wood should not be twisted or weakened, and that the frame that supports the cushions should be distinct and decorative. In a Turkish harem or a Pompeian room, where all recline, the furniture may be all cushions, but in a room where we wish to sit upright it is not good art nor good construction. The bad fashion will no doubt pass." We hope so, though it is not our experience that bad fashions are very ready to "pass," but we are glad to find a point in which we are able to entirely agree with the author. In the decoration of the walls of this room we notice that the frieze, which is dark red, is adorned with "a procession of squirrels." As the same idea in decoration is mentioned elsewhere in the book, we presume it is a favourite one. The use of the forms of the animals prevailing in a country, as part of the decorative "property," seems to be common to the east and the west, and the American squirrel is used in the same way as the Indian elephant processions on the temples which have been a good deal brought under our notice recently. Among other pictorial decorations of the same apartment "Raffaelle's and Holbein's Madonnas" hang as ornaments. There are a good many more of these in the States, we imagine, than Raffaelle and Holbein ever painted; the American air is favourable to their growth.

In the course of some remarks upon a library interior, the author observes that the library should be something more than a mere place for preserving of books. "It should be the most interesting, stimulating, and useful room in the house. Here the family should gather for talk, for work, for reading; here should come friendly people; here should wide, open, hospitable bookcases offer and tempt all comers by books placed within their reach." There is some truth in this. There is no doubt that more may be made of a library, properly so called, in the way of decorative effect, than is generally done. The very question of the best way of providing for and placing the bookcases is suggestive of the architectural treatment of the room; that is to say, it ought to be so, for the room ought to be designed for the bookcases, and not merely be an apartment in which bookcases may be placed. This is very seldom the case, nor is it so in any of the library interiors given in Mr. Elliott's book. We concur with the writer about open and "hospitable" bookcases. The system of keeping books locked up under glass, where no one can take up a volume without a process of unlocking and opening doors, appears to us to be contrary to all the best uses and influence of a home library. It is quite unnecessary for keeping the books from dust, which in fact cannot be kept out by this means, and the general result is rather that the books are never dusted at all, and seldom disturbed from their sacred repose. As to making the library more of a family room, it might often be done with advantage in moderate-sized houses, and where the owner does not require to carry on heavy or regular work in it. There is no difficulty in giving a look of elegance and attractiveness to such a room. In England, however, the room called "the library" is usually, in middle-class houses, the business-room and *sanctum* of the master of the house, and the name is often used for an apartment which has no real title to it; like the library mentioned in one of Thackeray's shorter stories, which "consisted chiefly of boots."

Among the most pleasing of the interiors given here is the simply-furnished but home-like library of Bryant, the poet, described briefly in his own words, and illustrated by a more effective drawing than most in the book. Next to this is the interior of a study at Harvard College, decorated by the author of the book, and which appears to be well done, and looks well in the drawing. The dining-room by Messrs. Emerson & Fehmer is also apparently a well-treated room, noticeable for the bold timbered ceiling of plain oak, with a good chandelier design hung from it in an effective manner. There is a solidity of style about the whole room and its furniture which is very satisfactory, and contrasts favourably with the somewhat flimsy character and style of a good many of the illustrations. The same kind of praise may be bestowed on the library of Mr. Burnham at Boston, also designed by Mr. Elliott, who appears to have certainly better taste and more reticence in his style of ornament than in his literary style. The dining-room from the same house is illustrated, and is also good. One sentence in the description of this latter apartment we must not pass over. "The dining-table in style may be termed Domestic Gothic,—not Eastlake, a most vague and badly-used term." This is puzzling. A gentleman of that name wrote a book on Household Taste, we know, which was well received in England. It should appear, however, from this quotation, that the secretary of the Institute of British Architects has the glory of having given a name to a style in the new country; no other explanation seems possible. "Hints on Household Taste" has scarcely got quite so far as that, on this side of the Atlantic; but the knowledge of his reputation on the other side may, we hope, console the author of it for anything which may possibly have induced him to regard himself, recently, as "a vague and badly-used term."

On the whole, it appears to us that Mr. Elliott is more successful in designing furniture and decoration than in writing about it, and that he may at least have the credit of teaching by example, as his own designs are the best in his book. The publication gives us, however, some idea of what is being done in America in the way of interior decoration, and what is the progress of taste therein; and, as far as we can judge from this book, it should appear that our American friends have got hold, in a second-hand way, of some of the revived styles of furniture and decoration which are now largely practised in England, but without penetrating the feeling and motive of them sufficiently to work out the details well. Even in the best specimens given there seems to be a want of feeling for style in detail, and a great deal of what is indicated would pass for very second-rate work in England. That is to say, as far as we can judge from the drawings, which we must say are very inadequate in execution. They are apparently photographed from pen drawings, and the author says that in making the sketches he has been "much assisted by the firm pencil of Mr. H. M. Stephenson, an architect whose eye seizes, and whose hand records, the nicest points." For the repute of American architects, we should hope that he of the firm pencil is not responsible for much in the drawings. The style in nearly all of them is ineffective and scratchy, and the perspective drawing of details is often fearful and wonderful. No English architect who valued his reputation among his professional brethren as a draughtsman would identify himself with such drawings. In regard to the general question of illustration, we may say that drawings of room decoration are much more likely to be of practical value to other designers (supposing them to be good enough to serve as models) if shown in geometrical drawing more than in views, unless the latter can be larger and more carefully finished in detail than those in the volume before us, which may help in exciting an interest in the subject among general readers, but can hardly be of much use to "the craft." We should be curious to know whether or not this book is taken to represent the best that has been done in this way in America.

The volume has for a frontispiece a photograph of the Dining-hall at Harvard University, built as a memorial hall to Harvard men who fell in the late war. It is a large apartment, seating 500 to dinner, with an open-timbered roof and walls wainscoted up to the sills of the range of windows, and decorated with portraits and busts, the latter placed on brackets against the wainscot. It appears to be a fine interior in a pure Gothic style, and not unsuccessfully reproducing the type of some of the great Mediæval halls of the old country.

It is noticeable that not a single specimen of drawing-room decoration is given in the book; an omission which strikes one very oddly in England, where the drawing-room is considered to be *par excellence* the ornamental apartment of the dwelling.

BANKSIDE.

THE history of the poorest and dirtiest neighbourhoods is often of more interest to us than that of the most aristocratic districts. The latter are seldom of sufficient antiquity for any literary associations of moment to have gathered around them; but the former, having frequently fallen from a higher position, attract our attention by the contrast of their past and present states. This is peculiarly the case with Bankside. Few Londoners know more of this place than is to be seen from the Thames Embankment on the northern side of the river, or from the deck of a steamer; and yet he who will walk quietly along the dirty street, which is bounded on one side by wharfs and boats lying in the mud, and on the other by miserable houses, and keep his eyes open to what is around him, may fancy himself back in Elizabethan London. It is quite true that Time is constantly making changes, but it is equally true that Time also resists change. There is nothing actually existing now in Bankside that was there in the sixteenth century, but the contour of the street, and nearly every name, have lasted in their integrity, and will last for many a long year more.

The "Bank" in Elizabeth's reign was a long straggling street, extending from the Manor of Paris Garden on the west to the liberty of the Clink on the east. The district grew gradually from its two extremities, the buildings at last joining in the centre. At the eastern end next to the Priory of St. Mary Overies, stood Winchester House, the palace of the Bishops of Winchester for several centuries. It was built by William Gifford, bishop of that see, about the year 1107, upon ground belonging to the Prior of Bermondsey. Stow describes it as "a very fair house well repaired, and hath a large wharf and landing-place, called the Bishop of Winchester's Stairs." In its early history the house was connected with one of England's greatest worthies. During the vacancy of the see, it was lent to Simon de Montfort and his wife, the daughter of King John, but they did not live in it long; for Henry III., in a fit of spite, ordered them to be ejected, and they escaping, took ship in the Thames, and went to France. On the 2nd of February, 1424, the Scottish king and poet, James, married Lady Jane Beaufort, in the church of St. Mary Overy, and the uncle of the bride,—the celebrated Cardinal Beaufort,—being Bishop of Winchester at the time, the marriage feast was held in Winchester House. Another celebrated holder of the see and resident in the house was Bishop Gardiner, who lived in great state, with a large number of gentlemen of family to attend him as pages. Among the "State Papers" is a letter from Gardiner to Sir William Paget, Secretary of State (dated the 5th of February, 1547), in which he states his intention of having a solemn dirge and mass for the late king, and adds that at the same time the players in Southwark are to have "a solemne playe to trye who shall have most resorte, they in game or I in earnest," requesting that the Lord Protector will interfere. This is an early instance of the collision between the actors and the clergy, which has been occurring again and again since that time.

The last bishop who lived in Winchester House was Lancelot Andrews, who died in 1626, and was buried in St. Saviour's Church. The Presbyterians, in 1642, turned the episcopal palace into a prison for the Royalists, and in that year Sir Kenelm Digby was a prisoner there. Of this worthy, Selden speaks as follows in his "Table Talk":—"Sir Kenelm Digby was several times taken and let go again; at last imprisoned in Winchester House. I can compare him to nothing but a great fish that we catch and let go again, but still he will come to the bait; at last therefore we put him into some great pond for store." In 1649 the house was sold for 4,380*l.* 8*s.* 3*d.* to Thomas Walker, of Camberwell, but at the Restoration it was recovered by Bishop Morley, who, empowered by an Act of Parliament, leased it out for various purposes, and bought a house for himself and his successors at Chelsea. To the south of the house were gardens, statues, fountains, and a spacious park, of sixty or seventy acres, the recollection of which is preserved in the name of Park-street. Adjoining to Winchester House on the south-west was Rochester House, the town residence of the Bishops of Rochester, of which Stow writes:—"By whom first erected I do not now remember me to have read, but well I wot the same of long time hath not been frequented by any bishop, and lieth ruinous for any lack of reparations." It was taken down in 1604, and in the churchwardens' accounts of St. Saviour's, (a MS. of the time of James I.) is the following entry quoted by Peter Cunningham:—"Rochester House was about forty years since one great house and a great garden, and now consisteth of sixty-two tenements." A little to the west of Winchester House stood the Clink, a gaol or prison "for the trespassers in those parts" which was under the control of the Bishop of Winchester. Here the Bishop tried

all pleas of debt, damage, or trespass. About 1745 the old prison which stood at the corner of Maid-lane being in great decay was abandoned, and a dwelling on the Bankside was appropriated in its stead, but the latter was burned down during the riots of 1780.

The borough of Southwark was added to the city of London in the reigns of Edward I. and III.; but the Clink liberty was specially exempted from City jurisdiction because it belonged to the Church. The consequence was, that vagabonds crossed over the water to Southwark in order to escape from justice, and the Bankside obtained a most unenviable notoriety. In a proclamation of Henry VIII. against vagabonds, ruffians, and idle persons, dated May 26, 1545, this place is specially mentioned:—"Yet be they soe rooted in mischeefe and idlenes, that they give themselves to noe labor or honest kind of living; but entertayne themselves with theft and falshood in plaie, whereby many simple yong men be polled, and some utterly undone, and with other detestable vices and fashions, commonly used at the Banke and such like naughtie places where they much haunt." This evil report was even then a thing of ancient date, originating in the existence on Bankside of the licensed stews.

We will now pass from the Liberty of the Clink to the Manor of Paris Garden, which takes its name from Robert de Paris, who had a house and garden here in the reign of Richard II., held under a lease from the Abbot of Bermondsey. It is described in a later grant as "the mansion house within the mote, the gatehouse, four pastures, two pastures ditched about." In illustration of this a note in *Notes and Queries* (No. 265, 1854) may be quoted:—"There is or used to be a ditch or dyke running across Great Surrey-street, Blackfriars-road, but for some years past it has been covered or built upon. All buildings thereon are subject to a ground-rent payable to the steward of 'Old Paris Garden' and collected half-yearly." Paris Garden figures in the Calendars of State Papers and in some letters of Mr. Recorder Fletewode, the place is well described. On July 12, 1578, Fletewode wrote to the Vice-Chamberlain and told him that Paris Garden was notorious for secret meetings of foreign ambassadors and their agents. The French ambassador was discovered by the watch on the previous night, accompanied by Sir Warham St. Leger and Sir Wm. Morgan. Resistance was offered, and the ambassador "swore grete othes that he wold do many things," but the watch said to him "they knew not his dignitie," and that he and his party were night-walkers contrary to law. In a letter to Burghley, Fletewode wrote that Paris Garden was a very bower of conspiracy. "He endeavoured to get into the house of St. Leger at Chandos-place, and then went over to Paris Garden, where the place is so dark with trees that one man cannot see another, except they have *lynceos oculos*, or els catte's eyes."

In the reign of Charles I. the manor-house of Paris Garden was known as Holland's Leaguer, and in 1632 two books were published with this title,—one was a stupidly indecent comedy, by Shackerly Marmion, which has no reference to Paris Garden; and the other, a little history by Nicholas Goodman, professing to contain an account of the origin of the name,—"Holland's Leaguer: or, an Historical Discourse of the Life and Actions of Dona Britannica Hollandia, the Archmistris of the wicked Women of Eutopia. Wherein is detected the notorious Sinne of Panderisme and the execrable Life of the Luxurious Impudent." A woman named Holland, seeking, after her escape from Newgate, for a house where she could carry on her nefarious traffic, finds the old untenanted manor-house of Paris Garden just suitable for her purposes. The situation of the house, with its ditches, trench, &c., is described, and it is stated to be near three famous amphitheatres, viz., "The Continent of the World" or the Globe, the Hope, and the Swan. The law attempted to oust her from her quarters, but the constable of the peace was successfally kept on the outside of the moat, and he beleagured the place in vain. In 1660 the place was still encompassed by a moat, and shortly afterwards the manor was formed into the parish of Christ Church, but the infamous old woman's name still lives in Holland-street, which is built on the site of her house.

We have not yet said anything of the Paris Garden Theatre, which is mentioned early in Henry VIII.'s reign. It was probably situated some little way to the east of the manor-house, although it was in the liberty of Paris Garden. In Agas's map of London there are only two open circuses marked as standing on the Bankside,—one is called the "Bull-baiting" and the other the "Bear-baiting,"—and near by are the dog-kennels. Both these circuses were rebuilt in a more substantial form; the one to the east was afterwards called the "Hope," and the other, on the west, was probably the Paris Garden Theatre, which appears, also, to have been called the "Swan." The Earl of Northumberland is said, in the Household Book of the family, to have gone to Paris Garden in the seventeenth year of Henry VIII., to see the bear-baiting there; and Pedro de Ganto, in his narrative of the visit made to England in February 1543-4, by his master, Don Manriquez de Lara, third duke of Najara, while describing the sports at the same place, writes,—"They brought a pony, with an ape fastened on its back, and to see the animal kicking among the dogs, with the screams of the ape, beholding the ours hanging from the ears and neck of the pony, is very laughable." The chief day of exhibition in the reigns of Henry VIII. and Elizabeth was Sunday, but James I. prohibited performances on that day. Robert Crowley, printer and clergyman, refers to this scandal in his "Epigrams" (1550):—

> "At Paryse garden, eche Sundaye,
> A man shall not fayle
> To fynde two or thre hundredes,
> For the bearwardes vaile";

and Thomas Cartwright, in his "Admonition to Parliament against the Use of the Common Prayer, 1572," says,—"If there be a bear or a bull to be baited in the afternoon, or a jackanapes to ride on horseback, the minister hurries the service over in a shameful manner, in order to be present at the show." It was on a Sunday, in 1583, that a fearful accident occurred at this theatre. The stage fell, and eight persons were killed, while many more were seriously injured. So popular was the sport of bear-baiting that the lawyers are said to have neglected their studies, "leaving old Plowden, Dyer, and Brooke to see old Harry Hunks" and Sackerson, the bear who is immortalised in "The Merry Wives of Windsor." This taste is ridiculed in one of the epigrams of Sir John Davys:—

> "Publius, student at the Common Law,
> Oft leaves his books, and for his recreation
> To Paris Garden doth himself withdraw."

The bears and their bearward are introduced by Ben Jonson into "The Masque of Augurs" (1622), where Slug says,—"Very sufficient bears as any in the ground, the Paris Garden, and can dance at first sight and play their own tunes if need be. John Urson, the bearward, offers to play them with any city-dancers christened for a ground measure." The bearward, whose name was Joshua Gosling, figures also in "Hudibras,"—

> "Next marched to Orsin, famous for
> Wise conduct and success in war,
> A skilful leader, stout, severe,
> Now marshal to the champion bear,
> * * * *
> Bred up where discipline most rare is,
> In Military Garden, Paris."

Among the broadsides in the library of the Society of Antiquaries is one which gives "The Plot of the Play called 'England's Joy,' to be playde at the Swan this day" (November 6, 1602), which shows the date at which the place was used as a theatre.

The site of his Majesty's Bear-garden at the Hope is marked by a court which is still named the Bear-garden. In Howes's MS. continuation of Stow's Survey is the following curious account of the means by which the same place could be used as a theatre for acting, and as a circus for the baiting of bears and bulls:—"The Hope, on the Banke side in Southwarke, commonly called the Beare-garden: a playhouse for stage playes on Mundays, Wednesdayes, Fridayes, and Saturdayes; and for the baiting of the beares on Tuesdayes and Thursdayes; the stage being made to take up and down when they please. It was built in 1610, and now pulled downe to make tenements by Thomas Walker, a peticoate-maker in Cannon-street, on Tuesday, the 25th day of March, 1656. Seven of Mr. Godfrie's beares, by the command of Thomas Pride, then hie Sherefe of Surry, were shot to death on Saturday, the 9 day of February, 1655, by a company of souldiers." Ben Jonson's "Bartholomew Fair" was first acted at the Hope, and here Taylor, the water-poet, challenged Fennor "to answer him at a trial of wit." If, as is stated above, the building was pulled down in 1656, it must have been re-erected after the Restoration; for, on April 12, 1682, a fine but vindictive horse was advertised to be baited to death for the amusement of the Morocco ambassador. The Hope is mentioned in a street-ballad, printed and sold on the frozen Thames in 1684, which is entitled "Freezland Fair, or the Icy Bear-garden,"—

> "He said that the Pope
> (Pray mind, 'tis a trope)
> Would send us his bulls by way of the Hope;
> And though for the sign we have all along been waiting,
> I t'other day saw on the ice a bull baiting."

The Rose Theatre was still further to the east of the Bankside, and its situation is marked by a place still called Rose-alley. Ben Jonson's "Every Man in his Humour," in its earliest form, was brought out at the Rose in the year 1596, when the theatre belonged to Henslow. There is not much history connected with the place; but Taylor, the water-poet, mentions it in his "True Cause of the Waterman's Suit concerning Players." The name appears to have existed at an early date, as a messuage or tenement called the Rose is mentioned in the charter of Edward VI., granting the manor of Southwark to the City of London. A house called the Swan is referred to in the same charter.

The Globe, "the glory of the Bank," was situated at the eastern end of Bankside, not far from the Clink Prison; but as we had an article on this renowned theatre not long since (April 11th, 1874), we will not further notice it here. After its destruction the site was used for a place of worship, and now it has been swallowed up by the great brewery of Messrs. Barclay & Perkins, in Park street. This was originally the Anchor Brewery of Mr. Child. Child's daughter married his clerk, Halsey, and brought the business with her as a marriage portion. Their only daughter married Lord Cobham, from whom the concern was bought by Halsey's manager and nephew, Ralph Thrale. At the death of the latter's son, Henry Thrale, the friend of Dr. Johnson, in 1781, the brewery was purchased by Barclay, the banker, for his son, and by Perkins, Thrale's chief clerk, for himself.

If we look again at Agas's map we shall see a considerable number of ponds marked near the two circuses already mentioned. These were the pike-ponds, for keeping the royal pike.

Near Paris Garden was the Falcon Inn, which was formerly in great repute, and was reported to have been a frequent resort of Shakspeare; but this is a mistake, for at the time of the great dramatist's death there were no inns on the Bankside. This fact we learn from a petition of the inhabitants of Southwark against the opening of a road or way leading out of Southwark to two newly-erected inns on the Bankside, which was presented to the Lord Mayor and Aldermen in March, 1619, and transmitted by them to the Lords of the Privy Council. The memory of the Falcon Inn still lives in the name of the Falcon Glass Works, situated in Holland-street.

Kemp, the actor, notices the theatres of Bankside and the inns of Southwark in his curious "Nine Daies Wonder, performed in a Daunce from London to Norwich. London, 1600." He complains bitterly of the ballads written against him, and seeks the ballad-maker. "I found him about the Bankside sitting at a play. I desired to speak with him, had him to a taverne, charg'd a pipe with tobacco, and then laid this terrible accusation to his charge. He swels presently like one of the foure windes, the violence of his breath blew the tobacco out of the pipe, and the heate of his wrath drunk dry two bowlefuls of Rhenish wine. At length having power to speake, 'Name my accuser,' saith he, 'or I defy thee, Kemp, at the quarter-staffe.'"

In conclusion, we would say a few words on some of the celebrated inhabitants of Bankside. Philip Henslowe, the manager of the Rose Theatre, and part proprietor of Paris Garden, "one of the grooms of his Majesty's chamber," lived close by the Clink, where he had previously carried on business as a dyer.

Philip Massinger, the great dramatist, lived on the Bankside. He died in March, 1638-9, suddenly; so suddenly, indeed, that retiring to bed in his own house, in good health, he was found dead the next morning. His body was buried in the neighbouring church of St. Saviour, the resting-place of many remarkable men, from the poet Gower downwards. Sir Edward Dyer, who died in Winchester House (1607); Lawrence Fletcher, a leading member of the company of actors to which Shakspeare belonged; Edmund Shakspeare, "player," the poet's younger

brother; and John Fletcher, the dramatist, all lie here. Sir Aston Cokayne wrote of Massinger and Fletcher,—

"In the same grave Fletcher was buried, here
Lies the stage poet, Philip Massenger:
Plays they did write together, were great friends,
And now one grave includes them at their ends;
So whom on earth nothing did part, beneath
Here in their fames they lie in spight of death."

Malone wrote, in his "Inquiry into the Authenticity of the Shakspeare Papers" (1796):—"From a paper now before me, which formerly belonged to Edward Alleyn, the player, our poet appears to have lived in Southwark, near the Bear-garden, in 1596. Another curious document in my possession affords the strongest presumptive evidence that he continued to reside in Southwark to the year 1608." These important manuscripts were unfortunately never published, and nothing is now known of them; but, if true, and there is no reason to doubt their authenticity, the interest of Bankside must be greatly increased to us by the knowledge that Shakspeare once lived there.

THE ENDOWMENT OF SCIENCE RESEARCH AND ART RESEARCH.

THERE is at the present moment, happily, a good deal of public attention directed to a subject hitherto neglected, but of no small importance. We allude to that of "Science Research Endowment," and we would wish specially to induce, on behalf of those whom we more particularly address in these pages "Art" Research Endowment. It would be difficult to imagine, as we view it, a more important subject of inquiry, or one more interesting to those who take concern in the progress and well-being of science and art. Some there are, we are quite sure, who more especially devote themselves to the all-important subjects of scientific or artistic researches and discovery. Who are they, and how specially do they work, and under what conditions? Of the value of these researches and discoveries sometimes there can be no sort of doubt; indeed, if we but go back a little into the past, dim though it be, we may well wonder at what, as we look at it, becomes but too visible. The present way of work is before us, and all may see it; it needs no more than the mere pointing to; and then he who runs may, and needs must, read,—a something and a somewhat. We propose here to confine ourselves chiefly to art research, that having been hardly as yet touched on elsewhere. It is to the full as important as the strictly scientific aspect of the question, and must needs be as interesting to artists, as science to experts. First, a word or two on the strictly scientific aspect of this question, now so much discussed. It must help to an understanding of the artistic. We have often and often wondered at the difference between the past way of work and doings, and the immediate present of them. We may note year by year, nay, almost week by week, the thinkings and doings of the Airys, Tyndalls, and Huxleys of to-day, and we may read of what they do so industriously, and mark by so doing the progress that is being made in scientific research. Such men are before the world, and cannot well be neglected. But when we go back to the days of Tycho Brahe, of Galileo, or of Newton, how very different everything becomes. How entirely science must have absorbed all their faculties, and how the passion for scientific research must have driven all considerations of difficulty out of their thoughts, is but too evident at a glance. All things would seem to have been against them; the very spirit of the times in which they lived and worked being a foremost one. And then, again, but think of the instrumental means they worked with, all of the very rudest and most clumsy sort. Let any curious spectator but look at the telescope that Newton worked with, now exhibiting, we believe, at South Kensington, and then compare it with the appliances of to-day, and he must needs wonder at how the mighty work he did do was ever done! Tycho Brahe, who was a lawyer by profession, abandoned law for astronomy, and was furnished with the means for "making observations" by a wealthy relative. Galileo, who committed so many offences against the then orthodoxy, taught mathematics, and must needs have worked in the face of all kinds of difficulties. His book was publicly burnt,—at this we may perhaps wonder, as also perhaps at how it was printed, and how many copies of it were sold. Of Newton what can be said that has not already been said? Why, truth to tell, a great deal. We have often wondered at the course of life of the boy Isaac, and that of Mr. Newton, and at how that wonderful passage from the old cottage to "Trinity" was ever made. In time, as we all know, Newton got to London city, as it then was, and lived in a dull street, St. Martin's-street, though in a somewhat dignified house, No. 35, at which we may again wonder a little, with his books such as they were about him, and a small observatory at the top of this house. Let us hope that this house will be preserved, evidencing as it does very many things. We might thus go on and cite examples without number of those who in the past have come more or less under the influence, in one way or another, of "science endowment." Society and individuals have in various ways assisted the votary of science to live, and to go on with his work of research and discovery. Such discoveries could never have been made without assistance of some kind or other, or in one or another form. Galileo could have got but little,—nothing, one would say,—for his "Discourse on the Solar Spots," nor could Newton have lived on the sale of his "Optics"; but who will doubt the infinite value of such works as matters of research, and as steps in a mighty progress, without which the standpoints now attained could not have been arrived at by any possibility? No more instructive subject of contemplation can there be than that of the difficulties and hindrances under which science has been wrought out, and advanced to the point at which we now find it. And it is the same with art,—if looked at as keenly.

We may now come to art and artistic matters, the necessity of research being not confined to science; it is equally necessary to art—to architecture, sculpture, and painting. No one who reads this will contend for a moment that these subjects are in any way exhausted, or that "research" in and about them has gone its full length,—nay, we had almost said, that the materials for it are but now accumulating, day by day, to be yet exhaustively analysed. Let us cite but one or two examples out of whole multitudes. We all know how a modern church is brought into existence: say, to make the matter as plain as may be, a Decorated church. Whatever its artistic worth, it is, as all know, the result mainly of the study in detail, more or less close and elaborate, of "precedent." An old church in the Middle English Gothic is, more or less, both in plan and in detail, copied and followed. The new building is a reproduction, more or less exact, of the old church itself, and a type of such. We are speaking here not of arrangement or purpose, but simply of the architectural and artistic forms and expression. It is the same with any other style, the precise style being fixed on and determined. But of the past way of work, what of that, and how shall it be even so much as cited, so totally different was the *modus operandi* of its production? Except in special cases, no attempt even ever seems to have been made to copy past and already existing work in detail, or even in plan. Here is a matter for "research," whether endowed or no. The Middle Age architect learnt,—there is no other way of putting it,—the language, as it was then spoken, of Gothic architecture, and was as ready with the words of it, all disjointed as they might be, as a modern writer is ready with his words and language to write a new book or a new poem. It was a wonderful process, if we do but think of it. Architecture was, in the now so dead past, a language of materials and forms, and was spoken, or rather written, as language itself then was and is. The old artist did not copy the last stone book, but wrote another and a new one, though with the same words. But there is a yet stranger aspect of this antique phenomenon. The general forms and details, as all know, the very language itself, *changed* as the centuries passed on. The stone language of the old Romanesque passed, insensibly may be, in the hands of its artists into the Early Gothic, and this, again, into the more advanced style which followed, and that in a way and by a process which may well demand farther "research." Nowadays it is mysterious enough. It is a mighty problem, and may well call for research and for the efforts and study of those who can give fair attention to it. We may see plainly enough the marked and distinctive difference between the Romanesque, and the Early English, and the Perpendicular; but of the gradual and well-nigh insensible change from the one style to the next in detail is not by a long way so easy to get at. We must here contend, therefore, that art research endowment is to the full as necessary in these days as science research endowment. Let us take one other instance from another style of art, from the Renaissance, as practised by such men as Wren and Inigo Jones. Both these artists worked from precedent, laid down for them with mathematical exactness, as any curious student may ascertain by going through the figured plates of a Palladio or Chambers. Yet how different the mode of work, and the use made of the art-language. The Whitehall front is not more a thing *per se*, in details, and a different thing from the east end of St. Paul's, in detail, than would be the chapters of a book written to describe those buildings. The "language" in which they are written is the same, but how differently written, and the forms the same, but how differently interpreted. This is not so striking an example as the Gothic changes and progress, but it is well worth deep and attentive study and research. The means for study which Wren and Jones had in their day were but small and narrow indeed, when compared with those which we now have all and everywhere about us. For every single volume which Inigo Jones could have had we, it is certain, have a score. It is truly wonderful to note what the old architects accomplished, when it is considered how little they had to go to or to work from. Who is it that will dispute the capabilities and the skill with which he of the Temple Church went to work, and built up that, as it must have been then, architectural gem? But where were his books and his "precedent"? Compare his no-means for going to work with the whole mountains of help out of which the New Law Courts, so close to it, are springing up. Surely there is room enough for "art-research."

Very much more might be said, in very many ways, on this need of art research as well as scientific research, and much might be said on the all but total absence of provision for it. Here and there a "professorship" is to be noted; but even those are mainly for the purposes of teaching by lectures what may be termed almost elementary matters to classes, so that full value is at once got for the money spent, and no one can complain. It therefore is hardly enough; a something more would seem to be needed. After years spent in the study and in the elaboration of new forms, out of or following the old, it would seem to be one of the vocations of all scientific and art societies; either those now existing,—such as the Royal Society,—or of new ones to be in the future founded with such purpose; to help those who have helped them, and to aid, *e.g.*, in the publication of results if they do no more. But more than this they might and one day will do. Newton must needs have spent years in the getting together the matter for the "*optics*" and in the mere writing of it, when every line was a new thought; but what its value was in the "eye of his bookseller," may remain a mystery to those to whom all such things are mysteries, but to none else. And there would seem to be no help for this in the very nature of things. Advanced work is addressed but to a few, and can only be appreciated and apprehended by such; but of its value there can be no sort of doubt. Is not the time, therefore, come when some help might well be given to those who do such work? A judiciously applied "Research" fund in art, as well as in science, would supply a crying want.

We would add a word of practical advice, and would be understood as advocating here, not so much the increase of existing means for encouraging science and art progress and thought, though that is needful enough, but the initiation of a new energy and new means of help,—one of them by the recognition of those who have, without previous aid, and of themselves, made any valuable and useful addition to the stock of already-known truths; and also by affording to such the means to follow up such studies. Such a mode of help could hardly fail, for the capacity of the applicant would be always guaranteed, and the fact of his special ability, whatever that might be, a positive and proved certainty. Might not, we would here venture to ask, a portion of the surplus funds of the International Exhibition of 1851, be devoted usefully to this purpose? That surplus is stated to be large, and it has been surmised that it is the intention of the Commissioners to appropriate it to the creation of a "first-class scientific library" at South Kensington. A good, doubtless; but is there not a large library there, as it is? And, by the way, books, after all, are but poor helps when you come to real business, and practical work, and original research.

STRONG AND WEAK POINTS OF THE EXHIBITION OF SCIENTIFIC APPARATUS AT SOUTH KENSINGTON.

THE new phase exhibited within the past few days by South Kensington Museum and its adjuncts is one that deserves serious attention. There can be little doubt that the able managers of this institution have long since made a practical discovery as to the mode of maintaining the interest of a museum, of which they have been careful to take advantage. Many of our readers may remember occasions on which they have been beset with a strange perplexity on attempting to re-visit some well-remembered object, or group of objects, in the Courts of South Kensington. Descriptions have been given, from time to time, in more than one journal devoted to the subject of art, of various branches of the Museum,—of the ceramic gallery, the goldsmiths' work, the sculpture, the stained glass, or what not. Armed with such a clue, the visitor has sought the spot, and found that, at least as matter of arrangement, the elaborate account was altogether inapplicable, a thing of the past, a mere source of confusion. We can bear witness to more than one expression of annoyance at a constant change, as incessant as, but without any of the calculated regularity of, those of the moon or of the tides. But to understand at once the reason and effect of this unresting movement the visitor should extend his observations. He should visit not only South Kensington, but other Museums in which no such cause of disturbance has to be deplored. Two or three experiments of this kind will give him a good deal of practical information. He will find that if he goes to examine a particular specimen, wishing to consult a museum as he would consult a library, the advantage of immobility is evident. But it is an advantage in this respect alone. As to general pleasure or satisfaction to be derived from the visit, it diminishes each time. The very effect on the eye of a stereotyped permanence of arrangement in a great number of carefully-preserved objects is wearying. One feels that one has seen all that before,—knows it all by heart. A sense of weariness and fatigue steals over the mind, and instead of having an ever-fresh charm, a museum assumes all the respectable dulness of a ponderous lexicon.

Revisit, after this experience, the establishment where constant change is the law. You then learn to appreciate the difference. With the perplexity before noted, you are sensible of the intermixture of a new source of curiosity. You no longer think the exhibition dull, or the objects wearisome. Old friends become new objects of admiration when set in a new light, or accompanied by new associates. And thus one learns, at length, to read the secret, and to observe that in constant variety, either of object or arrangement, or of both, lies the main charm of a permanent exhibition.

This principle has been very fully illustrated in the Ceramic Gallery at South Kensington, and the unrivalled display of objects of Persian art, to which we recently called attention, has been a source of very high attraction. But the strain, not only on the will and ability of the managers, but on the financial resources of the establishment, that is thus kept up must be considerable. And especially has this to be borne in mind by the friends and supporters of this valuable centre for æsthetic teaching—in view of the prospect intimated by the estimates for the year—that the grants in favour of South Kensington are more likely to be abated than increased. The great want of accommodation in that restricted set of rooms which the patient and cheerful care of the librarians has made, in spite of all inconvenience, the most accessible and practically useful of any public libraries, so far as the books contemplated in the scheme are concerned, is deplored by the heads of the Government department concerned to find the remedy: but deplored with that helpless resignation which implies that no relief is forthcoming. It may possibly be in consequence of the manner in which the vitality of the Museum proper has been preyed on by certain subsidiary schemes, not always (as in the case of the permanent International Exhibition) evincing the absence of very mature judgment; it may possibly be in consequence of some evil star that sheds its malignant influence over quasi-commercial, quasi-æsthetic enterprise whether in gardens or in music-halls; but, whatever the cause, South Kensington seems not to have passed beyond the stage of battling for existence, and is yet far from having attained the demure and undisturbed repose of its elder sister in Bloomsbury.

We therefore speak rather as inquirers than as critics, of the late attempt to add a sort of glorified Polytechnic Institution to the museum and library. "Conferences" seem to be the order of the day. An old authority tells us that in the multitude of counsellors there is wisdom. If the multiplication of this novel method of imparting information have the same effect, we are on our way to become a very wise people indeed. There can be no question as to the value and the beauty of many of the 4,576 objects which are included in the catalogue of the special loan collection of scientific apparatus at the South Kensington Museum, or rather in the westernmost of the two galleries erected for the defunct International Exhibition. There can be no doubt of the eminence of the men who have given a series of popular lectures in connexion with the display of the Loan Collection. The question which suggests itself more forcibly to the mind is, whether an effort of this nature can bear any adequate fruit as a temporary, not to say spasmodic exertion? Is there not a danger of passing the line which should divide study from amusement? Is it of much use to collect a mass of scientific apparatus, which it would require weeks of daily attention to examine in detail, in order to be visible for six months, and then dispersed to all corners of the world?

It must be remembered that the value and effect on the mind of a collection of scientific appliances is entirely different from that of a collection of objects of art. Study of the latter may be, to some extent, unconscious. The mere habit of beholding the master-pieces of art tends to exalt and purify the taste, where such a faculty exists, and to sow the seed where it has not yet been developed. It is of the very nature of art to train, rather than to teach; to affect the emotions, as well as the intellect; to produce the culture which we call æsthetic, in contradistinction to the teaching which is purely intellectual. And it may often prove to be the case that the more imperceptibly this influence descends on the mind, the more powerful and abiding is its effect. Lord Bacon says that there is a sense of strangeness in all excellent beauty. None but a born sculptor would perceive at the first glance the incomparable superiority of such a fragment of the mighty past as the scorched *torso* of a young female in the British Museum, over the highly-finished and life-like portraiture in marble produced by the best living Italian sculptors. Indeed, by many persons, the French *terra cotta* figures which have lately invaded our galleries,—concrete sins that they are against all purity of taste,—would be more admired, at the first glance, than any glyptic work of the day. But by familiarising the eye with the noblest and purest forms in architecture or in sculpture, with the richest and most harmonious colouring in painting, an insensible education, like that of the infant in the use of its faculties, is carried on. Thus merely to walk day by day through a gallery of well-selected objects of art is, in itself, a sort of education.

With scientific apparatus, however, the case is entirely different. No one is improved by looking at a scientific instrument, unless at the same time he to some extent understands it. There are many objects in the galleries at South Kensington which not only no ordinary visitor, but no scientific man, unless he had studied the particular branch of science which the instrument was designed to further, and unless he were well up to the state of discovery in that branch, would understand at the first glance. Take, for instance, the apparatus designed for obtaining information from the bottom of the sea. Fifteen different appliances for this purpose are exhibited. As far as we observe, there is no illustration of that mode which some explorers think to be the most satisfactory for ascertaining when the bottom is actually touched in great depths, namely, the change of rate at which the line runs out. But let any chance visitor cast his eye on No. 3,015, Capt. Ericsson's self-registering sounding machine, which was perfected by that very able engineer in 1836. What idea would it leave on his mind? So, again, with regard to an instrument which we believe to be destined to increase our knowledge of the hydraulics of the principal rivers and straits of the world to an extraordinary extent,—Revy's current meter. Further than a remark, mayhap, of the exquisite finish that Messrs. Elliot have given to the bronze work, and perhaps an expression of wonder what the little bronze vane was intended to do, who that had not studied the latest works on hydraulics could make head or tail of that valuable and ingenious instrument? We may go a step further: who that *has* studied hydraulics can understand how the instrument is to be safely and adequately slung; as no appliances for rope or wire fastening meet our eye? Thus we light on two out of the 5,000 above objects, either of which it would take five or ten minutes to explain and to understand. In the absence of such explanation, neither of them would produce any effect on the mind, or none but that of a notion of quaint form, or of finished workmanship. So we might go through the list. And it must be borne in mind that each object has, or ought to have, its special claim on the attention. It may be ingenuity of design, it may be delicacy of execution, it may be strength, it may be cheapness, it may be simplicity and readiness for use. Whatever be the special excellence of each exhibit, the object of the Exhibition is unattained unless that excellence be appreciated by the visitors.

Now, it would be idle to expect to attain such an object as this by the temporary display of a collection such as we have had the pleasure of visiting. A sense of bewilderment is the impression at first produced. For those visitors, if such there be, who have the self-command to take a room or a subject at a time, to examine a single class of objects alone, to enter into the design and execution of each, and so to fix on their memory the lessons thus learned, so that the reperusal of the catalogue will be sufficient to recall each successive object to their mind, the benefit to be derived from the exhibition will be of a very high order. How many of these will there be? How many will there be who go, as we before intimated, as they would go to a library, to consult a given book, in order to see the latest outcome of the mechanic's skill in some particular walk of science? And, apart from these two very limited classes, who will derive from a visit to a six-months' show the advantage which such a magnificent collection of instruments and apparatus is calculated to afford?

The inference is, that the exhibition now open at South Kensington is either too much or too little. If it be a merely temporary display, the objects are too many to be usefully grasped by the attention of the visitors, and the time is too little to allow of the full use to which such a collection might be put.

From another point of view, however, the collection has a further claim on our admiration. It is a very superb experiment. It is an unrivalled feeler of public opinion. If it be regarded as the nucleus or the programme of a real industrial museum, it will be a step towards supplying a want which is eminently discreditable to this country. Those of us who are familiar with the care that is taken, on the Continent as well as in the United States, to store up specimens of inventions,—to preserve the visible, tangible elements of the scientific history of the country,—have long deplored the want of an adequate institution of the kind among ourselves. It is true that something of the sort has been attempted in the Patent Museum,—a building which, in spite of its narrow space and structural disadvantages, possesses an extraordinary interest for all mechanical men. Indeed, the Patent Museum has lent some of its most interesting objects to the new gallery. But when we consider what might be effected if the resources of this country were properly applied to the formation of an industrial museum worthy of the name and worthy of the dignity of the United Kingdom, we can only hope that the display at South Kensington may have the effect of educating public opinion to demand something more permanent, as well as something more thoroughly and systematically organised.

For it must be remembered that there is an inherent weakness in all loan collections, a weakness which, in any collection of a scientific nature, is far more deplorable than in the case of any æsthetic display. Partial information in matters of art is better than none at all. Partial information in matters of science is perplexing and misleading, and may even be prejudicial. Now we have plenty of proverbs to the effect that beggars must not be choosers, that it is ill to look a gift horse in the mouth, and the like, that are very applicable in this case. Why should any one lend any scientific apparatus? In nine cases out of ten we shall probably find that the motive of the loan is the desire to advertise. The maker of a new instrument, or the perfecter of an old instrument, naturally wishes to sell as many of his wares as he can. If the opportunity offers him to display them at a

sort of Central Fancy Fair, he is likely to jump at it. By no other means can he obtain so much publicity at so small a cost. Thus the advertising spirit, which, while affording a certain convenience to the public, is one of the great pests of the day, lies at the basis of the accumulation of a loan collection. Next to the commercial exhibits will rank the hobbies—using that word in its widest sense—and including under that designation some of those special instruments of discovery to which science owes so much. A discoverer wishes, and rightly wishes, to bring his discoveries before the world. An opportunity is afforded him by an exhibition such as that in question. He has made a new engine or instrument—he sends it for display. He has invented a new process—he sends something to illustrate the results, or the method, of such process. When we have exhausted these two classes, under all their ramifications, we shall perhaps find some evidence of a third class, smaller in number but loftier in spirit than either of the other two, consisting of men who are really anxious for the advancement of learning, and the progress of science. They love truth for her own sake. They love her whether she reveal herself specially to them, or whether they may only share at a distance in the rites of her chosen priesthood. And they love, not only truth, but mankind. They are ready to spend and to be spent in spreading the knowledge of truth among their fellows. It is not the spirit of proselytism that prompts them; it is not the wish to enforce their own doctrines, or to increase the number or the influence of their own sect. It is something higher, nobler, purer, than any *propaganda*—it is the perception of the power and function of science, and the sincere desire to shed the clear white light of scientific knowledge as widely and rapidly as possible.

It is these men whom the nation should delight to honour. It is these men to whom should be committed the charge, as far as possible, of such an Industrial Museum as we desire to found. Their number may be small. As individuals they may, perhaps must, grade away into the second class previously mentioned. For a man to be a power, of any sort, in the world, he must have enthusiasm, and enthusiasm is apt to embody itself in the hobby. But it must not be a hobby for self-display. That, perhaps, is the best test, the best rule for drawing the line of demarcation. If a man regard his hobby as a sure means of benefiting his fellows,—good speed to him whenever he rides abroad on it. If he regards it only as a method for obtaining greater glory to himself, we cannot affect to mourn at the downfall which is pretty sure to follow. Therefore, while human nature is what it is, we should regard with kindly respect those men who, although undeniably addicted to hobbies, are so addicted to them as to produce a considerable amount of advantage to their fellows.

But for the utilising of this energy we require something far more stable and permanent than a six months' display of apparatus, or a few occasions on which men of science may talk in public for ten minutes or a quarter of an hour a piece. We want an organised, permanent, publicly supported Museum of Mechanical Science. That lectures should be given in connexion with it is a matter that would follow in due course, so that due provision were made for the support of such lectures. But it is obvious that such an establishment cannot depend on the shillings of the public, or the number of chance visitors. We shall be very glad to be proved wrong, but the impression which we have formed from visiting the spot is, that it does not excite any great amount of public interest. If we compare the exertions that have been made abroad, as well as at home, to bring together scientific relics of historic interest, with the result, so far as interesting the public goes, we fear that we shall have to use the word failure. We cannot see that the end is worthy of the means. We are all the more desirous that the effort shall not have been made in vain. And it will not have been so made, whether numbers throng the galleries or no, if it serves to bring out into full display our need of a mechanical and scientific museum, and to bring together elements that may be organised and combined for the supply of that great public want.

There is one point in the exhibition which militates against its scientific character, although it arises rather from the exigencies of the locality than from any purposed feature of the display. This is the interpolation of Mr. Buckland's fish apparatus, between the educational and naval department, and the electric and other scientific instruments. The interest and value of the fish museum are indubitable. Still they form a branch, not of what we understand by scientific apparatus, but of natural history. Their introduction in the circuit of the galleries tends to give a hap-hazard character to the collection. Again, the display of maps is very interesting. Many visitors will look with no small emotion on the few rude lines which represent so many weary days of the noble conflict of Livingstone against fever, climate, fatigue, and savage races. The coloured geological maps of various districts of England illustrate the well-known excellence of our Ordnance Survey. The latest production of the Ordnance engineers, the Jenin sheet of the new map of the Holy Land, is perhaps the most beautiful specimen of hill shading and manuscript map-work that has yet been produced by the Royal engineers of our country. Nor would it be easy to rival it in French, Italian, German, or Austrian work. Yet are we not here rather treading on the province of the Geographical Society, or of the Educational Department of Science? Are maps and plans, however beautiful, part of a collection of scientific apparatus? If so, the whole, not only of the western, but of the eastern galleries, will be required for an extension of the Exhibition; and the Albert Hall itself will have no space to spare for the votaries of science.

CONCRETE AS A BUILDING MATERIAL.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, held on Monday evening last, the president, Mr. Charles Barry, in the chair, the discussion on Mr. Payne's paper "On Concrete as a Building Material" was resumed and concluded.

The Chairman, at the outset, asked that the speakers should confine themselves as much as possible to the artistic aspects of the question.

Mr. J. P. Seddon commenced the discussion by relating his experience of concrete building in Ireland, in a very out-of-the-way place, where although there was an abundance of good stone, it was impossible to get a builder to build in anything but concrete; for, owing to the wretched weather which generally prevailed, skilled workmen would not stay there. This was on Lord Lansdowne's estate, and although the concrete was made of shingle and pebbles from the sea-shore, the work became perfectly dry. Indeed, all the cottages he examined on the same estate were built of the same materials, with walls 9 in. thick, and they were all "bone-dry." As to making the material seemly, he had employed medallions and plaques of glass mosaic made by Mr. Rust, and costing about 2*l.* per yard superficial. The mosaic of Mr. Salviati was also applicable to the same purpose. The medallions or plaques were let into the face of the concrete walls, pieces of wood of the size and shape required being used when the walls were being moulded to form the recesses to be ultimately occupied by the slabs of mosaic. Between these slabs of mosaic coloured cements were used with satisfactory effect. One great objection to concrete houses was the facility with which the material transmitted sound, particularly through floors. The evil might, of course, be obviated by not using concrete floors, although one great merit claimed for concrete was that it was a material equally applicable for floors and walls. As to the fire-resisting qualities of the concrete he had used in Ireland, blocks of it had passed unscathed through a lime-kiln. This concrete was composed of Portland cement and shingle from the sea-shore.

Mr. Lumsden said that, having heard a great deal about concrete building, he was induced to try it from the representations made by Mr. Tall to the effect that it was much cheaper than stone and lime building. He (the speaker) had tried it in his own county of Aberdeenshire, where stone was very abundant, and where also there was in most parts a good supply of gravel. He tried it first of all for cottage-work, and subsequently for an addition to his own house,—an old castle, three or four hundred years old,—the addition in question being 51 ft. long, 33 ft. wide, and 20 ft. high, with a circular hanging turret at one corner. The cost of this concrete addition had been 350*l.*, whereas the estimates given for the same building in ordinary lime and stone masonry were nearly double that amount. The sum named included partition-walls and everything that would be included in the masonry contract, but did not include the "harling" and slater work. The hanging turret referred to was 6 ft. in diameter and about 10 ft. high, and projected considerably over the corner. Its walls were 9 in. thick, and it was built on a timber framework, which was removed after a week had passed, and the turret remained in position without the corbels, which were afterwards "stuck on." The external coating consisted of one of sand and one of cement, which made a perfectly damp-proof covering. The external surface of the concrete was "harled,"—a method of treatment which was as applicable to concrete as to stone work. As to the use of concrete necessitating the employment of skilled labour, he had no skilled labour at all. He merely sent his "forester" up to London to see what was being done at "Tall's," and after a stay of a few days he returned, and had been doing all Mr. Lumsden's building work since that period in concrete, employing the ordinary labourers of the district at about 17*s.* per week, and thus effecting a saving of from one-third to one-fourth the cost under the old method of building. For floors on the ground level he used first of all a layer of about 6 in. thick of broken stone or road-metalling, then a layer of concrete made in the proportion of 1 of cement to 6 or 7 of sand, the surface being covered with a thin coating of fine cement similar to that used on the external wall. This made a perfectly damp-proof floor, but took about a month to dry.

Mr. E. Wyndham Tarn said his experience was rather against the use of concrete for private houses, and he thought architects ought to be on their guard against the statements made in the prospectuses of some of the concrete builders, who seem to be rather prone to exaggerate. For instance, in the prospectuses of two different patentees, it was stated that the advantages of concrete walls over brickwork were, amongst other things, that they were "half the cost in construction, and ten times as strong"; that they were "impervious to wet and damp"; and that, being one solid mass, sound is completely deadened." The first and second portions of the latter recommendation contradicted each other, for the more solid a wall was built the more readily would it convey sound. Another advertisement stated that concrete did not settle in parts as brickwork did, and that, in fact, there was no settlement whatever, there being no weak mortar joints. He (the speaker) was also told that there were certain warehouses, 60 ft. high, built some years ago, at the rate of 3*l.* 10*s.* per rod, as compared with brickwork at 12*l.* per rod. Now there were about twelve cubic yards to a rod, which would give about 6*s.* per cubic yard as the price of the concrete walling; but as a matter of fact the regular price for concrete, as used in foundations, was about 13*s.* per cubic yard. How, then, could walls be carried up 60 ft. high at the rate of 3*l.* 10*s.* per rod? He had found in his experience that a very heavy item of cost in concrete building was caused by the labour of taking-down, cleaning, and re-erecting the apparatus used; the mere filling-in between the boards took hardly any time, and constituted a very small item in the cost of labour. Then, again, he had found that the success of concrete building was greatly dependent upon the weather, especially in the case of thin walls, for if there was much wet 9-in. or 14-in. walls would require extra time for drying and setting, although, where the walls were 2 ft. or 3 ft. thick, with stone "packing," such as was used in Yorkshire and other stone districts, concrete building was not so much dependent on the weather. Then, again, concrete building could not be safely carried on in winter time, for if the frost got hold of it before it had had time to dry the whole mass would be rendered completely useless. For thin walls he found from experience that concrete was more costly than brickwork, that is if the ballast and cement had to be bought at London prices. As to concrete being "ten times the strength" of brickwork, if it were the case a concrete wall 12 in. thick would be as strong as a solid brick wall 10 ft. thick, which experience had shown was not anything like the case. All he (the speaker) was able to affirm was that if concrete building was very well done it was about as strong as good brickwork, although of course it all depended on the quantity and quality of the cement used. He had lived in a concrete house for the past five years, and he

* See pp. 353 and 431, *ante*.

could not endorse the statements which had been made that concrete was impervious to damp. The house in which he lived had been built without any damp-proof course, which was thought to be unnecessary, but the walls were sucking up the damp to a height of about 2 ft. In his opinion, a damp-proof course was even more necessary with concrete than with brick-work. As to the power of concrete walls for keeping out driving rains, it was said by the patentees that concrete buildings were weather-proof without an external rendering of cement, which was, in fact, only used for the sake of giving a more finished appearance. This statement he had entirely refuted by an experiment he made. He constructed a concrete floor 4 in. thick, made of rather fine ballast, gauged very strongly with cement, and very carefully mixed, in order to make a good experiment; but when it had set, water went through it as it would go through a sieve. As to the tendency of concrete to shrink, he had found the tendency to exist, notably in the case of a flat roof, 7 ft. 6 in. span, 13 ft. long, and 4 in. thick, with two or three T-iron joists thrown across at stated intervals. At the points where these T-iron joists went across there had been cracks ever since, and no sooner were the cracks filled up,—as they had to be once or twice a year,—than further shrinkage occurred, and the cracks again showed themselves. Generally speaking, he was inclined to believe that concrete had an inherent tendency to shrink, irrespective of "settlements," for in the house he lived in there was no settlement, but fine cracks were everywhere manifest. On the whole, he thought that concrete building was unsuited to the thin walls required for dwelling-houses, and that it could only be profitably and suitably employed when used for warehouses and even more massive structures. In such works the "packing," so strongly recommended by Mr. Tall, could be advantageously used. In reply to a question put by Mr. Edmeston, Mr. Tarn said that the concrete of the roof of which he had spoken was composed of 1 of Portland cement to 6 of ballast and burnt clay, costing about 2s. per cubic yard. Whenever burnt clay was used as an aggregate, care should be taken that it is thoroughly well burnt. He agreed with Mr. Seddon as to the tendency to transmit noise, which was one of the properties of concrete buildings.

Mr. Edmeston could not see why concrete, properly made and put together, should have any inherent tendency to shrink. Of course, the soundness of concrete work greatly depended on the materials of which it was composed, and upon the manner in which they were put together. In his experience, whenever concrete had been properly compounded of good materials, he had never observed the tendency to shrink and crack of which so much had been said. He had found that where gravel could be obtained close at hand, a saving of one-third in cost was effected. Proper care should, of course, be taken to select the cement, and to test it before using it, for imperfectly burned cement would "blow," and cause no end of mischief. He could not see why concrete walls "packed" in the manner advocated by Mr. Tall should be stronger than walls built solid with small concrete, seeing that it was the adhesive quality of the cement which gave the strength required. He did know, however, that such walls were very strong, for he had had to cut through some which had been built by Mr. Tall, and the work of demolition was very laborious and costly. One thing always to be borne in mind was, that concrete building did not necessarily require any complicated apparatus,—a few planks would suffice. There was one description of concrete about which nothing had been said in the discussion: he referred to the asphalte and gravel or stone concrete for the beddings of steam-hammers and other heavy machinery, which had been found to be the best thing for the purpose.

Mr. Woodthorpe feared that if concrete were to come into general use for house-building, the "able and enterprising" builders of the East End—and, indeed, of all quarters of London—would make it a convenient cloak for the use of such curious, but somewhat unstable, building materials as old leather boots and tin kettles. Indeed, one of the concrete builders who had taken part in this discussion had made it a boast that he had succeeded in eluding the vigilance of the district surveyor, and had used all kinds of questionable *débris* for "aggregates."

Mr. Cundy was of opinion that, unless in exceptional localities and under exceptional conditions generally, concrete building would not be found to be cheaper and more easily applicable than construction in the ordinary materials.

Mr. Joseph Jennings thought that if concrete were to be used at all largely, it would very generally have to be rendered in cement, and that being the case, it was worthy of note that cement could be decoratively treated without making it a sham. His experience of the use of concrete was that generally speaking it was a more expensive material to use than bricks and mortar, although, provided that a diligent personal supervision could be exercised over the selection and mixing of the materials, there was not the slightest doubt that in many places its use would be more economical. The strength of concrete was really a question of the strength of cement. As to the roof mentioned by Mr. Tarn, he (Mr. Jennings) was satisfied that the fault consisted in bringing together two materials of such dissimilar qualities as iron and concrete. He believed that concrete made of proper materials and properly put together would not necessarily shrink, and wherever shrinkage occurred there must, he thought, be some fault, either in material or construction.

Mr. Gilbert R. Redgrave said that if cement concrete was ever to become largely used as a building material, it must be taken for granted that concrete walling must be made by some system of throwing the material between wooden framing or boards, and this mode of erection implied the use of some mode of stucco treatment for external finish. That fact alone was a very serious obstacle to its use in some quarters. Mr. Payne had suggested in his paper some very ingenious methods of moulding the face of the concrete by ornamental dies; but a more simple and a very effective method was that of breaking up the surface by means of "rough-cast." Another very effective method of decoration in coloured cement was that known as *sgraffito*, specimens of which were to be seen at the back of the new Science Schools, South Kensington, and at the National Training School for Music near the Royal Albert Hall. Mr. Payne had suggested a surface decoration of tiles, the backs of which should consist of dove-tails moulded into and retained by the concrete; but one danger to be apprehended from this mode of treatment was, that water might find its way through the joints to the back of the tiles, and do a great deal of damage.

Mr. Adams said he had for some years past paid considerable attention to concrete building, and Mr. Drake had carried out several works for him, entirely to his satisfaction. The largest floor he had built was 12 ft. 6 in. by 11 ft. 6 in., 6 in. thick, and with a 4½-in. bearing on the walls. There was no iron in this floor, and it stood the test of being jumped upon in the centre with hardly any vibration. He agreed with previous speakers in thinking that the whole secret of concrete building consisted in the use of the best materials and careful and continued supervision. The cement should be selected from the best makers, the ballast should be perfectly clean and free from loam. The concrete might be poured in by unskilled labourers, but it should be done under the watchful eye of a careful foreman. For surface ornamentation he thought a simple form of *sgraffito* might be employed at a cost of only 2s. per yard superficial. If slabs of mosaic or tesselated work were used externally or internally, they might be so used as to dispense with the use of boards or similar apparatus.

Mr. Broughton pointed out a drawing which illustrated what a subsequent speaker characterised as a somewhat acrobatic trick in concrete building. This consisted of a balcony entirely supported on concrete cantilevers, projecting 3 ft. 6 in. from the wall. The cantilevers were 11 in. deep at the ends nearest the wall, diminishing to 3 in. at the outer ends, and were made of concrete consisting of one part Portland cement to six parts ballast. They were attached to the walls some twelve months after the latter had been erected, the only means adopted for fixing being to cut away the thin cement coating with which the wall was faced, and then to let the end of the cantilever come with a straight butt joint against the flat surface of the wall, the cementing material being concrete composed of 1 of Portland cement to 4 of ballast. Three days after the cantilevers were fixed in position, the balcony was tested by three men running along it; it survived the test, and was still standing. As to cracks caused by shrinkage, he had built a large warehouse containing 432,000 cubic feet, but not a crack was to be seen all over the building, and the same remark applied to his own house and to many other buildings. As to embedding the ends of joists in concrete walls, he had done so to the extent of as many as 500 in one building, but they had not caused the walls to split, nor was it possible that they could do so.

Mr. Cockerell said there was a great conflict of testimony as to the damp-resisting and weather-proof qualities of concrete, but these conflicting statements were capable of being reconciled to a great degree. His experience was that the more dense the concrete the greater would be its capillary attraction, and he was therefore of opinion that the best concrete was that which resembled a coarse honeycomb in texture, with as few knobs or points of contact as possible. This kind of concrete would not so readily suck up moisture from the ground as concrete of a finer texture, and although it would let water run through it like a sieve, a very thin external rendering of cement would suffice to keep out the most driving rains. As to cracks caused by shrinkage in concrete, he had built several concrete houses, and had not met with them; but, on the other hand, when one came to build a long garden wall or any similar work in concrete, it would be found to crack vertically at almost regular intervals of 14 ft. or 15 ft.

Mr. Horace Jones.—Your belief is, in fact, that the measure of the non-contractibility of concrete is 14 ft. or 15 ft.?

Mr. Cockerell replied in the affirmative. These cracks were not due to settlements.

Mr. Wyatt Papworth said that one important point, to which no reference had been made in the discussion, was as to the proper quantity of water to be used in mixing different kinds of concrete. He should be inclined to imagine that where shrinkage or cracks occurred in concrete work, too much water had been used.

Mr. Aitchison deprecated the use of iron in conjunction with concrete, particularly when it was exposed or near the surface. Where it was deeply embedded in the concrete, and where it bore but a small proportion to the general mass, iron might be admissible, but under other conditions he thought iron and concrete work would never prove to be sound, owing to the different rates of expansion and contraction of the two materials. The cleaner the ballast used the better would be the concrete. Mr. Leach, the engineer to the Thames Conservators, had caused a quantity of ballast taken from the river below-bridge to be thrown under one of the weirs in the upper part of the river, and allowed it to remain there for several years. When it was taken out it dried perfectly white, and with this ballast Mr. Leech had made very good concrete with only one-ninth of Portland cement. No tests had yet been made to test the relative strength of concrete structures in which iron was embedded, as compared with the same structures without iron, and Mr. Aitchison thought that Government might be memorialised to carry out some experiments of this kind at the dockyards. As to the decorative treatment of concrete, he thought that for ordinary buildings stucco would have to be used, while, for superior erections, tiles or slabs of mosaic work might be used.

Mr. Cates described the manner in which the timber-work of the dome of St. Paul's had been rendered fireproof by means of Brannon's patent stone-felt concrete. This material was applied in a liquid state, and all the timbers (which were of oak) had been completely covered with and embedded in it. Of course, this method of fireproofing timber was only applicable where, as in the case of St. Paul's, the timbers were thoroughly dry and well seasoned, otherwise dry-rot would set in and prove fatal. He thought that Mr. Brannon's material was worthy of extended trial for the purpose of coating iron girders and columns in so-called fireproof erections.

Mr. Payne, the author of the paper, then replied on the discussion, and remarked, with reference to the alleged tendency of concrete to shrink and crack, that in Paris there were sewers several miles in length constructed of concrete, but no cracks had occurred, or the sewers would leak. Again, concrete was very largely used for railway retaining walls of considerable length, and he had never heard of these walls cracking. It was urged against concrete that when it failed it failed more suddenly and disastrously than other materials, but it was forgotten that when it did fail it was generally through what he might call "playing tricks" with it. Things were done with impunity in concrete ninety-nine times out of a hundred owing to the almost miraculous strength of the cement; but if the

cement happened on the hundredth time to be rather poor in quality and a catastrophe occurred, people shook their heads gravely and spoke of concrete as a treacherous material. As to cost, concrete builders stated that concrete buildings could be built at half the cost of brickwork; his experience had not verified that statement, but he had found a saving of ten per cent. in cost. The cost of concrete building would be materially diminished by dispensing with the cumbrous and inconvenient apparatus generally used.

The Chairman, in proposing a vote of thanks to Mr. Payne, said the paper and the discussion to which it had given rise had been most interesting. It was perfectly clear, he thought, that concrete could only be profitably and safely employed under the constant supervision of men well acquainted with the material. There seemed to be a great tendency on the part of concrete builders and others to exaggerate the advantages of the material. He would advise the advocates of concrete not to claim too much for it. Mr. Payne had, he thought, taken a very moderate course in stating the saving effected by concrete to be about 10 per cent. As to the artistic decoration of concrete, he thought that architects and others who used the material should seek to give it its own distinctive treatment, which should be such that it could not possibly be mistaken for what it was not.

The vote of thanks having been carried, it was announced that the last meeting of the present session would take place on Monday, June 12, when the Royal Gold Medal and other prizes will be presented, and Mr. Eastlake will read a paper entitled, "An Historical Sketch of the Institute." This meeting will also be the opening meeting of the Third General Conference of Architects.

EDINBURGH.

IMMEDIATELY succeeding upon the closing of the Royal Scottish Academy follows the meeting of the Church Assemblies. The Established Church, United Presbyterian Church, and Free Church hold their respective parliaments at the same time. The influx of clergymen and their followers is considerable, and it appears strange that the exhibition should be closed immediately prior to their coming. The experiment was made of keeping the pictures a few weeks longer for the benefit of the clergy, but the encouragement given was so small as to cause the Academy to adhere to the former practice of closing during the first week of May. It is evident, therefore, that the love of art, the æsthetic element, does not hold a large place in the estimation of the Scotch clergy. The erection of such a structure as a cathedral upon a certain scale of grandeur will not, therefore, be looked upon by the Presbyterian "Fathers and Brethren," we should suppose, with much favour. The building of the cathedral proceeds slowly,—the centreing of the west doorway has been struck, and the aisle windows begin to appear, and at this slow rate of progress it will be some years yet before the work is accomplished.

We had occasion to remark upon the extraordinary vigour with which the construction of the new West-end Theatre was pushed on, but that vigour has gradually abated since the building was occupied, about six months ago, and the façade is still incomplete. Part of it, however, is built up to the cornice and surmounting parapet, and the large proportions of the parts may be seen; but their largeness does not at first sight appear obvious, owing to the want of a scale by which to measure them. Breadth, size, and simplicity are there, but there is no gradation of parts, the eye takes in the whole at a glance, and it is only when the spectator removes to a distance, and when the proportions of the façade are seen in combination with the adjoining buildings, that their size is fully appreciated.

No time has been lost as to the new façade of the Royal Hotel, designed by Mr. W. Beattie. It is being proceeded with in instalments, and already in the course of about two months one fourth of it is almost finished. There is nothing particularly calling for either commendation or censure about the work; it is commonplace in style. But commonplace although it be, it is not pretentious, which can hardly be said of the recently completed Waverley Hotel to the east of it; but this, we feel constrained to think, is not to be attributed to the fault of the architect, but to cheese-paring on the part of the employer. Nothing could be more out of place in such a street as Princes-street than the paltry statuette above the centre dormer window flanked by terra-cotta chimney-pots, and the meagre iron shafts on the first floor are equally paltry and unpleasing.

All Saints' Church, Brougham-street, which has since its erection, upwards of ten years ago, remained incomplete so far as the west elevation is concerned, has now been completed by the erection of a narthex having a triforium over it, access to which is gained by an octagon turret. In the original design a massive tower was contemplated, but this feature has been abandoned in the meantime, and the church is complete without it. There is, however, ample space whereon to erect a tower should funds be forthcoming for that purpose. The general effect of the church suffers from the absence of a parsonage which it is intended should fill up an ugly gap between it and the adjoining buildings. The additions have been carried out by Mr. R. Anderson, the original designer of the church.

Operations have begun for the formation of the last of the streets embraced in the City Improvement scheme. The street in question is to be called Marshall-street, and is cut through blocks of buildings between Nicholson-square and Bristo-street. In this street a new Baptist church is to be erected, from the designs of Mr. Thornton Shiells. In style the building is to be Lombardic, it will have a frontage of 50 ft., a depth of 65 ft., and 60 ft. of height. On the ground-floor there will be a meeting-hall, with side rooms. The church proper will be fitted with galleries, and covered by a barrel-vaulted roof. There are three doors in the front elevation, and these and the windows are round-arched throughout, and a considerable amount of foliated enrichment is introduced in the front elevation. Accommodation will be afforded for a congregation of 628 persons.

The City Improvement scheme has been considered a success, and it is, we believe, in contemplation to apply for extended powers. Both the amenity and sanitary condition of the city are open to many improvements, one of which would be the improvement of the neighbourhood of the proposed new college buildings by the widening of Bristo-street, &c. Operations have not yet commenced for the erection of the college buildings, but the surgical wards of the new infirmary are being rapidly pushed on.

At West Craigmillar, to the south of the city, a new Blind Asylum and school has been completed, at a cost of 12,000*l.*, on a plot of four acres in extent, most of which is laid out and planted with shrubs. The front elevation faces the south, and is 160 ft. in breadth, and consists of a centre block, and wings having Mansard roofs. The most marked feature of the design is a circular tower attached to the centre of the south front, and a more unhappy production we have seldom seen; it is 80 ft. in height, and is surmounted by a high-pitched roof and lantern of the most eccentric description. In front of the tower is a portico, with a truncated gable over an arched doorway, above which is carved a large representation of the royal arms. The building contains a workroom 72 ft. by 20 ft., a hall, and chapel 115 ft. by 28 ft., in which an organ has been fitted up. Amongst other things it is intended to train some of the inmates as piano-tuners, and much attention is to be given to their musical training. The designs for this building have been prepared by Mr. Charles Leadbeater.

"Painting" the Lamp-posts. — At a recent meeting of the Marylebone Vestry, Mr. Blythe called attention to the "disgraceful" way in which the street-lamps were painted and repaired. The Vestry had placed some excellent lamps in the new street, Mandeville-place, but they had been painted with some sort of composition that disfigured them. Mr. Hallam considered the lamps an utter disgrace to the parish. He was told that the sum paid for painting was 4½d. each lamp; if that was the case they could not wonder at the two coats of "something" that was put on. Mr. Blyth observed that the amount paid for painting was 3d. per lamp. The Vestry Clerk said that a complaint had been made to the Gas Company on the subject, and they answered that the sum paid by the parish was so small as not to allow the painting to be done "in an artistic manner." The sum paid to the company by the Vestry for lighting, repairing, painting, &c., was 18s. each lamp per annum. The subject was referred to the Works Committee. Marylebone is not singular in this respect.

FROM THE CENTENNIAL.

NOTWITHSTANDING the obloquy that attaches to comparisons, one cannot voluntarily annul experiences. The impression conveyed in my former letter might appear to have no justification on seeing the jubilant and triumphant expressions of the American press here, which, according to "Cable News," have been echoed by the English journals, but I could not forget former openings which I had witnessed, and a notion of numbers from assemblages like those at Sydenham, Epsom, and elsewhere. To-day, however, the papers have altered their tone. The *New York Times* heads its article with "The Great Exhibition.—The Third Day.—The Crowd away, and some of the Deficiencies more apparent. The Sound of Hammer and Saw frequent." The article concludes with:—"The exhibitors in Agricultural Hall are still very backward. Some of the spaces have not yet been filled, but the department has been notified recently that they will soon be occupied." The *New York Herald* says:—"Much of the readiness noticed on the opening day was deceptive. Owing to the bad working of the turnstiles, only 82,000 admissions were registered, an evident miscount, as the street car-lines carried more than double that number to the grounds on the opening day. The attendance on the grounds yesterday is officially reported at 16,400, a mere bagatelle by comparison with the 250,000 on the opening day."

I wonder who got the half-dollars representing the difference between the 82,000 of the "tell-tale" and the estimate of the papers! I asked the conductor of a street-car how many he carried on the opening day, and he told me 825 in eight journeys and a half.

The same paper speaks of a Centennial "unpleasantness," which the *Evening Telegraph* thus describes:—

"*Incidents of the Opening Day.*—The peculiar nature of the American people in their impatience of restraint was painfully illustrated in the grounds yesterday. An effort was made by the great mass of people collected near the west end of the main building to get nearer the ceremonies of opening. The curiosity of those out of the immediate sound of those speaking on the platform caused them to push forward against those in front, until the whole crowd swayed and surged against the rope stretched across, and broke them. Efforts were made by the officers in charge, and by the military, to make them go back, but they either could not or would not, and then a sham charge was made by the State Fencibles and a company of the 3rd Regiment. Even this latter demonstration had no effect on the irrepressibles, who still pushed on. As a last final resort, a real charge was made upon those who were apparently the most violent in their efforts to break through, but only when there appeared to be great danger of serious disturbance. By these prompt, though severe, means the crowd was compelled to recede to a proper distance, and everything was soon calmed down. Unfortunately in the mêlée there were several persons injured. One man had a bayonet thrust through his thumb, which burst an artery, and caused a very severe and painful wound. There were one or two other parties who received trifling wounds. The whole thing was much to be regretted, as the only circumstance that could mar the perfect enjoyment of the occasion."

The fact cannot be concealed that the Exhibition is in a most incomplete state. "It is a big thing!" I have heard frequently exclaimed, and the "big thing" is placed on a most beautiful site; but they should have been content with something less, or taken more time for its construction and preparation. Two months hence the grounds will be charming; but at present one has to walk the plank over what Mudby Junction must have been when half complete and still presided over by navvies.

The foreign nation that is most complete is Brazil, and a fine show that empire makes in the main building, and more especially in the Agricultural Hall. The Emperor must have been much gratified by the evidences of the industry of his people, as well as their ability to display it in time. Russia and Turkey have not yet unpacked. I suppose they have too much to do at home. Not so Egypt, who has prepared, within a temple on which is inscribed,—"Egypt, the oldest people of the world, sends SOODAN its morning greeting to the youngest Nation,"—a most excellent display of products of its soil and the handicraft of its people. This should inspire hope for its creditors when despair could only be awakened by the inactivity of Turkey.

The display by P. & F. Corbin, of New Britain, Connecticut, and 87, Chambers-street, New York, of locks, latches, butts, hinges, &c., fully illustrates the beauty and taste of these articles made decorative, as your article on the American houses mentions. I was much struck in the French department by the coffres-forts, or safes, of B. Haffner, aîné, made to represent cabinets or other articles of furniture, which could thus be placed in your library or any other room without

making a show of your wealth to your friends or inspiring the cupidity of burglars.

In the Agricultural Hall is a specimen of the imitation horse-hair which is made from the "Delta Moss" of Louisiana. It is a parasite that has been described with great horror by many travellers, but it is thus utilised. There is a soul "of goodness in things evil, would men observingly distil it out."

One of the most interesting objects, to me, is the Log Hut of Miss Emma Southwick. It is built to show an abode of the early settlers, and contains very many interesting relics which have been preserved by their descendants. There is a small cabinet which came over in the *May Flower;* the cradle "in which was rocked Peregrine White, who was born on board that vessel in 1620." There are old clocks, old books, commissions, spinning-wheels, which the owners authenticate. The attendants are in old-fashioned dresses, and it requires little effort of the imagination to picture the early homes of those who a century ago threw off the British yoke.

In the centre of the main building, where the nave and transepts intersect, there are trophies and illustrations of the four quarters of the globe, and "the representative men" are thus appropriated:—America — Franklin and Washington; Europe — Shakspeare and Charlemagne; Asia—Confucius and Mahomet; Africa—Ramses and Sesostris. Some may take exception to this arrangement. I cannot yet speak of the works of art of other nations, as although a catalogue is sold, the pictures and sculptures are not yet numbered. There is no difficulty with our own pictures, as each one has a label giving the subject, the name of the artist, and by whom lent. I cannot go on mentioning what I admire of these, as I believe I should have to give a list of the entire collection.

The American implements in the agricultural department are ornamented in the most artistic manner. The ploughs are painted and varnished in a style that would befit a state carriage, and the shares are polished to make them look like silver. The reaping, mowing, and other metallic implements might be entered at Elkington's, who, by the way, has a splendid display. This decoration would make our rustics stare, and make them doubt whether any good could be got out of an implement so "mighty fine."

A few figures about Philadelphia may be interesting. There are 817,488 inhabitants spread over an area of 129 square miles, traversed by more than 1,000 miles of streets and roads. There are 143,000 dwelling-houses, a number exceeding by 40,000 houses those of any other city in America. The consequences are that the inhabitants are not crowded together; there are rarely any epidemics; and the death rate is only 22·27 per thousand. All this I am assured is the result of the popularity and success of Building Societies.

F. S. A.

THE SCIENTIFIC CONGRESS AT SOUTH KENSINGTON.

THE Conferences in connexion with the collection of scientific apparatus have led to many interesting statements.

Holland.

Herr Professor Dr. Rijke discoursed on the historical instruments of Leyden and Cassel. He spoke deliberately in excellent English, remarking, by way of apology, that if any of the audience had to speak in Dutch, they would, perhaps, be glad to go slowly. His object, he said, was to speak of the services his countrymen had rendered to science. He pointed to a microscope on the table, which, he said, was the first compound microscope ever made. It was the work of Zacharias Janssen, of Middleburgh, in the Netherlands, somewhere about 1600. There was, too, the original simple microscope of silver made by Anthony van Leeuwenhock, who lived from 1632 to 1723. Then there was the modified instrument with which his wonderful observations on the infusoria were made. At his death it was found that he had made 247 microscopes and 172 lenses unmounted. The chief country to pay him honour was England, where he was made a F.R.S., a distinction, he said, he valued more than anything. Next the telescopes of Christian and Constantine Huygens were referred to, and the marvellous way in which these brothers made lenses. It was with one of these lenses that Saturn's ring was discovered. Dr. Rijke then passed on to some of the instruments of 'sGravesande, who lived 1688 to 1742. His heliostat was the first ever made; his apparatus for showing centrifugal force is singularly ingenious, and is still in use for class-teaching purposes. Professor Rijke worked it to show its action. His study of the velocity of falling bodies is especially deserving attention, if only from the fact that after a long series of experiments, when he found his theory wrong, he rushed in delight to his brother, telling him how glad he was he was quite certain he was wrong, as that was one important step to getting right.

Ventilation.

General Morin, director of the Paris Conservatoire des Arts et Métiers, spoke in the French language upon "Ventilation." He is in his eighty-second year, and full of intellectual vigour. He discussed the literature of the subject, quoting Dr. Reid (1844), Captain Douglas Galton, M. Chaumont, &c. He went on to describe systems adopted in hospitals, *crèches*, schools, and other public buildings in France and in St. Petersburg, including the arrangement which depends upon a *chambre de mélange* for the mixing of hot air with cold before admitting either of them into the room. He disavowed the means ingeniously devised by M. Daniel Colladon for ventilating the St. Gothard Tunnel. In the *salles* of the Corps Législatif tubes beneath the floor opening by orifices not quite beneath the members' seats are largely employed. In a large glass-roofed apartment of M. de Rothschild, at Ferrières, the air which a glass roof sends down in a freezing state in winter is warmed by a number of jets of gas. Different numbers of cubic mètres of air per hour are required for different purposes. In hospitals, for ordinary illnesses, 60 to 70 cubic mètres per hour must be admitted for each patient; the wounded require 100 mètres each; persons suffering from epidemics, 150. In prisons 50 mètres are enough. In ordinary workshops 60 mètres are enough; in unhealthy trades 100 mètres are required per hour. In barracks by day 60, by night 40 to 50. In theatres 40, in assemblies 60. In schools children require 12 to 15 mètres, adults 25 to 30. In stables and stalls the volume required is 180 to 200 mètres. Great losses were occasioned in the Mexican expedition by insufficient ventilation for the horses sent out before the ship *Calvados* was fitted up with proper appliances. General Morin concluded by exhorting ladies who preside over *salons* to preserve the health, beauty, and cheerfulness of their guests by abundant supplies of pure air.

Italy and Science.

The Cavaliere Professore de Eccher said no doubt his audience would wonder why he spoke in English, when on the last occasion he spoke in Italian. He said it was to thank them for their previous kindness. It would have been a matter of regret if, at the first International Exhibition of Scientific Instruments the celebrated apparatus from Florence should not have been described in Italian. The kind manner in which he had been received would be appreciated by his fellow-countrymen. He was now going to speak of modern instruments sent by Italy, and would employ English, as he had to speak of English work. He would first refer to Lord Dudley's astrolabe. To the Italian astrolabes exhibited he also wished to draw special attention. Then he would draw attention to the lens made by Benedetto Bregaus, of Dresden, presented by him to the Grand Duke Cosimo III., and used by Sir Humphry Davy, at Florence, in experimenting on the chemical constitution of the diamond. Averani and Targioni had, however, previously succeeded in vaporising the diamond. Then he wished to refer to the barometrograph of Felice Fontana, made in the end of last century, and briefly to his thermometrograph and other self-registering instruments. Next the following among Nobili's instruments were shown and described: his astatic galvanometer, another instrument for hydro-electric currents, and his magnetoscope; then his models of thermo-electrical piles, one of which was of the greatest use to him in experiments on the radiation of heat. In 1822 he made a globe round which there circulates an electric current, illustrating the magnetic phenomena of the earth. Professor de Eccher went on to compare the work of Nobili and Antinori on induction with that of Faraday. Faraday, no doubt, was first; but, hearing through the French Academy of his work, they repeated his experiments, and in some cases obtained results he did not. Hence the first magnetic-electrical machine was made by Nobili and Antinori. Working the machine,—that is, removing the keeper,—and showing the spark, Professor de Eccher said, the first spark it gave forth was on January 13, 1832. Turning to mechanics, Amici was spoken of, and his excellent microscopes and telescopes were referred to. Then, in conclusion, Matteucci's galvanometer was brought to the front, the instrument with which he conducted the experiments which, in 1844, led to his discovery of the muscular current. Before sitting down, Professor de Eccher expressed his regret that Italy had not represented herself more adequately in the exhibition. Florence alone, the birthplace of physical science, had contributed.

Prime Movers.

Mr. Bramwell, F.R.S., read a paper on prime movers. First he reviewed the motive powers used in ancient times—irrigation by the treadwheel or some such machine ("Egypt, where thou wateredst with thy foot."—Deut. xi. 10), or tortured galley slaves, 50,000 of whom would be required to give a force equal to 8,000 h.p. of marine engines. Then he divided prime movers, excluding light and electricity, into powers which depend on wind, water, or heat. Turbines and hydraulic rams are moved by the impact of water; in other cases water acts by weight or pressure; sometimes streams of water induce currents, as in the jet pump and the *tombe d'eau;* force is gained from falls, tides, and from the oscillation of the waves. The wind always works by impact, but heat by various ways. Heat developed by combustion may be applied to raise steam, or, as in the Giffard injector, to perform work by the currents induced by the flow of steam. Air and gases may be raised in temperature, and their expansion used as a force; and so may the rapid expansion of explosives. The heat of the sun may be applied to the production of power, as in the sun-pumps of Solomon de Caux and of Belidor, or the radiometer of Mr. Crookes. But, in fact, the great source of motion is the sun. The sun has raised the water by evaporation to the height from which it falls to turn the wheel; the tides rise by the influence of the sun and moon; the winds blow in obedience to changes of temperature induced by the sun; and Stephenson's *dictum* about coal, that it was the bottled-up rays of the sun, was true. The people of Laputa, who were engaged in extracting sunbeams from cucumbers, sought what was as really in them as in the sulphide of calcium tubes. The sailing of ships and the winnowing of grain were early instances of the employment of the wind; the water-wheel of the use of water. When falls are more than 40 ft. or 50 ft. high the wheel becomes large, slow, and expensive. Recourse should then be had to water-pressure engines, engines in which pistons move in cylinders, and, being pressed alternately in opposite directions by the head of water, set up rotary motion in the machine, as if the pistons were driven by steam. Much, however, may be done by the use of the turbine, of which the well-known Barker's mill may be looked upon as the germ. The utilisation of the rise and fall of the tide is described by Belidor (1737), who gives drawings of an arrangement of channels, so that during both the rise and fall of the tide the wheel revolves in the same direction. The enormous energy of the tide daily ebbing and flowing round our shores ought to be used more than it is to save our coal. Lord Dundonald (better known as Lord Cochrane) obtained a patent for propelling a ship by the use of cylinders containing mercury, the oscillations of which were to cause a vacuous condition in the cylinders, and so give motion to an air-pressure engine. Lately the apparatus of Mr. Tower has been produced; and a boat had been driven (it was said) against the wind at two or three knots an hour. Coming to the use of the wind as a motive power, Mr. Bramwell said the windmill was a comparatively modern introduction. He recommended the addition of a windmill to factories, to relieve the steam engine and save fuel. The Americans use in their sailing-ships a windmill to pump, to work windlasses, &c., in the place of the donkey-engine or the steam-winch. As for heat as a motive power, the sun's rays had been directly used for fountains. In the day-time they expanded the air in a box and drove out the water; at night the air became cooled and contracted, and the water returned. The heat of the sun was for the purpose intensified by lenses. The temptation to bring into practical use a machine of this character was very great. In a lecture delivered by Dr. Siemens to the British Association at Bradford, he said that the solar heat, if

fully exercised all over the globe, supposing that globe to be entirely covered with water, would be sufficient to evaporate a layer 14 ft. deep of water per annum. Now, assuming 10 lb. of water evaporated from the temperature of the air into steam for 1 lb. of coal (a much larger result than, unhappily, is got in regular work), this would represent an effect obtained from the sun's rays on each acre of water equal to the combustion of 1,680 tons of coal per annum, or about 92 cwt. of coal per twenty-four hours, or enough to maintain an engine of 200 gross indicated horse-power day and night all the year round. When, however, we consider the effect of the sun, not upon the surface of the water, but upon the earth, and deal with its power of producing heat-giving material, the result compares very unfavourably with the work done by the sun itself; and this, no doubt, arises very greatly, first from the fact that the sun is frequently obscured, and second from the fact that a large portion of the energy of the sun is spent in evaporating moisture from the ground, and not in the direct production of combustible material. If we take the sugar-cane we find that in extremely favourable cases as much megass and sugar together is produced as would equal about 5 tons of good Welsh coal. Coming to our own country, and dealing with a field of wheat, the wheat and straw together may be taken as being equal probably to about 2 tons of coal per acre as a *maximum*. The statements made as regards the production of timber per acre per annum, when grown for the purpose of burning, are very various, but the best average is that in this country there is produced as much wood as is equal in calorific effect to about 1½ ton of good coal per acre per annum. Comparing these productions of heat-giving material with the energy of the sun as shown in the evaporation of water, one sees how tempting a field is that of the direct employment of the solar rays as a source of power, more especially when it is remembered that those rays are obtained from week to week and year to year without having to wait the slow growth of the fuel-destined tree.

NOTES FROM MANCHESTER.

A "BUILDERS' Shelter for Cabby" has been recently erected in the centre of Piccadilly, opposite the portico of the Royal Infirmary. It is the first of its kind in Manchester, and is a neat structure of wood and glass. Its cost has been defrayed by Mr. Richard Haworth, and it is said to be much appreciated.

The new Victoria buildings, now being erected near the Royal Exchange, are proceeding very slowly; but it is understood that a contract has been entered into by the Company with Messrs. R. Neill & Sons for the whole of the works above the shop-fronts and for the hotel, and it is hoped that greater progress will now be made. The works so far have been let to the several trades direct.

The new building on iron stilts, at the corner of St. Mary's-gate and Deansgate, is approaching completion. The style is "Victorian Gothic," the circular corner having a truncated conical roof, within one side of which rises a huge chimney-stack, which sadly mars its appearance. In the event of a fire taking place in the corner shop, the firemen will wisely give it a wide berth.

In Deansgate, opposite the Barton Arcade, is a large stone-fronted block of shops and offices of a very solid appearance. The style is of French origin, with a profusion of carving. The front is carried over the shops on elliptical arches, without iron girders behind, and is, therefore, more ocularly satisfactory than those which have their construction hidden. Lower down Deansgate, at the corner of John Dalton-street, is the large building in course of erection for the Union Land and Building Company, in a very, very late Gothic style, such as one seldom sees out of our university cities. This, standing here alone in its glory, seems to be out of place in the busy crowd.

It is just publicly announced that the large plot of land near the cathedral, on part of which Ben Lang's Music Hall formerly stood, and which has been lying vacant for two years, eating its head (85,000*l.*) off, has just been sold to a company, and it is to be hoped that now a move will be made to cover it with substantial buildings. Having a long river frontage, it might become very valuable when the proposed steam navigation of the river is adopted. A proposition has recently been made by the Mayor to name the new hall, which is rapidly approaching completion, the "City Hall" rather than the "Town Hall," on the ground that now that the outtownships are incorporated with the city, as each of them has its own town-hall, some distinction is necessary to prevent confusion, and a vote was taken in the Council at their last meeting in which the members were so equally divided, that it was determined to adjourn the consideration of the subject, so as to give the public an opportunity of expressing its opinion, which, so far, seems to incline to the old name of "Town Hall," with which we fully agree. The old Town Hall, with the land on which it stands, is to be sold.

The Corporation has at last become alive to the loss and inconvenience arising from the situation of the Reference Library in Campfield, and a proposition recently made in the Council to relegate it to the attics in the new Town Hall having met with public ridicule and condemnation, it has been determined to seek a more central site on which to build a new library, &c., and the town clerk is advertising for 2,000 yards of land suitable for the purpose.

Although the Salford Corporation have, some time since, selected the kind of tram-rail they intend to adopt, yet the Manchester Tramway Committee are still undecided as to what they shall adopt, and have recently caused a number of models to be exhibited in an attic in the new Town Hall. With one or two exceptions, there was nothing either good or new, but there was one model shown of "Barker's patent rail and continuous chair" which seemed to be both. It is pretty generally allowed now that a tram-rail must have a continuous support throughout its length, and that that support must not be wood, which is found to require renewal in about three years on an average. The rail and chair mentioned has its steel rail T-shaped, with a groove for flanged wheel near its centre, and resting in and upon an inverted Λ-shaped cast-iron continuous chair, the rail and chair keyed together by the web, and of equal long lengths to break joint. This construction offers great facilities in laying down, and is likely to be durable. Whichsoever is adopted, it seems a pity that the Salford and Manchester tramways, which are to run in conjunction, should not have the same construction. Salford is said to have adopted what is known as the Leeds No. 2 system.

The prospectus is just issued of another attempt to float the property known as Manley Hall and Park, of sixty acres, into a limited company, for the purposes of a winter garden, &c. There is to be, besides the conservatories, which are justly celebrated, a concert-room, lecture-theatre, reading-rooms and library, art galleries, gymnasium, skating-rink, archery, croquet and bowling green, and a permanent orchestral band. Also, a large hall in which to hold agricultural and horticultural exhibitions, with a school of horticulture attached. For all these purposes, it is proposed to raise a capital of 200,000*l.*, of which 120,000*l.* are to be the purchase money of the land, and 60,000*l.* are to be spent on the erection of buildings for the winter garden, &c. It is hoped that the attempt will meet with success, and the remembrance of the Fullerian fiasco of last year be blotted out. The gardens have for some time past been opened to the public.

The works for the Cheshire lines extension, and the Lancashire and Yorkshire branch line to Bury, are being pushed forward as rapidly as possible. For the purposes of the latter, land belonging to Lord Derby's estate in Manchester, of the value of 178,313*l.*, has had to be taken, including buildings and severance, of an area of 83¼ statute acres.

The filthy rivers,—Irk, Medlock, and Irwell,—remain the common sewers of the town.

E. G.

Another Suggestion on the Paving Question.—A correspondent of the *Metropolitan* suggests that our busy streets should be paved with a combination of wood and asphalte. He believes that "a composite roadway of asphalte for the wheels and wooden blocks for the space between is the only solution of the problem for level roads; while for declivities it would be best to have asphalte for the wheel-tracks and granite stones for the space between. Thus we should have the minimum of friction for the wheels and the best foothold for the horses." We are afraid that a roadway consisting of alternate longitudinal strips of wood and asphalte, or granite and asphalte, looks better on paper than it would prove in practice.

THE VIADUCT TERMINUS HOTEL, HOLBORN.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last the Architectural Association visited the new hotel which has been for some time past in course of erection on the Holborn Viaduct, at the north end of the City Terminus of the London, Chatham, and Dover Railway. The building, which will cost about 120,000*l.*, is being erected by the London, Chatham, and Dover Railway Company, by whom it will be let to Messrs. Spiers & Pond. It contains 170 bedrooms, twenty-two reception-rooms, besides large coffee-rooms and billiard-rooms. The contract for the completion of the building expires on the 14th of November next, and its occupation will commence at Christmas. We are informed that the success of the building as a commercial speculation is so far assured that it is proposed to erect an additional wing, or, more properly, a detached block, in the rear of the east end, on or near to the spot where Green Arbour-court existed before the Viaduct was built. This detached block will cost an additional sum of 30,000*l.*, and will be connected by an iron bridge or bridges with the main building, a narrow thoroughfare leading to the side-entrance of the terminus intervening. Mr. Lewis H. Isaacs, the architect, was present on Saturday last, and accompanied the visitors over the works, Mr. Till, the clerk of the works, and Mr. Smethurst, the contractor's foreman, being also in attendance. The building has a frontage towards the Viaduct of 235 ft., and a depth from back to front of 70 ft. It is carried by wrought-iron girders over a low-level railway which connects the London, Chatham, and Dover line at Ludgate-hill with the Metropolitan line at Farringdon-street. These girders are necessarily very large and heavy, owing to the great weight of the superstructure to be borne; and although they had to be got into position without the slightest interruption to the traffic on the railway below, consisting of about 260 or 270 trains per day, not the slightest accident occurred. The ground-floor of the building is on a level with the Viaduct roadway, and also with the platforms, and is principally devoted to the purposes of the railway, including a large and lofty booking-office, together with waiting-rooms, ladies' rooms, and other offices. At the east end of the ground-floor is the restaurant and buffet, 74 ft. long, 30 ft. wide, and 20 ft. high. The walls of this apartment have been decorated by W. B. Simpson & Co., of West Strand, with Maw's tiles and majolica, from the designs of the architect, at a cost of 2,000 guineas. The joinery and fittings of this department are of walnut and ebony, and are from the workshops of Mr. Drew, Christopher-street, Hatton-garden, and are excellent in material and workmanship. Below the ground level there are a lofty basement and sub-basement, which will be used for the storage of wine, beer, coals, &c. These lofty basements were a necessity of the site, as the footings of the building had to be put in at a level of about 30 ft. below the ground-floor line, namely, on the blue clay, the Corporation having gone down to that level for the foundations of the Viaduct. The necessity of going to such a great depth absorbed the greater portion of a sum of 40,000*l.* Mr. Isaacs stated that for the planning of the booking-offices, Mr. Mills, the railway company's engineer, was responsible. The booking-offices are approached by vehicles under a covered way or loggia running parallel with the Viaduct, and having entrances at either end. This loggia or colonnade extends nearly the whole length of the ground-floor of the façade. To the east of the restaurant is the principal entrance to the hotel, giving access to the hall and staircase, a "service" entrance being situated in the rear of the building. The principal staircase is 20 ft. wide, and the steps are of Portland stone. In order to give the appearance, as well as the reality, of strength, the stairs are carried up on iron girders, the outer one being intended to do away with the insecure appearance presented by stone stairs supported only at the wall ends, and the inner one, or that nearest the wall, being adopted as a precautionary measure in case of the settlement of the party-wall which forms one side of the staircase, this party-wall having been built beforehand, and not going down so deep as the walls of the hotel. Ascending the grand staircase the hall and central corridor on the first floor are reached. This corridor will receive ample light by means of well-holes and by windows on one side. The principal coffee-

room is on this floor. This is a fine apartment, measuring 63 ft. long, 36 ft. wide, and about 26 ft. high,—extending in height through two stories. The walls will be decorated with Mexican onyx marble, and the ceiling will be enriched with carton pierre and decorated in colour. Adjoining there will be a large public billiard-room, 50 ft. long by 30 ft. wide, to contain four tables; a private billiard-room, smoking-room, reading-rooms, and several sitting-rooms. On the second floor is a suite of rooms designed for Masonic purposes, consisting of lodge-room, "a convenient room adjoining the lodge," and a banqueting-room. The remainder of this floor, and the third, fourth, and fifth floors are devoted to bed and sitting rooms. The sixth or top story is devoted to the service of the hotel, and contains the kitchen and all offices pertaining thereto, as well as a large number of bedrooms for the servants. The top story of a building of this kind is, in Mr. Isaacs's opinion, the proper position for the culinary offices, for not only are good light and fresh air obtainable, but the rest of the building is rendered free from the odours which would pervade it were the kitchen in the basement or on the ground floor. All comestibles, coals, and luggage are raised by a powerful lift, and there is a separate lift for passengers. In addition to the principal staircase there are two or three smaller staircases for the use of servants. Bath-rooms, waterclosets, and lavatories are provided on each floor. Each floor will have its own distinct "service," each apartment or suite of apartments communicating with one of the "service-rooms" which are provided for each floor. Electric bells will be the medium of communication, and in order to facilitate repairs or to remedy defects, the wires will be left exposed and readily accessible. The same rule, however, is not to apply with regard to the gas-pipes. The corridors on each floor are of iron and concrete "fireproof" construction. The iron-work has been supplied partly by Mr. Matthew T. Shaw, and partly by Messrs. Westwood, Baillie, & Co. The façade is Italian in style, and is wholly of Portland stone. The back portion of the buildings is in white Burham bricks, perfectly plain, but is an excellent specimen of brickwork. Indeed, the brickwork throughout is good, even in the partition walls, and was highly spoken of by the architect, who said that the contractor, Mr. William Webster, was noted for the excellence of his brickwork. The façade has two slightly projecting pavilions at either end, surmounted by Mansard roofs, and the centre portion of the building has pilasters running through three stories between the windows, a series of panels between the first and second floor windows having sculptured representations of the arms of the different cities and towns through which the London, Chatham, and Dover Railway passes. These heraldic devices are carved in bold relief, and remain the natural colour of the stone, but the flat ground of the shields is covered with leaf-gold. An interesting point in connexion with the building is that it is probably the only structure of so large a kind which has been erected without the usual scaffolding. The Corporation of London, it appears, refused permission for the necessary hoarding, declining to allow the pavement to be obstructed for so long a time as that required for the erection of the building. Necessity being the mother of invention, Mr. Webster designed and constructed two steam-cranes or derricks with long arms, the largest one of the two being capable of, and actually accomplishing, the hoisting of the chimney terminals, and bedding them in the exact position required,—a height of upwards of 80 ft. above the ground-line. These steam-cranes travelled on iron rails laid down on a gantry level with the first-floor, the public footpath being maintained underneath the gantry. This mode of construction is a novelty in London. The visit was very instructive and pleasant, thanks to the courtesy of Mr. Isaacs, although, as he said, the visitors were rather too late to see much of the constructive details, and rather too early to see the decorative features of the structure.

We shall give illustrations of the building in an early number.

Hornsey-road Schools.—Mr. F. K. Wallen, architect, has been selected by the Islington Guardians out of a list of eighteen candidates, to prepare plans and superintend the alterations and enlargement of the schools in Hornsey-road.

RICHMOND NEW WATERWORKS.

WE mentioned briefly in our last that the works at Richmond had been commenced. A bore-hole of 3 in. diameter has already been sunk into the chalk on the site of the proposed well. It discharges forty gallons of water per minute, making it seem likely that such a well as it is proposed to construct will yield an enormous volume of water. Messrs. Russ & Minns have sent us the following particulars respecting the well, which will doubtless interest our readers:—The first 100 ft. from the surface of the ground will be 8 ft. 6 in. internal diameter, lined with brickwork; the next 85 ft. will be 7 ft. internal diameter, also lined with brickwork. From this depth cast-iron cylinders of 6 ft. 6 in. will be carried down for a further depth of 40 ft., whence they will be reduced to 5 ft. diameter to the chalk, which will be reached at a depth of 265 ft. from the surface. The chalk being reached, a bore-hole of 24 in. diameter will be sunk for a depth of 150 ft., making the total depth of the well 415 ft. In the event of the highly improbable contingency of a sufficient supply of water not being obtained, the 5 ft. cast-iron cylinder will be carried a further depth into the chalk, and lateral headings driven to intersect the water-bearing fissures. By the side of this main well another well of 8 ft. 6 in. diameter will be driven to a depth of 110 ft., in which the pumps will be fixed, the two being connected by a heading. The depth of the various strata passed through, as ascertained by boring, is as follows:—

Made ground and gravel	20 ft.
London clay	178 ,,
Mottled clay	38 ,,
Sand	29 ,,
Chalk	150 ,,
	415 ft.

TEWKESBURY ABBEY RESTORATION.

A SPECIAL meeting of the committee and subscribers has been held, for the purpose of taking into consideration an amended plan for the arrangement of the choir prepared by Sir Gilbert Scott. At the last meeting there were three plans submitted, viz.: 1st, terminating at the western end of the eastern pier of the tower; 2nd, extending about half-way across the transept; 3rd, terminating at the western end of the western pier; and the plan now submitted extended the choir about half-way across the western piers of the tower. After considerable discussion it was proposed by Sir George Prevost, seconded by the Rev. C. W. Grove, and resolved with but one dissentient, "That the committee adopt the last amended plan of Sir Gilbert Scott as regards the extension of the choir and the arrangement of the stalls, requesting him, however, to substitute very light and open screens for the old panelling." The question of the position of the altar was then discussed at great length, and after an inspection of the choir, and a comparison with the different plans, it was proposed by Mr. Garrison, seconded by Mr. Fredk. Moore, and carried *nem. con.*, "That the question of the position of the altar-table be referred back to Sir Gilbert Scott, with a request from the committee that he report his own distinct opinion whether the communion-table should be placed in the extreme east, as shown in his original plan, or in the chord of the apse, or advanced in the centre between that and the east, as shown on the plan now produced." A plan of the paving of the choir was also adopted, and the question of lighting, either by pendent gaseliers from the roof or arches, or by standards, was unanimously decided in favour of the latter principle.

Two interesting discoveries have lately been made in the Abbey. Near the foot of a pillar north-west of the tower, the workmen employed in the restorations turned up the upper portion of a coffin-lid, on which was still remaining the greater part of a tilting helmet, on which the head of a monumental effigy formerly rested. The colour remains upon the unmutilated portion of this, and it has been suggested that this part represents the Prince of Wales's plume as it used to be delineated in Mediæval times. If this be so, then the coffin which it covered was possibly that of the unfortunate Prince who was slain so cruelly after the Battle of Tewkesbury. It was also thought desirable that the Clarence vault should be opened before the commencement of arrangements for laying the new pavement. On removing the large slab behind the altar, a flight of steps was disclosed leading into a vault with a depressed arched roof, and measuring 9 ft. long, 8 ft. wide, and 6 ft. 4 in. high. The pavement of this vault consists of encaustic tiles, and in the centre a long cross is formed of heraldic designs, some of the coats of arms not having been previously discovered in the Abbey. On the southern side of the vault is a stone coffin containing a large portion of two skeletons, the skull of one of which is perfect. These are supposed to be the remains of the Duke and Duchess of Clarence.

GLASGOW NEW POST OFFICE.

THE work of extending the Glasgow Post-office accommodation, which has been so long delayed, and for which there is very pressing need, is now likely to be proceeded with, as the contract for a portion of the work has been obtained by Mr. Jas. Grant, jun., of Glasgow. Mr. Grant's contract includes the erection of the building on the present unoccupied ground, the demolition of the old portion of the premises, and re-erection, but not the taking down and rebuilding of the newer portion at the corner of South Hanover-street and George-square. In the contract is included every requisite for the completion of the portion of the building indicated, viz., masons' work, joiners' work, ironwork, plumbing, plasterer's and slater's work.

SALTAIRE.

NEW buildings intended to serve as Congregational Sunday Schools, and erected at the sole cost of Sir Titus Salt, bart., have been publicly opened at Saltaire. The buildings are Italian in style, harmonising with the rest of the buildings in Saltaire; but little exterior embellishment has been introduced. On the ground-floor there is an assembly-hall, 85 ft. by 40 ft., from which open ten class-rooms, five on each side of the building, a vestry, and large lecture-room. Occupying an elevated position at one end is a platform-desk for the superintendent, while opposite to it, in a recess between the two entrances, is a raised gallery for the infants. Running round the assembly-hall there is also a gallery, which is approached from the two entrances by stone staircases with ornamental balustrading, and into this gallery open twelve other class-rooms, five on each side, corresponding with those on the ground-floor, and two of larger size above the lecture-room. The capacities of the various class-rooms are as follow:—Sixteen of them seat twenty-five scholars each; four seat forty each; and the two largest eighty each; giving a total capacity of 720. The assembly-hall will seat, in the manner described, about 800 scholars. It will thus be seen that the leading idea of Sir Titus Salt and his architects is, that the whole of the teaching, except, perhaps, that of the infants, shall be carried on in separate rooms. The entire cost of the structure, inclusive of the value of the site and furnishing, will be little short of 10,000*l*. The amount required for the latter item, estimated at about 600*l*., has been furnished. The contractors of the building have been,—Masons' and joiners' work, Messrs. John Ives & Son; plumbers' work, Mr. S. Rushworth, jun.; plasterers' work, Mr. James Duckworth; slaters' work, Messrs. Ridge & Hodgson; painters' work, Messrs. Dyson & Proctor. Messrs. Lockwood & Mawson are the architects.

SOLUBLE GLASS FOR COATING WOOD, BRICKWORK, AND METAL.

THE manufactory of soluble glass of Van Baerle & Sponnagel, of Berlin, recommends a coloured soluble glass in the form of a solution, which may be applied as a coating for the above materials. According to a communication in the *Deutsche Bauzeitung*, it is necessary, in using this solution, that the surfaces to which it is to be applied are dry, free from fat, glue, rust, or resin. An addition of lime or of heavy spar is especially recommendable; the silicate of lime or barytes then forming is insoluble, making the coating weather-proof. To give it a colour, any purely mineral colours may be added; for instance, all pure, natural, and artificial earth colours, such as ochre, red earth, and green earth, &c., ultramarine blue and green, zinc-white and zinc-green, soot, &c. From 20 to 25 per cent. of the volume of the colours added, mixed with powdered lime or heavy-spar, to which the double quantity, equal to 24 to 28 per cent. of soluble glass, has been added, are sufficient to make the colours fit for laying on.

The price of the carbonate of soluble glass being from 6s. to 7s. per cwt. and of potash of soluble glass from 14s. to 15s. per cwt., the cost of soluble glass required for a surface of 100 square mètres would be from 0·45s. to 0·90s., to which must be added the price of the colour chosen, and the powdered lime or barytes. The mass, after being carefully mixed, must be put on thin, the thinner it is the longer it will stand. By repeated coats, the surfaces are completely covered. The soluble glass colours adhere quite as well on cement plaster as on gypsum; if the latter is unprotected against rain it is necessary that the surfaces, before putting on the coating, should be washed first with luke-warm solution containing ½ to 1 per cent. of soluble glass, with a sponge, and after that rinsed with clean luke-warm water.

BUILDING MATTERS IN LEEDS AND DISTRICT.

A few weeks since a movement was commenced for the establishment of a Builders' Exchange in connexion with the Royal Exchange, Leeds. The proposals received a large amount of support from all branches of the building trades, and the principal firms in the district have been enrolled as members. The Exchange is held every Tuesday at three o'clock. The attendance last week was good, and business was reported to be lively. The brickmakers are full of orders, and are unable to satisfactorily cope with the demand. In the cabinet trade, work is almost at a standstill, the trade unions having resolved to maintain the strike. There is no other dispute in the trade in Leeds; and at Bradford the masons' labourers have resumed work pending the settlement by arbitration of the dispute between them and their employers. No public buildings of importance are at present being erected, but the prospectus of the company for the erection of the theatre and opera-house, Leeds, has been issued. The proposed site contains nearly 3,400 yards, and has two frontages of 162 ft. and 210 ft. respectively. The plans have been prepared by Mr. G. Corson. At Goole, the Bishop of Beverley has laid the foundation stone of the church of St. Thomas of Canterbury. It is to be of white brick, with black dressings, the style being plain Gothic. Messrs. Goldie & Child are the architects. Notwithstanding the almost unparalleled depression of trade in the worsted district, there is a great activity in the Bradford building trades. Among the principal buildings in course of erection are the Union Wool Warehouses, and large warehouses for Messrs. C. Semon & Co. The Society of Friends are building a meeting-house, and the corporation are erecting the second half of the covered market, with premises for the Central Free Library, from designs by Messrs. Lockwood & Mawson. The same architects are carrying out the erection of the Liberal Club. A large number of shops are in course of erection on an extensive scale, one for Mr. G. Thorpe, after designs by Messrs. Hope & Jardine, stands upon a site recently purchased for 22,000*l.*, or 43*l.* per yard. Messrs. Knowles & Wilcock have designed a pile of shop premises at Sun Bridge; and Messrs. Williamson & Gaunt's French Classic plans are being carried out in the block of shops and warehouses on the old Piece Hall property.

REGISTRATION AND CLASSIFICATION OF HOUSE PROPERTY.

We recently published in the *Builder* a paper read by Mr. John Cowan, builder, Glasgow, read before the Architectural Section of the Philosophical Society of Glasgow, in which he sketched out his scheme for the registration and classification of house property. At that meeting Mr. Cowan, with Messrs. Honeyman, Sellars, D. Thomson, and Forsyth, architects, were appointed a committee to consider the best means of carrying the scheme into effect. At a subsequent meeting of the committee, it was thought desirable to add to its number gentlemen connected with the various professions and trades interested in the condition of house property, and accordingly the names were added of Mr. John Erskine, writer (who had assisted Mr. Cowan in the preparation of his paper); Mr. Donald Fisher, writer; Mr. James Watson and Mr. R. Dempster, masons; Mr. Thos. Kay, joiner; Mr. J. L. Selkirk and Mr. R. D. Downie, factors; Mr. A. A. Ferguson, representing the Merchants' House; and Mr. John Baird, architect. The committee met on Friday last at Mr. John Honeyman's office, when that gentleman resigned the convenorship, owing to a pressure of business and other engagements, Mr. Councillor Selkirk being appointed to the office in his stead. The meeting expressed itself strongly in favour of the scheme, and those present pledged themselves to the formation of an association for practically carrying out Mr. Cowan's suggestion.

APPROACHING CONFERENCE OF ARCHITECTS, 1876.

The following is the settled programme:—

Monday, June 12th, 8 *p.m.*—Opening meeting. Presentation of the Royal Gold and Institute Medals and Prizes. Opening address by Mr. Charles Barry, President R.I.B.A., F.S.A. Paper by Mr. C. L. Eastlake, Fellow. Subject, "Historical Sketch of the Royal Institute of British Architects." The President and Council will receive gentlemen attending the Conference in the meeting-room between 7·30 and 8 o'clock.

Tuesday, June 13th, 11 *a.m.*—Visits to Improved Dwellings, as follows:—11 a.m., Mr. Allen's, Manor-road, near Stoke Newington Station, G.E.R., from Liverpool-street Terminus. 12 noon, Industrial Dwellings near Bethnal-green Station, G.E.R. 1 p.m., Peabody Buildings, Southwark street.

3 *p.m.*—Meeting. Subject, "Improved Dwellings" and "Artisans' and Labourers' Dwellings Improvement Act, 1875." Papers to be read by Mr. George Vulliamy, Fellow, London; and Mr. F. Chancellor, Fellow, London. Chair to be taken by Mr. George Godwin, Fellow, F.R.S., F.S.A.

7·30 *p.m.*—Lecture by Mr. Edmund Sharpe, M.A., Fellow, will be given before the Architectural Association, on the Architecture of La Charente, illustrated by drawings made during the last excursion of the Association.

Wednesday, June 14th, 2 *p.m.*—Visit to Messrs. Cubitt's workshops, yard, &c., Gray's inn-road.

8 *p.m.*—Meeting. Papers to be read by Mr. W. Burges, Fellow, on "The Importance of the Study of Greek Art and Literature to the Practice of Gothic Architecture;" and by Mr. R. P. Pullan, Fellow, on "Greek Art, illustrated by its Monuments." Chair to be taken by Professor E. M. Barry, R.A., Fellow.

Thursday, June 15th, 11 *a.m.*—Visit to Westminster Abbey, by permission of the Very Rev. the Dean. The party to assemble in the Chapter House, from whence they will be conducted over the building by Sir Gilbert Scott, R.A., ex-president R.I.B.A. If time permits Sir Gilbert Scott will accompany the party to the Architectural Museum in Tufton-street.

3 *p.m.*—Meeting—Subjects, "General Building Regulations for the United Kingdom." Papers to be read by J. Honeyman, Fellow, Glasgow, and J. Clarke, Associate, Liverpool; and on "The Registration and Classification of Houses," by Henry Parsons, Fellow, London, and J. Sellars, Glasgow. Chair to be taken by John Whichcord, Fellow and V.P., F.S.A.

8 *p.m.*—Paper to be read before the Society for the Encouragement of Fine Arts, at the Rooms of the Institute, on "Egyptian Architecture," illustrated by drawings and sketches; by R. Phené Spiers, Associate.

Friday, June 16th, 1 *p.m.*—Adjourned Meeting for discussion of any of the above subjects (if necessary).

6.30 *p.m.*—The Institute Dinner will take place at St. James's Hall, Regent-street. Charles Barry, F.S.A., president, in the chair.

LIABILITY OF ENGINEERS.

A very important and novel question, as affecting the position and liability of engineers, has been under the consideration of the Skelmersdale Local Board.

Messrs. Goodison, Atkinson, & Forde are the engineers to the Board, with an agreement to be paid the usual 5 per cent. commission on all engineering works, and they have during the last two years prepared schemes of water supply, sewerage, and gas, in addition to the plans, &c., of public offices; the total estimated cost of these works being about 40,000*l.* In connexion with the water supply, the Board, some time ago, thought proper (against the advice of the engineers, as they had previously bored and found water) to sink a trial well. They accordingly advertised for tenders, and accepted one from a person named Taylor, who was a local man, and much below the others. The engineers told the Board at the time he never could carry out the work to completion for the amount of his tender. However, he commenced work, and went on fairly for a time, until he got hampered for want of funds. Then roguery began. On two or three occasions, when one of the engineers was measuring the depth of the well, for the purpose of granting him a certificate, he managed to move the mark on the cord while Mr. Atkinson was taking notes in his book. By this means he got at the time of his stoppage 60*l.* too much. Notice was served upon him to proceed, and as he has not done so (having since decamped), the Board have taken possession of what little plant he left on the ground. The Law Clerk has advised the Board that inasmuch as they paid the money on the engineers' certificates, they cannot proceed against the sureties for the amount in question, and the Board have passed a resolution calling upon the engineers to refund the money. They attended the last meeting of the Board to protest against this course being adopted, but the Board persisted. This is a very serious matter for engineers, and should be carefully considered.

The engineers offered to refer the question, and, when the Board declined this, offered to bear the expense of counsel's opinion as to whether the sureties could not be made to pay the amount in question. This was declined also.

As a question of law simply, we should doubt the ability of the Board to compel the engineers to pay the money in question.

THE NEW EXCHANGE, DRESDEN.

The new exchange building in Dresden, the subject of our illustration, is the result of a competition which the authorities of the Exchange invited in April, 1872. The joint design of the architects Albin Zumpe and Guido Enrig, at that time residing in Chemnitz, received the first premium, and was selected by the jury. The building was to serve only for the business of the Exchange, but this intention has in so far experienced a change, as allowance has also been made for utilising its rooms for social purposes.

The new building is in the style of the Renaissance, executed in sandstone, and abundantly provided with ornament and sculpture. Its back is turned to the Waisenhausstrasse, its principal façade to the Promenade, the future Ringstrasse. The interior is kept in the same style as the exterior, and adequately decorated. It contains in the lower story reading-rooms and the rooms of the authorities, offices, cloak-rooms, &c.; in the principal story, the exchange-room, the brokers' room, the telegraph-room, cloak-room, &c.; and in the entresol, towards the Waisenhausstrasse, the secretary's office, archives, and the porter's rooms.

Building operations were commenced in the spring of 1873, and conducted conjointly at first by the above-mentioned architects. Herr Enrig, however, died in the autumn of 1873, and the sole direction of the works was left to Herr Albin Zumpe. It is the generally expressed opinion that the building is well fitted for the purpose for which it was designed, that it reflects great credit upon the authorities of the Exchange and the architects, and that it forms a conspicuous ornament of the city of Dresden.

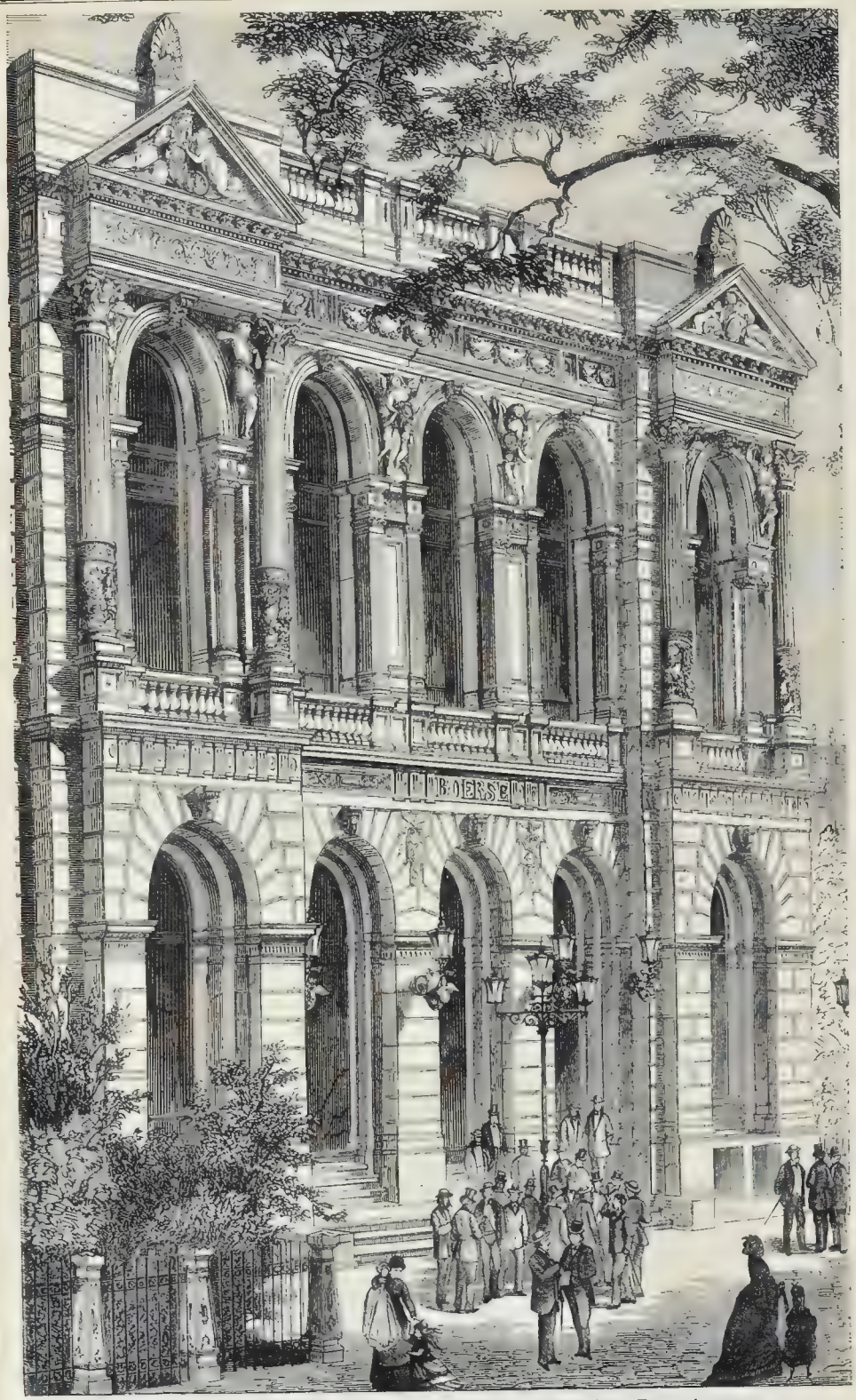
THE CITY LIBERAL CLUB, WALBROOK.

On Monday last Lord Granville laid the memorial-stone of the new City Liberal Club now in course of erection on the east side of Walbrook, close to St. Stephen's Church. The architect is Mr. Grayson, and the design was selected in competition. In our volume for last year, particulars of the design, the accommodation it affords, and so forth will be found,* and we now give a view showing the aspect the front will present when completed. As may be seen the style adopted is, on the whole, Classical. The building will be three stories high, irrespective of rooms in the roof, and will have a frontage of 58 ft., extending to a depth of 115 ft. On the ground-floor there will be reading, writing, visitors', and billiard rooms; the next, or first story being occupied by spacious dining-rooms. A large private dining-hall and smoking-rooms are to be provided upon the second story. These several apartments will be reached by one main staircase, passing through the centre of the building.

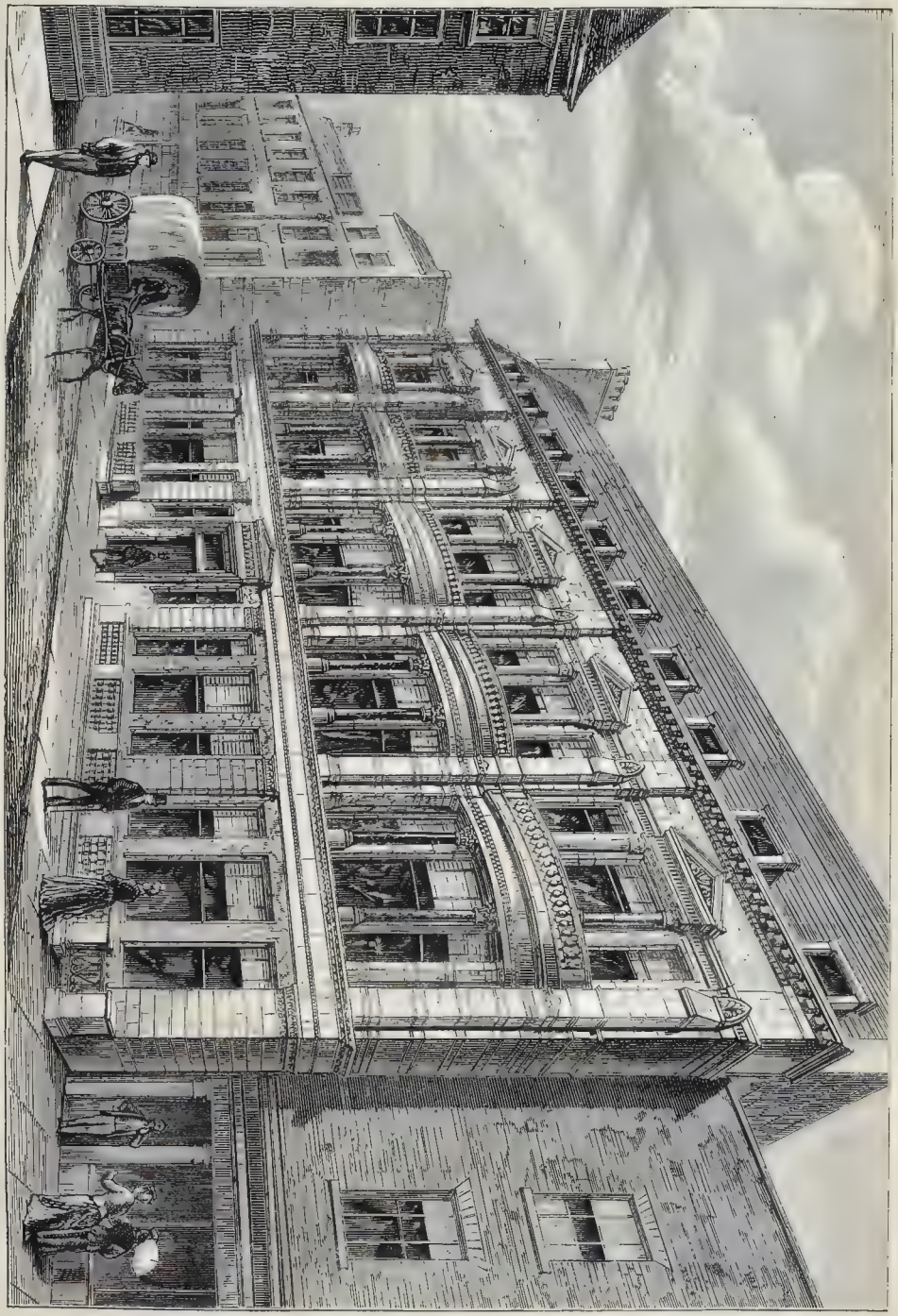
Messrs. Trollope & Sons are the builders, and the amount of their contract is about 32,000*l.*

An Oddfellow's Suggestion.—Writing to a Coventry paper on the subject of dwellings for artisans, "An Oddfellow" says:—"Our various lodges of Oddfellows, Foresters, burial societies, &c., have money at their disposal which they lend to corporations and other bodies at something like four per cent. Could not some of this be employed in the building of working-men's dwellings? Could it not by that means be made to pay *more* than four per cent.? As the majority of the members of these various bodies are working men, I would ask them to consider the question."

* Vol. xxxiii., p. 133.



DRESDEN NEW EXCHANGE.—HERR ALBIN ZUMPE AND HERR GUIDO EHRIG, ARCHITECTS.



THE CITY LIBERAL CLUB, WALBROOK.—MR. GRAYSON, ARCHITECT.

THE FACTORY AND WORKSHOPS ACTS.

THE report of the Royal Commission appointed in March last year to inquire into the working of the Factory and Workshops Acts, with a view to their consolidation and amendment, which has recently been presented to Parliament, is a very interesting and exhaustive document. Its great length, for it extends over 104 pages of a large Blue Book, precludes the possibility of a close examination of the opinions of the commissioners upon the various subjects which have been separately considered by them, but the general scope of their views may (says the *Morning Post*) be gathered from the summary of their recommendations with which the report concludes. Before proceeding to notice the principal of these recommendations, it may be observed that they are not concurred in by every member of the Commission, Mr. Knowles having expressed his dissent from all of them in which it is proposed to interfere with the provisions of the Mines Regulations Acts of 1872; and The O'Connor Don being unable to agree to so many of great importance, that he has written a separate report particularising the points on which he differs from his colleagues and his reasons for so doing. One of the special objects of the appointment of this Commission was to ascertain whether some means could not be devised to make the Factory and Workshops Acts more consistent and harmonious; and it certainly is most desirable that something should be done in that direction, there being already in force no less than fifteen statutes relating to the regulation of the employment of women, young persons, and children in what is technically known as a "factory" or "workshop." Besides these Acts there are others so closely allied to them that they may be placed in the same category, as, for instance, the Bakehouses Regulation Act, the Chimney Sweepers Act, those for regulating mines, and the Agricultural Children Act; so that it is no wonder that some confusion or discord in the working of all these measures has been experienced. With a view to the simplification of the law, it is here recommended that the Factory Acts from 1833 to 1874, the Ropeworks Act, 1846, and the Workshops Act, 1867 to 1871, should be consolidated into one single Act. There are in these various statutes numerous anomalies, and they have consequently been found to press unequally upon different employers and industries. The majority of such inequalities has no doubt been due to the passing of the Workshops Regulation Act, which established a distinction between factories and workshops that has received universal condemnation. A workshop, according to this law, is a place wherein less than fifty hands are engaged, and the statutory regulations as to employment in such establishments are much fewer and less binding than under the Factory Acts; so much so that many of the smaller manufacturers will sometimes purposely keep the number of their workpeople down to forty-eight or forty-nine, in order to free themselves from the restriction of the latter. Thus the larger factory occupiers were aggrieved by what they felt to be an invidious Act of Parliament, which, according to the evidence of the authorities, charged with the duty of seeing it obeyed, is difficult of enforcement, and often, it is believed, wholly inoperative. The abolition of this distinction by the repeal of the Workshops Regulation Act of 1867 is proposed by the Commissioners, on the general ground that there is no adequate reason for its existence; and if their recommendation is carried out, workshops and factories will henceforth be classed together, and the limitation in the definition of a workshop to places where the handicraft is carried on "by any child, young person, or woman," will for the future be extended to all factories.

The extension of the Factory Acts to some industries and occupations to which they have not hitherto applied is of course intimately connected with the proposal for a consolidated Act under which some of these would be brought. It is recommended that bakehouses, as defined by the Bakehouses Regulation Act of 1863, should be included under the new law, which might, it is suggested, be called the "Factory and Workshops Acts," "the word 'factory' being so defined as to include the factories now under the Factory Act of 1874, that is, premises in which any mechanical power is used in textile manufacture, and the word 'workshop' used to cover all other places of work within the Act," whether they be in the open air or not, excepting fields where agricultural labour is carried on. It may appear unnecessary to allude to such an exception, but the point was raised before the Commissioners, and decided by them as above. Amongst other industries to which it is proposed to apply the Consolidated Act are working in quarries and on pit banks, where these do not form one trade establishment with a mine, and also ropemaking. With regard to the regulation of times of labour, the Commissioners have made several recommendations, of which some are general and others particular, it being justly considered that no set of rules could be framed which would be applicable to all trades alike. The limits of the hours of work are, of course, the same for all factories and workshops, but, under certain circumstances, there might be a relaxation as to the times at which the day's work should commence and terminate. Other abatements of the stringency of the law with respect to times of labour are proposed, so as to meet the exigencies of all trades liable to emergency from sudden press of orders, or such as are "subject to interruption in the process by stress of weather," or in cases where loss would result from a process being left in an incomplete state, and in many other instances. In all their recommendations on this subject the Commission appear to have been actuated by the desire to leave to employers the utmost liberty of action, and only to interfere in order to meet proved abuses and to rectify particular evils. On the question of education, the report lays down the broad rule of direct compulsory attendance at school for all children, whether they are at work or not, and recommends that half-time should be considered a relaxation, allowed as a privilege, and not imposed as a burden.

The recommendations under the head of sanitary measures are primarily directed at ensuring that no child or young person under sixteen should be employed before the legal age, and for this purpose a certificate of birth should, it is proposed, be required in all cases of first employment under the new Act. If such a certificate cannot be furnished, the inspecting surgeon should estimate the child's age, and in either case he should state that the child is fit to be employed.

MASTERS AND MEN.

HARRISON *v.* PARAMOR.

THIS was a claim at Margate County-court (before Mr. George Russell, Judge) for 2s. 1d. for wages.

The plaintiff said: The defendants advertised for carpenters and joiners, at 7½d. per hour, and I answered their advertisement. They wrote to me, telling me to come down. When I was paid on the Saturday, I received at the rate of 7d. per hour. When I inquired why they did not pay me the 7½d. per hour, the defendant said he had only promised that amount to men.

The Judge: How do you make the 2s. 1d.?—52 hours, at 4d.

How long were you at work?—A week.

What was the bargain he made with you?—7½d. an hour.

And he only paid you 7d.?—Yes.

And what you charge is the additional ½d. per hour?—Yes.

The plaintiff handed in the advertisement, which appeared in the *Builder*.

The Judge: Do you consider yourself a good carpenter and joiner?—Yes. I told him what I was getting in London; 9d. an hour, the full wages.

Are you the full age?—Yes; I am 21.

Mr. R. Paramor: He did not tell me what he was receiving in London till I paid him. My shop foreman told me he had not earned more than 7d. an hour, during the week. My arrangement was to give 7½d. an hour for "good men," and he is not a good man.

The plaintiff: You did not write and say if I was not worth the money you would not give it me.

The Judge (to the defendant): Did you dismiss him?—No; he left on his own accord; but he called on the Monday and told me if I did not pay the amount now claimed, he would summon me.

Edward Padgett, the foreman, said: I generally rate the wages of the men; and I rated plaintiff's at 7d. That is the average amount paid in Margate; but we advertised for men at 7½d. because we had a better class of work in, and wanted a better class of men, and I reckon he is not a good man.

The Judge: When did you tell him you rated him at 7d.—On the Saturday.

Did you make any complaint to him during the week?—Yes, twice. I told him his work was not good, but did not say anything as to the rate of wages.

His Honour said he was of opinion that the defendant gave an answer to an advertisement, and that he, therefore, supposing himself to be a good carpenter and joiner, was entitled to those wages, as represented, and on the promise of which he came, and not at any deduction whatever. He thought there was nothing to justify a reduction, and judgment must, therefore, be for the plaintiff, for the ful. amount.

Maidstone.—During the past fortnight the masons engaged in the erection of the new church of St. Michael and All Angels struck work, in consequence of the contractor, Mr. Naylar, having obtained stone for the building from Bath, ready prepared for use. It is stated that the men have resumed work on the condition that no more worked stone should be obtained from the quarry, and that the bricklayers should not fix the stonework.

Bradford.—The strike of masons' labourers at Bradford is at an end, the arbiter having awarded them an advance of 2s. a week, making their wages 25s. in the town and 26s. in the suburbs.

Greenock.—At a conference of masters and men held on the 22nd ult., the men agreed to accept the masters' terms—viz., 9d. per hour. The men demanded 10d. per hour. There are still some questions regarding working regulations, and if these are satisfactorily arranged, the strike will be at an end, and the proposition to import German workmen will not be acted upon.

Glasgow.—On the 23rd ult. a large meeting of the joiners of Glasgow and district was held in the Albion Hall to receive answers from the employers regarding the demand of an advance of wages from 8½d. to 9d. per hour. It was stated that only 30 per cent. of the employers were agreeable to grant the request. A motion that the men come out on strike on Friday, the 26th ult., unless the masters reconsidered their decision, was carried by a large majority, only twenty-six being in favour of the previous question.

Oxford.—Many of the carpenters on strike have now left Oxford. Some of the foreign firms who have contracts in Oxford have conceded the advance to a few of the men, and it is to be hoped that the present state of things will soon come to an end.

Newcastle-on-Tyne.—At a meeting of the painters of Newcastle-on-Tyne it has been resolved to continue the struggle, and that the levies on the men working at the advanced rate of wages be reduced from 4s. 2d. to 2s. 6d. per week.

Middlesbrough.—The strike of painters at Middlesbrough has now terminated. The employers have offered the men ½d. per hour advance, making 7½d. per hour, while the men requested 8d. per hour originally. They have, however, agreed to accept the compromise, and end a dispute that was harassing house-owners and others to a great extent.

Manchester.—A deputation from the Master Lath-cleavers' Association has communicated to the secretary of the Manchester and Salford Trades Council a remonstrance against the action of the workmen in that trade. The men have been on strike for more than two months, the demand being for an advance from 4s. 4d. to 5s. per thousand, at fourteen days' notice. The masters resisted this, on the ground that other branches in the building trade always gave six months' notice, and also that the present rate of wages was quite high enough, viz., from 35s. to 45s. per week, the time being from 6.30 a.m. to 6.30 p.m., deducting meal-times. Upon this subject the masters add,—"What the men seem to want is to commence work about Wednesday, and receive 2l. for it, which they would dissipate away." The masters also state that the price in Liverpool is 4s. for the same counts, while Manchester gets as good timber as any other town to work up. Seven loads of foreign laths had recently arrived from Norway, where both labour and timber are cheap, and they were sold in Southport at 10s. per 1,000. The remonstrance concludes as follows:—"If the men walk about until Christmas, no advance can be conceded, for it would be better for the masters to get supplied from the Yorkshire district, where the wages are only two-thirds of the rate paid in Manchester."

Altrincham.—The bricklayers of Altrincham have had the advance demanded (one penny per hour) acceded to by the masters; but the labourers, to the number of about fifty, are still on strike, refusing to accept the Manchester rate.

Northampton.—In March, 1875, there was formed in Northampton a local branch of the National Association of Operative Plasterers, and influences were put forth to enrol every member of the craft. In the employ of Mr. Banks, master plasterer, of Abington-street, are two men who (having worked for him periods of fifteen and thirty-four years respectively, and having presumably done very well without the aid of any society during that period) could see no necessity for connecting themselves with the Branch. The two men in question were incessantly remonstrated with for not becoming members of the society. All efforts proved ineffectual, however, and on the 15th ult. the society men in Mr. Banks's employ went to him, according to the *Northampton Herald*, and demanded the discharge of the non-society men,

unless they expressed themselves willing to join the society. Mr. Banks very properly referred them to the men themselves, saying that, after they had given their reply, he would tell them (the applicants) his decision. The two men were then once more requested to join the society, but, declining to do so, the representatives of the society repaired to Mr. Banks and again demanded their discharge. Mr. Banks, however, refused to yield to such dictation, whatever the consequences. The men thereupon struck, but subsequently two of them found out that they had made a mistake in leaving without proper notice, and returned to work. Legal proceedings against one of the others, with the object of showing them their error, were commenced by Mr. Banks, and the case came before the borough magistrates on the 19th ult., when the defendant did not put in an appearance.

Hull.—After being on strike six weeks, the Hull painters have resumed work, having received an advance of ½d. an hour (they asked 1d.), and a reduction of hours from fifty-five and a half to fifty-three.

Lincoln.—The award of the arbitrator, Mr. Brogden, on behalf of the joiners, was received on the 13th ult., although it was specially requested, and also promised, that it should not appear until the 15th. Mr. Brogden has seen fit to give an advance of wages to the amount of 1d. per hour, or 4s. 6d. per week,—an advance equal to 15 per cent. on the present rate of wages. After the above decision, the master builders held another general meeting, and took into consideration the claims of the bricklayers, when it was unanimously resolved to accede to their demands. A committee was formed, and met the delegates on the 17th ult., when the decision was made known to the men, who from Monday, the 22nd ult., have received an advance of 4s. per week, and half an hour less work.

Southport.—The master joiners of Southport, in consequence of the men refusing to accept 8½d. per hour, are making arrangements with a contractor in Germany for about 100 men who will accept work at 7d. per hour. A few days ago seventeen joiners were sent over from Ireland. On their arrival at Southport Station the men were surrounded by those on strike, but the masters succeeded in getting them into a cart, and drove them to the works of Mr. T. Durfield, where they safely arrived, amidst the yellings, hootings, and jeers of the Southport joiners. Subsequently, one of the joiners on strike was fined 5*l.* and costs (or one month's imprisonment) for intimidating one of the Irish workmen.

Chester.—The bricksetters of Chester lately asked their employers for an increase of pay per hour, from 7½d. to 8½d., and for an hour less every day; while the bricklayers' labourers asked for the same curtailment of time, and a rise of from 5½d. to 6d. per hour. The bricklayers were offered 8d. per hour, and the shorter time asked for; but this they refused to accept, and turned out on strike. Before, however, the first day's strike was over, the masters agreed to their terms, and the men resumed work. Their hours will now be 49 in the week, instead of 54 as heretofore.

FREEDOM OF TRADE.

WITH reference to the strike against the Greenock masters, now, we believe, at an end, some curious circumstances have been made public by Scottish newspapers regarding the position taken by the workmen towards their employers. A system of "fines," or black mail, has for a long period been exacted by the men from the masters for what the former may consider breach of rules, &c. For example, an employer some time ago took a contract to build a property, in the specification given out for which was omitted the "pointing" of the building, the proprietor of the property wishing to retain this detail in his own hands. The job was finished, and about a year thereafter the proprietor employed a plasterer to "point" the walls. The operative masons thereupon called upon the master mason who took the original contract, and fined him several pounds sterling for taking a job under such circumstances; and the latter, being at the time under contract to proceed with important alterations in a public work during the Fair holidays, had to pay the money or have his workmen brought out on strike. Another case was that of a builder employed in the erection of a public institution in Gourock, who had two machine-prepared stone steps sent him from Glasgow, as specimens of what could be supplied him for the institution, and he having, unfortunately, used them, he was heavily fined, on the ground that the stones were machine-hewn. Another master, employed on a large contract in West Burn-street, Greenock, ordered two similar steps to be sent him, when he was fined 30*l.*, which was afterwards mitigated to 10*l.*, and the latter sum he had to pay. An employer engaged on a large contract in the neighbourhood of Greenock has, we believe, been repeatedly fined,—on one occasion to the extent of 100*l.*,—for doing something in connexion with his business which the workmen disapproved of. As to the question of apprentices, the number allowed each Greenock employer is stated to be four, no matter whether the master employs hundreds of journeymen or only two.

HAMBURG TOWN HALL COMPETITION.

THE Secretary of the Institute of Architects has announced that the Council have received notice of an important competition for a new Town Hall at Hamburg. The site of the proposed building is stated to be 338 ft. by 221 ft., open on all sides, and the total cost is fixed at 300,000*l.* Eight premiums of 250*l.* each are promised, with an extra premium of 250*l.* for the best of the eight. A pamphlet giving full particulars (in German) has been presented by Mr. A. Strong, Fellow, and is laid on the library table.

UTILISING THE TIDE.

SIR,—Mr. J. F. Wilkinson's scheme for utilising the tide, as described in your issue of the 27th ult., is no doubt very ingenious. But he treats my plan with some degree of scorn, because it modestly professes to utilise only one-eighth of the tide's force for any given area; and he seems to assume, because his reservoir possesses the full depth of the tide, and because the whole bulk of water, as it passes in and out, comes into contact with the paddles of a wheel which, by being floated, maintains the "same grip of water," that he consequently utilises the whole force of the tide for a given area. It is almost needless to say that if he so thinks, he is greatly in error. As I endeavoured to show, in the article which you so kindly published on the 13th inst., if we wish to express the full power of the tide for any area, we must suppose the whole bulk of water that is raised over that area to fall in the same time through half the tide's height. Now though we may allow (what, however, is not the case) that according to Mr. Wilkinson's scheme, the whole body of water acts upon the paddles, it certainly does not in so doing fall through half the tide's height. On the contrary, inasmuch as the wheel is made to float, and thus ascend and descend with the tide, the fall of water against it, as represented by the difference between the levels inside and outside the reservoir, cannot be expected to amount on the average to many inches, even in a tide of 20 ft. At the turn of the current, the difference between the levels will be *nil*, and the wheel, if connected with the works, will remain motionless for some time, both before and after the turn of the tide, and both at high water and low water. This is an awkward circumstance, especially as even to reach the modest eighth of the tidal force, which Mr. Wilkinson so contemns, he will have to insure for a tide 20 ft. in height an average difference between the levels on one and the other side of his paddles of at least 15 in. But I think, considering the delicacy of the machinery which he proposes to use, we may congratulate him upon having provided flood-gates which can be closed during repairs.

D. B.

SIR,—I hope my model to which you refer will not be compared to either of the schemes of your correspondents, "D. B." or "J. F. W."; for if the latter were to make his water-wheels as large as is possible, they would not bear the least comparison with mine, which has neither revolving-shafts nor working-barrels. My machine is nothing more than what is called the beautiful fountain of Nero, the Roman emperor, who, if I am informed rightly, instead of placing the supply-tank above the fountain, placed it in the ground below. The plan has been tried in some parts of Holland, but failed because not self-acting—an object that I have perfectly accomplished. It can be made to work on a small scale, like my model, or large, for draining tide-locked sewers, or even the Zuyder Zee. Roughly describing it: if you place say two pints of water on the table, and let one fall on the floor, the other will rise an equal height above the table.

B. CARR.

THE INSTITUTION OF SURVEYORS.

ON Monday last the eighth annual meeting of the members of this Institution was held at the offices in Great George-street, Westminster, under the presidency of Mr. Thomas Huskinson. The report adopted by the meeting, on the motion of the chairman, stated that the past year had been one of prosperity and steady progress. The number of new members elected had been greater than in any previous year. Since the date of the last report twenty-nine members, twenty-three associates, and two students had joined, and on the books of the Institution there were now six honorary and 294 ordinary members, 119 associates, and eight students, or 427 of all classes. The Council regretted to have to announce the deaths of the following members during the past year:—Mr. W. Marton (of Tunstall), Mr. J. Fyne (of Wimborne), Mr. G. J. Taylor (of London), and Mr. J. Clark. The balance-sheet showed a result of a very satisfactory character,—the revenue derived from all sources exhibiting a marked increase, whilst the ordinary expenditure had only slightly exceeded that of the previous year. The Council had applied, out of available balances, 500*l.* to the extinguishing of a corresponding portion of the capital debt of the Institution. The report further stated that several evenings of the session had been very profitably occupied in discussing the Agricultural Holdings Act. That measure was felt to be one in which the members of the Institution were specially concerned; and, looking to the magnitude of the interests affected, and to the previous uncertainty as to the practical effect of many of the provisions of the Act, it was thought desirable to devote an unusual number of evenings to its discussion. The exhaustive consideration which the measure received at the hands of the members had served a most useful public purpose, whilst the interest which the discussion had excited in influential quarters had brought a perceptible increase of reputation to the Institution. The new Valuation Bill had been discussed on several occasions; and it was hoped that the attention thus called to the measure might lead to its amendment when it came again under the notice of Parliament. The new volume of Transactions contained papers of great interest. The Council acknowledged their obligations to Mr. W. D. Gardiner, who contributed a valuable paper on "Ancient Lights," which formed a perfect compendium of the law on the subject. A notable addition to the collection of topographical works in the possession of the Institution had recently been made by the presentation of a fine copy of Dugdale's "Monasticon," for which the Institution was indebted to Mr. Alderman Ellis. Upon the appointment of scrutineers, the election of officers was proceeded with, and the following result of the ballot was declared:—President, Mr. Edmund James Smith; vice-presidents, Messrs. John Oakley, William Sturge, Edward Ryde, and Thomas Smith Woolley; council, Messrs. J. Matthews, W. J. Beadel, R. C. Driver, F. C. Vigers, V. Buckland, C. J. Shoppee, T. C. Chatfield, E. P. Squarey, C. Stephenson, D. Watney, W. Scarth, and E. P'Anson; and Associates, Messrs. J. H. Lloyd and R. B. Grantham. A vote of thanks to the chairman concluded the proceedings.

PROPOSED IMPROVEMENTS, HANLEY.

LAST week Major Tulloch held an inquiry at the Town-hall, Hanley, on behalf of the Local Government Board, in consequence of the Town Council praying for a provisional order empowering them to purchase compulsorily certain properties required for street improvements and sewerage purposes, and also for permission to borrow 37,000*l.* for sewerage works, and 6,000*l.* for street improvements. The first question considered was the continuation of Percy-street by the widening of Tontine-passage, where the council proposed to acquire 679 square yards of land. There was no opposition, and Major Tulloch spoke favourably of the proposed improvement. The next improvement was the widening of the upper end of Stafford-street. The quantity of land required was 616 yards. In Lower Charles-street 167 square yards were required, and the mayor remarked that all these improvements would be a great benefit to the public. With regard to the sewerage works, the surveyor, Mr. Lobley, explained that it was proposed to erect sewage works in meadows between Leek New-road and the Trent, the site covering nine acres. It was intended to deal with the

whole of the sewage there, where there would be tanks, but probably some attempt would be made at intermittent irrigation. The surveyor said the council would prefer the loans to be extended over fifty years. This had reference to the street improvement only. The rateable value of the borough was 103,115*l.*, and the debt 64,000*l.* The Inspector was afraid the Board would not consent to the money being borrowed for fifty years. If the council did so they would have to pay in all probability 4 per cent.; but if for thirty years the rate would be 3½ per cent. He doubted whether the Public Works Loan Commissioners would lend money for street improvements at 4 per cent.

CITY PAVEMENTS.

SOME two years ago permission was granted by the City authorities to the patentees of various systems to pave so much of Cannon-street as would enable the former to arrive at a definite conclusion as to their respective merits. Accordingly, in May, 1874, a piece of wood pavement, constructed on "Norton's Patent Wood Slab Pavement" system, was laid down. The slabs are 7 ft. 6 in. by 3 ft., composed of wooden blocks, which are cemented together by an original watertight substance. When laid down the proprietors asserted that this substance would prove to be wholly impervious to wet, thus obviating the chief objection to other wood pavements, viz., that the surface water percolates through the interstices of the blocks, and by so doing not only rots the wood, but creates a sanitary nuisance which at times might become exceedingly dangerous. A few days ago a slab of the pavement laid down in Cannon-street was lifted, in the presence of a number of gentlemen interested in the question, and an engineer informs us that when taken up the pavement exhibited a wear of less than ¼ in. only, and that when the blocks were split up to ascertain the truth of the assertion that the water would not percolate through the interstices of wood, the timber was perfectly dry, while the earth grit on which it was laid was also found to be in exactly the same condition as on the day it was first put down.

ART TREASURES EXHIBITION OF NORTH WALES AND THE BORDER COUNTIES.

GREAT preparations are being made for the Art Treasures and Industrial Exhibition of Wales to be held at the populous town of Wrexham from July to October.

The executive committee, of which Mr. W. Cornwallis West (the Lord Lieutenant of Denbighshire) and Mr. W. Chaffers are active members, have obtained loans from nearly every large collection in the counties of North Wales, Cheshire, Lancashire, and Shropshire.

The exhibition buildings will consist of two large houses recently erected in Hope-street, Wrexham. The approach will be by an arched gateway and long corridor filled with statuary, flowers, and shrubs, on one side of which will be the refreshment-rooms, extending 100 ft. in length; this leads into a central hall and an art gallery, 150 ft. by 70 ft., fireproof, being, in fact, a saloon of zinc plates, with wooden supports and rafters, lighted from the roofs. The Industrial annexes are distinct.

The plans have been submitted by Mr. Kennedy, the architect, to the executive committee, and approved.

CORNISH CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE thirty-third annual congress of this society will be held at Bodmin, on Monday, the 14th of August next, and will virtually terminate at Penzance on Tuesday, the 22nd inclusive. On this, the first occasion of a London learned society investigating the many interesting and remarkable features of Cornwall archæology, we are pleased to find His Royal Highness the Duke of Cornwall (by birth), Prince of Wales (by creation), has consented to become the patron of the meeting.

As the Association has for its president this year so well-known and popular a nobleman in the county as the Earl of Mount Edgcumbe, there is every reason to hope that the coming Congress will be one of the most successful the society has had, and as the noble president has invited the members and their friends to commence the proceedings at Cotehele, an interesting specimen of an Early Tudor residence, and belonging to the Edgcumbes from the time of the Wars of the Roses, the opening day with a trip by steamer up the beautiful River Tamar, on which Cotehele is situated, some ten miles from Saltash, will, weather permitting, prove a most attractive and agreeable commencement of the ten days' work.

BRADFORD STREET ARCHITECTURE.

THE worsted trade is passing through one of those crises of difficulty which have occurred periodically during the last fifty years, and which, it is believed by well-informed people, has its origin in the undue inflation and expansion of the productive power of the district in 1871. But although the district is labouring under the infliction of bad trade, there seems to be every faith in the future of the worsted industry, judged by the money that is being expended in the erection of costly structures, not only in Bradford, but in places round about. There is the vast pile of buildings in Manchester-road, known as the Union Warehouses, for the storage of wool, erecting by Messrs. Taylor & Hargreaves; the warehouse for Messrs. C. Semon & Co., rising in Bolton-road, and designed by Messrs. Milnes & France, the latter firm of architects having just completed a large block of warehouses, six stories in height, fronting to Canal-road, New Commercial-street, and New Kirkgate, and they are also engaged in the preliminary operations for placing on the White Swan Estate, in Market-street, Charles-street, and Brook-street, a range of buildings, for Mr. Angus Holden, of a costly character. The Society of Friends are having built in Brunswick-place a new Meeting-house; and the Corporation are erecting in Godwin-street and Darley-street the second half of the covered market, together with premises for the purpose of the Central Free Library. The latter structure is from the designs of Messrs. Lockwood & Mawson, and this firm have also in hand the block of buildings fronting New Bank-street, Kirkgate, Queensgate, and Hustlergate, comprising the premises of the Liberal Club, a large shop for Messrs. M. Rhodes & Sons, and other shops and offices, erecting in one complete design,—a feature not often found in Bradford. This pile promises to be as creditable to the architects as to the enterprise of the owners. The shopkeepers are launching out into heavy expense in the adornment of the town.

THE METROPOLITAN CONSOLIDATED RATE FOR 1876.

THE apportionments of the amounts of the consolidated rate required for the year 1876 by the Metropolitan Board of Works, upon the forty-eight parishes and districts within the Board's area, have been issued. The total amount required for the year is 444,980*l.*, being an average rate for the year over the whole of the metropolis of 4·61 in the pound, which is below the average of previous years, the present year being considered exceptional in consequence of the increased assessments over the whole of the metropolis. Although the mover of approval of the apportionments (Mr. Lloyd) was of opinion that they would not be able to calculate upon the same low rate next year, Mr. Richardson, who seconded the motion, thought otherwise, observing that he was certainly in hopes that next year the rate would be no higher than it was now, and he assigned as a reason a hope that, next year, they would be able to include as assets the value of the property that would then have come into letting. The Board had paid thousands of pounds for land which was in their possession; but until it was plotted out they could not include it in their assets. The aggregate rateable annual value of the property in the several pariahes and districts is 23,281,071*l.*, the largest amount, 2,968,086*l.*, being set down to the city of London, from which 56,260*l.* 2s. is required during the year. The parish of St. George, Hanover-square, stands next in order, the rateable value being 1,499,954*l.*

The Royal Scottish Academy's Exhibition.—The number of works of art sold in the exhibition was 234, realising 8,468*l.* 12s. Last year 260 paintings were disposed of for 9,011*l.*, while in 1874 the works sold brought 8,240*l.*, and in 1873 the amount was 6,675*l.* 5s.

BUILDING ON DUST REFUSE.

AT the meeting of the Metropolitan Board of Works on the 19th ult., the following report of the Works and General Purposes Committee was read:—

"In compliance with the resolution of the Board of the 5th instant, your committee have considered the letter from the Home Office, transmitting a copy of a letter from the Local Government Board with reference to the steps that should be taken to prevent the building of houses on foundations of dust and house refuse, and requesting this Board to give effect to the suggestion of the Local Government Board as to legislation on the subject whenever a Bill to amend either the Metropolis Local Management Acts or the Metropolis Building Act shall be brought before Parliament. This question, as the Board are aware, is one which has already on several occasions engaged their serious attention, more especially in connexion with the endeavours they have made to obtain an amendment of the existing legislation with reference to buildings in the metropolis, and it appears to your committee that, as regards the present communication, the proper course will be to furnish the Secretary of State with full information as to the repeated applications which the Board have made to Parliament for that purpose, and also as to other steps which they have taken with a view to preventing the evils referred to. Your committee have prepared a draft letter conveying this information, and expressing a hope that, with the assistance of Her Majesty's Government, some speedy and satisfactory amendment of the law may be obtained, and that they beg to submit the same with this report, and to recommend that it be approved and communicated to the Home Secretary. Your committee are, moreover, of opinion that, having regard to the great importance of this question as affecting the sanitary condition of the metropolis, the Board should, in addition to forwarding the letter above suggested, also seek an interview with Her Majesty's Government, and point out to them the difficulties against which the Board have had to contend, and should ask their assistance with regard to an amendment of the existing law. With this view, your committee further recommend that the subject be referred back to them with authority to confer with the Government thereon."

Mr. Selway, in moving the adoption of the report, said he believed this subject had been brought before the Local Government Board by the Hackney District Board.

Mr. Richardson seconded the motion, which was put and carried.

[The Hackney District Board of Works has good reason to take this matter in hand, as was shown a few months ago in the pages of this journal.]

THE TRAFFIC AT HYDE PARK CORNER.

LORD H. LENNOX, replying to Lord E. Bruce in the House of Commons, said he was happy to be able to state that, after long and anxious consideration, he had decided to approve a route for the relief of the traffic at Hyde Park-corner, and for opening a communication between Piccadilly and Belgravia, by crossing Green Park from Hamilton-place into Grosvenor-place. The plan will be almost identical with that shown in the course of last year. The road would have a wide entrance at Piccadilly, and would enable the traffic from the east and north-east to pass into it, and down to Victoria Station, without coming into contact with the ordinary traffic down Hamilton-place. The road would, however, have to cross Constitution-hill on a level; but a gate-keeper would be stationed at the crossing, who would prevent members of the Royal family and members of Parliament coming along Constitution-hill from being delayed there. The Commissioners of Police were of opinion that great relief would be given to the traffic by the proposed plan.

THE CRAIGMADDIE CROMLECH.

YOUR current number gives an interesting account of the dolmen or cromlech of Dolwilym, in Carmarthenshire, but large as it is, that appears to be only about half the size of one which exists within a few miles of this city, Glasgow, and which is probably the greatest in the three kingdoms. I refer to that which is commonly called the "Auld Wives' Lift," at Craigmaddie, in the Kilpatrick Hills, near the railway station of Milngaire. The table-stone of this magnificent pile rests upon two huge blocks, so arranged as to leave a free passage for voteries to creep through under the copestone, which is 18 ft. in length, and 11 ft. in breadth. The depth is 7 ft. at one end, and falls off to 2 ft., or little more, at the other, but I calculate the cubic contents at forty tons weight. The dimensions you give of the Welsh table-stone are 11 ft. 6 in. by 8 ft. 10 in., the depth not stated. Tradition has preserved no record of the purpose for which this dolmen was erected, but there is little doubt that beneath it rest the bones of one of the Pagan kings of Nentria or Strathclyde; and it was probably an altar as well as a tomb.

J. H. TURNER.

SURVEYORSHIP ITEMS.

Wigton.—A special meeting of the Wigton Highway Board was held on the 23rd ult., for the purpose of electing a surveyor to the Board, in place of Mr. Hutton, resigned. At a recent meeting there were forty-three applications, and a sub-committee was appointed, who reduced this number to six. Their letters and testimonials were carefully gone through and read to the meeting by the chairman, after which the voting took place, with the following result:—Mr. Joseph Robinson, Aspatria, 18 votes; Mr. Tate, Bowness-on-Solway, 15 votes; and Mr. Younghusband, Prior Hall, 7 votes. The contest then lay between Mr. Robinson and Mr. Tate, when there were for Mr. Robinson, 25, and for Mr. Tate, 18; so that Mr. Robinson was declared elected by a majority of seven. He is to reside at Wigton, and devote the whole of his time to the duties of his office. The salary is 160*l.* a year, and the mileage is estimated now at about 340 miles.

DAMAGE THROUGH RAISING A STREET.

SIR E. BAKER *v.* THE VESTRY OF ST. MARYLEBONE.

IN the Exchequer Division of the High Court of Justice, on the 24th ult., the case of Sir E. Baker *v.* The Vestry of St. Marylebone was heard:—

The action was brought to recover 25*l.* for damages done to the plaintiff's house, in Christ Church-buildings, Lisson-grove. The plaintiff is a tenant for life, and Mr. Smith said he admitted the street (Little James-street) was raised some 8 ft., pursuant to two local Acts of George III. This had blocked up the whole ground-floor and the doorway, and the latter had to be rebuilt and windows put in. Notice had been given to defendants under section 68 of the Lands Clauses Consolidation Act, but they had refused to summon a jury within twenty-one days. Apparently this case was governed by the case of "Ferrar *v.* The Commissioners of Sewers in London," which was reversed on appeal ("L. R.," 4 Ex., p. 227). But there was a distinction between this case and that. There it was held there could be no compensation unless the plaintiff had a ground of action, or the defendants had committed a trespass. The defendants under their local Acts, 35 and 57 George III., were enabled and justified in raising the road. There was no compensation or right of action given by those statutes. Section 68 of the Lands Clauses Act was not incorporated, and if it were what was done was no tort. Mr. Smith said he contended the case was governed by the Metropolitan Management Act (18 and 19 Vic., c. 120), which repealed, or rather superseded, the two local Acts. That Act gave powers to the Vestry to purchase easements or rights in and over land. The defendants must pay if they took an easement, as ancient lights or right of way. Under the Lands Clauses Act compensation was to be made for any land taken under an agreement. That Act, he submitted, was incorporated with the Metropolitan Management Act, except sections 16 to 68, which related to compulsory purchase. He maintained the plaintiff came within the earlier sections, 6–15, of the Lands Clauses Act. The power to raise and level roads did not mean that the Vestries should not pay for it. If that were so it would be most unjust. Barons Bramwell, Cleasby, and Huddleston gave judgment in favour of the defendants.

BREACH OF CONTRACT.

CLIFFORD *v.* CLARKE.

THIS action (heard in the Brompton County Court on the 10th ult., before Mr. Serjeant Wheeler) was brought to recover the sum of 15*l.* 10*s.* 8*d.*, for damages caused by breach of contract.

Mrs. Clifford said she resided with her husband, the plaintiff, at No. 1, Rutland-gardens, Kensington, and had employed the defendant to fit some hot-water apparatus to that and three adjoining houses. Had paid him over 70*l.* for the work, which was afterwards found to be defective, and persons had to be called in to remedy the defects in the pipes, and restore the damage done to the stairs and entries, through the leakage of the pipes, the cost of doing which amounted to the sum claimed.

Abraham Verity, hot-water engineer, said he was called in to examine the pipes at No. 1, Rutland-gate, and found the hall swamped by water. Did what he could under the circumstances, but thought the leakage was the defective workmanship in the arrangement of the "coils."

John Fairbeat Clarke, the defendant, said the work was properly done, and the leakage complained of was caused through an exceptional frost, over which he, of course, had no control.

Witnesses having given evidence for the defence,

His Honour said he believed there had been some breach of contract through the work not having been efficiently done, but he should only give plaintiff a verdict for 7*l.* 10*s.*

The New Market Hall at Goole.—The new Market Hall at Goole was formally opened a few days since. It is one-storied, the area of the interior being about 90 ft. by 60 ft. Round it are shops, which open to the market as well as to the streets. The site is midway between the two railway stations, and is close to the docks, around which the population of the town generally reside. The contractors were Messrs. Radcliffe & Radcliffe, of Doncaster and Rotherham.

VALIDITY OF CONTRACTS.

NAYLOR *v.* BENTLEY.

AT the Halifax County Court, on the 16th ult., the judge (Mr. J. W. Longueville de Giffard) gave judgment in the case of Naylor *v.* Bentley.

The plaintiff was seeking to recover 63*l.* 9*s.* 9*d.*, being a balance on the sum of 168*l.* 2*s.* 8*d.*, which it was alleged was the amount due to him from defendant for work done in his trade as a plumber, on five houses in Park View, at the rate of 24*l.* 10*s.* per house The action was commenced in the Supreme Courts, but remitted to the County Court. It was admitted that the work was done, and the balance had not been paid.

The defence of the action rested mainly on an agreement, by which the plaintiff claims 24*l.* The defendant filed a counter claim for 57*l.* 9*s.* 11*d.*, of which the principal amount is a claim for damages for non-performance by the plaintiff of the alleged contract, and the balance of 7*l.* 4*s.* for window-sashes sent by defendant to plaintiff to be glazed.

The first question the judge had to decide, was whether or no the plaintiff entered into the contract alleged; and if so, whether it was a valid contract in law. On the first question, whether there was a contract to do this work for a specific sum. The plaintiff denies that there was such an agreement. The alleged contract was in the following terms:—"17, Russell-street, Halifax, 1873. Tender for plumbing and glazing work required in the erection of twenty houses for Mr. Wm. Bentley, Hopwood-lane. I, John Naylor, hereby agree to do the whole of the plumbing and glazing work for the above for the sum of 24*l.* 10*s.* per house, as per plans and specifications shown.—Pro John Naylor, A.K."

After going through the evidence and commenting upon it, his Honour said, "On the whole case I am of opinion that the defendant has failed to prove the contract on which he relies, and the plaintiff is entitled to reasonable remuneration for the work done and the material supplied. It follows, of course, that the contract having failed, the defendant's counter claim fails with it. With regard to the sashes for which the defendant claims 7*l.* 4*s.*, he will be entitled to receive them on payment of the plaintiff's labour upon them, unless the parties can agree on some person to whom the amount can be referred, the case must be heard on this point at some convenient day. The plaintiff will be entitled to costs on the higher scale."

EMPLOYING YOUNG GIRLS IN BRICKYARDS.

AT the Old Hill petty sessions, on the 17th ult., Messrs. George and Thomas Wood, proprietors of the Brades Brickyard, Tividale, were summoned at the instance of Mr. G. L. Blenkinsopp (the sub-inspector of factories for the district), for infringing the Factory Acts of 1871 and 1875, by employing twelve girls under the age of twelve years in their brickyards.

Mr. Blenkinsopp stated that he had taken the present proceedings against the defendants under the 7th Section of the Act of 1871, which forbade, after the 1st of January, 1872, the employment of any female under the age of sixteen in the manufacture of bricks, and of course the law now was well known. For some time past several girls had been employed at the defendants' brickyards, and on the 6th inst. he, in company with Mr. Brewer, went to the place. Just as he was about entering the yard he saw several girls running away. He requested Mr Wood to fetch the girls back, but none were forthcoming, and upon search being made nine girls and one boy were found in a hovel by the marl hole. Shortly afterwards another girl was seen in the yard, and the others were about the works. In 1874 he visited the works of the defendants, and then found them employing a girl under age in their brickyard, and last year a girl named Mallory,—one of the twelve whom he found on the last occasion, was engaged in the yard, but as the defendants promised amendment he (Mr. Blenkinsopp) did not proceed against them.

Defendants were fined 1*l.* and costs in each case, amounting altogether to 23*l.* 2*s.* The parents of the girls were fined 5*s.* and 2*s.* 6*d.* each for allowing their daughters to be engaged in brickyards.

"BRICKLAYERS."

A MEETING of bricklayers was held last week at the Artisans' Institute, St. Martin's-lane, under the presidency of Mr. Frank E. Thicke, architect, to take into consideration the present educational condition of bricklayers, with a view of putting themselves on an equality with other branches of the building trade, and rendering themselves as eligible for the offices of foreman and clerk of works as masons and carpenters, who are now invariably chosen in preference to bricklayers. The chairman pointed out that architects refrained very often from designing ornamental brickwork because they knew that the state of the education of the bricklayers generally was such that they could not execute their designs in a proper and workmanlike manner. He trusted to see the architect and workman brought more in contact one with the other, and he, moreover, hoped that a technical class corresponding with those already existing at the Artisans' Institute for carpenters, stained-glass painters, modellers, plasterers, &c., would be formed for bricklayers. After Mr. J. Woodley, Mr. Morris, M.U.O.B., Mr. G. Savage, the Rev. H. Solly, and others had spoken, a committee of nine bricklayers was formed to report to a large meeting to be held at the end of June. A cordial vote of thanks to the chairman closed the proceedings.

CEMENT FOR CONCRETE.

SIR,—In your notice of what I said, at the Royal Institute of British Architects, on the subject of concrete, I am reported to have made use of the following words:—"Contractors were not alive to the necessity of the cement being fresh burned"; whereas what I really said was to the effect that contractors were not sufficiently alive to the fact that fresh-burned cement will expand in setting, and so lead to cracked and bulging walls; and, therefore, requires to be exposed to the air to get rid of the heat in it.

H. C. SEDDON.

INSCRIPTIONS ON HOUSES.

YOUR articles on inscriptions upon houses remind me that, when driving through portions of Hanover and Brunswick, I noticed a common practice of inscribing names, dates, and short sentences on the long beam which runs over the door, window, and wide driving-way, in the fronts of all the little eighteenth-century farm-houses. The German servant whom, through a deplorable ignorance, I had to take with me, Englished one of them thus:—"It is te man's name and his wife's name, and den,—'Please God, make ebery ting come *fuss-rate*.'"

It would, perhaps, be too much to expect every speculating builder to inscribe his productions with his name and his aspirations, but when a man builds a house for himself and his descendants, he might choose a worse decoration than the inscription of a pious wish; and his wife, poor thing, who will have so much worry with the place, might like at such a time to find herself remembered.

THOS. BLASHILL.

REMOVAL OF VARNISHED PAPER.

IN answer to "A Country Painter's" inquiry in your columns with reference to the removal of varnished paper from walls, allow me to say that I do not see the necessity for its removal, for by rubbing down the joints with pumice-stone and water, it will present a smooth surface for either paper or paint; but if the paper should be loose in places, and only come off in patches, then, of course, it will be necessary to remove it; and after fifteen years' experience I have generally found the best mode of attaining that end to be as follows:—Mix newly-slacked lime with a strong solution of soda to the consistency of paste, apply this to the paper with an old stick brush, taking care that the whole of the surface is covered. Allow it to remain on one or two hours, then wash it off with *hot* water. This will remove the varnish. There will then be no difficulty in taking off the paper itself with a scraper. If this plan does not prove effectual (it rarely ever fails), then I should recommend a charcoal-grate and scraper, and burn it off in the same way that paint is burnt off woodwork.

T. B. DENNETT.

TREES IN TRAFALGAR-SQUARE.

SIR,—Permit me to suggest an extension of the good taste by which trees have been planted up Northumberland-avenue from the Embankment to Charing-cross, viz., that they should further be planted all round the edge of the roadway, on the curb of the pavement, of the centre part of Trafalgar-square; so that the green leaves, mingling with the view of the fountains, may relieve the colourless aridity of the extent of stonework.

J. F.

BREAD BAKING OVENS.

I AM called upon more frequently than, I think, I ought to be, if the material used were the right one, to stop and point in the joints of the brick ovens in my houses. The masons themselves differ as to the best material for the purpose. One recommends lime from this kiln, another lime from that one; a third says that London cement is the proper article; while a fourth tells me that London cement is a first-rate thing against water, but that plaster of Paris is the only thing that will stand fire heat.

DEVONIENSIS.

Crystal Palace.—The great Hippodrome of Mr. J. W. Myers, which has excited an extraordinary interest on the Continent, especially at the great building known as the Magasins Réunis, at the Château d'Eau, Paris, and of which we gave a view not long ago, is to be transferred to the Crystal Palace, where preparations are being made for its reception, and where it will open on June 20th. An arena of great extent and picturesqueness will be formed for the purpose of exhibiting the classic sports, chariot races, and so on. The decorations have been entrusted to Mr. F. Fenton.

VEGETATION IN CEMENT WORK.

SIR,—I have had recently to combat a similar evil to that spoken of by your correspondent, "W. W.," and should not be surprised to find the vegetable in both instances was identical.

In the case I dealt with, the external faces of a country-house close to trees, and cemented over, had many years ago been painted; when I first saw the house the strength of the paint was nearly exhausted, and it was covered in places with spots of the greyish moss or fungus described. I ascertained by survey that no efficient means had been adopted either to keep the dampness of the soil beneath the foundations, or properly to construct the drainage, and, rightly or wrongly, came to the conclusion that the offending spots were the offspring of the evaporations from a damp soil and bad drainage oozing through the walling of the house, partially only retarded by the old paint. By way of remedy I endeavoured to thoroughly drain the premises, at the same time letting in as much air as possible in and about the foundations; the painted cement work was well scraped, brushed, and washed; many of the internal papers were also washed off; and the whole of the walls were allowed some time, as I called it, to "dry out." I have had them since painted with granite paint, and have not heard of a re-appearance of the spots, though many months have elapsed.

J. GOLDICUTT TURNER.

"A BRAVE WORKMAN."

"BARONESS MAYER DE ROTHSCHILD wishes to know if the editor of the *Builder* will forward for her 100 francs to the brave workman who did not flinch when his companion let the molten lead fall on his arm." Mr. S. Tucker, of the Heralds' College (*Rouge Croix*), in like manner, asks us to send a guinea; and another individual wishes to give a guinea. In consequence of these communications, we addressed a letter to the Curé of Anthisnes (M. J. Hogge), and have received from that gentleman a most satisfactory reply, showing that our account of the bravery exhibited by M. A. Karis was even understated, and that the present is not the first time he has shown similar noble pluck and determination. We shall therefore have pleasure in forwarding the sums offered; but we shall refrain from doing so for a few days, in case any other of our readers should desire to increase the amount.

DOINGS IN DARLINGTON.

"JERRY-BUILDING" is in full swing just now in this town. The character of the buildings reared is that called the "Mushroom Order." Early in the morning, the writer, on passing to his work, has seen the foundations of a four-roomed cottage laid, and by the same time next morning the roof being put on.

The great secret of the success of this system is, that solicitors (who know a thing or two) are the architects; they considering that the cleverest workmen are those that can do the work in the shortest time. Thus the bricklayer never consults his joints, quality of bricks, or mortar, and in cottages is content to make a half-brick partition between each house, on the very plausible plea of giving more room. The carpenter is considered the most skilful who can carry lintels across bay-window openings with an inch bearing upon the walls. Joists carried across fireplaces are thought nothing of, simply for the reason that they never have the fires lighted in the bedrooms. The plasterer is a most useful ally of the bricklayer. He it is who hides all the defects of the rascally bricklayer, who too often has been but a hodman, and he makes the place look inhabitable in the buyer's and housewife's eyes; but when they are settled, a few showers of rain soon settle the question; the rain comes in at the roof, the gutters are leaky, and there is no escape from the bottom of the downfall pipe; so that the walls are continually damp from the ground. The painter is an equally valuable ally to the carpenter. He it is who putties, paints, and glues over the carpenter's cheap jack-plane performances; and the ironmongery is of the usual Brummagem ware, made to sell and not to wear.

It is curious to notice the unanimity with which these workmen scout down the idea of any architect being appointed to superintend their work; they consider them modern barbarians, and say if the workmen cannot do their own work to the architects' satisfaction, why let the architects do it themselves.

Quakertown has been plunged into grief,—real grief this time, none of your half-and-half sham crocodile tears. The cause is, the transfer of the monopoly of the Darlington Water Company to supply the towns of Stockton and Middlesbrough with water. The latter petitioned Parliament against the water; they said it was nasty, and had been so for a long time, and in the end the company have got to sell their monopoly at twenty-five years' purchase. During the last week the shareholders' faces have been an inch longer than they used to be, and the best-mannered brewer in the town whispered me that, owing to the bad outlook of trade in the district, many of his best customers had ordered table-ale in lieu of strong beer for the next twelve months; while one spirit merchant and two wine-dealers had shut up shop altogether.

"AMINIDAB DRAB."

ARBITRATION.

RYDE.

LAST week a Court of Arbitration sat at the Town Hall, in the borough, in reference to a claim made by Mr. R. Allen, of Sea View, contractor for the new sewers executed by him for the Local Board of St. Helen's, for extra work and balance of contract, amounting together to 517*l.* 1s. 11d. The Local Board disputed the amount on the ground that the work under the contract had not been properly carried out, that certain omissions of work had not been allowed for in the account, that penalties had accrued under the agreement which would materially reduce the balance due, and that the surveyor had not given a final certificate of completion.

The length of the sewers constructed was about four miles, and the amount of the accepted tender was 2,438*l.*

The arbitrator on behalf of Mr. Allen was Mr. J. Binfield Bird, surveyor, of Cowes; for the St. Helen's Local Board, Mr. T. Dashwood, architect, of Ryde. Mr. F. Pittis, of Newport, was the umpire selected by the arbitrators. The solicitors in the matter were Mr. J. W. Fardell, for Mr. Allen; and Mr. C. G. Vincent, for the Board. The Court sat five days, and the following witnesses were examined on oath:—For Mr. Allen, Mr. Tomkins, surveyor, of Sandown; Mr. T. Saunders, architect, of Ventnor; Mr. Potts, the first clerk of works, who superintended the laying of the sewers; and several of the workmen employed on the works. For the Board, Mr. Francis Newman, Ryde, borough engineer, who projected the sewage scheme for the St. Helen's Local Board; Mr. Riddle, surveyor, of Brighton (but late in the employment of the Board); Mr. Gregory, clerk of works, who superintended the relaying of a portion of the sewers; the clerk of the Local Board; and various others.

The decision of the umpire has not yet been given.

CLOCKS AND BELLS.

Blaydon.—A clock and bells have just been provided for St. Cuthbert's Church, Blaydon. The clock is by Messrs. Reid & Sons, Newcastle; the striking-apparatus being so arranged as to strike the hours upon the tenor bell. There are three dials, each 5 ft. 6 in. in diameter, which will be illuminated, the Local Board having undertaken to defray the cost. The bells are from the foundry of Messrs. William Blews & Sons, Birmingham.

Sudbury.—The augmented peal of eight bells of All Saints' Church was first brought into use on the 19th ult. There were formerly only six bells, but about twenty years ago the heavy tenor was cracked. The late vicar, the Rev. C. Badham, commenced the preparation for the restorations, but died ere his scheme could be put into execution; but after his decease the matter was taken up *con spirito* by a special committee under the leadership of Mr. Elliston Allen, with the result that the tenor has been recast, two new trebles added (one given by Mr. Allen), new framework and floor erected, and minor improvements effected, at a cost of over 400*l.* One of the trebles bears an inscription in memory of Mr. Badham, and the other Mr. Allen's name as donor; while the tenor bears the date of casting at the Bury Abbey Foundry, 1575, and re-casting, 1876, with the names of the vicar and churchwardens—the Rev. A. H. Arden, and Messrs. Archer & Pratt. The work has been executed by Messrs. Warner, bell-founders, Cripplegate.

Uttoxeter, Staffordshire.—The parish church here has just had erected in its tower a set of chimes which play one tune for each day of the week. The work has been carried out by Mr. Smith, Midland Clock Works, Derby.

Liverpool Art Club.—An exhibition will be held by this club in the autumn, consisting of illuminated MSS. and early printed books, with illuminations. It will be opened in October.

CHURCH-BUILDING NEWS.

Newton.—The completion of the restoration of the chancel of Newton Church was celebrated on the 30th ult. The walls have been made sound, the rubble has been pointed with grey mortar, buttresses have been built at the north and south angles, a plinth has been added at the base, and an apron of brickwork laid around the walls, with a channel which carries off the water from the chancel roof to the lowest spot, whence it is conveyed away. Six new stalls have been fixed, fitted with folding seats, on the under-surface of which are carved the armorial bearings of the present and preceding rectors of the parish. The brick pavement of the chancel has been taken up, and the floor raised one foot-pace from the nave, and another at the altar-rail. The floor of the church has been laid with Minton's tiles, in brown, buff, and white; within the altar-rail a blue star has been introduced. Among minor alterations and improvements we may note that the sedilia on the south side of the chancel have been re-opened, and all the interior walls of the church have been stuccoed afresh, the stone quoining being cleaned and left exposed to view. The work has been carried out by Mr. Lot Jackaman, builder.

Linton.—Linton Church, near Ross, has been reopened, after restoration under the direction of Messrs. Haddon Brothers. The work of restoration has been carried out by removing the lath and plaster ceilings, and throwing open the roofs; by cleaning and renovating the timbers, replacing such as were necessary. The whole of the stonework has been laid bare, scraped, cleaned, and well pointed. During the progress of the work it was found necessary to take down and rebuild some portions of it. This was most cautiously done by replacing the whole, stone by stone. The stalls of the chancel, altar-rail, pulpit, prayer-desk, lectern, and chancel-screen, are of oak, carved by Mr. Merrick, of Hereford. The reredos, in Caen stone, is the work of Mr. John Welsh, of Hereford. The metal standards of choir-desks and altar-railing are by Messrs. Perkins & Bellamy, of Ross. The font, of Painswick stone, is the work of Mr. J. Hards, of Ross. The windows are glazed with cathedral tinted glass by Mr. Davies, of Shrewsbury. The contractors for the works generally, who have completed them in a satisfactory manner, were Mr. James Bennett, of Enardean, and Mr. E. Organ, of Drybrook, the total expenditure being about 1,750*l.*

Bournemouth.—The foundation-stone of the new church of St. Swithin, Bournemouth, was laid on the 22nd ult. by Lady Eden. The site is situate in the Manor-road on the East Cliff, and is the gift of Sir George Gervis Meyrick, bart. When finished the building will be capable of containing about 600 persons, and it is intended as a chapel of ease to St. Peter's. The contractors are Messrs. Hale & Son, of Salisbury, and the architect is Mr. R. Norman Shaw.

Slough.—The foundation-stone of the additions to Slough parish church was laid on the 4th ult. by H.R.H. Princess Christian. The plans were prepared by Mr. John Oldrid Scott, and a preliminary contract for the execution of the work has been entered into with Messrs. Wheeler, of Reading. It is proposed to add to the present building a chancel, chancel aisles, and large transepts, to accommodate about 300 additional people. The present building will then be re-seated and serve as a nave, until such time as it may be possible to build a new nave to harmonise with the portion that is now to be added. By these means seats will at once be secured for 1,000 people, at a cost which Mr. Scott estimates at about 8,000*l.*

Hoarcross.—The new church of the Holy Angels, Hoarcross, in the diocese of Lichfield, was consecrated on the 22nd ult. The church has been built at the sole cost of the Hon. Mrs. Emily Meynell-Ingram, of Hoarcross Hall, to the memory of her late husband, Mr. Hugo Francis Meynell-Ingram. The style adopted is English Gothic of the latter part of the fourteenth century. Entering at the north porch one finds a somewhat short and comparatively simple nave of two bays. The nave, and indeed the whole of the church, is built of red stone, from the Alton and similar quarries. The colour is of a warm, subdued, and quiet tint. The roofs of the nave, aisles, and transepts are of oak, moulded and carved. There is a south porch, which is arcaded and groined with stone, and has some carving. There is a central tower, with lofty arches and elaborately moulded piers and groined vaulting. The transepts are not deep, but somewhat spacious, and are lighted by large

traceried windows. At the eastern arch of the tower is a high screen of oak. The chancel is groined in stone. The east window is placed at a considerable height over the altar. The space beneath is filled by a reredos of carved stone-work with many figures, and bearing a large initial gold cross in the centre. This cross is bossed richly, and has the four Evangelistic symbols in sacred monogram, and at the foot the pelican "in her piety." The carved figures of saints and bishops include those of St. George, St. Patrick, St. Andrew, St. David, St. Michael, St. Raphael, and St. Uriel. Higher up are the Blessed Virgin and St. Gabriel, St. Chad, and other figures of angels. The mullions and jambs of the east window have niche-work and figures, the whole forming a composition of much dignity and beauty. All the windows of the chancel are filled with stained glass. In the north and south windows of the sanctuary the four "Fathers of the Western Church" occupy the lower part of one window, while the other has the four "Eastern Fathers." Above, in these and the other windows, is a "chorus angelorum." The church has been built at a cost of not less than 35,000*l*. The architects of the church have been Messrs. G. F. Bodley & F. Garner, of Gray's-inn, London; Mr. Peed has acted as clerk of works throughout. The carving has been executed by Messrs. Farmer & Brindley.

Alburgh.—The parish church of Alburgh, Norfolk, has been reopened, after restoration. The alterations and additions have been extensive, a sum of about 1,200*l*. being expended. The walls of the chancel, which is in the Decorated style, have been raised 4 ft. or 5 ft., and the moulder. ing fourteenth-century roof has been replaced by a new one of pine. This new roof is wagon-headed, and close boarded. It is divided into panels, the ribs of which are bossed at the intersections, and it has also a dentilled cornice. The chancel arch has been taken down and rebuilt, new columns and bases being provided. An old window at the east end of the building, which had been blocked up, has been taken out, and a four-light Decorated window put in its place. A vestry has been built on the north side of the chancel, on the site of the ancient Chapel of St. Margaret. This is an addition to the church, there being no vestry before. A window on the south side of the chancel, which was previously blocked up, has been opened out, and filled with stained glass, in memory of Mr. Barrabas Bond. A large gallery, extending some distance into the body of the nave, has been removed, throwing open the tower arch and disclosing a west window, which has been restored. On the site of this gallery a ringing-chamber has been constructed, and the ground space is partly occupied by the font. The old oak roof of the nave has been cleaned and oiled, some tie-rods were taken away, and the whole roof strengthened. A piscina on the south side of the building, and a rood-loft stairs opposite, were discovered and opened out. The south side of the chancel and the centre nave have been reseated with open poppy-headed benches, of pitch-pine, with carved oak ends, in the place of the old high-backed pews. A new carved oak pulpit has been provided, and also a new oak reading-desk and lectern. No material alterations have been made to the outward appearance of the building, with the exception of the raising of the chancel and the construction of the vestry. The architect was Mr. R. M. Phipson, of Norwich; and the builder was Mr. Morris, of Ditchingham.

Norton.—Norton Church, near Stockton, is in course of restoration, under the direction of Messrs. Alexander & Henman, architects, Stockton. The contracts of Messrs. Coates Brothers, masons, of Marton, and Messrs. Craggs & Benson, joiners, of Stockton, have been accepted for rebuilding the north and south aisles, and the west end of the nave, the erection of a porch, and cleaning and repairing the stonework of the nave.

West Derby.—The Bishop of Chester has consecrated an important addition which has been made to St. James's Church, West Derby. The enlargement of the edifice has been made at the east end by the erection of the Thornton chancel and chapel, the former chancel having been removed; and the south side has the addition of an organ-chamber and choir-vestry, advantage having also been taken to effect several other structural improvements in the edifice. The whole width of the east end of the nave, some 50 ft. in one span, has been opened up by three large pointed arches into the chancel in the centre, and the Thornton chapel on the one side and organ-chamber on the other. The chancel unites with the aisles on each side by a triple arcade with marble pillars. The work has been executed by Messrs. Jones & Sons, of Pleasant-street, the contractors, assisted by Messrs. Barker & Sons for the masons' work, Mr. Holt for the plumbing, painting, and glazing; and Mr. Callingham for the slating and plastering. Mr. Clay executed the colouring and decorating, Mr. Rogerson the carving and sculpture work, Messrs. Smith & Son the gas-fittings, and Mr. Powell the encaustic tiling. The designs were prepared by Messrs. W. & J. Hay, architects, Liverpool.

Dunston.—The church at Dunston, near Stafford, is about to be rebuilt, from the design and under the superintendence of Mr. Griffin, architect, of Wolverhampton. The building will be of stone, the outside being faced with the red stone of the district, and the inside with Bath stone. The tower will be surmounted by an oak shingled spire.

DISSENTING CHURCH-BUILDING NEWS.

Islington.—On Saturday afternoon, the 13th ult., the memorial stone of the new Union Chapel, Compton-terrace, Islington, estimated to seat 1,650 persons, and to cost in all, with schools for 900 children, lecture-room, class-rooms, and vestries, about 30,000*l*., was laid by Mr. Henry Spicer in the presence of a very large assemblage, including some who witnessed the foundation of the chapel it is destined to replace, seventy years ago. Mr. Spicer is the senior among the ten deacons of the chapel, having been appointed in 1832, and has contributed largely to the funds. The architects of the building are,—consulting, Mr. Alfred Waterhouse; and acting, Mr. James Cubitt. The builders are Messrs. L. & R. Roberts, of Islington.

Windsor.—The memorial stones of a new Wesleyan chapel in the New-road, Windsor, have been laid. The building, the site of which is at the corner of the Alma and New roads, comprises chapel, Sunday-school, four class-rooms, and minister's vestry, and the cost will be about 6,250*l*. The plans have been prepared by Messrs. Morris & Stallwood, architects, Reading. The style is Early Decorated. Provision will be made to accommodate 650 people. The chapel will consist of nave and side aisles, and the main frontage will be towards the New-road. At the back of the chapel there will be a building having externally the appearance of a chapel, to be used for Sunday-schools and other purposes. There will be a spirelet 90 ft. from the ground, it being intended at some future time to replace this by a spire, which will involve an additional cost of about 2,000*l*. The building will be of Wycombe stone, faced with Bath stone. Mr. George Reavell, of Windsor, is the builder.

Newton Abbot.—A new Congregational chapel was opened at Newton Abbot, Devon, on the 27th ult. It is built in the Early Decorated style, the material being the local grey limestone, relieved with Bath stone dressings. The building is 65 ft. long by 48 ft. wide, with organ and choir-chamber at the east end. At the west end is a massive square tower, which is ultimately intended to be surmounted by a spire rising to a height of 150 ft. The floor tiles and roof-ridging have been supplied by Messrs. Phillips & Co. from the neighbouring potteries. Appropriate texts are painted in colour over the arch of the organ chamber and the heads of the door and window openings, and other decorations have been executed in a very tasteful manner by Mr. Welch, of Bovey Tracey. The architect is Mr. J. W. Rowell, of Newton Abbot and Torquay. Messrs. Parker, of Newton, have been the builders, and the Bath stone work has been executed by Mr. J. Jackman, of the same town.

Crewe.—On the 15th ult. the foundation-stone of a new Wesleyan Chapel at Crewe was laid. The style was Italian, and the material used will be red brick, with stone dressings. The external dimensions of the building are,—length, 87½ ft.; width, 50 ft.; and the height from the ground-floor to the ceiling is 34½ ft., and the accommodation will be for 1,000 persons. The front of the chapel is to Mill-street, from which, by a flight of wide stone steps, the chapel is approached through a bold doorway. A gallery will extend round four sides of the building. Mr. George B. Ford, of Burslem, is the architect, and Mr. A. P. Cotterill, of Crewe, the builder. The contract is 4,231*l*. 10s.

Langton.—A new Wesleyan chapel at Langton, Dorset, has been opened. The chapel is Early Gothic in style, and is built of Purbeck stone. The fittings of the interior are of pitch-pine and selected deal, varnished, except the roof, which is stained. The accommodation provided is for 250 adults. There are two class-rooms and offices at the back. The architect is Mr. J. Wills, of Derby. The contractor for the wood, iron, and glazier's work was Mr. Griffin, Corfe Hills, and the other works have been carried out by local tradesmen. The total cost of the chapel has been 1,100*l*.

Ogilvie.—On the 17th ult. Ogilvie Free Church was opened for public worship. The church, which affords seats for 900 persons, is in the Gothic style of the fourteenth century. No spire has yet been built, but it is proposed ultimately to erect one about 100 ft. high. It was estimated that the church would cost about 4,000*l*. The contractors were,—Alex. Duncan, mason; Andrew Rae, joiner; David Brown, plumber; Wm. Yule, plasterer; and Stewart & Murray, glaziers.

Winchester.—The Congregational Church in Jewry-street, Reading, has been re-opened, after renovation and alteration, at a cost of 500*l*. Mr. Poulton, of Reading, was the architect.

Bristol.—The foundation-stone of the Whitefield Memorial Congregational Chapel, Ashley-road, Bristol, has been laid. The structure, capable of holding 500 persons, is to be of iron, and erected by Mr. Kent, of London. Schools will also be built in the rear to accommodate 200.

Margate.—The foundation-stone of the new Cliftonville Wesleyan Chapel, Margate, has been laid. The contractors for the erection of the building are Messrs. Bushell & Sons, the amount of whose tender is 4,087*l*.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Bradford.—The new R. C. Church of St. Mary, East Parade, Bradford, was opened on the 3rd ult. The building has been erected to supersede the present church of St. Mary, Stott Hill, and has been nearly two years in course of erection. It consists of a broad and lofty nave, with narrow aisles or ambulatories, with a lofty chancel, having the lady-chapel on the one side and sacristy with organ-chamber on the other. The choristers' sacristy, connected with the organ-chamber and presbytery, are in the main part towards East Parade, and opening out of the aisle on the opposite side of the church are the confessionals and side chapels. The exterior is plain and massive in structure, and relies for effect almost entirely upon boldness of outline. The chancel is apsidal, and on each face is a traceried window, the centre one filled in with stained glass, the subject being the "Ascension." The altar is of Caen stone, with alabaster super-altar and tabernacle and lofty canopy over. The lady-chapel, which opens from the chancel through a double archway, is lighted by a rose-window in the gable over the altar, filled in with stained glass. The principal dimensions of the church are as follow:—120 ft. long by 40 ft. broad, and 75 ft. high; the aisles are 120 ft. by 8 ft.; the chancel 30 ft. by 30 ft., and 75 ft. high; and the lady-chapel is 24 ft. by 20 ft., and 30 ft. high. The total cost of the church, so far as the works have proceeded, is 10 000*l*., including all fittings. A presbytery is now in course of erection adjoining the organ-chamber and chancel, and at the opposite end of the church a tower, baptistery and porch are projected. The church provides accommodation for about 800 worshippers. Mr. Simpson, of Bradford, is the architect.

Derby.—St. Marie's Roman Catholic Church, Derby, has been reopened, after a partial restoration and decoration of the interior. The nave is separated from the aisles by two rows of fluted columns, which rise to a height of 18 ft. All the timbers of the roof, which is powdered with stars, are visible, and are filled in with quatrefoils and tracery. The stanchions of the roof rest on corbels of stone, and on these are represented angels bearing shields. On the shields, as well as on those borne by the angels placed over each pillar, are various emblems of our Lord's Passion. The spandrels of the arches are filled with paintings representing subjects from the Old and New Testament. These paintings are twenty in number. In the aisles, the eight stations of the Cross on the walls, with the other six in the Lady Chapel, make up the fourteen stations of the way of the Cross. Under the large windows are the eight beatitudes from the Sermon on the Mount. The reredos contains sculptured representations of the Annunciation, Visitation, Adoration of the Wise Men, and the Flight into Egypt. Behind the altar in the apse

are three large stained-glass windows. Around the walls of the sanctuary are paintings of saints and angels. Nothing has yet been done towards the restoration of the two side chapels, the Lady Chapel, with the nuns' choirs, and the Chapel of Pietà; but this work Canon McKenna hopes to commence at no distant date.

Goole.—On the 17th ult., Dr. Cornthwaite, the Roman Catholic bishop of Beverley, laid the foundation-stone of the Church of St. Thomas of Canterbury, Goole. The edifice will accommodate 450 worshippers. The architects are Messrs. Goldie & Child, of London, and the contractor is Mr. Elliott, of Goole. The total cost will be about 2,000*l.*

SCHOOL BOARD SCHOOLS.

Garmouth.—On the 15th ult. the new public school at Garmouth (N.B.) was opened by Mr. Alex. Hay, chairman of the Speymouth School Board. The school is built upon an eminence between Garmouth and Kingston, and is Elizabethan in style. It is built of concrete, from plans from Messrs. Reid & Melven, architects, Elgin. The building is divided into two principal schools and a class-room. The general school, which is 47 ft. by 42 ft., and 15 ft. high, and will seat 112 children, is for the more advanced classes. There is a class-room immediately off this room, measuring 19 ft. by 18 ft., and seating forty-two children. In the west side is the infant schoolroom and industrial department. It measures 42½ ft. by 22 ft. There is a total accommodation for 250 children. The contractors for the work were—Messrs. Peter Bisset & Son, Aberdeen; Mr. J. Findlay, carpenter, Elgin; Mr. J. Kintrea, painter, Elgin; Mr. J. Wilson, slater, Elgin; Mr. J. Hunter, plumber, Elgin; Mr. G. Munro, plasterer, Elgin; Messrs. Sellar & Sons, ironmongers, Elgin; and Mr. R. M'Kenzie, Elgin, for earthwork. The total cost will be over 1,600*l.*

Potton (*Bedfordshire*).—These schools have lately been opened. Accommodation is provided for 140 infants and 210 boys and girls; also a residence for master. The infants' school-room is 46 ft. by 19 ft., with a class-room 20 ft. by 16 ft., while the mixed schoolroom is 46 ft. by 22 ft., with two class-rooms, one (with double sliding partition) 41 ft. by 20 ft., and another 20 ft. by 20 ft. The walls are of white brick, with red brick bandings and Bath stone dressings to the principal windows. The roofs are covered with blue Bangor slates with green ornamental bands. The schools are fitted with Moss's patent school-desks. The cost of the works, including all furniture, fittings, and boundary walls, was 3,575*l.* The contractors were Messrs. Langmead & Way, and the architects Messrs. Raynes & Shum, London.

Cromarty.—New Board schools were opened at Cromarty on the 15th ult. Messrs. Maitland are the architects.

Linlithgow.—The new Board school at Linlithgow has been opened. The plans were prepared by Mr. James Sutherland, architect, Edinburgh.

Bradford.—At the meeting of the Bradford School Board, on the 17th ult., tenders for the erection of a new Board school at Lidget Green, at a cost of 4,509*l.* 8s., were accepted, as were tenders for the erection of a new infant school at Whetley-lane, at a cost of 1,953*l.* 14s.

London.—At the meeting of the School Board for London, on the 17th ult., the following recommendations of the Works Committee were agreed to:—That the tender of Mr. J. Grover, of Packington-street, amounting to 6,094*l.*, for the erection of a school to provide accommodation for 572 children on the site in Langdon-road, Upper Holloway (the infants' department being omitted for the present), be accepted; that the tender of Messrs. Kirk & Randall, of Woolwich, amounting to 8,431*l.* for the erection of a school to provide accommodation for 828 children on the site in the Hollydale-road, Nunhead, be accepted. Mr. E. R. Robson is architect of both schools.

Sheffield.—The Sheffield School Board has passed a resolution rescinding a resolution adopted at a meeting of the Board on the 23rd of March last inviting competitive plans for the proposed central school and offices from architects in the town. Messrs. E. R. Robson (architect to the London School Board) and Mr. Flockton, have been appointed joint architects for the central schools.

Leeds.—On the 17th ult. Sir Andrew Fairbairn (the chairman of the Leeds School Board) opened four new Board schools. The cost of these has been 20,000*l.* The scheme of the Board is to erect twenty-nine new schools, fifteen of which have already been completed. The total cost of the scheme is estimated at 200,000*l.*

Yarmouth.—At a recent meeting of the Yarmouth School Board it was resolved to invite tenders for the erection of a school at Cobholm Island. The next business was to select a plan and estimate for the new schools on St. Peter's-plain. There was a general opinion that the design of Mr. J. T. Bottle, architect, was the best, having reference to the estimated cost (2,570*l.*), with fittings, and this was chosen. Eventually it was agreed to call upon Mr. Bottle to confer with the Board as to the "pruning" of his plans.

Shipston-on-Stour.—New Board schools at Shipston-on-Stour were opened on the 8th ult. The building was erected by Messrs. Denney & Voking, the amount of whose contract was 2,744*l.* 10s. The architects were Messrs. Bland & Cossins, of Birmingham.

SCHOOL-BUILDING NEWS.

Ashwell.—New schoolrooms, provided by the Merchant Taylors' Company, at Ashwell, to accommodate 100 boys, have been opened. The principal room is 48 ft. by 20 ft., and is 20 ft. high, thus allowing about 190 cubic feet of air for each child for whom accommodation has been provided. The schools have been built by Mr. S. Thorne, jun., of Ashwell, from the design of Mr. E. P'Anson, architect to the Company.

Audley.—The foundation stone of new premises for the Audley Endowed School was laid on the 3rd ult. The designs for the buildings are by Mr. Ford, of Burslem, and were selected in public competition. They are being carried into execution under his superintendence by Mr. Hayes, builder, Audley, whose contract amounts to 2,195*l.*, exclusive of boundary wall and fittings. The building is to be Gothic in style; it will be of red bricks, with stone dressings. The plan comprises a school and classroom and master's residence, which adjoin each other. The school will hold about 100 children, and the house will afford accommodation for boarders.

Grimsbury.—A new Wesleyan schoolroom at Grimsbury, built by Mr. Kingerlee, has been opened. The new schoolroom is a lofty hall, 35 ft. by 55 ft., and at the south end is a large classroom, while at the north end are four class-rooms, which can be thrown into the schoolroom by opening folding doors. The four classrooms are obtained by having two on the ground floor and two above, which are reached by a staircase. The new premises also include an infant schoolroom and a number of other rooms.

King Cross (*Yorkshire*).—A new building to be used as a Methodist New Connexion Sunday School, was opened at King Cross, Yorkshire, on the 18th ult. The school premises have been erected at a cost, including site and furniture, of about 2,800*l.* The architects are Messrs. Leeming & Leeming.

Fotheringhay (*Northants*).—New National Schools, at Fotheringhay, Northamptonshire, were opened on the 19th ult. The architect was Mr. Manders, and the builder Mr. Henry Martin, of Northampton. The style is Gothic, and the material used is Nassington stone, with Bath stone dressings and Broseley tiles. The school-room is built to accommodate fifty children, being 36 ft. by 16 ft.; it has an open wood roof, and is well lighted and ventilated. The master's house is built in a similar style. The cost has been upwards of 1,000*l.*, the greater part of which was defrayed by Lord Overstone.

Whitehaven.—On the 15th ult. the new colliery schools, erected at the cost of the Earl of Lonsdale, on the brow leading from the Ginns to Monkwray, on the outskirts of Whitehaven, were formally opened. The new schools, which are in the Old English style, have been built by Mr. Torrentine, of Whitehaven, from the plans of Messrs. Paley & Austin, architects, Lancaster, the sub-contractors being Mr. Burns, plumber and gasfitter, Mr. Atkinson, joiner, and Mr. Lowther Wilson, slater. The building has been in course of erection for the last nine or ten months, and has cost about 3,000*l.* The material used is Bransty stone, with red freestone dressings, the rooms being lined with glazed bricks to a height of 4 ft. 6 in. from the floor. The timber used in construction is pitch pine, the seats, patent desks, &c., being of beech. The schools will accommodate 350 children; but it is intended to build an additional school-room.

Books Received.

The Clerk of Works: a Vade Mecum for all engaged in the Superintendence of Building Operations. By G. G. HOSKINS, F.R.I.B.A. E. F. & N. Spon.

WE are not aware that there exists any book with the special title and intention of this one; that is, any published with the expressed object of assisting clerks of works in the exercise of their calling; though, of course, there is abundance of *lex scripta* at the command of the clerk of works if he chooses to apply to it. In general, the training for the position is of a purely practical character, and the clerk of works is kept up and advanced in his knowledge and experience by the very process of carrying out his branch of the profession; nor is there perhaps any better system (if it can be called a system) of arriving at a minute and full practical experience than by the constant exercise of supervision of the buildings in course of construction, accompanied by a habit of constantly noting the results of methods of workmanship and the behaviour of materials under different conditions. In short, the clerk of works' knowledge is a matter of continual accumulation by increasing practical experience, and it is not surprising, therefore, that the few architects who give care and thought to their pupils' progress sometimes recommend the undertaking of a post of this kind as a means of acquiring more minute practical knowledge after the period of servitude at the drawing-board is over. Such a proceeding, however, is hardly fair to the owner of the building selected for experimenting upon, however beneficial to the young architect. As a matter of fact, we believe that the really efficient clerk of works mostly rises from the lower stratum, rather than descends from the higher. He is usually a man born and bred to work with his own hands, rising by superior ability through the grade of foreman of his own branch to that of foreman of the whole,—in other words, clerk of works. In this position he extends and applies more widely the practical knowledge he has already gained in his own work.

This being, as we think it mostly is, the ordinary process of development of a clerk of works,—not a very regular or systematic, but for all that a very practical one,—there can be little doubt that the sort of book which is generally called a *vade mecum*, tabulating and systematising the information necessary for and the duties belonging to this very responsible and onerous position, would be highly valuable. But the present little book can have no claim to be anything of the sort. Conveying by its title the idea that it is a complete manual or book of reference for the clerk of works, it is, in fact, nothing more than the stringing together of a few generalities in the way of advice and memoranda: true enough as far as they go, but utterly insufficient for a representative book of the kind, which, in fact, it would be no easy task to compile. If the present essay were confined to general advice on the manner or principle of carrying out the duties it treats of, and called "Hints to Clerks of Works," it might be termed a meritorious little publication. But there is no defined aim of the kind; general advice is mixed up with occasional specific practical directions, which are out of place in a general treatise, and utterly insufficient for a practical treatise. Any clerk of works who required the practical information given here would be entirely unfit for his post, while those who really want tabulated information or directions for special difficulties will not find them here; the title of the book is therefore entirely misleading.

A Nile Journal. By T. G. APPLETON. Illustrated by Eugene Benson. Macmillan & Co.

THIS work contains no information or remarks on topics special to our pages. It is a disjointed collection of notes on the ordinary occurrences of a voyage up the Nile, interspersed with a little bad poetry, and a good deal of what the author means for delicate humour. As to the tone and taste of the book, we will only observe that a writer who refers by name to a lady whose name is known wherever English is spoken, both for her literary genius and philanthropy, as "that mature virgin," using the expression in a connexion which renders it very indelicate, has no claim to our consideration. The fact that he writes to ladies (the book is dedicated to his nieces) renders the tone of this and other passages the more offensive to good taste. Among

indications of the author's state of education, we notice references to a "hypæthal" temple, to a place called "Shaffhausen," and to a late celebrated Parisian authority, as "Hausenman." There may have been an excuse for writing the journal; there could be none for publishing it.

Miscellanea.

Proposed Convocation or Clergy House.—At a meeting of the Convocation of the Province of Canterbury, held at Westminster, Archdeacon Chapman presented a gravamen setting forth that, although the Houses of Convocation are summoned together with the two Houses of Parliament, and have letters of business from the Queen, there is no fitting place for their meeting, and praying the Upper House to take the matter into consideration. The Prolocutor said, notwithstanding the extreme kindness and courtesy of the Dean of Westminster towards this House with a view to make arrangements for their convenience, it was perfectly obvious, if they looked around that chamber, that they were not accommodated as a portion of the Provincial Synod of Canterbury ought to be. He had felt it for some years past, and should be thankful if something could be done to provide a Convocation House more worthy of the Church of England, and it appeared to him that there was now a favourable opportunity for entering into communication with some of the great societies connected with the Church. The House was probably aware that the Christian Knowledge Society was contemplating a removal from Lincoln's-inn-fields to a more eligible situation; and the Society for the Propagation of the Gospel was also likely to be unshipped in consequence of the Government requiring the space on which their house stood. It had been suggested that it would be a desirable thing if a Convocation House could be provided with rooms for these and other great societies of the Church of England grouped around it.

New Fonts.—A new font was dedicated, on the 7th ult., at St. Andrew's Church, Norwich. It has been executed by Mr. James Forsyth, from a design by Mr. William Smith (both of London). It is of Caen stone, and stands upon a dais of three steps. The idea that the doctrine of the baptism rests on the authority of the eight writers of the New Testament is worked out in the various details of the design. Cut in niches of Perpendicular work around the columns are four statuettes representing the Evangelists. The bowl is partitioned into eight panels, in which are alternately the cross of St. Andrew and the emblems of the other four New Testament writers,—St. Peter, St. Paul, St. Jude, and St. James. A fine moulding runs round the top of the bowl, and at each of the angles of the squares at the base is a cherubim in relievo. The cost has been 145*l.* A baptistery in memory of the late Thomas Dickson, M.D., of Wye House, Buxton, and of James Dickson, C.E., his second son, who died at Dunedin, New Zealand, in 1863, and who was re-interred at St. Peter's Church, Fairfield, Buxton, in 1866, has just been completed in St. John's Church. The floor is in tesselated tiles; the roof, seats, and sides are in red pine; the font is carved in white marble, and is the work of Mr. Twigg, of the Ashford Marble Works.

Swansea Royal Institution New Buildings.—The Committee appointed to report as to the most eligible site for the Institution new buildings, proposed to be erected in a more suitable locality than the present, have issued their report. The committee have come to the unanimous conclusion that the site in St. James's-crescent, Walter-road, on the eastern side of St. James's Church, would be in every respect the most satisfactory, and they recommend the Council to acquire the same without delay. The land in question, looking south-west, comprises a frontage of 197 ft., with a depth of 130 ft., and an area of 3,221 square yards. Appended to the report of the committee is the report of the advising architect, Mr. E. M. Barry, R.A., who states that after a careful consideration of all the circumstances, he is of opinion that the St. James's-crescent site offers the greatest advantages over all the others.

Sculpture.—It is proposed to erect a statue of the Right Hon. C. P. Villiers in Stafford. Men of all shades of opinion united at a public meeting in advocating the proposition. A committee was appointed to carry it out.

The China Clay and China Stone of Devon and Cornwall.—This was the title of a paper read before the Society of Arts by Mr. J. H. Collins, F.G.S. He said that the granite rocks of the West of England had long yielded materials for the use of the potter. These consisted chiefly of a fine white refractory clay called indifferently kaolin, porcelain clay, China clay, or Cornish clay, and of a white vitriable variety of partially decomposed granite known as porcelain stone, China stone, or Cornish stone. This latter appeared to be identical with the "petuntze" of the Chinese. The production of China clay and stone in the two extreme western counties in the year 1874 was more than a quarter of a million tons. Notwithstanding the vast improvements made in extracting and working it of late years, there was still much to be done in reducing the cost of production. For instance, at the present time about one ton of water has to be driven off from each ton of clay "in the dry," and this operation involves a consumption on the average of at least two tons of coal, and a cost of from 8*d.* to 10*d.* in labour. The uses of China clay were many, its first application having been to the manufacture of porcelain. Large quantities were used by bleachers for filling up the pores of calicoes as a dressing, and still larger quantities by paper-makers, to give body and weight to their paper, especially to printing paper.

The Iron Trade.—Messrs. Shaw & Thomson's *Iron Trade Circular* thinks the bitter depression which has so long characterised the iron trade shows no sign of abatement; on the contrary, every week deepens the despondency which has so long prevailed. For twenty-five years there has been no parallel to the present unfortunate state of affairs. Falling prices have brought no increase of orders, nor does there appear to be any chance of a further fall having this effect. There is equal, if not greater, depression in the iron trade of France, Belgium, and Germany. Works there, as here, are gradually being liquidated and closed. Those which are in operation, and have their raw materials in their own hands and on favourable terms, may make a small profit, or save a loss; but the great majority are losing money, and only restrained from absolutely closing the works by indulging in hopes of a revival, which may not at all events be looked for during the present year. The relations between employers and employed will undergo considerable change, compared with what they were two years ago, and the result will probably be beneficial to both.

Tarves' Buildings, Turriff (Banffshire).—These buildings, which have been in course of erection for some time, are now completed. They are situated at the corner of Main-street and Chapel-street. The stone is red sandstone from the Ardine quarries. The frontage along Main-street is 50 ft.; along Chapel-street, 53 ft. The architect was Mr. George Gellie, Kemnay; and the contractors were,—For masons' work, Messrs. Fordyce & Sons (the stones being supplied by Messrs. Duncan & Mair, Ardin quarries); for plumbers' work, Mr. Charles Duthie; for carpenters' work, Mr. Wm. Tennon; for plasterers' work, Mr. J. Gibson; and for slaters' work, Mr. W. Gillespie—all of Turriff.

New Cattle Market at Middlesbrough.—The commodious cattle-market, which has been provided by the Corporation of Middlesbrough, was recently opened for the sale of cattle. About an acre of ground is covered by the market proper, and half an acre by the cattle mart, which is now utilised for market purposes. Firm and substantial pens for cattle, sheep, and pigs are provided. On one side the market faces on to Corporation-road, one of the main thoroughfares of the town and a wide and handsome street, and on the other to Albert-road, a perfectly straight street, about 400 yards in length and 60 ft. in width, leading direct to the railway station, and connected by the tramways with the remoter parts of the town. There is accommodation in the market for upwards of 1,500 head of cattle, and if the market proves to be a continued success the area can be extended.

New Foot-bridge at Thropton, Northumberland.—A substantial wood foot-bridge has been constructed, by public subscription, over the river Coquet, at Thropton. The old one was carried off during a heavy flood some eighteen months ago. The bridge is built of creosoted timber, by Messrs. Elsdon, Brothers, Rothbury.

Edinburgh Prince Consort Memorial.—Since we last referred to this monument, progress has been made with the work remaining to be done, and the date of its completion may now be confidently indicated. There remain, we believe, to be made only some subsidiary castings, and Mr. Steel proposes, within a week or two, to enclose the pedestal and proceed with the placing of the statuary. The first thing to be done will be to fix the bronze relievos, four in number, which are to occupy the panels of the pedestal, representing respectively her Majesty's Marriage; the Opening of the Great Exhibition of 1851; the Prince Consort distributing Rewards of Merit; and the Prince in the Midst of his Family. There will next be placed the subordinate groups of statuary, also four in number, for which projecting platforms are provided at the several corners of the basement. These are intended to represent the various ranks and classes of Society in the act of paying homage to the Prince Consort. The group referring to the upper classes was designed by Mr. W. Brodie; that suggestive of the army and navy by Mr. Clark Stanton; and that embracing representatives of art and science by Mr. D. W. Stevenson, who also carried out the design significant of the working classes, which was originally entrusted to the late Mr. M'Callum.

Wood Peeling in Perthshire.—Perthshire is among the most extensively wooded counties in Scotland, and the landed proprietors derive a large revenue annually from the sale of various descriptions of wood. In order to show the extensive wood traffic, it is mentioned by a Scottish paper that during May, June, and part of July, several thousand persons, consisting of men, women, and children, are employed in the cutting down and peeling of oak and larch trees. The usual number of workers are busy at present in the woods of Strathearn, Strathtay, Breadalbane, Athole, and other districts; but some difficulty has been experienced up to this date, owing to the backwardness of the season, in stripping the bark, especially of the oak trees. The hands, which are chiefly Irish, earn good wages,—the men being paid at from 4*s.* to 4*s.* 6*d.* per day, and women's wages range from 2*s.* to 2*s.* 6*d.* daily. It may be mentioned that some difficulty is frequently experienced in procuring hands to work in thinly-populated localities, owing to the scarcity of lodgings, and it has been found necessary to erect rude huts in the woods, which serve as sleeping apartments and for cooking, &c. The oak bark, which is used for tanning purposes, is sold at from 7*l.* to 8*l.* per ton, and larch ranges from 3*l.* to 4*l.* per ton. The larch wood, after being peeled, is cut up into railway sleepers, pit props, &c., and realises good prices. The wood of the oak coppice is generally sold for firewood, and ranges at from 15*s.* to 16*s.* per ton, but the heavy, or what are called the standard oak trees, are sold for shipbuilding, coachbuilding, making shafts, cart wheels, and for many other useful purposes. The extent of the trade in wood-peeling may be gathered from the fact that on the small estate of Balgowan alone no fewer than 9,000 larch trees of larger and smaller dimensions will be out down and pealed this season.

Archæological Museum Wanted for Cambridge.—A memorial has been presented to the Council of the Senate of the University of Cambridge, calling attention to the importance of the objects of local and general archæology which exist in Cambridge, and suggesting that such objects ought to be arranged and exhibited in a suitable University building. A very considerable collection, the property of the Cambridge Antiquarian Society, is at present distributed, for want of other accommodation, in some three different places, which makes the collection unavailable for the purposes of study. The Antiquarian Society have expressed their willingness to hand over their collection to the University, provided a suitable building be found for the purpose, and the memorialists in question suggest that a building should be provided contiguous to the new Divinity Schools, which are shortly to be erected.

Free Library at Macclesfield.—On Saturday last a Free Library, erected at a cost of 5,000*l.*, and furnished with 7,000 volumes of books as an instalment of 10,000 promised by the donor, was given by Mr. Chadwick, M.P., to the town of Macclesfield. The only condition attached to the gift was the adoption of the Free Libraries Act, to ensure the maintenance of the library, which was unanimously done by the ratepayers in 1874, soon after the gift was promised.

Upperthorpe Branch Library, Sheffield. The new building for the branch library at Upperthorpe has been opened. It stands at the corner of Upperthorpe-road and Daniel-hill. Its style of architecture is an adaptation of the Italian, and red and white brick has been used in its construction. Over the doors—the entrance is 6 ft. wide—there is a stone arch, the semicircular space in which is filled by a carved panel, having a shield bearing a carved representation of the borough new arms. The cornice piece is supported by a bracket on either side of the door, and on these are two carved figures. One is that of a Sheffield factory-girl intently reading a book; the other figure represents a young Sheffield workman, with shirt sleeves rolled up, and hands resting on the handle of a large hammer. The sculptor both of the figures and the shield is Mr. J. W. Cooper, of Sheffield and Cambridge. A peculiar feature in the public rooms is that they are lined with white brick, with a few red bricks in bands and borders. The object of this is to save the expense of painting and papering, as the walls can always be washed clean. The total cost of the building is nearly 6,000*l*. Mr. E. M. Gibbs is the architect.

New Landing Stage at Birkenhead.—Messrs. Emmerson, Murgatroyd, & Co., engineers, have just completed a new landing-stage for the Great Western Railway Company, which is to be used instead of the present landing-place at Birkenhead. The stage was brought from the Great Float and placed in its permanent position between the Morpeth Dock and the low-water basin. In construction it is similar in every respect to the new Liverpool landing-stage, but its dimensions of course are very much smaller, the total length being 350 ft. Hitherto the cattle sent from Ireland for transshipment by the Great Western Railway Company have had to be landed on the Liverpool side, but in future it is intended that they shall be brought direct to the Birkenhead side of the river, by which arrangement considerable expense will be saved. The stage is to be connected with the piers by two bridges, which will exceed in size those which are erected at the Liverpool stage; for, whereas the latter weigh about 90 tons each, those which will connect the new Birkenhead stage with the shore will be no less than 150 tons each.

The Sewerage of Stourbridge.—Mr. E. B. Martin has, in accordance with instructions, presented a report to the rural sanitary authority of the Stourbridge Union upon the drainage of the district. Among other recommendations he says the pipe-drains laid down should discharge at suitable sites near the towns, where the greatly reduced volume of really valuable contents (without the usual admixture of rain water and street mud) could much more readily be either purified by filtration or utilised on the land, and where also the carts should convey the refuse from the privies and ashpits, to be used or sold as manure in its raw state, or to be manufactured into a more portable manure of greater value. Nine places are marked as suitable outfalls for the pipe-drains. At each outfall it is proposed, if possible, to obtain a sufficient amount of ground for the following purposes:—(1) (although not absolutely necessary) a small sewage farm, on which part of the sewage would be conducted direct on to the land; and (2) small works for disposing of the sewage at such times as it is not required on the farm or could not be sold to farmers in the neighbourhood.

White-Lead Poisoning.—Mr. Redgrave, inspector of factories, calls attention to the serious perils to which the workers in white-lead factories are exposed. The chief sufferers are women, generally of a low class and dissipated habits; and in their case "the white-lead was collected in masses under the nails of their fingers, whilst the hair and scalp were thoroughly engrained with it." Mr. Redgrave proposes that it should be compulsory in every white-lead factory to provide clothes, gloves, and caps, to be worn only in the works, waterpoof boots for those working with the moist white-lead, and respirators for those working with the dry white-lead. He also suggests that none should be allowed to leave the works unwashed or in factory dress.

The Directors of the Great Western Railway Company are about to erect a new block of offices at their terminus at Paddington, and have accepted the tender of Messrs. Jno. Waldram & Co., of Kingsland-road for the same. The works are to be commenced forthwith.

Presentation to an Art Master.—On the 18th ult., six of the senior students of the Stoke School of Art waited upon their late master, Mr. J. P. Bacon, at his residence at Penkhull, for the purpose of presenting him with a testimonial of the esteem in which he is held by the students and many of the principal supporters of the school over which he presided for so many years. The presentation consisted of a silver-gilt salver, having, in *repoussé* work, emblematic representations of the seasons, and ornament conceived in the style of the Italian Renaissance. *En suite* with the salver is a cut and engraved glass and champagne jug, with silver-gilt mountings. Round the salver, which is 22 in. in diameter, is an appropriate inscription. The subscription list was headed by the Rev. Sir L. T. Stamer, bart., Messrs. Mintons, Messrs. Copeland & Sons, and Mr. W. Keary, chairman of the School of Art. The presentation was made by Mr. F. Rhead in a graceful speech, and Mr. Bacon, in the course of his acknowledgment, spoke of the very kind and friendly feeling which had always subsisted between himself and the students.

Victoria (Philosophical) Institute.—On Monday, at the annual meeting of the members of this Institute, the Earl of Shaftesbury (in the chair) said he had a very gratifying task to perform, and that was, on behalf of the Institute, to present the testimonial which they saw before them to Captain F. Petrie, who had acted as honorary secretary and editor of the Transactions for the last five years and a half, during which time the Society had risen from 200 members to its present strength (690). The testimonial consisted of a purse of 100*l*., and a handsome tea-service and tray in silver, the inscription stating that it was presented by the President and Council to Captain F. Petrie, late 11th Regiment, in testimony of their high esteem, and in recognition of the very energetic and valuable services he had rendered to the Society as its honorary secretary. Captain F. Petrie having expressed his warm acknowledgements, Professor Birks then read the address.

Street Architecture in Derby.—The *Derbyshire Advertiser* states that some important improvements are about to be made by Mr. A. Woodiwiss, opposite the post-office, from plans prepared by Messrs. Giles & Brookhouse, architects. It is intended to complete the end of St. James's-street, by continuing the present stone buildings, known as St. James's-chambers, up to the end of the street, and to return the same by the brookside some distance,—forming four new shops and offices, or dwellings over. It is proposed to have a roadway over the brook of 40 ft. wide, provided the Corporation intend to continue the street to Sadler-gate Bridge, for which powers have already been obtained. At the circular corner is shown an entrance, with spacious staircase leading to the upper floors, which are to be adapted for the purposes of a town club. The building is to be erected in stone. The character is Italian. The outlay contemplated by Mr. Woodiwiss is, it is stated, at least 30,000*l*.

Slag utilised for Building Purposes.—Mr. R. D. Caddick, of Middlesbrough, has patented some improvements in the construction of machinery for the manufacture of bricks, blocks, tiles, and other similar articles, from slag or scoria. On the outer circumference of a circular table or wheel a series of moulds are mounted between bearings so as to be capable of being turned over. The machine is placed in front of the slag hole of the blast furnace, or in any suitable position, and the molten slag run into the mould in position to receive it, the circular table or wheel being revolved until each mould is filled. When the slag is sufficiently set, a key is fixed on to the end of the mould, which is elongated for that purpose, and the mould turned over thereby, so as to allow the brick or other article to drop on to a carriage for removal to the annealing or cooling sheds.

Bricklaying to be Taught in a Workhouse School.—At the meeting of the Holborn Board of Guardians, on the 17th ult., the School Committee presented a report recommending that a bricklayer be employed at the schools to teach the boys the trade of bricklayer. Mr. Hopkins moved the adoption of the report. He said if they employed a man to teach the boys bricklaying, they would get his salary out of the Metropolitan Poor Common Fund. They had plenty of work for a man for several months, and this would be a good way of getting the work cheaply done. The report was adopted.

Burning Lime and Cement.—A recent invention, by Mr. Ananias Smith, C.E., of Buffalo, U.S., consists, firstly, in a method of burning the raw material from which the lime or cement is to be produced, by subjecting the same to the action of heat produced by the active combustion of any suitable liquid fuel or vapour produced therefrom, comparatively free from sulphur, and especially (on account of its comparative cheapness) of petroleum, or other allied liquid hydrocarbon, or vapour produced therefrom, associated or in combination with steam, superheated or not, and with air. Secondly, in a similarly descriptive method, but in which the quantity of either or all of the elements of combustion therein specified is controllable. And, thirdly, in apparatus in which these methods are carried into practice.

East-Anglian Art Society.—We see by a Norwich paper that the increasing interest shown by the general public in the fame and works of local artists has led to the formation of a society having for its object the acquisition and preservation of their pictures, and the exhibition of them in a permanent gallery in Norwich. It has been for some time observed that many of the best pictures of the "Norwich school" have been gradually withdrawn from the county of Norfolk by the competition for good pictures, and thus many of the best works of Crome, J. S. Cotman, and others, have been, probably for ever, lost to the locality in which their authors are held in highest esteem. It is stated that until the society is able to secure a permanent building, the pictures already acquired will shortly be exhibited on screens in a room in the Museum.

"Letting by Candle."—At the village of Tatworth (says the *Wiltshire County Mirror*) is still observed the ancient custom of letting annually, during the time an inch of candle burns, a piece of land known as the Stowell' Mead. Only a limited number, about twenty, who own or occupy certain lands, are privileged to bid. The meeting this year was held on the 22nd ult., at the County Hotel, and presided over by Mr. J. C. Langdon. After a spirited bidding, Mr. Berry, of Southard, was the successful competitor, his being the last offer before the candle was burnt out, of 16*l*. for the land (seven acres) for the current year.

Floating Hotels.—Among the novelties which Philadelphia Centennial Exhibition introduces are a number of "floating hotels," or vessels fitted with special sleeping and dining accommodation, and moored in the river for the use of visitors who may be unable to find accommodation in the city, or who may prefer this novel style of hotel. From the New York papers it appears that parties have been formed at various parts of the coast, and at New York itself, to visit Philadelphia by steamer or yacht, the vessel being made the general rendezvous and sleeping-place during the stay of the party in the city.

The Potters' Disease.—Mr. Griffiths, the medical officer of Fenton, reporting on the health of the district, referred to Dr. Richardson's recent lectures on unhealthy trades (reported in the *Builder*), and said that nearly 60 per cent. of working potters died from diseases of the lungs, and that the average age at death of adult potters is 46½. Mr. Malkin, a manufacturer, remarked on this that he did not believe it was so much the employment as ignorance and thorough neglect of sanitary precautions by potters that was to blame. Mr. Stubbs said it was sometimes the fault of the masters in allowing the men to work in small, unhealthy, crowded places.

A Foundation-stone Robbed.—The brick-work surrounding the memorial stone on the new parish church at Slough, recently laid by Princess Christian, was broken through on the night of the following Sunday, and the bottle which had been placed within the cavity taken away, doubtless with the expectation of finding in it the current coins of the realm. The bottle, however, only contained papers and documents.

Bad Building.—Last week, in the Newington Vestry, a letter was read from the Vestry of Kensington, enclosing a resolution to the effect that having regard to the fact that houses in course of erection—either through defective material, faulty construction, or from undue rapidity—had fallen down, to the injury of persons, the Vestry urge upon the Metropolitan Board to introduce a Bill into Parliament with a view to remedy the evils complained of.

Abattoirs for Southampton.—At a meeting of the Southampton Town Council, on the 17th ult., the Sanitary Committee presented a report recommending the Corporation to obtain at the earliest practicable period powers to erect public abattoirs and lairs, with all necessary buildings in connexion therewith, upon the cattle-market land on the Marsh. An isometrical plan of the proposed abattoirs on the Marsh, prepared by the Borough Surveyor, Mr. Lemon, was submitted to the Council. The recommendation was adopted.

The Paris International Exhibition.—The final decision as to the designs has not been arrived at. The undertaking will probably be in the hands of the Government, and the profits arising therefrom go to the State. The cost is estimated at thirty millions of francs (1,200,000*l.*) or thereabouts. The work will be under the direction of Monsieur Krantz, assisted by Messrs. Viollet-le-Duc and Lefuel. Messrs. Davioud & Bourdais, whose names we mentioned in a recent notice, are on the list of those whose designs will receive the first prize, viz., 3,000 francs.

Church Building and Restoration.—An address to the House of Lords has elicited a supplemental return of the churches (including cathedrals) in England and Wales built or restored at a cost exceeding 500*l.* since the year 1840, and the total expenditure. The details supplied are, however, in many cases imperfect. The total number of new buildings and restorations returned for in England and Wales is 8,871, including 27 cathedrals, and the total expenditure 25,548,703*l.*

The Shakspeare Memorial Theatre.—At the last meeting of the Shakspeare Memorial Association, held at the Town-Hall, the Council proceeded to inspect the five sets of plans sent in by the architects selected for the second competition. No final decision was, however, arrived at, as the thorough examination of the drawings and estimates will take time. It is hoped that not only the theatre, but the picture gallery, will be commenced as soon as the plans are decided upon.

Loan Collection of Scientific Apparatus at South Kensington.—We are asked to state that a number of scientific gentlemen have volunteered to give lectures in connexion with the Loan Collection of Scientific Apparatus on the free evenings. These lectures will commence on Saturday next, at eight o'clock, in the conference-room, by a lecture from Professor Roscoe, of the Owen's College, Manchester, on "Dalton's Instruments, and what he did with them."

Strength of Girders and Joists.—Messrs. Macnaught, Robinson, & Co., of Bankside, have published a table showing the estimated safe permanent distributed loads, in tons and cwts., for the various rolled iron girders and joists kept by them in stock. It will be found useful. The calculations are based on the assumption that the iron in tension will break at twenty-one tons per square inch, and the safe loads are taken at quarter the breaking weight.

Educational Buildings, Nottingham.—The Corporation of Nottingham are advertising for designs, and Mr. M. O. Tarbotton, the borough engineer, has prepared what appear to be very full instructions to architects.

Newton Abbot.—The east window of the new Congregational chapel at Newton Abbot, Devon, has been filled with stained glass by Mr. Drake, of Exeter, at the cost of Mr. Sparke Evans, of Bristol.

Theatre, Mentone.—M. Garnier has just been entrusted by the Municipal Government of Mentone with the erection of a theatre in that city. The cost is to be 300,000 francs.

TENDERS

For the erection of ten houses, Dale-road, Chiswick. Mr. F. Beeston, architect:—
Downs & Co. (accepted).

For three shops, 31, Great Portland-street. Mr. Lewis Solomon, architect. Quantities by Messrs. Williams & Gritten:—

Pope	£2,320	0	0
Patman & Fotheringham	1,988	0	0
Wilson Bros.	1,952	0	0
Grimwood & Sons	1,920	0	0
Cohen	1,900	0	0
Downs & Co.	1,869	0	0
Davey	1,783	0	0

For the erection of a shop and dwelling-house, and for pulling down shops and cottages, Munster-street, Reading, for Messrs. Heelas, Sons, & Co. Mr. C. Smith, architect. Quantities supplied:—

	Amount of Tender.	Alternative Tender.
Elliott	£8,031	£71 3
Parnell	7,249	115 0
Simonds	6,715	85 0
Searle	6,690	66 0
Langmead & Way	6,650	61 17
Filewood	6,597	138 0
Hill & Co.	6,590	146 0
Pither	5,861	88 0

For the erection of a residence for Mr. W. B. Bragg, at Market Harborough. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Patterson	£2,450	0	0
Clark	2,323	0	0
Hobson	2,293	0	0
Mattock	2,283	0	0
Palmer	2,235	0	0
Hall (accepted)	1,860	0	0

For two houses and shops (exclusive of shop fronts), Atlantic road, Brixton, for Mr. Kemp. Mr. Treacher, architect:—
Macey (Brixton) (accepted).....£1,400 0 0

For the restoration of St. Mary's Church, Huntingdon:—

Thompson	£2,015	0	0
Bates	1,408	7	6
Osborn (accepted)	1,267	18	0

For new tun-room and stables at the Plough Brewery, Wandsworth-road. Mr. Henry Knight, architect:—

Jackson & Shaw	£1,990	0	0
Pritchard	1,920	0	0
Rider & Son	1,880	0	0
Lathey Bros.	1,870	0	0
Macey	1,698	0	0

For the erection of Wesleyan Chapel and Schools at Woodford, Essex. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Egan	£2,762	0	0
Hobson	2,596	0	0
Stephenson	2,573	0	0
Downs	2,558	0	0
Ennor	2,435	0	0
Morter	2,435	0	0
Niblett (accepted)	2,292	0	0

For rebuilding the White Horse tavern, Burdett-road, Mile-end. Mr. John Viney, architect:—

Hanley	£1,937	0	0
Stamp & Bowtle	1,893	0	0
Eaton	1,890	0	0
Shurmur	1,890	0	0
Downs	1,475	0	0
Atherton & Latta	1,465	0	0

For office fittings to 34 to 40, Ludgate-hill, for Sir J. G. Tollemache Sinclair, Bart., M.P. Mr. J. Lewis Holmes, architect. Quantities by Mr. J. Waghorn:—

	In Mahogany.	In Deal.
Scrivener & White	£1,207	£924
Drew	1,180	677
Cullum	1,160	570
Kelly Bros.	1,093	587
Gould & Brand	940	579
Somerville & Smith	896	595

For new stabling in rear of No. 93, Stanhope-street, Regent's Park, for the executors of the late Mr. W. Arkell. Mr. W. F. Hooper, architect.

		Channelled Paving, extra.
Kelly Bros.	£330	£14
Staines & Son	207	22

For enlargement of the Bedfont Schools, Middlesex:—
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We are compelled to decline pointing out books and giving addresses.

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Information relative to the Society may be obtained of the Collector Mr. ALFRED HILL, Bancroft Hospital, Mile-end road; or of J. GOLDICUTT TURNER, Hon. Secretary, 15a, Wilton street, Grosvenor place.

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The Value of Greek Art.

IN the preface to his Seventh Book, Vitruvius declares that he sought for the principles of his art amongst the Greeks, not the Romans. What little of the theory of Greek construction it was possible to acquire from the Latin author had long been studied by European architects when the archæology of "that Athens which invented all the arts" was made scientifically known to them by natives of this country. A little more than a hundred years ago exact drawings of certain masterpieces of Athenian architecture were presented to the public by James Stuart and Nicholas Revett. The two travellers,—in those days they were worthy to be called travellers,—arrived in Athens on the 17th of March, 1751; and during a residence there of more than two years and a half they measured and drew every original building which they found remaining, and of which the remnants extant seemed to them sufficiently important and interesting. Quitting Athens at the end of 1753, they crossed to Salonica, and afterwards to Smyrna, whence they returned to England at the beginning of 1755, having been absent nearly five years. It was only, however, in 1762 that the first volume of their celebrated work, "The Antiquities of Athens," appeared; and it was only in 1790,—twenty-eight years after the appearance of the first volume, and two years after the death of its principal author,—that the second volume was published. This was edited by William Newton, whose own death occurred before the publication of the third volume in 1794. The fourth and concluding volume did not see the light until 1816, fifty-four years after the first volume and more than sixty years after the return of Stuart and Revett to England. A French translation of the work, with a reproduction of their drawings, was published in Paris between the years 1808 and 1822. In 1832 the late M. Hittorf dedicated a careful reproduction in one complete volume of the "Unedited Antiquities of Attica,"—the work of the London Dilettanti Society,—to Charles Percier, adding notes of his own from personal experience in Greece. In these translations the French did loyal justice to the enterprise and ability of the English archæologists. In the matter of Roman and Græco-Roman antiquities, the former had long been masters of the situation; but, until the time of Stuart and Revett, purely Greek art was not thoroughly understood nor appreciated by them. In the reign of Louis XIV. the "Recueil des Antiquités de Rome" was brought out by Desgodetz, who had been sent into Italy by the Minister Colbert to measure and draw the early Roman buildings. This book was the first of the kind in which exact details, drawn to scale, were offered to the public; and, doubtless, the success which attended it led Stuart, who was conversant with Continental affairs, and was an art-student at Rome, to attempt the task he successfully, although tardily, accomplished. It is, however, much to be lamented that the only volume the publication of which he personally superintended should have been loaded with attacks and recriminations aimed at a French traveller who began his journey to Greece *viâ* Venice and Constantinople six months after Stuart had left Athens. This gentleman, by name Le Roi, professed to give details in a book called "Ruines de la Grèce," written, after a two months' visit, as accurate as those over which Stuart and Revett had spent two years. Hence bitter and unseemly criticisms of the quick and superficial Frenchman as unworthy of the English scholar as they were unnecessary to support the general accuracy of his memoranda. The researches of none of the three travellers could, however, have influenced the architect Gabriel, to whom the credit of having imparted a Greek *cachet* to the Classical buildings of his time is undoubtedly due. If the admirable façades on either side of the Rue-Royale, in Paris, seem to be more like the production of a Greek working for a Roman master than any of the numerous "monuments" erected by the two Mansards and their many colleagues, it is probably due to the labours of Desgodetz, and the data furnished by him. Gabriel's project for the Place Louis XV. (now the Place de la Concorde) was approved and signed by the king at Compiegne on the 20th of July, 1753, a month or so before Stuart quitted Athens; and immediately afterwards the Marquis de Marigny sent copies of the plans to the municipal authorities, who commissioned Gabriel to begin the celebrated Place, in the neighbourhood of which at the present day two avenues—Gabriel and Marigny—bear historical witness of these facts.

The original coloured drawings of Athens made by Stuart are in the library of the Royal Institute of British Architects, and attached to them is the letter written by his daughter, acknowledging a draft from the purchaser of "my father's drawings." They were presented by the executors of the late Thomas Howard, in November, 1873. An original edition of the "Antiquities of Athens" is also in the library, together with the supplementary volume, "delineated and illustrated" by the late Mr. Cockerell, Professor Donaldson, and others. We shall have done a pleasant duty if by this short reference we succeed in calling the attention of students, at least, to these valuable works, and thereby rescuing them from the oblivion to which they have been too long condemned. It may interest the curious to know that in the same library there is a memorandum-book of Stuart's containing notes and rough sketches of Italian subjects; and there are also some of his pen-and-ink sketches and MSS. referring to Greece collected in an album presented by the late Joseph Woods in 1863.

According to Spon and Wheler, who visited Athens in February and March, 1676, the Parthenon was then entire. It is certain that on the site of the present Parthenon there stood an earlier temple, and on the site of the Propylæa an earlier entrance gateway, both of which were destroyed B.C. 480 479. The present ruined buildings on the Acropolis were commenced under the superintendence of Phidias, B.C. 448, and it is said that the Parthenon remained sacred to the Virgin, Athene, down almost to the sixth century of the Christian era. It was then dedicated to another Virgin, and during the first years of the thirteenth century became the metropolitan church of Athens. In 1459 it was converted into a Turkish mosque, and during the siege by the Venetians in 1687 into a powder magazine, when the explosion occurred which precipitated its subsequent ruin. The Parthenon is said to have been completed in ten years, B.C. 448—438. The Propylæa were erected between the years B.C. 437—432; and these were regarded by the ancients, and Gothic scholars confirm the Classical opinion, as superior to the Parthenon itself. The Erechtheum, according to Bædeker's Handbook—and in the perplexity which any mention of this extraordinary puzzle usually occasions he may as well be cited as more orthodox historians,—"comprised within its ample precincts the most ancient and venerable shrines of Athens. Here Pallas Athene, the tutelary goddess of Athens, and her first priestess, Pandrosos, were revered; here were the tombs of the mythical kings, Erechtheus and Cecrops; here the sacred olive-tree planted by Athene, and the salt spring caused to flow by Poseidon, during the contest of these two deities for the possession of the country." Nearly all the remains of temples which are to be found in Athens, appear to have been built in the forty or fifty years which succeeded the Persian War. In the words of Mr. Fergusson,—"The whole of the great history of Greece may be said to lie between the battle of Marathon, B.C. 490, and the peace concluded with Philip of Macedon by the Athenians, B.C. 346. All those wonders of patriotism, poetry, and art for which Greece was famous, crowded into the short space of a century and a half, is a phenomenon, the like of which the world has not seen before, and is not likely to witness again."

The modern traveller has little inducement to visit Athens other than to gaze at the mutilated fragments of a very few monuments. So many books, drawings, and photographs, so many actual copies in stone and plaster in so many countries, are now within the reach of every student, that were it not for the Athenian Propylæa, which must be seen to be be understood, it is almost a pity to destroy by a visit more than one cherished illusion regarding

all antiquity divested in its ruins of even the still life which originally adorned it. In the museums of Europe lie half-hidden the ravished splendours of Athens. To the name of Lord Elgin belongs an unenviable notoriety. Ambassador from England to Turkey between the years 1801 and 1812 he carried away with him, amongst other things, to this country one of the columns and one of the caryatides of the Erechtheum; several of the metopæ, a large portion of the frieze, and the best statues of the tympana from the Parthenon; and the whole were transferred to the British Museum, and became the property of the nation by an Act of Parliament dated the 1st of July, 1816, at a cost of 35,000*l.*

Our excuse for the foregoing recapitulation of certain dry facts connected with Greek architecture is that, at the Conference of Architects to be held this ensuing week in London, one evening is to be devoted to a discussion on the subject. It is to be introduced by Mr. Burges in a paper on "The Importance of the Study of Greek Art and Literature to the Practice of Gothic Architecture," and he will be assisted by Mr. Pullan in another paper on "Greek Art illustrated by its Monuments." Perhaps no better moment than the present could have been chosen to reconsider the principles of Greek design and construction—to look at both with Gothic eyes and with Gothic arguments at the fingers' ends. The labours of Stuart and Revett have been productive of consequences in France, more extended and probably more enduring than the wide and congenial researches of Pugin and M. Viollet-le-Duc have effected upon recent architectural movements in this country. On the other side of the Channel the existence of a Neo-Greek school is an absolute fact patent to all who are able to penetrate its little subtleties, and comprehend the perhaps slight reasoning which dictates the use of materials, and the forms given to them. It is not too much to say that there is no *culte* or school of the kind in England, or even in Scotland; and that those copies of Greek buildings which have been erected in this island are too like their original models, or too Roman in their treatment, to deserve the title of Neo-Greek. The seed sown by "Athenian Stuart" fell in France upon soil prepared to receive it; but the majority of British architects still cling to the dictum of Sir William Chambers,—foolishly published in 1791,—that "the study of Greek monuments does not offer sufficient instruction." We are persuaded, however, that a parallel of Greek and Gothic principles, as deduced from an examination of the best Greek and Gothic works extant, would form a valuable contribution to archæological science, and be at the same time a practical aid to both masters and students. There is no reason why English architects should not one day do as well in their line as the Greek did in his. Artistic progress and success are said to be a question of race; and had there been no Pelasgi in Greece, there would have been no architecture as perfect as that of the great Grecian era. According to Mr. Fergusson, it was only as late as the seventh century before Christ that the old Turanian form of Pelasgic art gave place to creations of Hellenic design. The artistic "dark ages" of Greece lasted four centuries, during which the Aryan power of self-government and capacity for republican institutions developed with the laws of Lycurgus. In the composite Anglo-Saxon race, bred to a similar mode of thought and discipline, may surely be found something of each of the four great building races of mankind. Human nature, the force of reason, common sense, are much the same in living Englishmen as in the subjects of Pericles. "It must not be readily conceived," said Professor Barry in a recent lecture, "that man cannot do now what he once did; for to grant this would be to deprive us of all heart in our work"; and in another paragraph he continued very happily, "the rich and powerful pressed architecture into their service. For their purposes grandeur was everything. . . . . The poor might live in hovels, but there must be splendid palaces and stately temples. . . . . Great opportunities may hereafter occasionally arise for the architect, but for the most part he must prepare himself to take advantage of more numerous opportunities of smaller things." Although it may be vain, as Mr. Forsyth says in his "Life of Cicero," to look for the sentiment of Gothic architecture amongst Classic ruins, it is certain that in Gothic ruins there may be found every Classic principle of construction. We rejoice that in a recent article upon the works of M. Duc, the gold medallist of the year, we unconsciously gave a hint of the subject which is to be discussed next Wednesday evening. We said, the day has happily gone by when any professor dare intimate that the study of one form of pure art can militate against practice in another, and Englishmen who have designed the most successful adaptations of native architecture have owned, perhaps a little late, that from the Athenian Propylæa they first acquired a thorough appreciation of the principle and beauty of Mediæval construction. That a scientific reconsideration of classical details, and the antique mode of combining them, will not again lead, in England, to the erection of churches and other public buildings in the guise of Greek temples is certain now that all classes of the people have ceased to even wish to wrap their dwellings in the trappings of a Mediæval church. Satiated with every description of burlesque, modern communities cannot fail to see the bathos which underlies every, even the best, effort of restoration or reproduction,—that "alacrity of sinking" which Swift took as the text of a satirical sermon. Doric, Ionic, and Corinthian masterpieces succumb to the irony of circumstances when imported to these Western shores; and always in England, and often in France, even good copying from the antique may be taken as truly described in the line of Byron, itself an imitation:—

"You plan a vase, it dwindles to a pot."

Amidst the confusion of successive fashions in modern architectural art and a continual craving for originality, it cannot be unprofitable to remember that Solomon's wise saying applies equally as much to Greece in her best days as to every race of builders in wood, stone, or marble. Nothing was new in the Athens of Pericles, except intellectual refinement. The origin of every architectural feature that has been found in Greece may be traced to the artistic forms of Egypt and Assyria. In a stone capital taken from the Southern Temple at Karnac, built sixteen hundred years before the Christian era, are to be seen all the members of that of the Doric order,—a thousand years before the Etruscans or any other ancient people dreamt of such a thing. Out of the mounds of buried Assyrian cities have been dug fragments of mouldings and sculpture the almost exact counterpart of those which archæologists term Grecian. Although the Doric capital may have been honestly reasoned out by logic-loving constructors on a block of stone, it is certain that it came from Egypt, where architectural form is essentially based upon the traditions of wood construction. It is certain also that the Ionic volute came from Asia, and indisputably from a wooden model. It is impossible not to believe that the stone construction of the Greeks, however intellectually perfect, was evolved from an earlier mode, not necessarily Greek, of imitating wood beams in blocks of stone; and it is equally difficult not to perceive in the inevitable evolution of constructive details that a wood origin must be attributed to many of the mouldings and the ornaments which cover them, and which, under any other hypothesis, would possess no meaning at all. A suspicion that the ubiquitous "egg-and-tongue" moulding arose from the appearance presented by the ends of reeds laid side by side and cut obliquely does not detract from its acknowledged elegance. The slanting underside of the "corona" in many of the Doric temples and propylæa is essentially wooden,—like the sloping rafters of earlier and possibly smaller contemporary buildings. Indeed, M. Viollet-le-Duc shows this very conclusively in his "Habitations of Man in all Ages" (see Plate 67); and in such a way as to lead the reader to suppose that had he not asserted the contrary in a previous work he would have boldly maintained the wooden origin of several Greek details. His words put into the mouth of Eicos, the Athenian architect, are:—"You see that the form given to the entablature of the Doric order can be adapted with some unimportant variations to a structure in stone as well as to one in wood; in neither case involving the necessity of falsifying the form or the structure. I will not dissemble the circumstance that some architects combine the two methods; . . . . that is, they do not hesitate to lay friezes and courses of stone upon architraves of wood; but this is reprehensible. . . . . I say again it is scarcely admissible that a wooden structure suggested the stone structure in the composition of the Doric order. . . . . Still, it must be acknowledged that our architects have skilfully adapted the form to the structure in both cases!" Indeed, the conviction that the divers members of a Greek entablature are inspired from remote wooden precedents should no more militate in the mind of a modern architect against a just appreciation of Greek building than the reputed descent of man should eradicate amongst the students of Mr. Darwin admiration for the human form.

The manner in which some of the Greek temples were lighted has given rise to hypotheses of a different and contradictory kind by the several archæologists who have deemed the subject worthy of consideration. Mr. Fergusson, from his long and extended Indian experience, must know perfectly well how very little light is required in countries where light means heat; and where the atmosphere is bright, how brilliant a ray can penetrate through a chink in the wall, a broken blind, or a torn curtain. Yet under the blue vault of Attica, and on the summit of the Acropolis, he has imagined the statue of Minerva illumined through something very like a modern skylight. We are not disposed, however, to venture upon any supposition, or even to take literally the assertion of Vitruvius, that the Greek temples were "*Sine tecto et sub divo.*" But it would be pleasant to think that there was not such a hole in the roof of the Parthenon as people have been induced to believe. M. Viollet-le-Duc, in his second lecture on architecture, quotes a passage from Euripides. He says:—"In the tragedy of 'Iphigenia in Tauris,' Orestes and Pylades wish to gain an entrance into the Temple of Diana to carry off the statue of the goddess. Pylades proposes to penetrate into the cella through the openings left between the triglyphs. 'Look,' he says to Orestes, 'into the interval of the triglyphs where there is space enough for the body to pass through.' . . . May not these openings left between the triglyphs placed at the top of the cella wall have been intended to admit light and air into the inner inclosure? This hypothesis would favour the supposition that the cella was completely covered in." Although to the inhabitant of Western Europe the absence of a closed window or door appears almost an absurdity, yet at the present day in Constantinople and Cairo the one is often filled with open perforated screens of wood, plaster, or marble, and the other with hanging drapery. Even in the houses of the English conqueror in India the doorways are often deemed sufficiently barred by a curtain suspended to about two-thirds of their height, the space over remaining open both day and night. Sombreness and gloom lend additional sanctity to a sacred spot; and just as the Mediæval ancestors of the Western peoples are known to have withstood cold draughts and similar discomforts in the inside of church, castle, and domestic dwelling, so the absence of any large circulation of air in an Eastern public building may have caused but slight inconvenience to those who only visited it periodically. No traveller who has wandered amongst sacred bulls and monkeys in the temples of Benares can admit that to the noses of the faithful a foul smell detracts from an accepted odour of sanctity, even with a people as much given to personal ablution as the Hindus. In their temples a small oil lamp is often kept continually burning; and perhaps the Mussulman habit of suspending inside the mosques long rows of gorgeous chandeliers, and the use of numerous candles of all sizes and decorations in Christian altars, point to a common traditional origin.

Xenophon, in the "Memorabilia," says that Athens at the time when it was subdued by Lysander the Spartan contained about 10,000 houses, B.C. 404. In his charming and instructive novel M. Viollet-le-Duc probably describes Athens at the period of its grandeur in the time of Pericles, whose political career dates between B.C. 469—429. The French writer's imaginative description of the Greek metropolis is equal to Sir Walter Scott's mediæval sketches. "It was around the Acropolis that the houses were crowded together, and the population always in activity. . . . The streets and public places in which people passed their lives presented a busy and noisy scene. . . . Women as well as men were to be seen in the streets going to the markets and the public games. . . . Houses of the higher class occupied the second zone. They generally possessed a garden, and sometimes outbuildings of considerable extent. Around them were to be seen clients and parasites waiting for the hour when the master should make his appearance; whiling away the time in discussing the news of the day, . . . and laughing among themselves at the passing strangers."

o traces of any domestic dwellings remain, and here are no means of ascertaining what they ere except by analogy and conjecture. It is ery much the fashion to refer to the Roman city f Pompeii for examples of Greek domestic archi- ecture; and possibly its houses both externally nd internally bear something more than the im- ress of Greek tradition. But it is well to re- nember that Pompeii was destroyed A.D. 79, nd that consequently the disinterred city, as it s known to the archæologist, is more than five undred years younger than Pericles, and the east monuments of Greece. Sir Alexander Grant in his essay on Xenophon, says that ome of the features of ancient Greek society nay often be observed in India. He pictures f Socrates in the person of some stout Brahman ood humouredly lounging about in loose robes nd with bare legs ready to discuss for hours vith all comers any topic that may turn up"; and Socrates—the first lecturer extant, who identi- ied the beautiful in architecture with the relative good—said that "paintings and frescoes on the walls of houses often detracted from their com- fort, and therefore from their beauty, in necessi- tating the building of the walls in a particular way, by which the sun was too much excluded." It is certain that whether in the bazaar, the gharry, or on the plain, whether reclining, seated, or erect, the Hindu, with his long white dress and bare head, recalls to the mind of the traveller at least in Bengal much mental speculation concerning the ancient Greeks. His countenance may be more swarthy than theirs were; but at least their complexions were not so fair or delicate as certain Royal Academicians would have the world believe. If it be difficult, however, to realise the habits of life,—even with crowded Indian cities to inspire imagination,—of those who are called the "ancients," it is not difficult to perceive, from the writings of Cicero, that the separation between them and the "moderns" is far less real and obstructive than that which exists between the England of Magna Charta and of household suffrage. Cicero was born B.C. 106. He made his first appearance in the forum at Rome as an advocate at the age of twenty-five, and almost immediately afterwards he spent six months at Athens. He was as proud of his knowledge of Greek as any Englishman is of his French, and he interlarded his daily letters to Atticus with as much Greek as Thackeray contrived to admit of French into his later and less admirable novels. Forget the date, says an excellent essayist, and there is scarcely anything ancient about Cicero's writings. He was an art-collector probably more affected in the choice of rare articles than the most whimsical enthusiast of to-day, although undoubtedly less easily imposed upon. His friend Atticus, always *en voyage*, bought manuscripts, paintings, and statuary for him everywhere. Lord Elgin's vandalism was doubtless early capped by more than one Roman robber. Cicero had no confidence in other than Greek taste and design. He was ambitious that his country-house should resemble in plan the Academia at Athens, and he collected bits of sculpture,—even then, perhaps, called antique,—to decorate his library, which was the best room in the house, and full of books, for "Without books," he said, "a house is but a body without a soul."

ON THE ADAPTABILITY OF TERRA COTTA TO MODERN CHURCH WORK: ITS USE AND ITS ABUSE.*

BY MR. EDMUND SHARPE, M.A.

No doubt many will remember the lecture delivered by Mr. Roger Smith last year to the Institute on "New Building Appliances and Inventions," as well as the somewhat discursive but suggestive discussion which followed that lecture. It was, of course, impossible for Mr. Smith to do much more within the limits of an ordinary lecture than to give a general summary of these modern appliances; an account which his practical knowledge and personal experience in the use of many of them rendered extremely interesting. But no one who listened to the discussion which followed could fail to be struck with the variety and the extent of the information, of a special kind possessed by many who took part in it; and it occurred to me that, if, taking Mr. Smith's general summary as the basis for further action in the matter, different members of the Institute who had had special experience in the employment or treatment of any one of these arts or appliances, would each contribute by means of separate papers read at these meetings the result of his particular experience, and so give an opportunity for a general discussion, and the remarks of others, much useful information of a special kind might be brought together, which could not fail to have an important effect on the conclusions that might be arrived at in respect to the value or otherwise of such inventions, and the claims of each on the attention of the architect as a useful building material or appliance of the present time. And, in suggesting this idea to the Council of the Institute, I offered, if they approved of it, to do my part towards carrying the suggestion into effect by contributing a paper on the subject which is now before you.

In giving you the results of my experience of the treatment and use of burnt fire-clay,—an experience which is of very early, as well as of very recent, date; and my opinion of its suitability for church-work of the present day, to which I intend to limit myself, I shall do this as shortly as possible in order to afford more time for the observations of others quite as competent as I am to offer opinions on the subject; and in order to give opportunity for those questions and replies which often tend to throw more light upon a subject than a prepared discourse. It does not, therefore, enter into the scope of what I propose to say here to-night to make any reference to the history of terra cotta, nor yet to the nature of its manufacture, both of which subjects have, moreover, been largely treated of by others. My first experience of the use of terra cotta was in the church of Lever Bridge, near Bolton-le-Moors, designed by me in 1841, and my latest experience has been in the construction of the church of Scotforth, near Lancaster, designed by me in 1874, and finished in the beginning of the present year. A third building, the church of Platt, near Manchester, was carried out soon after that of Lever Bridge, and consecrated in 1846. Of other works in which I have employed the same material, it appears to me unnecessary to give the details, but I will describe those three buildings in the chronological order of their construction.

Lever Bridge Church.

Lever Bridge Church was constructed out of the fireclay deposits occurring in the colliery of the late John Fletcher, esq., of the Hollins, near Bolton-le-Moors. These deposits, in the form of small hard nodules, are generally found in the coal measures of that district. On exposure to the air they disintegrate and fall to pieces, and are then ground to powder, under heavy rollers, formed into a paste-like clay, and made into refractory fire-bricks for furnaces, coke-ovens, and similar purposes; this, at all events, was the only use to which this material had, up to that time, been applied. Mr. Fletcher, who was the chief promoter and the largest subscriber to the church at Lever Bridge, conceived the idea of building it entirely of this material, and I undertook to prepare the designs for it, and to superintend its construction.

The experiment was a bold, not to say a hazardous one, and its realisation was an extremely arduous affair. Kilns had to be built, and other necessary premises to be constructed; experienced workmen had to be engaged, and, above all, a competent and able modeller to be secured. It was, in fact, the creation of a new enterprise. Suffice it to say that, thanks to the indomitable perseverance of Mr. Fletcher, all was brought to a successful issue. The church was in due course commenced, completed, and consecrated in the year 1844. It was, I believe, the first work of the kind in modern times in which terra cotta had been used on so large a scale; for with the exception of the foundations and the rubble work between the outer and inner faces of the walls, neither stone nor bricks were used; and with the exception of that under the slates there is not a square foot of plaster in the building; the face of the walls inside and outside being formed of fireclay blocks, in 5-in. courses, well bonded into the rubble work, and built like an ordinary ashlar wall.

It is a small cruciform church, with an apteral or aisle-less nave, and a short chancel, north and south transepts, and west tower and spire. It is designed in the style of the early part of the Curvilinear period, *circa* 1320, with a spire of open tracery-work, crocketed pinnacles, deeply-moulded door and window jambs, parapet of open tracery, traceried windows, and all other detail characteristic of the period, fully carried out. The four arches of the crossing are formed of continuous arches of two orders, carrying the Curvilinear ball-flower in one of their hollows. A trefoiled arcade runs round the three sides of the chancel below, and the north and south walls above carry a series of crocketed tabernacle work having niches intended for memorial brasses. All these works are in terra cotta. The font, which is an octagon, richly diapered and panelled, is also in terra cotta; so also are the bench-ends, with their panels and finials; and so are the traceried panels of the seat-backs themselves, and those of the pulpit and organ-case. Indeed, the communion-table was originally a terra cotta structure, but it was objected to as uncanonical, and ultimately removed, and replaced by a wooden table, which, however, has now, under the influence of new ideas, assumed its super-altar, its candlesticks, its gilt cross, and its reredos. I have told you enough, I think, to satisfy you that when the upholders of stone and plaster, in derision, denominated this small church—which from one end to the other, inside and outside, shows nothing but terra cotta—*the Pot Church*—they had, apparently, some reason to do so. I say apparently, for, in point of fact, they had very little. And here I may tell you at the outset what is the real danger and objection to the use of terra cotta. It may be said of fireclay what has been said of fire itself, namely, that it is a very good servant, but a very bad master. It is the natural tendency of terra cotta to become *pottery*, and the natural tendency of terra cotta manufacturers to cause it to become such; the obvious duty of the architect in his treatment of it is so to deal with it as to preclude the possibility of this reproach. And although I will not go so far as to say that there is no part of this church where terra cotta is used that is not of the nature of stonework; yet I will at least affirm, that where it is artificially used, so as to resemble stonework, it has been so treated that the work is as solid there as if stone itself had been used. But I will be very honest with you, and point out all those parts and their mode of treatment to which this æsthetic objection may perhaps be raised.

I have told you this church was commenced in 1842 and completed, consecrated, and opened for public service in 1844. It is very easy to state this in a single sentence, but what is not at all so easy to do, is to describe to you all the difficulties we had to encounter, all the laborious work we had to go through, before this result was accomplished.

The three great difficulties which beset the terra-cotta manufacturer are the following:—

1. The danger of *warping*, either in the process of drying, or in that of burning the material.

2. The *shrinkage* of the material, varying as it does in amount according to the size and form of the piece.

3. The extent to which the piece had to be *fired* or burned, varying according to its size and form.

No doubt, the experience of the last thirty years has done much to reduce each of their difficulties to a minimum quantity, and there are manufacturers who will probably tell you that they have reduced these three problems to a matter of certainty, and who will guarantee to the architect the true execution of his designs according to the exact scale to which he has drawn them; but I must remind you that we had to encounter these difficulties in the year 1842, when there were no Doultons, and Blashfields, and Cliffs to perform this troublesome service for the architect. Many, in fact, were the experiments that had to be made, before we could venture to calculate with certainty that all the parts of a given portion of the design would come together, when set, with the accuracy of stonework. Take, for example, the lower portion of one of the aisle buttresses, it was easy enough to know the probable shrinkage of the coursed blocks of its masonry, but who was to predict beforehand the amount to which the upper and lower members of its base-mould would shrink? Experiments had therefore to be made which involved the preparation of moulds, and the forming, drying, and burning of the pieces before any degree of certainty could be obtained; and much was the work of this experimental nature that had to be gone through and thrown aside, before the true scale to which this detail work had to be designed could be accurately determined.

* This memoir, which was to have been read on the 29th of May to the Royal Institute of British Architects, could not be given in consequence of the adjournment to that day of the discussion on Concrete, reported in our last number.

I was, of course, anxious that, wherever it was possible, the terra cotta should be solid throughout; it was, however, found impossible in all cases to realise this. In the door and window jambs, arches and sills, and in the buttress set-offs, in the pinnacles, and in the base-course, the warping of the moulded lines, and the difficulty of thoroughly burning solid pieces of so great a size, obliged us to abandon the attempt, and to hollow out to a certain extent the back of the work, this hollow being filled in with concrete in such a manner as to render the whole perfectly solid. The most remarkable feature of the church, no doubt, is its traceried spire, which is built of solid terra-cotta from top to bottom, dowelled together, not with iron, which is much less durable, nor with copper, which is much more costly, but with terra-cotta dowels, which are imperishable. The six four-light traceried windows of the tower, transepts, and east end, and the two-light windows of the nave, are treated in the same way.

The church contains sitting accommodation for 350 persons, and cost, as it now stands, 2,600*l*. What it would cost in stone I never took the trouble to calculate; but the spire alone would, I should think, cost as much as the whole church has. Looked at as a piece of ordinary mason's work, it would be difficult to find a fault with it; nor would a stranger, seeing it for the first time, deem it, either from the appearance of its colour or its workmanship, to be anything else. Its primitive colour, when first built, was a ruddy buff, which is now considerably deepened by an exposure of thirty years to the smoky atmosphere of Bolton-le-Moors.

Platt Church.

Shortly after Lever Bridge Church was finished I was called upon by Mr. Thomas Worsley, of Platt Hall, near Manchester, to design another church in the same material, to be erected by him, at his own expense, close to his house in the township of Rusholme. The plan that I adopted for Platt Church was of a more Mediæval type than that of Lever Bridge, determined as I was to prove, that even in these comparatively parsimonious days, it was possible to reproduce, in this ductile material, a genuine example of the true Lincolnshire type of the fourteenth century, without stint as to the nature of the moulded and carved work with which its main features should be clothed.*

Now, this design, it must be explained, was made in the year 1844, that is to say, thirty-two years ago, and, therefore, very early in the Gothic revival, of which we now hear so much; about the time, in fact, when our late distinguished president was commencing his successful professional career, and when our present esteemed president must, I suppose, have been in his teens; and should you find any shortcomings in this design, you must put them down rather to the early period at which it was made, than to any incapacity of the material to produce a different result.

The experience gained in the construction of the former church much lessened our difficulties in dealing with the second. Their designs differ, however, considerably in character; the later church has less ornamentation, but it has clustered piers, floriated pier capitals, and moulded pier arches. It has a large five-light east window of flowing tracery, a diapered parapet to the aisle and clearstory walls, and a tower and spire, 170 ft. high. The whole of the exterior is of terra cotta, the coursed walling being of 5-in. blocks, as at Lever Bridge. The backing of the walls, however, is of brickwork, and the interior surface is plastered throughout. The spire springs from an octagonal lantern of particularly light work, which has suffered much from a cause that will be presently noticed. Altogether, I think, I am right in holding this tower and spire, considering the time at which, and the material of which it is constructed, to be a very remarkable work, and deserving of more care than it has of late received from those who have, under the Lord Chancellor, the charge of it. The whole work has been treated, as will be seen, as a work in masonry, and I believe very few of those who live in the populous neighbourhood in which it stands are aware that it is not so. All that has been said before in regard to what is solid and what is hollow in Lever Bridge Church applies equally to this church. Platt Church contains 650 sittings and cost, exclusive of the stained glass, about 4,000*l*.

* A view of this church we shall give in an early number.

Now before I begin to describe to you the third church, I will, if you will permit me, make a few general remarks on the use of terra cotta as it has been employed in the two churches which I have already described. And first, as to its durability, I have no occasion to tell you that of all materials, natural or manufactured, there are few that are so durable as terra cotta; the examples of it, some thousands of years old, that have turned up in Egypt, Assyria, and elsewhere, prove this beyond a doubt. But it is so on one condition alone; namely, that it be, in the language of the trade, thoroughly "fired." We were fully aware of this condition when we commenced the work for Lever Bridge, but we were hardly aware, at first, of the much larger proportionate increase of time in burning to be given to the larger pieces, in order to ensure their complete induration. The defect only made itself apparent after the material was built into the work, and a considerable number of pieces have accordingly had to be taken out and replaced. This has by degrees been done, and the church is now in a sound condition throughout. At Platt Church, on the other hand, where, in consequence of these failures, the whole work was much more thoroughly burned, a much more satisfactory result was obtained. I have recently inspected the church, and with the exception of certain defects in the spire and upper part of the tower, due to other causes, the whole of the church, nave, aisles, and choir are in excellent condition, and as sound apparently as the day they were built: a result which is entirely due to the greater extent to which the material was fired. This necessity for long and hard burning is diminished in proportion as you diminish the body of the clay, by hollowing out the back of the piece, and render it to that extent less solid; but here we fall upon another evil almost greater than the first, for it is pre-eminently unsatisfactory to reduce the ornamental part, or show-side, so to speak, of the block to the condition of a shell, whilst honest stone or concrete does duty at the back as the real masonry of the building. I need scarcely say that this is not the manner in which the terra-cotta used in these two churches has been treated; still there must always be the tendency on the part of the manufacturer to ensure the durability of his material by lessening the amount of its solidity, a result which goes far to prove that to employ this material in these large masses is a use of it which is in a direction, and of a nature, opposed to its natural capabilities.

It was this consideration which determined me, should I ever have occasion to use terra cotta in church work again, so to use it as to ensure the complete burning of the whole work with a moderate amount of firing; or, in other words, to use only small pieces throughout the whole building, and to limit them, in fact, to the following dimensions: namely, for the ordinary walling blocks, 9 in. by 4½ in. by 4 in., giving a cubical content of 162 in.; and for the largest pieces of ornamental work a maximum of 400 cubic inches; and thus, instead of obliging the terra cotta to suit the design, so to prepare the design as to suit the terra cotta.

Now it is obvious that this limitation in the size of the blocks to be used is inconsistent with Gothic work of the kind that was prevalent in this country in the thirteenth and subsequent centuries. Indeed, the massive effects that we see realised in Norman work were produced by stones much smaller in size than those which were used in certain situations in Gothic work. But still better adapted to the condition which I have just ventured to lay down, is the work of that period which I have endeavoured in my recent publications to call special attention, and which occupied the latter half of the twelfth century. For in this Transitional work, especially in that lighter description of it which was executed towards the close of the Period, we find in its mechanical ornamentation, and in the repetition of parts in its moulded and carved work, exactly those conditions which adapt themselves to the principle in the use of terra cotta which I propose to prescribe.

It was long, however, before the opportunity presented itself for putting this idea to the test of practical experiment. In 1847 I transferred the chief charge of my professional business to my pupil and partner, Mr. Paley, and shortly afterwards retired altogether from practice as an architect.

The year before last, however, I became one of the chief promoters and subscribers to a small church that was to be erected in my own township of Scotforth, and within 300 yards of my own house, and I considered myself justified under these circumstances, not only in preparing the designs of this church, as an amateur, but also in attempting to realise the idea I had conceived thirty years ago, by the help of which we might hope, with our limited means, to produce a structure of greater comeliness and ecclesiastical character than we could expect to accomplish were we to use exclusively the grit stone of the neighbourhood. It is to the manner in which terra-cotta is used in its construction, that I have now to call your attention.

St. Paul's Church, Scotforth.

This is a small church, of the usual plan, with nave and side aisles, clearstory, south porch, chancel, and circular apse; the only unusual feature about it being the situation of the tower, which is over the chancel,—a position in which it is more frequently seen in France and England. The church is built of flat-faced rubble walling, with terra-cotta dressings; the colour of both being very similar. It is designed in the style of the latter part of the Transitional period, *circa* 1170.

The works executed in terra-cotta are the following:—Inside, the piers, with their bases and capitals; the pier arches; the string-course above them; the roof shafts, with their corbels and capitals; the two chancel arches; the chancel arcade; and the vestry doorway. Outside, the clearstory windows; the circular wheel window at the west end; the doorway of the south porch; the corbels of the nave and apse roofs; the apse arcade; and the whole of the upper part of the tower, with its saddle-back roof.

The whole of this work was modelled from my own drawings, under my own eye, and moulded, burnt, and furnished, by Messrs. Cliff & Son, of Wortley, near Leeds. Every piece of this work with one exception, is solid and solidly built into the walls, just as if it were of stone; there is no hollow work of any kind, with the single exception above noticed, and no veneering of any kind. The terra cotta essentially forms part and parcel of the body and strength of the structure. No piece contains more than 400 inches in its cubical contents. The external walling of the tower being of blocks, measuring 9 in. by 4 in. by 4½ in., backed with ordinary brickwork set on edge, the two being securely bonded in, one with the other.

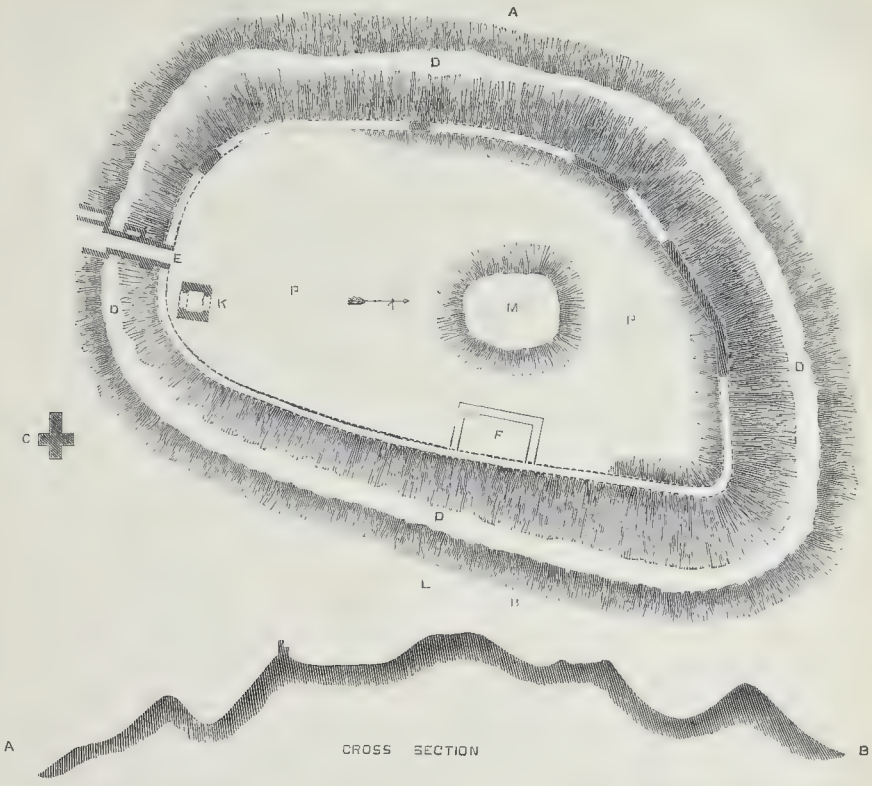
The material, as regards colour, is unexceptionable; of a warm cream colour, of the very best stone colour; and this is not only on the surface, but throughout. Burning does not darken or change the colour of the block internally, as is the case with some fireclay. It requires no special preparation other than that to which all other brick-clay is subjected. It will carry a great amount of heat in burning, and possesses, when burnt, all those proofs of durability which well-burnt fireclay ought to exhibit; it rings well, is extremely hard, and resists both the chisel and the penknife; it has already obtained an extensive reputation as a refractory fire-brick. It comes out of the coal measures at Wortley, near Leeds, where it occurs as a stony shale in beds of about 2 ft. in thickness.* Its texture is one that is agreeable to the eye, and which takes mortar well, and is therefore well suited to architectural purposes; but it has never yet been used on the scale and in the manner in which I have employed it in Scotforth Church; and it is because, as used in this little building, it has been, so far as I can now judge, a successful application of it, and because the experiment is one that may be useful to others, and in the employment of other fireclay elsewhere, that I have ventured to bring this design and its execution before the Institute,—a design which, *au reste*, is sufficiently modest, and which, except on this account, would have few claims on attention.

There are several different deposits of this material at Wortley, and several different fire-brick and chimney-top makers. Messrs. Cliff & Son, however, are the manufacturers who have supplied the whole of the work required for this church, and I have every reason to be satisfied with the manner in which they have executed their contract.

The church affords sitting accommodation for 300 persons, and cost, exclusive of the site and fence-walls, but including every other item,—pulpit, font, heating apparatus, and lightning conductors,—2,800*l*.

* For a description of the qualities of this Fire-clay and its Manufacture, see the *Builder* of May 2nd, 1874.

BRAMBER CASTLE.



C. Church. D. Ditch. E. Entrance. F. Foundations. K. Keep. L. Lowland and marsh. M. Mound. P. Platform.

THE CASTLE OF BRAMBER.

Of the shires of England there is none more intensely English than Sussex. Its name, the names of the most central of its two capital towns, of its principal and secondary divisions, of its parishes; nay, even of its fashionable watering-places, and in a very remarkable degree of its inhabitants, are but little changed from those they bore on the eve of the Conquest, and when under the sway of Godwin and Harold. Even the not infrequent marks of Norman occupation, in the form of parish churches, abbeys, and castles of great strength and durability, were many of them grafted upon foundations dating from the days of Alfred and Egbert. This is the case with Selsey, the ecclesiastical parent of the see of Chichester, with Bosham, Malling, Steyning, and other religious houses; and Arundel, Bramber, Knappe, Hastings, and Lewes, all great castles in their day, were the seats of English chiefs for centuries before their banks were crested with walls of masonry, or their mounds crowned with keeps constructed after the Norman pattern. Pevensey, indeed, boasts a still earlier origin. Its walls are, a part of them, Roman, as its earthworks are, a part of them, of English construction: it received from the Normans only its latest additions.

British remains in Sussex are but scanty. A few of the larger and more elevated of the hill-camps, and those of irregular form, as Cissbury, which includes 60 acres, are supposed to be the work of the Regni, the earliest recorded inhabitants of the district. It is also difficult not to see in the Arun, the Adur, and the Ouse names corresponding to the Aeron, the Dour, and the Esk, by which many streams in Celtic countries are still designated. Glynde has been claimed as a Celtic name, but it is very rare, especially in Sussex, to find the name of a parish of other than Teutonic origin.

Of the Roman period the traces are more numerous. The main road intersecting the county from Chichester towards London is undoubtedly of that date, and there seems to have been at least one other from Chichester—the Roman Regnum—to Pevensey. There remain also several rectangular camps, as Goushill, Hollingbury, Ditchling, Highdown, and Brightelmstone Down, evidently Roman. Chichester, though its Latin name probably includes an earlier appellation, has the Roman cruciform arrangement of its two main streets, though not the rectangular outline. Anderida, Mutuantoris, and Mida, Roman towns of which the site is disputed, seem to have been in Sussex; and at Bognor and other places, pavements and foundations and inscribed stones, and other marks of Roman habitation, have been discovered. Still, the remains, whether of British or Roman occupation, are but slight: all that speaks of law, of order, of property, of the family tie, of the forefathers of the people, of civil or religious polity, and of public worship—all of this character is ancestral, is English. This thorough uprooting of the traces of earlier occupation is due, no doubt, to the position of Sussex upon that part of the British coast most exposed to Saxon and Danish invasion, and which bore the attacks of those formidable invaders when at their earliest and fiercest. Sussex was late to come under the humanising influences of Christianity, remaining Pagan till the middle of the seventh century. The remarkable conservation, to our days, of the names and divisions is probably due to the very peculiar configuration of the district, and to the isolation produced by its steep and lofty frontier ridges, and by the dense woodland which covered, and to some extent does still cover, its central part. As the position of the principal castles is determined by this configuration, a few words concerning it will not be out of place.

Sussex forms the western half of a chalk basin. The chalk rises in a long, narrow, lofty, and very steep ridge, forming the northern, eastern, and southern margins of the area, its height, reaching to 800 ft., being known as the downs. The North Downs divide Sussex from Surrey, the South Downs are the frontier towards the sea. This latter ridge extends from near Chichester to Beachy Head, while the North Downs extend to Folkestone and Dover. The deep wooded area thus enclosed between them is the well-known weald of Sussex. The basin is cut across obliquely by the sea, and the south-eastern frontier of the county thus laid open for a length of about fifty miles. In former days, however, the broad marshes of Pevensey, Winchelsea, and Romney closed this opening with a barrier as effective as the Downs themselves.

Upon these Downs, and especially upon the range to the seaward, the early sea-kings seem to have pitched their resting-places. Here are still found such hill-camps as Woolstonbury, Caburn, Rookshill, and Chenkbury, circular in form, and therefore neither British nor Roman, and besides these, several others, as Newhaven, Seaford, and Burling, which are segments of circles, and, like Flamborough Head, enclose headlands, and are attributed, with some probability, to the Danes. It seems the general opinion that these circular or segmental earthworks preceded the mounds and banks found in the interior of the country and upon lower ground, the work of the same people after their settlement and civilisation.

Sussex is the only county the primary divisions of which bear the names of Rapes; of these

it contains six: Hastings, Pevensey, Lewes, Bramber, Arundel, and Chichester, subordinate to which are sixty-five Hundreds; each rape contains a portion of seaboard, a river, a haven, and a fortress. The rivers are the Lavant, which nearly encircles the city of Chichester, and falls into one head of the Bosham estuary, the port of Chichester, — the name is thought to be a corruption of the Saxon *hlifian*, a rising, because the springs rise annually from deep sources; — the Arun, which descends the dell bearing its name, cleaving the chalk-range, and reaches the sea at Little Hampton; the Adur, the river of Bramber, which also, by a pass in the chalk, reaches the sea at Shoreham; the Ouse, the river of Lewes, which, also by a narrow gorge, joins the sea at Newhaven; the Cuckmere, the river of Pevensey, but which leaves that haven far to the east, and descends, also by a gap in the chalk, to the sea, west of Beachy Head; and, finally, the Rother, the river of the rape of Hastings, but the common boundary of Sussex and Kent, and which falls into the sea at Rye. Pevensey Haven, though deprived of the Cuckmere, is the receptacle for a number of lesser streams, by which the upland waters formerly flooded that extensive level.

The fortresses of the Rapes are also six,—Chichester, long since destroyed; Arundel, Bramber, Lewes, and Hastings, all of præ-Roman date; Pevensey, and probably Chichester, of Roman origin. Ella, who landed A.D. 477, took possession of Chichester. All were the seats of English lords, and all were accepted by the Normans as well-chosen positions, and by them were occupied and strengthened. Knepp or Knapp Castle, subordinate to Bramber, in the same rape, like it, is of English origin.

Of the six castles, three, Arundel, Bramber, and Lewes, are posted at the upper openings of narrow gaps in the chalk downs. Chichester is placed to the east of and outside the chalk range. Pevensey stands within the weald, among the low marshes by which that tract opens upon the sea; and Hastings, also within the weald, stands upon the sea-cliff, on the rocks and sands to which it has given geologically its name.

All the six, as well as Knepp, possessed, on a larger or smaller scale, the conical mound so characteristic of English strongholds, and each, after the Conquest, became the chief seat of a barony, and was held by a powerful noble. Robert de Eu had Hastings; William de Warren, Lewes; the Earl of Moreton, Pevensey; Chichester fell to Roger de Montgomerie, who there founded a castle upon the site of the earlier works, of which the mound remains. The castle stood within the city enclosure, in the north-east quarter. It became, with Arundel, the property of the D'Albinis, and was destroyed by order of King John, after which the third Earl of Arundel founded on its site the Grey Friars, of which the house was probably built with the materials of the castle. It is said that upon the mound stood a circular or polygonal keep, as at Arundel, and that the traces of its foundations were long visible on its summit. The mound has survived all its Norman additions, and is the only relic of the ancient fortress that is extant. The city, within which the castle stood, is also an early strong place. The cruciform streets are, doubtless, Roman, as are the coins and inscribed stones occasionally dug up; but the outline of the city is not rectangular, and is enclosed within a bank and ditch of irregular outline, once of formidable strength, and still in parts tolerably perfect. It is not improbable that these earthworks are post-Roman, the work of the Romanised Britons, and therefore earlier than the date of the castle mounds. The later wall was built against the bank, which thus still, where it remains, forms a broad ramp or terrace.

Arundel Castle, next eastwards to Chichester, and its superior in military importance, stands on the right bank of and high above the Arun. The pass is of a more open character than those to the east of it. This castle has already been described in the pages of this journal.

Knepp Castle is in Shipley parish. It had a shell keep upon the mound, of which traces remain, but which is said to have been destroyed as early as 1216.

Bramber, the castle next eastwards of Arundel, is held to be the English "Brymmburgh," a fortress upon a brim or brink. It is, or rather was, the head of a barony, and the chief place of the Rape to which it has given name, and which includes 42 parishes. The Rape extends about twenty-four miles from the Surrey border to the sea, with a width of about eight miles. Narrow as it is, it contained till 1832 the four Parliamentary boroughs of Shoreham, Bramber, Steyning, and Horsham, returning eight members to Parliament, now reduced to three. The castle stands on the west side of, and just above, the channel by which the Adur reaches the sea at Shoreham. The pass thus commanded is four miles long and half a mile wide; the bottom flat and marshy, the sides very steep and rising to 600 or 700 ft. New Shoreham, founded about A.D. 1200, by the Norman lord of Bramber, stands upon the seashore; but old Shoreham, the English port, is now half a mile inland, the deposits from the river and the *débris* of the chalk range having encroached considerably upon the sea. Combe and St. Botolph's, ancient parishes, are placed within the pass, and higher up upon the same side is the village of Bramber, standing upon slightly rising ground at the foot of the western hills, and upon the edge of a broad tract of level land, still wet, and formerly impracticable, across which the sluggish and frequently flooded Adur takes a rather winding course.

The castle is placed a little to the north-west of the village, and, as was the English custom, close to the parish church. From thence a raised causeway is carried across the valley, leading to the village of Sele or Beeding, the Bedinges of Domesday, where was once a religious house dependent upon the castle. The village, composed of one short street, adjoins the causeway, and near it was discovered, in 1839, the piling and piers in masonry of an ancient bridge by which the road was carried across one of the bye-streams of the Adur. A charter of 1075 refers to this bridge and to a chapel upon it, as "Stes. Petrus de veteri ponte." The causeway, however, claims to be of higher antiquity, and to have carried a Roman road across the marsh then probably flooded by the sea.

In the construction of the fortress advantage was taken of a knoll of the lower or grey chalk, roughly oval in figure, and about 120 ft. high above the river. This was levelled on the top and scarped round the sides so as to form a more or less rounded area, 560 ft. north and south, by 280 ft. east and west. The scarp descended above 180 ft. at an angle of 45 ft., or a slope of one to one, into a ditch about 20 ft. wide at the bottom, and the opposite side of which, or counter-scarp, rose about 40 ft. at a similar angle, so that the ditch at the counter-scarp level was 100 ft. broad, and the crest of the scarp rose 30 ft. to 40 ft. above the ground opposite. A very formidable defence. Towards the east, where the ground was low, the counter-scarp was not above 20 ft. high, and to add to the depth of the ditch, it was crested by a light bank, from which the ground sloped towards the marsh. On the north and north-west, where the ditch was at its deepest, and the ground was high, the slope outwards is gentle, falling for a furlong or so. To the west, where there is a valley now occupied by the railway, the ground is low, and here the outer side of the ditch, forming the crest of the counter-scarp, is a narrow ridge, as at Arques, succeeded by a very steep slope. Thus those who approached the place on that side, after toiling up a steep and dangerous ascent, would only find themselves on the outer edge of a deep ditch, with a second still higher and steeper ascent beyond it. Towards the south the ditch crosses instead of skirting the hill, and is much less deep. Here was the entrance, and upon the small tail of the knoll thus cut off is placed the parish church, standing therefore, just outside the ditch, and in its turn defended by the slope of the hill, and by a hollow way which runs a few yards within the edge of the marsh, the level of which is 8 ft. or 10 ft. below it.

Upon the table summit, 160 ft. from its northern, and 40 ft. from its eastern, margin, was thrown up a conical mound, about 40 ft. high, and 70 ft. diameter at its summit. It is wholly artificial, and the material has evidently been scooped up from the surface of the area, which has thus been rendered slightly hollow, the surface rising gently towards the mound, and towards the outer margin of the area, that is, the crest of the scarp. The mound does not appear to have had any ditch proper to itself. It has been dug into and disfigured on its southern side. Possibly there have been buildings there. On the north the original and usual form is untouched. The slope is very steep. This was the "burgh" or keep of the original fortress.

What stood upon the burgh, or how the margin of the area was originally defended, is of course a matter of conjecture; but considering the wealth of timber in the district, it is probable that the defences were all of that material, as well as the adjacent church, and thus supposing, we may figure to ourselves the "aula" of Earl Guerd, who was the lord of Bramber during the reign of the Confessor. The position is a very strong one, and the view from it to the east and north-east extensive.

Bramber is one of the castles named in Domesday. It was then a part of the lordship of Washington, and held by Wm. de Braose, the Norman grantee. "Ipse Wills. [de Braiosa] tenet Wasingetune. Guerd comes tenuit tempore Regis Edwardi. Tunc se defend. pro LIX. hid. Modo non dat geldum. In una ex his hidis sedet Castellum Brembre."

William de Braose here mentioned probably was present at Hastings. A charter cited by Dugdale, dated 1075–6, shows him to have been of Braose, near Saumur, on the Loire. He had an immediate grant of nearly the whole rape of Bramber, and he adopted the castle as his chief seat.

Although local history is silent as to De Braose's operations, much may be extracted from the evidence of the existing ruins. Around the edge of the table area he or his immediate successor built a wall of *enceinte*. Where the ground was sound, this was founded upon the edge of the slope, but where the chalk had given way, the foundations were laid 3 ft. or 4 ft. lower down, so that the wall was built as a revetment, and the ground within formed a ramp against it. Of this wall of *enceinte* some large portions remain, and its foundations may be traced all round. It was 7 ft. to 9 ft. thick, from 10 ft. to 18 ft. high inside, and outside from 20 ft. to 30 ft. It was built entirely of large pebbles, as from the sea-beach, laid in very thick beds of mortar. Of course, such stones could have no bond, and are about the worst material that could, under ordinary circumstances, have been selected, but so firm is the mortar that the wall remains sound, and in places, even the parapet, 2 ft. thick, and composed of the same material, is standing. Towards the north-east is a sharp angle, and another of some boldness towards the south-west, but neither there nor elsewhere do there seem to have been any mural towers, although it must be confessed that a dense underwood of thorn and bramble renders a closer inspection of the exterior impracticable.

The Norman keep stood upon or just within the line of the *enceinte*, at its south end, close to the east of the entrance, and opposite to the church. It was a square of 40 ft., standing north and south, and about 240 ft. south of the mound. Its walls at the base were 9 ft. 6 in., and at the summit but little, if anything, less, and its exterior face was vertical. The basement chamber at the ground level was 21 ft. square and 14 ft. high, and above it were three stages, all with timber floors. The height to the rampart wall is, by guess, about 70 ft., or a diameter and three-quarters. The first floor, 23 ft. high, either rested upon joists which were supported by the north and south walls, now gone, or, which is more probable, upon a ledge in the wall, which is reduced in thickness at that level about 6 in., as seen on the west side. Only the west wall remains, and the lower 6 ft. or 8 ft. of the east wall. The north and south walls are entirely removed. The west wall is solid at the base, but the east wall is recessed in a curious way inside, and seems besides to have contained two cavities like cesspits. The whole mass has, however, been so pulled about, that little can be made of it.

At the first floor, also, the west wall is solid, save that in its south end is a short mural passage, vaulted, which seems to have ended in a garderobe, the vent of which is marked by a sort of vertical furrow in the wall. This passage was probably entered by a door in the south wall, near the south-west angle. The east floor, 19 ft. high, rested upon six joists in the east and west walls. In its west wall is a full-centred recess, 3 ft. deep, 2 ft. above the floor, 5 ft. wide, with jambs 7 ft. high. In the recess is a window 3 ft. wide, with jambs 5 ft. high, also full-centred. Both recess and window are quite plain, and are not splayed.

The third floor, 14 ft. high, also rested on six joists, east and west. This has no window to the west, but in the wall are two recesses for the vertical beams of a roof, and at the base of each a corbel. This looks as though the roof was inclined, as at Bridgnorth and elsewhere, at a low pitch, the north and south walls being its gables.

There are some indications, in a foundation, as of a forebuilding attached to the north face,

where probably was the entrance. The material of the keep is chalk flint, laid in copious beds of mortar. The flints are undressed, and the workmanship is coarsed rubble, very plain and good, but rather rough, with a tendency to herring-bone work. The window is dressed with ashlar, as are the hollow quoins of the interior, but there is no ornament, not even the usual Norman pilaster or plinth. The ashlar is probably the malm rock of the neighbourhood, a bed below the chalk, much like that used at Dorchester, and for some of the adjacent Oxfordshire churches. Altogether, this keep seems to be Early Norman work, perhaps as early as Malling, and was probably built by the first De Braose before 1095, when his son was in possession.

When the keep was blown up, as it evidently was, with powder, the south and east walls fell in four or five huge masses into the adjacent ditch, where they remain but little altered, though obscured with vegetation. If these were cleared, something more of the detail of the keep might be discovered. The north wall seems to have been broken up and removed.

About 40 ft. west of the keep are the remains of the entrance. So far as can now be seen there was no considerable gatehouse, probably only an arch in the curtain, as at Richmond. The fragment of a wall shows the approach to have been steep, and about 40 ft. from the gate was a bridge, the pier and counter-pier of which, 13 ft. apart, are still standing in the ditch, here not above 90 ft. wide and 30 ft. deep. The approach to the counter-pier rises steeply from the foot of the hill and passes the church.

The only building of which there are positive traces, besides the keep, within the area, was a rectangular pile, built upon the curtain, 60 ft. long, and projecting 24 ft. into the area. This is placed opposite to and east of the mound, and the passage between the two was only 15 ft. broad. A part of the base of this building remains, and shows a plinth and fragment of wall faced with squared flint. The work looks many centuries later than the keep, and most certainly is not Norman. There is no trace of a well.

The parish church shares the protection of St. Nicholas, in common with Old Shoreham. It is in substance Norman, probably rather later than the castle, and was originally a cross church with a central tower. The nave and central square remain, but the choir and transepts have been removed, and the arches blocked up. The south door of the nave has a plain billet moulding, but the original opening has been walled up, and a smaller segmental doorway inserted. The cruciform plan seems to have been much in use here. It is seen at Old Shoreham, Steyning, and Broadwater.

Bramber has little or no history. The lords were among the wildest, most turbulent, and most unfortunate of the Norman barons. Their founder, William de Braose, received from the Conqueror forty-one lordships in Sussex, chiefly in this Rape, and others in Dorset, Hants, Berks, Wilts, and Surrey. He founded St. Peter's Priory, at Sele.

Philip, his son, adhered to Rufus, but was opposed to Henry I., and was disinherited. He married Aanor, and left William, who married Berta, daughter of Milo, Earl of Hereford, with whom he had Brecknock, Gower, and other south Welsh lordships, and thus laid the foundation of much of the power and more of the misfortunes of his race. His descendents built the strong castle of Oystermouth and that of Swansea.

William, the grandson of the founder, recovered the estates and added to them by marriage a share of the Honour of Barnstaple. He founded New Shoreham Church and Port. He also joined in the invasion of Ireland with Henry II., and held the whole kingdom of Limerick in fee. He is accused, though upon scanty evidence, of a wholesale massacre of his Welsh neighbours at Abergavenny. His possessions in England, Wales, and Ireland were enormous, and he also held the Honour of Braose in the Bailliewick of Falaise, in Normandy, and a share of the Honour of Totnes, which he obtained with Maud de Hayes or St. Valerie, a daughter and co-heir of Joel of Totnes. For some reason, not very clearly ascertained, he became obnoxious to King John, and their strife, much embittered by the outspeaking of his wife, led in 1210 to his attainder and exile and the death of his wife and William their son, it is said of starvation, in the prison of Windsor Castle. He himself died at Paris shortly afterwards, in 1212. He was a considerable benefactor to the Church, and it is recorded of him that he was careful to use God's name with great reverence. The king seized the Rape of Bramber, and granted the Barony to Richard, Earl of Cornwall. Giles, Bishop of Hereford, and Reginald de Braose, brothers of the attainted baron, obtained after a time a share of the estates. Bramber was granted to the Bishop, who however died within the year. Finally, in the reign of Henry III., Reginald recovered Bramber and Knepp, and most of the rest of the property, and having married Grecia, daughter of William de la Bruere, died 6th Hen. III., and was succeeded by William his son.

William de Braose married Eve Mareschal, a co-heir of the great Earl. He fell into the hands of Prince Llewelyn, who accused him of too great intimacy with his princess, and put him to death at Builth, it is said, by hanging. He left four daughters co-heirs, whose descendants held the greater part of the estates.

There remained, however, an heir male, in John de Braose, by Maud de Clare: he was the son of that William who was famished with his mother at Windsor, and who recovered Bramber and Gower. His son was William de Braose, who held Bramber and Gower, and added considerably to the Sussex estates. He is said, in 1262, to have raised a large sum of money from his tenants by foregoing his right of murage. He died at Findon, 1290, 19 Ed. I., and was succeeded by John de Braose of Bramber, who married Margaret, daughter of Llewelyn, Prince of Wales. He died at Bramber of a fall from his horse (16 Henry III., 1232), and was succeeded by William, who died 19 Edward I. William was followed by another William, the eighth and last lord in descent from the founder. He was a powerful baron, and active in the wars of Edward I. and II. He was, however, extravagant, and reduced to sell Gower, which led afterwards to disputes between the purchaser and the lawful heirs of the vendor, of whom Alive, his elder daughter, married John de Mowbray, from whom descended, in the seventh generation, Margaret de Mowbray, who married Sir Robert Howard, whence descends the Duke of Norfolk, the present owner of Bramber Castle. The barony is in abeyance. Probably, with the failure of the elder male line of De Braose, the castle ceased to be a residence, but in 1644 it was strong enough to be held by Captain James Temple, for the King, against a strong Parliamentary party, and it was probably in consequence that the keep was blown up, and the castle reduced to its present condition. There is an engraving by Hollar, taken 150 years ago, representing it very much in its present condition.

Another branch of the family of de Braose rose to the rank of Barons of Parliament, and held large Sussex possessions. The last male of this cadet branch, de Braose of Chesworth and East Grinsted, died in the reign of Richard II.

Bramber is like Pontefract, Lewes, and Dudley, an example of a natural hill, scarped and defended by art, and crowned with an artificial mound, but unlike those castles, it has both a mound and rectangular keep, a rare combination, found only at Guildford and Christchurch. A rectangular keep upon a natural isolated hill, unaccompanied by a mound, though not usual, is not very infrequent. Examples of it are seen at Hedingham, Corfe, Bridgnorth, and Brough. At Bramber, as indeed in the case in many other sites of early fortresses, the original earthworks have survived the Norman additions, and remain pretty much as they must have existed before the Conquest. G. T. C.

MODERN IMPROVEMENTS IN HOUSE BUILDING.

ARCHITECTURAL ASSOCIATION.

In the discussion which followed the reading of Mr. J. Douglass Mathews's paper,*

Mr. W. W. Robertson, in moving a vote of thanks to the reader of the paper, said he thought the practice of giving a separate supply of air to the fireplace, by means of a tube or similar contrivance brought from the outside of the house to the underside of the fireplace, could not be too strongly condemned, on the ground that as the fireplace was generally the chief ventilating agent in a room, an independent supply of air to it would neutralise its ventilating functions at once. It might be true that, where the fireplace was not provided with an independent supply of air, there would be slight draughts, caused by the air being drawn through the doors and window-frames, but these draughts were to be preferred, in his opinion, to a foul and stagnant atmosphere. He believed that there was much to be learnt from an examination of new inventions, and it was worthy of note that of the 5,000 patents taken out every year, a large proportion were in respect of inventions connected with building materials and appliances. A very elaborate contrivance had been invented by Professor Reynolds, of Owen's College, Manchester, for effectually disconnecting soil-pipes from house-drains, and this, in a simpler form, was likely to be of general use. Among the inventions not specified by Mr. Mathews, he believed that the pneumatic bells, lately introduced, had been found to answer exceedingly well.

Mr. R. Morrison Marnock seconded the vote of thanks, and observed that a great disadvantage of pneumatic as well as of electric bells was that as there was only one gong, the servants could not tell from which room the summons had been given, except by going to look at the indicator. For this reason Mr. Hardwick had, in the house which he had just built for Mr. Millais at Kensington, while using electric bells generally throughout the house, determined to have three bells, viz., those from the entrance-hall, the dining-room, and the ladies' boudoir, fitted with wires and cranks in the usual manner, each bell having its own distinct tone. With regard to stoves, he thought the ventilating stoves introduced of late years were excellent things. As to giving the stove its own independent supply of air, he took it that the air coming in under the fireplace would not all be absorbed by the fire, but that part of it would circulate in the room.

The President (Mr. John S. Quilter) said it occurred to him to mention a mode of utilising the heat from a chimney flue which he had seen illustrated, but which he had never heard of being carried out in practice. The flue was made in the form of a terra-cotta tube or pipe carried up in a recess which occupied the place of the ordinary chimney-breast. He thought it obvious that this was an economical and simple mode of increasing the warming power of the stove.

Mr. Phené Spiers said he had seen stoves of the kind in use in Belgium, and they seemed to answer their purpose very well, but they had the disadvantage of projecting into the room,—a disadvantage which was, perhaps, more than counterbalanced by the effectual manner in which they warmed the apartments in which they were placed. The subject of ventilation was too large to be entered upon in a comprehensive manner in the course of a discussion. A great deal had been said of late with respect to the system with which the name of Mr. Tobin was identified. There was no doubt much credit due to Mr. Tobin for the persistency with which he had urged the necessity of ventilation, but the system which he claimed as his own was no new thing. He (Mr. Spiers) remembered the principle being advocated some twelve years ago. One of the members of the Institute wishing to have a "fling" at the Renaissance architects, and at the same time to suggest a means of improving the ventilation of the Institute meeting-room, suggested that pipes should be carried up from the external air through the pedestals and the empty-headed busts of the Renaissance architects which are placed at intervals along the walls of the room. There was Mr. Tobin's principle in its entirety. Mr. Spiers having cited an instance in which this mode of ventilation had been carried out as far back as ten years ago, said that although the principle was good, it had one defect, and even Mr. Tobin did not claim that it did more than dilute the air. Of course, the best possible principle of ventilation would be that which would quickly remove all vitiated air and replace it with fresh air; but perfection had not yet been attained in ventilation. Mr. Tobin's principle did not admit of the removal of foul air, or of the supply of absolutely pure air. He regarded Mr. Tobin's claims to priority of invention in this direction as preposterous. He knew that many architects had for years past carried out the same principle of ventilation, and that they were continuing to do so, regardless of Mr. Tobin's pretensions. As to the shrinkage of timber in modern houses, he did not know how it was to be prevented, seeing that the bulk of the timber used in modern work was brought wet from the dock, and cut up and used often without the slightest attempt being made to "season" it. An American architect had in-

* See p. 516, *ante*.

formed him that in America, where building operations were carried on very rapidly, all timber, before being used, was placed for about three weeks in a hot room having a temperature of about 200°, and it would not do to use timber which had not passed through this ordeal, owing to the great extremes of temperature which characterised that climate. To a slight extent this precaution was adopted in this country, it being the practice of some builders to place their timber in the boiler-house, where it was subjected to a temperature of perhaps 90°. In answer to a question, Mr. Spiers said the timber was dried in America after being sawn, and not in the balk.

Mr. W. F. Potter said he thoroughly concurred with Mr. Mathews as to the great importance of having dry basements, but it was sometimes difficult to obtain them. Of course, when a gentleman was building a house for himself he was very particular on this point; but in building cottages or houses for his tenantry or workpeople the concrete footings, &c., which alone would effectually ensure dry basements, were generally the first thing to be sacrificed if the estimates had to be cut down. Difficulty was sometimes experienced by architects in obtaining dry areas to houses, although if the engineer were able to build a dry dock large enough to berth a ship in, it would not be creditable to the architect if he could not construct what might be considered a miniature dry dock in which to build a house. One point worthy of attention was that by building on concrete footings, and by spreading a layer of concrete a few inches thick all over the site of a house, rats, mice, black-beetles, and other vermin would find no lodgment in the basement.

Mr. H. H. Stannus thought that such practical papers and discussions as the present could not be too highly valued. Mr. Marnock, in speaking of electric or pneumatic bells, seemed to be under the impression that such bells were necessarily only provided with one gong. That was not the case, for as many bells could be used as there were notes in the chromatic scale. The fact was that it was merely a matter of economy to have only one gong to a number of communicators, and except in large houses one gong would generally be found amply sufficient. As to gas-pipes, they ought either to be always exposed to view, as was the case in Paris, or if concealed they ought to be carried up in "chases," in the same manner as soil-pipes, &c. As to the fibrous plaster ceiling slabs, there was no doubt that their use would effect a great saving of time, inasmuch as they could be made while the house was building, and screwed up directly they were wanted, and thus no time would be lost in waiting for plaster to dry. But, on the other hand, the joists would have to be made exceedingly smooth and true on their under surfaces if the slabs were to fit with anything like accuracy, and this fact, together with the necessity of concealing the joints of the slabs,—either by floating a thin coat of plaster over them or by covering them with bands or mouldings in relief,—would add considerably to the cost. In concluding his remarks, Mr. Stannus referred to the Museum of Building Appliances, adjoining the Architectural galleries in Conduit-street, as being replete with instruction to the architect and practical man, and it was only to be regretted that it was so small and so greatly overcrowded with models, &c. It was greatly to be desired that the museum, which was open free daily, should become better known to the public, who would gain much information from it as to what constituted good building.

Mr. S. F. Clarkson stated, with reference to bath-heating apparatus, that by placing the hot-water cistern against the kitchen range, with the flow and return pipes going direct from this cistern to the cold-water cistern, loss of heat through radiation would be reduced to a minimum. As to pugging for floors, whenever it was used some means should be contrived, if possible, for ventilating the joists. He thought that, in lieu of spindle-valves for cisterns, stop-cocks placed on the outside would answer more satisfactorily. Mr. Mathews had spoken, with reference to high-water pressure taps, of the difficulty of getting a tap which would at once shut off the supply. He thought that Tyler's "waste-not" tap was a very good thing. Where gas was used in large rooms, means should be provided, by means of a Carter's valve in an easily accessible position, to regulate the gas at will. A Carter's valve was best, because its leather could be renewed by merely unscrewing the upper diaphragm.

The President, in putting the vote of thanks to the meeting, said that such papers as that which had been read by Mr. Mathews were a sufficient vindication of the Association from the charge which was sometimes brought against it, viz., that it had forgotten its mission in the field of practical architectural education, and was "going in" too exclusively for art subjects.

Mr. J. Douglass Mathews, in replying on the discussion, said that there was no doubt that the use of slabs of fibrous plaster for ceilings would render it necessary that the joists should be more highly finished and more accurately laid than was generally the case, but he did not think that the additional expense would be very great. As to shrinking timber in the American fashion, at a temperature of 200°, he was afraid that its only effect in this country would be to cause the wood to warp and twist to an alarming degree. He cordially concurred with Mr. Stannus's remarks as to the Museum of Building Appliances.

NORTHUMBERLAND AVENUE, STRAND.

THE tenders for the building land here are to be sent to the Metropolitan Board of Works at the end of this week. Speculation is rife as to the rents that will be offered. We are bound to say that the system of letting by written tenders has never seemed to us a good one, and in many cases, we have no doubt, does not result in producing the largest rent obtainable. Those who would tender are entirely in the dark, and in the present instance we know of two public bodies who would gladly have given a large rent, and are absolutely deterred from making any offer under the course adopted.

INDIA "SPECIAL."

THIS rather vague and pointless title has been given to the collection of sketches taken by Mr. Simpson in connexion with the recent Indian visit of the Prince of Wales, and which are on view at the Burlington Gallery in Piccadilly. Of the sketches exhibited, 200 in number, about one-fourth were made for and have appeared in the pages of the *Illustrated London News*, but the remainder are new to the public, and the collection is worth a visit, both on account of the ability displayed in the sketches, hastily made as they necessarily must have been, and the interest of these representations, drawn almost on the spot, of scenes and incidents in connexion with a journey that has excited so much attention in England, and amid a country and people with whom many of us, though feeling so much connected with them politically, are practically unacquainted.

The majority of the sketches are tinted or shaded in Indian ink, with very slight foundation of pencil outline; one of the best methods of producing effect rapidly and without overmuch labour. The first on the list, the sketch of a group of dusky subjects waiting on the edge of the line of railway from Madura to Tuticorin, to see the Prince's train pass, strikes us as one of the best of the series; the character and action of the people,—the chubby little naked boys in the front of the line, the old, turbanned individual squatted near the foreground, the nice-looking woman standing by him, whose white drapery falls across her figure as picturesquely as that of some "classic" statue, are capital specimens of figures "hit off," as one says, with a slight and rapid touch. How far such sketches are really to be trusted as giving actual detail of grouping and expression,—how far the circumstances of the case render a little cooking up for the home market a necessity,—one cannot of course quite estimate. "Tiffin in the Jungle" (12), however, which is on a larger scale and more finished, shows that kind of distinction of manner as well as countenance in the figures which gives a realism to the whole, and makes them look like portraits. Some of the pencil studies, much more carefully made, of "native" heads, are very interesting, and bring vividly before us the wide distance between the character of these Orientals and the Europeans, with whom they have become so much connected. The artist has also shown, in spite of a good deal that is hasty, and sometimes apparently tentative, in the drawing of his elephants, a considerable power of realising the peculiar action of the various animals introduced in the sketches, as in the two elephants on the right of the drawing in "Crossing a Nullah in the Terai" (6), the "Buffalo Fight" at Baroda (22), where the straining action of the animal with his back to the spectator is very well given; the action of the tiger clinging to the elephant, and pawing wildly at the people in the howdah, in No. 34 (though surely the size of the elephant is exaggerated here), the fighting rhinoscerosses—or should one say *rhinoscerî?*—(29), which, by the way, would not fight, and which are fettered by a chain on the fore-feet in a way that does not seem likely to have left them much scope for a spirited engagement.

Among the most interesting of the drawings, in regard to subject, are the "Grand Chapter of the most excellent order of the Star of India" (39), presided over by the Prince and Lord Northbrook, where the former is placing the collar of the order round the neck of an Indian dignitary, "the Arrival of the Prince at Agra" (50), which gives a vivid notion of the Oriental splendour of the scene, in which the gorgeously-decorated elephants play an important part; the "Dinner in the Cave of Elephants" (81), though we scarcely feel sure whether such an incident deserves the name of a "great historical event"; "The Prince witnessing the Fireworks in Bombay Harbour from on Board the *Mayfair*" (98), a capital sketch, in which both the figures and the effect of the fireworks are exceedingly well given; and the "Lama Dance before the Prince at Jummoo" (142), a place the exceedingly heathen-sounding name of which seems singularly appropriate for a festivity as grotesquely Pagan as could well be conceived, consisting of a wild and uncouth dance of people in fantastic dresses and masks representing the heads of elephants, bulls, and other animals. "It was understood," the catalogue note informs us, "that there was a symbolic meaning in the whole of this performance," but no one was present to explain it to the spectators. It is just possible that the explanation might not have been very edifying, either. "The Sacred Bull" is portrayed (103) as he walks mildly about the streets of Benares, and is ever and anon decorated with garlands from devotional passers by; and a less mild phase of animal life is shown in the sketch of "Elephant-fighting at Baroda" (97), which, however, is by no means so direful a piece of work as might be supposed, as it should seem that these big fellows fight merely by pushing against each other,—on the principle of "the ram," in fact; a sort of fighting which can only be impressive when there is such heavy metal on both sides. Among the few sketches in water-colour is a very good one of the interior of the Prince's tent in the camp at Delhi, and a very comfortable apartment it seems to make, with very little of the tent appearance left in it; and there is a very bold and not altogether unsuccessful attempt to represent the effect of the illuminations at Benares, January 5 (45), when the temples, palaces, and the broad flights of steps of the ghâts descending to the river, were all illuminated, and must have produced, in conjunction with the reflection from the water, a truly magnificent effect.

Architecture is not entirely overlooked by the "Special," in the midst of the more lively attractions of the tour; and his architectural sketches, mostly in colour, are very good. There is one of the rock-cut temple, now well known to most of our readers, at Ellora (90), called here "The Kaillas"; Mr. Fergusson spells it "Kylas." There is a very good sketch also, more finished than most, of the remarkable and elaborate front of a Buddhist temple at Ajunta (73), engraved on p. 125 of Fergusson's "Indian and Eastern Architecture," which we reviewed not long since. The interior of that unhappy specimen of builder's Gothic, the cathedral at Calcutta, receives illustration (130); and another drawing shows a curious specimen of architectural (if one may call it so) fancy, in the triumphal arch designed by Mr. Wise, and erected by the natives at Colombo, Ceylon, and which is formed by two great figures of elephants, constructed of a framework covered with leaves and branches, standing face to face on either side of the line of march, and with their trunks elevated, and meeting at the tips so as to form a pointed ogee arch. This is a new suggestion in triumphal arches, at any rate.

Looking over these numerous and able sketches, and comparing them with the equally-ably written accounts of the special correspondents of one or two of our leading journals, one cannot but reflect on the immense value of such attendance upon a semi-royal progress of this kind. But for the efforts of these gentlemen, wielding the pen of the ready writer and the

pencil of the ready draughtsman, the tour which has been followed with such interest by millions of people would have been a mere matter of hearsay, of no interest at all, except in any ultimate results, to those at home. As it is, between the pen and the pencil we almost follow the whole thing, and feel as if we had been there; the advantage of which is probably, at least, as great to those who are sketched and reported as to those who read and examine the reports and sketches.

A WORD FOR THE FUTURE OF EGYPT.

AT the last half-yearly meeting of the Anglo-Egyptian Banking Company (Limited), Mr. Charles Hill, F.S.A., recently elected a director, made a speech which was not only very interesting, but which evidently produced a feeling of reassurance. After some statements showing the manner in which the revenues of the country were increasing, and that Egypt, in his opinion, had been dealt hardly with by a portion of the English press, Mr. Hill said,—They have 1,100 miles of railway; they have greatly increased works of irrigation; and then they have a wonderful harbour in Alexandria, which will probably be one of the most flourishing ports of the world; 1,000,000 acres of land additional, which will come under cultivation; 300,000 acres partly under cultivation, affording a large area of taxation; 1,000,000*l.* expended in telegraphs; and throughout the country altogether there are elements of wonderful prosperity. Murray's Handbook speaks of Ismailia, which was a part of the desert, and the great founder of the Suez Canal put up a little hut there in 1861 or 1862. Then it was quite a desert; it is now described as a most flourishing and most luxurious place, having 3,000 resident inhabitants, and a constant influx of people from Cairo and other places as a cool sea-bathing place. That gives an indication of what Egypt can do. The land is bursting with a desire to produce, and it only wants irrigation to make that land productive in the highest degree. Well, there are all these advantages in favour of Egypt, and as your affairs are involved entirely in Egypt, you must see what possibility of improvement you have from this point. Now let me call your attention to the time when American securities, which are now 106, and thought to be one of the best securities going, were at the present price of Egyptian stock, and you will bear in mind what comments were made in the press on American securities at that time, and you will bear in mind the value of the remarks made on Egyptian securities now. American securities were decried in every possible way; they were driven away to Germany, and they have had the advantage of a rise from 40 and 50 to 100. The English people went into them with avidity at 80 and upwards. Do not let us despair because we are in a period of panic, but let us hope, on good foundation and facts, there is a future for Egypt consoling and satisfactory for those who hold Egyptian securities. I do not know that I need say any more, but, as I have studied the matter very much, I shall be happy to assure any one of the facts I have stated by pointing out to him the official documents that he may confirm this view. Now you see the injustice of a remark made: why should he embarrass himself with a 7 per cent. stock; if he had given a 3½ or 4 per cent. it might have done. What would be the justification of a man saying I will give 3½ per cent. when he could give 7? Recollect the wants of the poor bondholders. They have no friends in the Press whatever. I ask the gentlemen of the Press to look at both sides of the question, and consider how injurious their statements are to the bondholders. This bank issued one of the loans, and the distressing letters we have had are most sad, and the holders find no friends to stand by them. The comforts of a great number of English families have been increased by the investments in these securities over a period of ten or twelve years, and there has been no default till April, and they have been alarmed and frightened out of their bonds, nobody to stand by them or defend them. There have been some comments about the amount of stock issued, and the amount of money that has gone into the Treasury. I am going to state a thing which may probably surprise you, but I venture to affirm that more money has gone into the Egyptian Treasury in relation to the amount of stock issued than went into our Treasury during our exigencies when we borrowed money and raised stocks at various rates. In 1787 England created 25,000,000*l.* of stock, and the Government received 13,000,000*l.*; in 1798 they created 30,000,000*l.*, and received 15,000,000*l.* And so it goes on. In 1801 they created 44,000,000*l.*, and received 25,000,000*l.*, and comparing this with what the Khedive has received, you will not find there is very much to complain of. The rate of interest has been different, but the rate of interest in the two countries is naturally different. The country produces two or three crops, and where such is the case there is no ground to complain on that subject. The time will come, as soon as this panic is past, that this thing will be looked upon more dispassionately, and then I hope that you will have many friends to come round the Khedive and the Egyptian Government, and assure us that the revenue should be properly applied, and, the extraordinary expenses ceasing, there will not be the necessity for extraordinary loans or increase of expenditure, and there is a very fair prospect that the country will go on continually flourishing, and that the result in the end will be that every engagement will be properly kept. Mr. Cave says that no doubt the country has flourished under the Khedive, and I say, looking back, you have a right to believe that the honour of the man is well founded, and in the future will be as faithfully maintained as in the past.

NEW INFIRMARY BUILDINGS FOR THE ST. OLAVE'S UNION.

THE guardians of St. Olave's Union have had erected, from the designs and under the superintendence of Mr. H. Saxon Snell, a large block of buildings forming part of a new infirmary which, when completed, will provide for the reception of the whole of the sick inmates of their present workhouses. The portion now built will accommodate 172 inmates, but eventually there will be accommodation for 400.

The buildings, which are situated at the rear of the Rotherhithe Workhouse, Deptford Lower-road, and cover an extent of ground which, including airing yards, is somewhat less than 2 acres, have been recently opened.

The central block contains accommodation for all the administrative offices. On the left of the entrance court-yard is the doctor's residence, and on the right are the apartments of the steward, with his store-room adjoining. On either side of the entrance-hall is the medical officers' consulting-room and the waiting-room and matron's offices. The back portion of this central building contains the kitchen, 30 ft. long and 25 ft. wide, fitted with Messrs. Benham & Son's patent apparatus, which, besides being capable of cooking for the whole of the inmates, has sufficient boiler power to supply hot water and steam to the laundry, and also to the lavatories, baths, and sinks situated in various parts of the building. Besides this apparatus there is a kitchener, which will, however, only require to be used when the larger apparatus is not at work. The scullery adjoins the kitchen, and is fitted with washing-troughs, plate-racks, and shelves. The officers' mess-room is also contiguous to the kitchen, and on the opposite side of a corridor are six rooms of various sizes fitted up for the purposes of a buttery, larders, bread and root stores, &c. On the opposite side of the kitchen court-yard is a coal-store, and in the basement there is cellarage for wine, beer, and other like commodities. The upper portion of this central building is devoted, on the one side, to the matron's apartments, and on the other to dormitories for the nurses and other officers.

On entering the central building, and passing through the hall, there is a corridor 220 ft. long and 6 ft. wide leading right and left to the female and male sick wards respectively. The male sick wards are different from those of any that have heretofore been built in the metropolis, particularly so in the arrangements for ventilation. The plan of the building generally is in the shape of an elongated T. The central portion contains a well-staircase, with short corridors leading on each floor to two large sick wards situated on either side, and to a smaller detached ward for the reception of such cases as it may be desirable to keep in separation.

Adjoining the corridors are the nurses' rooms and ward sculleries, each of which has inspection windows overlooking the sick wards. Each of the larger wards contains accommodation for thirty-two beds, and is 96 ft. long, 24 ft. wide, and 13 ft. high, thus giving 72 ft. superficial and 936 cubic feet of space to each patient.

The construction of the windows of this ward is peculiar. They consist of a combined casement and hanging-sash arrangement. The lower part is a folding casement, and being carried down to within 6 in. of the floor, the folds when opened form a protection to the head of the patient from any rush of cold air passing into the room from the outside, and by this means, when the weather will permit, the wards may be kept well flushed with fresh air without inconvenience to the inmates.

For the ventilation of the upper part of the room, where the foulest air generally collects, it is sometimes desirable to open the top of the windows only, and in those designed by Mr. Snell this is provided for by a short upper sash hung on weights, as in ordinary windows. By the use of Smith's patent water bars, and the precaution of well grooving and tonguing the hanging and meeting styles of the casement, all fear of draught through the window when shut is thought to be prevented. The ventilation of the wards during the night, and at other times when the windows cannot advisedly be opened, is provided for by flues passing up the walls and emitting the fresh air into boxes placed under the head of each bed. These boxes have perforated zinc fronts through which the fresh air passes into the room and under the bed; and inasmuch as hot-water pipes are placed in these upright shafts, the fresh air is so rarefied that, on its entrance under the bed, it rises and in its course encircling, as it were, the upper part of the patient as he lays in bed, draws away from him the carbonic acid and other deleterious emanations of the body towards the ceiling, where there is over each bed an up-cast shaft for conveying away the fouled air from the ward. Each ward, besides being warmed by hot-water pipes, is provided with three open fire-stoves, and the flues of those placed at the end of the wards are so contrived that the brickwork surrounding them forms a screen to the door opening into the cross ventilated lobby that gives access to the water-closets attached to each ward.

Messrs. Croaker Brothers are the builders, and their contract, which amounts to 14,859*l.*, includes for the whole of the fittings, blinds, gas, and hot-water pipes and appliances of every description. Had the building been completed under the same contract the cost would have been about 60*l.* per bed.

The cooking apparatus and hot-water supply has been executed by Messrs. Benham & Sons. The gas-fittings and pipes were supplied by Messrs. Berry & Son, and the heating-pipes by Messrs. Potter & Sons. Mr. Butler is the clerk of works. The roads round the building were executed by Mr. Etheridge.

THE PUBLIC WORKS DEPARTMENT, INDIA.

COMPLAINTS reach us from several quarters of India. One engineer writes:—

Sir,—If promotion is to be no better than it is now in the P. W. D., and if no improvement is to be hoped for in the pension rules, it becomes a question whether it is worth the while of civil engineers to remain in the service. They will not forget that they are not tied down to this country; that they have a profession with which they can always earn bread and butter in many parts of the world. No climate and no conditions of life will be worse than they are to the majority of us here. If one could save money in India for the inevitable "rainy day," well and good; but if service here affords a mere livelihood, I argue that it is mere folly to remain in the country. Men fancy, or some men fancy, they are saving; but a sick wife, a short home furlough, or other little incidents of an Indian career, will very soon dissipate this delusion. No one can hope to really save money till he reaches the grade of a superintending engineer, first grade, and then he must be very slightly married indeed,—two children at most. Below this all saving is a sham; it is spent in going home, in sending children home, in going oneself, in the expense of payment transfers, and in fifty ways.

Compare the life here with life at home or in an English colony. There we have our wives, our bairns, always with us, healthy and happy. What so-called "Indian luxury" can make up for this? Is the huge darkened barn of an Indian house, with its mouldy thatch and rat-eaten floors, to be compared with the snug cottage of a temperate climate? Is the loathsome drive in the cheap buggy, or country-made barouche, drawn by a couple of horses that a cab-driver would not look at,—is this

luxury? Is this to be compared to the bracing walk in a bracing climate, with one's wife on one side, and the children round us, through the green fields? Are the food and drink here luxurious? Is there anything to compare with a decent beef-steak and glass of beer, with the ability to digest both of them? Ah! we are fooling away the best part of our lives in working for employers that have as much thought for us as our coolies. If we could really repay ourselves for this life of exposure and discomfort by making a few pounds for our old age, it would be reasonable; but we plod on here with no other hope than a short furlough, ending in a pension after thirty years' approved service, or, what is more likely, and pays Government better, death. I call on my brother engineers to ponder seriously on this question,—whether they are acting justly to themselves and their families in remaining in a country where nowadays there is nothing to be got, nothing to be saved, and, as we all know, much to lose. How many have lost wives, children, husbands,—and what for?—for a livelihood. I say a livelihood is to be got by any honest and hard-working man in fifty places where mere life is a pleasure. I shall be glad to see a little wholesome discussion on this point; and I doubt, when everything is summed up, whether any engineer in Government service is saving money, or is much better than a DECENT PAUPER.

A PARENT says,—

The Government engineers in India have not had very fair treatment. They give their past experience and their best years, and are bound down to their salaries, now so much reduced by the depreciation of the rupee; for they are not allowed, in any way, directly or indirectly, to add to their fixed income. Can you not say something for them? A word to the British public in your paper might do good. You can fancy what hard lines it is now for those who send money home, when it costs my son 2*l.* to send 10*l.* That wants no comment.

NOTES ON THE CONSTRUCTION OF PUBLIC AQUARIUMS.*

THE science of aquarium construction is still in its infancy, and has not advanced beyond the point of tentative experiment. So few such buildings have been erected on a large scale that we have to await the test of time and experience before we can with certainty say this or that arrangement is best suited to attain the desired end. In this short paper, then, the most instructive course which can be pursued will be to submit and explain a few plans of buildings already, or about to be, erected.

The plan of the aquarium at Hamburg shows a vaulted central hall, which the show-tanks on each side, lighted by a continuous skylight, and rooms at the end for table-tanks. The building is sunk to more than half its height underground, and appears to be admirably arranged, though on a small scale.

A very complete building has recently been erected for the Marquis of Bute at Rothesay. Entering through a spacious hall, 45 ft. by 28 ft., on either side are rooms for the table-tanks, each 26 ft. by 22 ft., with refreshment and retiring rooms adjoining. Leading from the hall is the aquarium corridor, 90 ft. 6 in. long by 15 ft. 6 in. wide, and having on both its sides tanks,—four for fresh and eleven for sea water. They have each a frontage of about 10 ft., and an average depth of about 9 ft. In the rear are the curator's room, work and pump room, and a probationary tank-room.

The Crystal Palace Aquarium, erected in 1871, has a corridor 250 ft. long by 20 ft. wide, having the show-tanks on either side, nineteen in number, varying from 25 ft. to 10 ft. frontage, and about 10 ft. in depth. All the tanks are for sea-water, but a large fresh-water tank is in course of construction at the north end. A notable peculiarity in the Crystal Palace Aquarium is the ambulatory running parallel with and at the rear of the show-tanks, in which are placed an equivalent number of tanks in reserve, which are used to contain surplus specimens, and also for storing the shrimps and other food for the fish. Light is admitted by a skylight running continuously the entire length of the tanks, the light before reaching the public corridor having to pass through the tanks. The sea water introduced in 1870 is still in use, and is preserved in good condition by being constantly kept in circulation, special means being adopted for its aëration. This system of a never-ceasing current has resulted in securing brilliancy of water and great healthiness of the fish, and attests the accuracy of Mr. Lloyd's views.* This reference to the Crystal Palace Aquarium concluded Mr. Norton's notes on aquariums already erected, and he next proceeded to describe several buildings either in course of erection or about to be erected, under the direction of himself and Mr. Philip E. Masey as joint architects. These embrace buildings for Weymouth, Clifton, Yarmouth, and Tynemouth.

Weymouth.—At Weymouth, the site is very circumscribed, and, whilst the Aquarium was of necessity to be the main feature, it was at the same time desired to combine the attractions of a music-hall and winter-garden. This latter feature is placed in the centre, and measures 200 ft. by 60 ft., laid out with flower-beds, aviaries, statuary, and fountain, allowing ample space for promenade. The enclosing walls are recessed to hold shallow table-tanks, &c., and support galleries for the orchestra and spectators. The whole is roofed with glass. External to this saloon are parallel corridors, 200 ft. long and 9ft. wide, forming ambulatories to view the eighteen show-tanks, which are respectively 39 ft. long in frontage by 13 ft. in depth, 19 ft. by 13 ft., and 20 ft. by 3 ft. 6 in. Reference to the Manchester plan shows the origin of this special arrangement, but with the notable variation that whereas there the walls which separate the corridors from the main hall are pierced with arches, throwing a confused light upon the fronts of the show-tanks, solid partition-walls have been adopted at Weymouth, and as the skylights extend only over the tanks, the corridors are in comparative darkness, and receive light only through the luminous water. The estimated cost of the building is 30,000*l.*

Clifton.—The building designed for Clifton shows the same main characteristics. The central hall and promenade measures 222 ft. by 60 ft. The chief variation consists in the continuity of the aquarium corridor or promenade, which surrounds the hall on its four sides, affording an ambulatory of nearly 600 ft. in length by 9 ft. in width. The show-tanks are lighted from the roof, and are twenty-nine in number, varying in frontage from 59 ft. to 19 ft. At the sides of the entrance-hall are the refreshment and retiring rooms, &c., and underneath the great hall a skating-rink is designed. This building is estimated to cost 25,000*l.*

Yarmouth.—The Yarmouth Aquarium is approaching completion. The site is at the north end of the Marine Parade, close to the Britannia Pier, and is one acre in extent. The great hall is 194 ft. by 60 ft., the nineteen show-tanks ranging the entire length of both sides. Fifteen of these are for sea water and four for fresh water. They have frontages of 50 ft., 33 ft., and 16 ft., and are mostly 15 ft. from front to back, though some are as shallow as 7 ft. and 5 ft. for special purposes. The water occupies a depth of 5 ft., and the bottoms of the tanks are 3 ft. 6 in. above floor-level. The reservoirs range underneath the tanks, from which they are separated by arches resting on iron girders, and both bottoms and sides of the reservoirs and tanks are lined with Val de Travers asphalte ½-in. thick, well tucked into the joints of the brickwork, specially raked out to obtain a "key." The depth of water in the reservoirs is the same as in the tanks, viz., 5 ft., the proportion between the water in the store-tanks and that in the show-tanks being 1 to 1. These store-tanks or reservoirs are, of course, kept dark. The show-tanks on the west side receive light by a continuous skylight, 6 ft. wide; those on the east side are lighted by large windows, the sills of which are 6 in. above the water-line. In the centre of the hall will be the orchestra, and ranged between the iron columns will be placed table-tanks. These are of thick plate-glass, with enamelled slate tops, angles, and bottoms, and are made by Stirling. They are 3 ft. 6 in. diameter, 3 ft. 1 in. from the floor, and have a depth of 1 ft. 7 in. of water, giving a total height of 4 ft. 8 in. A seal-pond is sunk in the floor at the south end, and an alligator-pond at the north end, the latter heated artificially, and both measuring 17 ft. by 13 ft., with a depth of about 5 ft. of water. The narrowness of the site not allowing of the ambulatory and store-tanks being placed in the rear of show-tanks, as at the Crystal Palace, a light gallery running the entire length above the glass fronts of tanks allows the attendant access to feed the fish, &c. Space is gained at the ends for reserve tanks, as well as for rooms for the naturalist and his assistants. The entrance to the aquarium and future skating-rink is by two vestibules 18 ft. wide and 100 ft. in length. The rink will occupy the remainder of the ground to the south, and the restaurant that to the north. Underneath the north vestibule are placed two vertical boilers, two horizontal steam-engines, and three 4-in. rotary pumps, each capable of raising 8,000 gallons per hour; two other 3-in. rotary pumps, each capable of raising 5,000 gallons per hour, and two other pumps capable of raising 7,500 gallons per hour. These are supplied by Leete, Edwards, and Norman, and will secure a constant circulation all the year round between the store-reservoirs and the show-tanks, both sea and fresh water. They also lay on the water to the table-tanks and seal-pond, the pipes running in trenches under the asphalte and cement floor, which contain also the heating-pipes, an apparatus by Bacon & Co. being fixed in the engine-room in the basement. The steam closet and chest, gas roasters, lifts, &c., are supplied by Wailer. It is intended to build a great music-hall over the aquarium, club and billiard rooms over the restaurant, and a glass winter-garden over the skating-rink. A temporary rink will be formed over the aquarium on the Portland cement surface which finishes Dennett's arched floor, and will afford about 20,000 square feet of area for skating. The contractors for this building are Messrs. Charles Aldin & Sons.

Tynemouth.—The Duke of Northumberland having granted, for a rental of 1*l.* per annum, some twelve acres of the cliff between Tynemouth and Cullercoats, the buildings are about to be commenced by Mr. Bergheim, at the contract price of 63,000*l.* The general arrangement of the great hall, relative position of tanks and reservoirs, and the proportion these bear to each other, are so similar to Yarmouth that it will only be necessary to state that the great floral and music hall will be 216 ft. by 50 ft. The aquarium will also be 216 ft. by 50 ft., containing tanks of varying depths and frontages, suitable for fresh and sea water fish, zoophytes, and sponges, in addition to which will be table and reserve tanks. The flanking buildings will be appropriated to entrances, refreshment and retiring rooms, and a smaller concert-hall. The baths in this scheme present a somewhat novel feature. They consist of ladies' and gentlemen's first and second class swimming-baths, private bath-rooms, and rooms for refreshment, engine, laundry, &c. The rink occupies a separate site on the upper level.

In conclusion, Mr. Norton said:—The noticeable distinction between the various plans I have submitted to you is the relative position of the show-tanks with respect to the ambulatory or spectators. At Westminster we see the evil effect of the tanks forming the sides of a top-lighted hall. At the Crystal Palace and Brighton the benefit of keeping the part devoted to spectators in comparative darkness is well shown. At Manchester the first suggestion was for an aisle, since actually developed in the designs for Weymouth and Clifton, where the nave is entirely cut off, and serves as a winter garden, the aisles forming the walks for spectators only deriving light through the plate-glass fronts, the water in the tanks being brilliantly illuminated.

The question as to the necessary proportion of water kept in the dark reservoirs, as compared with that in the show-tanks, is now being debated by those two eminent authorities, Mr. Lloyd and Mr. Saville Kent, the former gentleman insisting that it should never be less than 3 to 1. In actual practice at the Crystal Palace it is 5 to 1, and at Westminster 6 to 1, or 500,000 gallons to 100,000 gallons. Mr. Saville Kent, on the other hand, affirms that a proportion of 1 to 1 is all that is essential for success. Where such philosophers disagree it is difficult for us to decide; but, in practice, motives of economy, as a rule, determine the question, clients being unwilling to expend thousands of pounds in constructing underground cisterns when such an authority as Mr. Kent assures them that the reserve need not exceed the contents of the tanks themselves, which can thus economically be built, as at Yarmouth, in the space between the ground and the floor of the show-tanks. There is no necessity for sinking an aquarium underground, as at Boulogne and Hamburg. There is no need to

* From a paper read by Mr. John Norton before the Architectural Association on the 2nd inst.

* A full description of the Crystal Palace Aquarium, and of the means taken to aerate the water, will be found in the present volume of the *Builder*, pp. 222 and 246, *ante*; also in vol. xxxii (1874) p. 626.

change the sea-water; in fact, it is proved to be better suited to maintain healthy animal life now than when first imported, six years ago. The method of oxygenating the water by means of a constant flow and change has so completely taken the place of the old system of aërating by forcing air either from below or above, that in any buildings we are called upon to design it must be accepted as a *sine quâ non*, and arrangements made for steam-engines, boilers, and steam pumps. A continual source of annoyance at the Crystal Palace, at Westminster, and other aquariums has been the frequent bursting or blowing out of the glass fronts of the tanks, which, though of the thickest plate, have been found unable to bear the great pressure of the water. It is be hoped that experiments will now be made to with the new toughened glass, which is said to resist five times the ordinary breaking strain, and by which the depth of water may be indefinitely increased without danger. The greatest care must be taken in fixing the glass to the iron frames or mullions and the stone heads and cills, so as to secure a perfectly even bed or surface, and minor precautions taken which time does not allow me to enter upon. It is better to adopt asphalte than cement for the inside coating of tanks and reservoirs, and no expense should be saved in getting the work done in the best possible manner. The tanks are furnished with rockwork composed of granite, Derby spar, or Portland spalls, varying in thickness from 10 in. to 3½ ft., put together with Portland cement. The back of the seal-ponds may be fitted with rustic rockeries, waterfall, ferns, palms, mosses, and creeping plants. As no aquarium in its present highly developed form is supposed to contain sufficient interest to secure permanent success, it is now considered necessary to supplement its attractions by subsidiary features, and hence the necessity to provide music and concert halls, winter gardens, skating-rink, clubrooms, restaurants, baths, and pleasure-grounds. The whole subject is well worthy the attentive study of the junior members of the profession, as the fashion is rapidly spreading from the mother country to the far East and West, in proof of which I may mention that we have been already consulted as to the construction of aquariums in Australia and in America.

AMONG THE RUINS OF IONA.

WHAT is being done at Iona? There is perhaps no more interesting spot out of Judea than this "island of the waves"—the very cradle of Christianity in Britain,—an island that abounds with priceless relics of antiquity, and contains, according to tradition, the tombs of scores of early kings, chieftains, warriors, statesmen, monks, and bards. Alluding to its famous architectural remains and sculptured memoriale, Dr. Johnson uttered one of the most memorable of his sayings—"The man is little to be envied whose patriotism would not gain force upon the plains of Marathon, or whose piety would not grow warmer among the ruins of Iona." It may not be uninteresting to give some account of these ancient and sacred relics, and of what has been done, under the direction of the Duke of Argyll, the owner of the island, to preserve and enhance their appearance. Nearly all the foundations of the chapels and cloisters that were formerly heaps of rubbish by the fallen *débris* of the walls, and overgrown with grass, like so many green mounds, are now clearly defined, and built so as to present to the spectator a correct outline of the original plan of the abbey. The greater part of the labour has been bestowed on the north side of the cathedral, in restoring the chapel and refectory walls; the doorways and windows have been reconstructed in imitation of the style of the old architecture. The walls of the chancel have been strongly built, and to all appearance are quite capable of bearing a roof. A wall has also been built around the tomb in which St. Columba is said to have been buried. To the left of the entrance to the cathedral, on the Tow-Abbe, as the little hill in front is called where the saint is said to have uttered his remarkable prophecy, a square foundation is exposed, where once stood a cross. Outside the wall, and in front of this hill, another structure has been exposed. The excavations at the nunnery have been successful in bringing to view the lines of the foundations of that ruin also. The cloisters have been built a few feet high, the walls and gables have been repaired, and several of the windows restored. Among the numerous tombstones brought to light by the excavations is a very beautiful one, said to belong to the fourteenth century. The figures of two warriors in armour, and a galley, are sculptured upon it, besides other devices, and a Latin inscription not yet deciphered. It was found near the surface in the east aisle. If we are to believe the common tradition, it was in the year 560 that St. Columba, then forty-two years of age, crossed over from Ireland to Iona in a curragh, or wicker boat, and, founding a monastic establishment, he set to work to convert the people. The monastery, it would appear, was destroyed about 250 years after the Saint's death by the invading Norwegians, who likewise killed all the monks. The Martyrs' Bay, a little to the south of the landing-place, commemorates the massacre. During the next four centuries the island remained unoccupied, but about the beginning of the thirteenth century a sisterhood of nuns, who followed the rule of St. Augustine, found their way to the island, and established a nunnery. About the same period some Cluniac monks, from Paisley, of the order of St. Bennet, landed at Iona, and erected the cathedral, which remains an object of veneration to the present day. The edifice, which is dedicated to St. Mary, is cruciform; its length is 160 ft., breadth 24 ft., transept 70 ft., and the choir 60 ft. It has a square tower, 70 ft. in height, supported by four arches adorned with figures in basso-relievo. The tower itself is extremely plain, but the tracery of the windows is very fine, and some of the ornamentation in different parts of the church or abbey is curious and beautiful. The capitals of the columns are of freestone, and carved with grotesque figures, still very sharp and well preserved. One of the capitals, for instance, under the tower, represents an ox about to be sacrificed. Two figures hold the ox, and behind is a priest chanting. Above is a dog coursing a hare. On the opposite column are two persons buying, with a pair of scales. Other columns represent the temptation of Adam and Eve; the fall of our first parents, and their approaching punishment; the Crucifixion, with the Virgin Mary seated, and an angel on either side; Peter cutting off Malchus's ear; an angel weighing a man's good deeds against his bad, while the devil is trying to get the balance of bad deeds down. Besides these quaint delineations, there are represented dragons with tails, ending in scrolls and foliage.

Much of this interesting work has been injured and mutilated by the barbarous acts of unprincipled relic-hunters. Since the Duke of Argyll appointed a guide to show visitors over the ruins these acts of vandalism have, happily, in a great measure ceased. The style of the whole is Early English, but the pillars and their decorations are the vestiges of an earlier era. On the north side of the chancel are the tomb and statue of Abbot Mackinnon (who died in 1500), with the head broken off. The same abbot's cross is in St. Oran's chapel, to be noticed presently. In the centre of the chancel stands the tomb of Macleod of Macleod, now the largest monument in the island. North and east of the cloister are the refectory and chapter-house, the latter a gloomy vaulted chamber, of which the roof is still entire. Over the chapter-house was the library, the repository at one time of a very valuable collection of books. In former years Iona was the place where the archives of Scotland, with many precious MSS. were kept, and it was in this library probably where these were deposited. At the Reformation most of the books, &c., were destroyed, though many of them, it is believed, were carried off to the Scottish College at Douay, in France. Of the principal altar of the cathedral,—the altar of St. Columba,—no vestige now remains. This shrine, which was 6 ft. by 4 ft., and built of marble, was entire so late as the year 1688, and is described by Pennant. By the side of the west entrance to the cathedral may be seen a granite cistern, which is said to have been used for the purpose of washing the pilgrims' feet, and in front of the edifice stands the celebrated cross of Iona, dedicated to St. Martin. This object is adorned with a profusion of Runic sculpture, and hewn out of a solid block of granite 14 ft. high.

Undoubtedly the most ancient and interesting of the ruins of the island is the chapel of St. Oran. The architecture of this small building (it is only 40 ft. by 20 ft.) is of the plainest description, its only decoration consisting of some chevron mouldings in the arch of the doorway, and a triple arch, which latter, however, has been added to the chapel since it was built. It is supposed to have been erected by the Norwegians in the twelfth century. The chapel contains several tombs of different dates, among others the supposed tombstone of St. Oran himself, whose fate, according to the chronicle, was very melancholy. A contemporary of St. Columba, St. Oran, we are told, was buried alive here to appease some fiend who undid in the night Columba's work of the day. After three days Oran was dug up, and immediately began assuring the bystanders that there was neither God nor the devil, future happiness nor punishment. Of course, such heterodox, not to say wicked doctrines, could not be tolerated, and Columba ordered the backsliding saint to be immediately re-interred. The transaction gave rise to a Gaelic proverb to the effect,—"Earth, earth on the mouth of Oran, that he may blab no more." The tourist has also pointed out to him here the effigy of a man in armour, the monument of Macquarie of Ulva, that of Angus Macdonnell, Lord of the Isles, which bears the carved representation of a galley, and the cross, or rather a portion of it, of the Abbot Mackinnon, under a canopied recess. Some of the traceried designs on these stones are characterised by considerable elegance and intricacy, considering the refractory nature of the material (mica slate) on which they are executed. The chapel of the nunnery, which has now been partially restored, is not without interest. It was built subsequently to that of St. Oran, and its architectural features belong to the Later Norman period, verging into those of the Early English style. The vaulted roof is constructed of very thin stones, bound together by four ribs, which meet in the centre. Here we see the monument of the last prioress, which is damaged by, as it appears, a portion of the roof falling. However, the inscription may still be read, and runs thus:—"*Hic jacet Domina Anna Donaldi Ferleti filii, quondam Prioressa de Iona, quæ obiit anno MDXLIII., tio ejus animan Altissimo Commendamus.*" The figure of the prioress is carved on the face of the stone, her head being supported by an angel on either side, and above is the representation of a looking-glass and a comb. The monument also bears the effigy of the Virgin Mary, over whose head are the sun and moon, signifying that she was Queen of Heaven. When Pennant visited Iona in 1772 he found this chapel doing duty as a cattle-shed, and this interesting memorial of the good prioress embedded several feet deep in dung! It is satisfactory to know that it is now being better cared for.

Leaving the nuns' chapel, we pass along a paved roadway called "Straidh na Marbh" (the Street of the Dead), and reach Reliq Oran, the burial-place of St. Oran, the consecrated spot where

> "The mighty kings of three fair realms are laid."

The Royal Cemetery, a portion of which is railed in, adjoins the chapel of the saint mentioned. Here, as Robert Chambers remarks, are gathered together "perhaps the most extensive holy alliance or congress of European sovereigns on the other side of the grave." We fear, however, that little can be pronounced with certainty in regard to Reliq Oran. The accounts handed down to us do not tally with sufficient historical accuracy. The tombs have been a good deal disturbed, and then it is probable that some of them have disappeared altogether. Certainly the existing remains are very considerably defaced as well as effaced. The kings, it is recorded, were buried in three separate tombs in the form of small chapels. The first contained the ashes of forty-eight Scottish monarchs, from Fergus II. to Macbeth. It was called Tumulus Regum Scotiæ. The second was inscribed "Tumulus Regum Hiberniæ," and contained the remains of four Irish kings; and the third chapel, the resting-place of eight Norwegian kings, was known as Tumulus Regum Norwegiæ. But discrepancies exist as to the exact number of these monarchs. One writer says forty of Scotland's rulers, another limits those of Norway to five, while another adds one king of France to the list. The sanctuary of the Norwegian sovereigns appears to have been shared by the lords of the Isles,—the M'Leans of Mull, the Macquarries of Ulva, and others. The tombstones are disposed of in nine rows, the third being the ridge of the kings, containing the royal personages aforesaid; the fifth comprises the priors of Iona; in the sixth is the ancient Clach-a-Brath, or hollow stone basin, containing several others, which it was the custom of pilgrims to walk thrice round, according to the course of the sun; the seventh row is the resting-place of the McLeans, the chief of Coll's tomb being

the handsomest of all. A green mound is pointed out near the Bay of Martyrs, whereon the bier was wont to be placed or rested while the mourners formed procession; the coronach or wail for the departed was then raised, and the coffin was borne through the street of the dead to its long home in the Reliq Oran. Almost every family of distinction in the Western Highlands had at one time, it is believed, a burying-place in Iona, and each grave had its distinctive cross. But out of 360 crosses which once adorned the island, two only are left, if we except the pediments of two more. The cross of Iona we have already alluded to. On the west side of Martyr-street stands M'Lean's cross,—a beautifully carved pillar, well preserved. The remainder of these relics were sacrificed at the Reformation by a sweeping edict of the Synod of Argyll. A large number were thrown into the sea, and many more were transported to other places. At Inverary, Campbeltown, and Dunstaffnage, for example, may be seen sculptured stones of Iona which may have covered great lords of the Isles, and have been carried off, that humble chiefs of the mainland might repose under them. That Iona should have become the favourite place of sepulture in which so many kings, princes, and lords were so ambitious to rest, may be readily accounted for. For one thing, there was the peculiarly sacred character of the island; but the desire was due more immediately, perhaps, to the traditionary belief that Columba's isle was to be particularly favoured at the dissolution of the world. It was founded on an ancient Gaelic prophecy, of which the following is a translation:—

"Seven years before that awful day
When time shall be no more,
A watery deluge will o'ersweep
Hibernia's mossy shore.

The green-clad Isle, too, shall sink,
While with the great and good
Columba's happy isle will rear
Her towers above the flood."

In a second poetic prophecy St. Columba is said to have foretold the destiny of his retreat:—

"Oh, sacred dome, and my beloved abode,
Whose walls now echo to the praise of God,
The time shall come when lauding monks shall cease,
And lowing herds here occupy their place;
But better ages shall hereafter come,
And praise re-echo in this sacred dome."

This prophecy has been to some extent fulfilled. The time did come when monks ceased to say their prayers and tell their beads in Iona, and only lowing herds occupied their place for many a day. For have we not seen that the religious edifices of the place were literally turned into barns and cow-sheds? Although as yet praise does not re-echo in the sacred dome, the primitive inhabitants of the island (numbering about 500) have for years had a modern Established Church, as well as a Free Church, in their midst, and who knows that the concluding part of Columba's prophecy may not one day be fulfilled also, now that something has been done towards the restoration of Iona's ancient architectural remains?

RAILWAY EXHIBITION.

ON "Derby day" an exhibition was opened at the Crystal Palace of so-called "railway appliances," or objects connected nearly or remotely with railways and railway working. A good many objects were shown that could scarcely be said to relate to either.

The exhibition was arranged in the nave between the transept and the crystal fountain. The first objects presented were two powerful railway weighing-machines, one fixed, the other portable, by Messrs. H. Pooley & Son. Next in order was a hut roofed and walled with the patent concrete slabs of Mr. W. H. Lascelles, the capabilities of which have been recently noticed in the *Builder*, and do not, as adapted to cottage-building, call for further notice here. The erection was, however, in its proper place, inasmuch as attached to the hut was a short section of a cover for a railway platform, roofed, and the vallance formed, from the red tile-like slabs, showing the suitability of the material for this species of structure, as admitting of the erection rapidly, of a substantial station covering, at a small cost. A greater curiosity in the use of concrete was shown in the railway and tramway sleepers made of the same material. The railway sleepers had iron rods imbedded in the centre, not for the resistance of crushing, but of striking or hammering force. The strength of the material is very great, as had been proved by an octagonal block that was shown with the sleepers. It had been tested by hydraulic power with blocks of timber. Oak, with the fibre placed vertically, gave way at a pressure of between 180 and 200 tons, but the concrete block, under that pressure, remained uninjured. In durability, if in other respects it is suitable, the concrete sleeper would be superior to all others. For street and road tramways the concrete sleepers would probably be an improvement upon timber, provided that the rails can be properly fixed, and that the concrete would have power to resist the effect of concussions to which it would be subject. Its use would probably greatly diminish the injury and disturbance of the roads, and the inconvenience caused to other users of them, by the use of wooden sleepers. Mr. Lascelles's stall included also specimens of his patent sash-bars of cement, cast with an iron bar in the centre, and of his bent wood sash-bars. The one he recommends as being indestructible by the weather, and not requiring painting; the bent wood bars as combining maximum strength with minimum of material.

Among the novelties in railway appliances proper was an interesting working model of Sykes's patent lock and block electric signals, for which it is claimed that it would leave nothing to the memory of the men working the signals, and that it would make it impossible for more than one train to be in any one section of the line at the same time, as frequently occurs under the present block system. The construction appears simple, and easily adaptable to ordinary signal and point levers. In a recent railway accident the load of snow upon the semaphore bore it down from the horizontal, or danger position, to the slope, or "line clear." Mr. Sykes gives the semaphore-arm an upward slope for "line clear."

A beautiful working model was shown by Dr. Whyte, of Elgin, the inventor, illustrating his system of automatic electric signalling, by which the trains work the signals, blocking one section and opening another as they proceed. The model consisted of a circular railway fitted with semaphores, running and fixed contact plates, batteries, insulated wires, &c., and gives audible, as well as visible, signals with great precision as need may require. We noticed that every signal when at danger is guarded, and a bell is rung on the engine approaching, so that the signals are practically double; no signal can be unset by the passing train until another has been set, and a section is always kept clear by the arrangements adopted. The system is highly ingenious and complete, and has been tested successfully on a section of the Highland Railway. It may be feared that the delicacy of the apparatus and nicety of the arrangements will stand in the way of its general adoption. Dr. Whyte also exhibited an effective automatic brake.

A large working model was shown, illustrating the action of Mr. Attwood Brockelbank's patent coupling, that is regarded very favourably, we believe, by railway authorities, on account of its simplicity and the quickness and certainty of its automatic action.

The dangers attendant upon "fogging" are well known among railway men, especially on metropolitan lines, and Barry's apparatus, by which fog signals may be placed upon the metals without the signalman leaving his box, is well worth the attention of railway managers. In the Abbot's Ripton accident, it may be remembered, the signalman stated that he had not time to lay fog signals on the rails before the accident occurred. By the apparatus shown this would have been the work of only a few seconds.

Amongst exhibitors who may well dispense with any notice herein, their standing and reputation being enough to secure the respectful attention of the visitors, we may mention a few of many:—The London and North-Western Company, who sent five models of railway carriages, travelling post-offices, &c.; Mr. J. Cowdy, who furnished a fine galaxy of lamps; Messrs. Saxby & Farmer, signal engineers, who had an interesting stand; Messrs. Varley, who had an excellent display of telegraphic apparatus; Messrs. Banister & Annett, who showed a beautiful model illustrating their clever system of locking points and signals; Messrs. Reynolds's safety apparatus for the protection of points and signals; Mr. W. Inigo Jones's fine display of brass furniture for railway carriages; Hill's carriage window-holder, that is now getting to be generally and favourably known; Bristow's gas compressor; Wood's fine show of model engines; and divers others that we do not stop to name.

At or near the end of the range, towards the Hall of Kings, one of the most interesting collections in the Exhibition was to be seen in the assemblage of tools displayed by Selig, jun. & Co., represented by Mr. Neat. These were chiefly importations from America and the Continent of Europe, and included some remarkably clever tools and appliances. Those that attracted most attention were the hand-worked earth-borers, various in diameter; the belt-shipper, a simple and inexpensive contrivance, by which belts can be shifted whilst the machinery is in motion without the operator going near the riggers. This tool is, we hope, destined to come into general use until something simpler or more effective is brought out. On this stall also a machine for planing iron was shown, worked by hand, and taking work 8 in. by 4 in. It was shown at work, and performed well and quickly, quite distancing the progress that could be made by chipping or filing. The same firm showed, amongst a host of other tools, a hand-machine for boring wood to any angle, right or left, and another, double-action, for drilling iron to a variety of slopes and different bores. Tanite emery wheels were also shown, with other tools that we do not wait to enumerate.

The exhibits were not as numerous as they were last year; the exhibition, nevertheless, was of a most interesting character. Speaking for exhibitors who do not send attendants or guardians with their property, we should say that the Crystal Palace Company would do well to employ means to enforce the injunction, "Visitors are requested not to touch." With some visitors that we saw, a polite request was useless, whereas a sharp rap over the knuckles might have proved effective,—they deserved it.

CONGRESS OF FRENCH ARCHITECTS.

A CONGRESS of French Architects, under the presidency of M. Lesueur, will be held next week at the École de Beaux Arts, Paris, commencing, like that of their English brethren, on Monday, the 12th. Papers are to be read and places visited precisely as in our own case, and a confraternal dinner, at the "Grand Hotel," with *audition musicale*, will close the proceedings, on Saturday, the 17th.

Mr. Charles Lucas is the Secretary of the Congress Committee, at the meeting place of the Société Centrale des Architectes, 23, Quai de l'Horloge.

THE FRENCH INTERNATIONAL EXHIBITION OF 1878.

THE Commission appointed to examine and report upon the ninety-four designs submitted for the Exhibition building, have made their report. For reasons given, the Commission decline awarding a first premium. They consider that if it be desirable to utilise the ideas to be found in certain designs, it is just to acknowledge publicly the merits of their authors. Accordingly they recommend to the Minister to award a premium of 3,000f. (120*l.*) to each of the following six competitors, classed in the order of their hanging:—38, MM. Daviond et Bourdais; 69, M. Bruneau; 73, M. Crépinet; 80, M. Coquart; 89, M. Picq; and 93, M. Roux.

Considering that there are others which, by reason of certain points of detail, merit attention, they further recommend that a premium of 1,000f. (40*l.*) be given to the following:—42, M. de Baudot; 55, M. Simil; 60, M. Eiffel; 67, M. Raulin; 68, M. Hué; and 81, M. Flou.

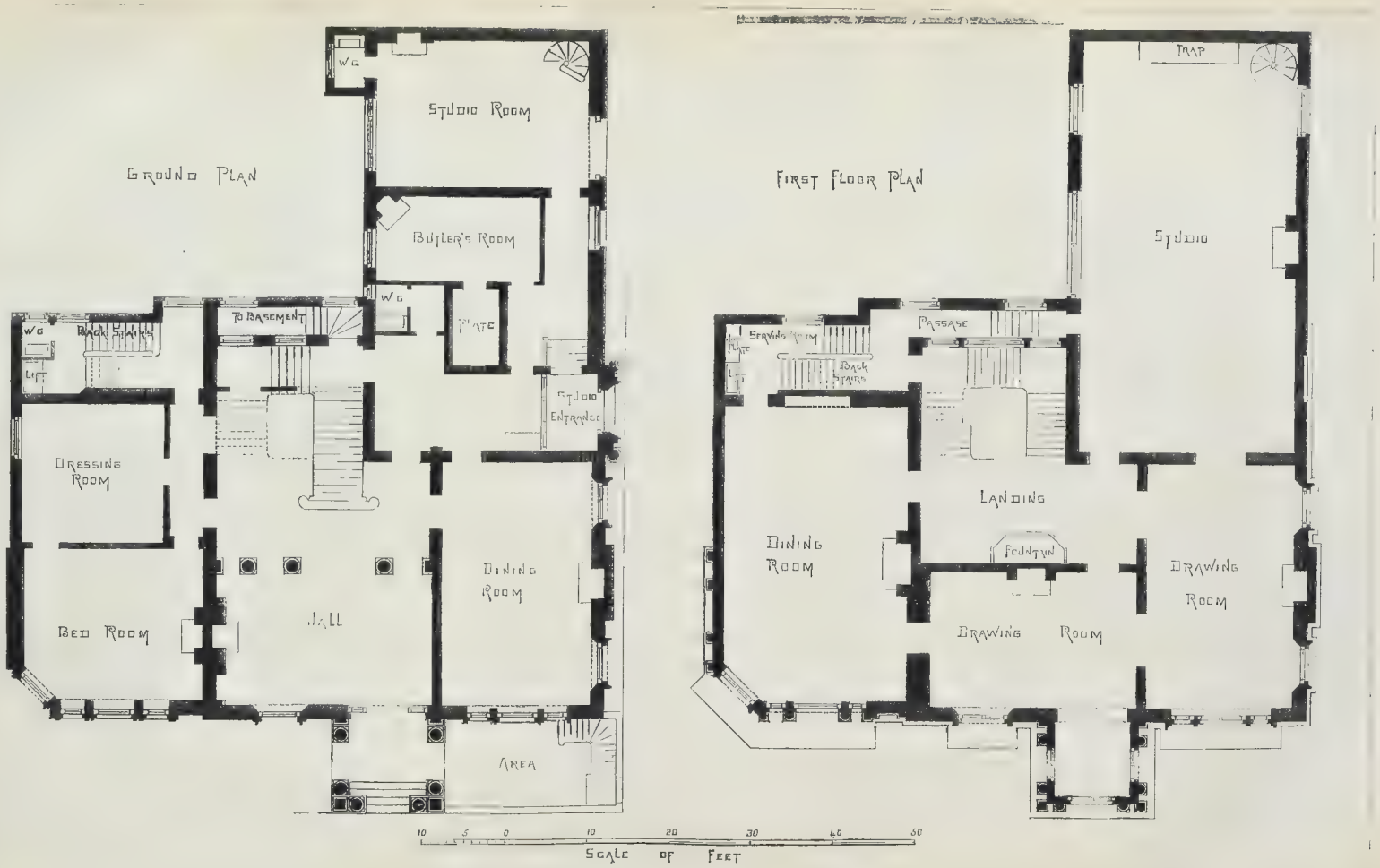
Lightning Conductors.—At the Science Conference at South Kensington on the 30th ult., Dr. Mann described the lightning-rods and apparatus for protection from lightning exhibited in the collection. He showed the relative values of copper and iron, the unimportance of their form, whether ropes, rods, or pipes, so that they are of sufficient size, and the need for domination of buildings by abundance of good points; but, above all things, he insisted on the indispensable importance of large earth contacts, and as to how these may be secured. A lightning discharge passing through an ample rod with large earth contact is a gentle stream, with low tension and no erratic and disruptive tendency. With small earth contact the discharge passes through the rod with high tension, and a most dangerous tendency to find other lateral passages of discharge for itself, and through bodies standing near the rod.



THE TOWN HALL OF BRESLAU, IN SILESIA.



NEW HOUSE AND STUDIO FOR MR. J. E. MILLAIS, R.A., PALACE GATE, KENSINGTON.
MR. HARDWICK, ARCHITECT.



RESIDENCE AND STUDIO, PALACE GATE, KENSINGTON.

HOUSE AND STUDIO FOR MR. J. E. MILLAIS, R.A., KENSINGTON.

SOME short time ago particulars were given in our pages of the house now in course of erection for our distinguished countryman, Mr. J. Everett Millais, R.A., from the designs of Mr. Hardwick, at Palace Gate, Kensington,* and we then promised to illustrate the account with a view and plans. This promise we now perform, and for convenience' sake we repeat a few of the particulars given. The building is Italian in style, the façades being of red brick, with Portland-stone dressings. It comprises basement, ground-floor, one-pair floor, and two floors above devoted to bed-rooms. The basement includes kitchen, larders, butler's pantry, and the usual offices, together with servants' rooms. A principal feature of the ground-floor is the entrance-hall, 29 ft. by 26 ft., which is approached from a porch. Running across the hall is a screen of columns of veined marble. The floor is paved with coloured marbles. Running round the hall and up the staircase, along the first-floor landing, and then as high as the great staircase-window, will be a dado of Carrara and veined marble. On the ground-floor will be a bedroom and dressing-room, with conveniences; private sitting-rooms, a room beneath the studio for models, storage of canvasses, and so on. Access to this room is obtained by means of a separate entrance provided on the south side of the building, and once in this room the studio above is reached by means of a circular iron staircase in the south-east corner. The principal staircase is of Portland-stone, with wrought-iron scroll surmounted by a hand-rail. The first-floor landing will have a fountain. The suite of rooms on this, the principal floor, represents a length of 145 ft. from end to end. The principal drawing-room is 29 ft. by 18 ft. The smaller drawing-room, 26 ft. by 18 ft. The principal dining-room is 35 ft. by 22 ft. All these rooms are 15 ft. high. But the chief apartment on the first-floor is the studio, 50 ft. by 29 ft., and 24 ft. high; with large doors opening into the drawing-rooms for special occasions. The studio is lighted in the day-time by three windows, two on the north and one on the south. The walls have a dado in wainscot oak, and from this pilasters are carried up at intervals to the cornice. All the rooms, including the studio, have open fire-places, but the studio and dining-room are also provided with hot-water coils for use in cold weather. The floors throughout are Fox & Barrett's iron and concrete fireproof construction. Foreign cherry-wood is largely used for doors, window-frames, and other joinery. Messrs. Cubitt & Co. are the contractors. Messrs. Welton and Denny have been the foremen in charge of the works.

We express a cordial hope that Mr. Millais, in his new home, to which he will probably remove towards the end of the year, will long continue to adorn the profession in which he rightly holds so distinguished a position.

BRESLAU AND ITS TOWN HALL.

BRESLAU, on the Oder, the capital and great central point of the Prussian province of Silesia, ranking third as regards number of inhabitants (220,000) amongst the cities of the German Empire, was already a town of some importance in the Middle Ages. Tradition traces its history back to 900 A.D., when it was, as Berlin somewhat later, only a cluster of fishermen's huts. Speculation has been rife as to the origin of its name, but the most probable of the theories advanced is that it is derived from the Sclav *brod slava*, "the Sclavs' ford," and it is explained in this way. On the right bank of the river Oder lay the strongholds of the Poles (Breslau, Glogau, Brieg), erected of wood; the country between them and the mountains separating Bohemia and Silesia was the fighting ground on which Poles and Bohemians strove for mastery and plunder; the former, when worsted, withdrew behind the protecting river. It is on the right bank of the river, round the old Polish bulwark, that we have to look for the first traces of its foundation. Here also, at the introduction of Christianity, the first cathedral, a wooden structure, was erected, which in time gave place to the present imposing edifice. The Breslau of our time, however, on the left bank of the Oder, dates from the time of the fearful incursion of the Mongols (1241), when the part of the town on the left bank, protected merely by wooden walls, constructed of palisading with earth rammed in between, fell a prey to the flames, kindled, probably, not by the Mongol hordes, but by the inhabitants themselves, who withdrew to the other bank of the river, under the protecting walls of the "Burg," or castle.

Breslau, consequently, though of such an early foundation, is by no means a city having a Mediæval appearance. Any one approaching it by rail from the north or west, and noticing the numerous lines of railways and its many manufactories, would think he is entering a modern industrial or commercial town; this picture, however, changes somewhat as soon as the cab or omnibus takes him through the more fashionable streets of the so-called "Geheimrathsviertel" (the privy councillors' quarter), many of which remind him in their dimensions of Berlin. This part of the city affords some of the best aspects of modern Breslau. The older portions of the city are entered where the streets get narrower, the great traffic of which becomes at times troublesome. But, besides a few old churches and the Town-hall, and some courts and interiors hidden away in quiet nooks and corners, there is little to remind him of a city of the Middle Ages. The "tooth of time" has been active in clearing away the traces, but, notwithstanding these changes, there is something in the old many-steepled city reminding us of former times. Anybody familiar with the architecture of old Polish or German towns will be struck with the correct rectangular regularity and the spacious laying out of the centre of the city. These fundamental principles of the plan, with its many market and church squares, were laid down by those men, entirely unknown to us, who undertook the rebuilding of the town after the great Mongol irruption; and so well known and appreciated were those features that the Emperor Friedrich I. once declared that "any one who had not seen Breslau had not seen a handsome town."

The centre of Breslau is formed by the "Ring,"—which consists in reality of four great squares,—a name given to market-places in Silesia, much to the confusion of the uninitiated, and not to be associated with the circle of streets surrounding old Vienna, the "Ringstrasse"; it is merely the Germanised *rynek* of the Poles, which means "market." A great square of houses, with many parallel passages, united in the centre of this ring, besides the "Rathhaus," or town-hall, begun a century after the invasion, and by degrees artistically decorated, everything required for commerce,—the "Tuchhaus" (cloth hall), the "Reichkram" (trade hall), &c. On the spot where now the present town-hall rises, the "Leinwandhaus" (linen hall) for the linen trade, once so flourishing in Silesia, and by its side the "Schmetterhaus," so called from an inferior description of woven stuffs sold in it.

On the western side of the great square of the Ring (the "Paradeplatz") stood the weighing-office, with the town scales. Here the bales, worth millions, of the world-famed wool-market were stapled, and round them fluctuated an active traffic. Here also tournaments were held, and processions passed in honour of high personages, or judgment was pronounced; as that bloody one by the Emperor Sigismund, after the rebellion of 1418, when twenty-three rebels were beheaded. In the houses of the west front, the party-walls of which have been cut through for this purpose, resided the Bohemian kings and German emperors, with their suites, when they visited Breslau; and to this day the name of one, "Zu den sieben Kurfürsten" (the seven electors), the exterior wall paintings of which have been preserved and lately artistically restored by the present proprietor, reminds us of that time. This side of the "Ring" derives its popular name from it, or the house next to it, "Zur goldenen Sonne" (the golden sun); another from the "goldene Becher" (golden goblet); a third from the great pump once standing there, the "grüne Röhre" (green pump); the fourth, the "Naschmarkt," or the "Naschmarktseite" (market for dainties), is to this day the market for fruit, vegetables, flowers, &c. Opposite to it, in the central square, lies the "Riemerzeile" (saddlers' row), which ought to be called at the present day Jewellers' Row, for the number of shops, with the stories above them, and their balconies and plate-glass windows, of the partly modernised, partly entirely rebuilt houses, afford a sight which is not put into the shade even by the Frankfurt Zeil and other inviting marts of large cities. In strong contrast to these are the booths, reminding us of old Breslau, an institution peculiar to Silesian towns, by which trade and industry utilised the space otherwise cramped by restricting town-walls. Here, also, they still surround, in different shapes and sizes, on two sides the Town-hall, and here they stand, more safely than on their feet, on their old right and continually-increasing value; a fund for the abolition and purchase of the obnoxious booths succeeding only slowly to lay them low. Modern architecture does not agree very well with such checkered varieties; it requires everywhere a clear view and straight lines. Consequently an artistically-schooled eye will put the question, Which is more beautiful—the baroque structures of the Middle Ages, strewed about apparently without plan, or the wide "Paradeplatz," filled only with sober rows of cabs, and decorated with the solitary equestrian statue of Frederick the Great?

The interesting building commanding this latter square, though somewhat too small and out of proportion to the vast space on which it is placed, the Town-hall already mentioned, and of which we give a view, contains in its interior the council-chamber and offices of the town council, and over them the valuable city library. The interior of this jewel among the buildings of Breslau is entered on its east front by broad flights, where we are faced by the symbols in stone of the juridical authority formerly exercised by the city, dating from the fifteenth century,—the beadle and the "outrider," a horseman in full armour; and opposite to them, on a high Gothic column, formerly serving as flogging-place and pillory, the executioner, with his instruments of punishment. Over broad stairs the spacious vestibule is entered, where the Mediæval number of the year 1481 strikes the eye at once. The foundation-walls of the building and some other parts are more than a century older, the building having been begun in 1330; and the Town-hall may be said not to have been properly finished until the sixteenth century, though its characteristic features, the richness of its ornamentation, belong to the preceding century. Thus the whole structure, although the archæologist may detect traces of budding Renaissance, is a creation in a beautiful Gothic style. There is a variety of oriels, of turrets, of ever-changing forms; and yet we perceive at once in the three gables of the principal front, through which we entered, the simplicity of the ground plan, a treble nave; but not carried out to the other side for the sake of convenience and local requirements.

The hall of the first story, 85 ft. long, the ceiling of which is supported by five pillars, and which, formerly, before the present municipal offices were parted off, took up the whole width of the building, was as often the scene of noisy assemblages of burghers as of the sittings of the ancient courts of justice,—of earnest deliberations as of gay civic festivities. Here the old patrician families as often stoutly defended the liberties of the city, almost as great as those of the free towns, resisted the encroachments of the guilds as of the emperors, and successfully maintained their right of keeping their own troops within the city, which, happily for Breslau, saved it from the many miseries which the rest of Silesia suffered in the many wars which ravaged it. In the "Fürstensaal" (princes' hall), next to it, the Silesian princes and estates held their sittings, and here the young Prussian King received, on November 7, 1741, their homage. Many more historic scenes, which were enacted here, might be recalled, but we have said enough. Let us step into the cool vaulted "Rathskeller" (council cellar), or "Schweidnitzer Keller," where to the present day the beer-desiring multitude is sometimes so great as to make ingress and egress a feat of some agility.

Leaving the Town-hall and the greater "Ring," we come into another large market square, the "Salzring" (salt-market), where formerly Russian caravans rested, bringing salt, tallow, skins, and similar products of the East and North, in exchange for cloth, linen, and colonial goods. It is now called the "Blücherplatz," the home of Rauch's statue of the great field-marshal, who, however, does not turn towards the west, but in the opposite direction,—a mistake in the erection of the monument not easily explained, except by the fatality which seems to attend the erection of statuary in all great cities, and of which Breslau offers no exception. The Mediæval-gable character of the square is already much disturbed by straight-lined structures, an instance of which is the new Exchange, a stately erection by Langhans, but which has become already the "old" one.

Symmetrically with this square, not insig-

* See p. 372, *ante*.

nificant in its dimensions, the "Ring" opens on to another of the same size, in the centre of which stands the Elisabethkirche, the principal Evangelical church of the city, an original Gothic structure of red brick, over which towers its steeple (289 ft. high), of which it has been said,—

"Majestically rises from the dust below
Its towering mass towards heaven."

Its former ornament, the high, but badly-constructed, leaden broach, was thrown down by a storm in 1529. Angels guarded its downfall, as an old sculpture below in the side of the tower testifies, and "only a cat" was killed by it. The present top, of copper, green with age, decorated with golden knobs, is more wonderful than handsome.

Passing the Elisabeth-Gymnasium, the Stadtbuchdruckerei (the town printing-office, dating back almost to the invention of printing), now Grass, Barth, & Co.'s, we come, through a narrow lane, to a spot where three market-places may be overlooked,—the "Ring," the "Salzring," and the "Neumarkt." The latter, a large square, has most preserved the type of the narrow gabled house and the pointed roof; and when the moonlight brings out its outlines sharply, its shades, however, less decisively and steadily, it offers, with its sombre, otherwise little beautiful row of booths on the one side, an aspect such as the artist's eye loves to see. In the mornings a bartering crowd fills its space, and many are the dialects of the Silesians who come here to sell their produce.

A fourth square, separated only by a short market street from the "Ring," is that on which stands the two-steepled "Magdalenenkirche," the second largest of the Evangelical churches, with its Gymnasium. An iron bridge, one of the many landmarks of Breslau, connects the two steeples at the top. On the south side of the church is a gateway which was brought here from the Convent of St. Vincent, erected in the twelfth century by the half mythical Peter Wlast, and destroyed in the fourteenth century for fear of the Turks, who, it was thought, might probably make use of it as an important position. It is a curious and artistic specimen of a semicircular arch, of which there are very few in Silesia, and not a second one in Breslau. All these buildings mentioned belong to the ground on which old Breslau stood. But there are no traces left of all that labyrinth of narrow turnings which in almost all old cities and towns of Germany lead the stranger astray and finally back to the spot he started from. Farther towards the north—where the imposing front of the university, with its observatory, is reflected in the surface of the Oder, here divided into two arms, and crossed by a handsome bridge of stone and iron, which took the place of the old Polish structure with wooden arches—begins a region of narrow and crooked lanes. This, however, is not the old building-ground of 1241; it is the spot where formerly stood three ducal castles along the Oder. Here also the Jesuits erected at the end of the seventeenth century their stately emporium, the remarkable aula of which, possessing excellent acoustic properties, as well as several large halls, are covered with a rich profusion of colour, stucco, and gilding displayed in luxurious rococo work, while the large exterior portals and window lattice-work, specimens of excellent wrought iron-work, are creations of a refined taste. The fighters for Papal supremacy have not been able to complete their gigantic project; their power was paralysed before they had even time to create a free space before the front turned towards the interior and its proud balconies, and the ugly row of old tumble-down houses still stands hugging the stately edifice.

Towards the south old Breslau was surrounded in a wide circle by a wall rich in turrets, of which traces may still be discovered by the local archæologist. With the pulling down of the old town wall in the fourteenth century, the city entered a new historical period, and by degrees lost its former semi-independence by being incorporated with the Crown of Bohemia. But during that time the city, by the care of its princes, increased wonderfully, and its fortifications were pushed further southwards in a still more sweeping circle. We pass over the period which followed, until, under Frederick the Great, the city was incorporated with Prussia; he caused it to be regularly fortified according to Vauban's system. Those elaborate fortifications were, however, destroyed by the conquering French already in 1807, not, however, without great benefits arising from it. As in 1813 the great national movement of the War of Liberation poured forth from its gates, until in an overwhelming stream it drove the despoiler from German soil, so the pulling down of the restricting boundary infused new life into the city, and the possibility for the Breslau of the present day was created. Now a well-kept promenade leads along the former ramparts; the large "Exercierplatz," or drill-ground, spreads out in front of the Royal Castle, rebuilt by Frederick William IV., bounded on one side by the new Exchange, built by Lüdecke in Late Gothic style, the large block of the House of the Provincial Estates, in which, besides the provincial administration, the provincial archives, and the picture-gallery find a home, as well as by the new palace of the Royal Bank. On the other side we notice the new theatre, rebuilt, after being twice burnt down, also by Lüdecke; the Government House, built after designs by the same architect, in the Florentine style of the fifteenth century; and, towering over both, the highest church nave of Breslau, the "Minoritenkirche" of St. Dorothea, supported by slender pillars.

If we turn our eye to the west, we arrive, past the Byzantine dome of the new Synagogue, past the great red-brick building in Late Gothic style of the "Stadtgericht" (court of justice), and the great central prison and several barracks, to the three western railway termini and the many manufactories which we noticed on entering the city. In the broad belt stretching from these western termini towards the east, past the "Central-Bahnhof" (central terminus), the former glacis has in the course of decennials been changed first to large gardens with single villas and houses, and finally into long rows of streets; and this change still continues. It will not be long before those streets will stretch in all directions for miles from the centre of the city, the "Ring."

It has been held in Germany that cities spread most in a southerly direction. If this is the case with Breslau, it is the natural consequence of its first foundation, as well as of the fact that the river Oder, running along the whole northern side of the city, separates it from the suburbs on that bank, and only now, after numerous bridges are in course of construction, the country begins to be covered with buildings in that direction. But what draws us especially that way does not consist so much in the new erections; it is the fact that this is the region of the oldest part of Breslau, which was first colonised. Of the former ducal castle, there remains only the small Church of St. Martin, an architectural curiosity Close by, public institutions, such as the Asylums for the Deaf and Dumb and the Blind, orphan asylums, hospitals, the botanical gardens founded by Treviranus and Nees von Esenbeck, and improved by Göppert, on a site formerly part of the old fortifications, the University Library, and the Museum of Antiquities, cluster round it. But this is especially the region of churches, for here moves the essentially Catholic part of Breslau's population. The stately double row of the silent "Domherrenkurien" (chapter-houses of the prebends), with the bishop's palace and the modern clerical seminary, form the centre. The cathedral of St. John the Baptist, just renovated, its oldest parts dating from the middle of the thirteenth century, when Romanesque forms were here and there still used, is in its principal parts a structure of the most beautiful Gothic. Its exterior shows little that is attractive to the eye, but the painting and sculpture of its interior, and especially of some side chapels, present to us the splendour of different ages and styles. The most important production of art is a work of the Nürnberg carver, Peter Visoher, the epitaph of Bishop Johannes Roth, date 1496. The Church of St. Mary-on-the-Sands, in its interior, surprises us by the boldness and lightness of its vaulting, while its outside strikes us by its massiveness. Its tower, like the twin towers of the cathedral, has lost its former pyramidal steeple, and is covered in by a temporary roof; the only tower of Breslau of Mediæval times which shows a Gothic form is that of the "Kreuzkirche" (Church of the Cross), which enjoys besides the advantage of having preserved its original beauty. Having been erected over the Church of St. Bartholomew, a crypt such as is not found anywhere else of such a size, it is approached by fliers. The most remarkable work which it contains is the tomb of its founder, Duke Henry IV., of Breslau, the Minne-singer (died 1290). But the two open-work pyramids in real Gothic style, towering over Breslau, belong to the present age; in the north-east that of the Catholic church of St. Michael, the design of which provided for two towers, the northern one, however, falling directly after being finished, and remaining a dwarfed creation; in the south-west, that of the Evangelical church of the Holy Trinity, a neat red brick building, belonging to the almshouse of the same name. There are two more Gothic towers in the course of erection, one of which will rise, in the south-east, over the Evangelical church of St. Salvator, almost completed; the other, in the south-west, over the Catholic church of St. Nicholas, just begun. The first three churches are replacing older places of worship removed for different reasons; the latter one destroyed as long ago as 1806 during the siege of the city.

If we take together in one view the panorama which we have just passed through, it will be seen that Breslau is a city which is developing itself in accordance with the requirements of modern life.

ANCIENT PERUVIAN RUINS.

AN American traveller has given in the *New York Times* an account of a visit recently made to the ancient Peruvian ruins which are situated at Pachacamac, a place about twenty miles distant from Lima. An hour before reaching the site of the ruins, massive walls stretching out over the sandy plateau gave assurance that the party had at length reached the object of its search. These ruins are usually thought to be those of a large city, but there seems to be more propriety in believing them to be the remains of a vast cemetery, to which the dead were brought from all parts of the surrounding country.

The ruins are situated on a sandy, barren plateau, destitute of any sort of vegetation, the lowest part of which is 100 ft. above the level of the surrounding country. The mass of the ruins is composed of structures, nearly square, measuring 25 ft. to 35 ft. on a side. These structures are generally simple undivided inclosures, although there are some which have been divided by interior walls into several smaller compartments, communicating with one another by doorways. The walls are from 6 ft. to 10 ft. in height, and are generally about 3 ft. in thickness. In spite of their being built of adobe, or sun-dried brick, these walls are generally in a good state of preservation: this is to be attributed to the infrequency of rainfalls and the total absence of frost in this region.

There are several reasons for supposing that these buildings were never used as dwelling-houses; for, although the buildings have doors, the lintels of which are made of split bamboo, they have no windows; nor have any traces of door-hinges and catches been discovered; nor are there any traces of fireplaces, which are an unfailing indication of human occupancy; nor have any remains of roofs been found; nor do the walls give any indication of having ever supported a roof-covering. But the best argument for supposing that these are the ruins of an ancient cemetery, and not of a city, is the number of graves which are found in the floors of all these so-called houses, and which in such a climate would have made houses whose floors were put to such a use absolutely untenable by the living. The small niche or niches—for several are often found in the same enclosure—found in each structure are supposed to have been the places where food and water were left for the spirits of the dead. There is, too, a large enclosure more than a quarter of an acre in extent, surrounded by walls 15 ft. high, but with no trace of a doorway or entrance of any kind. A rough entrance has, however, been broken through the walls by drovers, who use the enclosure as a cattle-pen on their way to Lima.

Besides these enclosures, there are several large rectangular mounds 40 ft. high, 60 ft. long, and 30 ft. wide, built solid of adobe brick. One of these had been opened in the search for hidden treasures; but the seekers, after having penetrated more than one-third of the depth, and having found no indication of either hidden chamber or tomb, had apparently abandoned the search. Upon the top of another mound were graves which had evidently been opened recently.

These various enclosures and mounds are distributed over a tract of over 400 acres; but, if all within the outer wall of the precinct is considered, more than 700 acres of ground are covered. It is a curious fact, that none of the buildings at Pachacamac are built of clay; the adobe walls are built of the alluvial soil found in the valley of the Lurin, just below the plateau. This observation applies equally to the huge ruins that are

found on the plain near Callao. But still more remarkable is it, that these vast ruins near Callao have had their interiors filled up with clay, which must have been brought from a distance, as there is none to be found in that neighbourhood, by a hostile race, for the purpose of destroying these temples of a conquered people with all possible degradation. (?) As clay is very scarce near Lima, some enterprising man has established a brick-kiln near these clay-stuffed ruins, and burns bricks for the Lima building-market.

The most interesting of the ruins is the large conical hill, which is usually called the Temple of the Sun, though the original inhabitants of Pachacamac, the Chimoos, were not worshippers of the sun, but of the god Pachacamac, who was considered the creator and ruler of the world. The worship of the sun was not introduced until the Chimoos were conquered by the Incas, about a century before the conquest of Peru by the Spaniards in 1533. This hill, the sides of which are covered with terraces, each about 50 ft. wide, is situated about half a mile from the seashore. It is about 700 ft. high, and its base must cover nearly thirty acres of ground. The terraces probably formed a winding and gradual ascent to the top of the hill, but have fallen into such decay that no continuous roadway now exists to the summit. The summit is nearly a rectangular space, perfectly level, of something more than an acre in area. No remains of the large stone building, which is said to have existed at the time of the visit of Hernando Pizarro, can now be seen. Some recent explorer, thinking that there must be an interior chamber somewhere in the hill, had dug a hole in the summit at its centre; but, after having sunk a hole about 20 ft. deep, he had reached the solid virgin rock, and had, of course, abandoned the search in that spot. He or some other explorer had made another cutting in the side of the hill; but, after penetrating the outer coating of adobe brick to a distance of about 45 ft., the virgin rock was again reached. This seems to show that this hill is simply a terraced natural hill, and not a creation of man, like the large stone pyramids which in Mexico were devoted to the worship of the sun.

PROPORTION IN THE FINE ARTS.

SOCIETY FOR ENCOURAGEMENT OF THE FINE ARTS.

On Thursday evening, June 1st, Mr. Danby Seymour in the chair, Mr. Cave Thomas delivered a lecture on "Proportion in relation to the Fine Arts." He said that he had endeavoured to bring common sense and a more rigorous method of investigation to bear upon subjects connected with the fine arts. He had not the least doubt that the Greeks could have given sufficient reasons for the proportions they used, and that they obtained these by a scientific method. We, like children, take the Grecian canons upon trust, and will never be masters till we know the why and the wherefore certain proportions are beautiful, as, doubtless, the Greeks did.

Mr. Thomas then showed by an examination of the constitution of the senses, the sense of sight being that immediately belonging to the subject of the discourse, that man is a meter of quantity, and that all criticism is virtually an act of mental mensuration; our knowledge is fundamentally quantitative. The recognition of this truth crops up in criticism, which, in disapproval, is ever the reprobation of either the too little or the too much.

All our knowledge being fundamentally quantitative of proportional relations, the lecturer proceeded to inquire whether there was any well-attested and recognised metric principle of rectitude? The reply was in the affirmative. The metric principle of moderation which, from the universality of its application, had been enthroned and crowned as the golden mean. It was one of the most ancient of scientific principles which we possessed, and the lapse of time only brings fresh testimony to its truth. Observe the *mean* in all things is a principle that has not been discredited from the time of Thales to the present day, though like other great truths it is more frequently honoured in the breach than in the observance.

Mr. Thomas then showed the position of the *mean* in the unitary calculus, and also in the calculus of ratio, or limits of differentiation, an instrument which arrays before the eye the entire universe of quantitative relation, and proceeded to apply the principle of moderation to the selection of elementary geometrical figures, showing that the ratio 1 : 2 had always been approved in the oval, the parallelogram, the lozenge, &c., also the succession of ratios 1 : 2 : 3. From this he went on to prove that the *mean* was the measure of human beauty; quoted Reynolds and Hogarth in support of his argument; and then applied the method of averages to its determination, in the same way that the astronomer determines the true place of a star from a number of imperfect or erroneous observations. From form he transferred the principle to colour, and pointed out that (white) light is, according to received notions, a *mean* of all the prismatic colours; that the principle obtains in mitigating pigments and in linking these together, as Spenser has it, by "toned meanes"; that the very ethics of art are to steer between extremes, and preserve a *mean* or mid-course between opposite qualities, between hardness and softness, between roughness and smoothness, between looseness and formality in composition, &c.; that this was the principle the observance of which made Raffaelle so pre-eminent; and that even Michelangelo, in the very torrent, tempest, and as he might say, whirlwind of his design, begat *temperance*, which imitators missed and fell into most ridiculous excess. Shakspeare thoroughly understood this metric principle of moderation, and Mr. Thomas, by applying the poet's words to Michelangelo's design, showed how applicable they were to both arts. The lecturer built up his science of proportion, as he believes the Greeks possessed it, on the central principle that rectitude lies in the mean, and consequently beauty, for beauty is neither more nor less than perfect physical rectitude. He also showed that there are common harmonic principles underlying all the arts. The lecture will be published.

A NEW WORKHOUSE FOR CAMBERWELL.

The present Camberwell Workhouse in Havill-street, Peckham-road, having for some time past been found too small for the requirements of the parish, the guardians have decided to carry out the wishes of the Local Government Board by erecting an entirely new workhouse on a new site adjoining Nazareth House, Peckham, which will not only be a much larger building than the present establishment, but will also be constructed on a much better principle than the building in Havill-street, which is in many respects inconvenient and unsuitable for its present purpose. In the discussion which took place on the subject at a meeting of the guardians which has just been held, some of the members strongly opposed the project, contending that the erection of two narrow wings and an additional story to the present building would provide for all reasonable requirements for several years to come, and instanced the fact of large spaces within the parish, formerly open fields, being now covered with houses and occupied by persons who were not likely to become paupers, showing that no great increase of pauperism in the district need be expected. It was urged, however, on the other hand, a very large proportion of those occupying these recently-built houses were composed of the needy classes, who had been driven from the more crowded parts of the metropolis, and had sought refuge in the outskirts, and that these were the class of people most likely to become paupers. The low class character of large numbers of dwellings recently erected in several districts in Peckham was cited in proof of the probability of pauperism increasing in the parish, and the yearly increasing difficulty of obtaining land around the metropolis was given as another reason why it was desirable at once to secure the erection of an entirely new building. The proposal to do so was affirmed by a large majority of the guardians. The estimated cost of the new building is about 45,000*l.*

NEW BUILDING ACT REQUIRED.

The Medical Officer of Health for Whitechapel (Mr. Liddle) in his last report says:—

In this district alone, owing to the defects in the existing Building Act, several houses within the last fifteen or sixteen years have been built, which are, in my opinion, unfit for habitation. These have been pointed out by me not only to your Board, but to the Metropolitan Board of Works; but owing to the defective sanitary provisions of the Building Act, there was no power to prevent their erection. It appears now to be highly probable that in due course upwards of 450 houses will be taken down in this district on the south side of Royal Mint-street, and on the site a superior class of new houses for the accommodation of the working classes will, probably, be built; it is, therefore, of the utmost importance that a new Building Act should be speedily obtained, whereby the erection of unhealthy houses may be prevented; the said Act to contain sanitary provisions as regards the foundation and the prevention of the rise of damp in the walls; to further enact that all the rooms, staircases and passages, shall be properly lighted and ventilated,—that all the rooms shall have sufficient superficial space, and be not less than 8 ft. in height; that all the necessary conveniences shall be provided separately for each house, and that each house shall have an open space at its rear. It appears to be a waste of money to pull down unhealthy houses, and, at the same time, allow others alike unhealthy to be built, which, shortly after their erection, may be condemned as unfit for human habitation.

In building a new class of houses for the better accommodation of the working classes, it is in my opinion essentially necessary, as tending not only to promote their health but to improve their moral condition, that every room should be light,—that there should be no dark corners for the accumulation of dirt,—and that the houses should not exceed four stories in height; for, unless the streets were made proportionally wide, the higher the houses the greater will be the absence of sunlight, and thus interfere with the proper ventilation of the rooms. High houses on each side of narrow streets, in which little or no sunlight is admitted, are not healthy. It is true that the current of air is greater while passing between rows of high houses, but currents of air, without the accompanying heat of the sun's rays cannot be considered as proper ventilation. A current of air passing through a tunnel may, perhaps, by some persons, be considered as efficient ventilation; but I apprehend that few persons with any regard to their health would like to reside therein. I firmly believe that many persons who are compelled to occupy rooms in which the rays of the sun never enter soon lose their health, and find it necessary to change their residence; and this remark applies, although perhaps with less force, to those who are confined to counting-houses during the day, in which no sunlight is admitted.

Sunlight is especially necessary for the healthy existence of children; and this is strongly pointed out in the evidence of the late Mr. N. B. Ward (the inventor of the "Wardean Cases" for rearing plants in towns, and conveying them to and from distant places, a gentleman of great eminence in the medical profession; and who had given much attention to the influence of the temperature of air and light on the health and growth of animals and plants) who says, in his evidence before the Commissioners appointed for inquiry into the state of large towns and populous districts, that, as the result of his experience, the influence of light is a matter of the highest importance to the proper physical development of the human species; and whatever stints the growth of a child, certainly operates upon his physical capacity for labour; that the amount of disease among persons occupying light rooms is infinitely less as compared with that in dark ones; and that the influence of light, especially solar light, in preventing the fatal termination of disease, is a fact well known to him.

In further illustration of this subject, Mr. Ward quotes a fact stated on the authority of Sir James Wylie,—"that the cases of disease on the dark side of an extensive barrack at St. Petersburg have been uniformly, for many years, in the proportion of three to one to those on the side exposed to strong light."

TOOLS AND MEASURING INSTRUMENTS.

Sir Joseph Whitworth, in returning thanks last week for the freedom and livery of the Turners' Company, which had been presented to him, said forty-three years ago he gave his entire attention to the construction of engineers' tools, and for these he took out the first patent, including in it the lathe, the planing-machine, the screw-wheel cutting-machine, and the boring-machine. As he then constructed the lathe and the planing machine, so were they made now without any alteration whatever. In the lathe the guiding screw formed one of the most important parts, and he did what he could for its improvement. He got rid of fractional measurements and made the screw as perfect as possible. In the guiding

screw, 30 ft. long, there were two threads in the inch, and they worked upon it every day for six months, making it take out its own errors, and that had remained ever since as their standard. Making a perfect screw was one, perhaps, of the most important as well as one of the nicest applications of mechanism. It took a long time to do it, and until he was able to measure with such accuracy there were no means except by the sense of touch of knowing when they had a screw that was absolutely correct. It was of great importance to the mechanical arts generally to have bolts and screws for general purposes of certain known forms and measurements, and he believed that now every marine engine and every locomotive in this country had the same screw for every given diameter. Sir Joseph then referred to the duplex lathe obtaining a balance of forces, and wherever the lathe was employed prices were reduced 40 per cent., in addition to which 40 per cent. more work was produced. At one time a workman was paid 12s. per square foot for surface planing, now it was reduced to 1d. per foot.

THE ARCHITECTS' BENEVOLENT SOCIETY.

A MEETING of the Council, past members of Council, and a few contributors to the Society, was recently held at the Institute of British Architects, to present a testimonial to Mr. John Turner, on his retirement from the office of honorary secretary to the Society, which he had held for over twenty-five years.

In the unavoidable absence of the president, Mr. Sydney Smirke, R.A., Mr. David Mocatta occupied the chair. A statement setting forth the amount of subscriptions received, viz., 58*l.* the purchase of a gold hunting-watch, with a suitable inscription engraved inside the top case, chain, and seal (the testimonial selected by Mr. Turner), having been read,

The Chairman, in making the presentation, alluded at some length, in appropriate terms, to the valuable services rendered by the late honorary secretary, and the advantage which had accrued to the Society from his untiring exertions.

Mr. Turner feelingly responded to the kind expressions addressed to him by the chairman.

The thanks of the meeting were voted to Mr. Mocatta for his able fulfilment of the duties of chairman; and to Mr. George Mair, who had undertaken the duties of treasurer and secretary of the testimonial fund; and both gentlemen having responded, the chair was vacated and the meeting terminated.

NEWCASTLE BUILDING BYE-LAWS.

A MEETING of architects, builders, and others interested in the Building Bye-laws was held on the 25th ult. in the conversation-room of the Mechanics' Institute, Newcastle. Mr. W. Temple was in the chair. The secretary (Mr. R. A. Storrar) read a statement as to the complaints which the deputation laid before the Town Improvement Committee. The first complaint was as to the thickness of party walls. With respect to the rejection of plans, and no reason being assigned for such rejection, it was suggested that reasons why plans were rejected should be given when such rejection was intimated, and that the officials be instructed to inspect plans on their presentation, and to point out to the depositors technical errors or omissions, and give the depositors an opportunity to alter them; and, further, that all rejected plans be returned to depositors. It was also stated that serious complaints were made with reference to the manner in which builders and others had been dragged before the police court, although they had to the full extent of their ability complied with the conditions of the building bye-laws; and in many cases they had improved upon the quality and convenience of the buildings they were erecting, for which they were sought to be fined, and some alteration in those cases was required. It was suggested that a thorough revision of the building bye-laws should be made, and the provisions of the Act of 1871 incorporated in the bye-laws, and that the bye-laws should be so framed that builders and others desirous of abiding by them should be enabled to determine, by a perusal of them, what was demanded, and how the demands were to be accomplished; and with this view a sub-committee of the Town Improvement Committee might be appointed, to meet a deputation of builders, and enter upon the matter fully, and report to the Town Improvement Committee thereupon. After a discussion, it was resolved "That all interested endeavour to obtain copies of the proposed new bye-laws, and that the secretary be instructed to call another meeting, when the matter may be fully discussed, and a committee appointed to watch the interests of the builders and others." The meeting then concluded.

BURSTING OF AN IRON TANK AT ST. GEORGE'S HOSPITAL.

AN extraordinary accident occurred at St. George's Hospital, Hyde Park-corner, on the 3rd inst., when the large water-tank which had been placed at the top of the building as a safeguard against fire suddenly burst, and the immense volume of water thus liberated burst through the roof, and fell into the ward below. This tank was situate on the top of the hospital, on the Grosvenor-place side, a little north of the entrance-hall. It was of cast iron. It was erected seven years ago, and there was not the slightest reason to suspect it was in any way defective. The first intimation of anything being wrong was water dropping from the ceiling of the top ward. Soon afterwards a terrible crash was heard, and nearly the whole of one side of the iron tank, weighing about two tons, fell through the roof of the building, and forced itself through the various upper wards into the students' room on the ground floor, carrying portions of the wards, with the beds and their occupants, into the lower room.

It is stated that the Queen, who is patron and president of the hospital, telegraphed for particulars upon hearing the first alarming reports of the disaster; the Prince of Wales and the Duke of Cambridge, who are among the vice-presidents of the hospital, came in person, and so did Prince Teck. The Duke of Wellington, the Duke of Westminster, and the Duke of Grafton came early to the scene of the wreck, and many offers of assistance were made, but room was found for all the patients in beds in the other wards. The students injured out of seven who were in the students' room were Mr. Vasey and Mr. White. The tank was built six years ago by Messrs. Easton & Co., of Erith. It was of iron plates § in. thick. The surveyor to the hospital, Mr. Salter, made his annual report on the buildings a fortnight ago, after inspecting them, and found no fault in the tank. An inspection of the broken tank shows that it is, roughly, 12 ft. deep and 10 ft. square. It is calculated to have contained at the time of the accident 25 tons of water, or 5,000 gallons. Its total capacity was 7,000 gallons. The east side of the tank is that which has given away. The iron has not parted from the rivets, but there is a large, jagged hole broken in it, approximately a circle with a diameter of 6 ft. It is not one plate that is broken, but several. All are on the east side. The tank was placed on iron girders, and these rested on brick supports. A leak of minute width, but 18 in. long, running down the tank not quite perpendicularly, was first observed: suddenly the whole side seemed to come out, and the superintendent and engineer who were examining it narrowly escaped being swept away.

It has been suggested to us that a great gathering on the roof on the occasion of the Prince of Wales's return may have had something to do with the break-down, but we know of nothing to justify the suggestion. The fact is that iron structures are always getting weaker. The occurrence should lead to very strict surveys in town and country.

THE TURF CLUB IN PICCADILLY.

ANOTHER new club-house, which has been in the builders' hands during the last few months, will shortly be completed and opened. Some time go the Duke of Grafton sold his town mansion, Grafton House, at the corner of Grafton-street, Piccadilly, to the Turf Club, and the building has undergone an entire reconstruction, so as to adapt it to the purposes of the club. Although the old external brick walls to Piccadilly and Clarges-street have been allowed to remain, both frontages have been architecturally transformed, and now present handsome elevations, harmonising with the several structures in the locality. In the Piccadilly front two bays have been thrown out, going up nearly the whole height. The elevation is surmounted by a balustrade, with vases for terminals. The Clarges-street frontage has also been restored, and new windows, with Portland stone sills and mullions, introduced, the elevation being surmounted by a balustrade and terminals uniform with the Piccadilly frontage. The principal entrance to the club is at the Clarges-street frontage, under a portico.

The floor of the vestibule, and the inner hall, approached from the entrance, is paved with marble, and the principal staircase from the vestibule to the first floor is also laid with marble. The ground-floor contains the coffee-room, the morning-room, and the reading-room, with principal frontage to Piccadilly. The first floor contains the dining-room, drawing-room, writing-room, and card-rooms; whilst the two upper floors are entirely set apart as bedrooms for the members of the club. The kitchen and cooking department are entirely distinct from the club buildings, a separate building for culinary purposes having been erected at the rear. The basement and sub-basement will contain the housekeeper's apartments and the wine-cellars.

Mr. John Norton is the architect, and Messrs. Cubitt & Co. are the contractors. It is expected that the inauguration of the club will take place in a few weeks.

RE-BUILDING OF ST. ANNE'S CHURCH, SOUTH LAMBETH.

ONE of the oldest churches in the parish of Lambeth is about to be demolished, to be replaced by a new structure more in accordance than the present edifice with the church architecture of the times. We allude to St. Anne's Church in South Lambeth-road, which was built in the eighteenth century, there being at that time no other Church of England building between Lambeth Palace and Clapham. With the exception of the parish church of St. Mary, Lambeth, it is said to be the most ancient church in the parish. At the time the old church about to be removed was built, the well-known Mr. Dollond, who has a lasting celebrity in connexion with telescopes, was the chairman of the building committee. It was originally built as a proprietary chapel, and called South Lambeth Chapel, and it was only in 1869 that it was called St. Anne's Church when first consecrated by the bishop of the diocese, who only consented to perform the ceremony on receiving an assurance that immediate steps would be taken to alter and enlarge it; but the difficulties and expense attendant upon obtaining possession of former proprietary rights, and the conveyance of the site to the Ecclesiastical Commissioners, have hitherto prevented the rebuilding of the church being carried out. Although the present structure is very unsightly, some portions of it will be retained, and altered so as to harmonise with the intended new edifice, the architect for which is Mr. Parkinson. The estimated cost of the new church, which will be much larger than the present building, is between 4,000*l.* and 5,000*l.*

BINFIELD'S PROCESS FOR TRANSFERRING WATER-COLOUR DRAWINGS TO WOOD.

THE invention of Mr. Binfield has for its object to enable the artist to produce his work with great rapidity and ease, and retain for sale the original drawings.

The process consists simply in using two preparations called Lignotints, which wash and flow freely, and require no education in their use. When the drawing is finished, it is placed face down on the wood block, put under pressure for a few minutes, or burnished by hand, and the result is a perfect transfer, with every tint, tone, or mark on the wood, whilst the original drawing is uninjured. Any tones or washes compounded with the Lignotints and Chinese white are equally applicable to the invention. We have seen some drawings transferred with great completeness. If this can always be effected with certainty the invention cannot fail to prove valuable.

BREAD-BAKING OVENS.

SIR,—If your correspondent "Devoniensis" would try ground fire-clay I think he would find it answer his purpose. I have never seen anything else used for furnaces, kilns, and ovens, and should certainly never dream of using lime, cement, or plaster of Paris.

JOHN M. GIBSON.

MASTERS AND MEN.

Wolverhampton. — By mutual arrangement with their employers, upon whom they had served notices for an advance in wages, the carpenters, plasterers, bricklayers, and labourers, at Wolverhampton have obtained a rise of ½d. per hour. They now receive,—the first three 8d. per hour and the labourers 5½d. By this rise the wages in the building trades in Wolverhampton are brought up to a level with the Birmingham scale. The decision having been arrived at without the intervention of Mr. A. Young, the arbitrator, that gentleman has been presented with a pair of white kid gloves.

Southport.—The strike of joiners at Southport still continues.

Carnarvon.—At Carnarvon, on the 3rd inst., twelve quarrymen were fined 5*l.* each, and ordered to find sureties for twelve months, for being concerned in a riot which took place at Hafod-y-Wern Slate Quarry, and which arose out of some trade dispute.

Fleetwood. Following the example of their Southport brethren, the Fleetwood joiners have given three months' notice that they require an advance to 8½d., the present rate being 7½d., and the time fifty-four hours per week.

Cardiff and Newport.—The painters, both of Cardiff and Newport, are now on strike. At the former town the men have called an open-air mass meeting, and it is understood that they have formed a co-operative body, with a view to do work on their own account.

Bristol.—The Master Builders' Association of Bristol have resolved to withdraw the lock-out of painters, and have offered work to the men at the old rate of 6½d. an hour. It is said that the non-society men are likely to accept the offer, but that the society men have announced their determination to continue the strike.

Greenock.—Following the example given them by the master masons, the master joiners of Greenock have resolved to summon foreign aid against the workmen. They have agreed to telegraph to Norway to ascertain whether craftsmen can be obtained in that country to take the place of the Scottish joiners on strike; and should an encouraging answer to this telegram be received, a deputation is to cross the ocean to enlist the Scandinavians.

Doncaster.—The Doncaster masons have refused an increase of 3s. per week and a reduction of 4½ hours, and are still on strike, demanding an assurance from the masters that they will not bring to the town certain foreign work, dressed stones, &c., and asking half-pay when unable to work through bad weather.

Lanarkshire. — The masons of Motherwell, Bellshill, Hamilton, Holytown, Uddingstone, Wishaw, &c., have commenced work at a reduction of wages. Those who were formerly paid 10d. per hour have been reduced 1d., and those who had 9½d. have been reduced ½d.

Whitehaven.—The journeymen painters of Whitehaven petitioned the masters for an advance of wages from 26s. to 30s., which has been granted by the masters without any stoppage of business.

Mossley.—The notice of the masons within the district of the Mossley Local Board for an increase of 3s. per week in their wages expired on the 1st inst., when the masters agreed to give the advance asked for. The wages will now be 36s. per week in summer and 33s. per week in winter. The masons' labourers have also given notice of an advance of 2s. per week on their present rate of wages, and their notice also expired on the same date, but they agreed to extend the notice for another month till the demand of the masons was settled.

Glasgow.—The Glasgow joiners, to the number of between 2,000 and 3,000, have struck work in the shops where the employers have refused to grant an advance of wages from 8½d. to 9d. per hour. Since the strike commenced the men have been holding daily meetings, and at the gathering on the 31st ult. it was reported that eighty-two masters who were not members of the Association had conceded the advance, and signed the bye-laws. On account of this a great number of the men who were on strike have returned to work.

Darlington.—The Darlington plumbers have asked their employers to concede one hour per week. Hitherto they have been in the habit of leaving work on Saturdays at one o'clock, and they ask to be placed on an equal footing with the other mechanics of the town, and end their week's work at noon. They also demand ½d. per hour extra wages.

COMPENSATION CASE.

MOLYNEUX *v.* CHESHIRE LINES COMMITTEE.

A SPECIAL jury was empanelled at St. George's Hall, Liverpool, on the 29th ult., under the direction of the Sheriff's Assessor, Mr. J. J. Aston, Q.C., to award the amount of compensation due to Mrs. Molyneux, of Staplands, for the land taken by the Cheshire Lines Committee from her estate, for the construction of their branch line of railway from Hunt's-cross Station to the North Docks, Liverpool.

The company have carried their line through a portion of the most valuable building land in the neighbourhood of Liverpool, passing through Childwall Valley, Broad Green, Knotty Ash, West Derby, and Walton.

Mr. Sherlock, Mr. Lewis Gorsblower, Mr. Wright, and Mr. Gustavus Hamilton (architects, surveyors, and valuers, Liverpool), Mr. Retford, C.E. (Manchester), and Mr. Brooks (Huddersfield), gave evidence in support of the claimant. Their valuations for land taken and compensation for severance averaged 9,150*l.*; while Mr. W. H. Weightman (Liverpool), Mr. Hewitt, and Mr. John Cross (Manchester), on behalf of the Committee, estimated the claim at an average of 3,774*l.*

The jury having heard the speeches of counsel, and the summing up of the learned Assessor, awarded the sum of 7,204*l.* 17*s.* 4*d.* to the claimant.

OBSTRUCTIONS OVER FOOTWAYS.

RECENTLY the Vestry of Shoreditch took proceedings at Worship-street Police-court against a tradesman named Reed, under the Police Act, for setting up a show-board which projected 11½ in. over the footway at a height of 2 ft. 3 in.

These facts having been proved, and the question of the right of user being excluded, as the premises could not be shown to have been covered with the dedication of the street), evidence was tendered by the prosecution that the projection was a substantial obstruction, and counter-evidence was tendered by the defence that it was not an obstruction. The Magistrate, Mr. Bushby, refused to receive such evidence on either side as being irrelevant, and upon the facts, decided that the show-board came within the scope of the 2nd and 3rd Vict., cap. 26, sec. 60, sub-sec. 7, and imposed a fine of 40*s.* The defendant being dissatisfied with this decision, the magistrate stated a case, but limited the question to the rejection of evidence. If he was right in such rejection the conviction was to stand, if not, the case to be remitted to the magistrate to be further heard. The case was before the Queen's Bench Division a few days ago, when Mr. McIntyre, for the appellant, contended that the magistrate ought to have heard evidence as to reasonableness, practically incommoded, because, after all, the projection might have been in a recess between two projecting houses, and so no obstruction. But the court, without calling upon the respondents, affirmed the conviction with costs, and held that the magistrate was quite right upon the facts presented to decide, and that if a hundred witnesses were called to prove that they were not obstructed, it would be no answer to the summons. This decision is identical with that in "Gabriel *v.* St. James's, Westminster," in which a projecting lamp, 10 ft. high, was the nuisance complained of.

LIABILITY OF SUB-CONTRACTOR FOR "SCAMPED" WORK.

GRIFFITHS *v.* POTTER.

IN this case, heard in the Exchequer Court, First Division (sitting at Guildhall), before Mr. Baron Bramwell and a special jury, the plaintiff was Mr. John James Griffiths, stone-merchant, mason, and pavior, of 283, Kingsland-road, and the defendant was Mr. Henry Potter, contractor, of Alfred-street, Stepney. The action arose out of the construction of the "Finsbury-avenue sewer," for the parish of St. Leonard, Shoreditch. It was stated on behalf of the plaintiff that he brought this action rather for the sake of vindicating his reputation for integrity than with the view of recovering damages.

It appeared that the plaintiff took the contract for executing the sewer and paving works in Finsbury-avenue. He sublet the paving work to the defendant, who was to do the work in accordance with plan and section, at the rate of 8*s.* per foot run, in 9-in. brickwork throughout. The defendant proceeded with the work, and on May 7, 1875, the plaintiff paid him 100*l.* on account, believing a portion of the work had been properly done. Early in June plaintiff received the defendant's account, which he sent to Mr. Perrett, the vestry surveyor, to check the "extras." On the 5th and 8th of June plaintiff wrote to the defendant to connect the drain near the new square, and defendant arranged with the vestry surveyor to do it on the 10th at nine in the morning. When Mr. Perrett went to the works with his assistant, Mr. Davis, they found the connexion had been made. It was subsequently discovered that the part of the sewer into which the drain was made was only 4½-in. work instead of 9-in. work; and it was afterwards found that a large portion of the sewer was done in 4½-in. work only, instead of the 9-in. work contracted for. An investigation into the matter was made by a committee of the vestry, when the defendant for the first time stated that he had sublet the contract to a person named Munsen, who alone was to blame. The plaintiff, in order to vindicate his reputation, asked the defendant to prosecute Munsen, offering to pay a portion of the expense. Defendant declined to do this, but his solicitor proposed that he (defendant) should make a statutory declaration of the facts instead, but after various excuses the defendant formally refused to make such declaration. Plaintiff had been obliged to repave the avenue at a cost of 69*l.* 10*s.* In cross-examination, plaintiff said he believed the defendant knew of the fraud.

Mr. George Charles Perrett said he was surveyor to the vestry of St. Leonard, Shoreditch. Witness was invariably at the works at nine in the morning and five in the evening, and went there three times some days. He never saw any 4½-in. work exposed. When witness went to fulfil the appointment made for connecting the drain, he found that the men had worked all night, and the work was covered in. About two-thirds of the sewer was afterwards found to be only 4½-in. work, instead of 9-in.

Robert Mason deposed that he was an excavator, and was employed by the defendant upon the work for fourteen or fifteen days. Saw the work going on at night. Some of the crown of the arch was then done in 4½-in. work. The men worked up as much as was done. A 9-in. end was always put right for Mr. Perrett to see in the morning.

Henry Potter, the defendant, stated that he was a contractor, and that his work under the reconstruction of the sewer in question to Munsen. In June plaintiff told him (defendant) that the work had been "scamped."

In cross-examination defendant stated that when he last saw Munsen he said he was coming to attend this trial.

Mr. Baron Bramwell.—There must be a verdict for the plaintiff, and Mr. Benjamin plaintiff's counsel does not press for damages. I am sure the jury will agree with me in saying that the plaintiff at least is free from all blame in this matter.

The jury intimated their assent, and found a verdict for the plaintiff for 69*l.*

His Lordship gave judgment for that amount, and certified for a special jury.

DAMAGE TO GOODS IN TRANSIT.

SINCLAIR *v.* THE GREAT NORTHERN RAILWAY COMPANY.

THIS action was tried at the Westminster County Court, recently, in which the plaintiff, a marble merchant, of Princes-street, Leicester-square, sought to recover the sum of 7*l.*, for damage done to a marble mantelpiece, in transit from Potter's Bar to London. Mr. Harmsworth appeared as standing counsel for the company.

From the plaintiff's opening it transpired that he sent a marble mantelpiece to a customer at Warren's Wood, which, not being approved of, was returned to the plaintiff.

James Maxwell, in the employ of the plaintiff, proved that the article in question was properly packed when it left the plaintiff's shop, and John Newton, from Warren Wood, proved the receipt of the packages in good condition, where they remained three weeks, and returned in the same condition to the sender, when William Bennett, the plaintiff's foreman, proved receiving the packages back, one of which was in a broken condition.

Joseph Dulley, manager to the plaintiff, said he opened the packages, and found one damaged to the amount sued for, and that he had applied to the company for compensation, who refused to make any, in consequence of which the present action was brought.

This being the plaintiff's case, Mr. Harmsworth said that the company had really no case to defend, as it had not been proved by the plaintiff where the damage had occurred, which might have occurred between Potter's Bar and Warren Wood by the carrier, who was not the agent for the company; and in reality the company were not liable.

Thomas Bonce, the checker at King's-cross, proved that when the packages reached that station from Potter's Bar they were uninjured; and Robert Hill, a porter at the same station, gave corroborative evidence, in which he was supported by that of Hold, the company's carman.

The Judge said that from the evidence of the company's witnesses there was in reality no case against them, and, therefore, he should rule in favour of the defendants; and, on the application of Mr. Harmsworth, granted the costs of counsel, attorney, and seven witnesses.

A DISPUTED CONTRACT.

ALDOUS *v.* PAYNE.

IN this case, heard in the Brompton County Court on the 24th ult., before Mr. Serjeant Wheeler, a claim was made for 21*l.*, for laying out grounds and garden.

Mr. Aldous, the plaintiff, said he was a florist and gardener at 8, The Kensington, and last year he was engaged by the defendant to prepare plans and estimates for laying out the grounds and garden at Mornington House, Northend, Fulham. He had certain assistance in the matter, and the plans and specifications were submitted to the defendant and approved of, but after the work was done defendant refused to pay, on the plea that it was not done according to order.

John Higham, ornamental gardener, having given evidence in support of the plaintiff's case,

Mrs. Payne, the defendant, said she instructed the plaintiff to lay out the garden after the pattern of Mr. Scott Russell's garden, but there was nothing said about "plans," because there was no necessity to prepare any.

After some further evidence had been given,

His Honour pointed out the difference between an estimate and a contract, and ultimately gave judgment for the plaintiff for 12*l.*

ACTION BY ARCHITECTS TO RECOVER COMMISSION FROM A TRADESMAN.

WALKER AND ELSOM v. WEEKES.

THIS was an action before Mr. Baron Huddleston, in the Exchequer Division, to recover 160*l.*, claimed as commission upon a certain building transaction.

Mr Day, Q.C., in opening the case, stated that the Messrs. Walker & Elsom were architects, and had been engaged by a Mr. Higgs, a person of some notoriety a few years ago, in connexion with the building of a palatial mansion and other structures in the neighbourhood of Twickenham. This Higgs was apparently but a clerk in an office in the City, but managed to amass a large amount of wealth, and to live in rather a princely style. In 1868 Mr. Higgs, being desirous of adding some horticultural attractions to his residence on the banks of the Thames, the defendants, Messrs. Weekes, who are horticultural builders in Brompton and Chelsea, were applied to for the purpose of getting certain conservatories or other structures erected. Mr. Alfred Weekes, a supposed partner of the defendant's firm, in the course of the communication which took place between Mr. Elsom, one of the plaintiffs, and himself upon the subject of the required additions, promised the plaintiffs five per cent. commission upon the transaction arising from this negotiation, and Mr. Elsom agreed to accept the same. This action was to recover 160*l.*, together with certain charges accruing on the delay that had occurred, amounted altogether to 250*l.*

Mr. Elsom, the plaintiff, in his cross-examination, stated that he was not acquainted with the defendants before the present transaction. He had been acquainted with Mr. Higgs for some years, having been engaged with his partner as architect in the building of stables. He had an agreement with him, but not in writing, by which he was to receive 5 per cent. on the cost of the structures. He would not have made a claim against the defendant unless Mr. Alfred Weekes had himself offered 5 per cent., saying it was the custom of the firm to make that allowance.

Mr. Torr.—Then, in fact, you did nothing for this sum. You accepted it as a mere gratuity?

Witness.—Yes; I submitted my drawings to the defendants. I had no authority at the time to employ the defendants specially.

Certain law points having been argued by the learned counsel on both sides, they ultimately agreed to submit the matter to the decision of the learned judge.

Mr. Baron Huddleston stated that as his opinion had been asked, and as he had an opportunity of speaking to the Lord Chief Baron (who was presiding in the next court), he had no hesitation in giving it, and that was, that there was no evidence to go to the jury in support of the plaintiffs' claim, and therefore he should order a nonsuit.

THE GREAT DOLWILYM CROMLECH.

THE letter of your correspondent, "T. N.," requires a brief answer. The illustration of this cromlech as given in the *Builder* is the first published engraving of the structure having any claim to a decided value or proper size. No claim was made in the *Builder* towards making the cromlech known to the public for the "first time." As to the trifling little woodcut in Dr. Nicholas's book, its accuracy has not been disputed, as it is evidently copied from an old and well-known photograph taken from a bad point of view. The "notice" in Dr. Nicholas's work amounts to a few lines only of perfectly valueless description. Neither cut nor description is of sufficient moment for any reference in your columns. As to the Cambrian Archæological Association having "at last found out" this cromlech, "T. N." needs to be informed that the Cambrian Association published two wood engravings, a lithograph, and an exhaustive description, together with the reproduction of some previously published notes by Sir Gardner Wilkinson on the same structure, in their *Journal* for 1872,—the year in which Dr. Nicholas's work first saw the light. CAMBRIAN.

A NUISANCE AT FINCHLEY.

SIR,—Close to my house and garden is a parish cesspool, which was built as a temporary means of obviating the nuisance arising from the sewage of the village of Whetstone running on to the surface of a field adjoining my garden. The stench arising is at all times most offensive, and I constantly have to send my children into the house, for fear of fever.

I have complained to the Barnet Sanitary Board, and their surveyor tells me that he considers my complaint coloured, because I have not actually had a case of fever in my house during the three years I have lived here. True; but at the other end of the field there has been fever amongst the cottagers, and as the Great Northern High Barnet line runs close by the field, Goodness knows how many cases of fever are carried into London by visitors. One of the men working on the line lives in a cottage at the other end of the field, and he has only just recovered from a most serious case of fever. In addition to this, tens of thousands of school children and others will come down this line in a few weeks, and will continue to come all through the summer months, to enjoy their treats in Hadley Wood; but who can say how many of them will return to sicken and die of fever contracted from this grave public nuisance?

GEORGE VINING.

*** Write to the Central Authority, Whitehall.

THE FOOTWAY AT CHARING CROSS.

SIR,—The Metropolitan Board of Works have yielded to pressure to some extent, but abide by their determination that the footway on the frontage to Trafalgar-square need not be so wide as that along Northumberland-avenue by 3 ft., or quietly suggest that if 12 ft. is insufficient the balance can be taken out of the Strand roadway. Evidently they consider the traffic along the Strand quite unimportant, so that they may be allowed to increase the profit balance on their costly adventure. But I suppose there is no hope, and that a mistake will be perpetrated such as the Board would afterwards give their ears to undo.

Z.

THE ENDOWMENT OF GENIUS.

SIR,—There has of late been much talk, as you say, about the endowment of research. This title may be a step towards a correct notion which has not yet attained its ultimate form. It is only partially developed, and if it were acted upon as now expressed, would lead to a considerable expenditure of money, without producing any adequate results. What we should really advocate is the endowment of men. This has been the policy which has led to the most splendid results in wisely-governed states, and in all ages. We rely too much on the machinery of institutions to accomplish our ends. This leads to a vast amount of patronage, under which nations generally become consumptive and break down. Institutions may do very well in the jogtrot of peace and easy circumstances, but when the pinch and strain come these give way. The clamour is then for men, and if a country has not taken care of them, she will either be in sore distress, or absolutely ruined. This is England's weak point. Dilettanti foppery flourishes to the exclusion of thoroughness, both in science and art. It may be urged that the true genius will work on under the most dire disadvantages, and without the slightest recognition from the charmed domain of showy seeming. This is quite true, but how much does a nation lose by the impediments cast in the way of a great man's life? Who shall answer that? To endow research, however, would be but to induce a lot of pigmy minds to pose themselves in the attitudes of giants, and to exclaim, "We will be discoverers!" The nation would, in that case, doubtless have most wonderful discoveries made. Germany is wiser in its generation, and when she finds a great man takes care of him. It is a sign of mental health in a State when it knows a great man, and not only recognises, but takes care of him. We stone genius to death with difficulties. The kind of men we require is not to be made by the endowment of research. I think it was Mrs. Glasse who said, first catch your hare and then cook him. In a somewhat similar vein I would say to those who are advocating the endowment of research,—first catch your genius, but in this case do not *do for* and cook, but endow him. METER.

CONCRETE BUILDING.

SIR,—The generally-expressed and accepted opinion at the meeting of the Royal Institute of Architects was, most decidedly, in favour of concrete construction as the best when properly treated.

The question of the evening was mostly lost sight off,—that is, its decoration and finish; but as the essence of its success commercially lies in that direction, it will have to be more thoroughly considered at some future time. Concrete has a brilliant future.

It seems at last a new era has set in for the construction and decoration of houses, fittings, furniture, and wares, as indicated by new systems, materials, and designs, and their combined effects. A thorough revolution in building operations has commenced.

Mr. A. Payne objected to the mode as employed in concrete building with the present building apparatuses, and patching on of pilasters, &c., that not being the science of its application. These are correct views against our present concrete builders.

Science, art, and skill are essential to all successful results in establishing one of the greatest reforms that ever took place in building, building operations, decorations, &c., appertaining thereto; therefore, the advocacy of our concrete builders for unskilled labour must be wrong, raising distrust of the qualified and impeding real progress by accidents. Constant and qualified supervision is the necessity, and a scarcity of skill the want. That being so, the more the subject is discussed the better by the architects, engineers, and mechanics, separately and in union, until a thoroughly certified qualified body of practical men is established in each respective department, fulfilling all the branches necessary for competency.

A PRACTICAL OPERATIVE.

The National Gallery.—In the House of Commons, on the 30th ult., Lord H. Lennox, in answer to Mr. Cowper-Temple, said the additions to the National Gallery were now completed, and would be forthwith handed over by the Office of Works to the trustees of the National Gallery.

STAINED GLASS.

Gloucester.—The great window of the north transept of the Cathedral has been filled with painted glass, as a memorial of Sir Michael Hicks Hicks-Beach, bart., M.P., and Lady Caroline Susan Beach. The window is by Messrs. Hardman, of Birmingham, and subjects are connected with the life of St. Paul. In the two sets of eight lights under the transom are represented St. Paul restored to sight, introduced to the apostles, Elymas the sorcerer, the offer of the priest of Jupiter to sacrifice to Paul and Barnabas, Council at Jerusalem, Paul casting out a spirit of divination, restoring Eutychus to life, and before Felix; Paul let down in a basket, making tents, beaten with rods, stoned, dragged out as dead, delivered from prison, shipwrecked, shaking off the viper. Four subjects occupy the eight lights over the transom,—stoning of Stephen, conversion of St. Paul, the third Heaven, the Martyrdom. In the centre, over these, our Lord is represented; on either side and beneath are cherubim, and in two uppermost lights are cherubim with crown and palm. At the base are the armorial bearings, and an inscription.

St. Giles's Cathedral (Edinburgh).—Another stained-glass window has been placed in the south aisle of St. Giles's Cathedral, and, in accordance with the plan laid down by the Restoration Committee, the subjects illustrated are the parables of "The Talents" and "The Ten Virgins." The inscription underneath the window reads,—"In memory of Alexander Clapperton, merchant, Edinburgh, born 1782, died 1849; and Ann Hume, his wife, born 1792, died 1873. Erected by their sons, John and Alexander Clapperton, 1876." The designs, and the execution of the work, are by Messrs. Ballantyne & Son, carried out under the direction of Mr. Robert Herdman, R.S.A.

Coatbridge.—The parish church of Coatbridge has just received an addition by the erection in the south gallery of two painted windows, presented by Mr. A. Whitelaw, M.P., and Mr. Wm. Weir, of Kildonan. The treatment adopted corresponds to that of the other windows in the church, having a single figure occupying the main position in each light, with a picture underneath, illustrative of a scene in the life of the apostle depicted. The figures are those of James, Paul, Peter, and Jude; and the pictures represent the martyrdom of James, the preaching of Paul at Athens, the calling of Peter, and the miraculous draught of fishes. The tracery lights above the main windows represent two angels, carrying between them a scroll inscribed with a text. The window is by Messrs. Morris & Co.

Northampton.—The east window of St. Giles's Church, Northampton, has recently been filled with stained glass at the expense of Mr. T. Portal, of Springfield, to the memory of his father, mother, wife, and two children. The subject of the window is the "Te Deum," and the work has been carried out by Messrs. Clayton & Bell. The window consists of five lights, the centre light containing a representation of the Saviour in majesty, surmounting a representation of the Holy Innocents. The two adjoining lights contain figures of angels glorifying the central figure of our Lord, and surmounting figures of Daniel and St. Catherine, whilst the tops of the lights contain respectively figures of David and St. Cecilia. The right-hand light contains at the top figures of St. Barbara and St. Mary Magdalene; in the centre, figures of St. Agnes and St. Lucy; and at the base, figures of St. Hilda and St. Susana. The left-hand light contains, in corresponding positions, figures of St. Peter and St. John; St. Giles and St. Edward the Confessor; Moses and Joshua.

Evesbatch.—Two stained-glass windows have been completed at the recently-restored church of Evesbatch, near Malvern, by Messrs. Wailes & Co., of Newcastle-upon-Tyne, one at the west end representing St. Andrew, after whom the church is named, the other on the south side of the chancel representing the Nativity of our Lord. The latter was the gift of the Misses Perrins, of Malvern.

West Derby.—The five-light east window of the new Thornton chancel at St. James's Church, West Derby, has been filled with stained glass by Messrs. Wailes, of Newcastle. It contains medallions with subjects of our Lord's Passion. The Crucifixion occupies the central place, with the Ascension above it, the triumphal entry and agony on one side, and the entombment and resurrection on the other, the institution of the

Lord's Supper below it, with the typical subjects of Abel and Melchisedek on one side, and the sacrifice of Isaac and the Passover on the other, the two sexfoils above being filled with the "Ecce Homo" and the "Agnus Dei."

Davidstow (Cornwall).—The old church of Davidstow, in Cornwall, has recently been rebuilt by the munificence of Miss Pearse, of Launceston. Three stained-glass windows have just been erected in the new building, by the firm of O'Connor & Taylor.

Whitford (Flintshire).—A stained glass five-light east window, by Mr. C. A. Gibbs, of the Marylebone-road, in memory of the late Mr. Alexander Cope, J.P., of Saithaclwyd, New Halkyn; also marble chancel-steps and altar railing, and an encaustic-tile floor, have been executed here, Mr. Lingen-Barker being the architect, and Mr. W. Balcombe the contractor.

CHURCH-BUILDING NEWS.

Evesbatch.—The parish church of Evesbatch, lying about midway between Malvern and Bromyard, was reopened on the 16th ult., after restoration under the direction of Mr. T. Nicholson, architect, Hereford. The church, which is very small, being scarcely capable of holding 100 persons, was, prior to the restoration, greatly dilapidated. The original walls of rude stones, both inside and out, were covered with common plaster and whitewash, except where time and negligence had let it fall off. These, where not taken down and rebuilt, have been scraped on the outer face and pointed. New buttresses have been added; the quoins to the angles are new, as also are the windows. A new south porch and a vestry-room on the north side have been added. A new wall at the west end under the tower has been put in; the upper part of tower, from the eaves, is new. The new porch is also of old oak, varnished. The whole of the roofs are new throughout. The chancel and nave floors are laid with encaustic tiles. The contractors were Messrs. Barratt, of Castle Frome, and the entire cost has been about 750*l.*

Sheffield. — The corner-stone of the Sale Memorial Church, Dyer's-hill, Sheffield, was laid on the 16th ult. by Mrs. Moorhouse, wife of the Bishop-designate of Melbourne, and daughter of the late Rev. Canon Sale, D.D. The church is the outcome of a desire to perpetuate the memory of the late Rev. Canon Sale, and will stand on the site of the Old Ropery, in South-street, Park, having a side elevation to the street. The plan comprises nave, aisles, a chancel with an octagonal end; two chancel transepts or side chapels, one to be used for the children and the other for the vestry and organ; and a roomy porch at the level of South-street. The extreme internal length of the edifice will be 109 ft., and the width 65 ft., the height of the nave at the centre being 51 ft. The building externally will be simple in character, the style being Early Pointed, changing into that of a little later period, with geometrical tracery in the chancel. A bell turret of massive proportions, rising 130 ft. above the ground at one angle of the nave, forms an important feature of the design. The expenditure, without the turret, is estimated at 8,700*l.*

Edinburgh. — The foundation-stone of a new Episcopal Church was recently laid at Borough-muirhead, Morningside, Edinburgh. It is to be seated for upwards of 500 persons, and will cost between 10,000*l.* and 11,000*l.* Miss Falconer, of Falcon Hall, is to defray the expense of the chancel, which will amount to upwards of 3,000*l.*

Hampton-in-Arden. —An effort is now being made for the restoration of the parish church of Hampton-in-Arden. The state of the fabric has for many years been a cause of grave anxiety, and the dilapidations are now so serious that a complete restoration is necessary. Even so far back as the year 1656, Sir William Dugdale, in his account of Hampton-in-Arden, says that "this church, being situated on so far an ascent, had a tall spire, which was a noted mark to a great part of the woodland, till by the extraordinary violence of lightning and thunder, happening on St. Andrew's Day, at night, in the year 1643, it was cloven, and fell to the ground; at which time the whole fabric, with the tower, were torn in divers places." From that time to the present the Forest of Arden has been without its well-known landmark; the fabric is still "torn in divers places," and some unsightly additions, worse almost than dilapidations, have been allowed to disfigure the architectural beauty of the church. Plans (approved by the bishop and archdeacon) have been prepared by Mr. W. E. Nesfield, architect, for the restoration of the building; but the cost so far exceeds the resources of the locality that the building committee are compelled to appeal for aid outside the parish, and the Rev. T. J. Morris (the vicar) accordingly asks for contributions.

Oxford.—The petition to the Bishop of Oxford for a faculty for the restoration of St. Mary's Church has been published. It states that it is now judged expedient, not only from considerations of architectural beauty and ecclesiastical propriety, but also in order to promote the general convenience of those that frequent the services of the church, altogether to remove the galleries which at present occupy the entire northern and western sides of St. Mary's Church; but, in order that no loss of accommodation may result from this change, to remove the partition wall (erected in the year 1733), between Adam de Brome's chapel and the body of the church; and also to remove the present cumbrous stone screen and organ-loft, which slightly encroaches upon the nave, as well as to readjust the sittings throughout the church, whereby an increased number of sittings of the parishioners at their parochial services, and for the members of the University at the University services and sermons, will be obtained, and the general comfort of both congregations be largely promoted. It is proposed to entrust the work to Sir Gilbert Scott. The estimated cost is between 18,000*l.* and 20,000*l.*, about one-half of which sum will be expended in remodelling the church, and the remainder for the decorations for the interior. In addition to 1,000*l.* given by the University, Oriel College, in whose gift is the living of St. Mary's, has voted 300*l.*

Bishopstrow.—About 1,200*l.* are about to be spent on the parish church of Bishopstrow, Wilts. It is proposed to repair the stonework of the nave and tower, and open out the south windows in the tower; to remove the existing ceiling of the nave, and open out and repair the oak roof; to take down the north porch leading into the chancel, to remove the ceiling, and take off the roof of the latter, and to lower the height of the walls thereof, and to insert new windows into them; rebuilding the arch between the chancel and nave, and re-roofing the chancel. A new vestry-room is also to be built on the site of the present porch, together with an organ-chamber opening into the chancel. The existing organ gallery is to be taken down and removed.

Wilby.—Wilby Church, near Stradbroke, was reopened on the 27th ult., after restoration. The church belongs to the Perpendicular period, there being no evidence of any building of earlier date. Its most prominent feature is one of those fine flint towers of which there are so many in Suffolk. This tower was in a very good state, and all that the architect in whose hands the restoration was placed—Mr. R. M. Phipson—found it necessary to do to it was to have new slate louvres placed in the belfry windows, to have the stone quoins renewed here and there, and the flint work picked out afresh in places. Whilst the tower needed comparatively little attention, the rest of the church, that is to say the nave, south aisle, south porch, and chancel, both inside and out, was greatly in need of restoration, for the walls were all plastered over, the windows of the aisle in a dilapidated condition, the lead roof of the chancel needed renewal, the stone dressings of the buttresses, &c., in many places were in a bad state, the stonework of the remarkably rich porch had suffered much, and a large part of the nave and the chancel were filled with high pews. Not much has been done to the open timber roof of the nave besides restoring the carved bosses at the intersections of the beams. The floor of the chancel has been re-laid with Minton's encaustic tiles, and a warming apparatus has been supplied by Messrs. Gidney, of East Dereham. As already noticed, the restoration has been carried out under the supervision of Mr. R. M. Phipson. Mr. Grimwood, Weybread, was the contractor; Mr. Vine, Eye, executing the stone work; and Mr. Bullen, Stradbroke, the bricklayer's work, whilst the wood-carving is the work of Mr. Groom, Ipswich. The total cost has been nearly 1,000*l.*

Kingstanley.—The parish church of St. George, Kingstanley, Gloucestershire, was reopened on the 20th ult., after restoration under the direction of Mr. Bodley, architect, London. The church, which dates from Norman times, exhibited, until lately, some of the worst features of that neglect and patching-up which characterised the "churchwarden" period. It appears that the rector has been labouring for fourteen or fifteen years to bring the work of restoration about; and about two years ago Mr. S. S. Marling, one of the present members for the borough of Stroud, made an offer to enter into an agreement with the rector to undertake the whole of the work necessary for the restoration of the nave, the whole of the aisle, and the tower; whilst his son, Mr. William Marling, undertook the repair of the porch and the external work in the churchyard, on condition that the rector, with the assistance of his friends, made himself responsible for the building of a new chancel arch, the new building of the chancel, with vestry and organ chamber, and for a new organ, and the whole of the furniture of the chancel. The whole work will cost between 3,000*l.* and 4,000*l.*

Books Received.

The Fall of the Stuarts, and Western Europe from 1678 *to* 1697. By the Rev. E. HALE, M.A., Assistant Master at Eton. London: Longmans, Green, & Co. 1876.

THIS is one of a valuable series of historical handbooks now in course of publication under the title of "Epochs of Modern History," and which narrate the history of England and Europe at successive periods subsequent to the Christian era. It is edited by good hands, and had its origin in the conviction that, "for purposes of education or study, a complete picture of any one important period of the world's history, carefully prepared and in an inexpensive form, is of more value than a mere outline of a history of a nation." Educationally these books are, we believe, successful. They are much used in middle-class schools, and will, we trust, lead to a more scientific and rational study of some few years of the world's history, rather than a barren outline of dates and births, conveying no idea of men or people to a pupil's mind. The Rev. Edward Hale, an accomplished scholar, has evidently devoted much time and consideration to the volume before us, small as it is, and has been successful in placing before young readers the result of a large amount of reading in an easy and simple form.

VARIORUM.

CASSELL'S FAMILY MAGAZINE well maintains its position, and at 7*d.* is certainly one of the cheapest of its class.——Sir Edmund Beckett, bart., author of "Clocks, Watches, and Bells"; "Lectures on Church Building"; "Astronomy without Mathematics," &c., has in preparation a new work to be entitled "A Book on Building." The subject will be treated both in its legal and practical aspects.——In the *Leisure Hour* a series of brief papers is appearing, giving seasonable information as to the history and present condition of Bosnia, Servia, and the other border lands of Turkey in Europe. Concerning Montenegro, the writer says:—"The capital, Cettigne,—certainly the humblest one in Europe,—consists of one long street of stone houses of two stories; from the middle of which another wider street projects at right angles, leading up to the palace. A large inn stands at the end of the main street for the use of visitors, and also for the accommodation of the senators who come from a distance. In itself nothing can be less romantic than the capital of the Black mountain. The senate is composed of sixteen elected chiefs of tribes, subject, however, to confirmation by the Prince; it is both a deliberative and judicial body. The Prince is the centre of authority, and to him personally every peasant has the right to appeal on every matter, however trivial. The usual meeting-place of the senate in summer is a green or meadow in front of the palace, under the shade of a wide-spreading tree, round which two rows of seats are built. There is a seat for the Prince, and below him the senators are ranged. Visitors to Cettigne may daily see the senate administering justice in the open air. There is, therefore, some ground for the boast that the Montenegrin senate-house is the largest in the world.

Architects Abroad.—The King of Holland has created Mr. Cuypers, the well-known architect of Amsterdam, a "Chevalier de la Couronne de Chêne." Architects receive more attention from the reigning powers on the Continent than they do here.

Miscellanea.

Art at the Royal Aquarium, Westminster.—The society's gold medal and 100*l.* for the best oil painting has been awarded to Mr. C. Green for his picture, "May it Please Your Majesty." The society's gold medal and 100*l.* for the best water-colour drawing has been awarded to Mr. J. D. Watson for his drawing, "Stolen Marriage." The society's gold medal and 100*l.* for the best piece of sculpture has been awarded to Mr. J. E. Boehm, for his group, "Short-horned Bull." The society's silver medals have been awarded to Mr. H. Moore, for his painting, "Sunset after Wind and Rain"; to Mr. A. Stocks, for his painting, "The Old Sailor's Museum"; to Mr. A. Johnstone for his painting, "The Flight of Mary of Modena"; to Mr. W. Hall for his water-colour drawing, "River Hodder"; and to Mr. G. Simmonds, for his statue of the "Falconer." The society's bronze medals have been awarded to Mr. A. F. Grace, for his painting, "The Moon is up, and yet it is not Night"; to Mr. A. de Breanski, for his painting, "September,—St. Paul's Cray Common"; to A. Hopkins, for his water-colour drawing, "The Mowers"; to E. H. Corbould, for his water-colour drawing, "Entry of Henry V. into London, after the Battle of Agincourt, November 23, 1415"; and to A. Bruce Joy, for his group, "The Fairy Tale."

The Architect's Department of the London School Board.—At the last meeting of the London School Board, the Works Committee submitted a recommendation to raise the salary of one of the clerks in the architect's office from 130*l.* to 150*l.* a year. Mr. Morgan, one of the members of the Board, opposed the recommendation, contending that the per-centage of the proposed advance in proportion to the salary was too high, especially as the clerk referred to had had two advances, amounting to 30*l.*, within two years, and now a third was proposed, making 50*l.* within two years. Mr. Morgan also raised a question as to the salaries and staff of the architect's department, but after explanations had been given by the chairman that the staff of the architect was not guided in the matter of pay by the rules laid down for other departments, inasmuch as it was a shifting staff, and was, in point of fact, being much reduced, and would possibly hereafter be almost abolished, Mr. Morgan withdrew his opposition.

Artists' Benevolent Fund.—The dinner in aid of this fund is fixed for the 17th inst., when Sir William Fraser, M.P., will preside, and should be well supported. The "Artists' Fund" was established in the year 1810, and consists of two distinct branches, "The Artists' Annuity Fund," raised and supported by the contributions of its members for their own relief in sickness or old age, and "The Artists' Benevolent Fund." The Artists' Benevolent Fund, which is a strictly charitable society, has for its object the relief of such of the widows and orphans of members of the Artists' Annuity Fund as are left in need; and this looks for support from the patrons of the fine arts and artists, and the annual contributions of the members of the Annuity Fund. The annual sum of 20*l.* is paid to each widow, and the annual sum of 5*l.* is allowed for each orphan under the age of sixteen.

The National Portrait Gallery.—The nineteenth annual report of the trustees of the National Portrait Gallery has been published. The trustees comment on the grievous loss sustained in the death of Earl Stanhope, their late chairman, who took a deep interest in the progress of the National Portrait Gallery. Five donations of paintings have been received by the trustees during the past year,—portraits of the Duke of Wellington, the Marquis of Rockingham, Mr. Charles Babbage, the Countess of Cumberland, and Mr. Charles Moorland. The trustees have purchased fifteen new portraits during the same period, and these are now placed in the gallery. There has been a steady and large increase in the number of visitors to the gallery.

Another Fire at Canterbury Cathedral. On the afternoon of the 2nd inst. a fire broke out in the Clock-tower of Canterbury Cathedral. It seems that the fire was occasioned by an explosion of the vapour of some benzoline used in cleaning the clock, and which had accumulated in the clock-case. Mr. Trimnell, a local tradesman, at the time was holding a lamp to enable one of his workmen to see the machinery, and was seriously injured in the face and hands by the explosion.

The Sunday Society.—The object of this Society is to obtain the opening of museums, art galleries, libraries, aquariums, and gardens on Sundays. It appeals to all who, having at heart the improvement of the people, desire to see vexatious restrictions on the use of an inestimable privilege superseded by legislative enactments which shall represent the freedom and enlightenment of the age. It desires to secure the co-operation of every one who recognises the elevating influence of science, literature, and art, and wishes for the addition of an intellectual observance of Sunday to that which has hitherto exclusively obtained amongst us. The committee meet at 1, Adam-street, Adelphi, and Mr. Mark H. Judge is the honorary secretary.

Steam on Tramways.—During the whole of last week a new tramway engine, manufactured by Messrs. Merryweather & Sons, London, whose name is intimately known in connexion with steam fire engines, was running on the Dewsbury, Birstal, and Batley tramway line in Yorkshire. The engine was attached to an ordinary car, and worked the regular traffic in its turn with the horse cars. It is entirely enclosed, and presents the appearance of a diminutive car in front of the other car, and is free from noise, smoke, &c. It is now the intention of the above tramway company to apply for Parliamentary powers to work steam on their lines. We understand that similar engines by these makers have for some time been running on the Paris tramway lines.

The "Universal" Disinfecting Powder. The time is coming when all will find good occasion for a safe and cheap disinfectant, and here, if we are not misinformed, is one. It is described as a combination of the mineral sulphates with the chlorides of the earthy salts. In solution, a chemical change occurs, making the solution slightly acid, and setting free a portion of chlorine and forming a proportion of chlo. zinc; thus this disinfectant acquires in use a combination of valuable antiseptic powers. It is said to be fully one-third cheaper than carbolic acid. We have tried it with satisfactory results, but depend rather on the professional testimony given in its favour.

Site for Government Offices, Westminster.—In the House of Commons, on the 29th ult., Mr. James asked the First Commissioner of Works if it was the intention of the Government, in accordance with the intimation given at the commencement of the session, to introduce a Bill for the purpose of appropriating as a site for public offices the land and buildings within Great George-street, King-street, Charles-street, Westminster, and St. James's Park. Lord H. Lennox said the Government had abandoned their intention to introduce a Bill with reference to this site.

Warwick Borough Surveyor. — Mr. Pritchard, C.E., has relinquished his duties as surveyor to the borough of Warwick, in consequence of his engagements as a consulting engineer on water-supply. He will continue to act on behalf of the borough in the latter capacity until the completion of the Haseley water scheme. His successor as the town surveyor is Mr. George Lewis, of London. The other four selected candidates were,—E. Frost, Hanley; R. Richardson, Cleator Moor; R. H. Inch, Croydon; and J. Eayres, Llanelly.

The Botanic Gardens.—On the 1st inst. the Duke of Teck, president of the Royal Botanic Society, who was accompanied by the Duchess and their children, opened the new wing of the Conservatory of the Royal Botanic Society of London, in Regent's Park. The winter-garden is thus completed, at a total cost of about 8,000*l.* The portion just finished has cost 1,600*l.*, which was raised by special subscription among the Fellows; and it makes the total superficial area of the winter-garden now 23,500 ft.

Temperance Hospital.—A bazaar is being held in Exeter Hall. Its object is to help to raise the sum of 10,000*l.* still required to erect the new Temperance Hospital Buildings, a suitable site for which has been acquired in the Hampstead-road. Upwards of 10,000*l.* have been already subscribed.

The Sand-Blast.—The sand-blast works at West Rutland, N.Y., have been engaged for the last year and a half in the manufacture of headstones for the national cemeteries. The names are inscribed upon the stone by the sand-blast in fifteen minutes.

Value of City Property.—The freehold site of the Church of St. Antholin, Queen Victoria-street, having frontages to Queen Victoria-street, Budge-row, and Sise-lane, and occupying a ground area of 4,330 square feet, was sold, last week, by auction, at the Mart, Tokenhouse-yard, by Messrs. Fuller, Horsey, Son, & Co., for 46,350*l.*, or at the rate of 10*l.* 15s. per square foot.

Rinks.—A new rink in Coventry-street, Haymarket, called the "Empress," has been opened. Claridge's Asphalte Company have laid the floor.——The Belsize Skating Rink has been re-opened. Since it has been closed, the old floor has been taken up, and Seyssel asphalte substituted, which has been provided and laid by the Société Française des Asphaltes (Limited).

Reredos, St. John's, Winchester.—A new reredos has just been erected in the church of St. John, Winchester. It is Perpendicular in style, and divided into five recesses, surmounted by enriched canopies, under which stand the four Evangelists, sculptured in Caen stone, the centre panel representing our Lord as the Good Shepherd. It was executed by Mr. Hitch, from the design of Mr. Clarke, architect.

The Slade Professorship, University College.—We believe this is still open. Mr. W. Cave Thomas, who is a candidate, has submitted a very remarkable set of testimonials. There are six candidates. One of them, we are told, cannot speak English, and has probably, therefore, a good chance in these times when we are made to take our Shakspeare through foreign lips.

The Artisans' Dwellings Act in Dublin. In Dublin a company has been formed for the purpose of carrying out the provisions of the Artisans' Dwellings Act in that city. Justice Fitzgerald presided. There is to be a capital of 50,000*l.*, 13,000*l.* of which have been already subscribed.

TENDERS

Accepted for two detached residences at Alverthorpe, for Mrs. Adams. Mr. William Watson, architect:—

Excavating, Brick and Stone Work.

Fawcett	£1,039 5 0

Slating.

Pycock & Sons	93 15 0

Plastering.

Platts	106 0 0

Carpenter and Joiner.

Phillips	407 0 0

Plumbing, Glazing, and Ironwork.

Kirk	167 0 0

Painting.

Leak	22 0 0

For Board schools and residence at Normanton Common, for the Normanton School Board. Mr. William Watson, architect:—

Young (accepted)	£3,000 0 0

For rebuilding business premises in Baxtergate, Doncaster, for Mr. S. Anderson. Mr. William Watson, architect:—

Anelay (accepted)	£247 0 0

Accepted for a block of three houses on the St. John's Estate, Wakefield, for Mr. John Link. Mr. William Watson, architect:—

Excavating, Brick and Stone Work.

Dickenson	£1,065 0 0

Slating.

Pycock & Son	66 10 0

Plastering.

Platts	119 10 0

Carpenter and Joiner's Work.

Speight	497 0 0

Plumbing, Glazing, and Ironwork.

Brooke	199 0 0

Painting.

Naylor	24 0 0

For making alterations at the Angel Tavern, John-street, Minories, for Mr. H. Chown. Mr. John Viney, architect:—

Cole	£559 0 0
Shurmar	495 0 0
Grimwood	455 0 0
Downs (too late)	447 0 0
Lamble	420 0 0
Eaton	392 0 0
Andrews (accepted)	300 0 0

For alterations at the Devonshire Arms, Lancaster-street, Lancaster-gate, for Mr. F. Gwyer. Mr. John Viney, architect:—

Eaton	£285 0 0
Coates	268 0 0
Godden	255 0 0

For rebuilding warehouse, No. 109, Hatton-garden, for Messrs. Hodge & Co. Mr. Lewis H. Isaacs, architect. Quantities by Mr. L. C. Riddett:—

Gammon	£3,665 0 0
Wagstaff	3,630 0 0
Howard	3,544 0 0
Scrivener & White	3,499 0 0
Wagner	3,357 0 0
Kilby	3,356 0 0
Macey	3,293 0 0
Brass	3,197 0 0

For the erection of a new horse repository, Canterbury, for Mr. George Slater. Mr. John Green Hall, architect :—

Gaskin	£2,820 0 0
Naylar	2,790 0 0
Wiltshire	2,767 0 0
Cosens	2,703 0 0
Wilson	2,632 0 0
Paramor & Son	2,269 0 0
W. & T. Denne	2,478 0 0
Featherstone & Lucas (accepted)	2,447 0 0

For new out-patients' department for Royal Hospital for Diseases of the Chest (exclusive of foundations), City-road. Mr. J. O. Abbott, architect. Quantities by Mr. G. Jackson :—

Colls & Sons	£2,458 0 0
Allen & Son	2,431 0 0
Manley & Rogers	2,414 0 0
Enoor	2,370 0 0
Dove, Brothers	2,365 0 0
Downs & Co.	2,102 0 0
Brass	2,063 0 0

For the erection of a villa at Ealing, for Mr. J. Davies. Quantities by Messrs. Northcroft, Son, & Neighbour :—

Nodes	£3,322 0 0
Sheppard	2,925 0 0
Mason	2,897 0 0
Adamson	2,814 0 0
Hook & Oldrey	2,799 0 0
Nye	2,725 0 0
Walters	2,663 0 0

For ten cottages at Hammersmith. Mr. R. E. Tyler, architect. Quantities by Mr. T. Nixon :—

Downs	£4,100 0 0
Lynn	3,990 0 0
Wall, Brothers	3,974 0 0
Smale	3,884 0 0
Marsland*	3,387 0 0

* Accepted for reduced amount, 2,986*l*.

For a block of warehouses, Paternoster-square. Mr. R. E. Tyler, architect. Quantities by Mr. T. Nixon :—

Phillips (accepted)	£5,847 0 0

For painting and decorative work at the Butchers' Hall, Eastcheap. Mr. H. Winstanley, architect :—

Pitman & Cuthbertson	£278 0 0
Colls & Son	259 0 0
Phillips & Son	237 0 0

For erecting twenty houses at Stratford, for Dr. Sweetman. Mr. E. Hide, architect :

Page	£6,680 0 0
Lewis	5,900 0 0
Judd & Hawkings	5,080 0 0
Ladd	4,200 0 0

For the erection of a villa residence at West Barnes, Merton, Surrey, for Mr. C. Dickson. Mr. Marsh, architect :

	If old house is pulled down and old materials re-used.
Boyd	£1,598 0 0 ..... £1,628 0 0
Judd & Hawkings	1,382 0 0 .....
Scase	1,149 0 0 ..... 1,189 10 0
Jarvis	— 995 0 0
Cobb	830 0 0 ..... 890 0 0

For the erection of a villa at Sheridan-road, Merton, for Mr. F. G. Courthope. Mr. Marsh, architect :—

Judd & Hawkings	£1,859 0 0
Boyd	1,848 0 0
Scase	1,550 0 0
Cobb	1,375 0 0

For house and school at Bickley. Messrs. Cooper & Son, architects :—

Boyd	£5,649 0 0
Payne & Bulling	4,060 0 0
Taylor & Son	3,907 0 0
Copping	3,827 0 0
Jopling & Co.	3,728 0 0
Staines & Son	3,686 0 0
Judd & Hawkings	3,637 0 0
Prebble & Co.	3,580 0 0

For the erection of buildings, 355, Hackney-road. Mr. Charles Fowler, architect. Quantities by Mr. Henry Lovegrove :—

Lawrence	£1,368 0 0
Chessum	1,338 0 0
Bays, Brothers, & Allen	1,297 10 0
Allen & Son	1,240 0 0
Brown & Sons	1,200 0 0
Smith	1,177 0 0
Bangs & Co.	1,159 0 0

For new schools and residence at Brockley, Suffolk. Mr. F. Whitmore, architect :—

Hawkins (accepted)	£640 0 0

For alterations and additions to house at Steeple Bumpstead. Mr. F. Whitmore, architect :—

Mason & Son (accepted)	£449 0 0

For rebuilding farm premises at Runwell, for Mr. Thos. Kendle. Mr. Frank Whitmore, architect :—

Kennell (accepted)	£321 0 0

Accepted for new church at Hawsker, near Whitby :

Masons' Work.

Winterburn	£938 9 3

Joiners' Work and Slating.

Robinson	490 0 0

Plumbing.

Dr[illegible]	87 10 0

Painters' Work.

Reckless	27 0 0

For offices, Fenchurch-buildings, including extra prices. Mr. Robert J. Worley, architect :—

W. & F. Croaker	£1,675 0 0
Falkner	1,235 0 0
Timewell	1,085 0 0
Ruckin (accepted)	1,057 10 0

For the erection of a new Roman Catholic church, presbytery, and schools, Market Harborough. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Gillard :—

Parnell & Son	£5,761 0 0
Bayes, Brothers, & Allen	5,497 0 0
Stamp & Bowtle	5,359 0 0
Jennings	5,315 0 0
S. & W. Pattinson	5,000 0 0
Halliday & Cave (accepted)	4,900 0 0
Margetts	4,668 0 0
Conquest	4,551 0 0
Bassett	4,438 0 0

For house and stabling, Hampstead Hill-gardens, Hampstead, for Dr. Andrew Miller. Messrs. Batterbury & Huxley, architects. Quantities supplied :—

Contract No. 1 (*foundations*).

King (accepted)	£139 11 9

Contract No. 2 (*house, stables, and fence walls*).

Deards	£3,835 0 0
Nightingale	3,260 0 0
Manley & Rogers	3,133 0 0
Patman & Fotheringham	3,095 0 0
Burford	2,996 0 0
King (accepted)	2,880 0 0

TO CORRESPONDENTS.

J. G. H.—I.—W. G. S.—R. S.—C. H. M. M.—C. L.—J. H. R.—G. R. K.—J. J. C.—Mr. D.—A.—T. & D.—B. P.—R. Y. T.—H. E.—H H—J. R. F (if D instructed C to supply the quantities, as stated, he would be liable unless he could prove that he had been misled. D. alone should be sued, the other parties having given no orders). T. B (call us in the condition described should be first papered).—T. G. (next week).—R. B. (next week).—B. D. K. (next week).—W. A. (next week).—R. B. F. (next week).

Error in —In "Notes from Manchester" in last number, for "Union Land and Building Company," read "The Queen's Building Society."

Hastings Town Hall — We have already mentioned that the premium was awarded to two firms in combination. The drawings from which our illustrations were made were signed by only one of them, and their names we therefore appended to the view.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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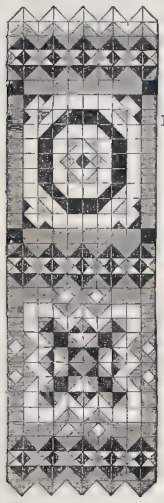
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Presentation of Royal Gold Medal at the Institute of Architects.

ON Monday evening last the concluding ordinary general meeting of the Institute, for session 1875-76, was held at Conduit-street, Mr. Charles Barry, president, in the chair. There was a very crowded attendance, the occasion being at once the closing meeting of the session and the opening meeting of the fourth General Conference of Architects. Visitors attending the Conference were received by the President in the library from half-past seven to eight o'clock p.m.

Professor F. Meldahl, president of the Royal Academy of Copenhagen, and Professor Alexander Resanoff, rector of the School of Architecture in the Imperial Academy of Russia, were by acclamation elected honorary fellows of the Institute.

The following gentlemen were balloted for and duly elected, viz.,—As fellows: Mr. G. A. Audsley and Mr. W. J. Audsley, of Liverpool; and Mr. Ralph Nevill, F.S.A., of Godalming. As associates: Messrs. W. R. Bryden, Clapham; A. A. Griffiths Colpoys, St. Leonard's-on-Sea; W. Crisp, Holloway; R. M. Fulford, Exeter; W. Frame, Tongwynlais, near Cardiff; H. R. Perry, Derby; E. Seward, Cardiff; and A. J. Style, Thames Ditton.

The President,—who on rising to present the Royal Gold Medal to M. Joseph Louis Duc, Commander of the Legion of Honour, Member of the Institute of France, and Honorary and Corresponding Member of the Royal Institute of British Architects, was warmly applauded,—said:—

"MONS. DUC AND HONOURED COLLEAGUE,—As President of this Institute it becomes my duty to address you a few words, and I would in the outset bid you a hearty welcome to England, and rejoice with you in the special object which brings you among us.

There has been happily a brotherhood of artists in all ages, even when countries were practically divided from each other. Freemasonry did a useful and encouraging work in this respect, and it would be indeed a reproach to us if now, with ready means of communicating thought, and with further easy means of personal communication, that such brotherhood and sympathy one with another were not largely increased. Amid the vicissitudes of an artist's life, and his many anxieties, the knowledge that there is this sympathy supports him in his trouble and animates him to exertion, and our struggling, talented brother feels that he is one of ourselves. The great dead, too, are still with us, labouring, as it were, with us, and giving us examples and encouragement.

As, indeed, the laws of beauty, by which real art can alone be judged, have existed unchangeably, and will, doubtless, ever be the same among cultivated minds and tastes educated and trained to understand and apply them, so may this unity of thought knit together the artists of this and future ages, not only as artists, but with the even warmer personal sympathy which our human nature so much longs for.

Sir, it is my duty, and also my pleasure, to be the medium of conveying to you a distinguished honour on the present occasion, and it is an honour which I believe to be nearly unique in its character. It is conferred directly by the Sovereign, the fountain of all honour, but it is so conferred on the advice and with the good wishes of your equals and rivals in art in this country. Although the Royal Gold Medal is placed unreservedly at the disposal annually of the Royal Institute of British Architects, and although it is the summit of the ambition of all of us here to deserve and receive it, the architects of England, worthily represented by this Institute, animated, I rejoice to think, by the sentiments I have attempted to express, have decided that every third year at least they will look abroad, and by recommending her Majesty to bestow it on a foreigner, show the desire to know and be known, to honour and be honoured, by those who, strangers to them in country and language, are yet their dear brethren in art as embodied in our noble profession.

Your title to this distinction, M. Duc, needs no description from me, yet it is a pleasure to all of us to remember that among our honoured ones is the distinguished architect of the graceful Column on the Place de la Bastille, and who has directed and restored the buildings of the Palais de Justice. And we remember also the talent of the man who could carry off the Grand Prix de Rome in 1825; the great prize, of several thousand pounds, given (in 1869) by the late Emperor; and whose unselfish love for his art prompted him to devote half of the sum before mentioned as prizes of encouragement to young architects.

This medal of honour was established by our Sovereign in the year 1848, and I think, sir, it will perhaps enhance the feeling with which you receive it to find yourself one among the little band whose honoured names have been made known to you, many of whom have passed away and live only in our memories and esteem; while of the others who are still among us, all whom absence or illness did not prevent are, I believe, here to welcome you to-night."

M. Duc was very heartily received on rising to receive the medal. He responded, in French, to the following effect:—

"*Chers Confrères*,—I was extremely touched with the announcement that the Royal Institute of British Architects had presented my name to your gracious Queen for the award of her Gold Medal. What I have done could not lead me to think of being designated for such an honour; and I am very proud and most happy to see my works crowned with the approbation of your Society. You know, gentlemen, one is never a good judge of one's own work, nor even of those of one's country; they must be sanctioned by the judgment of foreign nations, and yours is, for me, of great value. I receive, therefore, a supreme honour by the gift of this medal, and certainly my countrymen will participate in this reward. Nations can be rivals when it is a matter of conquest and interest. To-day, on this point, France, after severe trials, is most disinterested; and if she turns her eyes upon one part of the Continent, she confesses her inferiority in the art of destruction. She retires within herself, and desires to remain upon the ground of arts and of peace. In this path, *chers confrères*, we can unite our efforts so as to show to all people upon earth how the arts, and particularly architecture, honour a nation, and let us not forget that amongst the glories of antiquity, architecture is the most just expression of their greatness and their superiority. Look, for example, at that smallest part of the globe, which is named Greece, calling to witness her monuments and the treasures of your Museum; see with what lustre shines that art so perfect, which ever beams upon ours, and upon our taste. Therefore, if it be permitted to say that at the present time force takes precedence of right, never, I hope, will art be overcome by barbarism; and it may be affirmed that nations which have been rendered illustrious by art will have right to the respect and admiration of posterity. With this aim, *chers confrères*, let us unite the qualities which specially distinguish us. Born each with a different temperament, our two nations, by the union of their natural gifts, may produce perfect works. Here, *chers confrères*, permit a comparison which, amongst you, may be made without my being accused of irreverence. In your country,—producer of the finest breed of horses—you do not forget doubtless what share the crossing of breeds has had in it—those of the East and of Normandy. May it be the same for our art! You, Englishmen, shall bring the solid and brilliant qualities from your race, grandeur and hardihood of conception, a liberty and a power of execution which seem to increase in proportion to obstacles; I may add, an independence always moderated by the sentiment of the true and natural,—in fine, a taste remarkable and not without affinity to Greek art. We, Frenchmen, will bring our traditions of school and classical *ordonnance*, justified by a long experience of great epochs, and then—that grain of fancy which characterises Gallic wit. Such are, *chers confrères*, the elements of a good and profitable association. Let us hope that by our more and more intimate connexion and by mutual borrowings, brilliant results will be produced, and

force themselves upon the esteem of the whole world. I bring my humble thanks to the feet of your gracious Sovereign. I pray for the health of your illustrious President, and for the union of British and French architects."

The following medals and prizes offered by or through the Institute during last session were then presented by the president, by whom each recipient was addressed with a few words of encomium and encouragement:—

The Soane Medallion (for a design for a country house), to Mr. Josiah Conder.

A Medal of Merit (for a design for a country house), to Mr. J. O. Harris.

A Medal of Merit (for a design for a country house), to Mr. William Niven.

Sir W. Tite's Prize of 40*l.* (design for a concert-room), to Mr. Alfred Reading.

The Grissell Medal (design for a hall and staircase), to Mr. George D. Stevenson.

The Institute Medal and 5*l.* 5*s.* (for drawings of St. Alban's Abbey), to Mr. James Neale.

The Institute Medal (for drawings of Dryburgh Abbey), to Mr. James Lindsay.

The Student's Prize (for a design for a park lodge), to Mr. Henry Branch.

The Pugin Studentship (for the best set of drawings), to Mr. E. J. May.

A Medal of Merit (in the same competition) to Mr. Thomas Garratt.

A Certificate of Honourable Mention (in the same competition), to Mr. W. Talbot Brown.

At this stage of the meeting, Mr. F. P. Cockerell read a telegram in French, that moment received, to the following effect:—"The architects of France, assembled in Congress at the École de Beaux Arts, send their unanimous congratulations to Mr. Joseph Louis Duc, and their fraternal thanks to the Royal Institute of British Architects, on the occasion of the presentation of the Royal Gold Medal to their honoured colleague this evening. Signed, for the Bureau of the Congress, Bailly, president; Auguste Duvert and Lucien Etienne, secretaries."

Mr. C. F. Hayward called attention to an interesting series of drawings of coloured decoration found during the restoration of Copford Church, near Colchester. The drawings had been made at the instigation and at the cost of the Essex Archæological Society, who propose to reproduce them by means of chromo-lithography if a sufficient number of subscribers can be found. [We may add that they belong probably to the end of the twelfth century].

It was announced that the annual *conversazione* of the Institute will take place on July 12th.

This concluded the business of the Institute for the session, and the President then opened the proceedings of the Conference with these remarks:—

"I would now say a few words to open the Conference of 1876. This is the fourth that has been held, viz., in 1871, 1872, and 1874, previously. Of course it is not possible to point precisely to *exact* benefits of such meetings, but it is impossible to believe that the intercommunion of cultivated men having the same objects in view, and those *the* objects of their lives, will not be productive of benefit, not only to themselves but for the public, who are their clients. This Institute must naturally always be anxious to promote such objects, and rejoice if it can in some sort be a bond of union to all the architects of their country. While on these occasions we rejoice to impart to our visitors such information as we in London possess, we fully expect to receive much instruction from their varied experiences in return. I venture to anticipate that the meetings and visits that have been arranged for the next few days will be found both instructive and enjoyable. They have been arranged chiefly by the labour and efforts of Mr. Strong and Mr. Mathews, and if they are successful the merit will largely belong to those gentlemen as secretaries to the Conference committee, all the members of which, indeed, have been zealously anxious to lend interest to the visit to us of our country colleagues. At the end of the week, our labour over, I hope to be supported by a large gathering at the dinner which concludes the Conference,—that essentially English bond and evidence of good fellowship,—and now invite attention to Mr. Eastlake's paper."

Mr. Eastlake then read an Historical Sketch of the Institute, which we print *in extenso*, together with several other papers read during the week, with reports of the ensuing discussions, and we intend to print the remainder next week. Mr. T. H. Wyatt and Professor Donaldson spoke at the conclusion of the paper, and, on the motion of Mr. Godwin, thanks were voted by acclamation to the President, and the session came to an end.

GENERAL CONFERENCE OF ARCHITECTS.

THE fourth General Conference of Architects, held under the auspices of the Royal Institute of British Architects, commenced, as already stated, on Monday evening last, Mr. Charles Barry, president of the Institute, in the chair. There was a very large attendance of members and visitors from town and country.

On Tuesday morning, visits were paid to Mr. Matthew Allen's improved dwellings in flats for the middle classes, Manor-road, Stoke Newington; to two large blocks of buildings now approaching completion at Finnis-street, near Bethnal-green Junction, for the Improved Industrial Dwellings Company; and to the new blocks of buildings lately erected by the Peabody Trustees, Southwark-street. We will give some account of these buildings in our next.

On Tuesday afternoon at three o'clock a meeting was held in the rooms of the Institute, Conduit-street, to consider the subject of "Improved Dwellings" and "The Artisans' and Labourers' Dwellings Act, 1875."

Mr. George Godwin presided, and in opening the proceedings he said that it was very satisfactory to those who had been working for many years to effect some improvement in the houses of the poor, and to ameliorate the miserable condition of some of our large towns, to witness the public interest evinced in such questions; which were now recognised as being of supreme social importance, quite irrespective of the question of pounds, shillings, and pence. It was half a lifetime ago since these subjects had first engaged his attention, and the persistent manner in which the journal with which he was connected directed attention to the wretched condition of the dwellings of the poor and its evil consequences was at one time thought likely even to imperil its success. However, the subject was known to be of such serious importance that he and those who were acting with him were not deterred in pursuing the necessary inquiries; and it might be hoped that these endeavours had assisted in some measure in bringing about the present state of public opinion on the subject.

Mr. G. Valliamy then read a paper on the "Artisans' and Labourers' Dwellings Improvement Act"; and

Mr. Fred. Chancellor followed with a paper on "Improved Dwellings for the Working Classes"; both of which we print.

Mr. C. F. Hayward also read a paper on the same subject; and it will be printed in our next.

Mr. Eastlake said he had received a letter from Mr. Charles Barry, regretting his inability to be present, and enclosing the following notes of operations to the present time at the Battersea buildings adjoining the people's park there, consisting of one block for self-contained dwellings, which include ninety-eight such tenements of three and four rooms each, and it is supposed will house about 500 persons; and two blocks for mixed dwellings, which contain 152 rooms, to be let as single rooms, or two or three together, and will, it is supposed, house about 350 or 400 persons. Laundries are provided in separate buildings for free use of inmates in rotation, as may be arranged by the resident superintendent. As to the accommodation and arrangements of the self-contained dwellings for these tenements, the sitting-rooms have an area of about 150 ft. each, and the bedrooms 100 ft. each, and all are 8 ft. clear in height. The kitchens are duly fitted with water, coal-bins, cooking range, and copper, and open into balconies. A water-closet is provided for each tenement, approached only from the open air. In the mixed dwellings the rooms are of various sizes, and also 8 ft. high in the clear, so arranged as to be capable of various combinations of one, two, or three in a set. All the larger rooms are fitted with sink and water supply. Coal-stores for each tenant are provided in the court-yard. The water-closets in these blocks are only approached from a transverse passage on each floor, open to the air at both ends, and connected with the staircases, thus ensuring easy access from every room, and at the same time perfect separation from all dwelling-rooms, and a continual current of air and consequent ventilation. Dust-shoots are provided on all floors of all buildings, emptying into a dust-pit in the court-yard, which can thus be cleared out periodically without inconvenience to the tenants. Windows are all made to open top and bottom, and are kept close to the ceilings of the rooms. A contract has been entered into for the erection of these buildings at a cost of 33,800*l.*, and they are in course of construction, and will be ready for occupation in the spring of next year. The buildings at Stroudvale, King's-cross, are laid out in four blocks,—viz., one block for self-contained tenements, which will contain 120 such tenements of three rooms each, and house about 500 persons; and three blocks for mixed dwellings, which will contain in all 640 rooms, and it is supposed will house about 1,000 persons. No contract has yet been taken for these blocks; but specifications and plans are now ready for tenders to be asked for them forthwith.

Mr. Thomas Blashill said he had received communications from Glasgow and Liverpool giving particulars of dwellings erected for the working classes in those towns. Mr. David Thomson, architect, Glasgow, sent four sheets of tracings showing as many designs for artisans' dwellings, all of which have been erected near Glasgow, from his plans. Plan No. 1 shows plans of ground and upper floor of a range of houses of two stories, each house containing a kitchen and two small bedrooms. In each kitchen the sink or scullery-box is placed in a recess. The ashes are collected in a cast-iron dust-bin placed on the back wall at foot of the stairs, with shaft to the upper landing of the stairs. The upper houses are entered from the stair landing, and in each alternate lodging or compartment a close or passage is made for access to these stairs and the land behind, on which are built the coal-cellars, wash-houses, and privies, with small gardens for the tenants. Plan No. 2 shows plans of two-story tenements of a little better sort: each house in this plan has a kitchen, with small scullery and two good rooms. The stairs are under cover of the roof, though open to the back, and each lodging has a close or passage from the front. The wash-houses, coal-cellars, ash-pits, and privies are built on the land behind. In both these plans each kitchen and several of the rooms have fixed beds in recesses formed for them. Plan No. 3 shows plans of a four-story tenement, such as is occupied in large towns by the better portion of the working classes. The ground floor is made into shops, and the three upper floors are alike, each floor containing three separate dwellings, entered from a common stair. The centre house has two apartments, with fixed recessed bed in each, and the two side houses have each three apartments (one very small), with recessed beds in two. Each house has a watercloset, entered from inner lobby, lighted from staircase, and ventilated by vertical pipes carried up through the roof. Fresh air is admitted to these waterclosets from horizontal pipes between joists of floors. Plan No. 4 shows plans of a tenement of houses of a class somewhat better than No. 3. The tenement is four stories, with shops on ground-floor and shop cellar below, and the shops are extended behind, forming saloons. The airing-yards for tenants in upper floors are formed on the asphalted roofs of these shop saloons, on which also are built ash-bins and washhouses. These airing-yards are entered from a landing of the first stair, the window being made in casements. Three houses enter from each landing of the stair, and each house contains kitchen, parlour, and bedroom, with water-closet, two of these being large enough to contain a bath. The roofs in this case are all formed of asphalte on wood joists and boarding. Messrs. H. & A. P. Fry, architects, Liverpool, sent particulars of a double block of dwellings, erected 1872–73, in Ashfield-street, Liverpool, for the Liverpool Labourers' Dwellings Company. The two blocks comprise 128 houses and four shops (the latter facing Latimer-street). The houses at either end of the blocks contain three rooms each. Those running lengthways contain three, four, and two rooms. Those con-

taining three and two rooms were more readily let. The shops were immediately let. That at the corner of Latimer and Ashfield streets (a baker's) being let at 20s. per week, payable quarterly. The remaining three at 12s. The rents of houses range from 4s. to 6s. 9d. per week. The land was purchased for 13s. per yard, and is freehold. The cost of buildings complete amounted to 18,634*l.* The dividend since completion has been at the rate of 4*l.* 10s. per cent. per annum. Between the two blocks is an open court paved with Buckley bricks, averaging 46 ft. 6 in. wide, having a cartway laid with asphalte down the centre, 10 ft. 6 in. wide, for Corporation carts to collect ashes, &c. The basement floors are all laid with cement. The four basements facing the west being devoted to washhouses and baths, which are let to one tenant. All upper floors are wood. The blocks are constructed on the balcony system, there being four staircases (stone) in all, and these under the main roof of the building. The balconies are continuous, running from end to end of either block, but not roofed. These balconies as well as the living-rooms of all the houses are lighted with gas. The rentals quoted prior to this include all taxes excepting in the case of the shop let at 20s. The gas is also included and shut off by the keeper at eleven o'clock p.m. Between every couple of houses will be noticed an ashpit-door on each balcony; under each of the shafts, beneath the basement floor, is a large receptacle for the ashes of eight houses. Immediately adjoining this ash flue is a flue containing all the pipes, down one side of which is a double casing for gaining access at any time, running from top to bottom of the four stories. On entering each house is found a scullery, with hot and cold water sink, with bunk underneath the sink for coals, chips, &c. On one side is the water-closet. From each water-closet is communication with a ventilating-shaft adjoining the flue for pipes. The property stands on nearly an acre of land. The staircase walls are faced with white glazed bricks.

Mr. Gatliff read the following paper:—

There are two points to which more especially I wish to call the attention of this meeting, as bearing materially upon the question before it, viz., 1st, the effect of the cost of the superstructure; and, 2nd, the much greater number of persons to the acre that are accommodated in the improved dwellings of the Metropolitan Association than are at present accommodated in the most densely-populated parts of the Metropolis, notwithstanding that more than one-half of the land appropriated to the improved dwellings is left open, as conducive to health and for safe recreation. In Westminster, which is the most densely-populated part of the metropolis, the population is only 235 to the acre, whereas in the dwellings provided by the Metropolitan Association, including in the areas the large court-yards and play-spaces attached, the average is 1,140 to the acre, and yet the rate of mortality during the last eight years has not exceeded sixteen per 1,000, while the rate in the metropolis generally during the same period has been twenty-four per 1,000. The total area of land occupied by buildings in flats of the Metropolitan Association, accommodating 817 families in crowded parts of the metropolis, is 156,732 superficial feet, and of this 74,620 superficial feet only are covered by the improved dwellings, five, six, and seven stories high, the remaining 82,112 feet being devoted to playgrounds for the children, and for improved ventilation, and still the ground-rents of these dwellings are at the very low figures, varying from 1½d. to 1s. 6d. per family per week, or an average of 5½d. per family per week, that it will be seen that the cost or rent of the land, when even so utilised, forms a very small portion of the rent necessarily charged for the improved dwellings, and bears very lightly on each tenant. The majority of the buildings of the Metropolitan Association are placed on three sides only of a piece of land, oblong in shape, the remaining portion of the land (including the drying-ground in the rear) being left open for recreation and ventilation; and I here venture to express an opinion strongly in favour of thus placing, as far as practicable, improved dwellings on such sites, if they can be had, at the same time I am fully aware that in very many instances each building must be adapted to the site which may not always have a frontage of, say 200 ft. by 100 ft. deep, but if on a site of such dimensions (and I incline to the opinion that no inconsiderable number of such can be provided in the metropolis when we read of clearances of from six to ten acres of wretched dwellings are in contemplation) upwards of 1,100 souls to the acre can be housed in more healthy dwellings, such improvements may be carried on with much benefit to our less fortunate fellow creatures, and with great advantage to the metropolis, in an architectural point of view. Another advantage in the improved dwellings being set back some distance from the main street with a large court-yard in front, is, that wider areas to the basement dwellings can be obtained which will be better protected from filth and annoyance; but in making this remark it must not be understood that I am an advocate for dwellings in basements. At the same time I have no doubt that very many members present have often come in contact with sites where the excavations had to be made to a great depth to obtain a good foundation, as was the case with this Association, who, in one instance, had to excavate to the depth of 23 ft., and in another to keep a steam-pump at work for two months. And I only allude to this point in support of my position, and to state my experience that such spaces may be safely utilised for improved dwellings if kept well out of the ground with areas 6 ft. or 7 ft. wide on each side. I fully endorse the remarks made by Mr. Chancellor on the advisability of a separate water-closet being as far as practicable provided for each family, and the means afforded to each family of washing "their own dirty linen at home," and not that it and five hundred other matters should be incessantly discussed in a washhouse in common, which is my experience of them, and they are discontinued by the Association I have the pleasure of representing. I may here mention a circumstance which occurred twenty-eight years ago in our first dwelling in the Old St. Pancras-road, as showing the beneficial effect of giving a separate water-closet to each family, and that the closet or scullery in which it is placed should be approached from a separate lobby. Out of 100 sets of rooms in the building, some few of the sculleries were approached direct from sitting-rooms, the others being approached through the main entrance-lobby. In a very short time some of the tenants asked the superintendent, as a favour, that so soon as any of the last-mentioned dwellings became vacant, they might be allowed to change into one, as "you see," they observed, "if we have a few friends to see us, every one knows where we are going when we enter through that door,"—pointing to the door which opened direct from the sitting-room to the scullery. I am satisfied that attention to these minor points has a refining effect upon the tenants. I also endorse Mr. Chancellor's views that a second room, kitchen, or scullery should be attached to each dwelling, almost however small, as nearly thirty years' experience enables me to state my conviction that the class we accommodate do themselves desire to afford to pay the rent of two rooms, and will make personal sacrifices in other things to pay the extra money for them, and I would submit to this meeting that, in erecting improved dwellings, the plans should be settled for buildings which are occupied for many generations, and that the public and many of those who have had considerable experience in the working and effect of this movement hitherto are anticipating the approach of the time when every family in England will have at least two rooms to live in. I have elsewhere made similar remarks in support of this view, that too many single rooms should not be provided to accommodate the class that may be displaced under the Artisans' Dwellings Act, 1875. Having had some experience in the working of Mr. Matthew Allen's patent for making an excellent artificial stone, which he very liberally threw open to the public, and this Association having used it to a great extent in their new dwellings in the Farringdon-road, both in construction and to render those dwellings fireproof, I have pleasure in bearing testimony to the great saving in cost and labour and other advantages in using it very liberally. Instead of turning arches over the windows, and for door-heads and stairs, and for making fire-proof floors, as all combustible matter in its component parts (gas breeze, and cement) having in the manufacture been exhausted, it forms no inconsiderable guarantee for its use for this latter purpose. The Metropoliton Association also, on one occasion, tested the fire-proof qualities of this artificial stone, in the presence of Colonel Galton and other gentlemen, by placing a large thick slab of it over a very hot coke fire for several hours, and another block of the same dimensions, made of the same cement and small ballast, was put over a similar fire; the block made on Mr. Allen's principle was not charred a quarter of an inch deep, while the other block cracked in several places. I regret very much that absence from town, through illness, prevented my forwarding a list of dwellings which your committee kindly offered to include in your labours of to-day by visiting them, but probably some members of the Institute may have seen them on previous occasions, or may still do so. It has afforded me much pleasure to send here some of the working drawings showing the plans of the improved dwellings and their disposition on the land.

Mr. Matthew Allen said that one great defect in the buildings described by Mr. Chancellor was that there was no through ventilation to them; they merely followed out the principle of back-to-back building. He (Mr. Allen) claimed to be the originator of the plans of the buildings erected by the Improved Industrial Dwellings Company.

Mr. F. H. Fowler said that, as an architect and a member of the Metropolitan Board of Works, he had paid some attention to the subject, and he could not help viewing with some apprehension the working of the Artisans' Dwellings Act of last year, as it would tend to localise the poor in particular districts for ever. He thought this was an unfortunate thing for the metropolis, because the blocks of buildings erected under the Act, in place of the loathsome slums which at present exist in many districts, might, a few years hence, seriously impede, if they did not altogether render impossible, many important schemes of street improvements. It was unfortunate that the Artisans' Dwellings Act did not go hand-in-hand with a Street Improvement Act, so that while, on the one hand, means were afforded for removing and rebuilding unhealthy dwellings, advantage might be taken of the clearances made to widen existing streets, or to open up needed lines of communication. There was no doubt great credit due to those gentlemen who had been engaged for so many years in studying this question, and in insisting on the necessity of better dwellings for the people, but so far, he was afraid that very little had been done, and that the improved dwellings which had already been erected had not been, and were not, tenanted by those poorer classes by whom they were most needed. The question of providing healthy dwellings in towns, at rents which the tenants could afford to pay, and which should, at the same time, be remunerative, was one beset with difficulties in all directions. Whatever might be the progress made in the future, he hoped that a little more attention would be bestowed on the architectural effect of the buildings yet to be erected in London for the working classes.

Mr. Henman, of Stockton-on-Tees, said that some time ago he was asked by the president of the Cleveland Institution of Mining Engineers to read a paper on this subject, which presented a somewhat different aspect when considered with reference to the requirements of the provincial towns as compared with the wants of the metropolis. Many of the improved dwellings for artisans in Stockton were four-roomed dwellings, but were fearfully over-crowded. He had a careful census taken of two streets of average quality, and found that in some of the dwellings eleven people occupied one bedroom. The reason of that was that the tenants could not pay the rent demanded for the tenements, so that they took in lodgers. There was great room for improvement in the mode in which these dwellings in Stockton were built, for they were generally the work of speculating builders.

Mr. T. Roger Smith said he had been concerned some years ago in building some cottages for agricultural labourers, and they were provided with an additional bedroom on the ground-floor; but it was soon found that the tenants preferred to use this room as an extra sitting-room. This fact showed that before building dwellings for the working-classes care should be taken to understand their habits and requirements. The tall buildings which had been so largely erected in London afforded, no doubt, the most economical means of housing the poor in towns, and the balcony system of arrangement would produce the best result at the least cost. Miss Octavia Hill had preferred to adopt this plan, whether in building new houses or in adapting old ones.

Mr. Boardman, Norwich, said it was proposed to put the Artisans' Dwellings Act in force in that city, but he did not think it would be necessary there to erect such lofty buildings as were

built in London in the form of improved dwellings, owing to the fact that Norwich occupied a very large area in proportion to its population, almost every house having its garden. Even were it decided to build such lofty erections, he did not think the people could be got to inhabit them if they went higher than two stories.

A gentleman from Dundee, who said he was the Convener of the Works Committee of the Dundee Corporation, stated that most of the artisans' dwellings in the town had been built by speculating builders, in a manner far from satisfactory on sanitary and structural grounds; but since the Corporation had obtained a local Act, giving them greater power of control over these erections, there had been a marked improvement.

Mr. Carroll, Dublin, said it seemed to him that the buildings which had so far been put up in London did not meet the necessities of the poorer classes,—of those, indeed, for whom improved dwelling accommodation was most needed. One point as to the Artisans' Dwellings Act was that it appeared as he read it, to require the performance of an impossible feat by those who had to put it in force. Suppose they took an exceptionally crowded area of small extent, it would be sometimes utterly impossible to provide healthy homes for the same number of people as had been displaced on the area unless the buildings were carried to an extravagant height. It was much to be desired that more could be done towards improving and rendering healthy the existing dwellings.

Mr. Aitchison said he had looked over many of the large blocks of dwellings which had been erected of late years, and they all appeared to be characterised by a great want of economy in construction and arrangement. There was an excess of staircases and a redundancy of useless walls. Again, no attempt was made, as it might easily be in such buildings, to systematically ventilate and warm all the rooms, and in many other respects improvement was needed.

Mr. Porter thought it was highly essential that all dwellings should have thorough ventilation, and all water-closets should be approached from a lobby or passage, or from outside the walls, and never direct from any of the rooms. It was also of the utmost importance that each dwelling should be self-contained, and have its own conveniences. From all information he could glean as to what had already been done he found that no building to be used for the purpose of improved dwellings ought to cost more than 7d. per foot cube if a return of 5 per cent. was expected.

Mr. Blashill said he wished to remark, in reference to what had been said by Mr. Carroll as to the Artisans' Dwellings Act, that there was a saving clause which seemed to present two important loopholes for escape from the strict letter of the Act. It recited that at least as many persons should be provided for in the buildings to be erected under the Act as were displaced by the demolition of the old and unhealthy property, "unless there are any special reasons to the contrary," or unless a site could be obtained "in the immediate vicinity" of the property demolished. Interference with light and air to contiguous property might, he thought, be fairly urged as a "reason to the contrary" if it were proposed to erect buildings of too great a height in order to house all the inhabitants displaced on one particular spot.

Mr. Fowler said he thought very strong reasons would have to be shown before the Board of Works would give up the literal requirement of the Act, in that respect.

Mr. Roger Smith submitted the following resolution:—That the best thanks of the Conference be given to the Chairman and those who have aided in the discussion of labourers' dwellings by contributing papers, lending plans, and assisting those who have visited existing buildings. And this meeting, while recognising the great value of the results already attained, agrees that the subject still demands the best attention of architects, both as regards arrangement, economy, and artistic treatment.

Mr. Thomas Drew (Ireland) seconded the motion, and in doing so, expressed the thanks of himself and the provincial members of the Conference for the readiness with which the London architects were willing to impart their valuable experience to their Irish, Scotch, and provincial *confrères*. This was done in so generous a manner, and with such a total absence of exclusiveness, that it was highly valued; and the manner in which the professional men of London had placed themselves at the disposal of their visitors would be gratefully remembered.

The motion having been carried,

The Chairman, in returning his thanks, said he thought it was quite clear that the Artisans' Dwellings Act, whatever its imperfections, would afford the means for making very considerable improvements in the worst districts of London and our large towns, and he should, therefore, be sorry if Mr. Fowler's objection to it were to assume any tangible shape or to be strengthened in any way by anything said during the present discussion. With some defects, the Act afforded an opportunity of clearing away many of those frightful dens which had so long been helping to deteriorate the moral and physical condition of large portions of the London population. So long ago as 1854 he published a drawing of the various rooms of a house in one of the courts behind Gray's-inn-road (included in the present scheme), which exhibited a revolting state of things; yet up to the present time the place had remained in the same horrible condition. He hoped that the schemes at present before the Metropolitan Board of Works would have the aid of Mr. Fowler and his colleagues. One mistake made at the outset of the Holborn scheme was in making the widening of Gray's-inn-road an integral part of the project, and this proposal, if persisted in, would have wrecked the whole scheme by raising opposition. The owners of the property in Gray's-inn-road, which was in a fairly good sanitary condition, naturally objected to be compelled to sell their property ostensibly for a sanitary purpose, but in reality for effecting a public street improvement; for whereas, for the purposes of the Artisans' Dwellings Act, property may be compulsorily purchased at the bare market value, for the purpose of street improvements owners were able to claim 10 per cent. in addition for being compelled to sell. The scheme had very wisely been amended, and although when it came to be carried out a favourable opportunity would be afforded for widening Gray's-inn-road, the latter object must be effected by other arrangements. With regard to the Holborn scheme, he must confess he thought the large number of one-roomed dwellings (650 he thought) objectionable, and he hoped the point would be carefully reconsidered by Mr. Vulliamy and the Board. Mr. Chancellor's paper was an excellent one, and stated principles which should never be lost sight of in designing dwellings for the poor. He was glad to note that in the course of the discussion the necessity for separate water-closet accommodation to each dwelling was almost universally insisted upon, for he was perfectly satisfied that the nonobservance of this principle had been the cause of much demoralisation. He observed with regret that in the new Peabody dwellings in Southwark-street a separate water-closet was not provided for each family; but it was to be hoped that the Peabody trustees would, for the future, provide a separate water-closet to each tenement. As to architectural adornment or decoration, important as it was in refining the taste of the people, even that should be sacrificed if thereby the rooms could be made larger and more airy, and therefore healthier. A room too small for its purpose meant overcrowding, and overcrowding meant sickness and death. Many of the rooms in the dwellings which had been built of late years were certainly too small. It was worth consideration how far, by means of improved construction — such, for example, as the use of concrete—the erection of these dwellings might be cheapened. He could not agree with Mr. Hayward, that the poorer classes themselves should be asked to say what they wanted, for they did not know what they ought to have. Many of them had no notion of the laws that governed health, and did not care how small and how dirty a place was, so long as it was warm enough. Therefore to ask them how little accommodation they required, would lead to no good. The question of improving the dwellings of the working-classes was not a mere question of money; it was a matter of life and death. People talked about not building dwellings for the poor unless they could be made to pay 5, 6, or 7 per cent.; but it was absolutely necessary for the safety of England that the poorer part of its population, in town and country, should be housed with something like decency, healthfulness, and comfort. He hoped that the present meeting would give a fresh impetus to the thoughtful study of the question.

The meeting then terminated.

On Tuesday evening, at half-past seven p.m., Mr. Edmund Sharpe delivered a long and able lecture on the "Architecture of La Charente," being critical and descriptive notes on the Architectural Association's excursion to the South of France last autumn. The audience must have numbered between 500 and 600 persons, the meeting-place being the large hall of the Co-operative Institute, Castle-street East, Oxford-street (lately known as the Princess's Concert-room). The whole available wall-space was covered with screens to which were affixed drawings enlarged from measured and other sketches made by the excursionists themselves. A large number of gentlemen attending the Conference were present, and a discussion ensued in which Professor Donaldson, Mr. Penrose, Mr. Phené Spiers, and Mr. Roger Smith took part. Notice of Mr. Sharpe's lecture and of the discussion will appear in our next.

On Wednesday afternoon, at two o'clock, a visit was paid to Messrs. Cubitt's workshops, Gray's-inn-road. This establishment has lately been so fully described by us * that we need do no more in this place than to chronicle the visit.

On Wednesday evening, at eight p.m., a meeting was held at Conduit-street. Mr. E. M. Barry, R.A., occupied the chair. The subject for discussion was Greek Art, and the walls were hung with a large number of water-colour drawings by Mr. F. C. Penrose, Mr. R. Phené Spiers, and other gentlemen, illustrative of the Parthenon and other temples.

The first paper was read by Mr. Burges, who chose for his subject "The Importance of the Study of Greek Art and Literature to the Practice of Gothic Architecture." The paper was received with great approbation.

The second paper read was by Mr. R. P. Pullan, on "Greek Art as illustrated by its Monuments." This paper will be found on page 584.

The Chairman, before inviting discussion, moved the thanks of the Conference to Messrs. Burges and Pullan for their papers. Mr. Burges, with his well-known proclivities for Gothic art, had treated the subject in a broad and highly appreciative manner, while Mr. Pullan's paper was well worthy of one who had done so much in the shape of research in connexion with Greek art in Asia Minor.

Mr. Phené Spiers explained that at the time Mr. Fergusson read his paper on the Erechtheum, a month or two since, it was thought desirable to adjourn the discussion of the many important points raised by that gentleman for further consideration by the Conference, but when the arrangements for the Conference came to be made, Mr. Fergusson was in such a state of ill-health as to preclude the hope that he would be able to attend. It was, therefore, thought advisable to discuss the question of Greek art generally, and Mr. Burges and Mr. Pullan had very kindly consented to prepare papers on the two aspects of the question which were before the meeting.

A long and interesting discussion ensued, in which Messrs. J. Wood, Ordish (Leicester), J. P. Seddon, Charles Barry, Watkiss Lloyd, Hiscocks, H. H. Statham, and Arthur Cates took part, the Chairman offering some observations in conclusion. The discussion will be more fully noticed next week.

On Thursday morning many of the gentlemen attending the Conference paid a visit to Westminster Abey, by permission of the Very Rev. the Dean. The visitors assembled in the Chapter-house, whence they were conducted over the abbey by Sir Gilbert Scott, R.A., Mr. Micklethwaite, and Mr. King. Some of the party afterwards visited the Architectural Museum.

On Thursday afternoon, at three p.m., a meeting was held at Conduit-street, Mr. J. Whichcord, vice-president, in the chair, to discuss the subjects of "General Building Regulations for the United Kingdom," and "The Registration and Classification of Houses." The programme comprised papers on the former subject by Mr. J. Honeyman, Glasgow, and by Mr. J. Clarke, Liverpool; and on the latter subject by Mr. Henry Parsons, London, and Mr. J. Sellars, Glasgow. Mr. Clarke's paper will be found on p. 594, followed by that of Mr. Sellars. Mr. Honeyman's and Mr. Parsons's papers will be given next week.

On Thursday evening, at eight p.m. many members attending the Conference assembled in the Institute meeting-room to hear a paper, by Mr. R. Phené Spiers, on "Egyptian Architecture," which was arranged for by the Society for the Encouragement of the Fine Arts. An abstract of this paper, together with a report of the ensuing discussion is deferred.

* See p. 211, *ante*.

AN HISTORICAL SKETCH OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

BY MR. CHARLES L. EASTLAKE, SECRETARY.

In attempting to give a sketch of the history of this Institute, whose members and friends are assembled in so large a proportion to-night, and with which I have had the honour of being officially connected for the last ten years, I must preface my remarks by reminding you that it is but a sketch, and that to record with anything like fidelity the career of a society which has existed for nearly half a century, would be to fill not a single number, but a volume of our Transactions with details which, however interesting to you individually, would be tedious if presented as a whole. I shall, therefore, content myself with a rapid survey of the rise and progress of the Institute, describing as briefly as I can the original objects of its foundation and the extent of their development, the schemes which it has entertained for protecting and promoting the interests of our profession, and the work which it has accomplished in that direction. I shall endeavour to point out the causes which have been conducive to its prosperity, and the difficulties with which it has had to contend. Finally, I hope to explain the mode and manner of its administration as at present organised; and if in conveying this information I haply succeed in enlightening some of our professional brethren who are present to-night as visitors, and who have a somewhat vague idea of what the Institute is, as compared with a still more indefinite idea of what it ought to be, my paper will have served its modest purpose.

The earliest corporate association formed by the followers of our art it would be difficult to name. It probably existed, in common with other ancient guilds, during that golden age described by a certain Quarterly Reviewer when the "Master Workman" flourished in all his glorious independence. But, coming down to more modern times, perhaps the first Institution formed by professional men, with aims and objects similar to our own, was that of the London Architectural Society, established in 1806. This society had a president, four vice-presidents, a treasurer, and a secretary. It included in its ranks ordinary and honorary members. The former were required by its rules "to produce annually, according to rotation and time agreed on, an architectural design never before in any way made public, and accompanied by observations, critical and explanatory, under forfeiture of two guineas; also an essay, under forfeiture of half-a-guinea."

The object of the society's meetings, held once a fortnight, was to discuss the designs, observations, and essay above mentioned, and every member absenting himself for two successive nights incurred a fine of 5s., unless prevented by illness or a distance of ten miles (an excellent rule, which I venture parenthetically to recommend to the notice of our finance committee as a legitimate and, perhaps, fertile source of income). The designs and essays remained the property of the Society, who published such as they thought worthy of that honour, kindly presenting the author with two copies for himself.

The proposal of new members by nomination paper, and the subsequent election by ballot, resembled the forms still adopted by this Institute. The *raison d'être* of this society is given in a preface to their first volume of Transactions, where it is stated that,—"Among the institutions so liberally established in this city there is not one calculated for the encouragement of architecture. The feeble protection afforded by the Royal Academy can hardly be deemed an exception. The lectures have long ceased and medals privately distributed, and the use of the library for a few hours one day in the week, at a time when it is hardly possible for a student of architecture to attend, cannot be deemed of much value."

Thus we see that even in the early days of the present century architects conceived that they were neglected by the R.A. The list of members included many names which are well known at the present day in connexion with our profession, such as Ashpitel, Beazley, Billing, Elmes, who wrote the "Life of Wren" and other works, Peacock, Savage, Taylor, and Joseph Woods, the well-known author, and editor of the fourth volume of Stuart's "Athens."

How long this association existed I have been unable to ascertain, but it probably became extinct some time before the formation of the Architectural Society, which was instituted in 1831. The primary objects of this Society were stated to be "the advancement and diffusion of architectural knowledge, by promoting the intercourse of those engaged in its study, the ultimate desire being to form a British School of Architecture, with the advantages of a library, museum, professorships, and periodical exhibitions." For this Society all persons who had studied the profession of architecture in the office of an architect for five years were eligible as candidates. The rules provided for the admission of honorary (foreign) members, amateurs, and students under twenty-one years of age. The council consisted of eight members, besides a president, two vice-presidents, a treasurer, and secretary,—to be chosen annually,—Mr. Thos. H. Wyatt being among the first of the vice-presidents. The general meetings were to be held on every alternate Tuesday, beginning in November and ending in June. A curator was appointed to take charge of the library and museum, and, judging from the fact that he was to be elected every three months, we may assume that the office was honorary. The president (Mr. W. Barnard Clarke) and many other members presented casts and books, to which, under certain restrictions, the students had access at the Society's rooms in Lincoln's-inn-fields.

In January, 1834, we find that a meeting of architects and surveyors was held at the Freemasons' Tavern for the purpose of forming another society "*for the study of architecture and architectural topography.*" Some difference of opinion seems to have been expressed at this meeting as to the objects of the proposed Institution, and the condition of its membership. The consequence was a secession, and certain of the gentlemen present agreed to hold another meeting at the Craven Hotel. This resulted in the appointment of a committee, consisting of Messrs. P. F. Robinson, Kendall, Goldicutt, Fowler, Donaldson, Donthorn, Noble, and others, who were requested to draw up a scheme for the formation of an Institution calculated to uphold the character and improve the attainments of the architect. At a subsequent meeting Messrs. Barry, Basevi, Burton, Cresy, J. Gwilt, Hardwick, Kay, Lee, Sir J. Rennie, Papworth, Robinson, Seward, and G. Taylor, were elected as original members.

Here, then, we have the nucleus of that society which was afterwards known as the Institute, and, subsequently, as the Royal Institute of British Architects. Of its later coalition with the Architectural Society, or, rather, with certain members of it, I shall speak hereafter; but to various arguments for and against that coalition,—the pardonable rivalry which seems to have existed between the two institutions, and the expressions of personal feeling which it elicited, I shall not refer. Such details would have but little interest for the present generation, and had best be buried in oblivion. It will be well, however, to remind you that in, and at the outset of, their endeavours to establish the Institute its founders had to encounter numerous difficulties; that they met with frequent and long-sustained opposition from more than one quarter; that many members of the profession held aloof—as some will at the present day—from various motives, and had to be won over by arguments and persuasive proselytism which must have taxed the ingenuity and tired the patience of those who undertook the task. But they went on bravely—this little band of architects, and by degrees their labours were rewarded. Recruits came in from here and there, and their numbers increased with cumulative power. Petty jealousies died out in time; trivial objections were answered or explained away; personal considerations disappeared before the more important object of professional integrity, and the Institute became a fact.

As we glance down the list of its original members, and recollect that two-and-forty years have passed away since they first incorporated themselves for the purpose of accomplishing their laudable object, we shall not expect to find many who have lived to see the present development and extension of their scheme. The elder Kendall, Papworth, Robinson, Goldicutt, and others, to whose individual exertions the Institute is indebted for its earliest organisation, are gone, but among the veteran survivors who were elected in 1834 we may still note the names of Thomas Bellamy,* Decimus Burton, and Professor Donaldson. It was the object of these gentlemen and of others with whom they were associated, to secure for the earliest members of their society architects of prominent position and unimpeachable character, educated for, and following their profession as an art, and free from those conflicting relations with trade which in the early part of this century certainly did exist in some instances, and prevented that implicit confidence on the part of the public which should enable a client to regard his architect not only as his agent, but as his friend and adviser. The rules for professional practice then drawn up, and which formed the basis of those still in existence, secured this fundamental object, as far as it is possible to secure it by such means.

With regard to other qualifications for membership, the hard and fast line which it was at first found necessary to draw has been modified of late years. But it must be remembered that in the early days of this society, that honourable and eminently useful calling, which has since attained the dignity of a profession, was in its infancy, and its true position had not been realised. Few who remember the class to which the "Builder's Measurer" then belonged, would have recognised in it a prototype of the modern "Quantity Surveyor." I should not have alluded to this subject but for the fact that it occupied considerable attention at the very birth, so to speak, of the Institute, and that the question whether or not surveyors should be admitted as members formed a point of contention between the Society of British Architects and the Society of Architects and Surveyors, with whom an alliance was sought. Except on this point, the reports of the two committees appointed to confer with each other nearly corresponded. After several meetings, much discussion, and more correspondence, a certain number of the original, though junior society, were elected members of the Institute. Sir John Soane contributed the sum of 750*l.* towards its funds; and the medal, which still bears his name, was founded in acknowledgment of his liberality.

Earl de Grey, an amateur of considerable cultivation and artistic taste, was chosen as president, and Messrs. Donaldson and Goldicutt were appointed the first honorary secretaries. Rooms were engaged at 43, King-street, Covent-garden, better known as Evans's Hotel, a building said to have been designed by Inigo Jones, and celebrated in later, though still classic days, for songs and suppers, which have been immortalised by Thackeray in his description of "The Cave of Harmony." There the first general meeting of members was held on the 15th of June, 1835, though, strictly speaking, the Institute was founded in the previous year. In his opening speech, Lord de Grey pointed out the objects with which the society had been established, and described the advantages which architecture, as a national art, would derive from its foundation. His remarks were followed by an able address from the Senior Secretary, who was enabled to state that nearly eighty members had already been enrolled, that through the courtesy of the Foreign Office communication had been opened with several of the Continental academies, and that the nucleus of an excellent library had already been formed. Mr. Donaldson expressed his hope—a hope which he has lived to see realised—that in due time prizes would be offered to young architects for original designs and measured drawings of ancient buildings. He referred to the opportunities which would arise for discussing at the periodical meetings of the Institute questions of scientific and antiquarian interest, and he adverted to the possibility of establishing a fund which would aid the student in foreign travel. In short, Mr. Donaldson foreshadowed most of the projects which the Institute has since been enabled to carry out, and it is a tribute to his sagacity to observe that these early records, which I have perused with deep interest, include no visionary schemes which have since been abandoned, or ambitious prophecies which remain unfulfilled. Since those days the Institute has indeed extended the sphere of its work, and largely added to its aims; but in the path which its founders opened there has been at least, so far as I can trace, no retrogression. No castles in the air have vanished, because none were ever designed.

In regard to the subdivision of members the general conditions of membership, the formalities of election, the regulations respecting ordinary general meetings, and many other matters, the bye-laws drawn up in 1835 are almost identical with those of 1876. Even the amount of subscriptions, except in one particular, remains the same. The Council has indeed doubled its number of ordinary members, but its constitution in other respects is unaltered. The earliest

* After this paper had been read, the sad news of Mr. Bellamy's recent death was communicated to the meeting.

programme of our sessional papers on record includes the same variety of subjects which we are accustomed to hear discussed at the present day. The recent discovery of the crypt at York Minster, an essay on Building Stones, a list of queries for architectural investigation, a biographical memoir, the description of a tunnel sewer, a paper on "Ventilation and the Construction of Flues," another on "Suspension Bridges," and a "Review of Professional Practice." Such were the themes which interested the last generation of architects, such are the themes which attract—or, shall I say, ought to attract us?—in our day.

At the first inaugural meeting, a medal was offered for an essay "On the Nature and Properties of Concrete." This was gained by Mr. George Godwin, who dealt with the subject in a very able and exhaustive treatise. The Institute soon after published a useful little pamphlet, entitled "How to Observe," containing a series of suggestions for the purpose of aiding antiquaries and amateurs of architecture in their communications to this Society.

For the first year or two, as may be supposed, the funds of the Institute did not permit any regular and official publication of the sessional papers, though some exceptions occurred, and the Council always claimed the copyright of such papers until a certain interval — twelve or eighteen months—had elapsed after the date of reading. Nor were there for some time any external facilities for giving publicity to these communications. When the Institute was first established I believe no strictly professional journal, in the present sense of the word, was in existence. The *Civil Engineer and Architect's Journal*, however, was started in 1837, and continued to be published until 1849. In this periodical may be found abstracts, and after a time full reports of papers read at ordinary general meetings of the Institute.*

In 1836 the Council reported to the general body of members as to the expediency of procuring a Charter of Incorporation for the Institute. The expense was estimated at 300*l.*, and Mr. W. L. Donaldson, then honorary solicitor, undertook to prepare the draft. A resolution was passed at a general meeting adopting this recommendation, and a subscription was at once opened towards defraying the cost of the charter. By the following year the charter, obtained through the influence of Earl de Grey, had been printed, with the bye-laws attached to it, and circulated among the members. This step at once gave stability to the Institute, and placed it on the same footing as other incorporated societies. In the same year the Institute moved from its old quarters in Covent-garden to the more aristocratic neighbourhood of Grosvenor-street, where, at No. 16, it occupied rooms for many years afterwards. By this time Mr. Chas. Fowler had succeeded Mr. Goldicutt in the position of joint secretary with Mr. Donaldson, and the two names were long and honourably associated. In their report to the annual meeting in 1837 the Council naturally congratulated the general body of members on their improved position, one of the first fruits of which had been an exchange of Transactions with the Royal Societies of London and Edinburgh, the Royal Society of Literature, the Royal Geographical Society, and the Institution of Civil Engineers. The Society of Antiquaries and the trustees of the British Museum contributed some valuable works to the library. Meanwhile, communications with foreign societies had been extended by the election of new honorary and corresponding members of the highest reputation on the Continent.

In 1838 a proposition was made by the Architectural Society for the incorporation of that body with the Institute. Committees were appointed on either side, and after several meetings agreed upon a scheme of union which it was hoped would give mutual satisfaction. But, unfortunately, though it met with approval from the Institute, it was rejected by the Architectural Society. The result was that eighteen members of that body withdrew, and, of them, thirteen were at once elected members of the Institute. In reviewing this and other attempts to secure for the profession of architecture that unanimity of practice and principle which would naturally result in the establishment of one representative guild, and one only, it is almost superfluous to point out the obvious advantages of such a scheme, regarded theoretically, and the practical difficulties which, if we may judge from experience, invariably arise in the course of its realisation. It is true that in the legal and medical professions, for instance, the absolute necessity of united corporations has long been recognised. But it must be remembered that the conditions under which those corporations have been formed are widely different from any which we can hope to see founded in the present era of architectural practice. The absence of a legally authorised professional diploma as a condition of membership will in itself account for the existence of a large body of outsiders who from conviction or temperament are indifferent to what we are accustomed to call *esprit de corps*, and while this independence of action is maintained by individuals, we cannot be surprised if it tends to the formation of distinct societies. But, apart from this cause, it must be remembered that artistic aspirations form, or are at least supposed to form, an important element in our professional status. Now, it is notorious that art societies multiply more rapidly than any others, and for my own part I believe it is only because architecture is a business as well as an art that we have not a dozen institutes at the present time;—so diverse are the aims, and so opposed are the principles which may be recognised in our profession from an æsthetic point of view.

One of the first important steps taken by our Society, at the time to which I am now referring, was the appointment of a committee to consider the question of public competitions,—a subject of peculiar interest then, as indeed it has frequently become since. The committee issued their report in 1839, and it obtained a wide circulation. In glancing at this official record of opinion on a theme which has now grown threadbare by discussion, one is struck by the similarity between the arguments, grievances, and remedial suggestions enumerated by the last generation and those with which we are familiar in the present day. The advantages of the system are few but definite. It encourages emulation which, within limits, is of course a very desirable quality in any artist. It offers an opportunity for rising genius which might otherwise languish unencouraged. It opens a range of choice in respect of taste and technical skill which is of singular advantage to a public too often hopelessly ignorant of our art. On the other side, as we all know, the system presents a melancholy picture of professional jealousy, disappointed hopes, underhand jobbery, and sometimes, though let us trust less frequently now than formerly, instances of cruel and deliberate injustice.

In saying that there has been no departure from the scheme originally proposed by the founders of this Institute, I ought, perhaps, to note one exception. The periodical delivery of lectures on scientific subjects connected with the study of architecture, *e.g.*, acoustics, geology, and the use of iron, formed part of the early programme, and for a time proved attractive, but at length the attendance of members fell off, and the Council did not feel justified in incurring the additional expense entailed, for the lecturers were paid for their services. Meanwhile, the Institute prospered in more than one sense. The library was continually enriched by donations from foreign members. Many of the nobility became honorary fellows (I only wish the list was longer at the present time), and the Queen graciously allowed her name to be announced as patroness. It is a curious evidence of the urgent need which had been felt for the establishment of the Institute and the guarantee which it affords for the integrity of professional practice, that the Council, in their report for 1840, took occasion to disclaim, on behalf of all respectable architects, any share in that pernicious system which had once permitted their accepting a commission from tradesmen in addition to that received from their clients. The bye-law which prohibits, under pain of expulsion, any member from receiving such a gratuity was then, as it still is, in existence, and afforded material for the first, if not the best, answer to that invidious question which has sometimes been asked,—What is the use of the Institute? In 1841, the appointment of Lord De Grey to the office of Lord Lieutenant of Ireland deprived the Institute for a while of the advantage of his personal attention, but by this time Mr. Donaldson, who had retired from the position of honorary secretary, though he still conducted (I need scarcely say how zealously) the foreign correspondence, was elected a vice-president, together with Mr. Charles Barry and Mr. Philip Hardwick, both Royal Academicians, and both gentlemen who occupied the foremost rank in our profession. With such deputies as these it will be obvious that the president's absence was less felt, and, indeed, the *éclat* which in the eyes of the outside world attached to his social rank was probably more than compensated for within the walls of the Institute by the fact that the chair was now filled in turn by three architects of undoubted popularity and attainments. The Institute possessed an additional advantage in the services of Messrs. Charles Fowler and George Bailey as honorary secretaries.

Among the papers read at this period was one which deserves especial mention. I mean the valuable essay on "Vaulting in the Middle Ages," contributed by Professor Willis, and at the time of its publication one of the most learned and exhaustive treatises which had appeared on the subject. The Council paid it a tribute of respect which no other of our papers has received before or since. An extraordinary number of copies were printed, and the sum of 400*l.* was devoted to meet the expense of the volume for that Session. It is needless to add that that was not paid out of income, and considering the state of the Institute finances, it may be regarded as a somewhat bold investment. About this time a proposal was made to secure more convenient quarters for the Institute than those in Grosvenor-street, but it came to nothing, and several years elapsed before premises were secured elsewhere.

In the year 1843 the question of competitions was again brought before the Institute on the motion of Professor Hosking, who seems to have condemned the whole system except in cases where every competitor was paid for his work. The subject was discussed at a general meeting, but with no practical result beyond the ventilation of opinions which I suppose are pretty much the same as have always been formed on the matter. That there have been, and unfortunately still are, conditions attached to public competitions which are disgraceful to those who offer them, and still more disgraceful, from a professional point of view, to those by whom they are accepted, is an abstract proposition which no one in this room would be likely to deny. But unfortunately the only remedy lies in a measure that would probably be a worse evil than the one we wish to remove. It would, of course, be possible to shape the conditions of membership of this Institute in such a form that no one connected with it could take part in objectionable competitions. But it may be doubted whether it is not preferable that such competitions should exist than that a body of professional men should adopt rules based on principles analogous to those of a Trade Union.

In 1844, the Trustees of the British Museum, who had appointed Mr. Hawkins to accompany Mr. (afterwards Sir Charles) Fellows on an expedition to Asia Minor, applied to the Council of the Institute for suggestions, which might guide that gentleman in his antiquarian researches. A paper of instructions was accordingly drawn up indicating the points most worthy of the travellers' attention during their tour. It is only a few years since the same advice was sought and rendered in reference to the Palestine Exploration Scheme, and it is gratifying to note these early and recent instances in which the Institute has helped to promote a national object.

The aspect of modern London up to this time, had been one little worthy of this rich and ancient capital. But a marked attempt was at length made to improve its street architecture, and the club houses which rose one after another in Pall-mall represented, in spite of certain defects, an effort in the right direction. That the standard of metropolitan splendour was not overambitious, may be gathered from the fact that in 1845, the Council, while congratulating the Institute on the completion of Trafalgar-square, "with its terraces, flight of steps, fountains, basins, and triumphal column," expressed their opinion that "a feeling had arisen in the public for rich and effective combinations of objects of a monumental character." The Thames Embankment was a scheme still *in nubibus*, but the subject had been brought under the notice of a Parliamentary Commission in connexion with other plans for metropolitan improvement.*

* The first number of the *Builder* appeared in 1843; the *Building News* in 1855: the *Architect* in 1869.

Infirmary Buildings for the St. Olave's Union.—The whole of the blinds for this building were supplied by Messrs. Guynan & Son, of the Oxford Steam Works.

* The conclusion in our next.

ARTISANS' AND LABOURERS' DWELLINGS IMPROVEMENT ACT.

BY MR. G. VULLIAMY.

THE evils to be modified by this statute are the result of causes operating through many generations, and presented to us now, in the words of the preamble, as arising from densely inhabited buildings in courts and alleys, in many cities and boroughs, which, by reason of the want of light, air, and ventilation, or of proper conveniences, or from other causes, are unfit for human habitation, and fevers and diseases are constantly generated there, causing death and loss of health, not only in the courts and alleys, but also in other parts of such cities and boroughs.

These evils were found to be aggravated by the fact that the houses, courts, and alleys were the property of several owners, and it was not in the power of any one owner to make such alterations as were necessary for the public health. It was, therefore, deemed expedient to obtain power to pull down houses and reconstruct portions of the localities, and to make provisions for dwellings for the working class who might be displaced in consequence thereof.

The Act became law on the 29th of June, 1875, and its object is to provide more healthy dwellings in densely-inhabited localities.

[Mr. Vulliamy here gave a digest of the provisions of the Act.]

Proceedings under the Act.

The first official representation under the Act in the metropolis was received from the medical officer of health for the Holborn district, and the next related to certain courts and places in Whitechapel and Limehouse. These documents were received in time to permit the preliminary inquiries to be made prior to the time when the schemes had to be prepared and publicly notified. Schemes were accordingly prepared in November, 1875, by order of the Metropolitan Board, by Sir Joseph Bazalgette and myself, and have since been laid before the Secretary of State, and a commissioner has investigated them by his directions.

Holborn Scheme.

The representation for this scheme showed a number of densely-crowded courts and alleys eastward of Gray's-inn-lane, and bounded by Portpool-lane, Leather-lane, and Greville-street, &c. In that locality were found many houses unfit for human habitation; and diseases indicating a low state of health amongst the population were from time to time prevalent, and attributable to the closeness and narrowness of the courts, and to the bad arrangement and condition of the houses; also to the want of light, air, and ventilation, and proper conveniences in such houses.

The scheme proposed to improve the district by erecting upon the four acres of land constituting the improvement area, eighteen blocks, containing various superficial areas, the whole giving a total of 67,250 ft. Besides, one acre and a half out of the four acres are devoted to roads. Each block is to be five stories in height, and each story not less than 8 ft. in height in the clear. The blocks are to be so constructed as to contain in the aggregate not less than 950 tenements, which are to be composed of not less than:—

- 650 tenements of one room, each tenement containing a clear area of not less than 140 ft.
- 250 tenements of two rooms, each tenement containing a clear area of not less than 250 ft.
- 50 tenements of three rooms, each tenement containing an aggregate clear area of not less than 350 feet, and affording accommodation for not less than 3,500 persons, or about 70 persons more than the estimated number of the working-class which will be displaced.

Each block will be furnished with water-closets, sinks with water supply, and dust-shoots, according to the number and size of the tenements in such block. The old buildings will be taken down and removed in sections of buildings, and new buildings upon the lands erected according to regulations to be made by the Board with the approval of the Secretary of State. New streets are to be formed of the respective widths of 40 ft., 35 ft., and 30 ft. for carriage traffic, and two footways of 25 ft. wide.

The estimate required by the statute states:—

Cost of land	£103,000
Cost of roads and sewers, and incidental works	10,000
	113,000
Less recoupment	44,000
Net cost	£69,000

Whitechapel and Limehouse Scheme.

The representations from these localities relate to certain streets eastward of the Royal Mint, and abutting on Upper East Smithfield on the south, and Royal Mint-street on the north. The Great Eastern Railway Viaduct intersects the district. Only a small portion is in Limehouse district and Wapping parish.

Upon the improvement area twenty-two blocks of dwellings are to be placed with paved courts and streets alternating. The whole blocks will have a total superficial area of 92,488 ft., subject to similar conditions as in the first scheme, but the tenements would amount to 1,077, and the persons accommodated to 3,600.

The estimate of cost is:—

For land	£100,000
Road, sewers, and incidental works	10,500
	110,500
Less recoupment	56,100
Net cost	£54,400

Other Schemes.

These have to be dealt with previously to the session of 1877, and relate to the following localities:—St. Marylebone, Lisson-grove and near Edgware-road; St. George-in-the-East, various courts and alleys; St. George the Martyr, Southwark, unhealthy courts, &c., shown on plan; Whitechapel, Goulston-street, &c.; St. Martin-in-the-Fields, Bedfordbury, &c.; Clerkenwell, alleys, &c., Turnmill-street; Bermondsey, Crosby-row, &c. These, however, are only to be taken as samples of the deplorably neglected spots and "rookeries of the metropolis."

Many able men have laboured to bring under notice of Parliament and the public the want of proper dwelling-places for the hard-working labourer. In the foremost rank we may name Mr. George Godwin, F.R.S., architect, and editor of the *Builder*; also Mr. Thomas Beams, in 1851–2 preacher at St. James's, Westminster, during the time of the cholera, who wrote a useful book on "The Rookeries of London"; Mr. Henry Roberts, F.S.A., whose book in 1867, on "The Dwellings of the Labouring Classes," under the "Society for Improving the Condition of the Labouring Classes, &c.," gave plans and descriptions of what had been done at that date. There is also the book written as a prize essay, in 1864–6, by Mr. James Hole, of Leeds, on the "Homes of the Working Classes," which preceded the formation of Sir Sydney Waterlow's Company for Improving Industrial Dwellings. This Company was greatly aided in its first undertakings by the practical skill of Mr. Matthew Allen, of Tabernacle-walk, a builder and inventor of artificial stone, which has tended greatly to many economical and fire-preventing arrangements in such dwellings. His suggestions with reference to the construction of buildings under the new Act have been highly esteemed, and are explained in a pamphlet which he has circulated. A company has also been formed, under good auspices and with large capital, for the improvement of unhealthy localities under the statute, Mr. C. Barry, the president of this Institute, being the architect of it.

The Peabody Trustees Fund and Buildings being intended for a better class of artisans than are to be benefited by the clearances to be effected under the new statute, it is not perhaps needful now to allude to them, though highly beneficial as an example of well-directed acts of benevolence supported by practical action.

Previous Legislation.

It may be desirable to notice that the General Paving Act of 1817 made provision for closing unwholesome alleys by owners, and enacted a legal machinery by which any difficulties of title might be removed; but there were no means of compulsion indicated, and the health laws were not then studied or understood as they have been since epidemics tended to stir up men's thoughts in the right direction.

In 1868 the "Artisans and Labourers' Dwellings Act" was passed, and in the House of Lords changes were made in its clauses which placed the executive in the power of the Vestries and District Boards instead of the Metropolitan Board, and coupled with an impracticable restriction as to making a special rate. This has rendered the Act nearly inoperative, as shown by a return made to the House in 1875.

In several instances also the Legislature has required that when powers are granted for metropolitan improvements (see Improvements Act, 1872–3), sites for artisans' dwellings shall be provided at a moderate cost, and thus facilities for such structures have been obtained. The promotion of such works are also greatly aided by the recent arrangements for loans at easy interest from the public commissioners.

IMPROVED DWELLINGS FOR THE WORKING CLASSES.

BY MR. FRED. CHANCELLOR.

THE subject of improved dwellings for the working classes is so extensive that when I heard the time to be allotted to each paper was not to exceed a quarter of an hour, I felt it was almost useless to attempt to compress all that could be said upon the matter into that short space of time; but upon consideration I came to the conclusion that this was a wise arrangement, as it would necessarily compel each of us to select one of the many points worthy of consideration in connexion with the subject. The branch of the subject, therefore, which I propose to discuss is the planning and arrangement of improved dwellings in towns. And in discussing this matter, I am very desirous of avoiding any appearance of being dogmatic. I feel that it is a subject about which we all have a good deal to learn, and if I have ventured to take a prominent part in to-day's business, it is not because I feel I am able to teach my brother practitioners anything, but because I think it is wholesome to propound the ideas that occur to one in order that they may be discussed and criticised and reduced to their true value.

The planning and arrangement of improved dwellings seem to divide themselves naturally into two heads:—

1. The general arrangement of the blocks of buildings; and
2. The particular arrangement of each dwelling.

I found when I first took up the matter that there were, as regards the first head, two arrangements upon which the improved dwellings were being generally erected.

By the first plan an inclosed or partially inclosed staircase from top to bottom generally in front gives access on each landing to two dwellings.

By the second plan, which is generally known as the gallery plan, one staircase usually at the end of each block gives access to external galleries, to each floor, by which the dwellings are approached.

In preparing the plans for the buildings in the Farringdon-road, for the Metropolitan Association for Improving the Dwellings of the Industrious Classes, it seemed to me that there were objections to the first arrangement, inasmuch as the staircase was confined, and that the number of them was necessarily multiplied, and that they interfered very much with the general plan of each dwelling. And I also felt that there were objections to the second or gallery plan, namely, that the privacy of each dwelling was much interfered with, if not altogether destroyed, by the gallery forming a common passage-way to each dwelling, and so enabling every passer-by to overlook the rooms of each dwelling. It was also evident that the galleries very materially interfered with the access of light to those rooms opening on to them. It was a consideration of the objections to these two arrangements which led me, in designing the Farringdon-road buildings, to devise a plan which should embody the conveniences without the inconveniences of the two plans I have described. I have ventured to call it the Balcony plan.

By this arrangement staircase accommodation is economised, as compared with No. 1 arrangement, inasmuch as I get one staircase to four dwellings on each floor; and it possesses an advantage over No. 2 arrangement, inasmuch as absolute privacy is obtained for each dwelling, and the interference with light to the principal rooms caused by projecting galleries is avoided.

It affords also what I would submit is a

desideratum, a kind of balcony completely private to each pair of dwellings, which affords a very convenient arrangement for the cultivation of flowers. And may I here digress for a few moments to say how very much, I think, we are indebted to those good people who are endeavouring to cultivate a fondness for flowers amongst our working classes? I do not believe that a man who is fond of his flowers could ever thrash his wife, or that a wife who takes a pride in her flowers will ever have a slovenly and untidy dwelling.

Minor advantages of these balconies are that they afford recreation-grounds, although limited in extent, to the small child not old enough to be trusted away from the mother's sight, and I believe that they afford pleasant and airy look-outs of a summer's evening. It will also be observed that, as the staircases are open throughout, the circulation of air all round the buildings is certainly facilitated. There are other advantages which, I think, will commend themselves, namely, increased facilities for escape in case of fire, and also greater isolation. You will observe that the blocks of dwellings in Farringdon-road are really divided into three blocks each, the staircases almost destroying the possibility of the spread of any fire occurring in any one section.

I venture also to submit that by adopting the arrangement I have at Farringdon-road, I have economised space and ground-rent, and have been able to obtain a larger number of dwellings upon a given space than by adopting the ordinary plan of one range of buildings facing the road. And I obtain this further advantage that I give to each dwelling a fair average view, whereas, had I adopted the other plan, all the dwellings on one side would have had a pleasant lookout to the road, whereas the others would have had but a blank look-out into the yard below.

I now approach the second part of my subject,—the particular arrangement of each dwelling.

It cannot be denied that we English are, from the highest to the lowest, exclusive in our habits. What we have we like to have to ourselves, and there is an indisposition to hold things in common one with another; and I think I may say that this feeling is quite as strong, if not stronger, amongst the working classes than it is amongst those in the upper classes, and a somewhat extensive experience in connexion with the dwellings of the working classes has satisfied me that no arrangement is complete which does not give to each tenant all he requires exclusively. A washhouse or a closet held in common by two or three families is a constant source of quarrelling and ill will; and I would therefore insist upon this rule, that no arrangement of plan is thoroughly satisfactory which is not completely self-contained. In other words, that whatever the accommodation provided, the separate scullery and the separate water-closet should always form a part of it. More especially would I emphasise the importance of the separate water-closets, because I do believe that the loss of modesty and self-respect may in countless cases be first traced to the necessity of using in common one closet by two or more families.

Another point which I consider of importance is the position of the water-closets. It should always be approached from a lobby or passage, and should never be entered direct from any apartment. In the economy of space forced upon us by the money part of the question, it is no doubt difficult to arrange this point, but I should not hesitate to make a very considerable sacrifice in order to attain it.

Then, again, there is the question of extent of accommodation to be given in each dwelling. Those of us who have anything to do with the erection of cottages in the country must have been over and over again reminded of the necessity of always providing living-room, kitchen, or scullery, and three bedrooms; and I should be afraid to contemplate my fate were I now to submit to public criticism any plans of cottages which did not embody this accommodation at the least; but when we get to London, we find a different state of things, and I have with a calm conscience (and I am here to tell the tale) not only planned but erected several dwellings with but one room besides the scullery. No doubt the dense population of London justifies us in planning and building dwellings with limited accommodation,—I should, perhaps, say with especially limited accommodation, — whereas the sparse population of most country districts almost compels the erection of cottages which shall be suitable not only for the man and his wife, but also for the man and his wife and his grown-up sons and daughters. Still, I cannot but think that this iron rule of three bedrooms might in many instances be modified, and I believe will be modified, because I think our agriculturists, whether landlords or tenants, are becoming impressed with the fact that one of the best ways of preventing agricultural strikes is to provide good cottages for the labourers, and by good cottages I mean cottages suitable for different sized families.

A labourer will pause before he joins in a strike if he knows the penalty will be the loss of his good cottage; and if he is insensible to it, his wife will put before him such reasons as will in most cases shake his resolution. But I am somewhat digressing, and must return to my text, namely, the particular arrangement of each dwelling.

I have suggested that each dwelling should be self-contained, and that dwellings affording a variety of accommodation are advisable and necessary.

These were the general principles laid down and approved by the directors of the Metropolitan Association for planning the new buildings in the Farringdon-road, and in order more clearly to put before you the variations in the accommodation offered, I have prepared a large plan, showing three different classes of dwellings.

No. 1 is the smallest arrangement, and includes a living-room, with bed-recess; but this dwelling has a separate scullery, fitted with small range, copper, sink, coal-box, and pantry, and also a separate water-closet.

No. 2 includes living-room, with bed-recess and one bedroom, also with its distinct scullery, with fittings as before, and distinct water-closet.

No. 3 includes living-room, and two bedrooms, with scullery and water-closet as before.

You will see by these plans that each dwelling is complete in itself when the front door is shut, the only convenience used in common being the dust-shaft.

Of course these arrangements might be amplified to almost any extent, and, indeed, in one block there is a somewhat larger arrangement; but these plans are sufficient to show the principle which has been acted upon, and which I cannot too forcibly impress upon you, namely, that each dwelling, however limited in accommodation, should have all its domestic offices as complete as the one with a larger number of rooms.

In concluding these observations, I feel some apology is due for obtruding upon your notice the new buildings in the Farringdon-road. They were, however, built, both in block and in detail, upon the principles which I have endeavoured (I am afraid, however, in a very halting manner) to lay before you, and therefore seemed to be the most fit to illustrate my observations upon the subject. In working out those principles, and, indeed, I may say, in arriving at the principles themselves, I was most materially assisted by my good friend, Mr. Charles Gatliff, the untiring secretary of the Metropolitan Association, and who, from having been one of the pioneers in this movement, has accreted a large amount of experience, and a great mass of facts, all of which were most cheerfully placed at my disposal, and without which, I need scarcely say, I should not have been here to-day.

ON GREEK ART AS ILLUSTRATED BY ITS MONUMENTS.

BY MR. R. P. PULLAN.

IN former days,—I am speaking of no very remote period,—when Goth met Greek, "then came the tug of war;" architects were divided into two distinct and hostile camps; the Classicist and Mediævalist looked upon one another as sworn foes, and contended with one another on every public occasion. They even invented mutual terms of contempt; one party stigmatised its opponents as Pagan, the other retorted by the inelegant appellation of Mid-devil. Now, however, happily we have changed all this; we have concluded a truce, and champions amongst the Goths walk into the tents of the Greeks and prove their armour. The fact is, that our views on matters connected with our art have become broader and more liberal; we have found out by investigation that the principles of all true art were the same at all periods,—in short, that the fundamental principle of all good architecture was the common-sense one of employing the best construction that the materials at the disposal of the architect and his knowledge of construction permitted, and of decorating the constructive features in the most appropriate manner.

This principle was common to the only two pure styles, the Greek and the Gothic, though the results differed widely; because the conditions under which the architect worked were so entirely dissimilar. The Greek, having no knowledge of the arch, hewed immense blocks from the sides of the marble mountains around him. Some of these he laid side by side in rocky beds hollowed and levelled to receive them, united them with clamps so as to form a foundation as massive as the rock on which he built,—immovable even by earthquakes. This was the case at Priene, Halicarnassus, Cnidus, and elsewhere. Upon these he laid slabs of finer marble for his steps and pavements, and, with carefully worked blocks, he raised the walls of his cella; and then, as in his sunny climate shade was the great desideratum, he surrounded the cella with porticoes and colonnades. Upon the columns he placed massive architraves and cross beams, tying the whole together. The frieze was generally formed of thin slabs connected with cramps, and left for the sculptured decoration. This ornamental work was protected by a cornice, with sufficient projection to throw off the water through antefixæ placed at regular intervals, the whole being arranged according to certain laws of proportion. The architect then called in the sculptor, who began at the top of the building and worked downwards. My reason for thinking that generally the work was erected in block and finished afterwards is, because in the Mausoleum, and the temple at Priene, portions of the ornamental work have been left unfinished, and in the Temple of Apollo Branchidæ there is a column still standing which has never been fluted. When the sculptor had adorned the friezes, metopes, and, as in the Temple of Diana at Ephesus, even the columns with figures, the painter illuminated the whole with gold, red, blue, and other brilliant colours, so that when the temple was completed it was a perfect work of art.

The Mediæval architect having, as a rule, smaller stones to work with, understanding thoroughly the capabilities of the arch, and possessing a perfect knowledge of the proper ratio between bases of support and superincumbent weight, piled arch upon arch and pier upon pier, causing his building to spurn the earth and aspire to the skies, and thus constructed lofty vaults on comparatively slender columns, and erected spires which pierced the clouds on comparatively thin walls. At Salisbury, the wall of the tower is in some places not more than 3 ft. thick. He, too, designed his cathedrals according to certain rules of proportion, and decorated them with painting and sculpture, so that his building also was a perfect work of art. Therefore, the Greek and the Goth have no cause to despise and revile one another, seeing that the principles of their styles are identical. They have learned to look on both sides of the shield, and to own that each has excellences peculiarly its own, and that they are united by a common basis.

But my object is chiefly to point out certain qualities which are often denied to Greek architecture, but which it shares equally with the Gothic, and which no one who has studied its monuments *in situ* will deny that it possesses. These are grandeur, refinement, picturesque beauty with regard to its surroundings, and ingenious construction. Unfortunately, none of the greatest temples are still standing. There are, however, sufficient remains of one still in existence to assert its former grandeur. On the promontory of Poseidon, not far from Miletus, thereare three columns standing, 63 ft. in height, portions of the walls of a cella built of blocks, generally 6 ft. in length; capitals of pilasters measuring about 6 ft. each way. The building was above 300 ft. in length by more than 160 ft. in width, with ten columns to the front porticos, and a double row of columns,—106 in number,—surrounding it. Such a building as this, which was 100 ft. in height (without reckoning the podium lately discovered by a French expedition, under MM. Riyat and Thomas), surrounded by a forest of columns, and approached through an avenue of seated figures and sphinxes (some of which are now to be seen in the British Museum), must have possessed a grandeur approaching the sublime, quite equal to that of any Gothic cathedral.

I next have to speak of refinement as evidenced by exquisite proportion, subtle contrivances to improve the optical effect, and the beauty and variety of curves of mouldings, which were varied to suit their respective positions.

The system of proportion employed by Greek architects has been thoroughly explained in a treatise by Mr. Watkiss Lloyd, contained in Professor Cockereli's fine work on "Ægina and Bassæ," and it is a remarkable fact that for the most part the three temples which I excavated were found, upon a comparison of the various dimensions, to bear out his theory as regards both plans and elevations. That special refinements were used in the Parthenon no one who has read Mr. Penrose's learned work on that building can doubt. He therein proves satisfactorily that there was not a straight line in the building, and although the remains of the Temple of Priene were not in a sufficiently perfect condition to allow me to affirm the same with regard to it, I was able to note the fact that the walls of the cella battered, that the pavement of the peristyle sloped, and that the faces of the steps, the architrave, and corona of the cornices were none of them exactly vertical. These observations were made by the use of a level and plumb-line, with offsets taken at regular intervals. At a former Conference I had occasion to mention the variety of curves found in Greek mouldings, — the beauty of their contours, and their suitableness to their various positions. Thus, in each of these particulars there was a degree of refinement which is not equalled in any building of the Mediæval styles.

Of the picturesque arrangement of Greek buildings you have lately been able to judge from the drawings which illustrated Mr. Fergusson's interesting paper on the Erechtheum, and neighbouring structures on the Acropolis of Athens, and by some of the photographs on the walls. The bold crag, with the propylæa, the temple of Victory jutting out at the side, the elegant group of the Erechtheum on one side, and the Parthenon crowning the height, form a picture nowhere surpassed. This I have before described, but I shall mention another group of sacred edifices, which was but second to this, that of the temenos of the Temple of Minerva Polias at Priene. It was seated on a vast platform of masonry at the foot of a tremendous precipice, upon which stood the Acropolis. The temenos was entered by a sloping road through propylæa, having a small temple with four columns on each front, not quite in the centre of the east side. On entering, the temple was seen on the right, the view of it partly concealed by a large heroön, ornamented with sculptured friezes; on the left there was a long Doric colonnade overlooking the sea, and about the enclosure, which probably was planted with trees, were placed seats of various forms, and pedestals with statues. Thus, there was no formality, but an arrangement that was pre-eminently picturesque, whether seen from the agora below or from the level of the temple itself.

That the Greeks showed a certain degree of ingenuity in construction is evident from two buildings,—not temples,—in which there was a departure from the usual form: these are the Lion Tomb at Cnidus and the Mausoleum of Halicarnassus. In both there were the same conditions to be fulfilled, viz., how to support a pyramid,—the emblem of eternal repose,—over a circular chamber at a time when the arch and dome with voussoirs were not known. The problem was solved in both cases by the use of the *tholus*, or vault in the shape of a beehive, consisting of a series of corbels arranged on a circular plan, and united at the summit by a huge keystone, in shape like the bung of a beer-barrel. This *tholus* was used in the Treasury of Atreus of Mycenæ, and I am able to illustrate it by a drawing that Professor Donaldson has kindly lent me for this occasion. The vault of the Lion Tomb was found partly in existence, and as this monument and the Mausoleum were not twenty miles apart, it is probable that one was imitated from the other. It is supposed that the Lion Tomb was erected B.C. 394, and that it was the prototype of the Mausoleum. This system of corbelling was also probably used to form a relieving arch over the beams at the fronts of the Mausoleum, which were more than 16 ft. in length, and which could not, without some such contrivance, have supported the superincumbent weight of the pyramid. So that, you see, that even when unusual construction was required the Greek architect was equal to the occasion.

Will you pardon a digression while I mention a curious circumstance connected with the *tholus?* When at Rome two years ago I visited the so-called Prison of St. Peter, which consists of two subterranean chambers under the Church of San Giuseppe, in Falegnami. When I reached the lower of these I found myself, to my great surprise, in the lower part of a *tholus*. Five or six courses were *in situ*, projecting gradually one above another, and pointing to a regular centre. Here, then, was the oldest building in Rome,—an Etruscan treasury or sepulchre, evidently imported from Asia Minor, and clearly proving the Asiatic origin of the first colonists.

To return to the subject of Greek art. I have endeavoured briefly to show that there are certain qualities in Greek architecture which are peculiarly its own, worthy our study and imitation. By imitation I do not for a moment mean copyism; in fact, it was the copyism of Greek buildings by our predecessors which brought Classic art into that disrepute from which it is happily becoming free. Doric façades of engaged columns, with rows of windows between them, for churches and chapels, and gigantic propylæa for gateways to railway stations conveyed false impressions of the qualities of Greek art. Now, however, we are beginning to realise the fact that such qualities as grandeur, good proportion, refinement of mouldings, and picturesque arrangement were amongst its characteristics; to allow that, whether we make use of the Classic or Pointed styles, these qualities are essential to good architecture, and to perceive that if we invent a style of our own,—an architecture of the future,—it ought, in a great measure, to be based upon principles that comprehend these characteristics of Greek art.

M. VIOLLET-LE-DUC'S LECTURES ON ARCHITECTURE.

IN the author's preface to these lectures,* which are given to the English public by the same translator who has already done good service in making other works of M. Viollet-le-Duc better known on this side of the Channel, he tells us that some time previously to 1860 he had determined on opening a studio for pupils, and delivering a course of lectures on architecture. The proposition appeared to him to have no particular interest except for those who should wish to frequent the studio and attend the lectures. Not, however, belonging to any school, the intending lecturer found himself and his undertaking strenuously opposed by the representatives of the orthodox schools of architectural instruction in France, as a man of "dangerous" dogmas. "My friends began to intimate a general rising in arms,—a fierce impending conflict; and both sides were hoping for a goodly sight of broken lances. Now tumult is the foe of study, and I love study and detest tumult. I therefore allowed the storm to blow over; which, meeting no resistance, spent its rage in vain. I put the manuscript of my lectures back into my portfolio, and gave my mind to other matters." Although thinking that there was no good to be got out of controversy, M. Viollet-le-Duc nevertheless believed that his lectures contained a statement of truths and principles which it was worth while to invite more attention to, and hence the subsequent publication of these undelivered lectures, the object of which is to inquire the reason of every form of architecture, —"for every architectural form has its reason,"— and to point out the principles which underlie them, and trace the logical consequence of those principles, independently of the ideas or tendencies of any special school of criticism.

The most important of the lectures in the first volume is certainly the opening one, which contains a good deal that is not only in a great measure special to the writer, but is put in an original and thoughtful manner. The great point of the author, as stated in this first lecture, is, that art is always the same in its essence and its principles, and that it is independent of the element in which it originates and flourishes. The frequent division of the history of art into periods of splendour and periods of barbarism conveys, therefore, a false impression. A people who are, in some senses of the word, barbarous, may possess arts in great perfection; and Art cannot be barbarous, for the simple reason that it is Art. "It is really barbarous only in ceasing to be art; when it degrades itself by belying and violating its own principles; when it slavishly follows the caprices of that fantastical queen we call Fashion; when it becomes the plaything of a people without fixed ideas or convictions; and when, no longer reflecting national manners and customs, it is but an encumbrance,—a thing of mere curiosity or luxury." Such a state of things, however, may exist, does exist, as we know, in conjunction with a period of great social refinement and luxury, and great scientific knowledge; a sufficient indication, if any were necessary, that art is independent of scientific knowledge, and of what we may term "material civilisation," or mere luxury and completeness in the organisation of daily life, in opposition to intellectual civilisation. Then comes the question, what is this existence, this power, which we call "Art," and which is, in a sense, eternal and unchangeable in its essence. The remarks of M. V. Le Duc, in regard to this consideration, are most admirable; but either he or his translator does not make quite clear, what is certainly the fact, that they are applied to two different phases or sides of the subject; to the means of expression in art, and to the feeling or impulse which underlies and prompts the expression. Both these are spoken of as "art," but they ought certainly to be distinguished from one another more carefully. In regard to the origin of art, regarded as a means of expression, we shall not follow our author into details. His attempt to trace out the probable first beginning of artistic expression, in a rude form, is what has been done often enough before, though he does it remarkably well. His description of the process by which sculpture may have come into us as a means of expression is very logically put forth. A strong man of some ancient tribe kills a lion, and hangs the skin over his dwelling as a trophy; this trophy is perishable or decays, and he cuts as well as he can a less perishable representation in the rock, and to all who see this image it plainly says,— "This is the strong man who knows how to defend himself and his"; and when he dies his family hew out a cell in the rock as a sepulchre, and over it carve a man fighting with a lion, the figure of the man large, and that of the lion small, to indicate the might and power of the hero; for though it would really be a greater feat for a small man to kill a large animal, that is a complex idea which does not enter into the mind of the primitive artist. But this is the first and simplest form of artistic expression by means of sculpture; and in a similar manner the author illustrates the essential idea which gives rise to shades of expression in sound and modulation which finally develop into music.* But all this, though, as we have observed, very well put by the author, is only a repetition of a kind of imaginative conjecture which we have often met with before, and which, though always interesting and even fascinating to the mind, partakes too much of mere conjecture and fancy to lead to any very valuable result.

It is rather to our author's remarks upon the underlying impulse which gives rise to artistic expression that we would draw attention, the rather because the view which he emphasises is one which has not been nearly enough taken into account by the profession which he represents and which he addresses. Taking as the keynote of his discourse the axiom that "Art is an instinct, a craving of the mind, which, in order to express itself, employs various forms: but Art is unique, as Reason, Wisdom, Passion, are unique,"—he points out how a similar train of emotion may be aroused by expressions the most distinct from one another and from nature.

> "It would even appear that the farther the arts are removed from the imitation of nature, the more they are calculated to strike certain deep-seated chords in the soul, leaving a profound and lasting impression. The accent and action of an orator, a mere gesture, a musical phrase, or the sight of a noble building, will often produce such a perturbation of the nerves that tears start to the eyes, and we experience a sensation of heat or cold; though we are unable to describe the nature of the feeling which moves us. This feeling is our artistic instinct, which is touched by some one of the various expressions of art."

And if we analyse this feeling (so far at least as it is capable of analysis) we may perceive that "natural phenomena produce in our minds, through the senses, certain impressions which are essential to our nature, and are independent of physical fact." The roaring of the sea is but a sound of which we know the cause, but this grand harmony develops in our minds certain feelings which are already there in a latent state. "Now let us suppose that art, speaking the language of the musician, recals to you the harmony of the waves,—in an instant your mind is again filled with the same thoughts which

* Lectures on Architecture: translated from the French of Viollet-le-Duc, by Benjamin Bucknall, architect. Part I. (Sampson Low & Co.).

* It is noticeable that the manner in which this origin of music by Viollet-le-Duc is put strongly coincides with that suggested by Darwin, we forget at this moment in which of his works.

occupied it when you were on the sea-shore. . . . Suppose, again, that during those hours passed in listening to the waves, you were under the influence of some happy or some sorrowful event; the same feeling of joy or sorrow which you then experienced will be awakened by the musician." But has the architect a similar power to this of touching the heart and working upon the imagination? Yes,—according to Viollet-le-Duc. "If he (the architect) traces beneath the sky a long horizontal line along which your eyes may range without interruption, your mind will be affected by a sense of grandeur,—of calm,—which will arouse in it ideas analogous to those caused by the sounds of the sea, of which we have just been speaking." Or, again,—

"Take a person into a low far-stretching crypt, arched upon numerous short and massive pillars; although he can walk erect and breathe with ease, he will incline his head, and none but melancholy thoughts and gloomy images will present themselves to his mind; he will experience a sense of oppression, a longing for light and air. But take him into a building vaulted at a lofty height and flooded with light and air; he will direct his gaze upwards, and his face will reflect the feelings of grandeur which crowd into his mind. This is a phenomenon which any one may observe. . . . . Thus, then, long horizontal lines, low or lofty ceilings, a dark or a brilliantly-lighted chamber, will give rise in the soul to emotions of a widely different nature. This is natural and evident; all can understand it. But the human mind is complex; and by means of a deep-seated faculty, the workings of which we cannot comprehend, it establishes certain relations between sights, sounds, and ideas, which, however wonderful, are none the less real; since we find them recognised by all the individuals who compose a crowd at the same place and at the same moment. Thus (for we must reason familiarly if we would be understood), why, in music, does the *minor key* awaken in the mind different ideas from the *major*? It may be said that there is a *minor* and a *major* in all the arts, as also in the infinite details which constitute each of them several y."

These certainly are considerations which there is great hazard in committing to language or to print too formally and in detail, since they express truths which, though real (as all who can feel them know), are so broad, and vague, and (if we may use the term) spiritual in their signification, that an attempt at a logical statement almost tends to destroy them, for the moment, in the process. But one of the conclusions drawn by the author from these considerations, as applied to his special subject, cannot be passed over, and is stated in so uncompromising a manner as would rather startle, we imagine, a good many respectable "practitioners." "An artistic people," concludes our author, "is one which has equally understood all the different languages of art. An architect who can listen to a melody or a poem, or view a sculpture or a painting, without experiencing emotions as lively as those he would feel in viewing a building, *is not an artist*, but a mere practitioner; the same may be said of the musician, the poet, the painter, and the sculptor." This, we say, is a judgment calculated to startle not a little those practical members of the profession whose ideas and associations never travel beyond drawing-boards and estimates and specifications. But is it not true? And is not here the secret of a great deal of the false taste, the sentiment, and superficiality of the day,—that the building and its decoration are *not* the result of any innate feeling prompting the designer towards expression through form and mass and colour, but merely a contrived repetition of what in some former day did spring from an innate impulse, and was then and therefore genuine and impressive, whereas its reproduction or imitation at the bidding of a modern art-fashion, is something merely hollow and unreal? It is not to be supposed that a true artist must necessarily have the power of expressing himself equally well in every medium, because the manipulation of each form of expression, so as to produce the best and strongest effect, and to speak the finest language it is capable of, is in itself a matter often for lifelong study; though we need hardly remind the reader that a certain universality of power in production has characterised some of the greatest artists, and all the greatest epochs of art. But that this faculty of seeing in all the arts the various expression of the same latent emotion, of enjoying and understanding them all equally, is a most important test of real artistic feeling, we do as strongly believe, as we are only too certain that it is one rarely met with in the present day, and we are almost inclined to say most rarely among professed artists. Too often the painter is a mere painter, the musician a mere music-maker, the architect a mere builder of houses; and highly as we have long estimated the genius and the writings of M. Viollet-le-Duc, we gain a new respect for his genius, and a new proof of its reality, on finding that with all his multiform labours and industry in the field of art which he has chosen for himself, he has preserved so clearly and strongly this view of art as a whole, and has not been tempted to restrict his mind and his appreciation to the one form of its expression which he has specially cultivated. It is no doubt true that all cannot feel or appreciate this metaphysical unity of the arts, and to those who are debarred by nature from seeing it, education will, we suspect, do little or nothing to develop the faculty. They are in reality "art blind"; they can be conscious of the external form of art expression as a physical fact, but not of its inner meaning. How intense is this perception of the interchangeable nature of different forms of art, in delicately-organised minds, and how little education has to do with it, is illustrated by an anecdote of his childhood, which Viollet-le-Duc repeats in connexion with this subject, and which is too curious and suggestive to be omitted. He was taken by an old servant one day to the Church of Notre Dame:—

"He carried me in his arms, for the crowd was great. The cathedral was hung with black. My gaze rested on the painted glass of the southern rose-window, through which the rays of the sun were streaming, coloured with the most brilliant hues. I still see the place where our progress was interrupted by the crowd. All at once the roll of the great organ was heard; but for me the sound was the singing of the rose window before me. In vain did my old guide attempt to undeceive me; the impression became more and more vivid, until my imagination led me to believe that such or such paues of glass emitted grave and solemn sounds, while others produced shriller and more piercing tones; so that at last my terror became so intense that he was obliged to take me out. It is not education which produces in us this intimate connexion between the different expressions of art."

Considerations of space warn us that we must not here dwell longer on this remarkable introductory chapter, the perusal of which we commend to every thoughtful man interested in art as a whole (as every thoughtful man ought to be) or in the arts, as separate means of expression. There are those, no doubt, who will say that these thoughts have little to do with architecture. But then they are not the people for whom the introductory lecture was written. We must now say a word, though it can be but briefly, as to some other special points of the lectures included in this first volume. The second lecture, after some remarks on the buildings of primitive times, gives a brief review of architectural art as it existed among the Greeks, in the course of which the author gives very good and sufficient reasons for his non-adherence to the theory of the wooden origin of the Doric style, a theory not now enjoying such respectable patronage as formerly, but which has not often been so well and logically refuted as in this lecture. The comparison between the details of the Parthenon and those of the Lycian rock-cut tomb in the British Museum, with its genuine timber details, forms an important point of the argument. The construction and relation of parts in the Doric order is illustrated by a fine drawing in that half section, half perspective manner which some of the French architects are so fond of, and use so ably, in illustration. The whole of this account or analysis of the Doric style, and its logical process of development from one detail to another, should be read with attention; as also the remarks upon the line of demarcation between Greek and Roman art, which exhibit that remarkable universality of view which so distinguishes M. Le Duc among writers on architecture. Some observations on the modern style of cities we may quote:—

"We call ourselves a civilised people; yet what, for the most part, are our cities, and what in a few centuries will they become, when in all probability the vulgar regard for the satisfaction of material requirements will have utterly swept away the few remaining relics of former ages? What are the cities of the new world? And what the great manufacturing towns of England? That which we call civilisation has led us in the nineteenth century to make wide streets, and to line them with houses of uniform appearance. Our towns and cities have thus become deserts for thought; they have the wearisome monotony of solitude without its grandeur. What is there throughout these vast chessboards of streets to suggest historical associations? Where is there a centre of repose for the distracted mind of the spectator? On what point shall his attention be fixed? Where does he find the indication that a hundred generations have trodden the same ground before him? Not, indeed that I regret the fetid and tortuous streets of our old towns, with their houses seemingly brought together haphazard, their labyrinths of alleys, their public buildings obscured by booths and disfigured by dirt, accumulation without order, an indescribable chaos; yet in this chaos there was, at any rate, the imprint of man, of his labour, the memorials of his history,—something more than the indications of the merely material interests of his time."

The comparison between Greek and Roman architecture is carried out further in Lecture III. This is summed up in the comparison of Greek architecture to the perfect nude human figure, which is beautiful because every part of the exterior is the natural consequence of its organic structure; whereas Roman architecture is the man dressed, in a dress which may be very effective, very rich, very handsome, and so on, but which we feel to be almost entirely arbitrary in its form and detail, not the necessary consequence and expression of the body which it clothes. This criticism might, *à fortiori*, be applied to the architecture (so called) of modern engineers, who cannot be content with leaving the naked forms of their construction, which would often be beautiful, and always interesting, but must dress them in an arbitrary architectural (so-called again) clothing, often ugly, and always uninteresting. Another remark we may refer to in this lecture, as suggesting a subject for consideration. "The remains of Greek monuments and the valuable description of Pausanias prove to us that the Greeks never admitted the miserable expedient of modern architects who think to produce a grand general effect by conforming all the buildings of a public square, whatever be their separate destination, to the same design." This system is even more carried out in modern Paris, where these lectures were written, than with us; but we also are so used to it that few of us, probably, ever regard it as a subject for question. In some aspects of the system we are not quite so certain of its absurdity as our author. A large row of dwelling-houses, which are all on the same scale, and for the same purpose, we think, may, though they are distinct tenements, be legitimately treated as a symmetrical whole, and this is not incompatible with sufficient difference of detail and ornament to impart individuality to each separate dwelling. Treating a whole square, in which the buildings have various objects, and are on various scales and arrangements internally, in this uniform manner, is another thing, and cannot be defended on any rational grounds.

The detailed criticism on Roman architecture, in Lecture IV., though the subject seems of less artistic attractiveness, is one of the most interesting, from the novelty and originality of many of the ideas brought forward. As may be supposed, M. Le Duc is no enthusiast for Roman art; yet he fully recognises the element of greatness in it, and observes in one passage that Roman ruins produce so profound an impression because in them, in their forlorn nakedness, we see the essential character of Roman architecture, unspoiled by the questionable decorative taste of its builders. "One of those halls of Caracalla's baths, whose walls are shattered, whose piers are laid bare, and which exhibit to the astonished sight the gigantic mechanism of the Roman structure, would produce a less effect, perhaps, if we saw it draped, with its useless columns, its marble veneering, its decorations for show." But the author does not by any means deny that the Romans showed great architectural and artistic power in some of their works; his critical estimates of Trajan's column and the Pantheon are as sympathising as they are eloquent; and he holds up the Roman architects as examples, in spite of their corruptions of style and method, in one very important sense, in a passage which must form our last quotation, and which is *apropos* of the Coliseum and the numerous difficulties connected with the plan and construction of such a building:—

"It is these general dispositions of Roman buildings that are contrived with such profound insight that deserve our chief attention as examples. . . . . The Roman is never in uncertainty; his position indicates a very advanced civilisation, which submits everything to reasons of state. He commands as a master who knows exactly what he wishes and what he needs; and he knows how to make himself obeyed, because he knows how to make himself understood. . . . . Even now, in spite of our civilisation, in spite of the strength of our institutions, our ideas in art are vague and confused; we do not know what we want, and our public monuments are no sooner finished than we find them grossly defective, and perceive that we must modify or rebuild them at great expense. Our artists dispute about style,—are engrossed by one particular school of architecture,—condemn or approve such and such a form of art,—adopt or repudiate such and such a tradition; but as to the broad and true way of appreciating architecture becoming to a great people, it hardly occurs to them;—happy if they are allowed to carve the profiles they prefer, or to put columns or pinnacles here and there according to their fancy. As we are said to be of Latin race, let us resemble them at least in their excellencies. I fear, however, that we approach nearer to those Roman-Greeks of Byzantium, who were disputing about the light on Tabor while the armies of Mahomet II. were storming their ramparts."

We can only here add that the fifth and last lecture of the present volume treats partly of methods to be followed in the study of architecture, in which a good deal of what is said is what has been suggested in our columns at different times (sometimes almost in the same words). The work will be complete in six parts. To notice each "Part" separately and at length would be beyond our space; but we may return to the

work in detail when it is complete. Meantime, we specially recommend it to all young architects and architectural students, as a book full of learning, thought, and suggestion,—the product of a mind at once comprehensive in its range, and full and accurate in practical knowledge of details.

WORKS IN BLACK AND WHITE.

THE fourth annual exhibition of "Works in Black and White," which was opened last Monday at the Dudley Gallery, is an interesting and varied one, and contains somewhat less of the element of "original drawings for illustrations in the *Graphic*," and other works of that class, the superabundance of which we were disposed to complain of last year. On the other hand, there does not seem to be a very large proportion of that highest class of thoughtful and suggestive artists' work which gives the chief interest to an exhibition of this kind.

The largest work belonging to an ambitious class of subjects, and one of the largest of the drawings in the room, is a study in red chalk, by Mr. W. B. Richmond, for a picture of "Hercules and Prometheus" (215). This is not, to us at least, very intelligible; Hercules, a figure fronting the spectator, is, like the hero of the well-known song, shooting an arrow "into the air"; the head thrown back, with the face foreshortened, is very well given, the rest of the figure, the action of the legs, to our thinking, rather stiff; the part played in the scene by Prometheus, who reclines on the rock below, is not very obvious, but the figure is a fine study. Among other studies from the figure we notice a crayon head by Mr. Cave Thomas (108), and two very pleasing small sketches of heads by Miss Starr (156–7). Mr. Marks has two figures in his best style, of which "The Birthday Present" (99), an old gentleman, with spectacles pushed back, examining, with a half-pleased and half-critical air, a piece of porcelain, is admirable; and there is a humour that is, nevertheless, almost pathetic in the representation of the mild old monk who is "The Convent Drudge" (326). By M. Tissot is to be seen an etching under the title "Spring Morning" (56), in which an odious girl is the central object; and another etching, in a very free sketchy style, of a woman in rather odd costume standing "By the Window" (337), which is one of the cleverest and most original things in the room, and makes one wonder that the artist who can do this can so often content himself with mere commonplace figures.

Among the French artists whose names and works have been conspicuous in this exhibition since it was started, M. Lhermitte again delights us with his charcoal studies, among which there is nothing so remarkable or powerful, perhaps, in the way of figure-subjects as he has shown in some previous years; but there is real pathos in the "Petite Bretonne en Prière" (327) and the "Banc des Pauvres" (114), the expression in the latter depending mainly on the pose and sentiment of the figures, the faces being almost too roughly sketched; in the former the expression of the face is very finely indicated. A landscape, "The Boat" (127), and a town subject, the "Bridge at Landerneau" (218), with an extraordinary jumble of houses overhanging a space of black water, are both exceedingly fine, and, perhaps, realise the highest sort of effect that black and white can produce in this class of subject. The landscape studies, also in charcoal, of M. Achille Dien, are fully equal to some we have previously noticed, but are also a little too like them; the artist's range of subject and effect seems to be limited. Of M. Legros's contributions all are very good, some of them rather slight; but the etching entitled "La Mort du Vagabond" (416) is full of an almost terrible pathos; it is a thing that sinks into one's heart. The work is also a very fine specimen of the free, bold style in etching. To our thinking, the genius of M. Legros is shown to more advantage in these works than in his finished paintings.

Among the works which present specialities of excellence or of interest (and it is only those that we can find space to mention) are the pen-drawings of Mr. Edwin Edwards, among which we specially admire the studies of old man-of-war hulks, "The Old Bellerophon" (298) and the "Coal Hulks" at Portsmouth (381). Mr. Green's various pen-drawings for illustrations to a story in the *Graphic* are undoubtedly very clever, but not very refined in style or feeling. The sad and grim head of Mr. Carlyle appears in almost every exhibition now; if all the artists who paint him get sittings from him, we rather pity the "seer" of Chelsea. The likeness by Mr. Andrews (145) is not very successful in any sense. Rajon's etching from the portrait of "R. Spottiswoode, esq.," by Mr. Watts (150), is a beautiful specimen of the art. The drawing by M. St. François called "Chercheurs d'Obus" (195), a reminiscence of the siege of Paris, shows a desolate open space strewn with fragments of demolished buildings, among which one or two men are picking their way in search, we suppose, for "dead" shells which could be turned to account by the besieged. Mr. Harry Goodwin sends some effective and original drawings in a brown medium, of which "The Old Church, Winchilsea" (411), and "Evening, Caen" (464), are excellent. Mr. Glennie's sepia drawings, in their delicate tone and finish, scarcely hold their place against some of these rougher and franker methods of execution; but his "Morecamb Bay" (148) is a beautiful little drawing in a very pure and unaffected style. Among other landscapes, Mr. Palmer's "Old Yews in Norbury Park" (188), Mr. Arthur Litchfield's "Landscape" (231), Mr. Ellis's "Four Etchings of Paris" (310), Mr. Ridley's "At Rotherhithe" (353), Mr. J. H. Bradley's etching "Torcello" (389: an admirable work), Mr. Vaillant's "Atelier de Marayent" (404), Mr. F. E. Cox's "Homewards" and "Down Hill" (427, 478), Mdme. Cazin's "Windmill on French Coast" (531), and Mr. Watson's "Temple Bar" (538), are very good.

Mr. Arthur Hopkins's "Belle" (358) belongs only to the order of pretty things, but is so very pretty that it deserves a word. Mrs. Hopkins ought to understand that every one is tired of her joke of drawing little naked children, aping the attitudes of grown-up people; and to quote beautiful and serious lines of Tennyson's as an illustration to such nonsense as No. 386 is very bad taste. The lady is better in her two little "draped" children (399 and 540), in which there is real humour. Mr. Lawson's study of a little baby "Asleep" (252) is also very good. Among the jokes of the exhibition (there are always a few), the puppy "Puzzled" by the Noah's Ark animals (292) is not bad. The pen-drawings for *Punch*, by Messrs. Du Maurier, Keene, and Ralston, are all excellent, and show, even better than their engraved reproductions, what good artistic talent and humour are at the service of our contemporary, so far as the illustrative department, at least, is concerned.

An additional practical interest is given to this year's exhibition by the presence of two cases containing specimens of the tools used in engraving and etching, and of woodblocks, plates, and impressions in various stages.

While on the subject we may mention that a similar exhibition of "Ouvrages exécutés en Noir et Blanc" is to be opened at Paris during July, and that M. Deschamps, of the French Gallery in New Bond-street, is prepared to take charge of contributions from artists in England.

THE WATER-SUPPLY OF PARIS.

THREE years ago there was published a valuable Report, bearing the authoritative name of M. Maxime du Camp, respecting the water-service of Paris. Since that time, a curious development has taken place, proving to the great French capital that it cannot depend upon the river for its constant and natural supply. With that regard, therefore, which the French invariably exhibit for public interests of a social kind, a commission was issued, and its statement is in print, if not yet in circulation. But its publicity may be expected within the next few days. Meanwhile a brief recapitulation of the contents may be useful. Paris, it may justly be said, has taken the lead among the cities of Europe, in the matters of water and light, dark and miserable though its traditions have been. And yet it is a city, in this respect, of want and sacrifice; for there was, until lately, no worse-watered town to be discovered through the length and breadth of Europe. In plain truth, its principal streets have been considered to the disregard of its lesser thoroughfares, and the whole have suffered from the effects of this absurd municipal favouritism. But the new system is in full operation at present, and Paris enjoys now a real abundance of water. There is no quarter in which the mere turning on of a tap will not ensure an instant and copious service. Reservoirs, aqueducts, and fountains are far more numerous than in London. Paris, in fact, has escaped from what the Arab picturesquely calls "the hour of thirst." Yet this is an improvement of altogether recent date. When the last Report was published, during the earlier years of the Second Empire, the Cité, alone, of all that beautiful metropolis, enjoyed its pure and abounding issue from the hills around; and this water was irreproachably sweet. It was not derived from the Seine, which then held in solution a Thames-load of abominations and nuisances: yet this condition could not endure. The uncorrupted current flowed over a low marsh, and was polluted by it. But there was an explanation of this result, and it accounted for a great fact in the history of Parisian mortality during the ensuing years. The new aqueduct passed, by a tunnel, through "the Mountain of Martyrs," among graves and the uncoffined dead, and also through the vaults of a churchyard for the incurables, the consequence of which was the poisoning of an entire district for from between twenty and thirty years. However, all this has been abolished now the laughing little stream, the Bièvre, runs in place of the sour old sewer, and sparkles into the Seine, just under the grey, unfinished towers of Notre Dame; and the visitor is astonished to be told that those are the waters of Arcueil, brought by an aqueduct, *temp.* 1544, Roman and Julian in age and character,—*Guarda é passa*. There is not a syllable of truth in the legend, from beginning to end. These things are made up of Roman brickwork, and have no more true antiquity about them than the Bridge of Austerlitz. Nevertheless, they possess, no doubt, a particular interest. The monks of Saint Lawrence were determined to get drinking-water without having recourse to the Seine. They excavated, in an Indian manner, vast tanks at Romainville, Bruyères, Menilmontant, and Saint Gervais, and afterwards at Saint Martin-des-Champs,—St. Martin's-in-the-Fields, of London popularity,—and they did more than this, they dug a subterranean aqueduct, 7,000 ft. in length, which existed before the New River was actually in contemplation. Were these the works of ordinary workmen? No; of monks, who thus employed their spare, though not indolent, time. Let us honour them for it. Yet it must be admitted that they were, in a degree, selfish. They began, at any rate, by appropriating the waters of the wells and other sources to their own gratification. But King Philippe-Augustus put in a claim on behalf of Paris; and, after recognising his merits, we must, indeed, skip at least a hundred pages of the Report, in order that our own time may be reached.

Suppose, then, fifty ordinances, until we reach the present day. Paris now drinks from the Seine, from L'Ourcq, and from the Marne, from the wells of Arcueil and of Huis, and from the artesian wells of Grenelle and Passy. Its fountains are also fed from the steam apparatus at Chaillot, and from the ingenious mechanism at Belleville; and in all these places it is remarkable that the local territorial incidents are similar; that is to say, that the rain falling on the hills does not descend altogether into the valley, but is, in a main part, absorbed by the slopes, and furnishes Paris with its largest supply of water. Of course, however, advantage is taken of every opportunity possible for gathering into distinct channels, tunnelled or not, all the sweet water that can be accumulated, in order both to spare the Seine,—which is exceedingly impoverished in its current, at times,—and to provide a purer draught for the citizens. Still, the hollows cut through the earth, and constructed of unmortared masonry, from Belleville and the Prés-Saint Gervais, are neither more nor less than common drains, though used for drinking purposes, and they bring all manner of abominations with them. They are sewers, in point of fact, as M. Maxime du Camp confesses, and it is to be wondered at why Paris takes the trouble to be proud about them. So much is admitted in the official Reports—and French official Reports, we are bound to say, are, as a rule, unsparing. But there is a brilliant side of the picture, to which we willingly turn. It is that of a vast system, perfectly regulated, of reservoirs carefully covered in, not architecturally handsome, but protected from all unhealthy influences, with immense currents perpetually pouring through them,—tomb-like, the Parisians say,—and piled over with "brutal" masses of architecture to keep the water cool. Among the new structures may be seen many of older date; as early, indeed, as the middle of the seventeenth century, the outer walls and embankments of which are hoary with lichens, although the tanks are as pure and as free from noisesomeness as though they were the works of the Moguls, and had belonged to the marble

groups of Agra. These were architectural efforts, however, and no more recent monuments of a similar Parisian ambition remain. Notwithstanding, the water-system of Paris is improved, from year to year, and it is scarcely too much to say that every drop from the fountains of the earth, in the neighbourhood of the capital, or wherever it can be reasonably sought for, is utilised. Generally speaking, thirsty Paris has its thirst quenched from the north. The waters of the south are soft, and slightly unwholesome, though they sparkle brilliantly enough in the way of fish-ponds and fountains. The supply from them, however, amounts to not more than a million of gallons a day, which is a fractional total, for so large a city; and it is principally gathered through an aqueduct across the valley of the Bièvre, a work Roman in magnitude, with 500 yards of archway 70 ft. above the common road, in many parts, and with magnificent spans across canals and roads. Indeed, some relics of the Julian period are still to be traced in this monumental work, which French archæologists, however, affect to despise, for the plain, though insensate, reason that it has been put to common uses. It stops short, however, about 8,000 yards from the point of general distribution. Here is a gigantic hall, resonant with "the voices of many waters"; immense pipe-holes pierce its walls; a canal runs through the centre of the floor; there are pathways on both sides of it; galleries run above, with white-arched windows, letting in as much light as can be expected; the whole perspective suggests a prodigious cloister, with an ominous, offensive sound, though not much of a repulsive scent, pervading it. Taken for all-in-all, indeed, the atmosphere is rather refreshing and pleasant than otherwise. But it is impossible not to detect,—as the Report, indeed, avows,—the influence of the weather, above and beyond all artificial arrangements or precautions. Thus, when heavy rains have fallen, wells are full, rivers have overflowed, and even the gutters have been choked, the water-supply of Paris is out of order,—is unhealthy, is contaminated, and bursts with black bubbles into the cisterns, which, as every one knows, are always exposed to the rainfall. These are points especially insisted upon by the authors of the Report, who declare that numbers of water-sources, once famous in France, and especially in Paris, have been stopped up for architectural and other purposes, and who also remind their fellow-citizens that they were in danger—the Seine notwithstanding—of something like a water-famine during the German siege. Six steam-pumps were kept at work, by day and by night, in that sad time, at the Port d'Anglais, the Maison Alfort, the Quai d'Austerlitz, Auteuil, Saint-Ouen, and Chaillot, and even then the supply threatened to become a devastating scarcity. The cost of the machinery, and of its operation, was among the most remarkable items in the Budget of Paris, during that calamitous year. The Ourcq, however, flowed freely through its tunnels, which, upon their approach to the capital, are constructed of massive blocks, solid as those of a pyramid. There are sections, indeed, through which they pierce a kind of comparatively valueless coal-field, but through the lateral avenues of which water rushes at a tremendous rate, and in an enormous volume, though, at La Corderie, the Report tells us, a wheel of 90 ft. circumference is required. It is strange enough to find that, in this vast water gallery, a triple grating is needed to prevent the ordure of the suburbs from floating *into*, rather than *out from* the subterranean aqueducts of Paris. And, most repulsive of all, perhaps is the growth, upon those stone walls, of the "vegetable spider," bred at 26 degrees, *à zéro*, and a creature sufficient to infect any water under heaven. But the animalisation of the lakes, streams, and ponds of Paris is not, just now, all important. The capital of Paris is seated upon a curve of her capital river, which, by Frenchmen, in their odd way of talking, is called a gigantic corkscrew. Whatever that may mean, it has nothing to do with the scheme at present in view,—which is, through a grand series of hydraulic works, to secure for Paris a plentiful supply of water to drink,—water well selected and scientifically certified, selected from known sources, and free, so far as can be ascertained, from malarious influences. Eleven years have been devoted to this task, and the results have been very creditable to the public spirit of the Government of France. Thus, the commissioners have pointed out the sources of the Lhuis, at Parjois itself; they have explored all the tributaries of the Vanne; they have gone to the fountains of the Yonne, and, when we know that this means the difference positively between food and poison, we shall comprehend the importance of the general topic. Eleven pestilential rivulets flow their filthy weight into the Yonne, which creeps, black and heavy, into Paris, like a crime, and no tree, no flower, no herb of any kind will flourish upon its banks, where children are supposed to be nurtured up to girlhood and womanhood, nevertheless. Five years ago, an attempt at reform was commenced; there were new aqueducts opened; new, pure, clear conduits, cool and close-roofed, to supply the people of Paris, free from metallic taint, and from all chemical associations. Then was undertaken, and soon was completed, the existing system of Parisian waterworks. In their own superb language, the French commissioners report that "they constitute one of the most inspiring works which it is in the power of man to contemplate." We pass on, without feeling so precisely sure upon the point; but the new Parisian works are unquestionably imposing, and, at the same time, not obtrusive. The original design was, happily enough, abandoned. There are no bronze tritons, and there are no marble nymphs. There is a reservoir, three acres in length and width, with a uniform depth of 15 ft., perpetually full, banked up, on all sides, by a forest of palisading, to support the earthworks, and, although this is by no means the principal source of the Parisian supply, it is a main one, and exceedingly important. There are sixteen others, indeed, but, in comparison, they are insignificant. The official Report, just published, mentions only nine of them, the others being subsidiary, and, in a way, auxiliary to the rest.

THE NATIONAL GALLERY, BERLIN.

IT would be difficult to find a parallel in history of a rate of increase which could be compared with that of Berlin, the capital of Prussia, and now of the German empire. Originally a Wend fishing village, on the sluggish river Spree, it did not attain to any degree of importance until, in the days of the great Elector, it became the centre of the powerful State of which he may be said to have laid the foundation. It is situate about 100 ft. above sea-level, in the midst of a dreary plain of sand, destitute of either beauty or fertility,—"an oasis of stone and brick in a Sahara of sand." At the end of the seventeenth century it numbered, however, but 50,000 inhabitants. It made more progress during the reign of the first Prussian king, Frederick I. and his successors, until, at the death of Frederick the Great, its population numbered 145,000. But the city increased at an enormous rate during the present century. In 1833 it had 250,000 inhabitants; in 1858, the population, including a garrison of 15,000 men, had increased to 455,000, while now it ranks fourth amongst the capitals of Europe, numbering nearly a million inhabitants, of which 22,600 are soldiers of the garrison, 20,000 Roman Catholics, and 16,000 Jews. Amongst its population should be mentioned 6,000 French Protestants, the descendants of those exiles who were driven from their native soil by the intolerance of Louis XIV., whose attribute, "le grand monarque," reads like a satire by the side of such shortsightedness which could deprive France of some of her best children by the revocation of the Edict of Nantes. Berlin received the refugees with open arms, and has reaped ever since, along with the whole of Prussia, the benefits of such a wise course.

The area of the city is somewhat out of proportion to the number of inhabitants, covering as it does a space of 7,000 acres. The city is mostly composed of long straight lines, and shows throughout traces of modern origin. Its principal street, Unter den Linden, is so well known that we need say but little on the subject. It contains the finest buildings in a limited space, being but three-quarters of a mile long. If we enter it at its western end, the Brandenburg Gate, the model of which is the Propylæum at Athens, we pass by the palaces of the royal princes, the University, the Arsenal, the Opera House, the Academy of Arts, the Russian and English embassies, &c. Crossing the Schlossbrücke, we enter the grounds on one side of which is the Schloss, or Royal Palace, the Cathedral, and the Old Museum, designed by Schinkel, with its most beautiful colonnade adorned by the frescoes of Cornelius. Behind the latter is the New Museum, designed by Schlüter, which took twelve years to build, certainly the most striking building in Berlin. The new National Gallery, of which we gave an internal view in a recent number, and the exterior view of which is the subject of the illustration in our present number, faces the principal façade of the New Museum.

We have already given full details of this latest of Berlin's great buildings,* and we need add here only a few remarks on the great changes and additions which this quarter of Berlin, the so-called Museum Island, is to undergo. The railway which is to be constructed through Berlin will cross the island on a high viaduct, 600 ft. long, behind the museums. This will involve a rebuilding of the Custom-house. A great desire had been manifested for entirely removing it, and utilising the space thus gained for the construction of museums and galleries. The Government, however, has no intention of gratifying this wish, but it is willing to meet in another way the views of the merchants and artists. A colossal building for the Customs' warehouse and central depôt is to be erected at a distance of 200 ft. from the National Gallery, on the northern part of the island. It will have a width of 600 ft., with a depth of 700 ft., and will rise close to the Spree to a height of 60 ft. The railway will run in a tunnel through the building. Upon it will be constructed a plateau, after the manner of Brühl's Terrace at Dresden. Gardens, rows of trees, fountains, and statuary are to make it a pleasant promenade. An approach will lead from the south, opposite to the New Museum, to the plateau, and terrace-like bridges will connect it with the Park of Monbijou and the western bank of the Spree.

A larger imposing building is to receive the Academy of Sciences, and afford in its upper floors space for art exhibitions. Galleries of less elevation are to connect it with wings in which picture-galleries will find a home. All these buildings, in harmony with the National Gallery and the other Museums, will be in the Greek style. A colonnade is to lead round the terrace, intersected at the three approaches by triumphal arches in the manner of propylæa. The centre of all these new plans will be formed by a gigantic statue of Germania, to be executed in such dimensions that its gilded crown is to tower over all the buildings of the city, and be seen far and wide. The Park of Moubijou, which is to be formed into a town park, and the palace of which is to be changed to a Hohenzollern Museum, is to be in connexion with it; and gardens will be laid out on both banks of the Spree, obtained partly by the transformation of the ground in consequence of the construction of the railway, partly by the taking down of the artillery barracks. All these changes will make this part of Berlin one of the most beautiful spots to be found in any capital.

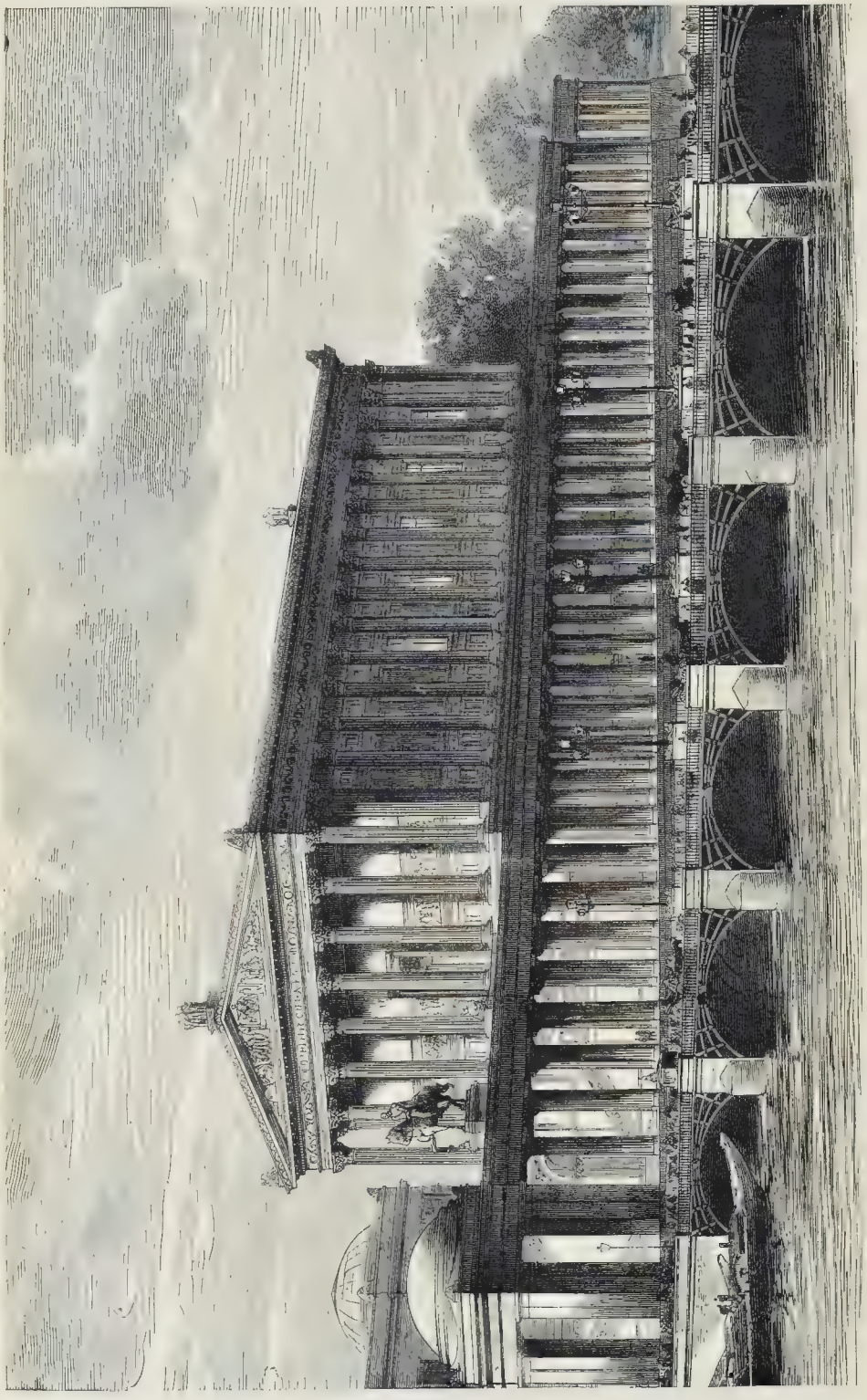
PENNY ART HANDBOOKS, SOUTH KENSINGTON MUSEUM.

WE took occasion some short time ago to review one of the interesting Shilling Art Handbooks published for the Committee of Council on Education in connexion with the South Kensington Museum.† These are reprints of the dissertations prefixed to the large catalogue of the chief divisions of works of art in the museum, arranged and abridged by Mr. William Maskell so as to bring them into portable shape. This was a very good step, and has placed a large amount of sound information, with engraved illustrations, within easy reach. The authorities, however, have now gone farther, and have issued a series of thirteen Penny Handbooks of the Industrial Arts, largely illustrated, which are sold at that price only at South Kensington Museum and the museums in connexion with it, or in one volume, in a paper cover, including 240 excellent illustrations, for a shilling. A library edition, bound, is sold by the publishers at an advanced cost.‡

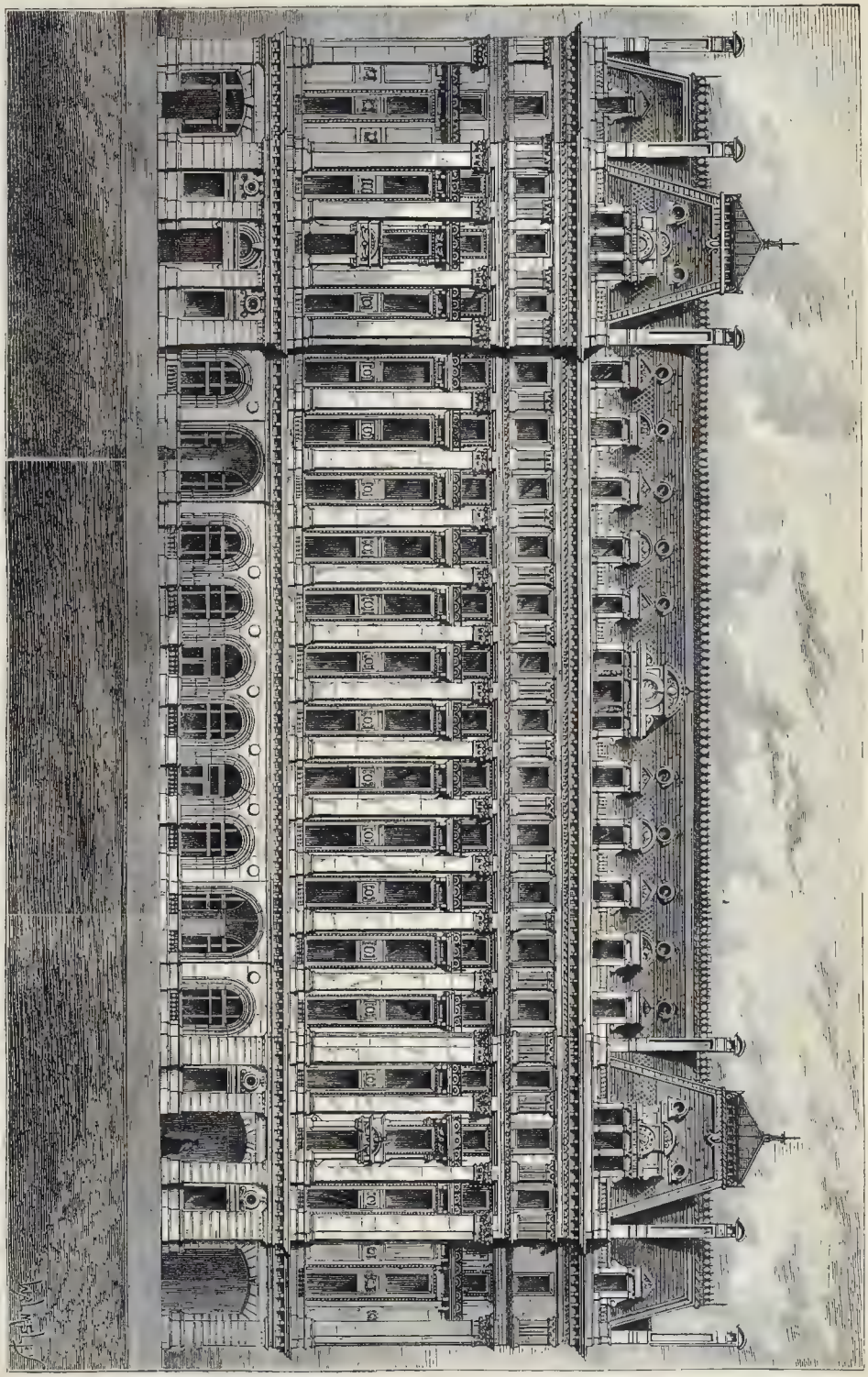
The following is a list of the penny parts:—1. Gold and Silver Work; 2. Bronze, Copper, and Iron; 3. Enamels; 4. Furniture; 5. Ivories; 6. Pottery and Porcelain, in two parts; 7. Majolica; 8. Glass; 9. Mosaics; 10. Arms and Armour; 11. Textile Fabrics; and 12. Lace.

If any of our readers can only afford a penny for information on the subjects within the scope of this list, in which he is interested, he cannot by any possibility lay it out better than he can at South Kensington.

* See p. 510, *ante*.
† Chapman & Hall, Piccadilly.
‡ The Industrial Arts. Industrial Sketches. With numerous illustrations. Chapman & Hall.



THE NATIONAL GALLERY, BERLIN.



HOLBORN VIADUCT STATION AND HOTEL.—MR. LEWIS H. ISAACS, ARCHITECT.

HOLBORN VIADUCT STATION AND HOTEL.

THE building forming the subject of our engraving is the City Terminus of the London, Chatham, and Dover Railway, which was opened for traffic a little more than twelve months ago. Some particulars of it were recently given in our pages. It occupies an area of ground, having a frontage to the Holborn Viaduct of 235 ft., by a depth of 70 ft. At the western end of this area is the low-level railway connecting the Chatham and Dover with the Metropolitan and Great Northern lines. To enable the building to be carried over this low-level railway, three enormous girders were constructed to carry the front, back, and centre walls, and from these smaller girders were fixed to carry the subsidiary portions of the building. The design of the principal girders and of the station and booking-offices was entrusted to Mr. Mills, the company's engineer. The utmost caution was necessary in getting the girders into position, and it is satisfactory to notice that, notwithstanding the traffic on the low-level line was not interfered with, no accident whatever occurred.

The station proper contains a booking-office of handsome dimensions, with first and second class waiting-rooms, cloak-room, parcels and telegraph offices, and the usual accommodation for the station-master and his subordinates. On the platform level will also be found the restaurant, a fine apartment, 70 ft. long, 30 ft. wide, and 20 ft. high. This room is elaborately decorated, the walls being covered with encaustic tiles and majolica enrichments; the ceiling is deeply coffered, gold and colour being freely used in its embellishment.

Adjoining the restaurant is the entrance to the hotel, leading to the hall and principal staircase. The latter is 20 ft. wide, and a noticeable feature in its planning is the abundance of light which prevails.

The first floor contains the principal coffee-room, 63 ft. long, 36 ft. wide, and 25 ft. high, the walls of which are being covered with Mexican onyx marble; the ceiling is formed of carton pierre, the plain surfaces being enriched with colour. There will also be on this floor a ladies' coffee-room, reading-room, public billiard-room, to contain four tables, smoking-room, and several private sitting-rooms of varying dimensions.

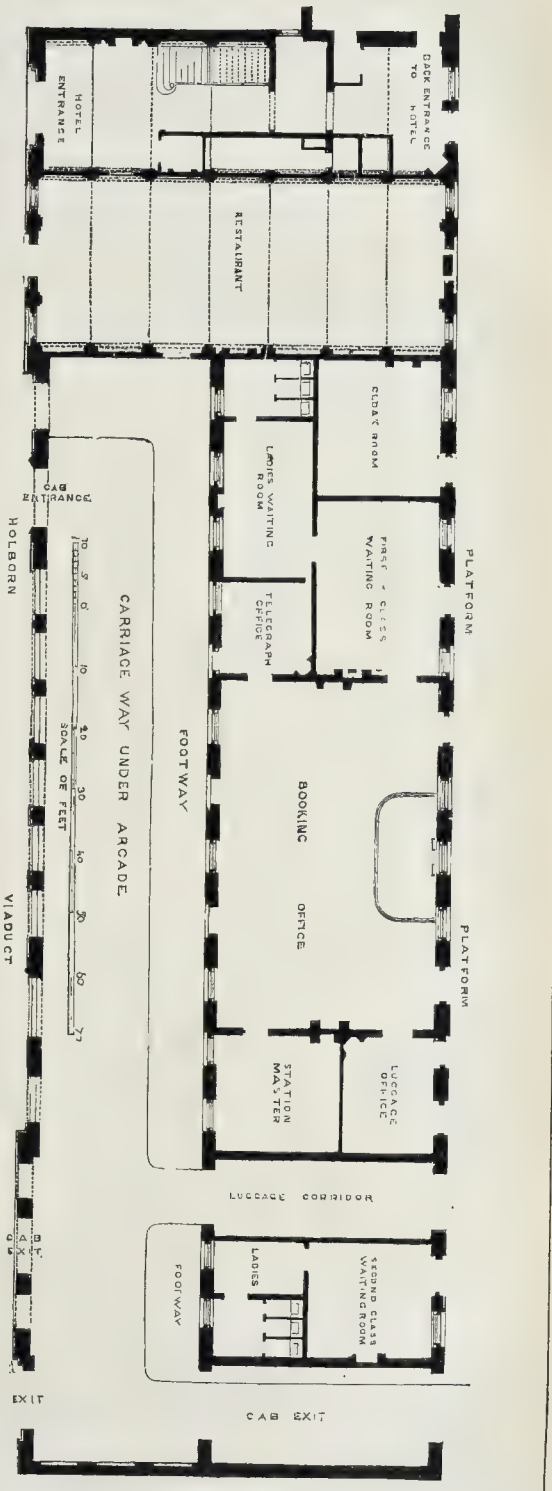
The four floors immediately above are intended for the accommodation of the patrons of the hotel, and are laid out as sitting and bed rooms. The sixth, or top floor, is devoted to the service of the hotel, the kitchen being placed at this level, thus ensuring immunity from the smells usually attendant upon culinary operations. Powerful lifts are provided for the conveyance of passengers and their luggage from the ground level to the upper stories of the building.

The façade next the Viaduct is entirely composed of Portland stone. It is Italian in character, with a good deal of French feeling exhibited in the fenestration, the dormers, the Mansard roofs, and the carved enrichments. Noticeable amongst the latter are the shields between the first and second floor windows; on these are cut the arms of the different cities and towns through which the railway passes; the effect of the carving is much enhanced by the ground being picked in with gold.

The hotel is to be opened for business at Christmas next, under the management of an experienced firm of railway refreshment contractors.

The works in connexion with the building have been executed by Mr. William Webster, from the designs and under the superintendence of Mr. Lewis H. Isaacs, architect. The whole of the carving on the front was executed by Mr. Thomas Bromfield.

The outlay involved is, in round figures, 120,000*l.*



HOLBORN VIADUCT STATION AND HOTEL.—*Plan of Ground Floor.*

Crosses in Churches.—The case of Masters *v.* The Rev. John Durst was before the Judicial Committee of the Privy Council on the 29th ult., on appeal from the Arches Court. It appeared that on the 27th of May, 1875, a movable wooden cross was placed, without the sanction of a faculty, on the re-table of the Communion table. Two days afterwards Mr. Masters, the parishioners' churchwarden, removed the cross out of the church without a faculty, and he is willing to give it to the vicar, but not to restore it to the place whence he took it. The present contention is whether the cross in the position mentioned is not forbidden by law. The argument on the legal point occupied the whole day.

ON GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

BY MR. J. CLARKE.

THE subject of building regulations is one of great importance to every architect, and when we think of the number of Acts in force, we are surprised how many of our brethren,—whose practice extends over a large area, in which there are many Acts and bye-laws in force,—get on under them, for they cannot remember the conditions imposed by all.

At present the following general Acts are in force:—Town Improvement Clauses Act, 1847; Public Health Act, 1848; Local Government Act, 1858; Sanitary Act, 1846; ditto Amendment Act, 1864; another Amendment, 1874; Public Health Act, 1875; Chimney Sweeps Act, 1875. And all the large towns (except Manchester) have special Acts. Many of the bye-laws are different one from another. How few there are who know the Sanitary Acts!

What I think would remedy these evils to a great extent is as follows: say, take the present Metropolitan Building Act as a basis, expunge the clauses found not to work, insert clauses as to strength of timber, iron, concrete, &c. as needed, and incorporate all the miscellaneous Acts connected with building in it; take evidence by a commission composed of Parliamentary and professional members as to what is wanted in the different places, and then frame an Act on their report.

I would suggest that the present system of building surveyor and districts be adopted as in the metropolis, except that in, say, three situations in England and Wales, two in Scotland and two in Ireland, there be head surveyors or referees, to whom all disputes as to the meaning of the Act and its carrying out should be referred, and who should see that it was properly carried out by the local surveyors; or another plan would be to divide the country into hundreds and appoint a referee to each. The referee should decide all cases of dispute between the surveyors and builders or proprietors; but should they not be satisfied with his decision, appeal might be made to the board in London (whom I shall presently bring before you) on payment of certain fees. The referees to be responsible to the board, and also to see that the Act was carried out. The board in London to have the entire control; to be composed of professional members with a Parliamentary head; they to have the power to make regulations for new materials, or new ways of using old ones, and in special cases to modify existing laws and to be answerable to Parliament for their acts. The referees and board to be paid by the State.

I would have all the surveyors practising architects; firstly, because they would imbibe the new ideas as they came out and not be obstructives; secondly, because one architect who was not a building surveyor would look pretty sharp after his more fortunate brother, who was, not as at present, when there is great neglect in looking after buildings. I came across a building a few months ago in which the beams were not according to the Act, and there were wooden blocks in half-a-dozen flues, and several other like matters; and about a fortnight ago a sewer which had no junction with the main, but both ends were left open, so that the sewerage might find its way into the building. One architect would inform another very often from friendship if he saw anything going wrong in his friend's district.

But some may say, how would you do for surveyors in very countryfied places? Well, I think some architects from a neighbouring town would very gladly take the post, and, if they would not, the overseer or some one who has duties in the place would, for the sake of the fees. The kingdom would have an efficient staff of surveyors, who would show neither fear nor favour, for they would not know when the referees might pop on them. The present Board surveyors do show favour and occasionally spite, for I could name houses that have not 50 superficial feet of yard space, much less the 100 ft. required to be left; also, where the bye-laws have not been enforced against members of the Board and have upon others.

No doubt a great deal may be said as to local customs, but the main principles of construction are the same everywhere, for a granite wall is put near the same thickness as sandstone, and bricks are all about one size. The cottage, which is of the minimum strength in the Highlands, is not too strong for London, and a General Building Act would not necessitate that everybody should build of the least strength allowed. There are no Building Acts in force in many country places where they are very much wanted, and where the bye-laws under the Local Government Act are in force they are to a great extent disregarded. If there were proper inspectors to go round the districts this would not be so likely to occur. You are, no doubt, aware that under many of the bye-laws all deficiencies must be found within three days: this would certainly require altering. It is an easy thing in a Jerry builder's eyes to say the work has been done four or five days or more, when it has only been done perhaps one. Another great advantage of a general Act would be that architects would know the regulations,—not be in a fog, as they sometimes are, and the general Act would carry more weight.

Let us take an instance of the difficulties experienced under the present system. A London architect receives a commission to design a building in Liverpool (he could not obtain a copy of the Building Act until last year because it was out of print); he makes his plans and perhaps finds great difficulty in getting at what the regulations are: say it is a shop, and he wishes some projection, and, looking over the Act, comes across the clause which allows shop-fronts to project 12 in. and the cornice 18 in., and sends the drawings down to be passed, and has them rejected, he cannot understand why, the explanation being that he has not complied with the Town Improvement Clauses Act. It is not an unusual thing for plans to be rejected when the authorities have no power to reject them. The best thing for an architect to do is to carefully read the whole of the Acts, and then go on building, for no plans are required to be passed for any building but houses. Nearly all the present Building Acts in the country want revising; the present generation have improved on the preceding one, and the next will improve on the work of the present. In Liverpool the following Local Acts are in force:—Building Act (1842), Fire Prevention Acts (1843 and 1844), which apply to warehouses only; Sanitary Act (1846), ditto, Amendment (1864), and Bye-laws under Local Government Act (1858). If we had one Act embracing the whole, and modernising them, it would be much better.

I will point out to you a few of the defects of the Building Act; but, first, we may say that the town council have ample power to appoint surveyors, but they do not exercise them sufficiently; there are two assistant building surveyors and two sub-assistants (the borough engineer is the building surveyor). There are at present about 6,000 buildings and alterations in progress, and 3,000 cases of dangerous structures; the Act provides that discrepancies must be noted within ten days. Too few surveyors to cope with so much work and find out the buildings being erected without notice, and to be called "Assistants." They are paid out of the borough fund. There are no fees.

Some of the defects in the working of the Act are as follow:—

There is no obligation to submit plans of buildings, and, as the Sanitary Act only deals with houses, this difficulty often arises. It allows no buildings to be erected except they are of stone or brick, hence the ordinary circus buildings, &c., are contrary to the Act. Thickness of walls depend not on the length and height of the wall itself, but on the length and height of the front wall; so the staircase, or party wall of a house may be put one brick thick and yet have no internal support for, say 60 ft., if the front wall does not exceed 36 ft. in height, or 39 ft. in front, and I have heard of a stable being put up with 9 in. walls because what was called the front did not exceed 15 ft., and the side walls were above 100 ft. in length,—one adjoined a common passage. There is not the slightest provision as to internal walls, they are put 4½ in. thick, and sometimes still less, except in the best houses. There is no obligation to build party walls up to the slates, and the jerries do not always do so. The surveyors do their best to get them carried up. There is no definition of a party wall. There are no regulations as to the material on which houses are built. A great many houses have been built on land filled up with ashpit refuse, and the foundations have given way and cracked the walls very much. There are no regulations as to ironwork. No special sizes of timber for warehouse floors. No obligation to lay bearing timbers on edge, so a floor for a 16-ft. room may be 8-in. and 2½-in. planks laid flat,—a queer floor. Fence walls and buildings wholly underground are excluded. The strengths given for wooden beams is too small in many cases for warehouses. Nothing about roof principals.

You will see that the foregoing very much increase the duties of the already very much overworked surveyors, and seriously mar the efficiency of the Act.

The Fire Prevention Act does not apply to dwellings or public buildings. When a new Act is formed it would be needful to include provision as to the safety from fire for dwellings, and especially for places of public resort.

It is a matter of question whether all plans should be submitted and passed, and I am inclined to think it unnecessary, as the disadvantage of having the surveyors to look over the drawings and say whether they are correct is great, for some matters might escape attention, and then the builders would say when the discrepancies were found out, "Oh! but you have passed the plans and this was on them," and it would tie the hands of the surveyors to a great extent. Also they would not be so inclined to look sharp after the building when they saw that the plans were according to the Act. The Liverpool Jerries are aware of this, and carry it to perfection, for they send in different plans to those they intend to build from.

One of the greatest difficulties is the finding out of alterations and new buildings. I think if the builders were prosecuted a little more it would act as a deterrent to this sort of thing.

I have thus endeavoured to bring before you the necessity of a General Building Act, and some of the disadvantages we in Liverpool observe arising out of the present system.

REGISTRATION AND CLASSIFICATION OF HOUSES.

BY MR. JAMES SELLARS, JUN.

THE subject which forms the title of this short paper is one to which the Society I have the honour to represent has recently been giving some attention. Being a subject which had at least the merit of novelty, and believing it would be found not unworthy of your consideration, we suggested it as a suitable one for discussion in response to the invitation of the hon. secretaries of the Conference. I am not the author of the scheme. I have simply undertaken to bring the subject before this meeting, and I shall do so as concisely as I can.

Mr. John Cowan, of Glasgow, was the first to suggest the idea at least in Scotland. His paper on the subject which was read before our Society has been reported in some of the professional papers, but I trust you will bear with me in repeating,—as I must necessarily do,—the gist of his paper, so far as it dealt with the details of the scheme. The publication of the paper will have, I hope, directed the attention of many gentlemen present to the subject, and my bringing it before this Conference will give an opportunity for its being discussed and having its merits and demerits brought to light in a way which no merely local discussion could do, and perhaps initiate some general movement for giving it practical effect should it bear the test of criticism, and meet with any measure of approval from the collective wisdom and experience of such an assembly as this.

What, then, is this new scheme which, as a practical idea, has just been launched by one of our Glasgow builders? For what reasons is the adoption of such a scheme either necessary or desirable? And in what way does it interest us as architects?

I shall apply myself to answer these three questions as fully as the limited time at my disposal will admit of.

First, then, it is a proposal to apply to house property a system analogous to that of "Lloyd's Register," as applied to shipping.

The machinery necessary for the scheme would be (1) a committee or board, consisting of say representatives from the architectural and legal professions, the mercantile community, and the building trades; and (2) a staff of thoroughly trained inspectors or surveyors. For the guidance of these officials a standard specification or specifications and set of instructions would be prepared which might be so general in their terms as to apply over all the United Kingdom. To these could be added such clauses as would be necessary to meet the different modes of construction, peculiar to certain localities.

Buildings which were to be registered would require to conform to this specification, not, perhaps, to the very letter,—because it would be impossible to do so in many cases,—but to the

spirit; that is, they would have to be constructed in a way which would come up to the maximum of excellence required by the standard specification.

It would be the duty of the surveyors to visit the building from time to time during its progress, and in accordance with their report at completion the committee would register it in Class A, B, or C, as the case might be.

The register would contain such information as the following:—Situation and kind of building; date of erection, name of architect and builder; character of foundations; system of drainage; thickness of walls; scantlings of wood and iron joists and beams; details of plumber work, gas-pipes, and bell-hanging; kind of fire-proofing, if any,—in short, a complete record of the kind and quality of all materials, and the mode of construction employed in a particular building, dealing specially with such details of construction as are hidden by the very completion of the building.

The register would be available for reference to all who paid the fee which would be charged. Fees would also be charged for each registration, and the fees derived from these two sources would form the fund from which the secretary of the committee and the surveyors would be paid. These surveyors should be a superior class of men, and be required to pass an examination either by the local Institute or the Royal Institute. The salaries of these officials ought to be liberal, and they should be strictly prohibited from doing any other kind of work.

It is not, of course, meant that the registration would be compulsory, but its advocates are sanguine enough to hope that the benefits would be such as would induce those interested in house property to conform to the standard specifications and seek for registration.

It is thought that three such committees and staffs of surveyors would be sufficient for the work in Scotland,—say, one at Aberdeen, one at Edinburgh, and one at Glasgow. These officials would overtake the work of the smaller towns in the district of which their head-quarters were the centre. The same system, with, of course, a proportionately larger number of centres, might be applied to England.

Such, then, is a brief outline of the scheme as set forth in Mr. Cowan's paper, and which we in Glasgow have been discussing.

Crude and unworkable it may be in its present form, but if the idea is one worth pursuing, a proper and efficient system for carrying it out would no doubt be devised.

I will now deal with the second question, viz., "For what reasons is the adoption of such a scheme either necessary or desirable"; and I think I shall be able in a sentence or two to show that it is both.

I shall be within the mark when I say that nine-tenths of all the domestic and commercial buildings in Glasgow and other large centres of industry in Scotland are built by the investment of the capital of those who personally know nothing of them as examples of construction, but look upon them simply as a safe investment for their capital. The value of such property, in Glasgow alone, must be reckoned by millions of pounds sterling.

In most large towns a considerable proportion of such property is erected without the plans or superintendence of the trained architect. In Glasgow, buildings innocent of an architect might be numbered by the street, and it is all but certain that they are of a kind which would not be classed A1 on the proposed register. These houses are, as a rule, built to sell, and at present they do sell, in most cases, at as high a price as the well planned and constructed building. There is thus no encouragement for the conscientious builder to get his house well planned and constructed. Under this system it would become the interest of the builder to do so, otherwise he would find no market for his wares, as the purchaser would certainly be guided by the register in making his investment.

If, then, it is admitted that "jerry" building exists to a large extent, and, I think the fact will hardly be denied,—and that this system of registration would help to stamp it out, encourage good planning, and tend to raise the standard of excellence in construction, I submit that the necessity and desirability of such a system must follow.

Now, as to the third part of my subject,—in what way does it interest us as architects? This is a question which such a meeting as this is fairly entitled to ask, and I hope I shall be able to answer it in a satisfactory way, otherwise I fear I shall have committed a grave error in presuming to occupy your valuable time.

If it is assumed that the result of the scheme would necessarily be an improved class of building, surely it is a system in which we whom the public hold responsible for healthy and safe houses to live in, and premises in which to carry on their business, must take the deepest interest; and if it is a scheme which it is desirable to carry out, our profession is bound to take an interest in it, and assist in putting it in working order, as it would be impossible to arrange its details without our co-operation.

But, it may be asked, are we not, by setting up a standard specification, and detailing the best mode of construction, simply helping every man to become his own architect? To such a question I would answer, No. For, although we say that walls of such and such a height are to be of a certain thickness, that joists over a given span are to be of certain scantling, and otherwise detail the various particulars of construction, it is only the trained architect who can bring the parts together and construct with economy and skill.

This is a fact which the capitalist will very soon recognise, and he will see it to be to his advantage to employ the qualified practitioner, so as to insure his building being constructed with economy, and in such a way as would entitle it to be registered in the first class.

May I therefore assume that the tendency would be in the direction of employing the trained architect to the exclusion of the poachers on our preserves, who have too frequently large commissions entrusted to their unskilful hands?

I think I have said enough to show that on public grounds, and even on professional grounds, the scheme is deserving of our support.

Before concluding there are one or two other points I should like to refer to. There is no doubt that such a scheme would be an immense boon to the legal profession and other bodies having money to invest in public buildings, and as they are the "public" from which many of our clients come, they are entitled to our best consideration. This register would afford them a reliable means of getting at the character of the property to be invested in. But would not this affect the vested interests of the licensed valuator? Would he not, like Othello, find his "occupation gone"? On the contrary, he too would have something reliable to work from, and his skill would be reserved for the consideration of the locality of the building, its depreciation from age, the value of the ground, and the many local circumstances which affect the value of property.

Another point which is of some importance may be mentioned. Suppose the case of the purchaser of the "jerry" house finding, after he has entered into possession, that he has no privacy in his rooms, as sounds can be heard all over the house; that the drains get choked, as they lead to nowhere in particular; that the plumber work is all wrong, or that doors will not shut, as the house has sunk half a foot on one side. Such cases are by no means uncommon, and they tend to lower the character of our profession in public opinion, as the blame is generally laid at our door by the sufferers who are probably unaware of the fact that their houses are blameless of an architect. Again, it may be asked, Do not the building Acts secure all that this scheme is expected to accomplish? The answer must be, Certainly not. At least they have not done so hitherto. It is true the Building Act requires that walls of a particular height, shall be of a certain thickness, and that joists of given span shall be of specified strength; but it does not demand that the wall shall be a well-built wall, or that the timbers shall be of first-class quality. The Building Act may be satisfied with a minimum of excellence, but this system demands the maximum of excellence.

Had time permitted, I might go on multiplying arguments in support of the idea, but if I have said enough to explain the intention of the proposal, and put you in possession of material for discussion, my mission is accomplished.

I may say, in conclusion, the idea has been warmly received by our Society, and by several of the legal profession in Glasgow to whom it has been explained.

A committee,—composed of represesentatives of the various bodies whom it is thought might be represented in the permanent Board,—has been appointed to consider details and devise some means of giving practical effect to the scheme.

This is only a local movement; however, should it appear to this meeting, composed of representatives from all parts of the country, to be desirable and practicable, such a movement would be much more likely to have a successful issue if it were taken up by the whole of the profession under the auspices of the Royal Institute.

That the scheme is practicable with houses will, I am sanguine enough to hope, be admitted. The scheme on which it is founded has worked well in the case of ships, where the result has been to raise the standard of excellence of both design and construction.

Is it too much to hope for a like result from the "Registration and Classification of Houses"?

ANOTHER LOOK AT THE CENTENNIAL.

DURING my stay in Philadelphia I have not confined myself to the Exhibition, but I have devoted some time to the city and the suburbs. I have made excursions on the Schuylkill, and wandered up the Wissahickon, whose sylvan beauties will doubtless be illustrated by some of your contemporaries. I visited the great cemetery at Laurel Hill,—a lovely spot to "rest from labours," but where the "owners of lots" seemed, in their very pretentious monuments, more inclined to display their wealth than evince their grief. One lot was adorned with a figure in bronze, life-size. I thought it must be a monument erected to the honoured memory of some deceased President; but no, it was only to mark the resting-place of some private individual with a very common name. I also went to Girard College, a foundation for orphans. The founder, by his will, ordered "that no ecclesiastic, missionary, or minister of any sect whatsoever, shall ever hold or exercise any station or duty whatever in the said college; nor shall any such person be admitted for any purpose or as a visitor." By the same will he directed that the building should be raised on a certain place, and of such dimensions as he therein named. Whatever may be the opinions formed about the former directions, there is no doubt he had a practical knowledge of architecture, or he was well advised. The college is exactly according to his wish, and I am assured that the boys who have been educated at the Institution have turned out well, and many by their works have made themselves famous among their fellow-citizens. The education is of a practical character, as can be judged from the copy slips that are shown in the Pennsylvania Educational Department, a building in the Exhibition grounds to show the statistics, the productions of the pupils in the various schools in the State of Pennsylvania. Among moral reflections and sentiments, such as the youth of the old country have to copy, are "Keep strict accounts, and balance them often." Having entered into partnership, "Great exertions are necessary to effect sales," &c.

I went to the State Penitentiary, which was one of the first prisons that adopted, amidst a torrent of opposition, the "separate system"; but, alas! the prison is now too small, and they are obliged to put two into one cell very frequently. I asked why this was, and the reply was that the State Legislature would not grant supplies either to build a new prison, or to enlarge the old one. Our "great unpaid" in England, whom Mr. Briefless, of three years' standing, is trying so hard to supersede, would not allow this scandal. I was introduced in one of the cells to a man of whom Dickens wrote in his "American Notes" in 1842,—"In another cell there was a German. . . . . I never saw such a picture of forlorn affliction and distress of mind. . . . . a more dejected, heart-broken, wretched creature it would be difficult to imagine. My heart bled for him, and when the tears ran down his cheeks the spectacle was really too painful to witness. I never saw or heard of any kind of misery that impressed me more than the wretchedness of this man." The report on the prison, by Richard Vaux, in 1872, has this passage:—"This German prisoner, this 'picture of forlorn affliction and distress of mind,' was sentenced to this Penitentiary for the first time, May 15th, 1840, for five years; on June 28th, 1852, he was sent to this Penitentiary for one year; February 24th, 1855, he was a third time convicted and sent to this prison for two years; April 4th, 1861, he came again, for one year; on March 12th, 1872, he returned, for two years. Thus this picture of forlorn affliction and distress of mind is now a living, hale, hearty man of seventy-two years of age, having served out nine years of imprisonment, with all its horrors and cruelty, 'such as no man has a right

to inflict on his fellow-man.'" This was written in 1872, since which time he has "got into trouble" again. I asked him how long he had been in prison altogether, and he said "twelve years, and he had two more to serve." Among other questions I put was, "Do you remember the visit of Dickens, some years ago?" He answered, "Oh, yes!" but no tears ran down his cheeks, which I considered gross ingratitude towards such an advocate. I hope the member for Leicester will not meet with so bad a return for the sympathy he manifests towards garotters and other respectable criminals.

Street architecture here is of a uniform cut and style, like the garbs of the sect who give the *sobriquet* to the city. Churches have increased, and the *quasi*-Gothic style has been adopted by various sects. There is a light-green stone found in this State, which they call serpentine. They use it, however, dressed with white and brown stone dressings, which has a very good effect, especially with the latter-named colour. To this are added shafts of Aberdeen granite, polished, which harmonise very well.

Now back to the Exhibition. Since the opening great efforts have been made towards completion, but still it is most incomplete. The French have opened the greater part of their 400 tons which they imported, and these wares give a gaiety to the main building which it lacked when there was nothing in their places but cases with the glasses smeared with whitewash.

Walking over the American Department, I came upon some old books and newspapers exhibited by Messrs. Sower & Potts. I came upon the *Examiner*, a journal published in 1799 by the predecessor of that firm. It says:—"Norristown, Friday, December the 20th.—We have the painful task to announce to our readers that the *Father*, the *Deliverer* of our country, George Washington, is no more. Panegyric and eulogy cease to be eloquent,—the inexpressible sensations of the heart of a true American can alone do the melancholy event justice. This mournful scene took place on the 14th inst., at eleven o'clock in the evening. It was occasioned by an inflammatory affection of the throat, which did not last twenty-four hours." I could not help comparing in my own mind this modest statement with the bombastic "caps" and "displays" that would be made on such an occasion by a modern American journal. Poor George Washington! If his spirit is conscious of what is occurring here, how it must be disturbed to see in what frightful effigies and limning he is depicted, the most terrible of all being the gigantic statue in the Memorial Hall, by Guarnerio Pietro, the father of the country being "ride-a-cock-horse" on the American eagle.

The Japanese collection has by far the greatest novelties, for the reason that the natives of that country were not exhibitors, or I think very slightly, before the Vienna Show.

I hope that those pictures that the French have opened are not the best they intend to exhibit; and I am disappointed with the display of Belgian pictures: they will not compare with what they showed in Paris in 1867, nor with those that were visible at South Kensington during the recent annual exhibition. The sculptures of Italy seem to me for the most part very commonplace,—little boys taking off or putting on their shirts; little girls lifting their dresses, in consequence of being frightened by lizards or other reptiles. But, perhaps, the Italians know their market. I have watched very closely, and I have found that among the majority the art that attracts the most attention is that which figures the people of other nations. A Laplander in his sledge, with white cotton for snow; a Swedish couple in their wedding attire; a Norway clockmaker; a Swedish group, with the mother holding up a baby; and others of like character, give the utmost satisfaction. But between the American and the French Fine Arts Department is a case that does excite wondering admiration. It is "Cleopatra with her Family," from Greutzberg's Great Museum, Chestnut-street. Cleopatra is a semi-nude figure, with that idiotic expression which is always given by a moving wax-figure. Her breast heaves with her breathing, and a little bird on her hand flaps its wings. Shade of Madame Tussaud! did you ever aspire to the Royal Academy? I turn from this to a more modest and interesting evidence of civilisation, the collection sent by Queen Emma from Hawaii. Natural productions, inlaid wood, hats made from the arrowroot plant, and other objects,—evincing a strong desire in the youngest country not to be left behind in the world's progress.

There appears but very little English machinery; indeed, the space applied for is far from filled. The American machinery is most interesting, from its ingenuity.

The display of china, glass, and porcelain is very brilliant. The British are represented very slightly in the jewelry department; but it is made up in many other products which are novel in these parts. The Americans rejoice; but, at present, not in large numbers. The majority have never seen anything like it before, and therefore wonder. But amidst the applause of all the beauties, there comes the thought—"The paths of glory lead but to the grave." In the American department there is what I have never seen, certainly never noticed,—a collection of monuments and tombstones. While looking at this with astonishment, an attendant rushed from behind, and said: "You may take that card. I am here to advertise my business, and I guess every one is here doing the same. I have brought eleven large monuments, just to show the world what monuments are, and if our firm do not know what monuments are, nobody does. Are you a resident here?" "No; I'm from England." "Well, there is some of your stone, which we use a good deal of." "Yes—Aberdeen granite." "Do you come from Aberdeen?" "No; but I know the stone. How much," I added, "would a monument such as this cost?" "Well, that is one ordered by the son of General Blank, who fell in the war. The cost of that is 8,500 dollars, but I could give you as nice a monument as any man could wish for 10,000 dollars."

Those who have seen American ladies on the Continent would be surprised at the plain, even dowdy, dresses of those who visit the Centennial; but perhaps the beauty and fashion of New York have not yet made their pilgrimages to the shrine of industry and art.

On the Queen's birthday a scratch dinner was hastily got up by some of the exhibitors, and there could not have been a greater success. The speeches would have done honour to any assembly. The representatives of our colonies were most eloquent. It is no wonder that they are successful when such loyalty, good sense, and noble sentiments, are the attributes of those selected as their representatives. The speeches of Mr. Mackay, from Queensland, and Mr. Davenport, from South Australia, deserved something more than the brief notice which was the result of the copious notes taken by the reporters.

I have heard great objection raised to the term "Siegarland," which Germany applies to herself in displaying her mineral products.

Outside the building the amount of enterprise shown is marvellous. There is the Grand Exposition Hotel containing 1,325 rooms; the Globe, containing upwards of 1,100 rooms; the Transcontinental, with over 600 rooms. There is, at least, a mile of restaurants, drinking-bars, and cigar-stalls, all of which have been built up, and are to be "torn down" when the Exhibition has closed. The proprietors must have had a strong faith in the financial success of the undertaking. Will the moral success be great? That the Americans must be astonished at many things there is no doubt; but will the effect of these world-fair teachings be as great as elsewhere? I doubt it. They are a "*wegotistical*" people, and have an ingrained conceit arising from the absence of that moral courage which is the result of strong individual conviction. The majority absorb all opposing sentiment, and a man must glorify "our country" because he has been taught and encouraged to believe that no other country is its equal. Never having been able to compare, they have only one standard. These remarks do not apply to those Americans who have travelled; but they are an infinitesimal number compared to the masses who rule.

Æsthetics will have a hard struggle against the "dollar standard," the only one that is of universal application. This occurred in Waterer's rhododendron tent:—"Well, I guess these are 'elegant.' Where did they come from?" The attendant replied, "From England." Questioner, with much disappointment that they were not American, but with as much conceit as if the whole three millions of square miles of territory belonged to him,—"Why don't they grow in 'our country'?" "They do grow wild, and in this neighbourhood." "Then why don't 'we' show them as fine as these?" "Because you have no gardens." Here a lady struggled to the front, and said, "Will you tell me which are the finest?" "That depends upon your taste." "But, I mean which are the best." The attendant here saw she meant "dollar standard," and handed her a catalogue, the prices marked on which might aid her in the formation of her opinion.

The papers show how influential this standard is. One of them spoke with satisfaction of the progress the American department was making towards completion, and added that Messrs. So-and-So's case, which was empty last week, has now been filled with jewelry,—not copying or rivalling Cellini,—worth $500,000. A visitor has only to listen at any point where art is displayed to find this standard applied. The crowds that still collect before Frith's picture of the marriage of the Prince of Wales, would be diminished, or a like crowd would collect before any other picture, it does not matter which, if an announcement were made that the latter had been bought by one of "our" prominent citizens for, say, $50,000.

In speaking of these peculiarities, one is always met by the response: "Ah, we are a young country." This I have combated by telling many Americans that the plea is a weak one. They have existed for one hundred years, during which time Europe and the rest of the world have made more scientific and moral progress than for very many centuries before. The Americans have had the advantage of this. They did not spring out of the earth, void and without form, in 1776. They branched off from the civilisation that we then possessed. They inherited our experience and our traditions. They have had the benefit of our mechanical inventions oftentimes without acknowledgment or reward to the inventors. They have taken the offsprings of our authors' brains without pay. They have seen with what pains and with what satisfactory results we have amended our laws that were defective. "Conceit" has not stopped us in our onward progress, and corruption has been rooted out where it prevailed in any political institution. The founders of the American Constitution were of a different stamp from those who operate now. Washington was a gentleman, and had he been compelled to ride in a street-car the Constitution might have been less democratic. Are not the "deficiencies" that the President so slightly alluded to caused by a want of reform in the Constitution, and not by the inexperience and follies of youth?

Philadelphia. F. S. A.

THE PRINCIPLES AND APPLICATION OF THE THEORY OF THE TRUSS.*

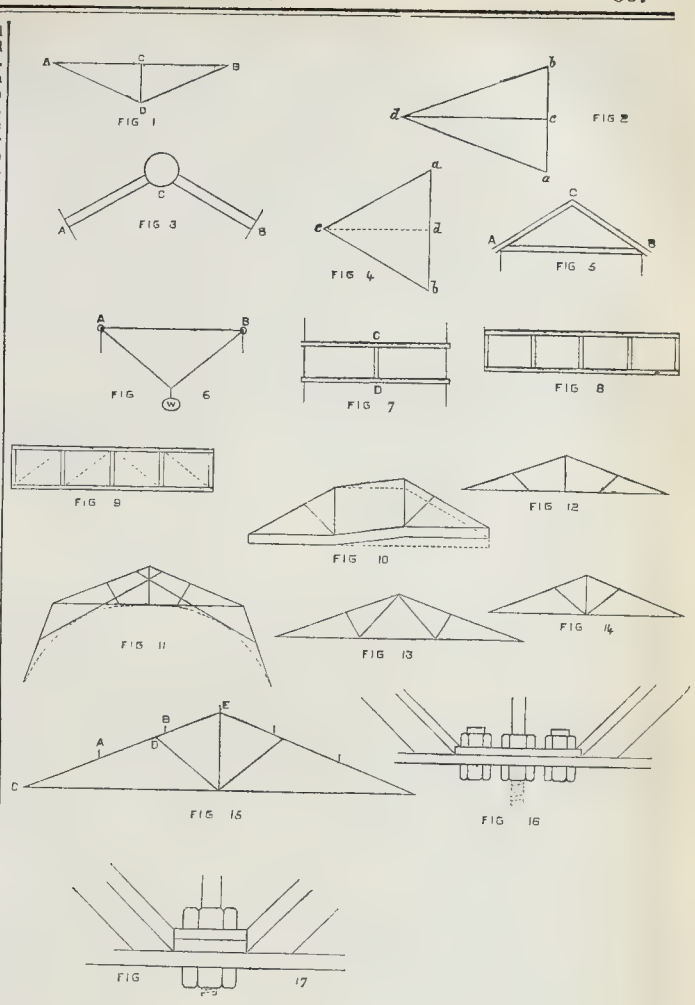
I VERILY believe that no one save the special correspondent of a daily paper would try to be eloquent on such a subject as trussing. An American writer has assured us that Shakspeare would never have attained to fame as a special correspondent of the *New York Herald*, because "he lacked the requisite fancy and imagination." Now, such a highly-gifted "special" as this remark suggests might probably see wonderful possibilities in my subject, but from the point of view of ordinary mortals, a truss is not a subject on which one can well wax eloquent. There is nothing supernatural about it, nor is it one of those things in general on which an eloquent lecturer might hope to awaken enthusiasm. Nevertheless, the subject of trussing is one of considerable interest, and at the present time is of increasing importance. It is a subject tolerably complete in itself, and one which, so far as I know, has not yet been fairly treated as an independent or distinct field of inquiry, so that, while much detached information is to be found in professional journals and in handbooks of construction, those general principles which govern all trussing, and which might fairly constitute it a complete branch of constructive science, have not, so far as I know, been brought together and presented to the student in their mutual relations as parts of a consistent theory of trussing. The student has, in short, rather been introduced to a collection of examples than to a set of principles. Now, of course it is impossible, in a half-hour's paper, to attempt anything like a complete or exhaustive treatment of the subject; I must, therefore, limit myself to the more elementary part of the subject,—to what I consider the fundamental principles of trussing, and a few of their simpler applications. I believe that no part of practical science is so much neglected in our professional education as

* From a paper read by Mr. W. W. Robertson before the Architectural Association, on the 2nd inst.

first principles; that there is no more fruitful cause of errors and mishaps and misapplied ingenuity than this neglect of general principles; and that nothing is more difficult than for those who are once fairly engaged with the details of a subject to turn back to its elements.

The general problem of building construction is, given certain external forces (pressure or loads), to transmit them safely to the ultimate support (the foundation). When we introduce the further condition that these pressures shall be transmitted to the ultimate support with the least expenditure of material which will ensure strength and, where that is necessary, *rigidity* in the structure employed, we enter the domain of scientific construction, wherein the perfect adaptation of the means to the end is aimed at, or, in other words, the application of that grand principle of economy which so conspicuously characterises all the works of nature. Now, if a load is to be carried between two vertical supports, there are three simple ways of doing it. Firstly, it may be supported by two inclined struts; secondly, it may be suspended by a chain; thirdly, it may be supported on a horizontal beam. These are the three great types of construction,—(1) the arch, (2) the chain, and (3) the lintel. Each possesses advantages and disadvantages. Comparing, first, the effects on the supports, we see that the lintel exerts only a vertical pressure, while the arch and chain exert oblique forces, requiring the expenditure of additional material to impart lateral stability to these vertical supports. Here, then, the advantage on the score of economy is with the lintel. Turning now to the bridging part of the structure, in the arch and chain the load produces only simple longitudinal stresses, viz., compression in the arch and tension in the chain, and this, as we shall presently see, is an economical application of material. But in the lintel the load acts transversely to the piece, and produces compound stresses which we need not stay here to analyse: it is sufficient to say that these forces exercise what is called a "bending movement" on the beam, and this, we shall see, is not by comparison an economical use of material.

Of course, an obvious point to be attended to in scientific—*i.e.*, economical—construction is so to use the materials, whatever they may be, as to subject them to those stresses only which they are best fitted to resist. Now, everybody knows that, whether the object to be attained is strength or rigidity, or both, the least economical mode of applying any material (even one of those which possess the greatest transverse strength)—the way in which the smallest possible resistance is obtained—is to subject the material to a transverse load; but few, perhaps, would realise this to its full extent without actual calculation. Let us take a case. There are only two classes of materials which possess considerable transverse strength, timber and metals. Take for an illustration a balk of yellow fir timber 10 in. square and 12 ft. long. If this balk be used as a strut or piller, and subjected to a load of 40 tons, it will then only be loaded to about one-sixth of its breaking load, and will shorten under the load about one-twelfth of an inch. If the same balk be used as a tie, and subjected to the same load, it will then only be loaded to about one-fourteenth of its breaking load, and will lengthen under the load about one-twelfth of an inch. If, however, it be used as a beam to carry a load placed upon its centre, its breaking load is only 17 or 18 tons, and its deflection under (say) eight tons will be at least 1 in. This, then, which is not by any means an unfavourable example, shows how very materially less both the strength and the stiffness of a piece are under a transverse load than under a load acting lengthwise on the piece; and this is the point in which the lintel fails to realise the ideal of economical construction. Here, then, we have ascertained, from our comparison of these different constructive types, that the use of the arch or chain is favourable to economy in what we have called the bridging parts of the structure, but unfavourable to economy in the piers; while the use of the lintel is favourable to economy in the piers, but unfavourable to economy in the bridging parts of the structure,—*i.e.*, in the lintel itself; and we have further seen that the unfavourable element in each case is the application of a force which does not coincide with the lines of the structure, but is perpendicular or oblique to them, viz., an oblique pressure on the support, or a transverse load upon the beam. Now, the object of trussing is to get rid of both these unfavourable elements: Firstly, to get rid of transverse loads, to transform the bending action which the load or loads would exert on a beam into simple longitudinal forces in the several pieces of the truss, these pieces thus becoming either struts or ties; and, secondly, to transmit the pressures vertically to the supports. There are other qualities in a theoretically perfect truss which we may come to shortly; but, in the meantime, we note these two points in a perfect truss: that the load produces no transverse strain in any part, and that the pressure on the supports is vertical. By way of illustrating these qualities, I now ask your attention to the simplest possible cases of trussing. The truss is, perhaps, most naturally considered as a development of the beam or lintel; but it can be approached from other types of construction, and we shall therefore now proceed to truss the three typical examples we have already considered. Taking the beam first, what we want to do is to eliminate the transverse strains. With this object we introduce the vertical, C D (fig. 1), under the point at which the load is applied, and connect the foot of this piece with the ends of the beam by the inclined pieces, A D and D B. We have, by the addition of these pieces, transformed the beam into a truss. The load now produces no transverse strains. The truss consists of the strut C D in simple compression, the tie-rods A D and D B in simple tension, and the beam A B in simple compression; and we may ascertain the magnitude of these forces by constructing the stress-diagram shown in fig. 2, making $a\ b$ vertical and equal to the load, and making $c\ d$ parallel to A D, $d\ b$ parallel to D B, and $d\ c$ parallel to A B. Then the compressive force on C D = $a\ b$ = the load; the tensile force on A D and D B = that on $a\ d$ and $d\ c$ respectively; and the compressive force on A B = $d\ c$. The pressures on the supports at A and B remain vertical, of course, as before, and are equal to $a\ c$ and $b\ c$ respectively. We now proceed to the case of the two inclined struts (fig. 3). In such an arrangement the forces produced by the load are represented by the triangle $a\ b\ c$ (fig. 4), $a\ b$ being drawn vertical and made equal to the load, while $a\ c$, drawn parallel to A C, is = the compressive force in A C; and $b\ c$ drawn parallel to B C is = the compressive force in B C; while these same lines $a\ c$ and $b\ c$ represent also the oblique pressures against the supports at A and B. What we want to do is to change these oblique pressures into vertical pressures. Of course, in order to do this, all that is necessary is to introduce a tie from A to B (fig. 5), which shall take the lateral thrust of the struts, leaving only the vertical pressure to be borne by the supports. The effect of this is represented in the stress-diagram by the addition of the line $c\ d$ parallel to the tie, which line is then = the tensile force in the tie A B, while the vertical pressures on the supports A and B are represented by the lines $a\ d$ and $d\ b$ respectively; and this diagram shows very clearly how, by the introduction of the tie, the oblique pressure on the abutment ($a\ c$) is resolved into its vertical and horizontal components, the horizontal component being taken by the tie-beam and the vertical component only being transmitted to the support. It is not necessary to consider in detail the case of the chain, as it is so clearly the converse case to that we have just considered, with tensile forces in the parts instead of compressive; and, to



transform the oblique pressures on the abutments into vertical pressures, we have, as before, simply to introduce the horizontal piece A B (fig. 6), which will, in this case, be in compression, the amount of the compression being found by constructing a stress diagram similar to that we have just been considering.

If these illustrations have been as clear as I have desired them to be, they will have made sufficiently obvious what I conceive to be the two great principles of trussing; that it excludes all transverse strains, and that it transmits only vertical pressures to the supports. Principles generally seem very simple things. Unlike those profound questions which puzzled Lord Dundreary, any fellow can understand them, and as it is so natural to suppose that what is simple is also trivial, I fear that those principles on which I have dwelt may seem to some of you of very little real value. Let us see, however, how they affect the practice of trussing. In the first place, to exclude transverse strains it is necessary to use inclined braces. In each of the three simple examples which we have taken you will see that inclined pieces are present, and if the strut C D (fig. 1) placed underneath the beam had been made to rest on a second horizontal beam, as in fig. 7, instead of on the inclined braces, the transverse strains would not have been got rid of, but simply transferred in part to the second beam. Such an arrangement as shown in fig. 8 does not eliminate transverse strains; it is not a true truss, but a pseudo-truss. Introduce diagonal braces, as shown by the dotted lines in fig. 9, and, if the pieces are properly connected, the whole system is changed; we have now a true truss, in which each piece is either in compression or in tension, none being under a transverse strain. Not only, however, is it necessary to use inclined braces; it is necessary, to insure rigidity, that these braces should divide the truss into triangles. This rule is universal, and its reason is worth a minute's consideration. The joints in trussing seldom or never possess such rigidity as to oppose any effectual resistance to the angular deviation of any piece from its normal position. In many cases (such as in wrought-iron trusses) they are merely hinged by a pin being passed through them, so that if one end of a piece were free to alter its position, the other joint would offer in many cases no resistance, and in *any* case *no considerable* resistance, to an angular motion of the piece. Now in a frame of pieces thus connected a square or polygon would possess no angular stability of itself; it could only be stable if it were so surrounded by triangles as to have the angular position of a certain number of its sides fixed by forming parts of those triangles. It might be in equilibrium under a particular arrangement of load, but it would be what is known as unstable equilibrium, –an equilibrium which would be upset by any variation, accidental or otherwise, in the distribution of the load. The triangle alone is the figure which possesses in itself such perfect rigidity that, even with hinged joints, the figure can only be altered by means of lengthening or shortening one or more of the sides. This is the reason why the true truss possesses a rigidity which is entirely lacking in the pseudo-truss. The pseudo-truss consists of the repetition of a four-sided figure which possesses no rigidity of itself, and the sole elements of stiffness are the transverse strength of the two beams, and whatever resistance to angular deviation there may be in the joints of the frame. The true truss consists of a repetition of the triangle, and depends for rigidity not on any stiffness in the joints or transverse strength in the beams, but on the resistance of the parts to direct lengthening and shortening. There are occasional apparent exceptions to this rule that the bracing must divide a truss into triangles, but they are only apparent. For example, in the ordinary queen-post truss, the space between the queen-posts is very often a rectangle, and unbraced; but here there are two or three things to be noticed. Firstly, so long as the load on the two sides of the truss is symmetrical, the truss is in equilibrium, and there is no tendency to alteration in the form of the rectangle. Secondly, the variation of load which might occur, tending to cause alteration, is usually very slight. Thirdly, the tie-beam is usually continuous, and of such size that it would oppose considerable resistance to distortion into such a form as shown in fig. 10, which is the form it would necessarily take if the triangles remained rigid, and the rectangle altered in form. This analysis, however, enables us to see that it is really the transverse strength of the tie-beam that imparts rigidity to a truss of this form under a variation of load, and that we can only rely upon it where the possible variation of load is small, and where the transverse strength of the tie-beam is considerable. The rectangle must be braced, *i.e.*, divided into triangles, in either of the following cases:—(1) If there is any considerable inequality in the distribution of the load, or if there is the possibility of any material variation in it, such as where a heavy load (say portions of machinery) or of a floor are borne by the beam adjoining one queen-post and not the other, or where a rolling load has to be borne, as in a bridge truss; (2) Where the tie-beam is discontinuous, or of small dimensions, and therefore of small transverse strength, as in a wrought-iron roof. No one, it is to be hoped, would dream of constructing a wrought-iron truss of this form without bracing the central rectangle; but we occasionally see things quite as defective. In fig. 11, for instance, is a truss which I believe has been executed; it has at least been put forward as a model for execution. It is designed to obtain a curved ceiling in connexion with a Mansard roof, and, at a casual glance, might seem a fairly passable example of a roof-truss. A little examination, however, shows it to be radically and entirely wrong. It would hardly be too much to say that it is faulty in every line. Every piece seems as if it had been introduced not to avoid, but to multiply, transverse strains. Take even the upper part of the roof, which surely was "plain sailing" enough. Fig. 13 is the form which it takes. Struts are introduced to support the rafters where they are loaded by the purlins. So far, good. They are brought down on the tie-beam. What then? The tie-beam must be supported, and this is done; but how? By a vertical king-rod supporting the tie-beam, not where it is loaded, but at an intermediate point. The tie-beam, in fact, becomes a girder of two spans, each loaded at its centre. There are two most obvious ways in which this might have been avoided:—(1) By using two inclined ties to support the tie-beam where the thrust of the struts is delivered to it, as in fig. 13; or (2) by bringing the feet of the ties to the point of the tie-beam, which is supported by the vertical king-rod, as shown in fig. 14. Either of these well-known forms is sound. The ties introduced to impart angular stability to the parts of the roof below the curb are also badly applied.

Proceeding a step further in our inquiry, such an arrangement as that shown in fig. 15 is not by any means an uncommon one. By this arrangement the load is delivered at A and B, and the trussing is so applied as to leave C D and D E, the two segments of the rafter, still under transverse strains; and we occasionally see not dissimilar arrangements in larger works. Now, it is almost superfluous to say that this is radically unscientific. The object of trussing the rafter is to relieve it of transverse strains, and this can only be completely effected by placing the struts under the loads. In other words, to avoid transverse strains it is necessary that the loads, whether they are applied to the upper or lower member of the truss, should be at the apices of the trussing, not at intermediate points. Of course, in applying such a principle as this we must remember that it is only a means to an end, that end being sound and economical construction, and we must be careful that, in following out logically an undoubted principle, we do not lose sight of the elements which enter into the questions of soundness and economy. Thus, it is not merely by disposing the material in the most scientifically appropriate manner that economy is attained; there is the element of economy of workmanship, the question of how the multiplication of parts may affect the soundness of the structure by increasing the chance of hidden defects or defective fastenings; these and other such elements have all to be considered, and hence it follows that there are occasional cases where the advantages of a more complex form of truss are not sufficient to warrant the rejection of the simpler though less-scientifically-appropriate form. None the less is it necessary that the principle should be present to the mind of the constructor, common sense showing him when he should rigidly apply it, and when, by so doing, he would allow the means to defeat the end. To return of fig. 15, the span may be small and the rafter timber of comparatively large scantling; or the span may be larger and the rafter of wrought iron of comparatively small dimensions; and it is obvious that what may be a sufficient approximation to the ideal in one case may be a most unjustifiable departure from it in the other. As I said before, common sense is wanted in the application of the rule, but the rule itself is absolute, viz., that to avoid transverse strains it is necessary that the loads should be at the apices of the trussing.

Following one step further the idea of the exclusion of transverse strains, I would observe that it furnishes a guide to the proper construction of the joints of the truss, because, unless the axes of the several pieces which meet at a joint intersect in one point as nearly as the exigencies of connexion will admit, transverse strains are inevitably introduced, and the greater the deviation from the rule the greater the amount of the resulting bending movement. This, again, is specially important in wrought-iron trusses, where the scantlings of the pieces are so small that any considerable transverse force must seriously impair the strength of the truss. A joint such as that shown in fig. 16, for instance, which one occasionally sees in an iron truss, must necessarily be inferior to that shown in fig. 17, as violating this rule, and bringing a considerable transverse strain on the tie-rod,—a piece of small dimensions, and therefore of small transverse strength. Illustrations of this point might be drawn from nearly every joint in a truss, but I must pass on. Before leaving this question of transverse strain, I would note that there is one case, and only one case, in which transverse strains cannot be entirely got rid of, and that is where the load is not concentrated at certain points, but continuously distributed over the load-receiving member of the truss. In such a case transverse strains in that member cannot be altogether eliminated; but they are minimised by its subdivision into segments by the bays of the trussing; and how far, in such a case, this subdivision should be carried so as to reach the point of utmost economy and efficiency, but not to pass it, is one of the problems of the science of trussing. I will not trouble you with any observations on what I have advanced as the second great principle of the truss, viz., that it exerts only vertical pressure on the supports. This principle is, indeed, so plain as to be almost self-evident, and in few cases do we find it overlooked, if we except some Mediæval trusses, where the neglect was probably intentional, as a truss minus this quality is really a species of arch, depending for its stability on the lateral strength of the abutment, and therefore quite in accordance with the constructional *motif* of Mediæval architecture.

I have already trespassed so long on your patience, that, so far as the principles of trussing are concerned, I will do little more than mention one other principle, to which I ask your attention, viz., that the strength of the truss, and, therefore, the economy of the material, is directly as the depth of the truss. This is probably too well known to require proof, but any one can satisfy himself of it, and of the economy of material from increased depth, by working out the stresses in two examples of similar type but varying depths, and comparing the results, when it will be seen that the deeper the truss that is made, the less will be the strains in the parts. Of course, there is a limit to this: we cannot increase indefinitely the depth of a truss and indefinitely economise by so doing. In any case a point would ultimately be reached beyond which the additional length of the pieces would balance any diminution in sectional area; but there is another consideration which would generally become operative before that. Long struts—*i.e.*, struts whose lengths exceed a certain multiple of their diameters (from 10 to 20 for the materials generally used in trussing)—give way by bending sideways, and this tendency has to be met by the use of material to stiffen them beyond what is required to resist simple compression. The longer the strut the more the additional material required to meet this tendency; and the deeper the truss the longer the struts; and the limit of economy is reached when the additional material required to stiffen the long struts would compensate for or exceed the saving which would otherwise be effected by increasing the depth of the truss. I fear that this principle, that the strength of a truss is as its depth is not so universally recognised as its simplicity might lead us to expect. One still hears occasionally of timber beams trussed with wrought-iron within the depth of the beam,—a device which was in much favour a generation ago. Such a mode of attempting to strengthen a beam is a delusion and a snare. What little strength is obtained is obtained in the most extravagant and wasteful way, with a totally disproportionate

expenditure of material. It is, in fact, an eminently unscientific application of the truss.

The most economical angles for the bracing, and the relative economy of the different modes of bracing used in such trusses, have been made the subject of a theoretical investigation by Mr. Bindon Stoney, in his work on "Strains in Girders," and his results are as follow:—The most economical mode of bracing is that in which the braces are placed at the angle of 45°, thus dividing the truss into right-angled isosceles triangles; and if the quantity of material in the bracing of such a girder be taken as 100, the relative quantity in a Warren girder, where the angle the braces make with a vertical line is 30°, and where the triangles are therefore equilateral, is 115½; while in a girder with vertical and diagonal, or N bracing, the most economical angle for the inclined braces is 55° with the vertical, and the relative quantity of material in the bracing is 141½. Turning now to the crescent girder, and more especially to the bowstring girder, we note that the depth of the truss decreases from the centre to the ends very much as the bending moment does, and that consequently there is very little variation in the stresses in the different parts of the flanges; and as the upper flange is inclined, the shearing stress is transmitted mainly through it, and under a symmetrical load there is very little stress on the bracing. On the other hand, in roof-trusses with straight slopes to the roof, the depth of the truss decreases from the centre to the ends more rapidly than the bending moment, and consequently the stresses in what we may still call the flanges (viz., the rafters and main ties) increase from the centre to the ends of the truss, being greatest in those parts adjoining the walls, while in the bracing the stresses increase, on the whole, towards the centre of the truss. In these respects, therefore, these trusses present a complete contrast to trusses with parallel flanges, in which the stresses in the flanges increase towards the centre and in the bracing towards the end of the truss. It would have been very easy to write a paper, or, indeed, several papers, on this part of the subject, and upon those lattice trusses where more than one system of triangulation is used.

In conclusion, Mr. Robertson summarised the principles common to all forms of trussing, as follows:—The object of trussing is twofold. 1. To get rid of transverse strains; 2. To prevent oblique pressures on the supports. To get rid of transverse strains it is necessary to use inclined braces. To insure rigidity it is necessary that these braces divide the truss into triangles. To get rid of transverse strains the loads must be at the apices of the trussing. The axes of the pieces which meet at a joint must intersect in one point as far as possible. The strength, and therefore the economy of the truss is, within certain limits, proportional to its depth. Other things being equal, those trusses (if of any considerable magnitude), are the more economical in which the struts are the shorter.

THE ECCLESIASTICAL DILAPIDATIONS ACTS.

THE Select Committee appointed to inquire into the operation of the Ecclesiastical Dilapidations Acts of 1871 and 1872 have reported. The Committee, in order to meet complaints made by the clergy, suggest that if the present regulations are retained a large number of approved surveyors should be appointed in each diocese, from whom the two parties, the outgoing and incoming incumbent, may select one, or nominate their own surveyor; that the archdeacon, instead of the bishop, should be made the ecclesiastical officer for putting the Act into operation; that a power of appeal should be given to some competent local authority; that all fees to the bishop's secretary and registrar should be dispensed with; that a definite principle of assessment for dilapidations should be laid down; that loans of money to incumbents of small livings should be provided; that the periods allowed for repayment should be extended; and, to facilitate the arrangements for obtaining a final certificate, that greater powers should be given to Queen Anne's Bounty Board for advances in cases of structural dilapidations and small livings. If the present regulations are not maintained, the suggestion made by the Bishop of Peterborough, and approved in effect by other witnesses, is "to get rid of the present system of dilapidations altogether, and to substitute for it a fixed annual charge on each benefice, payable either to a Diocesan Dilapidation Board or to Queen Anne's Bounty Board, and that such Board should build, repair, and insure glebe houses and premises, the clergyman being, in return for his annual payment, free from all charges now known as dilapidations." It was also suggested that there should be a periodical survey of all glebe-houses; that secretaries' and registrars' fees should be abolished, and the business now done by them be transacted by a clerk at a fixed salary. The Committee are of opinion that the operation of the Act of 1871 has, in many respects, failed to accomplish the objects for which it was enacted; that it has provided no remedy for the most important complaint under the old law,—namely, the inability of the representatives of deceased incumbents to meet the amount assessed for dilapidations, but has cast upon new incumbents an obligation to pay over the amount, and attached also to them a liability for fees previously unknown to the law, and has deprived the clergy of all power of acting in their own matters, of choosing their own advisers, and of all practical appeal against the official surveyor appointed under the Act. They consider the machinery cumbersome and expensive, and that the requirements of the surveyors have in many cases exceeded the legal definition of ecclesiastical dilapidations.

PRIZES, GLASGOW INSTITUTE OF ARCHITECTS.

AT the last meeting of the Glasgow Institute of Architects,—Mr. John Baird, I.A., president, in the chair,—the distribution of prizes took place.

The President reminded the Institute that two years ago Mr. John J. Stevenson, architect, of Westminster, one of the original members of the Institute, presented a sum of money to be offered in prizes for competition amongst the young men employed in the offices of members in town. Accordingly, prizes were offered last year, and a very excellent competition was the result. Indeed, the drawings sent in were all of such superior merit that the only regret the council felt was that they had not a greater number of prizes to offer. Encouraged by the success of that competition, the council resolved this year to offer a gold medal for the best series of measured drawings and illustrative sketches from any municipal or domestic building in Scotland erected prior to the eighteenth century, to be competed for by draughtsmen and pupils in the offices of members of the Institute. For himself, he was anxious that apprentices should not be overlooked, and he offered a silver medal for the best series of drawings illustrating the south porch of the Crypt of St. Mungo's Cathedral, Glasgow, to be competed for only by pupils who, previously to the 1st of May last, had not been longer than five years in any architect's office. The competition for the apprentices' medal, he was glad to say, was very keen. No fewer than nine competitors entered, and all their drawings were exceedingly meritorious. Mr. Baird then presented the book prizes, the recipients being:—John Cumming, in the office of Mr. John Honeyman; William Millar, in the office of Messrs. Campbell Douglas & Sellar; and James Smith, in the office of Mr. John Gordon. The president's prize was awarded to William Preston, and bore the following inscription:—"Glasgow Institute of Architects. Incorporated 1868. President's Prize, 1876, for Apprentices Gained by Wm. Preston. John Baird, president."

HOLY TRINITY CHURCH, DORCHESTER, DORSET.

THE Church of the Holy and Undivided Trinity was re-opened on May 31st, after having been rebuilt, and nearly doubled in size. The site is a very awkward one as far as regards architectural appearance externally, for buildings at the east and west ends almost touch the church. The south side is practically the most unencumbered, and this faces the High-street. The old church consisted of a nave only, minus aisles, or the least attempt at a chancel. Ponderous galleries disfigured it, and the building was destitute of any pretensions to architectural beauty. This edifice has been pulled down, and a new structure has arisen out of its ashes. The present church consists of a nave, 61 ft. long, and 27 ft. 6 in. wide, with a north aisle, 13 ft. 6 in. wide, of the same length as the nave. There is also a south aisle, but not so wide, being 7 ft. 9 in. across, and in length 35 ft. The chancel is about 23 ft. long, and of the same breadth as the nave. On the north side of the latter is situate the vestry and organ-chamber. On the south side is an aisle of the same width as the south nave aisle. The new building accommodates 626 persons without being encumbered with any galleries. The walls are principally constructed of Pokeswell stone, the external dressings being partly of Portland stone from the old church, and of Box Ground, and internally of Corsham Down. The height of the nave up to the wall-plate is 22 ft. 3 in. The roofs to the nave and aisles are open ones, with principals at intervals, covered with boarding at the back. That to the chancel consists of a boarded and panelled ceiling, with carved gilded bosses at the intersections of the ribs. All the roofs are of deal, stained in two shades, and varnished. Externally, they are covered with Portmadoc slates, with red ridge tile roll. Moulded arches, carried on piers alternately octagonal and circular in plan, separate the nave and aisles; while a moulded arch, resting on slender Devonshire marble shafts, corbelled from piers, marks the division between the nave and chancel. At the west end a lofty gabled turret, containing the large bell from the old church, surmounts the gable of the nave, and is ornamentally corbelled out from it. In style the church may be said to be an adaptation of that of the Decorated period, and contains many traceried windows, the west one (the largest) having four lights.

The organ will not be finished till late in the autumn, and its case has been designed by the architect. The warming arrangements have been managed by Messrs. Haden & Son, of Trowbridge. The builders were Messrs. Tilley Bros., of Dorchester; and the architect is Mr. Ferrey, F.S.A. The total cost of the works amounts to nearly 4,000*l*.

GOOD ADVICE.

THE *Times* gives it thus:—"It is dangerous for any branch of art to be placed at the random discretion of possibly unskilful judges; but this is a danger to which some forms of art must be prepared, however unwillingly, to submit. Poetry or painting, or even sculpture, can keep clear of it. Architecture has no such choice. The material in which the architect works is very costly, and far beyond what his own private resources can supply. He is thus essentially a creature of patronage, since on no other terms can he obtain the means of exercising his art at all. There is a style of architecture, too, very excellent in its way, and capable of producing very grand effects, about which there is not the same room for difference of taste as there is in other artistic matters. The sort of building that fits in well with broad streets and fine open spaces, which produces its effect by combination rather than by the influence of each separate part, and which conveys, so to say, the same kind of message to every beholder,—this is at once the best suited for civic purposes and the most safely to be trusted in the hands of civic judges. The City guilds, with their wealth and known liberality, will, we trust, do much in the future, as they have done a little already in the past, for the ornamentation of our great metropolis. But we would remind their members, and the citizens of London generally, that each can in his own way lend aid to the common work. Every new shop or warehouse does something to help or to mar the general effect of London. The owners and designers of these may not have it in their power to burn a perfectly pure incense to the divinity of art, but they can at least present an acceptable offering at a lower, but not unworthy, shrine. They may do wisely in letting high art alone, but they need not, therefore, decline the duty of encouraging the style of architecture best suited to modern London."

Museums for the Thames Embankment. At the meeting of the Metropolitan Board of Works on the 2nd inst., on the motion of Mr. Richardson, the Board referred to the Works and General Purposes Committee a letter from the President of the Royal Colonial Institute, and the President of the Royal Asiatic Society, transmitting copy of a paper referring to the proposed establishment on a site (the property of the Crown) on the Victoria Embankment of two museums, one for India and the other for the Colonies; and urging this Board to relinquish their right to the roadway between the public garden and the site referred to, in order that the proposed museums may be brought close up to the garden.

THE LATE MR. BELLAMY, ARCHITECT.

WE bear with regret of the death of Mr. Bellamy, one of the original founders of the Institute of Architects, in 1834. He died at his residence in Charlotte-street, Bedford-square, on Saturday night last, at the age of 76, after a long and painful illness. Amongst his works we call to mind, on the instant, Corsham-court, Wiltshire; King's College Hospital, London; and the Law Fire Insurance Office, Chancery-lane, the rear front of which was completed only just before his death.

THE DEATH OF MR. JAMES F. REDFERN, SCULPTOR.

ANOTHER of our younger artists, whose achievements have fulfilled early promise, has passed away. While painting has to mourn its recent losses in the death of Walker, Pinwell, and Houghton, sculpture must now write on its death-roll, beside the names of Alfred Stevens and J. B. Philip, that of James F. Redfern, who died on Tuesday, the 13th inst., at Hampstead. Some sixteen or seventeen years ago, while yet a youth, Redfern produced an admirable group of Cain killing Abel. This work attracted the notice and elicited the warm approval of the late John Foley. Soon after this he became engaged on works chiefly of Gothic character. He executed the elaborate reredos, enriched with many groups and figures, of St. Andrew's Church, Wells-street. Afterwards he displayed great skill in treating the long series of figures which now adorn the west front of Salisbury Cathedral. More recently he produced for Bristol Cathedral the sculptures upon which, a short time since, fell such an outburst of violence. He died at the age of 38. He was a native of Derbyshire, where, while yet a young village boy, without aid or teaching of any kind, his instinct for art was strikingly displayed by his carvings and modellings from the woodcuts of illustrated newspapers.

We well remember a visit from him in his early days, with his enthusiastic thanks for a few words of well-deserved approval which had appeared in our journal.

With his inborn love of art, and talent in its practice, were associated an amiability and simplicity of nature which endeared him to all who knew him.

DISSENTING CHURCH-BUILDING NEWS.

Seacombe.—The memorial-stone of the Welsh Calvinistic Methodist Chapel, Liscard-road, Seacombe, has been laid. The site of the new building is immediately opposite the end of Brougham-road, from which there is a fine view of the Mersey. The building will be cruciform, and consist of a nave, transept, and vestry. There will be a porch at the north-east angle, and tower porch on the north-east side. The style of architecture will be of the Early English period. The roof will be partly open, and follow the curve of principals, which will rest on detached columns of marble with foliated caps. The nave will be divided by means of the principals into three bays, with cross principals at the intersection of the transept. The pews, which will all be open, will be constructed of pitch pine with framed bench-ends, while the pulpit and communion-seat will be of Dantzic oak. The whole of the external stone used in the dressings and ashlar, &c., will be limestone from Mrs. Foulkes's quarry, Denbigh. The stone is of the same nature as Anglesey limestone. The total cost of the edifice, including the price paid for the land and the laying out of the grounds, will be about 4,000*l.* The contractor for all the works is Mr. William Jones, of Beaumaris; the architect being Mr. R. G. Thomas, of Menai Bridge, whose plans were accepted in a limited competition.

Coniston.—The new Wesleyan Chapel, which has been in the course of erection at Coniston during the last twelve months, was opened on the 1st of June. The style of the building is Early English Gothic, built with the blue stone of the neighbourhood, with chiselled freestone dressings. The interior woodwork is all of stained pitch-pine, the roof being an open-timbered one. Accommodation is provided for about 150 persons. The building has been designed and carried out under the superintendence of Mr. Eli Cox, architect, Kendal; the contractor being Mr. Bell, of Coniston.

CLAIM BY A SURVEYOR.

AT the Westminster County Court, before Mr. Russell, deputy-judge, Mdlle. Louise & Co., milliners, of Regent-street, were sued by Mr. Peebles, surveyor, to recover the sum of five guineas for fees alleged to be due under the following circumstances:—

The plaintiff said he called upon the defendant, on the introduction of Messrs. Lumley, the defendant's agents, and the defendant employed him to make a survey as to a party-wall of the defendant's factory in the City. On the 22nd of June last, he surveyed the premises in question and sent in his report, and when he sent his clerk for payment he was told by the defendant's shopman to send in the account and it would be attended to. He at once furnished the account, which was repudiated by the defendant, hence the present action.

Mr. Bretton called the defendant, who distinctly denied ever employing the plaintiff, or ever receiving more than two letters from him, one of which was asking for the survey of the Oxford-market, for the purchase of which witness was then in negotiation, and the second letter demanding payment for the present demand.

The Judge ruled in favour of the defendant, remarking in doing so, that as the English law did not allow of a verdict of "not proven," and the onus of proof lay on a plaintiff, he felt bound to decide in favour of the defendant, at the same time remarking that no imputation of any kind could be cast on the plaintiff, and that he believed that the work had been done by him under a misapprehension.

CARVING IN MEMORIAL CHURCH, HOAR CROSS.

SIR,—In your account of the Memorial Church at Hoar Cross, I see it is stated that "the carving has been executed by Messrs. Farmer & Brindley." Now, this statement does not convey all the facts, as it would give one the idea that these gentlemen had done all the carving, which is far from the case. They certainly did supply a good many of the carved stone figures (and very good they are). They also made the reredos and the organ-case. But there has been much oak carving supplied by other firms, and also several figures executed by Mr. Redfern. And they had nothing whatever to do with the ornament carving of the church done on the spot, of which there is a considerable quantity, for the most part executed by Mr. Hibbins, while part of it, namely, the whole of the work on the arch above Mr. Meynell Ingram's Tomb and the canopies at the sides, was modelled and carved by the writer of these lines.

The carving on this church (other than that executed by Messrs. Farmer & Brindley) has occupied a period of from two to three years.

W. AUMONIER.

FIREPROOFING TIMBER.

WILL you favour me by inserting the following explanation as to a most important point in respect to the fireproofing of timber, and the observations Mr. Cates was kind enough to make on the work done in the dome of St. Paul's Cathedral? The mode I adopt in such cases is to provide a perfect insulation of the protecting stone-felt sheeting from the timber to be protected, keeping a cavity between them through which the air circulates, thus preserving the timber better than when it is exposed or painted. It was only in the case of some of the dry timber supports or beams standing free in the interior that the material was laid to touch the timber, and this was done solely because the additional space of complete encircling cavities would have made the stanchions and other parts of the framework so bulky as to be unsightly.

PHILIP BRANNON.

ST. PAUL'S.

SIR,—I think that what occurred at a meeting of the Grand Lodge, a few evenings ago, should be pressed upon the notice of the Dean and Chapter. You may have observed that a proposition to contribute 1,000*l.* towards the completion of St. Paul's, to commemorate the safe return of the Prince of Wales, was negatived, and that it was referred to a committee to consider in what more satisfactory way this donation might be employed.

Certainly the Dean and Chapter have no reason to be surprised if contributions are no longer forthcoming from public bodies, and if even some feeling of regret may now be felt by those who hurried to subscribe to an object which apparently they are never likely to see attempted. But if the Dean and Chapter feel incompetent to decide upon what should be done, there is no want of artistic taste and knowledge in the world to help them, if they will but condescend to ask for it. They need not always fail. If they announced that an impracticable and bizarre scheme had been sufficiently condemned, and that a simple rational treatment is desired, that would not shock Sir Christopher Wren, or lessen the monumental solemnity the building has acquired since his time, there can be no doubt that all that can advantageously be done might be completed in less than five years; and if more money were wanted, the Dean and Chapter would not then be holding quite the position they do at this moment in the eyes of the public.

MASTER MASON.

HASTINGS WATER SUPPLY.

SIR,—Since my letter on the Hastings Water Supply, which you published in your paper of March 18th last, the subject has certainly been well ventilated, both in your columns and those of other journals. The *Lancet* gave a much worse account of the quality of the water than I ever ventured to do. Not half the remarks would have appeared in the public journals if it had not been for the persistency of the Hastings authorities in still declaring that the quality of the water was good. However, the contrary has been proved.

Some of the writers in the local papers, however, admit that the water supply is not what it should be; and they say further that myself and other people who find fault might at the same time suggest a remedy. I therefore would advise that the whole of the present supply should be properly filtered; each filter-bed having a layer of charcoal in it. Also that the water when so filtered should be stored in a covered reservoir or reservoirs.

This I should only consider as a temporary measure, till a supply of pure water is obtained from a distance. As to the permanent supply, and the locality to obtain it, I am doubtful about Glynde, as, though the green sand crops out there, it is the "upper edge," and the inclination of the strata falls away from Glynde.

My own idea is that a good supply, both as to quality and quantity, could be obtained by sinking wells in the neighbourhood of Robertsbridge, where the various streams rise that form the Rother river. Pumping stations should be erected here, to lift the water to high-service reservoirs in the neighbourhood, and the water could flow by gravitation to Hastings, and be stored in smaller covered service reservoirs on the heights near the town.

THE VISITOR.

DRAINAGE OF HORSHAM.

SIR,—I should feel much obliged if you or any of your readers could inform me why nothing has been done in respect of the competative schemes for the sewerage of the town of Horsham, in Sussex.

At the latter end of the month of March, I, in reply to an advertisement issued by the Local Board, sent in a scheme and estimate for the work—and I learn from paragraphs in local papers that fourteen plans were sent in, and the estimates varied from under 5,000*l.* to over 22,000*l.*

I can well imagine that such a diversity causes some perplexity to the members of the Board, who appear *not* to have called in professional aid to assist them in their selection.

Without assuming prophetic powers, I may venture to surmise that if the various schemes were submitted to the scrutiny of an able and experienced gentleman, it would be discovered that the higher estimates comprise much unnecessary work, and that the lowest sum is utterly inadequate to meet the requirements of the case.

Without such an opinion, the members of the Board must bear the odium and the blame if any unpleasant mistake or deficiency should hereafter come to light.

X.

HOT-WATER PIPES.

I HAVE for some time used hot water circulating from the kitchen boiler through iron pipes, with a galvanised iron cistern at the top supplied from a leaden cistern. The water is very hard and very soon stops the pipes, and the iron cistern soon rusts. I am going to substitute rain-water, which will not act as the hard water, but, I believe, rusts iron quickly; but as I cannot use lead I propose to pump the water through iron pipes. I must still use the galvanised iron cistern for the hot water. Will a similar cistern do for the cold water, or should it be slate? Will it be desirable to use galvanised pipes?

R. B.

Miscellanea.

The Salary of the City Architect.—At the discussion which took place in the Common Council, on the proposal of the Officers' and Clerks' Committee, that the salary of Mr. Horace Jones, the City architect, should be raised from 1,500*l.* to 2,250*l.* a year, to date from Midsummer, 1873, Mr. Roberts, in proposing the adoption of the committee's recommendation, said that the architect had saved the Corporation large sums of money, and done public work for which he was not paid, and that had they engaged another architect they would have had to pay for professional services 31,500*l.* An amendment, proposed by Mr. Fricker, to the effect that the salary of the architect be 2,000*l.* a year, to date from Christmas, 1875, gave rise to an animated debate, in the course of which several members spoke. The amendment was finally adopted, so that the architect's salary is raised to 2,000*l.* a year from Christmas last.

Co-operative Builders and Contractors. A meeting was held at the Artisans' Institute, Castle-street, W.C., last week, when Mr. M'Cormick, the manager of the National Co-operative Builders' and Contractors' Society delivered a lecture on "Co-operative Industry as applied to Building Operations." The Rev. H. Solly presided. Speeches were made by Mr. Hodgson Pratt, of the Workmen's Club and Institute Union, and Mr. James C. Lake, the chairman of the Society. At the close of the meeting a resolution was passed approving of the principles of the Society.

An Educational Conference will be held on the 23rd inst. by the Society of Arts to discuss the various means for promoting adult education.

The City Commissioners of Sewers *v.* **Her Majesty's Commissioners of Works.**—This was a summons taken out by the Commissioners of Sewers for the City of London under the Metropolitan Buildings Act, to recover 65*l.* 14*s.* for work done by order of the district surveyor in order to secure the building of the old Probate Court, which ran from Great Knightrider-street to Queen Victoria-street, and which was dangerous to the public. Mr. Poland appeared for the Commissioners of Sewers; and Mr. Hardy for the Commissioners of Works. It appeared that when Queen Victoria-street was formed, the wall of the old Probate Court, which abutted on that thoroughfare, was underpinned. On the 11th of May last, a police constable went to Mr. Power, the district surveyor, and told him that the bricks of one of the arches of that building had fallen into the road. He went down there and found, as the constable had stated, that bricks had fallen, and he ordered the wall to be shored up, the cost of which was 65*l.* 14*s.* Mr. Hardy said that he would admit that the bricks did fall, that the notices were properly served, and that the sum charged was a fair and proper charge to be made if the Commissioners of Sewers were entitled to recover at all. His defence was that the arch in question was only a surface arch of 4½ in. thick, and although the bricks fell that fact did not affect the stability of the wall, which was not a dangerous structure. It was underpinned by the Metropolitan Board of Works to meet the level of the street, and was, although an old wall, perfectly sound. Before the district surveyor called to inspect the premises the arch had been repaired, and the surveyor to the Commissioners of Works warned the district surveyor not to proceed with the work, as it was not necessary, the building not being a dangerous structure, and further that it was shortly to be pulled down. Evidence in support of this statement having been given, Sir Thomas White thought the district surveyor had acted precipitately, and dismissed the summons.

Municipal Buildings, Reading. — The ceremony of opening the new Municipal Buildings for the borough of Reading took place on the 6th inst. The site adjoins the old Town-hall. The buildings are from the design of Mr. Alfred Waterhouse, and the style of architecture is Gothic; the materials are local grey brick with red brick dressings, relieved with red terra cotta from the neighbourhood of Norwich. The principal feature in the structure is the entrance-tower, which now supersedes the old entrance to the Town-hall. It is 60 ft. high to the top cornice, and 100 ft. to the finials. The portion of the buildings facing the Market-place is three stories high, and that facing west two stories, with hall-keeper's residence above. The Council Chamber is 36 ft. long by 25 ft. and 24 ft. high, with a coved ceiling. In this room is a gallery for the public, the dimensions being 37 ft. by 12 ft. deep. Access to the tower is by a flight of steps 9 ft. wide. There are three doorways, two of which are for the public. In the building, offices are provided for the town clerk, the deputy town clerk, borough surveyor, medical officer of health, and four strong rooms for deeds and muniments. In the tower is a clock chamber for a *carillon* of bells arranged to play twenty-eight tunes, consisting of sacred, national, English, Irish, Scotch, and Welsh airs. An illuminated clock has been erected with a dial in each of the four quarters, and this with the bells has been provided by public subscription. The roof of the building is high pitched, and covered with tiles. The total cost is little under 10,000*l.* Messrs. Parnell & Sons, of Rugby, the contractors, have carried out the work.

Northern Architectural Association.—At an ordinary meeting of this society, held at the Old Castle, on Thursday, the 8th inst., Messrs. Prosser, Gibson Kyle, and W. Peachey were appointed delegates to the Architectural Conference, and to the Architectural Alliance, the meetings in connexion with which are to be held in London. Mr. Christian Wasgepeterson and Mr. Neil Macara were elected associates, and Mr. Morton, of South Shields, was nominated a member. The secretary (Mr. Thos. Oliver) read a number of communications from various architectural societies, in reference to the forms of contract and general conditions used by them. After considerable discussion, it was resolved on the motion of Mr. James Hogg, to adjourn the further discussion upon the general conditions of contracts included in the draft and forwarded by the secretary to the Newcastle and Gateshead Builders' Association.

Society of Engineers:—At a meeting of the Society of Engineers, held on Monday evening, 12th inst., in the Society's hall, 6, Westminster Chambers, Victoria-street, Mr. V. Pendred, president, in the chair, a paper by Mr. Henry Davey on the underground pumping machinery at the Erin Colliery, Westphalia, was read. The paper described what is probably the largest example of underground pumping engines extant. The system, which was originated by the author, may thus be briefly described. In the mine (which is 1,200 ft. deep) 920 ft. from the surface is placed a pair of compound differential pumping-engines, capable of raising 1,400 gallons per minute to the surface, at the same time supplying power through the medium of the rising column to two differential hydraulic pumping-engines placed at the bottom of the mine, and employed in lifting 1,000 gallons per minute to the main engines. Steam is carried down to the main engines from the surface at a pressure of 70 lb. per square inch. After passing through the engines it is condensed, and a vacuum of from 24 in. to 26 in. of mercury is obtained by means of a separate condenser which produces at once the vacuum on the engine, and enables it to start to work against the full column.

"The Imperial Museum for India and the Colonies."—Mr. Forbes Watson has returned to the charge, and in a fresh pamphlet advocates the erection, side by side, on the old Fife House site on the Thames Embankment, of two independent museums,—one for India, and the other for the colonies; the Colonial Museum to consist of sections representing separately the principal colonies, provision being made at the same time for the India Library and for the establishment of a special Colonial Library and Reading-room; the buildings likewise to contain the rooms of the Royal Asiatic Society and of the Royal Colonial Institute. His contention is, that South Kensington, although well suited for an educational institution like the Science and Art Museum, is too far away from the centres of political and business life to allow of the India and Colonial Museums, if placed there, to be readily consulted by the classes directly interested in their accessibility.

Dover Harbour.—The Chancellor of the Exchequer, in reply to a question put by Sir G. Balfour in the House of Commons on the 29th ult., said that, in consequence of the report of the Select Committee of last session, from which it appeared that if the works at Dover Harbour were to be proceeded with, there would be strong reason for enlarging them, and therefore increasing the expense, the Bill prepared on the subject was laid aside for further consideration, and having reference to the other works and expenditure which the Government had in view, they did not find themselves able to bring forward a measure in the present year. With regard to harbour improvements generally for the protection of shipping, it was the policy of the Government to encourage by loans through the Public Works Loan Commissioners the construction of harbours of refuge.

Dis-turnpiked Roads.—The report of the Select Committee of Inquiry into the Turnpike Acts continuance was issued on the 29th ult. The committee express the opinion that no time ought to be lost in bringing dis-turnpiked roads under a better system of management, and that any legislation to be effective should be compulsory. The committee call attention to the fact that the Turnpike Acts Continuance Act of last session was for the first time not inserted among the public Acts of Parliament, and that public inconvenience has arisen in consequence, and recommended that no departure from this invariable practice of Parliament for upwards of thirty years should for the future be made. The committee give a list of the trusts which in their opinion should be allowed to expire on an early date.

Proposed New Gasworks for Leeds.—The gas committee of the Leeds Town Council have agreed to recommend the construction of new gasworks in New Wortley, and the works are to comprise a retort-house, 380 ft. long and 70 ft. wide, or accommodation for 288 retorts 20 ft. long, with 25 ft. of floor space in front of the retorts on each side. In connexion with the retort-house there will be coal-stores capable of holding 5,000 tons. Then there are to be condensers, engines, scrubbers, purifiers, two gasholders, &c. The capacity of the gasholders is to be 1,250,000 cubic feet each.

Patents for Inventions.—The Institution of Mechanical Engineers have presented a petition to the House of Commons against the Bill now before Parliament, wherein they say,—"Your petitioners, whilst not objecting to any amendments of the laws relating to patents for inventions which may be reasonably beneficial to the public at large, object on principle to such legislation as shall operate to prevent invention, or to deprive inventors of their just reward, or to render property in inventions insecure and in many cases worthless."

New Police Station at Northwich.—For a long time past the want of increased and more convenient accommodation has been seriously felt by the police authorities of Northwich. A new station has been built in Leicester-street by Mr. W. Leicester, of Northwich, from the designs of the late Mr. Nichols, county surveyor. The new building comprises an office, dwelling apartments for the inspector, a large room for magisterial business, a magistrate's retiring-room, and six roomy and well-ventilated cells, approached by a corridor.

Fresh Excavations at Troy.—M. Schliemann, it appears, has again gone to Troy, to make fresh researches. On the 5th ult. he received a firman authorising him to continue his excavations for two years, and on the 26th he commenced with 150 labourers. M. Schliemann hopes that among those who will be present at a part of his work will be the Right Hon. W. E. Gladstone, M.P. The "Treasure of Priam," found by M. Schliemann in his former researches, remains in the cellars of the Bank of Athens.

The Walker Art Gallery, Liverpool.—A meeting of the General Committee appointed to make arrangements for the opening of the Walker Art Gallery was held on the 30th ult. at the Town Hall. Letters were read from Mr. Warrington Wood and Mr. Alderman Walker, stating that the sculpture and bas-relief for the gallery could not be ready in time to admit of the opening of the gallery in September, as at first intended; and the committee decided to postpone the opening of the gallery till the beginning of next year.

The Lichfield City Surveyorship.—At a meeting of the Lichfield Town Council, on the 30th ult., the Mayor reported that the Sub-Street Committee had met the trustees of the Conduit Lands, and had elected Mr. George Robinson, of Stroud, an inspector and surveyor. Four candidates were selected from the applicants, but Mr. Davoll retired, and Mr. Nevill declined to comply with the conditions regulating his duties. The other two were Mr. Robinson and Mr. Meakin, of Hanley. The appointment was confirmed.

Hampton Court Bridge.—The Metropolitan Board of Works have agreed to loan to the Kew and other Bridges Committee the sum of 40,000*l.*, at 3*l.* 15*s.* per cent. interest. This will, together with 20,000*l.* which the Corporation of London proposed to loan to the same body, enable them to free from toll Hampton Court Bridge over the Thames and the two bridges over the River Lea,—Chingford and Tottenham Mills,—thus completing the task set the committee in the Act of Parliament calling them into existence.

Researches in Asia Minor.—Mr. Pullan has brought together, at No. 7, Argyll-place, a number of drawings and photographs illustrating the progress of various late researches in Asia Minor, in which he has been engaged. The collection includes designs by several hands for the restoration of the Tomb of Mausolus (otherwise the Mausoleum), and we should say more about it but for the more than usual pressure on our space.

New House, Biggleswade, Beds.—The foundation-stone of a new mansion was laid a few days ago in the Park. The ceremony was performed by Mrs. Shuttleworth. The new house, which occupies the site of the old one previously belonging to Lord Ongly, is being built by Messrs. W. Cubitt & Co., London, from designs by Mr. H. Clutton. Mr. W. Bennison is clerk of works.

New Chancel at St. Mary's Church, Brighton.—This week Messrs. E. Nash & Co., of Brunswick-street East, and Farman-street, Hove, have commenced to erect a new and enlarged apsidal chancel for St. Mary's Church, St. James's-street, Brighton, the previous one having been inadequate to the requirements of the congregation. Mr. W. Emerson is the architect.

Pulpit, Carnmoney.—There has just been completed in the parish church of Carnmoney a pulpit, erected by Mrs. Thomson, of Lowwood, in memory of her late husband. It is of Caen stone, in fine panels, each panel having an appropriate floral emblem, with an illuminated text on a scroll. The ground work of the panels is gilt. The pulpit is from a design by Mr. Drew, and the work was entrusted to Mr. A. P. Sharp, of Great Brunswick-street, Dublin. A brass plate set into the base of the pulpit bears an inscription.

Newcastle-under-Lyme Borough Surveyorship.—A meeting of the above Town Council was held on the 2nd instant, for the purpose of electing a surveyor. There were nearly forty applicants, from whom five were selected to attend, viz., Mr. Frost, Hanley; Mr. Pearce, Liverpool; Mr. Taylor, Rochdale; Mr. Eayrs, Llanelly; and Mr. Winship, Malvern. Eventually Mr. John T. Eayrs, assistant surveyor at Llanelly, was appointed.

TENDERS

For new stabling and groom's house at Reading, for Messrs. Sutton & Sons. Messrs. W. & G. T. Brown & F. W. Albury, architects. —

Hill, Higgs, & Hill	£3,490 0 0
Sheppard	2,824 0 0
Elliott	2,806 0 0
Searle	2,800 0 0
Rider & Son (accepted)	2,778 0 0

For the erection of Welsh Presbyterian Chapel, Seacombe. Mr. R. G. Thomas, architect:—

Jones (accepted)	£2,850 0 0

For two new houses, shops, &c., in rear of the Salmon and Compasses, Penton-street, Islington, for Mr. C. W. Avis. Mr. T. H. Watson, architect:—

Batchelor	£2,876 0 0
Carr & Sons	2,335 0 0
Langmead & Way	2,317 0 0
Kelly, Bros.	2,293 0 0
Bentley	2,261 0 0
Marr (accepted)	2,187 0 0

Accepted for three houses to be erected in the Grand Avenue, West Brighton. Mr. I. Thomas, architect. Quantities by Mr. A. Farre:—

(A) Chappell	£3,000 0 0
(B) Chappell	2,343 0 0
(C) Chappell	2,857 0 0

For new conservatory and offices, Gloucester-road, for Dr. Sutton Townsend:—

Lascelles	£719 0 0
Grimwood & Sons	694 0 0

For sundry internal works to the *Morning Advertiser* office, 127, Fleet-street. Mr. W. Nunn, architect:—

Grimwood & Sons (accepted).

For the erection of the Gresham Life Assurance Offices Poultry, City:—

Scrivener & White	£47,980 0 0
Trollope & Son	47,900 0 0
Smith & Co.	47,713 0 0
Dove, Bros.	47,275 0 0
Colls	46,454 0 0
Hill, Higgs, & Hill	43,650 0 0
Kilby	40,750 0 0
Peto, Bros.	40,497 0 0

For repairs, painting, &c., at 45, Kensington Park-gardens. Mr. C. N. Beazley, architect:—

Smith	£247 10 0
Cowland	239 0 0
Staines & Son (accepted)	214 0 0

For new warehouse, at Waddon Steam Flour Mills, Croydon, Surrey, for Messrs. Charles Brown & Co. Messrs. George Elkington & Son, architects:—

Browne & Robinson	£1,870 0 0
Coleman	1,788 0 0
Rider & Son	1,768 0 0
Lathey, Brothers	1,730 0 0
Kingland	1,648 0 0

For Primitive Methodist chapel, Stapleton-road, Bristol. Mr. Alfred Harford, architect. Quantities supplied:—

	No. 1.	No. 2.
Howell	£3,468 0 0	£620 0 0
Stephens & Bastow	2,788 8 7	611 4 6
Veals	2,350 0 0	475 0 0
Holbrow (accepted)	2,306 0 0	467 10 0

For St. Andrew's Schools, Montpelier. Messrs. Pope & Paul, architects. Quantities not supplied:—

Dubia	£316 0 0!
Davis & Son	270 0 0
Humphrey	247 10 0
Beaven & Son	220 0 0
Williams & Son	215 0 0
Stephens & Bastow	197 0 0
Box	170 0 0
Baker & Son	165 0 0!

For chapel at Nazing. Messrs. Lander & Bedells, architects. Quantities supplied:—

Ebbage	£1,240 0 0
Grover	1,037 0 0
Bentley	1,025 0 0
Clarke	950 0 0
Hampton	916 0 0

For the erection of stables, Black Horse-yard, Westminster. Mr. H. Lovegrove, architect.—

Scrivener & White	£497 0 0
Hobson	496 0 0
Veare	491 0 0
Bishop & Hooper	460 0 0
Holliday (accepted)	427 0 0

For a pair of villa residences, and stabling to each, at Hornsey-lane, for Mr. T. Mattinson. Messrs. Lander & Bedells, architects. Quantities supplied.—

Southcott	£3,991 0 0
Axford	3,887 0 0
Ebbage	3,837 0 0
Carter	3,820 0 0
Kerry	3,815 0 0
Brass	3,810 0 0
Grover	3,787 0 0
Kelly	3,775 0 0
Williams & Son	3,732 0 0

For rebuilding warehouse, Addle-street, City. Messrs. Ford & Hesketh, architects:—

Crabb (accepted)	£2,000 0 0

For rebuilding warehouse, Wood-street, City. Messrs. Ford & Hesketh, architects:—

Nightingale	£4,902 0 0
Hobson	4,965 0 0
Peto, Brothers	4,924 0 0
Lawrance	4,814 0 0
Kirk & Randall	4,793 0 0
Ashby, Brothers	4,769 0 0
Downs & Co.	4,758 0 0
Adamson & Sons	4,754 0 0
Scrivener & White	4,696 0 0
Browne & Robinson	4,611 0 0
Brass (accepted)	4,586 0 0

For two semi-detached villa residences at Highbury-vale, for Mr. J. Gibson:—

Bird	£2,340 0 0
Clark	2,210 0 0
Wilson	2,190 0 0
National Co-operative Builders and Contractors' Society	2,150 0 0
Richards	2,090 0 0

For school buildings at Whitstable, for the Whitstable and Seasalter (U.D.) School Board. Messrs. Morris & Stallwood, architects:—

Webber	£5,535 0 0
Featherstone & Lucas	5,199 0 0
Knight	5,128 0 0
Bingham	4,891 0 0
Lawson	4,845 0 0
Cornelius	4,776 0 0
Foad (accepted)	4,539 0 0
Croxford & Co.	3,934 0 0

For sauce factory, Reading, Berks, for Messrs. Charles Cocks & Co. Messrs. Morris & Stallwood, architects. Quantities supplied:—

Rider & Son	£3,590 0 0
Sheppard	3,177 0 0
Woodroffe	3,140 0 0
Pither	3,130 0 0
Reavell	3,111 10 0
Bourton	3,110 0 0
Searle	3,105 0 0
Poffley	3,075 0 0
White	3,068 10 0
Sharpington & Cole	2,953 0 0
Simonds	2,887 0 0
Wheeler, Bros.	2,850 0 0
Gibson	2,695 0 0
Clements (accepted)	2,525 0 0

For village school and residence on the estate of Sir Henry Hawley, bart., at Leybourne. Messrs. Morris & Stallwood, architects:—

Vaughan (accepted)	£938 0 0

For the erection of ten cottages, to form the completion of School-terrace, at Newtown, Reading, for Mr. George Palmer. Messrs. Morris & Stallwood, architects:—

Wicks (accepted)	£1,683 6 0

Accepted for the erection of new stabling and coachman's house at Reading, for Mr. E. May. Messrs. Morris & Smallwood, architects:—

Higgs and Poffley (joint contract)	£856 19 0

For infectious wards at the Royal Berkshire Hospital, Reading. Messrs. Morris & Stallwood, architects. Quantities supplied:—

	Building, exclusive of Plastering.	Plastering, including Polished Parian Walls.
Filewood	£2,559 0 0	£272 0 0
Sheppard	2,550 0 0	—
Searle	2,529 0 0	215 0 0
Barnicoat	2,472 0 0	—
Davis	2,450 0 0	325 0 0
Wheeler, Bros.	2,450 0 0	684 0 0
Poffley	2,355 0 0	—
Sharpington & Cole	2,343 0 0	197 0 0
Rider & Son	2,338 0 0	420 0 0
Woodbridge	2,300 0 0	1,160 0 0
Simonds	2,300 0 0	436 10 0
Gibson	2,190 0 0	285 0 0

For alterations and additions to Board and National Schools at Erith, Kent. Messrs. Ford & Hesketh, architects:—

Willis	£1,290 3 0
Hills	1,222 14 0
Toogue	1,124 10 0
J. & H. Catchpole	1,081 10 10

For new schools, St. James's R.C. Church, Reading. Messrs. Morris & Stallwood, architects. Quantities supplied:—

Rider & Son	£918 0 0
Woodbridge	875 0 0
Reavell (too late)	850 0 0
Sheppard	838 0 0
Barnicoat	830 0 0
Filewood	827 0 0
Simonds	826 0 0
Gibson	815 0 0
Bourton	813 0 0
Poffley	809 0 0
Wheeler, Bros.	798 0 0
Searle	767 7 0
Pither	734 0 0

For the erection of a dwelling-house and appurtenances, to be, known as the Finches, Lindfield, Sussex, for Mr. James Proctor. Mr. T. Laurie, architect:—

Anscomb	£12,555 0 0
Newman & Mann	12,491 0 0
Barnes	12,190 0 0
Walsham & Co.	12,082 0 0
Dove, Bros.	12,008 0 0
Howard	11,974 0 0
Merritt & Ashby	11,967 0 0
Browne & Robinson	11,826 0 0
Chappell	11,783 0 0
Cheesman & Co.	11,578 0 0
Holands	10,425 0 0
Deacon (accepted)	10,325 0 0

For alterations at the Green Man, Little George-street, Westminster. Messrs. Bird & Walters, architects:—

Hanmar	£874 0 0
Brown	844 0 0
Hockly	835 0 0
Williams & Son	750 0 0
Anley	732 0 0

Gasworks.—The War Department have accepted the tender of Messrs. Chandler & Sons, of York-street and Newington-causeway, for the Government Gasworks extension. The tender of the same firm has also been accepted by the Ystrad Gas Company, for pipe-laying.

TO CORRESPONDENTS.

Erratum.—In account of Bramber Castle, in our last, for "Bognor," as site of Roman remains, read *Bignor*.

E. C.—Col. A. P.—H. H.—G. R.—Mr. F.—M. & Co.—C. & Sons.—N. & Co.—B. & A.—J. O. & Son.—T. P. McC.—T. D.—Omnia Sanitas.—H. & J.—P. Bros.—J. C.—L. (next week).—C. W. (next week).—J. H. (ditto).—H. L. (to comm likely).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

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"Utility and Progress" in Architecture.

AMONG the historical contradictions of the human mind there are none, perhaps, more singular in their opposite and irreconcilable character than the philosophy of the ancient Greek and his architecture. The one consisted of theories of utterly unattainable moral perfection, the other was a practical combination of the useful and beautiful. Neither the one nor the other could have had much influence over the exclusive learning of Western Europe in the Middle Ages. Nevertheless, the *naïveté* of Greek construction is only equalled, as far as is known of the world, by that of its Gothic prototype. Perhaps both merely prove the force of common sense, and are parallels only as far as constructive principle goes; for Mediæval architecture was undoubtedly aided by contemporary religious sentiment. But it is still more singular to find that the knowledge of those principles upon which both Greek and Gothic architecture reached perfection virtually died out at the very time when the ancient speculative philosophy received its final overthrow by the teaching of Bacon, almost immediately after the revival, or rather the beginning, of Classical learning in this country. "Two words," according to Lord Macaulay, "form the key of the Baconian doctrine, Utility and Progress. . . . . The ancient philosophy disdained to be useful. . . . . It would not condescend to the humble office of ministering to the comfort of human beings. . . . . What is the highest good, whether pain be an evil, whether all things be fated? . . . . These and other questions of the same sort occupied the brains, the tongues, and the pens of the ablest men in the civilised world during several centuries." Although Plato had studied music and painting, had travelled into Asia Minor, Egypt, and Italy, he thought that to apply geometry to any useful purpose was to degrade an intellectual exercise to a level "fit only for carpenters and wheelwrights." Yet in his time and in his native city more perfect buildings existed than any which have risen in Europe since the days of Bacon,—perhaps than any which have ever been built. According to the Platonic theory, philosophy and the art of building have nothing in common; according to that of Bacon, everything. "In my own time," says Seneca, who is quoted by Macaulay in a celebrated essay, "there have been inventions of this sort, transparent windows, tubes for diffusing warmth equally through all parts of a building. . . . But the inventing of such things is drudgery for the lowest slaves; philosophy lies deeper. It is not her office to teach men how to use their hands." Bacon's philosophy was of a totally opposite kind, and it has changed the thought of the whole world; yet all the "fruit" which his teaching has yet brought to architecture consists in a happy facility, developed and improved in the course of three centuries, of copying the Classical and Mediæval buildings extant. Again, the study of anatomy has reached a higher degree of excellence in our time than at any former period, and the result is apparent in a widely-extended knowledge of the animal frame. Phidias himself probably knew less of a man's skeleton, and the muscles which cover it, than many a student in a modern school of art, but he has not yet been surpassed in modelling the human form. The images which adorned the walls of Christian edifices in the Middle Ages were fashioned by the hands of faith; yet the most fervid devotee will not venture to compare their crude outlines with the god-like perfection of Greek sculpture. Neither religion nor learning, as both are interpreted in our day, contributed to concentrate on the Athenian Acropolis perfect works of art. Nevertheless it is impossible to believe that the Greek world, under the sway of Pericles, was divided, and twofold,—its speculative philosophy the work of learned gentlemen, its practical architecture that of ignorant slaves; and it is equally difficult to imagine that the few so-called great architects who have flourished from Palladio down to his disciples of this century were men of more technical learning than Callicrates and Ictinus, the reputed architects of the Parthenon. The fact is, that it is hazardous to take literally all that the writings of antiquity leave readers to assume. Plato, the pupil of Socrates who is said to have defined the connexion between the useful and beautiful, must have appreciated a good building when he chose to lower his eyes to look at it. Indeed, it is not unlikely that he twitted the workmen of his time with their inability to produce anything as good as the Athenian Propylæa, and that his criticisms of the æsthetic excellence of the Parthenon fell disagreeably on the unwilling ears of his contemporaries.

The contemptuous manner in which the ancient philosopher treated architecture,—if he is to be judged by his writings,—affords perhaps an excuse for the treatment it sometimes receives at the mouth of the modern one, and if Greek architecture flourished in spite of it, modern architecture may yet do the same. It is better for an art to be removed from the sympathy of those who do not understand it, than that they should impede its progress by illiterate admiration. But no one, except professedly, could misunderstand the art of Athens at the period of her supreme beauty, for she could never have been what she was unless, as M. Viollet-le-Duc has put it, an atmosphere favourable to its development had existed. Most people then must have understood the component parts of the buildings amongst which they lived. There was no mystery about them, no need of inquiring to what style each belonged, or whence an innovation came. A Greek portico tells its own tale at a glance, and how it is supported, what is its use, or what its ornament implies, is patent to all who look at it even in ruins and in the midst of ruins at the present day. The eye is not puzzled with any apparent *tour de force*, but, on the contrary, the mind is immediately seized with the simple and natural character of the means employed to effect the desired end,—a column was absolutely a point of support, an architrave honestly a double lintel the crown of the cornice an overhanging eaves, surmounted by a marble or terra cotta eaves-gutter. There was nothing very new in these details, since other countries had long had columns and lintels, and projecting eaves. If refinement ultimately distinguished a few buildings for a few years, that was not achieved until after borrowing of forms and methods from other and older communities,—after repeated study, travel, and practice by generations of men during several centuries.

If the ancient philosophy pretended to deny its services to architecture, the modern philosopher has been equally unkind to the architect. However both impartial critics may be to make an invidious comparison between Sir Edmund Beckett, Q.C., and Plato, it is impossible to doubt that the philosophy of both tends in a different way to a like contempt for the architect, and between the two he morally tumbles to the ground. "Dismiss," said Sir Edmund, some few months ago to the Institute of British Architects, "all grand ideas of new styles and the poetry of art, and the philosophy of architecture, and all that kind of thing; and, whatever you do, do not call yourselves artists. An artist is a man or woman who executes, whether he more or less designs, besides. . . . . You are artists in respect of your drawings, but not in respect of the buildings made from them. . . . . All the fine talking in the world cannot and need not make anything better of an architect than a designer of buildings." Truly a sad prospect for those who fancy they can see something mentally ennobling in the efforts of true architecture,—a much more unhappy state of things than even Mr. Ruskin has yet succeeded in seeing. Nor is Bacon, practical man as he was, less uncompromising in his opinion,—and we again ask pardon for mingling the names of Bacon and Beckett,—for he actually suggested in "The True Greatness of Kingdoms and Estates," that, as in Sparta, Athens, and Rome, slaves did the sedentary and within-door arts, so now slavery is abolished "that which cometh nearest to it is to leave those arts chiefly to strangers. . . . . and to contain the principal bulk of the vulgar natives within those three kinds, tillers of the ground, free servants, and handicraftsmen of strong and manly arts, as smiths, masons, carpenters, &c." Poor architect! who in Greece, as some say, was a slave and did great things; who in Mediæval Europe, as others say, was a master-mason, and did great things; whom Bacon would have chosen from

among aliens and foreigners, and whom a little later the Italian chose from among painters and sculptors; poor architect! that to-day in all seriousness many excellent and thoughtful people would sweep off the face of the earth.

And, forsooth, What is modern architecture? In this progressive and utilitarian age such a question is over and over again insinuated, not asked, by even enlightened men, and it is a most difficult query to answer; indeed, it is one rather to be illustrated by a parable. Thus, on the river Medway, about a mile from Maidstone, may be discerned, in the midst of gravel and sand heaps, a temple similar to many of those which, on the banks of the Nile, have charmed travellers in all ages. It is a cemented one-story building, with raking sides surmounted by a gracefully-curved overhanging cornice; and, contiguous to it, is a brick obelisk of thoroughly orthodox shape and termination pointing proudly heavenwards. In the one is concealed a steam-engine, and through the other rises the smoke of its fires, and both are connected with the waterworks of the Kentish metropolis,—buildings as useful as any which a Local Board can be called upon to devise, or on which architect or engineer can display a neat appreciation of antiquity. Taking things brutally and generally we answer,—That is modern architecture. And although some people may smile at such temerity, it is at least doubtful whether a hollowed obelisk is much more ludicrous than many of the buildings with which archæological research has lately endowed all the countries of the globe.

The Greek and Mediæval architects borrowed, their modern brethren have simply copied, and in their copying have flitted from one country to another, from one age to another, with the confident haste of superficial observation. Up to the advent of Palladio, the architecture of all Europe had followed certain cognate traditions, had been the speciality of no nation or men, had been guided, in fact, by common-sense rules and even natural laws, the property of every one. Then it was that an educated minority, dangerously possessed of a little learning, read Classical literature,—for, indeed, there was little other reading to be got,—and probably "talked" ancient architecture. The still living remnants of that art which flourished and was perfected before the speculative Greek philosopher pretended to ignore or depreciate its value, were doomed as soon as the pedants of the sixteenth century took them in hand. They lingered for a while, thanks to the workmen, who could not be taught to forget early traditional training. Indeed, some of the buildings of the Italian Renaissance seem to be less the work of a copyist than of a genuine borrower. The French,—a minority of whom, under Francis I., greedily appropriated Classical spoils,—clung to their artistic traditions almost as late as the age of Lewis XIV. And, although the splendid hypocrisy of that reign was reflected in each successive building through the length and breadth of Europe; although "slices of pilasters" and "bits of rustic" were even then fashionable in England, the new spires, then rising, of the English metropolis retained enough of native tradition to preserve their vitality as works of architecture. The domestic buildings of the reign of Queen Anne were well and truthfully put together under a pedantic guise. A little more learning and a great deal of increased pedantry were yet wanted to sever the weakened chain; and to Pope and Lord Burlington may be attributed the glory of having thoroughly broken it. With "Athenian Stuart" and Lords Aberdeen and Elgin came in and progressed the affected yearning for the "correct" and truly Classical in art which distinguished the close of the last and the beginning of the present century. Æsthetic upholsterers consummated the general ruin in the "*Style Empire*," and to the "poets and romancers" of the fourth George is due the reaction which immediately followed in favour of sentiment and "the picturesque." Almost every known form of architecture has been reproduced within the comparatively small compass of our island during the course of this century. Had the Assyrian marbles been brought to Europe fifty years before they were really landed it is probable that an attempt would have been made to reproduce some of their peculiarities on a small scale in the buildings of this country, just as the new-found beauties of Japan have been worked up in the "original Mediævalism" of the day. Façades of Egyptian character are still to be seen not only in London, but in places as remote as Cornwall; and as late as last week a successful explorer in Asia Minor ventured to tell an audience met to hear a lecture upon Egyptian architecture, that from experience in New York he considered it a "style" peculiarly adapted for gaols and similar buildings. As each new book or collection of drawings of any novel kind of architectural art has been presented to the public an ephemeral cultivation of it has taken place. The close imitation of Greek was followed by an equally close imitation of Italian, then of Gothic, buildings. There had been a combination called Græco-Roman; an Italian-Gothic combination was therefore inevitable. Nothing lasted, and a chronic compromise usually ensued. A house in the middle of a park might be in the Italian style, but the lodges at the park entrances might appropriately take a Gothic form. Churches and even chapels, it was said, might have high-pitched roofs and pointed arches, but town-halls and public offices must have low roofs, or none at all, and round arches. Bitter animosity was felt by the disciples of what were called the Pagan and the Christian schools. Men of intellect actually quarrelled over the merits of an arcade, or the origin of the pointed arch. The general antagonism endured until very lately; and only three years ago Sir Gilbert Scott deemed it worth while to allude to the two "camps." Even a Prime Minister has joined in the abortive discussion. Mr. Gladstone made a happy hit at the national weakness of employing a Classical architect to do Gothic public buildings, and a Gothic one to decorate Classical churches. But an extraordinary caprice has at length half settled the matter; and if it did not come from France it is supported by French models. A pupil of M. Millet, the well-known restorer of the Château of Francis I., at St. Germain, was induced to measure and draw certain "Châteaux, Palais, et Maisons" erected in France between the reigns of Henry II. and Lewis XIII., and what is more to publish his geometrical drawings to scale. M. César Daly had also completed the publication of his "Motifs Historiques." These fell loosely upon the profession of architects at the very moment when a few of their number had unconsciously started what is now known in auctioneering phrase as the "Queen Anne Style." This last, or at least latest revival, will follow doubtless the prescribed course of rise, progress, and decline before the abuse of archæological research by those who never think can be made to give place to useful and afterwards beautiful architecture by those who do. Each successive adaptation, according as fashion—and may we be forgiven the term—decreed, has helped, however, to confirm a belief in the common origin of all architectural forms. It used to be urged on the contrary that a different system guided the construction of different buildings at different periods, and that the education suitable to a man who is to devote himself to the designing of Gothic churches must necessarily be of a different character to that required for the construction of a Greek or a Roman edifice. Pages upon pages have been written to prove that it was wrong to reproduce, however perfectly, a Greek temple by men who, at the very moment were reproducing, with equal ability, Mediæval churches. Both procedures have separately and at different times been proved correct, as if an architect had only to ascend to the top of a high mountain, and—were it physically possible—to survey the countries of the world, in order to choose the particular building he thinks may please his employer. It is inconsiderate, therefore, to be angry with the critic or amateur who, intuitively conscious of the effect produced upon earlier communities by the language of architecture, fails to find in comparatively modern edifices any language at all. Although a low-caste Hindu knows the meaning of the carving upon the shrine at which he worships, cultivated English civilians can make nothing out of the "Gothic" of St. Paul's Cathedral in Calcutta. Few men stop to inquire about the story which is told within the pediment of the Royal Exchange; it would be tedious to attempt to decipher the façades of the Houses of Parliament. Within the last few months it has been discovered that certain new statues placed in an old cathedral in the West of England really meant something, and they have been hastily removed. Year after year the eyes of the country are attracted to fresh novelties, but its mind is not affected by them. Yet, according to Mdme. de Staël, "a fine monument of architecture is the only work of art which produces on the beholder an effect similar to the wonders of nature." No mere copy, however admirably executed, of however sublime a building, can produce that effect upon him who knows the original; to him who does not know it, the copy can only be an object of wonder, and the story imitated upon it an enigma which only the curious care to solve. Indisposed as many people may still be to admit it, there is quite as much genius displayed in Blenheim Palace as in the best recent châteaux of Gothic fashion; and some satirist may yet appropriately apply to more than one modern practitioner the harsh epitaph which Pope flung at the body of Sir John Vanbrugh:—

> "Lie heavy on him, Earth, for he
> Laid many a heavy load on thee."

There has been no lack of writers during the last thirty or forty years to tell the architectural world of its false aspirations. But the truth before it reaches its destination must be constantly repeated by many voices and pens. The proverb of "*de gustibus non disputandum*" is at the bottom of all the wrong notions about art that are now flying over the world. If it hold good with respect to taste, and we quote Lord Kames in his well-known "Elements of Criticism," "it must hold equally true with respect to the other external senses. . . . It may be resolved into the following general proposition that with respect to the perceptions of sense by which some objects appear agreeable, some disagreeable, there is not such a thing as a good or a bad, a right or a wrong." "But the Fine Arts," he continued, "are a subject of reasoning as well as taste." According to M. Viollet-le-Duc, the sentiment of pure and cultivated taste is merely an involuntary effort of the reason which does not find vent in expression. In April, 1864, Cardinal Wiseman, who talked well upon art matters, said to an audience at the South Kensington Museum:—"An additional clear deduction from observation of the past is this, that wherever monuments have been left us of architectural power and grandeur, these qualities have been exhibited in a characteristic style according to national types not varying from age to age, still less from year to year. There was a principle in architecture distinct from taste,—the second might change, but the first was invariable." Again, the reply to a critic which is to be found in the first volume of the "Stones of Venice," is equally destructive to the supposed unanswerable argument of taste:—"The writer," says Mr. Ruskin, "noticed my constant praise of St. Mark's. 'Mr. Ruskin thinks it a very beautiful building! We,' said he, 'think it a very ugly one.' I was not surprised at the difference of opinion, but at the thing being considered so completely a subject of opinion. My opponents in matters of painting always assume that there is such a thing as a law of right, and that I do not understand it; but my architectural adversaries appeal to no law; they simply set their opinion against mine; and indeed there is no law at present to which either they or I can appeal." This maxim that there is no disputing about taste covers every sin in works which paradoxically enough are the constant and ever-recurring subject of dispute. "When judged from their own point of view," says Mr. Fergusson, "we can never hesitate for a moment in estimating the relative value of any production of the Egyptian, the Classical, or the Mediæval schools; . . . . but when it is a question whether Egyptian or Classic or Gothic designs are to be adopted for modern English purposes, then indeed *de gustibus est disputandum*." It would, however, be tiresome to enumerate the reiterated opinions of learned men upon the unvarying nature of all true architecture of every nation and of every period of history until the close of the sixteenth century,—and so tiresome is it that the old bias and the young laugh when a reference to "true principles" crops up at any professional gathering. Perhaps, however, the recent coalition between Greek and Goth, which Mr. Barges and Mr. Pullan strengthened during the Conference of Architects just concluded, points to an inclination to generally accept the conclusions arrived at long ago by both M. Viollet-le-Duc and Mr. Fergusson, and by the *Builder* long before them,—to admit, in fact, that neither Greek nor Gothic buildings are in themselves worthy to be copied, but that the principles upon which they were constructed are identical in their origin, and took a similar course in their development; and that these principles are the only things which can be safely imitated in the design and construction of modern buildings. It is something to have been able to declare, as Mr. Pullan did amidst the approbation of a professional audience, that a truce has been con-

cluded whereby "champions amongst the Goths walk into the tents of the Greeks, and prove their armour. . . . . Views on matters connected with our art have become broader and more liberal. . . . . The fundamental principle of all good architecture was the common-sense one of employing the best construction that the materials at the disposal of the architect and his knowledge of construction permitted, and of decorating the constructive features in the most appropriate manner."

Progress in architecture, however, is not likely to become a fact, unless thoughtful persons will try to regard a building as something more than a mere mass of materials put together according to the principles upon which buildings were erected two thousand or five hundred years ago. One of the objects of architecture is to make people comfortable. A man who chances at a theatre to be placed behind a column or other similar obstruction,—the right of every spectator being to see uninterruptedly the actors on the stage,—is justified in condemning such an obstruction, and to blame the architect for having put it there. Let him go further and inquire the use of the columns and piers which are too often mere obstructive accessories in many a modern building. Some thirty years ago he would have been told that the column was a part of the "order," and that without the "order" it was impossible to give any definite character to the architecture. It is even now admitted, perhaps indirectly, that the reason for filling up the interiors of modern churches with columns and arcades is that they are "in the style." No one denies that a large building in which every worshipper might see and hear the priest at the altar, or in the pulpit, or anywhere else where service is conducted, could be as easily and as economically built without such obstructions if "the style" permitted. This is possibly carrying the exigencies of reason too far, because Christian traditions impose certain arrangements of plan which modern worshippers are willing to maintain. We may, however, for the sake of example, suppose that the two Houses of Convocation require a building in which to assemble. To construct a huge many-sided edifice of two stories, vaulted upon a central support, because the Mediæval Chapter-houses were so built, would be to defeat the object for which the building was erected,—that object being for the members not only to see each other, but to read and write, and discuss; therefore, the nearer they get to each other in the centre of the hall, the better for the purpose for which they meet. To descend to details, it is very desirable, under both an English and an Indian sky, to have a covered portico or carriage-way to a public hall, or even a private mansion, but carried up, as it sometimes is in both countries, to the full height of a building, it is not a covering at all, for both rain and sun beat in between the columns. Again, the object of rearing a canopy, in architecture, is to protect something under it. Archæologists who urge that the centre of the Parthenon was open to the sky, hint that perhaps the huge figure of Minerva was protected from the elements by a canopy; but it must have been a much more practical piece of design than the sentimental coverings which were placed over the heads of statues in the Mediæval cathedrals. An Albert Memorial on the summit of the Acropolis, with a statue, not of bronze and gold leaf, but of wood, ivory, and precious stones, would require an absolute defence to it against sun and rain. More homely instances may be cited. The Greek, in his temples and public buildings, did not make use of any pipe to convey rain-water from the roofs to the ground. The rain fell naturally from the gutter through the open-mouthed heads of animals sculptured or cast upon the outside of the gutter itself. The world has preserved the heads as meaningless ornaments to the Classical cornice, for in modern buildings no roof is ever drained, except by rain-water pipes. Modern sculpture and decoration are similarly illogical, and, as it were, with artistic consent. By the Greek, certain trees and certain animals were held sacred, and he manifested his respect in portraying upon the walls of buildings ceremonies connected with them. In the Middle Ages people had much the same habit, although in a purer fashion, of appealing to God through images and devices upon walls and windows. Greek and Gothic architects gave a faithful delineation in marble and stone of the customs respectively of their time; and thereby, thanks to archæological science, all modern communities have been enabled to learn something of both, yet, strange to say, Pagan and Mediæval *motifs* and symbols,—most necessary to those who could neither read nor write,—have been the principal, if not the only, ornaments used to adorn buildings erected in England during this century! No revivalist of either architecture, however, can safely reproach the other, for if British statesmen have been made to figure as tyrants and philosophers, modern bishops and curates are even now going down to posterity in the garb of early saints.

"ARCHITECTURAL STYLES."

A TRANSLATION into English of a full and yet tolerably compendious exposition of the characteristics of the principal known styles of architecture, by an able German writer,* is here offered to us as a desirable and useful addition to our architectural literature. One special reason why it should be so is mentioned in the short preface inserted in the English edition from the pen of Mr. T. Roger Smith, who observes that its claim on our attention rests not only on the comprehensive range taken by the author, but on the fact that it presents the subject from what is at present, to English architectural students, almost a new point of view. This consists in the fact that the author looks at his subject from the standpoint of "an academic and classical professor, and one brought up not only in familiarity with the best examples of ancient art, but with the habit of mind which recurs to classic and especially to Greek originals, both as a standard of taste and as models for the architectural treatment of modern works." This feeling is scarcely represented by any of the writers on architecture whose works are best known and most reputed in England at present; Viollet-le-Duc and Ruskin have, to the younger generation, effaced Chambers, Soane, and Cockerell. It may be that the present term of study and thought is more fruitful for modern architectural development than that of the old Classic school; we are disposed to think that it is so. But the classic and academic view of architecture is an important phase, to say the least, in the history of modern architectural theory and study, and in a certain sense it will always remain one side of the truth about architecture, though there may be great difference of opinion as to its relative value.

We have not unfrequently been asked by persons who wished to know more about architecture for the title of a work which would give them all the information and illustration they desired, without making too great a demand on their time. To expect busy people unconnected with the profession to read such a book as Mr. Fergusson's exhaustive "History" (if one may, by the way, apply such an epithet to any book on a subject which is practically inexhaustible) is out of the question: and though various more or less able short treatises on principles and styles of architecture exist, they are mostly very inadequately illustrated: and without full illustrations little idea is conveyed to the mind of a reader not acquainted with architectural terms and forms. The book we here speak of perhaps comes nearer to supplying the desideratum than most works we have seen in the language It is comprised in one moderate-sized volume; it is fully, and, on the whole, well illustrated by plans, perspective views, and details; and it furnishes readers with the general outline and characteristics of the main styles of the world, without perplexing them with too many examples or with theories and reflections which do not directly elucidate the main facts brought forward. The object of the book, in fact, is distinctly stated to be to give information, not to enter into critical dissertation; and consequently little or no mention is made of any theories as to genesis or relation of styles except those which are so generally accepted as to have passed into the category of historical record. Something more than this is necessary no doubt to the right understanding of architecture; and a short introductory essay on the main principles of the art would have been a useful addition, as giving a standing-ground from which to criticise the whole. But it was just as well not to embarrass the bulk of the historical illustration of styles with theory. If through the help of such a volume, we can get the reading public to recognise more clearly the individualities of the leading architectural styles, something at least will have been gained.*

There are, however, serious drawbacks to the acceptance of the work here offered, as a text-book for English readers on the subject of which it treats. To begin with, there is a most unfortunate blunder in the classification of styles in the book, and one liable to mislead all who are not already sufficiently acquainted with the subject to be aware of it. The three sections or "books" into which the volume is divided are respectively headed, "Ancient Architecture," "Romanesque Architecture," and "Modern Styles." The first book includes everything before the Christian era†; the third, everything from the Renaissance to the present day; the second, everything from the Christian era to the close of the Mediæval period. Of course, the employment of the term "Romanesque" in so extended a sense, is completely at variance, not only with the habitual phraseology of English architects and critics, but with the facts and relations of architectural style, as considered from the æsthetic point of view. However you may trace the links which eventually connect Mediæval architecture with Roman, it would be absurd to use such an expression as "Romanesque" of the late Gothic styles, from which every reminiscence of Roman influence has faded. For the benefit of the publishers, the readers, and the translator of the book, let it be here plainly stated that the term "Romanesque" is applied (rather vaguely, perhaps) to that phase of round-arched architecture prevalent in great part of Europe from about the sixth to the tenth, or into the eleventh century, in which the circular arch, and not a few of the architectural forms and details of Roman architecture, are retained, while mixed with a great deal of the manner and spirit, in detail and construction, which subsequently developed into the Gothic style in its complete form. Whether what we know as "Norman" architecture should be included in "Romanesque" or "Gothic" would depend a great deal on what we regard as the really characteristic element of Gothic; probably it is more logically defined as Gothic; but, at all events, there can be no question that when the pointed arch is once fairly established there is an end of the Romanesque element, as we all understand the term in England; and, therefore, even if this classification of Gothic as part of Romanesque were accepted in Germany, it should have been modified for English readers. But the fact is, that the whole thing is a jumble of the translator's. In the original German edition, the author heads his first and second "Books," "*Die vor-Christlichen Baustyle*," and "*Die romantischen Baustyle*"; that is, literally translated, "the præ-Christian styles," and the "Romantic styles." Then, under the latter head come the subdivisions, such as "*Die romanische Baustyl in Allgemeinen*" (the "Romanesque style in general"), "*Die normännisch-romanische Baustyl in England*" (the "Norman-Romanesque in England"); the "Pointed-arched styles" forming the concluding subdivisions of this "Book," but all under the general head of *romantisch*. Now *romantisch* is not "Romanesque," but "romantic," a word often used by German critics (and sometimes now by English ones, who have borrowed this use of it from them), to express one of the two great divisions under which all art and literature since the Christian era may be grouped; the "Classic," which is subjected to strict laws, and in which form is of pre-eminent importance, and the "Romantic," which represents the more free, wild, and imaginative art in which colour and effect predominate over strictness of form. On this supposition the classification of Rosengarten would be, in fact (as might be expected from a German critic), a very broad and philosophical one. Whether he intended it precisely in this sense it is not easy to say; it would not be quite beyond

* A Handbook of Architectural Style. Translated from the German of A. Rosengarten, by W. Collett-Sandars. With 639 illustrations. Chapman & Hall.

* It is really astonishing, we may here observe, what complete ignorance of the features of different styles is often evinced by those who are in general very well educated people, and who would on no account own to the same kind of ignorance in regard to music or literature, for instance. Not only so, but the want of any attention to the subject renders even the perception of the differences between styles beyond the power of many such observers. It seems almost incredible that persons of generally educated tastes, and with the power of vision and of reasoning, should absolutely be unable to perceive any incongruity in a Renaissance reredos, for instance, placed in a Gothic church, or to recognise that the two are composed and ornamented on different principles, but we have had evidence of this kind of style-blindness not unfrequently. The eye, after all, sees only what it has been taught to see.

† Except that the Indian styles are included in this book, though some of the examples given belong to a late period of the Christian era.

criticism, because there is no doubt that the Indian styles, which are not included in the second Book, but in the first, ought in that sense to come under the head of "Romantic" architecture, although it is obvious there would be a certain anachronism in applying the term to the earlier of them. Perhaps the best translation for English readers would have been "Post-Roman styles." At any rate, it is quite certain that "Romanesque," as the heading of the second Book, is in every sense wrong, and that by overlooking the important distinction between *romantisch* and *romanisch*, and translating them both by the same word "Romanesque" (which is the correct equivalent of *romanisch*), the translator has conveyed to all readers of the English edition a wrong impression upon an important point in architectural history and classification, besides crediting the German author with a mistake in the same direction which he certainly never made, but which, nevertheless, is actually referred to in the English preface as a special point in the book.

There are other peculiarities in Rosengarten's book which ought to have been noticed in introducing it to English readers. It should have been pointed out how meagre and out of date is the first chapter on Indian architecture, and that the only illustration given of that important form of Buddhist architecture, the "tope" (the small engraving, fig. 7), is both inadequate and, as regards the principal specimens, incorrect in form, for the walls of the typical tope do not batter inwards at the lower portion of the structure, as shown there, and could not stand, on a large scale, if they did. A more important point is the view which is taken of the Pointed style. It is perfectly absurd that a book should be published in England for the instruction of English readers on the characteristics of architectural styles, in which that style is described as the "Gothic *or German* style," and in which the illustrations of Gothic detail are taken in a majority of cases from the inferior and wiry detail of German Gothic, and the western façade of Freiburg Cathedral is offered as a typical specimen of the "soaring effect" of Gothic architecture. That is exactly what the Freiburg building does not illustrate; because, in place of the genuine and apparently natural and inevitable growth and development of one portion from another, which is the characteristic of true Gothic in its purest form, the lantern and spire at Freiburg are planted on a substructure with which they have no connexion, and no similarity of treatment or manner; not to speak of the hard and prosaic style of the whole. A reader who took up this book to gain some acquaintance with the characteristics of the Pointed style would derive an utterly wrong notion therefrom; he would merely see the style through German spectacles, and in place of its real beauties would only gain a knowledge of some of its failures, or at least of its secondary and partial successes. The German builders never really grasped or worked out the Pointed style in its finest capabilities, and the German mind has never appreciated or sympathised in its central and most poetic forms. Where German architecture is great is in its early round-arched or Romanesque style, which exhibits a union of solidity and grandeur with diversity of outline to a remarkable degree, and which, as Mr. Fergusson has observed, might have been developed into a very noble round-arched Gothic style. But "soaring" is not the prevalent quality of the German mind, and the Pointed-arched style, with its vertical tendencies, never received from them more than a half-hearted allegiance and an imperfect development. It is amusing to find in the chapter on the "Architecture of the present Day," the author's opinion as to the unsuitability of Mediæval architecture to the present period (an opinion we are by no means disposed to quarrel with *per se*), fortified by the reflection that "when the highly-gifted Schinkel only partially succeeded in attempts like these, it is not to be wondered at that less distinguished architects, who have but enjoyed a one-sided and deficient education, should not have attained satisfactory results in the endeavour to adapt this style to the every-day requirements of the present period." Now, the fact is, that "the highly-gifted Schinkel" never had, as his few attempts at it sufficiently prove, the slightest sympathy with the feeling of Gothic architecture, or comprehension of its peculiar poetry and beauty. If the question is to be debated whether revived Mediæval architecture can or cannot meet the tone and taste of modern times, and give rise to great and beautiful buildings which will be permanently admired, the controversy must at least be based upon some better specimens of what can be accomplished in this way than those left by Schinkel, who was, in fact, a beautiful draughtsman, with a great knowledge of classic art and uncommonly little feeling for architectural effect or expression, apart from sculpture and decoration. A characteristic indication of the German view of the subject occurs in the same chapter, a page or two further on, where it is observed that the buildings erected in the modern period in England differ essentially from those erected in similar styles in other countries, and that one characteristic of the English buildings erected in the Gothic style is "a deficiency of strongly-marked architectural keeping, for both main and subordinate features are generally irregular. In most cases the whole group is highly unsymmetrical, and the tower is at one corner, by which a picturesque effect is aimed at," and an illustration is given of this in a bad engraving of "A Memorial Church in Scotland," which, though not by any means a specimen of what our best modern Gothic architects produce, is at least a long way in advance in feeling and effectiveness, of anything generally produced in the same style by the compatriots of Schinkel. At the same time, it is not unwholesome to be reminded that unsymmetrical arrangement is not in reality by any means so much a part and parcel of Gothic architecture as it is the fashion to think in England, as we have often taken occasion to observe in our own columns. Modern English Gothic is further illustrated by what is complacently called "A View of the New Houses of Parliament, London, from the River," a statement for which the representatives of Sir Charles Barry might bring an action for libel against the publishers with every chance of success. It is a wretched engraving, representing one corner of the building, next to Westminster Bridge, the two towers and the river front being left out of account altogether. It is vexatious to think that this should have gone forth to German readers as an illustration of one of the finest of modern buildings. In England, where every one knows the building, it is of less consequence; but, for the credit of the publication, a better illustration should have been procured, or this one omitted altogether.

Other illustrations in the book are by no means so unsatisfactory as these. Almost the whole of what relates to Greek art and the styles directly connected with it is exceedingly well done, and fully illustrated with engravings of considerable finish and merit. Two remarks with reference to Greek architecture we may note. The one is that "the embellishments in the Grecian style uniformly assist in bringing out the intention of the mouldings, in such a way that the magnificence of Greek ornament never, with all its richness, runs counter to the simple, moderate, and practical character of the style; for the repetition of each scheme of ornamentation in form and adjustment fulfils to a certain extent that office for architecture which metre does for poetry." The other is in regard to the now undoubted fact of the introduction of polychromy on Greek buildings, about which Herr Rosengarten remarks that "this painting probably took place only in certain parts and details, in order to bring out the architectural form; as, for instance, in the case of mouldings, or in the frieze, to set off the sculptures. The temple, as a whole, appeared in the natural colour of the stone; and the artificial colouring, which was generally dark blue and dark red, though confined to subordinate details, contributed greatly to the general effect." An engraving of a portion of a Doric entablature, frieze, and cornice is added, attempting a restoration of this portion of the building, with the painted ornament, in a manner which has a very good effect and seems not at all far from what we may presume to have been the method and principle employed. What we would draw attention to is the author's theory of the partial employment only of the colour, leaving the marble as the ground,—a theory which seems to us far more credible, and more in accordance with the refined æsthetic sense of the Greeks, than the idea, supported though it has been by able English critics, that the marble surface of such a building as the Parthenon was entirely covered with pigment; and which seems contrary both to true taste and common sense.

The Roman style, and the styles of the Renaissance, are also well and fully treated and illustrated; in fact, it is a result of the classical leanings by which the author, in common with most modern German architects, is possessed, that all which is closely connected with Classic forms receives his attention and sympathy, while Gothic architecture, the greatest building style that the world has seen, is dismissed with comparative brevity and with insufficient and one-sided illustration, in which inferior types of design and detail are illustrated as if they were representative. The remarks on architecture of the present day show very insufficient acquaintance with contemporary English work.

In short, what Rosengarten's book required, in being presented in an English dress, was to be thoroughly well edited; portions containing ideas which are now superseded brought up to the level of the information and critical theory of the present moment, and misrepresentations which result from the exclusively German views of the writer corrected or counterbalanced. None of this has been done. The book is put before us in a translation which evinces in various points an insufficient acquaintance with the subject on the part of the translator, and preceded by a preface which says nothing to counteract any relative or positive defects in the book, but merely pats it on the back in introducing it to the English reader. Under these circumstances, it is impossible to regard the "Handbook of Architectural Styles" as really filling a gap in regard to English architectural literature which, had the translation been efficiently edited and annotated, it might very well have filled. As it is, we can only say that it may be useful as a popular treatise till a better one comes to fill its place.

OPENING OF THE NEW VICTORIA BATHS AT PECKHAM.

THE large new public baths which have just been erected in St. Martin's-lane, Peckham, nearly opposite Rye-lane, have been formally opened. The buildings, including those which inclose the baths, together with the engine-house and offices attached, cover an area of nearly two acres in extent. There are two large swimming-baths running parallel with each other. The first-class bath is 140 ft. long, and 60 ft. wide, with eighty boxes for bathers fitted up around the water's edge. It is coverrd in by a wooden and glass roof, with an open lantern light for ventilation purposes, running the entire length. A balcony for spectators, with a frontage of iron trellis work, is carried round the bath above the bathers' boxes. The second-class bath is larger than that just described, being 160 ft. in length, and 60 ft. in width, and fitted with 140 batbers' boxes. The roof and open lantern light are uniform with the first-class bath. The baths have a continuous supply of water from an artesian well, 300 ft. in depth, which has been sunk on a piece of ground immediately attached, in connexion with which an engine-house has been erected, with a pump sufficiently powerful to lift 25,000 gallons of water per hour. Provision has also been made for securing the water supply to the baths, in the event of a break-down of the engine, by laying down a number of pipes connecting the baths with the street mains. In addition to the swimming-baths upwards of forty private warm and washing baths have also been erected in a separate portion of the building running parallel with the first-class swimming-bath, on the west side. A large area of land on the north side of the baths has been reserved for a skating-rink, which is about to be constructed.

The baths have been designed and erected by Mr. Higgs, sen., the freeholder, formerly the senior partner in the firm of Higgs, Hill, & Higgs, builders and contractors. They have been designated the "Victoria Baths."

Drainage of Public Buildings. — In the House of Commons, on the 8th of June, Mr. C. Denison asked whether the rumour was correct that the new Public Offices, owing to carelessness on the part of the builder or architect, were most defective in their drainage, no communication having been made between the drainage of the buildings and the main drain in the street. Lord H. Lennox said the drainage of the Home and Colonial Offices had been found on one or two occasions to be in a very deficient state, and, of course, the person responsible was the architect who designed, and under whom the contractors built,—namely, Sir Gilbert Scott. His (Lord H. Lennox's) attention was called to the matter, and in an incredibly short space of time the evil was remedied, as far as possible.

PICTURES BY THE LATE L. R. MIGNOT.

A VERY remarkable collection of pictures is at present to be seen at No. 25, Bond-street; remarkable both for their artistic and poetic feeling, and for their distinctive character in regard to subject and aim. From time to time allusion has been made in our columns to stray works by Mignot, included in various exhibitions that have been noticed by us; but those who had only made acquaintance with the artist's works in this accidental manner will probably be surprised, as we were, at the impression they produce when seen collectively.

Louis Rémy Mignot was not a Frenchman, as is sometimes supposed from his name, but a native of Charleston, South Carolina, where he was born in 1831. At the age of sixteen he was sent to Holland, and placed in the studio of Schelfhout to learn the processes of the art which he wished to follow; we say "the processes" merely, because the style and feeling of his painting seem to be entirely his own, the result of the influence of the brilliant South American scenery upon an artistic and sensitive nature. His first artistic reputation, it is true, was gained in New York, and as a painter of North American scenery; but the really distinctive quality of his genius appears to us to have been developed by his visit to South America in '58, which gave rise to some of his finest and most original productions, and seems to have had a permanent influence in defining and developing his style. In 1862 Mr. Mignot came to England, ostensibly *en route* for India, where he proposed to himself to make the painting of Himalayan scenery his object: an intention which we regret was never realised, as he certainly had peculiar faculties for dealing with such a grand phase of landscape, so little treated by landscape-painters hitherto. Various circumstances, however, determined his stay in England, where he continued for the most part to practise his art till his death in 1870.

A specialty of interest is given to the exhibition, partly from the fact that in some of the most important works we find ourselves on ground unfamiliar to the English student of landscape. The characteristics of South American scenery have scarcely ever been set before us by an artist of genius, and even North American scenery, more accessible and better known, cannot be said to have furnished much as yet to the higher achievements of landscape painting. The great central wonder of Niagara has been the occasion of a great deal of rubbishy and common-place painting. No one can complain of common-place, at any rate, in Mignot's remarkable illustration, painted from the tower in the rapids above the Falls, and placing the spectator on the brink, as it were, of the precipice over which these turbid heaps of water are just about to discharge themselves, in a manner that is almost startling. A large picture of the Falls from below, with a mass of rock jutting out into the foreground, promised to be equal in effect to the other, but was never completed. The South American scenes, such as the "Tablelands of the Rio Bamba" (34), "Incense-breathing Morn" (46), "Moonlight in Ecuador," and "Sunrise in Ecuador" (102–3), are so much out of the beat of most English experiences of landscape that one must receive them in faith rather than in a spirit of criticism. But that they are genuine translations of Nature one is led to believe, not only from the evidence of thought and labour in the artist's style, but from comparison with the truthfulness of some other scenes more familiar to us. Look at the powerful little work representing a ruined cottage in Warwickshire, under the title "Desolation" (120), and we have in the perfect truthfulness of its tone and details an indication that the artist is to be trusted. A comparison of this with the splendid piece of glowing effect in the small "Sunset Study" (55) is sufficient to show Mignot's innate power and versatility, and his capacity for grasping the predominant feeling of a scene. No two subjects could be more utterly distinct in nature and in feeling than these, yet both are treated with equal power, and with a complete individuality of style.

The other quality which gives a certain specialty to Mignot's landscape-painting is that the best of his works combine in an unusual degree a feeling for the poetic aspect of landscape with a conscientious effort after truthfulness of representation; a combination not very common. Those who look with attention at the small painting of the "Valley of Meyringen" (36), for instance, will be surprised to find what delicate *nuances* of treatment, of colour, of aërial perspective are to be detected in this quiet and unpretending-looking picture. On a larger scale the same qualities are discernible in "The Lake of Lucerne" (29), and the large view of the "Jung-Frau" (2), a remarkably successful effort of realistic painting of a scene of this kind without hardness, and without losing the sense of distance and scale.

In illustration of the truly poetic feeling of the artist for suggestive aspects of landscape may be mentioned some of the small works in which a single chord of feeling is struck, such as a "Farm View in Warwickshire" (4), "Storm over Kenilworth Castle" (13), "Sunset Study, North America" (14), "Solitude," a rough sketchy painting of much power, representing a solitary rock in the midst of the ocean (22), "Sunset on the Pacific" (37), "Closing Day, South America" (62), "Winter View" (41), and others. A very striking and almost unique picture is that entitled "Thunder,—North America" (39), in which the aspect of sky and landscape, and even the *feel* of the air just before the crisis of a thunderstorm are remarkably conveyed.

The collection does not comprise anything like the complete works of Mignot, but enough are shown here to give a better idea than most persons in England, we imagine, have formerly had of his real power as a landscape artist. The collection has been got together by the exertions of the artist's widow, who has been desirous thus to obtain a wider recognition of her late husband's powers,—an effort which will have the sympathy of every one, on other besides artistic grounds.

GENERAL CONFERENCE OF ARCHITECTS.

As was briefly stated in our report last week, a general meeting of the members of the Conference was held on Thursday, June 15th, at three o'clock, on which occasion Mr. John Whichcord, F.S.A., presided, when the subjects of the papers were, "General Building Regulations for the United Kingdom," by Mr. J. Honeyman, of Glasgow, and Mr. J. Clarke, C.E., of Liverpool; and on "The Registration and Classification of Houses," by Mr. Henry Parsons, of London, and Mr. J. Sellars, of Glasgow.

The Chairman said they had to consider two very practical subjects, and he was very pleased to find that three out of the four papers to be read were by gentlemen from provincial towns. He ventured to think both of the above subjects merited the serious consideration and attention of this body, being as it was a representative one, not only of the members practising in London, and members of this Institute, but of those of their fraternity who had similar works to conduct in the large provincial cities. There was no question that the consideration of the regulations for building in the various local towns was a matter of primary importance, and commended itself not only to those whose practice mainly lay in that direction, but also to those who had by chance works to carry on in the different towns, because anything more difficult to deal with than the contradictory laws that exist at the present moment he could not conceive, and, in fact, it required an analysis of architectural judicature to be gone through in almost every town in which one had works to carry out. He would content himself by announcing one fact in relation to the first paper, viz., that the Institute, through the secretary, had had a correspondence with the Local Government Board quite recently in respect of one particular question arising out of a revision of the bye-laws, which they understood was contemplated as to the preparation and deposit of elevation drawings. He suggested that that correspondence should be read, in order to show that the Board have under consideration the preparation of a series of bye-laws, which he trusted would hereafter supersede the bye-laws that at present obtain, having the contradictory ends to which he before alluded; and he was glad to say the Right Hon. President of that Board (Mr. Sclater-Booth) had invited suggestions from this Conference, so that he thought the time was exceedingly opportune for the discussion of the question. With regard to the second subject on the programme (they had also two papers), the registration and classification of houses was a somewhat novel idea, and was closely connected with the registration and classification of another class of structures, viz., ships. He could see comparatively little difference between the classification of buildings and that of ships. No doubt it was an important, and at the same time novel, subject to consider. With regard to the first subject it was one which every architect throughout the kingdom must have material interest in promoting and bringing it to the comprehensive and general acceptation of those practising both in the country and in the metropolis, so that they might perfectly understand what they had to deal with.

The secretary having read the correspondence alluded to,

Mr. Honeyman proceeded to read his paper, which we shall print hereafter.

Mr. J. Clarke also read a paper on the same subject. This we printed in our last (p. 594).

In the discussion which followed these two papers,

Mr. Porter remarked that the Metropolitan Building Act was inapplicable to the suburbs of London. It was almost impossible to build houses in the suburbs without coming in contact with the Metropolitan Board of Works at nearly every stage. He thought that the Metropolitan Building Act should only apply within a certain range. If they wished to build a verandah in the suburbs, they must make an application to the Board of Works, and often great delay occurred in getting their permission in the matter. Sanitary regulations were not touched in the Metropolitan Building Act. If they looked round London they saw buildings erected upon a subsoil of ashes, with the most wretched foundations. He thought the Metropolitan Act should provide that a concrete foundation should be put in in such cases. In other instances they saw buildings placed on a clay soil, with 2 in. or 3 in. of water, and the damp arising. Drain-pipes were laid without any closing of the socket-joints, and the sewage percolated through the floors. While professional men were prevented from doing some useful things, the speculative builder might do anything with impunity. With regard to discretionary powers of district surveyors, some of them were elected from the most distinguished ranks of the profession, and he thought more, rather than less, discretionary power should be given to them. He did not think there was any provision as to timber in houses in the Building Act, and he was sure, in many cases he had seen, there was great risk from the inadequate scantlings of the timber put in.

Mr. Drew (of Dublin) said, in that city there was no Building Act, and the inconveniences there had come to such a head that necessity arose for immediately promoting one, and steps were now being taken for the purpose; and for that reason he approved of many of the suggestions in the papers in so far as they related to a General Building Act, and, in the case of Dublin, he considered it would be a great boon to that city. The great difficulty that arose there—and he dared say it applied to other cities—was, that whereas the city of London proper was but a very small part of the metropolis, Dublin itself consisted of the city and independent townships, altogether amounting to a very large area, with a population of some 350,000. The objection had been raised that under corporate bodies the chief object in promoting such an Act would be to create local patronage, and not with a view for the general good. With that point before him, he disagreed with the opinion that district surveyors should be solely restricted to the duties of their office. In his opinion, being in independent practice gave an individual a position which was valuable in relation to the duties of district surveyor. There was one point which was new to him, and struck him,—that was the proposal to appoint referees. There were many points of difficulty at present. He could go so far as to say, having no Building Act in Dublin, they had nothing to define what constitutes a party-wall, and that would be likely to give rise to a great deal of litigation in Dublin. At the same time he thought the appointment of referees

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in the case of the working of the Building Act would tend to take away practice from the legal profession, and that was a point which he cordially approved of. At the proper time he would, with the permission of the Conference, move a resolution on this subject.

Mr. Roger Smith would like to say a few words on some aspects of this question. When he came into the room he felt there was great difficulty in dealing with it, not so much with regard to the regulations to be defined, as to the mode in which their observance could be secured. The greater part of Mr. Honeyman's paper was directed to the status of district surveyors in carrying out the provisions of the Act, and he dissented from several of the views expressed. In the first place, he thought it would be better to leave London alone. London was very different from every other town; it was, in fact, a county by itself. It had a system which (with many faults) worked very well, and there could be no question the idea would never be entertained of including the metropolis in any general building Act. He thought with regard to London there could be no greater mistake than altering the status of the district surveyors and substituting for them the class of officers which Mr. Honeyman recommended. He said that not as the result of a few years' personal experience as a district surveyor, but as an architect in practice and coming much in contact with district surveyors. The difficulties of building were great and varied. It was almost impossible to fit the Act without great consideration and care, and if a person administered the Act who was not an official person, and had only to insist upon the work being carried out in accordance with the Act, and was himself engaged in building, and could sympathise with architects, and show what it was impossible to consent to and what he could reasonably consent to, half the difficulties disappeared, and the others were met in a more cheerful and reasonable spirit. This had happened to him constantly, and he could bear testimony to the fact that he had been met by district surveyors uniformly in the same spirit whenever he had got into trouble. Now, if they had men taken from practice, and simply officials, with nothing else to do but to carry out the Act, they would find an amount of friction which would be unendurable. If they left London alone, there were three or four large cities which they might assimilate to London. In large cities like Edinburgh, Glasgow, Liverpool, and Dublin, they might succeed in obtaining district surveyors from the same class as they did in London—that was, from men in general practice, and in their hands he imagined the Building Act could be safely administered, with which some additional regulations relative to foundations and sanitary matters and thickness of materials might be incorporated. But the object of the Building Act was not to supersede private surveyors. If people chose to put up buildings without science they should take the consequences. Building Acts were framed for public safety, and the Act, improved as suggested, might be taken as the basis of the administration of three or four large towns. When they came to smaller towns the difficulty of finding persons who could be entrusted to administer the Act might be great. He imagined in small towns a paid officer of some description would have to be put up with, and when that was the case he (Mr. Smith) imagined that the simpler and fewer the regulations were the better. He had heard with pleasure that Mr. Honeyman considered the last resolutions of the Local Government Board were incomplete. The more incomplete they were the less likely they were to lead to difficulty and trouble which could not be got over. He imagined that more than simple regulations as to thickness of walls, and precautions against the spread of fire, and a few general details, would be found exceedingly difficult of enforcement. This was a subject which was difficult to deal with in detail, and they could not do more than affirm broad principles. There could be no doubt general regulations were desirable. He hoped he should not be misunderstood when he used the word "incomplete," but what he meant was that the regulations should touch as few subjects as possible. The subjects which they touched should be decided very definitely, and, as far as possible, be limited to matters of the most urgent necessity. In all probability the establishment of referees might be made very useful and a very satisfactory feature in any Act; but those who remembered the working of the Metropolitan Building Act preceding the present one would be aware that the impossibility to make the official referees a practicable body was the cause of that Act being repealed.

Mr. Arthur Cates thought it desirable that the Conference should learn something of the model bye-laws, a copy of which had been sent to the Institute by Mr. Sclater-Booth. It seemed to him (Mr. Cates) probable that the Local Government Board felt the same difficulty as had been felt by architects practising in the provinces, whose business laid them under the control of the local bodies. There was also some difficulty from the framing of the bye-laws themselves, which had been drawn up at different periods by men with different views. The great point, he apprehended, was, that the bye-laws should not be inconsistent with the Act under which they were framed. An instance came under his notice in which the local authorities had prepared regulations purporting to be drawn up under the bye-laws, which required conditions to be satisfied far beyond what the bye-laws prescribed. That was a condition of things which it was desirable to get rid of. It was also desirable that there should be uniformity, and it appeared that the Local Government Board had devoted attention to the preparation of this general scheme of model bye-laws, a copy of which had been sent to the Institute, and on which communication and observation were invited. It was impossible for them at a meeting like this to deal with a mass of matter comprised in nearly 100 separate clauses, beginning with the ordinary definition clauses, and going on to the model forms and notices by which the whole system was to be worked; but it might be interesting to the Conference if he glanced at the heads of the subjects, from which they would see the general scope and intention of these bye-laws, which, he should say, were limited by the words of the 157th section of the Local Government Act,—he should rather call it the Public Health Act. Mr. Cates read the 157th clause, and then gave a summary of the bye-laws, after which he remarked that it would seem these bye-laws would provide what was so much required,—viz., provisions for the regulation of buildings with regard to construction and the necessities of health. Unfortunately, the limitation that these bye-laws must be made in conformity with the provisions of the Public Health Act seemed to preclude the possibility of their being carried further. It was possible that when these bye-laws came to be considered by the Council of the Institute, they might come upon some suggestions which the Local Government Board might think fit to submit to the Legislature, and in that way obtain additional powers; but even under the present powers, if they got a proper system of bye-laws carefully worked out,—and these appeared to have been prepared with the most thorough attention to all the points of difficulty arising in practice,—they would probably avoid those difficulties which Mr. Roger Smith contemplated would arise from too detailed regulations, and might tend, perhaps, to modify that gentleman's views. He thought if a general code could be established it would be a great advantage to the country. The great difficulty would be to secure its operation in districts of small populations. That was a point on which his knowledge was very trifling, but it seemed to him difficulties would arise in securing the application of the scheme to small localities, where it would be no less valuable than in the larger towns. It was a problem to be solved, and one which deserved a great deal of attention. He hoped expression would be given to the obligation they were under to Mr. Sclater-Booth for the attention he had paid to the request of the secretary of the Institute, and he hoped something would be done in a practical form to show that they appreciated that polite attention, and that some steps would be taken to elicit the observations which had been looked for. There could be no better centre than the Institute of Architects, to which the experience of the architects of the country could be brought, digested, and arranged; and he would give his support to Mr. Drew's proposition when it was brought forward, that the bye-laws in question should be referred to the Council. The form of resolution which occurred to him was as follows:—"That the Council of the Royal Institute of British Architects be requested to appoint a committee to consider the subject of general building regulations for the United Kingdom, who shall communicate with the provincial architectural societies and the Local Government Board, and report at the earliest period to the Council for the information of the profession."

Mr. Drew expressed a hope that the Conference would not separate without approving some general principle. It would strengthen the hands of provincial societies if some resolution of that kind were passed. His proposition would be, "That this meeting approves of the principle that a general Building Act regulation, applicable (within certain limits) throughout the kingdom, is desirable."

The above resolutions having been seconded, were put by the chairman, and unanimously adopted.

Mr. Hansard, in proposing a vote of thanks to the authors of the papers, expressed a hope that architects generally, especially those in the country, would communicate their ideas on this subject to the committee which would no doubt be appointed.

The Chairman, in closing the discussion, said he ventured to repeat the observation he made at the opening of this question, viz., that he thought the subject—although not of that æsthetic or artistic interest which other meetings of the Congress had had the opportunity of enjoying—presented features second in importance to no other that had come before them. He was exceedingly pleased at the tone which the discussion had taken, and at the practical result of it in remitting this subject to a committee to deal with it in detail, which in conjunction with the department of the Government who had charge of the measure, he believed would be prolific in results. The meeting, although not so large numerically as he could have desired, was representative, no doubt, and he hoped in the deliberations that would take place on this subject they would have the advantage of the opinions of their brethren in the different provincial towns. Those opinions he was sure would be received with great thankfulness, and would have every attention, especially at a time when the constitution of the Institute itself was under consideration, and with respect to which the committee cordially waited the co-operation of those who were not resident with them.

The vote of thanks having been unanimously accorded,

Mr. Honeyman, in acknowledging the compliment, said the discussion had not touched upon a very extensive range of subjects. It had been confined chiefly to the duties and position of district surveyors, which he thought would probably be the case, because the view he took of that question he feared was not popular with the greater part of his audience. He might say he had not heard anything to check his opinion that his proposition to limit the surveyor's duties in the way suggested was not right. Mr. Roger Smith had pointed out that in London they were contented to remain as they were, and if that was the case he (Mr. Honeyman) could assure them he had not the least wish or intention to draw them into any uncomfortable position. If a general Building Act were not wanted for London, let it be exempted; there might be many good reasons why it should be, although no reason occurred to him. He did not think Mr. Roger Smith mentioned any practical reasons why a surveyor should be a practising architect, except that it reduced the friction in the matter,—in other words, the surveyor might require a good deal more to be done than was considered necessary; but it was a question whether it was a good reason to the public for selecting surveyors in practice in preference to those whose duties were confined to their office. On the other hand, Mr. Cates said it was possible to frame bye-laws which could be brought into operation perfectly well by such a class of surveyors as he (Mr. Honeyman) indicated in his paper. It was connected with another point, viz., that in the country it would be extremely difficult to find the class of men for surveyors who were readily found in London, and probably in some large towns, but they formed a very small portion of the country after all.

Mr. Henry Parsons then read a paper on "The Registration and Classification of Houses," given on another page.

On the same subject Mr. J. Sellars, of Glasgow, read a paper, which appeared in our last issue.

The Chairman invited discussion upon a subject which, he said, was more novel than that which had previously come before them.

Mr. Collins said it was not quite so novel as the chairman anticipated. It had occupied

the attention of two bodies, viz., the Medical Association and the Social Science Association, and in both committees had been appointed to consider the subject. He was not able to agree with the statement that the way in which a house was built only affected the pocket of the owner. It affected the very vitality of the people, and because the Social Science and the Medical Association had so thought, he had endeavoured to set up some scheme which might obviate in some measure the extremely faulty construction of dwellings which, they were aware, prevailed not only in the metropolis, but throughout the whole country. This comprised proper foundations, the necessity for the drainage of the subsoil, and the proper provision for other drainage and present evils which they knew the difficulty in correcting. It was thought if every house was bound to have a habitable status, to be indicated by the certificate of district surveyors or Boards of Works, any person who wished to purchase a house might at once see the character of the building he bought. It was proposed that this should be permissive. An intending purchaser would ask for the certificate, and if it was not forthcoming the property would be depreciated. It was difficult for some classes of people to get professional opinion upon buildings, for the want of means of obtaining them; and while he did not agree with the whole scope of Mr. Parsons's paper, he concurred with the general principles which it set forth, and he thought, if a system of registration of houses were established, a better class of dwellings would be erected, and the public would not be inveigled into the purchase of worthless properties all over the country. In conclusion, Mr. Collins kindly offered to place any papers and information collected by the bodies referred to at the disposal of any committee which might be appointed by the Council of the Institute.

Mr. Mathews remarked that nothing was of more importance in a house than that it should have a good foundation, and nothing was more difficult to ascertain afterwards. In no better way could this be remedied than by such a system of registration as was now proposed. He thought if it were carried out it would be a great protection to property, and would tend to the erection of better houses than they had now. At present when a person contemplated purchasing a house, the usual plan was to employ a surveyor, and in nine cases out of ten the person employed was an auctioneer or land agent, who knew nothing about the construction of a house. He made his valuation upon the basis of so many rooms and so much rent, without knowing whether the house was erected in a proper manner, but simply looking at the size of the building, its rent, and its external appearance. The result was, persons erecting houses in an inferior way at half the cost, were able to get the same amount for them as was paid for houses erected under the supervision of an architect; and it often happened that a man could scarcely see his money back again after erecting a number of properly-constructed houses. It was a matter not only affecting them as architects, but also affecting the health of the people, more particularly with regard to foundations constructed in a manner to comply with the sanitary requirements of the case. He was entirely in favour of the suggested system of registration.

Mr. Porter observed that the existing Act was beset with many complications, and though some additional clauses with regard to foundations, &c., might be advantageously introduced, perhaps some of the existing clauses might be omitted. The idea of certificates was, to his mind, an extremely valuable one. Some amendments were proposed in the Building Act with regard to foundations and proper drainage of the subsoil. When a house was finished the district surveyor should have the power, and it should be his duty, to give a certificate that the house had been erected in accordance with the regulations of the Building Act, which would show that some regard had been paid to substantial construction. They had plenty of law, but the difficulty was to get it put in force. Mr. Parsons had suggested that there should be three classes of residences. If "extra first" were stipulated for, there might be a clause that that class should only be erected under proper professional supervision. As to second and third class houses, he feared there would be a difficulty in enforcing the necessary supervision, but with respect to the first class, he thought the Institute might make a strong point of professional supervision.

Mr. Anderson proposed a vote of thanks to the authors of the papers, and expressed a hope that the ventilation of the subject would conduce to some practical result.

The Chairman said, that to him the question under discussion was most interesting, and was also novel. The only system he had hitherto had to deal with was the old system of the rating of buildings under the Metropolitan Building Act antecedent to that which was now in operation. But that rather had to do with the scale of the building than its constructive excellence. The discussion had led a little into the provisions of the Building Act, and away from the direct issue of the subject of the papers. For example, the foundation work would become an important integer in the classification of houses; at the same time, that was one of the defects in the existing Metropolitan Building Act, as well as in the bye-laws of provincial towns. He could corroborate the remarks of his friend who had just spoken as to the mode in which scamping builders dealt with foundations and drainage works. To his knowledge, hundreds of buildings were erected upon consolidated mud taken from the river. The regulation was that they should be placed on solid ground or concrete; but it omits to state what thickness the concrete must be. The consequence was, that in the localities he spoke of human habitations were built upon the indurated mud of the Thames, with such an amount of concrete as just saved the definition, and no more. He believed in any modification or reconstruction of the Metropolitan Building Act, there were many defects that required to be remedied, and it might be made to include this novel idea of the classification and registration of houses, similarly to Lloyd's List with regard to shipping; and, as far as he could see, it would be essentially practical, and of considerable value to all parties concerned, originally to those on whose land the buildings were placed, whilst as to the benefits to the occupiers there could be no question. Altogether, it was a system which he should rejoice to see carried into operation. He did not see that legislative enactment was necessary for the purpose. He believed it would be self-supporting with regard to cash, and that the possession of such a certificate as was suggested would be of such value to persons purchasing property that there would be no difficulty with reference to the small charges incident to it. He was aware how difficult it was to organise and carry out matters of this sort and make them self-supporting, but if it could be revised, no doubt it would be infinitely better under private management than under legislative enactment. He trusted these papers and discussions would result in something practical being carried out.

The vote of thanks to the authors of the papers having been unanimously agreed to, and Mr. Parsons having briefly responded, the meeting adjourned.

EGYPT.

On Thursday evening Mr. Phené Spiers read a paper before the Society for the Encouragement of Fine Arts, at the rooms of the Institute, on "Egyptian Architecture." The paper was illustrated by a great profusion of drawings and sketches, principally from the pencil of Mr. Spiers himself, whilst many others were contributed by Professors Donaldson and Hayter Lewis, Mr. Cooke, and others. Dr. Richardson was called to the chair, and the audience was a large one.

The following is an abstract of the paper read on the occasion:—

Mr. Spiers commenced by pointing out how the earliest types of the habitations of mankind had from time to time served to give the original features which we now find in the oldest Egyptian buildings. From the hut and tent were derived supports such as the various kinds of columns; the mud or crude brick dwelling gave the peculiar raking or sloping side which we find in the pylons and temples, whilst the caverns and clefts in the rock (the original homes of hunters and fishermen) suggested possibly the idea of excavated temples and tombs. He then drew attention to the great age of the monuments in Egypt as compared with those in Europe, and the wonderful execution and finish of the earliest specimens. After a description of the position of the temples and tombs by the banks of the Nile, and a few words about the climate, religion, and history of the Egyptian people, Mr. Spiers proceeded to divide his subject under two heads, tombs and temples, placing the tombs first, in order to describe the earliest remains, viz., those of the Pyramids. Of these there have been found and examined some sixty-seven, the royal tombs of the kings of Lower Egypt, whose capital was Memphis. The structure of all these pyramids commenced in the centre and gradually developed, each successive layer of stone increasing the structure in lateral dimensions and height. After the death of the king his body was placed in a central chamber, and the whole pyramid covered with a casing of polished limestone, concealing the steps formed by the receding courses of stone, and with them the entrance doorway. After describing the pyramids of Cheops and Cephren, [in the latter of which a portion of the external casing still remains, and alluding to the pyramids of Mycinnus, of Dashoor (erected in brick), and others, Mr. Spiers passed to the excavated tombs, more especially those of the kings and queens at Thebes. It is chiefly in these that we find the marvellous drawings which represent the domestic life and customs of the Egyptians, the outward signs of their social state and religious character, and their mode of embalming the dead. These tombs also were excavated during the reign of the king, and in a measure vary in extent according to the length of his reign. The temples of Abousimbel, Derr, and Girscheh, were next described, being partially excavated and partially built. Turning then to the second class of the temples, Mr. Spiers noted that the civilisation of the Egyptians ascended the river from the Delta, and that the records of the earliest periods of Egyptian architecture were to be found in the representations of the façades of temples on the walls of the tombs of Memphis. The principle of the arrangement of the Egyptian temple Mr. Spiers explained by various plans and diagrams. He showed how the earlier buildings had been added to and developed from the mere cell or sanctuary, and how, in the later temples, the plans were similar, though every portion may have been erected within a short period. This showed the wonderful conservative principle which guided the Egyptian architects, and which might, in some measure, account for the comparatively slight changes in the Egyptian style of architecture during the 3,000 years it held sway. The architectural elevations, the pylons, court, hall of columns, were then described, and the position of the obelisk, seated figures, and sphinxes, which form the avenues to the temples. In speaking of the one or two buildings which are classed as palaces, Mr. Spiers pointed out that as the king was the spiritual as well as temporal ruler, the temple would be his palace. The buildings of Medine Habon, Dahr El Bayree, &c., however, from the nature of their sculptured decorations, were no doubt exclusively palaces. In speaking of the hall of columns, Mr. Spiers took exception to its denomination, as by a hall we are accustomed to understand a large open space covered over, and with the general view interrupted by supports, or with columns so slender that they do not obtrude themselves. "The columns at Karnac, however, are so enormous, and their intercolumniation comparatively so small, that a diagonal view can never be obtained, and the hall there is a series of columns." The difference of the architecture of the temples constructed during the Ptolemaic rule was pointed out, as also those of the so-called Mammeisi temples, one of which was copied in the Paris Exhibition of 1867. The whole temple was invariably surrounded by a crude brick enclosure, with groves of trees planted around, and reservoirs and tanks of water, the trees of one being still visible behind Karnac and the temple of the goddess Mouth. Mr. Spiers then described the various kinds of piers, columns, and capitals, and concluded his lecture by a few remarks on the wonderful climate of Egypt, which would preserve the Egyptian monuments for all time were it not first for their continual invasion by the sand of the desert in consequence of the non-cultivation of the land round the temples (due to the fact that the country is being depopulated by the withdrawal from Upper Egypt of the chief male population for works at Cairo and Suez); and, secondly, from the wanton destruction by travellers, who destroy whole bas-reliefs in order to carry away small fragments. The appointment of Mariette Bey has done much to remedy this latter evil, and it is to be hoped that when the railway is carried up to Thebes, and the number of visitors there increased, greater powers will be given to him to stop these ruthless and barbaric invaders.

After the reading of the paper, the Rev. Mr. Brock spoke of the thrilling interest with which

the gigantic ruins of Egypt inspired the visitor. Alluding to the figures of Egyptian gods in the sanctuary of Abousimbel, he mentioned that they were so placed in the temple that in the spring and autumn the beams of the rising sun pierced through the long avenue of pillars, and struck full upon the figures of the four gods, which produced a very beautiful effect, and amply repaid the visitor for the early hour at which it was necessary to rise in order to witness this phenomenon. He gave his opinion that the crude brick walls were as ancient as the temples round which they were built.

Mr. Cooke followed with some remarks expressive of his great admiration of the ancient monuments of Egypt, which he characterised as being perfectly beautiful. He considered that every sensible person who had the means and opportunity, should visit that wonderful and most interesting country, and highly complimented Mr. Spiers upon his good judgment in selecting it as the scene of his studies during his travelling studentship. To his great industry whilst there the beautiful drawings exhibited bore ample testimony.

Mr. Danvers Seymour begged to thank Mr. Spiers personally for his lecture. It was his lot to visit Egypt at the time Sir Gardner Wilkinson was there, and he had retained a great interest in that country ever since. Of course, the discoveries since he was there in 1845 were very great, and he was glad that a man of the ability and experience of Mr. Mariette had been engaged by the Khedive to form a museum for the preservation of works of art of the country. He was sorry to hear that these monuments were rapidly disappearing under the hands of visitors from countries considered to be civilised. It was a disgrace to them to carry away fragments from the monuments to which they belonged, and which destroyed the most beautiful portions of them. The monuments of Greece had, to a great extent suffered in the same way, and he was afraid those of Egypt would share the same fate unless measures were taken to prevent it. Mr. Brock assumed that the unburnt brick walls round the temples were of the same date as the temples themselves, and he entirely agreed with that opinion. He had himself seen bricks taken from the mounds of Babylon which bore the stamp of the Babylonian kings upon them. Mr. Spiers had not entered into the relations of Egypt with Assyria. It was at one time considered that Egypt borrowed largely from Assyria; but there was no doubt Egypt belonged to an earlier dynasty than its relations with Assyria, in an artistic point of view, would indicate; though there could be no doubt in the middle period of their history Egypt did borrow largely from Assyria. There was a large commerce between the two countries, and in the British Museum there were remains of articles which were undoubtedly brought from Assyria, and *vice versâ*. He was glad to find that Mr. Cooke and other artists were turning their attention to the illustration of the monuments and scenery of this beautiful region of the earth, and he hoped the lecture they had heard that evening would be the means of directing a greater amount of attention to that interesting country.

Mr. Carpenter (recently returned from Egypt) said, with regard to the destruction of monuments referred to by Mr. Danvers Seymour, he (Mr. Carpenter) saw some tombs very much injured – not by visitors, but by the rude carvings of the natives upon them of steamboats and people rowing—principally the work of Arabs. He had seen some very excellent carvings in a hard dark brown wood, which showed that the Egyptians were great in the representation of figures from a very early date.

Mr. Wood (the discoverer of the Temple of Diana at Ephesus) said he would be glad to know what was the size of the golden chamber in the tomb spoken of. [Mr. Spiers replied, 30 ft.] And also whether the arrises of the granite blocks referred to had been removed, as was the case in the Temple of Diana. When he was in New York he saw a building called "The Tombs," which was the common gaol of the city, and it struck him that Egyptian architecture was particularly suited for that class of buildings. Mr. Wood then proposed a vote of thanks to Mr. Spiers for his admirable lecture.

Mr. Statham referred to St. George's Hall in Liverpool as one of the finest instances of the Egyptian style of architecture translated into the Greek to be seen in this country. The façade shown on one of the drawings was almost precisely of the character of that of St. George's Hall. There was the row of heavy square columns suggested by the massive character of Egyptian architecture, beyond which there was a solid stone curtain. It was intended that between each column a statue should be placed, but that had not yet been done.

After a few words from Mr. Browning upon the influence of Egyptian architecture in Greece, and its gradual development into forms of the greatest beauty, the Chairman closed the proceedings with a few appropriate observations, and the vote of thanks to Mr. Spiers was carried with cordiality.

GREEK ART.

THE Conference of Architects was, as we briefly noted last week, occupied with the subject of Greek Art on the afternoon of Wednesday, the 14th inst. Professor E. M. Barry, R.A., presided.

Mr. W. Burges read a paper on "The Importance of the Study of Greek Art and Literature to the Practice of Gothic Architecture," which we print *in extenso* on p. 619.

Mr. R. P. Pullan followed with a paper on "Greek Art as illustrated by its Monuments." This appeared in our last (p. 584).

In inviting discussion, the Chairman said the Conference was very much indebted to the readers of the papers, and to the gentlemen who had contributed the beautiful drawings on the walls in illustration of the subject. The list of contributors included Mr. Penrose,—one of the most learned authorities on Greek architecture,—Mr. Arthur Cates, Professor Donaldson, and Professor T. Hayter Lewis, who were always ready to give help in furtherance of their art and the profession. Lastly, they had an interesting series of studies of Greek architecture by the late Professor Cockerell, whose memory would always be revered by the members of the Institute.

Mr. Phené Spiers having (as reported on p. 580 of last week's *Builder*) explained that the subject of Greek art was suggested by Mr. Fergusson's paper on the Erechtheum, read before the Institute a short time since, stated that he had forwarded to a friend of his,—a French architect,—at Athens a copy of Mr. Fergusson's paper, with the request that he would examine the building and say how far it appeared to support Mr. Fergusson's theory. His reply was that in some of the most essential points the building did not accord with Mr. Fergusson's restoration of it. This reply had been forwarded to the Honorary Secretary for Foreign Correspondence, with the view of its being published, together with Mr. Fergusson's comments thereon. He (Mr. Spiers) confessed to a somewhat Pecksniffian feeling in talking on the subject, for taking the Parthenon instead of Salisbury Cathedral, he saw drawings on the walls showing it from every conceivable point of view. When complete, the Parthenon must have been the most wonderful building ever erected. The delicate feeling for proportion which characterised it applied more or less to all Greek work.

Mr. Joseph Wood said he was reminded, on his last visit to Athens, that the beauty of the the Parthenon might be in a great measure restored by replacing some of the drums of columns which were lying at the foot of the steps. He could not agree with Mr. Burges as to the utility, to a Gothic architect, of a visit to Athens. He would not say that if a Gothic architect visited Athens it would be a waste of time, but he could not see of what practical advantage such a visit would be, seeing that the Gothic and Greek styles were so widely dissimilar. Had he known the precise turn the discussion would have taken he would have brought with him some detailed drawings of the Temple of Diana at Ephesus, especially of the sculptured drums of the columns, which were to be seen, however, in the British Museum.

Mr. Ordish, of Leicester, next made a curious speech. He said he had not long been a Fellow of the Institute; but, as holding office in the district in which he lived, he might perhaps be permitted to say one word. He was more an agriculturist than an architect at the present time; still there were times when they turned back to their old love, and when they poked about the ruins and "fiddled" about the *débris* of things to see if they could find anything out; but he was sorry to say he could make nothing out, either of Greek or of Gothic art. It appeared to him, amongst his trees and potatoes, as if the two great waves of art had gone by for ever. The magnificent minds which had put up the great buildings of antiquity had passed away, and the whole paraphernalia of their art had gone with them. Whole countries had passed away like generations. We had arrived at another age. Superstitions and idolatries had all gone, and our minds were all clothed in a new phantasmagoria, which would make us all happy. Slavery, intolerance, and superstition, the foundation of all evils, were gone, he hoped, for ever, and we were waiting for a chariot of fire which should take us away. He had followed Ruskin, Pugin, and the modern pioneers of Gothic, and such magnificent men as Mr. Cockerell and Professor Donaldson; but his advice was: follow those things which nearly everybody laid down as the foundation of our existence, and which sought to make man reverential and his life a sphere of happiness, instead of pursuing any of those chimerical notions or "rum"-shaped mouldings. A man once reviewed his works, and said he (Mr. Ordish) was "very critical." They might depend upon it that all art consisted in one thing,—in loving those things that the Creator laid before them. There was to be found the beautiful; and it might be gathered in every clime, whether upon the iceberg or in the sunshine. There were lots of things that were waiting to be won. They had a glorious arena for working in,—the whole field of Nature: so let no young man follow up the rigid deformities and rigid beauties of Greek art. Why, he remembered being excluded from the opening of a church thirty years ago because he wore a beard!

The Chairman here suggested that the speaker was hardly confining his remarks to the question before the Conference.

Mr. Ordish, in continuation, asked what was the value of Greek art to the members of the Conference, or any other art? What was to be learnt from it? He was sorry to say he should go away from the room about as ignorant as when he entered. He endorsed all that had been said in praise of the pioneers of research, such as Mr. Fergusson and others. He had read Mr. Fergusson's book with great interest, but what was the use of it? The whole subject was as delusive as the selection of architects to adjudicate upon competitions.

The Chairman again reminded Mr. Ordish that he was straying from the question, whereupon he said: I think, then, Mr. Chairman, I had better sit down, in a maze.

Mr. J. P. Seddon said the last speaker had inquired what was the use of Greek art, and he was bound to say that he thought that unless they realised that (except as a matter of education) Greek art had very little to do with modern art, it might prove a delusion and a snare to them. He had always thought and studied Greek art as being the very acme of perfection in proportion, however limited might be its aim or suitability in meeting the requirements of the present age. One could not look at the plan of a Greek temple such as the Parthenon without feeling that Greek architecture had little or nothing in common with our time and clime. We did not want the amount of shadow afforded by the peristyle; a modern building, indeed, was merely the *cella* of a Greek temple. What the Greek did was to thoroughly work out to the utmost degree of perfection the theory of the support and its entablature. He thought that a great many of the theories as to the *motif* of Greek art were far-fetched and fanciful, and had too long found acceptance. Some of them, indeed, had been, to his mind, quite disproved by M. Viollet-le-Duc, who had gone very minutely into the *rationale* of the construction of Greek architecture, as well as into its æsthetic merits. He could not agree with Mr. Pullan in considering Greek and Gothic as two opposite or distinct styles, for the latter was descended from the former by a long series of gradual and almost imperceptible changes. Gothic architects did not decry Greek art, but they did decry the manner in which it was travestied by the Romans, by means of sham orders stuck on to the faces of their buildings. Such a mode of procedure was fatal to all true architecture, no matter whether the operators were the ancient Romans or those who were responsible for much of the so-called Renaissance or other rubbish which was springing up so extensively in London and other large towns. Greek architecture was useful as a school of beauty, but the architects of the present day must bring common-sense to bear in the working out of present-day problems architectural construction, just as the Greeks and Mediævalists did.

Mr. Charles Barry said that as far as he had gathered from what the readers of the papers had said, the lesson they wished to impress upon the Conference was that an architect in whatever age, Greek, Mediæval, or Modern, should aim at the one great object of making his buildings suitable for the purposes for which they were intended. He thought that if we in the present day were to proceed more generally upon that principle, we should be gradually working out or evolving a style which would be essentially a new style, inasmuch as it would be the result of modern wants and requirements. It was interesting to notice that both Mr. Burges and Mr. Pullan were really inculcating the same truth, but from opposite points of view. Mr. Pullan, whose name was honourably and inseparably associated with researches as to Classic architecture, had found the same principles in Gothic buildings as in Classic ones; while, on the other hand, Mr. Burges, whose name was identified with Gothic architecture, had found a certain identity of principle in the Greek temple and the Gothic cathedral. Now if gentlemen, whose views had hitherto been regarded as wide as the poles asunder, found themselves coming to agree, it proved that art was universal, and that its principles were the same all the world over. Only by liberal study of all phases of art was it possible to cherish the hope of the creation of a new style. The coming style had been talked of for years past, and would continue to be talked of for many years to come, for man was ever dissatisfied with what he had accomplished, and aspired to do something better. Such aspirations were not altogether to be condemned, for the effort to attain to something new was a wholesome exercise for the mind, notwithstanding that what was sought for constantly eluded the grasp of the seeker. The training of the mind to think for itself, combined with the study of the beautiful, could not fail to result in the production of refined and original architecture, and the very process of endeavouring to enter into the thoughts and motives which had animated the great masters who had gone before would tend to imbue the student with noble aspirations.

Mr. Watkiss Lloyd said that so many topics had been touched upon in the two papers which had been read, that he felt that he could add very little to what had been said. His own view on the thesis that the study of Greek art and literature was advantageous to the Gothic architect would perhaps rather take the direction that the student of Greek art and literature would profit by the study of Gothic architecture. There could be no doubt that the study of Greek art and literature, supposing that there was time for them, would have the same advantage for the architect as it would have for the rest of the world. Just as the provincial would usually profit by a visit to the metropolis, and just as insular views would be enlarged by foreign travel, so, in the same way, and in a still greater degree, would the modern architect have his views expanded by a careful study of Greek art. The study of the arts and literature of Greece revealed to us a people of a different race to ourselves, separated from us by thousands of years, not having the same faith as that which prevailed amongst us, and yet a race of people before whom, in many respects, we must feel humiliated. Limited as were the constructive attainments of the Greek architects, limited as were the purposes to which their buildings were devoted, yet within that range there was such a degree of art, such a lavish expenditure of thought and refinement, and such an amount of devotion to the highest imaginative purposes, as had not been rivalled since their time, whether by Gothic or any other art. He confessed that when he saw the best examples of Gothic architecture, he felt that their perfection was enhanced by the perception that they approached to the refinement of the Greeks. Standing in the noble and beautiful presbytery of Ely Cathedral, a few days ago, he felt that he was in the midst of a work of architecture which might have been produced by a Greek, and this was high praise. Looking around, he found that many of the details and outlines were of a character which a Greek might have improved upon; but, nevertheless, the general spirit of the whole was that of Greek architecture. When he heard Gothic architecture contrasted with Greek, or Greek with Gothic, to the disadvantage of one or the other, he was reminded of the anecdote of the American boy, who, when he discovered that his father was born in England, exclaimed, "Didn't we lick you at Bunker's Hill!" Gothic architecture was the descendant of Greek architecture, by a long series of gradual changes. There was no breach in the continuity of the chain, although sometimes great strides had been made by men of great genius. Gothic architecture was as much the descendant of Greek art as the French and Italian languages had descended from the ancient Latin. He did not think that a new style was an impossibility, and the restlessness and love of variety which were now apparent on every hand seemed to betoken a feeling after a new style.

Mr. A. J. Hiscocks said that he had long been a great admirer of Greek art, and he should be sorry indeed if any observations made that evening had the effect of depreciating the value of its study to young architects. One great misfortune was that there were no examples of private dwelling-houses remaining to show what the domestic architecture of the Greeks was like. But, notwithstanding all that might be learned from the study of Greek architecture, we did not want to make slavish copies of Greek buildings, either for domestic purposes or for our abodes. He envied those who had had the good fortune to go to Athens, for there must be something very august about the appearance of a Greek temple, even when in ruins. Whatever might be thought of the chances of a Greek revival, we should probably never go back to the Egyptian style, unless, indeed, for such buildings as prisons. Much as it was the fashion to detract from the style of the present day,—"Victorian," or whatsoever it might be called, it evinced great study of Greek and Italian art.

Mr. H. H. Statham said, in the course of an interesting speech, he wished to refer to a point which occurred in the early part of the discussion. It was remarked by Mr. Pullan, in his paper, that the Gothic and Greek camps were now somewhat strangely mixed up, the one using the arms of the other. There was a curious illustration of that afforded by the present discussion. Mr. Burges, a consistent follower of Gothic during his whole life, advised young men to study Greek art; while Mr. Wood, whose name was identified with Greek architecture, said it would do no good to Gothic architects. A great deal had been said about Greek and Gothic being the only pure styles, but this assumption was generally taken for granted without any clear perception of the reason why. Greek and Gothic were the only two pure styles, because they were the only two which had complete systems of construction throughout, and because they were the only two in which the design completely expressed the construction in every point. He took it that Mr. Burges's advice to study Greek art as well as Gothic, was intended to have the effect of enabling Gothic to be treated with greater freedom, and so to cause it to be applied more successfully to the wants of the present day.

Mr. Arthur Cates said that every lover of Greek art must be grateful to Mr. Burges for the manner in which he had done honour to it, for he had called attention to points which even its professed admirers generally overlooked. Greek art was, perhaps, the most picturesque and the most free from trammels. It adapted itself to varying circumstances with great readiness, and the display of its productions in the best possible manner was not hindered by rigid rules of symmetry, while at the same time devoid of what might be called licence. He thought it might be taken as a fact that almost every group of Greek monumental edifices was surrounded by a peribolus or wall, and that the buildings were not invariably set upon fixed lines or bases. In the buildings on the Acropolis the axes of no two were precisely parallel, although they were all, apparently, in the same direction. Very much of the discredit into which the Classic style had fallen had arisen from the manner in which it had been represented as being bound by inflexible and unyielding rules. A more intimate acquaintance with Classic art, however, would show that it was capable of being worked in with as great an amount of freedom as any other style. Familiar as a man might be with the Parthenon, the Erechtheum, and the other monuments on the Acropolis, by means of pictorial representations, those representations, however correct and beautiful, must necessarily fail to adequately convey the effect which such structures had on the beholder. To fully appreciate Greek architecture its buildings must be studied on the spot. Whatever might be the aim of the architect, whether he intended to devote himself exclusively to the practice of either the Gothic or the Renaissance styles, a few weeks spent in the careful study of the buildings of the Acropolis would expand his mind and ennoble his artistic feelings in a remarkable degree. The importance of the careful study of Greek architecture was strikingly evinced by the inspection of a new building lately erected in Athens itself, viz., the Academy of the Fine Arts. The building had been erected from a design by Mr. Theophilus Hansen, an eminent architect at Vienna, assisted by Mr. Ziller. It had been built regardless of expense, and the materials and workmanship were of the best possible description. Nevertheless, from the simple fact that the building had been designed as we generally considered Classic buildings should be designed, viz., in a rectangular manner, the effect was most distressing, the distortion of the lines being something startling, especially under a brilliant sun. A careful examination of this building* on the spot was quite sufficient to justify the Greeks in the use of the entasis. Here was a building admirably executed, in the same material and style, and in the same climate, as the Greek temples of antiquity. On paper, the design appeared to be perfect, but in execution it was to the extent named a great failure, owing to the non-observance of a principle with which the Greeks were well acquainted. Archæologically, it was to be regretted that all traces of Greek domestic work had passed away, but artistically it was not to be regretted, inasmuch as it saved us from being surrounded with imitation Greek dwelling-houses. Mr. Pullan had said that order was an essential element of every style; but how would he limit the picturesque architecture of Mediæval times to the strict rules of order?

Mr. Pullan explained that what he meant by "order" was the subordination of the general features of the design to some common general scheme of plan.

The Chairman, in closing the discussion, congratulated the Conference on the discussion, as well as on the papers which had been read. He confessed that it was a great satisfaction to him to find a gentleman of Mr. Burges's eminence and well-known proclivities meeting Mr. Pullan and uniting with him in the endeavour to find some common ground between Classic and Gothic art,—a *modus vivendi*, in fact. He believed that a recognition of the catholicity of the principles of beauty would enable both styles to be more intelligently studied and more thoroughly appreciated. *Primâ facie*, it might be assumed that, when a building had received the admiration of ages, and when it had been the subject of enthusiastic praise by all classes of educated men, there must be something in it worthy of careful attention and study, if not of direct imitation, for without servilely imitating Greek art we might learn many valuable lessons from its simplicity, refinement, and suitability to its purpose,—lessons which might be advantageously applied in every-day practice. To go to Athens was not within the power of everybody, and when they got there the remains were found to be greatly mutilated, for when we talked of "Vandalism" we ought to remember the Elgin marbles in the British museum. Therefore if the architect wanted to study the sculptured forms and details of Greek art, he could perhaps do so more advantageously in the British Museum than at Athens itself. Some Ionic capitals there would well repay study on account of their extreme delicacy, as they afforded a lesson which should not be lost upon us in the present day, when there was such a tendency to coarseness of detail and roughness of execution. He agreed with Mr. Burges that to talk of a man inventing a new style was to talk nonsense. If a new style were to rise, it would grow gradually from definite principles derived from the works of antiquity, and applied in a common-sense manner to the requirements of the day. He should be very sorry to enrol himself on the list of votaries of that somewhat dismal philosophy which taught that nothing good remained to be done in architecture, and that we were to content ourselves by studying and admiring nature. They would get a new style, not by talking about it, nor by trying to be original, but by applying true principles with intelligence and common sense. It was related of Turner that he was once very much annoyed by some youngster asking questions as to the "vehicle" with which he mixed his colours, and he replied "Brains!" That was the vehicle which architects must use if they

* Described in January last in the *Builder*, page 1, *ante*.

were to be successful in making their buildings useful as well as beautiful. Refinement and perfection of detail were especially to be commended. It was impossible to look at a Greek temple without feeling that its architect left nothing to chance, and did not shirk his work in the slightest degree. Every moulding was designed with special reference to its place. When we perceived the beauties of old work, and were told on every hand that we could do nothing in these days, we were rather apt to indulge in feelings of despair. We found that Greece,—that small and favoured land,—gave lessons to all classes, statesmen, poets, philosophers, artists, and architects. But all that was not sufficient to maintain Greece in its palmy state. Where was Greece now? Unfortunately in a very different condition to that in which we could wish to see her, as a consequence of her artistic virtues. There was evidently something else wanting, and it was for us to say whether we, in the nineteenth century, could not supply what was needed, while availing ourselves to the full of all the experience of the past.

DWELLINGS IN FLATS FOR THE MIDDLE AND LABOURING CLASSES.

IN connexion with the recent Conference of Architects, visits were paid on Tuesday, the 13th inst., to the following blocks of buildings, viz., Mr. Matthew Allen's dwellings in flats for the middle classes, Manor-road and Bethune-road, Stoke Newington; the Improved Industrial Dwellings Company's buildings at Bethnal-green Junction; and the new buildings lately erected in Southwark-street, by the Trustees of the Peabody Fund.

The visitors first proceeded to Stoke Newington, where they were received by Mr. Allen and conducted over the buildings. Mr. Allen stated that for several years past he has turned his attention to the subject of the improvement of middle-class suburban dwellings, and has recently carried out an experiment on a somewhat large scale in Manor and Bethune Roads, Stoke Newington. This experiment may be said to have been so far successful that the majority of the houses, twenty-four in number, were let before they were completed. The twenty-four houses, which are divided into six blocks, vary in rent from 20*l.* to 60*l.* per annum. They are built on the "flat" principle, but each house has a separate entrance, and is entirely distinct from its neighbour in every respect. Of the twelve houses on the ground floor, eight let at 20*l.* per annum, and contain five rooms, with lobby entrance, lavatory, coal-cellar, larder, and other conveniences. Above these are eight 40*l.* houses, containing nine rooms, occupying two floors, and fitted with bath-room,—which is supplied with hot, cold, and soft water,—lavatory, hot closet, conservatory, &c. There are four 35*l.* houses, which have seven rooms on the ground-floor, fitted with every convenience. Besides the garden in front, there is a large croquet-lawn in the rear, which is approached from the drawing-room by means of a French casement. Above these four houses are four 60*l.* houses, each of which contains thirteen rooms, and is fitted with bath-room, and other conveniences. These have also a lawn in the rear, approached by steps from a balcony or verandah. Beyond the croquet lawns is a long gravelled walk, having on one side flower borders, and on the other side lean-to greenhouses, vineries, &c. Behind the wall of the greenhouses are the gardener's cottage, potting sheds, coach-house and stables; and in a line with these is a row of wash-houses (one for each tenant) fitted with washing coppers, troughs, &c. The roofs of the washhouses are flat, and they form a long terrace walk with steps at each end. In addition to the croquet lawns, there is a long bowling-green, skirted by flower borders and a row of standard roses, and a large playground for the children. All the tenants pay a small sum quarterly in addition to the rent, for the keeping in order of the grounds, which require about 10,000 bedding plants annually. In the centre of one of the vineries is a large garden-room, which is much frequented by the tenants, and being provided with a pianoforte, is used at stated intervals for dancing and evening entertainments of various kinds. Above the garden-room is a billiard-room, under the management of a committee of the tenants, who also regulate the affairs of the garden-room. The kitchen-garden, in the rear of the vineries and greenhouses, is about 1 acre in extent. All the tenants have free access to it, and they can purchase any of its produce on application to the gardener, who calls at every house daily for orders.

The arrangement of the buildings, as regards the number of rooms on each floor, are partly upon the Scottish principle; whilst the laying out of the grounds is after the French system; but Mr. Allen claims to have retained the all important feature of an English home,—perfect privacy. The ceilings between each flat being constructed of concrete with iron joists running through the centre of the same, are fireproof. It is stated that little or no sound penetrates through from floor to floor.

Such was the success which attended this experiment, that in the summer of 1874 Mr. Allen commenced the erection of two more blocks, comprising eight houses, on an adjoining estate, and they were nearly all occupied as soon as completed. Last summer he erected two additional blocks, and those houses which have been completed are already occupied. These last two blocks have been designed with certain modifications of the original plan, and several important improvements. Each block consists of six houses instead of four, and there are eight rooms in each house, which comprises one "flat." There is a separate entrance with lobby for each house, and the drawing-rooms are 22 ft. by 13 ft., a size which is somewhat larger than those of the original plans. The rent of the bottom and top houses is 40*l.* per annum each, and the intermediate or first-floor houses, pay 47*l.* per annum, and have the exclusive use of the vineries and greenhouses in the garden. All the tenants pay their own rates and taxes. No wood is used in the construction of the carcasses of any of the houses, and where iron is employed it is always embedded in concrete. The party and external walls are 14 in. thick, and the lintels, ceilings, roofs, and staircases are all formed of Mr. Allen's artificial stone. This material is fire-proof. An important point with regard to the footings is that the ground is taken out to a depth of 2 ft. below the intended floor line, and to a depth of 3 ft. where the foundations are to be laid, the whole of the space being afterwards filled in with concrete, and covered with a mixture of pitch, tar, and sand. In the two last blocks extra precautions have been taken against damp, by building the first 2 ft. of the external walls in the following manner:—2 ft. of 9 in. work on the inside, and slabs of artificial stone 3 in. thick, and projecting three-quarters of an inch beyond the face of the upper wall, on the outside, leaving an open space of 2 in. between the brickwork and the slabs. The whole is surmounted with air-bricks, thus allowing free circulation of air around the bottom part of the building and under the flooring. There are no drains under any part of the buildings.

Each block of buildings is surrounded by a footway paved with artificial stone, and this prevents the objectionable practice of planting flowers and shrubs against the external wall. By this mode of arrangement the walls are kept perfectly dry, and strength and durability are given to the foundations of the buildings. All the internal partitions are constructed of brickwork,—not a lath being used in any part of the buildings; and the ceilings being composed of artificial stone, as before stated, there are no snug places in which mice and other vermin can breed.

The visitors next proceeded to the large blocks of buildings in course of erection at Finnis-street, Bethnal-green, for the Improved Industrial Dwellings Company, under the direction of Mr. William Ward Lee. The buildings occupy both sides of the street, which is 45 ft. wide, the height of the buildings from the ground-line to the top of the parapet being 53 ft. There are fifteen blocks on one side of the street, and six on the other side, which is partly occupied by a Board school. The blocks (except, of course, those on opposite sides of the street) are not detached, being merely divided from each other by party walls. Each block is five stories high, with two tenements on each floor, making a total of ten tenements per block. The tenements vary in size from two to four rooms, besides sculleries. The rents vary from about 5*s.* 6*d.* to 8*s.* 9*d.* per week per tenement. Coal-bunkers, larders, dust-shoots, and other conveniences are provided, and the water-closets are placed outside the tenements in a sort of recessed balcony open to the external air, each tenement having its own water-closet, only approachable by the tenant. Playgrounds for children are provided in the rear. Each tenement contains within itself (in the scullery) a copper and other accommodation for washing. The company are their own builders, Mr. G. H. Gilbam being the clerk of the works, and Mr. William Smith, the foreman.

For want of time very few of the visitors went to the Peabody-buildings in Southwark-street, of which we need say no more than that they differ very slightly, if at all, from those at Pimlico lately described by us. Mr. Darbishire is the architect. Each set of buildings is excellently built, both as regards materials and workmanship; but in neither case do they provide a separate water-closet for each tenement, one water-closet being used in common by two or more tenants,—an objectionable arrangement, as we have already urged.

LONDON STREET ARCHITECTURE.

QUEEN ANNE CHAMBERS, No. 1, Poultry, which forms the subject of our illustration, has been erected from the designs of Messrs. J. & J. Belcher, and, under their superintendence, by Mr. William Downs, of Walworth, who has well carried out the architects' designs.

The Chambers have three frontages, one towards the Poultry, the centre one facing Cheapside, and the third towards Bucklersbury. They are built of red bricks, with green slates and red tiles for the roof. The bay windows and dormers form the chief features in the composition, requiring a varied sky-line, and strongly marked lines, as the building is seen from a considerable distance.

It may be taken as a specimen of a fashion which can scarcely have a very long reign.

NEW HOTEL AND SHOPS OPPOSITE TO THE CENTRAL RAILWAY STATION, NEWCASTLE-ON-TYNE.

THE block of buildings now in course of completion immediately opposite the Central Station, and situate in the most commanding position in the town, has three fronts,—that in Grainger-street West is 150 ft., in Neville-street, 64 ft., and in Westgate-road, 46 ft. in length, each being a leading thoroughfare from the railway station to the centre of the main business parts of the town. Grainger-street West is a new street nearly completed, and from its position is necessarily much thronged with business, and when finished will be one of the handsomest in the town. The whole of the building is cellared, which also extends under the footpath and flagging in Grainger-street West and Neville-street, and contains an area of about 9,000 superficial feet, which can be adapted for the use of the hotel and shops. Ample room is also left for a large restaurant, extending from Neville-street to Westgate-road, well lighted and ventilated, and a licence is already attached.

The ground-plan consists of eight spacious shops and conveniences, situated in Grainger-street West, Neville-street, and Westgate-road. The hotel extends over the whole area, from the first floor upwards. The entrance will be from the centre of the block in Grainger-street West, the doorway being a distinguishing and prominent feature in the building. There is a spacious entrance on the ground floor, leading to a circular stone staircase, 18 ft. in diameter, lighted by a large cupola, which will also be used as a means of ventilation; there is also a servants' staircase. A separate entrance is intended in Westgate-road, leading to a large bar on the ground floor. The first floor of the hotel comprises a large coffee-room, ladies' coffee-room, four private sitting-rooms, billiard-room, smoke-room, bar, private room or office, and seven beautiful bedrooms, also water-closets, lavatories, &c., well lighted and ventilated by an open area, which has an air-shaft brought into them at the basement story, to create a good circulation of fresh air.

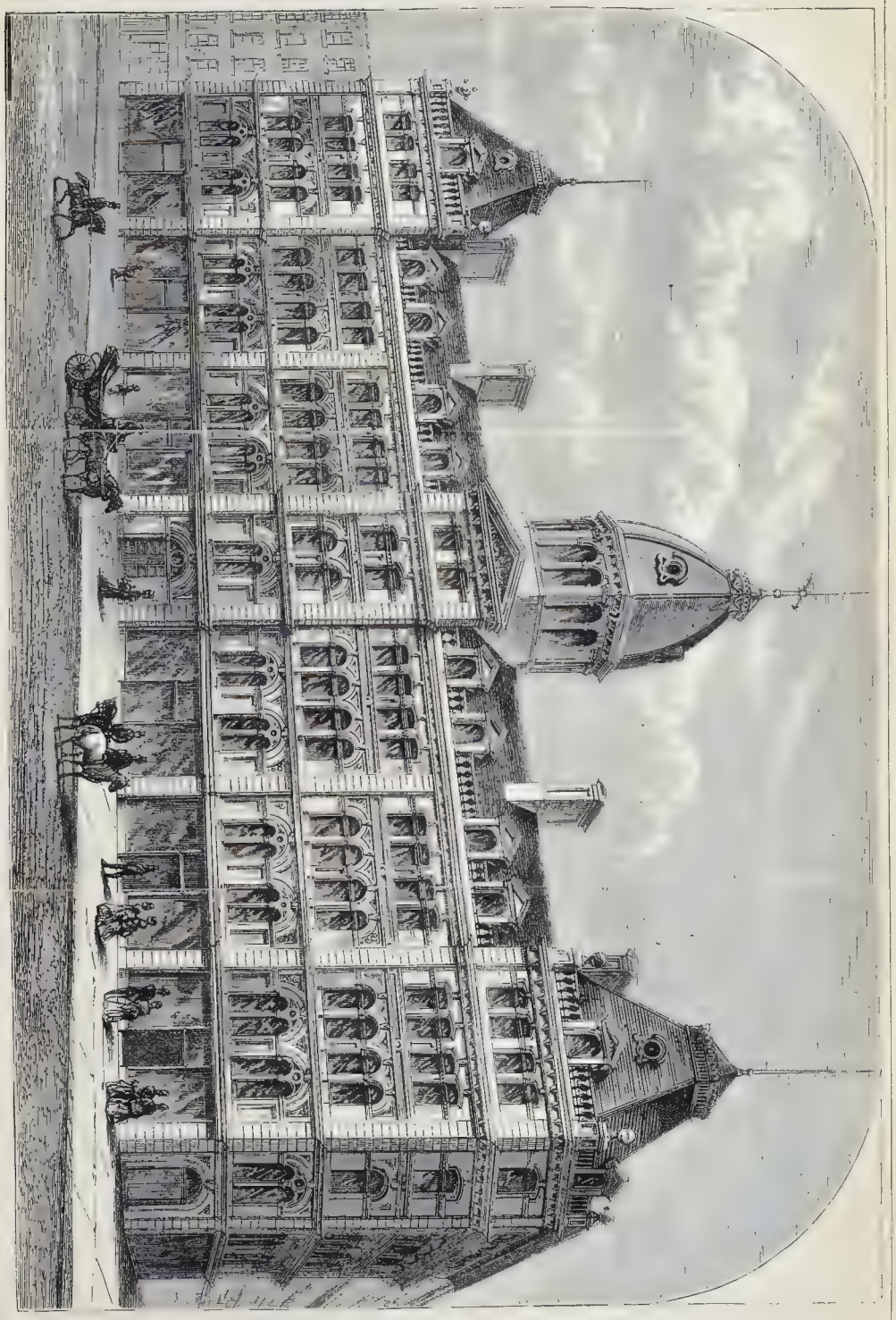
The second floor contains two sitting-rooms, and eighteen spacious bedrooms, bath-room, water-closets and lavatories, and other conveniences.

The third floor contains twenty-one spacious bedrooms, bath-rooms, water-closets, lavatories, and all other conveniences suitable to a first-class hotel.

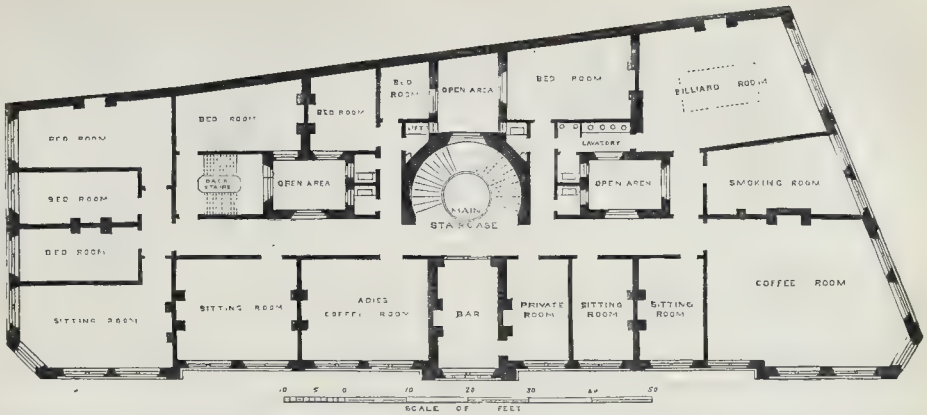
The fourth floor contains a large kitchen, 25 ft. square, situate in the angle of Grainger-street West and Westgate-road, the ceiling of which will be carried up to the high roof, to give space and ventilation; there are also sculleries, larders, pantries, and every other con-



LONDON STREET ARCHITECTURE: QUEEN ANNE CHAMBERS, POULTRY.—MESSRS. BELCHER, ARCHITECTS.



NEW HOTEL AND SHOPS, NEWCASTLE-ON-TYNE.—MR. J. E. WATSON, ARCHITECT.



HOTEL AND SHOPS NEAR CENTRAL RAILWAY STATION, NEWCASTLE-ON-TYNE.—*Plan of First Floor.*

venience suitable to the hotel. There are also eight good bedrooms for servants, and a servants' hall, and six excellent bedrooms, entirely shut off and distinct from the servants' apartments.

A lift will be constructed from the basement to the different floors for luggage, coals, and for the supply of all requisites necessary for culinary purposes, and is very suitably situated in the centre of the buildings.

The elevation is of polished ashlar work, with carved caps, panels, spandrels, &c.; the roofs are high-pitched, with cupola in the centre for light to the staircase, which, with the roofs, make a bold broken sky outline.

The building is being erected by Mr. Walter Scott, contractor, for Messrs. Gibson & Scott, the proprietors, from the designs of Mr. J. E. Watson, architect, Newcastle.

SIR GILBERT SCOTT ON WESTMINSTER ABBEY.

As was briefly recorded in last week's *Builder*, the gentlemen attending the Architectural Conference visited Westminster Abbey on Thursday, the 15th inst., when Sir G. G. Scott, R.A., delivered the following address in the Chapter-house:—

On the last occasion I had the pleasure of addressing the Architectural Congress in this Chapter-house, as a preliminary to their going the round of our glorious old abbey, I recollect pointing out that with exceedingly few exceptions there would be found in the Abbey specimens—and those of a high class—of every phase of Mediæval art from the eleventh to the sixteenth century inclusive. I may amplify this by saying that, though London would hardly be viewed by a stranger as a place especially fitted for the study of Mediæval art, it yet contains—mainly in the Abbey, but well supplemented by other buildings—as perfect and as fine a series of studies of every style as any city which can be named. As for instance:—

(1.) *Of Norman architecture, anterior in date to the Norman Conquest*, we have King Edward the Confessor's work at this Abbey.

(2.) *Of Norman architecture of the time of the Conqueror* we have the keep and chapel of the Tower of London,—the work of the Episcopal architect, Bishop Gundulph.

(3.) *Of advanced yet still pure Norman architecture*, we have our ruined Chapel of St. Catherine, Prior Rahere's noble work at St. Bartholomew's Priory in Smithfield; and we have also the fragments of our own Norman cloisters ranged in the vestibule of this Chapter-house.

(4.) *Of Transitional architecture*, though absent here, we have a noble example in the Round of the Temple Church, and a more obscure one in the crypt of the Church of St. John of Jerusalem.

(5.) Of genuine, *developed Early English*, we have noble specimens in the eastern part of the Temple Church; in the choir and lady-chapel of St. Mary's, Overy; and in the chapel of Lambeth Palace.

(6.) *Of the Second Transition,—that from Early Pointed to Decorated*,—I need only say, "*Si monumentum requiris circumspice.*" This abbey is the earliest and best example of the style in this country.

(7.) *Of the more developed Early Decorated*, I may say we have a noble specimen in the actual choir of this church, erected by Edward I.; but, as its architecture was greatly influenced by earlier work, I may also refer to the noble Chapel of St. Etheldreda, in Ely-place, Holborn.

(8.) Of Italian Gothic of these periods we may refer you to St. Edward's Shrine, the Tomb of King Henry III., and some minor works. I may also refer for *Monuments* of the Early Decorated style to those of Edmund, Earl of Lancaster, and his countess, Abeline, as fine works as exist.

(9.) For the *Later Decorated* I may refer you to three bays of the adjoining cloister, opposite the entrance of this chapter-house, and, not far off, to the crypt (would that its superstructure remained!) of St. Stephen's Chapel; and, for a later example, to the church of Austin Friars, in the City.

(10.) For the *Earliest Perpendicular* (our own nave being too much influenced by earlier architecture) I need go no further than the south and west walks of our cloister, and our noble neighbour, Westminster Hall.

(11.) Of the "*Perpendicular*" *works of the fifteenth century* we have not very numerous remains of a striking character, yet minor specimens are abundant. I may especially mention the chapel of King Henry V., and the altar-screen carried out in the time of Henry VI.

(12.) When we arrive at the *Perpendicular of the sixteenth century* we are rich indeed; and I need only allude to that "*orbis miraculum*," Henry VII.'s Chapel, and the exquisite double cloister of St. Stephen's, over the way.

(13.) Of the earliest *Renaissance*, I may refer to the wonderful examples by Torrigiano, in the tombs of Henry VII. and his mother, the Countess of Richmond; (14) and of its more nationalised form, to the hall of the Middle Temple.

In the above *catena* I have, I believe, repeated in substance what I said on a previous occasion; but for the present I have bethought myself of another *catena* which our abbey offers, almost single-handed, for our study, in that it contains, *with a single exception*, probably all the main varieties of Mediæval *vaulting*, and is, perhaps, the best building in England for the study of that right noble art. Thus,—

(1.) We have among our earliest works, the buildings of Edward the Confessor, two instances of the plain wagon-vault, a form repeated rather later in the chapel of the Tower of London, and we have among our latest works an example of the same in its most decorative form, in the vestibule to Henry VII.'s Chapel.

(2.) We possess beneath the dormitory (also of the Confessor's date) the simplest form of square vaulting with only transverse ribs. Of this, I may mention that the Priory Church of St. Bartholomew contains later examples.

(3.) Here comes our *one hiatus*, and one which I do not recollect that London supplements,—*the square Norman vaulting with diagonal ribs.*

(4.) Next comes the Pointed vaulting, with only transverse and diagonal ribs. Of this the Abbey contains very many specimens, in its aisles, the early parts of the cloister, and in the vestibule to this chapter-house.

(5.) Next is that which adds to the above, the ridge rib at least, in one direction, as our presbytery and transepts.

(6.) Next I may mention the extremely oblique groining of the bays of the aisle surrounding the apse.

(7.) Of the same date we have the simplest forms of polygonal vaulting, as in the apse and apsidal chapels,—the polygon not being perfect, yet the principle the same as if they were so.

(8.) This brings us to the great octagonal vault under whose canopy we are now assembled. It is *new*, yet worked accurately from the springers of the ancient vaulting, and one can hardly conceive of a scheme more perfect, though it is not easy to conceive of any other solution of the problem. It had been solved a century earlier at Worcester, both in the chapter-house, and less perfectly in the crypt. You will see that it is a perfect mathematical development of mere ordinary groining. There are, first, simple arched ribs from every angle of the octagon to its central column. These are the *transverse* ribs. The *diagonal* ribs necessarily bisect the angles which these form at the centre; and on reaching the central point of the triangles which the transverse ribs had formed, they are met by similar ribs from the angles of the octagon. This really completes the scheme, for the vaulted surfaces between these ribs form their own ridge-lines, which are not emphasised by mouldings. Had they been so, a second octagon would be described round the central pillar at half the distance to the angles, but in a position *reversing* that of the main octagon.

(9.) The next principle of vaulting I will mention is what has received the very apt appellation of "*Plough-share*" vaulting. This is very extensively used throughout. It is simply this:—That when windows nearly or quite as wide as a vaulted compartment have the springing lines to their arches higher than that of the vaulting, it is necessary that the compartment or cell which abuts against the wall must have vertical sides a certain distance up from the springing of the vaulting. This is effected by producing the plane of the side of the diagonal rib till it intersects with the wall as high up as the springing of the window arch. The vaulting surface has consequently to *wind*, or *twist*, like a plough-share. This will be seen in all the clearstories and elsewhere, beautifully carried out.

(10.) The next variety of vaulting which we have is what Professor Willis called the "*Sexpartite*" vault, or that in which one of the four natural divisions of an ordinary groined vault

on either side is bisected by another transverse rib, and the space between this and the more usual transverse rib is divided into two oblique vaulted cells. This is admirably carried out in the Chapel of St. Faith, between the vestibule of this chapter-house and the transept.

(11.) We next come to that vaulting in which *additional ribs* are introduced between the transverse and diagonal ribs, and in which ridge-ribs are almost necessarily added. This abounds in the Abbey, but I will especially mention its earliest introduction into Edward I.'s work over the choir. It will be noticed, on careful examination, that it has a peculiar effect on the vaulting surfaces, giving their horizontal sections a peculiar *notched* form.

(12.) The next variety I will name is the "*Lierne*" *Vault*,—that in which there are a number of merely ornamental ribs, making star-like figures round the bosses, &c. Of this a good example exists in the cloister of the time of Edward III., opposite the entrance to the Chapter-house, and I will mention the beautiful example in St. Stephen's crypt.

(13.) Examples of a later date exist, in which the *Lierne* system becomes complicated, and the ribs show an approach to the *fan* system. Of this I will call attention to specimens beneath the Chapel of Henry V., and in the Chapel of Abbot Islip.

Lastly, I arrive at the latest development of Gothic vaulting in this country,—the true *fan vaulting*. This is so peculiar and so new a system that it is not easy to define it clearly. Professor Willis, in an excellent paper on the groining of the cloisters at Norwich, has shown how the different bays of that cloister gradually approach that system by the horizontal sections of the groups of ribs gradually diverging from the *square* towards the *circle*. We often find this approach to circular radiation without the *actual fan* being reached. The fan-vault may be described as consisting of a series of concave-sided conoids springing from shafts and touching one another in their upper circles; the intervals being filled in with ornamental devices of tracery. Its actual introduction was approached by gradual and tentative measures; yet when attained it is so perfect a geometrical principle that one would imagine it to have been conceived *at once* as a single and perfect thought. Strange to say, it was foreshadowed some three centuries before it was actually developed; and we have at this moment over our heads its early foreshadowment. The sixteen ribs branching out from the central pillar of this chapter-house, and similarly from the much earlier one at Worcester, display the fan system as truly as any work of the fifteenth or sixteenth century; yet, so far as one can judge, the hint was not taken from a suggestion apparently so obvious. Had this chapter-house been *hexagonal* instead of *octagonal*, it might have had a perfect fan-groin without necessarily altering its existing central conoid. A space of indefinite size, but divided into exact squares, with a pillar at each of their intersecting angles, may be covered by an indefinite number of such conoids as this rising from each pillar, and their intervals filled in in some appropriate manner. It would seem from this that the system is applicable to *all styles*, from that of the Norman chapter-house at Worcester on to the latest form of Gothic, or even to other styles; yet, as a matter of fact, it is only associated with the Perpendicular style, first appearing, perhaps, in the cloisters at Gloucester towards the end of the fourteenth century, only becoming general a century later, and having its fullest development in Henry VII.'s chapel. It may be mentioned that the multiplicity of the ribs and tracery rendered it necessary to cut them out of the *solid*, so that the system would be equally perfect in construction without ribs, mere smooth conoids; but that its beauty rather arises from these features, which are purely ornamental appendages than necessary elements. An ordinary *square* compartment,—fan-groined,—consists of four quarter conoids meeting at the centres of the sides. Its plan is, therefore, drawn by describing four quadrants from the angle of the square with a radius of half the side, and then adding the ribs, &c., at pleasure. Each quadrant, however, usually has four or eight radials. The intervening space is filled in with a circle of tracery or other device. An *oblong*-planned compartment has similar quadrants or quarter conoids in its angles, but as these do not fill the longer sides, a second circle is drawn from the same centre, and with a radius of half the longer side boundary conoids of larger size which intersect with one another, and are imperfect. The more perfect system (that of *squares*) is found in the aisles of Henry VII.'s Chapel; the less perfect (that of *oblongs*) in the radiating chapels of its apse. The bays of the aisles have in their intermediate spaces a pendent conoid. The vaulting of the chapel itself presents at first sight an apparently inexplicable labyrinth; yet on examination it is easily solved. It is really treated as if there were two ranges of small columns, dividing it, as it were, with a *nave* and *aisles*, every groining bay of each of which would be *oblong* in plan; those of the quasi-*nave* having their longer sides placed *transversely* to those of the quasi-*aisles longitudinally*. Each is then dealt with as described for oblongs. This gives a series of *perfect* conoids of a diameter equal to the width of the *aisles*, and of *imperfect* ones of a diameter equal to that of the *nave*, one way, and equal to the width of the longitudinal bays the other way; but, as in all oblong fan-groined vaults, intersecting one with another. In the intervening spaces down the centre are placed small pendent conoids, as in the aisles. The imaginary columns are then swept away, pendants being substituted, and an arched rib, of great depth, and perforated, is introduced to do duty for them. This system had long before been anticipated in the vaulting at the Divinity School at Oxford, but it was reserved for Henry VII. to carry it out in full perfection. The apse has a somewhat similar system carried out with a portion of an octagon. It would form a perfect system of fan-vaulting for an octagon without a central pillar, but with a series of small pillars in each diagonal line, each carrying a conoid of such a size as exactly to meet each other, with a portion of a conoid rising from each angle and meeting the main conoids. The imaginary pillars are then, as in the body of the chapel, omitted, and a perforated rib made to do duty for them. The whole forms a perfect marvel of construction; at first sight inexplicable, yet, when unravelled, *perfect* and *systematic*, and of most wonderful beauty.

THE INSTITUTE CONFERENCE DINNER.

THE proceedings of the General Conference of Architects, reported at length in this and the last number of the *Builder*, were brought to a conclusion by the dinner of the Institute at St. James's Hall, Regent-street, on Friday in last week. Mr. Charles Barry, F.S.A., president of the Institute, was in the chair, and the company included the Right Hon. the Lord Mayor, M.P.; Mr. A. J. B. Beresford-Hope, M.P.; Sir George Gilbert Scott, R.A.; Professor E. M. Barry, R.A.; Sir John Gilbert, R.A.; Major-General Scott, R.E., C.B.; Professor Poynter, A.R.A.; Mr. Henry Bessemer, F.R.S.; Professor Kerr, Canon Barry, Mr. T. H. Wyatt, Mr. F. Ouvry (president of the Society of Antiquaries), Mr. W. Burges, Mr. J. Douglass Mathews, Mr. J. Whichcord, Mr. Talbot Bury, Mr. H. Currey, Mr. Horace Jones (the City Architect), Mr. John Honeyman, Mr. F. P. Cockerell, Mr. C. L. Eastlake, Mr. C. H. Cooke, Mr. Octavius Hansard, Mr. Alma Tadema, A.R.A., Sir E. H. Currie, Mr. J. Drew, Mr. J. Ross, Mr. A. J. Hiscocks, Mr. J. Gibson, Mr. J. M. Anderson, Mr. R. P. Pullan, and other gentlemen, to the number of between ninety and a hundred. The usual loyal toasts having been duly honoured,

The Chairman proposed "The Army, Navy, and Reserve Forces," coupled with the names of General Scott, R.E., and Captain Hayward, of Exeter, remarking that there was a peculiar appropriateness in calling upon General Scott to reply on behalf of the army and navy, seeing that his training was not alone confined to the service with which his name, rank, and honours, were chiefly identified, for he had attained to some distinction as an architect.

Major-General Scott, in responding, said that there was a time when the profession which gave the name to the corps in which he had the honour to serve was included within the domain of the architect. Michelangelo, Sangallo, and Leonardo da Vinci, were not only architects, but most distinguished engineers. Architects were, as a rule, men of peace; but he was sure that, whenever occasion might arise, they would turn engineers for the defence of their country, and throw aside the trowel and the hod (!) for the pickaxe and shovel.

Captain Hayward having briefly replied on behalf of the "Reserve Forces,"

The Chairman next proposed the toast of "Art, Science, and Literature." He remarked that architects claimed to be artists inasmuch as they had to deal with the beautiful in composition; they claimed to be scientific men inasmuch as they must necessarily deal with constructive problems calling for considerable knowledge of science; and they ought to be so far literary men as to be well acquainted with the literature of the different countries and epochs in which architecture had most flourished. He had hoped that the Conference dinner would have been favoured by the presence of that veteran artist Mr. E. W. Cooke, whose works were veritably "a joy for ever," but he was precluded from attending by a serious attack of illness. He (the chairman) felt sure that Sir John Gilbert, upon whom he should call to respond for Art, would not think that he (the chairman) was detracting from Sir John's peculiar merits in mentioning Mr. Cooke's name. With respect to Literature, the president of the Society of Antiquaries, Mr. Frederick Ouvry, was amongst the guests of the evening. Mr. Ouvry, whom he should ask to respond for Literature, was not only known as the president of the Literary Society *par excellence* of this country, but he was familiar to members of the Institute as its valued adviser in legal matters. With Science he begged to couple the name of Professor Kerr.

Sir John Gilbert, who was very indistinctly heard at the reporters' table, briefly responded on behalf of Art. He was understood to say that he could have wished that the name of some artist more renowned than himself, and more entitled to the honour, had been associated with the toast. He could only thank the company for the manner in which they had received the toast, for it was not necessary, in such an assembly as he was addressing, for him to enlarge upon Art. He looked upon the toast as a graceful tribute paid to the painters and sculptors by their brother-artists the architects.

Mr. Ouvry also briefly responded, remarking that he looked upon the association of his name with the toast as a tribute to his official position as President of the Society of Antiquaries.

Professor Kerr, in responding for Science, said that as regarded the interest which attached to science in connexion with architectural pursuits, he need hardly say a word. He had been connected, in a humble way, with the teaching of science in connexion with architecture and civil engineering for a considerable number of years, and he could only say this,—that the more he had taught, the more he had learnt; and the more convinced had he become that the architectural profession will pursue the right course during the next age if it will devote itself assiduously to the cultivation of science. The architects of the present day had acquired amongst them, in one way or another, a great deal of distinction as regarded art; and although that distinction had been most prominently achieved of late years in the pursuit of Gothic architecture, it was encouraging to him to find that of late some of the most distinguished Gothic architects had been led towards Classic art. During the Conference Mr. Burges had stood up to advocate the claims of Greek art, and in his (the Professor's) humble opinion that was "the beginning of the end" of the revived Gothic era, and that before very long we should see Greek architecture revived in this country. ("Hear, hear," and "No, no.") Everything must have its turn; and he felt satisfied that when it came to the turn of the Classicists, they would employ Greek architecture with as much credit to themselves as that which attached to the leaders of the Gothic revival. In conclusion, Professor Kerr reminded those gentlemen present who were members of the Institute that he had always been at their command whenever they wanted him to make a speech or start a discussion on whatever subject. He now asked them to pay him for his past services by allowing him to propose a toast of his own, viz., "The Sons of Sir Charles Barry." There were present three of the sons of that distinguished man. One of them had attained to the honourable distinction of being the President of the Institute; another was the Professor of Architecture at the Royal Academy; another (Canon Barry) was Principal of King's College; while a fourth (and younger) son was fast making his way to distinction. He (the Professor) had always felt, since his boyhood, a particular pleasure in the contemplation of the works of Sir Charles Barry. The peculiar grace which attended every stroke of his pencil was something most remarkable, and had made him pre-eminent amongst modern architects.

The Chairman, after briefly responding, called upon his brother,

Canon Barry, who said that he was only expressing the feelings of himself and his brothers when he said that their father owed very much to the Institute of British Architects, and his family were by no means insensible to the obligation. The kindly manner in which their father's name had been received was very gratifying to them. Sir Charles was much mixed up in public life, and although he held decided opinions on many subjects and expressed those opinions fearlessly, even those who most differed with him were impressed by his sincerity and by his devotion to the noble profession with which his name was identified.

Professor E. M. Barry, R.A., also responded. He thoroughly endorsed all that his brother had said, and remarked that his father was one of the earliest members of the Institute, and one of its most constant supporters. Nothing would have given Sir Charles so much pleasure, had he lived, as to see his eldest son occupying the honourable position of President of the Institute. Great as might be the deficiences of his sons in endeavouring to sustain his fame, they all felt the responsibility under which they laboured, and did their best to be worthy of his name and reputation.

The Chairman in proposing "The Health of the Lord Mayor of the City of London," remarked that municipal institutions, particularly in North Italy and in the Low Countries, had done much for architecture in the past; and in the present day the municipalities of London and the large provincial towns were by no means defaulters in this respect. The City of London had much to show in the shape of architecture, and the great improvements which had been effected by the formation of new streets and the erection of many important buildings had been greatly promoted and encouraged by the Lord Mayor and the Corporation. The present Chief Magistrate of the City of London had special claims on the consideration of the company, for he had a high appreciation of the value and importance of art, as was evinced by the banquet which he lately gave at the Mansion House to the members of the Royal Academy and other art societies, and at which he (the chairman) had the honour of being present as the representative of the Institute. On that occasion Lord Mayor Cotton made a speech which showed how thorough was his appreciation of the value of art museums, picture galleries, and good architecture as factors in the education of the people.

The Right Hon. the Lord Mayor, in responding, claimed that the City of London, from time immemorial, had always been a warm patron of the arts. With regard to architecture alone, he would only instance the great and honoured name of Sir Christopher Wren, who, to a great extent at the instance or with the aid of the Corporation of London, rebuilt a number of churches within the walls of the City, after the Great Fire of London, in addition to that finest and noblest of buildings, the Cathedral of St. Paul's, which, surmounted by its splendid dome, and surrounded on every side by the numerous churches built by the same architect, afforded a *coup d'œil* unparalleled in the world. More recently the Corporation had continued to maintain its position as a warm friend and patron of architecture, as evinced by the carrying out of such works as the Holborn Viaduct, which every foreigner came to see, and which was looked upon as one of the wonders of the world (laughter). The new City Library and Museum at Guildhall, built from the designs of Mr. Horace Jones, the City Architect, was also an earnest of the interest taken by the City of London in art and architecture.

The Chairman next proposed "The Houses of Parliament," coupled with the name of Mr. Beresford Hope, M.P., a gentleman who had had the honour of filling the chair of the Institute, and who was ever ready to champion the interests of art and architecture in the House of Commons.

Mr. Beresford Hope, M.P., in acknowledgment, created much amusement by an ideal description of the House of Commons as it might be regarded two thousand years hence in some manual of history for the use of School Board schools, and concluded by saying that often and often when he had tried to raise a discussion on art questions in the House his greatest success had been in the direction of purifying the atmosphere by diminishing, for the time being, the number of pairs of lungs breathing the air of the House.

The Chairman, in proposing the toast of the evening, "The Royal Institute of British Architects," said that as the company had so recently listened to Mr. Eastlake's interesting sketch of the history of the Institute, it was unnecessary for him to say much as to the past. The Institute had been formed not so much for the promotion of the study of architecture, as with the view of giving to the profession a moral status which it did not previously possess. Prior to the advent of the Institute some architects were in the habit of receiving money payments from builders as well as from clients, but inasmuch as no man could serve two masters, the evil effects of such a state of things were strongly felt. It was a condition of membership in the Institute that no member was allowed to receive money payments from builders in respect of works in progress or completed. This condition was rigidly observed and any infraction of it was followed by the expulsion of the member so offending. As a result, the moral effect was such that even amongst architects who were not members of the Institute the same excellent rule was adhered to, and was very rarely infringed. The Institute was also valuable as a common meeting-ground for the interchange of thoughts and ideas, and for the dissemination of experience gained in practice by the members, who, although in one sense rivals, were animated by a common desire to promote the welfare of their art. With the toast he coupled the name of Sir Gilbert Scott, R.A., who briefly responded.

Mr. Beresford Hope proposed "Success to the Conference," to which Mr. J. Douglass Mathews, one of the hon. secretaries of the Conference Committee, briefly responded.

The remaining toasts were "The Visitors" (proposed by Mr. Whichcord and responded to by Professor Poynter, A.R.A.) and "The Secretaries of the Institute" (proposed by Mr. Octavius Hansard, and spoken to by Messrs. Cockerell and Eastlake).

THE IMPORTANCE OF GREEK ART AND LITERATURE TO THE PRACTICE OF GOTHIC ARCHITECTURE.

BY MR. WILLIAM BURGES.

My present observations will, I am afraid, be considered very brief and very exclusive. They will be short because in a conference the great object is to compare experiences and to obtain as many opinions as possible: this evidently cannot be done unless the papers are very short. On the other head, of exclusiveness, I must remark that the very title of my paper indicates that it is addressed to one particular class of my architectural brethren.

In the first place, let me say a few words as to the present state of architectural art. If we take up any of the architectural publications, of which there are no less than four weekly ones, we are simply astonished at the number of various styles which are all being practised concurrently. There probably never was such a complete architectural masquerade as we see at the present time. The history of this state of things is not a little curious, and shows how important a part literature has played in this development.

Although Greek architecture was known and described a hundred years ago, it was little practised until Lord Byron published his poems and made us all Philhellenists. Then came Sir Walter Scott with his quasi-mediæval romances, who caused the Gothic revival to set in: the last phase—the Queen Anne style (as it is called)—being due to the works of Thackeray.

It was quickly found that the Greek style was unsuited to our habits, and still more to our climate; but these considerations did not apply to the Gothic revival, which consequently made a deeper impression, and lasted, and I hope will continue to last, very much longer. Some very few years back we were threatened with a Classic revival,—a revival freely predicted by the gentlemen who do us the honour of more or less instructing us in the columns of the architectural press. The so-called Classic revival has resulted, however, in the Queen Anne style, than which nothing can be less Classical, while its practitioners are simply deserters from the Gothic school. The real reason for the adoption of this style are—1. That it is easier to design; 2. That it takes fewer drawings; 3. It is very cheap; being, in fact, little else than the ordinary house with high-pitched roofs, white clumsy sashes and bars, with sundry rubbed brick scrolls over the doorways and other parts it may be wished to ornament.

Now these are certainly great advantages, but how about the art? As Mr. Ruskin would say, does the architect love his brick-scroll when he has done it? In future times, when it is a question of a new street, will any one of the buildings in question be spared by the Board of Works because it is beautiful? I think not. We must always take into consideration not only what we ourselves think of a building, but what posterity will think of it, and this brings me to the subject of this paper, viz., that if these deserters from the Gothic school had studied Greek art and Greek literature, as they ought to have done, they would not have drifted into their present very questionable style. It is true we may all, more or less, have to build cheap edifices; but then we can generally make them picturesque in their outline. This, indeed, the school in question has done; but cheapness does not of necessity involve bad art, and there can surely be no necessity to perpetrate the broken-backed scrolls and false little pediments. Just for a moment imagine an ancient Greek brought to life again and shown these buildings. What would he think of the unnecessarily ugly details?

It is as a cure for this state of things that I would most earnestly recommend a careful study of Greek art and Greek literature to my Gothic brethren. It is really the key to the position; but in studying Greek art it will not be sufficient to consult Stuart's "Athens" and other like books. The actual buildings must themselves be visited. A journey to Athens and back can be accomplished within three weeks, or at most a month, leaving a week for the Acropolis itself. It was not until I was actually on the spot that I understood how beautiful Greek architecture was, and how nearly it was allied in spirit to that of the thirteenth century. From that time I took a new view of the latter art, and things which had before appeared arbitrary and confused became clear and logical. I saw the same mind working at Athens as at Chartres, but in a different climate, under different conditions, and with different material.

I had been told that Greek architecture was beautiful; but I could not believe it, for I had only seen it represented in books, where the white columns were shaded until they looked like those thickly coated with soot on the outside of St. Paul's. It was impossible to believe that these things could be beautiful; but on the spot itself they were very different, and I saw that, dry bones as they were, the climate, which afforded the broad lights on their surfaces, and furnished the glorious blue sky which formed the background, made every difference. I also saw that each building was placed with the most consummate art, and turned exactly in the direction where it would be seen to the very best advantage from certain points of approach.

Further investigation showed traces of the colour, which, by artfully-designed ornaments, principally in bright tints and thin lines, softened down the intolerable glare of the white marble when first the edifice was built. It is a curious fact that colour thus applied upon a bright surface at a distance not only, as might be expected, loses its individuality, but also gives a light tint of its prevailing colour to the marble. Of course there were other parts coloured in greater masses, such as the triglyphs, which would be seen as local colour even at a distance.

The next information was obtained from Mr. Penrose's book. From this I learnt how by almost invisible corrections of the lines of the architecture the same softness was given to a hard marble building as we see in a sketch. Everybody knows how a design always looks better in a sketch than it does in a careful drawing (I am referring to geometrical drawings), and how very often the building itself looks even harder than the geometrical drawing, especially if the latter is touched up with stone joints, real or imaginary. The Greeks were perfectly aware of this fact, and provided for it accordingly. I hardly know a more instructive book than Mr. Penrose's, not for the purpose of copying, for the same curves would in all probability not work in again unless under precisely similar circumstances, but for the purpose of gaining a general view of the whole arrangement, and for showing how the Greeks proceeded in this matter under certain circumstances. I also venture to doubt whether the results were really obtained by the geometrical means shown by Mr. Penrose, or whether they were not due to some simple mechanical instrument, such as a bent lath in the case of the lines, or to free-hand drawing in that of the mouldings.

And here I may observe that there are few

things so difficult as the designing of mouldings. It is true that books have been published giving sections of mouldings which have at various times been used in all styles of architecture, but these will not enable the architect to design effective results. The section of a moulding is only the means to an end in the actual work. You do not see the action of the moulding; you see the front view, and whether that section will make an effective front view depends upon the position in which the moulding is to be placed, the amount of light, and the colour of the material. In Greek work, I suspect, the nature of the coloured ornament with which the moulding was enriched had something to do with the shape.

If we look at the Greek statuary we see precisely similar arrangements for making it effective and relieving it with colour; thus a seated figure seen from below would have an inclined lap and short thighs, in order to counteract the foreshortening in the perspective. The same thing occurs in the figures at Wells Cathedral, but Mr. Falkener, in his "Dædalus," declines to believe that the Mediæval artists were influenced in so doing by the same motives as the ancients. This deduction is evidently most unjust and erroneous, for it supposes that the men who worked at such places as Wells, Chartres, and Rheims, had neither eyes to see nor brains to draw deductions. The Greek sculptor, equally with the Mediæval master of living stones (as they were called), knew perfectly well from experience that monumental sculpture, *i. e.*, that destined for buildings, demands a very different treatment from that destined to be seen closely, and acted accordingly.

It may be asked how the student of Mediæval art can apply the lessons he receives at Athens. I reply that climate, material, and construction being totally different between Greece and England, he especially derives the very great advantage of not being able to copy; he must have recourse to that most laborious of occupations, that of using his head; in fact, he will be all the better if he does not make a single sketch. He may, indeed, enter notes in a note-book, but even that he may safely throw away when he has filled it up.

The questions he must ask himself are,—Why did the Greeks do this? Why did they cut away that stone or add this? Why was this building set at an angle? And when he has resolved such questions at Athens he will find himself very much more competent to resolve similar, but not exactly the same, difficulties when he works on the Classic style of the thirteenth century. It is true in the latter case that the mouldings are deeper; but he will learn to give them a proper quantity of light and shade, and not overdo them in this respect, as was the case in the Early English style in our own country. It is true that our climate prohibits, to a great extent, external polychromy, more especially that more delicate description which is only suitable for pure delicate substances, such as marble, ivory, and alabaster; but he can use colour in the more protected parts of his work, such as the tympana of the portals; and in the interior statuary, such as the font, pulpits, and domes, he can find employment for alabaster and marble, and consequently for the more delicate polychromy. Indeed, I do not quite see but that even the external system of polychromy might be used internally with regard to a room lined with white marble, or still better, with the more delicate-tinted alabaster.

To go into the question of the subsidiary arts, such as engraving, mosaics, enamelling, bronze-work, and, indeed, all those little arts which clothe the dry bones of architecture, and render it agreeable, would take too long a time; suffice it to say that the true architect should be able to design and superintend them. To suppose him to execute them would be asking too much. No human life would be long enough to acquire a moderate proficiency. The great duty of the architect is to design his architecture, and to see to its proper execution, as well as to that of the lesser arts.

In acquiring the knowledge necessary for him to do this, nowhere will he find greater help and instruction than in the careful study of Greek art. The vases, the mirror cases, the gems, the jewelry, — all have their instruction to give, more especially in the human figure; for the ancients had advantages in this respect which were denied to the artists of the Middle Ages. The Greek saw the nude human figure every day, and all day long; he also saw it developed in its perfection, for his fellow citizens did not contort their bodies with tight, ill-fitting garments and ugly shoes; on the contrary, they took the greatest care of it by means of bathing and athletic exercises. The Greek artist saw the human body in its natural attitudes, free from all restraint; he went away and remembered it,—a far better way of studying than that from a fixed attitude by an awkward, unintelligent model at 1s. 6d. per hour. The nearest approach to the old state of things is practised, I believe, in the monastic schools of Mount Athos, where, after the pupil has made his study from the model, the said model is removed, and the pupil is obliged to make another study from memory.

The Mediæval artist was to a great degree deprived of the study of the human figure in its nude state. In this case we moderns have clearly an advantage. We have not the chance that the Greek had of observing it all day long, but we can have models, and it depends on ourselves if we use them in an intelligent manner.

After all we shall fail to gain all the benefit we may hope to draw from works of the ancients if we neglect their literature. In the Middle Ages it was not neglected: it is true that Greek art was but little read, but educated men were perfectly familiar with that of Rome. The works of Chaucer, Dante, Petrarch, of the author of "Le Roman de la Rose," and many others, all abound in classical illustrations, and how many more advantages have we who have the whole of Greek literature at our disposal. I do not mean to insinuate that the architect is to be expected to read all the Classic authors in their original languages. Few of us have the advantage of a college education. Art is too long and too difficult to allow three or four years to be subtracted from our best and most teachable time. The little Greek learnt at school is soon forgotten: perhaps it was only presented to us under the form of small portions of Xenophon, Homer, and Euripides, our recollections of the tragedies being principally composed of the particles and accents.

On the contrary, our education proper begins when we leave school,—what we have learned there being only a preparation for it. There are excellent translations of all the best authors, and by reading concurrently two or three translations (one probably metrical), we can end by having a very fair idea of the author. I do not mean to infer that the Mediæval authors should be neglected; on the contrary, they should be read concurrently with those of the old world. There is wonderful similarity of feeling, for instance, between Herodotus and Froissart, much as there is between Greek and thirteenth-century architecture. Aristophanes and Rabelais are another instance of working on similar lines. The great use of the study of literature to an architect is not only to educate him, but to give him that judicial power which is called good taste. Literature itself will not do this, but it will help. Among other helps is the seeing of beautiful things, which also includes the surrounding yourself with them, and, above all, the study of the human figure.

These things are the more important as the question of art and taste is becoming more prominent every day; in fact, it is *the* question. If we are ever to have a style in architecture it will certainly not come from the exclusive choice of any of the existing ones, neither will it come in our own time, although certain writers, as early as thirty years ago, were calling out for no copying, but for the creation of a new style. They might as well have asked for the millennium. Nobody ever can, or ever will, invent a style; it must come by common practice and common consent. In the meanwhile we may help it on by becoming better artists, and being better read. No one can predict how the new style will be evolved, or when it will come: perhaps some day we may wake up and the law of leasehold may be abolished; then it may be discovered that it pays to make what is our own,—say our house or our warehouse,—the best of its kind. Then may follow the consideration that dirty brick and decaying stone are not the most suitable materials in a city like London, with its atmosphere saturated with gases; then may follow the reflection that granite, porphyry, and majolica are the only substances which will resist the said gases.

But majolica can be decorated and painted and made to tell histories, and to speak like the living stones of the Mediæval artists, and then, if we have not neglected our opportunities, and if we have studied the arts,—both the great and subsidiary,—in a monumental spirit, then indeed we may see the beginning of a new style,—a style founded upon common sense, and construction in our own materials combined with beautiful and monumental art.

IMPROVED DWELLINGS IN TOWN.

BY MR. C. FORSTER HAYWARD, F.S.A.

HAVING so recently read notes on this subject at this Institute, I will confine my remarks at present within very strict limits. It seems to me that one of the best chances for artisans' dwellings being improved is to get artisans themselves to combine and erect them for their own accommodation,—of course, with suitable professional assistance and oversight. We should then *see* what we can at present only surmise—what the British workman thinks most suitable for himself—not only what the various benevolent agencies at work think he ought to have. If by co-operation applied to building—particularly artisans' dwellings—a solution could be found of the question (for it is a question still which will crop up continually, notwithstanding triumphantly strong statistics as an answer), whether it will pay to build houses for artisans in London as an ordinary business transaction, some good at least would be done. Also, if it could be decided definitely whether the workman objects to live in flats, and only tolerates this kind of residence because he can get no other near his work, another step would be gained. Again, it would be something to know, by seeing the actual execution of work by a body of British building workmen, what sort of water-fittings for instance, as for sinks, closets, &c., and what kind of workmanship in woodwork and finishing generally was deemed sufficient or desirable in a workman's dwelling. For it seems all very well, but perhaps a little beside the mark, for us to discuss too minutely what is best here and there for men who are or ought to be, as a body, more capable than ourselves of stating what they want, and how much they can pay for it. In other matters workmen or artisans are not slow to tell us what is best for them, or what they think is so. Why not, therefore, trust them, and urge them to show what is wanted for themselves in the way of dwellings of a (1) common, (2) an "improved," and (3) a "model" character? By this I would wish to be understood to refer to three grades of buildings suitable for artisans of all positions, including poor widows and working women generally. It will be seen that I refrain myself from discussing details too minutely, feeling that this has been done already by the kind and thoughtful, and would now desire that the artisan should think and act for himself, and prove his capability of supplying his own needs now that the new Act has removed difficulties as to sites.

I have received, as I suppose we all have recently, a prospectus of a Co-operative Building Society, which aims, amongst other things, at providing artisans' dwellings, and so the matter seems ripe for solution, as among the members of the management committee, are "an engineer's assistant," a "late builder," a "superintendent of works," a "foreman of works," a "clerk of works," besides an accountant, a stock-broker, and another. I fear, however, the object we are discussing is but a small part of the proposal, and is only intended to be undertaken as any other business that may offer, and not as a genuine co-operative work for the provision by the promoters of something wanted specially by themselves and their own class. Of course, I do not suggest action to be taken by such without proper advice, or such assistance as may be wanted to perform for them what they cannot perform for themselves.

Of the three grades of buildings referred to, those of the first, or common, as I have said, can be discussed with the greatest advantage to the parties interested (because it is the most neglected of all), though perhaps with the least pleasure to ourselves. It will compel us to consider how little, not how much, can be put into these buildings, so that they may be decent and good, and yet not too expensive. How strong and sound work can be made, and yet how simple and effective; in fact, be a wholesome study in severity and substantiality. And our artisan builders, too accustomed to flimsy, scamping work, would find a good lesson in erecting a substantial (and cheap, because substantial and good of its kind) poor man's dwelling, so as to pay better *in the end* than ordinary work for a similar purpose.

Again, directing one's attention to this lower class of building will be the right way of heaving

up the whole mass. The raising of the top class can best be done by lifting the lower, if only the lever be strong enough; but to cater for the respectable well-to-do operative only, and to leave the poor widow and her family, and the struggling street seller and his wife alone in their poverty, because they *cannot afford* to pay the rent of the superior accommodation, is, I think, a mistake. I am thus, it will be seen, pleading for the poorer classes; and I have plans to show,—though there is really nothing special in them that we do not all know of,—how far I think we ought at present to go in providing improved accommodation for them. I have lately seen the commonest and poorest courts of Drury-lane clean, decent, and comfortable,—almost an impossibility, one would think. So there is hope on the side of improvement, and encouragement to balance disappointment. One of the greatest helps to the proper conduct of the inhabitants and their appreciation and care of improved homes is the kind and considerate but firm and wise conduct of the agent, especially when both owner and agent of this character are one and the same person.

AN HISTORICAL SKETCH OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

BY MR. CHARLES L. EASTLAKE, SECRETARY.

IN 1846, at the instance of Lord de Grey, her Majesty was graciously pleased to bestow on this Institute a lasting mark of her favour, by founding the Royal Gold Medal, the annual award of which has since become one of the most interesting events of our official year. It was originally intended as a student's prize, to be offered for the best designs in Grecian, Roman, or Italian architecture, and the Council proposed to supplement it with the sum of 50*l.* on certain conditions of Continental study, such as are at present attached to the Soane medallion. But the fates had ordained another destination for the Royal medal. Although the subject fixed on for the prize was one calculated to fire the enthusiasm of competitors, being no less than a new Institute, the drawings submitted did not reach that standard of merit which the Council deemed necessary to justify the award, and no award was made; but out of this apparent evil a decided advantage resulted. A consultation took place, and, with her Majesty's consent, that which had been founded as a student's prize became the most honourable distinction to which our profession can aspire,—a distinction which is coveted by foreigners as well as by Englishmen,—and which has been conferred, I need not tell you how deservedly, on the eminent and gifted French architect whom we have the pleasure of welcoming this evening.

About this time I am glad to find that the Institute took the first steps towardi the organisation of a benevolent scheme, which, though it has since passed into other management, was first devised by a committee of our own body, and is still supported by a large number,—I wish I could say by *all*,—of our own members. That excellent institution, the Architects' Benevolent Society, the very name of which proclaims its object, and should suffice to enlist our sympathies, is an offspring of which the parent Institute may well be proud. Ably mansged and judiciously administered, this charity has for many years past done much good and silent work; and if to mention it be a digression from the immediate subject of my paper, I hope I shall be excused by making it an appeal for your extended, continuous, and liberal support.

While referring to the prolific character of the Institute, I must not forget another bantling which may claim its paternity, and has received its fostering care. I mean the Architectural Publication Society, which, after experiencing many vicissitudes, is now in a fair way of arriving at maturity. "Of making many books," says the preacher, "there is no end." In this case there is only one book, but a big one, in many volumes, and I make no doubt, that when Mr. Wyatt Papworth writes "*Laus Deo*" on the last sheet of copy for the Dictionary of Architecture, he will have completed a work for which posterity, as well as his contemporaries, will be grateful.

The year 1849 was remarkable for the appointment of a committee whose object was precisely similar to the one which reported only last year, viz.:—An inquiry into the affairs of the Institute, with the view of increasing its efficiency. That history repeats itself is a proverbial fact, and it is curious to note that some of the problems which presented themselves for solution a quarter of a century ago, have turned up, like a recurring decimal, in the present day. Some of the schemes for improvement then devised have since been realised; as, for instance, the publication of a synopsis of our proceedings at the close of each session, the appointment of special committees, the holding of an annual *conversazione*, the requisition of original papers from newly-elected members, the adjudication of prizes by the general body of members, and modification of the terms on which associates were elected. But wilder proposals for reform met with no encouragement, and were consigned to that limbo which is guarded by prudence and discretion.

The following year found the Institute, like the rest of the world, big with hope as to the result of the first Great Exhibition of all Nations. With great public spirit the members voted a sum of fifty guineas towards an undertaking, the effect of which, though vastly overrated in regard to some of its aims, has, I suppose, had a permanently beneficial influence on the industrial art of this country.

By this time Mr. J. J. Scoles had succeeded Mr. Poynter as Honorary Secretary, and in conjunction with Mr. C. C. Nelson held that office, while Professor Donaldson still conducted the foreign correspondence. I cannot mention their names or those of Mr. (now Sir Digby) Wyatt, and Mr. T. Hayter Lewis, who shortly afterwards occupied the same position, without reminding my hearers how deeply indebted the Institute is to the zeal and energy with which those gentlemen discharged their duties. They held office during a period which must have been a most critical one for the welfare and advancement of this society, and it is not too much to say, that but for their exertions it might never have been what it has since become.

It was at the Foreign Secretary's suggestion, that in 1851 the Council, with the authority of the general body of members, memorialised her Majesty on the subject of the Royal Tombs in Westminster Abbey, which at that time bade fair to perish from decay and mutilation. In the previous year a committee of members had done public service by their advice respecting the Metropolitan Buildings Bill, then in course of preparation. A little later we find in the annual report an earnest appeal for the necessity of improving the dwellings of the poor, and special mention of Mr. George Godwin's name, which has been so long and honourably associated with that benevolent object. In these and numerous other instances, the Institute has identified itself with matters of national importance, and I trust will long continue to do so.

For some years following the period at which we have now arrived in the history of the Institute, no material changes in its administration took place; nor do we find any events of importance recorded in its annals. The number of members increased gradually, but not in the same rate as in the first *decennium* of its existence, and by no means so rapidly as at the present time. A considerable proportion of the annual reports issued by the council was devoted to comments on the papers read during the previous session. Events of public or professional interest, such as the completion of the Houses of Parliament, the establishment of the Architectural Museum, the International competitions at Amiens, Hamburg, and Lille; the Public Health Bill, and various architectural improvements in London, elicited from time to time an expression of official opinion; but as they are matters lying beyond the immediate scope of this paper, I will not stop to consider them in detail.

The Metropolitan Buildings Act, passed in 1855, marked a notable event in the career of the Institute, by including in its provisions that examination with the conduct of which the Institute has been since officially charged, and which every candidate who desires to become a district surveyor is expected to pass before he can be appointed to that office. This practical recognition by the Government of our corporate body is one which could scarcely be other than gratifying to all who value its national status; and it is due to the memory of Sir William Tite to add that he availed himself of his position in Parliament to accomplish that which he was eminently qualified to recommend.

It was at first thought that this measure would have formed a basis for the adoption of one in which our profession is more immediately interested, viz., the establishment of a diploma; but the question, as you know, remains unsettled at the present time, in spite of endless discussion and arguments, which have almost become stale by repetition. The subject is so intimately allied with another to which I must presently refer,—viz., the architectural examination,—that I shall reserve the few words that I have to say respecting it until I can deal with both together.

The limited extent of my paper prevents me from describing at any length the origin and progress of the Architectural Association,—a society of young and energetic students formed in 1842, and which, as you know, still flourishes under this roof. Suffice it to say that, in 1857, certain proposals were made by which it was supposed the Association might be induced to join the Institute, and in fact become merged in it, on apparently advantageous terms. The offer was then, as it has been since, courteously declined; and though one cannot help regretting that, in a provision like ours, one representative society does not suffice to secure all the requirements of a professional guild (and this, in the interests of architecture, whether regarded as an art or a business, it should undoubtedly do); one can nevertheless understand and appreciate that independent spirit of the Association which has resulted in honest emulation and judicious self-government.

The time had now arrived when the increasing number of its members, and the enlarged scope of its corporate functions, obliged the Institute to think of securing more room and convenient quarters than those in Grosvenor-street. This desideratum led to the formation of the Architectural Union Company, a body of professional men who raised, by the issue of shares, a capital sum, sufficient to secure these premises for the occupation of societies connected with architecture, and with architecture alone. Such at least was the hope entertained at the time; and if I am wrong, I can but refer to the legend which runs across the front of this house. The principal floor was destined for the special use of the Institute, while the spacious galleries which were erected at the rear of the building were intended to accommodate the Architectural Exhibition, the Architectural Photographic Society, and the Institute itself on certain occasions. But, alas, for the vanity of human aspirations! The Architectural Exhibition, after struggling many years for existence, is defunct; and the Photographic Society did not long survive it. The Genius of Painting and the Goddess of Music, both arrayed in a somewhat commercial garb, have by degrees taken possession of the ground floor; while the sister art of Architecture lives in daily fear that, as time goes on, they will be creeping upstairs. To drop the metaphorical strain, let me remind you of the specific purpose for which these premises were acquired, and express my earnest hope that we may, ere long, make some effort so to secure them for our society that it may be housed in a manner worthy of its name.

In 1859, Mr. F. C. Penrose, whose researches in the field of Greek art had secured for him a well-deserved reputation, succeeded Professor Donaldson as hon. secretary for foreign correspondence; while Mr. Digby Wyatt, who had held office as hon. secretary for three years, gave up his portfolio to Mr. Thomas Hayter Lewis, better known of late years as the distinguished Professor of Architecture of University College.

In 1860, the Institute found itself in new quarters and under new generalship. Lord de Grey, whose last public act was to open the proceedings of the session, died full of years and honours, after having held the office of president for a quarter of a century. On the abstract question whether it is or is not desirable that that office should be held by a non-professional member, opinions may be divided; but there can be little doubt that, while the Institute was still young, and required the stimulus of Royal favour and aristocratic patronage, Lord de Grey's social position was of immense service in securing these advantages. With his name our charter will be inseparably associated. To another non-professional president, Mr. Beresford Hope, the Institute is indebted for having been enrolled among the Royal Societies of this country.

Lord de Grey was succeeded by one whose name is among the most loved and honoured in our profession; an architect who, at an early age, received from the world, as a tribute to his talents and accomplishments, an amount of admiration which might have turned the heads of vainer men, but which wrought no change in his naturally modest and unassuming disposition. Gifted by nature in more than one sense,—a cultivated scholar, a refined artist, a courteous and

* See p. 591, *ante*.

kindly-hearted gentleman,—I can scarcely fancy in our profession a career more worthy of respect and imitation than that of Charles Robert Cockerell.

The removal of the Institute to its present quarters was followed by a large accession of members, and seems to have stimulated the council of that day to the consideration of novel measures. The subject of a professional examination had long been discussed in connexion with the diploma question, and in 1861 it was brought before a special general meeting, at which considerable difference of opinion was expressed. Eventually the matter was referred to a committee, who in due course presented their report. Of this committee the late Mr. Arthur Ashpitel was chairman, and the late Mr. J. W. Papworth hon. secretary; and if the architectural examination scheme may be considered one of the good works of this Institute, to Mr. Ashpitel and Mr. Papworth must be accorded the chief praise for having accomplished its organisation.

In dealing with this important question two preliminary questions had to be settled. The first was, whether the examination should be voluntary; and the second was, whether passed candidates should be entitled to a diploma. The former was one which soon settled itself. In the absence of any legal obligation to qualify, a compulsory examination, even for members of this Institute, would have been out of the question, and the logical deduction was, that a diploma which conferred on those who possessed it no more right to practise than those who did not, was of no value. For a long time even the issue of a certificate was steadily opposed, and of late years, since that point was ceded, the mortifying discovery has been made that we have won a hollow victory. The principle on which a certificate should be granted is admitted on all sides; but meanwhile the examination languishes, not for want of certificates, but for want of candidates to claim them. The truth is, that a certificate is not the same thing as a diploma, and the issue of a diploma involves a question on which a great difference of opinion has always prevailed. It is, in short, the question whether architecture should be an open profession or not. The arguments on both sides may be briefly summarised as follows:—The supporters of a diploma said, in effect,—"We are members of a profession which is no less a business than an art. To the duly qualified practitioner it involves an expensive education, a long course of study, including researches in physical science, chemistry, geology, and what not; an acquaintance with mathematics and the theory of construction; an experience of legal issues; a commercial insight into the value of materials and labour; to say nothing of such accomplishments as a linguist and draughtsman may claim. Is it right or is it fair that after we have spent the best part of our lives in attaining these qualifications, we should find ourselves, in the eyes of the public, in no better position than a builder's clerk, who, being a pushing young man, with a little interest and more assurance than his betters, touts for every job that comes in his way, and, with no real pretensions to taste or advantages of education, slips into a practice which many a qualified man can never secure? The remedy for this is an examination and a diploma, without which no one should be allowed to call himself an architect. Establish them, and the public as well as the profession will be benefited."

On the other hand, their opponents replied:—"It is quite true that architecture is a business as well as an art, but it is an art first, and into the exercise of that art the element of natural taste, however cultivated, largely enters. How can the value of that taste be gauged by a standard which must always be fleeting, and therefore empirical? Who can say, even of our accepted authorities, that they are unanimous respecting the choice of a style, or even the varieties of a style? For three examiners who pronounce in favour of a design you will find nine outsiders of equal eminence who call it commonplace. And if a criterion is to be sought among those monuments of antiquity whom all agree in admiring, a new argument must be encountered. The great masters of our art, who flourished in Italy and France, to say nothing of those in this country, graduated in no school of architecture, and who will contend that their works are the worse for it? It is true that you may eliminate the question of taste altogether, and confine your examination to matters of practical science, but whom will this benefit? Not the *bonâ fide* architectural student, who has naturally turned first to the artistic studies of his profession, and who has yet to learn its science and its business from experience, but the builder's foreman or clerk of works, who has worked at the bench, and knows twice as much about construction as any young gentleman who has just completed his articles. Your examination, in short, will become the means of admitting to the ranks of our profession the very men whom you wish to exclude."

Such, gentlemen, were some of the old *pros* and *cons.* of a question on which I will venture to offer no personal opinion, and from which I must now pass to other topics.

The Professional Practice Committee, one of the first and most useful of those appointed by the Institute, had long felt the desirability of establishing a series of rules relating to the practice and remuneration of architects, which, based on custom and confirmed by experience, might serve as an authority for the profession, as well as a guide to the public. It was a measure which required some caution and delicacy in promoting, and one on which it was deemed advisable to consult the opinion of individual members. With this object in view a series of questions was drafted and confidentially circulated among members of the Institute. The result was a mass of valuable information, which, after careful sifting and analysis, afforded material for the General Rules drawn up in 1862, and, after a slight modification, is still recognised, not only by members of the Institute, but by the profession at large. It is to be observed that those rules, although not absolutely binding on any one, represent so fairly the details of professional usage that they are constantly accepted as evidence on that subject in courts of law.

The year 1862 saw another good work accomplished by the Institute. An excellent and thoughtful paper had been read by our late president, then Mr. G. G. Scott, "On the Conservation of Ancient Monuments and Remains," calling attention to the neglected state of many architectural relics in this country, and urging the necessity of adopting some means of rescuing them from decay and wanton injury. Such a duty would, in the minds of optimists, naturally devolve upon the State. But the principle of British Government, as we know, is not paternal, and the fear of interfering with the rights of private property has long presented difficulties in dealing with this question. Under these circumstances it seemed advisable that a standing committee should be appointed by this Institute for the purpose of investigating cases in which a protest might occasionally be made in favour of ancient buildings threatened with destruction. One of the first duties undertaken by this committee was the preparation of a series of suggestions for the guidance of architects and others charged with the custody or restoration of such buildings. The issue of that paper was in itself of service. But the committee has done more than this, and ever since its appointment it has lent a ready ear to every appeal which has reached it on behalf of architectural relics of historic or artistic interest. In some cases, of course, when counter-pleas of public utility can be urged, or financial considerations present themselves, a remonstrance from any quarter must be unavailing, but, speaking generally, whenever the Institute has been justified in interfering it has done so, and I believe not unfrequently with success.

In the late Sir William Tite, who succeeded Professor Cockerell as president, the Institute found a liberal benefactor. His wealth enabled him to contribute largely to many of the objects for which this society was founded, while his position in Parliament gave a certain weight and influence to any measures partaking of a public character which it undertook during his twice-renewed term of office. Among the numerous acts of generosity that are associated with his name may be mentioned a gift of 500*l.* to the library fund, and a legacy of 1,000*l.*, the interest of which, under the terms of his will, is annually devoted to encourage the study of Italian architecture. I cannot refer to the former gift without reminding you of the splendid store of literary and illustrated works on architecture which has been gradually amassed in our library,—a collection, so far as I know, quite unrivalled in this country, and presenting great advantages to the student. To Mr. Wyatt Papworth the Institute is largely indebted for gratuitous services in forming that collection, which, for some years past, has been under the care and efficient supervision of our librarian, Mr. S. W. Kershaw.

It was during Mr. Tite's first term of office that the Institute appointed a committee, of which Mr. Charles Barry (our present president) was secretary, for the purpose of drawing up and forwarding to the First Commissioner of Works a series of valuable suggestions respecting the Thames Embankment. A few years later the Institute took an active part in advising the Government on the subject of a new Metropolitan Building Act. I might mention many other instances in which this society, seldom accredited with anything beyond the advancement of professional interests, has undertaken, at a considerable sacrifice of time and trouble, labours for which the public has reason to be grateful.

In 1860 Mr. C. C. Nelson, having discharged the duties of honorary secretary for twelve consecutive years, retired from office, after receiving a handsome testimonial in recognition of his zealous and active services. In the same year the Institute paid a fitting tribute to the memory of Sir Charles Barry by attending his funeral in Westminster Abbey. His friend and fellow-worker, Welby Pugin, had predeceased him by some ten years; but the cause which Pugin had most at heart,—the revival of Gothic architecture,—was still a watchword with his friends and admirers, who determined to perpetuate his name by founding a studentship, with the nature of which you are all familiar. The power of awarding that studentship is vested in the Institute; and I am glad to add that the result has been most gratifying to all concerned.

In 1862 Professor Donaldson succeeded to the highest office in the Institute, and it was during his presidency that Mr. C. F. Hayward and Mr. J. P. Seddon were elected honorary secretaries,—a position with which their names were long and gratefully associated.

In the following year the first Architectural Examination was held, and eight candidates passed in the proficiency class. Of these, two subsequently passed in the class of distinction. Modest as these numbers are, they have never been reached since, in spite of certificates and other inducements; and this want of response is a question which still remains to be solved.

In 1863 the Council appointed a finance committee, who have since discharged the responsible duty of regulating the expenses of the Institute, and who annually issue an estimate of the receipts and disbursements for the year.

A little later an attempt was made to establish, in connexion with the Institute, a School of Art accessorial to architecture. The scheme, after some delay, was in part realised by the art classes for figure drawing, &c., opened at the Architectural Museum, and in support of which some liberal grants were made by this Institute. But here, again, the demand for this species of art-education was found incommensurate with the supply. The British workman and the young British student of architecture were found on trial to be somewhat indifferent to the opportunities provided for them, and the plan was abandoned.

In 1865 Mr. Beresford Hope, one of the most accomplished of our honorary fellows, was elected president of the Institute, and entered upon the duties of his office with a zeal hardly expected from an amateur, but eminently characteristic of his devotion to our art,—a devotion which may be described as one of the traditions of his family.

On Mr. Hope's retirement from office in 1867, Mr. Tite was re-elected,—this time for three years. To him succeeded in due course, and for a similar term of office, Mr. Thomas H. Wyatt and Sir Gilbert Scott. It would be almost presumptuous, and certainly unnecessary for me to dwell upon the advantages which this Institute has derived from the generalship of two such distinguished presidents. Suffice it to say that during the last six years the Institute has largely extended its functions and sphere of work. A perusal of the notice papers and the annual reports which have been issued within that period will reveal a record of almost uninterrupted activity, and will afford the best answer to that ill-natured and groundless assertion which we find occasionally made that the Institute is doing nothing, simply because it has not been noisy and officious. It would be a mere platitude to observe that the best and most useful work which is done in this world is often quiet silent work, and I think we should all regret if this Institute, for the sake of a little public notoriety, were to rival in this meeting-room the business of a vestry-hall. But if we are to be judged by deeds rather than words, I could give numberless

instances in which the Institute has done good and public service to our profession and the art which it represents. The very proceedings we inaugurate this evening,—the Conference itself,—grew out of a scheme proposed not very long ago by the Architectural Alliance and matured by a committee of the Institute, in which Professor Kerr took an active part, and at the present moment there are under consideration by our Council and past vice-presidents questions involving as important issues as any which have called for your decision.

In 1867, the number of the Council was increased by five, an addition contemplated in our charter, and fully justified by the fact that the Institute has more than trebled its numbers since that charter was granted. The term of office for which the president and Council are nominated has been prolonged to three years, subject, however, to their annual re-election by the general body. The policy of this change will be understood when it is remembered how largely the functions of the executive have increased of late. It is not too much to say that it requires months of experience before a member of Council can really master the details of the work which he has undertaken, and it would be obviously inexpedient that he should retire from office at the very time when his services are becoming most valuable. Few of those who have not served in the Council can have any idea of the number and variety of subjects brought under their notice and requiring their consideration.

About thirty Council meetings are held during the session, and on each occasion, perhaps, a dozen matters of more or less importance are discussed. Some of these are at once referred to committees, of whom no less than fourteen sat last year; the total number of their meetings having been fifty. The committees report to the Council, in whose name all external business is transacted. This business, it must be remembered, is often quite independent of that involved by the general meetings in this room, of which some twenty have been held during the past twelve months. With these statistics before you, you will not perhaps be surprised to hear that the official correspondence in 1875 reached 1600 autograph letters. As for communications in a set form, half lithographed and filled up by hand, printed circulars and notices,—they are issued by thousands. The letters we receive may be generally classed under two heads, those which come before the Council and those which do not. The first are permanently deposited here; the others are classified under some twenty different heads, and preserved for a year or more according to their importance. This subdivision may be considered excessive, but it enables the secretary at a short notice to refer to any letter on any subject under discussion. The minutes of meeting are all indexed on the same principle and for the same object.

The publication of our Transactions, formerly deferred until the close of the session, now takes place, whenever possible, once a fortnight. This would present no difficulty so far as the papers themselves are concerned, but in order to insure accurate reports of the discussion a copy of each speaker's remarks is now sent to him for correction, and they are not always returned in time for issue between one general meeting and the next. Even with this precaution the most careful editing is required to prevent mistakes, and whenever such mistakes occur it is generally because the publication has been hurried. At the recommendation of the Sessional Papers Committee, to whom the Institute is now indebted for choice of subject and author, special invitations are sent before each general meeting to members and others likely to be interested in the topic under discussion. I have issued as many as fifty of these invitations for a single paper.

Without wearying you with further details, or referring to those special matters of business which require special attention, I shall perhaps have said enough to show you that duties which include those of a secretary, editor, and accountant, could not possibly be expected from an honorary officer, who, to be of practical service, must attend daily at the Institute, and that for not one, but for six or seven hours a day,—at least at this period of the Institute's career. It was with this conviction that, five years ago, the general body resolved that one of the secretaries should receive a salary, and having said thus much, I shall say no more on a subject respecting which I should be the last to obtrude my personal opinion.

For similar reasons I shall refrain from comment on any of the measures which the late committee on the affairs of the Institute and the present committee of Council and past vice-presidents have had under consideration. It is obvious that, as time goes on, and the conditions of things change, the administration of this and every other society will present opportunities for improvement which commend themselves with special importance to individual minds. It is on such occasions that the collective wisdom of an executive body is of service. They alone can estimate the worth of this or that suggestion for reform. They alone know the difficulties which have deferred its realisation.

Finally, in thanking you for the kind attention to which you have listened to a paper, prolonged I fear, too far for your patience, I will only add my hope that the general Conference which this meeting inaugurates may be attended by practical advantage to our profession and to the several societies by which it is represented.

THE CLASSIFICATION AND REGISTRATION OF BUILDINGS.

BY MR. HENRY PARSONS.

I WILL, by way of preliminary, explain why I have been induced to consider this matter.

I am, as many gentlemen present are aware, in charge as district surveyor under the Metropolitan Buildings Act of one of the largest and most busy districts in the metropolitan area, and it has fallen to my share, in common with others of the district surveyors, to act on the various committees appointed to consider the several Bills proposed to be introduced into Parliament by the Metropolitan Board of Works.

I have observed with great regret that these Bills appear to contain provisions dealing with such very minute details as to greatly aggravate the difficulties already experienced by the district surveyors under the present Act.

I find that it is impossible now to insist on every "jot and tittle" required by the present Act, and I look with the greatest dread on the serious multiplications of requirements contemplated by the Board, as set forth in the Bill presented by them to Parliament in 1874. An experience of nearly twenty years has taught me the almost impossibility of enforcing the strict requirements of the Act; first, as to notice to the district surveyor; secondly, as to the due execution of such matters as trimmer arches of the proper size, chimney-bars, pargeting, and other details.

One or two letters are written to the builder, and then a formal notice is sent, which is met by a promise to amend; this promise is unfulfilled, and nothing remains but to take out a summons. The magistrate, who is already overburdened with work, hears the case, elicits from the district surveyor that the question in dispute is not material to the stability of the building, but simply "contrary to the Act," and either dismisses the case or makes an order grudgingly.

This order, as a rule, is never complied with, and the district surveyor has to submit to a serious loss of time and annoyance, without any remuneration whatever, and with the unpleasant feeling that he has assisted in making clear how the Act may be evaded.

I have also been greatly struck by the enormous and unnecessary waste of time and labour which is entailed by the present system of collection of fees.

The present arrangement seems carefully planned to enable the dishonest and scamping builder to evade payment altogether, because the fees are not payable under the Act until he is bankrupt, or has disappeared; hence the man who has given the most trouble in the execution of the work is precisely the individual who gets off scot free, and the unfortunate surveyor not only has his labour for nothing, but is out of pocket by any proceedings he may take.

I have also observed, with great regret, that the public appear to be quite unacquainted with the real scope of the Building Act, and the power or functions of the district surveyor, and the purchaser of a house which turns out to be badly built does not blame himself for his want of judgment or his parsimony in not obtaining a proper opinion, but quietly or noisily, as the case may be, anthematises the district surveyor, because he had bought "shoddy," the erection of which he considers the surveyor should have prohibited.

Now, being myself of a strongly conservative cast of mind, I have the greatest objection to interfere with the liberty of the subject or the rights of property, and I am of opinion that the public have no more right to interfere unduly with the freedom of the building trade than they have with the freedom of any other trade. I therefore consider that interference should be limited to restraining persons from building in a manner dangerous or injurious to themselves or others, or from offering for sale what I may term an adulturated or spurious article; but I would confine that restraint to the fabric or carcass of the building, which is really the only part which affects the question of safety, or which could be afterwards covered up, or concealed by cement or otherwise, from the examination of a duly qualified expert.

This being so, I consider that the provisions of the present Act, with some slight modifications, cover the whole ground, so far as constraint is concerned: the only thing which is required is an effectual means of enforcing those provisions, and, at the same time, distinguishing the difference between houses reasonably well built, and those which are the reverse.

I believe that if the stringent rules and regulations in contemplation are to be carried into effect the simple result would be a stoppage of building, and a consequent enormous rising of rentals and rates, and I fail to see the policy of compelling the present generation to pay largely increased rentals merely to leave posterity in possession of houses too well and expensively built to pull down, and yet obsolete in their arrangements and fittings. I would rather that an ordinary dwelling-house should be so constructed as to be fairly exhausted and worn out in a reasonable length of time, and then pulled down, and its place taken by what will doubtless be a vastly improved system of construction.

I say a reasonable length of time, but inasmuch as the length of a lease varies very much according to circumstances, I do not think a hard-and-fast line as to the quality of work can be drawn. Hence I arrive at what I term a classification of dwelling-houses. I think it would be unreasonable to require, for instance, such a quality of building as to preclude the erection of dwelling-houses on a holding, say, of forty years; and yet we know that although such buildings might be erected, and might be serviceable for such a length of term, the builder would not see his money back if the usual conditions on a well-arranged estate, or the stringent provisions of an Act were enforced, and, therefore, the land would remain unbuilt upon, and the free exercise of the rights of property interfered with.

I would therefore permit such houses to be built, but I would take care that their substantial quality should be known.

I would therefore enact that all dwelling-houses should be either extra first class, first class, or second class.

I would define as "first class" houses built, so far as the carcass is concerned, in accordance with a general specification to be scheduled in the Act, such specification to be adapted to meet the reasonable requirements of a ninety years' lease, but not going too minutely into details.

I would define as "extra first-class" houses built in a more substantial manner, either as to thickness of walls, scantlings of timbers, or qualities of materials than the foregoing.

And I would define as "second-class" houses built in a manner inferior in quality to the first class.

I would require that no house should be occupied (under penalties) until a proper certificate should be given of its class.

I would enact that no certificate should be granted until the district surveyor was satisfied that, to the best of his knowledge and belief, all the requirements of the Act had been complied with.

I would enact that, as at present, due notice should be given to the district surveyor, but that if the builder made default in giving notice he should pay a double fee.

I would provide that on giving notice the builder should pay two-thirds of the estimated fee, the balance to be paid on receipt of the certificate.

I would require the builder to set forth in his notice the class in which the proposed building was to be registered, and it should be the duty of the district surveyor to notify from time to time to the builder if in his opinion the building was not up to its class.

The builder should have the right within a a limited time to appeal to "the Court."

The certificate when wanted should be signed by the district surveyor, and countersigned by the registrar of the Court, and bear an *ad valorem*

stamp, the revenue from which would be paid into Court.

The certificate should be an integral part of the title to the property, and a duplicate obtainable if necessary from the Court.

The court should consist of a judge possessing the qualifications of a county-court judge, and administering not only the Building Act but other cognate Acts. He should be styled "Judge of the Municipal Court."

He should be assisted by three assessors: one appointed by the Metropolitan Board of Works (an architect being a Fellow of the Institute of not less than fifteen years' standing); one appointed by the Royal Institute (a Fellow of not less than fifteen years' standing); one appointed by the London Association of Builders.

A registrar and clerk, being a solicitor, should also be appointed.

The assessors should be in the commission of the peace, to enable them to hold sittings under the Building Act, and assist in adjudicating in matters arising under the Act.

The salaries of the judge and assessors should be provided by the Metropolitan Board of Works, who would be recouped by the *ad valorem* stamps; other expenses would be covered by Court fees.

The Court being thus constituted, it appears to me that the working of the Act would be greatly simplified. Instead of the present troublesome and tedious system of applying for summonses, and attending before a police magistrate to enforce compliance with the rules of the Act, a simple withholding of the certificate would checkmate the dishonest builder, whilst the unreasonble demands of a crotchety district surveyor would be set right by the supervision of competent professional men at a very small cost, and without the very serious objections of hanging about a criminal court.

The man who is building fairly well will be spared the mortification of seeing his scamping neighbour realising almost the same price from the ignorant and unwary public for a much inferior article, and yet the necessity to a prudent purchaser of obtaining a competent opinion as to the value of his proposed purchase will not be obviated.

The purchaser who invests his money in a house say twenty years hence will have an unmistakable testimony as to the manner in which it was originally built.

As to the district surveyor, his position will be fortified. He will be able to carry out his duties in a less irksome manner, and although he will have more apparent responsibility put upon him, in my opinion it would be more apparent than real, because even at present the signature of the "returns" to the Metropolitan Board is a certificate that to the best of his knowledge all the requirements of the Act have been complied with in regard to the buildings set forth in the returns, and his signature to a certificate would not imply a greater responsibility, but rather less, because should any irregularity remain unamended he could very readily refuse a certificate, whereas at present the return must be made, and it often happens that from lapse of time or change of builder it is impossible to enforce amendment.

The penalties should be for occupying as well as knowingly permitting the occupation of an uncertificated house.

The following is a general idea of the specifications proposed for the first class. The footings to rest upon good lime or cement concrete to the satisfaction of the district surveyor, the walls to be constructed with sound, well-burnt bricks, laid in good mortar, and provided with a proper damp-course. All timber to be of good quality and well seasoned, and to be of not less scantling than is set forth in the schedule.

I must apologise for having looked at this subject from what I call a metropolitan point of view, but I have done so because I am hardly competent to say whether our system could be carried out even in the large provincial cities. I think it of great necessity that the Act should be administered, as at present, by officers who are not the mere servants or creatures of a corporation or board, but holding the position of statutory officers with duties clearly defined in an Act of Parliament, and not subject to capricious interference. I think it is also desirable that these officers should be professional men in practice, as at present, because that fact brings them more in sympathy with those whose works they have to supervise, and to a considerable extent obviates the tendency to drift into what is called "red tapeism." I think also the principle of payment by fees is the correct one, but the districts should be so proportioned as to bring the annual income up to such an amount as to render it worth the while of men to come forward for the appointments whose experience, attainments, and known character would ensure the confidence and respect of the profession, the building trades, and the public generally.

It has been suggested to me that a venal or dishonest surveyor would certify anything for a consideration; but I put that on one side, as I would make the status of the surveyor and the emoluments of his office of such a character as to quite preclude the possibility of a bribe. I think bribery, corruption, and undue influence are far more likely to occur in the case of men of inferior class in the position of paid servants, at low salaries, and under the thumb of men who are probably engaged, directly or indirectly, in building speculations which are under the supervision, so to speak, of their own officers.

I am induced to touch upon these points because the whole feasibility of my suggestion depends upon the professional and personal character of the officers appointed to carry it out, and I am quite satisfied that the builders of London, to say nothing of the architects, would recoil from the idea of being put under the control of a class of men inferior to their own foremen, a class of men who dub themselves surveyors or engineers, as the case may be, and who come forward to undertake all sorts of functions for the brilliant salaries we see constantly advertised in the papers, and who are rated by the worthy magistrates, aldermen, and other authorities who advertise for them as being on a footing with their menial servants.

In conclusion, sir, permit me to say that my proposition in reference to houses is somewhat similar to the system which prevails in regard to shipping, the only difference being that, whereas an unsound or badly built ship usually affects men's lives, a badly built house only affects their pockets; and my object is not so much to control the quality of a building as to provide a means of more readily and effectively enforcing the salutary provisions of the Act in relation to sufficiency of construction and protection from fire. I have not the slightest desire to see landowners relieved from the necessity of employing their own professional advisers by putting the duty of regulating materials and workmanship on a public officer. I would only give the public officer a similar power to that now possessed by the private surveyor of refusing a certificate if the obligations of the Act were not complied with.

THE INSTITUTE SOIRÉE.

SIR,—I wish to make an effort (not the first) to induce those who are responsible for the arrangements for the annual *soirée* to do something better than has heretofore been done in regard to one item of the entertainment—the music.

Some of your readers, and a good many readers of other publications, are aware that I have some little claim to an opinion on musical subjects; and I venture to say that if the Council, or whoever manage the matter, knew how completely behind even the general taste and appreciation of the day their entertainment is in this respect, they would see the necessity for an alteration.

We come to Conduit-street to what is in fact an "evening party," given by a society professing sympathetic and enlightened feelings in regard to art. We find the musical part of the entertainment represented by a military band placed in the middle of the room, kept "going" conscientiously the whole evening (so loud, of course, as to render any attempts at conversation painful), while the selection itself contains not a thing that educated persons can care to listen to, the music being more of a type which one might expect to hear at Vauxhall or Cremorne; at least so I should imagine, though I confess this comparison is made at random, as I am not acquainted with those places of classical entertainment. I have a vague recollection of hearing a polka called "Wine and Woman" at the last *soirée*, or some nearly equivalent title (possibly it was only *Weib und gesang*); I am pretty sure I heard the "Cric-Crac Galop"; at all events, the "style and title" of the pieces generally was of the description which these reminiscences sufficiently indicate.

On remonstrating once with the secretary on this matter, the reply was that it was necessary to have something of the kind going on to keep the thing from falling flat. In other words, that instead of using music as a part of the rational entertainment of the evening, it is to be a mere noise kept up as an accompaniment to the proceedings. That may be all very well for the opening of a skating-rink, but for an evening entertainment given by the representatives of an educated and artistic profession there is something more paltry and deplorable in the idea than I can well express. I venture to think that no similar society of French or German architects would illustrate a similar entertainment in such a fashion.

That it is perfectly possible to do better I have had evidence from attending the *conversazioni* of another Society which is connected with art, and holds its meetings sometimes in the Conduit-street rooms. At the entertainments of this Society (which has nothing like either the wealth or, in some senses, the *prestige* of the Institute) the arrangement is that at a certain part of the evening a selection of vocal and instrumental music is gone through, and listened to, and that with attention and pleasure: indeed, it seems to be considered the most enjoyable part of the evening's programme. The performers are sometimes professional, sometimes amateur, or a combination of both; the music is not in a very severe or "classical" style (nor should it be on such an occasion, when the audience is not a professedly musical one), nor is the performance such as one would hear in a first-class concert-room; but it is such, both in selection and execution, as educated people may listen to with pleasure; such, in fact, as you would be likely to hear in the drawing-rooms of people with a cultivated appreciation of music. And I wish to ask, why cannot we have something of that kind at the Institute *soirée*, instead of having the accompaniment of music offered to us in a form which at once vulgarises the whole thing, and is almost enough in itself to drive away any musically-cultivated visitors?

I really hope that the authorities at Conduit-street will give consideration to this suggestion, which is not made in a carping or fault-finding spirit, but from a real wish to see the "style" of the Institute *soirée* improved in a point in which there is certainly room for improvement, and which has been, to myself at least, a periodical vexation and annoyance every time the occasion has come round.

H. H. STATHAM.

CASE UNDER THE METROPOLITAN BUILDING ACT.

At Hammersmith William Shopland, a butcher, of Seagrove-road, Lillie Bridge, was summoned by Mr. Moseley, district surveyor of Fulham, for infringing the terms of the Building Act by building a party-wall for a stable at the back of his house with "half-brick," instead of one brick in thickness.

Mr. Moseley submitted that the wall came within the warehouse class.

Mr. Ingham looked at the Act, which applied to "every warehouse or other building used either wholly or in part for the purposes of trade or manufacture."

Mrs. Shopland, who attended for her husband, informed the magistrate that there was no internal communication with the house.

Mr. Ingham remarked that he could not patch up holes in an Act of Parliament, and said he was of opinion that the wall did not come within either of the classes mentioned.

Mr. Moseley argued that it came within the dwelling-house class because the premises were rated together.

Mr. Ingham replied that there must be an internal communication.

Mr. Moseley said he would place the case before the Metropolitan Board of Works for them to fight out.

Mr. Ingham commended Mr. Moseley for taking up the case, because a number of rubbishing houses were built in the metropolis without supervision; but he (Mr. Ingham) could not fill up omissions in an Act of Parliament.

The summons was adjourned for Mr. Moseley to communicate with the Metropolitan Board of Works.

If the district surveyor had not been taken by surprise, he would doubtless have pointed out to the magistrate Clause 8, in First Schedule, Part I., which provides that "all buildings, except public buildings, and . . . . buildings of the warehouse class, shall, as respects the thickness of their walls, be subject to the rules given for dwelling-houses."

Visit of French Workmen to Philadelphia.—The Municipality of Lyons is making preparations for sending twenty-eight delegates belonging to various working men's societies to the Philadelphia Exhibition.

LEAD BURNING *v.* SOLDERING.

SINCE the fire that occurred at Canterbury Cathedral in 1872, the whole of the lead jointing and repairing upon the roof and in other parts of the Cathedral have been effected by an improved lead-burning machine, specially made by Messrs. Merryweather & Sons, of fire engine notoriety, London, for the purpose. The machine was seen in operation at Messrs. Merryweather & Son's works, at Lambeth, by Mr. Austin, the surveyor of Canterbury Cathedral, lining some large acid tanks with lead. The simplicity of the machine so satisfied him that one has been in operation since the date mentioned, upwards of 10,000 ft. on the Cathedral roof alone having been jointed, and this at a saving in cost of solder and time of about 250*l.*

Miscellanea.

Artists' Benevolent Fund.—On Saturday, the 17th inst., the annual dinner in connexion with the Artists' Benevolent Fund was held in the Freemasons' Tavern, Sir William Fraser, M.P., presiding. The usual toasts were proposed in a very few words, the chairman believing, as he said, that the company would find a selection of music which he had made, more pleasing to listen to than anything he could say. Among those who responded to toasts were Captain Arkwright, R.N., Mr. George Godwin, Mr. Cave Thomas, and Mr. Mole. Replying to the toast of the evening, that of "Prosperity to the Artists' Benevolent Fund," Mr. Godwin remarked that while some artists were handsomely paid if they only threw a brushful of paint on a piece of canvas, there were many others whose position was far from enviable. This season, he could say, a great deal of distress existed among a certain class of artists. He had heard, even in quarters that would astonish them, of an entire absence of buyers, artists who had usually been able to dispose of their pictures having this year failed to do so. For these reasons he urged artists to avail themselves of the advantages of the fund. Mr. Cave Thomas, who replied for the Royal Academy, said it was not the fault of that institution, but of the leaders of the people, that it was not very different from what it was. Whatever its demerits might be, however, it had fostered art through long periods in which no general artistic feeling existed in this country. At the present time art was, perhaps, too much subject to the caprice of individuals, but when it was properly encouraged by our public men, and when the people were better educated, it would become of higher order. The secretary, Mr. Young, announced subscriptions to the amount of 823*l.* The fund consists of two distinct branches. One, called the annuity fund, is supported wholly by the contributions of its members for their own relief in sickness or old age; the other, which receives public subscriptions, is designed to relieve such of the widows and orphans of artists who have belonged to the annuity fund as are left in need.

The Devouring Element.—The telegrams of one day say that a large fire broke out at Moscow, on June 18, destroying over fifty houses. It is believed that the loss is enormous. Three-fourths of the whole town of Kadsahory, Caucasus, including the bazaar, were destroyed by fire on June 17. A conflagration of enormous dimensions broke out at St. John's, Quebec, on June 18, destroying almost the whole business portion of the town. Both sides of Richelieu-street and the east side of Champlain-street were burnt down in their entire length, including seven hotels, nine churches, the Custom-house, the Court-house, two banks, the woollen-mills, the docks, the bridge, and several vessels. Altogether about 200 stores and dwelling-houses are burnt down, and the destroyed district is one mile in length and 600 ft. in width. Several women perished in the flames. The damage done to property is estimated at a million and a half of dollars. It seems about time that people should set about reforming their mode of building.

Munificent Bequests to Manchester Institutions.—Mr. C. S. Beyer (of the firm of Beyer, Peacock, & Co.), whose death was announced a few days ago at Manchester, has left to Owens College his interest in the Gorton Locomotive Works, which is expected to realise from 100,000*l.* to 200,000*l.*, and to the Manchester School and Infirmary, 10,000*l.* each.

Sanitary Science at Cambridge University.—We learn from Cambridge that in the Examination for Sanitary Science Certificates, the following have satisfied the examiners in Part I.:—C. H. Allfrey, M.D., B. Davies, M.D., K. M. Downie, M.D., H. Finch, M.R.C.S., A. S. Lethbridge, M.D., T. Moore, F.R.C.S., and J. B. Siddall, M.D. The following have satisfied the examiners in Part II.:—C. H. Allfrey, M.D., B. Davies, M.D., K. M. Downie, M.D., H. Finch, M.R.C.S., A. S. Lethbridge, M.D., T. Moore, F.R.C.S., J. B. Siddall, M.D., J. Simpson, M.D., A. Skeen, M.B., M.C., F. H. Spencer, M.B., M.C., and E. W. Symes, M.D. Examiners:—A. W. Barclay, M.D., George Buchanan, M.D., James Dewar, M.A., Arthur Ransome, M.D.

Wood-working Machinery.—Among the miscellaneous implements exhibited at the Bath and West of England Society's meeting, at Hereford, Messrs. F. W. Reynolds & Co.'s wood-working machinery attracted considerable attention. Messrs. Reynolds have made several improvements in their "Eureka" combined circular and band saw machine, and exhibited this machine in its improved form for the first time at the meeting in question. Several large wood-working machines were exhibited by this firm, and were shown at work, being driven by a new steam-engine, which Messrs. Reynolds exhibited as specially adapted for such purposes.

Rendle's System of Glazing.—When the King of the Belgians went to the Royal Aquarium, his Majesty was so much pleased with this new system of glazing, that he requested Mr. Rendle to send all the particulars to him at once to Claridge's Hotel, with a view to the introduction of the system into Belgium. During the visit the firemen of the building took out a large number of squares of glass in the great circular roof over the central promenade, and refixed them in a very few minutes in his presence, and the King was naturally astonished at the rapidity with which the whole was performed.

American Institute of Architects.—We have before us the published proceedings of the Ninth Annual Convention of the American Institute of Architects, held in Baltimore, Nov. 17, 18, and 19, 1875; Mr. A. J. Bloor being the editor, published by the Committee on Publications of the American Institute of Architects, 1876. It is for the most part a record of business done, the papers read being handed for publication to the *American Architect*, a weekly journal just now commenced.

Art Galleries.—At the last meeting of the Metropolitan Board of Works, the application of Sir Coutts Lindsay, bart., for the consent of the Board to the construction of a gallery of communication between the two art-galleries proposed to be erected in Grosvenor-mews, St. George's, Hanover-square, was granted conditionally.

Honour to Architecture.—At a recent meeting of the Council of King's College, London, the name of Professor Edward M. Barry, R.A., was brought forward as that of a former student, who had conferred honour on the College by his after-acquired distinction, and he was unanimously elected an Honorary Fellow of the College.

The Dublin Carpenters.—At a general meeting of the "Regular Carpenters," No. 2 body, Cork-hill, it was unanimously agreed that on and after Monday, the 19th of June, the wages of the members of their trade shall be 6*s.* per day, and 8*d.* per day extra three miles from the General Post Office.

The Fratry, Carlisle.—It is stated by the Carlisle papers that the complete restoration of this fine old building, in the Abbey, Carlisle, will shortly be begun, from plans prepared by Mr. Street, R.A., and approved by the Dean and Chapter.

The Royal Academy Conversazione is fixed for Friday the 30th inst.

TENDERS

For repairs to Great Woodcote Farmhouse, and building six cottages. Mr. H. J. Newton, architect:—

Hockley	£2,099	0	0
Stewart	1,868	0	0
Shurmur	1,800	0	0

For the erection of the Heath-street Schools, for the School Board of Dartford, Kent. Mr. W. H. Powell, architect. Quantities by Mr. Thomas Ladds:—

Greive & Littlejohn	£3,779	0	0
Sharp & Son (accepted)	3,297	0	0
Wallis & Clements	3,098	0	0
Croxford & Co.	2,878	0	0

For the Tyne Steam Shipping Company's offices, Newcastle-upon-Tyne. Messrs. Austin, Johnson, & Hicks, architects:—

Reed	£6,421	9	8
Harbottle	6,378	13	3
Jackson	6,110	0	0
Elliott	5,610	0	0
Kyle	5,399	0	0
Simpson	5,291	3	5
Hudspith	5,199	8	6
Whichello (accepted)	5,100	0	0
Lee	4,616	13	4
T. & R. Lamb	4,998	0	0

For the erection of new offices, for Messrs. H. & C. Collins, in Blagrave-street, Reading. Messrs. Wm. & J. T. Brown and F. W. Albury, architects:—

Elliott (accepted)	£1,774	0	0

For additions to the premises of the Brighton and Hove Co-operative Supply Association. Mr. Lainson, architect:—

Howard (accepted)	£949	10	0

For repairs to St. Peter's Church, De Beauvoir Town. Messrs. W. Waymouth & Son, architects:—

Shurmur (accepted)	£495	0	0

For the erection of a new shed at Orchard Wharf, Blackwall, for Messrs. Hyatt, Devitt, & Parker. Mr. Edwin A. B. Crockett, architect. Quantities by Mr. D. Cubitt Nichols.

Limn	£2,763	0	0
Conder	1,934	0	0
Manley & Rogers	1,904	0	0
Outhwaite & Son (accepted)	1,828	0	0

For the erection of a warehouse in Hermitage-street, Wapping, for Mr. J. D. McK. von Dadelszen. Mr. Edwin A. B. Crockett, architect. Quantities by Mr. D. Cubitt Nichols:—

Outhwaite & Son (accepted)	£2,156	0	0

For alterations and additions to No. 1, Trafalgar-square, Fulham-road, for Mr. John Clark. Mr. Edwin A. B. Crockett, architect.

Outhwaite & Son (accepted)	£386	0	0

For building infirmary wards, board-room, medical officer's house, receiving wards, mortuary, and porter's lodge, at Newington Workhouse, for the Guardians of St. Saviour's Union, Surrey. Messrs. Henry Jarvis & Son, architects:—

Joselyne	£23,500	0	0
Coles	23,400	0	0
Colls & Son	20,159	0	0
Downs & Co.	19,990	0	0
Lawrance	19,783	0	0
Marsland	19,625	0	0
W. & F. Croaker	19,476	0	0
Shepherd	19,450	0	0
Tarrant & Son	18,799	0	0
Downs	18,769	0	0

For the erection of Sheriff-hill schools, for the Gateshead School Board, to accommodate 450 children, exclusive of desks and benches, but including covered grounds, cementing to the yards, and boundary-walls, and palisading. Quantities by Mr. George Connel. Mr. Thomas Oliver, architect:—

Gowens	£3,046	6	0
Saul	5,722	0	0
English	4,734	0	0
Elliott	4,660	0	0
Tate & Lowes	4,394	3	0½
R. & J. Mitcheson	4,390	17	0
N. & R. Reed	4,377	16	5
Hutchinson & Southron	3,960	0	0
Burton	3,948	18	0
Greason & Stockdale (accepted)	3,694	15	0

For the erection of Askew-road schools, for the Gateshead School Board, to accommodate 830 children, exclusive of desks and benches, but including covered playgrounds, cementing to the yards, and boundary-walls, and palisading. Quantities by Mr. G. Connel. Mr. Thomas Oliver, architect.—

Gibson	£8,176	7	6
Glaisher	8,149	5	0
Ferguson	7,860	10	0
Elliott	7,453	0	0
Miller	7,389	12	1
N. & R. Reed	7,349	12	1
Southron	7,249	13	0
Greason & Stockdale	7,232	4	10
Mitcheson	6,990	0	0
Hutchinson	6,884	8	10
Reed	6,854	0	0
Harrison	6,528	11	8
Brick and Stone Co.	6,503	4	10
Smith	6,485	10	0
Lee (accepted)	6,202	13	0

For rebuilding "Hogg" Tavern, Broadwall, Stamford-street. Messrs. Ingram & Hollands, architects:—

Woods	£2,163	0	0
Hobson	2,098	0	0
Stamp & Bowtle	1,987	0	0
Downs & Co.	1,980	0	0
Merritt & Ashby	1,058	0	0
Newman & Mann	1,926	0	0

For new warehouses, 10 and 10½, Jewin-crescent, for Messrs. McBeyde & Orr. Messrs. Ford & Hesketh, architects. Quantities supplied by Messrs. Franklin & Andrews:—

Dove, Bros.	£8,625	0	0
Hill, Higgs, & Hill	8,434	0	0
Shepherd	8,073	0	0
Newman & Mann	7,915	0	0
Adamson & Son	7,898	0	0
Rider	7,895	0	0
Downs & Co.	7,860	0	0
Hobson	7,827	0	0
Brass	7,747	0	0
Peto, Bros.	7,616	0	0
Ashby, Bros.	7,475	0	0
Browne & Robinson	7,393	0	0

For alterations and fittings at No. 8, Bucklersbury, E.C. Mr. J. H. Rowley, architect:—

Lascelles	£150	0	0
Downs	397	0	0
Sage (accepted)	382	0	0

For building the "Nag's Head" Public-house, Wandsworth. Mr. Young, architect. Quantities supplied:—

Newman & Mann	£3,065	0	0
Patman & Fotheringham	2,976	0	0
Axford	2,875	0	0
Macey	2,716	0	0
Parsons	2,703	0	0

For contract No. 1 for foundations and underpinning adjoining walls on the site of No. 37, Walbrook, City, for Messrs. Parker & Wainwright. Mr. John Wimble, architect. Quantities supplied:—

Croker	£6,230	0	0
Ashby & Horner	6,100	0	0
Scrivener & White	6,050	0	0
Newman & Mann	5,825	0	0
Brass	5,819	0	0
Killby	5,800	0	0
Dove, Bros.	5,729	0	0

For two villa residences at Hampstead, for Mr. Farquharson. Mr. T. Arnold, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Merritt & Ashby	£4,525	0	0
Williams & Son	4,489	0	0
Newman & Mann	4,468	0	0
Burford	4,413	0	0
Temple & Forster	4,275	0	0
Brass	4,140	0	0
Aitchison & Walker	3,995	0	0
Browne & Robinson (accepted)	3,982	0	0

For warehouse on the Charterhouse Estate. Mr. R. Collier, architect. Quantities supplied by Mr. W. H. Barber:—

Mark	£3,635	0	0
Aitchison & Walker	3,575	0	0
Coleman	3,459	0	0
Stephenson	3,458	0	0
Moreland & Nixon	3,395	0	0
Scrivener & White	3,365	0	0
Newman & Mann	3,325	0	0
Hart	3,316	0	0
Laurence	3,199	0	0

For dwelling-house, stable, and appurtenances, at Totteridge, Herts, for Dr. F. J. Wood. Messrs. Searle, Son, & Hayes, architects. Quantities supplied:—

Newman & Mann	£5,505	0	0
Sewell & Sons	5,456	0	0
Dove, Bros.	5,395	0	0
Williams & Son	5,240	0	0
Roberts	4,724	0	0
Woodhall	4,420	0	0

For alterations and repairs to York-road Chapel, York-road, Lambeth. Messrs. Searle, Son, & Hayes, architects. Quantities supplied:—

Brass	£3,365	0	0
Sharpington & Cole	3,193	0	0
Newman & Mann	3,146	0	0
Tarrant & Sons	3,015	0	0
Dove, Bros.	2,965	0	0
Roberts	2,947	0	0

For alterations and repairs at No. 110, Lower Thames-street, for Mr. E. Seaman. Mr. J. W. Forge, architect:—

Newman & Mann	£331	0	0
Brewer	275	10	0
Cleaver	220	0	0

For villa residences, West-end-lane, Hampstead, for Mr. H. Smith. Mr. William Thompson, architect. Quantities supplied by Mr. Walter Burnett:—

Burdett	£2,650	0	0
Bangs & Co.	2,285	0	0
Scrivener & White	2,237	0	0
Newman & Mann	2,200	0	0
Kinnimont	2,199	0	0
Perry	2,175	0	0
Shaw	2,145	0	0
Boyce	2,134	0	0
Sheppard	2,060	0	0

For completion of the mansion known as The Finches, Lindfield, Sussex, for Mr. James Proctor. Mr. Thomas Lainson, architect. Quantities supplied:—

Anscombe	£12,555	0	0
Newman & Mann	12,461	0	0
Barnes	12,190	0	0
Waldram & Co	12,082	0	0
Dove, Bros.	12,009	0	0
Howard	11,974	0	0
Merritt & Ashby	11,967	0	0
Browne & Robinson	11,826	0	0
Chappell	11,783	0	0
Cheeseman	11,578	0	0
Dollands	10,425	0	0
Deacon (accepted)	10,225	0	0

For new premises, Newgate-street, for Mr. L. Salomons. Mr. J. E. Saunders, architect. Quantities supplied by Messrs. Osborne & Russell:—

Gammon	£12,800	0	0
Colls & Sons	12,345	0	0
Pritchard	12,239	0	0
Merritt & Ashby	11,911	0	0
Newman & Mann	11,782	0	0
Brass	11,749	0	0
Tarrant & Son	11,564	0	0
Ashby, Bros.	11,471	0	0

For new warehouse, corner of Upper Thames-street and College-hill, for Mr. C. Oppenheimer. Mr. J. E. Saunders, architect. Quantities by Messrs. Osborne & Russell:—

Tarrant	£11,009	0	0
Carter	10,171	0	0
Conder	10,850	0	0
Colls	10,733	0	0
Newman & Mann	10,630	0	0
Brass	10,585	0	0
Merritt & Ashby	10,555	0	0
Ashby, Bros.	10,473	0	0

For pulling down and rebuilding "The Lord Nelson," Whitechapel-road. Mr. R. C. James, architect:—

Woods	£983	0	0!
Colls	925	0	0
Cook	914	0	0
Charlton	897	0	0
Fisher	895	0	0
Young	857	0	0!

For Bradford Drainage, Wilts, contract No. 2. Mr. A. W. Estridge, engineer. Quantities supplied:—

Botterill & Co.	£3,770	0	0!
Haynes	3,000	0	0
Brock & Bruce	2,626	0	0
Bugbird	2,600	0	0
Cowdery & Sons	2,274	17	7
J. & G. Bell	2,145	0	0
Long	1,650	0	0
Croxford & Co.	1,629	0	0
Everest	1,623	8	4
Coker	1,275	0	0
Sibsey	1,210	0	0!

For Midsomer Water Drainage. Mr. A. W. Estridge, engineer. Quantities supplied:—

Bissett	£6,045	0	0!
Bugbird	4,765	0	0
J. & G. Bell	4,526	10	0
Young & Co.	4,479	15	0
Brock & Bruce (accepted)	3,900	0	0
Greenwood & Co.	3,584	0	0
Coker	3,275	0	0
Sibsey	2,600	0	0!

For works at West Ham Cemetery. Messrs. N. S. Josephs & Pearson, architects:—

Newman & Mann	£998	0	0
Browne & Robinson	997	0	0
Bangs & Co.	989	0	0
Rivett	977	0	0
Scrivener & White	951	0	0

For foundations for house, No. 25, Devonshire-terrace, for Mr. Beddington. Messrs. N. S. Josephs & Pearson, architects:—

Browne & Robinson	£1,068	0	0
Scrivener & White	897	0	0
Newman & Mann (accepted)	790	0	0

For alterations and additions at Thorncombes, near Guilford, for Mr. Edward Fisher. Mr. Sancton Wood, architect. Quantities by Messrs. Mann & Saunders:—

Newman & Mann	£2,948	0	0
Colls & Son	2,840	0	0
Stimpson	2,650	0	0
Fish	2,360	0	0

For the erection of the Gresham Life Assurance Offices, Poultry, City. Mr. J. J. Cole, architect. Quantities by Mr. James Barnet:—

Scrivener & White	£47,980	0	0
Trollope & Son	47,900	0	0
Smith & Co.	47,713	0	0
Dove, Bros.	47,235	0	0
Colls & Sons	46,434	0	0
Hill, Higgs, & Hill	43,680	0	0
Killby	40,730	0	0
Peto, Bros.	40,497	0	0

For a new house, Grove Park, near Chiselhurst, Kent, for Mr. D. Macartney. Mr. E. Mathews, architect. Quantities by Mr. R. C. Gleed:—

Harrison & Wood	£2,974	0	0
Vears	2,877	0	0
Ebbs & Sons	2,640	0	0

For the erection of new schools, Church-road, Leyton, for the Leyton School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Reed	£4,894	0	0
Arber	4,880	0	0
Rivett	4,787	0	0
Hoskings, Bros.	4,627	0	0
Ashby, Bros.	4,469	0	0
Atherton & Latta	4,350	0	0
Morter	4,243	0	0
Sayers (accepted)	4,114	0	0

For taking down and rebuilding Nos. 17 and 18, Devonshire-street, for Messrs. Brown & Norton. Mr. W. S. R. Payne, architect. Quantities by Mr. Edward Morfee:—

Kiddle & Son	£4,299	0	0
Ashby, Bros.	4,225	0	0
Conder	4,184	0	0
Outhwaite & Son	4,053	0	0
Holland & Hannen	4,031	0	0
Lathey, Bros.	4,030	0	0
Tarrant & Son	3,953	0	0
Laurence	3,885	0	0

For alterations to the "Two Brothers" Tavern, New-road, Battersea. Mr. F. Edwards, architect:—

Gammon & Son	£347	10	0
Marsland	311	0	0
Lathey, Bros. (accepted)	307	0	0

For Premises in Throgmorton-avenue, City, for Mr. A. J. Waterlow:—

Hill, Higgs, & Hill	£15,700	0	0
Baker & Sons	15,460	0	0
Jackson & Shaw	15,273	0	0
Lascelles	14,983	0	0
Trollope & Sons	14,973	0	0
Lucas, Bros.	14,922	0	0
Holland & Hannen	14,784	0	0
Chappell & Co.	14,567	0	0
Adamson & Son	14,490	0	0
Peto, Bros.	14,275	0	0
Brass	13,987	0	0

For a house at Woodside, near Croydon, for Mr. James A. Wright. Mr. John Berney, architect:—

Coles	£2,028	0	0
Hyde	1,995	0	0
Cox	1,985	0	0
Marriage	1,810	0	0
Smith (accepted)	1,806	0	0

For new premises for the Civil Service Co-operative Society, Oxenden-street, Haymarket. Mr. Thos. Verity, architect; Mr. Ed. Robins, surveyor. Quantities by Mr. W. S. Plimsaul:—

Hobson	£11,069	0	0
Howard	10,784	0	0
Simpson	10,500	0	0
Kirk & Randall (accepted)	9,824	0	0

Iron and Fireproof Flooring.

Dennett & Co. (accepted)	4,965	0	0

For alteration and additions at the residence of Mr. Thomas H. Chubb, at Malmsbury, Wilts. Mr. John Berney, architect:—

Brown (accepted)	£780	0	0

For alterations and additions to the Rectory House at Ardingley, Sussex, for the Rev. James Bowden. Mr. John Berney, architect:—

Box (withdrawn)	£3,783	0	0
Smith (accepted)	4,044	0	0

For new mansion, at Sevenoaks, for Mr. A. Druce. Mr. J. M. Hooker, architect. Quantities by Mr. T. Ladds:—

	Red Mansfield Stone.
Smith & Co.	£12,210 ..... £340
Jackson & Shaw	12,319 335
Brass	11,884 354
Longmire & Burge	11,749 329
Trollope & Sons	11,676 348

For repairs to "The Trafalgar," Latimer-road, Shepherd's Bush. Mr. H. J. Newton, architect:—

Wells	£130	0	0
Hockley	109	0	0
Shurmur	99	0	0
Bowden	98	0	0

For repairs to "The Queen," Neate-street, Camberwell. Mr. H. J. Newton, architect:—

Shurmer	£117	0	0
Smith	109	0	0
Hockley	107	0	0

TO CORRESPONDENTS.

Peebles v Thompson.—The plaintiff's solicitors, Messrs. Crook & Smith, have evidently not read the report in our columns or they would not have written such a stupid letter.

Improved Dwellings.—We have received a communication upon this subject from Messrs. Allen & Son, but it was too late for consideration this week.

Errata.—In Mr. Gatliff's paper (p. 579, *ante*) read in lieu of what is printed, "I wish to call the attention of this meeting, as bearing materially upon the question before it, viz., 1st, the effect of the land or ground-rent as compared with the cost of the superstructure; and," &c.

Newcastle-under-Lyme Surveyorship.—In the list of selected candidates for the above in last Saturday's *Builder* you give the name amongst others of Mr Pearce, Liverpool, whereas it should have been Mr. J. B. McCallum, Liverpool.—J.

Dex (we are forced to decline. Look to the schedule of charges issued by the Royal Institute of British Architects) —W. A.—F. H. —H. & W.—J. R.—Sir G. G. S.—A. W. E.—H. J.—A. & Son.—W. C. G. —B. B. & B.—A Subscriber.—W. P.—J. H. R.—G. & S. F.

We are compelled to decline pointing out books and givin addresses

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

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The Adaptability of Terra Cotta 648
Workmen's Trains 648
"Galvanised Iron Cisterns and Pipes" 648
Presbyterian Churches at Liverpool 649
Presbyterian Church, Blyth 649
Church Building News 649
Dissenting Church-Building News 649
Sunt Cuique 649
Books received: Fryer's Architectural Ironwork (Trubner); Varlorum 649
Miscellanea 650



Decoration and Art.

THE French Academy and the Institute are well known all over the world, but the National Library, as a seat of professorships, and an arena of lectures, is not. Nevertheless, it was within those vast and stately walls that, the other day, a controversy of high public interest took place, on the relations between the fine and the decorative arts, and the possibility of their union. This has always been a favourite object of French inquiry. Fifteen years ago, M. Beulé directed attention to it, and put himself upon the proof, historically, of his assertions. Van Eyck, he said, somewhat hyperbolically, was the discoverer of artistic ornament; Raffaelle derived inspiration from the arabesques among the ruined baths of Titus; Poussin reproduced the Aldobandini marriage-symbols; and painters from every country have copied, with a frenzy of enthusiasm, the frescoes of Pompeii, and Ingrés himself had drawn classic groups upon a vase destined only for the decoration of a servants' hall. We have seen how this principle, or sentiment and principle combined, has been acted upon, since exhibitions began in Europe. Often in barbarisms and grotesques,—as of Ethiopian slaves holding forth bronze lamps, piles of Cupids surrounding fountains of immodesty; and the various trash, in the same sense, of nineteenth-century competitions. So far, M. Beulé. The new French Department, representing his views, has just declared itself more broadly upon the point; it says,—we all admire the Greeks, yet we imitate, and do not study them. We copy their types, their costumes, their furniture, even their domestic utensils; and, after all, what is the result? The skin of the lion on the body of the ass! This is a French judgment, with the justice of which we have nothing to do. For the question, as propounded before the professors and students of the National Library, in the Quartier Latin, in Paris, is, whether Apelles and Zeuxis were not decorative painters, after all. There is more seriousness in the problem thus suggested, than, at a first glance, might appear. We will, at any rate, reflect the latest French idea,—of a master of the art and of its critics,—upon the subject. He said, in effect, "You are losing yourself upon vast spaces of canvas, more wintry than winter; or upon athletic figures with well-arranged tunics clinging to them; you are setting little notions in frames which you think worthy of Pompeii; you are playing with toys, and painting for children; and yet you think that decoration is not one of the arts! Now, through all this controversy, which the French Report revives, runs a principle, according to the doctrine of the "Library," to the effect that the art insisted upon shall be either "Mural" or "Monumental." "It is in the combination of these terms," writes a Parisian Commissioner, that the "Decorative" manifests itself. Here is the grand point, so to speak, of disunion. The Fine, historically, it is said, according to modern prejudices, have refused to associate themselves with the Decorative Arts. Well, it may not be easy to judge of results in these matters; but we have some land-marks, at any rate, by which to guide ourselves. The Greeks were masters of art and architecture, yet they dedicated their genius to decoration in a high degree. Their temples and porticoes blazed with colour; they did not study proportions only, but effects, artificially, — perhaps not so artificially,—also, and they enslaved a mathematical knowledge of beauty into their service. We recognise, in the teaching of M. Beulé, something like a principle. It abandons the idea of huge antique, colossal, and monotonous masses; of dreadful contrasts between terrifying light and overwhelming shade; between deep glooms and enamelled open spaces; but all this became familiar, after the Loggia of Raffaelle and the Pompeiian Chambers had been illustrated by learning and by art. The new discoveries were made by those who, in Sicily and Greece, preserved the purest classic traditions. It is not in the new sense propounded, for on that point the latest theories of "The Librarians" will not be accepted without a few "grains of salt." For example, a few years ago, the cry was raised that walls, capable of being painted, were wanted in France. Forthwith, an entire school of wall-painters presented themselves, and a reaction took place, favouring the painting of roofs. Now, all who have sojourned or travelled in France, Belgium, Holland, or Germany, will admit that, in the matter of artistic decoration for public buildings we are very far behind, if not in taste, at at all events in enthusiasm, the general European idea. There is not a town-hall or a court of justice, a police office or public baths, in continental Europe but what has its allegory and its heroic, in crimson and gold. But this is only by the way. In antique times, the plafonds, or hollow roofs of edifices—such as we see now reproduced, in a manner, at Brussels and Amsterdam, were painted, not by artists, but by workmen. Some architectural ornaments ran about the cornices and enlivened the coffers; but an eternal blue tint prevailed, relieved only by golden stars, such as those which, since 1868, have disfigured the vaulted heights of Notre Dame, at Paris. To a later, though scarcely to a less barbarous, period, belong the decorative masters, attempting to carry out the Sicyonian idea of substituting, for simple arabesque, on a blue ground and golden flowers, little figure groups, star clusters, discoveries which melted and lost themselves, as it were, in the spirit of the architecture; and a thousand thoughts of decorative genius, from floor to cupola, which provoked, perhaps, an equal number of controversies. The "Library" is of many opinions on this point. It says,—"A cupola should have no light"; it says, again,—"A cupola should have no shadow." And the masters of the Venetian school reply by asking,—"What has this to do with decoration relatively to the fine arts?" It is impossible to admit any of these prejudices, —we cannot call them theories,—in full. Otherwise, a deep injustice would be done to both the Byzantine and the earlier Italian artists who both wrought upon the idea, prettily expressed by the American poet when he said, "The beautiful should be the bride of the useful." Yet this is not exactly the purpose just now to be kept in view. The greatest of all artists have asked the question,—What is art, if not decorative? What did Julio Romano do except paint a roof at Mantua,—that is, as his masterpiece? In a limited sense, the same might be implied of Michelangelo and Raffaelle. They had to illustrate the signs of the Zodiac, and, in that sense, what were they except decorative painters? The argument is ingenious, if not insulting; but it belongs to the artistic cynicism of the day,—a feeling, by the bye, which may be turned to good or to bad account, as we may please. And here a powerful protest interrupts us. M. Beulé says,—"Nearly all artists, when commissioned to paint a plafond,"—the work, of all others, which the unfortunate Haydon most desired,—"is satisfied to do his work at home; to paint tranquilly in his studio; to imagine what his groups ought to be. He covers his canvas; he sees it nailed up; it may be the Apotheosis of Homer, copied from the Luxembourg; it may be magnificent enough; but it is not the work of a man who has stood upon stool or scaffold, beneath the vaults of Saint Jean de Lateran, old Fontainbleau, or the Palace of Justice at Rennes." Of course, when art is thus associated with decoration, the embarrassment of riches is obvious. The ancients, who had little, except their history and their mythology to fall back upon, did not encounter the same difficulties. Nor should we, who have, in addition, eight centuries of modern history, with all the legends of Judaism and Christianity, to work upon, or from. Socrates, they tell us, only wanted a workman, with a tunic and a suit of sandals, to make any amount of archæology out of. Still, the relation between decoration and art must be sought for, and found, between narrower limits than these. We may even be compelled to omit from our perspective, architecture and poetical painting. It is, indeed, the object of the inquiry, stimulated by so many exhibitions, to invite from down their supreme pinnacles the grandest ideals of art, and ask them to mingle and blend with the tastes and habits of ordinary

life. If it will be believed, there was, at one time, a desperate struggle against the bare notion of association of art with decoration. Shall it be said, exclaimed the Professor of Dresden, that this art, producing a new-born Christ of Correggio, so sublime, that by none can it be seen except by those who stand within the rays of the cradle, must be degraded to the uses of the furniture-maker and the Casino gilder? M. Beulé gave a sensible reply to this somewhat absurd question. He inquired whether there was any value in the decoration of churches and palaces? and whether this principle, of taste and beauty, might not descend through every purpose and propriety of life? It is in snatches that we get the history of art,—in a solitary column; in a lonely vase; just as a rich curtain indicates a luxurious interior, a single tree a forest, a spring a river. No doubt, if we seek for our ideas of art connected with decoration so far, they may be brought home to us. "Colour," insist these last authorities, "is essential to decoration; and nothing is more saddening than works which possess the deadness of sculpture, without its solidity." It may be questioned whether this comprehends the entire question. In the face of the South Kensington colourists are submitted the ochre of Attica and the red of Sinope. These were the two tints of an austere art practised, in its several ways, by Giotto and Masaccio, Michelangelo and Raffaelle; yet they were painters, not decorators, in whose favour M. Beulé pleads. Less than in these can it be imagined that Véronese, Rubens, Romano, Guido, or Poussin sustains the same idea. It is only, in decoration, from the French, that we snatch a thought across the borders of art, that we embroider an idea upon a suggestion. Such is the secret of the charm possessed by us in ancient tapestries, in chinas and enamels of the Renaissance; in crystals and glass-work of the Middle Ages; in Byzantine mosaiques; in the cashmeres of North-Western India; Chinese vases; Persian and Turkish carpets; and Greek and Albanian embroideries. It is half art and half decoration. It means, the Orientals say, an improvisation of use and art combined. The spirit of modern art adds, however, that the two principles are not merely reconcileable, but inseparable.

"ILLUSTRATED PAPERS ON CHURCH ARCHITECTURE."

THE second number of Mr. Sharpe's serial work under the above title* continues the subject of Cistercian architecture, still in illustration of the general plan of its churches and conventual buildings, which is farther exemplified by a sheet of plans, on a small scale, of twenty-one Cistercian abbeys or churches in France, England, Germany, and Spain. A special point which these plans (reduced from those which accompanied the author's lecture on the subject at the Institute of Architects in 1871) illustrate is the development of the eastern chapels upon a square east end, a simple form of which arrangement is exemplified in the plan of Abbey Dore, and a more complicated and extended development of it in those of Riddagshausen and Ebrach, in Germany. The arrangement of eastern chapels in what has been called the *chevet* form, about an apsidal east end, is, of course, both much more frequent, and, from the recent attention paid to French architecture in England, much more familiarised to most of us. The employment of chapels in connexion with a square east end gives to the exterior design at this point a peculiar aspect, illustrated by the views of the eastern terminations of the three abbeys just referred to. In Abbey Dore the chancel chapels, which occur at the east side only of the chancel, and are marked off from the eastern aisle only by an arcade, are under the same roof-slope as the aisle; but in the two German buildings we have first the lean-to roof of the line of chapels surrounding the chancel on east, south, and north; above and within that the aisle walls, with their lean-to roof; and within that again the main centre compartment of the chancel rising above, with a gable in the usual form. The result is a kind of pyramidal composition, which is very marked and characteristic in its effect, more especially at Riddagshausen, the appearance of which, with its pyramidal grouping and plain pointed windows, presents a kind of mingling of the picturesque and the practical, which is both unusual and impressive. The walls of the north and south chapels extend nearly as far from the centre line of the building as the transepts, against the east walls of which their roofs stop. The interior also, of which an admirable drawing from the author's own hand is lithographed, is of a noble completeness and simplicity of design, and the illustration thus afforded of this not much-known building is in itself enough to make this Number worth the attention of architectural students. The author refers to it as a phase of Cistercian architecture that has been little noticed, and which, in comparison with "the simpler plans of the earlier churches of Fontenay, Montbronn, Fountains, and Kirkstall, or with the description of the earlier church at Clervaux, built by St. Bernard himself, affords an idea of the rapid progess which Ritualism of this kind had made, even in the Cistercian order itself, during the last half of the twelfth century."

A point just touched upon by the author is the significance of the names of some of the principal Cistercian abbeys, as indicating the motives for choosing the site, and other little suggestions in regard to their history. Thus, in relation to the Abbey of Brombach, we are told that the site was fixed upon on account of the abundance and excellence of the springs (*Brunnen*), of which "Brom," therefore, would seem to be an abbreviation, and "Brombach" to be literally, in English, 'Spring-brook." Mr. Sharpe goes on to say, "that we have in this German example a complete parallel as regards the cause of the choice of its site, the derivation of its name, and the preservation of its buildings, to the corresponding examples of nearly contemporaneous date in France and England (*Fontenay* and *Fountains*), is a fact of unusual interest, the importance of which will be more apparent when we come, hereafter, to compare the designs of their buildings and the details of their works." The contrast, one may add, between the carefulness about water-supply, and about sanitary conditions generally for prolonging life, and the placing of the buildings and the framing of the rules of the order, so as to cut off rigorously, as one would suppose, all that could make existence worth having, is very significant of the temper and spirit of a movement which it seems almost impossible to realise, in its actual facts, at the present day.

Mr. Sharpe, it seems, has, however, had an unexpected opportunity of realising it in the course of his archæological explorations; and his account of this is so curious and unusual, and helps so much towards enabling us to fancy what life in these Cistercian buildings actually was, that we must extract the passage. It was when staying at Narbonne, in 1865, that the author, on consulting his Cistercian records, found a note of a monastery founded in 1145, under the name of "Fons frigidus" (again, it will be observed, a name referring to the nature of the water-supply), and having discovered in the Ordnance map the name of "Fontfroide" in the direction indicated, and learning that there were some ruins at that place, set off to pay it a visit.

"Following the high road from Narbonne to La Grasse, which diverging from the Carasonne road, soon enters a barren valley between two low ranges of rocky hills, I arrived, after a drive of an hour and a half, at a point where a by-road to the left enters a pleasant green valley, watered by a small meandering stream, with sloping banks, growing steeper and higher as we advanced; the whole presenting the usual features of a true Cistercian valley. At the distance of about a mile and a half the valley makes a sharp turn, and in the narrow basin thus formed we suddenly came upon a group of grey buildings, of the original destination of which I could entertain no doubt. Whether they were occupied or not seemed to be doubtful, for the heavy double doors of the old gateway were closed, and not a sound came from the buildings themselves; a pretty loud summons on the closed doors, however, was shortly followed by the sound of approaching footsteps; the bars were withdrawn, and there stood before me a Cistercian monk, clad in the identical garments described in p. 12 of part II. of this work. On recovering from the startling effect produced upon me by this apparition, I inquired of the ghost-like figure whether I was right in supposing that this was the Abbey of Fontfroide, and whether, in that case, I might be allowed to see the buildings; the Cistercian—for it was a real monk that I saw before me—silently motioned me to enter, and conducted me to the cloister, where he consigned me to the charge of another monk, who proved to be the Hotelier (*Hospitalis, Hospitalarius*), the only monk, beside the Abbot, to whom the privilege of speech was allowed. It appears that a French land-owner, some years ago, purchased the ruins of this ancient convent, and refounded it for the use of such inmates of the Bernardine monasteries of the high Alps as were unable any longer, from failing health or increasing years, to sustain the rigours of the climate of those elevated regions.

"At the time of my visit there were eighteen or twenty monks in the convent; they had repaired the church and some of the conventual buildings, and contrived to raise on the land attached to the abbey sufficient to support life. They were evidently in the greatest state of poverty, and living in the complete realisation of that life of self-denial and severity contemplated by the founders of the order, and practised in the twelfth century. I enjoyed their simple hospitality for two days, and was permitted to visit and to draw the different buildings and the church when and as I pleased. It was a singular existence. Not a footfall was heard in the buildings, for the monks wore sandals; and it was somewhat startling, when in the cloisters, or the chapter-house, you fancied yourself alone, to find, on turning round, one of these voiceless, Mediæval, white-robed figures at your elbow. The only sound that disturbed the deep stillness of the place was that of the voices of the monks as they chanted, five times during the day, their orisons in the church."

Few real experiences could have seemed more like a dream, we should imagine. Fontfroide monastery possessed some peculiarities of plan, in the existence of an apse to one of the eastern chapels of each transept, as well as the principal apse of the chancel; and in having (which is very unusual) the conventual buildings on the north side of the church instead of on the south.

The subject of the process of construction, or of the thinking out of the construction, of Mediæval buildings, receives some special illustration in the present number of Mr. Sharpe's work; he endeavours to give more emphasis to the idea which has been a good deal mooted lately (and which we rather believe he was the first to suggest), that the Mediæval vaulted buildings were designed rather from above than from below, the arrangement of the vaulting, and the plan of the upper portion immediately connected with it, being determined upon, and the substructure planned and designed with this end in view. The idea that the plan of the Mediæval transeptal churches was really designed with a symbolical meaning, and did not arise merely from constructive influences (a theory which has been sometimes questioned) receives at least very strong confirmation from the sentence which the author quotes from a "Ritulum Cisterciense," published at Paris in 1721:—"Omnes ecclesiæ ordinis nostri in honorem beatæ Mariæ dedicatæ sunt, et fere in modum crucis constructæ, instar ecclesiæ Cisterciensis omnium matris"; and although we are not told positively the date to which this injunction is to be traced back, it certainly infers a tradition to the effect suggested. The manner in which this injunction is carried out in Cistercian churches affords, in the author's opinion, a convincing proof of this theory, that the whole building was designed with reference to the upper portion. If we examine the ground-plans of Cistercian churches, we find the cross form often very much broken up, and sometimes rendered little recognisable amid the greater or less complication of the ground-plan. But take the plan above the triforium and in reference to the upper walls only, and the symmetrical form of the Latin cross is apparent in almost every one of them. The block plans of fifteen out of the twenty-one churches illustrated, above the aisle-roofs, are given on Plate III., and all show a complete and symmetrical Latin cross, of not very differing proportions; a few only of the plans having the arms of the cross decidedly longer in comparison to the stem than the others. This way of contemplating the plan is at least rather new, and may suggest something as to the principles which governed the planning of the buildings. In its bearing upon the conclusion derived from it, however, it must not be pushed too far. We doubt whether it is possible really to arrive with certainty at a clear idea of the method in design of the Mediæval architect, or the manner in which his problem suggested itself to his mind. But every suggestion on the subject is interest-

* Illustrated Papers on Church Architecture. By Edmund Sharpe, M.A., F.R.I.B.A. "No. 11. Cistercian Architecture. Part I., General Plan (continued)." London and New York: E. & F. N. Spon.

ing. The present number of Mr. Sharpe's publication is, in short, a very good one, with much of what is of special interest in it. We regret again, however, to see drawings (the exterior views of Abbey Dore, and of the two German abbeys before referred to), which in execution and style are very inferior to what used always to be connected with Mr. Sharpe's name. The two interior views of Abbey Dore and Riddagshausen, which bear the author's own signature, afford a marked contrast to the exterior views.

HEALTHY HABITATIONS.*

WE are told upon the best authority that there occurs annually in this country upwards of 4½ millions of cases of preventible sickness, and that 125,000 persons are prematurely cut off every year from a neglect of sanitary precautions. We are accustomed to consider that the house is to blame for this desperate state of things, and the case is certainly a strong one. We dress in the morning, and unsuspectingly don linen washed, dried, and ironed in the home of a laundress, the inmates of whose non-disinfected household have been stricken down with fever. Or the contagious matter may have been imported in the woollen interstices of a coat shapen and sewn by an out-working tailor whose seat-board was within the length of a rose-tree from some one whom fever is fast hailing to the silent land. We then breakfast, and if we escape enteric poison in the milk-jug it is entirely owing to the cleanly surroundings of the farm or dairy. The meal over, the post may bring us some infection in a newspaper, not one newly radiant from the press, but fresh from a friend whose house is under a fever-cloud, as was the case the other day, when the virus of scarlatina was conveyed from far Inverness to Exmouth. The Nemesis of uncleanness follows the innocent traveller, too, for "mine hostess of the inn" has perhaps permitted him to sleep in a bed last occupied by one who had just sickened or who had insufficiently recovered from some ailment. Even if the bed be without reproach, his slumber may not have given him corresponding relaxation, and draughts from the window or chimney may have induced a violent cold just when the greatest radiation from his skin prevailed, and he was powerless to avert it. Or the faint night breeze may be loaded with the invisible horrors of sewer-gas, which we all know very well is not an imaginary case.

Alas for the very poor, whom we shall have always with us, how do they suffer from domiciliary uncleanness! They risk the eating of cheap, unfit food, and the drinking of putrid water, we know; but they may also sleep upon beds made up of shredded rags which the dealers have collected from the marine stores and town dust-yards, innocent of cleansing or disinfection. Their wearing material is sometimes also just the shoddy made up of woollen rag flocks, from no one knows where, or they may have been purchased in the clothes-exchange of some rag-fair, and stored with germs only lacking an opportunity for mischief. A late outbreak of scarlatina in Hereford was traced to an old-clothes shop of this description. The furniture, also, of the poor classes is as likely as not purchased at an auction, the sale of which, fresh from an infected house, was not arrested by the health officer, as was a late sale at Sydenham. Nor do the poor suffer alone; they perforce communicate it to those around them. During the present year at Chippenham, the pew-cleaner bore infection into a family pew. The saddest case I know of occurred also this year at Leeds, where typhus was carried with some infected articles into a pawnbroker's house, and with fatal results. Sanitarians must aim at improving the dwellings of the poor first of all, and the hands of the health inspectors ought to be strengthened, so that they may not only seek out, but promptly remove the engendering evils. As fast as a crocodile's egg is discovered an ichneumon should be let loose upon it. The medical officer of health and his inspectors are here the masters of the situation, or rather should be, not the magistrate and his Admirables of the Blue. Perhaps, however, some day the police will get tired of so much hunting up of cases for the Board school, and will supplement a fair share of that by furnishing a list of sanitary delinquencies to the proper authorities.

The first chief consideration when about to erect a house is that of procuring a suitable site. In cities we have little choice except that of avoiding the neighbourhood of rank nuisances, such as slaughter-houses or gas-works. But it would, perhaps, be better to have built there the town residence rather than upon the more aristocratic site, since the foundations would have, it may be, to be built in trenches dug out of soft core. The labouring man suffers exactly in the same way, with this enhancement of evil, that in his case the house may be built up for the most part of old materials sold with the site, bricks sodden with the impurities of a century, and put together with mortar manufactured out of filth-saturated plaster. If the history of the 129,000 houses which have been erected during the last ten years in London were accurately known, some desperate revelations might be expected, and a great deal of metropolitan sickness accounted for. We ought, as has been said, to have a due knowledge of the amount of population in each street of every city within the land, and thus be able to detect unhealthy areas by separating the cases of zymotic diseases from other seizures. By this means the causes of filth diseases might be rooted out. The late Dr. Ross pointed out a street in St. Giles's district, London, in which there was in the course of each year a death in every house. In the neighbourhood of a square in the same district the mortality was only one in forty-one houses. Not density, and not overcrowding, however, caused the fatality in the street named, but defects of construction and arrangement in the houses, and, above all, dirt inconceivable.

I have heard it repeatedly remarked that the mansions of the good old times were invariably built upon exceptionally good spots, and with which no fault could be found. This may be true of most abbeys and priories, the sites of which were chosen by conclaves of wise men, but is not true if predicted of many old mansions; since I have frequently seen these, though commanding the finest views, abandoned to the owl, and new residences built at some distance, because of the healthiness of the fresh site. If our forefathers erred, however, occasionally, we err very frequently indeed. I could point out houses, dwelt in by patricians of our own land, the subsoil of which is continually—in flood-time or dry harvest—charged with the water of adjacent streams or lakes, the water having actually to be pumped out of the cellars at stated times. Many modern mansions have I met, too, which had been erected as if in the bottom of a saucer of water-bearing rocks, and which are never dry.

When houses are built upon alluvial soil and the subsoil water lies close to the surface, the advent of malarious diseases may be regarded as a certainty. Paroxysmal fevers have also been traced to the digging up of the wide gravel walks in the gardens of houses unprovided with a subsoil drainage. A great deal has lately been said of the fevers due to the disturbance of the soil in Rome, and many experiments upon the ground-air have been made at home and upon the Continent. It is necessary that such experiments be made, for a medical man has lately related how, in Carlisle, he suffered for nine weeks from a fever due to the disturbance of the soil in the neighbourhood for the purpose of levelling a building site and constructing a new road on the estate. The prevailing winds must also be taken into account, for where the house has been erected regardless of proximous fens or marshes, and there are many even in crowded England, the malarial factors are many and intense. And, apart from all this, houses are sometimes rendered unbearable through standing open-mouthed in the way of winds blown from dry sewage outfalls and supersaturated lands. I know a nobleman's house one wing of which is made most uncomfortable during certain winds by chemical works fully three miles distant. To a very serious degree, indeed, do dwellers in manufacturing cities and towns suffer when the noisome works are crowded in amongst the dwellings. These manufacturing vapours, during northerly and easterly winds especially, increase the local death-rates enormously. In Glasgow, when such vapours are condensed in fogs, the poorer districts, well open to their influence, have suffered a mortality of over 65 per 1,000, as against 19 to 36 per 1,000 in the better parts of the city at the same time. If there stands a sufficient reason for the weeding out of too closely congregated public-houses on the score of morality, a much greater necessity obtains for the better isolation of these unhealthy factories. And just as intramural burying-grounds have been banished to the suburbs, so should these atmosphere-poisoning laboratories be gradually moved on to the outlying districts, even should a workmen's railway follow each of them.

It is customary with us to condemn the erection of a residence upon clayey soils, and to praise gravelly ones, but the choice is not always a happy one. True, drift gravels may be free from sinister imputations, and so may deep permeable gravels and deep sandy soils, such as our Bagshots; for there the chance is that the many escaping wastes from our dwellings may filter harmlessly away. But shallow gravels, and gravels of mere river origin, if these rest upon non-absorbent rocks, are to be suspected, inasmuch as the wastes which sink through them would anon reach the surface again. There is no natural surface-drainage possible in such cases, and the adjective well-poisoning is also here well applied. Now, upon a clay soil—and cholera flies a clay soil—it has been remarked, all this evil can be avoided; the foundations can be built upon concrete, and even the whole basement, whilst the wastes can be drawn without fear of soakages. As a rule, all house sites should be drained just as fields are drained, and below even the concreting.

The greatest care should therefore be exercised in making a proper choice of a site. If the district be very damp and marshy, the influence of miasmas cannot, I think, be averted by any amount of gum-tree or sunflower planting, however much moisture these may dispose of, and Dutch experiments on clean-water ditches to the contrary notwithstanding. They cannot be reckoned to counteract the evils of a subsoil continuously fed with impure liquids. It has been said that it is in the power of floriculture to conquer a whole district from deadly malaria by covering it with aromatic vegetation, and the inspired writer may have had this in his mind when he spoke of the desert blossoming as a rose; but powerful as is the peculiarity of certain flowering plants to produce ozone, on exposure to the sun's rays, they could have but little effect upon the surroundings of a house which can only be drained in the subsoil upon which it immediately rests.

A word or two as to the prospect and aspect of a house, and the necessity of this has been carefully elaborated by Professor Kerr. The prospect may be chosen with the view to making the most of the scenery. As regards aspect, the north is best allotted to the dining-room, as the twilight lasts longest there, and the staircases are also best when arranged upon this side of the house, being always cool. For the larder and dairy this aspect is unexceptionably good. The bedrooms will be found most comfortable when facing the north-east, as they get a pleasant morning sun, and are correspondingly cool at night. The east is suitable for the breakfast-room, morning, and library, but not for the drawing-room, because of the east winds and lack of afternoon sunshine. In the south-east may be placed the reception and best rooms, and for a sick room this aspect is not to be surpassed for fitness. The south is unsuited for the dining-room windows, except there be a good verandah; and as for the south-west, it is the worst aspect of all, and unpleasantly hot for bed-rooms. Neither is the west to be purposely chosen for bedrooms, or even for a dining-room; it is suitable, however, for the smoking-room and for one side of the conservatory. The north-west is suitable for an evening-room if fitted with good blinds. To conclude, the east aspect is dry, but sometimes subject to bitter winds, which planting may obviate. The south-east is also dry and the winds mild, whilst the south is eminently sultry. The worst aspects are the south-west, with its frequent rains and boisterous winds; the west, with its rain and undue warmth; and the north, with its prevailing coldness.

It may be said that this care as to the aspect is mere sumptuousness, but not so. Even in the case of a labourer's cottage in the country, when there was the whole welkin to choose from, how often do we see a senseless choice made,—just as we see a senseless choice made with villas when aspect has been ruthlessly sacrificed for prospect's sake. The bed-rooms of the farm labourer's family may look out on the north or south-west, the kitchen faces the west, the dairy the south, and the privy, dust-midden, and piggery dung-pit are all clustered together where the sunbeams most do congregate, instead of the north. I have no practical remark to make upon this part of my theme, except to lament that intending investors do not oftener have recourse to models before they transmute their money into bricks and mortar. This precaution

* By Mr. W. Eassie, C.E., delivered before the National Health Society, London, June 21, 1876; Mr. G. Godwin in the chair.

would cost little more than 1 per cent. on the outlay, and would save much heartburning. It is only what every good engineer does before he builds a bridge or constructs the simplest piece of machinery.

But to approach the house closer, ceasing, however, the alternate harpings upon rich and poor residences, and choosing a building of moderate pretensions as a representative erection. As we near it we diagnose immediately and safely as to its healthy condition. If a damp one, it carries intemperance upon its face; its walls are dun-coloured in patches, due to dampness in the walls, a dampness which can be traced up outside at times to the first floor. The wet yards speak gushingly of water hidden below the pavement, and which cannot run its allotted course to the nearest brook. Once inside, we notice the damp basement floors which not the coal-wasting kitchen fire can recover to normal dryness; and in the more neglected rooms of the same floor it would seem as if they were intended for the production of newts and frogs. This is no overcharged picture, and is as bad many times when there is no cellar accommodation. The ensteepment of the house is moreover traceable elsewhere than in the ground-floor, in the cupboards of which, by the way, mouldiness grows upon the boots almost in a night's time; for in the library upstairs a mildew prevails, making limpid the rare leather bindings; and the sense of mustiness is ever present, even in the bedrooms. It is as if a premium had been held out to shiverings, rheums, and agues. Only last week I visited an ancestral hall in Lincolnshire, and found out just such a state of things in a new wing which had been built about a year. The painters of a noted West-end firm were busy coating the walls with oil paint, and nearly as fast as the coats were put on the water rose up the walls and bulged out the paint into blisters, resembling those generated by a severe burn, and needing, in similar fashion, only the prick of a knife to liberate the water.

The state of things in this mansion was simply due to building the foundations without concrete underneath, and without any damp-course to intercept the rising wet. Had the site been drained, even, it would have been less of a blunder. Dampness in houses is often traceable to having laid the stone, tile, or brick paving upon the damp earth, one consequence of which may be that the floor will perhaps be lifted up out of its place by underside growths. Under every circumstance a bed of concrete should sublie all paving. Another cause of humidity in the house is due to the banking up of damp earth against the walls, and the non-provision of an area wall. The latter, like virtue, is indispensable, and the contractor who provides it when the designer of the house has omitted to specify it is worthy of the Order of the Pope's Silver Rose, if he has more than the "Golden" one. I would say to the builder—Put it in, even should you never get paid for it; for, depend upon it, if you do not the residence will always be cited against you as a badly built one, and your balance due will be escheated, which may cause you a sweating sickness in the bank parlour. I may also here add, that the moistness due to the nonplacement of a damp-proof course can alone be remedied by cutting out the wall and inserting one above ground-level line. No damp-proof paints can long withstand the enemy behind, which, when it ceases its legitimate march through the wall, only begins to crumble away at the wall material behind. True, it can be hidden from the eye by boarded linings, but the truce is only for a time.*

* To be continued.

YORKSHIRE ARCHITECTURAL SOCIETY.

ON the 21st of June this society made an excursion to the neighbourhood of Guisbro'. Immediately on reaching Middlesbrough, the party set out for Acklam Church, where a short paper was read on the effigy of a lady, supposed to be Margaret Conyers, the wife of Sir Thomas Boyton, who died in 1402. Thence they proceeded to Marton Church, which was partially restored in 1843, under the superintendence of an amateur architect, Mr. J. B. Rudd, of Tollesby Hall, Marton. Leaving this, the members, following the guidance of the Rev. C. Baillie, the rector, went to Marton Hall, the residence of Mr. H. W. F. Bolokow, M.P., who had kindly invited them to view the pictures there. The extensive collection contains masterpieces of Landseer, Rosa Bonheur, and others. After spending nearly an hour at the Hall, the party was compelled to hurry away and get to Great Ayton as soon as possible. Here are two churches, one just finished from the designs of Mr. Ross, of Darlington, and the other a Norman fabric, which is only used occasionally. This was examined at length by the members. The next stopping-place was the small Norman Church at Newton. The font, of Transitional Norman work, from Ingleby, Arncliffe, memorial cross slabs, gable crosses, the Norman door on the north side, and especially a very old sculptured stone now built into an out-house adjoining the church, successively formed subjects of discussion. Upon reaching Guisbrough the members went into the church to see the remains of the beautiful Bruce tomb, the new font, and the fine old plate belonging to the church. They next went into the grounds of Admiral Chaloner, to see the ruins of Guisborough Priory. A short paper was read upon the salient points of the ruins, and then a rapid investigation took place.

CHAMBERS & CO.'S ARCHIMEDEAN BRICK MACHINE, PHILADELPHIA.

THIS machine belongs to the class known as "*tempered-clay machines*," or "clay-tempering brick-making machines," and was invented by the junior member of the firm, Cyrus Chambers, junior.

The machine is constructed almost wholly of iron, and is made very strong and durable. It *tempers its own clay with water*, taking the clay as it comes from the bank, without any *previous handling or preparation*, and forms it into bricks, with well-defined corners, and smooth, straight surfaces, at the rate of from fifty to eighty per minute, or from twenty-five to thirty-five thousand per day of ten hours. The clay is taken direct from the bank and dumped at the side of a conical funnel that leads into the tempering case of the machine, and mixed, when necessary, with *loam, sand, or coal*, the requisite amount of *water* being added to temper the clay to the proper consistency; the mass is shovelled into the hopper and falls into the machine.

The tempering portion of the machine consists of a strong iron case, in which revolves a horizontal shaft, into which are set spirally, strong tempering knives, or blades of steel, so that, as they pass through the clay, they move it forward. The clay being stiff, and not having much water on it, is not liable to *slip* before the knives, but is cut through and through, and *thoroughly* mixed; so that by the time it reaches the small end of the tempering case it is ready to be formed into bricks. On the end of the tempering shaft is secured a conical screw, which revolves in a cast-iron conical case, the inside of which is ribbed, lengthwise, so as to prevent the clay from revolving in it, and is chilled, to prevent wearing. The screw being *smooth* and very hard, the clay slides on the screws, thus becoming, as it were, a *nut*; the screw revolving, and not being allowed to move backward, the clay *must* go forward. This operation further tempers the clay, and delivers it, in a solid, round column, to the *forming die*, which is of peculiar construction and form, and so designed as to reduce the round column to a rectangular one, whose breadth and thickness is the *proper breadth* and *thickness* for a brick, while at the same time it *forces the clay into the corners* of the square or rectangular, finishing part of the die, so that the angles of the bar of clay are made very solid and sharp, thus insuring perfectly square and well-defined corners to the bricks. This bar, as it issues from the die, is conducted by a plate to the cutting device, which consists of a thin blade of steel, secured to the periphery of a wheel, in the form of a spiral, the distance between the blades of which is that required for the length of a brick. This spiral knife runs perpendicularly, in an endless chain, which supports the bar of clay at one edge and bottom, so that the blade in passing through the clay is supported, thus insuring the angles unbroken, and the cutting smooth and square.

The distance between the spiral blades being uniform, the lengths of the brick are absolutely uniform, thus overcoming the great practical objection hitherto existing in the Chambers machine. The drawing cut of the spiral cuts the end of the bricks perfectly smooth, thus correcting another defect hitherto existing in this class of machines.

The speed of this spiral cutting blade is controlled by the clay itself; hence no matter how irregular the flow of clay, the spiral runs in exact unison therewith; consequently, the absolute uniformity in the length of the bricks. This controlling of the speed of the spiral by the clay is so positive with that of the clay that it will run at any speed from one to one hundred bricks per minute, while the machine runs at full speed. These cutting and regulating features are the new parts, and overcome the old valid objection heretofore urged against this machine as now introduced.

The bricks, thus cut from the continuous bar, are separated and carried by another endless belt through the dusting or sanding machine, which consists of a chamber, into which is thrown, by centrifugal force or a blast of air or steam, a continuous cloud of dust or fine sand, which adheres to the surface of the bricks, rendering them much nicer to handle, preventing them from sticking together on the barrows, or in the hacks on the *drying cars*, and much improving them in colour when burnt.

All brick clays have more or fewer stones in them, and as it is impracticable to pick them *all* out, there is a necessity for making some provision for them, and this is done.

PROFESSIONAL PRACTICE IN AMERICA.

A CASE of professional practice has just come before the Chicago Chapter of the American Institute, and the *American Architect* gives the following particulars:—

Mr. Cochrane, one of the members of the Chapter, had been employed by the county to design the County Hospital, and after having furnished the necessary drawings and tracings for the work, was requested by two of the contractors in the work to supply them each a set of the general drawings in addition. This he did, charging them each $200 for the drawings, a price which he thinks brought him no profit. In a report of the grand jury this charge was referred to as matter of reproach against Mr. Cochrane, who then laid the question before the Chapter, and requested their opinion whether the charge was an honourable one, and also whether there should be a limit to the amount of work which could be required from an architect. The questions were referred to a special committee, Messrs. Cleveland, Baner, and Wight. The committee, reporting on the subject, quote the fourth article of the Constitution of the Institute, which, after saying that the condition of membership shall be the honourable practice of the profession, adds that "no member shall accept direct or indirect compensation for service rendered in the practice of his profession, other than the fees received from his client." They say that in this case Mr. Cochrane's client was the County Board, and that the mechanics to whom he furnished the drawings were only contractors, and they consider Mr. Cochrane's acceptance of money from them an indiscretion.

With regard to professional usage in such a case, the committee call attention to the fact that the former custom of architects in charging contractors for working-drawings furnished them has been out of date for at least fifteen years (we doubt if it has prevailed at the East within a much longer period), and that it is the custom among architects at this day to furnish all the drawings that are needed, and even extra ones, without added compensation; they holding that to receive money from a contractor is likely to create suspicion, and wishing to carefully preserve their independence. The question, whether a limit is to be set to the work required from architects, they defer to the Chapter for future consideration. The committee exonerate the transaction of any dishonourable character, in view of the entirely open and business-like manner in which the thing was done.

Building Loans in Carlisle.—The various building societies of the Carlisle district have issued their reports. In the course of the year the Fisher-street Society have advanced no less than 105,245*l.* in loans, being twice as much as they lent in 1874, and nearly three times as much as in 1873. The deposits in the same period were 155,271*l.* The number of members is 4,445. From the report of the Enterprise Permanent Benefit Building Society, we learn that 49,537*l.* have been advanced on loan during the year. The Carlisle and Cumberland, and other societies, have also done a much larger business than usual.

THE PRINCE OF WALES'S LOAN EXHIBITION.

THE extensive collection of presents brought home by the Prince from India is now open to the inspection of the public in some of the galleries in connexion with the India Museum in Exhibition-road. The collection is a very rich and, considering the mode and time in which it has been got together, a very extensive one, and is sure to prove of much interest to general visitors, though there is nothing new in it for those who are acquainted with Indian ornamental art.

The collection includes a considerable amount of very rich, and some very beautiful, gold and silver work. A centre ornament of silver, of almost flower-like delicacy and fragility, in one of the cases, is an object of general admiration: a silver tea service, in much more massive style, has more of the traces of European feeling and taste, by which its designer has evidently been influenced. On the other hand, there is evidence in the collection that the silversmith's art has been progressive in India in modern times; for some silver articles labelled "seventeenth century" are in a much more commonplace and less fanciful style than the best of the contemporary work. The habit of bringing into use the natural products of the country, either in form or substance, as features of its art, is a good deal exemplified. A couple of egg-stands are made from ostriches' eggs, silver-mounted, cut across, and one portion made to open as a hinged lid. Cocoa-nuts are carved into elaborated open work with minute and delicate surface ornament, and mounted and hinged in the same fashion. Elephants in one form or another abound, in stone, in marble, in brass, in agate, &c.,—some of them tolerably realistic representations, others conventionalised into mere approximate memoranda of elephants. The spirit and force of many of these, which seem in most cases to be mere ornament, is remarkable.

The collection of weapons includes some of the most interesting and richest work in the exhibition; many of the scabbards, especially, being studies of rich and perfectly tasteful decoration. A state elephant howdah does more, perhaps, to realise the idea of the gorgeous effect of an Eastern *fête* than even the graphic pencils of our newspaper illustrators can convey to us. An ivory palanquin, covered with fret ornament, attracts a good deal of attention; but is more remarkable, in our eyes, for richness and elaboration than for excellence or suitability of ornament in an artistic point of view. It suggests the idea that a palanquin must be a very comfortable and luxurious conveyance, for a person of small proportions. The delicate nature of the Indian physique is indicated in other things in the collection; among the arms, for instance, where we see big swords, some of them of formidable length and weight of blade, with a hilt which most average-sized Englishmen would find too small for their hand to wield with any comfort. Some good and characteristic specimens of ivory carving on a small scale are to be seen; a fair display of jewelry and personal ornaments of various kinds, and some rich gold lace and other stuffs. Hookahs are in great force,—hookahs of a size and magnificence to be marvelled at. Among other miscellaneous objects we came upon a couple of handles of carved ivory about 15 in. long, ending each in a hand (about quarter-size), with the fingers partially extended and bent downwards, and cut nearly to a point at the end. These implements of Oriental civilisation are described on the card affixed as "ivory back-scratchers." Possibly that may be considered, at all events, an improvement on the post which the inhabitants of a certain portion of Great Britain used to be supposed to carry about with them, according to the delicate satire of a previous generation.

Though, as we observed, there is nothing particular to be learned in the way of Indian art from the Prince's collection, there are plenty of things that are worth looking at, and which appear to be considered so by a large crowd of visitors.

Workmen at St. Paul's Cathedral.—On the 23rd ult., Mr. Joseph Wilkinson (clerk of works), on his leaving St. Paul's Cathedral to undertake work in the country, was presented with a testimonial from the working staff of the fabric, consisting of an ivory rule with silver fittings, four volumes of "Cassell's Technical Educator," and an illuminated address in a carved oak frame.

LAMBETH FAÏENCE.

THE collection of art pottery from Messrs. Doulton's works at Lambeth, on view at Messrs. Howell & James's, is a very gratifying reminder that there is really good and original work of this kind, both as regards design and execution, carried out among us at the present day. The collection, which is the second annual one that has been made, comprises two classes of work, faïence and stoneware. In the former work we are struck with the rich and harmonious character of the colouring, as well as the grace and originality of a good deal of the design, which occupies in character a mean position, for the most part, between the irregularity of the Japanese types of ornament and the too mechanical and exact symmetry which distinguishes a good deal of modern work of this kind, especially French. A small collection of recent French work occupies part of the same room in which the Lambeth work is collected, and a comparison of the two is not a bad lesson in the qualities which separate artistic effect and character from mere commonplace prettiness in this class of production. In the French work the colouring is far inferior in depth of tone to that of the Lambeth productions; it is hard and raw in comparison; the shape and surface of the vases are finished with a finical neatness which deprives them of richness of texture; gilding is occasionally applied,—a source of effect quite out of keeping with pottery art, and which always results in giving a more or less tawdry effect. In the Lambeth work there is little of attempt at rigid and precise symmetry; some of the designs are studiously devoid of symmetrical arrangement (and this is the character of some of the best among them), but in the main there is freedom without carelessness in the details of the designs, which are largely founded on floral types; and the forms of the various vases, plates, and other articles are in almost all cases good. One special merit, however, which all this ware possesses is, that there is an absence of that endeavour after excessive smoothness and hardness of line and finish which is not the natural character of earthenware, and the attainment of which, in reality, only means the obliterating of the real character of the material and of the design expressed in it. This portion of the collection includes, we may observe, four of those little alto-relievo subjects by Mr. Tinworth, four others of which are in the Royal Academy vestibule, and were noticed by us in some recent comments on the sculpture at the Academy.

It is in the "stoneware" productions that we think the Lambeth pottery is even more original and successful than in the faïence. A style has been adopted in this class of work which gives a great deal of richness and variety of surface, while preserving the true character of earthenware: the design showing, in fact, its process of manufacture almost on the face of it. Part of the work consists of designs etched by incising on the surface of the clay before it has received its final hardening, the incised lines being then filled with a greyish tint; this process gives the opportunity of drawing and designing in a very free style on the surface of a vase, without in any way transgressing the limits imposed by the nature of the material. The purely ornamental portions of the work are in tolerably sharp relief, the employment of serrated and ridged lines to mark out the principal sections of the design being a favourite device, producing a great deal of glitter and richness of surface. The colouring of this class of work is mostly exceedingly good, and, in its own way, quite equal, as an accessory to the decorative effect of a room, to much of the Japanese enamel which is so much sought after, and which, of course, is a more delicate and elaborate kind of production, but is in reality rather work for minute inspection than for decorative effect. The stoneware is chiefly exhibited in the form of vases for flowers, &c., of various sizes. Smaller articles are, however, made in it. We noticed in the collection such things as salt-cellars, and a small stoneware tea-service, not including, however, cups and saucers, for which it is considered the material is not light enough in bulk and appearance; but we can see no reason why it should not be used for such a purpose. There is rather a taste at present for excessive fragility in the furniture of the tea-tray; but an opposite taste may be consulted also.

The picture-work, as we may call it, in the collection, where large dishes are made the ground for paintings of heads, or of figure subjects, is well executed; but we do not so much sympathise with this kind of design in such a material, which is ill-qualified to do justice to it. But the bulk of the collection is excellent work, and shows a spirit both in design and execution such as it is generally the custom to say is not existent in modern ornamental work at all, and which is certainly but rarely found.

PUBLIC IMPROVEMENTS IN HAVRE.

AN attempt is being made to place the "Haven of Grace" in the position which its natural situation at the mouth of the metropolitan river of France has failed to secure for it,—that of an attractive watering-place. Trouville, Deauville, and other smaller towns along the coast have risen in popularity, and large sums have been lavished in improving them and rendering them attractive to visitors, but Havre has hitherto been left in the cold, and neglected. In a recent report, Consul Bernal states that the new law courts, on the Boulevard de Strasburg, are approaching completion. "Whatever," he says, "may be the success of their internal arrangements and accommodation, they are, in an architectural point of view, a failure. Heavy in design and wanting in elevation, it is very strange that they should be the outcome of a public competition. The town of Havre is, however, in no way responsible for them, Rouen and its authorities being, under the system of departmental government, the arbiters in such matters."

New houses continue to be built, and, though trade is dull, and "hard times are come again," rents are high. One great improvement which is now projected is the formation of a marine boulevard, a plan of which has been submitted by the Mayor to the Town Council. The project comprises a boulevard along the sea-shore, about 2,100 yards in length and 27 yards wide, extending from the pier to the suburb of Sainte Adresse. The estimated cost is 280,000*l*. There is no doubt that such a work would place the claims of Havre in the front rank as a fashionable watering-place, and would soon repay the outlay in the increased popularity of the town.

An English Episcopal Church, opened last year, is one of the principal ornamental additions to the town, but a debt on the building has prevented its completion, and the spire has not been erected. The exterior of the edifice is as pretty as that of any English church on the Continent; but the internal accommodation is bad, and the best use is not made of the limited space available.

The population of Havre is only about 87,000, but the trade is of considerable importance. Indeed, it claims to be "the second commercial port of France." Among the steamers built and launched here in 1875, are two, built for the London, Brighton, and South Coast Railway. "This apparently singular circumstance," says Mr. Bernal, "is accounted for by the fact of the Western Railway Company of France being co-proprietors of this line of steamers, which run between Dieppe and Newhaven." This fact only seems to partially account for the circumstance that steamers are built in France for an English company. It is, in our judgment, only another proof of the injury which is being done to English trade by the foreign competition which "strikes" in our own country do so much to foster, and this view is borne out by the following general remarks with which the report closes:—"With labouring classes who are sober (on the whole), thrifty, endowed with taste, accustomed to cheap amusements, of domestic habits, and comparatively free from the two-edged weapon of strikes, the French employers are in many respects better off than their British compeers. Were it possible for France to enjoy for ten years perfect political quiet, as well as the self-government which England possesses, she would attain to a fabulous height of national wealth and greatness."

Death of a Great Ironmaster.—Mr. James Baird, of Cambusdoon, the well-known millionaire and ironmaster, who recently gave 500,000*l*. to the Church of Scotland, died at his residence, Cambusdoon, near Ayr, on the 20th ult. It may be said that by the energy and enterprise of his firm the Scotch iron trade was created. Glasgow and the surrounding districts owe much of their prosperity to him and his brothers.

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BYZANTINE ARCHITECTURE AND THE ARCHITECTURE OF LA CHARENTE.

ARCHITECTURAL ASSOCIATION EXCURSION, 1875.

ON the 13th ult. Mr. Edmund Sharpe lectured in the large hall of the Co-operative Institute, Castle-street East, Oxford-street, on "The Architecture of La Charente," giving some account of the buildings of the district visited by the Architectural Association during the 1875 excursion. The lecture was illustrated by a very large number of drawings specially prepared from the measured and other sketches of buildings, and their ornamentation, made during the excursion.

Mr. Sharpe said,—In the year of our Lord 540 there was to be seen rising in the eastern metropolis of the Roman Empire a building the like of which had till then never been seen. It was a Christian church, dedicated to Divine Wisdom, as the term literally interpreted signifies. A contemporaneous writer explains that this appellation was so used as expressing the chief attribute of the Godhead; but Rupertus, in his "De Divino Officio," cap. xv., lib. 10, interprets the term ἡ ἁγία Σοφία to mean what is understood by "The Word of God,"—*i.e.*, the Son of God. In this sense the dedication would be equivalent to that of a Roman Catholic church in Manchester, which is denominated "The Church of the Holy Name," or to that of numerous English churches that are called St. Saviour's or Christ Church.

The church of St. Sophia, however, which Justinian began to build in Constantinople in the year 532, was not the first church of that name in the city; it was a reconstruction of an earlier church built by Constantine the Great under this title which was burnt, together with others, in the rebellion called Νίκη against Justinian in the early part of that century. But the restored church, like many restorations of the present day, was nothing like its predecessor. Of this we have the most convincing proof in two different accounts of the building written soon after its completion by two persons who were both of them eye-witnesses of its construction, the one being Procopius, the historian and panegyrist of Justinian, who wrote the history of his wars, his acts, and his buildings; and the other being an anonymous author, who, in all probability, had been employed in some capacity in the building itself,—the one is the description of an amateur, the other that of an architect; both, however, coincide in describing the building as unique, and unlike anything that had previously been constructed. The amateur describes the unusual character of this new and wonderful building in terms which, whilst they graphically portray the general effect of its novel and striking features on his senses and imagination, leave no room to doubt that the building which he thus saw and thus described was the actual building which still exists at Constantinople. The other writer, on the other hand, occupies himself with all the detail of the structure; he records the preparation and the arrival of the material, the purchase of the necessary site, and the contrivances and expedients that were resorted to for persuading or compelling unwilling sellers to cede their land and houses,—he even gives their names and callings; he deals with the practical difficulties of the construction,—the composition of the mortar, the working and preparation of the stone, the failures of the work, and the remedies provided, with all the technical knowledge of a professional man. Altogether, these two documents are, I think, without any exception, the most interesting records of the construction and completion of a building, by contemporaneous writers, that it was ever my fortune to examine; and when we reflect that they are the descriptions of one of the most remarkable and original buildings that the world ever produced, our interest in them becomes redoubled.

The question will naturally occur to many, how is it that two such important pieces of documentary evidence have not yet been published, and taken their place amongst the current architectural literature of the day? To this I have to reply, first, that the language in which they are written is that of the low Greek of the later empire, and that one of them, the professional account, is so full of technical terms as to render it almost untranslatable. The only person, I believe, who ever attempted to translate it into a modern language,—and there was no fitter person,—was Professor Willis, and he, I know, abandoned the attempt. At all events, I do not know of the existence of any translation of these works, except the Latin translation which accompanies the only copy of them that I have ever seen or heard of; and this Latin translation gives all the technical terms, precisely in the words in which it finds them in the original Greek, without attempting to Latinise them.

In the next place I have not been able to find, or to hear of any but one copy of the last-named of these two accounts, although I have inquired and made diligent search for it in most of the public libraries of the Continent and in England. I do not doubt, however, that it must exist in some of the many works printed in the last century, which contain collections of such documents, and could be found, if one knew where to look for it, either in the British Museum or elsewhere. On the only copy to which I have access, I have long been at work, not hitherto with much industry or great success, but I hope, if my life be spared long enough, to complete, with such help as I can get, an English translation of this technical description of the construction of St. Sophia.

I refer to these documents now, however, for the purpose of establishing the fact, or rather a strong presumption of the fact, that St. Sophia's at Constantinople, was the first building, sacred or secular, which exhibited the Mediæval dome, as distinguished from all previously-constructed domes, resting as it does, not upon a circular wall, or hollow cylinder, but on the summit of four arches springing from solid square piers. The internal evidence in support of this conclusion, which is afforded by the account of Procopius, to which I have already referred, is so strong that I will venture to read to you that part of my translation which refers to it. He commences with a general eulogium of the building, and says that had any Christian seen the design of the new building whilst the old one stood, he would have wished the latter destroyed in order to see it reconstructed in its present form. He then goes on to say:—

"The Emperor then, no regard being had to cost,* devoted himself to the building, and collected all kinds of materials and workmen from every part of the world. Anthemius of Tralles, being the most skilful person in the science of mechanics,† not only of those of his own time, but of those who lived in a much earlier age, seconded the Emperor's zeal, designing the works for the artisans, and preparing the models of the future building.‡ With him was associated another mechanician named Isidorus, a Milesian by birth, a man of general intelligence, and one well suited to the purposes of the Emperor Justinian. And herein was the distinctive favour of God towards the Emperor apparent, in having previously provided for him agents who should be most serviceable to him in the execution of the work. Nor is the prudence of the Emperor the less to be admired, namely, in his having selected for matters of the greatest moment the men who, of all others, were the best fitted for their task.

The church accordingly presents (he continues) a spectacle of the greatest beauty; to those who behold it, indeed, wonderful; but to those who hear of it, altogether incredible. For, raising its summit towards heaven, and riding as a ship at anchor above the other buildings, it towers over the whole city; adorning the latter not only as one of her own buildings, but as rising out of her, and presenting an eminence from which the whole city may be seen, as in a mirror, at a single glance. Its breadth and its length are so suitably adjusted that, although very long and exceedingly broad, it will, nevertheless, not be found to be out of proportion. It is, indeed, pre-eminent for its indescribable beauty, for it is alike remarkable in both its majestic size and the harmony of its admeasurement; there is nothing either superfluous or deficient about it. It is wonderfully replete with light and the splendour of the sun; you would say that the place was not lighted from without by the sun, but that the effulgence arose from within, such is the abundance of light that is poured around this temple."

We must remember that the whole of the dome, and, indeed, all the vaults, were covered by Justinian with inlaid gold, and that the light that was admitted through the thirty-six windows that pierced the lower part of the dome, reflected from this golden surface, would no doubt produce that amount of effulgence and the very effect that is here described.

He then goes on to describe more particularly the design, and I must beg you,—bearing in mind that this is the description of an amateur and not of an architect,—to follow this description on the plan which is behind me, and which presents the nearest approach, so far as I am able to form an opinion, of the Church of St. Sophia as it existed when completed by the architects, Anthemius of Tralles, and Isidorus of Miletus; it is taken from one prepared by M. Texier, which is in the library of the Royal Institute of British Architects, and has been compared with those given by Salzenberg and others, all parts having been struck out that appear to belong to a later date; it is drawn, as all the plans that are shown on the walls here to-night are drawn, to the scale of 3 ft. to the inch; the elevations and sections being to the scale of 1 ft. 6 in. to the inch; and it is one of the advantages of a meeting like the present, and of a room such as the one in which we are assembled, that the true relative proportions of different buildings can be exhibited and understood at a glance,—all being drawn to the same scale,—without any fear of exceeding the limits of the space available for the purpose. With such an object and for such an occasion, with an intelligent audience of technical men met together for purposes of mutual study, the necessary inducement is, moreover, offered for the sacrifice of the time and trouble which is necessary in the preparation of diagrams of such large dimensions. This plan of St. Sophia has been kindly prepared for me by Mr. Quilter; and is drawn, like all the others in this room, to the scale of 3 ft. to the inch on twenty-two sheets of imperial cartridge, 2 ft. 6 in. by 1 ft. 10 in.

Procopius, then, thus proceeds to describe this building in language which I have ventured to translate in the following manner. You must imagine yourselves, in following him, to be placed in the inside of the building; he commences with the east end:—

"Now the front of the temple, which faces the east, where the sacred rites to God are performed, is constructed in the following manner: the building rises from the ground, not erected in a straight line, but being by degrees contracted from the sides and receding in the middle* in the form that those skilled in such matters call a semi-cylinder;† this portion of the work rises to an abrupt height and terminates in the fourth part of a sphere." (It is impossible that a more accurate and concise description of the eastern apse, covered with its concha or semi-dome, as it exists in St. Sophia at the present day, and as shown on this plan, could be given by one ignorant of the proper technical terms in which to describe it.) "And, above, on the parts adjoining this portion of the building, is raised a certain structure of a crescental form,‡ which excites astonishment on account of its exceeding beauty, but fear on account of the apparent insecurity of its construction; for it does not appear to rest upon any solid support, but to be suspended aloft to the peril of those who happen to be there. Nevertheless, it is, on the contrary, based upon a safe foundation." (The larger apse, with its semi-dome of crescental form, abutting against the eastern crossing arch.) "On each side of the above buildings, and on the floor, are columns disposed, not in a straight line, but assembled so as to turn towards one another in the form of a semicircle, and above these again is suspended a crescent-shaped structure."

Having thus described the eastern portion of the church, he turns to the west:—"On the side over against the eastern side rises the wall in which are the entrances, and on each stand columns arranged in a semicircle, and supporting a structure altogether similar to that already described."

He next describes the central portion:—"In the middle of the temple are fixed four masses, made by the hand, which are called piers, two on the north side and two on the south side, opposite and equal to one another, having, moreover, between them four columns on each side. These piers are constructed of very large stones, carefully selected and skilfully fitted together by stonemasons. They rise to a great height, and appear to the beholder to be abrupt rocks.

"Upon these piers rest four arches forming four sides, the summits of which, descending together upon the tops of the piers, are fixed there. Each arch thus adjoins its neighbour, the rest of the building rising to an abrupt height.

* ἀφρόντισας χρημάτων ἁπάντων.
† ἐπι σοφίᾳ τῇ καλυμένῃ μηχανικῇ λογιώτατος.
‡ τοῖς τεκταινομένοις τὰ ἔργα ῥυθμίζων, τῶν τε γενησομένων προδιασκευάζων τα ἰνδάλματα.

* ἐκ τῶν πλαγίων ὑπεσταλμένη καταβραχὺ, καὶ κατὰ τὰ μέσα ὑποχωροῦσα.
† ἡμικύλινδρον. ‡ μηνοειδές τι.

Of these arches two are erected in open space those, namely, which are on the east and west sides, the rest have a wall below them and small columns. Upon the arches is raised a building of circular form, on which at daybreak the sun first shines. It surpasses, in my belief, everything in the whole world. It is important, however," he says, "that in describing this part of the building I should be neither verbose nor obscure. The four arches being united upon the four sides of a square, the intermediate spaces consist of four triangles, and the boundary-line of each of these triangles is formed by the approach of the arches to one another, coming down to a sharp angle below, but expanding as it rises upwards, until it finishes above in a circular line, which bounds the triangle on this side, and forms the other angles there."

It is impossible to conceive or to write a simpler or a truer description of the Byzantine pendentive than that which is contained in the few lines I have just read; and had I told you that it was written by Mr. Penrose in description of the numerous examples that we saw last year in La Charente, instead of by Procopius, the historian of Justinian, in the middle of the sixth century, it would have caused no surprise to those friends who took part in that excursion, but would have been accepted by them as a very faithful and scholarlike description of a peculiar feature,—the pendentive,—that was constantly before their eyes in the course of that tour.

"And upon this circular wall rises an immense spherical dome,* which presents an admirable appearance, for it does not appear to rest upon a firm structure, in consequence of the lightness of the work, but rather to hang by a golden chain from heaven, and thus to cover the place.

I have only a few words to add to my quotation, descriptive of the perplexed state of mind in which this novel kind of building left this astonished observer when he had completed his examination of it.

"Now, all these things, thus adapted to one another in a marvellous manner to this height, some being carried by others, and deriving their support only from those parts which are nearest them, form a harmonious whole† of perfectly unique character (?).‡ Nor do they permit the eye of the beholder to dwell upon any particular object too long; but each in turn attracts and easily fixes attention upon itself; the sight is thus kept in perpetual motion, and the spectator is entirely unable to determine which object of all that he sees pleases him most; but looking about him on all sides, his mind intent, and his eyebrows contracted, he is unable to comprehend the nature of the work, but goes away, wondering at his inability to understand the sight. These things then are so."

He then goes on to describe the other parts of the building. But the extract I have read establishes, I think, two points very clearly; first, that the building Procopius describes is that of which this diagram is the ground-plan; and secondly, that this was the first building of its kind that existed when he wrote. The plan of the Church of St. Sophia, at Constantinople, thus became the typical plan of the Greek Church, and remained so throughout the whole of the Mediæval Periods up to the present day; just as the Basilican plan of old St. Peter's at Rome remained and still remains that of the Latin Church, also up to the present day,—the very last example of that Eastern typical plan, of which it is a very becoming and faithful transcript, being a design which is on the walls of the Academy this year, for a Greek Church to be built at Notting-hill by Mr. John Oldrid Scott.

Modern Byzantine churches of a more extravagant and pretentious character, but based on the same typical design, have been constructed also at Paris and at Geneva.

Now, I do not propose on the present occasion to carry this matter further, or to trace the course of Byzantine architecture from the time of Justinian downwards; although I may attempt to do this at some future time, or, in any case, with the help of the *incertus auctor*, to whom I have referred, to give some account of the actual rebuilding of St. Sophia; of the difficulties that were met with in its construction; of the manner in which they were overcome; and of the successful completion and decoration of the whole work. Any one who wishes, however, to enter into this interesting question, and to work out for himself the history of Byzantine architecture, will find great assistance in his inquiries from the following works that have been published on the subject:—First, the work of Mons. Salzenberg, on "The Early Christian Monuments of Constantinople," which was very ably epitomised and reviewed by Mr. C. C. Nelson, in the Transactions of the Royal Institute of British Architects," in 1855. Next, the admirable work of M. Charles Texier on "Byzantine architecture," edited and given to the world by his friend and collaborateur, Mr. Popplewell Pullan. Thirdly, an interesting volume of M. Couchaud, on "The Churches of Greece." And last, though not least, the marvellously interesting work of Signor Fossati, the architect employed by the late Sultan Medjid in the restoration of St. Sophia, containing perspective views of every part of the building, inside and outside, in coloured lithography.

Before, however, we quit the East in order to observe the first appearance of this Byzantine strain in the churches of the West, let me once more call your attention to the chief characteristic feature in St. Sophia, the one, in fact, which ruled and determined the plan not only of St. Sophia, but of all those Eastern churches of which we have any knowledge,—I mean the large central dome or cupola, balanced on the top of four circular arches, which rested again on four enormous square piers. This vast hemisphere, 107 ft. in diameter, is the predominant idea of the design, to which all the other parts of the plan are subordinate. It rises out of and above them; it is round this great central dome-covered space that the other parts of the building are grouped so as to form in plan pretty nearly the figure of a square; it is in reality a parallelogram of which the length from east to west is somewhat greater than that from north to south. And this is, in fact, the plan of almost all the Eastern churches built after the construction of St. Sophia.

Now, if we contrast this plan with that of the great original Basilican churches of St. Peter, St. John Lateran, St. Mary Maggiore, and St. Paul's without the walls, with their elongated naves, and long range of columns and arches in double rows on each side, and their flat wooden roofs, we shall be struck with the great difference that existed in Christendom between the type of the early architecture of the church of the East and that of the West.

During the next 500 years of the Christian Era we find few traces of the influence of Byzantine art in the churches of the West. At Ravenna we have, it is true, several churches, the ornamentation of which is of Byzantine character, but with one exception their plans are those of the Latin church: and that exception, San Vitale, although covered with a dome of very singular construction, is of octagonal form, and not therefore in accordance with that of the Greek Church. It is not, indeed, until the close of the first thousand years of the Christian Era that we meet with a church in Western Christendom the design of which reminds us of the plan of St. Sophia and of these early buildings of the Eastern Church.

In the Church of St. Mark, at Venice, we recognise at a glance the same great typical feature which distinguishes St. Sophia's, namely, the large central dome carried by four circular arches resting on four square piers. We see not only that, but four additional domes of nearly equal size and weight grouped round the central dome; and we thus see realised in the plan of a Western church, for the first time, so far as I know, the true form of the Greek cross, consisting of four limbs or arms of equal length, height, dimensions, and importance, differing in this respect from all Eastern churches with which I am acquainted.

St. Mark's has been so materially changed by work of later date, inside and outside, that we cannot form a correct idea of its primitive appearance or of the ornamentation with which it was clothed; but we have no difficulty in determining the primitive ground-plan, and of stripping it of all additional work of later date. The diagram behind me presents that ground-plan in what I believe to be its original condition.

It is obvious that we have here the same great principle of construction that characterises St. Sophia. It is true that whereas the central dome of St. Sophia is 107 ft. in diameter, that of St. Mark is only 41 ft., but to make up in some sort for this, we have the four other great domes of the nave, transepts, and choir, altogether giving a total domical surface nearly twice as great as that of St. Sophia

The 160 drawings on the walls are the enlarged diagrams of the same number of sketches, selected by me from the total number of 662 drawings that were made by the twenty working men of the party who accompanied me to La Charente. They are typical examples of the architecture of the department, which, I may explain, very nearly corresponds in its limits with the ancient province of "Angoumois." The department contains upwards of 500 churches, of which no less than 432 owe their chief character, if not their origin, to the church builders of the twelfth century; there are some few of probably earlier date, but very few that show any later date. Church building, in fact, seems to have been begun and to have been carried on in Angoumois during that century with a fervour and in a manner to which there are few parallels in Christendom, but which completely died out there at the close of that century.

We find, as we might expect, the repetition of the same main features throughout the whole of these churches, marked, however, by a distinctive orginality of treatment, according as the church was a large or a small one,—a cathedral, a conventual, or a parish church,—which renders their study one of peculiar interest.

To attempt to give a detailed account of each of the churches that we visited during this excursion of fourteen days, within the limit of time that is at our disposal this evening, is quite out of the question. What I therefore propose to do is, first, to point out the chief characteristics of this remarkable phase of the architecture of Europe of the Transitional period, and afterwards to pass rapidly in review the drawings on the walls that best illustrate these chief points of interest, indicating, at the same time, the most remarkable of the buildings that we visited.

The first feature to be noticed is the dome; its existence over the central portion of the church or crossing, where the church was a cross church, is almost invariable; but its extensive use as a covering for the several compartments of the nave, where it occurs as a substitute for the Romanesque barrel vault of the middle and South of France, and for the quadripartite vault of the north, is much more remarkable. That it was an importation from the neighbouring province of Perigord there is little doubt. It does not appear, however, to have been thus used before the commencement of the twelfth century. In some few of the earlier examples its section is semicircular, and its form that of a hemisphere; but in by far the greater number its section shows the pointed form. With the exception of this modification it remained unaltered from its first introduction to its final disappearance at the close of the century; nor was its use extended beyond the limits of these western provinces, or turned there to any other account than has already been noticed; it was found, in fact, entirely unsuited to the new ideas in art that then began to prevail; its finite form had nothing in common with the aspiring features and vertical tendencies of Gothic work.

The experiment had been tried and had failed. The appearance, however, of this Eastern feature in buildings which, in all other respects, are thoroughly Western in character, has a singular and striking effect to those who see the interior of an Angoumois church for the first time. As regards the exterior, it does not appear that these domes were ever visible outside. They were covered with a timber roof, which stopped against the west gable, on which its traces, wherever the gable has not been destroyed, are always visible. There are numerous illustrations on the walls of these series of domical vaults over the nave which I shall point out by and by. Before, however, I leave this feature, I must explain that its employment as a covering of the crossing in this Department appears to be earlier than its use as a vault to the nave. Moreover, in the nave the spandrel between the arches and the dome is filled with a pendentive, whilst over the crossing we often find this space filled with a squinch, which appears in this country to be the earlier form of the two.

The next feature to be considered, one that is in immediate connexion with the last, and one that constitutes one of the leading characteristics of the architecture of the district, is the manner in which these central domes were covered, for of course it would never have entered into the heads of these Mediæval artists to leave this plain hemisphere to remain exposed in its crude nakedness, looking like a baker's oven in the North of England, or like a close kiln in the South of France. They covered

* Θολός is the word used here τρουλὸς by the Auctor Incertus.

† Μίαν ἁρμονίαν. ‡ Ἐκπρεπεστάτην.

it in a seemly manner with a central tower, crowned, usually, with a conical spire of remarkable character; and, although by far the greater number of these towers are destroyed, a sufficient number of them remain to enable us to judge of their general character and effect. One of the best examples of which drawings are exhibited is that of the tower and spire of Trois Palis, the low conical spire of which consists of a series of stones resembling scales, somewhat difficult to describe. Another characteristic of this country is the manner in which the west fronts were designed. The chief ornamentation of the exterior was lavished upon them; they were usually divided into three compartments vertically, and into four or more horizontally, including the gable. The ground story generally shows three large arches, the central one containing the principal doorway. The second story usually carries an arcade of many small arches, the whole of the capitals of the small shafts being richly ornamented with figures and foliage. But there is one feature that is often met with in these west fronts that gives them a meaning, a significance, and an importance that add immensely to the interest with which we regard them as works of art. It has often been remarked that in several of the west fronts of this district is to be seen the figure of a knight on horseback, with accessories about it of a peculiar kind. The existence of this feature in the churches of Chateauneuf, Ruffec, Aubeterre, and Civray has often been noticed, and variously explained; it remained for the Abbé Michon, who has published a very interesting account of the churches of this country, to assign to this feature its full significance. He asserts that this effigy represents the knight or baron who founded or constructed the church, and he finds in the prostrate figure before his horse's feet at Chateauneuf the symbols of his feudality, and in the standing female before his horse's head the representation of his wife. I have no doubt whatever that this interpretation is the right one; but I am prepared to carry the proof that these west fronts,—the last works of the completed church,—had this monumental character; for where this effigy is wanting we have other proof that this was their true designation. We have, for example, at Chalais, the representation of a half-opened tomb, with female mourners in front of it,—a probable indication that the burial of the founder, who may have died before the church was finished, is thereby indicated; and at St. Arnaud we have, as I believe, the actual sepulchre of the founder himself, inserted, after its completion, in the west wall of the church, under the left-hand arch of the ground story, with an ornamental arcade on its front; we have also at Villognon and at Montbronn monumental slabs, in the former case existing in the west, and in the latter case removed to the wall of the south transept, when the west front was restored in later times; and at Chillac a monumental coped slab, resting on the seat of the left-hand arch of the ground story. Regarding, then, these west fronts as the last work and the memorial of the founder of the church, we have no difficulty in accounting for their ornamental treatment and their pretentious character, and can readily understand the clerical wisdom which induced those who controlled the execution of these works to prescribe that the memorial of the benefactor who constructed the church should find its place in the part of the building which was the last to be constructed.

But perhaps the most remarkable characteristic of the architecture of this province is the extraordinary richness of its ornamentation. This ornamentation is of two kinds, that which represents figures of men, animals, and birds, and figures of a mixture of all three; and that which represents foliage. The former is altogether more or less of a barbaresque, the latter of an extremely rich and pure character. It is, of course, not difficult to imagine and to attribute meaning of a deeper interest than meets the eye at a first glance at these "*chapiteaux histories*," as the French call them; but I confess that I do not think it is at all necessary to search the Scriptures for the interpretaion of the scenes we find sculptured in these works. They seem to me to be the natural representations of the scenes of ordinary life with which the inhabitants of those countries were at that time generally occupied: scenes of battle and strife, scenes of the chase, and struggles with the beasts and animals with which the country abounded. Here and there an allusion to some Biblical text may be detected, but they are rare cases. Mr. Sharpe concluded by rapidly passing in review a few of the chief buildings represented in the magnificent series of drawings on the walls, and expressed his great obligations to many gentlemen who had given up much time and labour to produce them.

Mr. Sharpe interpolated with his paper some supplementary comments, in the course of which he combated the notion that the pendentive was an abstruse or mysterious piece of construction. He coincided with the view of the late Mr. J. W. Papworth when he said that there was very little thrust on a dome unless it was loaded; indeed, a dome was very nearly self-supporting. But there was very considerable lateral thrust on the arches which supported the dome, and this had to be provided for. Even so great an authority as Sir Gilbert Scott had theorised about the dome, and had stated that the four pendentives were merely four segments of a larger dome; but this was the result of accident, and not of design. In reference to St. Front at Perigueux, which was almost a copy of St. Mark's at Venice, and was one of the earliest Byzantine domical buildings in France, Mr. Sharpe referred with regret to the fact that it had been "restored," the full significance of which term was not realised by Englishmen, loudly as English restorations were sometimes condemned. A French restoration frequently meant what had been done at St. Front, which had been absolutely pulled down and rebuilt, professedly in the same style, and no doubt with a greater or less degree of approximation to the original composition. The droll irony of the situation was that although in France no buildings were eligible for "restoration" until they were old and interesting enough to be classed as "*monuments historiques*," the very process of "restoration" destroyed their history, and robbed them of all their interest. In reference to the two hundred drawings on the walls, Mr. Sharpe said that they had been enlarged from the same number of sketches selected by him from the 662 drawings, large and small, made by the excursionists. The whole of these drawings were the result of only fourteen days' work of from fourteen to sixteen gentlemen, although the preparation of the enlarged diagrams for the lecture had occupied a period of nine months. The ground-plans of the buildings visited had been made by Messrs. Quilter, Paice, and Hayes; Mr. Kersey had groped amongst the roofs and taken the measurements, which had been chronicled and delineated by Mr. Garrett. The west fronts were the work of Mr. Arthur Hill. Mr. Waddington's pen-and-ink sketches were as remarkable for their excellence as for the rapidity of their execution. Mr. Penrose had made some graphic pencil sketches, while Mr. Spiers had made a beautiful series of water-colour drawings of the buildings visited. Mr. Burges some time ago described the Association's excursion as a "scramble"; Mr. Sharpe only wished that such "scrambles" could become more general amongst young architects.

Professor Donaldson, in moving a vote of thanks to Mr. Sharpe, said that in his interesting account of the Church of St. Sophia, at Constantinople, he had given the poetry of Procopius, but not the prose, inasmuch as he had omitted to state that the dome fell three times. In fact, the present dome really consisted of two domes struck from different centres. The love with which Mr. Sharpe pursued his studies in architecture was only equalled by his public-spirited desire to further the welfare of young architects.

Mr. F. C. Penrose, in seconding the motion, bore testimony to the fact that the success of the Association's annual excursions was mainly due to the untiring energy, admirable foresight, and good management of Mr. Sharpe. He (Mr. Penrose) coincided in the expression of regret that by the so-called method of "restoration" in vogue in France pages of history were continually being lost which could never be replaced.

Mr. Phené Spiers, in supporting the motion, expressed the opinion that the dome of St. Sophia's was a purely Classic dome, and was not the same as the Mediæval dome.

Mr. Roger Smith also supported the vote of thanks, remarking that Mr. Sharpe had in some sense, but in a different sphere, filled the void occasioned by the death of the late Professor Willis. The systematic manner in which he grouped his illustrations for purposes of comparison was a point well worth noting and remembering by others.

The motion having been put to the meeting and enthusiastically carried,

Mr. Sharpe, in reply, expressed his acknowledgment of the kind manner in which his efforts had been referred to by Professor Donaldson, Mr. Penrose, and Mr. Roger Smith,—all of them gentlemen whose commendation was exceedingly valuable. He thought that Mr. Spiers had slightly misunderstood him, for a dome was a dome, and was neither distinctively Classical nor distinctively Mediæval.

The meeting then broke up.

GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

BY MR. J. HONEYMAN.*

THAT I may fully utilise the time at my disposal, I shall, without preliminary remarks, plunge at once into my subject. My object is to show, first, that it is expedient that the regulations affecting buildings in all parts of the kingdom should be assimilated and made the subject of one Act of general application; and, secondly, to indicate the proper scope of such a measure. It will be convenient still further to subdivide my subject thus:—Under the first division I shall show (1) that the existing state of matters is unsatisfactory; and (2) that the defective and unsatisfactory character of the present system can only be remedied by the operation of a general Act; and under the second main division I shall direct your attention (1) to the class of subjects which alone should be dealt with in a Building Act; and (2) to the machinery by which its provisions should be enforced.

First, then, as to the existing state of matters: I shall only devote a few sentences to this part of my subject, and, indeed, I refer to it chiefly for the benefit of our metropolitan brethren who are in a great measure exempt from evils which afflict us less fortunate provincials. The special feature of legislation affecting buildings as it stands is this: that every borough throughout the country is allowed to devise its own bye-laws. Most of the large cities have done so, as well as innumerable insignificant boroughs, and their various local codes have received the sanction of the State, either in accordance with the provisions of the Public Health Acts or by special Acts of Parliament. Now this diversity of laws regarding matters which must ever be essentially the same in all parts of the country is obviously a mistake, and cannot fail to be a source of inconvenience. Moreover, where special Acts are obtained, an additional element of mischief is introduced; because in such cases corporations invariably reserve power to make bye-laws for themselves, and the community may be subjected not merely to bad laws, but to still worse and more harassing, because variable, bye-laws.

Addressing such an audience, I need not pause to illustrate this, but hasten on to show—secondly—what perhaps may not be quite so obvious, that relief from these and other evils of the present system must be sought in the operation of a well-devised general Building Act.

A variety of considerations have of late forced this conviction upon me, especially this, that there seems to be in the minds of civic rulers a sort of unaccountable, but distinctly pronounced, jealousy of the outside public, and a disinclination to be guided by, or even to listen to, any professional men, except their own officials, which makes it hopeless to expect that any local Act shall embody the collective wisdom even of the locality for which it is intended, much less that of the country. Now, in most cases, the collective wisdom of the Town Council and their architect is wholly inadequate, and the only way to concentrate the intelligence of those best qualified to deal with the subject, whether lay or professional, is to give the measure a central character. In this endeavour past experience would hardly warrant us to expect much encouragement or assistance from provincial authorities. The initiative must certainly be taken by others, and by none can this be done with more hope of ultimate success than by the architectural profession throughout the country, through the instrumentality of the Institute.

The failure of corporations in dealing with the subject in times past is manifest; and it is worthy of remark that whereas the London Building Act, which is the oldest, is still the best, the most recent attempts at legislation seem to be the worst. Nor is the reason of this

* Read at the General Conference of Architects, as already mentioned. See p. 607, *ante* for discussion which followed.

far to seek: in framing the Metropolitan Building Act the highest professional talent was called into requisition, and the experiences gathered from many previous attempts at legislation were utilised; but in framing local bye-laws the highest talent is apparently not desired, and is, in point of fact, unattainable. As a rule the only advice a corporation will consent to take is that of their own paid official, whose interests must be more or less affected by any legislation, and who, therefore, cannot be an entirely suitable adviser, even if he approach the subject free from those prejudices which in course of time naturally spring up in the comparatively isolated sphere of official duty. Let it not be imagined that I wish to throw discredit on borough surveyors, or in any way to imply that those in the large cities of the kingdom at least are not men of ability and integrity. I have the highest respect for those I know, have experienced much courtesy and consideration from those with whom I come most in contact, and bear ill-will to none. My object is simply to bring out clearly their comparative insufficiency as advisers in a case of this kind. However disinterested, however able, they comprise after all but a fraction of the profession, and "in the multitude of counsellors there is wisdom." Let us then endeavour to bring the wisdom of the many to bear on the subject, and unite in obtaining for the general good a wise and moderate measure.

I can hardly pass on to the second division of my subject without, in justification of my strictures on local legislation, making at least a very hurried reference to some of its recent results. Let us, for example, glance at some of the bye-laws newly promulgated by the Corporation of Birmingham. By these it is enacted that the builder must furnish not merely "detail plans and sections" showing the position and form of everything, and therefore, I presume, elevations, but also a copy of the specification, which with the plans "shall be retained by and belong to the Council." Again, "the borough surveyor shall determine the position, thickness, and situation" (*sic*) of division walls to prevent the spread of fire, and whether a new building requires such division or not. He shall also determine when a building must have a layer of concrete or other hard material, "of such thickness as he shall prescribe, spread underneath the floor-line." He shall determine the height of chimneys, their dimensions, and the materials to be used in their construction; also how drains are to be ventilated and how trapped. He must also design the means of egress and ventilation for every building "intended or adapted" for the reception of more than 200 persons. He is also, among other things too numerous to recapitulate, to approve of the plans and specifications of the urinals which every public-house keeper is required to erect, and he is to use his discretion in regard to a great many other things. Now, in view of such provisions as these, it must naturally occur to a stranger to ask if there are any architects in Birmingham at all? We know that there are able men in Birmingham; but apparently the Corporation and their advisers have thoroughly satisfied themselves that their architects are such a set of imbeciles as to be utterly unfit to be trusted with the most ordinary details of their professional work.

Of course it must not be forgotten that in all large towns the greater portion of the dwelling-houses are erected by speculative builders, without the aid or supervision of architects, and it is probably the necessity of dealing with such cases effectively which leads the authorities to seek somewhat arbitrary powers; but it is, I conceive, quite possible to define clearly what is required, and highly inexpedient to leave much to the discretion of officials, or practically to supply speculative or disreputable builders with architects at the public expense.

But both the laws and the administration of them are at present utterly inefficient; and even when corporations have it all their own way, they seem, with their present staff of officials, to be incompetent to exercise the power they possess. I shall just offer one illustration of this. In the important town of Greenock, which is blessed with a dean of guild court, a master of works, and bye-laws of its own devising, prescribing, among other things, the lodging of very complete working plans, and their appropriation by the authorities, a building has just been completed in which every sound principle of arrangement and construction, so far as these bear on the safety of the lieges, seems by a most perverse ingenuity to have been set at defiance. The building is about 145 ft. long. The street-floor is occupied by shops, of which there are eleven, and three floors above these are occupied as dwelling-houses, the access to which is by galleries extending along the back wall. There are in all about thirty separate houses, and the only communication between the three upper floors and the street is by one confined stair ascending from a passage fully 100 ft. from one end of the building. The galleries are formed by simply allowing the joisting of each floor to pass through the back wall, and project to the required width; and to complete the picture, the whole area of ground behind is covered with buildings one story high, part being occupied as a hall, and the rest as saloons in connexion with the shops. The steps of the stair are stone; but they are actually supported and enclosed by lath-and-standard partitions. There may be some brick partitions in the building above the first floor,—I believe there is one; but I must say that, on the occasion of my visit, none of those I sounded were brick. Now let it be supposed that a fire occurs in the cabinet-maker's shop, which is about the centre of the building; if the stair stood long enough the families nearest it might possibly escape, but the case of half the families would be utterly hopeless. The first burst of flame would destroy the wooden galleries, all connexion with the only staircase would be cut off, and they could neither get down nor up. The latter consideration certainly is not of much consequence, as the front wall has no parapet, and the building is much higher than those adjoining at either end. On the other hand, if the fire happened to occur in the shop immediately below the wood-supported stairs, the cremation of those thirty families would be a matter of absolute certainty. The arrangement is monstrous, even if the staircase and galleries were fireproof; what shall we say of it as it is, or of those who, with the full details before them, can sanction such an erection?

Perhaps in this connexion I should allude to a bye-law to which municipal bodies seem to attach much importance,—I refer to the law by which they secure copies of all plans which they approve. I do so for the purpose of stating a few facts regarding its working, showing what a great and useless burden it is upon the community, and not because it is a special grievance to our profession. I am satisfied that if it could be shown to be of any practical utility we,—I shall certainly say for myself, *I*,—would not object to it. We have ourselves to blame if we are not properly remunerated for any extra work it causes us; and it is not as a professional man, but as a member of the community, that I protest against it. The law is simply indefensible, and besides necessitating a vast amount of useless labour and expense, it undoubtedly subjects many architects to gross injustice. In illustration of the first of these results the following facts may be interesting:—

In the city of Glasgow alone, excluding the suburbs entirely, in the course of the year ending September 1, 1875, 657 sets of drawings (besides plans of new streets), were made for and retained by the Corporation. Each set comprises block plan and working plans, elevations, and sections, with all dimensions figured complete; and assuming that on an average five sheets are sufficient for these, we have this pleasing result, that the community are annually saddled with the expense of preparing 3,285 sheets of carefully prepared architectural drawings for no earthly purpose of utility,—"rubbish heaps," in short,—where embryo city architects perchance may grope, and the mere custody of which entails an annually increasing expenditure.

But while, in large cities, there is not much likelihood of any unfair use being made of these drawings, the case, under the present system, is widely different in small boroughs. There the architect, who supplies a complete set of his working drawings, in terms of this bye-law, is entirely at the mercy of the borough surveyor; or the man who is variously styled surveyor, town architect, inspector, or master of works, who gets possession of the plans, and practically does what he likes with them,—a most disagreeable state of matters, and likely to give the surveyor a most unfair advantage over, it may be, a rival practitioner.

I must now refer to an objection to a general Act which will naturally occur. It may be thought that building regulations suitable for one part of the country could not very well be enforced in another without numerous modifications to suit peculiarities of local practice; but the force of this objection depends entirely upon the scope of the Act. The object of the legislation we desire, and the only excuse for it, is to secure in the interest of the community certain *desiderata* not necessarily affected by locality, but the attainment of which must be made paramount alike to local prejudice, ignorance, or indifference; and this leads me to the second division of my subject,—the consideration of what can and ought to be embraced in a general Building Act.

I. The distinctive character of every regulation which is admissible must be that it has reference to something which is absolutely necessary for the public safety in whatever way that may be affected by the concentration of men in large communities. Such regulations, it is obvious, should be as applicable, and as obligatory, in one part of the country as in another. Admittedly, it is no easy matter to determine what these are. It would be a hopeless task for any single individual to attempt to do so, and hence the peculiar fitness of such a meeting as this taking up the subject, and such definite proposals as I venture to make will, I trust, not merely incite others to criticise, but also to contribute towards the elucidation of what is best.

It may help to clear our way if I commence here by pointing out some things which ought not to be included in a general Act. In this category I place all regulations relating to the laying out of land for building purposes, the width of streets, the formation and maintenance of streets and sewers, the prevention or removal of nuisances, the prevention of overcrowding, and other analogous details of local management. These and all purely sanitary regulations not affected by construction must necessarily be excluded from a general Building Act, and be left in the hands of the different corporations or local authorities, rural or urban as the case may be, and their respective superintendents or masters of works, or sanitary inspectors, to be dealt with by special bye-laws as at present, under the provisions of the Public Health Act. In such matters uniformity of practice is neither possible nor desirable. For example, the corporation of Birmingham has decided that no street is to be less than 50 ft. wide, and no one outside of Birmingham has any cause to complain of this; but such a restriction in a general Building Act would be simply preposterous, because other boroughs may with equal authority fix upon 60 ft., or 40 ft., or 30 ft., as their minimum; and, in point of fact, the width of every street should be determined by accidental local circumstances; for instance, it should have a distinct relation to its aspect, as well as to its length, and a narrower street would be admissible in London than in Aberdeen.

I cannot, in the time allotted to me, illustrate this further, but trust it is unnecessary to do so. It must be evident to every one that in framing a general measure we cannot be too careful to steer clear of the quicksands which have proved so troublesome in the course of provincial municipal legislation—the accumulations of unnecessary details; the references to matters purely local, it may be temporary, expediency; restrictions of doubtful utility; and the ambiguity or latitude of interpretation which justifies officials in at one time approving and at another refusing to sanction the very same thing. Besides, it must never be forgotten that the less the building trade or any other trade is interfered with by a paternal Government the better. Undue interference discourages invention, diminishes proper responsibility and self-reliance, and is in every way inimical to those principles of sound political economy to the recognition and application of which our country owes its pre-eminence among the nations. We must therefore see to it that any new legislation on this subject is not of a reactionary or restrictive character, but rather that it is adapted to foster ingenuity and every beneficial innovation which our advancing science may suggest.

Keeping such limitations in view, I shall now attempt to sketch the outlines of a suitable measure; and here it will save time and make my treatment of this part of the subject intelligible if I say at the outset that I take the Metropolitan Building Act as the frame—the backbone of the new Act; and as you are all familiar with it, or at least may easily refer to it, I shall not recite the various sections which I approve of—that is, the great majority of them—nor such as I accept with very slight modifications. These must be held as read, and I shall thus be free to deal with additions and alterations only; and in the meantime I shall lay my proposals before you without note or comment.

1. A suitable title might be the Boroughs Building Act, or Boroughs General Building Act.

2. In any borough with a population of less than 6,000, the adoption of this Act should be optional, but the council would not be authorised to enforce any different regulations.

3. The limits of boroughs for the purposes of this Act should be extended; thus, in boroughs with less than 100,000 inhabitants, the limit would be extended to half a mile at all points beyond the borough boundary; and in boroughs with upwards of 100,000 inhabitants the limit would extend one mile beyond the borough boundary; while in certain exceptional cases, such as London, Manchester, Glasgow, and other cities of first importance, the area would extend still further, and be specially defined by the Act.

4. In all cases a block plan and block section, showing the relation of the proposed building to the street and to adjoining properties, and the relative positions and levels of the drains and sewer, should be lodged with and retained by the corporation. All other plans lodged and approved should be signed by the surveyor and returned.

5. No buildings should be exempt from the operation of the Act.

6. Sections C. to CIV. of the Local Management Act, relating to paving and draining of private courts, formation of vaults under streets, occupation of underground rooms, &c., should be incorporated in the new Act.

7. Sections CXXI. to CXXIII. of the same Act, regarding hoardings, should, with some alterations, be adopted.

8. Section CCIV. of the same Act, prohibiting the erection of buildings over sewers, &c., would also be useful.

9. It should be enacted that in certain circumstances when a building is to be erected on formed ground the entire area should be covered with asphalte, concrete, or some other impervious material.

10. Regulations for the construction of scaffolds, stands, and other temporary erections should be added.

11. The regulations affecting stone buildings must be amplified, to meet the requirements of localities where building with stone is the rule, and with brick the exception.

12. Before commencing any new work, building owners should, whether they intend to interfere with party structures or not, intimate to adjoining owners, by registered letter, their intention of building; and adjoining owners should have an opportunity of examining the plans of the proposed buildings in the office of the District Surveyor at any time during, say, four clear days after such intimation has been issued.

13. The twenty-seventh section of the present Act, limiting the size of buildings without a fireproof division to 216,000 cubic feet, should be modified, and the limit extended.

14. While regulations affecting iron structures must remain somewhat indefinite, it is highly desirable that a minimum of strength should be prescribed for iron pillars and girders carrying stone or brick walls.

The other modifications of the existing Act which I think desirable refer chiefly to the duties and emoluments of surveyors, and will be most conveniently stated in connexion with the second head of this division of my subject, namely,

II. The machinery by which the provisions of the Act should be enforced.

It is important that the committee or court charged with the administration of this Act should be purely an administrative, and in no respect a judicial, body. Their business would simply be to see, with the aid of competent surveyors, that the various requirements of the Act were honestly enforced. It would require no special qualification,—except the possession of an average amount of common sense,—for the exercise of such a function; and, believing the creation of an *imperium in imperio* to be inadvisable where it can possibly be avoided, I propose that no new authority should be created, but that the work should be left to vestries and district Boards in London, and to a special committee of the town council in each borough. These committees or Boards would receive periodical reports from their surveyors, as prescribed in Sections LII. and LIII. of the present Act, and present a full report of their proceedings to the town council or central authority annually. The staff of surveyors would really constitute the most important part of the machinery for giving effect to the Act, and care must be taken to prevent any but experienced, efficient men being eligible for these posts. With this view I suggest the following regulations:—The thirty-first and subsequent sections of the London Act, with reference to the qualifications and appointment of surveyors, would remain, with these two slight modifications—(1) no one should be eligible who had not served as an apprentice and draughtsman a certain number of years in an architect's office; and (2) for the convenience of candidates in different parts of the country there should be one or perhaps two centres for examination in Scotland, and probably four in different parts of England, besides London, where the examinations would remain in the hands of the Institute, with which the different local boards of examiners should co-operate. A further and radical change in the office of surveyor which I propose is this—that in all cases he should be bound to devote his whole time to the duties of his office, and should be strictly debarred from engaging in any other professional work. He should also receive a liberal salary from the Corporation, to whom all fees should be paid. It may not be easy for those who have been accustomed to the present arrangement in London and elsewhere to reconcile themselves to the idea of such a change, but it seems to me to be recommended by weighty reasons. Its most obvious immediate effect would be the resignation of a large number of the present surveyors. This, though in itself not desirable, is inevitable; and from this would follow the worst, probably the only bad effect of the change,—namely, that the community would thus lose the services of many gentlemen of ability and great experience who at present hold appointments as surveyors. This, however, would only be a temporary inconvenience, and would probably be more than counterbalanced ultimately by the uniformity of practice which would result from the special experience of the new class of surveyors, whose further qualifications and duties I shall now attempt to sketch.

The sixty-second section of the present Act prescribes that, "it shall not be lawful for the superintending architect to practise as an architect, or to follow any other occupation;" and this rule should apply to every officer appointed under the new Act. In point of fact, most of the new staff would be in the position of the "superintending architect" of the old Act, as there are only about a dozen cities where more than one surveyor would be required, and where the rule would extend to subordinates. The name, "surveyor" or "chief surveyor" as the case may be, should be retained in preference to "architect," to prevent confusion with another official who would still continue in the employment of many corporations, I mean the "city architect." There ought to be no such official, I may be allowed to observe in passing. The chief surveyor should be able to give the corporation any professional advice they require, and if they wish professional work they can, and ought, to get it done by regular practitioners.

But, to return. It must be borne in mind, while considering this point, that we are dealing with the provisions of an Act which shall be enforced in towns great and small in every part of the country. Now it will, I think, be at once conceded that certain safeguards against unfairness provided by the London Act, and in force here, would be, to all intents and purposes, impracticable in smaller communities.

It is essential that the impartiality of the surveyor should be as far as possible insured, and the best security for this is, that he should simply act as the guide and officer of the corporation within clearly-defined limits, receiving from it adequate remuneration for so doing. Another incidental advantage of this arrangement would be that, the surveyor not being in a position to make use of the plans submitted to him for his own purposes, architects would more readily give him every facility for studying their plans, and all necessary information regarding them; they would, in short, co-operate with the surveyor, greatly to the advantage of the public.

There is still another reason for the change which seems forcible to me—perhaps because I have not a special gift for organising—namely, this, that by the present system the most experienced surveyors are just the men who have least time to attend to the duties of their office, and the greatest temptation to neglect them; and surely that is a bad state of matters. Observe, I do not say that any of the district surveyors do neglect their official duties; I have no information on that point before me, but the fact remains as I have stated it. The better qualified a man is to act as surveyor by the acquisition of mature experience in general practice the less time he must certainly have for his duties, and the more must he depute these duties to subordinates. The value of large experience is unquestioned, but you will observe that the regulations I have already proposed insure the appointment of experienced men,—men at least who, even when they commenced their duties as surveyors, would probably possess the necessary qualifications for membership of the Institute. Now the great bulk of the surveyor's work prescribed by the Act could be performed by such men perfectly as well as by the most eminent member of the profession; they would receive suitable remuneration for the kind of work they were called upon to perform, and the eminent architect,—whose advice, of course, would always be available if required,—would be free to turn his wider experience to more profitable account.

But how would such a change affect the status of surveyors? Clearly thus: In a few exceptional cases, chiefly in the metropolis, the new surveyors would be inferior to those who at present hold the office; but in the great majority of cases throughout the country the status of surveyors would be vastly improved. To secure this, however, it is essential not merely that their qualifications and duties should be clearly defined, but also that their salaries should not be left entirely to the caprice of corporations. In no case should the salary be less than 500*l.* per annum, and chief surveyors should receive considerably more. To the ordinary municipal mind the idea of paying more than 500*l.* per annum to an inspector of buildings will seem ridiculous; but this is only another proof, if proof were needed, that the ordinary municipal mind is not competent to deal with the subject, and that the sooner the Imperial mind is brought to bear upon it the better. It seems, indeed, sufficiently difficult sometimes for corporations to comprehend any good reason for paying architects much more than labourers' wages, and we need not be surprised if they fail to discriminate between a district surveyor and a clerk of works or inspector of nuisances, who is probably overpaid at two guineas a week. Yet, in point of fact, there should be as wide a difference between these two classes of officials as there is between one of her Majesty's Inspectors of Schools and a School Board officer who looks after defaulting parents.

Obviously, 500*l.* would be too much for every petty borough to pay; but it is no more necessary that the work of a surveyor should be confined to one borough than that the work of an inspector of schools should be confined to the jurisdiction of one School Board. To each surveyor would be assigned a district, the fees from which should nearly, if not wholly, cover his salary and other incidental expenses. In some cases the district would be large, and embrace several boroughs; in others, it would be confined to one borough; and in others to a part of a borough. Let me offer one illustration taken from a district with which I am familiar. Glasgow, and the suburbs which would be connected with it for the purposes of this Act, would probably require four surveyors, and, without any additional burden on the community, we could afford to give each about 900*l.* per annum; but one surveyor would easily overtake all the work in Paisley, Johnstone, Renfrew, and Greenock,—perhaps I may say in every borough in Renfrewshire,—and the work would be better done and more cheaply than if each of these boroughs employed an inferior class of surveyor at a much lower salary. The distribution of surveyors, in short, would be determined by the requirements of the different districts, and precise information on that point could be easily obtained. By some such arrangement as this, the administration of the Act in every part of the country would be in the hands of thoroughly qualified independent men, who would command the respect and confidence both of the public and of their professional brethren.

Much more might be said on this important part of my subject, but time forbids. Doubtless much diversity of opinion must be expected in such a meeting as I now have the honour to address, but I trust this will not interfere with that patient and cordial co-operation so essential to the attainment of any valuable practical result.

Although I fear that I have already overtasked your patience, before resuming my seat I must allude, for a moment, to the gratifying circumstance that the subject which we have now been

considering has already engaged the attention of the Government. The Local Government Board appears to have arrived at the conclusion that it is not only possible to frame building regulations of general application, but that it is a thing which ought to be done. Through the very great courtesy of the president, Mr. Sclater-Booth, I have had an opportunity of perusing the draft of model building regulations at present under the consideration of the Board. These are incomplete, and fail to embrace many of the requirements to which I have referred, but so far as they go, with some trifling exceptions, they are admirable, and, let me say, especially admirable in this, that they are well defined and free from ambiguity; that most objectionable expression, "to the satisfaction of the borough surveyor," or "in such a manner as the borough surveyor may direct," does not once occur in them. I sincerely hope that the Local Government Board will persevere and carry on to completion the good work which it has so fairly commenced; and I may be allowed to say in conclusion that the evident desire of the heads of this important department to benefit by the collective wisdom of our profession is not the least hopeful augury for the ultimate result of their deliberations.

OPENING OF A NEW BOARD SCHOOL AT DEPTFORD.

ON Tuesday evening last the 120th new school built by the London School Board was opened in Regent-street, Deptford. This school is planted in a district teeming with the class variously designated "street arabs," "gutter children," and by Lord Sandon recently as "waetrels." The chair was taken by Sir Edmund Hay Currie, vice-president of the London School Board, whose opening address vindicated the policy and work of the Board.

The building is in the Queen Anne style, and was designed by Mr. Robson, architect to the Board, with Mr. J. Jackson as clerk of the works. The contract has been executed by Mr. B. E. Nightingale. The building has a frontage of 180 ft., the premises extending in width between Regent-street and Stanhope-street, in each of which streets there are separate entrances to the schools for boys, girls, and infants. Each of the principal schools is 60 ft. by 21 ft., the rooms for the infants and babies being on the ground-floor. In connexion with each of the three schools there are three rooms, 20 ft. by 19 ft. each, those on the ground-floor being appropriated, one as a babies' room, and two as infants' class-rooms. The boys' and girls' schools on the first-floor have each three class-rooms attached. There are also rooms provided for the head master and mistress.

The whole area, including the playgrounds, is 13,000 square feet, which is much less than the Board desired to provide. The schools are fitted with Elsley's patent window gearings, and with Boyd's ventilating stoves. The whole of the rooms are lofty, light, and airy. The cost has been 7,526*l.* 9s. 4d., or 9*l.* 0s. 11d. per head. Provision is made for 300 infants and babies, and 266 each of boys and girls. On the first day of opening there were 234 infants present, 130 girls, and 180 boys. Sir Edmund stated that while this was the one hundred and twentieth school opened, they had fifty more schools building, and twelve others under consideration. They had already made provision for 106,000 scholars, and were providing accommodation for 37,000 more, or 143,000 in all. When they commenced their operations there were 174,000 children attending school; at Christmas, 1875, the number was 288,497, or 114,000 more children attending school. Of these 35,000 had gone into voluntary schools and the balance to Board schools. There were sixty districts in London in which there were no Board schools, but the Board visitors were none the less doing good work in such districts. Respecting the incidence of the rate, he reminded his hearers that Greenwich, which was the largest division embraced by the London School Board, while it paid a twentieth, received a tenth,—the City of London and St. George's, Hanover-square, contributing largely for the erection of schools in Deptford, although they had not one single Board school of their own.

Southport Free Library and Art Gallery Competition. — Competitors are asked to allow their designs to be suspended for another week, as there has been unavoidable delay in obtaining builders' estimates of cost for the satisfaction of the committee.

DOINGS AT BRIGHTON.

The Aquarium.—Some additions and alterations to the Brighton Aquarium were opened on the 24th of June. Upon a piece of enclosed land below the Marine Parade, and to the east of the main building, has been erected a series of apartments which will afford greater facilities for carrying on the work of the aquarium, and above these a skating-rink, balcony, *café*, &c., have been constructed. The south-eastern corridor has been continued for a further length of 145 ft., and abutting on this additional length are several new apartments in modernised Gothic style. The new chess-room is 23 ft. square, the billiard or lecture room 59 ft. long by 22 ft. in width, and 15 ft. high; the smoking-room 23 ft. by 22 ft.; and there is also a room erected for performances of classical chamber music. The skating-rink has been constructed immediately above, and, with the new terraces, forms the roof of the new part of the building. It may be approached either through the terrace gardens or from the Madeira-road, and is distinct from the aquarium proper. The floor-space is some 150 ft. long by 50 ft. wide, and is laid with Claridge's patent asphalte. A light iron hand-rail runs round the parapet of the rink, lamp pillars and brackets being placed at intervals. Adjoining the rink are skate-rooms, lavatories, and a refreshment-bar, and an orchestral stand is in contemplation. In direct connexion with the aquarium is a balcony communicating with an elegant *café*. The balcony is 171 ft. in length, and about 15 ft. in width, projecting from the side of the cliff over the southern side of the rink. It is laid with encaustic tiles, and, being covered by a verandah, forms an agreeable promenade. A conservatory, which is not yet complete, is to be constructed at the east end of the balcony, and will be available for smoking and refreshment. The entrance to the *café* is from the balcony. This portion of the building is 55 ft. long, and the interior is decorated with plate glass, marble, gilding, and colouring in neutral tints relieved with black and gold. Messrs. Patching & Webber were the contractors.

School of Science and Art.—Sir Henry Cole, K.C.B., recently laid the foundation-stone of the new buildings for the School of Science and Art. The building is situated near the centre of the Grand Parade. A florid style of architecture has been chosen. When completed, the school will include an elementary art-room, 38 ft. by 32 ft.; an antique-room, 33 ft. by 22 ft.; painting-room, 22 ft. by 16 ft.; modelling-room, 20 ft. by 16 ft.; lecture-room, 31 ft. by 22 ft.; two science class-rooms, each 33 ft. by 16 ft.; also a laboratory, library, Board-room, professors' room, occasional class-rooms, master's room, and a ladies' room, as well as all the minor accommodation necessary. Mr. J. G. Gibbins is the architect, and Mr. G. R. Lockyer is the contractor. The cost will be between 8,000*l.* and 9,000*l.*

A People's Park.—Negotiations are in progress between the Mayor (Alderman H. Abbey) and the legal representatives of Mr. and Mrs. Benett-Stanford, for the acquisition by the Town Council of the piece of ground, about 40 acres in extent, in front of Preston-place, which for some time past has been the scene of the Polo Club's exploits, and the drill-ground of the local volunteer corps. The addition of such an open spot in continuation of the Steyne enclosures, St. Peter's Green, the Level, the grounds of Park-crescent, and situated in what will be in course of time the centre of the town, is viewed with great satisfaction.

Proposed Rebuilding of St. Mary's Church.—When, some short time since, it was decided to enlarge the chancel of this church, that was thought to be all that was necessary, and was, indeed, all that was necessary to meet the wants of the congregation; but an unfortunate accident which has occurred has raised so many misgivings as to the soundness of the structure that the advisability of pulling it down and rebuilding it has been seriously mooted. Messrs. E. Nash & Co., builders, of Hove, were selected to do the work of enlarging the chancel. A few evenings ago the old flat arch over the chancel was observed by the foreman in charge to be cracking. The workmen, who were engaged in erecting a portion of the walls of the new chancel, were at once called off, the arch almost immediately afterwards crumbling under the weight of the old pediment, and falling in. With it came the piers, a part of the old chancel which it was intended to leave, and a small portion of the northern end of the roof. The chancel piers stood until after the arch had fallen, when the pediment brought the upper part down. It would appear that the alterations had previously been effected to the chancel; and as the walls were found to be very roughly built with rubble work, Messrs. Nash did not pull them down so much as intended; but were, at the time of the occurence, engaged in building up the lower portion of the work of greater thickness to strengthen the piers. It is stated that, if rebuilt, the style will be Gothic instead of Classic, whether it be erected on the same site, or on that which adjoins it. It has been suggested that, instead of standing at right angles with St. James's-street, the new church should be rebuilt parallel with that thoroughfare.

Widening of the Preston-road.—Simultaneously with the formation of the grand Drive round the outskirts of the town, another great improvement (thanks to the liberality of Mr. Benett-Stanford, M.P.) is to be carried out, namely, the widening of the Preston-road, the plans for which (prepared by Mr. P. C. Lockwood, C.E., the borough surveyor) have received the sanction of the Brighton Town Council. That portion of the Preston-road which is to be widened is on the western side, at its northern extremity, just before entering the village from Brighton. It runs, in fact, from the grand old trees, once known as "the Shaw,"—beneath whose shade Brighton fashionable society in the early part of the century was wont to hold its picnics,—almost to the Black Lion (formerly the old toll-house), a distance of over 1,000 ft.

St. Luke's School Church.—St. Luke's School Church, situated at the corner of Islingwood-road and Park-road West, has been opened by the Bishop of Chichester. Mainly by the liberality of Miss Elliott and her family, and Miss Thompson, of West Hill Lodge, Brighton, who laid the foundation stone, sufficient subscriptions were gathered to justify the commencement of the work. This was done by Messrs. E. Nash & Co., contractors, of Hove, and by them was completed on the 25th March. Mr. W. White, of London, was the architect. A light building, in Early English style, whose interior measures 80 ft. long, 40 ft. broad, and 37 ft. to the ridge, and which can accommodate 450 persons, has been raised. One of Constantine's convoluted stoves has been procured to heat the building; a floor of blocks of wood on concrete, from which little or no noise arises when trod upon, has been laid, and rush-bottomed chairs and hassocks have been provided all over the church. In the brickwork over the porch is a carved emblem of St. Luke in stone.

BUILDING ASSOCIATIONS IN AMERICA.

AT a Conference of the American Social Science Association, held at the College of Physicians on the 1st ult., a discussion took place on "Building Associations," resulting in the adoption of a resolution commending this Philadelphia institution to other communities. The secretary, Mr. F. B. Sanborn, stated that he had sent queries to members of the Association in different cities as to the peculiarities of living in those places. From William F. Channing, of Providence, R. I., a paper was received describing the peculiar conditions affecting the homes of operatives in that State. Rhode Island is a hive of workshops, and has an unusually large proportion of skilled mechanics. Many of these live in houses containing two tenements. This style of building is a Rhode Island institution. The houses are generally two-storied wooden structures, built for the occupation of a family on each floor. These are considered as respectable socially as separate houses, and, practically, the families are entirely independent of each other. Rhode Island was founded on the idea of individual freedom, while in Massachusetts a rigid organisation characterised its early history. This difference in early training shows itself in the different modes of living. Providence is a city of 100,000 inhabitants, with almost every dwelling house by itself and surrounded by a garden. People consent to live in blocks in Massachusetts town, while the passion throughout Rhode Island is for isolated houses.

Mr. Oliver H. Stratton, of Louisville, reported that the first organised effort in that city to establish what are commonly known as building or homestead associations was begun in 1868, and there are now thirty-nine associations of the kind there.

From other cities reports were received showing that building associations had been established and were being operated on a substantial basis in all parts of the country.

Judge Pence remarked that in his experience of ten years upon the Bench he had known of but one case of peculation in all the societies existing in Philadelphia. This peculiarity, he thought, was wonderful. The judge was forcibly impressed with the perfect safety of these investments. He believed that the ownership of homes made all citizens interested in the public welfare, and made each one feel that a responsibility rested upon him in advancing the general prosperity.

Mr. Lorin Blodgett suggested that the discussion be directed toward inaugurating such associations in New York, where a great necessity existed.

Dr. Harris, of the Sanitary Department of New York, agreed entirely in this view, and conceded to Philadelphia remarkable facilities for commerce and remarkable advantages for the investment of capital, because there the highest skill of any city could be obtained. He said a conference of New York capitalists and representative working men, with prominent building association organisers of Philadelphia, was projected, and he offered as the sense of the conference the following resolutions, which were adopted :—

"That the development and results of the system of home building, or home ownership, by the working men of Philadelphia and Wilmington, commends to our fellow citizens and the promoters of social and economical improvements in the cities and large manufacturing towns the agencies by which the success and benefits of the system have been attained."

"That among the most essential agencies and influences of this system we recognise :—1. A simple method of offering adequate means and prudently guarded conditions for enabling working men and the wage classes to acquire ownership of their homes. 2. The operation of care and responsible concern for the co-operative, safe using, and control of the self-accumulating funds from which loans are offered for the purchase of homes. 3. Most important of all, agencies to promote the desire and efforts of working men's families to obtain and own their houses, we recognise that general diffusion of information of the methods and benefits of enjoying self-made homes and the ownership of them as real property."

"That in cities and villages no less than in rural communities the working men need to be encouraged to become freeholders and owners as respects their family dwellings, and, if ownership is not practicable, that the relations of tenants and families should be such as to interest and help the tenant to make the tenement as perfect and attractive a home as possible."

SANITARY CONDITION OF RAILWAY PROPERTY IN SOUTHWARK.

A CASE came before Mr. Partridge, at the Southwark Police Court, which disclosed the fact that railway companies sometimes prove themselves to be culpably negligent as to the sanitary condition of the property under their control. Some time ago the South-Eastern Railway Company became the owners of several small dilapidated blocks of cottages in the neighbourhood of Gravel-lane, Borough, for the purpose of making the junction line, now nearly completed, for connecting their railway with the London, Chatham, and Dover line at Blackfriars. The following statements show the disease-breeding character of the company's property. Mr. Errington, the sanitary inspector of the St. Saviour's Vestry, summoned the occupiers of six of the houses in Glasshouse-yard, Gravel-lane, to show cause why the houses should not be closed, being in such a filthy and dilapidated condition as to be unfit for habitation, and injurious to health. He stated that they contained three rooms each, and were inhabited by from ten to a dozen men, women, and children in every house, very poor, and chiefly Irish. The roofs of some of the houses were partially off, the shutters and doors gone, and the flooring, balusters, and nearly every bit of woodwork torn away for lighting the fires. The walls were in an extremely filthy state. The only water-closet was in ruins, and unfit for use, and the small yards unpaved and very dirty. The inmates had been turned out by the railway company some time ago, but as the company did not require the houses after that, they were taken possession of by the present occupiers, who not only paid no rent, but refused to leave. The medical officer of the Saviour's District Board of Works said that the houses were in such a filthy condition as to be totally unfit for human habitation, and unless they were soon emptied and closed, the whole neighbourhood would be in danger of fever. He added that he could not think how human beings could live in such dens. One of the occupants of the houses appeared, and objected to being evicted, and, admitting that he had not paid any rent for three months, said the houses "were quite comfortable." The magistrate ordered all the houses to be closed forthwith. It may be asked, why did not the railway company at once demolish the whole of those uninhabitable places the moment they were empty, instead of allowing them to stand and be taken possession of, as above stated?

SCIENCE AT SOUTH KENSINGTON.

THE Department are now doing good work with the Loan Collection of Scientific Apparatus, in the South Kensington Museum. The apparatus is put in action at intervals, and explanations are given.

Programmes for the week may be had showing what is to be done.

Arrangements are being made for the delivery of Lectures in the Conference-room on the various Scientific Apparatus in the Collection on *Saturday and Monday evenings* at eight o'clock, to which visitors to the Museum will be admitted, so far as space will permit. Men of high class have agreed to lecture.

BRISTOL STATION OF THE GREAT WESTERN RAILWAY.

A "TRAVELLER FROM ABROAD" wishes to know who is responsible for the architecture of the new station, now in course of erection for the Great Western Railway Company in Bristol, and indulges in some lamentably unfavourable comparisons with structures of a similar character recently seen by him in other countries. We do not wonder at his despair and horror. The style of the station in question is Pseudo-Gothic of the commonest and most vulgar kind, utterly wanting in refinement and knowledge. We cannot answer his question. The shareholders, however, ought to learn at the next general meeting who it is who is thus wasting their money. An ornament (?) which runs round the walls of the refreshment-room, midway, might be safely worshipped,—it is like nothing on the earth or in it.

MANCHESTER SOCIETY OF ARCHITECTS.

THE Manchester Society of Architects has for some years given prizes to be competed for by the students attending the classes of the Building Trades Institute.

The competition was held at St. John's Church Schools, in Garside-street, in the presence of the honorary secretary of the Society, and the prizes were awarded in accordance with the report of the committee. We learn from this that,—

"The competition took place on April 25th last, in the presence of our hon. secretary. The students were allowed about two hours for making the different drawings, after which they were collected by the teacher.

Twenty-one drawings were submitted by different students, of whom eighteen belonged to the elementary class, and three to the advanced class.

The number of questions which must be answered, either by description or drawing, was fixed by the instructions at three. Out of the number of students thirteen either answered or attempted to answer more than the three questions. Many of the answers were wrong; but altogether the attempts showed that the students really thought of what they were attempting to do."

The prize of two guineas offered by the Society was given to Lorenzo Benson; the prize of one guinea, placed at the disposal of the Council by Mr. Bennett, architect, to John Clark; and the prize of one guinea, given by Messrs. Holden & Son, to J. S. Richardson.

Area of Exhibition Buildings. — Dr. D. G. F. Macdonald writes :—As considerable misapprehension exists respecting the area of the Centennial Exhibition buildings at Philadelphia, and as most persons are fond of comparing similar structures, a statement of the relative space occupied by each may interest the public. The area of the main exhibition building at Philadelphia, exclusive of annexes, is 21½ acres; of the Sydenham Crystal Palace, 14 acres; the Paris Universal Exhibition building occupied 11 acres; the New York Pavilion, 4 acres; the Dublin one, 6½ acres; and the Hyde Park Crystal Palace of 1851, 17½ acres. The five principal exhibition buildings in Philadelphia extend over 48 acres, and the fenced-in part for exhibition purposes comprises 236 acres of Fairmount Park, the most beautiful I ever set eyes on, containing about 3,000 acres. Our American cousins do everything on a grand scale, and the outlay for the great national enterprise of 1876 represents about 1,700,000*l*.

"PICTURESQUE EUROPE."

UNDER this title Messrs. Cassell, Petter, & Galpin have commenced the publication of what promises to be a very charming work. The numbers already issued relate to the British Isles. Nearly every page is illustrated by a wood-cut or steel engraving, and the descriptive particulars are written by authors supposed to be acquainted with the different localities. As a specimen of the woodcuts, though by no means the best, we give one of the views which accompany the account of "Warwick Castle," lately burned and now restored, and we take a passage from the letterpress connected with it :—

"The Castle, as a glance will show, is not the work of one age, but has been patched up and altered, and renovated from time to time. Of the 'donjon' of Ethelfleda, daughter of Alfred; of the buildings of Turchill, its last Saxon lord, nothing remains. Ruined in the wars of the Barons, it was almost rebuilt towards the end of the third Edward's reign; but after the fall of its princely owner, Warwick, the king-maker, its next three possessors died by violent deaths, and its walls became dilapidated under the reign of the Tudors. Sir Fulke Greville (created Lord Brooke by James I.) restored it at great expense, 'making it the most princely seat that is within the midland parts of this realm.' His restorations and yet later alterations have almost obliterated the earlier work in the upper part of the Castle: but the sub-structure, with its massive vaulted roof and clumsily-moulded octagonal pillars; Cæsar's Tower, with its machicolated battlements; the entrance-gate and barbican, with their double portcullis—all the work of Thomas Beauchamp, in the fourteenth century—are still perfect, as is the picturesque Guy's Tower, which crowns the highest part of the rock, and is, perhaps, of slightly later date than the rest.

Few dwellings in Britain are more closely connected with the most stirring scenes in English history. Here was the home of a line of warriors, whose swords did service in many a fight against Scotland and France. Here lived the 'Black Hound of Arden'; and hither he brought the miserable Gaveston to meet his fate on Blacklow Hill. Here also lived the 'father of courtesy,' Regent of France, and guardian of Henry VI.; here open house was kept by the king-maker, who fell on Barnet field, 'his glory smeared in dust and blood'; and after him came the ill-fated, 'false-fleeting, perjured Clarence,' and, in the next century, John Dudley, the Lord High Admiral, whose head, like that of the previous owner of the title, fell on the scaffold. Since then more peaceful endings have been allotted to the Earls of Warwick, though the title has twice become extinct.

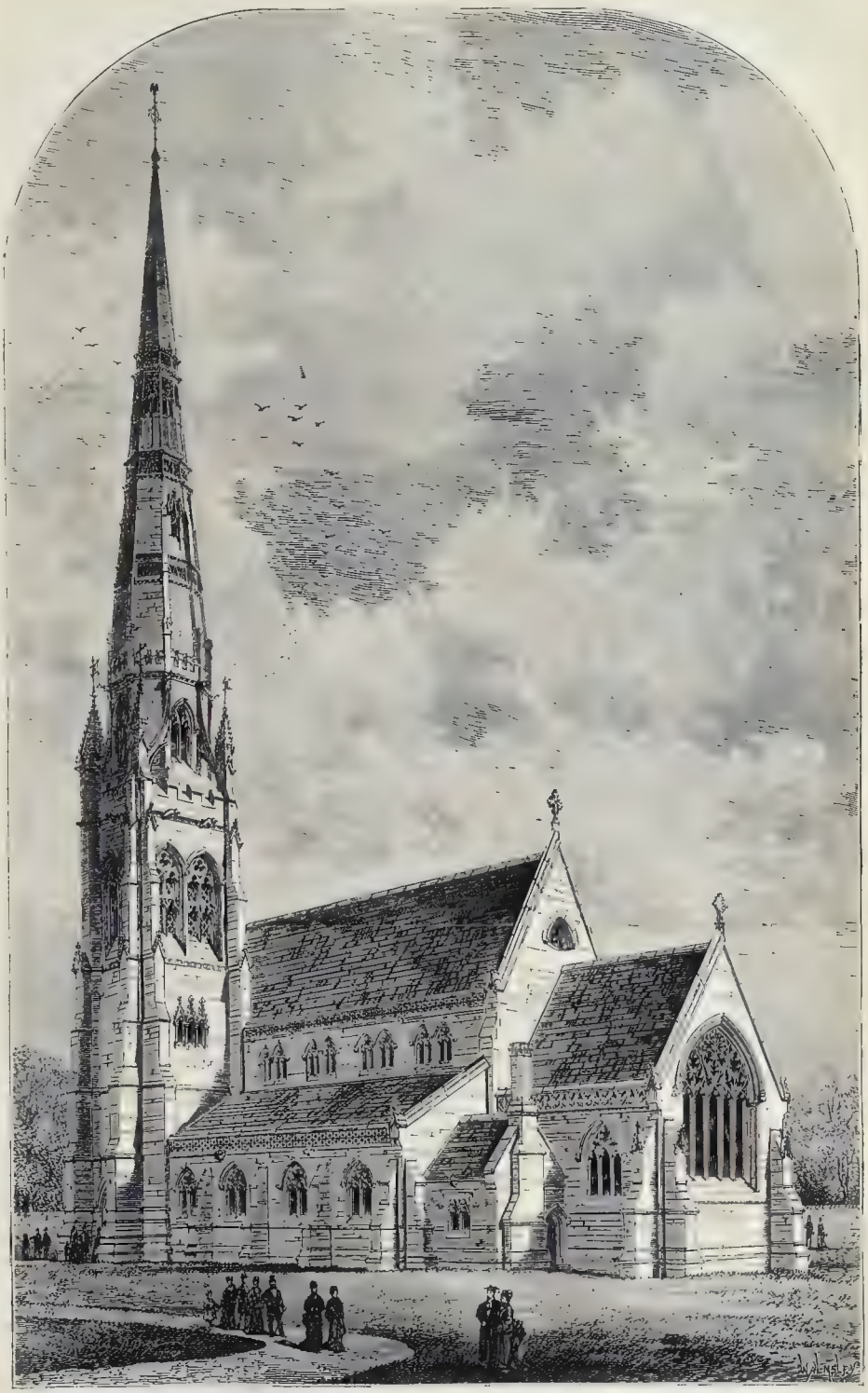
We must not linger in the interior of the Castle, tempting as that still is, though sadly shorn of its choicest treasures by the fire which raged in the eastern part in the year 1871, when the library, the baronial hall, with its magnificent collection of armour, many valuable pictures and ornaments, were almost wholly destroyed.

From the home of the Earls of Warwick turn now to their last resting-place. The antiquity of the town is still indicated by the four streets crossing one another near the middle at right angles. In the northern of these is the parish church. From a distance its general proportions and its lofty pinnacled tower are remarkably effective, but it is disappointing on a nearer view, from its defective details. The reason of this is at once obvious. It is a Gothic building of the reign of Queen Anne. The town suffered terribly in the year 1694, from the ravages of a fire, in which the western part of the church was destroyed. As the architects of that day were masters of proportion, but without the slightest sympathy with or understanding of Mediæval details, the result of their attempt to rebuild in the original style is what might be expected. In our time the case is exactly reversed. It never seems to have struck our architects, as a rule, that in planning a great work they have not only to satisfy a material want, but also to embody a poetic conception. The consequence is, that they exhibit learning without genius, imitative but not creative power; and we get ill-composed structures covered with details so incoherent that they might be termed 'scorbutic,' were they not by themselves beautiful."

We should have preferred a little more order in the arrangement of the subjects. North Wales follows Eton, and Warwick North Wales. Doubtless, however, the publishers could give a reason.



WARWICK CASTLE, FROM THE WEST.



A TERRA-COTTA CHURCH: PLATT CHURCH, NEAR MANCHESTER.—MR. EDMUND SHARPE, ARCHITECT.

PLATT CHURCH, NEAR MANCHESTER.

TERRA COTTA.

IN the course of a paper on the adaptability of terra cotta to modern church work, by Mr. Sharpe,* an account was given of a church erected in this material, from the author's designs, at Platt, near Manchester. To illustrate what was then said, we now give a view of the church, as promised. Mr. Sharpe reminds his readers that this design was made in the year 1844,—that is to say, thirty-two years ago, and, therefore, very early in the Gothic revival,—and says, should you find any shortcomings in this design, you must put them down rather to the early period at which it was made, than to any incapacity of the material to produce a different result.

The church has clustered piers, floriated pier capitals, and moulded pier arches. It has a large five-light east window of flowing tracery, a diapered parapet to the aisle and clearstory walls, and a tower and spire, 170 ft. high. The whole of the exterior is of terra cotta, the coursed walling being of 5-in. blocks. The backing of the walls is of brickwork, and the interior surface is plastered throughout. The spire springs from an octagonal lantern of particularly light work, which has suffered from a cause that is noticed in the paper. Altogether he thinks he is right in holding this tower and spire, considering the time at which, and the material of which it is constructed, to be a very remarkable work, and deserving of more care than it has of late received from those who have, under the Lord Chancellor, the charge of it. The whole work has been treated, as will be seen, as a work in masonry, and very few of those who live in the populous neighbourhood in which it stands are aware that it is not so.

* See p. 553, *ante*.

THE PRIORY OF ST. JOHN OF JERUSALEM, CLERKENWELL.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON the 10th ult., Mr. G. H. Birch conducted a large party of the Architectural Association to the scanty and much-mutilated fragments which now remain of the Priory Church of St. John of Jerusalem, Clerkenwell. The visitors assembled at St. John's Church, situate in the somewhat out-of-the-way close, St. John's-square, a locality teeming with clock and watch makers, jewellers, enamellers, gravity-escapement makers, and, in short, with almost an infinity of tradesmen engaged in the manufacture of horological, meteorological, and mathematical instruments. This somewhat sequestered place (so far as vehicular traffic is concerned, for of pedestrians there are a goodly number) is approached from Smithfield Bars by a narrow street known as St. John's-lane, at the top of which is St. John's-gate. It is also approached from St. John's-street-road by a short and narrow thoroughfare called Albemarle-street, and from Aylesbury and Red Lion streets by two or three narrow courts or entries. The comparative seclusion of the "square" is about to be rendered a thing of the past, for the new street from Oxford-street to Shoreditch, now in course of formation by the Metropolitan Board of Works, will cut obliquely across it, about equidistant between the church and the gatehouse, necessitating the demolition, amongst other buildings, of the house on the west side of the square, known as Burnet House, at one time occupied by Bishop Burnet. St. John's Church, which has its west end abutting on to the east side of the "square," and its east end overlooking a churchyard between it and St. John-street-road, presents (as seen from the west end especially) a more than usually bald and ugly "churchwardenesque" appearance, and many of the visitors were loth to believe that it could possibly be the appointed *rendezvous*. We never look up to the insignificant clock-turret of this church without being reminded of the proverb to the effect that "the shoemaker's wife is always the worst-shod woman in the village," for here, in the very midst of a busy centre of horological industry, the church clock, having got out of repair, stopped at twenty minutes to two one morning or afternoon, and for several years (three or four at least—perhaps it is ten or twelve years ago now) sought to persuade the inhabitants and passers-by that "*tempus fugit*" was an aphorism of the past, for the clock-hands remained stationary, neither retreating nor advancing. The church, however, although appearing externally to be so unpromising to the antiquary, is built over what remains of a very interesting crypt.* Four bays of this crypt remain, the two easternmost ones being of the Early English period, while the two westernmost bays are of Transitional work, the division between the work of the two periods being well defined and plainly visible. The visitors having passed through the church descended into the crypt, which is so damp and noisome that even architects and archæologists would not care to remain in it very long.

The Church.—Mr. Birch read a paper, in which he said:—The church in which we are now met is one which is not very well known to the generality of ecclesiologists, the exterior giving no clue to what is to be found in the interior, so completely has the hand of the destroyer eradicated every vestige of antiquity from its principal front. Indeed, generally speaking, nothing remains of the original magnificent church of the military order of the Knights of St. John of Jerusalem but a few fragments in the church, the beautiful Early English crypt, and the gatehouse. The order to which the buildings belonged was one which owed its origin to the Crusades; more fortunate than their contemporaries the Templars, they not only escaped their destruction, but were enriched by their possessions. They were called the Knights Hospitallers of St. John of Jerusalem. When Jerusalem was taken from the Saracens, vast numbers of pilgrims flocked to the Holy Sepulchre and to other places of the Holy Land, and one Gerardus, associating himself with others of like mind, devoted himself to the most useful and humane intention of harbouring and sheltering the pilgrims, and furthermore of defending them from insult in either going or coming. The Knights Hospitallers adopted a black habit with a white cross of eight points. Godfrey of Boulogne instituted them as a regular order, and they soon increased in wealth and numbers. In England they attained to great power and position, and on the loss of Jerusalem the military knights had to settle first at Rhodes and then at Malta, and took their names severally from those places. They never lost their title in England, but retained it to the Dissolution. Their prior ranked as the first baron. More popular than the Templars, they yet incurred the hatred of the vulgar, and in 1382 their house at Clerkenwell was burnt by the Communists of that period. Garnerius de Neapoli was their first prior, and Sir William Weston their last. Their revenues, according to Dugdale, amounted to 2,385*l.* 12s. 8d. The order is not extinct in England, and, I am told, never has been. This house in Clerkenwell (near unto Clarke's Well) was founded by Jordan Brisset and Muriell, his wife, A.D. 1100, in the reign of Henry I. Ten acres of land were purchased from the neighbouring priory of St. Mary, twenty acres in the parish of Willinghale, Kent, being given in exchange,—an early record of the value of land in London. When Heraclius, or Araclius, patriarch of Jerusalem, was in London, he dedicated the "chyrche of ye Hospitall of S. John's, Jerusalem, to ye honor of S. John Baptiste, in ye yere of Christ 1185, on the 6th ides of Merche. Ye same dey was dedycatyd ye high altre and ye altre of S. John Evangelist." Joseph de Channey, prior (1274-1280) built a chapel, and William de Henley, prior, erected a cloister between 1280 and 1284. The church was Transitional, of a very fine type, judging from remains of capitals discovered from time to time, and still to be seen, I believe, in the south wall, next Jerusalem-court. I have alluded to the church and buildings being burnt in 1381-82. It is recorded that they were burning for seven days; but immediately after this disaster they were rebuilt, not being completed until 1504, John Docwra being then prior. This rebuilt church was, of course, Perpendicular, the earlier remains having been incorporated, and it consisted of a nave with aisles, a great bell-tower (of which John Stowe has the following curious entry: that it was a lofty and beautiful steeple, curiously graven, gilt, and enamelled, to the great beautifying of the city, and passing all other that he had ever seen), and a choir with aisles and side-chapels. Of all this scarcely anything now remains, the present church being only a portion of the choir,—the crypt, now bricked up, having extended westward. The width of the crypt is 16 ft. 3 in., the height being 12 ft. A compartment on the south side was bricked up in 1793, and is the vault of Simon Michell, who so utterly destroyed the church and disguised it in its present garb. The crypt, although now partly, if not entirely, subterranean, was not so formerly, Hollar's view showing the entrance. The central portion of the crypt is of four bays, the two western ones being Transitional, and the two eastern ones Early English, and the work deserves most careful examination, for the voussoirs of the arch-ribs, instead of being cut to a curve,—*i.e.*, following the line struck from a centre, are each of them straight, the necessary curvature being obtained by making these voussoirs so small that their want of curvature is scarcely perceptible. My attention was drawn to this curious fact by Mr. Pettit Griffith, F.S.A., when he read a most valuable paper on this Priory Church before the London and Middlesex Archæological Society, in whose "Transactions" it is published. In 1854 the bases of the columns were exposed, in an excavation made for that purpose, and were found to possess some curious characteristics. The real floor is 1 ft. 5½ in. below the present one, a layer of clay having been spread over it to prevent damp from rising. The two western bays were lighted by a narrow lancet window on each side. The wall is 4 ft. thick, and is considerably splayed. In 1860 the coffins were removed into the side-aisles, and the openings bricked up, thus considerably curtailing the crypt of its proportions; and an Early English trefoil-headed doorway which existed on the west side of the north compartment was obliterated from view. In this crypt was buried the body of the girl who figured in 1762 as the "Cock-lane Ghost,"—a singular impositon believed in by many at the time. History repeats itself, however, and the unquiet spirit of the Cock-lane ghost manifests its presence by the knockings and scratchings so extensively indulged in by the modern spiritualists. The church above the crypt has been so completely gutted that little remains to be said of it. The fragment which had been left of Docwra's choir was tinkered up and "Classicised" by Michell when the church was made a rectory by the Commissioners for building fifty new churches in London and the neighbourhood. When Mr. Pettit Griffith repaired the church in 1845 he noted the following particulars. When the plaster was removed from the inside of the east wall and central window it was discovered that Docwra's masonry still existed from the ground to the middle of the said window-arch,—about 27 ft. high. Above that was the brickwork of Michell's time. The window is in the same state as shown in Hollar's view. The mullions are perfect, but the cinque-foil cusping is all destroyed. When the pews against the south wall were removed, it was found that portions of the former church had been used as a foundation to them. These consisted of moulded vaulting ribs, parts of shafts and groining, and capita's of clustered columns, coloured and gilt; these showed the masons' marks. The floor of the church is 14 in. above the old level. The south wall had been rebuilt by Docwra on the remains of the Early English wall, which still remains some few feet above the floor, showing the narrow splayed openings of the original windows, and a doorway opening into Jerusalem-court. Docwra's wall contains large Perpendicular windows, above which Michell has rebuilt the wall. The north wall was also rebuilt by Docwra, and shows several large windows. A very beautiful angle capital was found built in in this wall.* The arms in the east window are those of Prior Botyler, a chevron between three combs. The establishment was suppressed by our English Caligula in 1541, but was not destroyed at once, like so many other splendid fabrics. It was converted into a repository for military stores. The king's tents were kept here, and so remained until 1550, when the so-called Lord Protector Seymour, Duke of Somerset, caused the nave and side-aisles, and the great bell-tower, to which allusion has been made as being richly graven, gilt, and enamelled, to be blown up by gunpowder, in order to use the stone in building Somerset House in the Strand, and the porch of All Hallows', Grace-church-street. This was not the only sacred building which fell into the devouring maw of this Protector,—the cathedral itself was not respected. The part of the choir that remained, with some side-chapels, was closed up at the west end, and otherwise repaired, by Cardinal Pole, in the reign of Queen Mary, and Sir Thomas Tresham, knight, was made prior; but it again

* Illustrated in the *Builder* some years ago.

* All these fragments have now entirely disappeared.

was desecrated by Elizabeth. The buildings of the Priory had been sold by Henry, together with the site, circuit, and precinct of the hospital, to John Dudley, Viscount Lisle, Lord High Admiral, in consideration of his services, and for 1,000*l.* sterling,—no inconsiderable sum in those days. James I. granted the site, described as containing one great mansion-house and one great chapel (the mutilated choir), to Ralph Freeman and to his heirs in free and common soccage. Then it became the property of Lord Burleigh, whose daughter married Bruce, Lord Elgin, by whom the choir was used as his private chapel until 1706, when it was again sold, and was finally bought by Simon Michell, in 1721. Its subsequent history has already been noticed. When Michell bought the choir, the north aisle had been turned into a dwelling-house, and the upper part of the south aisle was used as a library. It is very much to be desired that sufficient money were forthcoming to once more exhume, as it were, the treasures still hidden in its mutilated walls, and to more perfectly reveal Prior Doowra's choir.

The Gate-house.—Adjourning to the gate-house (locally and generally known as "St. John's Gate"), which has been much mutilated to serve the purpose of a tavern, the visitors passed up into "Dr. Johnson's Room," where Mr. Birch read the following short paper:—This structure must often have impressed you when you passed through its noble archway, as Boswell says it impressed Dr. Johnson when he beheld it for the first time. This old gate, apart from its other associations, will always be inseparably linked with the name of that great man, for here he was wont to shut himself up in a room assigned to him, and to allow no one to disturb him but some compositor or "printer's devil" waiting for "copy," for the time-honoured publication of "Sylvanus Urban," yclept the *Gentleman's Magazine*, was printed and published within the walls. Of course a gate-house stood on this spot in 1100, when the hospital was first founded, but that was probably burnt down during Wat Tyler's abortive attempt at Communism. The present structure, like the choir of the church, was rebuilt by Prior Doowra, the last prior but one before the Suppression. The walls are about 3 ft. thick, and are of brick faced with Reigate stone. The ground plan consists of an arched opening with rooms on the east and west sides. Towards the north or St. John's-square side two towers project from the face, as well as two towers on the south or St. John's-lane frontage. The archway, being thus recessed, has a great appearance of breadth and solidity. The arch was, until a few years ago, partly filled up by a wooden erection serving for a billiard-room, greatly curtailing the height of the headway, and quite ruining the appearance of the entrance. This erection was put up when the gatehouse was converted into a tavern. The original ground level is 3 ft. below that of the present pavement. On the south front over the archway are sculptured five shields in foliated panels,—in the centre France and England quarterly, surmounted by a crown; on each side the arms of the priory, a cross; beyond, Doowra's arms, a chevron engrailed between three roundels cross in chief.

"Numerous discoveries have been brought to light during the last thirty years in excavating for drains, foundations of new houses, &c. When the Metropolitan Building Act of 1845 came into operation, the gateway had a narrow escape. It was condemned as dangerous, and it was proposed to 'compo' it." However, this calamity was averted, and in 1846-47 the stonework was reinstated, battlements added to the north front and partly to the south front, and the angular turrets partly rebuilt, with new windows, &c., under the direction of Mr. Pettit Griffith. "Among the spoliations which have been effected in order somewhat to fit the gatehouse to serve as a tavern, the projecting tower in St. John's-lane, on the east side, was cut through and supported at the angle by a cast-iron column, totally disfiguring the south front. The original stone mullions of the windows in the large room over the gateway have been removed, and miserable deal mullions substituted. All these alterations were effected many years prior to the restorations of 1846. In 1865 the freehold was purchased by Mr. Wickens, in whom the old gatehouse found a friend anxious to retain the fabric as far as possible in all its integrity. With this view, in 1866, 350*l.* were expended upon its further restoration. The modern staircase on the west side was cleared away, and the oak staircase in the north-west tower (this staircase winds from top to bottom with solid oak steps and an oak newel) was restored, also the old stone doorway in the same tower, formerly the entrance to Cave's printing-office, was raised 3 ft. in height, the continual raising of the street paving having shorn this doorway of its fair proportions."*

Once more the gate has changed hands, and after all its vicissitudes, belongs again to the very order of the Knights of St. John of Jerusalem who formerly possessed it. Sir Edmund Lechmere has purchased the building, and as his name is as a tower of strength for the preservation of ancient buildings, we may safely leave this old building in his hands, in quietness and confidence as to its future. We may add that one of the upper rooms is now in course of restoration under the direction of Mr. Norman Shaw, for the purpose of serving as a chapel.

The afternoon's proceedings were brought to a conclusion by a visit to the interesting Chapel of St. Etheldreda, Ely-place, Holborn, now in course of restoration by Messrs. Whelan & Young, with Sir Gilbert Scott as consulting architect. The walls being now stripped of the galleries, lath and plaster, &c., a good opportunity is afforded of realising what the building must have been before its successive mutilations. The chapel is a good specimen of Decorated work, and will well repay a visit at the present time. We have so recently † referred to it in detail that we need say nothing here.

FIRE-PROOF TOWNS.

IT is curious that, while we have such disastrous and numerous fires in this and neighbouring countries and in North America, there are cities and towns not far off absolutely fire-proof,—as Buenos Ayres and Montevideo. In Buenos Ayres, a city of 250,000 inhabitants, a poor charwoman sleeps with her children with more safety from fire than the Princess of Wales and the Royal children,—who have been in danger from a fire taking place in Marlborough House, and the Prince being present first directed the children to be removed to a distant part of the house, and then ascending to where the fire was, he fell over the joists. Sandringham has also been on fire since his Royal Highness purchased it. Yet it is so easy to make houses fire-proof, using wood, not to speak of iron, that the older architects and builders of Buenos Ayres and other towns there probably never knew they were building fire-proof! They neither use iron nor the arch; but simply, that province being without trees, they have to use the hard woods from far up the river, which are therefore dear, and so they use little, this being the whole secret.

A hundred walking-sticks may be placed 2 in. from each other, and yet a fire cannot be made of them if they are spread gridiron-fashion, say, across two little walls of brick and a fire kindled below; it will burn through, say four of the sticks which are in the flames, but there it ends. In the same way, if a cartload of shavings and pieces of pine were provided, and half be packed under the best bed in a Buenos Ayres house, and the other piled over it and set on fire, the bonfire would eventually burn through four or five of the joists above, and the bricks and tiles of the floor would fall through; but there it would end, the house could not be set on fire.

The houses are built as follows, the material being brick. Alike each floor and the roof (which is flat) are supported by joists of hard wood about the same distance apart as in this country; across these are laid rails of the same (3½ in. by 1½ in.), and the space between these is bridged over by thin bricks 13½ in. long; another layer of bricks is then laid, and generally on this a layer of tiles. The roof is exactly the same, but has a slope of 1 in 30 or 35. Then the doors and windows have no boxes, but simple frames, which are set up on building the walls and built in; and there is no lathing, nor wainscot, nor skirting of the bottom of the walls. And all the wood is of the hard and hardish kinds, the doors and windows and shutters of cedar, slow to ignite.

The modern houses of Buenos Ayres are pretty much like those of London, Bath, or Edinburgh, nor would any one see hardly any difference. It would be easy, therefore, to adopt the same way of building here with the necessary slight modifications. The ends of the joists in the walls would probably rot in course of time, from external damp penetrating if they were not of wood indestructible from damp, like in the River Plate towns, where, in the experience of the Spaniards, which extends to nearly two centuries, it does not rot in the damp in that time. Hence, if they were only of oak in this country, a *battre*, like a cornice, should be built at the top of the walls of each story on which the ends of the joists are to rest, so as to sustain them if their ends, built into the wall, ever rotted. The projection, stuccoed over, would form a cornice; but the joists could easily be of iron instead, this being the cheapest country for iron in the world.

The lathing of the ceilings and walls should be done with iron ribbons, and the slates be supported by sheet iron, to which they could be fixed by small screws and nuts. Then the coldness of the floors should be obviated by a lining of black poplar, ¼ in. or ¾ in. thick, and carpets above; but all the rest to be of oak or teak, or other hard wood, both hard and wanting in that resin which makes pine so combustible.*

Instead of filling our houses with combustible pine it would surely be better thus to copy the Spaniards in their fireproof towns,—Buenos Ayres, Monte Video, Rosario, Parana, &c. No human lives are lost there by fire,—no priceless works of art! *We* not only make combustible private dwellings, but hospitals, infirmaries, lunatic asylums, sailors' homes, and the like, and the inmates are burned alive, or they are nearly killed by the bursting of the cistern on the roof, as in St. George's Hospital, the other day. Lord Clyde returns from India, from the mutiny, and is nearly burned alive the first night he reaches a friend's mansion in the North. A noble mansion is passed in the train, in England, and some one says, "That is the Earl of ——'s,—the new castle. The old one was burned down, and the Dowager Countess was found a cinder"; and a Buenos Ayrean who listened thought it strange that an English earl had not a house where his old mother would be safe. Even royalty is not safe. Theatres, halls, and churches are built combustible, exposing us to frightful risks, and the money losses are tremendous. Mills, factories, ironworks even, in the country where iron is so cheap, are built combustible, and then *insured*.

ALMA.

SHRINKAGE OF TIMBER.

SIR,—IN your report of the discussion at the Architectural Association which followed the reading of Mr. J. Douglass Mathews's paper, "Modern Improvements in Housebuilding," Mr. Phené Spiers says, "As to the shrinkage of timber in modern houses, he did not know how it was to be prevented, seeing that the bulk of the timber used in modern work was brought wet from the dock, and cut up and used often without the slightest attempt being made to 'season' it," and he proceeds to explain that the practice in America is "to place the timber for about three weeks in a hot room having a temperature of about 200°," and that "to a slight extent this precaution was adopted in this country, it being the practice of some builders to place their timber in the boiler-house, where it was subjected to a temperature of 90°."

May I suggest that in the discussion of these questions it would be very useful for the avoidance of vagueness to adopt the builder's nomenclature, and to confine the use of the word "timber" to the structural woodwork of the carpenter, and to call the wood of the joiner "deal," or "stuff"? Many persons, on reading Mr. Spiers's remarks, would be led to believe that our cousins desiccate their joists, plates, roof principals, and rafters; but I do not think that this can be his meaning: if it be, I think he should be cautious in recommending us to adopt the same course, as there can be no doubt that "timber" thus dealt with loses a large quantity of its power of resistance to cross strain, is rendered less lasting, and becomes so brittle that, to use a carpenter's phrase, when it breaks, it breaks short like a carrot.

Doubtless, wet timber drawn out of the floating docks, cut up, and fixed in the building, and the work hastily carried on to ultimate completion, is the source of many ceiling cracks, and fissures at the junctions of quarter partitions with brick walls, and (in London with the Building Act-encouraged ∨ gutters) is the cause of

* W. P. Griffith. † See p. 311, *ante*.

* In Buenos Ayres they use carpets in winter, which are replaced by cool mats in summer. For greater warmth, however, and probably as now cheaper, some builders have latterly put in pine floors on the hard-wood joists, instead of bricks and tiles, which is bad policy, and these new houses are not included when I state that the city is absolutely fireproof.

many leaky roofs. But here again the terms should not be confounded. Wet timber is not necessarily unseasoned; in fact, timber cannot be properly seasoned without the water process. The true remedy is less haste in building, nor let the architect cast all the blame of this on the hurry-skurry of the times. Many a client would adopt his advice to erect the building in carcass, and allow it to remain in that state for a season open to the free wind to dry both walls and timber, not to be finished until the drying process is completed. But this does not suit us. We, like all the rest, wish to get the job finished and have our money, even if it be at the sacrifice of some efficiency.

If the building must be pushed on at all hazards, then you should use as much as possible for your constructional carpentry the stoff of the joiner, in the shape of planks, deals, and battens; these, being imported in their converted forms, are not brought wet from the docks, but are comparatively dry, but, as compared with timber imported in the bulk, they are neither so well "seasoned" nor are they cut from trees which supply wood of so vigorous a growth or so lasting a nature: they are perhaps a little tougher than timber, but not so strong.

For joiners' work, the objection to desiccating the wood is not so strong, as it has no strain to bear, and is in great part protected from weather, but for joinery the wood will be much sounder and more lasting if dried by a more gradual process than that suggested by Mr. Spiers.

The want of knowledge sometimes displayed by architects on this subject is lamentable. I remember reading in your pages the remarks of a gentleman to the Architectural Association accounting for shrinkages in doors and splittings of panels in outer framings, by stating that the timber for these was drawn wet out of the water of the docks, where it floated, and was immediately cut into door thicknesses, and put together. His great mistake was in imagining that doors are made out of logs, whereas the commonest joiner could have informed him that the framings, even of the most scamping of Jerry-built houses, are made from deals which are stacked on land in the docks, and have never been in the water after their conversion at the port of export. L.

OBITUARY.

Mr. Matthew Noble, the sculptor, has just died, at his residence, in Kensington. He was born at Hackness, near Scarborough, in Yorkshire, in the year 1819, and was a pupil of the late Mr. John Francis. Among his best-known works are the statue of the Queen, in St. Thomas's Hospital; the statue of the late Lord Derby, in Parliament-square, near Westminster Hall; and the statue of the late Sir John Franklin, in Waterloo-place. Twenty years ago he was successful in the competition for the Wellington Monument at Manchester. Latterly he has been engaged in executing posthumous memorials. Last year he exhibited at the Academy busts or figures of the Rev. Henry Venn, the late Bishop of Manchester, and the late General Sir James Yorke Scarlett. This year he has exhibited the late Mrs. Lionel Astley and the late Mr. Hope Scott, and the latter work is to be placed at Abbotsford. In October, 1874, Mr. Noble had the misfortune to lose a son of great promise, who was expected to make a prominent mark in his profession, which was also his own. Last year Mr. Noble lost another son, in the Abbott's Ripton railway accident, and this double bereavement has accelerated his death.

Mr. Robert Morris, a Liverpool contractor, died at his residence, 42, Bedford-street, Liverpool, on the 23rd ult., after six days' illness. He had for many years carried on the business of a contractor, and his name will be remembered in connexion with many works of importance, including the Berwick and Kelso Railway and the Neath Valley Railway. Among other large works which were entrusted to him was the building of the Prescot Workhouse, and he was associated with Mr. Jesse Hartley in some important dock works. Mr. Morris was much esteemed for his charitableness of disposition and kindness of heart. He was in his fifty-ninth year.

Mr. Richard Clarke, the Borough Valuer of Birmingham, is dead. He was appointed Borough Valuer in 1853, and parish-surveyor in 1867.

Mr. C. Hide, architect and surveyor, died at his residence, 2, Colonnade, High-street, Worthing, on the 20th ult., at the age of 66. He was a civil engineer by education, and was senior partner in the firm of Hide & Patching, auctioneers, &c. He filled the office of Town Surveyor for a period of about thirty years, commencing his duties under the old Town Commissioners, and continuing them under the Local Board. During his surveyorship, the drainage scheme was carried out under his personal superintendence. He built the town-hall; and several of the terraces and villas in Worthing were designed by him. A year or two ago he patented a new kind of cement called "Frescos," for facing the outside of buildings in imitation of different kinds of stone.

The *Rev. Walter Field*, rector of Merstham, Surrey, has died from fever caught at Rome. He was long connected with the Church Building Society, and was the founder of the *Church Builder*.

COMPETITIONS.

The Drainage of Horsham.—At a meeting of the Horsham Local Board on the 23rd of June, Mr. Alfred Agate moved, "That the premium of 100*l.* for the best scheme produced should be given for the plan submitted by 'A. B.'" Mr. W. Lintott seconded.—Mr. W. Aldridge moved, "That the premium of 50*l.* be awarded for the plan of 'Tria juncta in uno,'" and Mr. Thomas seconded.—Mr. Cowan said he considered the plans named were as worthy as any two that could be suggested, but he could not help thinking that the scheme of "Gravitation" was equal to either of them, and these three were so nearly equal that he felt it would be more in accordance with justice and the intention of the Board if the second premium of 50*l.* was given to each; and he should move an amendment to that effect.—Mr. Agate had no objection to withdraw his motion if the premiums could be divided in the manner suggested.—Mr. Aldridge also expressed his concurrence. It was then proposed by Mr. Cowan, seconded by Mr. Bostock, and carried, that the 50*l.* premium be given to each of the three schemes, viz., "A. B.," "Tria juncta in uno," and "Gravitation."

Tyldesley Cemetery.—Nineteen sets of drawings have been submitted in this competition. Premiums of 50*l.* and 20*l.* were offered by the Local Board for the best and second best designs respectively, and plans showing the site of the proposed cemetery, and "conditions" were issued for the guidance of the competitors. In the conditions it was specially stated that the cost of the work should not exceed 5,000*l.* A critique, avowedly written by an architect, appeared in the *Leigh Chronicle* for Saturday last. The writer states that he has seldom seen a more commonplace series of drawings. Some of the competitors appear to have ignored the limitation as to cost. The *Chronicle* has a leading article urging that professional advice should be obtained before the premiums are awarded.

REPORT ON THE RESULTS OF THE CONFERENCE ON HEALTH AND SEWAGE OF TOWNS AT THE SOCIETY OF ARTS.

THE Chairman of the Conference and the Executive Committee, after having considered the information furnished from the various localities, as well as the facts brought forward during the Conference, have submitted the following as the conclusions to which such information appears to lead:—

1. In certain localities, where land at a reasonable price can be procured, with favourable natural gradients, with soil of a suitable quality, and in sufficient quantity, a sewage farm, if properly conducted, is apparently the best method of disposing of water-carried sewage. It is essential, however, to bear in mind that a profit should not be looked for by the locality establishing the sewage farm, and only a moderate one by the farmer.

2. With regard to the various processes based upon subsidence, precipitation, or filtration, it is evident that by some of them a sufficiently purified effluent can be produced for discharge, without injurious result, into watercourses and rivers of sufficient magnitude for its considerable dilution; and that for many towns, where land is not readily obtained at a moderate price, those particular processes afford the most suitable means of disposing of water-carried sewage. It appears, further, that the sludge in a manurial point of view is of low and uncertain commercial value; that the cost of its conversion into a valuable manure will preclude the attainment of any adequate return on the outlay and working expenses connected therewith, and that means must therefore be used for getting rid of it without reference to possible profit.

3. In towns where a water-carried system is employed, a rapid flow, thorough ventilation, a proper connexion of the house drains and pipes with the sewers, and their arrangement and maintenance in an efficient condition, are absolutely essential as regards health; hitherto sufficient precautions have rarely been taken for efficiently ensuring all the foregoing conditions.

4. With regard to the various dry systems, where collection at short intervals is properly carried out, the result appears to be satisfactory, but no really profitable application of any one of them appears as yet to have been accomplished.

5. The old midden or privy system, in populous districts, should be discontinued, and prohibited by law.

6. Sufficient information was not brought forward at the Conference to enable the committee to express an opinion in regard to any of the foreign systems.

7. It was conclusively shown that no one system for disposing of sewage could be adopted for universal use; that different localities require different methods, to suit their special peculiarities, and also that, as a rule, no profit can be derived at present from sewage utilisation.

8. For health's sake, without consideration of commercial profit, sewage and excreta must be got rid of at any cost.

The Executive Committee, whilst abstaining from submitting any extensive measures, have no hesitation in recommending that the prevention of dangerous effects from sewage gases should receive the immediate attention of the Legislature, and they submit the following resolutions as the basis of petitions to Parliament:—

"1. That the protection of public health from typhoid and other diseases demands that an amending Act of Parliament be passed as soon as possible, to secure that all house-drains connected with public sewers in the metropolis, and towns having an urban authority, should be placed under the inspection and control of local sanitary authorities, who shall be bound to see to the effective construction and due maintenance of all such house-drains, pipes, and connexions. Provisions having this object in view already exist in the Act constituting the Commissioners of Sewers in the City of London, in the Metropolis Local Management Act, 1855, and in the Public Health Act, 1875, but practically they seem scarcely sufficient for the purpose.

2. That plans of such drains and connexions be deposited in the charge of the respective local authorities, who shall be bound to exhibit them and supply copies of them to the public on payment of a moderate fee.

3. That the owners of houses be compelled by law to send to the respective local authorities, within a specified time after the passing of the Act, plans of all house-drains on an appointed scale."

PAYMENT OF ARCHITECTS IN MARYLEBONE.

AT the last meeting of the Marylebone Board of Guardians, a debate on the reconstruction of the workhouse was resumed by Mr. Galsworthy stating that the information he had had furnished him with reference to the opinion of Sir G. Scott that 2½ per cent. was a reasonable charge for an architect for a public building was found to be incorrect, and he apologised to the Board, as did also Mr. Endean, of Oxford-street, his informant.

At the desire of the Board, Mr. Galsworthy then read a letter from Sir G. Scott to Mr. Endean, in which he stated that he never took 2½ per cent. in his life, and only once less than 5 per cent., and that many years ago. He questioned whether an architect could be a member of the Institute of British Architects if a less commission was taken. He was opposed in general to competitions amongst architects, but if one was selected, it should be for his professional merit, and not because of friendship and low charges. After alluding to a matter of a personal nature, Mr. Galsworthy said the question, although in one motion, would have to be divided—that was, whether they should have one architect, and whether the rate of commission should remain as at present; and if it was adopted he should have to divide the question on another occasion. He then went into what the Asylums Board were doing, with a view to show that 2½ per cent. commission was sufficient.

The motion, "That it be an instruction to the Workhouse Reconstruction Committee to draw and issue to a limited number of architects a series of instructions inviting plans; that one of such instructions be that the architect's commission be 2½ per cent. on the amount of the contract," was then put and negatived.

The "Church of the English Martyrs." Cardinal Manning has opened the new "Church of the English Martyrs," which has been recently built in Great Prescott-street, Minories, adjoining Tower-hill. The new church, which supersedes a small, close, and inconvenient chapel, is a Gothic structure of lofty dimensions, in the Decorated style, but many of the details, especially in the carvings of the arches and capitals of the pillars, have been left rough. The roof is groined in stone. It will accommodate about 1,500 worshippers, and consists of a nave and two side aisles. The architect was the late Mr. E. Welby Pugin. Owing to the fact that other buildings adjoin the church on all sides, it is lighted by a clearstory. The cost of the building is between 10,000*l.* and 12,000*l.* A certain old writer of the name of Foxe would have been greatly edified by the sermon that was preached on the occasion.

MASTERS AND MEN.

Bristol.—At a delegate conference of builders' labourers on June 24th, it was unanimously resolved to cease work on the first Monday in August should the Master Builders' Association refuse to concede the terms demanded.——The painters' strike has terminated, the masters agreeing to a general advance of one halfpenny per hour.——A strike of operative stonemasons commenced on the 19th ult., in consequence of the refusal of the employers to grant a halfpenny per hour advance, and to accept a new code of rules which the men seek to impose. The dispute has since been settled, the masters yielding the additional halfpenny, and the men giving in in another direction.

Chester. — The carpenters and joiners of Chester are still on strike. The men are being supported by their trade societies, and are receiving from 12s. to 15s. per week as strike pay. They assert that they will remain "out" during the summer unless the masters concede their demands. On the other hand, employers say that trade is dull, and it will do them no harm, and do the men much good, to remain idle for a while. In the meantime there are rumours that the bricklayers intend to make common cause with the joiners.

Cardiff.—The strike of painters at Cardiff still continues. They ask 7½d. per hour and their tools found. They are receiving assistance to the extent of 12s. each a week.

Newcastle. — The Newcastle master-painters have rejected the operatives' offer of arbitration. The latter ask an advance from 7½d. to 8½d., and 3s. for staying out of town over Sunday. They say their present wages are 5s. less than those of joiners, and 8s. less than masons' or bricklayers'. It is now three years since they received an advance. They have agreed to continue the strike.

Richmond (Yorkshire).—The strike amongst the masons employed in the erection of the new barracks at Richmond has terminated, an amicable settlement having been arrived at between employers and men. The depôt centre has to be completed within a certain time, and the contractors having been thrown back by the strike, have been obliged to advertise for 200 more men.

Greenock.—During the late strike of masons, several of the masters employed more apprentices than the number allowed by the operatives' bye-laws to each employer, and now since the dispute has been settled two of the firms are being called to account by the men. One of these firms is the Messrs. Cogbill & Son, who are building the large poorhouse at Smithston, a contract amounting to nearly 100,000*l.*, and who employ at present about 200 men.

Portsmouth.—The whole of the members of the Portsmouth branch of the Operative Bricklayers' Society have struck work, demanding an increase of 1d. per hour in their wages, 6½d. per hour being the present general rate, although some masters are paying 7d. The employers, as a rule, are resisting the demand, holding that the present rate of wage is a fair and equitable one.

National Federation of Builders' Labourers.—An important step has been taken by the operative labourers employed in the building trade throughout the country, and numbering, it is said, some 200,000 workmen. They have decided upon a scheme for federating the whole of the existing district and local unions into one large national association. Hitherto there has been a marked absence of unanimity upon trade and other questions among the builders' labourers. With a view to remedying this state of things, the Executive Council of the London Amalgamated Labourers' Union have convened a congress of delegates representing various labourers' societies throughout the United Kingdom, to assemble in the Albion Hall, London, on August 7, when a scheme will be discussed for the regulation and government of the proposed national federation.

Glasgow.—A meeting of the operative joiners was held at Glasgow on the 22nd ult., when a motion asking those who were at work to contribute the increase of pay was adopted unanimously, the mover suggesting that the men at work should give 5s. a week in support of the non-society men. One of the speakers held out hopes of success, even though the struggle should be prolonged beyond the Fair time. He said only 650 men were now on strike; and that they had more to fear from "low-class workmen" than from the opposition of the employers. The masters were bound to give in, and he believed, instead of 9d., the men would, ere long, be receiving 10d. per hour. It was simply a question now between the operatives and the employers, how much each could grind out of the other,—a state of matters which was to be attributed to the conduct of the masters. A non-society man ridiculed the idea of men being expected to go about idle, receiving only 6s. a week, when they could easily be earning 38s.; but his remarks were not in consonance with the general feeling of the meeting.——A case of considerable importance in connexion with this strike was heard by Bailies Lamberton and Ure, at the Northern Police-court, on the 21st ult. Two workmen, named George Turnbull and Fergus Jardine, were charged with having intimidated a third operative, named David Wright, while he was at work in Hope-street, on the 17th ult. The accused were fined two guineas each, with the alternative of fourteen days' imprisonment.

THE WAGNER THEATRE, BAYREUTH (BAVARIA).

THE new theatre erected for the performances of Herr Wagner's new operas is on a gentle eminence to the south of the town, amid most lovely scenery. The building has been constructed of solid stone, and the works have been executed by the architect, Herr Bruckwald, upon the monumental plans laid down by Herr Semper. A correspondent of the *Times* says,—The internal arrangements differ materially from those of other theatres, since they have been adapted to the special requirements of the great composer. Herr C. Brandt, director of the machinery of the Darmstadt Court Theatre, has superintended the disposal of the stage and the machinery; while Herr Hofmann, scene-painter, of Vienna, is preparing the most elaborate decorations.

As to its internal organisation, it may be stated that the space set apart for the audience rises in the form of an amphitheatre, culminating in the Princes' gallery at the back. It will hold 1,344 persons, all told, and the seats are exceedingly comfortable and commodious. There being neither side boxes nor proscenium boxes, the seats are all alike excellent for witnessing the performance. The public will be able to quit the building with rapidity,—in fact, within the space of a few minutes,—since there are no less than twelve places of exit. Moreover, the precautions against the dangers arising from fire are admirable, the stage being surrounded by four high so-called water-towers.

The novelty in the arrangements is the provision made for the orchestra, which we have described and illustrated. Its members will be seated in a deep hollow between the stage and the hall of the spectators, this hollow being divided into three terraces. The musicians will be invisible to the audience, being screened from view by a sound-board, intended to catch and repel the sound, thereby carrying it to the auditorium.

NEW SKATING RINK NEAR MANCHESTER.

THE populous suburbs of Manchester, Sale and Ashton-on-Mersey, have now an excellent skating-rink, in the construction and arrangement of which are some novel features.

A plot of land, one acre and a quarter in extent, within seven minutes' walk of the railway station, has been laid out as an open and covered rink, and in the whole there are 3,000 yards of surface of Val de Travers asphalte. The open rink has in the centre a spacious lawn, suitable for promenading or for the various games now in vogue, such as croquet and lawn tennis. Along the boundary walls are beds planted with trees, shrubs, ferns, and flowers, the skating surface being between the lawn and the borders. The covered rink consists of a brick-walled and iron-roofed building, of such ample dimensions and so well built, that it would be suitable for almost any public purpose, such as a flower-show, a bazaar, volunteer drilling, or public addresses.

The internal dimensions are,—163 ft. long, 52 ft. wide, 16 ft. high to the eaves, and 36 ft. to the peaks of the skylight. The walls are built of Ruabon bricks, the light colour of which, both inside and out, is agreeable to the eye. The construction of the roof is worthy of notice. The ends are hipped, and an ornamental cast-iron gutter goes all round the building. The principals, 12 ft. apart, are of wrought iron, strongly trussed; on these are wooden purlins, which receive tongued and grooved ¾-in. boarding; over this is laid Croggon's asphalted felt, and on the outside are screwed down galvanised tiles, curved to the sweep of the roof. This construction prevents condensation and down-draughts, and tends to preserve an equable temperature, resisting alike the cold of winter and the heat of summer. The galvanised tiles are each about 8 ft. long and 2 ft. wide, with corrugated rolls 3 in. wide, 12 in. apart.

There are five large doorways for skating in and out, which can be closed by Clark's roller shutters. At the entrance end are the pay offices, and rooms for various purposes, and the upper part forms a convenient gallery for a band of music or for spectators. The general effect of the interior is good, as the purlins and the boards of the roof are stained and varnished, and the iron framework painted a delicate blue. The whole of the works have been carried out in accordance with the designs of Mr. J. H. Lynde. The skating surfaces have been laid down by the Val de Travers Asphalte Company; the brickwork and excavations were executed by Messrs. Luke Winstanley & Son; the whole of the roof and ventilators by Messrs. Edward T. Bellhouse & Co., of Manchester; and the plumbing and glazing by Mr. Collier, of Sale.

DEMOLITION OF THE LONDON TAVERN.

THE well-known London Tavern, which for many years back has been the scene of an untold number of banquets and festivals, will shortly be a thing of the past. It was finally closed for business purposes three weeks ago, and during the past fortnight the furniture, stock, and the entire appointments have been sold preparatory to the removal of the old structure, which is to be replaced by a new palatial edifice for banking purposes. The building, which covers an area of little more than 6,000 ft., has been sold by the London Tavern Company to the proprietors of the Royal Bank of Scotland for 80,000*l.* In a few weeks it will be taken down, the purchasers intending to enlarge their bank premises, immediately adjoining, by the erection of an additional building, covering the whole of the site at present occupied by the tavern. The new building will be of Portland stone, and the Bishopsgate frontage is intended to be a striking one.

ROYAL VISITS AND PEST-HOLES.

SPECULATION has been rife as to the cause of the postponement of H.R.H. the Duke of Connaught's visit to Liverpool last week to join his regiment, the 7th Hussars. When the visit of his Royal Highness was announced, the Corporation resolved to place Newsham House at his disposal; but the Duke courteously declined the offer, preferring to occupy the officers' quarters at the barracks in Rupert-lane. It now turns out that these were discovered to be in such a disgraceful state that a communication was forwarded to the Duke requesting him to postpone his visit. Below the house which forms the officers' quarters a huge well was discovered, containing a large quantity of offensive matter. The well, it seems, was sunk when Rupert House was built, some thirty years ago, for the purpose of receiving rain-water, which was stored and pumped up for domestic purposes, for at the time referred to the wants of Liverpool were supplied by the old water companies. The odour from this disused well was sufficient almost to have bred a pestilence in the neighbourhood. As soon as the discovery was made, steps were taken to empty the well. For three hours, on Tuesday, the 20th ult., the steam fire-engine Hamilton was engaged in pumping up the foulest of stagnant water, ere the more solid refuse could be got at, and the following morning the nightsoil carts removed the offensive matter taken out of the cesspool. The *Liverpool Journal* very pertinently comments upon the matter by saying that "it is all very well to be specially solicitous for the health of Royalty. . . . . But can anything exceed the fatuity of officers and others who have allowed this atrocity to exist for many years under the rooms they occupy without making an effort to get it abolished? Why should the arrival of a Prince be required to arouse gentlemen of education to a sense of the necessity of the commonest safeguards of health? . . . . . We read of Indian villages being half depopulated with cholera, and take notice with a feeling of superiority that such calamities are natural enough where all sanitary principles are defied. And

then we discover that beneath well-appointed officers' quarters in one of the greatest towns in England has accumulated for sixteen years, in a deep well, filth of the most horrible and intolerable kind. Will it never be understood how terrible is the responsibility incurred by all who anywhere tolerate conditions of living which are inimical to health? It is a satire on common sense that a Royal visit should be needed to make us empty our pest-holes."

GUILDHALL AND BOW CHURCH.

THE last afternoon visit of the Architectural Association for the present session took place on Saturday last, when a visit was paid to Guildhall, by the courtesy of Mr. Hadland, the hall-keeper. After examining the crypt—the greater part of the eastern portion of which is in a tolerably perfect condition, though of the western portion nothing is left except the springings of the ribs on either side—and other portions of the building, under the guidance of Mr. G. H. Birch, who read a short paper on the subject, and was accompanied by Mr. W. H. Overall, F.S.A., the librarian, the visitors made their way to the Church of St. Mary-le-Bow, Cheapside, where they examined the remains of the well-known Norman crypt. The church ranks first among the parochial churches of the city, and has played no inconsiderable part in history. It is one of the "peculiars" of the Archbishop of Canterbury, the Bishop of London having no jurisdiction within its walls. Its name was derived from the crypt—St. Mary of the Arches. In the crypt the ecclesiastical tribunal known as the Arches Court formerly met. The church was always looked upon by the citizens as *their* church, in contradistinction to St. Paul's, which was more in the hands of the clergy. From its tower the curfew was tolled, and later on, the London apprentices used to wait for its bells to ring as a signal to shut up shop. The present church, with its well-known detached campanile, was built by Wren after the Fire of London.

THE HOLBORN SCHEME: ARTISANS' DWELLINGS.

MR. SECRETARY CROSS has declined to confirm the scheme, or any portion of it. His secretary, in writing to the Metropolitan Board of Works, says,—

"The partial scheme appears to Mr. Cross to be inadequate and also objectionable, from want of proper space, the street not being sufficiently widened in proportion to the height of the adjacent buildings. On the other hand, the entire scheme, as deposited, does not, as shown in Mr. Nichols's report, provide accommodation for as many persons of the working class as would be displaced. The failure to comply with the statutory requirement would alone put it out of the power of the Secretary of State to confirm the scheme, even were it in other respects not open to objection. This, however, is not the case. Mr. Cross is of opinion that the area proposed to be dealt with is too irregular in its configuration, and too much broken up by other buildings (which are not taken) to admit of being converted into a convenient and appropriate site for working men's dwellings on the scale which is required to meet the necessities of the case. He much regrets that he had not before him the larger scheme of improvement, which was originally submitted to the Board by Sir J. Bazalgette and Mr. Vulliamy."

The delay which will thus be caused is much to be regretted. We had hoped that by an interview, and improvements on the part of the Board, the Home Secretary might have found himself able to authorise the commencement of the works.

SUGGESTED NON-LIABILITY FOR RENT ON ACCOUNT OF DEFECTIVE DRAINAGE

BLACKBURN-MAIZE *v.* TOWNEND.

THIS was an action (tried in the Common Pleas Division of the High Court of Justice, before Mr. Justice Denman and a special jury) to recover 30*l.*, the amount of one quarter's rent of a house which the defendant had rented of the plaintiff. The defendant denied his liability upon the ground that the house had not been kept in a fit state to be inhabited, and he also set up a counter claim for damages upon the ground that his wife met her death in consequence of the improper drainage.

It appeared that the plaintiff was a gentleman living at Bound's Park, Tonbridge Wells, and in 1868 he took from Alderman Sir Thomas Gabriel an interest in one of three houses in Penington-road, Southborough. He lived there with his family from that time until 1872, and afterwards let the place to the defendant. This gentleman lived there until June last, when his wife died; and he, having had the drainage examined and reported upon, refused to remain longer in the house, but left, and declined to pay any rent except down to the day when the occupation ceased.

The case for the plaintiff was, that he and his seven children had excellent health while they lived in the house, and that the same could be said in reference to the other two houses, which were occupied by the Baroness de Larpent and Colonel Hebbert. The level of the land was such that the houses could not drain into the public sewer, and they had to be drained into cesspools. There were three cesspools, one for each house, and these overflowed into a fourth cesspool. Previous to the defendant taking the house, Mrs. Townend went over the place with the plaintiff, and he fully explained the system of drainage to her, and the periods when the cesspools should be cleaned out. The defendant went into the house in November, 1873, and in October, 1874, he wrote to the plaintiff: "My wife and family enjoy good health at Southborough, so I am willing to take the premises for three years further provided you do the following repairs." A few days before the death of the defendant's wife he wrote to the plaintiff complaining of a smell from the housemaid's sink, and added that this was the cause of the illness. It was a case like that of the Prince of Wales. There had been a previous complaint, and the plaintiff sent workmen to do what was necessary; but they were not allowed to proceed with their work because their noise disturbed the patient.

Evidence was given for the plaintiff to the effect that the drainage of the house, though not perhaps the best, was good. [The case was settled by arrangement between the counsel, a juror being withdrawn.]

COMPENSATION CASE.

KELLOCK *v.* THE CHESHIRE LINES COMMITTEE.

THIS case was recently heard at the Sheriffs' Jury Court, St. George's Hall, Liverpool, before Mr. Aston, Q.C., assessor, and a special jury. The Cheshire Lines Committee require, for the purposes of their new branch goods line to the north end of Liverpool, to pass through the estate of Mr. C. W. Kellock, shipbroker, of Liverpool, and the jury required to assess the amount he should be paid for the land actually taken, and as compensation for injury to the rest of the estate.

It appeared that Mr. Kellock purchased the estate with the residence thereon some ten or twelve years ago. It is situated at Woolton, abutting on Grange-road, and adjoins the lands of the Marquis of Salisbury, Major Walker, and others. Mr. Kellock resided upon the property, which is some 36 or 37 acres in extent, and has spent considerable sums upon it, having established a miniature model farm. The new line intersects it in such a way as to sever a portion of it,—about nine acres,—from the main part by an embankment ranging from 18 ft. to 21 ft. in height. The valuers on both sides agreed that the estate might be considered building land; but the two sides differed even in a greater degree than usual in their estimates of the total compensation. The first witness called for the claimant valued the 18,312 yards of land actually required by the railway at 2s. a yard, or 2,754*l.* 6s.; or, with the 10 per cent. for compulsory sale, 3,029*l.* 14s. 6d. The damage by severance to the main portion he computed at 6d. per yard on 88,323, or 2,213*l.* 1s. 4d., and to the eastward or smaller section, 1s. 6d. per yard, to 3,345*l.* 15s. He also allowed 1,000*l.* for the erection of a residence, making his total estimate 9,596*l.* 9s. 6d. Several other valuers called for the claimant brought up their estimates to similar amounts. The valuers for the railway company, on the other hand, placed the actual value of the land at a much lower figure, and their estimates for injury to the land were correspondingly low, and they allowed nothing for injury to the residence. Their total valuations averaged only a little over 2,000*l.* The jury found, as the value of the land taken, 2,624*l.* 15s.; as severance damage, 3,597*l.* 6s. 9d.; and as injury to residence, 1,000*l.*; making a total of 6,122*l.* 1s. 9d.

THE BURSTING OF THE TANK AT ST. GEORGE'S HOSPITAL.

AN inquest has been held by Mr. Bedford, the coroner for Westminster, touching the circumstances attending the death of Eliza Gomez, aged twenty-four, an in-patient lying in the Wright ward, which is situate on the east side of the building, and above which, on the extreme top, was erected an iron tank, capable of holding a sufficient quantity of water to supply the whole of the hospital. On Saturday, June 3rd (as already recorded by us), one side of the tank gave way, crashing through the flooring of the above ward, as well as the ward below, destroying the furniture, and severely injuring several of the patients, amongst whom was the deceased, who, after lingering in great agony, expired from the effects of the injuries.

Charles Todd, secretary to the hospital, said,—The tank was constructed in 1869 by Messrs. Eastons & Anderson, according to a tender sent by them, which was accepted by the authorities of the hospital. The tank has been in operation ever since that year, and cleaned quarterly by the plumbers of the hospital. It was last cleaned in the month of April of this year. There was no intimation then that there was anything wrong with the tank.

Mr. Henry Hunt, Victoria-street, surveyor, deposed that, having been instructed by the governors of the hospital to make an examination of the broken cistern, he had done so, and found that the tank was of cast iron, 10 ft. by 10 ft., by 12 ft. in height, fastened with 5-8th wrought iron bolts. The immediate cause of the accident was the breaking of one plate of each pair of cheek plates, which, being weakened by corrosion, were unequal to the double strain put upon it. The cast-iron plates, two tiers in height, being thus left without restraint, bulged out, cracked, and fell. This corrosion was in the wrought-iron rods and cheek plates, and in consequence of such corrosion the plates and rods became weakened, and the tank therefore burst. Persons getting upon the rods or placing a ladder upon the cheek plates might possibly weaken them. The cross bolt in the plates was not long enough, and the accident possibly occurred through that.

By the Coroner.—It was quite possible that the fracture in the tank might have resulted from frost, but it was very unlikely.

Mr. Stephen Salter, Woburn-place, Russell-square, said,—I am the architect of this hospital, and on Saturday, the 3rd, I was informed of this lamentable occurrence. I examined the premises to see if anything had given way in the walls, and found, to my great relief, that the walls had not the slightest crack in them, and I came to the conclusion that the fabric of the hospital was perfectly sound and safe. The cast iron girders traversing the various floors were quite intact, and the cast-iron shoes also sound, the damage being confined to the rafters and woodwork and plastering of the floors and ceilings, together with that portion of the roof smashed by the falling water and cast iron. I took no part in the construction of the tank, and therefore would rather not say anything about the cause of the accident. As architect I superintended the construction of the brickwork upon which the tank was to rest, but the engineering work, of course, I left to Messrs. Eastons & Anderson themselves.

The jury returned a verdict that the death of the deceased resulted from the slipping of the tie-rods in the tanks, and that such slipping was due to an accidental cause. The jurors furthermore expressed a hope that in future the governors of the hospital would take measures for having the tank examined by a competent engineer, instead of a mere workman like the carpenter of the hospital, every time it was cleansed.

PAISLEY.

THE new Burgh Lunatic Asylum has been inspected. The new building is situated at Riccartsbar, about a mile to the south of the town, on an elevated plateau, commanding a magnificent view. The main building is of a **T** shape. There is a spacious entrance-hall in the centre, behind which is the dining-hall, kitchen, &c., and on each side the accommodation for the male and female inmates. Behind the main building is placed the engine-house, washing-house, laundry, &c. The frontage is 270 ft., and the pavilions at each side extend backwards 120 ft. The heating and ventilation are effected by air,—cold in summer and hot in winter,—being forced by a steam fanner into every apartment. This part of the work was executed by Messrs. Weems, of Johnstone. The asylum will accommodate 120 patients, and the total cost is about 12,500*l.*, exclusive of the price of ground. The whole has been carried out from the designs of Mr. John Honeyman, architect, Glasgow. The builders were Messrs. Lyall & Leckie, and the clerk of works was Mr. C. Henderson.

ST. MARGARET'S CHURCH, TOPSHAM, DEVON.

THE parish Church of Topsham, on the Exe, near Exeter, has been partly rebuilt, and the eastern portion was reopened on the 17th ult. The former church had long been found inconvenient and unsuitable. On the site of the ancient church, of which the tower only remains, a large room (literally), nearly 70 ft. square, was erected about 1790, in a very unbecoming style, with wood windows, and a plaster ceiling, groined into imposts on a few wooden Doric columns. The greater part of this building is now removed, and a good portion of a church, in the Decorated style, is erected in its place, being the chancel, its aisles and transepts, at a cost of 3,700*l.* The nave portion, wanting to complete the edifice, is now commenced. The material is Torbay limestone, with Bath stone dressings. The whole outlay (retaining the old tower) will be about 5,550*l.* The site is rather a favourable one, on a steep bank of the river, and well seen from the South Devon Railway.

The architect is Mr. Edward Ashworth; The contractors are Messrs. Stephens & Son, of Exeter; and the clerk of works is Mr. R. Bradford.

The east window of the chancel (five-light) has the four Evangelists and the Good Shepherd, central, by Drake. There is also stained glass in the north transept window,—eight subjects in our Lord's life,—the gift of Capt. Greatwood, the work of Beer & Driffield; another stained-glass window in the chancel is the gift of the Rev. H. T. Ellacombe, by Hughes.

Memorial.—A bronze statue of the late James Carmichael, engineer, from the chisel of Mr. John Hutchison, R.S.A., has been unveiled in Dundee. The ceremony was held on the centenary of the birth of Mr. Carmichael. Mr. Carmichael was the inventor of the fan-blast, and of many improvements in mechanics. The statue and pedestal rise to the height of 17 ft. Mr. Carmichael is represented in sitting posture examining a plan, with miniatures of his inventions on the plinth.

FINE IRONWORK.

AT the Philadelphia Exhibition, an ornamental pavilion in cast and wrought iron, designed by Mr. Thomas Jeckyll, of London, and manufactured by Barnard, Bishop, & Barnards, of Norwich, is exciting some attention, and justly.

This pavilion, which is intended for use upon a lawn, or ornamental grounds, is 35 ft. long by 18 ft. wide, and 35 ft. high to the extreme ridge. It is mounted upon a dais of four steps. It has two floors, the upper of which is reached by a spiral staircase. It is supported by twenty-eight square columns placed 2 ft. 6 in. apart. The ornament in the shafts of these columns is of a very rich and varied character. At a height of 7 ft. 6 in. from the ground, a transom bar connects the columns. The lower verandah is supported by cast-iron brackets, firmly secured to the columns. The outlines of these brackets are in all cases alike, but the enrichment of their spandrels is varied by bas-reliefs, the subjects of which are studies from the "Apple Blossom, with flying Birds," "Whitethorn, with Pheasants," "Scotch Fir, with Jays," "Sunflower," "Chrysanthemum, Narcissus, Daisy and Grass, with a Crane and rising Lark," &c. These brackets further support the gutter and cresting of the lower roof.

The upper floor is surrounded by a wrought-iron balcony railing, 4 ft. high, of a light and severe design. The upper roof is supported in its turn by twenty columns of a similar design to the lower ones. These are connected by a transom bar, above which is a rich open-work fish-scale panel supporting the upper gutter, with cresting and fans of a like character to the lower ones. The brackets, however, upon these columns are of a different outline to the lower ones, and the spandrels are filled with many designs of a bolder character. Between each bracket, both upper and lower, is an ornamented ceiling of a combined floral and geometrical pattern, the chrysanthemum being taken as the type for its ornament. The roof (the rafters of which are of wrought T-iron) is covered with zinc, in curved tiles, and is surmounted by an elaborately-carved cresting.

One of the most important and novel features of this work is the railing which surrounds the entire building. This is 4 ft. 6 in. high, and is entirely of wrought iron. The sunflower has been taken as the type for its ornament. The railing is divided into seventy-two panels, each of which is occupied by a sunflower 3 ft. 6 in. high, the flower itself being 11 in. in diameter, having carefully-veined leaves, six in number to each flower.

THE CHIMNEY-SWEEPERS ACT.

AT the Huddersfield Borough Police Court, Messrs. Stead & Co., master builders, Cowcliffe, were summoned for unlawfully constructing a chimney by not having rounded off the angle of flue 4½ in., as required by law. Mr. R. P. Berry appeared for defendants.

Mr. Learoyd appeared on behalf of the prosecution, and informed the magistrates that the charge was brought by an inspector of chimneys (Mr. Hill), who was employed by some philanthropists, who, throughout the various towns in the country, had taken up the question, considering by so doing that they were serving humanity. In the first place, they took up the question in reference to the employment of boys in sweeping chimneys, and in the next place they took up the question on the legal ground that the flues ought to be of such a dimension as that chimneys could be swept by brushes so far as domestic dwellings were concerned. The Act of Parliament, in order to do this, provided that there must not be an angle, but a curve, and therefore it was an offence if any one built a chimney with an angle instead of a curve.

Mr. Rowbottom, assistant to Messrs. John Kirk & Sons, architects, Lion Arcade, was then called, and said he inspected four houses, which were being built by the defendants, at Marsh, on the 27th of October last, and found the angles in each acute instead of round, while the "with" between the flues was only about 1¼ in.

For the defence, Samuel Crowther, mason, said he did the mason's work at the chimneys. The chimneys were rounded off, and he was sure it was quite possible to sweep the chimneys with a machine from the bottom. The angle was not chipped off, but rounded with mortar, so that a brush could pass.

The Bench, after a brief consultation, stated that they had given the case very serious consideration, and they felt bound to convict, but at the same time they had decided to convict in the lowest penalty, 10*l.* in each case and costs, in all 21*l.* 2*s.* Other builders were also fined.

THE NEW MINERS' HALL, DURHAM.

THE new Miners' Hall, at Durham, was inaugurated on the 10th inst. by a special meeting of the Council of the Durham Miners' Association. It contains offices for all the leading officials, together with a large public office, committee-room, retiring-rooms, and lavatories upon the ground floor. Upon the upper floor are the large hall, ticket-office, cloak-rooms, smoking-rooms, and other conveniences. The hall is 55 ft. long by 32 ft. broad, and is 22 ft. high. At one end is the raised platform for the speakers, and at the opposite end is a gallery. The hall is lighted by sunlights, and the seating is cushioned throughout.

The building is in the Italian style, and has at the north-western angle a lofty unequal-sided octagonal clock tower, with domical roof covered with lead, and surmounted by lofty gilded finials.

The foundations of the building, when opened, proved to be of the most treacherous nature, the soil being for the greater part nothing but a wet spongy bog, whilst in one portion a quicksand, from which the water rose in large quantities when tapped, had to be dealt with. It is satisfactory to hear, however, that the building has been successfully completed, and that although some portions are heavily weighted,—as, for instance, the tower portion,—nothing in the shape of settlement has taken place. The estimated total cost will be about 9,000*l.* Mr. Thomas Oliver, of Newcastle-on-Tyne, was the architect.

THE GLASS-LINED IRON PIPE.

THIS is an American invention of recent date, and seems an important one in a sanitary point of view. It consists of a wrought-iron pipe, into which a tube of flint glass, one size smaller, is inserted. The space between the glass and the iron is filled with a plastic substance, composed of plaster of Paris and other ingredients, forming an excellent non-conductor. This filling is uniform and perfect, all the air being pressed out of the intermediate space by the process of lining. This connecting substance firmly unites the two materials, and at the same time overcomes the difference of expansion and contraction between the glass and iron. The lining is protected at the ends of the sections of pipe by cement or paraffine, a thin layer of those materials being placed in the space where two ends of the pipes or fittings are screwed together, so as to make perfectly water and air-tight joints. Bends, branches, and connexions, are made by means of glass-lined elbows and tees, and the pipe is put up or laid in the same manner as gas and steam pipes. The pipe is manufactured in lengths of 8 ft. for continuous lines, and such shorter pieces as may be required for special locations. After a line of pipe is completed it should form a perfect inner surface of glass.

THE ADAPTABILITY OF TERRA COTTA.

SIR,—In his paper on this subject, published in a recent issue, Mr. Edmund Sharpe, writing with the authority of experience, assumes that the value of terra cotta as a building material is commensurate with its "solidity." I think that an examination of the best examples of ancient terra cotta would prove the fallacy of the assumption; and, that we possess these examples, proves that their makers knew pretty well what they were about. That its durability is due to the paramount condition of being thoroughly "fired" is undoubtedly true, but this amenability to heat is in its turn dependent upon the antecedent condition of being thoroughly "dry."

The difficulty of drying a solid block is at once apparent. The drying proceeds *from* the surface inwards, thus gradually imprisoning within the block a sufficiency of moisture (and, probably, other latent force) to occasion its disruption under the subsequent heat of the kiln. Thorough "drying" is the prime necessity in obtaining first-rate work, and which being properly carried out, there is little danger of warping under firing.

Some noteworthy examples of the successful manufacture of terra-cotta in considerable bulk may be found in most of the school buildings recently erected by the London School Board. The steps used in these are of hollow terra-cotta, 4 ft. 6 in. long, with a rise of 6 in. and a tread of 10 in., and 1½ in. in thickness of material after leaving the kiln, in which they require to remain a fortnight.

These steps, therefore, are not "solid"; but, to use Mr. Sharpe's words, are solidly built into the walls just as if they were of stone. They essentially form part and parcel of the body and strength of the structure in which they are placed, and I think it must be conceded that, on the point of strength and durability, terra-cotta can hardly be submitted to a more trying test than to fall beneath the daily-reiterated tread of our energetic school children. C. W.

WORKMEN'S TRAINS.

"To live in London or not to live in London" is now the question for the wage-earners. Leave off work at five, a walk home of five minutes, and after that the theatre, music-hall, or tap-room; or a short railway ride toward your own country house and the evening spent in your garden, plant-house, or shop, besides having room to move and good air for the growing family, —that is the question discussed in the *Builder* of the 17th ult. With workmen's trains the latter method is possible, but ought not the Legislature to compel railway companies to issue tickets (weekly if desirable) as late as eight o'clock in the morning, so that warehousemen should get to their business before half-past? Some time back I spoke to a brewer who had to walk between Fulham and Caledonian-road, and a few days back with a pipe-maker who had to be at business at least an hour before time and walk near 1½ mile because no workmen's trains ran between King's-cross and Kensington. If the railway companies obtain exclusive rights, ought they not to use those rights for the public benefit at the most suitable times, and allow the use of passes between District and Metropolitan lines for workmen as well as other persons? JOSEPH CHRETIEN.

"GALVANISED IRON CISTERNS AND PIPES."

SIR,—"Galvanized iron cisterns" are steadily supplanting all other domestic appliances for the storing of water. Builders, a class singularly free from prejudice and the trammels of tradition, long ago recognised the superiority of "galvanised iron cisterns" over those constructed of lead or slate. They saw that they were cheaper, lighter, less likely to get out of order, and that the water drawn from them was cool, pure, and free from all metallic taint and chemical association. If a slate cistern gets leaky, it has to be caulked with gaskot and red lead, and unless the cistern is constantly kept full, the red lead perishes, leaving behind a poisonous powder, which the water absorbs as soon as the cistern is refilled. Your correspondent, "R. B.," in his letter complains that his "galvanised iron cisterns" rust. Now, this is just what good "galvanized iron cisterns" do not do; therefore, in the absence of fuller information, we are drawn to the conclusion that your correspondent's cistern is of inferior manufacture, and badly galvanised. I have had one constantly in use for the last six years, and the "rust" he alludes to is "conspicuous by its absence." W. C. B.

*** Much longer experience than this is needed. Many of the galvanised iron cisterns sold are utterly worthless, and fall into holes in a few years. The question is how long, under various circumstances, will the best last?

PRESBYTERIAN CHURCHES AT LIVERPOOL.

Kirkdale.—The foundation-stone of a new Presbyterian Church, situated at the corner of Stanley-road and Fountains-road, Kirkdale, and which is to be called the Union Presbyterian Church, was laid on the 15th ult. by Mr. Samuel Stitt, J.P. The edifice will be in the Venetian Gothic style of architecture, and is to accommodate 900 persons. Beneath the church there will be spacious schoolrooms, intended to provide for about 600 children. The building will be bounded on the south by Fountains-road, and on the east and west by two streets yet to be constructed. The main entrance to the church will be from Fountains-road. There will be vestries and minister's room, with separate entrances, attached to the church. The estimated cost is about 7,000*l.* Messrs. Thomas Wainwright & Sons, Leigh-street, are the architects. The contract for the building has not yet been let; but Messrs. Wells & Sons provided the foundation-stone and necessary fittings.

Waterloo.—On the same day the memorial-stone of a new church at Waterloo was laid by the Moderator of the Presbyterian Church, the Rev. Dr. Anderson. The church, which is being built at the junction of Crosby-road and Great George's-road, is a substantial brick structure in the Early French Gothic style, with stone and black brick dressings. The dimensions are 85 ft. 6 in. in length by 32 ft. 6 in. in width, and it is intended, when completed, to accommodate 500 persons. The design includes a tower and spire rising some 60 ft. from the ground. Hitherto the congregation have worshipped in the Assembly-rooms in East-street. The new building, including the land, will cost about 5,000*l.* The building operations were commenced about eight months ago, and the church, it is expected, will be opened in the course of another three or four months. The builders are Messrs. Costain & Kneen, of Great Crosby. Mr. Barker, the architect, made a statement as to the details of the building. He said that in the nave of the church there would be sittings for 323 persons, but there would be an end gallery, in which the organ would be placed, and in that gallery there would be sittings for 40 people, making a total accommodation for the present for 363. As soon as the funds permitted they proposed to couple two transepts, which would give extra accommodation for 168, thus making a total accommodation for 531. The present contract was for 3,200*l.*

PRESBYTERIAN CHURCH, BLYTH.

THE new English Presbyterian Church at Waterloo, Blyth, was opened on the 6th ult. The building forms a commanding architectural feature. The lofty nave, and the tower and spire, are visible for miles around, and from far out at sea. The principal front, with the partly-detached tower and spire rising straight from the ground, the large buttresses to the nave, with sunk and traceried panelling and carving, the deeply-recessed doorways, and the exceedingly lofty traceried windows, are its characteristics. The chancel arch is executed in stone, and supported by marble columns. Within the chancel is placed the platform, of somewhat larger and more ornate character than usual. Accommodation is provided for between 700 and 800 persons. The estimated cost is from 4,000*l.* to 5,000*l.* Provision has been made for the erection of a large school room. Mr. Wm. Winship has acted as clerk of the works; and the contractors were Messrs. White & Sproat for the excavation, mason and bricklayers, and carpenter and joiner's work, also the slater's and plasterer's works; Mr. T. Walker for the painter and glazier's works; and Messrs. Walker & Elmley for the ironfounder's, plumber's, and engineering works. Mr. Thomas Oliver is the architect for the building.

CHURCH-BUILDING NEWS.

Putley (Herefordshire).—Putley Church, near Ashperton, on the Hereford and Worcester line, has been reopened, after restoration under the direction of Mr. Thomas Blashill, architect, London. The church formerly consisted of a nave, with a wooden south porch, and a square wooden belfry, which was probably erected about 1799, a chancel, and a small modern vestry. Every portion was in a state of extreme dilapidation, though the building had been renewed from time to time, and but little of the ancient architecture remained when the work of restoration was lately commenced. The work of restoration was commenced last June. The north wall of the nave and the greater part of the chancel and vestry have been rebuilt, and a new timber belfry has been provided. The fittings throughout the church are new, and there are a new heating apparatus, new deep drainage, and new roof coverings. In the restoration of the church some interesting relics were found. In the *debris* of the north wall of the nave a considerable quantity of fragments of Roman bricks, roofing tiles, coarse pottery, and mortar was found, which would lead to the belief that a Roman building of some description once existed on or near the spot. These "footprints on the sands of time" have been carefully preserved. The old east window was a single light, 3 ft. 1 in. wide, and was evidently composed of the fragments of an older window which it in turn replaced. Some exception was taken to the proposal made by the architect to replace it by a new three-light window. He found a precedent for his proposition in the fact that the jambs of an old three-light window were still *in situ*. A new roof of trussed rafters has been put to the chancel, and the old fifteenth century roof of the nave has been cleaned and repaired. All the roofs are covered with Broseley tiles. The modern belfry still retained fragments of the ancient pyramidal-roofed structure, of which an illustration was given in the *Gentleman's Magazine* for 1795, from a sketch by James Walthen. The new belfry is made of similar design. The whole work has cost over 1,300*l.* The works have been carried out by Messrs. Collins & Callis, of Tewkesbury.

Newabbey.—The foundation-stone of a new parish church at Newabbey has been laid by Mr. Oswald, of Auchencruive and Cavens. The new church, of which Mr. Barbour (of the firm of Halliday & Barbour, Dumfries) is the architect, is a Latin cross on plan, the main part of which will measure internally 73 ft. by 25½ ft., and be placed due east and west; and the transept arms of the north and south will each measure 17 ft. 9 in. in width, and project 11 ft. 3 in. In the northern angle of the building will be placed the vestry, measuring 9 ft. 3 in. by 7 ft.; and in the centre of the south side wall will be the porch—an open one—measuring 12 ft. by 8 ft. The number of sittings to be provided for is 400. The roof will be open, the principals being framed with carved struts springing from stone corbels in the walls, and over the principals will be purlins, rafters, and sarking—all cleaned. The principals and purlins will be of pitch pine, and the rafters and sarking of white pine. The walls will be built of granite rubble and red freestone dressing. The style adopted is thirteenth-century Gothic.

Letheringsett.—Letheringsett Church has been re-opened, after restoration (with the exception of the circular western tower). The church, which is of the early Norman period, is supposed to have been built, or else restored and enlarged, by Grimbauld Bacon, a Saxon, who settled in Letheringsett, or Leringsett as it was then called, soon after the Conquest. The long and short work at the east corner of the north aisle and the round tower, together with its non-parapeted and pyramidal roofing, are thought to be the remains of Grimbauld's church fabric, and probably much of the side walls are of the same date. The chief work of restoration in the present instance, in addition to the usual repair of defects and removal of worthless fittings, has been the return to the original level of the floor in the nave and aisles; the bases of the clustered columns having been found buried 12 in. under a modern brick pavement. The internal proportions of the building obtained by the removal of this pavement have thus been set right and the ascent to the chancel increased by two steps. The arcade used to finish eastwards with what appeared to be half columns, but these proved to be entire clustered columns like the others, but half enclosed by masonry. This masonry has been removed so as to disclose the columns, and to enable archæologists to determine what may have been the original or intended form of the church. The east window has been filled with stained glass (by Preedy), representing the Ascension. The internal sill level of the old window has been retained, and used as a shelf, upon which a stone reredos has been placed, with a black marble super-altar, the gift of the architect. All the fittings throughout the church are new, and as there were no old ones to dictate a restoration, they have been designed as nineteenth-century work. The whole work has been carried out by Mr. Chapman, of Hanworth, from designs and under the superintendence of Mr. E. J. Tarver, architect, London.

Hastings Town Hall.—The Town Council are certainly unfortunate. What was stated by those who took this question in hand in November last, and whose opinion was cast on one side as worthless, and which was again pressed by Mr. Alderman Williams in Council as to the right of the Town Council to erect the proposed building upon the Central Cricket Ground, in Meadow-road, has after seven months been discovered to be true, as it is stated the Council are now advised that the property in question is trust property. The land is to be used for recreation purposes and cannot be used for public building, unless every subscriber consent to the arrangement; but Mr. Williams was told the law propounded by him was bad, and if the consent of the Cornwallis Trustees were obtained any building could be erected, and this has proved to be an error.

DISSENTING CHURCH-BUILDING NEWS.

Newcastle-on-Tyne.—On June 5th, the corner stones of a new United Methodist Free Chapel at Bulman Village were laid, the present chapel at Bulman Village having been found to be too small. The new chapel, which will provide sittings for 730 adults, is to be built from plans by Messrs. Septimus Oswald & Son, architects, Newcastle, at the junction of the West-avenue (a newly-formed street on the Gosforth Park Estate) and the North turnpike road. The architecture of the chapel is English Gothic of an early type, with a trace of French feeling in some of the details. The walling throughout is to be of "snecked rubble," with chiselled ashlar dressings. The extreme internal dimensions are 82 ft. by 43 ft., and 38 ft. high. The estimated cost of the building is upwards of 4,000*l.*, and with the price of the site the total cost will be about 5,000*l.* The contractors for the whole of the structural works are Messrs. Henry Hudspith & Son, their sub-contractors being:—Messrs. Wylie for joiner and carpenter's work; Messrs. G. & T. J. Waite for plumbing work; Messrs. J. Montgomery & Son are the contractors for plaster work, and Mr. C. S. Wardroper (Bulman Village) for painting and glazing.

Reading.—A new Congregational church is about to be erected in this town as a mission church to accommodate a body who have for some time past held services in a schoolroom. Messrs. Wm. & J. T. Brown & F. W. Albury are the architects.

SUUM CUIQUE.

ON the stairs of the Delavan Hotel, at Albany, New York, there is a marble slab, upon which there is the following inscription:—

"Delavan House, erected 1845.
J. W. Adams and J. P. Kirkwood, Architects.
William L. Woollett, Jun., Superintendent.
Enlargement completed, 1849.
Enlarged and improved, 1856.
W. L. Woollett & E. Ogden, Architects.
W. Delumano, Decorative Artist.
James W. Eaton, mason; John N. Parker, carpenter; William Gray, stone-cutter; Ridgway, Russ, & Nesbitt, plumbers; Iva Porter, painter and glazier; W. Mansig, gas-fitter and steam work; Dixon & Munson, marble work; Pruyn & Lansing, iron work; Hoch Strasser & Blachall, bell-hangers; Steele & King, paper-hangers; Henderson, Kennedy, & Kneeland, grates; Richardson & Barrett, tinmen; Van Hewson & Charles, gas-fixtures, Aubin Gas Works; H. Gilbert, foreman carpenter; P. Mansfield, foreman mason."

To make the list complete, the name of the man who mixed the mortar ought not to have been omitted. Is the tablet a proof that those who were employed "took it out" in advertisement? H.

Books Received.

Architectural Ironwork: a Practical Work for Iron-workers, Architects, and Engineers, &c. By WILLIAM J. FRYER, Jun. Illustrated. Willey & Sons, New York; Trübner & Co., London.

THIS book, the lengthy title-page of which designates it as written generally for "all whose trade, profession, or business connects them with architectural ironwork," and as including "valuable suggestions for the successful conduct of business," is apparently a practical ironfounder's experience put into systematic form, as a general book of hints and reference for those engaged in ironfounding, and the application of ironwork in building. "Years of study, observation, and hard practical toil were the price of the author's thorough knowledge of this class of work," he tells us, and the book conveys the idea that this is the case, and that the writer has drawn his conclusions from practical observation, combined with a good deal of thought and shrewdness.

In regard to the bulk of the book, the practical directions for carrying out iron construction, we observe nothing new; but the book may be said to be generally very full and very systematically compiled. There are sufficient diagrams to render clear every point in construction that is described, and the pages bristle with tables of figures for simplifying calculations and ascertaining the proper proportions between load and sectional area, and other such prac-

tical problems. Some other suggestions which are special to the book are in relation to the conduct of the ironfounding business, and are worth attention. The author strongly urges keeping an accurate account of the cost of material and labour on each separate job turned out, and on all the different portions of the work, as the only way of arriving at a certain knowledge of how the business is prospering, and of getting a basis for safe and reliable calculations of cost in future work. The reason that many ironworkers, after doing a large business, find themselves at the end of the year little better off, is that they have neglected a thousand and one small items in making their estimates, and, in fact, have practised a system of self-deception. It is true, observes the author, that the man who has fixed a line of prices upon accurate calculations will often find work apparently leaving him because he cannot compete with the lower prices of less careful estimators. But "such a man need have no regrets. Let him confine himself to such articles as do pay, or raise the standard of his work so as to command a superior price in the market." More money, he observes, is made or lost in the foundry than in any other department. This part of the work should be superintended by a foreman possessing practical ability in the turning out of good castings, rather than one full of scientific theories. The foundry business, also, is "peculiar" in one respect. "The manager has continually to overcome a tendency to name lower rates per pound in taking orders than the facts of the real cost of production warrant. The business is carried on for the purpose of making money, and that aim needs to be constantly enforced by thorough and systematic management of and reference to tables of costs." This is good, sound, wholesome advice; but we should hardly say the tendency referred to was "peculiar" to the ironfounder's business.

The only fault we find with the book is in reference to the first word of the title (which had better have been "*Practical* Ironwork," than "*Architectural* Ironwork"), and some of the reflections which have reference to that view of the subject. The author has aimed at doing something to improve the nature of architectural design in iron, in regard to which he observes that "there is a growing discrimination between the true and the false in this branch of productive industry. A higher order of taste is being developed, and the tendency is towards more finished and more ornamental work": a state of things which, though "encouraging," involves an increased expenditure in pattern-work. But Mr. Fryer, though meaning well, and in some respects writing sensibly on this point, has not got hold of the principle of the matter quite. He thinks architectural character in ironwork is to be ensured by conforming to the details and style that have long been accepted as good in masonry design. "The principles of architecture," he says, "which have endured so long, will remain for ever, simply because they embody true taste and common sense, both of which the public have and understand." If the public in America have it, they are better off than the public in England; but, as Hamlet says to Polonius,—"Your news is not true." Mr. Fryer is quite correct in saying that the principles of architecture are those of common sense, and will remain for ever; but he seems to think "the principles of architecture" consist in certain forms, such as cornices, modillions, columns, &c. The said principles, on the contrary, consist in the effective treatment and ornamentation of material in the way best suited to its qualities and its manner of construction; and the author's specimen of an iron-fronted building (p. 81) is directly contrary to the principles of architecture. It is a sham altogether. Columns and pilasters of Classical proportions, and with elaborate foliated capitals, are used, and pedestals and panelling—all the details belonging to a masonic style, and having no affinity or relation with iron at all. He complains in one place that some persons call iron a sham, and that it is no more so than a stone front, which he calls a veneer front to a brick wall. But the stone front is built up with the brick wall and bonded to it, and partakes of the same construction; whereas Mr. Fryer's iron front is iron imitating stone in every point; a tensile material imitating a compressile material. His entire want of realisation of the problem is shown in other passages. Iron, he says, is "the best material for American street architecture," and on that point we will not undertake to contradict him here; it may or may not be; but he proceeds to say "whatever moulding is good in stone, for projection and general outline, is good in iron." The statement would have been much more like the truth if it had run "is *not* good in iron." Iron requires a totally distinct treatment from stone; a much lighter treatment, and one in which the putting together, the construction, is clearly shown. In his typical front the nature of the construction is entirely masked and falsified, and made to look as if built up instead of, as it really is, tied and bolted together. He shows in one place a drawing of a heavy cornice in iron, with the section of an Italian stone cornice, only a mere empty shell. Such a thing is simply an insufferable sham, one of the worst that could be made. The Corinthian capital stamped as a decoration on the back of the book is enough in itself to show how little Mr. Fryer is acquainted with the real nature of the problem before him. Such a capital, with its leaves cast and filed up separately and riveted on, is a piece of clumsy humbug in design, the only use of which is to provide something that will pass muster with the general public, and save the trouble of thinking how best to treat the material decoratively at that point, and at the same time suitably. The author inveighs against those who treat iron in such a merely utilitarian way, using it in thin and starved proportions. They may not do it artistically, but they are more likely to be in the right with a purely practical treatment, than Mr. Fryer with his iron front imitating a stone-built edifice. One of the reasons given for the superior suitability of iron fronts is that they can be painted so frequently, and are always, therefore, fresh and new and inviting, and that if a man has a "store" with a stone front next door to one with an iron front, the latter, with its annual spring coat of paint, will be much more attractive to customers than the stone front without paint, and in which presently every stone assumes a different tinge or colour; which seems to be thought very untidy in America. Indeed, one proprietor who rejoiced in a marble front had to give in, and have it painted, in order to keep pace with his neighbour of the iron front. Comment on this, as the papers say, "would be superfluous."

In short, Mr. Fryer unfurls the iron-founders' flag, though in a perfectly open and honest manner, and with an evident wish to fight well under that standard. But before he talked so much about architectural common-sense, he should have learned a little better in what it consisted, and what manner of constructive design is really suitable for the nature of iron. He speaks very feelingly in one place of the mischief which every building in bad taste or dishonestly designed exercises, more or less, in lowering the general public taste; but if he is building or putting up iron fronts, after the model illustrated in his pages, he himself is a far greater culprit in this way than he appears to be the least aware of.

VARIORUM.

"THE Peasant's Home, 1760—1875" (Stanford, Charing-cross), is the title of an essay by Edward Smith, F.S.S., to which the Howard Medal was awarded by the Statistical Society. The author's personal attention to the subject seems to date from a very recent period, and the book is a mere compilation. Still it may be useful. —— "Handbook of Rural Sanitary Science," edited by Dr. Lory Marsh (Smith, Elder, & Co.), is, like the last-named work, the result of an offered premium for an essay, but of a much higher character. It includes the pith of four of the essays sent in. The editor thinks it may prove useful to justices of the peace, the clergy, sanitary officers, and others. So far as regards the justices and the clergy, we fully agree with him, read, and learn; but the sanitary officers who find and hope the classes in question will buy read, much that is new are scarcely fit for their position.——"He that overcometh" is the title of a clever tale, in two volumes, by Miss Fanny Aiken-Kortright, better known as the author of "The Dean," just now published by Remington & Co. The characters are clearly discriminated, and the story is full of incident and very interesting. Like all that Miss Kortright has written, it may safely be placed in any hands.——*Belgravia* is going ahead. A shilling number which includes a story by Chas. Reade, a poem by Algernon Swinburne, a serial story by Miss Braddon, and another by E. Lynn Linton, with illustrative engravings, and much other writing, must be pretty sure of a large circulation.

Miscellanea.

Freemasonry and Architecture. — Mr. Emra Holmes, in "Notes on the Old Minute Books of the British Union Lodge, No. 114, Ipswich," in the *Masonic Magazine* for June, says:—"We have alluded to the introduction of operative masons into our order as testified in these records, and we are disposed to suggest that Grand Lodge, the Supreme Council 33°, and Grand Mark Lodge especially as being perhaps most nearly allied to operative masonry, should foster the study of architecture in every way. Why should they not, for instance, give a gold medal away every year to the writer of the best paper on architecture or archæology, or any kindred subject, or the best design for cathedral, church, castle, or mansion? Would it not be a good thing if operative masons were encouraged to join us by being admitted at a lower fee, and in the case of the A. and A. Rite we believe it would popularise that Rite and make it much more useful if all architects were given up to the 12th degree, that of Grand Master Architect, for a nominal fee on taking the usual obligation of allegiance to the S.G.C. 33°. Further we submit that such offices as Grand and Prov. Gr. Superintendent of Works in the Craft, and Grand Inspector of Works in the Mark Grand Lodge, should be confined exclusively to professional architects or civil engineers, or to such as have made architecture and archæology their peculiar study. We have known drapers appointed to such offices who did not know what archæology was. The restoration of churches and cathedrals and the preservation of castles and other places of historical interest ought to be a matter of the greatest possible interest to the three great Masonic bodies we have named; and Freemasons at large, if they are worthy of their descent, and believe at all in the traditions of the Order, should surely show as keen a delight in these records of the past,—these monuments of history,—as do the outer world, who are not Masons. But do they? That is the question."

Discovery at Stoke-upon-Trent.—A few days since an interesting relic was discovered in the churchyard of the parish church of Stoke-upon-Trent. In digging a grave on or near the site of the church which was taken down when the present modern church was erected, the workmen came upon what (according to the *Staffordshire Advertiser*) is to all appearance the shaft of a churchyard cross of the eleventh century. It is quadrangular in shape, and the ornamentation bears a general resemblance to that of several other Norman crosses still existing in the county. On one side is a plain treatment of a trefoil leaf and stalk, on another a chain ornament, on the third a guilloche, and on the fourth a "key pattern" of the simplest kind. The old church at Stoke had a round-headed chancel arch and other indications of a Norman church having once existed, but the chancel, at the time of the removal of the church, was Early English, and the nave and tower were of considerably later date. The shaft has been dressed to form a door lintel, and it may fairly be inferred, from the position in which it was found, that it once formed the lintel of a priests' door in the south wall of the chancel.

"Fires in Cathedrals."—Mr. Frederick S. Waller, architect and diocesan surveyor and surveyor to the Dean and Chapter of Gloucester, writes from Gloucester:—"I venture to ask space for a few lines to relieve anxiety as regards Gloucester Cathedral, and to show that there has been no neglect of duty on the part of the authorities here. In 1872 I adopted the same course that Mr. Ferguson had recourse to in 1874: I wrote to all the cathedral authorities, asking for information as to the means adopted by them to guard against the destructive effects of lightning. From nearly all replies were received. I submitted to the chapter a report upon the whole subject, and, after much consideration devoted to it, the following costly works were at once ordered and carried into effect:—1. The whole of the cathedral was protected by lightning conductors, on the same system as that used in her Majesty's Navy. 2. Water-pipes of ample dimensions, with hydrants at intervals of 110 ft., were laid all round the building, connected with the largest main from the city works; and many other safeguards were adopted in this cathedral. ——The Dean and Chapter of Winchester, with a view to protect the cathedral in case of fire occurring, are about to place a tank, containing 1,000 gallons of water, on the top of the building.

Penny Banks and Thrift.—A meeting was held on the 20th ult. at the Belle-isle Mission-hall, Metropolitan Cattle Market, in order to further the establishment of a branch of the National Penny Bank (Limited) in that neighbourhood. Mr. George C. T. Bartley (general manager of the bank) having explained the principles of the institution, the Right Hon. C. E. Childers, M.P., who occupied the chair, said that as one of the trustees of the bank, and as one who took an active and lively interest in the success of the undertaking, he certainly hoped to see very shortly a flourishing branch of the establishment at work in the vicinity. He thought that those persons who had the welfare of the country at heart could do nothing better than encourage thrift, especially among the working classes. Thrift should be encouraged from one end of the land to the other, and he thought that the bank of which he was speaking gave great facilities for the cultivation of those habits of thrift on which the future of the country so much depended.

The Employers and Workmen Act.—At the Lambeth Police Court, last week, a bricklayer named Steer, who was accompanied by a dozen fellow-workmen, waited on Mr. Chance and raised a point of some importance under the Employers and Workmen Act. He wished to know whether, when men were kept waiting for their money, they were not entitled to pay for an hour's time. They left off work at one o'clock on Saturday, and were not paid until half-past two o'clock. Mr. Chance was of opinion that if workmen gave notice that they should expect to be paid for waiting after a specified time, he should be disposed to grant a summons. If, however, after notice, a master declared that he would not be bound by such a notice, and men kept in his employ, there would be no remedy. Steer thanked the magistrate. The matter was of interest to workmen generally, as they were frequently kept waiting beyond a reasonable time for their money on pay-days.

The Thames Toll Bridges.—At a meeting of the Richmond Select Vestry, on the 20th ult., some discussion took place with reference to the Toll Bridges (River Thames) Bill, the vestry having at a previous meeting resolved to oppose the Bill as it originally stood. Mr. E. C. Dermer stated that he had some conversation with Mr. Alderman M'Arthur, the promoter of the Bill, and the latter expressed his willingness that the Metropolitan Board of Works should pay the compensation for taking to the bridges, and that the counties of Middlesex and Surrey should make an annual payment. The subject was brought up at a meeting of the County Finance Committee of Surrey last week, at which Mr. Cubitt, Sir H. Peek, Sir Trevor Lawrence, and others, were present, and it was then thought that the proposal of Alderman M'Arthur would be exceedingly acceptable to the county.

Short Time at the Crewe Engine Works.—A Manchester paper announces that, commencing with this week, the whole of the men employed in the great locomotive works of the London and North-Western Railway Company at Crewe, to the number of 7,000, have been put upon short time. This means that the men will leave their work on Friday night, and not resume it till breakfast-hour on Monday, making only five days. This has resulted from three causes:—1. A decision in the Court of Chancery restraining the London and North-Western Company from making engines for other companies; 2. The introduction of superior machinery by the chief engineer, Mr. Webb; and 3. By the depression in trade.

The Arundel Society.—During 1875 the financial prosperity of this society, which seemed to have met with a slight temporary check in the preceding year was, according to the annual report just now published, fully restored. The gross receipts amounted to 7,187*l.*, a total which exceeds that of 1874 by more than 1,000*l.*, and is only surpassed by that of 1872, a year which had before been noted as exceptional in the society's history. The increase of income last year was accompanied by a more than equivalent increase of expenditure; but this, when explained, is no cause for dissatisfaction.

Art Exhibition at Southampton.—The annual exhibition of works of art at the Hartley Institution, Southampton, was opened on the 20th ult. The exhibition comprises about 800 examples of high-class painting in oil and water colours, drawings, etchings, &c., and a selection of objects from South Kensington Museum.

Technical Education of Bricklayers.—A second meeting in furtherance of the social as well as trade condition of bricklayers was held on the 21st ult. at the Artisans' Institute, St Martin's-lane. After the committee appointed at the last meeting had presented their report, a permanent committee of ten bricklayers was appointed, and it was arranged that a class for technical instruction should at once be formed, and twenty-eight men from the body of the meeting handed in their names as students, and paid their entrance fee of 1s. each.

Architect to the North-Eastern Company.—Mr. William Peachey, architect, of Darlington, has been appointed successor to the late Mr. Burleigh in the post of architect to the North-Eastern Railway Company. Mr. Peachey has been for twenty years architect for the Stockton and Darlington Railway Company, including the period during which that company's district has been part of the North-Eastern system. The appointment will necessitate the removal of Mr. Peachey to York.

Fatal Fall of a Building in Sheffield.—On the 22nd ult. an accident, involving loss of life and great damage to property, happened at the South Yorkshire Steel and Iron Works of Andrew S. Burrows & Co., Pothouse-lane, Attercliffe, Sheffield. Without any warning the lofty and heavy wall dividing the steel warehouse and the rail-mill fell, killing George Smith (33) on the spot, and injuring another. Mr. Burrows narrowly escaped.

Ebury-square.—The Duke of Westminster has asked the Board of Works to take upon lease from his Grace the ornamental garden known as Ebury-square, Buckingham Palace-road, Pimlico, to be thrown open to the public in the day-time throughout the year, the Board paying the expense of the police, and of maintaining the garden and the railing.

Tamworth School Board.—The designs of Messrs. R. J. & J. Goodacre, architects, of Leicester, have been selected, in a limited competition, for the above schools. The other competitors were Messrs. Giles & Brookhouse, of Derby, and Mr. Basil Champneys, of London. The schools are intended to accommodate 800 children.

Hogg's Ventilating Company.—The system worked out by this company for ventilating dwellings and other buildings seems very well calculated to be effective, and we have no hesitation in advising such of our readers as really desire to have properly-ventilated houses to apply to the Company for assistance.

Statue of Tyndale.—The Board of Works has granted the use of a site in the garden of the Victoria Embankment for a monument to William Tyndale. The design for the monument will be submitted to the Board for their approval.

The Paris Exhibition, 1878.—It is proposed to fix the sum to be subscribed by the City of Paris towards the fund for the Exhibition of 1878 at 200,000*l.*

TENDERS

For proposed vestry-hall and offices, for the parish of St. John, Hampstead, with Portland cement dressings. Quantities by Mr. Abbott. Messrs. Kendall & Mew, architects:—

	Bath stone dressings extra.	Portland stone dressings.
Beach Brothers ...	£11,822 ... £1,829	... £2,439
Carter ...	10,270 ... 1,170	... 1,970
Manley & Rogers	10,130 ... 2,270	... 2,270
Bunor ...	9,807 ... 1,930	... 2,840
Tyerman ...	9,570 ... 1,284	... 2,552
Burford	9,472 ... 979	... 1,745
Temple & Foster ..	9,048 ... 1,057	... 2,169
Crockett ...	8,999 ... 1,454	... 2,026
Garrud ...	8,990 ... 1,300	... 3,350
Hunt ...	8,508 ... 1,755	... 2,517
Shepherd ...	8,503 ... 1,100	... 1,900

For mortuary, fence walls, &c., to public recreation ground, for the parish of St. George-in-the-East. (First contract.) Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Hearle ...	£1,335 0 0
Ennor ...	1,311 0 0
Palmer ...	1,268 0 0
Manning & Dowdney (accepted)	1,250 0 0

For rebuilding the Roebuck public-house, Cannon-street-road, E. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Grimwood ...	£3,373 0 0
Coleman ...	3,224 0 0
Palmer ...	3,175 0 0
Ennor ...	3,079 0 0
Bennett ...	2,998 0 0
Manning & Dowdney (accepted)	2,990 0 0

For Cinderford drainage. Messrs. Gotto & Beesley, engineers:—

Brock & Bruce ...	£8,035 0 0
Coleman Bros. ...	7,438 0 0
King ...	7,000 0 0
Flewitt & Henderson ...	6,700 0 0
Cowdery & Son ...	6,733 0 0
Dickson (accepted) ...	5,675 0 0
Marfell ...	5,543 0 0

For alterations and decorations, Sydenham. Mr. Robert J. Worley, architect:—

	Decorations.	Billiard-room, &c.
Land ...	£130 12 6 ...	£64 17 0
Howe ...	94 0 0 ...	535 0 0
Smith ...	93 0 0 ...	420 0 0
Vincent ...	94 0 0 ...	406 0 0

For rebuilding the Castle tavern, Moorgate, for Mr. T. Norton. Mr. R. Roberts, architect:—

Coleman ...	£5,835 0 0
Kiddle & Son ...	5,799 0 0
Ashby & Horner ...	5,783 0 0
Rider & Son ...	5,687 0 0
Hart ...	5,584 0 0
Perry ...	5,535 0 0
Newman & Mann ...	5,529 0 0

For two studios, Stanley Gardens, England-lane, South Hampstead, for Mr. Auguste Ballin. Messrs. Batterbury & Huxley, architects. Quantities supplied:—

Warne ...	£1,155 0 0
King (accepted) ...	1,100 0 0

For the enlargement of Grayshott-road chapel, Batterseas. Mr. A. J. Rouse, architect. Quantities supplied:—

Wilde ...	£1,433 0 0
Bland ...	1,384 0 0
R. & E. Smith ...	1,321 0 0
Grieve & Littlejohns ...	1,250 0 0
Moy & Giles ...	1,200 0 0
Tull ...	1,165 0 0
Hobern ...	1,160 0 0
Jopling & Co. ...	1,149 0 0
National Co-operative and Contractors' Society, Limited ...	1,100 0 0
Lose ...	1,055 0 0
Hocking (accepted) ...	1,040 0 0

For the erection of cottages in the Boston-road, Walthamstow, for Mr. J. Coningsby:—

Thomason (accepted) ...	£200 0 0

For new roof and ceiling, painting, and sundry work, at the Queen's Arms, Hackney-road, for Mr. B. Phillips. Mr. H. W. Buist, architect.

Thomason (accepted) ...	£168 10 0

For additions to the stores at the Bethnal-green Industrial Schools, Leytonstone, for the Guardians of St. Matthew, Bethnal-green. Mr. W. Munday, architect:—

Stamp & Bowdle ...	£119 10 0
Taylor ...	116 10 0
Wire ...	109 12 0
Judd & Hastings ...	103 11 0
Arber ...	98 0 0
Thomason (accepted) ...	97 10 0

For enlarging chancel of St. James's Church, Hampton Hill, for Rev. J. F. Fitz Wygram, M.A. Mr. W. Wigginton, architect:—

Falkner (accepted) ...	£630 0 0

For St. Barnabas Parsonage, Grove-road, Bow, for Rev. Mr. Barnes. Mr. W. Wigginton, architect:—

Falkner (accepted) ...	£1,819 0 0

For Lewes Skating Rink (exclusive of iron roof and asphalte floor):—

Harman ...	£498 0 0
Cheesman & Co. (accepted) ...	478 0 0
Steer ...	465 0 0

For the erection of a villa residence, at Finchley, for Mr. Albert Saunders. Quantities by Messrs. Rogers & Vining. Mr. Walter Graves, architect:—

Cooper (accepted) ...	£2,340 0 0

For erecting additions to surgery, &c., to Westbury House, Willesden, for Dr. H. Braithwaite. Mr. Walter Graves, architect:—

Tilbury (accepted) ...	£144 0 0

For erecting additions to "Ellerslie," Nicol-road, Willesden, for Mr. Wm. Burgess. Mr. Walter Graves, architect:—

Horne (accepted).

For rebuilding a warehouse, Wood-street, City. Messrs. Ford & Hesketh, architects:—

McLachlan & Son ...	£5,291 0 0
Adamson & Son ...	4,941 0 0
Perry & Co. ...	4,917 0 0
Kirk & Randall ...	4,834 0 0
Ashby Bros. ...	4,871 0 0
Peto Bros. ...	4,858 0 0
Downs & Co. ...	4,817 0 0
Browne & Robinson ...	4,719 0 0
Brass ...	4,697 0 0
Newman & Mann (accepted) ...	4,536 0 0

For the erection of villa residence, at Fairfield-road, Chesterfield, for Mr. H. Slack. Messrs. Rollinson & Son, architects:—

Pattinson & Co. ...	£1,499 0 0
Hoole & Handby ...	1,390 0 0
Madin ...	1,343 10 0
Slim ...	1,342 0 0
Greenwood ...	1,281 0 0
Forrest (accepted) ...	1,280 0 0

For residence in Corporation-street, Chesterfield, for Mr. J. Carnegie. Messrs. Rollinson & Son, architects:—

Forrest ...	£2,933 0 0
Tutin ...	2,917 0 0
Marriott ...	2,760 0 0
Wright & Madin ...	2,657 0 0
Slim ...	2,586 0 0
Wright ...	2,583 0 0
Greenwood ...	2,578 0 0
Saul (accepted) ...	2,540 0 0

For main drainage works, Bolsover and Pilsley (Derbyshire), for the R. S. Authority of Chesterfield Union district. Messrs. Rollinson & Son, engineers:—

Bolsover.		Pilsley.
Stevenson..... £1,713	...	Pallinson & Co. £840
Pallinson & Co. 1,570	...	Barber & Miles 558
Barber & Miles* 1,520	...	Stevenson*..... 550

* Accepted.

For new hall for the Carpenters' Company. Mr. W. W. Pocock, architect. Quantities by Messrs. Thomas Chamberlain & S. B. Wilson:—

Ashby Brothers	£32,879	0	0
Killby	32,547	0	0
Willson Brothers	32,279	0	0
Fish	32,200	0	0
Patrick & Son	31,230	0	0
Browne & Robinson	29,997	0	0
Morter	29,923	0	0
Perry & Co.	29,453	0	0
Brass (accepted)	28,992	0	0

For new stabling, &c., for the Lewisham District Board of Works. Mr. John Carline, engineer. Quantities by Messrs. Selby & Rogers:—

Major	£3,328	0	0
Burchell	3,193	0	0
Amer	3,170	0	0
Payne & Balding	2,867	0	0
Thomas	2,700	0	0
Mowlem & Co.	2,700	0	0
Rider & Son	2,428	0	0

For repairs to the exterior of St. Jude's Church, Whitechapel. Mr. W. A. Longmore, architect:—

Read & Son	£368	0	0
Killby	265	0	0
Jacobs (accepted)	252	0	0

For rebuilding premises, 67A, Bishopsgate-street, for Mr. Gibson. Mr. G. Fowler, architect:—

Wells	£2,765	0	0
Borrows	2,732	0	0
Barlow & Co.	2,730	0	0
Sharp & Co. (accepted)	2,726	0	0
Miter	2,400	0	0
Pritchard	2,339	0	0

For rebuilding house, St. John's-square, Clerkenwell. Mr. R. Norman Shaw, architect:—

Ryder & Son	£1,568	0	0
Cooper	1,550	0	0
Lascelles	1,465	0	0
Braid & Co. (accepted)	1,390	0	0

For residence at Mill Hill, for Mr. W. Austin. Mr. R. Norman Shaw, architect. Quantities by Messrs. Franklin & Andrews:—

Hill & Higgs	£4,840	0	0
McLachlan	4,485	0	0
Jarrett	4,415	0	0
Lascelles	4,350	0	0
Tyerman	4,343	0	0
Braid & Co.	4,250	0	0
Brass	4,078	0	0

For rebuilding Nos. 2 and 3, Tothill-street, Westminster. Mr. John Groom, architect:—

Allen	£2,106	0	0
Braid & Co.	2,100	0	0
Heath	2,054	0	0
Gough	1,998	0	0
Mansell & Charlton	1,989	0	0
Crabb	1,918	0	0
Long	1,905	0	0
Wagner	1,630	0	0

For a mansion, Chislehurst, Kent, for Mr. G. Emmett. Mr. Peak, architect. Quantities by Mr. W. T. Glan:—

Broker	£7,970	0	0
Rivers & Co.	7,890	0	0
Meman & Co.	7,847	0	0
Sharp & Co. (accepted)	7,843	0	0

For the erection of nine cottages, at Flint, for Mr. Robert Hughes, Coleshill, Flint:—

Lloyd	£1,143	0	0
Williams	1,083	12	0
Lloyd	1,045	0	0
Williams & Bevan	1,008	9	7
T. H. Evans	993	0	0
Astbury	987	10	0
J. Evans (accepted)	954	13	6

For alterations and repairs at the Britannia tavern, Mare-street, Hackney, for Mr. Finch. Edward Brown, architect.

Stamp & Bowtle	£7	7	0
Marr	724	0	0
Salt (accepted)	655	0	0

For alterations at the Lock and Key, West Smithfield, for Mr. H. Walker. Mr. Edward Brown, architect:—

Heeps	£228	0	0
Lister (accepted)	210	0	0

Warehouse, Croydon.—Instead of "Kingland" (p. 652), read "Ridge & Kingsland."

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The Builder.

VOL. XXXIV. No. 1744. SATURDAY, JULY 8, 1876.

ILLUSTRATION.

The Votive Church, Vienna.—Herrn H. Ferstel, Architect 664, 665

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Kensington House.



ANY of our readers must have noticed the gradual growth of a large stone mansion, consisting of centre and wings, in the Kensington High-road, and many more have heard rumours as to the sale of it by the well-known gentleman for whom it has been built, first to one distinguished personage and then another. Some reticence has been shown as to the communication of information, and nothing has yet been said as to the arrangement of the interior. A few particulars will, doubtless, be found interesting. Kensington House has been built from the designs and under the continuous personal superintendence of Mr. James Knowles, architect. The site comprises about 7½ acres of freehold land, which four years ago was chiefly covered by one of the worst and most squalid neighbourhoods in London. The front opposite Kensington-gardens was occupied by Kensington House and Colby House. The high road at this point was narrowed almost to a lane, and has now been widened by setting back the front fence of the new Kensington House. On the opposite side (the park side) of the road stood a long dead wall, with a gardener's cottage, which wall is now replaced by an open iron railing, giving a fine view of the old palace.

It is worth noticing that so large a site was acquired and cleared without any sort or kind of compulsory powers, and at no extravagant cost,—considering the prices which have been given for land in this neighbourhood.

The house itself is probably (excepting the palaces) the largest private residence in town,—the ground-floor alone containing a suite of family rooms as well as of state rooms, which are usually distributed over the ground and first floors in houses of the highest class. The arrangement of the family suite, it is necessary to say, as well as of other parts of the house as it now stands, has been considerably altered since originally built as planned by the architect.

The leading idea of the plan is to make a central feature of a large conservatory, which lights the main hall and two drawing-rooms,—all of which are capable of being thrown together upon occasion into one grand reception-room of many compartments. From this, as its centre, the rest of the plan radiates.

On entering by the principal portico (fronting the high road), which is sustained on monoliths of pink granite in the form of coupled Ionic columns, the visitor finds himself at once on the general level of the ground floor, which is uninterrupted by a single step throughout. Passing through a vestibule having on either side waiting-rooms and conveniences, and beyond these two morning-rooms looking on to Kensington-gardens, he enters the great hall, upwards of 90 ft. long and 30 ft. wide. Immediately opposite is the conservatory, about 40 ft. square and 40 ft. high, opening from the hall by five wide and lofty casements, which together make a wall of glass, designed expressly to give an effect of brilliant colours from the groups of flowers, lighting up, as it were, the whole house from the first moment of entering it. Going forward into the conservatory, drawing-rooms, each about 50 ft. long, open from it on either side, while all three open on to the raised garden terrace, paved with marble, which extends along the entire south front of the house, and forms a link of connexion for the whole of the various rooms.

Returning to the main hall, it will be found divided into three compartments by two screens of coupled fluted Corinthian marble columns, of which each shaft is a single block. The central compartment opens on to the conservatory as already explained, and in the compartments right and left, behind the screens of columns, rise two staircases of solid Sicilian marble to the level of the second floor. The first landings of these staircases are carried upon marble caryatides, supporting a marble balustrade and gilded candelabra, and form a kind of porch-like approach to the rooms beyond. On the left hand these caryatides represent Spring and Summer, and flank the opening to the picture-gallery, and ball-room, in the eastern wings of the building. On the right hand they represent Autumn and Winter, and lead to the dining-rooms, billiard-room, library, and the other apartments of the western wings of the house.

A vista from east to west through the whole length of the house is formed between these caryatides and the column screens, or rather was formed, until an alteration of the dining-rooms blocked up this vista at the eastern end of it.

The pavement of the hall and staircases is of Roman mosaic in marble, and the walls are cased with a veined marble dado.

Passing from the hall to the east wing, under the landing carried by the eastern caryatides, the picture-gallery is next entered. It is 106 ft. long by 25 ft. wide, and at the two ends is lobbied off by screens of columns into rooms with side-lights for water-colours. These ends are fitted with fire-places, and treated as rooms, and should be divided by velvet curtains from the main picture-gallery.

The picture-gallery leads to the ball-room, 84 ft. long by 25 ft. wide and 30 ft. high, divided into three compartments by lofty arches carried upon marble monolithic columns. The centre compartment, opposite the entrance to the room, is enlarged by a tribune for the music. The picture-gallery is connected with the ball-room by three entrances, for use upon the occasion of great receptions.

Turning back to the hall, traversing its length, and passing between the western caryatides, on the right is the billiard-room, about 35 ft. by 25 ft.; on the left the library, 32 ft. by 25 ft.; and in front the two dining-rooms, each 42 ft. by 25 ft., and capable of being thrown together into one large room. These dining-rooms were originally built as three rooms, one in the centre having a large bow window facing the centre room at the end of the vista of the house, and two others of about 25 ft. by 25 ft., one on each side, all throwable together for large entertainments. The alteration is a considerable injury to the house as a place to live in, but the original plan would be easily restored.

The whole of the reception-rooms open on to the garden terrace before mentioned, which is about 223 ft. long by an average width of 30 ft., and has a central flight of steps opposite to the conservatory, 38 ft. wide, leading on to the tower, as well as two side flights of steps of lesser width.

The basement accommodation is arranged so as to have the offices lighted from the front and the two ends of the house, no lights whatever being placed on the south or garden front, which is occupied by the raised garden terrace.

The upper floors of the house are devoted almost entirely to bed and dressing rooms, most of which are provided with fixed hot and cold baths, so as to avoid the daily necessity of setting out pans and cans. The house contains in all about 100 apartments, of all kinds, or *pièces*, as the French call them.

It is built on a massive and thick slab of concrete, the ground having had to be taken out to a considerable depth over the whole surface, to get rid of the old drains and cesspools with which it was honeycombed, and every trace of which was rooted out, until nothing but clean and virgin soil remained to place the concrete upon. The materials used are brick in cement, and stone ashlar also in cement, the stone being Bath Box-ground Weather, with all upper members of strings, cornices, &c., in Portland stone. The whole of the ground-floor is divided from the basement by Dennett's fireproof arching, and the floors, where not marble, are either oak parquet or pitch-pine throughout the house.

The grounds have been entirely made up from a very low level (about the level of the existing garden-lake), until the effect of a natural slope of park-like land has been obtained, which falls towards the garden-lake, and is raised to a considerable height all round the boundaries of the property, so as the more effectually and rapidly to screen out, by planting, the circumjacent houses. To those who knew the neighbourhood originally the change effected here is wonderful.

From the terrace the Italian garden is first reached, having the orangery and the aviaries forming the chief part of the north side of it. Beyond this is a small open-air skating-rink, and following round the border of the ornamental water is a boat-house and a summer-house, and a winding walk to the stables. These front to Kensington-square, and contain accommodation for twenty-four horses and twelve carriages,

with kitchen and mess-room for grooms, grooms' dormitories, and second coachman's rooms on the first-floor, and head coachman's house looking on to Kensington-square. The stables are built of brick and stone, in the same manner as the house, with a wooden pavement in their two court-yards.

Returning from the stables, and passing along by the lake, one comes to what is intended to be a sub-tropical garden; and beyond that, by another winding walk through the shrubbery, to the American Bowling-alley, placed where the noise of the players would be least audible from the rest of the grounds. Beyond the sub-tropical garden are the plant-houses, lily-tank, forcing-pits, potting-sheds, gardener's bothie, and the poultry-house, with a green trellised run for the fowls.

The various contractors employed deserve to be mentioned.

The bulk of the work to the house itself has been done by Mr. Chappell, of Great George-street; the internal plumbing, by Mr. Hall, of Bulstrod-mews; the hot-water services and warming by Mr. Herring, of Chertsey; the pitch pine flooring by Messrs. Geo. Smith & Co.; the Roman mosaic of the hall, by Mr. Orr, of Baker-street; the marble staircases and columns, by Messrs. Walker, Emley, & Beall, Newcastle-on-Tyne; the marble paving of conservatory and vestibule, and the marble dado to the hall, by Mr. Burke, of Newman-street; the electric bells, by Mr. Sax, of Great Russell-street; the French plate-glass, throughout, by Mr. Willmore, of Kensington; the ironmongery and fittings, by Mr. Gibbons, of Wolverhampton; the marble caryatides, by Mr. Fontana, of Glebe-place, Chelsea; the wrought ironwork and the iron-work of the conservatory, by the Thames Ironworks Co.; the gas supply, by Messrs. Strode, of Osnaburgh-street; the stoves and chimney-pieces, by Messrs. Benham, of Wigmore-street, and by Messrs. Yates, Haywood, & Co., of Thames-street; the cast-iron crestings and balconnettes, by Messrs. Turner & Allen, of Thames-street; the iron scroll balustrades of the principal stairs, by Mr. Turner, of East-street; the revolving shutters in the basement, by Mr. Clarke; the carton pierre and other enrichments to the ceilings, by Mr. Böckbinder, of Thornhill-road, Barnsbury Park; the pink granite shafts of the portico, by Mr Wright, of Aberdeen; the oak parquet floors, the walls of the dining-rooms, the picture-gallery, and the front entrance walnut screen, &c., by Messrs. Howard, of Berners-street; and the coloured decorations of the enrichments and ceilings, mentioned hereafter a little in detail, and the general painting and papering, by Mr. Sang, of Sackville-street.

The stables, the orangery, the garden terrace, the lodge, trellis, &c., were executed by Mr. Thorn, of Cremorne Wharf, Chelsea; the stable fittings, by Messrs. Barton, of Oxford-street; the bowling-alley, by Messrs. Nixon; the plant-houses and poultry-houses, &c., by Messrs. Weekes; the front iron fence, by the Cadogan Ironworks Co.; the boat-house and summer-house, by Mr. Fox; and the gardens and grounds, by Mr. John Gibson. Mr. Anton has been the architect's zealous and active clerk of works throughout.

Coloured Decorations.

To the right and left of the entrance-hall short corridors lead to two waiting-rooms, one attached to the proprietor's study, the other to the lady of the house's room. In the study, a room of about 25 ft. square, the woodwork (as doors, skirtings, and window-sashes), is brown, black, and gold; the walls a Pompeian red, with a Turquoise blue frieze below cornice, studded with ornament and golden stars. The ceiling is rich in modelled and gold ornaments.

The corresponding room, on the other side, has warm pale blue walls with enriched green and gold borders accompanied by gold mouldings, the ceiling in light Raffaellesques and white and straw coloured grounds, flowers, cameo heads as medallions, the cove with relieved white festoons on a blue ground.

The ceilings of the double staircase are painted in positive sky blue, brown spandrels surrounded by gold mouldings, festoons, Raffaellesques, and clusters of fruit, &c., on a dark blue ground. The side walls of hall and staircases are of a quiet sunny pale green. The ceilings of the two drawing-rooms, with their triple glass doors into the conservatory and their spacious bow-windows, have each oval centre panels, enriched cove, cornice, and mouldings, most of them gilt and variegated coloured grounds, and extensively embellished by figure subjects and Capricci. The panels of walls of the one drawing-room are amber satin, with gold frames and turquoise blue styles, while the opposite drawing-room has panels in turquoise blue satin, white and enriched framing, with borders of pale Naples yellow.

The treatment of the picture-gallery is quiet, and in its colouring and ornamentation kept in a tone to receive oil paintings. The woodwork is of dark walnut and ebony; the walls a dark green, similar to those of the Palazzo Pitti at Florence; the cornice is simple grey, white, and gold; the cove, again, is grey, white, chocolate, and gold.

The two dining-rooms,—one the summer and the other the winter dining-room,—on the west of the building, and approached by a spacious corridor from the central hall, are different in treatment from the other rooms, the walls being in panelled oak and walnut. Some large panels in the walls lined with morone cloth are intended for pictures. The ceilings are massively panelled, the beams and mouldings being treated similarly to those of the side walls, while the larger compartments of the ceilings are embellished with pictures representing fishing, shooting, the pressure of the grape, and so on.

The ceiling of the library, one of the most elaborate in the building, is embellished in various sombre and some very bright tints, with allegorical figures of the arts and sciences, while cameo heads on a gold ground, viz.—Chaucer, Bacon, Milton, and Shakspeare,—form the principal ornament of the central panel.

In the hall and concert room a large bow-window opposite the principal entrance forms a striking feature of the room as you enter. The dome of this latter has an orchestral group of juvenile Cupid musicians, and sylvan scenery in the background. The leading tints of this room are white, mother-of-pearl, and gold. The central ceiling, domed, is painted with a group of Apollo and the Muses,—panels, spandrels, and borders being framed in gold. The two ceilings at the ends of this room are similarly treated, though with other subjects and ornaments. The walls are panelled, having arabesques as pilasters of original design on a ground of mother-of-pearl, the centre of each containing portraits of the leading ladies of the English and French courts, from Charles II., Louis Quatorze, down to Marie Antoinette. For these, which are indifferent copies of indifferent pictures, we have no admiration. The three doors leading to this apartment from the picture gallery have on the panels small views by Mr. Joseph F. Sang, jun.,—two of Versailles, one of the Forum at Rome, one of Venice, and two of Richmond.

The colouring, as a whole, is overdone, but several of the rooms are very satisfactory.

AN AFTERNOON AT ROMSEY ABBEY.

THE Abbey Church of Romsey, though well known to fame, is hardly so much a shrine for architectural visitors as its remarkable and unusual features of interest would lead one to expect. For one thing, Romsey is not exactly on the way to anywhere. It stands on a branch line of railway, and it has not the prestige of a cathedral town, though possessing a church to which some of our cathedrals may yield, not only in interest but even in grandeur of internal effect. Our own route to the quiet little country town did not in this instance lie along the Bishopstoke and Salisbury Railway, but along some of the white chalky roads which lead northward from the skirts of the New Forest, and on which in full summer the sunlight flares in a way that makes the wide grass borders, that so often line the roads here, as pleasant to the eye as to the feet. Threading our way along some of these, diverging now over a patch of furze-covered common, now along a narrow bridle-road by way of a short cut, dipping into the hollow and crossing the stream past Wellow Mills (pleasant-sounding name on a hot day, reminding one of Chaucer's "colde welle streames"), we presently leave on the right the meadows and the square and squat white mansion of Broadlands, late the country-seat of the most practical of recent English statesmen, and enter the town by the bridge that spans the strong current of the Test, in whose brown water the long green weeds sway to and fro continually. Romsey ought to be well off for water, we think, as we go up the straggling street, for on our right there runs all down the street a deep, rapid brook, close to the front of the houses, artificially hemmed in and narrowed by retaining walls on either side,—a kind of miniature Thames Embankment scheme,—which reduces the channel to 3 ft. or 4 ft. Over this the front doors of the dwellings are reached by stone landings; or the water disappears for some yards in a tunnel, to fume out all the more rapidly when it emerges; or it splashes through a weir and slowly turns a wheel to assist some industrial purpose; everywhere a rapid, strong, and, to all appearance, clear current, looking a very healthy and refreshing companion by the road-side. Yet, unfortunately, it is whispered that this lively tributary of the Test does not conduce to the sanitary state of Romsey; that it is put to base uses by thoughtless inhabitants, and carries down with it a percentage of things that would be better disposed of otherwise. This may be libel; the sense neither of sight nor smell discovers such an abuse. But if there be any foundation for the charge, it is a matter that cannot be too soon or too strictly looked into. Better turn the stream out of the town at once than make it a disseminator of impurities. A running stream is a delightful neighbour in itself, but then, like Cæsar's wife, it must be above suspicion.

As to Romsey itself, it is not a picturesque town; nor is there anything besides the church to attract the eye of the architectural visitor, if we except the new Boys' School, near the station; a brick Gothic building, showing much refinement of detail and true architectural feeling. In the centre square or "place," an irregular open space, stands the bronze statue of Lord Palmerston, and also the White Horse Inn, not without solid attractions, other than architectural, for the traveller. But we will suppose the hospitalities of the White Horse achieved, and hasten to the church which immediately adjoins the square.

The Benedictine Abbey of Romsey, like most of the establishments of the order, stood on rising ground, the church being at nearly the highest point of the town; the ground to the west falls away gently to the bank of the Test, and the expanse of flat meadow land beyond. Nothing remains of the establishment except the conventual church; nothing, at least, outwardly visible or conspicuous; and the external appearance of this does not convey much idea of the real interest of the structure. We see a plain, heavy, Norman building, with an Early English west end, Geometrical windows inserted at the east end, and later Gothic insertions on the north side; a broad, heavy, square, centre tower, rising very little above the roofs; we notice that the grey thin-jointed masonry is in admirable preservation, and that modern parapet walls have been added to the nave and aisle roofs, in place of the eaves-gutter, which no doubt existed formerly. Entering through a door by the north transept, we pass through what is in fact an apsidal chapel attached to the east wall of the transept, though now separated from the latter, and through a corresponding doorway in the north choir aisle, and find ourselves in an interior certainly unique in this country, and which is in some points one of the most remarkable and perhaps one of the most puzzling monuments of Early Gothic architecture that could be seen anywhere.

At first sight, we seem to be in an almost pure Norman church, of considerable scale, and of the massive proportions and severe simple detail proper to the style. But as we look round we become conscious of remarkable peculiarities, some of which have before this, of course, been adequately described, though others have not; but some comprehensive notes of the aspect of the whole and the relation of its parts may not be without interest. The first thing we notice is the unusual aspect of the square east end,—the aisle carried round behind the present position of the altar; the east side of the choir divided into two bays with a pier in the centre, and arches ranging with the main arcade opening into the east aisle; and opposite these two similar deeply recessed arches filled with fine windows of Early Geometrical date. A lady chapel has been either built or intended beyond this point; the foundations of it have, in fact, we were assured, been discovered during the investigations accompanying the restoration of the choir; but no evidence on this point has been left visible by those who may have made the investigation. Let us look at the outside of the present east wall. What we see there is curious enough, but the tale does not seem difficult to read. We have, first, the exterior of the geometrical traceried windows. Above them are seen, built up in the masonry, two larger circular arches, of the Norman period; not, however, central with the pointed windows, their centres being

somewhat closer. Outside these, again, are two pointed wall-arches, or wall ribs, again out of centre with both the other arches beneath them, having their centres wider apart than either. These wall-arches spring from a wall shaft in the centre, and from similar shafts in the angle formed by a buttress, of apparently the same date, at each side. The round arches preserved in the wall seem to infer the existence of an opening through to a building farther east, in the Norman period; they are too large for windows, and appear, as far as the eye can judge, to coincide with the interior arches of the east aisle. This building has been removed, with the intention of building a new lady chapel in the Early English or Early Geometric period. The larger wall arches are the wall ribs of the intended vault of this chapel; and over each shaft from which they spring, both in the centre and in the angles formed by the buttresses, may be observed the breaking up of the face of the masonry where the springing stones of the vaulting-ribs have been, but which have either been broken down or worn away. But between the removal of the Norman Chapel and the fair commencement of the new one, something occurred to stop the progress of the latter, and it then became necessary to fill up the east arches and make windows of them, by partly building up the round arches and in them placing the windows with Geometric tracery which are now seen. That these windows are quite apart from the scheme to which the pointed vaulting-ribs belong, is evident from the fact of their centres not coinciding. The buttresses would seem to have been built, or a portion of the wall of the new building, just commenced, finished as a buttress at each side, to give some sort of completion to this portion when the carrying out of the chapel was abandoned. So we read the story of this eastern end. It seems impossible to suppose that the Early English lady chapel was built, and subsequently removed, with no attempt to put anything in its place; nor is it easy to account for the geometrical windows, except on the supposition that the work was interrupted or abandoned, and the east end had to be closed up as they best could. As it now stands, the plan of the east end has some resemblance to those plans of square-ended buildings in England and Germany, with eastern aisle and chapels, given in Mr. Sharpe's last number of his work on Cistercian Architecture, which we noticed the other day (p. 628, *ante*). The resemblance, however, is apparent or accidental, rather than real, owing to the now incomplete state of the plan; but it is suggested the rather by the apsidal chapels opposite the eastern extremities of the choir-aisles, in which the apse form appears internally only, being formed almost in the thickness of the wall, while the east wall externally is in one plane right across.

Turning to the interior of the chancel again, we notice that lofty Early Geometrical windows have also been inserted in the main wall, over the lady-chapel roof that was to be. The main arcade has the usual characteristics of Late Norman architecture in its bases, the plan of the pier, the zigzag archivolt decoration. The capitals are mostly also pure Norman, only interspersed here and there with a carved capital,—in one or two instances of considerable elaboration, showing the impending new spirit of the Transitional period; and some of the capitals in the east aisle show a double row of "scallop" ornament of a V section, quite different from the big round rolls of the pure Norman capital which occur in the same part of the structure and in the same arcade as these more advanced specimens, making it almost impossible to say whether the advanced or the conservative spirit predominates. The former appears again in the hood-mould ornament to the main arcade, a series of sunk circles, containing each a little diamond-shaped panel with convex sides, and each two of which are separated by a little extra spacing from the next two, instead of being continuous. It is in the triforium and clearstory, however, that we first come upon the more remarkable peculiarities of the building. Each triforium arch has a couple of sub-arches on a centre shaft, standing quite free, and with an open spandrel; and from the junction of the two sub-arches over their shaft rises a second little shaft to the soffit of the main triforium arch, as if to carry the keystone of the latter. A more extraordinary ornament, and one more contradictory of all our ordinary notions as to the principles and practice of arcuated building, could hardly be conceived. Then we carry the eye further up to the clearstory, and another surprise awaits us. Here there are three-light windows with angle shafts, the centre light greatly stilted; but on the shafts of this light stand, on either side, two small shafts rising to the springing of this stilted arch, and which, if we wanted a name for them, we might call "stilting-shafts." There is something so unlike the spirit of English architecture in the look of these two shafts standing on the capital of the lower one, and so strongly reminding us of French Romanesque, that one is tempted to think that some special connexion with France, either on the part of the masons who worked, or the abbot who ordered the work, must have existed to draw closer than usual in this instance the connexion of Anglo-Norman architecture with the land of its origin. Something special of Continental influence we seem to see, too, in the broad flat rib which divides the bays of the aisle vaulting throughout the whole of the earlier work, except in one instance.

Coming west to the crossing and transepts, we find no less to command our interest. The great crossing arches are simpler in treatment than almost any others in the building, being merely three square recessed soffits, with neither moulding nor chamfer of any kind; above them runs a low massively-treated arcade round the four walls, and immediately below the ringing-loft floor. The effect of the crossing, with its massive piers at the angles, is very grand; and perhaps the effect of the angle piers is enhanced by the fact that the inner members of the east and west arches are stopped at the level of the triforium string, leaving a mass of plain walling beneath. The double arrangement which we notice at the east end is again carried out in the north and south transept walls, which are vertically divided into two by great roof-shafts running their full height; shafts which could not, as far as one can see, have had any proper architectural function at all in reference to the roof. They are now abruptly stopped, the one by a small window cut in the gable of the north transept, the other by the low-pitched post-Gothic roof, which has been placed over the south transept. Roof-shafts cut off square at the ceiling level, and having no real constructive function, are, of course, common enough at the side of a building; but these rise under the ridge, and not under the bearing or springing of the roof. It would almost seem as if the Norman builders, in this and one or two other instances, carried the "order" of the side arcade round the end wall, vaulting-shaft, and all, from mere thoughtlessness or a notion of symmetry, without considering the suitability of the treatment to the position. The builders who added the Geometrical windows in the main east wall have repeated the same idea, and a vaulting-shaft of that period has been hung on to the wall, on a corbel, between the windows, for no earthly purpose that one can conjecture. The anomalous character of the building is again forcibly illustrated by the extraordinary triforium arch in the south transept, over the return of the nave aisle, where the two sub-arches are carried by a thick stumpy column, rather than shaft, unlike anything else in the building in this position, and which carries on its face, above the level of its proper capital, a clumsy projecting bracket to take the outer member of the sub-arches. If any ancient building could be picked out to justify the "inspired workman" theory, this corner of Romsey Abbey would be the one, for it literally seems to be the result of different men working independently of each other, and each man doing what was right in his own eyes. This confusion of purpose is still more marked when we advance to the adjoining bay of the nave aisle. We will pause one moment to remark the small wall arcade in the west wall of this transept, where some of the capitals are of most unusual design, one form being finished under the abacus by a series of small inverted interlacing arches, which have their springing downwards from the under side of the abacus; and the heavily-moulded arches of this arcade are pointed, though they are moulded in quite an early transitional style, and are arches of decoration only, such as in transitional work of this class are usually circular; but in Romsey nothing goes by rule, and here we see decorative pointed arches along with constructional circular arches, reversing the usual arrangement. This wall-arcading, we may observe, is much hidden and obscured by the staircase to the hideous gallery, which still deforms both transepts.

But now turn round into the south aisle of the nave, where the plot thickens still more. It is impossible to tell what the builders have been driving at here, or what special genius of eccentricity could have presided over this portion. The heavy transverse rib of the vaulting, which, over all the rest of the transitional church, is square in section, has, at the end of the first bay, a heavy roll moulding. This bay, it may be noticed, contains the only doorway belonging to the Norman church; in the rest doorways of Late Gothic period have been inserted. In the second bay of the aisle is a wall arcade of interesting round arches of most singular character, the caps and bases of the arcade appearing in profile only, and the arch-mould formed by making a square sinking in the face of the archivolt first, and then digging a moulding out; the whole thing being like an arcade of the usual detail squeezed flat, or with all the projections cut off. The second transverse arch springs from a respond considerably east of the corresponding pier of the nave, so that the arch is skew. The responds of both these two bays are formed of three shafts, the centre the larger, of which the two side ones have the square capitals turned diagonally to meet the line of the diagonal vaulting ribs which spring from them; an arrangement which obtains nowhere else in the church: in the rest of the responds of north and south aisles (as far as the Transitional church extends) the diagonals spring from small angle shafts rising from a string-course running under the windows between the responds. The whole of this piece, the first two bays of the south aisle, seems as if it were a portion of the structure commenced on a completely different plan from the rest. This would, of course, be quite comprehensible if the dates were manifestly different, but the whole of the adjoining portions are, to all appearance, so completely of similar date, and so intimately connected constructively with this abnormal corner, that they would seem almost to have been carried on simultaneously; and it is this which makes this corner such a piece of puzzle-work.

But it is time to look at the general design of the nave, which presents other points sufficiently remarkable. The nave contains seven bays, of which the first four (counting from the crossing westward, the direction in which the work evidently proceeded) are Transitional Norman, the last three of later date. Uncertainty and change of plan are again plainly evident here, together with a remarkable grandeur of style and conception, as if the church had been laid hold of at this point by an original genius with a great idea in his mind. What gives the peculiar dignity to this part of the edifice is the unusual treatment of the arcade, which is carried up through the triforium string, the outer members of the triforium arch over-sailing those of the ground-story arcade, which thus becomes, in fact, a secondary order or sub-arch beneath the great arch which springs on a level with the triforium impost, and the supports of which run through two stories. The first conception of the method of carrying this out is seen in the first piers on each side west of the crossing. These are plain cylindrical piers carried up through the ground-story arcade, and with their caps at the triforium impost line; but as the ground-story arcade must have something to spring from; there is a subsidiary capital formed at its impost level; only, as the pier of course projects beyond the plane of the ground-story arch, which is a sub-arch, the lower cap does not form a ring round the column, but is broken off short at the line of impact of the outer member of the ground-story arch, on the side next the centre aisle. On the other side the cap goes round, in one pier, to take the transverse rib of the aisle vault; but even in this point there was a difference of opinion, and the circular column on the south side has a special arrangement of shafts tacked on to it to receive the transverse rib of the aisle vault. Apart from this, however, it seems to have been felt that the circular column met the case in a very clumsy manner, though it was evidently deliberately adopted with the view of producing a fine effect. However, it evidently would not "work," and in pier No. 2 we are back to the compound pier again, the same form of which is repeated up to the end of the fourth bay. An advantage of the compound pier, besides adjusting itself to the two sets of arches above and below, is that we get a separate roof-shaft from the ground, whereas with the circular column there is only a short roof-shaft springing from a corbel above the triforium. It is noticeable that the arch immediately west of

the circular column, and those which follow it, are much wider than the first bay. This sudden change in the design perhaps accounts for the discrepancy between the second pier and its respond on the south side, and the skew arch in the aisle, as it may have been determined on after that part of the aisle wall was built. In the triforium the same design is preserved as in the choir; the two sub-arches and the little shaft rising to the soffit of the main arch; but the treatment of the sub-arches here varies oddly. In the first bay they have a zig-zag ornament, as in the choir; in the second bay they form a mere bar, square in section; in the third bay an almost classic cornice is turned over them, a quarter roll and an ovolo of considerable projection; in the fourth bay the sub-arches have more distinctly Transitional Gothic mouldings, the spandrel over them is filled up solid, and the little shaft before-mentioned accordingly disappears. The clearstory we will have a word about just now. But before quitting this portion of the church we will just notice that the fourth bay of the ground-story on the north side suddenly varies from the others in having a zig-zag ornament on the main arch, betraying, however, the progress of the style, in that the ornament in question zig-zags horizontally and not vertically; and there is a late form of zig-zag embroidering the diagonals of the aisle vault of this compartment. This decorated compartment was not improbably the baptistery of the original church. What is most remarkable about it architecturally is the carved capital of the fourth pier on this side, which presents a mixture of reminiscence of the Classic capital with prophecy of the Gothic in a manner seldom found combined in one and the same detail.

At this point we come upon the end of the Norman Transitional church, and reach the portion added in very nearly the full Early English period. But we have not done with anomalies. The west end, with its fine triple lancet, is pure Early English; so also are the caps and arch mouldings of the ground-story; and so still more emphatically is the triforium, with its richly-moulded trefoil-headed sub-arches which have replaced the plain round ones of the other bays. But below and above this Early English work we find distinctly Transitional details. The mouldings of the bases approach very nearly to Early English in character, but are not quite; in fact, they mostly resemble in profile a base mould, which subsequently became common in the Decorated period, and of which the present base, a kind of corruption of the Classic base, might seem to be the forerunner. But the angles of the bases are occupied by ornamental foliage carving, which in style and feeling is distinctly Transitional, and is here seen in remarkably fine form, the leaves in many cases rising in a bold relief unusual in this ornamental feature, which is more commonly kept rather flat. These angle carvings of the bases clash most curiously with the style of the upper part of the arcade and the triforium, and suggest the idea that the progress of this new portion of the building must have been very slow. But a still more odd and incongruous effect is produced when we run the eye up to the clearstory, and find there, above the pure Early English triforium, arch-moulds and caps of a thoroughly Transitional character. This would be inexplicable but for the fact, which at first sight seems perhaps only a farther complexity, that the same detail is continued along the whole of the clearstory, above the Norman Transitional portion, with which it has as little affinity as with the Early English substructure in the west bays, forming, in point of style, in fact, a kind of connecting link between the two. But this fact of the continuation of the clearstory on the same design (except one feature) all the way along, tells the tale at once. There was a distinct interval between the completion of the Transitional Norman triforium and the commencement of the clearatory, during which the Pointed arch had been thoroughly adopted, and accordingly appears in the clearstory with that degree of richness and breaking up of the mouldings which verges towards the Early English treatment, though still retaining the predominant squareness of outline of the Transitional arch-mould. The caps present that mingling of free foliated carving with a flat leafy-looking ornament which is the last remnant of the Norman "scallop," which occurs in such features as the arcade inside the west wall of Peterborough (which might be exactly contemporaneous with this triforium); the abacus is square. When, not long after this was completed, the lengthening of the church was carried out, the builders were seized with the unwonted idea, for Mediæval builders, of preserving a uniformity between the old and new portions of the clearstory, the first part of which is of admirable workmanship, and was probably a good deal admired in the district. So they continued the design of the Late Transitional clearstory over the Early English triforium, with one little alteration; they changed the abacus of the shafts from square to round. The square abacus was now utterly doomed and condemned as an awkward thing; but the rest of the Transitional details they followed for the sake of uniformity. That seems to be the history of it, and a curious little bit of history it is. Among other peculiarities illustrating the uncertainty of purpose which is so prevalent throughout Romsey, we may notice that while on the south side the double billet ornament of the triforium string stops dead against the outer member of the fourth pier, on the north side it is carried round this part of the pier, and a foot or two on the other side (a little job which must have been done by an "Early English" mason), and then stopped abruptly by a little knop of Early English foliage placed to intercept and form a finish to it. One can fancy the master-mind of the works coming round some morning, and finding John of Somewhere-or-other continuing the billet ornament, and telling him not to go on with that old-fashioned concern; and then John considering how he could make a neat finish of it, and cutting out this little knop of foliage in the latest style to do the trick. Among other little points it may be noted, too, that while the roof shafts of the earlier portion are stopped off short, those of the Early English portion have a moulding round them which shows just below the present nave-roof.

This said roof is not a satisfactory feature. The interior has had two restorers, the nave and crossing having been in the hands of Mr. Ferrey, and the choir, coming under different ownership or responsibility, in those of Mr. Christian. Both restorations seem in the main to have been eminently conservative, and to have consisted mainly in cleaning the stonework and repairing it where necessary, which apparently was not very much. But the restoring architect of the nave has placed upon it a high-pitched roof with a wooden ceiling forming a barrel-vault in cants, ribbed and panelled, and coloured a sort of dark slaty tone, with gilding at the intersection of the ribs. The colour effect (if it can be called colour) is disagreeable and heavy, and the design very weak-looking in comparison with the massive character of the principal portion of the edifice. Mr. Christian has put a solid-looking open-timber roof, also preserving something of the general section of a barrel-vault, over the choir roof, with better effect. The north aisle has a new roof designed, we were told, by the present vicar, with tolerably heavy curved principals slightly decorated in colour, and with good effect. The south transept, as mentioned, has a flat-pitched roof of modern style, though old enough and somewhat gone now. The other woodwork of the church needs renewal in a better style. The seating is very ugly and flimsy; the old pew style, in fact. The two galleries are anything but ornaments to the interior, and the organ, by Walker, which stands in one of them, will be none the worse for a new case. Mr. Butterfield, we believe, has made designs for the reseating, which is at present in abeyance. It is understood also that the same gentleman is desirous to "treat" the interior in colour in the same style as that in which he has treated St. Cross at Winchester. We should be sorry to oppose any scheme of Mr. Butterfield's, but we must express an earnest hope that no such performance as that at St. Cross will be permitted at Romsey.

Looking round the outside, though there is nothing of the interest which the interior presents, we cannot but be struck with the noble simplicity of the design of the west front, with its two great buttresses and its triplet of tall and large windows, without a suspicion of "ornament" anywhere, or anything to mar the unity of character of the whole. We may also note the fine work of the clearstory, and that it presents exactly the same characteristics we noticed in the interior. The present vicar has restored a portion of the north aisle, re-roofing it with an eaves cornice instead of the parapet which had been added, and replacing the late Gothic windows with windows in the style of those in the south aisle, which are those of the old church. We should be very glad to see the parapets removed from the whole of the roofs; and if the late windows that have been removed were as bad and "debased" in style as one or two others in different parts of the church, they need not be missed. But this sort of restoration, which really falsifies the history of a building, should only be resorted to in extreme cases; and we hope there is no idea of continuing the same process in the next two bays of the north aisle, as one at least of the late windows inserted there is a good one of its kind, and ought not to be removed. The boldness and variety of design, and the fine workmanship of the corbels beneath the gutter-table, in the choir portion especially, cannot escape observation. Both in detail and in general design there is an extraordinary impress of power at Romsey; power of a somewhat rude and untutored description, but not the less remarkable. The square tower, with its one stair turret, is impressive solely from its mass and the almost unbroken expanse of grey stone which it presents. Climbing to the summit (no very arduous task), we find the bells hung in frames above the level of the tower walls, though of course the bearing is a good deal lower. An octagon wooden turret, of the plainest and most meagre appearance, a kind of shed in fact, has been built over them on the tower roof; this is a point which is susceptible of improvement, and might very well be improved away altogether, and something more in keeping with the character and expression of the structure substituted, at the same time when the interior woodwork and fittings shall be improved. The bells are an old peal, formerly of eight, and were hung in an adjoining tower, very likely that of the church often found in the vicinity of Benedictine monasteries, for the use of the laity in connexion with the establishment as workmen, &c. About 1790 the bells were re-cast, by the firm of Mears, as a peal of six, and hung in their present position, and the tower in which they hung has disappeared. They look like a fine peal, of considerable size and weight; we did not hear them. Romsey tower, though by no means lofty, from its raised position commands a fine prospect, and from it we look southward across Hampshire and the New Forest, and can see, beyond, the outlines of that remarkable heap of chalk hills which is known all about here as "The Island," looking faint and blue in the extreme distance. And so farewell, for the present, to Romsey Abbey Church, an architectural monument remarkable not more for its stern grandeur of style than for its individuality of treatment, and in which some of the most cherished convictions of the modern architectural student seem to be called in question.

IRRIGATION AND WATER SUPPLY.

THE Society of the Union Castellana (with its head-quarters at Valladolid), established for the purpose of developing the industrial interests and general prosperity of the Province of Old Castile, and its chief city, Valladolid, the ancient capital of Spain, obtained, on the 21st of April last, a Royal decree for a perpetual concession, authorising them to throw a dam across the River Douro, and construct a canal of thirty-one miles, with a view of fertilising thousands of acres of the richest land in Old Castile, and supplying the city of Valladolid with drinkable water. The quantity of water to be taken from the river and thus distributed exceeds 80,000,000 gallons daily, which is entirely distributed by gravitation. The Society Castellana have assigned their concession to Mr. George E. Peters, of London, without any payment beyond a share of the net profits which it is believed will be very large, water being in Spain such a necessity, and particularly to the "burning plains of Old Castile." Spanish water companies have the power of selling a certain quantity of water in perpetuity for a certain sum of money, and the Corporation of Valladolid have already bought 40,000*l.* worth of water for public services, to be paid for in annual instalments, commencing at once.

The Somersetshire Archæological and Natural History Society.—The twenty-eighth annual meeting will be held at Bath, on Tuesday, July 18th, under the presidency of Mr. Jerom Murch. An opening address will be delivered by the president. The Abbey Church will be visited, and the Society will visit various points of interest in the city, under the guidance of the Rev. H. H. Winwood. On Wednesday the Society will leave for Bathampton; and on Thursday for Englishcombe.

REFINEMENT AND BUILDING.

IT ought to be some consolation to those who, amidst the remains of historical edifices in different parts of the world, in museums and similar places, entertain a secret wish to admire, and a half-formed, latent intention to learn how to do so, that the priests of the art-divinities have long been very much divided upon the question which perplexes laymen. Thackeray's Colonel Newcome was not more vexed and puzzled when young Templars told him that Dr. Johnson did not write English, and that Addison was a shallow trifler who merely expressed himself with elegance, than is many a worthy scholar and gentleman who, at the present day, attempts to penetrate the morality of architectural principle. That doctors of every profession should differ, and agree to differ, is acceptable up to a certain point; but that technical opinion should be apparently irreconcilable, both in spirit and practice, increases the confusion of style which now reigns in all kinds of buildings. So anomalous is the artistic composition of a London street that the British representative of Nemesis doubtless looks contentedly aside; yet the disagreeable old goddess of Rhamnus, who may be called the patron-saint of archæologists and modern architects, has so often turned her envious glance upon the world's stage — whenever artistic felicity has been reached, or, to her mind, has endured long enough—that the various forms of ancient architecture are a ready subject of professional dispute, and the so-called architect of to-day one of amateur derision.

According to the Socratic dictum, men differ as to what is fleeting, and agree as to what is eternal. It would be well if in architecture they differed only as regards form and details which are fleeting, and agreed about principles which are eternally true. But it does not seem that a principle of construction is yet acknowledged to be inviolable, nor, indeed, that any such thing as a principle is generally recognised. Nevertheless, after a protracted dallying with the beauties of every known method of structure and decoration, there is springing up an inclination, amongst architects at least, to reform the present mode of ornamental building upon a basis of common-sense rules. But, we take it, people must be first brought to understand what these rules are, and, before all, to define the real meaning of that hackneyed compound word, common-sense, when it is technically applied. Nothing can be more indisputable than the repeated assertion that true architecture combines the useful and the beautiful; but how and to what extent beauty is to be added to utility is a fruitful theme of discussion, and one to which the usual resort to natural evidence or example brings little aid. Fitness, according to Burke, is not only not always the cause of beauty, but, in nature, experience shows use and beauty to be in no way dependent on each other. "The idea," said he, "which mankind most commonly conceive of proportion is the suitableness of means to certain ends. . . . . Therefore it was necessary for this theory to insist that not only artificial, but natural objects took their beauty from the fitness of the parts for their several purposes. But . . . . . on that principle the wedge-like snout of a swine, with its tough cartilage at the end, the little sunk eyes, and the whole make of the head, so well adapted to its offices of digging and rooting, would be extremely beautiful."*

Nature in this instance has attained her aim in the speediest and readiest fashion, whether by the law of survival or any other law is immaterial to the argument; and it would be absurd to ask her to add what might be ornament in the modern sense of the term, but certainly not beauty, to her work. Yet many excellent critics say that art must go further than this. They maintain that no building, however common-place, is artistically perfect unless the attainment of the end is accompanied with beautiful results; and they are backed by the unsupported theory that in ancient and mediæval cities all buildings were beautiful. But these enthusiasts surely forget that it is only the higher order of artistic creation which has been preserved to the world. To argue that, because the Parthenon is an example of utility and beauty inseparably blended in one incomparable whole, therefore all the smaller Athenian buildings, houses, and huts, of the Periclean epoch, were models of artistic excellence, is to say that, because there have been found statues which were executed more than two thousand years ago, and which show the human form in the highest bodily perfection, therefore there were no ugly men of intellect in those days; and that then even so useful a scavenger as the pig was an object of beauty and refinement.

In the leading article of our last number we related from a French source how Ingres, with his classical brush, had painted a vase destined only for the decoration of a servants' hall. Again, the tourist of the Loire may have visited a certain château built partly on a bridge which spans that river, and he may remember that all the kitchen accessories are preserved—unused—in the state of perfection which belonged to them in the sixteenth century. To be able to see and admire in even the commonest domestic utensils something quaint or otherwise remarkable, to touch nothing that is artistically or æsthetically unclean—in fine, to be surrounded with the beautiful, is the bright aspiration of many at the present day. Cultivated ladies and gentlemen who, with great trouble and at a vast expense, succeed in making the insides of their houses totally distinct from the outsides, adorn the walls of their rooms with objects foreign alike to the private connexions of family, and the common traditions of national history, with the idea that such ornaments are bizarre, uncommon, or unique. But neither Ingres at work upon the vase for John's and Mary's edification, nor the painfully clean kitchen-furniture at Chenonceau, nor all the purple and fine linen of the artistic Pharisees, nor all the broken china and spurious curiosities of the bric-à-brac hunter, shows a healthy state of education, or even comprehension, of artistic culture. There is a touch of priggishness and affectation about all of them. It would have been better that the domestics of fifty households had possessed in each of their halls a vase containing a creditable delineation of some national custom or native story than that one should be favoured with an object which Ingres had affectedly enriched with his own hand. Those plates and dishes which elegant ladies now cause to be hung upon wires in their boudoirs and drawing-rooms were meant to hold slices of bread and meat, cheeses, and pats of butter; and in an age of refined feeling for art their place would be the pantry or the hall. The effective hanging of such things for purposes of "ornament" alone in incongruous corners no more proves that their owners possess a love for art than that an ill-conditioned man, who keeps in his library a copy of the Ten Commandments, will hesitate to sell adulterated goods, or covet what belongs to his neighbour.

The streets and squares of a city may be eminently beautiful, and yet contain a majority of commonplace, strictly utilitarian buildings. The known archæology of the world proves it. Travellers may say that the native city of Agra is a direct proof to the contrary; that there, balconies, kiosks, and hooded windows adorn every petty house in the principal street, which is brilliant with carving and decoration. It must be remembered, however, that in India, marble, stone, and similar durable materials are reserved for two only of the three classes of humanity in general, and that the poor and uneducated have not, and never have had, any solid shelter except,—and then not always,—as the slaves or dependents of their betters. In Calcutta and similar Indian cities native servants may be seen every night rolled up in white coverings upon the pavements, and sometimes on bedsteads placed in the open street. It is not by any means likely that the lower orders of the Athenians, under Pericles, were better cared for than are those of India under English rule. In England itself a totally opposite state of things, due partly to custom, partly to climate, exists; for to rest at night, even for a few minutes, in a London street results in a peremptory order to move on, or in forcible removal to the lock-up. It is consequently an inevitable necessity for every one, even the poorest, to find some sort of absolute shelter, if not by day at least by night; and the obvious question arises, admitting, as reasonable men do, that there must always be poor people, are such shelters in the millennium yet to come to be specimens of artistic excellence and æsthetic beauty? A lesser wit than Sydney Smith might have answered it with equal force In his time somebody had been talking or writing about ornamental architecture at Botany Bay, then a favourite penal settlement, and he inquired how in such a place a sane person could aim at any other architectural effort than the exclusion of wind and rain. "A man," said he, "who thinks of pillars and pilasters when half the colony are wet through for want of any covering at all, cannot be a wise or prudent person."

Amongst ancient communities little heed was paid to the wants of the many; but modern laws forbid the masses to starve either with cold or hunger. It would be absurd to build for them, putting the question of economy on one side, anything else than what, analysed, is a useful and an honest piece of construction; but because it is mere utilitarian building it is by no means likely that ordinary workmen can do it without refined superintendence. It has, however, been recently urged that workmen should be encouraged to form themselves into co-operative clubs, for the purpose of erecting blocks of dwellings for themselves, and to their own liking; but we can conceive no more suicidal mode of procedure. The first thing the vulgar mind is seized with is a combination of pilasters, vases, and a backless pediment; or one of useless buttresses, false arches, and crocketed pinnacles. Much cultivation is required to know when the really useful has been attained, and, above all things, in an honest fashion. A mere utilitarian building may contain every principle of architecture. It is by the existence, or the contrary, of principle in such buildings that the true critic judges, and upon which, very often, not only the durability of the work, but the comfort or discomfort of the inmates, and the general internal and external aspect of the entire home, depend.

The gradual recognition of the theory that architecture is building refined affords an argument to those Englishmen who, knowing the difficulty of rivalling the Greeks, urge that native mediæval example is as worthy of modern emulation as it is capable of being adapted to actual habits of life. A cheap utilitarian building shaped into Gothic outlines, say they, may be picturesque in spite of any baldness of appearance. You have but to ornament or decorate its constructive parts and you reach—architecture. That, however, is to go too far or not far enough. We will suppose that in a workman's dwelling we have a window-opening 8 ft. high and 4 ft. wide. It is perfectly easy and traditionally correct to cover an opening of such a size with a flat or a slightly-segmented arch. To put over it a pointed arch of any description, or a rounded arch with a pointed extrados, simply to impart a picturesque effect, is not to refine building, but to burlesque architecture. And for whom, pray, is the sentiment contained therein introduced? Surely for the passers-by rather than the inmates; and if, for the former's sake, the modern architect is to make poor dwellings picturesque, the modern tailor must also be invoked. It must be much more painful to the refined appreciation of the Londoner in his short cut-away coat and tall chimney-pot hat to meet face to face British workmen in their unpicturesque garments, than to pass a street lined with their dwellings.

That characteristic of old architecture, which has come to be prized so much of late years, has induced a certain love or rage for irregularity-at-any-price, which is a reaction, as it were, upon the symmetry-at-any-price of our grandfathers. Certain comparatively old families had inherited houses which had been altered, enlarged, or repaired by their ancestors, as one died and another succeeded. But these were few; and more numerous families newly ennobled or newly enriched coveted similar houses. The architect, with his archæological bible in hand, was equal to the occasion; and aspirants, if they had money enough, had but to ask and have in three years the exact counterpart of towers, gables, and cloisters which formed the amended patchwork of three centuries.

Time is the great master whose work attracted the public in their search after the picturesque. But men live so fast nowadays that they cannot wait for time. Their manufacture of churches, castles, and manses is now arrived at such completeness that, on mediæval hunting-ground, even the professional archæologist sometimes loses the scent. That, however, was not the way in which, in the Middle Ages, buildings were designed and constructed. Like the Greek masterpieces, most of the French and English cathedrals were erected within an

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* This quotation, from the celebrated "Essay on the Sublime and Beautiful," is admirably balanced by one from the sixth *Entretien* of M. Viollet-le-Duc:—"Animals possess 'style,' from the insect to the noblest among quadrupeds. With them there is never a gesture or a movement which does not indicate distinctly a want or a defined intention, a desire or a fear; animals are never affected, pretentious, or vulgar. Handsome or ugly, they possess style, because their sentiments are simple, and they seek the ends they have in view by simple and direct means."

incredibly short space of time, and, what is more, they were generally symmetrical in plan and section. Subsequent and repeated alteration, to say nothing of fire and fury, have imparted the irregularity which now distinguishes them. But that the strikingly picturesque effect of the Athenian Propylæa was obtained in the same manner, or that the Greek grouped his buildings in regard to their surroundings with an intention of obtaining that effect, cannot possibly be admitted. It is the Teuton who mentally suggests, not the Greek who practically invented the picturesqueness which clings to the gates of the Acropolis. Romance and sentiment came southwards, with the wild hordes who subdued the Roman Empire, and ultimately destroyed the strict traditions of classical art. Lord Aberdeen, writing in 1822, on the principles of beauty, said:—"The ancients never possessed any perception of those qualities of external objects which are called picturesque. At least, in the Greek writers, there are no descriptions to be met with of scenes viewed merely as pictures, or as delighting the eye through the imagination alone." That is to say, there was no scenic architecture in Greece, for in ordinary works it was strictly utilitarian, and in extraordinary ones it was æsthetically refined into beauty. We take it that, in the time of Pericles, the Greek architect was a highly cultivated, matter-of-fact person, deeply versed in mathematical science, and secretly proud of the power he had acquired, through inheritance and study, of counteracting optical illusions in the perspective of his buildings. Essentially a constructor, he would no more have strained after a picturesque effect than have been guilty of word-painting; he might have delivered some of M. Viollet-le-Duc's lectures, but never any of those of Mr. Ruskin.

If it is absurd to build up, or, to use the appropriate phrase of the theatre, to "build out," the picturesque, it is still more absurd to suppose that refinement, in the Greek acceptation of the technicality, ought to be applied to any and every description of modern building. To imagine such a thing is to imply that poetical inspiration is the appanage of all men, and philosophical argument their habitual recreation. Now that the snare of mediæval picturesqueness is beginning to be found out, it may be opportune to add that the pursuit of Greek refinement is worse than a snare. Its attainment, except in a few cases out of thousands, is as impossible as it is unnecessary. Every salient line in the stones of the Parthenon was the subject of minute calculation and laborious study. Human happiness, according to Swift, in the "Tale of a Tub," is a perpetual possession of being well deceived; and to satisfy the cultivated mind and humour the equally cultivated eye was the aim which the Greek attained. Those who, for 300 years, have been sticking or hanging columns and pilasters to stone and brick walls; crowning them with pediments; and heaping, in laboured caricature, fragmental imitations of antiquity one over and against another, did not know how the Greek master finessed in order to insure observers of his own and future times a perpetual possession of artistic happiness. They believed that classical architecture could be revived by the symmetrical distribution of certain columns and cornices of certain shapes; and that symmetry meant similarity of arrangement and preciseness of dimension. It was only during the early years of this century that the truth was discovered; and, as we have already shown, principally by the labours of Englishmen,—at least as far as Greece is concerned. The lesson now to be learnt is that the Greek architect was not governed, as Mr. Penrose has well said, by "fixed formulæ which he could not modify." Like his less cultivated successor of the Middle Ages, he cut his coat according to his cloth; and, as an instance, having obtained with much difficulty the requisite number of lintel-stones—whose collective length was sufficient to cover his colonnade—he cared little whether the inter-columniation was exactly regular. Witness the flanks of the Parthenon, where some of the lintels are rather more, some rather less, than a certain uniform length. All that he seems to have insisted upon was, that the joint of the lintels should fall exactly over the centre of the column, and that the centre of the triglyph, which was the vertical continuation of the column or point of support, should fall exactly over the joint of the lintels.

Of course, all sorts of hypotheses have been made to account for the irregularity which has been discovered in parts of the arrangement, and in some of the details, of the Parthenon,—an irregularity which would have been allowed to escape comment had not the rest of the building evinced the minutest mathematical exactness—and that those which attribute it to the dictates of necessity, utility, and common-sense now obtain the largest number of adherents is a favourable sign of the times. Indeed, many who have carefully measured ancient and mediæval works will not be indisposed to agree with Mr. Burges. In his recent thoughtful paper upon "Greek Art,"—to our mind a valuable and significant addition to the technical literature of the day,—he ventured to doubt whether the delicate curves obtained by the Greeks resulted from the geometrical means described by Mr. Penrose; and he suggested that they were due "to some simple mechanical instrument such as a bent lath in the case of the lines, or to free-hand drawing in that of the mouldings." It is quite useless to discuss how such curves were obtained; suffice it that they exist; and those who have seen, in the north-west of India, native draughtsmen squatted upon their haunches and drawing complicated curves upon loose paper laid on the knee, may perhaps incline to Mr. Burges's suggestion regarding the free-hand tracing of the moulding and enrichment of a Greek cornice. That an analysis of its component parts reveals a series of delicate and subtle observations on the part of the architect has been admirably shown to the student by M. Viollet-le-Duc. If the Greek enriched the face of his marble or terra-cotta gutter, it was not for mere love of ornament, but because the face of such a gutter must inevitably get spotted and disfigured with rain and dust, the effect of which was concealed or counteracted by the lights and shadows of the enrichment. As long as he remained a cultivated utilitarian he put no base to his columns for people to knock their sandals against; and even when he did begin to put bases they followed the contour of the column. He increased the diameter of an angle column in deference to a desire for strength, and in defiance of what is now called symmetry. If a projection here and there upon his best works extant yet remains unexplained, it probably held a piece of scaffolding, of which he was as sparing as the builders of to-day are lavish. He never altered the profile of a cornice, or even of a moulding by the ornaments with which he enriched it. Indeed, the form and the structure were with him so much one and the same thing that no mental effort or embarrassment takes place in the attempt to grasp or understand his intentions.

But although the Greek architect expended the wealth of his intellect upon the public works of his country, there is sufficient evidence to show that in private buildings he was as hostile to ostentation as the English gentleman is or was reputed to be. In Athens, in the best times, when the temples were magnificent, the private dwellings, according to Demosthenes, were invariably simple and modest. Even the residences of Aristides and Miltiades could not be distinguished from those of their neighbours. It was when attempts were made to emulate in smaller public buildings and in domestic habitations the grandeur and refinement which had been dedicated to the Gods that the subtlety of Greek art disappeared. Ridicule, at least in art matters, then killed in Athens as surely as it does, or lately did, in Paris. If it does not kill in more fortunate countries, it is perhaps because, there, the bathos is neither felt nor perceived. Our grandfathers piled full-sized models of the "Lantern of Demosthenes" and the "Temple of the Winds" one over another in the form of a Gothic steeple, which they set astride a classical portico. In our own time we have warehouses and taverns with traceried and stained glass windows; and as in human so in artistic morality, too much familiarity breeds contempt.

That a disposition to sobriety in architecture is gradually spreading amongst all classes of educated people is evident. So much is known now that it is absolute labour for one man to make a complete display of his antiquarian lore. He cannot now bear down upon friends and clients with all his archæological learning at one fell swoop. The best works of antiquity and of the Middle Ages are like "funeral baked meats" served cold at the marriage-feast of modern eclecticism; and the *gourmand* scorns a *réchauffé*. The other day an architect, who has been engaged for a quarter of a century on the practical work of his profession, wrote:—"For myself, as I get older, I begin, for all ordinary work, to believe in the 'no style,'—something very plain, simple, and genuine." Such an admission betrays, perhaps, satiety; but it certainly implies intellectual ripening. It requires intellect to put together a plain, simple, and genuine edifice; whereas, mere artistic superficiality can accomplish with ease what is picturesque, pretty, and pretentious. Simplicity and genuineness mean refinement as Englishmen understand,—ay, as the ancient Greeks understood,—the term. They mean something which is the natural enemy of burlesque and masquerade. They mean work for gentlemen and men of intellect; and unless this class of the community chooses to interest itself seriously in architectural matters, the progress and improvement of modern cities is impossible; for, although regeneration in national policy may sometimes spring from inferior popular strata, regeneration in national art must descend from the cultivated classes of society.

PROGRESS AT SALISBURY CATHEDRAL.

THE work of restoration which has been going on for twelve or thirteen years at Salisbury is now not very far from completion. The eastern arch of the nave is still blocked up by the very unsightly boarding which has for a good while past stopped the view at that point, where, considering the length of time that the obstruction had to remain, it might be thought that something a little more decorative might have been contrived as the background to the temporary choir. However, there seems now no reason why the work should not be completed at least at an early period in next year, if not within the present year.

The scraping and revivifying of the surface of the masonry in the choir and north transept has been accomplished, and the repairing of the numerous portions of the Purbeck marble shafts which had decayed past making good, except by the excision of the decayed portion and the replacing of it with new material. This cutting and repairing of the Purbeck marble, an operation requiring great care, has been one of the most costly items in the work of restoration. At present the south-west transept is a forest of scaffold-poles, and the same work of scraping the stone and repairing the marble is being carried on there. In the choir the floor is in process of being re-formed at its original level, as it had undergone the process of raising which the restorers of another epoch were so fond of indulging in; and some of the marble inlay which, together with tiling, is to form the floor design (in the manner already carried out in the floor of the presbytery), is in readiness for laying. The last discovery during the restoration was that of a stone screen of Late Perpendicular work, containing a series of niches, between the piers of the arch in the south arcade of the choir which coincides with the eastern transept. This screen had been built over by a plain wall, within the masonry of which it was enclosed, and which has been removed and the screen restored in its original form. The piers of the arcade, by the way, between this point and the crossing, lean away towards the east, under the pressure of the tower, to an extent which is painful to the eye, though probably not now of special consequence in other respects, since the abutment was built into the eastern transept arch. Had this abutment arch been part of the original scheme, in place of the lofty east transept arch going up through the triforium stage, and leaving a great void at the level of the springing of the main arcade, there would probably have been no movement of the piers of the latter worth speaking of. As it is, the abutment arch was a kind of abutting of the stable-door after the steed was stolen; it prevented the possible total overthrow of the structure, but could not ameliorate, of course, the work of displacement already done. One can only wonder, in looking at such an incident, at the extraordinary contradiction between the boldness, enterprise, and genius of the builders who could plan and execute such a structure as this, and the want either of almost ordinary common-sense and foresight, or of statical knowledge, which could render them blind to the necessary consequence of such a discrepancy between the vertical pressure of the centre tower and its longitudinal abutment.

So much of the scheme of decoration of the choir is completed as may enable one to form an idea of the result of the whole, which seems likely to be good; rich in effect without being too heavy or pronounced. The surfaces of the vaulting are decorated by figures nearly white, and merely lined in, in circles and on grounds of blue or ochre. These are painted in the centre of

each compartment on the white surface of the vaulting, the remainder of which is painted a brick pattern, and the mouldings of the ribs coloured. The design is on the basis of remains of the original coloured design discovered on the vault, and has been executed by Messrs. Clayton & Bell. The mouldings of the arches in the main arcade, triforium, and clearstory, are relieved in colour, of which the most prominent lines are formed by colouring the roll mouldings red and green; the red, subdued in tone, being the more largely employed; the hollows are coloured in more receding tones, and in some cases picked out with a simple decoration in white. A similar decoration is continued in the vaulting ribs; the bosses of the vault are gilded, and the fillets of the Purbeck marble caps in the upper and lower arcades are also relieved with gilding. The spandrels over the arches are covered with a conventional scroll ornament on a large scale, of symmetrical design, and following in its disposition the shape of the spaces to be covered: the main part of the design being carried out in line with portions of positive colour, of low tones, introduced at the emphatic points of the scroll-work.

The new reredos is in process of execution at the hands of Messrs. Farmer & Brindley, and a new organ by Willis is in hand; both these, we understand, being the gifts of individuals. We may mention that about 6,000*l.* or 7,000*l.* are wanted to complete the work, which is paid for, or nearly so, up to the present point; subscriptions towards the completion will be welcomed.

It seems a pity, as the restoration and the decorative schemes of the choir are being very completely carried out, that some of the stained glass offers so little for satisfaction. The east windows of the presbytery are filled with very questionable glass, by a firm which had more reputation at the outset of the Gothic revival than it now possesses. The windows are weak in design, and heavy and inharmonious in colour. Over the arch which separates the choir from the presbytery is a truly dreadful window of some two centuries ago, which, being a family memorial, must, we suppose, be considered sacred, and which, in fact, has been lately repaired and made to shine with added lustre. Under the circumstances, we presume, its retention in its original position is unavoidable; but it is a terrible eyesore, not only in style and design, but in the crudity and harshness of its colour, which injures the aërial perspective of the choir, and will clash seriously with the scheme of colour decoration on the walls. Then there is the south window of the east transept, which has been filled with the *débris* of old glass in a most marvellous manner. In the east window of the south aisle some of the old glass has been put together very successfully, at each side of the window, as a framework to a modern stained-glass design; but in the transept window some hundreds of odd bits of glass are promiscuously leaded-up without the slightest attempt at systematic arrangement, with a result which suggests nothing so much as looking into a kaleidoscope at the wrong end. Seriously, the effect of this is exceedingly bad, and it is absurd to say that every morsel of old glass is so precious that it is to be stuck together in this way to disfigure one of the principal windows of the cathedral. Let this glass be taken out, and the pieces which will work together rearranged into something like a design, and the remainder made out with modern glass. Some other use might, no doubt, be found for the parts of the old glass which will not work into any shape; but it would be better even to throw it away than to disfigure the five lancet windows, as they are now disfigured, by this piece of archæological hodge-podge.

Readers need hardly be reminded that the restoration has been carried out under the direction of Sir Gilbert Scott, who has also just completed another small piece of restoration, in the shape of a very picturesque residence overlooking the close,—a quiet bit of late domestic Gothic, which harmonises very happily with the peaceful aspect of the broad, level lawn, surrounded with trees, from which the cathedral rises, and which affords such a beautiful base for its aspiring vertical lines and pyramidal composition. On this particular day, however (one of unusual brightness), the best thing we saw was the view of the building from the west walk of the cloister, with the tower and spire, white and glittering in the strong sunlight, soaring into the blue of a cloudless sky, above the cool green of the cloister court and the two cedars,—a picture worth remembering.

HEALTHY HABITATIONS.*

I HAVE often been called to a residence where a dank and unpleasant smell was prevalent, and traced it to nothing but rot. I do not allude to the wet rot which seizes wood alternately wet and dry, as between wind and weather of a fence-post, but the dry rot which is due to the placing of unseasoned wood, or, indeed, any wood in close contiguity to the surface mould and the gases evolved in its decay, and in situations where there are no ventilating air-bricks, and consequently no change of air. Floor joists which have been long surrounded by dead air will weigh light as a feather when taken up, all due to fungous growths and the like. The worst of it, too, is, that by a catalytic action the decaying wood infects the sound, and the mischief never ceases until that whole level of floors is destroyed. If on inspection the attack has been found a moderate one, and the space between the joists and the ground sufficient, the infected places may be cut out and the space ventilated. A pipe may also be laid underneath the fire-grate for a time, to ensure thorough drying. But if the joists rest on the bare ground, the only remedy is to take them up, dig out the earth, laying down some concrete if necessary, and refix fresh and seasoned timbers. I would not depend even upon sulphate of copper or chlorine. Many architects specify the joists to be treated with various solutions, under pressure or otherwise; but it is really not necessary if good ventilation amid joists be provided. With greater reason should we seek to preserve our wood-carvings from the ravages of those three species of beetles which require plenty of light and open air, and would seem to look upon a rich chasing as does a gourmand upon a sumptuous restaurant. One wonders, nevertheless, how our fathers escaped these pests, and why we do not find the powdering rot or the shell-lined burrows in the time-honoured timbers of our many abbeys. I carefully examined an Egyptian coffin the other day at Dresden, and it showed decay of no kind. My own impression is that we build far too quickly, and out of undesiccated materials.

Pass we to the walls of the house. Bad walls may be constructed of too-porous materials, which will allow the beating wet to pass through them. Here the advantage of hollow walls is manifest, down the interior space of which the moisture may trickle and be carried away. It has been suggested that walls should be built of impermeable materials, to prevent the intrusion of water; and at one ironworks alone in this country some 120,000 bricks formed out of blast furnace slag, are turned out weekly. But in a house built in Bavaria with this very material, it was found that, although dry at first, it proved unbearably damp in the end; the reason being that the vapours given off in cooking, washing, and breathing simply condensed upon the inner surface and remained there. The truth is a wall must breathe; and even with the doors, windows, and registers shut, a sensible supply of air should pass in and out of the room through the wall substance. This is supplying fresh air without draught, and as was intended by Nature. For this reason also it is wrong to paint the walls either inside or outside, to cover them with varnished papers, or, in fact, to do aught but distemper them with water-colour which cannot close up the pores. For so surely as we do prove treasonable to Nature in this matter, so certainly shall we suffer. In halls and in corridors where ventilation is constant, and where one merely passes and repasses, we may indulge to the long length of our purses in marbles, casings, tiled dados, and oil-painted spaces; but in our living-rooms and dormitories let us beware of such innovations.

The walls of a room may, however, be properly enough built and yet act prejudicially, owing to the papering bestowed upon them. I need say nothing, however, of the arsenical papers and the poisonous flock papers, for householders are now mainly alert to the mischief which they work, and are even demanding that Government paternal should forbid their importation or manufacture amongst us. That arsenic is sometimes poisonous, even when present upon smooth substances, was proved the other day at Bonn, where a professor and two students were seized with violent headaches, and where the mischief was traced to the green shade over the lamp, which was coloured by the poison, and which the heat of the lamp had set free. In like manner the dust falling from the poisonous wall-papers is dangerous when breathed by the inmates of a room. Such dust is even conveyed to other rooms by our senseless habit of dusting with dry cloths upon the floor. Nor does the evil of paper-hanging end here; for coat upon coat of paper and paste, size and paper, may sometimes be found on the walls of a house just got up for an incoming tenant. I have seen seven different paperings, embodying apparently every taste under the sun, taken from the walls of a single room, and the difference to the occupant afterwards was something wonderful.

Ventilation and heating I treat as kindred subjects, and as dependent upon each other as are the boiler and firebox of the engine upon the coal and water of the tender. I have examined in many countries some hundreds of patents, and seen generally, I believe, all that has been most lauded in the way of ventilating houses, and I have found that the best systems have always been the simplest. First of all, decide whether you will adopt the common firegrate or the ventilating fireplace. If you adopt the ordinary firegrate in the living-rooms,—and choose you the old Rumford pattern,—supply it with air from without, and it will then cease to draw cold air from the passages and chill your feet as you sit by the fire. Then provide an inlet of cold air, broken up by passing it through a grating, such inlet to be from the floor line as high as one can conveniently reach. As for the outlet, if you have a separate foul air-flue running up alongside the chimney-flue, insert an Arnott's or a Boyle's mica-valved ventilator into that just below the cornice; and if you have no separate shaft, then insert the ventilator into the smoke-flue. I would further recommend a shallow ventilator over the head of each door, the whole width of the door, and with the means of closing it in winter. In summer, when all these are open, the effect is congratulatory. But be sure that the kitchen is well shut off, or well ventilated of itself, with separate inlets and a strongly withdrawing foul air-shaft.

In the case of bedrooms, where common grates are to be used, I would equip the doors with the same ventilating panel overhead. But I would furthermore raise the lower sash of the window 3 in., filling up the gap below by a piece of wood stretched across the opening. Provide, also, the means of lowering the top sash. The lower sash being lifted up, a never-ceasing air-current from outside is directed between the meeting bars and driven upward towards the ceiling, being, moreover, sensibly warmed in its passage. The outlets will be found at the registers of the grates or at the valves in the chimney-breasts. Mr. R. Rawlinson, who kindly showed me, at his own residence, windows fitted up upon this system, has expressed himself to the effect that this plan of Dr. Bird's is the best possible arrangement. The living and bed rooms thus ventilated, there remains the staircase, which should be provided with an outlet. Mr. Rawlinson lifts up the flat ceiling-light a little; and where there is none I would make an opening into the outer air at the highest point, with a protection-box to prevent an inward current.

If the owner makes choice of ventilating grates behind or around which a chamber is formed, in which air from without is warmed and allowed to enter the room at about mantel-piece level, and if the architect has built separate foul-air flues alongside the smoke-flues, I would still provide the valvular ventilators in the chimney-breast, because I have seen them act beneficially. But if no such separate flues exist, these should not be inserted in the smoke-flue, as might be done with impunity with a common fire. The behaviour of the hot air, as it issues from the warm-air chamber, is to mount to the ceiling, adown the wall, dispersing itself pretty equally throughout the room, and then across the floor to the fire. But although this is so, I would nevertheless introduce some inlets for fresh air during the summer, and, moreover, retain the power of withdrawing the respired air by means of the foul-air flue in the chimney-breast.

When building a house I would always provide the panel over the door, and separate air-flues to supply the fires with air for combustion. Between the smoke-flues I also invariably provide a foul-air shaft, terminating a few inches above the ridge on the sheltered side of the chimney-stack. In the case of a cottage, one such foul-air flue will serve several rooms, but in larger mansions I always make a separate air-withdrawing flue to each room. In the reception-rooms and other large rooms I cause on each wall, during the process of building the walls, a

* By Mr. Eassie. See p. 629, *ante*.

4-in. shaft to be built from the ground-line to the eaves, and these can be made to act as inlets or outlets, according to the weather. In the depth of winter, also, they are readily utilised for gas calorigens.

I need not, I think, describe the whole-house system of ventilation, although I warmly approve of it, because it must be studied in detail. Here a single inlet of warm or cold air is provided for the whole house, and also one common abstraction shaft as an outlet, with controllable valves and other requisites. It has proved a great success where it has been tried by Drs. Drysdale and Hayward, and if properly attended to will change the air in every room of the house every twenty minutes. I am afraid, however, that the system would be too costly for general use.

I have only one word more to say on this part of the subject, and that is that, whenever possible, a vestibule should be constructed in the hall, and the air warmed for the hall use, and for the use of all the passages. The advantage of the ventilating panels over the doors will then also be felt. But the stove or calorigen should be fed with a tube-conveyed stream of pure air to be warmed within it, for delivery into the room. If hot-water pipes or coils are used, bring in all the same the stream of cold air to the under side of the pipes or coils, and save the churning and burning of the air over and over again. Moreover, if there be a coil-case, see that it runs on castors, and enables the servant to dust the pipes,—burnt dust being very offensive.

Ventilation should be so perfect as to permit even of the withdrawal of any lighting gas which may have escaped, or at least for a sufficient dilution of the gas to prevent the recurrence of such disasters as the late one at Arbroath, where three people perished by suffocation. The results of gas poisoning have been carefully noted, and the reports of the necropsies given by Dr. Lockie, of Sunderland, in which city a youth of eighteen years was poisoned, and by Dr. Sneddon, of Beith, where a man aged thirty and a cat perished together. Within the past two years leaks from gas-pipes have also caused explosions, which resulted in the loss of three lives at Southgate and two at North Durham, and London has but lately to lament the loss of Dr. Foster by a similar calamity. Serious explosions have also occurred at Sheffield, Wirksworth, Rochester, Ashbourn, and doubtless at an endless number of unreported places. Sometimes gas has escaped into the house from leaks in the main outside, and gas will creep along underground for an astonishing distance. It has been traced for 30 ft., and even across a roadway on one occasion. The only cure for this evil is to compel the companies to insert stop-valves in their mains, so that the flow of gas from a fractured pipe can be prevented pending its restoration.

But I would recommend more than this, and nothing less than the compulsory testing by the gas companies of the house-pipes before their commodity was allowed to pass through them. And I would insist upon the pipes being tested every time the reading of the meter was taken. With our system of working, the gas companies are independent of the leakage going on in the house-pipes.

Now, in America, before the gas companies will make the connexion with the meter, they satisfy themselves that the pipes are intact. The contrivance used for testing is a force-pump of simple construction, and connected by a tube with the only one of the burners which has not been plugged up. If, after forcing the air into the pipes, the mercury rises in the gauge and remains steadily at the one height after the stop-cock has been shut off, the pipes are sound. But I have often seen the mercury dance up the pipe and disappear when the pumping ceases, in which case either there is a leak at the joint or a split at the weld, or may be there is a plug left out behind the papering, as happened to be the case the other day, or peradventure something has happened to the composition piping. It would not matter very much certainly whether the gasfitter were bound to test the pipes before the gas company laid on the gas, or whether the gas company are compelled to test the gas before they connected to the main, so that the pipes were tested. I have seen here in London the most disgraceful jobs in the way of gasfitting which nothing but a systematic testing would have discovered. Another improvement which should be encouraged is the use of a gas-regulator. The best one I know can be seen in use at Judkins's, of Fleet-street.

As we perambulate through our ideal mansion, the next thing we would likely take notice of would be the water-pipes and the cisterns. In no house, whether the water supplied be hard or soft, should the water for culinary or drinking purposes be conveyed in leaden pipes. I will not insult my hearers by recapitulating the reasons for this precaution. Of late years the lead-encased block-tin pipe has been found to obviate very many of the evils complained of in lead pipes, and it will always have good work to perform for the community. But a still better pipe is used in America, and steps are just now being taken to introduce it into this country. I refer to the glass-lined water and gas pipe, in which the water comes into contact with glass only, and in which there can be neither oxidation nor corrosion. The interior being smooth also, there is less friction, and consequently the flow of water can be carried upwards with less pressure. Fortunately, too, the resisting power is very much greater than lead, and the cost is very little more than lead pipe. Those who have used it in America say that they would rather pay for this pipe than have any other fixed for them free of charge. It is constructed of an iron exterior casing, and between that and the glass is a compressible plastic substance, which is both a non-conductor of heat and cold. It is certainly a great advance upon everything that has yet appeared as a water or gas conveying medium, and deserves universal patronage.

One thing is quite certain, and that is, leaden cisterns should be abolished altogether, or confined simply to the supply cistern over the closets. I do not think either that galvanised iron cisterns are fit for the storage of water, inasmuch as zinc is a coarse metal easily oxidised. Poisoning by the oxide of zinc deposited in the cheaply galvanised iron cisterns and along the zinked pipes have been somewhat frequent. Thus, too, we have been obliged to discontinue the use of zinc-lined kitchen utensils. Paper collars also, when they were covered with zinc white, caused eruptions around the neck whenever the perspiration dissolved the zinc coating. I believe the best and handiest materials for cisterns will be found to be slate, enamelled inside. I always specify them, if used for drinking-water, in order that the least dust within will be discoverable at a glance.

When a house is supplied with well water only, it is wise to periodically analyse it. Seventy-five per cent. of waters sent from the country has proved on analysis to be unfit for use. I have a client at the present time residing in London who has fled a magnificent country seat simply because not a well on the house premises can be found to yield good water. When sickness first seized the establishment, the drainage was suspected, and certainly some serious evils were laid bare and remedied, but nevertheless the unhealthiness continued, and at last the water proved to be the delinquent; and the strangest part of the matter was, that the water which had been considered best on the estate, and which had not long ago been brought into the house at great cost by a neighbouring plumber, proved to be the very worst sample of the lot. Wells are more often than otherwise poisoned by the infiltration of sewage matter, but not unfrequently are they made unwholesome by the introduction of lead suction-pipe. When a well has been found impure, and it becomes incumbent to sink another, I make a trial of the most likely spot with the aid of a tube well, and if the discovered water proves to be good on analysis, I sink a well there. Several of these tube wells are now, however, driven at intervals apart, and, united by longitudinal pipes, are brought to one spot where a pump is fixed. This is often found to be cheaper and even better than sinking a well.

Many residences in the country are entirely short of water, taken either direct from the river, or raised from the water-bearing rocks. There is, therefore, nothing remaining for them but the utilisation of the rain-water. But in such cases I carefully exclude the supplies from lead flats, and use them in the soil-drains for flushing. In every case, however, where rain-water is used for drinking and cooking purposes, it should be well filtered. Sometimes I use a simple filter of one chamber, the water rising through sand and gravel, and in a general way this is sufficient. But cases do occur when it becomes necessary to interpose a depositing-tank previously to the water finding its way into the cistern, and when one must also use a more compound filtering media, as, for instance, chalk and charcoal, and shingle or sand. And when the sole supply of the house is derived from the rain-water collection tank, especial care should be taken to keep the gutters and downspouts in a cleanly state. It is perfectly astounding what impurities will collect there in a few months, what a load of fæcal matter, and what dead atomies of winged life. And not only should an overflow be provided for the tank, but a drain from the bottom, fitted with a plug and spindle, so as to facilitate cleaning. These drains should not, however, lead into the soil-drains. For the rest, a large ventilating pipe should be led up out of the tank to the open air.

I am surprised, considering how long the cylinder system of hot-water heating has been known, to see how persistently our best engineering firms continue in the use of the huge boiler at the back of the fire, and all its liabilities to explosion and other drawbacks. So thorough a case has been made out against the system, that I am sure every one is acquainted with its demerits. Indeed, the very method of its supply —from the often filthy small supply cistern in the corner, or in the dark cupboard, or even in the wall, is enough to prove that there is too much of the hole-and-corner business in it to guarantee perfect cleanliness. On one occasion, in Wimpole-street, London, I saw the small cistern mud thick with the remains of dead beetles and cockroaches, nor would the defilement have been discovered had not the decoction in time discoloured the water, and induced a search.

In the cylinder system of hot-water supply—and I never in any case recommend any other for washing up, or for bath water—I use the Dyer patent. The cold water is at the top of the house, and the hot-water cylinder near the fire. There is no need of a circulating hot-water cistern upstairs, neither of any small-feed cisterns downstairs. The cold water from the upstairs cistern enters near the bottom of the cylinder, and the boiler of the apparatus is of the smallest possible size. Should frost set in, and no water flow from the upper cold-water cistern to the cylinder, so as to force the hot water up, there will simply be a stop to the supply of the hot water for a time, but as the cylinder will be nearly full of water all the time, the small boiler will always be kept charged, and remain so until the frost surrenders. It is impossible to empty the cylinder from any of the taps, although it is in the power of the master or mistress to open a sluice-cock and empty it when it requires to be cleansed out. It may occur, of course, that a small boiler in connexion with the nursery or still-room fires would prove a great boon, and there is no objection to these. But there is to the large coffin-sized boiler at the back of the kitchen and scullery fires, it being a perpetual menace to the lives of the household, and worse than the sword of Damocles. With the cylinder system it is also possible to heat a few coils for warming the rooms and passages; but the coils should be galvanised if the water is wanted free from discolouration.

People are now so tired of being lectured upon drainage, of the danger of laying pipes under houses, of using bad drain pipes, and not truly turned ones like Stanford's; of the propriety of a good fall for the pipes; of good joints free from stuck-up shirt collars of cement inside; and have so often been told how a coating of tar round the outside of the pipe will prevent the entry of roots at any joint, that they smile simply, and hazard an opinion as to their entire acquaintance with all that could possibly be said upon the subject. This boast would, however, be a fallacious one, for with an engineer in good practice nearly every week brings him a fresh fact to startle him as to what evils may be silently working, mole-like, underground, and sapping the health of the too trustful ones. Too much can scarcely ever be said regarding the danger of permitting old cesspools and brick drains to remain inside a house, and of the propriety of even searching for them, if the house be an old one, the very moment that the first smell is manifest, or when the first rat crosses the Rubicon. I look upon the sewer rat as really a beneficent animal, sent by Providence to warn us of the possibility of sewer-gas eruptions. He is to cleanliness in the drain what the *Cimix lectularius* is to cleanliness in the bed, a sort of moral *gendarme* flying in the face of danger even to bid you be wise in time. And just as I would search for old cesspools and brick drains, and abolish them, so would I get rid of all the filthy places in and about the stable-yard, the garden, and even the kitchen offices, and replace them with earth contrivances of automatic action.

I never look upon the word trap in a book, or see one, but I am reminded of the deceptive character of the article. We must have traps, I know very well, but we do not require many save in the streets, at the gullies, or just before the house-drain enters the main-drain, the sewer, or the cesspool. We try to cut off all connexion with the sealed drain by the insertion of an article not much larger than an old-fashioned watch, and with a water seal hardly thicker than its silver back, and believe we can resist the influence of gases generated in about, say, ten miles of sewer, and seeking an entrance into the rarefied atmosphere of the house. The idea is monstrous, and ought to have needed no Dr. Fergus to have laboriously ridiculed it. The best trap is the syphon-trap, when it is a syphon, but I have seen so very many imperfect syphons, both in earthenware and lead, that I would almost insist upon having a worshipful order of syphons, in order to obtain a hall-mark upon them, and so be certain that they really trapped. I took out of a mansion the other day in Lincolnshire a leaden bend supposed to trap, and which a plumber had not long put in, and I characterise its condition and beauty of shape sufficiently when I say that it is now in the museum of the establishment, and duly labelled.

I am almost forgetting our imaginary house, but we will see the state of our waste deliveries. Does the cistern overflow deliver into the soil-pipe?—cut it. Does the bath waste so deliver? cut that off. So do the sinks of the housemaids', butler's, and housekeeper's rooms so deliver, cut them off also. Let nothing go into the drain direct, and disconnect in every direction. But what is disconnexion? Well, if you take the cistern waste-pipe out of the soil-pipe, or out of the rainwater-pipe connected with the drain, and allow the cistern waste to deliver in the face of day upon the roof, or the pavement below, that is disconnexion. If you find that the waste-pipe of the lead safe under the watercloset goes into the soil-pipe, and thousands do, or into the D trap, and if you make a simple hole in the wall, and put the lead waste-pipe through it, you have disconnected such lead closet safe. In like manner, if the kitchen or scullery sink runs direct into the drain, trapped or otherwise, and if you lead the waste out through the wall, and cause it to deliver in the open air over a grease-trap, or just under a ventilating grid, that kitchen waste has been disconnected. Formerly it was deemed sufficient to interpose a small body of water between the inside of the house and the drain, but now, in place of this, we interpose an open-air space between the trapping water in the drain and the ends of the wastes outside the house. The rule is now to allow a current of fresh air freely to travel from the disconnecting tanks up the soil-pipes, and so out at the roof, the constant action being maintained by the adoption of a foul-air withdrawing cowl. Instead of the house-drains containing pent-up gases and foul air, they are now made into highways for fresh air, and the difference in favour of health is self-evident. No matter what pattern of closet be used,—hopper, pan, or valve, the latter with or without D traps, if this disconnexion be carried out with the soil-pipe,—and Mr. Field was, I believe, the first to venture upon so bold a course,—if there be a momentary exposure of the wastes, from that moment of exposure the house is safe. Between the foot or two of exposure and the larger drain, the sewer or the cesspool, can be put a syphon, and nothing will force that, or if gas does so on any one occasion, it will simply rise out of the disconnecting chamber, up through the grating, and be harmlessly dispersed in the open air.

Lord Byron bade his readers of "Childe Harold" farewell on the banks of the ocean, and the idea was in keeping with the high sustained character of the poem. In like manner I will bid my hearers adieu at the edge of the dust-bin, that microcosm of good and macrocosm of evil. How many fevers have been traced to that sarcophagus-looking box, to that mausoleum-looking tomb under the area steps, or in the vault of the close back yard? I think the only care is for the authorities to forbid the mixing together of the kitchen refuse,—and this may mean anything, from the lungs of a hare to the stalk of a lettuce,—and the dust proper, that is, the ashes and house sweepings. I would also forbid the placing of the dust-bin below the floor level. Your time will not permit me to say more at present, but I have indicated, I hope, some of the chief reasons why houses prove unhealthy, and with your leave will revert to others on some future occasion.

A NEW VESTRY HALL FOR PENGE.

THE Vestry of Penge have hitherto been without a public hall or offices, and up to the present time the business of the vestry has been conducted in a private house. This unsatisfactory state of things has led to much inconvenience, which is about to be remedied. At their meeting last week, the Vestry decided upon the erection of a new vestry-hall within the parish, and the preliminary steps for effecting this object were taken. The Vestry resolved, with the sanction of the Local Government Board, to put in force the Act passed to prevent the holding of vestry meetings in churches or private places, and the erection of a new vestry-hall having also been agreed upon, a committee was appointed to further the undertaking by purchasing land; and it was further determined that an application should be made to the Local Government Board for permission to borrow a sufficient sum of money for carrying out the undertaking. The question of appointing an architect was next considered, the name of Mr. Elkington, a member of the vestry, and the gentleman who designed the Lewisham vestry-hall, being mentioned. It appeared that Mr. Elkington had tendered his resignation as a member of the board, which the Vestry having accepted, the chairman observed that it was necessary to have the advice of an able architect to assist in the first as well as in the more advanced steps of action in the matter, and suggested the name of Mr. Elkington as that of a gentleman on whom they could fully rely for judgment and ability to advise them on the subject, and by whose assistance they would be sure to have erected a handsome and commodious vestry-hall. Mr. Elkington, after some discussion, was appointed the architect. The estimated cost of the intended new building is 5,500*l.*

THE THAMES TOLL BRIDGES BILL.

THE Bill for freeing the bridges across the Thames came before a second committee of the House of Commons last week, the House having referred its further consideration to another committee, other than that before whom evidence had already been taken. The petitioners (who appeared by their counsel or agents) against the Bill were the Corporation of London, the Metropolitan Board of Works, the Board of Works for the Greenwich district, the South-Eastern Railway Company, and the Vauxhall Bridge Company. Mr. Blyth, the solicitor in favour of the Bill; Mr. Fowler, Mr. Mitchell, Mr. Gunn, and other gentlemen who gave evidence in favour of the Bill before the select committee, were in attendance for further examination, if required. Sir Edmund Beckett, who appeared for the Corporation, asked the committee not to proceed with the Bill, inasmuch as it had been altered since its introduction to the House, but this objection was overruled by the chairman, and the committee decided to hear evidence and the arguments of counsel, the Corporation having withdrawn their opposition for the present, in consequence of the decision of the committee. After considerable discussion, and the arguments of the several counsel, together with some additional evidence, not given before the former committee, the committee unanimously passed the preamble of the Bill, and at a further sitting the clauses were agreed upon.

The Government Prison Bill.—The Howard Association have passed a resolution that "The committee of the Howard Association regard with much satisfaction the new Prison Bill introduced into Parliament by the Home Secretary, as tending to effect, or facilitate, some important improvements which this Association has for years been actively advocating. In particular, they hope that its provision for a large reduction in the number of unnecessary gaols will receive the cordial and early support of both Houses of the Legislature. They would desire that the undue restrictions placed by the Prison Act of 1865 upon varied and profitable gaol industry (limiting prisoners' occupation too much to the treadmill and similar 'work') should be definitely repealed." The daily average of prisoners in England and Wales is 18,500 in the county and borough gaols, and 8,500 in the convict prisons; a total of 27,000 to a population of 24 millions. Hence there is only about one prisoner to every 1,000 free men. Consequently the competition of prison industry with free labour is, and must be, almost infinitesimal, with any moderate distribution of trades amongst the prisoners.

CHOIR OF EXETER CATHEDRAL.

THE restored choir of the Cathedral Church of St. Peter, Exeter, has been opened. The work has been in progress between four and five years. Now that the choir has been finished, the nave will have its turn. The cost of the restoration of the choir is estimated at about 25,000*l.* When the nave is completed, the cost of the restoration of the whole interior will probably amount to 40,000*l.*, the extent to which funds are at present forthcoming.

The whole series of stalls is new, excepting the ancient misereres, whose quaint style and excellent workmanship marked them out as worthy of embodiment in the new design. Of these new stalls we gave an illustration in our volume for last year.* When an opportunity occurs, we will go through the cathedral.

It may be as well to mention, in a few words, the general work of the restoration, and those who have been instrumental in carrying it out. The whole of the restoration, as our readers are well aware, has been carried out from the designs and under the instructions of Sir Gilbert Scott. Under Sir Gilbert, for a considerable period, Mr. Snellgrove superintended the work; but for some time past Mr. E. G. S. Luscombe has had the charge. The whole of the restoration work generally, the new pulpit, the restoring of the bishop's throne, and a portion of the new woodwork, have been done by Mr. Edwin Luscombe, of Exeter. The new stalls erected have been provided by Messrs. Farmer & Brindley, of London. The painting and stained-glass windows have been done by Messrs. Clayton & Bell; the lighting arrangements and altar-rails by Messrs. Hart & Peard, of London; the brass choir-desks, pulpit-railing, metal gates, and grilles, by Mr. Leaver, of Maidenhead; and the organ by Mr. Henry Speechley, of London.

HASTINGS BATHS.

AT the suggestion of Mr. Alderman Howell, plans were prepared for Public Baths and Aquarium adjacent to the sea-wall, Hastings. The design by Messrs. Jeffery & Skiller and Cross & Wells, local firms of architects, was selected, and here for a time the matter stopped. Then the Mayor called a public meeting, and the result was that the Public Baths and Aquarium Company was formed. Eventually the White Rock site was secured, the company undertaking to erect a sea-wall, and to give up the roof of the building as a public parade, in return for which the Council were to pay them 1,500*l.* Another delay was caused through the usual routine of red tapeism in connexion with the office of Woods and Forests, but everything being at length settled satisfactorily, tenders were issued for the erection of the building, and the contract of Mr. Adcock, of Dover, at 27,000*l.*, was accepted. Some misunderstanding seems to have arisen between Mr. Adcock and the directors of the company as to his liability, and failing to arrive at an amicable settlement, he threw the contract up. The directors,—not wishing to delay the works,—held a meeting at which it was decided that they should carry out the work themselves under the direction of the architects, and that decision was approved of. Another question which arose was whether the aquarium could be carried out on a remunerative scale; all admitted the necessity of the baths, but there were many who did not see the need of an aquarium. The decision arrived at, therefore, to proceed with the baths and leave the aquarium an open question for the present was universally admitted to be a wise one. The designs now consequently embrace the baths only, though, of course, the sea-wall must be completed. The baths will be placed on the western portion of the site, and the entrance from the parade will be by a double flight of steps leading to an open portico. Right and left of the ticket-office will be the entrances to the ladies' and gentlemen's swimming-baths, and on the other side of the large open area will be placed the first-class private baths, eight in number,—for ladies and gentlemen, each consisting of a bath-room with dressing-room and water-closet attached. A spacious corridor forms the approach to the gentlemen's swimming-baths, which has an area of water 100 ft. by 40 ft. The dimensions of the bath used by the ladies are 56 ft. by 26 ft. A cold fresh and salt water shower-bath will be provided at the end of each bath. To make the bathing establishment complete, a small Turkish

* Vol. xxxiii., p. 975.

bath will be attached. A large room, 65 ft. by 30 ft., with refreshment department, will be placed beyond the baths, and this would admirably answer the purpose of a reading or concert room.

Already the works are in operation. Mr. L. Dillon, a gentleman who has experience in hydraulic works, is superintending the erection. His foreman is Mr. Gambling, who was for a long time employed in the construction of the concrete blocks at Rye Harbour, and in laying them in the wall which forms Dover Harbour. Concrete will be the chief material employed in the construction of the building. During favourable weather the foundation blocks will be formed on the exact site of the wall. The smaller blocks will be moulded on the platform prepared for the purpose in the enclosure, and when they have to be fixed in position in the wall they will be bedded and bonded in Medina cement. On Wednesday in last week the first block of the building was laid by Mr. Brassey. A massive block of concrete, 21 yards cube, was placed in position on the rock 5 ft. below the surface of the beach, and above this the memorial block, weighing six tons, was suspended.

SURVEYORSHIP ITEMS.

Caerleon.—Mr. William Harris has resigned his office as surveyor to the Caerleon Highway Board. He concludes a letter to the *Hereford Times* by saying,—"I leave it to the public to judge whether a surveyor of over eleven years' standing, who has always given general satisfaction, should be called upon (in the absence of any complaint) to render a monthly account to each waywarden of the district, of how and where his whole time is spent each day. I feel confident that the course I have taken in resigning rather than carry out such a motion will meet with general approval."

Gillingham.—Mr. W. Tozer has been appointed surveyor and inspector of nuisances to the Gillingham Urban Sanitary Authority.

Hove.—At a special meeting of the Hove Commissioners, on the 1st inst., Mr. E. B. Ellice-Clark (now of Derby, and late of Ramsgate) was elected surveyor for the town and district of Hove, at a salary of 400*l.* per annum, subject to his devoting the whole of his time to the duties of his office. There were 100 candidates, the final choice being confined to three, viz., Mr. A. M. Hiscocks, Mr. Clement Dunscombe, and Mr. Ellice-Clark, the successful candidate.

Lincoln.—For the office of city surveyor of Lincoln there were forty applicants, and at a recent meeting of the Town Council six were selected, and requested to personally attend another meeting of the council, held on the 27th ult. At this meeting Mr. J. J. Henderson, of Leeds, was elected by a large majority.

Long Eaton.—Mr. W. B. Redgway has been appointed surveyor and inspector of nuisances to the Long Eaton Urban Sanitary Authority, *vice* Whittaker, resigned.

Newcastle-under-Lyme. — Mr. J. T. Eayers has been appointed surveyor to the Newcastle-under-Lyme Urban Sanitary Authority.

Newcastle-on-Tyne.—Mr. Lamb, the property surveyor of the Newcastle Town Council, having resigned, the Town Council has accepted the following recommendations of the Finance and Town Improvement Committees, viz.,—"That the whole management of the duties attached to the offices of property surveyor and borough engineer and town surveyor be placed under one competent person as the head; and that the salary be fixed at 1,000*l.* per annum, and that eventually such officer shall have power, subject to the consent of the respective committees, to engage and discharge subordinate officers and clerks. That the proposed arrangements do not apply to the present borough engineer and town surveyor [Mr. Fulton], whose continuance in office shall remain with the council."

Reigate.—At a recent meeting of the Reigate Town Council, Alderman Field, in the absence of Mr. Alderman Thornton, who had placed the motion on the agenda, moved,—"That in consideration of the extraordinary services rendered by the surveyor this year, and the great zeal and efficiency shown by him, by which the corporation has been materially benefited, his salary for the year be increased by a prompt payment of 100 guineas." A general feeling was expressed that the surveyor had well earned this gratuity, and the resolution on being put was carried.

Salisbury.—At the last meeting of the Salisbury District Highway Board, a discussion took place on the conduct of the surveyor, Mr. Whinnerah. It was alleged he had expended a sum exceeding 5*l.* in materials without the consent of the Board. A vote of want of confidence in him was, however, lost by a majority of twenty votes to sixteen. Then arose the question whether Mr. Whinnerah should be censured for expending more than 5*l.* at one time without the order of the Board. Mr. Read moved an affirmative resolution, which was seconded by Mr. Marsh. Mr. Crook, who spoke strongly in Mr. Whinnerah's favour, moved a direct negative, and was seconded by Mr. Street. On a division, Mr. Read's motion was carried by a majority of twenty to nine.

Warrington.—The Warrington Town Council have, on the recommendation of the General Purposes Committee, resolved to increase the salary of Mr. R. Vawser, the borough surveyor, by 100*l.* per annum, *i.e.*, from 330*l.* to 430*l.* In addition to his salary Mr. Vawser is allowed two per cent. on "quantities" taken out for works under his direction. He is also provided with an office, and is allowed private practice beyond the limits of the borough.

Warwick.—Mr. G. Lewis, assistant surveyor to the vestry of St. Pancras, has been appointed surveyor to the borough of Warwick, *vice* Pritchard, resigned.

Wednesbury.—At the fortnightly meeting of the Wednesbury Local Board, held on the 26th ult., it was resolved,—"That, in view of the increased size and importance of the town, it is expedient that a committee of the whole Board should take into consideration the present administration of the office of surveyor, in order to make such arrangements as shall enable the gentleman filling that office to devote his whole time to the duties thereof."

Weymouth.—Mr. Seaman, the late borough surveyor of Weymouth, has received a letter from the clerk of the Local Board of Health, informing him that at a recent meeting of the Board it was resolved,—"That Mr. Seaman, having sent in his resignation as surveyor to this Board after a service of many years, this Board, desires to express to him their great satisfaction at the admirable way and faithful and honest manner in which he always discharged the onerous duties of his office whilst in their employ, and wish him every happiness in his retirement into private life."

ARCHITECTURAL ASSOCIATION.

THE last meeting of this Association for the present session was held on Friday, the 30th ult., the president, Mr. John S. Quilter, in the chair.

Mr. John Douglas, of Chester, was elected a member. Mr. Pownall, the librarian, announced that Mr. Bedford Lemere had presented the Association with a series of photographs of specimens in the Architectural Museum. The best thanks of the Association were accorded to the donor.

Messrs. Francis and Maclachlan, jun., the scrutineers appointed to examine the voting-papers, reported that the following gentlemen had been elected office-bearers in the Association for session 1876–77, viz.:—

President.—Mr. Henry Cowell Boyes.

Vice-Presidents.—Messrs. S. Flint Clarkson and W. W. Robertson.

Members of Committee.—Messrs. T. W. Cutler, E. B. Ferrey, H. L. Florence, R. M. Marnock, B. A. Paice, J. S. Quilter, W. L. Spiers, H. H. Stannus, J. Sulman, and C. G. Vinall.

Treasurer.—Mr. J. Douglass Mathews.

Librarian.—Mr. R. E. Pownall.

Secretaries.—Messrs. Edward G. Hayes and Aston Webb.

Solicitor.—Mr. Francis Truefitt.

Assistant Librarians.—Messrs. H. W. Pratt and V. Trubshawe.

Auditors.—Messrs. A. Conder and R. C. James.

Registrar.—Mr. T. H. Watson.

Collector.—Mr. Alfred Hill.

Thanks were given to the president and secretaries for the past year.

Mr. Thomas Blashill read a paper on "The Architect and the Pupil," and this we print *in extenso* on p. 667.

Divergent Estimates.—The *Metropolitan* states that a survey of the borough of Oldham being required, the Town Council prepared a specification, and asked for tenders. Several were sent in accordingly, and they varied from 750*l.* to 12,450. No tender was accepted.

THE VOTIVE CHURCH, VIENNA.

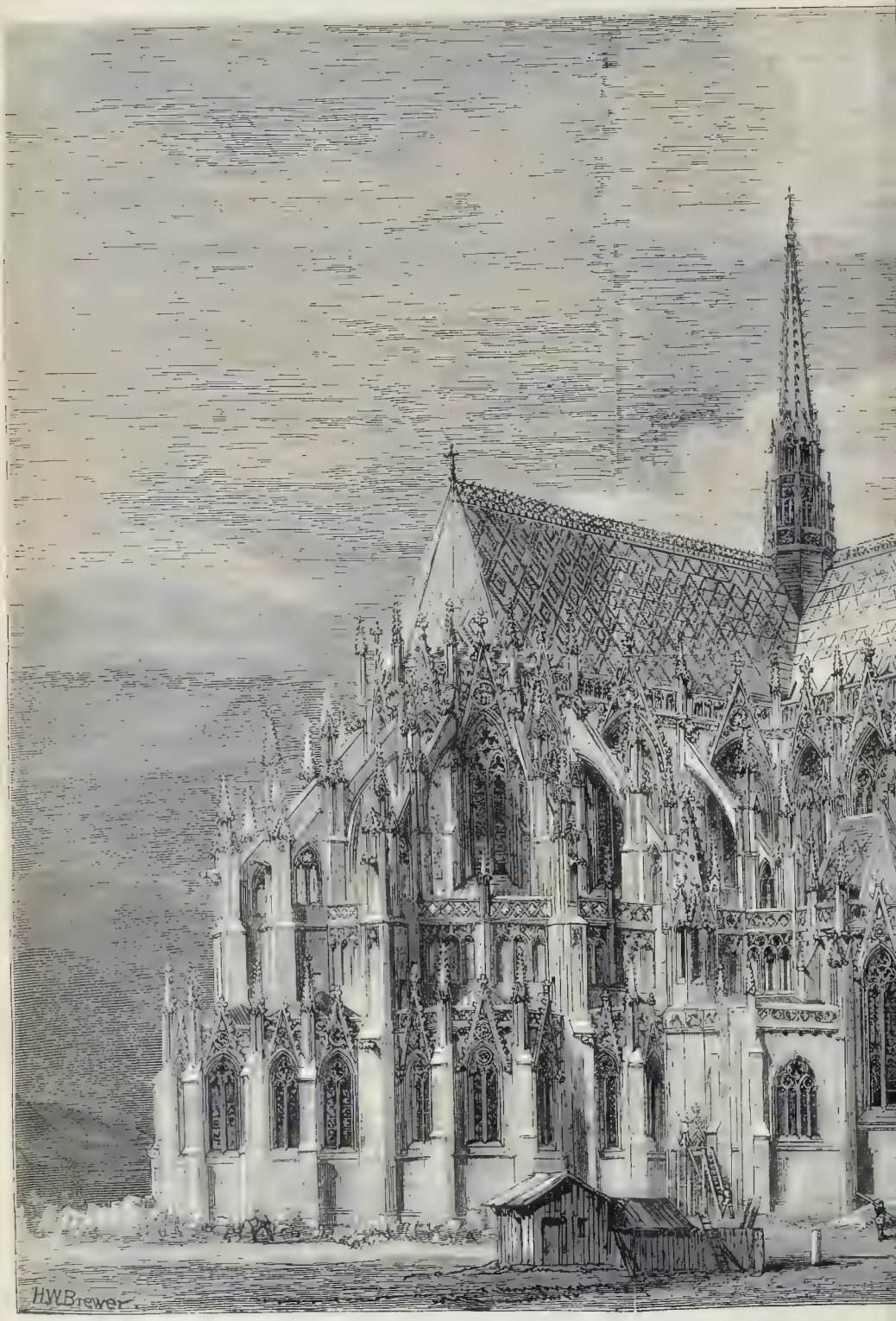
THE Church of the "Messiah," more commonly known as the "Votiv Kirche," erected by public subscription to commemorate the marvellous escape of the Emperor of Austria from assassination on the 18th of February, 1853, will, when completed, be one of the most beautiful specimens of Gothic architecture executed in modern times. The plan after which it has been built was designed by Herrn H. Ferstel, architect, of Vienna, in 1854, and chosen out of seventy-two designs, sent in answer to an invitation from the general committee; but it was not until 1856 that the work was actually commenced. As will be seen from the ground-plan, which we shall give on another occasion, the building consists of a nave and two side aisles, the latter continued round the chancel as choir gallery, communicating with seven small chapels, and of a transept, with four corner chapels abutting on it.

The principal façade, facing the Ringstrasse, is crowned by two elegant octagonal spires. Underneath is the main entrance to the nave, with separate portals to the two side aisles. A smaller spire, constructed in iron and sheeted with lead, marks the point of intersection of the nave and transept. Projecting portals form the entrances to the transept at both ends, leading through vestibules into the body of the church. The polygonal chancel forms seven sides of a regular dodecagon, and above it is an oratorium in form of a triforium, which, together with the choir gallery, attains the same height as the roof of the side aisles.

The best ecclesiastical Gothic of the period, between the thirteenth and the middle of the fourteenth centuries, was chosen as the standard by which to work, and has been adhered to as strictly as the small dimensions of the building permitted. The minute elaborations of a more florid style have been obliged to give place to simpler details for want of space; but so thoroughly has the original conception been carried out, that the statuary adornment of the exterior is founded on the same typological sculptural period as that of the architecture of the rest of the building. The principal front contains a representation, carved in marble, of the "Mystery of the Redemption," while the "Creation" and "Sanctification" severally adorn the right and left façades. But it is on the interior that the greatest amount of time and adornment has been spent. The carvings and mouldings of the pillars and capitals are studied from those of the cathedral at Cologne, and the elaborations of the altar-piece and pulpit, which promise to be richer than anything of their sort yet accomplished, will probably delay the opening of the church until 1877.

The leading dimensions are as follow:—Greatest length, 292 ft. English; greatest span, 94 ft. 6 in.; span of nave, 37 ft. 6 in.; height to ceiling of nave, 93 ft. 3 in.; height of spires, 325 ft. The building was commenced in 1856, and the whole completed to the height of the ceiling of the side aisles in 1862. The two spires and nave to its full height in 1864. The former to the height of the main roof in 1865, and the last stone of both spires in 1868. The nave, transept, and chancel were not finished until 1871, nor the roofing until 1872. Since then the entire energy has been concentrated on the internal decorations, and the erection of statues in the niches of the exterior of the building. The stone is throughout hard sandstone; the roof, of iron construction, that of the nave being covered with slates of two colours, and those of the aisles with lead. The total cost when completed will amount to 374,850*l.*, and the result will be a grand monument to commemorate a national thanksgiving for the preservation of a sovereign. Some years ago we gave some particulars of the undertaking, and a small view, but the importance of the building justifies us in publishing a more complete representation of it.

Alcester Water Supply.—On the 21st ult. Mr. Samuel Smith, C.E., inspector under the Local Government Board, held an inquiry at the Town-hall Alcester, into the proposal of the Alcester Rural Sanitary Authority to constitute a portion of the parish of Alcester a special drainage district, under the Public Health Act, 1875, for the purpose of constructing works of water supply, at a cost of 3,035*l.*, in accordance with plans prepared by Mr. Edward Pritchard, C.E., of Warwick. The inquiry was somewhat stormy.



THE VOTIVE CHURCH, VIENNA



ERRN H. FERSTEL, ARCHITECT.

THE ARCHITECT AND THE PUPIL.

ARCHITECTURAL ASSOCIATION.*

In the many discussions that have arisen in recent years on the question of architectural education, the system of pupilage, which lies at the very root of the matter, seems to have received less attention than it deserves. Very much has been said upon "the arts accessorial to architecture," and it seems to be assumed that, while a certain class of subjects, all more or less useful to the architect, and all pleasant to know, can be taught to the pupil, he must pick up as much of the art of architecture as he can, mainly by his own observation and industry. Starting from the idea that this art cannot be taught, it is but one step to the idea that the system of pupilage ought to be discontinued, and that, contrary to the rule which obtains in other departments of industry, from the humblest trade upwards, the young architect of the future will prepare himself for practice without the preliminary training which an architect's office can give. But besides this theoretical notion, there is a solid basis of dissatisfaction with the actual working of the pupilage system. The architect complains that he gets no useful work from his pupils, and that they expect to be *taught* like schoolboys,—a duty which he cannot undertake. The pupil complains that he is turned down in the office, in an anomalous position, to pick up what he can. The paid assistant just tolerates him, at the best. If not actually jealous of him, he finds it easier to get through his work alone than to have the help of one on whom he can never depend. Perhaps all parties are best satisfied, for the time, if the architect is so unselfish as to place his pupils quite apart, and occupy them solely with copying old examples and model drawings of buildings specially prepared for their use. But whatever mode may be adopted, there is certainly a growing opinion amongst persons of experience that, as a rule, the pupil in architecture leaves his office at the end of his term less finished in training, less mature as to his powers, less useful to others, and therefore less able to get a living, than the pupils of other professions. If this view is correct, as I think it is to some extent, it is clear that it points to something wrong in the system of training; for the profession of architecture, however difficult it may be to acquire and to practise, it is certainly not more so than other professions. Pupils come to it with the same powers of mind, with the same objects, and I think with even more desire towards it on their own parts, for it is not one which a youth is likely to be urged to adopt against his will. Finally, I believe the articles by which the pupil is bound are not materially different from those in general use. I propose, therefore, with the view of introducing this subject to the serious attention of all whom it may concern, to notice the relationship created by articles between the several parties to them, the duties of the architect and the pupil, and a few other matters bearing upon this subject.

The question, "What is an architect?" may seem too simple for us to consider here; but, as it is sometimes thought to involve a great deal of debatable matter, it may be well to come to an understanding about it. Practically, at the present day, an architect is one who designs buildings in all their detail upon the instructions of his clients, and generally with certain limits as to cost; he makes arrangements with builders for the execution of the work by contract or otherwise; he is entrusted with the supervision of the works and of the accounts, and with certain powers of arbitration between client and contractor. It is sometimes said,—as if we were in an exceptional position,—that anybody may call himself an architect. You will, perhaps, be surprised to find that we are in a position not materially different, in that respect, from the members of other professions. Any one can call himself a doctor, or a lawyer, or a clergyman, or anything else, and, except in a very few points, specially provided for, he may do work and receive pay in all those capacities. What he cannot do with impunity, unless authorised, is to call himself a fellow or a member of certain societies, a solicitor, or the holder of certain positions in the Church of England. Besides this, he may, by particular enactments, be unable to recover his fees or charges if not paid when his services were rendered. People in general go to the "regular practitioner," not because they are compelled to choose him by any exclusive privileges, but because they see reason to place confidence in persons of his class, and not in persons outside that class. What is enough protection for persons belonging to the professions that have become more "close" than ours is probably enough for us. You will, therefore, understand that if I advocate the system of architectural privilege it is not from any idea that it ought to be compulsory, but because I believe it to be the best, and, indeed, the only means generally available for the education of the young architect. The system involves three distinct parties, all of whom have their special views and interests,—"the parent or guardian," the pupil, and the architect in practice.

Of these the architect appears to me to have the least interest in the continuance of a system by which he becomes bound, for a consideration usually very moderate, to train for five years a youth who may be troublesome to him, and, unless exceptionally intelligent, docile, and industrious, will not be of very great use. Indeed, the more seriously the architect thinks of his responsibilities, the less he will be inclined to enter into them. If at all selfish he may reckon, amongst other contingencies, the possibility of the pupil becoming in a few years his rival, and, on the whole, I do not see that one in active practice can be compensated for his trouble, unless he gains the intelligent, energetic, and confidential help of the pupil during the later years of the term.

As to the object which the youth has in becoming a pupil, we may believe that, in general, he has acquired a liking for the art (or what he supposes to be the art) of architecture, and is favourably disposed to fall in with any system that appeals to his good sense, and is not too irksome. But there is a third party to the bargain, whose views and objects are entitled to a good deal more attention than they often receive,—the "parent or guardian," who pays the premium, and consents that the youth shall up to, and perhaps beyond, the age of manhood, be clothed and maintained while he earns nothing for himself. His object is not that the youth should become a clever sketcher, nor a sound archæologist, nor that he should pick up a little of everything, and get into a gentlemanly profession, but that he shall in due time acquire a profession *by which he can live*. No doubt he assumes that it is to be a very honourable calling, worthy the highest powers of the mind; but still neither the parent, nor, indeed, the youth himself, would enter into the arrangement, if it were put to them that on arriving at the age when other men are getting on comfortably, the pupil would, probably, be still poor and dependent. Such being the views of the several parties, let us look at the document which expresses the contract between them, and which they are all supposed to read. In consideration of certain payments (though if there were no payment to the architect, or even if the payment went the other way, I see no difference in the obligation), the architect covenants to take and accept the youth as his clerk and pupil, and by the best means he may or can, and to the utmost of his skill and knowledge, teach and instruct him, or cause him to be taught and instructed, in the practice and profession of an architect, "in such manner as the said architect now doth, or at any time hereafter during the said term, shall use and practise the same." Observe the distinct way in which the mode of teaching is laid down. He is not to be taught any number of things "accessorial," but he is to be taught the thing itself, as his master uses and practises it. This, in fact, does but describe the essential principle of the teaching that has prevailed in all ordinary kinds of business in all times. There are countries in which a man's trade or "caste" is fixed for him by the accident of his birth. In this country the profession of agriculture is almost exclusively confined to those who are themselves the sons of farmers, and have been all their lives daily working in the business, and very few besides these persons succeed in it. Where the choice of a calling is free, the first thing a parent thinks of is to place his son, who has chosen his line of life, with some person who "himself uses and practises the same." The practitioner himself is inclined to look with some distrust on any man who enters his profession without serving some sort of apprenticeship to it, and this not merely from the vulgar selfishness of trade-unionism, but from the common idea that a man cannot be competent unless he has been apprenticed. In fact, it is only in recent times that a man could ever make a decent show of belonging to any particular trade unless he had passed this routine. The trade secrets were locked up in the trade, and it was not only the practice of it, but the knowledge of every detail belonging to it, that the apprentice had to acquire. From various causes, of which the arts of printing and engraving are the chief, there is hardly any trade now with which any man may not acquire acquaintance enough to enable him to make a show of understanding it, and a man of acuteness may even get to know enough about it to puzzle in conversation the ordinary practitioner of it. This brings us to a question which it is worth while to consider at some length, because it is of importance to distinguish between the class of subjects which can be learned in this way, and subjects of another class which cannot be so learned. I am going to ask you to distinguish them in your own minds as *matters of science* and *matters of art*.

In ordinary dictionaries the word "art" is said to mean—amongst other things—"science," and science is put down as meaning "art." This shows that there is a loose way of using the two words. Science, as we find the word used by persons who wish to attach a distinct meaning to it, represents "knowledge reduced to a system," not that the system can make much difference to the thing, but because it is often convenient to be able to distinguish between the knowledge possessed by persons who have been systematically taught, or have investigated special matters that are obscure, from the common knowledge picked up by ordinary people. Still science is knowledge, of whatever kind, and however acquired, much of that which is possessed only by the trained and learned man of one generation becoming in the next the common property of all. Now art must be understood as meaning something quite distinct from this. It is "skill" in the employment of one's powers, and in the application of one's knowledge to whatever matters we have in hand. It is of no consequence that many "artists" have their own special way of using the word, reserving it perhaps exclusively for their own kind of work, calling their art "high" to distinguish it from all others, perhaps contemptuous of other folk who are using similar powers of mind and body in the application of other branches of science to other objects. Doing a thing artistically, as I understand it, means doing it with clear insight and with skill, whether the thing to be done involves labour mainly physical or mainly intellectual, and to whatever objects the mind and hand are applied.

One would have thought that these things were tolerably clear; yet if we ask some of our friends for a short distinction between the two professions of engineering and architecture, they will say the first is a "science" and the second is an "art." Now the truth is that one requires the possession of a large amount of a peculiar class of knowledge carefully systematised, while the other requires rather less of this kind of knowledge or science. But the possession of all the engineering science in the world would not make a man an engineer without practical skill, nor would all the fancy and all the readiness with the pencil that are possible make a man an architect without the possession of such knowledge, systematic and common, as belongs to his branch of human industry.

In a paper read lately on engineering, the very able and thoughtful writer began by saying that his subject was entirely practical and utilitarian, and he would not go into questions of "art." I should have thought it impossible to make such a division; for either part must involve the other, and that the writer's distinction of the beautification of building construction from construction itself, was one the justification of which we had better leave to folks who attempt to carry out one without the other. It is, however, impossible to go further into this question now; it is one with which other professions have to deal for themselves. The medical profession has settled it by dropping the use of the word art. They distinguish the two departments of knowledge and skill as the "scientific" and "practical," and if we call them the "scientific" and the "artistic," we shall be able to distinguish between things which can only be acquired by something of the nature of pupilage, and those things which can be better acquired in other ways.

Anciently, all kinds of instruction were acquired in the workshop or office, because they could be acquired in no other place. The science was got by some little teaching, but more by

* By Mr. Thomas Blashill. Read at a meeting on June 30.

daily conversation over the work and by experience acquired in the work,—perhaps, also by some old book; the art was, of course, acquired by daily practice at the work. Now a very large part of the science-teaching can be got a great deal better elsewhere. It is taught in special schools, in classes, and by books, illustrated, where the subject demands it. As to such matters as geometry, arithmetic, and the higher mathematics, if the pupil has not got them at school, he makes up his deficiencies later in life, out of office hours. Draughtsmanship, beyond the plain outline and distinctive colouring required for plans, sections, and elevations, can be much better taught in classes than in the office. Even as to the art of perspective, remembering that it was never found necessary in the best periods of architecture, still it is easy of acquisition, and any youth must be dull who cannot make himself tolerably proficient without troubling the architect or the assistants in his office to teach it to him. Then there is the great subject of archæology, which circumstances have forced into such prominence in modern days in architectural education and practice. I say that the whole subject, from "the five orders" to the latest developments of Mediæval architecture, can be best studied in classes, by joining societies, by books and otherwise, independently of office training. By privately studying this subject the young architect may get a full knowledge of it, and not that partial acquaintance with it which prejudices him in favour of one or another style; so that the same person becomes an enthusiastic admirer of Greek or Gothic, not from any merits of these styles, nor from any taste of his own, but from the accident of his position in one kind of office or another. With regard to such matters as the chemical constitution of building materials, the effects of their combination, their strength and durability, the question of ventilation and warming of buildings, and their drainage, all these matters are best acquired from books or by classes, and cannot be regularly or fully taught in the ordinary routine of an office. But as to all these, and many more which I might mention, if you were to acquire them perfectly, though they would be useful in many positions of life,—though there is hardly any person, however high, whom such knowledge would not adorn,—there is no particular reason why a man should call himself an architect because he has pursued such studies. At the best he is but just ready to begin to apply himself to that or some other useful calling.

The only thing that can make a man so trained into an architect—the thing that is wanting to him—is the practical performance of architectural work. That is the only reason why a youth goes into an architect's office, and the need for his going there arises from the fact that it is the only place where such work can really be seen and done. It is there only that there are real clients to satisfy, real builders to deal with, real difficulties to contend with and to overcome. The reason why the medical profession has practically abandoned the pupilage system, and has substituted teaching in hospitals and medical schools, is the same reason why we shall retain the old system and not adopt a new one. The medical pupil could only study and practise his art imperfectly in the surgery, and it was found that when not only books, but actual subjects for study and practice were accumulated within the walls of a hospital, the pupil naturally went after them, and there he will remain. For it is only at the hospital that the pupil can see accidents and diseases in all their varieties; can see how they are treated, and watch their progress from day to day. It is there that he has opportunities, by dissection and otherwise, to acquire skill of hand in performing operations on the body, and ultimately he has the more responsible duty of watching cases, and using considerable judgment and discretion, according to the changes in the patient's condition. Now all these things differ from the parallel teaching in the best school or college that might attempt to teach the art of architecture. They are no fancy subjects set for the exercise of the pupil's mind; they are the very things which he will have to deal with in after life. The young architect can find no such chances of study and practice except in the routine of an architect's office; and this brings us to the closer consideration of the relation between architect and pupil which the articles create.

I have said that the more the architect considers the responsibility of taking a pupil the less he will be inclined to incur it. But if he does undertake it, he is bound to fulfil his duty by teaching his pupil the art of architecture *as he practises it himself*. With the greatest possible respect for those who most unselfishly attempt to train their pupils by such work as copying ancient examples, I submit that the thing which brought them into the office was that they might help to work out modern examples; and it seems to me neither difficult to induce them to do this, nor improper for the architect to benefit by what they do. With regard to those architects who put the pupil into the office without much personal supervision, it appears to me that a very little consideration and pains would make of their system all anybody could expect or desire. Some of my good friends who have had experience talk of the difficulty of making anything of such youths as are met with nowadays. It strikes me that this is the very difficulty that they have undertaken and must grapple with, but one which will be found less as it is fairly encountered. Let us try to remember what we and our companions were at 15, 16, or 17 years of age. There might not be the quickness of perception which belongs to children, nor the anxiety of children to look at people who are working, and to help anybody and everybody, but there was a great deal of youthful energy and quickness left. The severest critic would perhaps wish that such a youth was half as fond of work as he is of play. If he is not, it must be because work is made less interesting than play, and a very great deal less interesting than it might be, for work, or at least *our* work, is not reckoned by grown men as by any means uninteresting. If we consider that the person whom we have undertaken to train is not an overgrown boy, but a young man, we should treat him as such, by giving him work which he will feel to be of some consequence, which he will see can be done well or badly, and which he will be held strictly responsible to do well. The work would, no doubt, be very humble at first; but if a pupil can see the use of it,—how needful it is in the office routine,—how he is gaining facility in handling the ordinary implements,—acquiring confidence, and holding a respectable position,—there are very few youths who will not take a proper interest in their work. My own experience leads me to place very little value on work done merely "for practice"; there is seldom any proper test of its quality. The pupil should, as soon as possible, be put to work—such as tracing,—that will actually remain as an office record, or go out of the office to be worked from; and if his master will occasionally look at it, and insist on such points as exactness in copying, clearness of line, distinct legibility of lettering and figuring, and general neatness, he will be appealing to the common sense of the pupil, and forming habits which will be of the greatest utility to both alike.

As soon as possible the pupil should go on works, even if no one has time to tell him anything while there; but a youth of any sharpness can be well utilised in writing down notes from dictation, or in taking messages: if he is merely sent to look on without any particular object, he will look on and come back just as wise as he went. He ought to copy the business documents of the office, and a few questions will show whether he understands them. On suitable occasions he ought to be present at business interviews, and be encouraged to form his own opinion of matters in dispute. As he grows up he will have to make out drawings from rough sketches, and if the architect's sketches are sometimes very rough, it will be a good opportunity for seeing whether he puts down windows and fireplaces in reasonable positions when they are indistinctly shown or forgotten in the sketch. He will, of course, have learnt duodecimals at school: he will occasionally have to take dimensions from drawings or on works; enter them properly, and square them up. He ought very soon to be able to go on works, see what kind of materials are being used, and be a fair judge of ordinary foundations, bricks, sand, and workmanship; and, before his pupilage is over, he ought certainly to be able to write a common specification,—a thing that several men of twenty-five years of age have told me they never did in their lives. I say nothing of the "arts accessorial to architecture"; they are not what the pupil came to the office for; but he should have advice as to these matters, and facilities for studying them at fixed times, so that when at work on the office business he may be quite depended on,—as much so, in fact, as a paid assistant,—for I contend that the only way to properly train a pupil is to make him work—while he is at work—as steadily as he will have to work later in life. If the office is one where there is not much work going on, it has probably been chosen because of some other advantage that presented itself; and in that case the pupil will probably get some amount of careful teaching to make up for the lack of practical work; but he ought, at any rate, to see all the work that really comes into the office.

Now, as to the pupil. If he has any enterprise, he is probably rather glad to get away from school, and see what the world is like. He has come to the profession of his choice. I need not insist on this point, that it is work for *men*, and quite worth all the attention he can give to it. There may be certain kinds of rough and uninteresting work. The best thing is to get through that work in the early days, for whether as training for the hand or for the mind, it cannot safely be shirked; and the most selfish of architects will hardly keep a clever youth doing the work of an office-boy when he can make much better use of him. He should not despise such work as tracing, for there is no other way of learning how to draw properly at a time when his knowledge of the details of construction is very small. He should, if possible, read every letter that comes in and goes out, and become thoroughly acquainted with the whole of the office business. One of the most useful acquisitions for a young architect is shorthand, not only for his own use, but because, if in the office of a gentleman of eminence, he may at times act as his secretary, and get into the presence of persons whose ways of transacting business are a very interesting and useful study. Not to make these details too wearisome, I will only mention this most essential thing for a pupil to do. He ought, while in articles, to thoroughly *interest* himself in the office business; to form the best opinion he can as to the way in which designs will come out in the execution; how certain lines of conduct in business matters will succeed. He will feel glad when the work is successful; *personally* sorry when there is a want of success, as if it had happened to himself.

When his articles are at an end, he will naturally consider that he is entitled to call himself an architect, whatever other people may be able to do. He will be a young architect, with a great deal more to learn, but so far as he goes, he should be a whole architect, and not a bit of one,—not merely a draughtsman, who can draw ornament or perspective, and nothing else, or merely a surveyor,—unless he finds, as he may very likely do, that this is really his *forte*. And as a comfort to men who find themselves only adapted to one kind of thing, I may mention that one meets very successful men, in many departments, such as surveyors, engravers, engineers, who were trained as architects, and have drifted off in the direction in which their taste or their chance of employment lay.

If the pupil becomes an architectural assistant, as is likely, he will find that, as a rule, he will be put to whatever kind of work best suits his employer. He will have little chance of seeing a variety, of trying his hand on new kinds of work, or in getting out on buildings. It is the more important, therefore, that he should have acquired habits and powers of working well in all the departments of his profession while he has the opportunity of practising himself as a pupil, and the right of getting the chance of such practice.

My subject being limited to matters relating to pupilage, I shall say little upon matters that are common to the pupil and the more advanced student. I need hardly mention the many opportunities which the Association presents for supplementing the duties of the office in the education of the young architect. Our annual volume will tell more of the advantages which have recently been placed at the disposal of students by the Royal Academy, under the superintendence of our good friend Mr. Spiers. For draughtsmanship of a kind, and applied to purposes which are not often met with in ordinary office work, this class offers very great advantages. My own recollection of Royal Academy lectures, many years since, and the reports we now see of them, lead me to think that they most usefully supplement office routine in their sound archæological teaching, while the student has the great advantage of learning from the professors of other branches of art. Of University College, which in my time had the great advantage of Professor Donaldson's labours, and where the work is still carried on

with undiminished usefulness, I would make one observation which may be a hint to students, young and old. Not having travelled in the countries where remains of classical architecture exist, it was not till I came to hear the careful and lifelike descriptions of Professor Donaldson that I formed any idea of the beauty and the reasonableness of the styles on which he was so competent to discourse. Dry descriptions in books are nothing beside the words of one who has seen the remains which he describes and can impress them upon the mind by his vivid description.

Having ventured on a hint or two such as these, I may just give one hint on matters which it may be best to avoid. Many young architects are vastly attracted towards anything that involves minute workmanship, small prettiness, vivid colouring, such as furniture, metal utensils, and crockery. Let me suggest that the art of architecture, though quite within the scope of ordinary men, is rather a large matter to learn in the years devoted to pupilage. It is worth all your attention during that time, while you have many distractions of a social character that cannot be put aside. It is hardly possible that a man who habituates himself to such studies as these can thoroughly master the larger matters of construction, or can fail to be influenced in his architectural designs by the taste acquired by work in these smaller matters. I should think it best for an architect to be content to know rather more of these things than the ordinary public; but as his duties must finish somewhere, to draw the line at the limits of his profession, and leave matters of furnishing to those who are better able to study them.

There really is no time to waste on trivialities, however enticing. The world wants us, if it can get us, with all our mind and all our energy concentrated on the service that we profess to render. If it cannot get these, it will try to do without us, and we may go on making pretty pictures of architectural subjects—castles in the air. It is our business to design and to carry out in every detail all the great works of the world which do not involve those special questions which, by common consent, are handed over to the engineer. I want to urge that we should stick more closely to this work from our earliest youth, even if we have to read less, to sketch less, and generally to lead a less pleasant life, if, indeed, that which I have distinguished as man's work can be otherwise than pleasant to men.

If we may for a moment consider the future of the art of architecture in connexion with this question of pupilage, I may repeat a remark often made by persons of good general culture. They ask,—How is it that while the men of other professions are generally acknowledged to be making advances, and satisfying themselves at least in the progress of their art, the architect is always grumbling, always acknowledging his inability to satisfy himself, or to rival the works of his predecessors? I know nothing that bears the semblance of a reason for this, unless it be that the architect is often so strongly impressed with the importance of everything that bears at all on his work, that he gives himself too little opportunity to study the central—the real—business of his life. When men of fair ability set themselves to do anything, they generally succeed pretty well if they employ suitable means. One feels disheartened to hear, after twenty or thirty years' experience, the same complaints,—the old story of our own deficiencies. By way of beginning at the beginning, I have ventured to make these few suggestions on a subject which, as I have said, is at the very root of the question of architectural progress, whether as respects the individual, the profession, or the art.

ARCHÆOLOGY AT BANBURY AND NEIGHBOURHOOD.

THE Archæological section of the Birmingham and Midland Institute visited Banbury on the 21st ult. The drive through Banbury, past the historic "cross," and past the last century church, which replaced one of the finest churches of Mediæval England, and which required restoration so little that its walls had to be blasted to shake them down, soon led into the pleasant leafy lanes and among the well-tilled fertile fields which cover the great table land where Oxfordshire extends to the Edge-hill range. A pleasant hour was spent at Hanwell. The interior of the church well repaid minute examination: and then the party wandered down a picturesque lane to admire the massive brick tower, now almost the only relic of the great hall of the Spencer family, who occupied Wormleighton and Claverdon in the reign of Henry VII. Another drive along the shady lanes brought the party to Shotteswell Church, where a dozen architectural details were eagerly discussed, and where a great wall-painting of St. Christopher, of the fourteenth century, remaining untouched by time and uninjured by whitewash, attracted great attention as one of the finest examples of the painted walls of our churches five centuries ago. In the absence of the vicar (the Rev. Mr. Pinwell), Mr. J. R. Holliday read a short paper sent by the vicar, who takes a deep interest in the history and condition of his church, describing not only what remained of interest, but the old wall-paintings which had been destroyed, with two exceptions, only a few years ago. Great regret was expressed generally by the visitors that so fine an example as the St. Christopher should be the only relic of the history of purely English art in church decoration, and that the hand of the restorer should have removed so much that could never really be "restored." Taking to the carriages again, the party proceeded to Harley. Here nearly an hour was spent in examining the curious old epitaphs on the gravestones and the details of the architecture of the church. Then Harbon Church, scarcely less interesting, was visited, and at one o'clock the carriages pulled up at the Round House, at Ratley, where Oxfordshire slopes suddenly down into Warwickshire, on the long line of the Edge Hills. Here luncheon was provided. After luncheon, the visitors proceeded along the edge of the cliff, with passing glimpses through the trees and the sunlit plain below, to the finely-placed Warmington Church. Another long drive among some lovely scenery brought the party to Burton Dassett Church, where the vicar explained the most interesting remains of the church. At Fenny Compton tea was provided. After tea the carriages proceeded to Wormleighton, where the grand old house of the Spencers and the richly-carved screen of the church were greatly admired; and soon after eight p.m. the party reached the Fenny Compton station, and left for Birmingham.

LINCOLN DIOCESAN ARCHITECTURAL SOCIETY.

THIS society has just held its annual meeting at Horncastle. The meeting extended over two days, and included excursions to many places of interest in the neighbourhood.

Horncastle Church was described by the Ven. Archdeacon Stow. The church consists of a tower, nave, north and south aisles, north porch, chancel, south aisle, and a chantry chapel and vestry beyond it serving as a north aisle to the chancel. Formerly, its exterior was so much patched with brickwork as to vie in extent with the original stone surface of the fabric, through the decay of the soft sandstone of which it is built; but this has now been substantially restored. The oldest portions are the lower stage of the tower and a small part of the east wall of the chancel, showing that the present church is precisely as long now as it was at first, and that this was of the Early English period. The north and south aisles are Decorated, but almost entirely new; above is a Perpendicular clear-story. The chancel is also of that style, together with its aisles. The chantry chapel, forming a part of the north aisle, is of a slightly higher elevation than the rest, and its embattled parapet is enriched with panelled work; eastward of this the work is entirely modern, and a vestry there now takes the place of an older structure. The remarkable change that has taken place in the exterior of this church since the Society's last visit to Horncastle is most striking. Then the fine old Perpendicular roof of the nave was concealed by a plaster ceiling. There was a gallery at the west end, a gallery over the north aisle, a gallery over the south aisle, and a considerable portion of the remaining space was occupied by a high quadrangular structure, leaving very little room indeed for the accommodation of the parishioners in general. Now all these obstructions are removed. The aisles of the chancel are separated from it by well-carved oak screens, partly of ancient work and partly modern. The east window is modern, and of a Flamboyant character, which neither agrees with the older base mouldings below it without, nor with the Perpendicular work around it, but it has a good effect. It is filled with painted glass, by Heaton, Butler, & Bayne, as a memorial to the late Rev. H. Milner, vicar of Horncastle. In the north, between what was formerly a chantry chapel and the chancel, is a small square ironed aperture, concerning the use of which there has been some doubt, but most probably it only served as a hagioscope. Holles mentions that he saw in the east window of the south aisle of this church, in his day, figures of a saint with a lock and chain, St. Crispin and St. Crispinian with their trade tools, whence it is assumed that this glass was provided by a shoemakers' guild. Besides the east window there are other specimens of painted glass in this church serving as memorials. In the west window of the north aisle is some glass by Preedy, commemorating the late Vicar, the Rev. Robert Giles, and in the corresponding one of the south aisle is another specimen of Messrs. Heaton, Butler, & Bayne's work, and other glass of theirs in the tower lancets. The centre window of the north aisle is by Messrs. Clayton & Bell, commemorating the late Mr. Fred Harwood.

Leaving the church, the party drove by the pretty village of Thornton, through the park of Mr. A. Floyer, on to Martin. The church here occupied the attention of the party for a few minutes. Dedicated to St. Michael, it is celebrated as the church in which Scott, the Bible commentator, was ordained. The Tower on the Moor was driven past, and formed the subject of much comment, and the next halt was made at Kirkstead Abbey, where the Rev. J. Conway Walter gave a short history of the ruin, and the party then moved on to the chapel. After the little building was crowded, the comforting announcement was made that the building was in such a condition that it might possibly fall; the walls were rent in many places, and the roof having but frail support it was liable at any time to come down on the heads of the worshippers. No effort had been made at restoration, and a sum of 1,500*l.* would be required for the purpose. Tattershall church was next reached. The Rev. G. T. Harvey read the Archdeacon's notes on the building. Created by Lord President Cromwell a Collegiate Chapel, it passed at length under the ban of Henry VIII. It is much too large for the population in its neighbourhood, and the chancel, which has been restored, is now used as the parish church. The castle close by it was one of the most interesting objects on the route. Although called a castle, and provided with means of defence, it was probably only built for the purposes of baronial grandeur. It is a fine specimen of rough brickwork. Mr. G. T. Clark delivered an address descriptive of the building. A halt was made here for luncheon, after which a short drive brought the party to Coningsby, where the church, dedicated to St. Michael, was the only object of interest. The fabric, all but the roof, has been restored. An hour's ride from Coningsby, and Haltham was reached. The church contains as objects of interest some ancient screen work, probably intended to separate the chantry chapel. Wood Enderby Church was next reached. Restored about fifteen years since, it now presents but a stone coffin of the thirteenth or fourteenth century, and some minor architectural items, to interest visitors. Scrivelsby was next visited. The church has been restored since the last visit of the Society. It is rich in monuments of the Dymoke family, the hereditary champions of England. A good specimen of ancient screen work stretches across the chancel, and many of the architectural features are of a thoroughly definite character. A short drive brought the party back to Horncastle. The route had ranged over about twenty-three miles.

The evening meeting was held in the Corn Exchange at 8 p.m., the Right Rev. the Lord Bishop of Lincoln presiding. An address of welcome from the inhabitants of Horncastle was read by the vicar, and responded to on behalf of the Society by the Bishop. Mr. W. J. Clarke then read a paper on "Lincoln Castle," and the vicar of Horncastle followed with one on "Horncastle Fair." This brought the first day's proceedings to a close.

The second day's proceedings commenced with a visit to Hameringham. The church, dedicated to All Saints, is of the Early English period, and possesses a good arcade. An iron frame, originally used by the Presbyterian incumbent to regulate the length of his discourses, is now fixed on one side of the pulpit. The building is much dilapidated, and the Bishop expressed the hope that the churchwardens would do all in

their power to make the church more worthy the purpose for which it is intended. Wincsby was next reached. The church is new, and dedicated to St. Margaret. Standing at the east end of the church, the party had a view of a portion of the battlefield of Winceby, fought in 1643, between the Royal and Parliamentary armies. After a pleasant drive, the next stop was made at Lusby. The church is Norman, and the exterior presents a Norman tower, and a Norman loop window. It is dedicated to St. Margaret. Hagworthingham welcomed the party with a merry peal. The church is dedicated to the Holy Trinity, and is of the Early English style. The building was restored in 1859. The route next lay past Stopford Mill and Harrington Hall on to Bag Enderby. The church here is dedicated to St. Margaret, and is of the Perpendicular style. It possesses a curiously carved font, and several brasses, among which is one to the memory of Albini de Enderby, who died in 1407. In a window on the south side are the flagellum and knives, arms of Croyland Abbey. Somersby Church is a building of the Perpendicular period, but possessing few objects of interest. There is a good specimen of a churchyard cross on the south side, which towers gracefully from the base. Tetford Church, dedicated to St. Mary, was the next halting-place. It is of the Perpendicular period, and possesses north and south aisles and chancel. Leland says that the Britons fought with the Saxons at Tetford in Lindsey, in the time of Vortimer, the son of Vortigern, and there are, close by, the remains of an earthwork that may have been thrown up by the Saxons on that occasion. Plans for the restoration of the church were exhibited. The architect's estimate is 1,200*l*. After luncheon the visitors proceeded on to Salmonby. The church, dedicated to St. Margaret, is of the Perpendicular period, and has recently been restored. It possesses a memorial window by Clayton & Bell. High Toynton was the last place in the route. The church is dedicated to St. Margaret. A short drive brought the party back to Horncastle again, where the two days' meeting was brought to a conclusion by the annual dinner, which was served at the Bull Hotel.

THE NATIONAL GALLERY.

IN reply to questions by Sir J. Leslie, in the House of Commons, Lord H. Lennox said: As soon as I saw the question of my hon. friend on the Orders of the House, I communicated with Mr. Burton, the Director of the National Gallery, who has furnished me with categorical answers to the questions of my hon. friend. I propose now to read those answers to the House:—

"1. The Director's letter was not written to cause delay in the re-opening of the National Gallery, as no avoidable delay was occurring; but to explain some statements in an article of the *Times* of the 3rd of June, as was distinctly stated in the letter.

2. It is one of the duties of the Director of the National Gallery to go abroad to inspect pictures which he has reason to believe would be eligible for the Gallery, and are for sale, and it was on such an unavoidable mission he was called away towards the end of May last.

3. It may be easily conceived that the problem of arranging on given spaces upwards of 700 pictures of the highest excellence, and by masters of distinction, in such a manner as to do justice to all, to properly fill the spaces, and to produce a satisfactory architectonic effect, is one that requires thought, experiment, and time, and cannot be executed lightly.

4. The obstacle to the successful and immediate prosecution of the work of placing the pictures was the glare of sunshine from parts of the glass roofs. This impediment is now being removed, and no delay whatever has occurred in the hanging."

Sir J. Leslie thereupon gave notice that, as soon as the business of the House would permit, he would move a resolution,—"That, in the opinion of this House, it is not desirable that the National Collection of Pictures should be closed during the months of May, June, and July."

COMPETITIONS.

Wednesbury Free Library.—At the last meeting of the Wednesbury Local Board of Health, the Free Library Committee reported that at their last meeting the plans of Mr. Newman were selected; and it was also agreed that the first premium of 25*l*. be awarded to Mr. Newman, the second of 12*l*. 10s. to Messrs. Townshend & Horton, and the third of 5*l*. to Mr. Charles W. Tombs, of Wednesbury.

The Shakspeare Memorial, Stratford-on-Avon.—A meeting of the Council of the Shakspeare Memorial Association was held at the Town-hall, Stratford-on-Avon, on the 1st inst., when it was announced that the Council had finally decided upon the appointment of an architect. The result arrived at is the unanimous choice of the design bearing the motto, "But to the purpose, and so to the venture," and which proved to be the work of Messrs. Dodgshun & Unsworth, of Buckingham-street, Strand, London.

Kensington Vestry-hall.—At the last meeting of the Kensington Vestry, it was resolved to issue advertisements inviting architects to send in competitive plans and designs for this proposed new building. Premiums of 100 guineas, 50 guineas, and 30 guineas are to be given to the authors of designs selected 1st, 2nd, and 3rd, respectively, in point of merit.

Free Library and Art Gallery, Southport.—Premium for best design, 50*l*.; 2nd, 25*l*. Premiated plan, "Classic," Messrs. Wm. Waddington & Son, Burnley, who have received instructions to carry out the work. Second best, "Haut et Bon," Mr. John, Stephens, of Manchester. The other designs were "Labor Omnia Vincit," "As you like it," "Thorough," "Claremont," "1876," "Salus Populi, A & B," "Art," "Science," "Art and Science," "Education," "Arch," A dot in a square, "Pro Bono Publico," "Hal," "Audeo," "Chaucer," "Let there be light."

Auction Hall, &c., Penrith.—The competition for the new auction hall, &c., for the Farmer's Auction Company (Limited), at Penrith, has resulted in favour of plans sent in by Mr. J. Mawson, architect, Lowther and Penrith.

YANWATH HALL.

DINING IN YE HALLE IN YE FOURTEENTH CENTURY.

ON the occasion of the outing of the Cleveland Literary and Philosophical Society to Ullswater, Yanwath Hall was visited. The party assembled in the courtyard, and Dr. Taylor gave an interesting and minute description of the ancient feudal fortress, in order that the visitors might see for themselves in what manner their ancestors lived four hundred years ago. The doctor concluded his remarks as follows:—Let our fancy carry us back to some of the scenes which may have been enacted here. At the far end of the hall, opposite the screens, was the dais, or raised platform of two steps, with its high table, or 'high-borde,' for the lord and his principal guests; down the hall in front were ranged the boards on trestles, and the benches for retainers, and those of inferior degree. No carpet covered the floor, but it was strewn with sweet rush, lavender, and sweet plants. The lower part of the walls was wainscoted in the Gothic style, or that same quaint linen-pattern that you still see on the outer door leading into the court-yard, and of which there is some beautiful work shown at Brougham Hall. From the stag antlers on the walls hung the furniture of war—shields and targets, lances and pennons, broadsword and battle-axe, and the long-bow and cross-bow — together with the engines and trophies of the chase. Here hung also the beautiful burnished armour (which at this period had attained its zenith of perfection), which might be donned hastily any night, on the alarm note of the warden's bugle on the tower signalling the firing of the Beacon of Penrith. Under the benches lay the dozing but quick-scented bloodhounds, kept and provided by the lord, both for the chase, and, if need were, for the pursuit with *hot trod* of the *red hand* moss-trooper over the border. Over the chimney-piece, on heraldic escutcheons, were blazoned the armorial bearings of the Threlkelds, and the quarterings of their alliances,—the Clifford and Vesey. On the wall behind the dais there was a hanging of arras tapestry, representing within its embroidered border some famous incident in chivalry, the work of the fair ladies of the house, — an art but lately introduced into England. The period, let us say, was at the end of the long reign of Edward III., or the close of the fourteenth century, the most glorious in the annals of English architecture, and the most brilliant for prowess in the whole history of England. The great North of England barons, Roger de Clifford, of Appleby, and Ranulph de Dacre, commissioners on the Border marches, and all gentlemen of inferior array, were ordered by Royal mandate to repair to their northern estates, and there keep residence, and arm their followers, to defend the country against the Scots. The lord of the beautiful domain of Yanwath of that day was William de Threlkeld. Let us people the whole with his immediate friends and neighbours. There were Thomas de Lancaster, of Sockbridge, and his kinsman, Sir William de Lancaster, of Howgill, knight, both branches of the family of the powerful barons of Kendal. There was William de Wybergh, of St. Bees, who had just succeeded to the manor of Clifton Hall, by his marriage with Eleanor, the only daughter of the last of the d'Engaynes, of Clifton, besides John de Carleton, of Carleton; Edmund Sandford, of Askham; and many others; and lastly came the Knight of the Shire, Sir Hugh Lowther, whose office it was to marshal the array of vassals and men at arms that might presently be wanted for the Scottish border; and to swell the lordly possessions of whose successors it was destined the manors of most present were to pass. Nor was the Church unrepresented, for the white and black garb of the monk and the cleric rustled softly amid the clang of the half-mailed knights; and the grace was said by the abbot of the neighbouring monastery of Heppe, and after the feast the pax was offered, and the alms-dish presented by my lord's "aumonier," or private chaplain.

The hour is half-past ten; on the upper table the white cloth is spread, and the trumpet has sounded the call to dinner—for our forefathers of the fourteenth century rose at five. The pages bring in the ponderous dishes for the banquet,—a beautiful and varied fare. Salmon from the Poke Dub, the pool in the river below, the great grey lake trout from Ullswater, eels from the Stanke at Pooley; the head of a wild boar speared in Grisdale; venison from a "stag of ten," shot with the quarrel-bolt of the bowman in Martindale, or from a noble hart, a veritable "hart o' grease," run by the "sleuth dogges" from the park of Whipfell, in the manner of Oglebird, and brittled at Tarn Wadlyn, in the forest of Inglewood. Nor do the men-at-arms below the salt fail to help themselves with their fingers (for there were no forks in those days) to huge slices of beef from the baron of one of the knowted kine, a reprisal in an *outrode* against the Elliots of Liddlesdale, or on the braes of Annandale. Nor does the "high table" lack in the more refined samples of culinary art: the highly-flavoured pasties, and the poignant ragouts, mortrews and stews, hotly-seasoned with spicery, and coloured with saffron; for our ancestors were *bon vivants* and epicures in their way. The mead and sack, the Malmsey and Rhenish, and the flagons of highly-spiced claret cup, and ippocrasse—and the wassail and the mazer bowl pass freely from hand to hand; and the "celerarius, with his black-jack stoups, makes many a trip to the buttery hatch, for the nut-brown ale, to fill up the horns of the thirsty comrades at the lower tables.

> And, 'twas merry in the hall,
> And the beards wagged all.

And during the while, the fool, in his motley, cracks his widest jokes, and the band of jongleurs or wandering minstrels in the music gallery, in their fanciful dresses, strum their merriest airs to divert the company, and sing their ballads and roundelays, or narrate in their jingling rhymes how the Scots fell at Halidon Hill, or how some border knight won his spurs on the field of Cressy or Poictiers."

GENERAL CODE OF BUILDING REGULATIONS.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—The subject of a general code of building regulations for the United Kingdom having been discussed at the recent Conference of Architects (as reported in your journal), the council of this Institute have appointed a committee to communicate with the provincial architectural societies and the Local Government Board, and to report to our council on the subject.

Meanwhile, this committee would be glad to receive from architects practising in the provinces any communications relating to this matter, especially with reference to the defects of building bye-laws at present in force, and such other details as their experience leads them to consider it desirable to embody in a general code of the kind proposed.

The council hope that the great importance of this subject to the profession and the public at large will induce those who have considered it to give our committee all the information in their power.

Communications should be addressed to me before the 31st of July. CHARLES L. EASTLAKE, Sec.

London Trees.—A motion was made in the St. Marylebone Vestry to plant trees in the Edgware-road in front of twenty houses where the footway is about eight yards wide, and a memorial was sent by the shopkeepers highly in favour of the proposal, but it has been negatived,—bricks and mortar are too much in the ascendant.

* Received last week too late for insertion.

THE POLLUTION OF RIVERS BILL.

THE Bill introduced by Mr. Sclater-Booth "for making further provision for the prevention of the pollution of rivers" contains prohibitions against putting solid matters into streams, and against the drainage into them of sewers and of poisonous and polluting liquids from manufactories or from mines. Persons are not, however, to be deemed to have committed an offence against the Act if they can show, to the satisfaction of the Court having cognisance of the cases, that they are using the best practicable and available means to render harmless the polluting matter. It is also provided that no proceedings are to be taken against owners of factories or mines under the Act, save by a sanitary authority, nor without the consent of the Local Government Board, "which Board, in giving or withholding their consent, shall have regard to the industrial interests involved in the case and to the circumstances and requirements of the locality." Other provisions are that the sanitary authority is to afford facilities for factories draining into sewers, and that the Local Government Board may authorise sanitary authorities to make bye-laws for the protection of streams.

The following is the full text of the clauses relating to sewage pollutions and to manufacturing and mining pollutions:—

Every person who causes to fall or flow, or knowingly permits to fall or flow, or to be carried into any stream, any solid or liquid sewage matter, shall (subject as in this Act mentioned) be deemed to have committed an offence against this Act. Where any sewage matter falls or flows, or is carried into any stream, along a channel used, or in process of construction at the date of the passing of this Act, for the purpose of conveying such sewage matter, the person causing or knowingly permitting the sewage matter so to fall or flow, or to be carried, shall not be deemed to have committed an offence against this Act if he shows to the satisfaction of the Court having cognisance of the case that he is using the best practicable and available means to render harmless the sewage matter so falling or flowing or carried into the stream. Where the Local Government Board are satisfied that further time ought to be granted to any Sanitary Authority which at the date of the passing of this Act is discharging sewage matter into any stream by any such channel as aforesaid, for the purpose of enabling such Authority to adopt the best practicable and available means for rendering harmless such sewage matter, the Local Government Board may by order declare that this section shall not, as far as regards the discharge of sewage matter by such channel, be in operation within the district of such Authority until the expiration of a period to be limited in the order. Any order made under this section may be from time to time renewed by the Local Government Board, subject to such conditions, if any, as they may deem fit. A person shall not be guilty of an offence under this section in respect of the passing of sewage into a stream along a channel over which he has no control.

Every person who causes to fall or flow or knowingly permits to fall or flow or to be carried into any stream any poisonous, noxious, or polluting liquid proceeding from any factory or manufacturing process shall (subject as in this Act mentioned) be deemed to have committed an offence against this Act. Where any such poisonous, noxious, or polluting liquid as aforesaid falls or flows or is carried into any stream along a channel used or in process of construction at the date of the passing of this Act for the purpose of conveying such liquid, the person causing or knowingly permitting the poisonous, noxious, or polluting liquid so to fall or flow or to be carried shall not be deemed to have committed an offence against this Act if he shows, to the satisfaction of the Court having cognisance of the case, that he is using the best practicable and available means to render harmless the poisonous, noxious, or polluting liquid so falling or flowing or carried into the stream.

Every person who causes to fall or flow or knowingly permits to fall or flow, or to be carried into any stream any poisonous, noxious, or polluting liquid proceeding from any mine, other than water which has been drained or raised from such mine, and has not been subsequently used for washing or cleansing ore, shall be deemed to have committed an offence against this Act, unless he shows, to the satisfaction of the Court having cognisance of the case, that he is using the best practicable and available means to render harmless the poisonous, noxious, or polluting liquid so falling or flowing or carried into the stream. Unless and until Parliament otherwise provides, proceedings shall not be taken against any person under this part of this Act, save by a Sanitary Authority; nor shall any such proceedings be taken without the consent of the Local Government Board, which Board, in giving or withholding their consent, shall have regard to the industrial interests involved in the case, and to the circumstances and requirements of the locality.

An Arbitration Case Settled.—The arbitrator, Mr. James Edmeston, of London, has made his award in the case of Bays *v.* Farren, the hearing of which took place several weeks ago. The plaintiff claimed of the defendant the sum of 69*l.* 18*s.* 6*d.*, for preparing plans and specifications for a house at the corner of Market-street, Cambridge, and for other services connected therewith, and the defendant resisted the claim on the ground that the plaintiff's plans were practically useless to him. The arbitrator has awarded the plaintiff the sum of 10*l.* 10*s.*, and has directed that each party shall bear his own costs of the litigation.

STATUES.

King Alfred.—It has been generally known for some time past that Count Gleichen has been entrusted with a commission from Colonel Loyd Lindsay, V.C., M.P., to execute a statue of King Alfred the Great, with a view to its erection in the town of Wantage, the birthplace of the illustrious king. The statue is being sculptured in marble, and will be placed upon a granite pedestal. The cost will be over 2,000 guineas. The king is represented holding a roll of parchment in one hand. The offer of the statue having been duly made to the town by Colonel Lindsay through the Commissioners, and formally accepted by that body, the next point was to choose a fitting site whereon to erect the monument. For some time past the present structure in the centre of the Market-place, known as the Town-hall, has been an eye-sore to the inhabitants, and it has been resolved that the building be pulled down, and the site utilised for the erection of the statue.

Prince Consort Memorial, Edinburgh.—Preparations are in progress for the fixing of the bronze statuary and bas-reliefs of the Prince Consort Memorial in Charlotte-square. Mr. Steell, the sculptor, has (says the *Scotsman*) undertaken to have the memorial ready for inauguration by the middle of August. When the memorial was first projected, competitive designs were invited, and, out of a large number sent in, seven were selected to be submitted to the Queen, with the view of obtaining an expression of her Majesty's opinion. Before indicating any preference, the Queen requested the late Sir Charles Eastlake, president of the Royal Academy, to examine the models, and on comparing notes, it was found that Sir Charles concurred with her Majesty in selecting the design by Mr. Steell, in which the Prince was represented on horseback, with subsidiary groups round the pedestal to suggest the homage paid to his Royal Highness by a grateful people. While reserving to himself the execution of the equestrian statue, as also four bas-reliefs intended to illustrate the Prince Consort's career, Mr. Steell invited the co-operation of other Scottish sculptors in the modelling of the subordinate groups; and these have accordingly been carried out, from his designs, by Messrs. W. Brodie, Clark Stanton, and D. W. Stevenson, the work in each case being cast at Mr. Steell's foundry.

The Orleans Family.—Several statues in white marble are to be placed in the crypt of the tomb for the Orleans family at Dreux. The first, ordered by the Count de Paris, represents Mdme. Adelaide lying on a bed, the head and breast surrounded by a lace veil. The three others have been commanded by the Duke de Montpensier, who will place them on the sepulchres of his daughter and two sons. All four are the work of the sculptor Millet.

MASTERS AND MEN.

Carnarvon.—The men at the Menai Moel Tryfan slate quarry struck on the 30th ult., in consequence of the manager refusing the Saturday half-holiday.

Brighouse.—On the 26th ult. the Brighouse painters made a demand upon their employers for an advance of wages at the rate of ½d. per hour. Nearly all the masters agreed to this, except one firm, whose men were offered ¼d. advance, but refused this, and turned out.

Rugby.—At a large representative meeting of joiners and carpenters of North Warwickshire, held at Rugby on the 24th ult., it was unanimously agreed to strike work, because of the masters refusing to increase the rate per hour from 7d. to 8d., and it was agreed by the men to fetch their tools away on Monday morning. The masters refuse because the men had an advance from 6¾d. to 7d. only so short a time back as September last. The executive of the Carpenters' and Joiners' Society approve of the step taken, and will support the men.

Ayr.—The strike of the operative joiners of Ayr, which has lasted more than a month, is now at an end. The men demanded an advance from 7¼d. to 8d. per hour, 1s. advance on the rate extra while working in the country, and the masters to sign the bye-laws. On the 22nd ult. the men agreed to the following terms:—7¾d. per hour and the masters to sign the bye-laws.

Worcester.—Mr. J. D. Prior, Secretary of the Amalgamated Society of Carpenters and Joiners, lately lectured at Worcester on "Trade Unions and their Influence on the Relations between Capital and Labour." At the close of the lecture the following resolution was agreed to:—"That this meeting, recognising the great benefits to be derived from trade unions when wisely conducted, earnestly recommends all working men to avail themselves of the advantages which these societies confer upon their members in the time of need."

Glasgow.—At a meeting, on the 27th ult., of the operative joiners on strike at Glasgow, it was stated that six additional employers had acceded to the demands of the men. At a subsequent meeting a communication was submitted from the Trades' Council suggesting that a committee of twelve, representing the men, and a similar number representing the employers, should be appointed, with a neutral person as chairman, to consider bye-law 10, which binds the men to an agreement for twelve months. The meeting would not entertain the proposal, however. A similar communication has been forwarded to the Master Wrights' Association. A motion was agreed to that the men employed do not work over-time until the dispute is at an end, as it would have a prejudicial effect both on the employed and the unemployed. The strike has now lasted for about six weeks, and those yet out seem determined to return to work only on condition that their demands are conceded. The employers, on the other hand, are as determined as ever not to give in, and allege that the reported additions to the number of masters who have signed the bye-laws do not mean much. A meeting of the operatives was held on the 28th ult., when the chairman, Mr. Grant, stated that the deputations appointed to wait on the men working on the old terms had not been so successful as could have been wished. Those on strike were still determined to remain out until their demands were granted, and it was reported that an extra allowance would be given to the non-society men during the fair holidays.

Willenhall.—On Monday last, the 3rd inst., about 400 of the rim and mortise lock and key smiths of Willenhall struck work, in consequence of the refusal of the employers to give them an advance of ten per cent. on their wages, in addition to the ten per cent. advanced to them last autumn, about which time the Wolverhampton smiths received a twenty per cent. increase. Negotiations have been going on for some time past between employers and employed, and a fortnight ago the men gave formal notice for an advance, which expired on Saturday last. The masters refused to grant the advance, for the following reasons:—1. That the general trade of the country is now in a very depressed state, and prices of almost every article of manufacture have a downward tendency. 2. That the demand for locks has much fallen off for the last three months. 3. That the amount of foreign competition is greatly on the increase. It is stated that large quantities of door-locks are now being imported into this country and the colonies from America, at prices very much below those of English make.

Southport.—The joiners of Southport have made an offer to the masters to resume work at 8¾d. per hour, and 9d. from the first week in August. This, however, the employers have refused, as they have nearly filled their shops with men from other towns.

Sheffield.—Five months ago the masons in Sheffield gave notice of a demand to be paid a halfpenny per hour beyond their present rate of remuneration; in other words, an advance of 2*s.* per week. The notice expired on the 3rd inst. Several interviews have taken place between deputations representing the men and representatives of the Master Builders' Association, the result being that the masters offered an advance of a farthing an hour, equal to a rise of 1*s.* per week. This offer the men have rejected. On the 28th ult. the Master Builders' Association held a meeting at the King's Head Hotel, under the presidency of Mr. Rodley, for the purpose of discussing the position of affairs, when a resolution was unanimously passed in favour of submitting the dispute to arbitration. A general meeting of the operative masons was held on the 30th ult., when the master builders' proposal to refer the question to arbitration was fully considered, and the following resolution was unanimously carried:—"That we, the masons of Sheffield, adhere to our original notice for 8¾d. per hour, and consider the master builders' proposition to refer the wage question to arbitration so ill-timed that we cannot at the last moment our notice is about to expire accept it."

CHURCH-BUILDING NEWS.

Tranmere.—St. Catherine's Church, Tranmere, Liverpool, has been reopened, after being closed twelve months for renovation and enlargement. The alterations carried out have effected a complete change in the character of the building. The whole of the east end has been replaced by a new chancel and transepts, erected in stone; stone facings have been added to the old portion of the church; and stone doorways have taken the place of the former means of ingress. For the flat ceiling which existed, an open-timbered roof has been substituted at an increased altitude of 14 ft., and the gallery located in the west end has disappeared altogether. Gothic windows of geometrical glass are introduced throughout. The stained-glass window in the chancel at the east end,—the gift of the vicar, the Rev. M. L. J. Mortimer and family,—contains the figures of Christ, the four Evangelists, and St. Catherine. The chancel is paved with encaustic tiles, and is furnished with a new pulpit of Caen stone. Additional space has been gained by the removal to the east end of a vestry formerly located in the west extremity of the church. The structural alterations have had the effect of providing 300 additional sittings. The cost, inclusive of special gifts from friends and members of the congregation, has been over 3,300*l.*, exclusive of a contemplated tower and spire. The whole of the work has been executed by Mr. W. H. Forde, of Claughton-road, Birkenhead, in accordance with designs furnished by Mr. J. F. Doyle, architect, Liverpool.

Boughton.— St. Paul's Church, Boughton, Cheshire, has been reopened, after restoration to an extent almost tantamount to rebuilding. The old building was in the Classic style, but in the alterations this has been lost, the walls and foundations only being retained in the new building, which is Early Gothic in style. Externally the walls are cased with red bricks, relieved with stone bands. The roofs are slated with dark-coloured slates, and the bell-turret, which forms a conspicuous feature, is covered with oak shingles, with an iron cross as a terminal. Internally the wide span of the former church is divided into a nave and two aisles by a timber arcade consisting of pitch pine pillars with arched openings and framing above, forming panels, which are filled in with cement, the white colour of the panels presenting a pleasing contrast to the dark stained timber work. The high pitched roof covers the nave and aisles in one span, and is plastered between the timbers internally, the latter being exposed to view and stained. The benches or open pews are of pitch pine, stained and varnished. Messrs. Farrimond & Co., of Chester, were the contractors for the whole of the work, which has been carried out by them at a cost of about 3,300*l.* The architect is Mr. John Douglas, of Chester.

Polmont.— Polmont parish church has been re-opened, after restoration. The condition of the church has been much improved, one noticeable feature being that behind the pulpit the ten commandments are set up in gilt letters on a blue ground, surmounted by a scroll, with another running underneath, bearing the inscription:—"The Law was given by Moses: Grace and Truth came by Jesus Christ." This, as well as the whole painting of the church, has been done by Messrs. Fergusson & Bell, Falkirk. The old pulpit, with sounding-board and the precentor's desk, has been removed, and an oak pulpit and a Communion-table, with three chairs behind it, have been substituted. In front of the Communion-table stands a Caen-stone baptismal font. All these articles have been supplied by Mr. Gilbert J. French, Bolton.

Ipswich.— The Vestry of St. Lawrence's, Ipswich, have approved of the plans prepared by Messrs. Barnes & Bisshopp for the restoration of the parish church. They provide for the erection of an organ-chamber and vestry on the north side of the chancel, so that the organ and the choir will be brought closer together. The organ-chamber will be divided from the chancel by a perforated arch, springing from granite shafts, with moulded stone capitals and carved bases. The gallery at the west end of the church upon which the organ now stands will be altered so as to extend across the entire width of the nave, and will be utilised for benches, so as to afford about fifty additional sittings.

Drighlington.—It is proposed to build a new church at Drighlington, in place of the present edifice, which has become too small for the increasing population of the neighbourhood. The proposed site is an extension of the existing churchyard. The plans have been prepared by Mr. Swindon Barber, and the design includes a square tower, 20 ft. clear inside measure, with walls of a corresponding thickness, and is arranged to accommodate seventy people, every one having a complete view eastward, through an arch 18 ft. wide, opening into the nave. In the tower is a five-light window, and the ceiling forms the floor of the ringers' chamber, which is supported on heavy beams and moulded joists. Very slightly projecting piers support the chancel arch, which is 22 ft. wide and correspondingly lofty. The principal entrance to the church is by a low-roofed porch, 10 ft. deep. The aisles are 12 ft. wide and of equal length with the nave, divided from it by an arcade of four arches. Above the arcade is a clearstory wall pierced by three-light windows, which supports a heavily-timbered roof. The chancel is 36 ft. long, and to the north are arranged an organ-chamber and vestries, and to the south a corresponding aisle of two bays of equal height with those in the nave. The east window is of seven lights, the tracery being enclosed by a four-centred arch, according in outline to the hammer-beam roof, which is strengthened by upright posts and traceried heads. Little or no ornamental carved work is employed throughout the church.

Newcastle (Staffordshire).—St. Giles's Church, Newcastle, Staffordshire, has been consecrated. Sir Gilbert Scott is the architect, and the cost has been 13,000*l.* or 14,000*l.* The following is a statement of the principal dimensions:—Extreme length, 150 ft.; width, 75 ft.; height from the nave floor to the top of the ridge tree, 64 ft. 6 in.; height of the chancel arch, 40 ft. 6 in.; width, 24 ft. 6 in. The east window is seven lights wide, and the head is filled in with elegant tracery. There are no galleries, and the church will accommodate upwards of 1,000 persons.

Stowmarket.—It is proposed to restore the tower of Stowmarket parish church, at a cost estimated at 500*l.* It is stated that the tower is in a dangerous condition, and requires prompt attention.

Hagley.—The inhabitants of Hagley intend to erect, by subscriptions amongst themselves, in memory of the late Lord Lyttelton, a lych-gate to their parish church, which was recently partly rebuilt and restored from the designs of Mr. Street.

Salisbury.—The enlargement of St. Paul's Church, Fisherton, by the erection of a new north aisle, is about to be proceeded with. The work is to be done by Messrs. Hale & Sons, of Salisbury, whose tender (1,567*l.*) has been accepted.——The galleries in St. Thomas's Church, Salisbury, having been removed, the present lofty pulpit is no longer needed, and it has, therefore, been decided to have a new one of stone. It is to be designed by Mr. G. E. Street, R.A., and will cost about 150*l.*

Taunton.—At a vestry meeting recently held at Kingston, near Taunton, it was unanimously resolved to restore and repair the ancient parish church. Mr. Spencer, of Taunton, has been appointed the architect. The Ecclesiastical Commissioners have promised a portion of the amount of money required.

Netherhampton.—At a meeting of the parishioners to consider what steps should be taken as regards the proposed improvements of the church, the plans prepared by Mr. Butterfield, architect, were approved.

DISSENTING CHURCH BUILDING NEWS.

Moreton Corbett.—A new Wesleyan chapel has been opened at Moreton Corbett, near Shawbury. It has been erected by Messrs. Paterson, of Wellington, at a cost of 650*l.*, and contains 250 sittings.

New Swindon.—A new chapel for the Primitive Methodists of New Swindon has been completed and opened. The building is of red brick, with Bath stone dressings, and is in the Italian style. The principal entrance is in the centre of the Regent-street front, with additional entrances at each end. There are galleries at each side and at each end, supported upon light iron columns, the front panels being filled in with ornamental iron work. The seats are executed in best red deal, stained and varnished. In the rear of the building there are three large class-rooms and other necessary offices, and underneath the chapel a large schoolroom, 38 ft. long, 32 ft. wide, and 9 ft. high in the clear. The architect was Mr. Orlando Baker, of New Swindon; and the contractor, Mr. George Wiltshire, of Swindon. The total cost is about 2,000*l.*

Dorking.— The memorial-stone of the new Baptist Chapel in course of erection in the Junction-road, Dorking, was laid on Whit-Monday. The chapel has been designed by Messrs. Searle, Son, & Hayes, architects, of London, and is being built by Messrs. Colls & Sons, of London and Dorking. It will seat 230 persons, while provision will be made for the erection of galleries to seat 100 more when required. There will also be a vestry and school-room attached. The total cost will be about 1,600*l.*

Seacombe.—The memorial stone of the Welsh Calvinistic Methodist Chapel, Liscard-road, Seacombe, has been laid by Mr. David Davies, M.P. The building will be cruciform, and consist of a nave, transept, and vestry. There will be a roomy porch at the north-east angle, and tower porch on the north-east side. The style of architecture will be Gothic of the Early English period. The roof will be partly open, following the curve of principals, which will rest on detached columns of marble with foliated caps. The nave will be divided by means of the principals into three bays with cross principals at the intersection of the transept. The pews, which will all be open, will be constructed of pitch pine with framed bench ends, while the pulpit and Communion seat will be made of Dantzic oak. The accommodation will be for 270 sittings in the nave, and the intention is to use the transept as schoolrooms. It will be divided from the nave by brick partition walls, which when taken down and thrown into the chapel will give 120 extra sittings. Externally the main gable, which will front Liscard-road, will be flanked by a tower and spire,—which will rise in four stages to a height of 90 ft. from the ground to the top of the vane,—and on the north-east side by a small turret, which will be 40 ft. to the top of the finial. In this gable will be a seven-light tracery-headed window, having three-quarter columns with moulded caps and bases. The whole of the stone used externally in the dressings, ashlars, &c., will be limestone, from Denbigh. The roofs will be covered with blue Bangor slates. At the intersection of the transept with the nave there will be a *flèche*, covered with lead and surmounted by a finial. The total cost, including land and laying out the grounds, will be about 4,000*l.* The contractor for the whole of the works is Mr. William Jones, of Beaumaris; the architect being Mr. R. G. Thomas, of Menai Bridge, whose plans were selected in limited competition.

Tattingstone.—The memorial-stone of a new Wesleyan chapel at Tattingstone has been laid by Lord John Hervey. The new buildings are to be in the Decorated Gothic style (the material used being red brick, with white facings), and will comprise chapel, school, two vestries, and offices. The window-heads will be of stone, with quatrefoil openings, in which will be placed ventilators. The chapel, approached by two entrance-lobbies, will be seated with plain stained and varnished deal benches; and the rostrum will be under an arched recess, 3 ft. 6 in. deep. The chapel, including gallery, will seat 320 persons. The school, which is at the back of the chapel, is 25 ft. long, by 20 ft. 6 in. wide. At the junction of the school with the chapel are placed the minister's and steward's vestries, giving a transept appearance. These are so arranged as to be available for large congregations in the chapel on Sundays, or in the school-room on week evenings. The contract, including lighting, warming, and front boundary fence, has been taken by Messrs. Saunders, of Dedham, for 1,094*l.* The architects are Messrs. Cattermole & Eade, of Ipswich.

Proposed Memorial of Viscount Falkland.—The poet Southey, many years ago, proposed that a column should be placed on the spot where Lucius Cary, Viscount Falkland, fell in the royal cause, at the first battle of Newbury, on the 18th September, 1643, but no practical efforts have as yet been made to preserve his memory. The proposal has been revived by the Newbury District Field Club. Lord Carnarvon, whom the committee of the club consulted, has expressed a warm interest in the work. The design is intended not only to record the death of Lord Falkland, but of Lords Carnarvon and Sunderland, and many other distinguished Royalist officers who fell in the same battle. The cost of the memorial in Portland stone, and including sculpture, has been estimated at 600*l.*

SURVEYORS AND LOCAL BOARDS, &c.

SIR,—Is there no appeal against "frivolous objections" to plans passing,—the committee's and their surveyor's? I am told that if I sent rejected plans to the Local Government Board they would only return them and nothing more.

I will give you a brief sketch of my peculiar position, viz., I have been many years trying to work up a practice in a rough district of cotton and woollen manufacturers, &c., and the neighbourhood, gradually increasing, is divided into districts under Local Boards.

Our Board give 150*l.* per annum to their surveyor, and he was *not* to practise for himself; but I find that he is doing so, and one of his "building committee" is a contractor, and doing work under him. I seldom send a set of plans in without there is the usual "petty objection" which delays the work for a month, and the client says to me, "Your plans have not passed"! I have been now twenty years nearly in constant private practice as an architect and surveyor in every sense of the term. Just imagine this, when your plans have to pass a *surveyor* of twenty-three or twenty-four years of age, and a building committee of a local board composed of little dealers in all sorts, &c. Again, an individual told me lately, that if he gave the surveyors to Local Boards plans to make for buildings to be erected on his land, he would have *no trouble* as to their *passing*, or during erection.

Then it is very easy for a surveyor to a local Board to do work at 50 per cent. *less* than an architect, who has *not* this regular income; and yet the architect is saddled with rates to pay the surveyor's salary. Sometimes a change in the members of the Board produces a change in the surveyor. He may be of the wrong creed (*credo mihi*) or colour. Then he sets up for himself in your little district, and gradually begins to get hold of little things that one used to fill up time with to advantage. The same process goes on at intervals, until the little district and its surroundings are full of this sort of thing.

There is another matter, viz., that most of these Local Boards state in their bye-laws that copies of all plans, &c., of buildings shall be left for the surveyor. I once sent copies of a mansion to the surveyor of a seaport town, on tracing paper, but he wanted copies mounted on canvas (he had not the mansion to design), and I was some time before I could get them (the copies) accepted, on the finest patent linen. He knew my client. As to copyright of a design,—is an architect obliged to send anything more than the *bare openings* of windows and doors on the elevations sent to Local Boards? If a Local Board gets hold of a surveyor, and he answers their purpose, and does their private work for next to nothing, the man in private practice in the district gradually gets under-worked in price, and is often annoyed by people saying that his plans have "not passed."

Will any brother architect in a similar position give me a little of his experience as to what can be done through the Local Government Board? Surely they are only paid servants of the public, and consequently must do something more than return plans without redress! If surveyors to Local Boards are to practise on their own account, what is to stop them from *borrowing* from *original designs* deposited with them by architects? Is not an architect's design his copyright? I fully intended being at the "Conference" on the 12th inst., but it takes me all my time to keep my little practice together, or I would have opened up two or three matters of this kind. To depart from the straight line, why cannot there be the "Conference week," and held annually at different provincial towns, and, say, every three years in London? Much good might be done thereby.

ONE OF THE CRAFT
WHO LOVES HIS PROFESSION.

SUSSEX MANSIONS.

SIR,—The volumes of the Sussex Archæological Society contain engravings of notable buildings, besides those mentioned by me in the *Builder* (April 8), viz.:—Vol. v., p. 250, Rusper Priory, near Horsham, A.D. 1781, "presenting none of the customary features of conventual structures," by Mr. S. H. Gremin (Burrell MS. Brit. Mus., No. 5,698, fol. 486, and catalogue of MSS. maps, drawings, &c., vol. ii., 1844, p. 246); also, two views, by Mr. John Dunstall, of "A Temple by Chichester," a round church, apparently placed on a hill. This artist (A.D. 1662) is named in Walpole's Hist. of Engravers. Vol. vi., Gateway of Lewes Castle, N.W. view, p. 126; Michelham Priory, &c., nine woodcuts, p. 129–63; Relics of Lewes Priory, three views, pp. 259–62; Pevensey Castle, east view, and map, pp. 264–74. Vol. vii., Crowhurst Manor House, p. 15, and plan; Brickwork at Laughton Place, six views, pp. 65–72. Vols. viii. and ix., Plan of Sedgwick Castle, view of Dureford Abbey. Vol. ix., views of Bodiam Castle, being three engravings and a lithograph of the south transept of Bayham Abbey, the ancient Begham, "abode encircled with streams as with a garland," the Saxon "beag," or "beg," *i.e.*, chaplet, or crown, built by Sir Robert de Turneham, in the reign of Richard I.; Eastbourne Priory, five views; East Mascall's Timber House, Lindfield; and Southover Priory. Vol. x., two views of Danny, and three of Wakehurst Place, erected A.D. 1590 (see Burrell's Add. MSS., 5,684, f. 151); Slaugham Manor House, and the Staircase, Star Hotel, Lewes, seven views; Benfield and Gravety Houses, A.D. 1611, and A.D. 1598, in Hangleton and West Hoathley parishes; the Crypt, Lamb Inn, Eastbourne. Vol. ii., Lindfield Old House, timber built, 1578; Holmesdale, Chaloners, and Holland House, in East Hoathley. Vol. xii. contains engravings of Nayland House, of the Elizabethan period; Brede Place, two views. Vol. xiii. contains Old Petworth House, wherein Edward VI. was received A.D. 1552, and ancient houses at Petworth and Hastings; also, Eastbourne Parsonage and Chiddingley old houses. Vol. xviii., Isfield-place (*see* Horsfield's Lewes, vol. ii., p. 142). Vol. xix., Ote Hall, A.D. 1600, Petworth George Inn and old houses, 1866. Vol. xx., Buck Hall, Cowdray, Glynde-place and Gateway, Brambletye Manor House and Gateway (*see* Horsfield's Sussex, vi., p. 389). Vol. xxi., Mayfield Palace Ruins, Lordington House Staircase (seventeenth century), Holmeshurst, and Bateman's, being "lone manor-like Elizabethan and Caroline houses," in Burwash Grove House, Hollington, A.D. 1804. Vol. xxiii., Hall of Old Racton House, 1782, Hickstead-place and Castle, (sixteenth century). Vol. xxiv., Parham Clock House, Cuckfield Park (A.D. 1681), Streat-place, and stone mantelpiece (Elizabethan). Mr. C. Sergison observed, vol. xxv., p. 81, note, "in the reign of Hen. VIII. mansions were built in the form of the letter H. In Elizabeth's time, in the form of E; and in the time of Jas. I. in the form of a figure to represent J—one straight line forming two right angles with another one." Pakyns, at Hurstpierpoint, may be a specimen of this style of domestic architecture.

CHR. COOKE.

CONTRIBUTIONS FOR ANNUAL OUTINGS.

SIR,—May I enter a protest in your paper against the growing practice, in full play just now, of the workmen employed by builders, &c., writing to manufacturers and others for contributions to their annual outing? I think it a most unjust tax, and quite contrary to the independent spirit which these same men exhibit, about annually, when they strike for higher wages, &c. So much is the practice growing, and becoming a recognised institution, that we are now receiving regular printed forms, with the name of the employer, &c.

Being considerable employers ourselves, we never allow our workpeople to accept fees, nor do they at all look for it; and will venture to hope that your artisan readers, who work for employers and clients, will see the injustice of receiving "something for nothing."

A. S.

CANTERBURY CATHEDRAL.

SIR,—I was present, and watched with great interest some trials of Messrs. Merryweather's steam fire-engine at Canterbury, on Monday and Tuesday last; and when we think of the many narrow escapes the cathedral has had from the ravages of fire,—one so recently as five weeks ago, another in 1872,—the significance of the present attention the Dean and Chapter pay to the important trusts committed to their charge becomes only now manifest. As a national monument it will be conceded that Canterbury Cathedral stands unique; and connecting as it does the Saxon Heptarchy with the nineteenth century of the Christian era, it possesses claims upon our attention second to none in the kingdom. Your readers will remember the circumstance, before alluded to, as occurring some five weeks ago, of Mr. Trimnell, jun., of Canterbury, being fatally injured by an explosion of benzoline in the clock-room of the cathedral. By the kind permission of Mr. H. G. Austin, the surveyor to the fabric, I saw the effects of the explosion in the clock-room itself; these are not of very serious actual moment, but if attention had not been immediately directed to it, the probabilities of serious injury accruing to the south-west tower would have been materially increased; it was, therefore, with satisfaction that I observed the very great interest taken by the Very Rev. the Dean, the Bishop of Dover, Archdeacon Harrison, and in fact all the cathedral authorities, in the experiments made with the steam fire-engine, Mr. Austin taking a most enthusiastic part. By these it is demonstrated that with the assistance of this powerful engine it is quite possible to cope with a fire situated in any part of the cathedral, not excepting the Bell Harry Tower, which is 235 ft. in height; for not only was the water forced up through 320 ft. of hose, but a jet was projected to a further height of 30 ft. above the pinnacles,—themselves 75 ft. higher than the tower. This is the severest test I have ever seen a steam fire-engine put to, the back pressure in the pump-valves being enormous, but the slow, steady stroke of these well-known engines was equal to the occasion, and its performance was greeted with genuine enthusiasm by a large number of spectators. Another interesting experiment was made on Tuesday from the top of the Arundel Tower, the height of which from the ground is 130 ft. The hose was carried up outside the building; steam was raised in eleven minutes to 125 lb. pressure on the square inch, and at 140 lb. steam pressure and 120 lb. water pressure, a 1-in. jet of water was projected to the Bell Harry Tower, a distance horizontally of 170 ft.

The significance of these trials is apparent, and through the medium of your columns I venture to direct the attention of other cathedral authorities to these feats of hydraulic engineering, so that they may emulate the good example set them by the Dean and Chapter of Canterbury, and make provision beforehand for a calamity which attacks some of the grandest of our national monuments before we are well aware of it. The Very Rev. the Dean of Lincoln, late a Canon of Canterbury, is particularly impressed with the importance of an efficient service in case of fire, and since his promotion, has, I understand, devoted his attention to his cathedral in this respect, and adopts a practical rendering of the old Latin motto, *Semper paratus*.

CHARLES B. KING, C.E.

SALT IN SAND.

WHAT is the best method of detecting the presence of salt in sand used for building purposes?

I. O. U.

CLAIM FOR ARCHITECTS' COMMISSION ON "EXTRAS."

HADFIELD *v.* GAINSFORD.

AT the Sheffield County Court, on the 28th ult., before Mr. T. Ellison, judge, Messrs. Hadfield & Son, architects, Sheffield, sued Mr. T. E. Gainsford, colliery proprietor, for commission for services in connexion with the erection of a house at Whiteley Wood.

Mr. Barker, in opening the case, stated that in the year 1872 Mr. Gainsford purchased an estate at Whiteley Wood Hall, near Sheffield, with a large mansion-house upon it. Mr. Gainsford was about to make considerable alterations in the house, and he applied to the plaintiffs to provide him with plans, &c. The plans were duly prepared, and afterwards working plans and specifications for the contractor to work by, and finally the work was contracted for by Mr. Corrie, who was a plumber. He undertook the whole of the work for 1,532*l.* 10*s.* The alterations were proceeded with, and Mr. Charles Hadfield superintended the work. After a time, however, Mr. Gainsford did what was almost invariable in such cases; he wanted some deviations to be made from the contract, which meant adding more work than was contained in the original contract. These extras were done and added to Mr. Corrie's bill, so that the total sum paid to him amounted to 1,877*l.* 15*s.* 6*d.*, and Messrs. Hadfield, the plaintiffs, claimed to be entitled to their commission on these extras as well as on the amount of the original contract. The amount on 86*l.* 13*s.* 6*d.* had been paid to the plaintiffs, and whether or not the commission was due on the extras would no doubt depend upon the custom of the profession. Another smaller item in dispute was the commission claimed on a contract entered into by a man named Tomlinson, for panelling the drawing-room, which amounted to 17*7l.* Mr. Gainsford declined to pay that, on the ground that he had done the work himself, and Mr. Hadfield had nothing to do with it.

Mr. Gould admitted that Messrs. Hadfield were entitled to the usual commission, but urged that a number of things had been done with which, as he was instructed, Mr. Hadfield had nothing to do.

Mr. Charles Hadfield, partner in the firm of Messrs. Hadfield & Son, architects, having given evidence in support of Mr. Barker's opening statement, the case was adjourned to a day to be arranged by the advocates.

VARIORUM.

LET us view the progress of an English generation. A writer in Cassell's *Family Magazine*, says:—"An English generation on the march from the cradle to the grave is an instructive spectacle, and we have it carefully presented to us in the report by Dr. Farr. Let us trace the physical fortune which any million of us may reasonably expect. The number, to begin with, is made up of 511,745 boys and 488,255 girls, a disproportion which, by-and-by, will be redressed by the undue mortality of the boys, and will be reversed before the close of the strange eventful history. More than a quarter of these children will die before they are five years old,—in exact numbers, 141,387 boys, and 121,795 girls. The two sexes are now nearly on a level. The next five years will be much less fatal. In the succeeding five years,—from ten to fifteen,—the mortality will be still further reduced. Indeed, for both sexes, this is the most healthy period of life; the death-rate, however, is lower

for boys than for girls. There will be some advance in deaths in the next five years, and still more in the five which follow, but 634,045 will certainly enter on their twenty-sixth year. Before the next ten years are at an end, two-thirds of the women will have married. The deaths during that period will be 62,052, and of these no fewer than 27,134 will be caused by consumption. Between thirty-five and forty-five, a still larger "death-toll" will be paid, and little more than half the original band,—in exact number, 502,915,—will enter on their forty-sixth year. Each succeeding decade, up to seventy-five, will now become more fatal, and the numbers will shrink terribly. At seventy-five only 161,124 will remain to be struck down, and of these 122,559 will have perished by the eighty-fifth year of their march. The 38,565 that remain will soon lay down their burdens; but 2,153 of them will struggle on to be ninety-five, and 223 to be 100 years old. Finally, in the 108th year of the course, the last solitary life will flicker out. Such, then, is the average lot of a million English men and women."

——The *Victoria Magazine*, conducted by Miss Emily Faithfull, keeps on its way agreeably, but scarcely gives enough for the money to run successfully against other monthly serials.——*Leisure Hour* has a seasonable word or two on Locks out of Order:—"It is a small house that has not some twenty doors, every one of which ought to be lockable and unlockable at all times. The proper place for the key of a room-door is in the lock, for when lock and key are together both last longest. It is from want of use more than anything else that locks and keys get out of order; "the used key is always bright," says the proverb, and the lock that is used fairly will not refuse to open at the touch of the key. Keep your locks easy by occasional oiling with sweet oil. When a lock refuses to work, draw the screws, and take it off; it may want nothing but cleaning, or it may be that one or two of the wards are bent out of position, and may be set right by a touch of a tool. If the case is beyond your cure, take it to the locksmith (do not send for him) and have it repaired at once. If a key is lost, take the lock to a smith and get another made or fitted. Street-door keys should be kept in duplicate or triplicate, so that if one should be lost others may be procured without removing the lock. As regards locks and keys, it may be affirmed that the cheapest are the dearest in the end. Good locks are now so cheap that it is sheer folly to put up with inferior ones. A lock will often go stiff and seem out of repair simply because the screws by which it is held in its place are a little loose, when all that is needed is to tighten them."

Miscellanea.

Street Directories.—The Street Lamp Committee of the Manchester City Council, at a recent meeting, unanimously authorised the erection in Market-street, by way of experiment, of eight of Messrs. Pearse, Lever, & Co.'s "Public Street Directories." These directories are a novelty in their way. The directory consists of a frame, containing either four, six, or eight name-plates, which can be adjusted to the existing street-lamps. Four directories will be placed at equal distances on each side of the street. At the top will be printed the name of the street; and below, the words "Public Street Directory of ——." The name-plates are constructed to slide in the frames, so that they can at any time be corrected without trouble. They will contain:—1. The names of the various firms trading in the street in which they are erected, with the numbers, arranged alphabetically. 2. The names of the various streets and courts leading from the street, with the numbers nearest from which they abut, arranged alphabetically. 3. Information as to the nearest postal and telegraph offices, railway, fire, and police stations, doctors, &c. Each of the directories will accommodate from 300 to 400 names.

Inspector of Nuisances, Staines.—The election for this office took place at the last meeting of the Local Board. The district comprises an area of about 22,484 acres, and a population of 16,838. The salary is 100*l.* per annum, which includes travelling and other expenses. There were five candidates for the office, viz., Oswald Jacobs, of Feltham; Stephen King, of Shepperton; R. J. Thorpe, of Feltham; Benjamin Clarke, of Guildford; and Henry Ball, of Stanwell; and the first-named candidate was the successful one.

Bucks Architectural and Archæological Society.—This Society recently had an excursion to Magna Charta Island, which is in the parish of Wraysbury, in the county of Bucks. Having travelled by rail to Bourne End, the party numbering about sixty, embarked in a saloon boat and proceeded down the river. After lunch, the annual meeting of the Society was held on board. The Rev. C. Lowndes then read a paper on the Magna Charta Island, in which he referred to the principal events in connexion with the granting of the great charter by King John. The Rev. J. Wood next read some notes on the ancient Nunnery of Ankerwyke, in Buckinghamshire, which had been prepared by Mr. W. de Grey Birch, F.R.S. The foundation of the house was placed as far back as the time of Henry III., in the twelfth century, the founder being one Sir Gilbert de Montfichet. As the boat passed Eton Mr. W. Lowndes read a paper on Eton College, and in about another hour (the journey having lasted altogether nearly six hours), the party arrived at the Magna Charta Island. Here dinner was served under a magnificent walnut tree. The journey by the river, however, had occupied so much more time than had been anticipated, that there was but little opportunity of making explorations, but the cottage in which the grey stone on which the Charter is said to have been signed was visited. The stone, which is enclosed in a strong frame of oak, bears the inscription:—"Be it remembered that on this island, June 25, 1215, John, King of England, signed Magna Charta; and in the year 1834, this building was erected in commemoration of that great and important event, by George Simon Harcourt, Esq., Lord of this Manor, and then High Sheriff of this County." The walls of this cottage (occupied by the ferryman of the island) are decorated with shields bearing the arms of the barons who were in array at Runnymede when the Charter was obtained.

New Buildings at Cambridge University.—The Museums and Lecture Rooms Syndicate of the University of Cambridge have reported to the Senate that in accordance with the Grace of May 4th, 1876, they have obtained tenders for the erection of the proposed new buildings for the Department of Comparative Anatomy and Physiology, according to the plans and specifications of Mr. Fawcett. Tenders have been received from Messrs. Bell & Sons, Messrs. Gray & Sons, Messrs. Horsman & Co., and Mr. Thoday. The lowest tender was that of Messrs. Bell & Sons, amounting to 8,500*l.*, which sum includes 400*l.* to cover unforeseen contingencies. The tenders for laying on gas and water amount to 96*l.* and 330*l.* respectively. A difficulty respecting lights having arisen with an owner of house property in Corn Exchange-street, and his claim for compensation being very greatly in excess of what the Syndicate are advised is reasonable, they have caused the tenders to be divided into two portions, viz., for (A) the western portion of the building, together with the ground floor of the portion facing Corn Exchange-street, including the roofing of the same, and for (B) the upper floors of the portion facing Corn Exchange-street. The amount of Messrs. Bell's tender for (A) is 7,015*l.* for (B) 1,485*l.* The erection of the portion (A) will not interfere with any existing rights of light. The Syndicate therefore recommend that the Vice-Chancellor be authorised to contract with Messrs. Bell for the construction of the portion (A) above described, upon the terms of their tender.

Mr. Simon's Successor.—It has been announced that Dr. Edward Cator Seaton is to be the future medical officer of the Local Government Board, in place of Mr. Simon. We learn from a medical contemporary that "Dr. Seaton has for some years held a senior position in the medical department of the Privy Council, and subsequently as assistant medical officer of the Local Government Board. Dr. Seaton is especially well known in connexion with the subject of vaccination, on which he is a great authority, both scientifically and in respect to official organisation."

Hinderwell and Staithes School Board, Cleveland.—An adjourned meeting of this Board was held on the 27th ult., for the purpose of considering plans for the erection of Board Schools at Staithes to accommodate 300 children. From the nine designs submitted, the one selected was that by Mr. Alfred J. Martin, architect, of Darlington. The schools will be built of brick, and are estimated to cost, exclusive of fittings, about 1,500*l.*

How Sewage Farms are sometimes Mismanaged.—Mr. W. Hope, V.C., of the Romford Sewage Farm, draws the following picture of the manner in which party-spirit occasionally operates to hinder the success of sewage irrigation:—"To begin with, local boards only meet once a month. It is true there is generally a so-called 'farm committee,' which meets once a week or so, but not unfrequently the board is exceedingly jealous of the committee, sometimes on personal, sometimes on political, and sometimes on religious grounds; and at the monthly meetings the board not unfrequently undoes half of what the committee has done or attempted to do. The committee is probably composed of town-bred men, but still at their meetings held on the farm, the bailiff (who is eager and energetic until he loses heart after the first six months or so), by his importunity, succeeds in making them comprehend that he cannot work without tools, and must positively have, for instance, another couple of pairs of horses. But when the committee propound this to the board, several of the more reasonable and impartial members are perhaps absent, and the opportunity is pounced upon by the Baptist clique to veto, in harsh terms, the recommendation of the committee, which is for the moment composed of Anabaptists. The committee, in a rage, resign, and forthwith, at the same meeting, the Baptists instal themselves in place of the Anabaptists, and this not because they know anything whatever about farming, or have been able to find any real fault with their predecessors, or even have any wish to be bothered with the management of the farm, but simply and solely because they wish to spite the Anabaptists, and to see their victory recorded in the columns of the next number of the 'Claypool-cum-Puddleborough Intelligencer.'"

Carving in the Philadelphian Exhibition. Mr. Harry Hems, sculptor, exhibits, among other things an oak cabinet, elaborate in all its details. It measures between 5 ft. and 6 ft. in length, is about 3 ft. wide, and nearly 4 ft. high. Its average thickness is 4 in., and at the angles the wood is doubled. The body of the coffer is panelled, there being four deeply-recessed panels in front and in back, and two panels at each end. These are separated by mountings, the whole being solidly butt-joined, and fastened firmly together, after the old style, by oaken pins. Each panel is filled with carving of curious designs. Around the various panels ornaments of running design are carved, and effective cresting is introduced. At the angles are columns entwined by ornament, and surmounted by carved capitals. The treatment of the back is the same in character as the front, but every item of detail is different. The lid is of roof-like form, panelled with diaper and other ornaments. The inside of the lid is also carved; so that when raised (by means of springs) the interior is in unison with the exterior. This work of art has been made entirely out of beams which, for upwards of 600 years, formed a part of the choir of Salisbury Cathedral. The various hinges, lock-plates, bands, clasps, scrolls, &c., are unique, and have been made by Mr. W. Shrivell, London.

Surcharge of Architects' Charges at Altrincham.—At a recent meeting of the Altrincham Union, the clerk stated that in regard to the surcharge made upon the chairman by the auditor, the chairman had received a letter from Messrs. Mills & Murgatroyd, and he must say that in all his experience he never met with a letter like it. It was much to their honour to write such a letter, and it showed the respectability of the firm. He then read the letter as follows:—"23, Strutt-street, Manchester, June 3rd, 1876. To the Chairman of the Altrincham Board of Guardians. Dear Sir,—We see by the *Altrincham and Bowdon Guardian* that you are likely to be surcharged a portion of the amount paid to us for our professional charges in connexion with the new hospital. Aware, as we are, of the difficult position in which gentlemen occupying your post are placed by the officials to whom they are accountable, we can assure you that we should be very much indisposed to allow you to be subjected to any personal inconvenience on that account, and that we shall be glad to forward you our cheque for any amount you may be called upon to repay on account of our charges.—We are, &c., Mills & Murgatroyd, Architects." The reading of the letter gave great satisfaction; and the clerk added that he did not think Messrs. Mills & Murgatroyd would be called upon to forward a cheque.

Proposed Clock-tower, Aylesbury.—For some time past a project has been on foot for the erection of a clock-tower, to supply the place of the one taken down when the old market-house and tolls reverted to the present Market Company. Various public meetings had been held from time to time, a committee appointed to carry out the scheme, and subscriptions solicited for the purpose of carrying on and completing the work. The appeal met with a hearty response, the total amount of subscriptions reaching over 500*l.*,—a sum sufficient to justify the committee to make a commencement. Plans and specifications were advertised for, and that of Mr. Brandon, London, was accepted. The tower will be of brick, faced with Combe Down Bath stone. On either side will be a drinking-fountain, from which water will be conveyed to troughs at the foot of the steps for animals. The clock will have two illuminated dials, placed at an altitude of 36 ft. from the ground, and above will be a bell-turret, with a spire surmounted by a vane. The entire height from base to spire will be 64 ft., and the style is Early Gothic.

Archæology at Lewes.—A Hastings paper states that with the permission and assistance of Mr. J. C. Lucas, the owner of the property, Colonel Lane Fox has undertaken the opening of one of the barrows in the vicinity of Mount Caburn. There are many points of interest connected with this mount, which forms a bold termination to the spur of downs extending from the Cliffe at Lewes nearly to Glynde. On its summit is the famous circular encampment, consisting of a formidable double trench, enclosing a rampart of about three furlongs in extent. The fortification is supposed to have been of British origin, and there are numerous traces of both Celtic and Roman occupation in the neighbourhood. A preliminary survey has been made, and it is expected that Colonel Lane Fox will prepare a paper on the subject for the next meeting of the Sussex Archæological Association.

Manufactured Antiquities.—At the Central Criminal Court, on the 27th ult., Edward Brown pleaded guilty to an indictment which charged him with unlawfully transferring the mark of the Goldsmiths' Company from a silver article to another article composed of base metal. It appeared that the prisoner had got possession of some ancient silver articles, and transferred the marks upon them to articles manufactured so as represent ancient silver articles, but which were composed of base metal. It was stated that there was a sort of mania among a portion of the public to possess antique silver articles, and that the things manipulated in the way above stated were frequently sold at enormous prices; and it appeared that a regular system was going on of manufacturing these spurious articles. Judgment was postponed to the next session.

Compensation.—The case of Hailey and the Metropolitan and St. John's Wood Railway has been tried before Mr. Under-Sheriff Burchell and a special jury, at Red Lion-square. It was one of the first claims arising out of the new line about to be constructed from St. John's Wood to Harrow. The claim was in respect of a newly-built residence, No. 7, Devonshire-villas, Kilburn, near to Edgware-road Station of the North London Railway. Leasehold for a term of 97 years, at a ground-rent of 30*l.* per annum. The amount claimed in respect of the property was 3,000*l.*, and in support thereof Mr. Alfred Baker (the claimant's surveyor), Mr. Heaketh, Mr. Thompson, and others, gave evidence, whilst the company's surveyor (Mr. Harry Jones), supported by Messrs. Walker, Barrett, & Lowe, estimated the compensation at 1,900*l.* The verdict of the jury was for 2,600*l.*

The New Law Courts.—In answer to Mr. Mellor (House of Commons), Lord Henry Lennox said,—The agreement between Mr. Street, the architect of the New Law Courts, and the Office of Works, was made on September 23, 1870. The architect was to receive five per cent. on the amount proposed to be spent; one-third was to be paid on the execution of the contract, another third as soon as one-half of the contract sum was paid to the builders, and the remaining third when the final payment had been made to the builder. With regard to the second part of the question, it was arranged that if any alterations or additions were made to the work entailing an increase in the cost of the whole work, the architect should receive at the rate of five per cent. on that increase.

Liability of Highway Boards.—At the Darlington County Court, on June 22nd, before Mr. E. R. Turner, judge, an action was brought by John Reid, bailiff of the Darlington County-court, against the Darlington District Highway Board, for 30*l.*, for personal injuries. It appeared that on the night of February 24th last the plaintiff was driving in a dog-cart towards Darlington, and on arriving at Dean Bridge, which was under repair, his vehicle was upset by stones on the road. Plaintiff could not attend to his duty for some time from the injuries he had received. The defence was that the Highway Board were not liable, inasmuch as they had let it to a contractor; but his Honour held that as there had been no special contract for watching and lighting, the Board were liable. Verdict for 25*l.*

An Architect called upon to Rebuild Work at His Own Expense.—At a recent meeting of the Holborn Board of Guardians, a letter was read from the Local Government Board, stating that Captain Lockwood, sub-inspector, had visited the City-road workhouse, and found that in the block building occupied by infirm women there were certain structural imperfections which necessitated its demolition and rebuilding, and the Board wished to know what the guardians proposed to do. The building committee reported that they had considered the subject, and requested that the Local Government Board be informed that the defective brickwork referred to in their letter was about to be rebuilt at the expense of the architect.

Death of a Scotch Artist.—The death is announced of Mr. Thomas Gray, a young and promising Scotch artist. For some time deceased had suffered from pulmonary disease, but it was not thought that the end was so near. He was a native of Aberdeen, but had for several years been resident in London. In his youthful days, while yet in the north, he gave his attention to painting, and found an able instructor in his uncle, Mr. James Cassie, A.R.A. Amongst a large circle of his brethren in the metropolis he was well known, and, taking great interest in the formation of the Hogarth Club, he was appointed its secretary in 1869, an office which he held till the day of his death.

Artisans' Dwellings Act in Birmingham. The order of the Local Government Board, affirming the street improvement scheme proposed by the Corporation of Birmingham, has been issued, and incorporated in a Government Bill which has been introduced in the House of Lords. After reciting in full the scheme and the estimates attached thereto, the order sets out the subsequent proceedings for publication, service of notice, &c., and authorises the execution of the scheme, with the sanction of Parliament, subject to certain conditions and modifications.

A Turf Advertisement.—The proprietors of the *Glasgow News* have done a big thing in advertising. The slope of the hills behind Ardenlee has been cut with letters each 40 ft. long and 6 ft. thick. The length of the advertisement is 323 ft., it covers an area of 14,858 ft., and is 1,485 times the size of a page of the *News*. The borders of the letters are sown with sweet allysium—a white flower; the centre is set with dwarf beet, a dark purple; and on each side of the latter is a row of light purple candy-tuft. Passengers on board the ocean-going steamers can read this horticultural announcement nine miles off.

The Sanitary Condition of Rome.—Mr. Arthur Arnold, taking part in a discussion in the *Times* on the sanitary condition of Rome, says that the reason why the poor of Rome are comparatively healthy, is because they have not their houses so constructed as to become charged, especially at night, with the noxious gases of cesspools; it is peculiar to the rich to domicile poison in this way, and the requisite machinery is an invariable feature of the Anglo-Roman hotel.

Rendle's Patent System of Glazing.—A number of engineers and architects interested in the construction of railway roofs met together at the Paddington Station, on Tuesday last, to examine the ridge-and-furrow roofs (glass) put up for the Great Western Railway Company, on Mr. Rendle's new system. They are very light and agreeable in appearance. The system has been so successful, that the patentee has received instructions from the company to cover the stations at Cardiff, Swansea, Neath, Bath, Plymouth, and Sandon.

The National Byron Memorial.—At a meeting of the National Byron Memorial Committee, on the 1st inst., it was determined that the statue of Lord Byron should be in bronze, and that the pedestal be constructed out of the marble offered to the committee by the Greek Government. Mr. Fitzwilliam Dick made the offer of 1,000 guineas towards the construction of a classic canopy, provided other persons interested in the monument would contribute towards that object. The statue will ultimately be erected in the Green Park, opposite to the house wherein Byron wrote "The Siege of Corinth."

Strike even at Saltaire.—A deputation having waited upon Sir T. Salt, Sons, & Co., spinners and manufacturers, at Saltaire, with a view to endeavour to arrange some terms of compromise, the firm offered to make slight modifications in the proposed reduction of 10 per cent., and to open their mills on Monday morning to all such workpeople as chose to return to work on these terms. The result was communicated to two large open-air meetings of the locked-out workpeople on Saturday, and it was unanimously resolved to remain out until the late rates of payment are conceded. The differences have since been arranged.

A Tribute to Bunyan.—A short time ago the Duke of Bedford presented to the town of Bedford a statue of John Bunyan, which was inaugurated a few months since with considerable ceremony by Dean Stanley. The duke has just added to his gift another memento of the "dreamer" by presenting to Bunyan Chapel, in Mill-street, Bedford (or rather, as the building is somewhat oddly called, "Bunyan Meeting"), a pair of bronze doors of artistic design, and illustrative of ten scenes from the "Pilgrim's Progress." The doors have been executed from the designs of Mr. Frederick Thrupp.

Restoration of a Scotch Mansion.—The mansion-house of Lincluden, the residence of Major Young, which was almost totally destroyed by fire about a year ago, is now being restored. The mansion was built in the Tudor style, and its situation and surroundings are of the most picturesque description. The wish of the proprietor was to maintain, as far as possible, the original design of the mansion, and plans were prepared by Mr. Bryce, architect, Edinburgh, for having this carried out, and the building restored to what it was prior to the fire. The contractor is Mr. J. Halliday, Dumfries.

Ely Cathedral.—A meeting has been held at Cambridge in furtherance of the completion of the exterior of the octagon of Ely Cathedral. The bishop of the diocese presided. It was resolved to accept the plans as submitted by Sir G. G. Scott, and Mr. Wood's tender as approved, at a cost not exceeding 2,965*l.* The fund contributed already amounts to 2,500*l.*, and 500*l.* more is needed. The work will take three years, and will be commenced forthwith.

TENDERS

For erecting new premises in Oxford-street and Old Cavendish-street, for Mr. Thomas Brandon. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode:—

Hill, Higgs, & Hill	£24,470	0	0
Colls & Sons	21,577	0	0
Kirk & Randall	21,100	0	0
Thorn & Co.	20,950	0	0
Nightingale	19,835	0	0
Sheffield	19,727	0	0

For laying out a portion of airing-courts at Kent County Lunatic Asylum, Chartham, near Canterbury, for the Justices of the Peace for the county of Kent. Messrs. John Giles & Gough, architects. Quantities supplied:—

Nicholson (accepted)	£2,975	0	0

For sundry painting works, terrace walls, and additional stabling at Southwood Hall, Highgate, for Mr. W. Jardine. Messrs. John Giles & Gough, architect. Quantities supplied:—

Hook & Oldrey (accepted)	£1,040	0	0

For rebuilding premises, 107, High-street, Shoreditch, for Mr. G. Stone. Messrs. Berriman & Sons, architects. Quantities by Mr. C. H. Goode:—

Faulkner	£2,423	0	0
Crosker Brothers	2,283	0	0
Tully	2,180	0	0
Shapley	2,135	0	0
Bangs & Co. (accepted)	1,970	0	0

For rebuilding premises, 108, High-street, Shoreditch, for Mr. Sharman. Messrs. Berriman & Sons, architects. Quantities supplied:—

Faulkner	£1,176	0	0
Crosker Brothers	1,115	0	0
Tully	1,090	0	0
Bangs & Co.	1,054	0	0
Shapley	1,048	0	0

For rebuilding premises, 109, High-street, Shoreditch, for Mr. McCann. Messrs. Berriman & Sons, architects. Quantities supplied:—

Faulkner	£1,252 0 0
Croaker Brothers	1,195 0 0
Tully	1,115 0 0
Shapley	1,090 0 0
Bangs & Co. (accepted)	982 0 0

For the construction of drainage works, Buntingford, Herts, for the Buntingford Rural Sanitary Authority. Messrs. Smith & Austin, engineers. Quantities by Mr. E. H. Horne:—

	Contract No. 1.	Contract No. 2.
Young & Co.	£1,474 0 0	826 10 0
Acock	1,415 0 0	745 0 0
Cowdrey & Sons	1,286 0 0	806 0 0
Bloomfield	1,262 0 0	707 0 0
Potter	1,200 0 0	700 0 0
Gray	1,200 0 0	676 0 0
Botterill & Co.	1,113 0 0	613 0 0
Gibbons (accepted)	1,047 0 0	583 0 0

For the erection of cemetery chapel and curator's lodge, Eckington. Messrs. Rollinson & Son, architects:—

Marriott	£6,231 0 0
Greenwood	4,523 0 0
Stevenson & Fidler	4,322 0 0
Miles (accepted)	4,275 0 0

For the erection of schools, residence, fence-walls, and conveniences, at Ashover, for the Ashover School Board. Messrs. Rollinson & Son, architects:—

Greenwood (whole tender)	£2,771 13 0
Excavator's, Mason's, Slater's, and Plasterer's Departments.	
Hopkinson	£1,644 13 8
Fidler	1,567 0 0
Asker (accepted)	1,527 0 0
Carpenter's, Joiner's, Plumber's, Glazier's, Painter's, and Smith's Departments.	
Davenport	£974 0 0
W. Statham	964 10 0
Mellor	854 0 0
H. Statham (accepted)	730 0 0

For the erection of a villa residence at Gladstone-road, for Mr. J. Parkin. Messrs. Rollinson & Son, architects:

Tatin	£1,779 9 0
Wright & Madin	1,775 9 0
Sim	1,769 0 0
Saul	1,732 0 0
Forrest	1,709 0 0
Greenwood	1,691 0 0
Maw & Madin (accepted)	1,609 0 0
Hoole & Handby	1,485 0 0

For new warehouse, corner of Southwark Bridge-road and Sumner-street, Southwark, for Messrs. Riddle & Couchman. Messrs. Osborne & Russell, architects. Quantities supplied:—

Chessum	£10,200 0 0
Wood Brothers	9,483 0 0
Colls & Sons	9,183 0 0
Greenwood	8,775 0 0
Tarrant	8,100 0 0
Sabey & Son	7,990 0 0
Downs & Co. (accepted)	7,950 0 0

For alterations to 109, Aldersgate-street. Mr. Broadhurst, architect:—

Crabb (accepted)	£1,670 0 0

For sewers, &c., in connexion with the south-west portion of the Wilson estate, Hampstead. Messrs. Farebrother, Ellis, Clark, & E. and C. Lowe, surveyors:—

Mowlem, Burt, & Co.	£13,470 0 0
Nowell & Robson	11,814 0 0
W. & C. Watts	11,172 0 0
Crockett	10,973 0 0
Killingback (accepted)	10,750 0 0

For Hotwell Schools, Bristol. Messrs. Hay & Oliver, architects. Quantities supplied:—

Veals	£3,050 0 0
Davis & Son	2,990 0 0
Estabrook	2,918 0 0
Forse & Ashley	2,930 0 0
Brock & Bruce	2,880 0 0
Fugsby	2,816 0 0
Lewis & Elbrooke	2,815 0 0
Hatherly	2,799 0 0
Cowlin	2,793 0 0
Humphreys	2,790 0 0
Wilkins & Son	2,790 0 0
Hill	2,690 0 0
Stephens & Bastow (accepted)	2,598 0 0

For the erection of a small mansion, at Maidenhead, Berks, for Mr. R. Wilson. Mr. Fred. King, architect:—

Jones	£3,596 0 0
Walker	3,276 0 0
Sutton	3,152 0 0
Croxford & Co.	2,999 0 0
Unwin	2,974 0 0
Dover & Co. (accepted)	2,961 0 0

For six pairs of villa residences, at Shortlands, Kent, for Mr. R. Dixon. Mr. W. Bridge, architect:—

Dedman	£10,877 0 0
Broadbent	10,829 0 0
Walker	10,692 0 0
Unwin	10,429 0 0
Croxford & Co.	10,111 0 0
Dover & Co. (accepted)	9,999 0 0

For the erection of a villa residence, Woodside Park estate, Finchley. Messrs. Spalding & Knight, architects. Quantities by Mr. G. Fleetwood:—

Miskin	£2,610 0 0
Temple & Foster	2,343 0 0
Boyce	2,291 0 0
Plowman	2,235 0 0
Stephenson	2,243 0 0
Southcott	2,217 0 0
Aitchison & Walker	2,197 0 0
Donne	2,175 0 0
Small & Taylor	2,037 0 0
Jopling & Co. (accepted)	1,979 0 0

For building warehouses and stables in Hawley-road West, pulling down and rebuilding premises in rear of 220, High-street, Camden-town, for Messrs. Ward & Rawley:—

Gould & Brand (accepted)	£998 0 0

For new hall at the Royal Masonic Institution for Girls, Clapham Junction. Mr. T. Masss, architect. Quantities supplied by Mr. W. Barret:—

Waldram & Co.	£8,740 0 0
Colls & Son	8,537 0 0
Oliver	8,250 0 0
Pritchard	7,886 0 0
Fish	7,830 0 0
Brass	7,677 0 0
Kirk & Randall	7,684 0 0
Smale	7,017 0 0

For skating-rink and clubhouse in Langham-place, Regent-street. Messrs. Archer & Green, architects, Quantities supplied by Messrs. Argent & Woodward:—

Langmire & Burge	£24,400 0 0
Waldram & Co.	23,870 0 0
Chappell	23,408 0 0
Perry & Co.	21,700 0 0

For additions to No. 9, the Grove, Clapham-road. Mr. G. Legg, architect:—

Kent	£1,415 0 0
Chessum	1,376 0 0
Sweeting	1,345 0 0
Rider & Son	1,294 0 0
Shurmur	1,152 0 0

For rebuilding No. 1, Talbot-court, for Sir William Mitchell. Mr. G. Legg, architect:—

Conder	£3,847 0 0
Ashby & Horner	3,570 0 0
Little	3,497 0 0
Shurmur	3,440 0 0
Chessum	3,277 0 0

For Hammersmith Fire Brigade Station, for the Metropolitan Board of Works. Quantities by Mr. T. Nixon:—

Wood	£4,683 0 0
Chamberlain	4,336 0 0
Williams	4,321 0 0
Stimpson	4,290 0 0
Greenwood	4,289 0 0
Morter	4,200 0 0
Adamson	4,195 0 0
Shurmur	4,195 0 0
Hook & Oldrey	4,120 0 0

For alterations to the Cheshunt Almshouses, for the trustees. Mr. T. J. Hill, architect:—

Bentley	£347 0 0
Archer	343 0 0
Saunders	339 0 0

For Baptist Chapel, Wood-green. Mr. B. Fletcher, architect:—

McCowan (accepted)	£2,045 0 0
Vincent Brothers	1,975 0 0

For stabling and conservatory, Cavendish-road. Mr. B. Fletcher, architect:—

Butcher	£377 19 6
Densham & Sons	275 9 0

For alterations, No. 100, London-wall, E.C. Mr. B. Fletcher, architect:—

Dunt	£305 0 0
Weekes & Sons	285 0 0

For villa residence at Sydenham. Mr. B. Fletcher, architect. Quantities by Mr. R. C. Gleed:—

Wells	£1,430 0 0
Shapley	1,195 0 0
Watson & Dennett	1,030 0 0
Brevitor	987 0 0

For warehouse proposed to be erected at Cloth Fair. Mr. J. Collier, architect:—

Mark	£1,815 0 0
Coleman	1,8 8 0 0
Lawrence	1,799 0 0
Scrivener & White	1,799 0 0
Crabb	1,795 0 0
Newman & Mann	1,756 0 0
Hart	1,697 0 0
Moreland & Nixon	1,597 0 0
Aitchison & Walker	1,533 0 0
Stevenson	1,495 0 0

TO CORRESPONDENTS.

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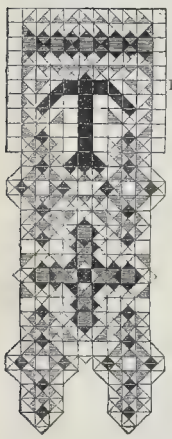
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The Life-Saving Exhibition in Brussels.

THE Brussels Exhibition, of which we gave an anticipatory notice a few weeks ago, has more than answered its promise. The general scope of the project was to set forth, as in a bird's-eye view, the actual state of opinion and invention, with reference to prevention of accidents and cure of diseases, including the risks of war. Upon a majority of the details, however, it might be superfluous in these columns to enter. But a vast proportion of them refer to the positive house accommodation, comfort, and security of people, whether inhabiting a city or a village. Several courts are filled with contrivances of escape from burning houses, and not a few are rich in suggestions of humanity in many a kindred form. It is the house which is the practical point to arrive at, notwithstanding all the luxurious ideas of M. Viollet-le-Duc, who writes only for the rich, and whose château is not complete without a vinery and a peach-orchard. The exhibitors at Brussels are less ambitious. They are pragmatical in a certain sense, no doubt, in so far as they construct theoretical "cities" for "working-men" in which no working man would consent to live, as though he were a *cagôt* or a leper; they aim at doing too much,—the Germans and the Russians especially; but, taken for all in all, they have made a display to which the epithet "noble" may, without the slightest reserve on the score of hyperbole, be applied. But, since Mr. Kay, the travelling commissioner for the University of Cambridge, wrote his admirable volumes, the question of the workman's or labourer's house has taken a front rank in all sanitary discussions. We find it here, at Brussels, most elaborately and variously illustrated. There are plans for the drying of foundations, the weather-proofing of roofs, the decent separation of the sexes, in even the poorest cottage, the cheapening of fires for winter, the full and free ventilation in the summer-months, the storage of food, economy in furniture, and the healthy arrangement of clothing — a point upon which, it may be remarked, the Germans and the Russians, the Swedes and the Danes, are peculiarly careful. No fewer than 240 examples occur of this character in the Exhibition at Brussels, concerning which itself a word may be said. It is not contained in a single structure, but grouped, without detriment to a single tree, in Maria Theresa's Park, — a cluster of pavilions, kiosks, galleried edifices, and so forth; but all arranged in harmony with the original design, each part being happily accessible from every other. "Sweet home," it may be said, is the burden of the entire scheme. The Belgians, like the Dutch, it will be remembered, have a narrow area upon which to work; they have little room for orchards or gardens; they are not, habitually, tourists or travellers; hence, in some degree, their peculiar attachment to home, as demonstrated in this Exhibition. But the domestic evils in connexion with the house, which are displayed at Brussels, are, if slightly exaggerated, none the less suggestive. The comparisons drawn between the Belgian capital, Paris, and London, are by no means complimentary to ourselves, or even just; but Continental ignorance may be excused. We may admit, however, "the heavy, squat appearance of the houses in our suburban streets." Then, the promoters of the Exhibition, quoting from an English writer, say,—"Over and above the daily routine come the cataclysms; the pipes burst in frosty weather; the spring runs dry in the summer; the drains get out of order; and stinks and rats infest the house. . . . . An east wind blows all the smoke out of the fireplace, and ruins, in an hour, the wall-paper and the satin furniture; and yet houses are built too high for their breadths, which is as much a fault of the Continent,—where all is not faultless,—as of England." But the Brussels Exhibition is, only under certain aspects, subject to our review. Those aspects are:—its proposed enlargement of dwelling-space for families; its intention, as the programme states, "to bring homes more under the influence of architectural taste," and, in connexion with these and several other topics, we have a large variety of opinions. For example, it is said, and we fancy it has been said before:—"First, we have hotel life, admitting of great mobility, but made miserable by endless jostlings with complete strangers of every rank, and in every stage of hurry and bustle, by the impertinence and unconcern of the servants, due to their entire independence of you. . . . . Next come the flats, which have the merit, in common with the hotels, of rendering architecture of a noble kind possible; but this is all." The American eulogium, even at a competitive exhibition, stops here. Not, however, that, at this point the Exhibition stops. Will our readers have patience while we demonstrate the "thoroughness of a new American mansion," or hotel, for the object, as designated, is vague, with "thirty dining-rooms, thirty halls, thirty libraries, and thirty sets of books, pictures, ornaments, and articles for furnishing all these rooms, with thirty cellars, at least, to be filled with coal in cold weather, and more than thirty water-closets." Then, says the report, "We must have one dining-room, two drawing-rooms, one hall, one library, a few additional rooms; and, as sources of additional gratification," make us "one billiard-room, one theatre, or lecture-room, one smoking-room, one reading-room, and one billiard-room whereto a gentleman can retire, with hope that silence will not be an 'unattainability.'" So far, the Brussels Exhibition is an exhibition of nonsense and quackery, with a thread of commonsense and practical experience running through it. But, as a rule, exhibitions are the opportunities of empirics. We are very far from wishing to undervalue the ideas or results entertained, attempted, or demonstrated by the promoters. A future occasion may, perhaps, allow us to render justice to them. It is invariably a delicate task to state and classify the laws underlying complex relations, because it is really optional how far we are bound to carry our analysis. Just as we may describe granite as made up of quartz, felspar, and mica, we are at a loss when we think we have found an exact result.

This, however, is wandering from the principal point, which is that of the industrial home. In the Brussels Exhibition, as in that of Amsterdam, the "dwelling-house" is set down as "among the first requirements of civilised society," and from the German catalogue we extract the following:—"Class I.—Shortly termed houses, but including institutions for the use of working men; plans of dwellings for married and unmarried working men and agricultural labourers; plans of bedrooms, kitchens, and boarding-houses; washing and reading rooms, and places of amusement. It also includes (we are not responsible for the grammar of the catalogue), —"Any portions of these buildings; model dwellings; materials for construction; experiments with cheap materials; mortar, iron, and concrete; felt and other coverings for roofs; and, in short, as the projectors declare, every element or component part of domestic architecture." Of course, they are right in their assertion that the importance of decent and healthy dwellings stands foremost amongst the social necessities of the day. This is, after all, the most indispensable need of the poor. Without a house there can be no health. And tens of thousands of habitations in London and our other great cities are not houses, or homes, at all. There was a noble-minded man, who lived a few years ago, and who wrote a few words upon this subject. He said,—"We need not waste words in pointing out the essential character of this necessary of life,—a home of some sort, in which an existence not wholly unworthy shall at least be possible."

Such is the idea of the inventors, belonging to this class, at the Brussels Exhibition. They contribute, for example, new systems of gas and water supply, and so forth; and, if it be impossible to welcome all of these with cordiality, some, at any rate, may be adopted, upon trial at least. Mr. Hovell Thurlow may be depended upon, with regard to one point, and it is a point that concerns every family, — the low-class families particularly,—in the land. Dealing with the Mulhouse system of four-house blocks, persisted in at Brussels, from 1867 until now, and which we have invariably opposed, he says:—"In blocks of four contiguous houses, one morose owner, one shrew, or common scold, or one set of ill-conditioned children, from whom there is no power of escape, may make the

habitations of the other three unpleasant, and render most desirable the right of forcible eviction"; and he tells us, further, how, in a court, "a common pump has kept an attorney in good practice." Such affairs are known in England, and they are known elsewhere all Europe over. Drury-lane and Houndsditch, let it be marked, have their parallels upon the Continent.

But, referring, once more, to the Brussels Exhibition. The Dutch Carpenters' Society have a model for a row of cottages. This represents a block of eight buildings, precisely similar to those which were exhibited at Amsterdam, eight years ago,—each with a separate entrance, opening immediately into the living-room. The models of the little buildings at Dort, however, are, perhaps, the most practical. We will allow Mr. Howell Thurlow, if he will permit himself to be abridged, to describe them, and his description answers accurately to what we have just seen at Brussels. The cottages face east and west, and have two fronts, one family occupying the ground-floor, and another the upper story. Each enters by a porch containing an outhouse. "In the case of the first-floor family, this porch is reached by a broad, solid stair, springing from a yard about 50 yards square." From the porch—and here is a point of considerable interest in the Brussels Exhibition, as it was at the Exhibitions of Paris, Havre, Leipsic, and Amsterdam—you enter a parlour, without an approaching passage, 14 ft. or 15 ft. each way, "with two windows; a fireplace in the middle of one side,"—a rather unmanageable Dutch phrase,—having a cupboard on the one and a sleeping alcove on the other side of it, and "in the back wall" two doors, one leading to a well-lighted kitchen, with a chimney and stove, two large cupboards, two dressers, and a cellar for the storage of potatoes; the other into a sleeping-room, with two beds. The internal arrangements of the upper and lower floors are precisely identical. But the garret is wainscoted, and can be divided between two families, the upper one entering by an in-door ladder, and the ground-floor family by an out-door ladder, leading to an end gable window. The underground cellar can, likewise, be divided, and entered, as Mr. Thurlow says, by the ground-floor family, if desired, from the inside of the dwelling, and by the upper-floor family over some steps from their garden. Usually, however, the ground-floor family takes the whole cellar, and the upper family the whole garret. Social precautions are understood thus, as in a philosophical treatise which came into our hands,—"In either case, the two families need never meet, and there need be no collision, nor even communication, between them, if not desired by themselves." It is not to be wondered at that this subject should have engrossed so large a share of attention on the part of the Brussels Commissioners, and their colleagues in every quarter of Europe. No doubt they had other questions of interest to engage their minds,—the disposal of the dead; projects of cremation, mortuaries, new burial systems, and hospital architecture. There are, with reference to the last-mentioned topic, no fewer than 101 models and plans,—some of overpowering magnificence, which can never, by any possibility, be carried out; at once splendid and sad, grandiose and mournful; works of "soft-handed gentlemen," concerning the majority of whom it may be said, justly, that "there is no record of design at all." Saying this, however, we do not intend to imply that the Brussels Exhibition is a failure. It is, on the contrary, up to a particular point, a great and deserved success. There was nothing attempted which has not been carried out, and we have only, for the moment, glanced at one portion of the ground supposed to be covered, i.e., the architects' and the builders' fancies. In other respects, and in many varieties, the Exhibition is full, rich, and, so to term it, thoughtful. We have inspected many, in every country almost of Europe, but have never seen one which adhered to its purpose so faithfully. If, indeed, our notice has confined itself to an especial class, it is, at any rate, on account of no default on the part of the Exhibition, which deals with the construction of ships as well as of houses; of fire-proof buildings, and fire-escapes; and with every mechanical means of protecting human life from the consequences of human neglect or ignorance. There is hardly an invention of recent times,—whether with regard to lightning conductors, gunpowder magazines, railway appliances, the disposal of the dead, or the safe employment of workmen on scaffolds, or in vaults, or mines, that is not, more or less, illustrated in an exemplary manner. Well, after all this effort, must it still be true (and, as a matter of fact, it is not true now), that "there is nothing which a Londoner will so strenuously condemn as his abode, and that this is but an excusable result of all the troubles and inconveniences that the house inflicts upon him. The house in question is, generally, a wooden booth, covered at the top with slates, enclosed around with a thin film of brickwork, and daubed about with plaster. It can hardly, in fact, be called a building, and, for its size, it has far less strength and stability than the furniture it holds." Says a Belgian writer, "an English abode is a deep and inexplicable mystery, tending to irritate the stomach and derange the brain." Possibly, however, we may have seen some illustrations in the Exhibition of the Brussels Park which may not merely reconcile ourselves to our own domestic architecture, but also induce us to congratulate the Belgians upon being our best imitators in Europe. Their Exhibition is one worthy of them, and of all the nations by whom their grand ideas of humanity have been approved. The Fourth Henry of France said that he wanted to see a fowl on every peasant's table; the Second Leopold of Belgium says, in effect, that he wishes to see a decent roof over every industrious man's head.

DIFFICULTIES IN THE WAY OF PROMOTING DWELLINGS FOR THE POORER CLASSES.

THE Earl of Shaftesbury brought the Whitechapel and Limehouse Improvement Scheme before the House of Lords on the 4th, and again on the 6th inst., in order to make observations on what he supposed would be the first of a long series of Bills. No one who takes a real interest in the welfare of the working classes can fail to agree with Lord Shaftesbury in regretting that no provision should be made, in Bills of this nature, for the convenient accommodation of the persons to be ejected from their dwellings. It is by no means the first time that attention has been called to the serious evils attendant on wide and sudden displacements which have already occurred in more instances than one. The example of Glasgow is one which should be remembered by our English Municipal Bodies. The municipality of that city have made extensive improvements, involving the demolition of much house property, and of the abodes of many poor persons. In no case, however, were the people compelled to remove until it was ascertained that adequate accommodation was provided for them within reasonable distances. When we remember the wide sweep that has been made in the metropolis for railway purposes, and the extent to which the house accommodation of the poor has thus been reduced, without any thought of providing an equivalent, it is obvious that any schemes directly intended to remove crowded dwellings ought to be jealously regarded, lest in fighting against one evil another be introduced. We shall be among the last persons to be rightly accused of indifference to that part of sanitary reform which demands the demolition of unhealthy and overcrowded dwelling and lodging houses. But it is not by the simple process of turning the inhabitants into the street that such a reform is to be effected. We trust that before Bills for such objects are confirmed by Parliament the president of the Local Government Board—or, failing that official, some independent member of one or other House of Parliament,—will insist on the insertion of clauses that shall prevent the injustice of the wholesale routing out of poor inhabitants without due provision for their need of shelter.

In the amended Bill some provision is included for this purpose. The new tenements are to be disposed in blocks, of five stories high. Eight hundred and eighty-eight tenements are contemplated. These are to consist of 117 tenements containing three rooms each; of 650 tenements containing two rooms; and of 121 consisting each of a single room. Thus, accommodation is provided for 3,870 persons, allowing one room for two and a half occupants. It appears, however, that the very difficulty which the new buildings are intended to obviate springs up afresh on the very face of the scheme. One considerable cause which has led to overcrowding is poverty. We do not deny that a vicious habit once formed is hard to eradicate, and that those who, in the first instance, would have shrunk from the crowded publicity of a poor lodging-house may become so accustomed to the life they were at first forced to lead that they will not be ready to take any steps to change it. That, no doubt, is often the case. The habitations of the poor in our great cities have not, until late years, been built expressly for them. They have, to a great extent been formed out of old houses, of moderate, or even of large size, situated in neighbourhoods which have gradually lost their original respectability in consequence of the ever-increasing density of the building with which they are surrounded. Such houses will, in the first instance, have lost the favour of the class of occupants for whom they were built. They will then, very likely, have remained long tenantless, and thus have fallen into that dingy and ultimately dilapidated condition which attaches so much earlier to empty than to tenanted houses. Most likely while in this state they have been sold, or have passed in some way into the hands of those who will have striven to increase the rent they returned by multiplying the number of tenants they contained. They have been let, sublet, and re-sublet. They have been divided into all sorts of inconvenient and unwholesome ways,—and crowded both as tenements and as rooms. Thus they have been often converted into sources of income as large as they could have afforded in their palmiest days. But it has been an income wrung out of the poor. Each tenant has had to pay a rent which might be all that he could afford, and which possibly might not have been too high for such house-room as ought to have been provided for him. It is by the process of crowding that the rent has been raised. We can thus trace, step by step, the mode in which these rookeries have sprung up. But we cannot see that the causes which led to their formation have been checked. On the contrary, some of these causes are in more vigorous action year by year. The old and miserable dwellings, on which no more was laid out for repairs than would keep a roof over the walls, may have attained long since their highest rack rent. But over all other portions of the area of the metropolis and other great cities and towns, the rate of rent is continually rising. The very clearing away of old houses raises the price of the surrounding land. All things that contribute to the expense of building have, as our readers well know, risen of late immensely in price. To build a house on a given spot in London, containing the same cubic quantity of space and material as the house that was built on the same spot fifty or a hundred years ago, would require a far higher expenditure at the present moment than that which was incurred in the former instance. Thus it is obvious that, to some extent, the accommodation which we are now preparing for the poor is more costly than that which we are destroying, and rightly destroying. It is more costly because we insist on more cubic space for individuals. It is more costly because it is a new building instead of an old one, and because its rent ought to be proportionably higher than the bare interest of the money, so as to provide for depreciation of property, and, at the lapse of a given time, for thorough repair or rebuilding. The old houses have long since passed this stage. Every year that they can be coaxed to stand is an almost unhoped-for addition to their life. On economical principles, then, their rent ought to be lower than that for new houses of equal accommodation ought to be,—it does not follow that it is. It may be said that the old rent is an unjust and extortionate rent; but it is possible that this might also be the case in new houses. We cannot enter into the question of the moral character of the landlords,—we can only compare legitimate causes of increase in rent. And these, other things being alike, are in favour of the old building against the new. Thirdly, the prime cost of the new building must be very considerably greater, for the same amount of the accommodation than was that of the old one. Therefore looking at the case not in a sensational, but in a practical manner, we find that the new abodes offered to the poor are in danger of becoming more costly than the old ones. They may be made to bear a higher rent than the old ones did, except in so far as that rent was improperly high—that is to say, in so far as it was raised by the greediness of the landlords above the fair ratio of remuneration properly due to the amount of capital involved in the house property. This being the case, one great evil which led to the overcrowding in the old houses, may be actually aggravated in the new. If sanitary legislation steps in, and limits the subletting process, and insists on the allotment of a given cubic space per inhabitant, —which, we all

agree, ought to be the case,—how is the economic difficulty to be met? Who is prepared with a plan that shall make both ends meet,—that shall provide the requisite accommodation, pay ground-rent, or interest on the purchase of land, house-rent, or interest on the capital sunk in building, together with provision for the replenishment of that capital within a given time, and current repairs; and that shall at the same time only impose a rent within the means of the class of tenants who are contemplated to pay? The difficulty is serious, and anything that may tend to lighten it should be received with much gratitude.

All the questions to which attention has been so properly directed by the Earl of Shaftesbury seem to us to be subordinate to this master difficulty. Indeed, they tend, to a certain degree, to aggravate its pressure. Provisions of all kinds for the decency, the comfort, and the cleanliness of the lodgers are essential. But every such provision entails cost,—that is to say, entails an advance on the minimum rent per tenement. So again, as to water supply, high service and constant service are most desirable. But the height of the blocks of buildings, and the level of the ground on which they stand, have to be taken into account. We may ourselves look forward to the time when high pressure and existent service shall be adopted throughout the metropolis. There is good reason to anticipate (although the matter is by no means certain) that a less daily demand would be made on the stores of the metropolis water companies by a constant service than by the ordinary plan of supply for a limited time, and the storing of water in cisterns. But we cannot expect that the price of supply per head will be less, at any rate, on the constant service system, than it is at present. The water companies, then, cannot be expected to supply the new buildings at less than the actual average rate of a ton of water per week per individual. We see that two and a half individuals are allowed per room. That gives two and a half tons of water per room per week. The actual price per ton, if we analyse the reports of the water companies, of the present supply, is 1·4d. That will give a water-rate of 3½d. per room per week, or 3½d. per week for a single-room tenement; 7d. per week for a double-room tenement; and 10½d. per week for a three-room tenement. But this charge, which amounts to 15s. 2d. per annum for the single room, and to 2l. 5s. 6d. per annum for the three-room tenement, is a very notable addition to the rents. As a check upon this estimate, it may be noted that the annual average charge per head on the inhabitants of the metropolis during the last year returned for water was 6s. 6d. This would give a rate of 16s. 3d. for the single-room tenement, and of 2l. 8s. 9d. for the three-room tenement. The difference of cost probably represents the water taken for public purposes. Has this matter been duly considered and wrought out in black and white by those who are projecting the new dwellings for the poor?

Again, the question of lighting has to be considered. If we regard, not the present cost of London gas, but that diminished cost at which it is proposed, in the Bill now before Parliament, that it shall ultimately be supplied, we have a price of 3s. 9d. per thousand cubic feet. The ordinary burner used by consumers produces a flame 3 in. high, giving the light of sixteen sperm candles of six to the pound, by the consumption of 5 cubic feet of gas per hour. This is the proportion arrived at for what is called sixteen-candle gas. If the gas be impoverished in quality it must be increased in quantity. Thus 6·65 cubic feet of twelve-candle gas are required to give the light of 5 cubic feet of sixteen-candle gas. If we consider light to be required for twenty-one hours per week on the average throughout the year, in each room, we have a consumption of nearly 5,500 cubic feet of gas; or, if there is no waste, of exactly 5,460 cubic feet. This alone amounts, at the price above quoted, to 1l. 5s. per tenement per annum. It may possibly be said that a smaller burner may be used, and that thus a less annual consumption will occur. On the other hand we have taken all the conditions most favourably to the consumer: pure gas at a minimum price, burnt for a minimum allowance of time. It must be remembered also that we have only allowed one burner per tenement. Additional gas must be consumed for passages, staircases, and the common portions of the block buildings; and these burners ought, as a rule, to burn through all the hours of darkness. Again, the question will arise as to the distribution of gas. If each tenement were supplied with its own meter, there is an addition directly made of 4s. or 6s. per annum to the charge for gas. Without separate meters there is no mode of apportioning the charge. The occupant of one tenement might require double the number of hours of light required by his neighbour. Some average must be taken in order to avoid the cost of separate meters. The average rate per head actually paid by every Londoner for gas last year was 17s. 3d. This, of course, includes public lighting of streets and courts, as well as private consumption. But it by no means excludes the consumption of an enormous quantity of oil, tallow, and other hydrocarbons. The poor, who use gas, use it far more exclusively than the rich, and thus probably consume a quantity per head not much, if anything, short of the average consumption. Much of this, however, no doubt, will be in the street shops, and not in the dwelling-rooms. The average of 17s. 3d. per head gives a charge of 2l. 3s. 1½d. for each room accommodating 2·5 occupants. For these reasons it is probable that the above estimate of 1l. 5s. per tenement per annum for lighting is not in excess.

The total cost per head of the various rates now levied in London comes to an average of 50s. per annum. This includes the foregoing items of gas and water. If we deduct the allowances already made for these supplies from the total, there still remains a charge of 1l. 6s. 3d. per head, or 3l. 5s. 7½d. per room, for Metropolitan police, Local District Boards, Board of Works, Commissioners of Sewers, and Metropolitan School Board. It is not very evident how solid and substantial houses, such as those which we contemplate must be, can be relieved, without special legislation, from a proportionate part of their rates. In case of their liability, it will be an addition to the rent, made probably in that form. Even if the occupiers were themselves rated separately, which would be a great waste of money in the matter of collection, the amount payable would not be diminished by that fact. If we conceive that by any arrangement the occupants of the new lodging-houses were only made liable to half the average rating of the metropolis, estimated per head, which would reduce the incidence of all rates, with the exception of what may be called the remunerative charges for light and water, to about a couple of shillings per head, we still have an annual sum of 3l. 2s. 6d. per room to be added to the rent proper, or hard upon 1s. 2½d. per week for each one-roomed tenement.

The question of rent itself remains to be considered. If we allow 500 cubic feet of space to each individual, we require 1,250 cubic feet per room. Will builders be found to execute the work required at a lower price than 10d. per cubic foot? If so, a proportionate reduction has to be made on the following calculations. For cottage dwellings, indeed, accommodation may be provided at probably the half of this price per foot. But if we regard substantial houses, five stories high, built under the conditions incumbent on the London builder, the rate will not be low. We take a maximum, because we wish the subject to be wrought out in all its bearings. The builder's price for the tenements will amount, on the above assumption, to 52l. 1s. 8d. per room. To this must be added a sum for land, whether purchased or paid as ground rent. It would be rash to place the price of land in the central parts of London at a much lower price than 10,000l. per acre. From two and a half to five times that amount is no unfrequent valuation—without going to such extreme cases as the site of St. Mildred's Church. The price of 9,680l. per acre amounts to 2l. per square yard. If we allow for five stories, we have a sum of 8s. per square yard, or 5l. 12s. per room to add to the cost of building. This gives a cost price of 57l. 13s. 8d. per tenement. The ordinary return which is regarded as the limit for the productive employment of capital in building is 8l. per cent. To keep quite within bounds, let us reduce this rate to 7½ per cent. We thus have a charge of 4l. 5s. 9d. per room per annum, or about 1s. 8d. per week, required for the remuneration of the capitalist, apart from any charges for collecting, watching, or other purposes. Thus, in the absence of some aid or supplement, from some source not yet indicated, we cannot calculate on being able to offer lofty tenements of a substantial sort, which shall contain 500 cubic feet of space per inhabitant, for a less sum than 7l. 8s. 3d. per annum, or 2s. 9½d. per week for each room accommodating 2½ residents, for rent and rates alone, exclusive of any house tax or incidental charges of collection or of maintenance.

Now if, by going to work in a way that is consistent with the stability of building, and with the fulfilment of sanitary requirements, we find that the rent, rates, and water supply, and lighting of a single room, averaging two and a half occupants, come to 7l. 8s. 3d. per annum, exclusive of taxes, watching, warming, and any other contingent expenses, how does this tally with the needs, and with the means, of the population we are seeking to provide for? And what remains for those who cannot pay the sum of fifty-nine shillings per head per annum for rent? If we find that we can reduce the cost of building as low as 5d. per cubic foot,—a rate that we believe will cover a very tidy sort of cottage,—we shall reduce the rent and ground-rent to less than a shilling per room per week,—the rates thus forming a higher charge than the rent. Thus it is obvious that a very serious question as to the rating of houses built in lofty blocks for the accommodation of the poor has to be discussed, independently of the structural problem of the least costly mode of construction. These questions must be put in time, and must be considered in time. If we proceed without looking the difficulties of the case fairly in the face, we shall be entering on a sea of troubles. We shall be placing a considerable portion of the population,—a portion which is so helpless as to demand the utmost consideration and regard,—in direct collision with the law. We shall be re-enacting, in the heart of the metropolis, the Irish ejections described by the novelist. If the life is more than food, and the body more than raiment, attainable shelter is more than housing, which, however suitable from a secondary point of view, is unattainable by reason of its cost.

On moving the second reading of the Metropolitan Improvements Bill, the Duke of Richmond and Gordon stated that arrangements were contemplated by the measure which would provide for proper sanitary arrangements in the houses to be erected. The Earl of Shaftesbury, in thanking the Government for thus far attending to the suggestions he had previously made, took occasion again to urge the duty of timely notice to those who were to be displaced, and of provision for their immediate shelter. The two conversations in the House of Lords show what can be effected by one earnest man. We trust that the question of cost of lodging will receive an equal degree of intelligent attention and support.

PROPORTION IN THE FINE ARTS.

UNDER this heading we gave, in a recent number, a *resumé* of the substance of a lecture delivered by Mr. Cave Thomas, at a meeting of the "Society for the Encouragement of the Fine Arts," on the 1st ult., the main object of which was, in recommending a theory of beauty in art with which the lecturer's name has been previously connected, to show that art was not, or need not be, tentative in its endeavour after excellence, and that, in fact, there was a sure guide for the artist in securing the most beautiful forms and proportions in his productions, if only he would avail himself of it.

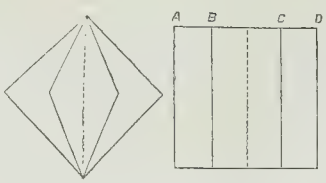
The discussion of this idea, which in one shape or another has been not unfrequently brought forward, is in process of being a good deal revived just at present. Only a week or two previously, in the same room, the members of the Architectural Association listened to a lecture from an able architect on the theory of definite and fixed proportions which should pervade Gothic buildings, and upon which designs ought to be constructed, instead of on what was referred to as *tâtonnement*. This special application of a theory of proportion in architectural design we do not intend here to dwell upon, only referring to the fact of the two lectures having been delivered within so short a period of each other as apparently significant of a movement of interest in the subject. The last word in regard to the subject of architectural proportions, treated of by Mr. Pullan, has not, we think, been said; but it is, in fact, a different kind of consideration from that brought forward by Mr. Cave Thomas. It is in reality only concerned with a method of working out a design the leading *modulus* of which has been determined on; it is a process rather than a principle; whereas the lecture by Mr. Thomas attempted the establishment of a definite principle of design, a standard whereby the better or worse, the beautiful or the not beautiful, were to be tested.

This principle, briefly expressed in the summary of the lecture (page 570, *ante*), was offered to his audience, apparently, by Mr. Thomas as a certain and almost unimpeachable deduction derived from years of study of the subject; and we understand that, contrary to the usual custom at the meeting of the Society, before which it was delivered, discussion on the lecturer's views was politely prohibited. With every recognition of the ability of Mr. Thomas both as an artist and a philosophiser on art, we can scarcely, however, follow this example, or allow the statement of his theory to pass in our columns without a word or two of examination in regard to a view of the basis of art which seems to us very much open to question.

"The golden mean" is, according to Mr. Thomas, the end and aim of art. That which is most beautiful, most satisfying to the mind and the eye is that which is the central form between all excesses on the one hand, and deficiencies on the other hand. All criticism of art really resolves itself, he thinks, into an act of mental mensuration. With this definition of criticism we do not quarrel, as expressed in these words, which it will be observed are capable of a very elastic meaning, and really express very well the true function of criticism, which is first to ascertain or consider what the aim of the artist has been, and then how far he has in any respect either exceeded or fallen short of that aim. But the application of a system of estimating or finding the mean, as a guide in artistic production, is complicated by other considerations.

It appears to us that Mr. Thomas uses the expressions "proportion" and "mean" to express two things which are radically different in their nature, and which are to be estimated in a very different manner. One of the illustrations which he gave (not referred to in the summary furnished to us) consisted in supposing that we had placed side by side a heavy, bulky, over-muscular figure, such as would be taken to represent an Atlas or a Hercules, and a thin, wiry figure, built for speed alone, such as some of the well-known types of the figure of Mercury. Both these err, and are only partially satisfactory, because both are excessive in opposite directions. Alter by degrees that which strikes one as out of balance in either of them; refine down by degrees the superabundant muscle and development of Atlas; add by degrees more flesh, and fuller and finer contours, to the figure of the Mercury; and the two gradually approach each other in form, and at the point where they become similar we find the characteristics and proportions of such a form as the Antinöus, which is admitted on all hands to be a form of almost perfect beauty and symmetry. That is not a bad illustration of the process of selecting types from nature. In connexion with the subject, reference was made to the fact that the individuals of any species of animal which are the most beautiful are those which exhibit the mean between any excess or deficiency in proportion. And so we might, as Mr. Bonomi pointed out in a letter in our columns not long since, obtain valuable conclusions as to the correct standard of the human figure, if we could induce the Government to let us have for this purpose a synoptical table of the sizes and proportions of the men in our Guards' regiments, who exhibit probably the best average of the human figure which is attainable from the living model in the present day. So, also, there is some reason to think the Greeks carried on their observations of the figure, observing what was common to the best figures, accepting that and rejecting the points which were only exceptional. All this is perfectly reasonable as a means of arriving at a general idea of the standard or normal proportion of the human figure, for example; and there is something in the process of thus eliminating the best out of a number of varied types which reminds one of Darwin's generalisation in science, and suggests the idea that in art, as in human and animal life in unrestricted conditions, there is a "survival of the fittest."

But the idea of the mean assumes a different aspect when we come to any attempt to reduce it to figures or to a calculable form. Mr. Thomas illustrated his lecture by some simple diagrams showing this search for the golden mean in a geometrical aspect. In the following two figures, for instance, it was stated that the most pleasing and satisfactory proportion of parallelogram was that included within the lines *B* and *C* in fig. 1, in which *B* and *C* stood at equal distances from the boundary lines and the centre line of the complete square; and fig. 2, in which the area of the inner diamond is equal to the sum of the two areas between it and the rhomboid, is supposed in like manner to show the most pleasing proportion for that style of figure. This illustration



was not accidental to the lecture, but was part of the reasoning by which the argument was built up. But does not Mr. Thomas perceive that in this case he is reasoning by analogy between two things which are totally distinct? The beauty of the human figure, for example, is in its expression as a living, acting, and thinking organism; and seeing that all such organisms are not equally expressive or equally beautiful, we may arrive by comparison and selection at certain conclusions as to the finest type, and that fitted to be the medium of the highest art expression. But a geometrical form belongs to quite a different category of things. A geometrical form or proportion has no expression, except in relation to some function which it fulfils. Abstractedly, it is almost impossible to say that one is more beautiful than another; and as to the illustrations given, our own eyes contradict the truth of them every day. As to the "golden mean" diamond shape, for instance, to take a very familiar example; in the leaded panes of Gothic windows the proportion which looks best, and has been most employed both in old and new buildings, will be found, we suspect, if the matter be worked out with mathematical accuracy, to be a broader and shorter form in almost all cases. As to the parallelogram, fifty instances suggest themselves at once in contradiction to Mr. Thomas's mean form. In fact, proportions in geometrical forms are beautiful or not in relation to their position and use. The Doric column is a beautifully proportioned thing in its own place on a large scale. Put it to support the horizontal rail of a balustrade, and it looks a mean kind of stick. Magnify the baluster, and place it as a column in the temple, and it will look hideous. Each form is proportioned to its position, to the work it has to do, to the scale of the building, and to what we know of the nature and tenacity of the material in which it is executed, and which, being a constant, will not admit of the same proportionate tenuity on a small scale as on a large one. These and a score of other considerations, sometimes too delicate for analysis, and rather to be felt than described, go to determine whether a certain form in a certain position is well proportioned or not.

Then there is the question of the physical basis of certain arts, which comes to be imported into the subject. It was shown "that there are common harmonic principles underlying all the arts." If words mean anything, this cannot be the case. Where is the common harmonic principle between music and sculpture, for instance? There is a common harmonic basis underlying music and painting, inasmuch as there are fixed and mathematically demonstrable ratios existing between different sounds and between different colours, and the proportionate relations are, to a certain extent, the same in sound and in colour. But does any painter,—does Mr. Thomas himself,—arrange the colours on his canvas on the basis of a calculation of the harmonic ratio of the vibrations of the light reflected by the different pigments? The painter arranges and combines them, no doubt, to produce a harmonious effect, and the knowledge of the numerical relations of colours may explain to him, if he cares to know, why such and such combinations are pleasing; to a certain extent, at least, for we do not believe such knowledge will explain it entirely. But after all, the practical outcome of it is, that it is the painter's eye and feeling that do the work, not his power of calculation. And so with music, to which Mr. Thomas appealed in support of his views. There are certain very interesting facts in regard to the physical basis of music, and which connect it in one sense physically with colour. There is the fact, for instance, that the series of sounds which form the "harmonics" to any note, have their proportionate vibrations in an arithmetical ratio.* There is the fact, that only one combination of sounds can be permanently satisfying to the ear, as the final chord of a piece of music, and that the vibrations of its three initial component sounds are as 4, 5, 6. But these facts have little or nothing to do with music *as an art*. The first of them, which is exciting much interest now, was absolutely unknown to the great composers. Their works were quite independent of it, just as the colouring of Titian is quite independent of any knowledge of the vibratory proportions of colour. Such knowledge is very interesting, it may be very valuable in more ways than perhaps we know of at present; but it will never make a man an artist. It is worth notice that Bacon, whose opinion should at least go for something, draws the very same comparison that Mr. Thomas draws, between painting and music, but with the opposite conclusion. In his essay "On Beauty," he refers (whether correctly or not is no matter here) to Apelles and Albert Dürer as artists of whom "the one would make a personage by geometrical proportions, and the other by taking the best parts out of divers faces to make one excellent"; and he adds, dryly, that such personages "would please nobody but the painter who made them." Then he proceeds,—"Not but that I think a painter may make a better face than ever was, but he must do it by a kind of felicity (as a musician that maketh an excellent air in music) and not by rule." And this we believe to be "the truth on't." Nor do we suppose that Mr. Cave Thomas would wish to be understood as conveying the idea that any one by mere application in the path of his theories and instructions could "arrive," as the French say, to produce works of art of the highest class. But we must say that his lecture, as delivered, was calculated to produce that idea in the minds of "weak brethren" who may have heard it; and that he is himself in danger of being led away by a theory which, like most theories of the kind, is, in regard to actual artistic and expressive power, an *ignis fatuus*, leading the artist away from what should be his true aim. And for Mr. Cave Thomas himself, we think that we are paying him no ill compliment, and giving him no bad advice, in saying that we rather wish he would paint more, and theorise less.

* To put it in a more popular form: if the dampers of a piano are raised and a note in the lower register of the instrument struck forcibly, certain strings, and no others will vibrate and sound in sympathy with the string originally sounded, and their vibrations will be, respectively, to those of the originating sound, as 2, 3, 4, 5, 6, 7, to 1. Mr. Cave Thomas seemed just about to refer to this in his lecture, but he spoke, instead, of the vibrations of a note to its *octave* being as 1 to 2. So they are, but the remaining octaves follow in *geometrical* progression—4, 8, 16, &c. It is the "harmonics" that follow an arithmetical progression.

NEW SCHOOLS AT OXFORD.

THE new University schools have been finally voted by Convocation. The design selected by a delegacy appointed in November, 1875, is that of Mr. T. Graham Jackson, fellow of Wadham College; Messrs. Bodley, Champneys, Deane, and J. O. Scott having also engaged in the competition. The general arrangement is that of a spacious quadrangle, surrounded on three sides by buildings two stories high, containing the examination schools and their offices,—viz., on the ground floor nine *viva voce* schools, with a small private room for examiners attached to each, and on the first floor three large writing schools (for 200, 200, and 120 candidates respectively), with a tenth *viva voce* school and two examiners' rooms. In the writing schools 25 square feet is allowed for each candidate (the space in the examination rooms of the University of London being only 19½ square feet); and the cubical air space obtained by lifting their ceilings into the roof will insure the necessary condition of wholesomeness which is so conspicuously absent from the present schools. The fourth side of the quadrangle, between the schools proper and High-street, will be occupied by a building with the principal frontage to the street, containing a large and lofty writing-hall, with offices, &c. The material is to be stone. The design is described by the architect as "Gothic in feeling and motive," but he has chosen in preference to Early Gothic work "that late eclectic style of which Oxford and Cambridge contain admirable examples."

PAINTINGS ON CHINA.

IN the same gallery where was exhibited the collection of stoneware from the Lambeth potteries, of which we have said a few words, Messrs. Howell & James now exhibit, for the first time, a collection of artistic painting on china, for the best productions in which branch of art they have offered prizes and medals, to which a definite value is attached from the fact that these have been adjudged upon the decision of two artists of recognised position, Mr. Poynter and Mr. E. W. Cooke.

A certain proportion of the objects in this collection ought not to have been produced at all. Any attempt at landscape or realistic interiors is out of place in china painting, serving only to show what the material can *not* do. Such things as the views in Falaise and Rouen (20 and 29), for instance, are complete mistakes; no aërial perspective can be realised in them; they only look coarse and inartistic. The same may be said of other productions, which have obtained prizes as landscape subjects. It may be questioned also, apart from the suitability of the material, whether such subjects are not unsuited for the decorative treatment of a dish or plate which, though it may be hung up as a picture, of course, is always supposed to be capable of practical use as a receptacle for something; and to put a landscape or an interior in realistic perspective upon it is out of place; it should have a flat and conventional treatment. The incapability of the material is, however, the more important drawback; and for the same reason we object to the attempt to finish heads with life-like realism in the same way as in oil-painting; the girls' heads in Nos. 5 and 7, for instance, and others of the same type here, are what no one of fastidious artistic taste would care to possess. Mere sprigs of flowers, with birds and insects grouped with them, may be treated more realistically with good effect, as they form, when so dissociated from any of their natural surroundings, a kind of conventionalism in themselves. Of this class Miss Merry's two designs (22, 23) are good, and Miss Maplestone's "Purple Iris" on an orange ground (164); Miss Spiers's "Summer," a group of flowers and a thrush (171); Miss Butler's "Lilies and Birds" (175); and others. Then it is possible to arrange subjects of this kind so as to express, in a decorative manner, a certain distinct sentiment, as has been rather well done by Mr. Haines in a design called "Evening" (68), where flowers and birds are delineated against a ground which suggests in tone and arrangement the evening sky, without any attempt at actual landscape effect or perspective.

Among the examples in which figure subjects are introduced we must recognise the merit of that by which Miss Linnie Watt has gained the 15-guinea prize for the best work by professional artists, and which, though it comes in the category of subjects we have mentioned as not really suitable for the style of art, is much more satisfactory to the judgment than some others of the figure subjects, from the richness of texture preserved, quite different from that hard mechanic look which some of the specimens of this class present. Lady Rawlinson's head of "Rubens" (72), drawn and shaded in monochrome, and with a bold and effective border consisting of an orange scroll on a purple ground, shows true artistic feeling; so does Mr. Holiday's drawing of "The Arts" (180), showing figures of natural flesh-tints on a green ground conventionally representing foliage. Mr. H. Ryland's small plate, with a "Venetian Head" (188), lined in blue, against a light and dark ground, dividing the plate irregularly into halves, and with a very well-designed little border, is a model of the kind of way in which figure subjects may be effectively treated in this material. There are some other plates of figure subjects which are in a good style and commendable, but which we decline to particularise, because they are sent with the name of Somebody "& Co.," whom we are not going to advertise. Who is "Co.," and at what school of art did he study? We do not recognise "Co." as an artist. When we see a design we wish to know who invented and drew it, not who "exploited" it. We may observe that there are a good many productions of the Lambeth School of Art hung up, not for competition, but just to show what the school is doing. We take it that the Lambeth School of Art is on the wrong track in regard to subjects for painting on china, and is far too ambitious in its tendencies. Let the students attempt less on china, and they will do more.

In purely ornamental design (and we confess our sympathies go most with that) we notice some beautiful bits of work; scarcely anything, perhaps, so good as Miss Faulkener's "Decorative Plate" (173), with a design symmetrically unsymmetrical, as one may say, of blue leaves and stalks intertwining, with orange buds and centres to the flowers,—a most refined little bit both in tone and design. "Conventional Floral Decoration," by Mr. Church (88), has the same kind of merit. Miss Lewis's "Kingfisher and Wild Flowers" (316) is notable for the very original and artistic border, effective both in line and colour; and Mr. Haines, whose name we have mentioned before, and who seems thoroughly to know what he is about, has a beautiful "Conventional Design" (375) of leaves and broad yellow flowers, with a border of very dark mottled green: as a bit of colour this is one of the best things, as well as in style. M. Huart's "Persian Design" (449), and Mr. Payard's designs under the same title, though in a very different style (451, 476), are exceedingly good; the former, however, belongs in fact to the style now recognised as Rhodian. A little conventional design for "Peace," by Miss Jacobs (390), shows some thought and a true style.

Four more of Mr. Tinworth's little terra-cotta basreliefs are exhibited, and are as clever as those we have previously seen; in spirit and point the one representing the Jews who had sworn "not to eat or drink till they had killed Paul" is especially admirable. The same artist has furnished the design for a large stoneware vase, called "The Solomon Vase," the leading feature of which is a set of little figures in niches round the broadest part of the vase, illustrating in various ways the verses of Ecclesiastes, following the sentence, "For everything there is a season." One or two of the illustrations strike one as oddly conceived,—for instance, "A Time to Embrace" is represented by "the Shunamite and her son," and the opposing clause, "A Time to Refrain from Embracing," by "Joseph in Potiphar's House" (!), which is to the point, certainly, in a way. But in outline, colour, and detail this vase is a noble production of the art, and worth looking at in itself.

THE HINDOO AND HIS ARCHITECTURE, AT SOUTH KENSINGTON.

VERY much is sure to be written and said about the unique collection of Hindoo curiosities of all kinds, which have been acquired by the Prince of Wales during his late tour in India, and which are now exhibiting, through his Royal Highness's considerate kindness, at South Kensington. The objects are, doubtless, in themselves enough to attract a large amount of public attention, but varied comments on them will certainly attract more and more of detailed attention and study. In the rooms preceding those which contain the Prince's collection are many fragments of sculptured architecture, together with photographs, forming part of the India Museum, and we propose to look at a few of them, especially the architectural ones, and to point to some lessons which they may possibly teach. The history of architecture has yet to be adequately written, and its very foundations and first beginnings need to be dug into by dint of thorough and laborious work and research. Here, in this vast continent of India, with its thousands of square miles, with its millions of inhabitants, its all but perfect and primitive language, and its past history stretching back into times beyond record, is to be found a field of inquiry not to be surpassed, if it can be equalled in interest elsewhere. We have often regretted that Humboldt—that first of travellers—did not accomplish for India what he did for America, and the kingdom of New Spain. How many books there are about "India," none need to be told, but unhappily the information they afford is but slight. We want insight into the place. Here in this collection of facts there is at least a something certain to go by.

In the first place, it is to be observed that the architectural section of this display of fine things is a good deal scattered about the rooms, the object in the arrangement being, perhaps necessarily, to keep the individual collections, as collections, together. We must needs, therefore, search the galleries many times before getting the "architecture" well together in the mind's eye. Then, of course, it is very imperfect and fragmentary in character, coming from all parts, and as applied to all purposes. The collection includes many notable specimens. We are here referring to actual fragments. There are also many very valuable drawings, both native and otherwise, which tell of architectural arrangements, and with their details. We but glance at the vast subject, hardly knowing where to begin, the objects being so scattered.

Numbered 19 is a native drawing giving a fair idea of that essentially Oriental display,—a Royal and Imperial audience, such as might have been seen in the days of the great Akbar, or Aurungzebe. It, at times, is thought that all Oriental things are to be infinitely improved by close and intimate contact with things of "Western" invention and growth. Those who think thus should examine in detail this interesting sketch, and compare what is in it, especially as to the costumes, with those which are now taking the place of them. It is like so much else that is valuable of the past, it cannot return, but it is worth the long looking at for many reasons! The architecture of it, too, is noteworthy, and shows how all things, if left to themselves, grow together and harmonise with each other; the men and women, the dresses they wear, and the dwellings they live in. Such a drawing as this, with many others scattered about, will afford insight into the life of Indian royalty in past days. And reference to many of the actual objects collected together here and there from the palaces and other places, and given by the successors of those who built the throne-room represented, will make the impression the drawing makes on the mind the more vivid and real. What would Imperial Akbar, one of the strong men of the East, say could he but see this display as we now see it?

Not far from this drawing are two models in wood of painted ceilings, well worth note and study; in one of them circular mirrors are most ingeniously inserted as panels, and must have, *in situ*, a striking effect, not interfering with the idea of a ceiling, or roof, as such, but simply adding to the effect and novelty of it. The colour of these ceilings is of that bright, though quiet kind, which the Hindoo artist and workman seems to create instinctively.

While on the matter of ceilings, it may be well to look at some sunk panels, wonderful in ingenuity of design, from the Upper Temple, Pelwarrah. Such work shows how thoroughly the Hindoo architect understood his special work, and style of architecture. No labour would seem ever to have been spared in the working out of an Hindoo art thought. Ceilings there are, too, in abundance here, in photographic illustrations, drawn from the temples and palaces, and well worth looking at, thus to get at *general* ideas, and at the position of the architectural fragments.

A model of a complete ceiling, as it now exists, it is to be hoped, at Lahore, should be noticed; it is in all ways worth attentive study.

Passing from the *ceilings*, on which really a volume might be written, we may come to the perforated panelling which forms so striking a feature in Mahometan Hindoo architecture. In these panels the quiet and skilful labour of the Hindoo workman shines conspicuously. There is no end to the variety of the interlacing patterns, and no end, as it would seem, to the *labour* involved in their execution. There is a "lattice," in blue stone, in room No. 1, from Keroly, and a square panel in stone admirably cut. A panel also in black marble with ivory inlaid letters from Malwa. These elaborate and ingenious works of art cannot well be copied, perhaps not at all, by our workmen, but they may be looked at, and studied, to learn what is possible, and how much a people may do without any of our *mechanical* helps. The reader may here perhaps be usefully reminded that these things we have noted are not among the brightest and most attractive in this magnificent display of Indian work, but they are not the less notable and worthy of study. Indeed, we may affirm generally that it is among the duller objects that the most characteristic, and truly Hindoo and native art action shows itself. It is important to bear this fact well in mind, for the very conspicuous, and very bright, and highly-coloured objects, are "Europeanised," and have indeed come from India, but from our art schools as well. Is it gain or loss? We have thought, as more immediately interesting, in this place, to confine our thoughts, having already spoken of the Prince's collection generally, to the architectural phase of the collection, which, though not quite so attractive as the gorgeous coloured woven fabrics which hang on the walls, is quite as important and as interesting if looked at closely enough and with patience. Indeed if

we want to come to a thorough understanding of the art of India and the art power of the native races who inhabit the country and have inhabited it for so many ages, we must begin with the architecture—with common house and temple building, and even with cave making and forming. It is difficult to say where "architecture" really begins; but it is certain that some kind of habitation, however rude, to *house* the man must have preceded the building of a temple, however necessary that might be. We are told that a "damp wretched hut," consisting of but one room, is the usual dwelling of the poor in Bengal. Even this, therefore, though not architecture in the common acceptation of that word, is at least *building* or construction, rude as it is, and simple in the putting together, and the palace itself springs up out of this. We thus get to the origin sometimes of a native style of architecture, and there is in this very collection a singular illustration of architectural growth. It needs close study to be fully appreciated.

We allude to a careful and measured drawing, both plan and elevation, of the Amravâti Tope, by Sir Walter Elliott. The plan, unfortunately, though an elaborate one, has no references, so that a good deal may be missed in the study of it, and no section is given, but what there is, is curious enough. The Tope itself was, in all probability, like others, originally surrounded by wooden posts firmly set into the ground at regular distances, and the spaces between these posts were then filled in with wooden strips interlacing them like basket-work. Indeed, it would seem that the mode of work adopted in the forming a basket was directly imitated, and made to do constructional duty in the building of this wooden wall. All this simple construction has, in this Tope wall, been translated into stone, and, with its gateway (quite a study in itself), was elaborately carved. It shows an architectural growth, and how an "architecture" may possibly spring into existence out of the very commonest and most obvious constructional forms. No one will dispute the applicability of the word *architecture* to the forms as seen in this drawing; but few would seek for their origin in an osier basket! We may pass from this rude architecture to some examples of a far more elaborate kind, and will wonder at the ingenuity and inventive power of the strange people who created them. There are some columns magnificently cut, with colossal figures from the Tennevelly Pagoda, Southern India. These are seen in a photograph only, it is true; but they will evidence to many how individualised races work, each one in its own way. Neither Assyria nor Egypt has done better. The Seringham Pagoda, "horse-court," should be noted, and the wall frescoes. These, with others, show how very much there is yet to be found in Hindoo art and architecture, and how architecture, as a fine art, develops itself and *grows* when sufficiently isolated.

This fine collection suffers, as we have said, a little from the way in which it is necessarily exhibited. We should like to see all the architecture together, and in one room, and scientifically arranged, the varied details illustrating the general forms, both as seen in drawings and in models,—the sculpture here forming part, and an essential part, of the architecture, and growing out of it. It might be a work of time and industry to do this well, but when done it would, to a few at least, throw not a little light on the growth of architectural forms. It is to be remembered that "ruins" exist all over India, many buried in the thick jungle, and that we possess here but a fragment or two of them. Their extent may be judged of from the *models* here to be seen of but two or three groups of them. These are in Room II., and will serve to show what this architecture of the Hindoo looks like when grouped together, in lengths of buildings, towers, and courts, one beyond another. Such truly architectural arrangements are hardly to be imagined in these days as having reality, and still less use. Then the whole mass of these buildings was covered, both inside and out, with the most elaborate carving and stone writing, like an MS., and doubtless as capable of being read as we now read a printed book. To us the forms as here seen in detached fragments are strange and unintelligible enough, and we may dream anything about them, and their precise meaning may never be found, but to those who wrote on the walls the writing was plain, without doubt. If any spectator, looking at this display of the works of a bygone day, will compare it, architecturally and otherwise, with what he sees around him, he will not, surely, have visited this fine show in vain.

THE REMONSTRANCE OF M. SCRIBLERUS THE YOUNGER WITH THE CHIEFS OF THE ROYAL ACADEMY.

It hath been long (my dear Academicians) the subject of my concern and surprise, that whereas numberless authors have digested the Catalogues of ancient Exhibitions, there hath not risen up among us one person so publick spirited, as to perform the like for the modern. Although it is universally known, that our every way industrious artists, both in the quantity of their productions, and in the velocity of their execution, do so infinitely excel the ancients. Therefore to supply this defect I purpose to analyse some of the poetry and philosophy of the Royal Academy Catalogue, and to collect sundry critical observations, which have not heretofore been printed, upon the practice of the deep geniuses of your body; imitating herein my predecessor, the secretary of the renowned *Temple:* and in this my undertaking I am the more animated, as I expect more success than has attended that great Critic, since his wit, though it might be brilliant, has ever been slackly understood, and his sarcasm however just appreciated only by a very small number.

If we visit those Exhibitions of Antiquity, which have not been entirely dismantled by the professional Iconoclast, we shall find Painting and Sculpture arrayed as the handmaidens of Architecture; and, withal, possessed of a mien unassuming, and graceful. Therefore it hath been thought that the higher arts were kept in bondage by the ancients, under the rule of Mechanical learning. The emancipation by the moderns of Painting and Sculpture from the thraldom which they endured in so confined an arena as the Parthenon at Athens, or in some of the Roman Temples and publick monuments, hath opened to them an extended career. For in such buildings, the inspirations of the artist were degraded to purposes of meer utility, and their employment directed by that pestilent foe to High Art, and destroyer of fine figures, which is known by the name of Common Sense. But in your Exhibitions (my dear Academicians) the rein is given to originality, and in your Catalogues to versatility. It is your custom to mingle, in long and lofty Galleries, bits of the most various and discordant kinds, landscape, history, portraits, animals; and by strong oppositions of colours, and contrariety of images, to ensure the greatest happiness of the greatest number, by selling as many works as the public can be induced to buy.

It may be expected that like other Critics, in speaking of the most popular Exhibition of modern times, I should particularize the best pictures of the year, for the guidance of merchant princes at a distance, and of successful stock-jobbers at home. But this hath been done with completeness, while even the ideas of the artist were flowing from his brush to the canvas; and the publick prints have announced, several months before the annual invocation of the Goddess in March, how prolific has been the brain of Jove. The short limits of this discourse will not allow me to treat of all the grounds upon which I have founded my remonstrance. Therefore I shall subdivide it, as my predecessor did a similar one, addressed to the poets of our nation; and as he discriminated, in a *Catalogue of books*, between the Florid, the Pert, the Alamode, the Finical and the Cumbrous, so, in your *Catalogue of pictures*, I shall illustrate the Inexplicable, the Statistical, the Realistical, the Comical, and the Classical.

1. THE INEXPLICABLE.

One of the sources of the Unique or Singular is to be found in a complete oblivion of everything that has gone before, and another in a total disregard of whatever may come after. An explanatory quotation, which is to serve for purposes of description, must not be too clear, lest it seem vulgar; for obscurity bestows a cast of the wonderful, and throws an oracular dignity, which hath no meaning. For example: you paint a pretty English face, with an open mouth, disclosing the sweetest set of teeth that ever Nature developed, or Dentist mounted; you clap it within a grille of iron bars; and, with a monk touching the foot of a crucifix, you obtain a representation of "Below the Doge's Palace at Venice in the Fifteenth Century" (350); then, to make doubly sure, you add, in this manner,

> "And ne'er
> In madlier accents rose despair."

Or, you take as a model some low type of female beauty, from the coasts of Asia-Minor or Southern Italy; you emphazise the curve of the nose, the curl of the lip, and an almost absence of forehead; you paint only her head and shoulders; and with the skin of some animal, and an armlet, in the shape of an asp, you produce:—"Cleopatra" (1282).

Or, if your model be some young and innocent-looking girl, you take the opportunity of imparting to her a useful moral lesson, such as (1320),—

> "Maidens should be mild and meek,
> Swift to hear and slow to speak."

Because there is no fear of any one else interpreting your covert meaning.

2. THE STATISTICAL.

While the style to which I have referred seeks to confuse, this aims at giving instruction. Having made a charming picture of "A Port on the Zuyder Zee" (573), you swell the size of the catalogue by adding gratuitously:—"This inland sea is about to be drained by the Dutch Government."

[In the preceding divisions I have thought fit to treat of the Catalogue; and in the following ones I shall speak more particularly of the pictures].

3. THE REALISTICAL.

"The Hymn of the Last Supper" (579) is in this Style. Nothing seems more plain than that Europe hath been long weary of the Conventional manner, and that as we have had "Passion Plays," complete in character and costume, so we must be prepared to find the idealistic illustration of Holy Writ, superseded by the portrayal of realities; it being certain: our knowledge of the ancients justifies a presumption that the modern painter hath the means, at least, of learning the archæology of the First Century. Human nature itself favours the change: the taste of the *bathos* is implanted in the soul of man, and if the ancient painters were perverted by custom to relish the sublime, very few people understood them; but on the contrary regarded their works with the unprejudiced eyes of children. Modern painters work up, or rather down, to the taste and comprehension of the people. But to descend to the *bathos* in one particular, argues the necessity of discovering the "profound" in all. If our painter hath with propriety laid the scene of the Last Supper in a wooden hut (of somewhat colossal dimensions), and furnished it with an oddly-shaped table of rude and elaborate workmanship, he hath at the same time introduced a cloth so white and unsullied, as to be fit for the palace of kings. Moreover, both table and cloth are anachronisms, rendered the more inconsistent by the presence of three-legged stools. In the First Century it was the custom, even in Athens and Rome, to lie extended upon couches (witness the term, "banquet"), during the hours of repast. And it hath struck me that if in Asia, where chairs and tables are even now uncommon, the fashions of Rome were sometimes adopted by the Rich, the habits of nature were always practised by the Poor; and that then as now the inferior inhabitants of India, Syria, and Arabia used the earth for a table, and in lieu of benches . . . . . (*hiatus in MS.*). I am also constrained to believe that before the descent of the Barbarians, the colour of the peoples of Western Asia and of Southern Europe was neither brown nor red; and although it hath been supposed that Jupiter was of a carroty hue, it cannot be ethnologically exact, to paint the ancients who inhabited those countries with hair of that colour, as in "The Hymn of the Last Supper"; unless indeed the custom in India, at the present hour, of dyeing red the blue-black hair of children, obtained in Syria among men in earlier times.

4. THE COMICAL.

Characteristical of this Style is the portrait of "His Reverence" (1346): that of a priest lifting his hat to two unsophisticated girls. In order to do so, he has turned upon the Critics that side of His Reverence, which it hath ever been deemed impolitic to present either to friend or foe. For the one is ungracious, and the other cowardly; but our painter perhaps argues that an action, which in a man would be resented as offensive, may in an ecclesiastic be regarded as comical. Nor are the accessories of the picture opposed to such an hypothesis, for as in representations of *Orgies à la Régent*, the pleasantries indulged in by the guests were reflected in the images which

cover the walls and the furniture, so the haze, which obscures the action of His Reverence, is reflected in the surrounding Architecture. Therein the base-mouldings of a column resemble fungus which clings to the neck of a bottle; and while the distant street, which is at a stone's throw, is enveloped in mist, some of the steps, that His Reverence is about to mount, are without a joint, implying one of two things: either that they consist of long slabs of stone, or are composed of the best Parian cement.

5. THE CLASSICAL.

If any one doubt that I have an excuse for making these observations, let him seek it in this concluding division. Among the ancients, it was the province of Painting and Sculpture to adorn Architecture, but among the moderns, Architecture and Sculpture are impressed into the service of the painter: and in "Atalanta's Race" (943) he has treated both, with a light heart and a heavy hand. I have sought in vain to learn what relation the colossal column (in the middle distance), which is partly hidden by *Atalanta* (in the foreground), bears to the Ionic temple on the left; and if it form part of another temple, I cannot perceive (even with the Erechtheum in my mind's eye) where the rest of that said temple is situated. Nor is the subtlety of the Greek acknowledged in the divers bases and cornices and such architectural devices, for the painter hath so placed them that their projection would have injured the feet and thighs of the passer-by, or torn his sandals and his robe. As for the glare of the marble, it hath been left in its natural harshness, which (it is well known) was softened by the ancients with colour. And, at the same time, so little has the author of "Atalanta's Race" appreciated the minuteness with which optical illusion was counteracted by them in the best period, that the distant canopy, which covers the judge, is supported by columns without *entasis*, and crowned with a pediment whose raking lines have no curve.

The defect of whiteness, which the moderns love, is also exaggerated in a view of Thebes in "The Daphnephoria" (241); and though I grant the excellence of that picture, I herein enter a solemn protest against the practice of giving pretty English features, and white forms, to slave-girls, who had never been permitted to wander far from their masters, had they been only half as charming as it is the custom of the moderns to depict them. Witness the habits of nations, who, at the present day, are not totally removed in thought and inclination from the ancient Greek.

As I have thought fit to censure poetical licence, so I will condemn artistic solecism. The painter of "An Audience at Agrippa's" (249), wishes us to believe that his *Agrippa* is he, who came into the world 63 years before our Lord; and with whose connivance was erected in Rome that Pantheon, in which (Mr. *Addison* said) the imagination is filled with something great and amazing. Therefore it were well had our painter reflected that to draw the marble walls of *Agrippa's* house with gaping joints, that were newly put together, and with worn cornices, that no elbow approached, exactly as the rubbings and concussions of Time hath handed both to us, is to commit a blunder, which, in the contests and dissentions of Athens and Rome, was thought to be worse than a Crime. In *Agrippa's* house, as our painter hath imagined it, the arch is moulded and jointed, not as ancient Romans would have constructed it; but as it was imitated by the architects of the Most Christian King, in the Saloons of Versailles, and the Pavilions of Marly. The *extrados* of the Roman arch was truly defined; and when, as often happened, the marble face was a veneer, laid against a core of bricks, its jointing was never dissembled, like that of the moderns, in numerous edifices they erect, under a system of false economy and immoral speculation.

My master, the Dean, described the Critic as a collector of people's faults; and it was a pretty conceit of Mr. *Fielding*, to couple the professions of Criticism and Christianity, when he said: if we judge according to the sentiments of some Critics and of some Christians, no author will be saved in this world, and no man in the next. I have not however failed to relish many beauties, which (my dear Academicians) I encountered in your pictures, while searching after defects; but of them it is not my present intention to treat. I have thought fit to warn the proper authorities how baneful an effect the manner of exhibiting those beauties hath upon Critics who honestly go to admire them. The Geometrician in delineating the great examples of ancient Architecture draws them to a uniform scale: for facilitating reference and inviting comparison. But in an Exhibition of the Royal Academy, a "View of the Queen's Apartment at Lilliput" rubs frames with "Gulliver and the Maids of Honour in Brobdignag," a hazard not unaccompanied with injustice. For as beauty ever delights in the companionship of a foil, so the Academician seeks a contrast of mediocrity to attract the wit, and dissipate the bile of assailants. Because no man can penetrate your Galleries (my dear Academicians) without being seized with a megrim; and when that hath arrived, I would most fervently enjoin the visitor to seek repose in the room devoted to Architecture. There, Venus, eager for flirtation, may lure Adonis, not now unready. Nor hath the publick, which seldom judges inconsistently with itself, blame for this. Architects have not known how to touch that string in the harmony of human understanding, which, in most visitors to the Royal Academy, is exactly of the same tuning. Instead of prosaic description of architectural drawings, something in the Comical, or the Statistical, or the Inexplicable Styles should be added to attract the modern intellect. Instead of naming one of their works, "A Drawing Room in the Mediæval Style," architects might dignify it with such a motto as,

> "Cracked bargains from brokers,
> Cheap keepsakes from friends."

Or, to some monument of more than sepulchral outline (designed in the taste of Her late Majesty), they might add,—

> "Tully was not so eloquent as thou,
> Thou nameless column with the buried base."

Or, to a twilight sketch of the temple of *Pallas Athene*, they might append a line of the epigram of the modern *Aristophanes*, concerning the rich attorney's elderly, ugly daughter, thus,—

> "In the dusk with the light behind her."

Indeed, there are no limits of the *bathos*, to which the poetical touch of nature doth not descend; but I have done. I warrant my remonstrance, though it may escape the ears of painters, will open the eyes of architects to a perception of their shortcomings in this wise; and future visitors to the Royal Academy will be unable to say of its Architectural Gallery that

> "Something of sadness had wrapt the place."

And I beseech you (my dear Academicians), should you doubt the aptness of my poetical quotations, to remember that all of them, and forsooth many others of a like kind and equally superfluous, are printed in the pages of your Catalogue—this current year of Grace.

THE CASTLES OF BROUGHAM AND BROUGH.

ANNE Dorset, Pembroke, and Montgomery, Baroness Clifford, Westmoreland, and Vesci, hereditary sheriff of Westmoreland, and Lady of the Honour of Skipton, in Craven, was in every way a remarkable woman: she was of high birth, held large estates, was the widow of two considerable peers, and had received and largely profited by an excellent education. To a strong and copious memory she added a sound judgment and a discerning spirit. She was a person of great firmness of character, and passed her life amidst events that exercised and strenghtened that quality. Among the many subjects upon which she was informed, and which ranged, says Dr. Donne, from "predestination to slea silk," was included a very close knowledge of the particulars of her own estates, and a very thorough determination to maintain her houses and castles in good repair. She found the castles of her Clifford and Vipont ancestors, Appleby, Brougham, and Brough, in ruins; she restored and made them habitable, and, though time and the hand of the spoiler, have again brought two of them, Brougham and Brough, to decay, their walls still exhibit much of the amending hand of the great Countess, as well as of the original work of her remote ancestors.

BROUGHAM CASTLE.

This very curious pile stands on the right bank of the river Eamont, just below the point at which it is joined from the south by the Lowther, so that the combined stream covers the fortress on the north, as do the two waters and the marshy ground between them, on the west front. The castle is placed but a few yards distant from, and but a few feet above, the Eamont, and between it and the large rectangular camp, which marks the site of the Roman "Brovacum," whence both castle and township derive their names; such, at least, seems the most probable etymology, though a claim has been set up for Burgham, which would have been more tenable had there been evidence of the place having been an English as well as a Roman stronghold.

The Roman road from Brough and Appleby towards Carlisle and Penrith skirts the north-eastern front of both camp and castle, and is carried, by a modern bridge, across the river, a few yards below the latter. Above the castle and upon the Eamont, was placed the castle mill the weir connected with which still remains. The actual site of Brovacum has been claimed for Brougham Hall, on the adjacent high ground; but, however this may be, the camp below is undoubtedly Roman, and an excellent example of the entrenchments of that people. A Roman altar was found, in 1602, at the confluence of the two rivers. What earlier name is embodied in the Roman Brovacum is not known, but "Bro" in South Wales is the old Welsh word for "the hill country," and is preserved in Brocastle, and Broviscin, in Glamorgan. The parish of Brougham is large; the church is called Ninekirks, probably a corruption of St. Ninian's kirk. The parochial chapel, which stands near Brougham Hall, is dedicated to St. Wilfrid.

The camp is contained within a single bank and exterior ditch, both very well marked, though in height and depth much reduced. Along the scarp or inner slope of the ditch are traces of a step or terrace, as for a line of palisades, in front of and below the main defence. The area within the ditch is 113 yards broad, and its length, now 134 yards, was probably 198 yards, those being the proportions of the camp at Brough. The ditch is 172 yards broad. The entrance is gone; it was no doubt in the centre of the east side, that towards the road. The angles are, as usual, slightly rounded. The castle stands a few yards north of the camp, the adjacent parts of the latter having been cut away and levelled in forming its outworks. The castle is, in plan, a very irregular four-sided figure; the south and west sides meet at less than a right angle, and are in length 80 yards and 77 yards. The north side, at right angles to the west, and upon the river, is 50 yards. The east side has been partly rebuilt, with a low salient angle. It is in length about 40 yards. This area is the main, or rather the only, court of the castle. The keep originally stood clear within the court, near to its north-east angle; a large gatehouse now occupies that angle, and much of the north front, and is connected with the keep, which, therefore, is no longer isolated. The hall and domestic buildings stand against the south wall, and are continued a short distance along the east wall. A large square tower is placed at the south-west angle, and covers a postern. The west wall is free, and seems to have been low. The castle is about 50 yards from the river, and 30 feet above it. The entrance was from the east, along the bank of the river. A ditch, wholly artificial, and probably filled with rain-water, protected the west, south, and east fronts. Towards the west it is broadest and deepest, that being the exposed front. Towards the river the natural fall and the marshy character of the ground were a sufficient defence. The entrance is, and probably always was, in the east wall, at its north or river end. This part of the *enceinte* wall is built with a shoulder or re-entering angle, so as to command, for some yards, the approach to the outer gate. The moat is now traversed by a causeway of earth, replacing the earlier drawbridge.

The *gatehouse*, rectangular in plan, and 90 ft. long by 39 ft. broad, occupies the space between the keep and the north wall, and extends either way beyond the keep. It is composed of two parts,—one, a block of chambers, lodges, &c., forms, or rather abuts upon, the curtain; the other, connecting these chambers with the keep, contains the vaulted entrance. The entrance is broken transversely into two parts, separated by a small open court. The outer passage, 34 ft. long, belongs to the outer gate, the other, 36 ft., to the inner gate. The keep forms one side and the lodges the other. Thus, there are really two gate-houses,—one abutting on the north-east, and one on the north-west, angle of the keep, each with

it's own defences and gates, the buildings on the north communicating with both. The exterior portal is in the east wall. It has no flanking towers, being protected by the curtain. The north-east angle is capped by a square buttress, placed diagonally. The gateway has a plain flat segmental arch over it. Upon a stone are the words, "This made Roger," and above are two tiers each of two good decorated windows of two lights, with trefoiled heads and a quatrefoil in the head, and divided by a transom. Between the two upper windows are three bold corbels, intended to support a machicolation resembling those on each face of the keep. It is said that formerly the arms of Vaux, "checquey," were carved over the entrance; but it seems probable that they were the arms of Clifford, "chequy, a Fess," or it may have been "a Bendlet." The passage within, 11 ft. broad, is vaulted. The first defence was a portcullis, of which the square groove, 6 in. broad by 4 in. deep, remains. Within this is the rebate for a pair of gates, and on the right the small door of a lodge. At the inner end of the passage was a second pair of gates, opening towards the first pair, and beyond them the open court, with the keep-wall on the left. Above this outer gateway is a large room, 21 ft. east and west, by 32 ft. long. In its west wall is a fireplace, and a door opening into the middle chambers. In its north wall a good Decorated window looks upon the river; in the east wall are two windows overlooking the outer gate, and between them, over the gate, a recess for working the portcullis.

Beyond the open court is the second part of the gatehouse, which commences by a portcullis backed by a pair of doors, within which is a passage 20 ft. long by 16 ft. broad, vaulted in two bays with transverse and diagonal ribs springing from six corbels. There are no ridge ribs; the inner or further portal also had doors. The left-hand lodge is a vaulted cell, 11 ft. long by 3 ft. 3 in. broad. On the right the room is much larger, and leads to the north postern. The exterior or north front of these two gatehouses forms a handsome block, and is pierced by various openings at different levels. At its north-east corner is an angle buttress; then follows one in section a half square, set on diagonally; and west of this, again, is a large square buttress, in one side of which is the north postern, a small shoulder-headed door at the foot of a flight of stairs.

The lofty tower at the south-west angle of the court is about 35 ft. square, with an appendage on the east face. It has thick walls and mural passages, and projects but little from the curtain. It has a basement and three upper floors. The first-floor was entered by an exterior flight of stairs, which also communicated with the rampart of the west curtain. At its junction with the tower is the postern, the approach to which is guarded by a loop, while nearly over the door discharges the shoot of a garderobe.

Along the south wall are the domestic buildings, of which the chief was the chapel, about 35 ft. by 20 ft. This was on the first floor, with a timber floor and open roof. The chamber below was entered from the court by a lancet door. The chapel had a large east window, of which the jambs remain; and in its south or curtain wall are two long trefoil-headed windows, splayed within. Towards the east end are three sedilia, also with trefoiled heads and trefoils in the spandrels, the whole beneath a flat top. There is also a piscina of late Decorated aspect. Near the chapel, towards the south-east angle, the remains of a large fireplace seem to indicate the kitchen, and along the east wall are two windows, and traces of a fireplace between them, all which seem to belong to the hall. At the north end, also, on the first-floor, are remains of a handsome door, in the Perpendicular style, with a four-centred arch beneath a square head. The staircase may have been exterior. Grose shows some walls here in 1775, which are now gone.

The *keep*, called in Countess Anne's time "the Roman Tower," the only remain of the original castle, is 44 ft. square, and, in its present state, of unusual height. Its exterior plinth is confined to the north side. The two western angles are covered by pilasters, 12 ft. broad and of 6 in. projection, one on each face, meeting so as to form a solid angle. Two other pilasters, balancing these, cover the east end of the north and south walls, but there are none on the east side, that having been covered by the fore-building. The south face is prolonged eastwards 12 ft. by a wall 5 ft. thick, which rises to the third-floor level, and formed the south end of the fore-building. The pilasters rise to the present summit of the wall, and terminated originally in four square turrets, of which traces remain at the two northern angles. The keep has a basement and three upper floors, of which the uppermost, if not an addition, has been recast. The walls are 11 ft. thick at the base, and at least 10 ft. at the rampart level. The parapet is gone. There is no external set-off. In the centre of each face, and near the top, are three or four bold corbels, which evidently carried a short machicolation; and in the angles, near the top, are several cruciform loops, slightly fan-tailed at the top and bottom, and with lateral arms ending in oillets, much resembling those at Kenilworth. Some of these are the lower half of those of the turrets, which, with the parapet, were standing in 1775. At the upper part of the south-eastern angle the wall is corbelled out 12 in. for a breadth of 15 ft. on the southern, and rather less on the eastern, face. This is to give a little more space to a mural oratory, which has a loop on the south face, and a small trefoil-headed window towards the east, clear of the fore-building. On the north face, near the east pilaster, a vertical line of six loops shows the presence of a well-stair from the first-floor. The four lower loops have round heads; the two upper have square heads, and are probably later.

The basement is at the ground level. It has splayed loops to the north, west, and south; and in the east side is a recess with parallel sides, and a trace of the rebate of a doorway. This, if original, must have led into a cell below the fore-building, as at Rochester; but it may be a Decorated insertion. It is nearly covered up with rubbish. In the north-east angle, which has been filled up with a short wall, is a small door opening into a bent passage, which now leads into the open air, at where was the foot of the great entrance-staircase. There may always have been a cell here, but the cross-wall and the outer door are not original. In the west end of the north wall is another recess opening into a garderobe chamber, 5 ft. long by 3 ft. broad, and original. The floor has had a vaulted and ribbed roof, springing from corbels at the angles, and from four others, in the centre of each side. There was, in 1775, a central pier. As at Richmond, this vault was an insertion, replacing timber. The basement was about 13 ft. high.

The *first floor* is 23 ft. square. It has round-headed window-openings to the north and west, in round-beaded recesses, with beaded angles. In the south wall was a fireplace, probably an insertion; and in the north wall, near the west end, a small door opens into what was probably a garderobe, like that below. In the north-east angle, filled up like that below by a short cross-wall, is a door opening on a well-stair, which occupies that angle, and ascends to the roof. The east wall has been in some measure rebuilt, recently. In it may be seen parts of a large decorated doorway, evidently inserted to give a direct entrance to the chamber. This floor has had an arcade against its walls, of which traces remain on the south and west sides. The arcade had slender piers and trefoiled arches. It is unusual to find so ornate a room in the first, or, indeed, any floor in a Norman keep: it must have more resembled a chapter-house than a private chamber. The chapel at Castle-Rising was so arcaded, and those at York, and that in the curtain at Richmond. This floor was about 15 ft. high, and was covered by the joists and floor of the room above.

The *second floor* has round-headed recesses, beaded at the angles, for the windows, in the north and west sides; and a flue, now laid open, occupies the south side. In the east wall is the original entrance,—a plain round-headed arch of 6-ft. opening, with a chamfered rebate for an exterior door. There was no grate. Close north of this is a small door entering an oblique passage, which opened, as at Middleham and Rochester, upon the turret over the outer entrance. The well-stair has no direct opening into this floor, whatever may have been the case before the alterations. There seems to be, as below, a garderobe in the north-west angle.

With this floor the original keep seems to have ended. There is now, however, a *third floor*, which if not altogether new, has been remodelled. The walls are very thick, and the four angles within are filled up with short walls, converting the chamber into an octagon, or rather into a square with the angles taken off. One of these fillings up, that to the north-east, is carried down the whole way. The other three are confined to the top floor, and rest upon brackets. This floor had a large recess and a window in each of the four main faces, of which that to the west is segmental and ribbed. These recesses are quite inaccessible; but it would appear, from the thickness of the wall, and from certain square apertures outside, that they communicate on the west side with mural chambers. In the north-west angle is a very remarkable fireplace of about 9 ft. opening, with a perfectly flat platband, composed of thirteen stones joggled together. This is a very fine example of this kind of work, and it stands quite unaltered. In the opposite, or south-eastern angle is a shallow-pointed recess, and in it a square-headed doorway, which opens into the oratory. The window recess in the south wall differs from the rest. Its arch was high-pointed, and moulded with deep reduplicated bands, with half-shafts with bell capitals; no doubt Decorated, but of Early English character. From the east jamb of this recess a second passage opens into the oratory, and this was probably the principal entrance to it. The oratory is seen from below to be vaulted and groined. It occupies the south-eastern angle of the building.

The east face of the keep was covered by the *fore-building*, which evidently contained a straight staircase, which rose from the north-east corner of the keep, and ascended to the main doorway on the second-floor level. This doorway is near the south end of the wall, but, notwithstanding, the steps must have begun above the ground level to reach, without undue steepness, so considerable a height. The wall has been so much injured, and so freely repaired, that the marks of the stairs are no longer visible, but a toothing and some springing stones, as for an arch, seem to show that the staircase rose from the east angle, under a covered way or low tower, the battlements of which were evidently reached by the oblique passage still seen above in the wall. Below the level of the original doorway are traces of a larger and more lofty doorway, in the ornate Decorated style,—evidently an insertion. This would give direct passage into the first-floor of the keep, and was probably inserted when the arcading was introduced, and this converted into the main apartments. There are other toothings and roughnesses in the wall, indicating various alterations. The fore-building was about 12 ft. broad, and contained a basement and two floors, as shown by the openings in the south wall, which are, near the ground, a loop; above it, a small window, and above that a garderobe, corbelled out upon two heavy blocks upon the south wall. Above the line of roof of the fore-building is to be seen the east window of the oratory, and near it a cruciform loop.

Unfortunately for the close examination of this very curious keep, the upper part is inaccessible, and ladders of sufficient length are not readily to be procured. The architectural history of the castle may be inferred from its details, so far as these are visible. It is evident that the original fortress was a Late Norman keep, and it must have been placed within an *enceinte* pretty closely corresponding to that now seen, and which skirts the edge of the ditch. Of this supposed *enceinte*, as well as of the domestic buildings and gatehouse, which must have been present in some form or other within it, there remain no very certain traces. The keep and the ditches probably were the work of Robert de Vipont, very early in the thirteenth century.

In the Decorated period the castle underwent great alterations. The keep was raised a story, and an oratory included in the new work. The basement was vaulted, the first floor arcaded, and the fore-building so altered as to admit of an entrance on that floor. All the rest of the castle, gate-houses, domestic buildings, and the whole of the *enceinte* wall belong to one general period, and are probably the work of Roger de Clifford, the first of his race who held this property, and the husband of Isabel de Vipont, its heiress, in the reign of Edward I. Usually, when a Norman fortress was remodelled in the Edwardian period, the keep was neglected, and left in its original isolation; here, however, it was decided to turn the keep to account, and to ornament its principal chambers, and connect them with the suite of rooms in the upper floor of the gatehouse.

There are some peculiarities of detail in this castle which need further investigation. The large windows of the first and second floors of the keep are original; but the half piers and bell-caps in the exterior jambs look much later, and may be a part of the decorated additions. It is said that the buildings against the east wall received some alterations from another Roger de

Clifford, grandson to the former. It is curious that walls so thick as those of the keep, and of such good material, should have been left solid, unpierced by the chambers and passages so much affected by the Norman architects. It is also to be observed that the curtain wall is but scantily furnished with flanking defences. Countess Anne mentions "the Tower of Leaguer," and "the Pagan Tower," and "the Greystoke State Chamber," in Brougham Castle.

BROUGH CASTLE.

Brough Castle covers the whole of a steep knoll which rises 60 ft. on the left bank of the Swimdale or Helle Beck, and is about 50 yards from the water. The beck receives the Augill from the south-east, just above the castle, and their combined waters, at times of considerable volume and force, fall into the Eden about a mile and a half lower down. The castle itself is 630 ft. above the sea level, and the encircling fells of Westmoreland and Yorkshire rise to elevations of from 1,000 ft. to 2,000 ft. About five miles to the east are the sources of the Greta and the Balder, and a little further off and towards the north the head springs of the Lune, not the noble stream that gives name to Lancaster, but a tributary to the Tees.

Even in this wild and almost impenetrable country are traces of Roman civilisation. The road from Lavatræ (Bowes) to Luguvallium (Carlisle), ran through Brough, which is identified with the station Verteræ, and by Appleby and Brougham, joining at Penrith the main road, the work of the same people, from the south. Five and seven miles to the east of Brough are two Roman camps, and there are others upon the same line of road at Redlands and Kirkby-Thore, and a very perfect one at Brougham. The Roman road at Brough runs generally east and west, and crosses the Beck at Market-Brough, so called in distinction from Church-Brough, which lies three furlongs to the south of the river, and contains the castle. The collective parish is named "Brough-under-Stainmore." Verteræ, if identified with the existing camp and castle, stands off the main road, and south of the river, as at Brougham.

Verteræ is represented by a rectangular camp, of which the castle covers the northern and higher end, that next to the river. This camp is 157 yards north and south by 113 yards east and west, of which the platform within the ditch covers 134 yards by 90 yards. Of this area there is cut off at the northern end by a cross-ditch a plot, 90 yards east and west by 50 yards, which is occupied by the castle. This portion is further defended by some additional earthworks, perhaps Norman, to the east and west. The southern fragment of the camp seems to have been used as a sort of out-work to the castle, probably for the protection of sheep and cattle.

The castle was thus placed crosswise in the camp and parallel to the river, the action of which has carried away the outer half of its ditch, and converted the slope into a precipitous bank, at the top of which is the curtain-wall. The eastern outwork is composed of the end of the knoll or ridge on which the castle stands, and which is scarped into a triangular platform, the base of which, 57 yards long, covers the end of the fortress, and projects 38 yards. The ditch cutting off this work from the body of the place is 23 yards broad, and very deep. The earthworks westward are two banks and ditches, across the tail of the knoll, one 57 yards long, and 47 yards in advance of the main ditch, and the other 84 yards further in advance, and 94 yards long. Both are intended to cut off approaches along the river bank. The cross-ditch covering the south front of the castle is about 30 yards broad, and up it, from the east, came the main approach. These ditches, on the south east and west fronts, are wholly artificial. There is also a trace of a bank and ditch along the east front of the camp, about 30 yards in advance of the main ditch, and about 60 yards long. A road, which may be Roman, comes up from the south, and crosses the Augill by a bridge, 250 yards above or to the east of the castle, to join the main road over another bridge in Market Brough. Upon this stream is the castle mill. The defences, in masonry, seem to have been confined to the castle proper. There is no trace of such upon the out-works, which probably were stockaded. The ditches are at far too high a level to have been fed from the river; but the soil is retentive, and they seem to have been filled with rainwater.

The castle is composed of one ward, a trapezium in outline, the east, north, and west sides being at right angles, and respectively 77, 90, and 57 yards, and the south or oblique side, 94 yards. It is, in fact, a right-angled triangle, with the acute angle truncated. The keep is placed at the truncated end, and forms the south-west angle of the ward, its south and west sides being exterior, and in the line of the curtain. The domestic buildings were along the south side and about the south-east angle, and built against the curtain. Near the centre of that side was the gatehouse, and attached east of it the hall, beyond which a large three-quarter drum tower capped the south-east angle. This and the gatehouse are the only mural towers. The kitchen and chapel and some later buildings probably rested against the east wall, and there are slight foundations between the gatehouse and the keep. The north curtain, towards the river, seems to have been free from buildings. Upon it are two buttresses, and in one a garderobe, entered probably by a side door and passage in the wall. This curtain is 3 ft. to 5 ft. thick, and from 12 ft. to 15 ft. high inside.

The *gatehouse* is placed near the centre of the south side of the castle. It was an oblong building, and formed the west end of a block of which the hall and withdrawing-rooms formed the eastern part and remainder. It was composed of a passage between two walls, of which one remains, and is 6 ft. 6 in. thick and 45 ft. long; the outer 10 ft. being outside the curtain. The portal is gone, but the springing-stone remains of the inner doorway, 3 ft. 7 in. broad, and recessed 8 ft. 6 in. within the inner front. The vault of the passage, about 10 ft. long, rested upon three bold ribs, of which the springing-stones remain, and beyond which was the outer gate, of which a part only remains. There was an upper floor, and if the rubbish were cleared away the plan of the gatehouse would be visible. The walls seem Norman, but the ribs, vault, and fittings are probably insertions of the Decorated age.

The *hall* was poor. It was on the first-floor level, and had a floor above it, and, therefore, a flat ceiling. The basement is composed of three vaults placed transversely, with flat, slightly-pointed arches. The doors are towards the court, and one chamber has a small Tudor fireplace, in a corner. Each had a loop in the outer end, and in the ends of two are mural garderobes in the substance of the curtain. The hall was not above 12 ft. or 14 ft. high. In its north side is a round-arched recess, probably the original entrance, by an outer stair; and near it a fire-place. In the south or curtain side are two good late Decorated windows of two lights, rather flamboyant in tone, with plain exterior drips. Above these is a step or ledge for the floor of the upper room, and two windows not directly over those of the hall.

There is no very decided evidence of a chapel. The kitchen, probably, was near the north-east end of the hall, and against the east curtain. The withdrawing-rooms were at the east end of the hall, and extended into *Clifford's Tower*, a fine bold drum of 30 ft. diameter, which caps the south-east angle of the ward. This tower seems to be of Decorated date; and the base and part of the wall original; but it has been almost re-built, probably with the old cut stones, in the Tudor period, to which belong its numerous square-headed windows. Part of it was taken down in 1763.

The keep stands upon rather the highest part of the enclosure. It is rectangular, 43 ft. east, and west, by 51 ft. north and south, and stands upon the curtain, with which its west and south faces are continuous. As it does not quite cover the whole end of the ward, this is closed by a low curtain, 17 ft. long and 3 ft. thick, which extends from the keep to the north-west angle of the ward. The keep is composed of a basement and three floors, and is about 60 ft. high. The parapet is gone. It has a plinth only on the two exterior faces, where the ground is low, and there are two sets-off which indicate the level of the second and upper floors. At the end of each face is a pilaster, 7 ft. broad and of 6 in. projection, and those adjacent meet and form a solid angle. These pilasters rose clear of the wall to form angle turrets, of which parts remain. From the upper set-off, on the north and south faces, rises an intermediate pilaster, 3 ft. broad. The walls at the base are 10 ft. thick, and, at the top, 6 ft. The basement is at present nearly filled up with earth and rubbish, and much of the east side, and part of the south-east angle, fell in in 1792, and obscures the details of the main entrance.

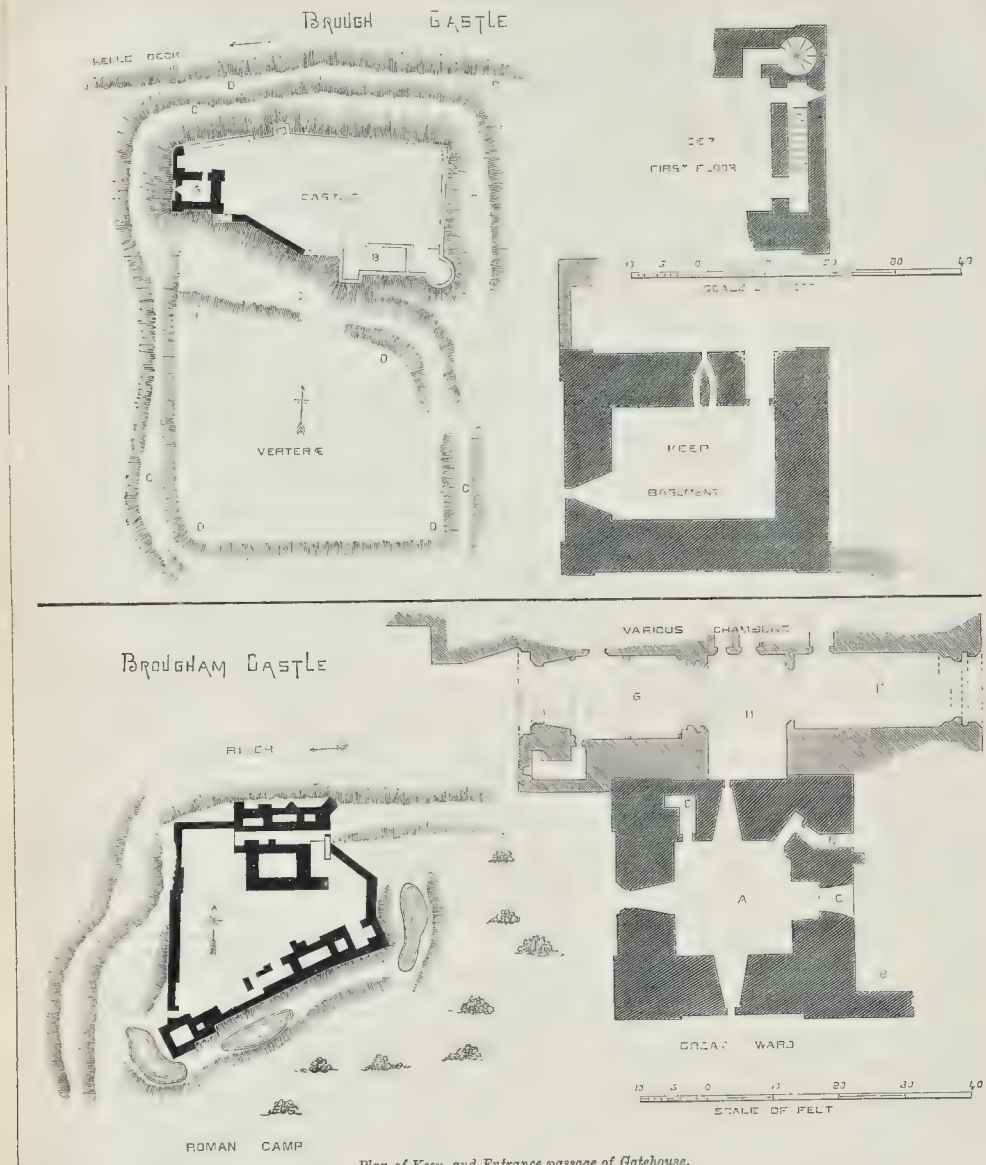
The *basement* is at present entered by a plain round-headed doorway of 4 ft. 7 in. opening, in the north wall near its east end. This has a rebate for an inner door, but no groove for a portcullis. The outer jambs are broken away. It is pretty clear from a comparison of its ring-stones with the original arches above, that this entrance is an insertion, probably of the time of James I. or Charles I. In the same side, near the doorway, is a very peculiar air-hole formed of two loops, 2 ft. apart, which converge to a single exterior loop. Possibly the basement was divided into two chambers, and one loop opened from each; but there is no trace of any partition. In the west wall there was probably another loop now converted into a window of 2 ft. opening, square-topped, set in a bold splayed recess, evidently an insertion of a period when security was no longer the first consideration. The window opens in the line of the plinth, the set-off of which is carried over its head as a square hood-moulding. The south wall was blank, and so, probably, was that to the east. The basement was 13 ft. or 14 ft. high, with a flat timber ceiling. There certainly were no mural chambers and no staircase in it. It was probably entered from above by a trap-door and ladder, and used as a store.

The *first floor*, about 13 ft. high, seems to have had loops in plain round-headed recesses in the north, south, and west sides, of which the latter is broken away, and a two-light Tudor window inserted. The northern loop has also been replaced by a similar window. In the south wall the loop is represented by a small square opening. In the ruins of the east side may be traced the remains of a doorway and the base of a lobby and staircase in the wall. It is clear that the external door was in this face, near the south end, and that it opened direct into the first floor, while right and left in the thickness of the wall, was a mural passage, at it south end a mere lobby, but to the north containing a straight staircase which rises 13 ft. by twelve steps, 4 ft. 4 in. broad, towards the east angle, where was a small lobby which opened on the second floor, and was lighted by a loop in the east wall.

Thus, the *second floor* was entered in its east side by a direct mural stair, like those at Carlisle, at Chepstow, and at Ludlow. In each of the sides, north, south, and west, of this floor is an original round-headed recess, and in the east wall, over the mural stair, are traces of a shorter recess, placed higher up, whence seems to have been a passage into a mural chamber in the south-east angle. The southern recess alone contains its original window. This is a small coupled window of two lights, square-headed, but within a round-headed arch. The dividing shaft is decidedly Norman, as is the whole character of the opening. The north window is also coupled and round-headed, but looks like a Stuart insertion. The east and west windows are square-headed, of Tudor date. In the north-west angle is a mural recess with loops, possibly a garderobe, and in the north-east angle a square-headed doorway opens by a lobby into a well-stair, which commences at this level and ascends to the roof. It is 7 ft. 6 in. in diameter, and rises 31 ft. by forty-six steps to the rampart walk. This second was originally the principal and uppermost floor, lofty, and with a high-pitched roof, the weather moulding of which is still seen on the east and west walls. The roof ridge was at the level of the rampart walk, and, as the north and south walls seem original, there must have been a deep cavity on either side, with the gutter in its bottom. Subsequently this roof was removed and replaced by a flat roof, at the rampart level, the line of which is marked by a row of corbels in the north and south walls. The cause of this change, common probably to all Norman keeps, was the superior convenience of a flat roof, rendered possible by the introduction of sheet lead as a roofing material.

The *third floor* was formed by dividing the height thus gained by a floor laid at the level of the springing of the old roof, and thus was created a second floor of 10 ft., and a third of 20 ft. In the west wall was opened a square-headed window, in a splayed recess, and close south of it is a small Tudor fireplace, the flue of which ascends into the south-west turret. The east wall is less perfect, but still shows the line of the old roof and the jamb of a Tudor window. In the north-east angle is the door from the well-stair.

The floors of the walls were throughout of timber, the joists of the first and second resting in holes in the north and south walls of the turrets; that at the south-west is probably modern. It contains the flues of several fireplaces, which appear to have been inserted in the south wall,



Plan of Keep, and Entrance-passage of Gatehouse.

BROUGH CASTLE.

A. Keep. B. Hall. C. Ditches. D. Banks.

BROUGHAM CASTLE.

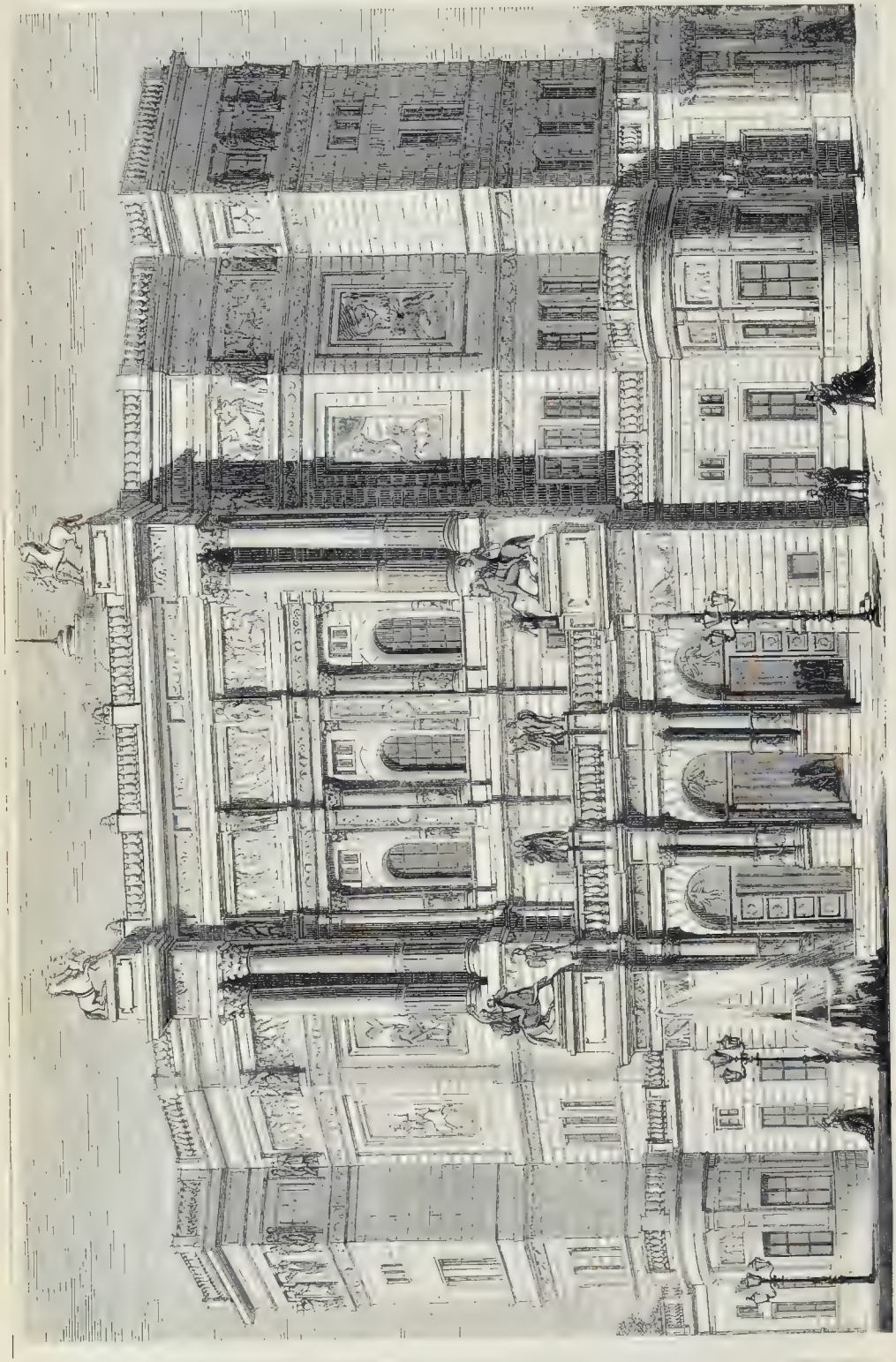
A. Keep. B. Site of fore-building. C. Later doorway. D. Later opening.
E. Garderobe. F. Outer gatehouse. G. Inner gate-house. H. Open court.

but which have fallen out. The keep probably had originally no fireplaces. The north-east turret contains the head of the well-stair. The other two turrets seem to have been mere shells, having only the two outer walls. They all rose about 12 ft. above the rampart walk, and 5 ft. or 6 ft. above the crest of the parapet on the outside of the east and south walls of the keep. Near the top are ranges of triangular holes formed by thin tile-stones set on edge, and looking much like pigeon-holes. The row in the south wall has five holes, and in the south-east turret are three. In the east wall are two sets, one of three holes, and one, imperfect, of two. There is one hole in the north-east turret. They are evidently original and do not appear to communicate with the interior. There is no trace of a regular fore-building, for which the keep, like Goderich, was too small, but there was probably an open stair either of wood or stone ascending to the main door, which was about 12 ft. from the ground. The exterior of the keep was quite plain, and of rather rude workmanship. The pilasters are of square stones, and the wall, in part of similar material, and in part of stones of irregular shape, laid as uncoursed rubble. There is no herring-bone work, and no visible trace of Roman material worked up.

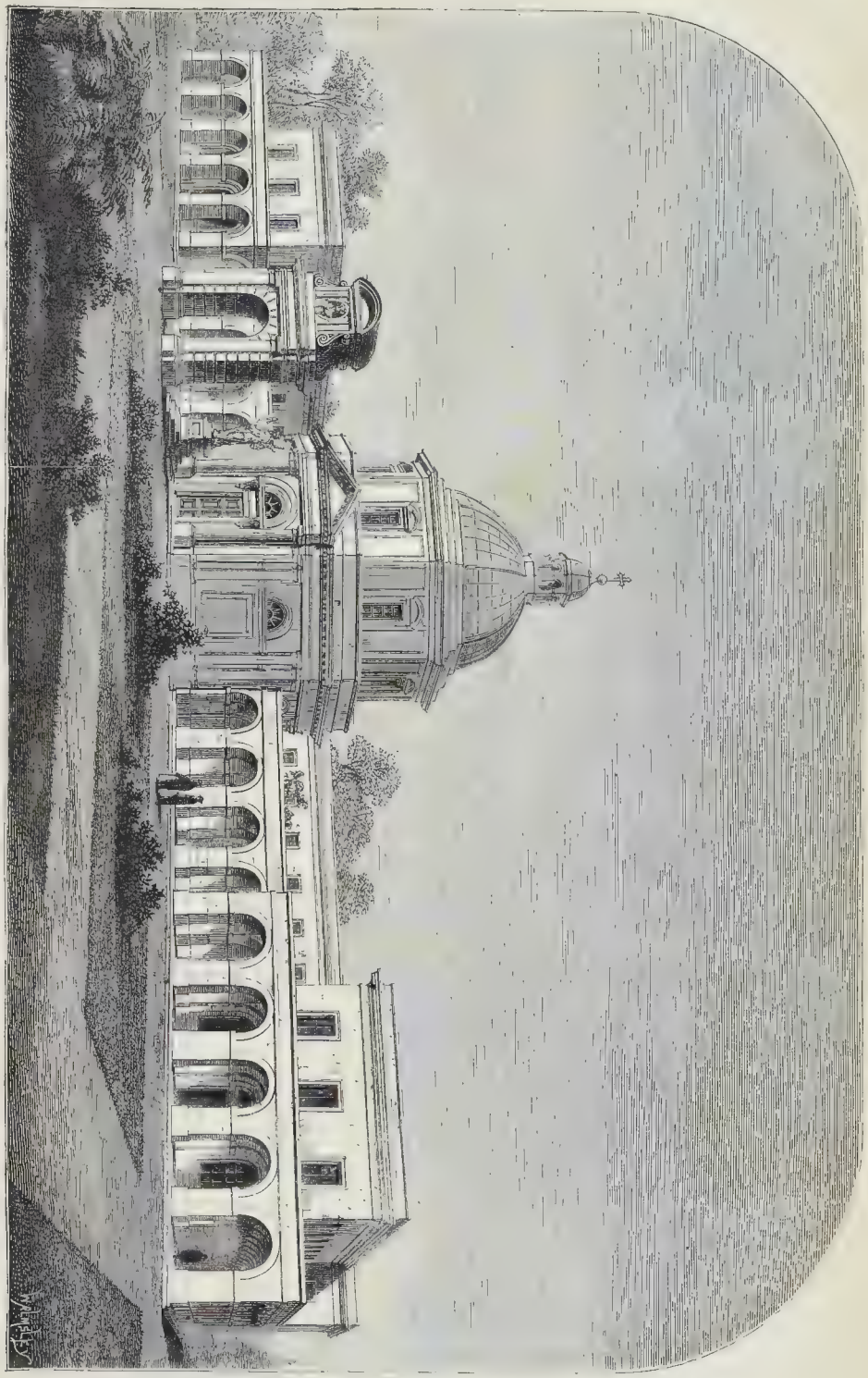
The keep is evidently late Norman, and the walls are original, though much pulled about, and with many insertions of the Tudor and Stuart days. This is another example of the high-pitched roof, as at Richmond and Bridgnorth, the whole roof having been concealed by the walls.

Probably the founder of the castle built both the keep and the curtain wall on the lines of the present curtain, and cut the cross ditch which isolates it from the rest of the Roman camp. The gatehouse and hall and the south-east tower were probably alterations and additions of the Decorated period. The whole fortress was repaired by Countess Anne, whose hand may be traced throughout the structure. The keep has been split with gunpowder, probably by order of the Parliament, producing fissures in its north and south walls.

Robert de Veteriponte or Vipont, the head of a great Westmoreland family, to which the armorial bearings of the Musgraves and Lowthers, the Blenkinsops and Hellbecks, show them to have paid early allegiance, is regarded as the founder of the castles of Brougham and Brough, at any rate in their Roman form. His imme-



RENZ'S CIRCUS, BERLIN.—HERR A. WESENBERG, ARCHITECT.



THE EUGEIA INSTITUTION FOR THE TRAINING OF DESTITUTE ORPHANS, MALTA.—FROM THE DESIGNS OF COUNT VESPIGNANI, ARCHITECT.

diate ancestor came over with Duke William from Normandy, and the family first planted themselves in the counties of Devon, Northampton, and York. Robert, the second or third in descent, flourished in the reigns of Henry II., Richard, John, and Henry III., dying in 1228, the twelfth of the latter sovereign. He filled many posts of military trust, was custos of many castles, and sheriff of many midland and northern counties. He was also a justice itinerant, and of the Common Pleas. In 1203 (4th John) he had a grant from the king of the Bailliewick of Westmoreland and the castles of Appleby and Burg, at first during pleasure, but afterwards in fee. Possibly the grant was connected with the fact that his mother, Maud, was a member of the great Westmoreland family of Morville, and probably a daughter of Hugh de Morville, one of Becket's assassins. Robert's wife, Idonea de Buisli, was heiress of the castle and Honour of Tickhill. He was a man of very great wealth and power, and likely to have taken steps to secure his Westmoreland barony against its northern neighbours. The grant mentions the castles of Appleby and Burgh, and Burgh, that is Brough, was sacked by William of Scotland in 1174. Probably, therefore, there already existed some kind of strongholds at those places, founded it may be by the English on the Roman stations. Moreover, the year 1204 is very late indeed for keeps of so decided a Norman type, and it is no doubt possible that De Meschines or De Morville, the preceding lords of the fee, may have built both castles, but on the whole the evidence is rather in favour of Lord Robert as the founder, or at any rate the builder of the oldest parts now to be seen.

John de Vipont, son and successor, died 25 Henry III., in debt to the king, who gave his estates in ward to the Prior of Carlisle, who neglected the castles. In his time the keep of Brough was out of repair, and the joists rotten. Lord John sided with the barons, and died of wounds received at Lewes. His daughter, and finally sole heiress, Isabel, was married to Roger de Clifford,—the Roger of the inscription over the gate of Brougham,—and who was killed in battle in Anglesea by the Welsh, in the reign of Edward I. Robert de Clifford, their son, lord of the Honour of Skipton, of Appleby, Brougham, and Brough, fell at Bannockburn. There were then two parks at Brough, a mill, and the demesne land. The castle ditches let for the herbage at 6s. 8d. per annum, and the constable had 40s.

Roger, the next lord, was a great builder; he followed the fortunes and shared the fate of Thomas of Lancaster. He is thought to have made the additions to the eastern side of Brougham, where his arms and those of his wife, Maud Beauchamp, were long to be seen. His successor was his brother Robert, whose second and surviving son Roger, proved age 28th Edward III., recovered the family estates which had been forfeited, and kept his castles in repair. He died, 15th Richard II., seized of Appleby, Burgham, and Burgh. The four following Lords fell in battle: Thomas in Germany, John in France, Thomas at St. Alban's, and John at Towton. In the 4th Henry V., the Castle of Brougham lay waste, and the whole profits of the demesne were not sufficient to repair and maintain it. The next, Henry, was the Shepherd Lord, who in 1519 held a great feast at Brough, at Christmas, which was followed in 1521 by a severe fire, in which the castle was burned to the bare walls, and long remained waste. The succeeding lord and his son, both Henry, were the first and second Earls of Cumberland, of whom the latter died at Brougham Castle about 1560. George, the third earl, the admiral, who died 1605, was born at Brough in the last year of Queen Mary, 1558. With his brother Frances, the fourth earl, who entertained King James at Brougham for three days in 1617, the male line failed, and the estates and baronies came to Countess Anne, the daughter of Earl George. This lady, who repaired Brougham and Brough in 1651–2, was born at Brougham in 1589, in the same room in which her father was born, her mother died, and King James was received. Margaret, her daughter, by the Earl of Dorset, carried the estates to the Tuftons, earls of Thanet, who also inherited the hereditary shrievalty of Westmoreland, until their extinction in the present century. They dismantled Brougham and Brough, and sold the fittings in 1714. The present owner appears to be very attentive to what remains of the two castles. Both are repaired in a very substantial manner.

G. T. C.

RENZ'S CIRCUS AT BERLIN.

THE celebrated Ernst Renz, the "king of horse-riders," as he is styled, was forty years ago the nameless member of a wandering equestrian troupe. He became better known to the German public when he made Berlin the centre of his activity, where he first introduced those representations, half drama, half ballet, sometimes called pantomimes, sometimes *féeries*, &c., which gradually overshadowed the more legitimate branches of horse-riding, equestrian performances on horses saddled and bare-backed, which no longer entirely satisfy a modern public. For such representations a standing circus was necessary, and it was erected by Eduard Renz, the younger, in the Georgenstrasse, Berlin. This the latter had to vacate again in 1872, the site being required by the Berlin Metropolitan Railway. He subsequently acquired a considerable space of ground for the erection of a new circus in the Lindenstrasse. The plans for the building, the ideas of which had been supplied by the owner himself, were drawn by Herr A. Wesenberg, architect.

The front part of the ground, as far as it borders the street, is to serve for the erection of a residence for Herr Renz. The circus and the stables are to occupy the rear part of the plot, the area of which is nearly 2½ acres. The circus is calculated to hold 4,500 spectators, room being found for that number in an amphitheatre and two galleries. There is, besides, a row of private boxes, with a number of retiring-rooms. The building also contains a stage for the orchestra; an arena, of a diameter of 43 ft.; a stage, of 5,382 square feet, which may be thrown into one with the arena; all the necessary machinery for the transformation of the stage; a spacious principal vestibule, two side entrances, pay-offices, refreshment-rooms, riding-corridor, saddling-place, harness-room, sixteen wardrobe and dressing rooms, room for dancing and gymnastic exercise, painters' room, and a few property-rooms. Outside of the circus-building proper there will be stables for 110 horses, with different connecting-passages, stables for sick horses, and conveniences for the public, the artistes, and attendants.

The whole building, with a façade rich in sculpture (the subject of our illustration) stands free. Carriage approaches are not provided; but there is a wide glass-covered passage from the front part of the building to the road.

THE BUGEJA INSTITUTION FOR DESTITUTE ORPHANS, MALTA.

DURING the recent visit of His Royal Highness the Prince of Wales to Malta the first stone of the charitable institution for the education and training of destitute orphans, founded by Mr. Vincenzo Bugeja, a wealthy inhabitant of Malta, was laid by Lady Van Straubenzee, wife of the governor. It had been supposed, in the first instance, that the Prince would have performed the ceremony, but it being a purely Roman Catholic establishment, this was not found to be convenient. Nevertheless, by the Queen's command, the Prince conferred on Chevalier Bugeja the Companionship of St. Michael and St. George.

The object of the institution, which is to be erected under the name of the Vincenzo Bugeja Conservatorio, is to feed, clothe, educate, and train to industrial occupations fifty female children deprived of their natural protectors through death, crime, or other misfortune. The site selected for the building is in a very central and healthy situation, about two miles out of Valetta, and the building is so designed as to admit of being extended hereafter to accommodate 100 inmates. Besides the entire cost of the building, the Chevalier Bugeja has provided an endowment of 1,000*l.* per annum in perpetuity. The gift will in all amount to about 40,000*l.*, the largest ever made in the island.

The plans were prepared by Count Vespignani, the architect of Pius IX., and have been adapted to the site, with improvements in the internal distribution, and sanitary arrangements, by Mr. W. Poulson, of Malta, an architect and sanitary engineer of practical ability.

The object of the founder is to give to Malta a model of an institution, as regards the education and training of children, and the arrangements for health, organisation, and discipline. In the course of the address made on the occasion of laying the first stone, the founder said,—"I am aware of the danger attending such institutions when admissions to them are made too easy, namely, that of encouraging parents to be remiss in the discharge of their duties to their children. I am also aware of the difficulties by which young women brought up in an asylum are generally surrounded, when they leave that institution. But of the two evils, the abandonment of destitute children appears to me to be the worse. The building which I contemplate to erect will afford accommodation for fifty girls. The plan, however, which I have now the honour to submit for your approval, admits of enlargement, by the mere addition of another floor. I have, as far as lay in my power, made arrangements, which I hope will be found satisfactory, for the management of the institution after my death; and I cannot refrain at this moment from expressing my heartfelt thanks to his Excellency Sir Charles van Straubenzee, the worthy governor of this island, for the permission he has given me to entrust part of that management to the heads, for the time being, of some departments of the public service, and my gratitude to that eminent English firm 'Baring, Brothers, & Co.' who, looking to the nature of the institution, have, in deviation from their usual practice, consented to accept the office of trustees of the funds destined for its maintenance. May it, with the aid of Almighty God, and under your auspices, prove equal to its object."

The block-plan of the building is in the form of the letter E, the chapel, seen in the view we give, standing forward between the two projecting wings, and being connected with the main building by arched corridors. A boundary-wall and railing enclose the whole, with a Triumphal Arch at the entrance, through the opening or gateway of which the statue of St. Vincent de Paul is seen.

THE AMRAVÂTI SCULPTURES.

INDIA MUSEUM, SOUTH KENSINGTON.

THE last ordinary meeting of the Royal Asiatic Society for the present session was held on the 3rd inst., in the India Museum, South Kensington, in order to allow of Mr. James Fergusson, F.R.S., giving an account of the Amravâti sculptures, now arranged there.

Mr. Fergusson, in commencing, said that the marvellous sculptures arranged on the walls had never previously been properly exhibited. The Amravâti tope or tumulus, to which they belonged, was in the Guntoor district, and was first discovered by Ensign Mackenzie in 1795, while travelling in the district on official duties. At that time the site of the tope was being excavated by order of the Rajah in order to provide stone and lime for building a new city and palace at that place. The sculptures which Ensign Mackenzie saw during the progress of the excavation struck him as being of extreme interest, and twenty years afterwards, when he became Surveyor-General of India, he sent a large staff to the spot, and this staff was occupied for two years in making drawings of such marbles as remained. The drawings were made in triplicate, and one set was deposited in the India Office. There were also sent over and placed in the India Museum two or three pieces of the sculpture from Amravâti. These sculptures, which were unlike anything else in the Museum, attracted Mr. Fergusson's attention, but nothing could be made of them, as no text or description of any sort accompanied them. It was difficult to tell their relative positions, or, indeed, of what structures they formed parts. They remained inexplicable until 1867, when Mr. Fergusson was asked to send some casts of Indian sculpture to the Paris Exhibition. As it happened, these particular pieces of sculpture were the only ones which Mr. Fergusson thought of sufficient interest to send casts to Paris. He expressed this opinion to one of the official attendants at the Museum, who replied, "Why, sir, if these are the things you want, we have plenty of them in the coachhouse!" On further inquiry and examination, Mr. Fergusson found that all the sculptures from Amravâti now on exhibition in the India Museum at South Kensington, had been stowed away in the coachhouse for want of room. They formed the Elliott collection. It appears that when Sir Walter Elliott was Commissioner of Guntoor he was aware of the existence of the sculptures at the Amravâti tope, and had sent them over to England, but there was no room for them in the old India Museum in Leadenhall-street, nor was there space for them in the temporary quarters of the Indian Government at the

Westminster Palace Hotel; so they remained hidden away until 1867, as already mentioned. When they were removed from the coach-house they were all photographed to the same scale, so as to afford facility for "piecing" the photographs with a view of discovering the design. After much time and trouble, Mr. Fergusson found that they could be arranged into two or three groups of sculptures of different styles, and bit by bit it dawned upon him what they were. In a plan of the tope made by Mackenzie, no central building was shown, only a circular space surrounded by two rails, inner and outer. From evidence afforded by the pieces of sculpture themselves, Mr. Fergusson came to the conclusion that one group belonged to the central building. He could never have arrived at this conclusion but for one peculiarity in Buddhist architecture, viz., that when the Buddhists wanted to ornament a building they had no means of doing so except by repeating indefinitely a miniature representation of the building itself. From the plan, and from the sculptures themselves, Mr. Fergusson gleaned that the central building was a tope about 20 ft. in perpendicular height, with a further height of about 20 ft. to the top of the dome, and about 30 ft. in diameter. This point being determined, it was easy to see that the rest of the sculptures could be divided into two great groups, one belonging to the inner, the other to the outer rail, and by piecing them together, as shown in the diagrams, the arrangement of the building was easily understood, and the position of nearly every fragment of the sculptures ascertained with certainty. The mode in which this was done, and the reasoning on which his conclusions were based, were fully set out by Mr. Fergusson in his work on "Tree and Serpent Worship," which was the result of this examination. Passing from this branch of his subject, the lecturer proceeded to give a few figures and facts which appeared to him necessary for the understanding of what was to follow. Buddha, the founder of the Buddhist religion, was born in 623 B.C., and was a prince of a royal family north of the Ganges. At the age of twenty-seven, struck with the misery of mankind, he resolved to devote the remainder of his life to the alleviation of human misery. He died in 543 B.C., at the age of eighty, having devoted himself to preaching and teaching for fifty-three years. His body was burned, and his relics distributed to seven different cities who claimed a right to them. His religion languished for 300 years after his death,—at least, we found very slight records of it during that interval. But in 250 B.C., Asoka did for Buddhism what Constantine did for Christianity,—*i.e.*, he made it the religion of the State. From that date until about 750 A.D.,—a period of a thousand years,—it continued to flourish. During this period an immense number of topes were constructed. Tradition assigns 84,000 as having been built by Asoka alone; but however incredible that may appear, they were certainly built in vast numbers. They were never sepulchral monuments, but were erected either to receive relics or to mark the spots where Buddha had preached, or performed some miracle either in his present or some previous state of existence. The outer rail at Amravâti was about 14 ft. in height, and was ornamented with a number of discs 3 ft. in diameter, externally representing lotus flowers, internally covered with figure sculptures. There were thirty pillars in each quadrant of the rail, each with a central disc, and two half discs at top and bottom, and three discs in the intermediate rail between. At bottom there was a Zoöphorus or frieze of animals; above, externally, a procession of the figures bearing a roll, and internally a storied bas-relief, the whole extending to upwards of 600 ft. in length. The sculptures of the central building and of the outer and inner rails afforded a complete pictorial Bible, so to speak, of the Buddhist religion, and as a procession path ran round between the rails the priests and people constantly had these sculptures before them. The inner rail was later and more elaborately sculptured than the outer one. The outer rail of the Amravâti tope was built about the beginning of the fourth century, when Buddhism was in the plentitude of its power in India, and when the celebrated tooth relic, which up to that time had been enshrined at Pari, where the temple of Jugganath now stands, visited this place on its way to Ceylon, where it was shown to the Prince of Wales a short time ago. The inner rail was at least a century more modern. About the year 500 the tope seemed to have been deserted, and apparently got buried; but about the year 1,200 a part of it was re-arranged for the purpose of receiving the tooth of Buddha, which was then brought back to India. In conclusion, Mr. Fergusson expressed a hope that the site of the tope at Amravâti would be further explored, for although no doubt many of the sculptures (being of marble) had been burnt by the natives to make lime, many might yet remain. These sculptures were most interesting, not only architecturally, but on account of the insight they gave of Buddhism as it existed in the fourth century. There were no books so old as that in India, and these sculptures afforded a picture of Buddhism as it existed at that date. They showed what was unsuspected until they were discovered, viz., that there was a great deal of Tree and Serpent worship mixed up with the Buddhist religion at that period. Since the Amravâti sculptures had been discovered, Gen. Cunningham had succeeded in bringing to light a rail dating as far back as 200 B.C. This rail was as rich in sculpture as the one at Amravâti, and each bas-relief contained a title or inscription to say what it was. In the celebrated Sanchi tope the gateways were decorated with sculptures dating from the first century A.D. By comparing these different sculptures it was possible to read the history of Buddhism and of its varied changes and corruptions. It was a remarkable fact that although Buddhism was the most extensive religion in the world, and although it was still the religion of China and the surrounding countries, it had entirely disappeared from India, where there was now not a single Buddhist establishment of any sort. The inscriptions and sculptures of the time of Asoka, 250 B.C., showed that Buddhism possessed a singularly complete and pure body of doctrine at that time, which especially inculcated the duty of children to their parents, and kindness to animals. There was no figure of Buddha seen in the sculptures before the first century of the Christian era. On the outer rail of the central building at Amravâti there were numberless instances of the serpent being worshipped, and a number of trees. On the Sanchi tope, tree-worship was represented eighty times. It was believed that Tree and Serpent worship was the fetish of those races who were originally converted to Buddhism; and that, while it did not make itself apparent when Buddhism was in its strength and power, it gradually made itself felt, and as Buddhism got weak and corrupt, native superstitions cropped up and became incorporated with it, until it lost its original distinctive character. The engrafting of these superstitions was probably the cause of its fall, for it was then no longer the religion of a great and intelligent people.

A VISIT TO THE NEW VICTORIA DOCK WORKS AT EAST HAM.

THE London and St. Katharine's Dock Company are at present engaged in the construction of a very great extension of the Victoria Dock, the intended enlargement of the existing water area of the dock being upwards of 90 acres, in addition to further quay and warehouse space, having a frontage of nearly four miles in length, and covering an area of about 120 acres, the aggregate area of the enlarged dock and quay space being about 200 acres in extent. The works are now in active progress, and the following particulars, obtained by a visit made last week to the spot, may be interesting. The site upon which the new dock and quays are being constructed forms a portion of the Plaistow Marshes at East Ham, and stretches in an eastward direction from the boundary of the present dock to the north-west bank of the Thames, where the dock will be entered from the river at a point between North Woolwich and Barking Reach, and about a mile and a half below the first-named place. It is bounded on the north by Beckton and the gas-works, and on the south by North Woolwich. The entire length of the land on which the dock and quays are being formed, from the junction with the existing dock to the river bank, is upwards of two miles, situated partly in the parishes of East and West Ham and Plaistow, in the county of Essex, and partly in that portion of North Woolwich which forms a part of the county of Kent. The company obtained an Act of Parliament last year for the works in question, and there has been no delay in their commencement. A large area of land, several acres in extent, at Silvertown, and immediately adjoining the new dock site, presents a perfect village of workshops and huts, which have been erected by Messrs. Lucas & Aird, the contractors, for the purpose of carrying on the works. The excavations for the docks are being actively carried forward, upwards of 2,000 men being at work, and more than a score of locomotive engines, in addition to several excavating machines of American invention, which perform both the work of excavation and also that of conveying the excavated earthwork into the wagons drawn by the locomotives. The amount of excavation to be effected is something enormous, amounting to between 3,000,000 and 4,000,000 cubic yards, of which a large portion has already been executed, the excavated material forming an embankment on the north and south sides of the intended water area, and which will form the site for the quays, and the warehouses, and other buildings to be erected. In carrying on the excavations some interesting geological discoveries have already been made. From the surface to a depth of several feet the earthwork consists of peat, and amongst it a number of fallen trees, in an admirable state of preservation, have been found. Underneath the peat a bed of gravel has been met with, and below this gravel a stratum of concreted shells and clay has been come upon, intermingled with which stag-antlers and other animal remains have been found. The water area of the new dock will be 7,640 ft. in length, with a width at the water level of about 540 ft., covering, as already stated, upwards of 90 acres, and it will have a minimum depth of 27 ft. below Trinity high water. In addition to this area the entrance-lock from the river into the dock will be 800 ft. long and 80 ft. wide, with strong and powerful gates, which will be opened and closed by hydraulic power. The enlarged dock, when completed and joined with the present dock, will thus have two entrances, namely, the present entrance on the west side at Blackwall, and the new entrance now in course of construction at the east end near Barking Reach, there being a river frontage of three miles and a half in length between the east and west entrances respectively. Near the entrance-lock to the enlarged dock below Woolwich, the Ham Hall and Woolwich Manor-road intersects the land, which will form the lock, and this road is intended to be diverted in the direction of the river, with the construction of a swing-bridge across the lock, to be opened on vessels entering and leaving the dock. The facing of the dock walls will be of granite, several feet in thickness, and, in addition to the large quantity of stone which will be required it is estimated that not less than 30,000 tons of Portland cement will be used in the construction of the works. An important feature in the undertaking is the diversion and partial reconstruction of the North Woolwich branch of the Great Eastern Railway. This line runs immediately along the north-east side of the present Victoria Docks, intersecting a portion of the site upon which the enlarged dock is in course of construction, and in order to admit of the extended dock being connected with the existing dock, the North Woolwich line is to be diverted, and carried under the dock by a tunnel at a depth of 43 ft. below high-water mark. The entire area of the Victoria Docks and quay space, when the works now in progress are completed, will be upwards of 300 acres, with a circumference of more than five miles. It is calculated that the new works, the estimated cost of which is nearly 1,000,000*l.*, will take about three years to complete. They have been designed by Mr. A. M. Rendel, C.E., of Great George-street, Westminster, Mr. Anrons being the resident engineer.

The magnitude of these works suggests a comparison between the area and extent of the London docks, and those on the banks of the Mersey, at Liverpool and Birkenhead. The estimated water area and quay space of the London and St. Katharine's Docks are about 120 acres; the East India Import and Export Docks, 32 acres; West India Import and Export Docks, 54 acres; South Dock, 24 acres; Timber Dock, 21 acres; Commercial Docks, 150 acres; Grand Surrey Docks, 75 acres; and Victoria Dock, 90 acres (exclusive of enlargement in progress); being a total of 566 acres. The water area and quay space of the Liverpool docks are 259 acres, and that of the Birkenhead docks 166 acres, being a total of 425 acres on both sides of the Mersey, as compared with 566 acres, the present area of the docks on the Thames, exclusive of the Victoria dock extension in progress.

DINNER OF THE ARCHITECTURAL ASSOCIATION.

THE annual dinner of this Association took place on Friday, the 7th inst., at the Holborn Restaurant, Mr. J. S. Quilter, president for the past year, in the chair.

In proposing "Prosperity to the Architectural Association," the chairman said the Association was established, now a good many years ago, to supply a want felt by the younger members of the profession, who needed help, but could find no one to help them. They, therefore, determined to help themselves, and the result was seen in the fact that the Association now numbered between 700 and 800 members, many of whom would, doubtless, in due time come to be the leading men of the profession. Adverting to the internal working of the Association, Mr. Quilter observed that, although a large proportion of its members took an active part in its management, its prosperity depended upon the sustained individual interest and support of each member. With the toast was coupled the name of Mr. H. C. Boyes, the president elect.

Mr. Boyes, in responding, said he looked upon the presence of Mr. Charles Barry, the president of the Institute, as a great honour to the Association, and as an earnest that the Institute and the Association would for the future work more in unison than had hitherto been the case. With reference to the proposals made a year ago or more for the amalgamation of the two societies, he (Mr. Boyes) felt bound to express his conviction that each society would get on better, and would be best promoting its own welfare and the advantage of the profession, by maintaining a complete independence. At the same time, it would be advantageous to the Association and the profession if in every way in which it was possible the Association would accept the advice and leadership of the Institute in all matters of professional importance, while at the same time maintaining its own system of government and working. He hoped that means would be devised for closer union between the two bodies on some such basis as this.

Mr. Roger Smith said the Association that evening received the unprecedented favour of the presence of the President of the Institute. He (Mr. Smith) fully agreed with Mr. Boyes as to each society maintaining its independence. It was, indeed, absolutely necessary that there should be two societies. The Association was essentially a students' society, whose members had as their primary object the meeting together for mutual instruction. Having had some opportunities of seeing the manner in which the classes of the Association were carried on, he could bear testimony to the excellent quality of the instruction given therein. Nor was the instruction given through the medium of the Association confined to matters of construction or design; its members had opportunities of learning the conduct of business, and of preparing themselves to meet the larger outside world. On the other hand, the Institute had to maintain the dignity of the profession, and in all matters pertaining thereto the Association would do well to follow its lead. He felt quite sure that when the Institute did anything the value of which could be perceived by the Association—and the Institute had done a great deal for the Association and for the junior members of the profession generally — the Association was generally sufficiently appreciative. The Institute had, however, done some things for the junior members of the profession which had not been so fully appreciated as could have been wished. For instance, the Institute established the Voluntary Architectural Examination; but he appealed to the members of the Association to say whether it had been adequately responded to. He was quite sure that in the hands of Mr. Barry the conduct of the Institute would continue to be favourable to the objects of the Association. Mr. Barry not only inherited a great name, but had himself produced works of no mean order. The pleasure with which his election as president of the Institute was received was unalloyed, and his presence at the dinner of the Association was a valuable augury as to the future. He (Mr. Smith) was not one of those who thought the time would come when both societies would amalgamate, but he did look forward to a time when they would be in closer union, and co-operate more together. He begged to propose "The Health of Mr. Barry."

Mr. Barry, who was very warmly received, said he had accepted the invitation to be present at the Association's dinner with especial pleasure. He agreed in thinking that the Association and the Institute might be of great use to each other. Indeed, he looked upon the relationship between the Institute and the Association as that of a father and son, and he thought the Association might look up to the Institute as a son looked up to a father, who had gone before and borne the burden and heat of the day. On the other hand, the Institute might look upon the Association as a father would upon a son, as being more energetic, more enthusiastic, and one in whom he felt exceedingly proud. The Association was undoubtedly a great success, and had fully proved its *raison d'être*. At the same time, it was necessary to give dignity and impress to the exertions of the younger members of the profession, and that function could only be discharged by the Institute. It was quite probable that some efforts now being made within the body of the Institute would result in closer relations being established between the two bodies,—he would not say "affiliation," for he did not like the term, although he had used the simile of father and son. In conclusion, Mr. Barry thanked the company for the manner in which they had received the toast.

The remaining toasts were "The Retiring President" (proposed by Mr. W. H. White in a humorous speech, and responded to by Mr. Quilter), "The Past Vice-Presidents" (proposed by Mr. Phené Spiers, and spoken to by Mr. H. C. Boyes and Mr. H. L. Florence), "The Secretaries" (proposed by Mr. J. Douglass Mathews, and acknowledged by Messrs. S. Flint Clarkson, E. G. Hayes, and Aston Webb), "The Officers, Committeemen, and Presidents of Classes" (proposed by Mr. Riddett, and responded to by Mr. Pownall, librarian), &c.

The torrent of speechmaking was agreeably diversified with songs by Messrs. Dale, Riddett, Dear, Booth, and Hazlehurst, and Mr. Hennessey gave a recitation in a very able manner. Mr. Riddett's song, "The Architectural A B C," on the model of "A was an archer who shot at a frog," afforded much amusement.

THE HEALTH OF SCHOOLS.

THE American Social Science Association have wisely taken in hand the investigation of this subject. In answer to a call issued from the Department, a public sectional meeting was held last year, at which were read completed and authorised reports from the committee of the Department upon two subjects: viz., "The Nervous System as injuriously affected by Schools," and "School Gymnastics." Brief communications, made in response to an urgent public demand for information, were also presented by the Department, concerning Defects of Sight, the Care of the Eyes, Medical Supervision of Schools, Systematic Inspection of Schools, Statistics of Sanitary State of Schools, Statistics of Rate of Growth of School Children, and School Architecture. The latter series of papers must be considered as provisory, rather than as containing the full expression of the Department's opinion. The secretary's report, explaining more fully the character of the work done, was read without debate. These papers have been printed, and are now before us.

The first session of the Department of Health was held in the Council Committee-room of the City Hall, the Rev. Charles H. Brigham, of Ann Arbor, presiding.'

The writer of the paper on "The Nervous System as affected by School Life" (Dr. D. F. Lincoln) says,—"Our entire nation is believed to be suffering from certain widespread sources of nervous degeneracy. Our children are but a part of the nation, and must suffer along with the older members of the population. How shall we discriminate between what is national and what is simply scholastic? Give the child a constitution derived from excitable parents; a nutrition in infancy and childhood from which iron, lime, and the phosphates are mainly excluded; a diet in later childhood most abundant but most unwholesome, and based upon a national disregard of the true principles of cookery; a set of teeth which early fail to do their duty; a climate which, at its best, is extremely trying, killing either the aged by excessive cold, or the little children by tropical heat; an atmosphere so deprived of moisture, that the most casual observers speak of it, and men of science consider it as capable of modifying our constitutions most profoundly; add to these influences those of a moral nature, arising from the democratic constitution of our society, spurring on every man, woman, and child to indulgence in personal ambition, the desire to rise in society, to grow rich, to get office, to get everything under the heavens; add a set of social habits, as applied to the life of young girls and boys, which is utterly atrocious, which robs so many of them of their childhood at the age of ten or twelve, and converts them to simpering, self-conscious flirts and men of the world, *rusés*, and independent of control, a depraved and pitiable breed of 'little women and little men'; add finally the fact that we have now a population of six millions dwelling in cities of over one hundred thousand inhabitants, and exposed to those deteriorating influences which notoriously belong to great cities: give the child these conditions to grow up under, and can you wonder that he or she 'deviates from the type' (as it is fashionable to say) of the sturdy Anglo-Saxon pioneer who settled this continent?"

The Association is seeking in every direction information on the subject of school hygiene, and Dr. Barnard, a member of the committee, is now in London with that end in view.

ROME.

IN the rooms of the Institute of Architects, Mr. John Henry Parker has just now given three lectures on "The Ruins of Ancient Rome," the proceeds being devoted to the Roman Exploration Fund. The Fund Society is now making an effort to raise 500*l.* for the purchase of a strip of land in Rome, extending from the Aventine Mount to the Cœlian, and containing one of the short *aggeres* of Servius Tullius spoken of in the first lecture. This *agger* crosses the valley which had the Porta Capena at its east end. Mr. Parker dug ten pits on that line in 1868, and in each found the *agger* face by the wall, and with the aqueduct carried upon it, but was obliged to have the pits filled up again, because the owner would not then sell the land. The plot has now changed hands, and the present proprietor is willing to sell it. It is deemed very desirable to secure it, since it demonstrates that each of the seven hills was a separate fortified village, until Servius Tullius enclosed all within the ring-fence of his own wall.

The second lecture was on "The Forum Romanum and the Via Sacra." Mr. Parker took an imaginary walk with his audience through the Forum Romanum and the Via Sacra, showing them all the objects of interest in succession as they passed along, beginning with the building now called the Municipio, because it contains the Municipal offices, but originally called the Capitolium, and which then also contained all the public offices, the Treasury, the Record Office, and the Senate-house, or *Curia*. The upper part had been of wood, and had been burned several times; once in the time of Sylla, when the body of Clodius was burned in the Senate-house, at the east end. The fine wall of travertine was part of the reconstruction of that period, but the west end of the building has not been rebuilt, and is mentioned by Varro as one of the earliest buildings in Rome. In the Forum itself he pointed out the various objects of interest—the temples, Basilica Julia, Cloaca Maxima, screen walls of white marble, with fine sculpture of the time of Trajan and Hadrian, &c. In the Via Sacra he showed that the temple of Antoninus and Faustina has just been cleared out to the lowest level, now making visible the steps recorded by Palladio as being there, but never visible before. The magnificent monolithic columns of *cipillino* marble, 46 ft. high, can now be seen for their whole height for the first time for centuries. The last lecture was devoted to the Colosseum. The great excavations made under the area or *arena* in 1874 and 1875 have entirely changed the ideas previously entertained respecting the history of this enormous structure. Instead of being entirely the work of the Flavian Emperors, as is commonly said, it is now clear that all they really built were the magnificent stone front and double corridors round a brick theatre previously existing. He evidently uses the words "theatre" and "amphitheatre" indifferently, and contrasts the insanity of this amphitheatre, holding 80,000 people, with the great theatre of Pompeii, which held only 40,000, though built fifty years later, when the city had been so much increased. On an inscription found in the amphitheatre it is called Theatrum only. In the old tufa walls are vertical grooves for lifts to send up the wild animals in cages on to the stage or arena above, through trap-doors, and behind the outer wall, nearly under the *podium* of the lower gallery, are the dens for the

wild beasts. The scenes must have been prepared below, and sent up in the central passage to the arena above. One of the scenes was a representation of the Tarpeian rock, and culprits were thrown from the top of it down to the bottom of the gulf. The rock was 50 ft. high, and the gulf 21 ft. deep, so that the culprits were cast down 71 ft., and this scene was witnessed by 80,000 people.

THE CORNWALL CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE intended proceedings of the Congress have been sketched :—

Monday, August 14th.—Reception by the Earl of Mount Edgcumbe at Cotehele on the Tamar. Dinner at Sandoe's Royal Hotel, Bodmin, after which the company will adjourn to the Guildhall, where the Mayor and Corporation will receive the president and association, and the Earl of Mount Edgcumbe deliver the inaugural address.

August 15th.—Excursion to Tintagel, driving through Pancarrow grounds and camp; then on to Lanteglos Rectory, where the Rev. J. J. Wilkinson will receive and entertain the members at luncheon, and conduct them over the church, &c. After, Tintagel Church and Castle, Camelford, will be visited if time will permit. Evening meeting at Bodmin.

August 16th. — Excursions to Restormal Castle, Lanhydrock, Lostwithiel, and St. Neot's Church, where Mr. Loftus Brock, F.S.A., will describe the painted windows and architectural features of the church. Evening meeting at Bodmin.

August 17th.—Excursion to Launceston. A *conversazione* will be held at the Bodmin Guildhall.

August 18th.—Excursion by train to Truro, to the Royal Institute of Cornwall. Reception by the president and members, and further excursions to several places of interest in the neighbourhood. Train to Penzance.

August 19th.—Excursions. Passing several monoliths in fields adjacent to the road, arrive at Boscawen Un—Stone Circle, thence to Sennen Church, and the Land's End. Luncheon, thence to Buryan Church, Rosemoddress Circle, Boleit monoliths, and underground structures. Evening meeting at the Guildhall, Penzance.

August 21st. — To Chywoone Castle and cromlech, Bosullo hut circles. Luncheon at Chywoone. Then proceed to St. Just Church and inscribed stone, Chapel Enny, cave dwellings and barrow. Evening meeting in Penzance Guildhall.

August 22nd —Excursion to St. Michael's Mount, where they will be received by Sir John St. Aubyn, bart., M.P.; thence to Chysanster, hut village, Bosphorthennis Beehive-hut, Lanyon cromlech. Closing meeting of the Congress at Penzance.

SOCIETY FOR IMPROVING THE CONDITION OF THE LABOURING CLASSES.

ON the 29th ult., the Earl of Shaftesbury presided at the thirty-second annual meeting of the Society for Improving the Condition of the Labouring Classes, held at Willis's Rooms. Mr. Charles Payne read the report. The details were generally satisfactory, and suffered by no comparison with previous years or the efforts of kindred agencies. The Streatham-street (Bloomsbury) house, for fifty-four families, full; the George-street (Bloomsbury) house, for 104 single men, furnishes an average of 103. The Thanksgiving Model Buildings, Portpool-lane, Gray's-inn-road, for twenty families and sixty-four single women, with a public washhouse, return full occupation and increase of washings. The renovated lodging-house, 2, Charles-street, Drury-lane, for seventy-two single men, full; the renovated dwellings for 102 families, Wild-court, Drury-lane, return full tenancy; the renovated dwellings for seventy-two families, Clark's-buildings, Broad-street, St. Giles's, return full; the renovated dwellings for eighty-seven families, and lodging-house for thirty-six single men, Tyndall's-buildings, Gray's-inn-road, show marked improvement and nearly full occupation; Great St. Andrew-street, St. Giles's, renovated houses for twelve families, full. The amount received by the Society from all sources during the year was 5,570*l.* 15s. 9d., which, with a balance in hand at the beginning of the year of 426*l.* 5s. 5½d., made a total of 5,997*l.* 1s. 2½d. The current expenses of all the Society's houses (including repairs) amounted to 3,629*l.* 16s. 9d. This, with other specified outgoings, left a cash balance of 544*l.* 3s. 2½d. The property belonging to the Society is estimated as worth 32,841*l.* 12s. 10½d., and the general liabilities amount to 22,613*l.* 15s., leaving assets to the amount of 12,227*l.* 17s. 10½d.

Thanks to the noble chairman having been voted by acclamation, on the motion of Sir Walter Stirling, seconded by the Rev. Mr. Allen, Lord Shaftesbury, in acknowledging the compliment, took occasion to animadvert on what he deemed the mistakes of recent Acts of Parliament for improving the habitations of the poor. He complained that they fostered the perverse system of single rooms, and made no suitable provision for housing those who were being improved off the selected sites. The Limehouse, Whitechapel, and Birmingham schemes were all open to these objections, while the Glasgow experiment, on the other hand, seemed to have steered clear of these rocks. The Society's practice of adapting old buildings, rather than erecting new ones, he was convinced, was a sound one, and they would adhere to it until it was proved to be otherwise.

LAYING THE FOUNDATION-STONE OF A VICARAGE HOUSE AT KENNINGTON.

THE foundation-stone of the vicarage about to be erected in connexion with the Church of St. Agnes, Kennington Park, which has been built from the designs of Mr. George Gilbert Scott, jun., was laid on Saturday afternoon last by the Rev. Canon Gregory. The vicarage will be uniform in its architectural character with the church and schools, both of which are in the Early English style, built of red brick with stone dressings, and covered in with red tiles. The site of the vicarage-house is immediately in front of the west elevation of the church, and its principal frontage overlooks Kennington Park. In addition to a basement it contains two stories, with gables in the centre of the main elevation. The formation of the building is of a somewhat peculiar character. It extends the entire width of the west-end elevation of the church, and the ground-floor portion of the structure is divided in the centre by a passage 8 ft. in width, approached under a recessed Gothic archway, leading to the principal entrance into the church. The main body of the elevation is 21 ft. in height to the eaves, the two central gables being carried to a height of 36 ft., and a high-pitched roof rises 16 ft. above the main cornice. The study, an apartment 19 ft. by 13 ft., is on the north side of the archway, on the ground floor, and the drawing-room and dining-room on the south side. The rooms on the upper floor and gables will be devoted to bedrooms and servants' apartments. The kitchens and other domestic offices are in the basement. In consequence of the unusual shape of the site there is not a square apartment in the building, the study and the other rooms on the ground floor, as well as those in the story above, being oblique and irregular in form. Mr. G. G. Scott, jun., the architect of the church and schools, is also the architect of the vicarage, and the contractors are Messrs. Hill & Higgs, who have also just undertaken the contract for the completion of the church, the works at which have been suspended during the last few months, but have this week been actively resumed, and the edifice, which has an exceptionally lofty and striking interior, is to be completed and opened on the 1st of November.

ALL SAINTS', STOKE NEWINGTON.

A NEW church, situate in Aden-grove, Stoke Newington, and dedicated in honour of All Saints, has just been completed, and was consecrated by the Bishop of London on the 1st inst. The foundations, which, from the peculiarly treacherous nature of the soil, alone cost upwards of 1,100*l.*, were built about a year and a half since.

The style of architecture adopted by the architects has the English characteristics of the thirteenth century. In plan the church consists of nave and aisles, with narthex at the west end; chancel with vestries and organ on the north side; and a south aisle intended for use as a morning chapel. The building is constructed throughout of brick, with Bath stone dressings to the doorways, windows, water-tables of buttresses, gable crosses, copings, &c.; and red Dumfries stone in the shafts of the clearstory and sedilia. The roof internally is barrel-vaulted, divided into panels, which are filled with monograms and ornamental decoration in distemper. Over the nave arcade, which is in five bays, is a range of detached columns, combining triforium and clearstory, and continued the entire length of the church, except the sanctuary at the east end.

The font, executed by Mr. R. L. Boulton, from a design by the architects, is of Painswick stone, and has been made sufficiently large to allow of immersion. The church will contain about 760 worshippers. The architects are Messrs. Francis T. Dollman and William T. Allen; and the contractors are Messrs. Hill, Higgs, & Hill.

CHELTENHAM WINTER GARDEN AND RINK COMPETITION.

IN reply to advertisements from the Winter Garden and Skating Rink Company, eight designs were sent in. After examination it was decided to award the first premium of 100*l.* to the plans with the motto, "Neits zonder arbyt," and the second of 50*l.* to those signed "Faith." The former proved to be those of Mr. Darby, of Cheltenham, and the latter those of Mr. E. L. Paraire, of Oxford-street. The skating area of the rink, as shown in the successful plan, is about 17,000 ft., or about 3,000 ft. larger than the new rink at the Crystal Palace. Mr. Darby's plans furnish only the accommodation asked for by the committee, comprising rinks, pavilion, and promenade, and winter garden, all on one floor. The building has a central dome and transept, which, with the wing on the southern side, are set apart for the winter garden and promenade, while the skating-rink occupies the lower or northern wing, which is, however, easily convertible into a promenade or meeting-room. Towards the Queen's Hotel are an entrance-drive, porch, and the necessary offices. This is the only design in which red brick is not prominent. The main work is of cream-coloured brick, with roof of iron and glass.

NEW BARRACKS, SURREY.

THE barracks at Stoughton are now approaching completion. To the left of the entrance-gate on entering the barrack inclosure stands the keep, a lofty, embattled, square structure, with towers at each of the angles. This, as well as the rest of the buildings, is constructed of red bricks, the walls being 3 ft. thick. The sills and heads of the windows are formed of artificial stone, and the red brick has been further relieved with Pether's ornamental white bricks, with nail-head mouldings. The keep has been fitted in the interior for the guard-room, &c. The top of the building has been fitted for a magazine, and here are also two tanks containing each about five thousand gallons of water, which is supplied from the Guildford Waterworks. Further to the left is a block of buildings about 190 ft. long, which will be used for offices. Still further to the left, and separated from the offices by a wide road which leads to the side gate, are buildings intended for wood stores and workshops, with a space for a coalyard. Running parallel and to the northward is a block of soldiers' dwellings, in which four rooms are allotted to twenty-eight men. Adjoining the north wall is a drill-shed, the size of which is 130 ft. by 30 ft. Ranging along the east side are blocks of buildings forming the married soldiers' quarters, &c., there being accommodation for twenty-three married soldiers and school in one block, while a second block of buildings at the back of this contains room for twelve more, and has also a laundry under the same roof. In the north-east corner is situate the hospital, with an infectious ward isolated from the main building. The officers' quarters, which stand at the opposite side of the entrance-gate to the keep, consist of buildings of a more pretentious character. Suites of rooms are arranged for eight officers and two field officers. The building, like the rest, is of red brick, relieved with artificial stone and white bricks. It has entrance porch, supported by Aberdeen marble pillars with carved Portland stone caps and bases. Several features about the internal fittings call for remark. The floors of the buildings are formed not of boarding, but of cast slabs of artificial stone, formed of Portland cement, ashes, and other ingredients. Flights of stairs have been cast in a single piece with the same material. The flights, it may be

added, are erected without any artificial support. The mess-room has a costly white marble mantlepiece, inlaid with majolica tiles of a passion-flower pattern. The works have been carried out by workmen employed by Government, under the direct supervision of Lieut. Elliot Wood, R.E., assisted by Sergeant-Major Snelling. The barracks are expected to accommodate about 300 men. The barracks will also form the head-quarters of the 2nd Surrey Militia when in training. It is worthy of notice that no fewer than four million bricks have been used in the works; these have been supplied by Mr. W. Wells, of Ryde's-hill. The Stoughton Estate, adjoining the barracks, has been purchased by various gentlemen, with a view to building. Mr. George Garnett has erected for Mr. W. Wells a large hotel, which was licensed in March last. He is at present erecting a mansion for Mr. Leake.

DISPUTE AS TO SUFFICIENCY OF BILLS OF QUANTITIES.

BULL AND SONS *v.* THE BOARD OF MANAGERS OF THE WEST LONDON SCHOOL DISTRICT.

VICE-CHANCELLOR Sir Richard Malins some short time ago decided this case, in which the plaintiffs were Messrs. Joseph Bull & Sons, of Southampton, who prayed that a contract entered into between them and the defendants, the Board of Management of the West London School District, in May, 1870, should be set aside, and that they should be entitled to receive from the Board, in lieu of the contract price, the fair value of the materials and works actually supplied and executed by them for the Board, together with interest thereon, at 5*l.* per cent. per annum from the time of the same being so supplied and executed.

It appeared that in February, 1870, the Board of Management advertised for tenders by builders for the erection of the then proposed schools at Ashford, in Middlesex. The plaintiffs answered the advertisement, and were supplied with bills of quantities for the intended works, and a form of tender. No specification had been then prepared, and the drawings from which the bills of quantities had been prepared were in the rough and in pencil. Some of these drawings, however, were seen by the plaintiffs at the office of the surveyors to the Board. In April, 1870, plaintiffs sent in a tender for the works, which was accepted by the Board, for a sum of 43,590*l.* according to the form supplied to the plaintiffs, and based on the bills of quantities furnished to them. In May, 1870, the contract was executed for the works, and plaintiffs were put in possession of the site. They had since completed the school buildings. Early in the progress of the works they were supplied with a specification, which was then signed by their firm. Questions, however, arose, and plaintiffs alleged that they subsequently discovered, as the fact was, that the specification specified work and materials to be done and supplied greatly in excess of the work and materials included in the bills of quantities, and in many instances of a more expensive quality, and not included at all in those bills; it was on the faith of the bills of quantities alone that they had undertaken the construction of the buildings. Plaintiffs did the works according to the more costly specification, and claimed to be paid, in addition to their tender under the contract, several thousands of pounds for their extra labour. The Board had offered to pay them for any extra work, according to the contract that might be fairly due to them; but the plaintiffs' case was that they were, under the circumstances, entitled to go behind the contract, so to say, in their estimate of what was to be paid to them, and they ultimately filed the bill in thissuit, praying for the relief already mentioned. The surveyors of the Board, who had been, but were not now, partners, appeared at the hearing by separate counsel; and there was a question whether they should be allowed separate sets of costs.

The Vice-Chancellor, having given the counsel for the various parties time to consider on what terms (if any) they could settle the question in dispute, ultimately made an order, by consent, that the matters should be referred to some skilled person, as arbitrator, to determine what amount should, beyond the original tender, and outside the contract, be paid by the Board of Management to the plaintiffs in respect and satisfaction of their demands in the suit. His lordship allowed the surveyors one set of costs only.

CASES UNDER THE BUILDING ACT.

RAILWAY COMPANIES' EXEMPTIONS.

AT Southwark, on the 30th of May, the London and South-Western Railway Company were summoned under the Metropolitan Building Act for having several houses in Agnes-street and Vine-street, adjoining their terminus in the Waterloo-road, in such a state as to be dangerous to the persons inhabiting them.

Mr. Napier, from the solicitor's department of the Metropolitan Board of Works, said that the houses in question were purchased by the railway company for the purpose of extending their station accommodation, for which they obtained a special Act of Parliament. The houses, however, had not been pulled down, but were inhabited by families who paid the rent to the company. Some of the houses, two stories high, were found to be from 8¼ in. to 12½ in. out of the perpendicular at the rear. The railway company, through their counsel, Mr. Bullen, contended that their houses were not in a dangerous state, and, it being the private property of the company, the Metropolitan Board of Works had no right to interfere with them. He also contended that the Act of Parliament protected them from such interference. A few days ago Mr. Partridge made an order upon the railway company to take down and otherwise secure the houses, as required by the Metropolitan Board of Works. Mr. Crombie, solicitor to the company, asked for and obtained a case.

"PICKING UP TOOLS."

AT the Westminster Police-court, Messrs. Peto Brothers, of Pimlico, builders, were summoned before Mr. Woolrych, by Richard Lawless, a bricklayer, for the sum of 9d., alleged to be due in lieu of an hour's notice, for "picking up tools."

Complainant said he had been engaged in the service of the defendants, and was told at five o'clock that he would not be required any longer, and he was to fetch his money. He claimed 9d., one hour's money, for "picking up" his tools, but was not paid, and hence the summons.

Mr. Woolrych asked if it was the custom of the trade?

Complainant said it was. He had as many tools to pick up and grind as others in the building trade.

The defendants' cashier said they never paid this claim in any house in the trade. The only money paid was to joiners for grinding money, and that was two hours. Besides, they always gave notice to these men, and notice had been given to the complainant.

The foreman proved that at a little after two he gave the complainant and his mate notice that at five they would not be wanted, and all the man had to "pick up" was a pair of lines and a trowel. He was discharged because he did not do enough work.

Mr. Woolrych was of opinion that this claim was unfounded, and was not a custom of the trade. He was also of opinion that notice had been given by the foreman. The summons would be dismissed.

LABOUR AND TRADE UNIONISM IN THE UNITED STATES.

THE report of the British Consul at New York furnishes some important details respecting the condition of the labour market in the Eastern States of the Union, and also of the position of trade unionism. A comparison is made between the wages last year and those current fifteen years before. Last year there was great commercial depression, employment was difficult to obtain, labour was abundant and far in excess of the demand for it, and skilled workmen in thousands were working as labourers at labourers' pay. The quotations, therefore, are only given as nominal. The following items are of interest:—

	1860. Dol. c.	1875. Dol. c.
Foreman of blacksmiths	2 50 ...	4 00
Blacksmiths	1 50 ...	2 65
Foreman in foundry	3 00 ...	5 45
Foreman of brass-founders	3 00 ...	3 20
Brass-founders	2 50 ...	3 00
Foreman of pattern-makers	2 50 ...	3 75
Pattern-makers	1 75 ...	3 00
Wood-workers.....	1 60 ...	2 18
Painters	1 40 ...	2 30
Labourers	0 95 ...	1 25
Ordinary workmen, U.S. armoury	2 00 ...	3 00

Domestic servants receive now from $2 50c. to $4 50c. a week, the common domestic getting about $3; cooks of skill, $4 and $5. In 1860 the rate was $1 50c. to $2, running rarely to $2 50c. The general average of advance, which must, as the Consul enforces, be taken in connexion with the difficulty of getting employment on any terms, shows wages to be 52 per cent. higher than in 1860. In cotton work the increase was 50 per cent.; in woollen, 65 per cent.; in iron and wood, 64 per cent.

Turning to the subject of trade unionism, it appears that the unions number about one-third of their total strength in 1873. The building trades societies had suffered especially in loss of members, dwindling down from 10,000 to only 3,000. Altogether the unions in 1873 number 48,180 members; this year they contain less than 18,000, of which 3,000 are out of employment. Of workmen outside of trade organisations it is estimated that out of a probable 58,000 two-fifths were idle at the beginning of the year.

LONDON SCHOOL BOARD.

FOUR new schools have been publicly opened by Sir E. H. Currie, vice-chairman of the Board, within the last few weeks. The first at Wandsworth, on the road to Tooting, which consists of two separate buildings, one for infants, the other for boys and girls, with spacious playgrounds between. The accommodation is for 607 children, and the contract price was 5,473*l.* Mr. Pritchard, of Finsbury, was the builder; and Mr. Hall, clerk of works. The next was at Bermondsey, in the Neckinger-road, the accommodation being for 872 children. The infants are placed in a one-storied building, that for the boys and girls being of three, the ground-floor forming a covered playground. The elevation is relieved with some good carving in red brick by M'Culloch. The cost of the site was 4,008*l.* 2s., and of the building 8,378*l.* 10s. 1d. The builder was Mr. Jerrard, of Lewisham, Mr. Carter being the clerk of works. The third school is situated in the Knapp-road, Bromley-by-Bow, near the central gasworks, and consists of a three-storied building, standing in ample playgrounds. The ground floor has one large schoolroom and two class-rooms for infants, the first and second floors, for boys and girls respectively, having two schools and two class-rooms with double staircases and exterior covered corridors to each. The number of children is 841, and the cost as follows:—Site, 2,620*l.* 13s. 10d.; building, 7,362*l.* 14s. 3d.; or equal to a total cost of 8*l.* 15s. 1d. per head. The contractor was Mr. Nightingale, of Vauxhall, and the clerk of works Mr. Tester. The other school is placed in Regent-street, Deptford, and of this we gave particulars lately. The accommodation is for 832 children, the cost of the site being 3,810*l.* 15s. 9d., and of the building, 7,516*l.* 9s. 4d. All of these schools are in the Queen Anne style of architecture, from the designs of the Board architect, Mr. E. R. Robson. At each of the three latter openings a musical performance was given by some of the Board teachers in the neighbourhood, under the direction of Mr. E. Sibson.

SCHOOL BOARD SCHOOLS.

Ashey (Isle of Wight).—The new school recently erected by Messrs. Jenkins, from the design of Mr. Francis Newman, for the School Board of the United district of Ryde, was formally opened on the 19th ult. by the Chairman of the Board (Mr. Thomas Dashwood, J.P.).

Peterhead.— The Peterhead Burgh School Board have accepted the following tenders for the work in connexion with the proposed new schools to be erected in King-street:—Carpenter work, Mr. David Fraser, Peterhead, 540*l.*; plasterer work, Mr. W. Stuart, Peterhead, 119*l.* 10s.; slater work, Mr. Wm. Simpson, Peterhead, 169*l.* 7s.; plumber work, Mr. John Ferguson, Peterhead, 110*l.* 8s. 4d.; mason work, Mr. Wm. Stuart, jun., Peterhead, 1,578*l.*; and blacksmith work, Mr. Wm. Fowler, 89*l.*

Hemel Hempstead.—At a meeting of the Hemel Hempstead School Board, on the 15th ult., Mr. Robinson (of the firm of Cave & Robinson, architects) attended the Board, and was informed that their plans for the schools for Piccot's End and Bury Mill End were accepted; and Mr. Ladds, architect, of Chapel-street, Bedford-row, London, was informed that his plan was accepted for the school at Boxmoor.

North Shields. — The new Eastern Board schools, situate in East Percy-street, North Shields, were opened by Alderman Green, the chairman of the Tynemouth School Board, on the 12th ult. The schools are divided into three departments, affording accommodation for 250 boys, 250 girls, and 280 infants,—total, 780 children, and in general arrangement of plan may be likened to the letter E, the northern arm of the letter being occupied by the girls, the southern arm by the boys, and the centre by the infants. There are two entrances,—one for boys, and the other for girls and infants. The style is Tudor, the walls being of snecked stone rubble work, with ashlar dressings. The corridors are lined with white glazed brick, and floored with cement, and the whole of the woodwork is varnished. The various rooms are heated by open fires, Boyd's hygeistic grate being used to ensure the emission and circulation of heated, fresh, and pure air. Ventilation is provided for by the use of Hill & Hey's Excelsior syphon ventilators. The contract for the whole of the works was let to Mr. Joseph Elliot, of North Shields; the internal fittings have been supplied by Messrs. Colman & Glendinning, of Norwich; and the work has been carried out from the designs and under the superintendence of the architect to the Board, Mr. F. R. N. Haswell, of North Shields, Mr. Hartman being the clerk of works. The total cost is about 20,000*l.*

Northowram.—At a meeting of the Northowram School Board on the 13th ult., the chairman moved that Mr. R. Horsfall, architect, Halifax, be engaged to prepare plans and superintend the erection of Catherine Slack school and master's house. This was seconded by Mr. Bates. Mr. Wormald moved that Mr. William Henry Haworth

be the architect, and Mr. Sunderland proposed Messrs. Jackson & Fox; but as neither of these two amendments was seconded, the original motion was carried by three to one.

Normanton.—On the 27th ult. the foundation-stones of new schools at Woodhouse, for the Normanton School Board, were laid. The buildings have been designed by and will be erected under the supervision of Mr. William Watson, of Wakefield, and consist of three separate and distinct departments. They will accommodate 500 children, and are planned to form three sides of a square. The main front is towards the high road leading from Normanton to Wakefield, on which abut the two principal entrances to the schools; on the one hand that for the girls and infants, and on the other that for the boys. The central, or infant school-room, is 54 ft. long by 26 ft. wide; the class-rooms are 26 ft. by 18 ft.; and running back are the boys' and girls' schools, 40 ft. by 20 ft. each; and classrooms, 20 ft. by 18 ft. The design is Romanesque. The school will be built with the best pressed red brick, and with Huddersfield hard-stone facings. The contract for the entire work has been taken by Mr. Henry Gibson, of Normanton, for 4,420*l.*

SCHOOL-BUILDING NEWS.

Holdenby.—A new national school was opened at Holdenby, on the 13th ult. It has been built from designs by Messrs. Carpenter, of London. It has a high-pitched roof, Gothic flat-headed windows, with tracery, two high chimneys, and a porch. The building is divided by partitions, so that part of it can be used as a class-room. It measures, without the porch, 42 ft. in length and 18 ft. in width. The roof inside is open-timbered, plastered between the rafters.

Codford St. Mary.—A new national school was opened at Codford St. Mary, near Salisbury, on the 15th ult. Accommodation is provided for about seventy children, the principal room being 22 ft. 10 in. by 17 ft., and the class-room 13 ft. by 17 ft. The material used is Westbury brick, and the roof is composed of dun-coloured Bridgwater tiles of a special pattern. The rooms are fitted with Penfold's warming and ventilating grates. Moule's earth-closet system has been introduced. The cost was between 500*l.* and 600*l.* The architect was Mr. E. H. Lingen Barker, of Hereford; and the builder, Mr. Gaisford, of Warminster.

Dean (Bedfordshire).—On the 8th ult., the new National School of this village was formally opened by Mr. J. W. Rawson-Ackroyd, who gave the site, and was the principal subscriber. The total cost, including fittings, will not be short of 580*l.* The school is of pale brick, with Bath stone dressings; the weatherings and set-offs being in brick of a deep red. The style is Tudor. The building consists of one large room, with a coved, panelled ceiling, the cornice and moulded ribs being stained of a darker colour than the panelling. This room will be divided by a rod and curtain, for school purposes, into two apartments. The architect is Mr. W. Lewis Baker, of Hargrave, Northants. The contractors were Messrs. Smith & Son, of Raunds. The ironwork of the benches and desks was supplied from the foundry of Messrs. L. Baker & Co., of Hargrave.

Gloucester. — The St. Catherine's Schools, Gloucester, were opened on the 15th ult. The building consists of a boys' and girls' room, 60 ft. by 20 ft., and an infants' room, 20 ft. by 18 ft., each approached by separate entrances, with porches; the porch of the infant school, however, has direct communication with both the rooms. They have lofty open-timbered roofs, with ample means of ventilation. The fireplaces are open, and the floors are boarded. The style and material of the schoolrooms harmonise with the church. Messrs. Medland & Son are the architects, and Mr. W. Fream, jun., the builder. As the site occupied a low position, and was liable to floods, it has been raised 4 ft. and 5 ft., the ground having been made level with the churchyard, and in parts planted with shrubs. There is ample space surrounding the schoolrooms, which will be available for playgrounds. The cost has been 1,000*l.*, exclusive of land.

Edgbaston.—At a meeting of the shareholders of the Edgbaston High School for girls, the council reported that a house in Hagley-road had been purchased for the sum of 3,500*l.*, and they had obtained possession of the premises. In order that the school might be opened at the earliest possible period the council had ventured to obtain from the architects, Messrs. Martin & Chamberlain, a plan for adapting the premises for the purposes of the school. This plan had been approved, and a specification placed in the hands of three builders.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

SIR,—On the 4th inst. I went to the Loan Collection at South Kensington, to hear Mr. J. Bonomi explain the measuring instrument which he has invented, and which I have taken the liberty of calling the Anthropometer. I regretted there were not more persons present on the occasion. It is astonishing how slow the English are to perceive the importance of anything new.

There is no knowing what a judicious use of this anthropometer might reveal to us by yielding a series of measurements of the human frame. Its testimony might either confirm or upset the theory of progressive development. Let me explain. I was myself measured by it, but the measurement from tip to tip of my fingers, with outstretched arms, was not exactly the same as that of my stature. I did not exhibit that squareness insisted upon by Vitruvius by several eighths of an inch. But the width, measured in the same way across the arms of the two persons who passed under the anthropometer after me, far exceeded their stature. The following questions then occurred to me:—

1. Does an exceeding length of arm indicate a closer relationship to the Simian type?

2. Does the equality between the measurement of the outstretched arms and the stature indicate a balanced intellectual and physical constitution?

3. Does shortness of arm occur in over-brained persons?

4. Do the uncivilised races exhibit great length of arm?

You will, sir, I think, allow that these are important questions for determination, and Mr. Bonomi ought not merely to register the dimensions of the persons he measures, but their trades and professions, and, when eminent, also their names.

There is another service which the anthropometer could render us. It is high time that we should determine the normal proportions of an Englishman; and should the canon of Vitruvius not be verified by that determination, it should at once be cast aside. The eminent lecturer on anatomy at the Royal Academy, Dr. John Marshall, has it in his power to utilise the anthropometer, and to add by its means another to his scientific laurels.

METER.

CONTRIBUTIONS FOR ANNUAL OUTINGS.

SIR,—Your correspondent "A. S." has done wisely in calling attention to this subject. The company I represent employs about 300 men, and contributes to the fund for the annual holiday, or "bean feast," on the distinct understanding that the manufacturers, tradesmen, and others are not solicited for subscriptions. If the latter persons were to send on to the employers any applications received from workmen, the nuisance would soon cease.

J. M.

From enclosed circular, dated 22nd May, the editor of the *Builder* will see that the principal houses in the iron trade have already taken steps to check the further growth of a tax which is now demanded with confident assurance or humble solicitation, in either case most derogatory to the independence of English artisans. If employers would discourage these appeals, *employés* would soon find more agreeable and manly methods of raising funds for their annual outings.

M.

FAIR MEASURE.

SIR,—Will you kindly spare a small space in your valuable columns for the suggestion measure for measure, which I think has long since been lost sight of among the many supporters of your paper? It is well known that a builder's rod is 272 ft., nor is he spared if it be any less; but too often quantities delivered are much less than their proper measure. It has been the custom of lime merchants long since to deliver lime in sacks at the works of builders, and supposed to be for their convenience, and frequently seven sacks comprise the yard. Now, should these sacks be imperial ones, and contain 3 85 of a yard, there would be no reason to doubt the lime merchant's consideration for the builder for so delivering the same; but when the sack measures 3 ft. 6 in. by 44 in. in girth, it is quite clear that there are not 27 cubic feet in seven sacks, and the so-called yard is a mere delusion; and to prevent any further delusion I beg to offer this suggestion. Suppose the sack be 48 in. in girth and 3 ft. 10½ in. in height, seven will then hold the yard; or if a box, 1 ft. 3 in. by 1 ft. 3 in. and 2 ft. 2 in. in height, be kept on the works, I see no difficulty in turning the sack's contents each time into the box, which will give one-eighth of a yard when filled, and spare the yard measure, which is frequently too bulky to find space for. It is quite certain there is no reason why 27 cubic feet should not be served to the yard, as well as 272 ft. to the rod. If this suggestion be carried out, I feel persuaded that builders will not be "sacked" any longer, but look to their yards, and have measure for measure.

J. ROBSON.

THE SLADE PROFESSORSHIP, LONDON UNIVERSITY.

SIR,—I think you will be sorry to hear that they have elected M. Legros, a Gascon, who cannot speak English, who has deserted his own country, whose painting and drawing are eccentric, and who has never shown that he is a master of the theory of art, or that he can lecture. The Slade Professorships are now filled by two amateurs and a foreigner. Could this be in any other country? In blinking the wrong of these things, art and the country are injured.

There is an affected jargon about art being cosmopolitan. Are not all the professions cosmopolitan in the same sense? But let the council of the same college propose to elect a French Professor of Medicine, and what would be the result? To be cosmopolitan in the true sense would be to elect a foreigner if there were no Englishman fit for the post. As you know, there was, at any rate, one thoroughly fitting candidate.

SHADE OF SLADE.

SURVEYORS AND LOCAL BOARDS.

SIR,—"One of the Craft, &c.," seems much put out because Local Boards and their surveyors do the duty assigned to them. At the same time he, I think, should have refrained fr m heaping abuse upon his brethren who are in office, and whom he appears to accuse of "borrowing" the efforts of his brain.

Much has been said lately about the deposit of plans, and more about the deposit of elevations.

I am aware that this latter entails a little more trouble on the part of the architects (but for which they can fairly charge their clients); the submitters of drawings, however, must be treated impartially, and in many cases it is quite necessary to study the elevations, in order to see that all the requirements of the Act and bye-laws have been complied with.

Were an experienced architect (as I take "One of the Craft" to be) employed on all occasions, this, perhaps, would not be necessary; but I can assure him that very odd arrangements are sometimes presented for approval by builders, amateurs, and others, which could not be understood without elevations.

As to drawings deposited being used, I doubt if there ever really was such a robbery perpetrated. In my district the tracings (on linen or paper) are examined numbered, submitted to Board, passed (or otherwise), and filed away, to be looked at again when notice is given of the completion of the structure, when, if all is right, I give a certificate that the house, &c., is fit for habitation, and the drawings are seen no more.

I have held an appointment under the Local Government Acts for ten years, and have also been in private practice for over twenty years, but I certainly have never been asked to work for members of the Board for "next to nothing," or for anything less than the usual professional charges. It is true mine is not a "rough district," still I expect the members of my Board are a fair sample.

All Local Boards have bye-laws, which are printed, and may be had for the asking. If my friend will carefully comply with these, give the proper notices, and conform to the Public Health Act of 1875, he will have nothing to fear; and if, after having done so, he has his plans returned, he will be at liberty to proceed with the work, and no judge will decide against him.

MEM. M. E. & S. ASSOC.

SALT IN SAND.

SIR,—In reply to "I. O. U.'s" inquiry in your last week's issue,—"Shake up a portion of the sand with pure distilled water in a perfectly clean stoppered bottle, and allow the sand to settle; add a few drops of pure nitric acid, and then a few drops of solution of nitrate of silver. A white precipitate indicates a tolerable amount of salt. A faint cloudiness may be disregarded."

It is only fair for me to state that I have made the foregoing extract, as some of your readers will know, from Mr. G. G. Hoskins's book, "The Clerk of Works," just published.

C. O. I.

To detect salt in sand,—Taste it.

SETTLED.

Hawick Archæological Society.—The June meeting of this society was held on the 27th ult., Mr. Robert Murray in the chair, when a paper was read by Mr. D. Watson, secretary, entitled "Notes of an Excursion to Hexham and the Roman Wall."

THE ATKINSON ART GALLERY COMPETITION, SOUTHPORT.

COMPLAINTS reach us as to this matter. Mr. William Atkinson, of Southport, having offered to the town 6,000*l.* for the erection of a Library and Art Gallery, competition was invited, and a number of designs were sent in, the expenditure being limited to the sum named. The committee selected a design by Messrs. Waddington & Son, and on inquiry found that to carry it out would cost 8,000*l.* After some endeavours to reduce the cost, Mr. Atkinson again came forward and increased his gift to that amount. The contention, of course, is that by this mode of proceeding great injustice has been done to those competitors who restricted their expenditure to the sum originally named.

The style of the selected design is described as Composite Italian. A central composition, with coupled turrets, has been inserted to relieve the severe line of the parapets required to hide the gallery skylights. The pediment will contain an allegorical group of figures, with medallion of "Inspiration" over the door. The side and back elevations are finished in brick, relieved by stone dressings. The internal treatment generally is of a plain substantial character. The general reading-room is to the left, as needing most light. As it is intended as a lecture-room, it has been designed as large as circumstances would permit, averaging 63 ft. by 24 ft. It will be lighted from two sides, the darker portion being assisted from the area. The general library (inclusive of screened passage, over which is a book platform) is 44 ft. by 25 ft. 9 in. The reference library and reading-room is 53 ft. by 24 ft. The news-room is placed next the entrance, and is 39 ft. by 24 ft., having glazed screen, in order that the attendants at the general counter may see when their services are required.

The first-floor plan of the art gallery provides main picture gallery, 67 ft. 6 in. by 26 ft. 9 in., and two other galleries, each 44 ft. 9 in. by 25 ft. 9 in. Two galleries are also provided for sculpture casts, reliefs, &c., each 21 ft. 9 in. by 18 ft. All these rooms are lighted from the roof.

CHURCH-BUILDING NEWS.

Atherstone.—The new church at Atherstone-on-Stour, near Stratford-on-Avon, has been opened by the Bishop of Worcester. The church replaces a dilapidated structure, which, although possessing some features of interest, had fallen into such decay that restoration was entirely out of the question, the area of the old structure being insufficient for the required accommodation. The new church, which is built as nearly as possible upon the site of the old one, consists of nave, chancel, with vestry on the north side, and porch, with tower and steeple over, at the south-west corner of the nave. The style is Decorated Gothic, harmonising with several features of the old church in the shape of windows and a door that have been retained and embodied in the new work. The walls are of Whimpstone stone, lined with brick and plastered internally. The dressings of the doors and windows, and the spire, tracery, and ornamental portions, are of Bath and Campden stone. The roof is open-timbered, the principals having curved ribs, and springing from moulded and carved corbels, the woodwork throughout being suitably stained. The roofs, which are plastered and coloured between the rafters, are covered with slating of a sea-green tint. The three bells from the old church have been rehung in new framework in the new tower, at a cost of about 50*l.*, by Messrs. Barwell, of Birmingham. The work has been carried out under the architect's supervision by Messrs. Collins & Cullis, of Tewkesbury, at a cost of about 1,700*l.*, Mr. Holland acting throughout as their foreman. The architect was Mr. John Cotton, Birmingham.

Tudely.—The ancient church of Tudely has been re-opened, after being closed for a twelvemonth for restoration. The interior arrangements of the church have been entirely altered, the west gallery alone being retained. A new north aisle has been added, and, as well as the rest of the church, has been filled with open seats, to replace the old and unsightly pews. Four windows have been placed in the new aisle, filled with cathedral glass. The chancel arch has been cut back, and the chancel itself raised many feet. A new east window has been added, and four small stone windows have been restored, which are shortly to be filled with glass. The restoration has been carried out under the superintendence of Mr. R. Medley Fulford, architect, Exeter.

Uplyme.—The parish church of Uplyme, which picturesquely stands upon a knoll at the entrance to the village, situated upon the borders of Devon and about a mile from Lyme Regis, having been restored, has been re-opened. The restoration has been confined to the interior. The church consists of nave, chancel, north aisle, and a chapel on the north of the chancel, known as the Ware Chapel, now used as an organ chamber. There is a porch on the south side of the nave. Formerly a gallery ran across the western end of the nave, blocking up the west window and door. This gallery has been removed, a new west window constructed, and the doorway thrown open. The gallery in the north aisle has not been removed, the accommodation not being sufficient without it. The nave has been filled with seats of pitch pine, with a flooring of tile. New choir stalls have been added in the chancel, but the old carved oak stalls remain. The screen dividing the chancel and nave has (says a local journal) been "lightened," and the stone hammer-dressed. Alterations have been made in the centre panel of the reredos, which has been "touched up." The bells—six in number—have been re-hung by Messrs. Hooker & Stokes, of Woodbury. The restoration has been carried out by Mr. Lockyer, of Uplyme, from plans prepared by Mr. Bather, architect, Shrewsbury. The cost is about 750*l.*

St. Nicholas-at-Wade (*Thanet*).—The work of restoring the parish church has been commenced. All the high pews have been removed, and are to be replaced by benches of the modern style. Some of the memorial stones in the nave, one with a brass of the Emptage family, dated 1642, are to remain. The tower of the church is 75 ft. high, and commands a fine land and sea view, and contains a fine peal of bells. The arches in the nave are of two different dates—the south Early Norman, the north Pointed, or Early English.

Books Received.

Sanitary Work in Villages and Country Districts. By GEORGE WILSON, M.D. London: Churchill. 1876.

THIS is a reprint with enlargements of a paper by Dr. Wilson, read before the Society of Medical Officers of Health at the beginning of the year. If largely circulated amongst proprietors and occupants in the country, it would do good by suggesting what they should look for and seek to improve. Some of our valued friends, the doctors, seem (by the way) to be strangely ignorant, or to desire to seem ignorant, of the length of time during which existing sanitary evils have been pointed out by ourselves and others.

A Manual of Design: compiled from the Writings and Addresses of Richard Redgrave, R.A., &c., &c. By GILBERT R. REDGRAVE. Chapman & Hall.

WHATEVER be the merits of this treatise or compilation, there can be no doubt that its title is incorrect. A manual of design, if words mean anything, implies a book teaching the art of designing; that is, of drawing, more or less, or giving examples of the leading schools of design and their chief characteristics. Designing is not talking, but drawing; but here is a book calling itself a manual of design, in which there is scarcely a stroke of drawing, only two or three stray illustrations of objects referred to. If it had been called "Thoughts on the Principles of Design," it would have been all right; as it is, the title is totally misleading.

We do not know that we have any fault, however, to find with the volume, further than professing to be what it is not. The editor tells us in the preface that it was proposed to him by the Lords of the Committee of Council on Education that a compilation from his father's numerous addresses on Art at South Kensington, chiefly on the occasion of presenting prizes and medals to the students, should form one of the South Kensington Handbooks; and no one will quarrel either with their lordships for wishing to put in a permanent form the criticism and advice of a thoughtful and cultivated man in regard to the matters specially entrusted to his oversight, or with Mr. Gilbert Redgrave for the interest and satisfaction which he must naturally have felt in undertaking such a task on such recommendation. The book takes the form of chapters or lectures, as they might be termed, on principles of ornamental art, grouped under three heads: Six chapters on "The Principles of Ornament"; five on the application of these principles to manufactures; and two on "The Teaching of Ornament, and the education of the Designer." Of the opinions and principles laid down it may be said that they are nearly unimpeachable; it cannot be denied, however, that a great deal of this correct principle has been repeated and repeated, sometimes in nearly the same words, till it tends to become mere common-place. At the same time we must consider Mr. Redgrave's remarks in connexion with the date and the place at which they were spoken, when some things which now appear hackneyed may have seemed less so; and they are certainly more true in taste, better expressed, and far less pretentious, than some utterances which have come from the regions of South Kensington. Among remarks which are more out of the beaten track, we notice some observations in the first chapter on the pervading love and desire for ornament among the French lower and middle classes as by no means necessarily evincing the prevalence of a true taste; as proceeding rather from a desire to have in their own homes, if possible, something of the glitter and brilliancy of the places of public amusement, which in turn have taken their cue from, and try to vie with, the style of the palaces and other national buildings of Paris. The flat system of dwelling-houses, too, renders possible a greater degree of decorative treatment without proportionate expense to the tenant than is the case with us. But the art employed for this purpose is gaudy and brilliant rather than tasteful and homelike. It is the national taste, but a taste may be national without being pure or good. The chapter on "the source of style" contains a good deal that is suggestive; and in referring to Japanese art we are glad to see Mr. Redgrave had the courage (for it almost requires courage at present) to say that the absence of symmetry in this art, however piquant and interesting at first and as a novelty, is felt in the end to be an error in principle. In the following chapter, on "Elements of Style arising out of construction," the degree in which the faults of bad styles arise out of false construction is duly brought out; and the short chapter on "Fitness of Ornament to the Material to which it is applied" includes enough of important truth to make in itself a radical change in a large proportion of our ornamantal manufacture, were the principles laid down here understood and carried out by the designers and manufacturers of decorative articles or materials.

In the chapter on the decoration of buildings, which comes under the second general division, we are fully in sympathy with what is said as to what Mr. Redgrave called "the *appliqué* work of the plasterer and decorator," part of the remarks on which we may quote as a specimen of the tone and style of the book:—

"A cornice so many inches in depth is found to be needed, and from a well-filled storehouse of such works in every style the plasterer, disregarding every other consideration, seeks the pattern which most readily complies with the necessary conditions of depth and projection. A centre flower for the ceiling, so many feet in diameter, is the next requisite, and, the labours of the plasterer at an end, the decorator and the upholsterer step in, and the former touches up his work with colour, applied with no regard to relative fitness and appropriate gradation, while the upholsterer sends in the hangings and furniture suited to another country and another age. Scale seems to have been quite disregarded in the work of the plasterer, since the fruit and flowers, the birds and game of one part, are different in size from those of another part. The style, again, is mixed, one part being two centuries earlier than the other. There is, besides, far more pains taken with the exact rendering of fur or a feather, than in perfecting the form of a moulding, or the shape of a panel. The architecture has, in the designer's mind, been subordinate to the ornament, and an ill-formed ellipse, or a coarse and unrefined moulding, appears of less importance to him than the mere imitation of the feathers of his birds or the fur of the animals of which his ornament consists. Carry this treatment a little further, and it will result in having the game, the fruit, the foliage, and the flowers not only modelled to the exactest imitation, but the skill of the painter called in to add to its naturalism, and the whole painted with the colours of nature: thus decoration will be thought perfect only when it competes with that strange group in relief we sometimes find framed to form a picture."

The remarks on the right principles of stained glass, in the same chapter, embody in a clear form what we have repeatedly urged here as to the necessity for a flat and conventionalised treatment, and the undesirability of a pictorial style in this art; and we call attention to some comments (p. 127) on the preference given, in much modern silver work, to mere glitter and finish

of the material rather than artistic design, "objects being loaded with toolings and burnishings, and matted and frosted, and every other expedient attempted, to show the silver rather than exhibit the art." This, undoubtedly, is true, and is what gives a great deal of vulgarity of manner and style to silversmith's work; but, on the other hand, it must not be forgotten that design carried out in any specially costly and beautiful material ought to exhibit its special beauties as a material, although not so prominently as to put the artistic interest in the background.

The two concluding chapters on education are thoroughly sound in principle, and contain some speciality in the way of putting things, and in the main we may see that for good taste and true critical sense this compilation from Mr. Redgrave's addresses is quite irreproachable as far as it goes.

VARIORUM.

THE current number of the *Popular Science Review* includes an interesting and valuable article on "Aquaria: their Present, Past, and Future," by Mr. W. A. Lloyd, of the Crystal Palace Aquarium. The writer says in conclusion:—"There are few things more trying to that great virtue,—patience,—than a large public aquarium, especially in its preparation, before it is ready for the reception of animals. It is to this lack of patience on the part of the directors of the Royal Westminster Aquarium, and to their absolute refusal to allow me to have proper engineering assistance during its construction, and to general mismanagement, that its present confused state, and its unsatisfactory condition in every way, is due. On this account I resigned my post of adviser to the society, as I found it useless to advise when advice was recklessly disregarded. Aquarium work, being hydraulic engineering on a small scale, is essentially the work of an engineer, and not that of an architect, unless he is also an engineer and a mathematician. There is for aquaria a great and important future, both as regards their influence on science, and as pecuniary speculations, if indeed, as I much doubt, there can be any real severing of these two interests. Success, however, must always be the result of a careful study and representation of what nature does, and of a strict avoidance of the recent heresies to which I have in this communication adverted."——"Old and New London" is getting on fast to an end. Here is a sentence from the current number as to *Hyde Park*:—"In remote ages the tract of land now enclosed as Hyde Park was bounded on the north by the Via Trinobantina,—one of the great military roads,—now identified with Oxford-street and the Uxbridge-road. On the east ran another Roman way, the old Watling-street which crossed the other at Tyburn, and sloped off to the south-east, in the direction of Park-lane. On the west and south its limits were not equally well defined. Under the Saxon kings, it would appear that the Manor of Eia, of which it formed a part, belonged to the Master of the Horse; and Mr. Larwood most appropriately observes, 'Could the shade of that old Saxon revisit the land which he held when in the flesh, no doubt he would be satisfied, for nowhere in the world could he now find finer horses and better riders than those we daily see in Rotten-row.'"——Looking through the current No. of Cassell's "Technical Educator" (amongst a pile of other useful serials from that firm), we find a reminder as to the Menai Suspension Bridge:—"The most stupendous undertaking in which Telford was engaged, and perhaps the most imperishable monument of engineering fame, is the Menai Suspension Bridge over the Menai Strait, one of the most magnificent works in the world. It was full time that some such means of crossing the strait were constructed, as between the years 1661 and 1842, no less than 180 persons had been drowned at the Ferry of Moel-y-don. So early as 1810 more than one design for a bridge had been designed, and rejected as impracticable; and it was not until the completion of the great Holyhead road by Telford that he saw the absolute necessity of devising some safe means of crossing. He selected a spot called Ynys-y-moch, where the bold and rocky shores on each side gave opportunities for a lofty roadway, which was carried 100 ft. above high-water mark, so as to allow vessels of the largest size to pass underneath. It is difficult for the eye to estimate the colossal proportions of this wonderful bridge in the air, and it is only after attentively observing the vehicles and human figures crossing it, and looking in the distance through the high trellis-work of iron like flies in the web of a spider, or sparrows fluttering in a net, that it is fully appreciated. A sensible vibration is produced by the passage of a vehicle, or even a man and horse; but it has withstood the greatest storms of wind almost without injury. The weight which the chains support is calculated at 489 tons, and that which they are capable of supporting at 2,016 tons, leaving the available power of 1,520 tons to resist the unusual strain. The total cost of its construction was 120,000*l*. The masonry is of hard limestone from Penmaen, in Anglesea."

Miscellanea.

Importance of Architects.—There is a story on record of an architect repudiating any connexion with the building fraternity, in the case of the late eminent Mr. Alexander, architect of Rochester Bridge and other fine buildings in Kent. He was under cross-examination in a special jury cause at Maidstone, by Sergeant—afterwards Baron—Garrow, who wished to detract from the weight of his testimony, and after asking him what was his name, proceeded:—"You are a builder, I believe?"—"No, sir, I am not a builder. I am an architect."—"They are much the same, I suppose?"—"I beg your pardon, sir, I cannot admit that; I consider them to be totally different."—"Oh, indeed; perhaps you will state where this great difference consists."—"An architect, sir, prepares the plans, conceives the design, draws out the specifications—in short, supplies the mind; the builder is merely the bricklayer or the carpenter—the builder, in fact, is the machine; the architect the power that puts the machine together, and sets it going."—"Oh, very well, Mr. Architect, that will do. And now, after your very ingenious distinction without a difference, perhaps you can inform the Court who was the architect of the Tower of Babel?" And now mark the reply, which for promptness and wit is not to be rivalled in the whole history of rejoinder:—"There was no architect, sir,—and hence the confusion!"—*Extract from a Letter by the Rev. J. Jessopp.*

A Legal Refinement.—According to the decision of Mr. T. K. Kingdon, the judge of the Bristol Tolzey Court, machinery used in woodworking is not mill-gearing within the meaning of the Factory Acts. The case of Wilson *v.* Brown was brought under the Factory Acts of 1844 and 1856. The plaintiff, Edwin Eland Wilson, brought the action by his next friend, Charles Henry Wilson (he being legally an infant), against Archibald Douglas Brown. The defendant carried on the business of a cabinet-maker, in Bread-street, Bristol, having about sixty persons in his employ, and the plaintiff was apprenticed to him. The action was brought to recover damages in consequence of an accident which occurred June 16, 1875, whereby the plaintiff's arm was so injured that it had to be amputated. Damages were laid at 200*l*., but it was agreed between the parties that in case a verdict was given for the plaintiff, the amount of damage should be 100*l*. For the defendant it was submitted that the plaintiff was not entitled to recover in the action, inasmuch as the machinery was not, in any sense of the term, mill-gearing within the meaning of the Act. The judge thought this contention was right: that the machinery in question was not mill-gearing within the meaning of the section; and that, if it were mill-gearing, there could be no exemption, and that it must be fenced. The plaintiff was accordingly nonsuited.

The Devonshire Baths, Eastbourne.—The directors of these baths, with a view to giving even better accommodation to the public, have recently carried out extensive alterations and enlargements. The most important alteration consists of the work done at the swimming-baths. The gentlemen's bath, which, as first constructed, was of a total length of 60 ft., and a width of 30 ft., has been increased in length to 155 ft. The ladies' bath has been increased from 57 ft. to 120 ft., with a width of 24 ft., these lengths being not from wall to wall, but the surface of the water, and to each are added two shower-baths of fresh water, a life-buoy, and other apparatus necessary for saving life. The whole of the works have been carried out by Messrs. Wallis & Co., Mr. G. A. Wallis being the engineer in charge.

Curious Wages Case.—On the 24th ult., at the County Petty Sessions, Warwick, Samuel Borton, labourer, of the Commercial Buildings, sued Mr. G. F. Smith, builder and contractor, Milverton, for 1*l*. 8*s*. 9*d*., wages due. Mr. R. C. Heath defended. The defendant is the contractor for the Haseley Waterworks under the Town Council, and the complainant was working for him up to the 17th ult., when he went to receive his money along with the other men. The wages are paid through a small window, and the workmen are all called up, not by their names, but by numbers. The complainant's number was "12," and his statement was to the effect that he heard 11 called up, and 13, but that 12 was missed. After all the men had been paid he went to the window and stated that he had not received his wages, but defendant referred to the pay-sheet, and finding that 12 was crossed off he refused to pay again, on the ground that complainant ought to have presented himself at the window so that it could have been found out who had his money. Defendant affirmed that the money was paid, and said that the number 12 was called out. The Bench dismissed the case.

The Warwick Military Depôt.—The new barracks and other buildings which are to form the new Military Depôt at Warwick are nearing completion. They are situated in the parish of Budbrooke, about two miles from Warwick. The site was purchased from Lord Dormer by the Government, and on the 3rd of August, 1874, the works were commenced by Messrs. J. & T. Davis, of Banbury, whose contract amounted to above 40,000*l*. The various buildings have been erected on the four sides of an open space of ground, which will form the parade when laid out. Already the soldiers' quarters, the canteen, drill-shed, married soldiers' quarters, hospital, infection ward, officers' quarters, quartermaster's quarters, and the guard-room have been put up, and the armoury is up to the first-floor level. The structures are all of red brick, with bands of blue brick, and dressings of stone. The only attempt at ornamentation is in the officers' quarters, the material of which is the same as that used in the other edifices. The barracks will accommodate about 300 men, and it is expected that they will be so far finished as to admit of their being occupied by the end of next month.

"An Unhealthy Area."—According to the *Staffordshire Advertiser*, there is "ample scope and verge enough" for the application of the Artisans' Dwellings Act to Netherton. That that is "an unhealthy area" of the borough of Dudley, inspectors, Government and local, abundantly testify. The Local Government Board have called upon the town council, as the sanitary authority, to remove the dwellings *en masse* as unfit for human habitation. The local inspectors say it is impossible to purify them, medical men testify that good health cannot be enjoyed in such bad places, and the ministers of morality and religion declare that mental and moral degradation must needs go hand-in-hand with such material ruin. But the soil is rich in coal and ironstone, and the Earl of Dudley, the owner, has informed the town council that he does not feel called upon to surrender the right to work the mines. As building new dwellings while the mines are reserved appears to be out of the question, the town council have sought the advice of the Local Government Board.

Sewage Experiments at Aston.—Mr. D. A. Wilks has patented a method of treating sewage by which he proposes to filter a disinfectant composition, which turns the solid fæces into a manure, and decomposes the liquid matter for after-treatment. This manure is stated to be of considerable commercial value to farmers. On the 25th ult. Mr. Bloor, chairman of the Aston Local Board, spent several hours in investigating the chemical and mechanical arrangements of the system. The experiments which Mr. Wilks has conducted are said, from a sanitary and chemical point of view, to promise good results, but the *Birmingham Gazette* would like to see them fairly tested in the presence of impartial authorities on the subject.

The Drainage of Hawick.—The Hawick Town Council have received a report from Messrs. J. & A. Leslie, engineers, and Mr. J. Falconer King, city analyst, Edinburgh, on the drainage of the burgh. The estimated cost of the purifying works is 4,000*l*., and from 2*l*. 10*s*. to 3*l*. would be required per day for working expenses.

Working Boys' Home, Hereford.—The memorial stone of a new building in Bath-street, Hereford, which is intended to be the Herefordshire and District Working Boys' Home, has been laid by Mrs. Atlay, wife of the bishop of the diocese. The premises occupy a site near the Model Farm. The principal entrance will be approached from Bath-street through a framed timber porch into the hall, on the left of which will be the visitors' room, and the waiting or committee room, and on the right will be the master and matron's sitting-room, the master's office and store-room being adjacent thereto. In the rear there will be a spacious school and dining-room, capable of being divided off into a class-room by a patent movable partition. The cost will be about 1,650*l.*, and it is expected that the work will be completed by the close of the present year. The contractor is Mr. Thomas Lewis, of Hereford, builder; and the honorary architects are Messrs. Haddon, Brothers, of Hereford.

To Write upon Glass.—M. Tergnem has communicated to the *Société industrielle du Nord*, of France, a process which permits of very permanent writing being done on glass with ordinary or India ink. For this purpose, the surface of the glass is gently heated over an alcohol lamp, or Bunsen gas-flame, until the vapour of water ceases to condense upon it, when it is to be coated with a varnish made after the following recipe. The materials are, 80 grammes of alcohol (90°), 4 grammes of mastic, and 8 grammes of sandarac. This mixture will be dissolved by heating it over the water-bath in a flask well stoppered and tied. This varnish is very hard, and ought to be completely transparent; if the surface over which it is poured is cold, it becomes opaque. The glass surface coated in the manner described, may now receive any design or sketch drawn upon it with ordinary ink or India ink. It is then covered with a film of any non-alcoholic varnish.

Memorial Font, Wath-upon-Dearne.—A new font has recently been erected in the parish church of Wath-upon-Dearne, by Mr. W. S. Cadman, of Millfield, York, as a tribute of affection and respect to the memory of his father, Mr. Wm. Cadman. The new font is executed in Hollington stone, and is designed to harmonise with the choir fittings and reredos. It is hexagonal in form, and, with the base upon which it stands, is 5 ft. in height. Each face is panelled with traceried work and carved label mould, and has buttresses and crockets supporting each corner. The cover is 5 ft. high, and has a carved and traceried spire. The stonework is from the workshop of Mr. William Earp, of Lambeth and Manchester; and the oak cover was made by Mr. William Tomlinson, of Leeds. The whole of the work has been designed and carried out under the superintendence of Messrs. Hadfield and Sons, architects, Sheffield.

Church Decoration at Banbury.—The work of decorating the chancel of the parish church, Banbury, is now actively going on. The designer is Mr. Blomfield, the architect, who has been entrusted with the whole of the alterations which have been made in the chancel. The three wall panels will contain the twelve apostles in groups of four in each panel, the figures being more than life-size. The dome will be richly decorated, the subject being taken from the 4th chapter of Revelations. The pilasters between the panels, &c., are being richly ornamented in gold and colours. The work has been entrusted to Messrs. Heaton, Butler, & Bayne, under whom the other decorations of the church and the painted windows have been executed.

University Buildings for Edinburgh.—A deputation from Scotland has waited upon the Prime Minister to urge that grants should be made out of the Imperial Exchequer to extend and improve the buildings of the University of Edinburgh. They presented a memorial showing that this was very much wanted; that Scotland had already subscribed 81,000*l.* out of a total of 91,000*l.* required; that the University conferred benefits upon the whole country, and on that ground they asked for Imperial funds. Mr. Disraeli said the subject should occupy the thorough attention of Her Majesty's Government.

Health of Hastings.—The Medical Officer of Health reports that the death-rate in Hastings for the past quarter amounts to 16·4 per thousand, against 17·7 in the quarter ending March. This cannot be considered other than satisfactory.

The Artisans' Dwellings Act and Wolverhampton.—The Artisans' Dwellings and Streets Improvement Committee of the Wolverhampton Town Council submitted a report on Monday last, the 10th inst., stating that they find that the area of the town reported on by the Medical Officer of Health on the 13th of March is an unhealthy area, and that the Corporation have a sufficiency of resources for carrying out a scheme proposed under the Artisans' Dwellings Act by the committee for rendering the area healthy. Notice has been given of a resolution adopting the draft scheme, and empowering the committee and town clerk for obtaining its confirmation by the Local Government Board, a provisional order, and a confirmation of the order by Act of Parliament.

Building Operations in Warrington.—We learn from a local paper that, notwithstanding the dulness of trade in most parts of the country, and the corresponding distress caused by depression, the activity of trade in Warrington is as great as ever, and the building operations of the town are especially noticeable. At the last meeting of the Town Council a matter calling for special remark was the fact that during the past month plans for the erection of no less than 240 dwelling-houses had been passed by the Council, and this remarkable state of activity has existed for some time past. Then there are a number of large buildings on hand, some of which are nearly completed, and others are being just commenced.

River Pollution in the Potteries.—Some twelve months ago the Duke of Sutherland announced his intention to secure as far as possible the purity of the river at Trentham by compelling the towns above that spot to abstain from polluting the Trent and its tributaries. Longton came to terms with his Grace at an early stage, but the authorities of Tunstall and Newcastle have been brought by the Duke's solicitors into intimate if not agreeable relations with the High Court of Justice, and now the Burslem Board of Health is threatened with an injunction. The Sanitary Committee of the Board have been considering for some time past the best mode of dealing with the sewage.

Co-operative Stores at Spennymoor.—New co-operative stores have just been built at Spennymoor, from plans prepared by Mr. W. V. Thompson, architect, of Bishop Auckland. Contracts for the building were let in the spring of last year, the contractors being, for mason and brickwork, Mr. Thos. Winstone, Spennymoor; joiner work, Mr. Thompson, Bishop Auckland; painting, glazing, and plumbing, Mr. Almond, Durham; slating, Mr. Mascall, Bishop Auckland; heating, Messrs. Walker & Elmley, Newcastle. The premises consist of shops, warehouses, stables, and house for the manager.

A Chinese Magazine.—Messrs. Bourne & Co. have sent us a copy of the *Chinese Industrial Magazine*, published monthly in Shanghai, and which circulates widely throughout China. Its object is to impart to the Chinese information regarding the arts, sciences, and production of European nations, and, partly from the example of Japan and partly from other causes, the Chinese have now become sensible of the value of such information both to their individual profit and national welfare. The cuts which illustrate the magazine are obviously English, and have a trade bearing.

Civil and Mechanical Engineers' Society. The annual meeting of this society has been held. The names of gentlemen elected to the various offices during the ensuing session are as follow, viz.:—President, Mr. Robert M. Bancroft, C.E. Vice-presidents: Messrs. Henry Valpy and Charles Henry Driver. Council: Messrs. Percy Burrell, F. E. Cooper, Henry Ellis Hill, Christopher Kingsford, Alex. Payne, Edward Perrett, Robert E. Pownall, and Robt. Harkness Twigg. Hon. Treasurer: Mr. William C. Street. Auditors: Messrs. Joseph L. Anderson and James Hutt. Secretary: Mr. W. Williams Thomas.

Means of Exit from Factories on Fire.—The recent terrible calamity at Ayr, by which twenty-nine millworkers were burnt to death, is attracting much attention in the North, and Lord Dean of Guild King, of Glasgow, has directed that an inquiry shall be at once made regarding the means of exit provided in all the factories in and around Glasgow. At the last ordinary meeting of his Court, Mr. King expressed the hope that the millowners would generously assist him, and regard the inquiry as "neither inquisitorial nor purposeless."

New (R. C.) Seminary, Westminster.—Cardinal Manning laid the first stone of the new seminary for the diocese of Westminster, on the 7th. The building is to be a quadrangular arrangement, of large dimensions. Red brick is to be used for the facing, with Chilmark stone dressings, and tiles for the roofs. The amount of the first contract is 17,000*l.* Mr. Bentley is the architect.

The Liverpool Water Supply.—At the special meeting of the Liverpool Town Council on the 26th ult., it was resolved that in view of the imperative necessity of an ample supply of water for sanitary and trade purposes, the water committee should in future base their calculations on a supply of thirty gallons per head per day upon the estimated population. The calculations have hitherto been on the basis of twenty-five gallons.

The Persons Employed by Messrs. J. W. Bird & Co., the Emporium Marble Works, Euston-road, supped together on Wednesday evening, the 5th inst., on the occasion of the fiftieth anniversary of the birthday of the principal, Capt. J. W. Bird, 1st S.A.V.B., when the opportunity was taken of presenting him with a testimonial, subscribed for by the permanent staff, with a congratulatory address.

The Horsham Waterworks.—The Horsham Local Board have resolved to accept the offer of the water company to sell the whole of their works, materials, &c., for 7,000*l.*, subject to the approval of the Local Government Board.

Abingdon.—Mr. Charles Claridge, builder and contractor, of Banbury, is engaged in erecting extensive malting premises in this town, for Mr. Walter J. Powell, from designs by Mr. W. Jenkins, architect, Birmingham.

TENDERS

For stabling and garden-walls, at Wandsworth, for Mr. Robert Jones. Messrs. A. & C. Harston, architects:—

Bange	£1,645	0	0
Ennor	1,632	0	0
Baker & Son	1,591	0	0
Tilley	1,487	0	0
Adamson (accepted)	1,345	0	0
Hill, Higgs, & Hill	1,340	0	0

For shop and three houses, in Wilford-road, Nottingham. Mr. T. G. Alderson, architect:—

Johnson	£998	0	0
Middleton	880	0	0
Mason	812	0	0
Parnall	800	0	0
Sharpe	726	0	0

For Congregational School Chapel, Woodley, near Stockport. Mr. W. Ranger, architect:—

Warren	£520	0	0
Hague (accepted)	484	0	0

For forming a new road and sewer, at Balham, for Mr. S. W. Causton, Messrs. E. Habershon & Brock, architects:—

Lost	£698	0	0
Bloomfield	616	0	0
Mattock, Brothers	568	0	0
Neal	386	0	0

For a pair of semi-detached residences, at Sudbury, Middlesex. Messrs. E. Habershon & Brock, architects:—

Mattock, Brothers (accepted)			

For painting, &c., at the Poplar and Stepney Sick Asylum, Bromley, Middlesex. Messrs. A. & C. Harston, architects:—

Cocks	£554	0	0
Derby	439	0	0
Selby	369	17	6
Vigor (accepted)	270	0	0

For business premises and residence, at Haverfordwest, Pembrokeshire. Mr. Gaskell, architect. Quantities supplied by the architect:—

Lawton	£10,000	0	0
Stephens & Bastow	9,110	0	0
Jones & Co.	8,732	0	0
Thomas, Watkins, & Jenkins	8,703	0	0

For rebuilding a warehouse, Goldsmith-street. Messrs. Ford & Hesketh, architects:—

Merritt & Ashby	£2,244	0	0
Downs & Co.	2,190	0	0
Mark	2,166	0	0
Killby	2,135	0	0
Hobson	2,134	0	0
Newman & Mann	2,123	0	0
Browne & Robinson	2,097	0	0
Brass	2,097	0	0
Crabb	2,060	0	0
Lawrence	1,999	0	0
Boyce (accepted)	1,912	0	0

For an additional story to a warehouse, in Wood-street. Messrs. Ford & Hesketh, architects:—

Downs & Co.	£726	0	0
Newman & Mann	711	0	0
Brass	711	0	0
Merritt & Ashby	687	0	0
Browne & Robinson	682	0	0
Mark	676	0	0
Lawrance	666	0	0
Hobson	653	0	0
Killby	645	0	0
Boyce	632	0	0
Crabb	613	0	0

For public offices, Tipton, Staffordshire, for the Tipton Local Board of Health. Messrs. Charles Round and Henry Beddoe, joint architects. Quantities supplied:—

Millard	£2,220 0 0
Nelson	2,980 0 0
Round & Bagnall	2,939 0 0
Mallin	2,878 5 0
Stockton & Son (accepted)	2,657 0 0

For a cottage and offices, at Tipton-green Furnaces, for Mr. W. Roberts. Messrs. Round & Beddoe, architects. Quantities supplied:—

Nelson	£1,041 0 0
Holland & Sons	1,021 0 0
Adams	894 0 0
Tranter	865 0 0
Stockton & Son	863 0 0
Grosvenor & Sons (accepted)	743 0 0

For a residence and outbuildings, Dudley-road, Tipton, Staffordshire, for Mr. W. Lowe. Messrs. Round & Beddoe, architects. Quantities supplied:—

Burkitt	£3,187 0 0
Adams	2,359 0 0
Millward	2,305 10 0
Stockton & Son	2,268 0 0
Bagnall & Round	2,104 0 0

For alterations and building shop additions to Nos. 152 and 154, Salmon-lane, Limehouse, for Mr. Bebrouth. Messrs. A. & C. Harston, architects:—

Abrahams	£392 0 0
Bulford	384 0 0
Johnson	336 0 0
Harris & Wardrop (accepted)	313 0 0

For addition to No. 181, Salmon-lane, Limehouse, for Mr. Steil. Messrs. A. & C. Harston, architects:—

Johnson	£189 0 0

For model building, to be erected at Hampstead, for the Wells Charity Trustees. Mr. Henry S. Legg, architect:—

Nightingale	£5,595 0 0
Brass	5,301 0 0
Sewell	5,292 0 0
Manley & Rogers	5,233 0 0
Browne & Robinson	5,193 0 0
Burford	5,132 0 0
Allen & Son (accepted)	4,650 0 0

For Board schools and teacher's residence, at Michelmersh, Hampshire. Mr. W. H. Mitchell, architect:—

Stevens	£970 0 0
Chapman	968 0 0
Rowland	938 0 0
Crook (accepted)	929 0 0

For alterations, &c., to Clare Lodge, Clapham Park, for Mr. C. Allcock. Mr. W. Newton Dunn, architect:—

Clemence	£750 0 0
M'Lachlan & Son	695 0 0
Smith (accepted)	551 0 0

For new factory, Nag's Head-court, Golden-lane. Mr. Finch Hill, architect. Quantities supplied:—

Thomas	£1,463 0 0
Pocock	1,455 0 0
Eaton	1,394 0 0
Moreland & Nixon	1,381 0 0
Lawrence	1,359 0 0
Sabey	1,350 0 0
Ebbage	1,247 0 0
Hobson	1,222 0 0
Bays (Brothers) & Hannen	1,150 0 0
Grover	1,146 0 0

For Wesleyan Chapel, at Brockley. Mr. Banister Fetcher, architect:—

	Brick.	Kentish Rag.
Taylor	£7,359	£7,700
Slade	6,816	
Bishop (accepted)	5,580	5,580

For repairs at Hobson's-place, Spitalfields. Mr. B. Fletcher, architect:—

Hodges	£320 0 0
Bushell	188 10 0
Single	179 0 0

For the erection of a villa, Peckham-rye. Mr. B. Fletcher, architect:—

Weeks & Son	£590 0 0
Brevitor (accepted)	450 0 0

For Alterations at Monmouth-court, Dudley-street. Mr. Fletcher, architect:—

Hobern	£375 0 0
Robson (accepted)	300 0 0

For Aston and Handsworth combined sewers. Contract No. 1. Mr. W. Humber, engineer. Quantities supplied:—

Nowell, Brothers	£39,977 5 0
Palmer & Lee	39,631 15 0
Young & Co.	34,961 4 0

For a house, to be erected on the Chelsea Embankment, for Mr. J. J. Lowndes. Mr. A. W. Blomfield, architect. Quantities supplied by Mr. S. Tucker:—

Messrs. Dove	£4,325 0 0
Lascelles	4,177 0 0
Messrs. Adamson	4,023 0 0
Gregory	4,019 0 0
Gillow & Co.	3,720 0 0

For alterations and additions to "Longcroft," near Hayes, Kent. Messrs. Tress & Innes, architects:—

Stimpson & Co.	£6,242 0 0
Ashby, Brothers	5,591 0 0
Sewell & Son	5,467 0 0
Payne & Balding	5,243 0 0
Fish	4,913 0 0

For new offices and County Court Office, Reading, for Messrs. H. & C. Collins. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Elliott (accepted)	£1,774 0 0

For rebuilding the Saracen's Head, at Reading, for Messrs. H. & G. Simonds. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Dodd (accepted)	£1,023 0 0

For the erection of new Congregational Church, in Friar-street, Reading. Messrs. W. & J. T. Brown and F. W. Albury, architects:—

Elliott (accepted)	£2,850 0 0

For additions and alterations to The Gibraltar Tavern, Tidal Basin, Victoria Docks. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Manning & Dowdney	£930 0 0
Taylor	807 0 0

For alterations and additions at St. Cuthbert's, Bournemouth. Mr. T. S. Archer, architect:—

Dashwood	£425 0 0

For alterations and additions at Montague House, Bournemouth. Mr. T. S. Archer, architect:—

Hoare, Brothers, & Walden	£139 10 0
Carpenter	116 10 0
Dashwood	115 0 0

For the erection of a range of vineries at Kelsey Manor, Beckenham. Mr. T. S. Archer, architect:—

Messenger (accepted)	£518 0 0

For alterations and additions to school buildings, Sutton Valence, Kent, for the Clothworkers' Company. Mr. F. W. Porter, architect:—

	Additions.	Laboratory.
Holland & Hannen	£4,700	£240
Avard	4,689	223
Conder	4,650	250
Vaughan	4,600	219
Dove, Brothers	4,564	220
Naylor (accepted)	4,397	200

TO CORRESPONDENTS.

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Agra, Delhi, and Lahore.

SO much has been recently written, so many sketches, prints, and photographs have lately been made, of the great cities of Mogul sovereignty and fame, that we may well apologise for attempting to prolong an interest in India with reminiscences of a spot of earth, certainly less known, and perhaps more valuable and interesting, to the practical architect than any other region, except Greece and just a corner or two of Western Europe. The descriptions given of Mogul Capitals by early and rare travellers founded the well-worn and sometimes derided faith of the West in the splendour and magnificence of the "gorgeous East." Yet the three cities, the names of which we have linked, are even now little known even to the majority of those whose youth and prime are being expended in India; and they are totally ignored, except by an infinitesimally small number, by those who have never crossed to the eastern side of the Indus. These cities are now lying open to any diligent book-maker who is competent to read what scattered monuments of architecture are able to tell; and although the traditions of true construction are said to be now understood by all and practised by none in Europe, within and around Agra, Delhi, and Lahore, there are still rising tombs and palaces constructed upon something of the principle, or rather absence of affectation, which distinguishes the best temples and cathedrals of classical and mediæval Europe.

But if individual cities in India are actually waiting for a bookmaker, what may not be the reward of him who shall write a popular treatise or handy-book upon Indian geography?—not only for the use of those who travel by land and by water, but also for that large section of the English community which stays at home or at most ventures to cross the Seine or paddle upon the Rhine. Before people can safely be taught the Indian method of combining white marble, red sandstone, and Persian tiles, perhaps a knowledge concerning the position of the divers centres of art and industry, the names of which they are to read, might be advantageously acquired. Thirty-six years ago, Macaulay, in his essay on Lord Clive, maintained that hardly one cultivated man in ten could tell "whether Sujah Dowlah ruled in Oude or in Travancore, or whether Holkar was a Hindoo or a Mussulman"; and at the present hour a person bound for Allahábád, viâ Suez and Bombay, is not unfrequently asked by pertinacious friends to leave a parcel with a missionary in Mysore, or to call upon a doctor at Darjeeling. The deplorable disregard for exactness—not to say ignorance—shown by educated Englishmen as to what is comprised under the head of Bengal, or similar geographical distinctions of political or other origin in India, is only equalled by the admitted incapacity of Parisians to understand the language and locality of any city but their own. At the same time this absence of knowledge lends something of mystery and romance to the subject. To hear, correctly enough, that Mr. Fergusson journeyed upon the back of a camel while collecting notes for his famous books about Indian architecture, increases the interest which they afford. To imagine, not unnaturally, from the surfeit of elephants with which artist-correspondents in the jungle have lately favoured the British public, that those quadrupeds are constantly passed and repassed upon every trunk road, and at every turn of a high street, is, of course, eminently attractive. But depressing as the truth frequently is, it is an absolute duty to say that the great Indian routes, especially those of the North-west Provinces, are now prosaic thoroughfares, on which may be encountered some of the comforts, and few of the discomforts of modern travel. There is really no reason why, during the winter months, English gentlemen and ladies should not see the new world of an old civilisation. It would not cost very much more than shutting themselves up, as they often do, in Nice and Hyères. After three short sea-passages they can land at Bombay, to find hotels, quite as good as any French ones out of Paris, and society far better than that usually encountered at a Mediterranean sanatorium. The plains of Delhi, seen from the summit of the Kútab-Minar, are necessarily a more impressive sight than that vast expanse of nothingness to enjoy which travellers flock to Cairo and climb the Great Pyramid. Although Bombay and Calcutta are more than 1,400 miles apart, travelling between them in winter is by no means hard work, at least to a tourist; and although Delhi is 1,235 miles by rail from Bombay, and 955 from Calcutta, the three Mogul cities are comparatively close together. Agra and Lahore are nearer to each other than London and Edinburgh; and Agra and Delhi are only separated by a distance of 127 miles. You may take your railway ticket at any of these places with far greater ease than is possible in England or France; and, in so doing, you will be treated with respectful consideration, singularly different from the good-natured roughness of the one and the polished incivility of the other. You will travel in carriages as roomy and comfortable as those on the great lines of Europe are crowded and confined; and in the city of Sháh-Jehán your address, if you so choose, may be St. James's-place, near St. James's Church, Delhi!

Much as the Anglo-Saxon tourist has been reviled by smart writers for eccentricity in sight-seeing, it is he, nevertheless, who has helped to make archæology popular, by "doing" the principal historical buildings of Europe; and until the plains of Delhi are systematically "done," the best examples extant of Patán and Mogul architecture will not be permanently added to the store of archæological treasure which has been amassed during the last fifty years. Brown, Jones, and Robinson, who have already got as far east as Pera, Cairo, and even Jerusalem, must be induced to take the great plunge of the Red Sea and Indian Ocean. Not that some of their better-class connexions have not already done so, sometimes under leading-strings, sometimes under mutual protection. We remember to have met members of these great tourist families at the Kútab, where they shot wild turkeys, fired at a female pig, and towards sunset—at the halfway house known as Safdar-Jang's tomb—they were destroying tame pigeons under an Indo-Saracenic arcade, as a happy mode of relaxation on their way from the ruins of old Delhi to the new city of Sháh-Jehán, now our Delhi. That same cold season there were some of the American branch of the same families, whose chief delight and constant occupation consisted in urging too-eager native athletes to jump from the tops of minarets and domes into the tank beneath. Of course these are the travellers whom the pure and simple archæologist would shun, but whom wiser men would encourage, because they require hotels and dák-bungalows, carriages and gháris, guide-books, and the like. All these modern necessities they ask for, but do not always get. Yet, without them travel is difficult and irksome; and then even the archæologist—the pure and simple one aforesaid—forgets to tell his friends that the North-west Provinces of India possess some of the finest bits of natural and artistic scenery, and in November, December, and January, the finest climate, in the world.

When all sorts and conditions of rich people have done this, have grumbled over their journey, and written all kinds of complaints to the newspapers about the want of really-consumable ice at Agra, of torn mosquito-curtains at Delhi, and the absence of comfortable hotels at Lahore, we shall probably get what we want, in the way of archæology, concerning these Mogul cities. Perhaps some excursionist, wiser and more practical than his fellows, may remain to commit to paper, in the shape of plans, sections, elevations, and details—the tombs, palaces, and mosques he went to "do." We remember seeing a few years back at the Dalhousie Institute, in Calcutta, some lithographed instalments (to scale) of a book upon these buildings. They were prepared by Mr. R. R. Bayne, a gentleman who distinguished himself as a student in London before he removed to India, and we have waited to hear if the publication of his book be already commenced, or if it remains still in the throes of preparation. At present there are no really technical works for students upon the architecture of any part of India. Such books as the "Sacred City of the Hindú," by the Rev. Mr. Sherring, as the descriptions and photographs of Ahmedábád and Bijapúr,* as even Mr.

* The mode of spelling Indian names is in a state of transition. To be correct *Lahore* should be spelt Lahúr, the river *Hooghly* should be Húgli. But it is difficult or

Fergusson's "Indian and Eastern Architecture," are often difficult to understand by practitioners, and entirely puzzling to the student. What is really wanted is the careful representation upon paper, and to an English scale, of the best Patán and Mogul ruins of the older cities of Delhi—of the mosque of our Delhi, of the Táj Mahál at Agra, and perhaps as a foil to earlier work, of the mosque erected by Aurangzeb at Lahore, in 1674. Scattered over India there are a few Englishmen — and some of these are even reviled officers of the Department of Public Works—perfectly competent to undertake the task; and it cannot be too often repeated that such a task, although it may be aided by sketches and photographs, can only be effectually accomplished by the scientific use of square, compass, and foot-rule. According to the opinions of those who know the difficulties usually encountered in India, no books of the kind we name can possibly be made until the Government of that country organises a special service of measurers and draughtsmen to prepare the necessary drawings. At present, even guide-books to the principal cities are rare; and while the majority are useless to the traveller, none are of any great archæological value. There is, it is true, a well-written and well-illustrated "Agra Guide," by Mr. H. G. Keene, the genial and accomplished judge of that station; and this gentleman has also compiled, from Captain Harcourt's and other writer's pamphlets, a very tolerable guide-book to Delhi. At the beginning of this year a small book on Lahore was also published under the auspices of Mr. J. L. Kipling, a sculptor, and pupil of the late Mr. Birnie Philip. This guide-book describes the city as it is and as it was; the second part of it being to a great extent a reprint of an excellent pamphlet by Mr. Thornton, C.S. Although new to Lahore, Mr. Kipling is no novice in Indian art, for after nearly ten years' artistic service in Bombay he has become the Principal of the Lahore School of Art, and Curator of the Museum, which now contains so large a collection of recently-discovered Græco-Búddhist antiquities.

Those who, without having seen, wish to understand something about the architecture of this small portion of Hindústan, must be good enough to remember that, although the Great Mogul was sovereign of India, he ignored Búddha and Bráhma as thoroughly as the Bráhmans ignore the former; that he felt not the smallest religious sentiment for the waters of the Ganges and the Jumna; that he planted a big mosque in the very heart of Benáres, where devout Hindús still aspire to die and be burnt; that he used the stones of desecrated Hindú temples for the construction of his palaces and mosques,—taking care to conceal whatever sculpture was upon them in the inside of his walls,—more ruthlessly and far more completely than the Hindú had previously attempted with the monuments of Búddhist architecture; and that, far from coming of an old family, his best buildings, which are on the plains of Delhi, are contemporaneous with the best works of mediæval Europe. In the city, which is now called Delhi, there is nothing older than the days of Sháh-Jehán, 1628–1658. Although the empire was founded by Báber, in 1494, the Mogul style did not take its distinctive character in architecture until after the death of Akbar, in 1605. This monarch's principal seats of government were Agra and Lahore; and then the latter city was described as "the grand resort of people of all nations," its glories having been sung 200 years previously as "a city great among the cities of India." The Emperor Akbar's favourite residence was at Fattehpúr Sikri, about twenty-two miles from Agra, and it had been erected under his own direction. In the time of his son, the Emperor Jehángir, in 1626, two Englishmen paid a visit to the Punjáb, and passed over the high road from Lahore to Agra. It then consisted of a loose avenue of trees, extending from "the town's end of Lahore, twenty days' journey to the town's end of Agra." Most of these trees bore a kind of mulberry, and, in our countrymen's words, "every five or six *kos* there are faire seraies of the kings and nobles . . . . where you may have a chamber and a place to get your horse." Fifteen years' later a Spanish monk passed that way, and thus described his arrival at Lahore: "On the 21st day from our departure from Agra at sunrise we came in sight of the city of Lahore . . . . but large as it appeared, there were not houses enough for the accommodation of the people, who were encamped for half a league outside the city. . . . . I entered . . . . a very difficult undertaking, on account of the number of people, who filled the streets, some on foot, some on camels, some on elephants, and others in small carts, jolting one against another as they went along. . . . . The second city of the Mogul empire (as well on account of riches as its size) is ornamented with fine palaces and gardens, also with tanks and fountains. As for the abundance of provisions it would be unnecessary here to describe it. The principal street shown to advantage would equal the richest European mart." This prosperity occurred in the time of Sháh-Jehán, but it was not destined to continue. Disgusted with Agra, where a tomb was rising to perpetuate the memory of his lost wife, he had ordered the erection of a new palace, a new mosque, and new gardens in the neighbourhood of Delhi. The foundation of this city, in 1635, was a turning-point in the history of Lahore, which, on the accession of Aurangzeb, in 1658, had greatly diminished in wealth and population. When, in 1664, Bernier, a French physician, passed through it, some of its houses were dilapidated, others in ruins. This traveller, who landed in India in 1655, and stayed there some years, described the new colony of Sháh-Jehán, who had made it the capital of the empire instead of Agra, where the summer heats were too violent. "The ruins," he said, "of old Delhi have served to build a new city; and in the Indies they scarce speak any more of Delhi, but only of Jehánábád." With the death of Aurangzeb, in 1706, the Mogul empire practically perished; and, ten years later, in that palace with which Sháh-Jehán had enriched his new city, an event occurred, small enough in itself, but pregnant with the seeds of great changes. A Scotch surgeon, Gabriel Hamilton by name, cured the then emperor of an illness, and was rewarded by "that permission for his employers to establish a factory, and to maintain a territory of thirty-eight towns on the banks of the Hooghly, which was the foundation of the presidency of Fort William." Less than a hundred years after, an English officer described his visit to the ruins of Lahore in his diary, 24th May, 1809:—"Here the lofty dwellings and mosques which, fifty years ago, raised their tops to the skies, and were the pride of a busy and active population, are now crumbling into dust. . . . In going over these ruins I saw not a human being,—all was silence, solitude, and gloom."*

Mr. Keene, in one of his guide-books, calls the plains of Delhi, which cover an area of about ten miles by six miles, the "Rome" of Asia. The comparison is a little inappropriate, seeing that the oldest remnants upon them are not older than the eleventh, perhaps even the twelfth century. The Rome of Asia is the sacred Hindú city; and although successive Indian dynasties have aimed at the historical effacement of their predecessors, there are still in Benáres buildings, portions of which stood *in situ* while Rome was celebrating a triumph to Cæsar, or swaying to and fro under the influence of Cicero's eloquence.† But nothing in Benáres is so fertile in suggestions to the architect, or, as he is represented in India, to the officer of Public Works, as Indo-Saracenic architecture. It was made suitable to the exigencies of climate and local materials by Hindús working in accordance with their own traditions of indigenous art. There is nothing barbarous about it, as in the remains of Búddhist topes and monasteries, or in those of Hindú temples and shrines. The construction of Túglak Sháh's castle, and also his tomb in the middle of what was once a lake, three miles from the Kútab-Minar, betrays a stern simplicity worthy of Greek builders before they attained the refinement of Athens in its prime. The word of the Korán forbids the introduction of images of either men or brutes upon the walls of Mahomedan edifices, both sacred and domestic, and thus all ornament became forcedly useful, or of a literally descriptive character. The Mahomedan gospel was cut in Arabic upon the external face of the red sandstone walls, and forms, perhaps, an incised ornament more beautiful than any similar decoration of either natural or conventional origin. It attracts the spectator, because, although he may not understand it, he is able to feel that it must mean something. The three divisions of an Indian mosque are covered each with a dome, the largest being in the centre. They are entered under a big central archway, and a smaller one on either side, all open to the air, without doors or windows. The mosque itself forms one side of a courtyard open to the sky, with generally a fountain in the middle, and the other three sides are enclosed by covered arcades and sometimes cells. The entrances to the courtyard, generally three in number, resemble triumphal archways; and whether the buildings be the work of men who lived in the days of Ala-úd-dín, or of Shír-Sháh, or of Sháh-Jehán, the system is always the same. There is always enough of truth and science, even in the later buildings in which traditions have not been strictly preserved, to keep them "alive" as examples of architecture. The great mosque of Delhi now stands isolated upon an open square, or more properly a wide plain,—the houses which encompassed it before the Mutiny having been pulled down. It stands alone, a more perfect specimen of refined building than any other work of its own time throughout the world. Begun by Sháh-Jehán in 1644, it was completed in 1658, the same year that its founder was deposed by his son and successor, Aurangzeb, —seventy-eight years after the death of Palladio; eight years before the death of François Mansard; and one year after Christopher Wren had been appointed, at the age of twenty-five, a Professor of Gresham College. Bernier, the French traveller, whom we have already mentioned, described it as "standing upon a rock flatted to build upon, and to make round about a large *place* for four long and fair streets to end upon, and answering to the four sides of the mosque. . . . . The three entries are stately . . . . and their large gates are covered with copper. . . . . That in the middle is much bigger and higher than the two others." Bernier, who saw it a few years after its completion, and who had doubtless seen the brand-new Château of Maisons, admitted that the Delhi mosque was not built according to the *ordonnances* of architecture; but he was wise and honest enough to observe that nothing in it offended the eye. "I rather find it," said he, "to be well contrived and well proportioned." In our own time a pilgrimage to this mosque formed the limits, so says Mr. Keene, to the extramural movements of the once Great Mogul; and here, on a Friday in September, 1857, the fatal year of the Mutiny, was read the last litany of the House of Timúr.

Agra, which, like Delhi, is situated on a bank of the river Jumna, has been called Akbarábád, the city of Akbar; but there is little left in it older than Sháh-Jehán. Although it is known to have been occupied by Báber in 1526, it is probable that the Agra of his time was on the opposite bank of the river, the side on which the railway station is situated. The earliest portions, mere remnants,—of the palace are attributed to the Emperor Akbar because of their similarity in construction to Fattehpúr Sikri; but they are by no means proved to be the work of the sixteenth century. The fame, however, of Agra, rests less upon its palace than upon the streets of the native city, and upon some of its public buildings; but, most of all, upon the celebrated tomb of Sháh-Jehán's wife, whose name in the vernacular will add no lustre to our description, although she was called "The exalted one of the Palace." This tomb of white marble inlaid with precious stones,—the astonishment and delight of all who visit it, and the paradise of foliage which leads up to it,—is the Táj-Mahál. It is compared by Mr. Fergusson, after a preliminary sentence of apology, to the Parthenon; and on the strange plea that its exquisite inlay suffices to raise it almost to a level æsthetically with the Grecian masterpiece. It is perhaps hardly fair to quote a single passage from one chapter of his book, because other portions of the text in other parts of it balance or soften the argumentative statement to which we allude. A comparison, by means of section and elevation, between the Parthenon and the Táj will suffice to show those who have not seen them that, although they may not be unequal in superficial beauty, yet in every utilitarian view of constructive principle and all æsthetic appre-

us to alter established home orthography. We would merely add that the short "a" is pronounced as the English "u"; that *Akbar* is pronounced Ukbur, and the term *Mogul* has the accent on the first syllable.

* The population of the city of Lahore, according to the census of February, 1875, is 149,035, of whom 71,777 are females, while that of the suburbs is 30,896, of whom 14,753 are females. Of all these, only 1,725 are English. The city contains 19,830 houses, and in the suburbs there are 6,617 houses. See an account of Lahore, 1876. It is printed at the Government Civil Secretariat Press of that city, and prepared by the joint labours of Mr. T. H. Thornton and Mr. J. L. Kipling.

† Mr. Fergusson maintains that there are no authenticated architectural remains in India older than 250 B.C.

ciation of the same, they are manifestly distinct and opposed. It is impossible not to feel, and even see, that the upper portions of the four great entrances to the Táj are as "backless" as any modern imitation of the Greek pediment in London or Calcutta; that the dome, though not a sham like that of St. Paul's, or an utterly false excrescence like that of the "Invalides," is built up for show alone; is full of emptiness, or at best the home of birds and insects; and merely marks a vaulted structure, smaller than itself! The useless upper story or dome is half as big again as the lower one which it covers; while the real tomb, where the fair lady's body lies, and that of the Emperor's beside it, is beneath both in a basement,—on a level with the soil, if not a little below it. We leave any one, who has studied Mr. Fergusson's valuable theories upon the principles of beauty in art, to say whether Athenians of the time of Pericles would have loaded the earth so uselessly even to obtain an outline so beautiful as that of the Táj-Mahál.

Delhi and Lahore contain each a museum; and three years ago there was a small collection of antiquities and local curiosities in a building at Agra; but these, we believe, have been removed to Allahábád. To the Lahore Museum have been consigned many of the justly-celebrated sculptures recently dug from the soil of the Punjáb. These are remarkable, as evincing the influence of Greek culture upon Búddhist art. Among them are capitals of the Corinthian order, which Mr. Fergusson, judging from photographs, describes as more Greek than Roman in their foliage, and more Roman than Greek in their volutes. There are also fragments of the human form, carved in a soft micaceous sandstone, all referring to Búddha, but unmistakably Greek in inspiration and character. They are described by some who have seen them as "architectonic and conventional," but never monstrous, like ordinary Búddhist and Hindú sculptures. Mr. Fergusson considers that it would be correct to call them Byzantine; but he significantly adds, and we sincerely hope that the authorities will afford an early opportunity,—"till we have *detailed* drawings, and know more of their surroundings, it is difficult to give a positive opinion as to their age."

The characteristic craving of the Tartars for tomb-building and garden-planting was very powerful in these Mogul cities; and under English rule there seems to be every disposition to encourage the development of the latter, or rather perhaps to revive it. The Emperor Báber began his improvements at Agra by laying out a garden which was long a subject of wonder to the natives, who chose to call it Kabul. "God Almighty," said Bacon, "first planted a garden"; and while tradition has assigned that of Eden to the Kabul valley, living men are ready to point out the exact spot in the island of Ceylon! It is certain that the Hindús have no native term for a garden, and that their common word "bágh" is Persian. "Coming," says Mr. Thornton, "from the well-watered valleys of Ush and Andejún, Báber regarded with almost European disgust the dusty, treeless, plains of the Punjáb." At the present day, however, Lahore, Delhi, and Agra are studded with public and private gardens. To all outward appearance they seem to be charming abodes, and in December are undoubtedly so in fact. Spreading as the English portions of them do for miles in all directions,—into cantonments for the military, into lines for the police, and into civil lines for the Government functionaries, high and low,—they resemble somewhat the picture which has been prettily drawn of Babylon. They are small fortified provinces rather than large cities, and consist of country-houses, with farms and gardens attached. The last King of Delhi, who, after the Mutiny, solaced himself with poetry, wrote in Urdú:—

> "Call not Delhi a city,—call it rather a garden,—
> The abode of perfect peace;
> But the book of its past is blotted out,
> And nought remains but a desolated village."

Although no one probably is unwilling to admit that under English rule the cities of India form "the abode of perfect peace," it is faint justice to the royal poet to confess that, as far as Indian architecture is concerned, "the book of its past is blotted out." It behoves us, therefore, to help the natives of the North-west Provinces at least, —for our own more than for their sakes,—to re-write it; and afterwards to apply its teaching, with the broader experience and more powerful instruments of our own more progressive civilisation.

PROFESSIONAL CHIVALRY.

A good deal was said, not long since, and well said, by a respected member of the architectural profession, on the subject of professional *esprit de corps*, the want of it in our profession as compared with some others; the value of such a fellow-feeling and sense of common interests in binding the members of the profession together, and in raising the status and tone of feeling of the whole body corporate. And it would be difficult to over-estimate the value to the members of a profession, or the gracefulness in the eyes of the rest of society, of that sort of spirit which leads men of the same pursuit to stand by each other as natural allies, and to combine in keeping the standard of professional conduct up to a high point of honour and integrity. These considerations, valuable as they are, refer, however, mainly to the profession regarded in its practical and business relations, and as comprising a society of men governed, or who should be governed, by a code of honourable dealing in regard to each other and the public which is to be rigidly maintained. Without pausing here to inquire how far this desirable ideal of professional *esprit de corps* has been and is realised, we may remind each other sometimes that there is even a higher standard than that which may be aimed at, and which perhaps affects individual character rather than that of the profession *en masse*, but the effect of which would be, if it were more generally kept in view, to raise not merely the status of the profession morally and socially, but that of architecture itself, in its results and in its character as an intellectual and artistic occupation. What we mean is that kind of feeling which leads a professional man, more especially an artist of any class, to aim, in the first instance, at doing the very highest work that he can get, and doing the very highest with his work; which would lead him to prefer carrying out a few works, and those of a high class, really well, even at no great pecuniary gain, to "getting on" and making money by a more promiscuous practice carried out on less uncompromising principles; an end which, if steadily and firmly kept in view, results perhaps in something as near what may be called "chivalry" of principle and aim as mere professional life in modern times can very well attain.

Some reflections of this kind are suggested by the prefatory remarks to the interesting and agreeably-written memoir of three deceased French architects, read at a recent meeting of the Institute. Speaking at the outset of the pleasure which he had derived from the process of collecting information for the paper of "Biographical Notices of Deceased Foreign Members," Mr. Cockerell observed that this pleasure arose from the contemplation of the high qualities of the subjects of his notice. "I find," he said, "in a remarkable degree in the lives of these French artists a quality which, if it is not peculiar to the French as a nation, is at least one of their very marked characteristics, and has shown itself in other walks besides intellectual ones; in war, in missionary enterprise, in the relation of the affections. I mean a certain chivalry and self-sacrifice, which in its various spheres of action amounts frequently to heroism. In the subjects now under consideration I find a high ideal involving a high ambition, pursued with a singleness of aim and an untiring energy and devotion which is quite unsullied with any taint of greed. The early ambition of these men, whether they are born to ease or to toil, is not to rush into practice and to secure commissions, but to distinguish themselves in the schools, and to gain its honours and their prize,—the Grand Prix. When they achieve professional success, their ideal is not to multiply jobs, but to carry out with conscientious perseverance some one or very few works. When we consider the time occupied in one of the great public works, and learn that their authors have scarcely any others simultaneously, we may judge how great is the sacrifice which they make of comfort and luxury to the attainment of perfection." These remarks are exemplified more or less in the lives of the three French architects which formed the subject of the paper here quoted from,—Duban, Vaudoyer, and Labrouste. The first of these spent some of his best years in studies which brought him honour, and gave him proficiency, but for a long time no other result; and he never carried out one building entirely from the first conception; for even the École de Beaux Arts did not fall into his hands till its main plan was arranged, and the foundations laid. It is impossible to suppose that one who had acquired the reputation which he had, at an early period of his career, might not have had more work to do, had he been disposed to take what offered itself. That he had not more we must apparently attribute to a high ideal of his profession which induced him to decline any chance of occupation in its every-day walks, and rendered him indifferent to anything except the class of building in which he could carry out and illustrate his own aspirations. His high sense of professional dignity and responsibility was shown in his retiring from the position of architect to the Louvre rather than yield to Governmental and public opinion in a point where he believed himself to be right. Vaudoyer, after pursuing the same kind of hard study in pursuit of honours in the early part of his career, adopted in his professional practice the same uncompromising principles which Duban appears to have acted upon. He commenced by opening an *atelier* for pupils, and contented himself with this until work came which he thought worthy of his exertions. He rejected, throughout his life, all private work "which might subject him to the caprice of clients, or force him to devote to sordid and trivial considerations the time which he could so much better employ in the advancement of art and of his own reputation." It is true that Vaudoyer had independent means; but even under such circumstances this high ideal of professional practice is unusual, to say the least, in our own country. Of Labrouste we are told that "he regarded his art as a thing sacred, and not to be profaned by superficial treatment, or by application to sordid and common purposes; and to this must be attributed the fact that he never sought or obtained success in ordinary practice." Almost his first practical work in building was the Library of Ste. Geneviève, which was not undertaken till he was forty-two, and to which he devoted seven years almost exclusively, giving attention to every detail both of design and practical construction throughout the building. And in contemplating this kind of principle of carrying out architectural work, one cannot but echo Mr. Cockerell's observation,—"These lives may, indeed, put us to the blush, and I cannot but feel with humiliation how great is our need of the study of them."

All professions in all countries of course include those, often a majority, who enter them and continue in them with nothing but the most sordid and what might be called beggarly views and aims. The sort of man who says, on being convinced of some serious defect in a building he has recently completed, "Never mind, I have got my commission," or he who openly avows that he cares for nothing but what will pay (and we have heard both these statements made in sober earnest, and by educated men), are not, perhaps, worth any serious arraignment. They have their reward, and may be left to enjoy it. But among those architects in this country who have a higher ambition than that, who wish to produce something that will bring them fame, who have even acquired reputation and some degree of wealth, the idea of refusing anything either because they have not time to give proper attention to it, or because it involves what, on their own principles, they ought to disapprove of, seems hardly to be contemplated as a possibility. We remember a case that happened to come to our knowledge some little time since, when a point was raised in reference to the restoration of an old building, in regard to which the architect stated in writing his opinion that a certain method of treatment demanded by his clients was contrary to true archæological principles, and to all that he had been advocating himself for years back. The point was nevertheless insisted on. Did the architect (a man in large practice and presumably in no absolute want of one particular commission) decline to stultify himself and withdraw? By no means: he put his principles in his pocket, and did the wrong thing while he protested against it:—

> "And there it stands unto this day,
> To witness that he lied,"

as practically he certainly did, against the highest interests of the art and the profession. But we fear the course was only what almost every English architect would have pursued; grumbling, perhaps, but averring that he could not do otherwise. The case of some large public buildings, carried out by an eminent architect in a style opposed to all his expressed convictions, because Government would have that style and no other, will occur to many. We have no wish in one

sense to bear hardly on such cases, because they, in fact, result from following the usual standard of professional architectural morality in England, in which it is regarded as a rule of business and common sense not to refuse work. And in the case of men in small practice and struggling for their daily bread we hardly know what other rule can practically be applied. Nor in the case of those who are better off do we wish to say that there is anything absolutely or morally wrong in such a proceeding (though we can quite conceive some highminded people thinking that there is). But what is pretty evident is, that the course which a successful and eminent English architect would feel himself quite at liberty to take in such a case, a French architect of the same standing would consider beneath him, and a degradation of himself and his art. This is a matter worth very serious consideration. It is recorded that a certain sprig of German royalty brutally told Humboldt, whom he objected to have to meet on equal terms at Court, that "there were two sorts of persons who could always be had for money, authors and ——," a certain even less respectable though more ancient class. It would be very sad to add architects to such a category; nor will any impartial person, we think, assert that the architectural profession in England is more griping than other professions; it is certainly worse paid than most, as a rule. But we fear it must be accepted as a fact that English architects are willing to undertake, from ordinary motives of business, commissions which involve a departure from their acknowledged principles or which should be beneath their ambition, and that French architects of the same relative standing will not do so. And this is hardly a satisfactory reflection to have to make.

There is another point of view in which the question of the highest professional principle, or what we have called architectural chivalry, comes in, and which is directly forced upon us also by the biographical notices we have referred to. This is as to the degree of attention which a large and important work ought to have from its architect, and the artistic morality of accepting a multiplicity of smaller commissions when a man has one great and important work to which he ought to give all possible attention. Here again we shall be flying in the face of business principles and what in England is called "common sense," which seems often to mean merely looking out for "number one." We suppose an English architect who refused two or three smaller things because he considered his undivided attention was claimed by a large and important work, would be considered Quixotic and neglectful of his own interests. It is the fact, however, as we see, that in France this is rather the rule than the exception among architects of the highest order, and that it is not uncommon for a man to devote years to elaborating a single building. Whether this be Quixotic or not, we have no hesitation in saying that this is a principle that ought to be more acted upon in England than it is. There are two or three great buildings now in progress in this country which, in order to be carried out in a really satisfactory and complete manner, ought to claim the undivided attention of their architects, who, in fact, are responsible perhaps for two or three score of smaller works at the same time. It is not surprising under such a system that architectural design comes to have such a look of mechanical repetition, and such a want of thought and refinement in detail, and that the evil of designing and drawing by proxy is continually on the increase. The love of money in this country is demoralising all classes, and it can hardly be expected that the architectural profession should have escaped the contagion; but, whether the reminder be of any avail or not, we cannot help asking them to look for a moment at the evidence of the existence and acceptance of a very different theory and principle among their French brethren which has recently been laid before the Institute, and to consider whether there is not possible in architectural practice such a thing as "chivalry," the essence of which quality lies in the abnegation of mere selfish ends, and the postponing of material success to the greater aim of doing as well and as nobly as possible that which we have undertaken to do.

Quebec Harbour.—The Quebec Harbour Commissioners have instructed Messrs. Kinipple & Morris to prepare contract drawings for proposed improvements.

THE INSTITUTE SOIRÉE.

THE annual entertainment of the Institute of British Architects was held on Friday, the 14th inst., at the Rooms in Conduit-street, and may be considered a very successful one, more especially in regard to the appearance of the rooms. In the upper room, where the guests were received by the president, Mr. Charles Barry, there was the usual array of objects lent for the evening, including artistic furniture, water-colours, paintings on china, designs for ornamental work of different kinds; and we should be disposed to say that there was a larger amount of objects possessing special interest than usual. A model of the new Opera-house on the Thames Embankment was exhibited; and in the Library some curious old volumes of illustrations of the principal towns of Europe were turned over with a good deal of interest. We noticed some of Mr. Pullan's oil sketches of architectural remains in the East, and some fine architectural views by the late D. Roberts.

In the downstairs room there was a certain novelty of effect, in comparison with what we have been used to at the recent *soirées*. Usually there has been some exhibition of paintings going on in this room, and these have been left in their situation to form part of the decoration of the evening. It is not, however, possible to look at pictures with much satisfaction when they form the background to a row of heads of persons occupying the seats against the wall; nor in most cases have the pictures which have happened to be present been much worth looking at. It was therefore an agreeable surprise to find, instead of this exhibition of doubtful art, that the walls were hung with strips of decorative carpet and curtain stuffs, of very good character in detail, and presenting a very satisfactory *ensemble*; and one effect, as it seemed to us, was to make the room appear considerably larger than when the walls were crowded with gilt frames.

The Royal School of Art Needlework at South Kensington was represented by some beautiful examples of curtains, and a screen, executed for the Duke of Westminster from designs by Mr. Walter Crane. Messrs. Trollope contributed from their Museum of Decorative Art numerous costly objects, including specimens of modern French *cloisonné* enamel, alabaster and onyx, ancient tapestry, &c. Of English ceramic art and decorative pottery there were some fine examples executed by Mr. J. Mortlock, and several pieces of modern "lustre" ware, cleverly reproduced from old designs of Mr. W. de Morgan. In addition to several choice cabinets of rich workmanship and other decorative furniture exhibited by Messrs. Jackson & Graham, the same firm sent a large quantity of Oriental pottery, fine Japanese lacquer, and articles of bric-à-brac. The Persian, Indian, and other textile fabrics (some of them very rare and costly), and which lined the walls, as already referred to, were contributed by Messrs. Gillow and by Messrs. Farmer & Rogers, together with a selection of Morris & Co.'s quaint and boldly designed curtains, Mr. Holbronner's woven fabrics and similar specimens of textile art,—all showing the advance which has been made of late, both in taste and execution, by English looms. In the department of artistic metal-work, a similar improvement was noticeable in the productions of Messrs. Benham & Froud, and of Messrs. Hart, Peard, & Co. A conspicuous object in one of the rooms was a pulpit executed entirely in decorative stoneware and glass mosaic, by S. Belham & Co., from the design of Mr. J. P. Seddon.

The band of the Coldstream Guards was in attendance in the downstairs room, and contributed in the usual form to the entertainment of the evening. Some of our readers may remember that a question was raised the other day as to the suitability and merits of the musical part of the entertainment by a correspondent, whose letter was inserted, as it appeared that the subject was open to consideration, though without the idea that any decided improvement could be organised in time for the present occasion. We have reason to believe, however, that the opinion expressed by our correspondent met with a good deal of concurrence, and that some improvement may very well be made, and, in fact, ought to be made, next year, upon the present somewhat old-fashioned style of thing. The band did better, we recollect, when a gallery was available for its accommodation. On the floor it is universally found to be too noisy, independently of the musical question. But we think the latter should be considered. To go on always in the same way, saves a good deal of trouble, no doubt; but is not always the best way of keeping up the interest of an entertainment, seeing that tastes and habits change very much. In a general way the Institute *soirée* is, on the whole, hardly so brilliant an entertainment as one might expect from the means and influence of the Institute; and one or two happy innovations, to put a little new life into it, might very well be welcomed, and may perhaps be looked for from the new administration.

NORTHUMBERLAND AVENUE.

THE statement which has been published as to the letting of the "leg of mutton" plot, as it has been called, bounded by Charing-cross, Northumberland-street, and the Avenue, was premature. An offer to the tune of 15,400*l.* per annum is before the committee, and if that should fall through there are others from responsible persons to very nearly the same amount. The rent offered is equal to 8*s.* per foot superficial. Plot 24 has been let for 500*l.* per annum (5*s.* per foot); and plots 9 and 10, together, for 1,620*l.* per annum. These large prices give good grounds for the belief that the improvement will return a money profit to the ratepayers.

THE LIVERPOOL ARCHITECTURAL SOCIETY AT SHREWSBURY.

ON the 8th inst. the members of the Liverpool Architectural Society held their annual excursion, when Shrewsbury was visited. The gathering of members was not so large as anticipated, but the entire excursion from beginning to end was a success. The members were accompanied by their president (Mr. J. A. Picton, F.S.A.), their ex-president (Mr. J. Boult), and one of their vice-presidents (Mr. Henry Sumners), Messrs. Aldridge, Herbert, Fry, &c. The church of St. Mary was first visited, and here Mr. Edmund Sharpe met the members, and discoursed on the several gradations and varied styles this church has passed through since its foundation. This church is said to have been founded by King Edgar about the year 980, but since that date it has passed through many vicissitudes. It was very rich in the time of Edward the Confessor. It stands upon a commanding position, and, together with that of St. Alkmund,—which church was founded by Ethelfleda, daughter of Alfred the Great,—their spires can be seen almost from any part of the county of Shropshire within ten miles of the capital town. Mr. Sharpe lucidly pointed out the many points of construction at the hands of successive architects at different times, until at last came the restoration of Mr. S. P. Smith, of Shrewsbury, at whose hands most of the churches and ancient buildings throughout this district have been almost reproduced. The abbey was next visited, noting on the way the half-timbered houses, the old market-hall, and other objects of interest, and the fine old pile, or rather that which remains of it, received due attention. Here also Mr. Sharpe gave a descriptive lecture, and the interior was pronounced by all well worth examination. After leaving the abbey the members separated, some visiting Haughmond Abbey, Battlefield Church (originally built to commemorate the victory of Henry IV. over the Earl of Northumberland and his son, Percy Hotspur), others finding their way to Quarry Avenue, one of the most celebrated promenades in the kingdom. The company afterwards dined together in the Lion Hotel, and returned to Liverpool in the evening.

Proposed Modification in Asphalte Road Pavement.—Admirable as is asphalte as a road material in point of smoothness and cleanliness, it has, as it has been hitherto laid down, the great disadvantage of being exceedingly slippery, and therefore dangerous, at certain seasons. It is said that there is now a fair prospect of this difficulty being overcome, the Val-de-Travers Company having recently introduced slabs of their asphalte, upon the surface of which are studs of chilled iron. These studs are starlike in shape, and are distant about 3 in. from each other. It is claimed that these give absolute security against slipping, and that consequently the slabs are specially useful within, and at the sides of, tramway rails. They can, it is stated, be laid down at the same cost as granite setts.

THE RAILWAYS OF BELGIUM.

THAT illustration of the working of the railways of the United Kingdom which may be afforded by a comparison with the systems adopted in other countries, is a subject not unfamiliar to our readers. It is to the accounts of the French railways that our attention has been chiefly directed hitherto, as it is in this case that the fullest information has been accessible to the student of the subject. Without inquiring how far the tone and temper of a nation, and the general tenor of the laws and institutions of a country, may render different modes of executing and conducting public works advisable in different States, it is possible to form a judgment as to the superiority of system considered with reference to its professed object alone. Thus, it is possible that the French system may be, considered in itself, better than our own, while yet invincible obstacles may exist to its introduction into this country. It is with the prime question that we alone concern ourselves at present. In the French lines there has been a degree of State interference which has resulted in a good distribution of railway network over the country, regarding the requirements of the several districts as more important than the sole question of remunerative traffic in the first instance. Again, in consequence of the guarantees afforded by the Government, it has been possible so far to raise capital at the ordinary rates of interest as to secure to the original shareholders an average benefit of more than ten per cent. on their investments. Finally, it has been arranged that the entire property of the lines of railway shall, at a definite period, return to the State.

A condition of things so contrary to that which has prevailed in this country has been pretty generally understood to exist in France, although the details may have been less familiar to our knowledge than was desirable. In Belgium there exists an organisation of the railway system which differs as much from the French method as from our own. But the facts regarding the Belgian lines are far less known, and far less easy to ascertain, than those relating to either the French or the English railways. It is not as matter of detail alone that this difference exists. It is a profound difference of principle that is involved. It is conceivable, at least in theory, that it might be worth while for a State to provide gratuitous means of transport for passengers and for goods over its territory. It cannot be said that this experiment is actually in progress in Belgium; but there is, at all events, a certain approach to it. The Belgian lines are worked at tariffs so low that where they are adequate to cover actual working expenditure they still leave interest on capital to be borne, at all events in great part, by the tax-payer. In a country in which taxation is more complicated than perhaps in any other, it has proved comparatively easy to adopt a system of which the results demand very careful study.

The public accounts of Belgium are to a great extent smothered under their own fulness and multiplicity of detail. As to audit, it is said that the perfection of system has been attained. But for that clear, incisive statement which the general reader can at once comprehend and remember, we look in vain. Thus as to the railways, which now form a portion of the public service of that country, we find much detail, but no general *resumé*. The estimates and accounts are not only extremely diffuse, but are drawn up in different forms. The accounts of past revenue are all that can be desired; those of expenditure are always imperfect, tardy, and perplexing. No less than three out of the twelve budgets into which the public accounts are divided have to be studied in order to arrive at anything like a railway balance-sheet. The gross receipts on the various lines are given in the Budget of Ways and Means. The working expenses are stated in the Budget of Public Works. The interest on loans is given in the Budget of Public Debt. An estimate of the future year is nowhere given, and can only be made up in an uncertain manner by calculations based on these several budgets.

We are indebted to Mr. Barron, her Majesty's Secretary of Legation at Brussels, for the best guidance available in this perplexing labyrinth. In a report, dated in April last, Mr. Barron has given an elaborate statement of the population, revenue, expenditure, taxation, and debt of Belgium, from which we are able to gather much positive and valuable information as to the Belgian railways.

When it is borne in mind that, in spite of the elaborate minuteness of the fiscal system of Belgium, — vendors of spirituous liquors, for example, paying sixty-six different rates, varying from 1·06 fr. to 185 fr. per annum,—the national revenue and expenditure are the smallest of any, and the whole incidence of taxation is only 1·463*l.* per head of the population, against 2·100*l.* per head in Great Britain and 2·852*l.* per head in France, it is clear that a system so special deserves study. Regarded in itself alone, as a self-supporting branch of the public service, the railway organisation of Belgium is economically indefensible. What may be its merit as an integral part of a general fiscal and financial system producing such enviable results is another matter. Into that we do not now attempt to enter. But it is needful to bear this in mind in order to show that it is for the sake of analysis, and not for that of criticism, that we investigate the operation of the railway system of Belgium.

The length of the Belgian State railways at the end of 1874 was 698·5 kilomètres. That of the connected lines worked by the State was 944·7 kilomètres. To the total of this State "*réseau*" of 1,643·2 kilomètres thus arrived at has to be added 309·8 kilomètres, being the length of the Grand Luxembourg Railway, purchased by the State in 1873, and that of conceded lines worked by various companies, amounting to 1,478·6 kilomètres. This gives a total length of railways worked in 1874 of 3,431·7 kilomètres, or 2,128 English miles.

The capital actually expended by the State down to the end of 1874, raised either from its ordinary revenue or from loans, was 382,177,773 francs. Adding the value of three annuities charged on the railway for the purchase of two lines and of certain rolling-stock, the gross capital is raised to the amount of 421,000,000 francs, or 16,840,000*l.* It is not distinctly stated in the report whether the whole of this sum is chargeable against the lines owned by the State, including the Grand Luxembourg Railway. If this be the case, the nominal cost of construction will average nearly 27,000*l.* per mile. The capital expended, and thus the price per mile, will be seen to be very considerably in excess of that which is stated in the *Annuaire Officiel* of 1873, as calculated up to the end of 1871. But the price above arrived at is not that of construction alone. It covers all the annual deficits in working since the opening of the lines. In this respect the information supplied by the Belgian budgets is not only imperfect, but misleading. It is desirable to have a statement of actual cost accompanied by a table of annual deficits in working. In the absence of this information, our estimate of cost can be only approximate, whether we rely on the *Annuaire Officiel*, or on the report of Mr. Barron.

The official balance-sheet sets down the value of the railway property of the State at the above figure of 421,000,000 francs regarded as prime cost. This is a mere illusion, as the depreciation of plant and working stock alone would very considerably reduce the value of the assets, supposing all expenditure to have been incurred in *bonâ fide* construction and purchase. The State owes, on this score, 248,000,000 francs in the form of redeemable debt, and 77,000,000 francs in the way of treasury advances, or 13,000,000*l.* sterling in all. The principle of the law of 1834 was that the railway should purchase itself from its own earnings, thus finally costing nothing to the State. But no profit thus applicable has accrued. The charge for interest on debt is rapidly increasing, and the net revenue of the line is small and precarious. The sooner the matter is regarded in its true light the less will be the ultimate complication.

The cause of this anomalous condition of affairs is the extremely low tariff in force on the Belgian lines. The gross receipts per mile in 1874 are a little higher than those of the railways of the United Kingdom were in 1870, being 2,871*l.* per mile. But the working expenses for the same year amount to 1,961*l.* per mile, or rather more than 68 per cent. of the gross revenue. The passenger-rates are incredibly low. For a single journey they are per mile: first class, 1·088d.; second class, 0·816d.; third-class, 0·514d., with a reduction of about one-fourth for return tickets. The average length of a passenger journey appears to be about six miles, as the number of passengers carried in 1874 were 29,457,707, and the receipts amounted to 24,929,327 francs. The proportion of revenue from heavy goods to the whole traffic receipts is about 54 per cent. That which prevails in the United Kingdom is 56 per cent. The goods tariff is proportioned to the distance travelled. Distances are divided into six zones, and goods arranged into four classes. The shortest zone is below fifteen leagues, each league being equal to five kilomètres. The longest zone is above forty leagues. For the first set of distances the charge rises from 0·6d. to 1·51d. per English mile per ton. For the largest zone the rates vary from 0·15d. to 0·60d. per mile per ton. Coals for export are carried for one-tenth of a penny per ton per mile. Mr. Barron justly remarks "such freights cannot possibly pay. Under the present tariff heavy goods are carried at a positive loss to the State."

Although the passenger traffic shows a steady increase, both in numbers and in revenue, for the years 1872-73-74, the goods traffic in the last-named year exhibits a falling off as compared with 1873. The respective tonnages were: 1872, 13,076,981 tons; 1873, 13,775,425 tons; 1874, 13,287,652 tons. The receipts for the same years were respectively 47,210,401fr., 48,636,707fr., and 39,329,920fr. The official returns, as before intimated, fail to present any distinct statement of the net income. Mr. Barron has deduced from a comparison of the different budgets that the net revenue fell from 23,000,000fr. in 1871 to 9,000,000fr. in 1873; rising to 12,483,000fr. in 1874. The latter sum represents a return of 2·97 per cent. on 371,969,074fr., the capital spoken of as "utilised" in 1874. This is a sad falling off from the years 1864 and 1871, which produced over 7 per cent. As the interest to be paid on the debt ranges from 4½ to 5 per cent., it is evident that such a net return as a little under 3 per cent. involves a practical bankruptcy. The matter is made apparently worse than the truth by the mode of swelling the capital to which we before referred. But in brief the Belgian Government are now subsidising the travelling and freighting public at the rate of at least 20 per cent. on their actual outlay. The tariff being so fixed as to give a net revenue of 31⅔ per cent. of the gross revenue, produces a return of 3 per cent. on a capital on which the State has to pay 4½ to 5 per cent. It would require an augmentation of the tariff by at least 20 per cent. to make the railways of Belgium solvent and self-supporting enterprises. To the extent here indicated the traveller in Belgium is subsidised by the State. How far that subsidy is justified by the impulse given to the general industry of the country is matter for very serious consideration.

ACTIONABLE NUISANCES CAUSED BY BUILDINGS.

THERE are probably few points of greater importance to those who are in any way engaged in the designing or construction of buildings than a clear notion of what constitutes an actionable nuisance. A proper appreciation of the true bearings of this subject would often cause much money to be saved which is spent in expensive litigation or in subsequent alterations consequent upon the decree of a court of law. It is quite true that nearly every such case depends upon the particular facts and circumstances by which it is surrounded. At the same time, if the principles which govern this branch of law are fairly grasped, there is no reason why many cases which are now decided in the courts of law should not be prevented, in the first instance, from arising at all. A nuisance may be defined as anything which annoys a person or is injurious to his property, and which arises from the property of another. A further and important element in a legal nuisance is that it must be a continuing act or series of acts, not a merely isolated and temporary one. English legal writers are very chary of giving precise definitions, and one of a nuisance will be vainly sought for in the text-books, but the above proposition, in the absence of any definition by leading legal authorities, is given as containing the chief characteristics of a legal nuisance. The element of continuity is of marked importance, for it is this which chiefly constitutes what in legal parlance is termed a nuisance. For if a spout on my neighbour's house suddenly pours a quantity of water on to my roof, and through my roof it penetrates to my rooms below, he is liable, if this accident was preventible, in damages for injury done to my property. Yet it is a simple wrong and in no way a nuisance. But if every time there is a fall of rain this spout pours its contents on to my roof, a distinct element of continuity is introduced, and a legal nuisance is the consequence. But a legal is not necessarily an actionable nuisance, and it is this fact which has

caused many hasty and ill-advised persons to demand redress for what they have wrongly supposed to be an actionable nuisance. An actionable nuisance has been defined by a very able judge to be "an inconvenience more than fanciful, more than one of mere delicacy or fastidiousness, an inconvenience materially interfering with the ordinary comforts physically of human existence, not merely according to elegant or dainty modes and habits of living, but according to plain and sober and simple notions among the English people" (Walter *v.* Selfe, 4 De Gex & Smith, 315, 1851). If this somewhat involved sentence be carefully considered, it will be found to contain the key to the decision of all questions which may arise upon this subject, the crucial test of all such questions being whether the act complained of materially interferes with the ordinary comfort and arrangements of an ordinary existence. If we judge all the reputed cases by this test, it will be found that it tries them fairly.

Taking this definition as the guiding principle, some cases may be pointed out as examples of it. But questions of nuisance, in so far as they are connected with buildings, arise in comparatively few ways. To group these several ways will further simplify the understanding of this subject. Legal actionable nuisances may arise from buildings in a threefold form, either from position, construction, or use. Every nuisance will be found to be produced by one or some of these causes. To touch briefly on the first head, the *position* of the building must be such as to interfere substantially with the ordinary habits of mankind, in order to bring it within the scope of the above-mentioned principle. A very good illustration, negative in its character, will be found in a case decided some ten years ago in the Court of Chancery (Smith *v.* Owen, 35 Law Journal, Chancery, 317). Mr. Smith was the owner of a shop in Bond-street, and Mr. Owen was the owner of the adjacent house. The latter commenced alterations in his premises which would throw the front further into the street, and thus prevent Mr. Smith's shop from being seen so far down the street as it formerly was, and consequently the goods in the window would also not be perceived so soon by the passers-by. Mr. Smith accordingly filed his bill in the Court of Chancery asking for an injunction to prevent the defendant from continuing his alterations. But the present Lord Hatherley, then Vice-Chancellor Wood, held that "there was not such an amount of injury as would induce the Court to grant an injunction: all that could be complained of was that persons could not see the goods as soon as they might if the alterations objected to had not been made." Here it was not a question of ordinary comfort, or of ordinary arrangements being injuriously affected, and it is quite clear that the objection was rather fanciful than real. If the building had been altered in such a manner, had that been possible, as seriously to diminish the plaintiff's custom by shutting out the view of his window, this would have been a very different thing: it would have been a substantial inconvenience. It is at all times a question of degree, but that degree must be tried by the test whether the inconvenience is fanciful or substantial.

The next point is that of the *construction* of a building.

In some respects construction does not differ very materially, as the example last given shows, from position, but cases may arise which are not so near the border-line as that which has just been touched upon. The most frequent way in which construction causes an actionable nuisance is by depriving a person of light and air. But it must be borne in mind when dealing with this point that the surrounding circumstances will be taken into consideration. What might fairly be considered an actionable nuisance at the West End may not be one in the City, where the size of the buildings and the course of trade necessarily render the same amount of enjoyment of sunshine and air impossible. The case which we propose to use as an example of nuisance arising from construction, again a negative one, will serve also as an instance of the necessity of taking into consideration the place where the nuisance is said to arise. The reversioners in fee of houses on both sides of a court in the City of London sold their reversion of a house on one side of the court to a person who at the same time obtained from the termor an assignment of his interest. The purchaser cleared the site, and on it and on adjoining land commenced building in such a way as to interfere with the access of light and air to the vendors' houses on the opposite side of the court. As a matter of fact, the new buildings exceeded by 16 ft. in height the old block. "But," said Lord Justice Turner, "it is not every impediment to the access of light and air which will warrant the interference of this Court. Some material or substantial injury must be established." And, again. It may well be believed that in such a court as this it would be difficult to find sufficient light to work at all times, or even, perhaps, at any time in the day in the month of November." Accordingly the plaintiffs were unsuccessful in this suit (The Carriers' Co. *v.* Corbett, 4 De Gex, Jones, & Smith, 764, 1865). When we come to consider the third head, that of nuisances arising from the *use* of a building, we find that the surrounding circumstances are even of greater importance than when it is a question of construction. Thus among a number of factories the owner of a house annoyed by the many disagreeable concomitants of a manufactory could scarcely obtain relief, but if a noisy factory is placed among a number of dwelling-houses, it is probable that the owner of the factory would be prevented from continuing his operations in the same manner. But a very good instance of the improper or materially inconvenient use of a building will be found in a case decided in the present year (Broder *v.* Saillard, 45 Law Journal, Chancery, 414). The facts of the case are very clearly related in Sir George Jessel's judgment: "The position of the defendant," he said, "is a remarkable one; the original plaintiffs are the owners of a house in St. George's-terrace, Primrose-hill. The defendant is the lessee of Hill View, a house standing immediately above the plaintiff's house. He is in a very unfortunate position. He seems to be a merchant who has taken a house, with a stable adjoining, at a high rent, and on the usual terms. The plaintiffs find their tenant threatening to go away, on account of the noise which was inflicted upon him by the horses in the defendant's stables." Further on the Master of the Rolls observed,—"I take the law to be this, that a man is entitled to the comfortable use of his dwelling-house. If his neighbour makes such a noise as to interfere with the ordinary use and enjoyment, and to cause serious annoyance and disturbance, the owner and occupier of the dwelling-house is entitled to be protected from it." Of course, this is again, to some extent, an instance of a faulty construction, but it is also an equally good instance of use, because the manner of using the adjacent building was the actual cause of the nuisance. By using it for the same purpose, but with greater care, the noise of the horses might have been considerably diminished. A still more striking instance arose when the ground-floor of a house in Green-street, Grosvenor-square, was used as a stable (Ball *v.* Ray, Law Reports, 8 Chancery, 467). This was a distinct instance of the use of a building in a special manner being the actual cause of the nuisance complained of, to which the judgment of the Court put an end, and is perhaps a more useful example than the similar yet more recent case decided by the Master of the Rolls. It would be beyond the range of a sketch such as the present to go further into this branch of the law, and into such essentially legal portions of it as have to do with acquiescence in the nuisance, the length of its existence, and so forth. The portions of it upon which we have touched are those which most vitally affect persons engaged in planning or advising upon buildings. If these principles, which have been briefly pointed out, be properly considered and applied either to the examples already given here, or to those which are constantly occurring in the course of professional duties, or which may be found by the dozen in law reports, they will not be without value to all whose work obliges them to consider the subject.

E. S. Roscoe, Barrister-at-Law,
Author of "Outlines of Civil Procedure."

Population of the Principal Towns of Scotland.—The Registrar-General of Scotland reports the following as the estimated population of the eight principal towns in the middle of the year 1876:—Glasgow, 545,144; Edinburgh, 215,146; Dundee, 139,125; Aberdeen, 96,499; Greenock, 70,192; Leith, 52,919; Paisley, 48,679; Perth, 26,535. The total is 1,194,239, or more, by about 18,000, than a third of the population of Scotland. Since the census the registration area of Glasgow has been extended, and that of Edinburgh contracted.

MOVEMENT IN INDIA.

It is rumoured that the question of transferring the management of the East India Railway to the Government of India has once more been raised, and, it is said, will be carried into effect in 1879. A report that the Board of Agency has declined to sanction any large outlay for new stations or other buildings has, however, been contradicted.

A grand scheme for the system of canals through Eastern and North-Eastern Bengal has been started. By this means a large portion of the Sconderbuns would be drained, other districts would be supplied with fresh water, while the accommodation for local traffic would be greatly increased. The great cost of any such project renders its execution extremely problematical.

The Punjab Government has sanctioned an expenditure of about 70,000*l.* in improving the water-supply of the city of Lahore, and an annual expenditure of 2,000*l.* for maintaining the new arrangements in proper working order.

The consulting architect of the Tanjore district has been directed to place himself in communication with the Surgeon-General and the Sanitary Commissioner, with a view to preparing and submitting to Government sketch-plans of the Mofussil Dispensaries.

Among the public works just finished in Madras are new Government stores and workshops, and those at present in existence are to be converted into a military hospital. Quarters for the lady nurses have been erected at the General Hospital, at a cost of Rs. 26,162, and a new palace is in course of construction for the Prince of Arcot, which will involve an outlay of 11,000*l.* or 12,000*l.* The zenana has been finished, but the palace-grounds have still to be enclosed, and the durbar-hall has to be furnished.

A movement is on foot to provide a suitable memorial of those who have fallen at Perak, which, if sufficient subscriptions are forthcoming, will take the form of a stained-glass window, in St. George's Church, Penang.

The Station Church of Lahore is about to be restored, pending the building of a new one, which is much needed. The Mahommedans of the city are also collecting subscriptions for the restoration of the Jaina Masjid, and have already gathered over 2,000*l.* for the purpose.

The trustees of the Indian Museum have lately purchased Dr. Day's large collection of Indian fishes. They are also negotiating for the purchase of the late Mr. W. S. Atkinson's collection of Indian insects. It fills twenty-five large cases, and is particularly rich in Darjeeling *lepidoptera*.

The death is announced of Mr. James May, C.E., resident engineer of the Madras Harbour Works. He had had considerable experience in this style of construction, having previously been engaged upon the harbour works at Kurrachee, Alderney, and Alexandria. The local Government has telegraphed to send a successor at once.

The French in India are in luck. A native named Soobroya Pillay has left the Pondicherry Government 30,000*l.* by his will, and it is proposed to establish a school of Industrial Arts with the money. There are, it appears, a number of young men, European, East Indian, and native, going about in the French colony without employ, not having the means of earning an honest livelihood, and it is hoped that if such a school were established they would, by learning a useful trade, cease to be a burden on society.

The Government of Bengal have had under consideration projects for the formation of a similar school or workshop for the practical instruction of the passed students of the Civil Engineering classes of the Presidency College; but the expense attending the foundation of a separate institution for this purpose, and the difficulties in organising it, have delayed the introduction of the scheme.

The re-organisation of the Madras Department of Public works is said to be again on the *tapis*. An officer from Bengal recently visited the Presidency, and is said to have drawn up a memorandum tending to show that the whole department is far behind the age, and that it must be thoroughly reconstituted on the Bengal model throughout.

Great efforts are being made to push on with the new water-works for the supply of Bangalore, under the control of Mr. W. Henderson, C.E. The project is intended for the collection of the storage of the rainfall on a comparatively high portion of land north-west of the station, and it is estimated that the total cost will be about 70,000*l.*

The native state of Mysore has provided 33,300*l.* for the restoration of tanks, and 30,000*l.* for new roads, in its estimates for the present year. The total estimated revenue is only about a million sterling.

The Forest Department, Burmah, have recently been extracting crude turpentine from two kinds of pine trees—the Musonia and the Khasyana,—which are found growing abundantly on the Salween hills, and there is some talk of making the product an article of commerce.

The King of Burmah has signed a contract with a Venetian gentleman for the construction of a railway from Mandalay to the British frontier, and Italian capitalists are said to have subscribed the necessary capital. The line is to be completed within six years and a half from the present time, and is to be handed over to the king whenever he is prepared to pay its cost with a fair profit added. Until then it will be worked by the company, 12 per cent. profit yearly being guaranteed by his Majesty.

A selection from the Yusufzya sculptures, weighing about twenty-two tons, has been despatched to England by the Duke of Argyll. It comprises statues, pillars, and carvings of sacred subjects, &c., together with the whole of the carved facings of the steps discovered at Jawalgiri, representing various "*Jatakas*."

General Cunningham has found two *dated* inscriptions of Asoks, one "when years after the Nirvana of Bhagavat had been fulfilled," only, unfortunately, the middle figure in both is doubtful. The first and the last are, however, almost certainly two and six.

Dr. Buhler has discovered the Sanskrit school, erected by Raja Dhar in the centre of an old mosque, and forming an integral part of the mosque. On one pillar are the Sanskrit conjugations; on another, opposite, the Sanskrit decensions. Round about are quaint punning Sanskrit slokas, in praise of Raja Dhar. The rest of the mosque is built of pillars, &c., taken from ruined temples.

While the archæological surveys of Bengal and Bombay are being carried out by General Cunningham and Mr. Burgess, very little has been done for Madras. A lengthy correspondence has taken place on the subject between the Madras and the Supreme Governments, and an offer has been made from the India Office of a salary and travelling allowances for a surveyor; but the sum mentioned is so very small that there is no immediate prospect of any competent person being tempted to undertake the duty.

The Conservator of Forests in the Tenasserim Provinces has published a return of the number of teak logs of all descriptions that have been imported into Moulmein from the Shan and Karenne States, as also the number of logs which have been brought into the market from our own forests. The whole quantity in the seventeen years, 1859—76, only comes to 237,305 pieces of timber. In 1859-60 only 52,955 logs of all sorts came to Kadoe, the timber station; from that year till 1866-67 the number ranged from about 64,000 up to 95,000. In 1869-70, the supply fell as low as 44,362. During the year 1875-76 no fewer than 138,609 logs came down.

The municipality of Lahore has unanimously resolved that plans for the introduction of a pure water supply and the drainage of the city and suburbs, prepared by Mr. Leslie Clark, C.E., together with an application for a loan of 135,000*l.* to carry out the works, be submitted for the sanction of the Government.

Among the many memorials which it is proposed at present to raise in India, is a little one which it is to be hoped will not escape notice among its more pretentious neighbours,—viz., a small monument over the grave of Captain Butler, of Naga Hills celebrity, at Golaghat; and, if a balance should remain, something towards perpetuating his memory in England.

Recent excavations at a place called Mahetshet, near the city of Bulrampore, have brought to light a number of interesting remains of Buddhist temples, and it is now intended to erect a museum for their reception at Gonda, in Bengal.

Factories for the manufacture of small arm ammunition are about to be established in each of the three presidencies of India. Machinery of the latest pattern has been manufactured for the purpose, and lies at Woolwich Arsenal ready for exportation.

Sir Richard Temple, who rarely mounts a hobby without winning the race, has declared himself strongly in favour of establishing a hospital for incurables in the neighbourhood of Calcutta. There is not money enough for this new project just at present; but a modest little house has been converted to this purpose as a temporary hospital at Sealdah.

A translation of the "Coppa Sasana," recently placed in the Mysore Museum, has been made by Mr. Rice, the Director of Public Instruction in Mysore. It is dated A.D. 481, and is written in Old Canarese characters; but the language is Sanskrit. It describes the Chora line of kings, whose capital was Talkad (now a deserted city in the Nugur Division of Mysore), and who ruled over the whole of the south of that province from the beginning of the Christian era to the end of the ninth century, or for about 1,000 years. One plate of the Sasana is wanting, and the east side of one plate is illegible; but the remaining plates are in an excellent state of preservation.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

THE third annual meeting of this Association was held on the 6th and 7th inst., in the hall of the Institution of Civil Engineers, Great George-street, Mr. James Lemon, president, in the chair. The first day's proceedings were devoted principally to purely business matters concerning the Association, such as the consideration of the annual report (which showed the society to be flourishing), alteration of rules, and the report of the council upon the election of officers, &c.

Mr. Lemon, after thanking the Association for electing him their president, proceeded to remark that sanitary engineering was of comparatively modern growth, as it might be said to have sprung into existence less than thirty years ago, when the investigations of Mr. Edwin Chadwick and Dr. Southwood Smith into the causes of zymotic disease led to the passing of the Towns Improvement Act of 1847, and the Public Health Act of 1848, which were followed by a host of Sanitary Acts down to the present time. The adoption of the Public Health Act of 1848 necessitated the appointment of surveyors; but though some appointed at that time were gentlemen of ability, the large majority necessarily possessed but a limited knowlege of sanitary science. The demand thus created for special knowledge naturally induced civil engineers and surveyors to devote themselves exclusively to the study of this important branch of the profession, and the result had been the creation of the sanitary engineer. But it was reserved to that Association to take legitimate steps to bring together the official talent of the country, and to adopt means of instruction whereby the standard of knowledge of sanitary science amongst its members might be permanently raised. This brought him to the present position of towns and districts under the Public Health Acts, and the duties of their officers. The first duty of the sanitary authority was the removal of excremental matters, which brought into play the constructive skill of the sanitary engineer, and the chemical knowledge of the medical officer of health. It was satisfactory to know that great differences of opinion now no longer existed on the sewage question, and that there was a healthy tone of general accordance on main points, which augured well for the settlement of the most difficult problem in sanitary science. The more we studied the subject, the more we became convinced that the choice of the system must depend entirely upon local circumstances. Closely allied with town drainage was the disposal of sewage at the outlet, and in this particular all towns were in the same difficulty. Sewage utilisation or purification had been the subject of much controversy, and large sums of money had been expended in the attempts to solve the problem; but the advocates of irrigation, precipitation, and filtration, had come to the conclusion that sewage utilisation did not pay, that the attempts to make a profit out of sewage must be given up, and that it must be treated as something to be got rid of without nuisance. Local Boards must either pay a subsidy to public companies, or they must make an annual loss if they elect to do the work themselves. In either case there must be a charge upon the rates. If the sewage outlet is above the intake of the water supply of another town, then the best means of purification is to apply the sewage to the land. If this condition does not exist, then precipitation or filtration may be resorted to; but in every case the standard of purity of the effluent water should not be lower than that of the river into which it is discharged. There are many details connected with the drainage of a town to which the attention of this Association should be specially directed, with the view of acquiring by discussion a better knowledge of the subject, and more uniformity in working. Among the many subjects upon which he hoped to hear papers read and statistics given were,—(1) sewage pumping machinery; (2) the separate system; (3) the area of land for irrigation and intermittent filtration per 1,000 gallons of sewage, exclusive of rainfall; (4) the drainage of sewage farms, the formation of the land, and the cost per acre; (5) the cost of precipitation by various processes, and the cost of drying the sludge. At the late Conference at the Society of Arts, strong opinions were expressed in reference to the defective condition of house drainage, and as to the desirability of the work being done by the local authority. This was, in many cases, correct; but we must avoid paternal government in these matters. Local Boards have ample powers to enforce the construction of efficient drainage, but this can only be done by an increased staff of inspectors, involving increased annual expenditure. Whether the inspection of buildings should be paid for by fees, as in the metropolis, was a matter for serious consideration. The Government, as they were aware, were promoting a Bill for the prevention of pollution of rivers, which on the whole was a very good measure; but he considered the 8th clause defective, as it would give encouragement to manufacturers to carry liquids into the sewers, to the serious detriment of the purification of the sewage. The opinion of two such large towns as Wolverhampton and Birmingham might be taken as evidence of the desirability of excluding such refuse from the sewers on any condition whatever, and admitting only the effluent water at such a standard of purity as should be approved by the local authority, with power of appeal, in case of dispute, to the Local Government Board. The next subject to which he would allude was that of water supply. The importance of good water could not be over-estimated. All towns which are without this vital necessity have a high rate of mortality, and a heavy percentage of zymotic disease. Local authorities who take no steps to prevent their constituents from being poisoned by bad water should be held responsible for such neglect, and the Local Government Board should compel such local authorities to provide a constant supply, of a fixed standard of purity, within such time as they might direct. The central authority very properly compel Local Boards to drain their districts, injunctions are easily obtained against the pollution of rivers, and the Government have a Bill before the Commons giving them increased powers; but the supply of one of the necessaries of life is left to chance and the voluntary efforts of water companies. Towns should not be left to the tender mercies of public companies, whose chief desire is to keep up their dividends; but the water supply should be in the hands of the local authority, and an analysis should be made by an independent officer under the central authority at least once a year. The influence of this Association had already made itself felt, and last year they succeeded in getting a useful addition to the clause in the Public Health Act in respect of the compulsory supply of water. Further amendment was, however, necessary. Powers are given to the local authority to compel the owners to supply water to their houses at an expense not exceeding the water-rate of the Local Act. But corporations who have constructed their own works are still liable to the limitation of 2d. per week, unless they apply to the Local Government Board. This absurd regulation was no doubt intended to protect the poorer classes, but it is not the occupier who is the objector; it is the owner, who wishes to avoid the expense of laying on water from the main to his houses. Parliament would, he thought, act wisely if they encouraged the acquisition of water-works by corporations, on the basis of annuities equal to the maximum dividends, and not upon the more prevalent system of so many years' purchase upon the dividends or profits. Corporations might also be allowed to hold shares in waterworks by consent of the Local Government Board, by which means they would gradually become the entire owners of the property. The question of water supply naturally brought him to the consideration of public baths and washhouses. The Act passed to encourage the establishment of these, like all permissive legislation, had failed to accomplish the object for which it was designed.

Very few towns have adopted it, from the fear of increased local taxation. In these days of active legislation for the working classes, and for the promotion of temperance, sanitarians should not overlook cleanliness and home comforts. The Artisans' Dwellings Act was a step in the right direction; but public baths and washhouses should form part of the scheme. If local authorities could see their way to adopt this Act without loss, they would be induced to do so, and it was the duty of that Association to endeavour to solve the problem. Amongst the many duties of the local surveyor there were none requiring more close attention than those in connexion with the maintenance of the public highways. The importance of carefully-prepared statistics as to the cost of maintenance could not be overestimated. The cost must depend upon local circumstances; but still there were so many conditions in common in all towns that much valuable information could be mutually afforded. Whatever opinions they might have as to the best material for our roads, there could not be a question as to the suitability of asphalte for public footways; but in selecting asphalte, his experience taught him that the best description was the cheapest. He had a preference for the compressed asphalte, as nothing but the genuine rock was used. The cost of new streets should fall upon the freeholder, and not upon the small leaseholder, as he reaped a very large profit by the transfer of his property from agricultural to building land. He had long been of opinion that the incidence of taxation in towns required adjustment, and that the cost of permanent works should be paid by the owner, and the maintenance by the occupier, with power to the leaseholder to deduct the proportion of the rating from the ground-rent, the same as property tax. But as taxation and representation should go together, he would give a vote to the owners in boroughs for the election of members of the Town Council. This would bring about greater interest in local matters on the part of the upper classes. They had lately received an addition to their sanitary legislation which would put local self-government on its trial. He alluded to the Artisans' Dwellings Act of last year. The difficulty which he saw in putting the Act in force was the definition of an unhealthy area, which Clause 3 defined as an area where diseases indicating a generally low condition of health among the population have been from time to time prevalent; and then it went on to state the causes to which these diseases may be attributed. But this was not sufficient. In his judgment, all courts and alleys wanting in light, air, ventilation, or proper conveniences, should be declared an unhealthy area, whether sickness prevailed or not. Sanitary measures, if they are to be effectual, should be preventive, and not remedial. It was, he believed, admitted that small towns required the Act as much as the large ones, and even more so. We have now rural sanitary authorities, who should take up this question and publish to the world how the agricultural labourer was lodged. This would bring out some startling revelations. The preparation of schemes, and the designing of artisans' dwellings, would fall upon the surveyor, who would also have to submit estimates of cost. This would be a work of considerable labour, and he hoped it would be met by Corporations in a liberal spirit. Expenditure and probable receipts should be set out showing the annual loss. That there would be a loss he had no doubt, and from his experience in laying out new streets he should estimate that loss at 50 per cent. at least of the whole cost. But although this loss would fall upon the rates, there would be a gain to the poorer classes living upon unhealthy areas from the decrease in their expenditure in times of sickness, and diminution of enforced absence from their daily toil. The consideration of this important measure naturally led one to reflect as to the causes which led to its passing, and the answer was, *laxity of local control over the formation of new streets and buildings*. The Artisans' Dwellings Bill would remove many evils; but how much better it would have been if the minimum width of streets and building regulations had been defined by Act of Parliament, and not left to the local authority to legislate on by means of bye-laws. Two years ago, at the annual meeting at Birmingham, he read a paper on this subject, and the general opinion was strongly in favour of a Borough Building Act in lieu of bye-laws; but as the local conditions vary considerably, an Act of this kind could not be framed to work satisfactorily without the local knowledge and assistance which an association like that alone could give. He should consider it his duty at an early day to call the Association together to discuss this question, and to prepare suggestions which he hoped would be accepted by the Local Government Board.

The president having concluded his inaugural address, the reading and discussion of papers was proceeded with. The syllabus included the following subjects:—"Street Tramways," by Mr. P. B. Coghlan; "Street Pavements as adopted in the City of Manchester," by Mr. H. Royle; "The Duplicate Mode of Town Drainage," by Mr. H. Jacob; "Constant Water Supply," by Mr. J. E. Greatorex.

In the course of Mr. Coghlan's paper, he said:—"I now come to the construction of the tramways. The introduction of steam power will, in my opinion, give the *coup de grace* to the system of using longitudinal wooden sleepers for the rails. It might be said that this is contrary to our experience on railway permanent way; but I think it is not so. In railway permanent way the block or rigid system was admirably adapted to the traffic expected at the time. It was only the greater speed of twenty and forty miles an hour that showed the necessity for a more elastic road. The jumping and hammering caused by such speeds shook the rolling stock to pieces on a perfectly rigid road, but when the speed is limited to ten or fifteen miles an hour, there is no such vertical motion in the carriage except when the rails are out of level, and except at the joint of the rail. If a perfectly rigid bearing is best for the tramway traffic which does not exceed ten or fifteen miles an hour, there is, no doubt, however, that with steam engines the average speed will be increased, and the joints of the rails laid upon longitudinal sleepers will give way much quicker than they are now seen to give way on the tramways laid on timber. I do not know that any system of permanent way is quite satisfactory, even on railways, and the same remark applies much more forcibly to tramways. In the timber system, as laid in London, Liverpool, Middlesbrough, Dublin, and other places (including part of the Leeds tramways), I think the construction is unsatisfactory, because the road is elastic; and though there are iron plates under the rails at the joints, a depression of the rail and a jolt of the car are generally to be found there, and this would be worse with an increased speed. Besides, I do not think the longitudinal sleeper properly holds the side fastenings generally used to clamp the rails to the sleeper. The alternate wet and dry so near the surface of the road must have a prejudicial effect on the timber, and particularly at the curves, where the timber has to receive vertical cuts, about 1 in. or 2 in. in depth, in order to bend it round, to correspond with the required curvation of the rail. If cross timbers could be used, I should think a satisfactory tramway might be constructed with wood, but, as long as we require the surface of the road to be paved, a difficulty will arise, on account of the impossibility of bedding the paving-stones satisfactorily where the cross timbers occur. Mr. Deacon, borough engineer, Liverpool, has designed a tramway which he considers specially adapted for towns, such as Liverpool, in which the ordinary traffic is very heavy. The advantages claimed by Mr. Deacon are, that a uniform bearing is secured for both pavement and rails, by forming a Portland cement concrete foundation beneath the whole street. The sleepers which are creosoted to the heart, rest upon the smooth surface of the concrete. The rail is of steel, and trough-shaped, and weighs rather more than 60 lb. to the yard, though the width is only 2½ in. (the usual width being 4 in. or 4½ in.). The depth of the flange, and consequent transverse strength, are therefore exceptionally great. The top of the sleeper is formed to fit the trough shaped under side exactly. One of the objects sought has been to connect the rail with the underside of the concrete foundation in such a manner that while full advantage is taken of the rigidity of that foundation, a slight elasticity is secured by the presence of the timber sleeper. With this end in view, a cast-iron washer is bedded in the lower part of the concrete, and from this washer, a bolt is brought up 2½ in. above the concrete, and screwed with a right-handed thread, and the sleeper having first been drilled vertically, so as to admit this bolt, is placed in position. A second bolt, having an eye at its upper end, and being screwed with a left-handed thread, is connected with the lower bolt by a large right-handed nut. Through the side flanges of the rail two opposite holes are drilled, and the eye of the upper bolt having been placed between them, a three-fourth inch pin is inserted to connect them. By screwing up the nut, engaging the lower right-handed and the upper left-handed bolts, the rail is drawn down to its position, and holds the timber sleeper, which acts merely as a packing piece in position between the rail and the concrete foundation. These fastenings are placed at every 3 ft. The second object claimed was greater uniformity of the surfaces of the rails and adjoining setts. The whole of the setts, with the exception of those immediately adjoining the rails, are laid upon ½ in. of sand. The sets next to the rail are carefully picked, and if necessary dressed, and are alternate wholes and halves. The two extreme ends of the base of each rest upon the concrete. The stability of the whole pavement is further insured, and it is expected that the surface-water will be prevented from penetrating to the sand or to the sleepers, by filling the joints with a bituminous composition. With the object, on the one hand, of obtaining a larger tread for the tram-wheels, and, on the other, of reducing the inconvenience to ordinary traffic inseparable from the existence of a broad iron rail, the groove and wheel flange is placed in the middle, and thus, while the tread and life of the wheel are increased, the width of the rail is, as already stated, reduced to 3½ in. I consider Mr. Deacon's system to be very ingenious; but I do not think a timber sleeper, 3 in. wide (even though it may be 6 in. or 7 in. deep), can possibly make a permanent job, particularly when it is cut about for fastenings and at curves. Besides, it would cost as much to tighten up these fastenings as it would to put in new fastenings on the ordinary system, and I do not see any equivalent advantage in the additional first cost. I should gladly support any scheme for reducing the width of the rail to a minimum, but I am compelled to object to the groove in the centre of the rail, because I do not see that any advantage is given sufficient to compensate for the additional haulage power required for pulling the cars on this form of rail. With the bearing surface of the wheel on one side only of the flange, the groove, to a certain extent, cleans itself, but with the bearing surface on both sides the flange wedges dirt and dust into the groove. I have formed a very favourable opinion of the plan recently submitted by Mr. Souttar to the Manchester corporation.

The first day's proceedings were concluded by a dinner at the Westminster Palace Hotel.

On the second day, Mr. Ellice-Clark, of Derby, read a paper "On the Construction and Maintenance of Highways." This was followed by a paper "On the Leeds Sewage Works," by Mr. A. W. Morant, of which the following is an abstract:—

After giving the statistics of area, population, levels, rainfall, &c., he described the steps taken by the corporation to effect the main drainage of the chief part of the borough, the sewage being conveyed to one outfall at Knostrop, about two miles and a quarter from the town-hall. When this was done an injunction to prevent the sewage being allowed to flow into the River Aire until purified was obtained by the riparian owners. The Utilisation of Sewage Committee having visited all the towns where processes for purifying sewage were being tried, finally decided to adopt that of the Native Guano or A B C Company. In 1870 they entered into a contract with that company, and first constructed experimental works, and afterwards permanent works, sufficiently large to deal with the whole sewage of the borough. The length of sewers in Leeds is about 130 miles, and the cost has been 283,266*l*. Mr. Morant then fully described both the experimental and permanent works, the cost of which has been 57,543*l*. The quantity of water supplied to the town from the waterworks is about 7¼ millions of gallons per day, and the quantity of sewage flowing to the outfall has been found lately, by careful gauging, taken in perfectly dry weather, to be about 9 millions of gallons. It had been considered to be much more. There are about 8,500 water-closets. The outfall works consist of pumping machinery (as the whole of the sewage has to be lifted about 18 feet), machinery for grinding and mixing the ingredients used for purification, twelve depositing-tanks, and a shallow reservoir of about five acres in area. Various processes have been tried for the purification of the sewage, chiefly those of Rupert Goodall, the Native Guano Company, and John Hanson. Each gives a good result, and it has not yet been finally determined which to

adopt. In order to compare the efficiency of these processes, Mr. Morant described the materials used, and the cost, and then showed the analyses of the effluent water and of the sludge. The sludge removed from the tanks, after being dried so far as possible in the air, is made into a powdered manure by means of Borwick's patent drying cylinders, which are found to answer well.

Mr. E. Buckham, of Ipswich, then read a paper on "The Removal of Excrementitious Matter in Towns in Connexion with Sewage Disposal," in which he stated that it was in contemplation to use Morrell's earth-closets at Ipswich instead of carrying out drainage works, which, from the nature of the ground, would be very difficult and costly.

Mr. T. W. Grindle, of Hertford, followed with a paper on "The Cost and Construction of Sewage Tanks," which we give elsewhere.

In the discussion which followed the reading of these papers, the "pail system," as in use at Rochdale and elsewhere, was very strongly condemned by almost every speaker. Reference was made to the recent Sewage Conference at the Society of Arts, it being remarked that the conclusions which had been arrived at by that gathering were devoid of anything like novelty. The principles laid down in the recommendations of that Conference were substantially if not identically the same as those which had been all along insisted on by the Association, and it did not seem likely that much good would result from outside conferences on the subject. It was generally admitted that where the contour of the land allowed of it, irrigation was the best means of disposing of sewage; and next to that, underground intermittent filtration. It was further observed in this connexion that the towns to which one or other of these systems could not be applied were very few indeed. A suggestion of some interest was made by Mr. Lynde (Manchester) on the subject of sewage-tanks. He proposed that instead of the ordinary oblong form, they should be made somewhat in the shape of a wedge, or perhaps in the shape of a fan when about half opened. The sewage was to be admitted at the narrow end, which would be deep, and drawn off in a thin film at the broad end, which should be very shallow, the bottom of the tank sloping upwards as it spread outwards from the narrow to the broad end. Mr. Lynde was of opinion that this form of tank would allow of a much speedier subsidence of the solids, and would result in a purer effluent. Mr. Grindle said he had to make another tank for purposes of experiment, and he was half inclined to adopt Mr. Lynde's suggestion. As to the various chemical precipitating processes of treating sewage, it was pointed out that their great defect was that they largely increased the amount of sludge. Hardly one of these processes was to be preferred to another, and inasmuch as lime formed the basis of nearly all of them, it would generally be found much cheaper, and almost, if not quite as effectual, to use lime only. Mr. Lewis Angell and other speakers, in referring to the pail system as adopted at Manchester, said that any one in the vicinity of the "sanitary depôt" where the pails were taken to be emptied would not need to inquire the way to it; his olfactory nerves would prove an unerring guide. The smell was something horrible, and yet, it would hardly be credited, opposite to this depôt of filth were the splendid new abattoirs erected by the Manchester Corporation, and on the side nearest the depôt the carcasses were hung, when fresh killed, for a day or two, previously to being sent all over the city and the surrounding districts. In face of what Professor Tyndall and others had said as to the "germ theory," a more effectual mode of spreading disease than placing these two establishments together could hardly be conceived. It was a gross blunder, due, he believed, to the different Corporation committees working in ignorance of what other commmittees were doing. The "sanitary depôt" would, he heard, soon be removed, and the sooner the better, for such a state of things ought not to be tolerated a day longer than necessary. In reference to Ipswich, most of the speakers deprecated the dry-earth system proposed to be introduced by Mr. Buckham, and advocated the construction of low level sewers discharging into or near the sea. The sewage of seaport towns generally would be best disposed of by pouring it into the sea, subject to such arrangements as would preclude its being carried back to the shore.

The foregoing summary of the discussion presents the salient points touched upon by the speakers. We may publish abstracts of some of the other papers read, but the Association seems to be inclined towards the short-sighted policy of giving scant facilities to the representatives of the press.

The Association now numbers 180 members, and an augmentation is expected to result from the establishment of a district branch or section for Bristol and the neighbourhood.

THE COST AND CONSTRUCTION OF SEWAGE TANKS.*

It generally occurs that works for precipitation are in low-lying situations, the difference of level between inlet and outlet regulating the depth of the tanks, if advantage is to be taken of gravitation as a means of emptying. The size of the tanks depends upon the process adopted. Where rapid coagulation takes place, as in the phosphate sewage, "A B C" or M. Hillé's process, smaller tanks are requisite. In Hertford, where the lime process was in operation, the size of the tanks (six in number) was 120 ft. long, 20 ft. wide, and 4 ft. 6 in. deep, each having a capacity of 67,500 gallons, the tanks being always in use.

Under the phosphate sewage process, four of these tanks are found amply sufficient, while the fifth is being cleansed of sludge, and the sixth kept in readiness for storm water.

A series of narrow tanks is found preferable to two wider ones.

The division-walls are two bricks and a half in thickness; outer walls, two bricks. The rule adopted to ascertain dimensions of the division-wall is obtained by taking the weight of material used in the construction of the walls, which should be of sufficient weight to resist the pressure of water thrown against them at the maximum height.

All walls should, of course, be perpendicular, so that the solids will more readily fall to the bottom of the tank. In one case, where the brickwork was perfectly dry, I had the interior of the tank *tarred*. This prevented the growth of sewage fungi.

Tanks containing sewage should always, if practicable, be covered.

Near the entrance to the tanks, a junction with a sumph common to all of them is made, into which the sludge is swept, to be lifted to the drying-beds by the elevators. It frequently happens that there is not sufficient admixture of the chemicals with the sewage, to induce which an agitator was designed, consisting of a rectangular chamber at the sewer-mouth, with boards placed alternately at the top and bottom of the tank, at equal distances apart; this causes agitation, and answers admirably.

The cost of constructing sewage-tanks varies with the locality, so that no reliable estimate can be given. At Hertford, the brickwork cost 14*l.* a rod; Ponder's End, 20*l.*; Buckhurst Hill, 17*l.* 10s.; at Hatfield, only 12*l.* 10s. At Ponder's End, 16s. a cube yard was paid for concrete; at Hatfield, only 10s. 6d.; but in the former case, cement was 2s. 6d. per bushel, in the latter only 1s. 9d.

The elevating machinery should be of the simplest description, that it may be worked by unskilled labour, the only kind that can be obtained to conduct operations on sewage works. The sludge should be elevated by the common dredge (chain and bucket). Pumps are cut by the silt in the sludge.

The speaker at some length then referred to sewage filtration, observing that he found granulated coke to make the best filter or strainer, arresting those particles of sewage that are not acted upon by any known precipitant, and which, if escaping into streams, get attached to the sides or bottom, and, though uninjurious, give the appearance of extreme sewage pollution. Before concluding, he remarked that a saving of steam-power in many cases can be made by utilising the outfall of the effluent water. At Hertford, a fall of only 3 ft., with 700 gallons per minute, is found sufficient to drive the whole of the chemical machinery and sludge-elevators.

The paper was illustrated by several drawings of works constructed by Mr. Grindle.

The following is the rule referred to as to strength of division walls.

In estimating the pressure of the water to be resisted, and the requisite strength of the division wall or partition, the following calculations may be used:—

P = the pressure of the water in pounds to be resisted.

d = the depth of water = 5 ft.

Taking 62·5 lb. as the weight of a cubic foot of water,—

$$P = \frac{62{\cdot}5d^2}{2} = \frac{125d^2}{4} = 781{\cdot}2 \text{ lb. per lineal foot of wall.}$$

M = the moment of water tending to overthrow wall $= P \times \frac{d}{3}$

$$\therefore M = \frac{125d^2}{4} \times \frac{d}{3} = \frac{125d^3}{12} = 1{,}302 \text{ lb.} \quad \ldots\ldots\ldots (2)$$

Let w = the weight of a cubic foot of the wall, which may be taken at 105 lb. for brickwork.

h = the height of the wall above the invert = 5 ft.

t = the thickness of the wall, 2 ft. 3 in.

D = the moment of the wall to resist overthrow.

$$\therefore D = \frac{ht^2w}{2} = 1{,}328{\cdot}95 \text{ lb.} \quad \ldots\ldots\ldots (3)$$

For safety D should exceed M.

MORTUARY FOR THE PARISH OF CLERKENWELL.

THE parish of Clerkenwell has for many years past been unable to provide a proper mortuary, consequent upon the difficulty of obtaining a site for the building. The Marquis of Northampton has, however, come to the rescue by granting the use of a portion of the now disused Spa Fields Burial Ground for the purpose for a term. It is the intention of the Marquis to hereafter lay out the whole of the burial-ground as a garden for the recreation of the inhabitants, and consequently it was desirable that the new building should be somewhat more ornamental than is usual with such structures.

The Vestry have instructed Mr. H. Saxon Snell to design for them a building that should be as complete in all its details as possible, desiring that whilst the strictest economy should be observed, everything should be done that sanitary knowledge could suggest for rendering the place unobjectionable to the inhabitants. The site is about 36 ft. wide and 130 ft. long, and it is situated to the south of the entrance to the burial-ground from Fletcher's-row, and abuts upon the back portion of the houses in Northampton-row.

There are two dead-houses, each 24 ft. long and 12 ft. wide, and a "post mortem" room, 18 ft. long and 15 ft. wide. The walls of all these rooms for 6 ft. in height are lined with Cliff's white glazed bricks; the floors are of asphalte, the coffin tables are of planed slate, and there is every facility for well flushing and cleansing all parts with water. The inquest-room is 22 ft. long, and 17 ft. wide, and the waiting-room for witnesses adjoining is 18 ft. long and 15 ft. wide. There is a separate lavatory and water-closet accommodation for the coroner and jury and for witnesses. The walls of these inquest and waiting rooms are lined with Cliff's buff-coloured glazed bricks and red skirtings.

An important feature in the plan of the building is the verandah, which affords covered access for the coroner and jury to the dead houses when it is necessary to view a body.

At the north-east corner of the ground is a disinfecting chamber, fitted with Messrs. Fraser's patent aparatus, and over this rises the tower and chimney shaft, with flue for carrying off the offensive odours of the disinfecting closet below. The upper part of this tower contains the cistern, and below is a room for the caretaker.

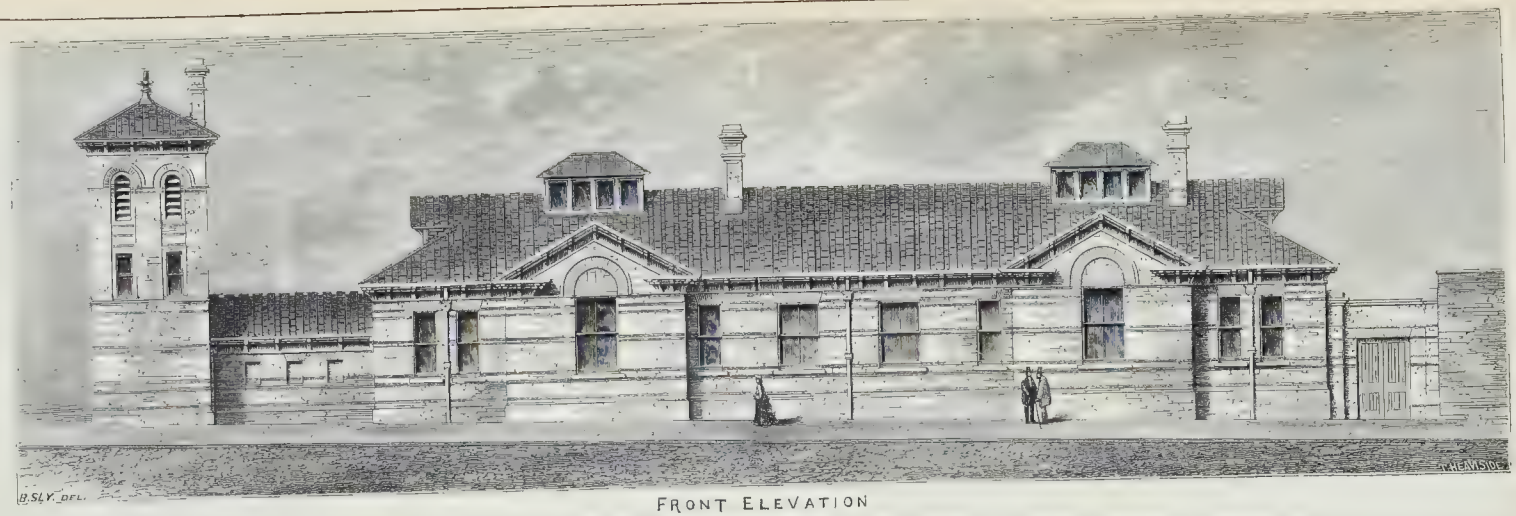
The roads, yards, and floors are all to be covered with Claridge's asphalte.

The present entrance from Fletcher's-row can only be reached by foot-passengers; but houses have been purchased in Northampton-road, and arrangements are being made for forming therefrom an entrance for hearses and other vehicles.

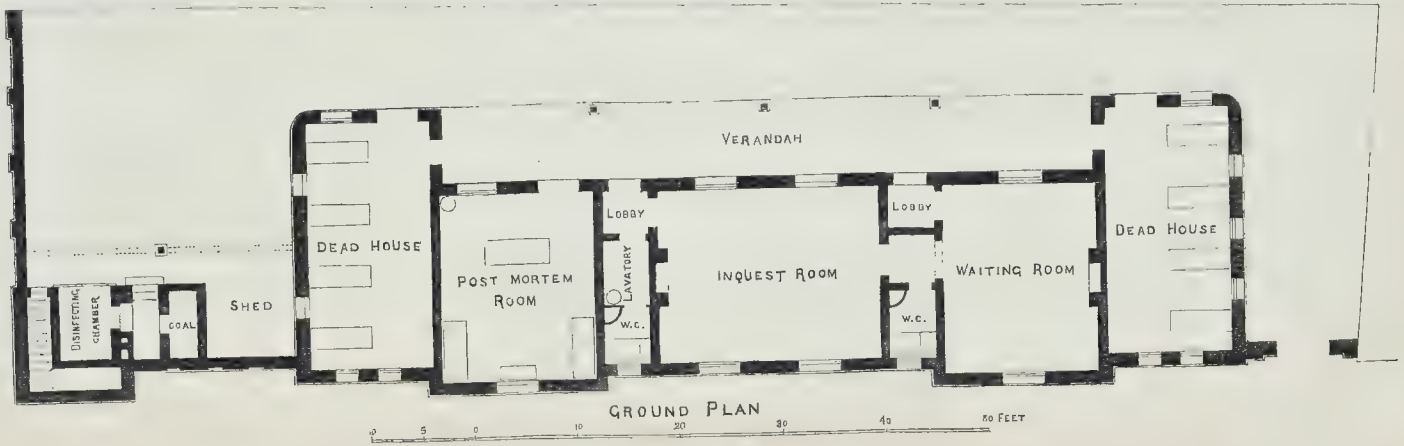
The builder, Mr. Patten, has undertaken to complete the whole of the work, including fittings of every description and gas and water, for the sum of 2,260*l.* Mr. Herbert, the clerk of works, superintends the erection of the building under the direction of the architect, Mr. H. Saxon Snell.

Loan Collection of Scientific Apparatus, South Kensington Museum.—Explanations of apparatus in action, lectures, and so forth, are still going on. Programmes should be looked at.

* By Mr. T. Wilson Grindle, Borough Engineer, Hertford.



FRONT ELEVATION



MORTUARY FOR THE PARISH OF CLERKENWELL.—MR. H. SAXON SNELL, ARCHITECT.



THE NEW TOWNHALL, PHILADEL



U.S.—MR. JOHN M'ARTHUR, ARCHITECT.

THE NEW TOWN HALL OF PHILADELPHIA.

VISITORS to the Centennial Exhibition will find occasion for admiring Philadelphia as one of the handsomest of cities. The buildings of the city, as is well known, bear favourable comparison with those of the Old World; and it is to be regretted that the edifice forming the subject of one of our illustrations could not be finished by the 4th of July. Philadelphia is building herself at the present time her town-hall, after the designs of the architect, Mr. John McArthur, and under the supervision of a German, Herr F. Loenholdt, of Frankfurt. The building, of ambitious design, is placed on a plot of ground 1,000 ft. square, situate at the crossing of two wide thoroughfares,—Broad-street and Market-street,—and covers, not reckoning the courtyard, a space of 4½ acres. The north and south façades measure 470 ft., those of the east and west 486 ft. 6 in. The four fronts are treated in a similar style; the centre of each is formed by a pavilion 90 ft. broad, and rising 200 ft. Gate-ways, 18 ft. broad and 36 ft. high, form the principal entrances, and at the same time passages leading to Market and Broad streets. The outside of the substructure is of fine white granite, and forms a firm basis for the colossal superstructure. The granite alone for its construction costs $550,000. The rooms of the principal story over the basement have a height of 36 ft.; over this is a second story, 31 ft. high, and a garret story, 30 ft. high. The whole façade over the granite structure is of white Massachusetts marble, with elaborate details. The marble used for it cost $5,800,000. The building surrounds a courtyard of 200 ft. square, on the north side of which rises an imposing tower. Its foundation is concrete; its walls are 20 ft. thick, and formed of blocks of stone weighing from 2 tons to 5 tons each. The tower measures at its foot 90 ft. square, and tapers to an octagon bearing a cupola, surmounted by a statue, 35 ft. high, of William Penn. Altogether, the tower will have a height of 510 ft., and will consequently be the highest in the New World. The whole building numbers 520 rooms. Four great lifts lead to the different stories, communication throughout the building being, besides, made easy by all possible means.

THE ETHICS OF TASTE.

GOOD taste is in reality a matter of deeper significance than may at first sight appear; it is, indeed, a matter of principle affecting the mind and character, an essential element towards the formation of excellence.

In the construction of a building it is not sufficient that the material employed is sound, and the workmanship good; something more than mere utility is required to satisfy the demands of good taste,—the material must also be arranged and adjusted in a pleasing and artistic form. The material must be good, the workmanship good, the form good; a deficiency in any of these respects detracts from the good taste of any work of man.

Shabbiness is one of the most contemptible of qualities, and indicates a certain narrowness and meanness of mind which displays itself in the effort to do things by halves, and to make things appear better than they are. The love of display which results in vulgar ostentation is the result of selfishness, of a desire to excite the envy of others rather than the wish to share benefits with them,—an effort to appear great, without striving to be great in reality. The works of a man are not to be estimated by their intrinsic value only: the richest material may, by great labour, be tortured into the most repulsive form, but it does not gain in value thereby, whereas material which in its natural condition may be of trifling value, may, under proper treatment guided by good taste, be made to assume a form which renders it of priceless value.

Profuseness of ornament unregulated by good taste is the counterpart of extravagance. The separate items may each be good of their kind, but too much of a good thing is destructive alike to mind and body. Misapplied wealth is more dangerous than poverty. Ornament rightly applied should help the design, not overlay and obscure the form; it must be applied with discretion and forethought, not profusely and at haphazard. Eloquence does not consist of loud talk and extravagant gesticulation; however high-sounding the words, unless they convey ideas, they are worse than useless,—an annoyance and source of weariness and disgust to those upon whom they are inflicted.

An illusion prevails, even amongst people of intelligence, that good taste is intuitive, and does not require study or thought. The germ of good taste must doubtless exist in the mind before, and can be cultivated, but, like every other mental quality, it must be trained and carefully nurtured if it is to be productive of good results. The people of this country are generally in a condition of simple ignorance in relation to the fine arts. The benefit to be derived from the study of art seems vague and illusory to those whose artistic instincts are weak; they cannot see that a careful study of works of art is worth the trouble,—that any benefit to be gained thereby is worth striving for unless it be the sordid one.

The eye must be pleased and the sense of beauty gratified wherever man is raised above the lowest stage of barbarism, and this sense of beauty will be displayed in every direction if it is real and genuine, and not affected and superficial. Common sense is often lugged in as an excuse for the neglect of art; the absence of good taste in the exterior of a house is spoken of as a merit, and an appeal is made to the alleged fact that it is perfect within. But upon analysing this alleged perfection, it is found to consist of common-place elements, and that neither art nor good taste is amongst them. We have heard a man boast that his garden would compare with any he had ever seen, but take merit to himself for having built an ugly house in the midst of it. "The house was built to live in, sir,—not to look at." The absurdity of this is surely obvious. Need the house of necessity have been ugly in order to be a comfortable residence? Did the ugliness of the house add to the beauty of the garden? or was the good taste (if there was such, which is questionable) displayed in the one a complete compensation for its absence in the other? An ugly object in the midst of a beautiful one is certainly out of place. An idea seems to have taken possession of some minds that an artistically-designed house must be a gimcrack affair. "A plain, square, substantial house" is talked of as the acme of perfection, as if a house of that description must necessarily be substantial, and one of a more artistic description flimsy. The much-boasted-of common sense, if it really existed, would suffice to destroy this illusion. Beauty of form is not incompatible with usefulness, but, on the contrary, true beauty is an essential element of genuine usefulness. An ugly object may be useful, but it would certainly be more useful if of good form. Superadded ornament is not by any means essential to beauty, but good proportion is; a well-proportioned object is always beautiful, although unadorned by detail. Manufactured articles which are cast from a mould, for example, vary considerably in appearance, although they bear a decided resemblance to each other; but the sharpest casting is the best in quality as well as the most beautiful in appearance. The workmanship of a skilled hand, again, is superior to that produced by a mechanical operation; superfluities are got rid of, and imperfections carefully avoided, and variety and effect are produced which cannot be attained by the use of unintelligent mechanism. Thus it is that the skilled hand is called in to overhaul and remedy the defects left by the machine, and to make the object more beautiful and useful.

There are men so constituted that they cannot comfortably hold an independent position; they lean for support upon authority, and that too often without any attempt to inquire into the right of the authority to the position held. There are doubtless many so weak and ignorant in regard to certain matters that they never go safely unless in leading-strings, and it is well that they should be safely guarded, but it is requisite that the guides should be trustworthy and capable. In matters of taste there are men who adopt the character of guides, who act without authority and without sufficient knowledge of the position. They have no fixed object in view, but are swayed by every change in the wind of fashion. At one time they point to a newly-opened and distant land as the only place worth looking at, and at another they say you need not go beyond the next street in order to see what is really beautiful. These beauties they never discovered till other men of keener perceptions pointed out that something good was to be found in that direction, and forthwith they declare that everything there is admirable. These men are not devoid of knowledge, but "a sane mind does not always escape an epidemic folly any more than a sound body escapes an epidemic disease."

"To understand and to perform are two very different things." There are "mute inglorious Miltons," who feel the afflatus stir their souls, but the power of expression is denied them; a seal is upon their lips which forbids utterance; they see clearly the object of their admiration, but have not the power to grasp it. The man who feels thus, who understands but knows he cannot perform, is certain to place himself under proper guidance if left to his own choice,—he employs one who can extract poetry from form, and is rewarded by becoming the possessor of an admirable work of art.

It is a comparatively recent discovery that no inconsiderable number of people are colour blind, and it is a remarkable fact that it is very difficult to convince them that they are so. Not only is this the case, but there are others who do not labour under this defect, but who, from not having cultivated the eye, do not perceive the existence of certain colours, and cannot distinguish a variety of tints. The instructed eye of the artist who sits down to sketch a landscape perceives numerous tints on a grass field where the uninstructed eye sees only one or probably two. So, too, much that is beautiful, both in mind and manner, is unperceived by those of grosser nature, they are unable to discern the delicate refinement and sensibility which cause the finer natures to shrink from all that is base and unlovely.

There is a consistency in Nature which applies to the noblest work of the Creator, the mind, the soul of man. The *suaviter in modo* and the *fortiter in re* must be combined where there is good taste; good taste is ordinarily allied with generosity and manliness of character and amiability and gracefulness of manner. And what are these but the outward expression of that charity, without which we are nothing worth,—the chief item in the formation of "the beauty of holiness"?

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY'S VISIT TO MR. D. KIRKALDY'S WORKS.

THE members and friends of this Society paid a visit to the above works, on Saturday last, by the kind permission of the proprietor.

Upwards of thirty gentlemen availed themselves of this favourable opportunity, and each, upon signing the visitors' book, was presented with a programme of the different contents of the establishment. The past-presidents of the society, who attended, and took a special interest in the visit to these testing and experimental works, were Messrs. Eachus, Mem. I.C.E.; B. Haughton, M. I. Ingénieurs Français; C. W. Whitaker, and G. W. Willcocks, Assoc. I.C.E.; and amongst other visitors and friends were Messrs. J. B. Costello, Toplis, Groves, Gill, Barfield and Humby, of the G.N.R. engineer staff; H. Valpy, Mem. I.C.E.; H. Ellis Hill, Assoc. I.C.E.; &c., &c.

The first object of interest to catch the eye in the office is the coloured drawing, by Mr. Kirkaldy, of the steamship *Persia*, which was in the Royal Academy Exhibition 1861, being the first, and as yet the only, engineering drawing admitted to that institution. It is a good specimen of draughtsmanship, and was admired by many present.

On the ground-floor are to be seen the testing-machine and its arrangements for applying the different stresses; also the great variety of tools necessary to meet the diversified requirements in testing materials; the steam-engine and boilers for working the hydraulic pumps and other machinery; three travelling cranes, for moving girders and other heavy articles; machines and instruments for accurately weighing and measuring specimens.

In the first-floor, or machine-room, there are turning-lathes; planing, shaping, slotting, and drilling machines; tools and standard gauges for accurately preparing such specimens as require it, previously to their being tested; also for making additional apparatus if required.

The second-floor is reserved for additional machinery, &c.

On the third-floor, or museum, are so many thousand broken specimens which have been tested at this establishment that it is almost impossible to enumerate them; suffice it to say there are columns of bricks, stone, and wood; bars and plates of steel, iron, and bronze; railway rails and girders; samples of cloth, canvas,

ropes, belting, &c., which have all been tested with one machine. One specimen deserves special notice: it is known by the workmen as "the man's leg," owing to its having a centre bar of wrought iron and six smaller ones of the same metal spaced round the centre, and cast into the body of the sample bar. This same bar was said, by the parties who sent it, to be tensilely strengthened by the aid of some secret mixture of chemicals,—but lo! when broken by Mr. Kirkaldy, the fraud was exposed, and there it remains to this day in the museum, and is well worthy of attention, to show the special value of testing and experimental works.

So minutely is the testing-machine registering dial divided, that it registers to less than one-hundredth of an inch, and it must have cost years of labour to bring it to its present state of perfection.

After a visit of over three hours' duration, the party broke up with passing a vote of thanks to Mr. Kirkaldy for the great trouble he had taken in personally conducting the party over his establishment.

PROPOSED BOROUGH MARKET, WAKEFIELD.

PLANS for the new general market which it is proposed to erect for the Borough of Wakefield have been decided upon. They have been prepared by Mr. W. Watson, architect, Wakefield, under whose supervision the works will be carried out. The buildings will be erected upon the oblong piece of land now occupied by a few temporary sheds, and used in part as the present market-place. It is bounded on the east by Teall-street, on the west by Brook-street, on the south by Westmoreland-street, and on the north partly by the Old Market House, and completed in a line with the same by the new buildings, extending altogether over an area of about 2,665 square yards. Around this space, and inclosing the inside market, will be forty-two shops, divided as follows, viz.: — Fourteen in Teall-street, with a frontage of about 11 ft. each, and 14 ft. deep in the clear of the walls except one, which is 14 ft. each way; there are six in Westmoreland-street, with a 12 ft. frontage, and 16 ft. deep, also two corner shops, each 14 ft. 6 in. by 19 ft., fronting respectively to Teall and Brook streets, as well as to Westmoreland-street, and having angle doorways. Eighteen shops will face Brook-street, seventeen of which will be 9 ft. by 14 ft. in the clear, and one 14 ft. by 14 ft.; this shop and one of the others will also have an open front to the inside of entrance. The enclosure will be completed by two shops in line with and abutting against the old market-house, fronting the inside market, and being 10 ft. by 14 ft. in the clear. Facilities will be arranged so that many of the shops in Brook-street may largely increase their size and accommodation by a communication between them and the inside shops, thus allowing the occupiers to carry on trade both inside and outside of the market. The "inside market" is to be approached by three entrances—one from each of the streets—two of which rise up several steps, as it is intended to make the new inside market-floor level with the present market-house, the two entrances to the same being allowed to remain. Through communication is thus given, making the entire market, both old and new, of considerable length. The interior is fitted on three sides with thirty-eight shops about 9 ft. square. Eighteen of these shops will be finished and fitted as second-class butchers' shops. In addition to these shops, there will be three rows of open stalls, occupying the centre of the market, divided into seventy-eight divisions, about 10 ft. long by 3 ft. 6 in. broad, each properly fitted up, and having a moveable dado, with lock and key, for stowage, under the stall-board. The total area of the inside market between the walls will be about 1,628 square yards, the floor of which will be covered with wood, on strong joists and sleeper walls, excepting the top part next the old market and the entrances, which will be of stone. The whole of this area will be covered in by a light iron roof in six bays of 30 ft. span, running east and west, supported on iron lattice girders in two lengths, meeting over a centre row of iron columns, with ornamental caps and bases, and semicircular spandrels springing from the same and the walls, thus forming two avenues north and south, each 34 ft. wide. Light is obtained by means of skylights on the north side of each bay to its whole length, as well as by semicircular windows in each gable, and ventilation is provided by fixed louvres at the top of the roof, also to the entire length of the bays, as well as by part of the semicircular windows being made to open and close. The general character of the buildings is Byzantine, the material being red pressed Oldham facing bricks and Huddersfield stone dressings. The principal elevation will be that to Westmoreland-street, the chief points of its architectural effect being the circular pedimented entrance in the centre, executed entirely with stone, the spandrels of which will contain a carved panel of the Wakefield arms; there will also be a carved string-course the length of this front, stopped at either end by the projecting octagon bays, which are carried up considerably higher than the other buildings by Mansard roofs. The chief features in the Brook-street and Teall-street elevations are entrances which are in the same character as that in Westmoreland-street. The shop-fronts have segmental arched head springers and key-stones, with ornamental ironwork filled in at the segments. The front wall of these shops is carried up to a parapet with a moulded stone string-course and coping.

ACTIONS AGAINST THE COMMISSIONERS OF PUBLIC WORKS.

DAMAGE TO STRUCTURE.—LIGHT AND AIR.

At the Northumberland Summer Assizes, on the 11th inst., before Mr. Justice Lush, the following case was heard:—

Angus & Co. v. The Commissioners of Her Majesty's Works and Public Buildings, and Dalton.—Mr. Littler, Q.C., in opening the case, said the action was brought by the plaintiffs to recover damages for very serious injuries suffered by the destruction of their manufactory and warehouse. The premises, which were situate in Westgate-road, Newcastle, were altered in 1847 into a coach-building manufactory, and the plaintiffs carried on business there. The house adjoining the works in Westgate-road was purchased by the Commissioners of her Majesty's Works and Public Buildings, and in November last it was pulled down, in order that an office for the District Probate Registry might be erected on the site. There was no party-wall, and when the house was pulled down plaintiffs' premises became exposed to air at the side. The plaintiffs did not rely upon the walls of the defendants' house for support; their place was supported by a chimney breast which went up from the bottom to the top of the plaintiffs' premises, and into which transverse beams were tied, the other ends of the beams being tied into the opposite gable. The defendants had a right to pull down the wall adjoining plaintiffs' premises, and its pulling down was not the cause of the building falling. On November 9th, plaintiffs' solicitors (Messrs. Stanton & Atkinson) wrote to the Commissioners, and Mr. Dalton (the contractor who was carrying out the works for the Commissioners) stated that plaintiffs' premises had been exposed to the air, and stating that they did not object to the removal of the wall, and adding that they held the defendants liable for any damage they might suffer. The end of plaintiffs' premises was then boarded up by the defendants' servants. When the building was entirely removed, the site was excavated to a depth of about 11 ft.; and Mr. Dalton and the clerk of the works were warned that if they did not take care they would bring down the chimney-breast which supported plaintiffs' premises. A beam was placed in between the chimney-breast of plaintiffs' premises and Dr. Heath's house (on the opposite side of the excavation), but that made matters worse. In the beginning of this year the chimney breast gave way, and the beams fastened into it fell, and the whole place slipped down into the excavation. Plaintiffs' premises were perfectly safe until the hole was excavated; and the fall of the premises was attributable to that excavation, and the want of proper support by the defendants. Mr Dalton contracted with the Commissioners to "shore up the adjoining buildings, and make good all damage that may be caused thereto by the erection of the building." Mr. Littler quoted the recently decided case of Barron v. Peace (Law Reports for June), and held that, under the decision in that case, the Commissioners were liable. He added that it was estimated that the damage done to plaintiffs' building was 1,350*l.*, 1,100*l.* to stock, and about 700*l.* for loss of profit, and 150*l.* for rent of another warehouse.

Witnesses having been examined,

Mr. Stephens and Mr. Herschell agreed to a verdict being given for the plaintiffs, with leave to the defendants to move on questions of law.

A verdict was given for the plaintiffs, the amount of damages to be decided by an arbitrator.

At the same Assizes, on the 12th inst., the following case came before Mr. Justice Denman:—

Clark v. Her Majesty's Commissioners of Public Works. — In stating the facts of the plaintiff's case, Mr. Herschell, Q.C., said the plaintiff was the owner of some property adjoining the new post-office, which had been recently built in a street called St. Nicholas's-buildings. The action was originally brought against Mr. Wetherley, contractor, who built the post-office, and her Majesty's Commissioners of Public Works, to recover damages for interference with his property,—a trespass on his property,—and an interference with the lights of his building. The trespass had, however, been settled between the contractor and the plaintiff, and therefore the action was now against her Majesty's Commissioners in respect of the interference which the new building had caused to the ancient lights of the plaintiff's building. The premises were used as a boot and shoe and clog-making establishment, and were bought by the plaintiff upwards of twenty years ago. They had since been occupied by him for the purpose of his trade. The premises fronting into St. Nicholas square were not injuriously affected by the post-office, but the back rooms were all lighted from the side, and it was in regard to these rooms that the action was brought. Between the plaintiff's building and the structure that formerly existed there, there was a passage 7 ft. square, and this building adjoining at 7 ft. was very much lower than the post-office which had now been raised on its site. The eaves of the building did not quite go up to the bottom of the windows on the second floor of Mr. Clark's house, and from that point there was a sloping roof of about 9 ft., so that the second floor windows and the windows above had most excellent light, and, in point of fact, nothing o interfere with them. The first-floor windows also had a very considerable direct light from the atmosphere through the sloping roof of the building opposite. These rooms were used by Mr. Clark for the purpose of his business, and until the Post-office was erected, the first and second floors and attics enjoyed an excellent light, being really without any obstruction for a very long distance. The Post-office had been raised to the height of 42 ft. above the top of the plaintiff's house, and it was utterly impossible that that building could have been erected without considerably affecting the light. Plaintiff's windows were much more than twenty years old, and when a man had a window twenty years old, his adjoining neighbour had no right to build anything on his land which would cause him to have less light than previously.

Mr. Fitzjames Stephen on behalf of the defendants, said the question in the case would only be one as to the amount of damage done to plaintiff.

Mr. Herschell, resuming, said that it was perfectly settled that a person might even alter his windows as he pleased, and provided he did not put greater burden on his neighbour's land by doing so, he was still entitled to his old rights. It was at one time thought that if a man enlarged or changed the character of his windows, he lost his right to the light. That had now been decided by the House of Lords not to be the case, and therefore, in considering the damage the plaintiff had sustained, they must not only look to the condition that the place was in now. Mr. Clark was the freeholder of the building, and the question was, how much had the premises been deteriorated in value by what the defendants had done?

During a discussion, his Lordship asked if a settlement might not be come to between the parties, seeing that the point between them was in respect to the damage?

No arrangement being arrived at, the case was proceeded with. Several witnesses were called who had been in the plaintiff's employ, and spoke to the altered light. Surveyors were also called, one of whom stated that the damage to the property, &c., caused by the depreciation of the ancient light, was about 1,400*l.*

The jury found a verdict for the plaintiff for 350*l.*

GROWTH OF PECKHAM.

BUILDING ON THE GREAT DUKE OF MARLBOROUGH'S ESTATE.

THE large plot of ground lying between High-street, Peckham, and the Old Kent-road, and bounded on the north-west side by Commercial-road, and on the east side by Asylum-road, has for some time past been in the hands of the builders, and already some hundreds of houses have been erected, whilst building is still actively proceeding, large numbers of houses being at present in progress, and the locality promises shortly to form a little town in itself. A special interest attaches to this immediate neighbourhood, which is fast losing its suburban character, to be speedily covered with bricks and mortar. For several years past a portion of it has been known as Peckham Park, whilst several acres have been occupied as market gardens. It forms what formerly was the domain of the great Duke of Marlborough, when his grace resided in a mansion then standing on the estate, but which has long since disappeared from view. Marlborough-road, however, leading from the High-street to the borders of the estate, is a standing record of the past, and Goldsmith's house, at the south-west angle of the estate, which it overlooks, still remains, although it is believed that this historical residence will soon share the fate of many other old landmarks, and be removed out of existence in order to make way for what are called "modern improvements." The poet's residence, which is at the east end of Goldsmith's-road, has inscribed over the doorway "Goldsmith House." It is a quaint old white building, two stories in height, standing in its own grounds, and was occupied by the poet when he was tutor in the Duke of Marlborough's family, and is popularly believed to be the house in which the "Vicar of Wakefield" was written.

Not far from the centre of the estate a new church, dedicated to St. Jude, has just been opened. It is in the Norman style of architecture, and is built of white brick, with red brick and Bath stone dressings and facings. Four gables rise above the lean-to aisles, both on the north and south sides, and at the north-west and south-west ends there are lofty Gothic porch entrances, deeply recessed, with a smaller entrance at the south end. There is a prominent bell-turret, with a coping of stone, at the west end. Internally, the church is 120 ft. in length, and a little more than 50 ft. in width. The interior walls are faced with white cement, relieved by red brick bands, and the arches of the arcades which divide the nave from the aisles, as well as the circular window-heads, are

similarly faced. The flooring of the body of the church is of a peculiar red concrete, which has been recently patented by Messrs. Wilkinson, of Newcastle; whilst that of the chancel, which is raised several feet above the nave by a flight of six steps, is laid with encaustic tiles in varied patterns and colours. There is a clearstory, with a range of ten windows on either side, above the nave; and the church has an open ceiling in pitch pine, stained. The font at the west end is a prominent feature in the church. It consists of a solid block of pure white marble, supported upon four coloured marble columns. It is octagonal in form, and in the central panel is a representation of Christ blessing little children, sculptured by Mr. Earp, of Kennington-road, who has also executed the whole of the work. Mr. A. Blomfield is the architect, and Messrs. Adamson & Son, of Putney, are the contractors.

THE LATE LADY SELWYN, OF RICHMOND.

INAUGURATION OF A DRINKING-FOUNTAIN.

CAPTAIN HUGHES HALLETT, the husband of the late Lady Selwyn, of Selwyn Court, Richmond, has erected a drinking-fountain to the memory of his wife, who died last year, and it was inaugurated last week by Dr. Selwyn, Bishop of Lichfield, who is brother-in-law to the deceased lady. The fountain is situated in the Kew-road, not far from the Richmond railway station. It is in the form of an obelisk, and consists of a needle, in polished Cornish granite, 10 ft. 6 in in height, mounted on a die and base, 5 ft. by 4 ft., also in granite. This rests on a double platform of two steps, also in granite. On each of the four sides of the die there is a basin of pure white Sicilian marble. The outer face of each basin is carved with acanthus-leaves, supported by shafts of polished red granite, which rest on moulded bases of the same white marble let into the large granite base. Over each basin is fixed a lioness's head, in bronze, and the water flows into the basin through a jet from the lioness's mouth. On the two plinths forming the base of the needle is engraved the inscription, as follows:—"This drinking-fountain is erected by Frank Charles Hughes Hallett, late Captain of the Royal Horse Artillery, in affectionate memory of his wife, Catharine Rosalie (Lady Selwyn), and is presented by him on the first anniversary of her death to the parish of Richmond, in remembrance of the deep and lively interest she took in everything that concerned the parish welfare during a residence of twenty-one years." The fountain was designed and executed by Messrs. Farley, of the Goswell-road.

THE NEW CADOGAN PIER AT CHELSEA.

THE new pier which has been constructed on the Thames at Chelsea, in lieu of the old Cadogan Pier, which was removed when the Embankment and the Albert Bridge were completed, has just been opened for the traffic of the river steamers. Owing to some differences between the Steam Boat Company and the Thames Conservators, the reconstruction of the pier has not been carried out until within the last few weeks, the consequence being that for more than eighteen months past the steam-boats have not been able to land or take on board passengers at Chelsea except at the old bridge opposite Chelsea Church. The differences between the River Conservators and the Steam Boat Company having, however, been adjusted, the new pier just opened was proceeded with.

The new structure, from its light and ornamental character, compares favourably with the unsightly appearance of most of the piers along the Thames, whilst it is constructed on a new and improved principle, one feature of which is that there is additional security for the landing-stage being kept in its place without the aid of moorings. At each end of the stage iron cylinders, about 8 ft. in width, have been sunk into the bed of the river for a depth of several feet, the upper surface of these cylinders being about low-water mark. In order to strengthen the foundation and secure a solid base, these cylinders have been loaded with concrete to the upper surface level, and upon them rests a circular framework of iron, of a cone or pyramid shape, carried to a height of upwards of 20 ft. above the average low-water level. This framework secures and keeps in its place, at either end of the stage, a massive timber upright, in which there is a groove into which a projection at each end of the stage is fitted, the stage being thus secured during its rising and falling with the ebb and flow of the tide. The stage is about 150 ft. in length and 50 ft. in width, and is approached from the Embankment by a light iron lattice bridge, about 200 ft. in length, with a roadway of 15 ft. wide. The shore portion of the bridge approach, to the extent of one half its entire length, is on a level with the Embankment, and is supported by framework of iron columns sunk a considerable depth into the bed of the river. The remaining portion of the bridge, connected with the stage, rises and falls with the tide. The new pier, which is situated several yards to the eastward of the old structure, has been erected under the superintendence of the Thames Conservancy Commissioners.

THE ARCHITECT AND THE PUPIL.

ARCHITECTURAL ASSOCIATION.

IN the discussion which followed the reading of Mr. Blashill's paper,*—

Mr. Maclachlan, in proposing a vote of thanks to Mr. Blashill, said he could not say that he had come out of his pupilage altogether dissatisfied, although he was not afforded all the opportunities which he thought ought to be possessed by a pupil. In reference to Mr. Blashill's remark as to agriculturists being generally the sons of agriculturists, and that few or none succeeded who were not so born, he believed that as a rule it was best for the son to be brought up to the father's business, unless he showed some marked predilection in another direction. When it was intended that a boy should follow the profession of architecture, the latter years of his school-life should have some bearing on his future pursuit, and it might often be found advantageous to substitute for Latin and French a good grounding in the elements of science. When they entered an office pupils were very rarely able to learn the methods of professional practice as well as the science of construction. In some offices it was considered a very great favour to allow a pupil to go over any works at all, and his chances of seeing practical work were therefore very small. The first thing he was set to do was tracing, followed by a course of inking-in details, and that, again, by inking-in elevations and plans. If he was very clever he learnt a little about planning and designing before his term of pupilage was up, but he would learn nothing of the practical part of his work. Mr. Blashill had recommended that pupils should be allowed to copy documents, and to be present at business interviews between their masters and their clients. As to the latter recommendation, he thought some architects would hear it with great astonishment; and as to copying documents, a man might go on copying specifications and never know the meaning of the terms employed, unless he had some one whom he could ask. If he asked an assistant, he might be met with the rebuff, "I don't come here to teach you"; if he wished to ask his master, he might be engaged with a client, or even if alone in his *sanctum sanctorum*, he might not like to be disturbed. Certainly the information to be gained during pupilage was not sufficient to fit a man to enter upon the full exercise of his profession. Pupilage required to be supplemented by private work on the part of the pupil after office-hours, and, as a matter of fact, most pupils were fully alive to this matter. But three years' pupilage, even in conjunction with private study, would not suffice, in ordinary cases, to fit a man for practice. Assuming that he would have to serve for a few years in the capacity of assistant, even then every opportunity of private study should be taken advantage of. Mr. Blashill appeared to deprecate the spending of time upon such small matters as furniture, metal-work, &c., but he conceived that if a pupil showed taste in such matters he should not be discouraged, for a knowledge of treating such subjects was always of use to the architect.

Mr. R. E. Pownall said that the members of any particular profession were generally apt to consider that that profession had grievances beyond those of any other profession. He could not at all see how the architectural profession, so far as regarded the education of its members, had any paramount grievance. Was it to be supposed that the solicitor took more pains to teach his "articled clerks" than an architect in extensive practice took in teaching his pupils? Certainly not. The articled clerk of the solicitor had, as a rule, not much longer time in which to learn his profession than the architectural pupil had. It was true that at the end of his term of articles the embryo legal practitioner had to come up to a certain standard of knowledge, and that he must pass an examination before he would be allowed to practise for himself. But, then, there was such a thing as "cramming" for an examination; and even after the law-student had passed his examination, he had generally to be content to serve as an assistant in some office. Mr. Pownall proceeded to draw an analogy between the work of the architectural and the law pupil, maintaining that the phases of progress step by step were similar in each case. He agreed with Mr. Blashill in regarding a knowledge of shorthand as of great value to the architect: it would save much valuable time in taking notes. On the whole, he believed that the present system of pupilage was the best suited to our requirements, and whatever deficiencies it might possess could always be easily supplied by the pupil, if he were so minded.

Mr. Leonard, in seconding the vote of thanks, said he agreed with Mr. Blashill on a great many points, and he was especially struck with the conciliatory spirit in which the paper was written, for Mr. Blashill had neither "sat upon" the pupil nor the architect. He (Mr. Leonard) thought that a great deal of mischief was done in the present day by sending pupils from architects' offices practically uneducated as to the real work of their profession. Their parents, anxious to bring them up to a "respectable" profession, were partially accountable for this, for even though they might determine years in advance what their sons' profession should be, they seldom or never sought to make their school education take some bearing on the nature of their profession. Thus it happened that, partly from the fault of the master, and partly from the fault of the parents, pupils concluded their term of pupilage with a very indistinct notion of the nature of their profession. Such young men, after flitting from one office to another, and perhaps picking up very little by the way, rushed into a competition, and on the strength of getting the first premium, set up in business, all-incompetent as they might be. Even when they succeeded in winning a premium, however, such men were never selected to carry out the building, and if their designs were made use of, they were considerably modified by some one else. It was this class of young men who were always eager to lower the dignity of the profession by entering upon a competition, however humiliating the terms. If such young men had inducements held out to them to pass the Voluntary Architectural Examination, it would be much better for them and for the profession at large.

Mr. Aston Webb said that he was certainly of opinion that the system of pupilage was best suited to English requirements; but Mr. Blashill had not entered upon the question of the length of time over which the "articles" should extend. Should it be seven, five, or three years? If either of the longer terms, he thought that three years was quite long enough to stay in one office. In discussing this question, regard should be had to the requirements of the architectural profession rather than to the conditions which obtained in the study and practice of the law. He agreed with Mr. Blashill that pupils and assistants should have access to all business correspondence; unless, indeed, this was the case, they would not be of much use.

Mr. J. Douglass Mathews said that the system of pupilage was based on the old system of apprenticeship,—a system which had of late years undergone a great deal of modification. As Mr. Blashill had pointed out, in former times apprenticeship was the only means of learning a trade, although now there were opportunities of picking up knowledge in a less regular manner; but he preferred the old-fashioned way, as it was better that a man should enter upon his trade or profession through a front door rather than a back one. There was a kind of *prestige* about apprenticeship or pupilage which should not be lost sight of. It was often assumed, in discussing the question of architectural pupilage, that the architect was to be looked upon as a schoolmaster; but an architect who had been plodding on for a number of years to get together a decent practice did not suppose that when he took a pupil he was taking a dolt, incapable of picking up knowledge for himself. On the other hand, it was to the interest of the master no less than to that of the pupil

* See p. 667, *ante*.

himself, that the latter should be directed in his work in such a manner as that, if in earnest, he would soon be of real value in the office. But even with the most complete office-direction, and with the utmost desire to profit by what took place in the practice of the office, no young architect must expect to succeed (unless exceptionally gifted) without having recourse to work and study after office-hours. As to pupils not understanding the technical terms which they were continually copying in specifications, &c., he believed that as a rule it was their own fault for not seeking information; he could not think that a master would object to impart such information. As a rule he was convinced that masters did their best to advance their pupils, especially when the pupil manifested a lively interest in the work of his profession. He agreed with Mr. Webb that it was possible for the pupil to remain in one office too long. As to opportunities being afforded to pupils to see works in progress, he thought that such opportunities ought to be given, or the master failed in his duty. As a matter of fact, he believed that when such opportunities were accorded, the pupil did not always take advantage of them.

Mr. W. W. Robertson expressed his pleasure at listening to Mr. Blashill's very able and moderate paper. The author had carefully avoided partisanship, and had therefore been able to show the mutual obligations of architects and pupils. The subject was an inexhaustible one; and while it might be true that the pupil could not in fairness expect his principal to be a schoolmaster, he might justly claim that he had a right to be taught his profession. It would not suffice to say that the master afforded the pupil facilities for seeing what went on in the office; the master ought to direct the pupil's labour and study into proper channels. In reality, the interests of architect and pupil were identical. If at the end of five years a pupil had learnt nothing, both master and pupil were probably equally blameworthy. He was rather inclined to think that the pupil fared better, on the whole, if articled in a small office,—especially if he was his master's sole assistant in office-work,—than in a large office; for he had the great advantage of the direct supervision of his principal, who would be anxious to make his pupil of real value to him at the earliest possible date.

Mr. Pratt asked what number of pupils Mr. Blashill would think it reasonable for an architect to have in his office at once?

Mr. Clarkson having said a few words.

The President (Mr. Quilter), in putting the vote of thanks, said that in discussing the subject raised by Mr. Blashill's paper, it was necessary to start with a negation of the aphorism applied to poets, for that *architectus nascitur, non fit*, could not be truly said. They were obliged to start with the assumption, then, that the architect had to be made. He agreed in thinking that the education of a youth intended for the architectural profession should bear some relation to his future pursuit. He also agreed in thinking that where a pupil showed any marked predilection for designing furniture or metal work, the bent of his talent should be encouraged. The importance of the pupil being allowed to see works in progress was beyond question, and the master who wished to do his duty by his pupil would give all reasonable facilities in this respect.

The motion having been put and carried,

Mr. Blashill briefly replied on the discussion. He said that while he did not wish to be understood as deprecating real efforts in design, whether of furniture or metal work, he did wish to discountenance the pupil's time being wasted in mere prettinesses. Directly a pupil entered an office, he should be made to work; nor need the principal feel any compunction in exacting such work; for if trained to steady work while young, the pupil would find himself more easily able to apply himself in future years. Pupils should never be backward in asking for information. His (Mr. Blashill's) master used to say that questions were the keys of knowledge. The question as to length of pupilage was a difficult one, and depended more on the capabilities of the pupil than upon anything else. As to the number of pupils any one architect should have at one time, he knew of no rule on the subject; there was no restriction, so he might have as many as he could attend to. But when a pupil came out of his articles, he ought to be able to say he was an architect, if not an experienced one.

The meeting then terminated, and with it Session 1875–76 of the Association.

NORTHAMPTON GENERAL BUILDERS' ASSOCIATION.

A SOCIETY bearing the above title has recently been formed in Northampton, with the object of promoting and protecting the interests of the building trade of Northampton, by the following amongst other means:—Unity of action in the settlement of all questions arising between employers and their workmen, with a view to prevent injustice against individual members of the Association. 2. The general adoption of equitable conditions of contract, such as those agreed to by the Royal Institute of British Architects. 3. The interchange of information and mutual co-operation when desirable with other kindred societies throughout the country. 4. The assistance of each other by grants of money or advice in case of accident or loss by fire, or in any other matter the committee may think deserving of assistance.

On the 12th inst. the Committee appointed to organise the Society invited all those connected in any way with the building trades of the town and neighbourhood to a general meeting. There was a fair attendance. Mr. Thomas Cosford presided. The business of the meeting was of a formal character, consisting of the adoption of rules and the election of officers. The principal regulations of the Society as adopted by the meeting, after full discussion, were as follow:—

The Association shall consist of employers of labour connected with the building trade in Northampton and its neighbourhood duly elected. The members shall pay an annual subscription apportioned according to the number of men employed by each, for fewer than ten, 10s. 6d., and for more than one hundred, 5*l.* 5s. The business of the Association shall be conducted by a president, vice-president, and twelve members, to be elected at the annual general meeting, five to form a quorum; two auditors shall also be elected at the same time. Every member shall strictly conform to the trade rules and rates of wages agreed to by the employers and workmen, but in case of any demand being made by the latter, not consistent with the rules, the employer shall immediately inform the secretary, who shall bring it before the next meeting, or before a special meeting if desirable, and as far as possible common action shall be taken in such matters.

The following were chosen the officers of the Society:—President, Mr. Hy. Smith; vice-president, Mr. Thos. Cosford. Committee, Messrs. H. Martin, J. Watkin, G. Heap, D. Ireson, and J. Brown (general builders); Messrs. Cleaver, Tucker, Goy, and Alsop (painters); Messrs. Banks and Woodford (plasterers); and Mr. G. Belton (stonemason). Messrs. Higgins and Tomes were elected auditors; and the trustees appointed were, Messrs. H. Smith, T. Cosford, and J. Watkin.

THE INSTITUTION OF CIVIL ENGINEERS.

THE originality, labour, and ingenuity displayed by the authors of some of the communications submitted to the society during the past session have led the Council to make the following awards:—

Telford Medals and *Telford Premiums* to Walter Raleigh Browne, for "The Construction of Railway Wagons, with special reference to Economy in Dead Weight"; William Cawthorne Unwin, B.Sc., for his "Investigation of the Motion of Light Carriers in Pneumatic Tubes"; Gilbert R. Redgrave, for "Sewage Interceptor Systems, or Dry-Sewage Processes"; W. Shelford, for "The Treatment of Sewage by Precipitation."

A Watt Medal and a Telford Premium to Gabriel J. Morrison, for "The Ventilation and Working of Railway Tunnels."

Telford Premiums to C. Bontemps, for "Experiments on the Movement of Air in Pneumatic Tubes"; R. Spelmen Culley and R. Sabine, for "The Pneumatic Transmission of Telegrams"; J. G. Gamble, B.A., for "The Brighton Intercepting and Outfall Sewers"; Wilfrid Airy, B.A., for "The Probable Errors of Levelling, with Rules for the Treatment of Accumulated Errors"; Sidenham Duer, B.Sc., for "The Hydraulic Canal Lift at Anderton, on the River Weaver"; G. J. Symons, for "The Floods in England and Wales during 1875, and on Water Economy"; C. Greaves, for "On Evaporation and Percolation"; W. Sugg, for "On Estimating the Illuminating Power of Coal Gas"; J. Nelson Shoolbred, B.A., for "The Changes in the Tidal Portion of the River Mersey, and in its Estuary."

The Manby Premium to D. Alan Stevenson, B.Sc., for "The Dhu Heartach Lighthouse."

Horsham Drainage.—The Local Board have resolved to carry out the plan marked "A. B.," sent in by Messrs. Gotto & Beesley, subject to the approval of the Local Government Board being obtained to the scheme.

STUDENTS, ROYAL ACADEMY.

THE following admissions to the Architectural School of the Royal Academy have just been made:—

Students of First Class.—Henry Branch, E. E. Sayer, S. Vacher.

Students of Second Class.—W. H. Berry, G. W. Browne, J. H. Ince, F. W. Kite, F. A. Powell, W. Stevens, A. H. Tiltman, W. E. Wallis, W. H. Wood, T. C. Yates.

Probationers.—R. S. Allen, H. Bradfield, H. W. Barrows, H. B. Cullerne, W. S. Fraser, A. J. Gale, F. Hemings, J. F. Hennessy, A. S. F. Kirby, W. Millard, R. J. Morris, H. A. Pelly, G. H. T. Prynne, J. Robbins.

THE AMALGAMATED SOCIETY OF ENGINEERS.

THE annual report of the Amalgamated Society of Engineers, Machinists, &c., for the year 1875 has been issued. At the end of 1875, there were 44,032 members. During the year there had been admitted 3,210 new members; but over against this accession of recruits or conscripts, must be set the death-list of 570 members, and the "black-list" of no fewer than 1,627 members expelled the Society in twelve months for sundry offences against its rules, chiefly for arrears in the payment of contributions and for misdeeds vaguely described as "acting contrary to the Society's interest." These deductions by death and default reduce the net increase of the Society in 1875 to 882 members. The total of the Society's income for the year was 120,024*l.* About 114,000*l.* of this total are the receipts from members' contributions, propositions, and entrance fees. At an average payment of 1s. per week, 44,032 members would yield a revenue of 114,478*l.* Thus it may be taken that 1s. per week is somewhere about the sum paid by each member on the average for his share in the advantages the Society offers, and the provision it makes for the various contingencies of a trade unionist workman's life,—want of work, suspension of work on account of trade disputes, accidents at work rendering the sufferer temporarily or permanently unable to labour, superannuation by old age, sickness, and death. The Society makes stipulated pecuniary allowances to its members in each of these casualties, and completes its undertaking to every member by paying to his family after his decease a sum not exceeding 12*l.* for his funeral expenses, and for other purposes of family necessity. The Society's expenditure in 1875 was 94,371*l.*; or nearly 26,000*l.* less than the income; and consequently the balance of the reserve-fund or accumulated assets of the Society was raised in twelve months from 238,989*l.* to 264,641*l.* This fund amounted at the close of the year to about 6*l.* for every member entitled to benefits. Six years ago the Society had in its treasury not more than 2*l.* 5s. per member. The improvement of its financial account has therefore been marked in the interval. Its expenditure last year under the several heads amounted to 2*l.* 2s. 9d. per member.

CASES UNDER BUILDING ACT.

BUILDING WITHOUT NOTICE.

ON the 18th of July, 1876, George Tolfree, of No. 8, Queensbury-street, Essex-road, Islington, and J. Digby, of No. 28, Queensbury-street, Islington, were summoned at Clerkenwell Police Court before Mr. Hannay, by Mr. Rowland Plumbe, district surveyor, South Islington, for that they did in May and July erect certain buildings in the rear of No. 310, New North-road and in rear of No. 10, Queensbury-street, without giving him, as the district surveyor, any notice.

The District Surveyor stated that, in consequence of a written complaint sent him, he went to the rear of No. 310, New North-road, and found that a building 15 ft. 10 in. by 9 ft., and 7 ft. to 9 ft. 6 in. high, had just been erected; it was enclosed nearly all with wood, had a tiled roof, and it adjoined and was nailed to another wooden building in rear of No. 10, Queensbury-street without any party wall being built between them. Both had flues in them, and if a fire occurred in one it would extend to the other. He (Mr. Plumbe) ascertained the defendants had erected them, and on the 6th of July served them with a notice requiring them to remove the wooden enclosures, and enclose them with walls constructed of brick, stone, or other hard and incombustible substance. This had not been done, and he now summoned them for the penalty for not giving him, as the district surveyor, any notice, and also for noncompliance with the notice of irregularity.

Mr. Hannay fined them each 4s. and costs, and made an order for the buildings to be enclosed with walls, &c., according to the notice of irregularity.

MUSEUM OF HYGIENE.

AT a meeting lately held at the residence of Mr. Erichsen, at which were present many of those who were associated with Dr. Parkes at University College, it was resolved,—

"To establish at University College, London, a permanent memorial of the late Dr. Parkes, in such a form as to aid scientific investigation and practical study in the subjects to which Dr. Parkes's life was especially devoted." It is hoped that a sufficient sum may be collected to establish a Museum and Laboratory of Hygiene similar to those now existing at the Army Medical School, Netley. There is at present no Museum of Hygiene or Sanitary Science in London, and it is felt that the establishment of such a museum would prove a great boon to the members of the medical profession, and to engineers, architects, and others, who are interested in sanitary progress. The promoters say it should be borne in mind that University College is a place for the education, not only of medical men, but also of architects, engineers, and others, on whose thorough instruction in sanitary details the health of the public so largely depends. Subscriptions may be sent to Mr. Erichsen, 6, Cavendish-square.

MASTERS AND MEN.

Bristol.—A new code of rules has just been agreed to and signed by the representatives of the Bristol Master Builders' Association and the local branch of the operative Stonemasons' Society, for the guidance of both employers and operatives. Most of these rules are substantially the same as before, but there are two or three important alterations and additions. One rule enlarges the city boundary, and another provides "that no employer of masons sub-let any mason's work, and no mason work by piece or sub-contract with or for any employer of masons.* The present custom as to worked stone is not to be interfered with by the operation of this rule." The rule was formerly worded, "No master mason or builder shall," &c., but under that regulation persons engaged in extensive building operations, who employed a clerk of works to manage affairs, were exempt, and hence alteration. The latter sentence as to worked stone is an addition. The wages rule reads, "That the wages shall be 8d. per hour throughout the year, fifty-four hours per week to be worked from the first Monday in March to the second Monday in November, and forty-eight hours per week from the second Monday in November to the first Monday in March." The rate of pay is thus ½d. per hour more than before. It was for this advance that the strike recently took place, and the increase was given on the men agreeing to the new regulations. The last rule on the list is as follows:—"That six employers and six operatives act as a standing committee to hear and determine any minor disputes that may arise from time to time as to the intention and working of the foregoing rules, and their decision shall be regularly binding on both parties, and that no suspension of labour shall take place pending the decision of the conciliation committee." It is to be hoped that the existence of this committee will prevent trade disputes taking place so frequently as in the past. We understand that during the past week the masons in the employ of Messrs. Brock & Bruce, one of the largest firms in the city, have struck work because those gentlemen had some non-society hands in their service.

TEMPLE COWLEY, OXFORD.

THE foundation-stone of a school-chapel for the above district was laid on Monday, July 3rd, by the Venerable Archdeacon Clerke. The new buildings, when completed, will accommodate 150 persons, when used for divine service, and 96 children, when used as a school, will comprise chapel-school and class-rooms, shut off when used for school purposes from each other by folding-doors, lavatory, and cloak-room, with porch adjoining, and the necessary offices. The plans, which also include the necessary buildings for teachers' residences, are estimated to cost about 1,450*l.*, which includes, also, all necessary drainage, fencing, &c. Mr. Henry Castle, of Cowley-road, is the builder; and Mr. A. Mardon Mowbray, of Cowley Lodge, Oxford, the architect.

* The workmen thus shut the door through which so many of their class have from time to time passed into the class of employers.

LEAD IN AMERICA.

THE production of what the *Iron Age* (New York) terms "domestic" lead in America has so greatly increased during the past few years that, for general purposes, there is no longer a large demand for imported metal. Since the development of an extensive lead mining interest in Utah and Colorado, the domestic production has been greatly increased, and promises a development in proportion to the consumptive requirements of the country. When Missouri was the principal source of supply the annual consumption was about 60,000 tons, and 40,000 tons of common were imported, in addition to a production of 20,000 tons of soft for corroding purposes. Since then the domestic production has increased and the importation fallen off, and the bulk of the lead consumed in the country is now produced at home. The statistics of domestic production are at all times difficult to obtain with accuracy, owing to the great extent of the lead-producing territory of the West: hence it has not been easy to judge of the position of the metal. This, in connexion with the uncertainty which has existed with regard to the probable future requirements of the building trades, has been instrumental in causing many otherwise causeless fluctuations in the lead prices. The perplexities surrounding the course of lead were further increased by doubts as to the course the Government would pursue with respect to the stock it still held, and which was to be turned over to consumption. Under these circumstances it was to be expected that attempts would be made to control the metal by large speculative purchases, and although speculation has at no time since 1873 been assisted by a large consumptive demand, they have nevertheless, exercised at times an important influence on the course of prices. Of the lead consumed in America about 30,000 tons are absorbed for general uses, such as plumbing, shot, &c., and the remaining 30,000 tons are taken by the manufacturers of white-lead. In Missouri, great efforts have been made to produce all the soft lead needed for corrosion, and thus dispense with foreign lead altogether. Ability to do this as yet may be doubted, and this adds another element of uncertainty to the future of the metal. Taking advantage of the situation, the speculators have organised a movement during the past few weeks which has resulted in advancing the price of lead considerably, including pretty much all varieties.

PROPORTION IN THE FINE ARTS.

SIR,—The *Builder* of last week contains some strictures on my lecture on "Proportion," which I believe would be answered by a careful perusal of the lecture in its entirety.

In consequence of previous lecturers complaining of being baited by a number of debaters who, instead of listening to the lecturer, are pondering over their own speeches, it has recently been enacted by the council of the Society for the Encouragement of the Fine Arts that the talk after the lecture should be limited to that of asking questions. Nevertheless, and contrary to the new rule, discussion at my lecture was invited. To this invitation, however, only one or two responded, and therefore the chairman closed the evening by expressing a favourable opinion on the views I had brought forward. For my own part, I can only say that I am exhilarated by free debate, and was not in the least aware that any of my audience desired to break a lance with me. It is not every lecturer, however, who, immediately after his lecture is over, likes to be told by his audience that they know more about the subject than he. If I rightly understand the writer of the article on "Proportion" in last week's issue, he agrees with me that the human canon of beauty must be the mean of the measurements of a great number of individuals. Both Hogarth and Sir Joshua admitted the golden mean to be the metrical expression for beauty; but I believe I have been the first in recent times to point out the practical method of obtaining it. Dryden most comprehensively expresses himself when he says, "There is a mean in all things, and a certain measure wherein the true and the beautiful consist, and out of which they never can depart."

It is a great mistake, and a very prevalent mistake, to suppose that all art must be beautiful. The essential condition of all true art, as that of all true nature, is, that it shall be adapted to its purpose. There are wonderful forms of being, all admirably adapted to their purposes, but which are nevertheless absolutely hideous to human beings. It is a certain conformity to our human nature which constitutes beauty.

The Greeks sought above all things the beautiful, but the moderns have other leading motives, and the adaptation of art to these motives, or by these motives, has superseded the pursuit of the beautiful.

The writer of the article referred to admits that the method of averages is that which should guide us to the measures of beauty, and yet repudiates the same method when applied to architectural forms. But is not the human figure itself a glorious piece of architecture? This is a house too—"The House of the Soul." And if the method is applicable to this, why not to the lower and inferior kind of architecture? It is not all human beings that are formed in the beauty of the mean. All other individual or special forms are adapted to a special purpose, and depart from the mean or mid-form in various degrees into ugliness, as your special forms and adaptations in architecture do. If you call these adaptations "beautiful," it is in a rigorous sense a misnomer. I should never expect to find the ratio of *mean* variation, 1 : 2, in Gothic architecture. Grecian architecture stands, as it were, as a *mittel-punct* between your Egyptian and your Gothic. It is the architecture in perfect accord with the beautiful humanity, and therefore exhibits a moderation in its proportions. The Greeks considered the ratio of 1 : 4, as scientifically it is, extreme.

The science of art is but a science of the human nature—perfect nature works according to just instincts. Our metrical science, our science of proportion, is but a measure of these. But as rational beings we desire to add knowledge to feeling.

There is a certain rhythm or music in all fine works of art, as may readily be discovered by attempting to change those proportions which the consummate artist may have in any case determined.

The symbols 4 : 8, 8 : 16, and 16 : 32, are only different modes of writing 1 : 2. They are, in fact, the same ratio. But of all detail I shall have more to say elsewhere.

I might tell a great many people that they had much better do anything but write. It is, however, but common courtesy in all public correspondence to leave the reader to judge whether the writer is speaking to the purpose or not.

W. CAVE THOMAS.

ST. SWITHIN'S CHURCH, EAST GRINSTEAD.

SIR,—In your number of January 9th, 1875, you mentioned some differences of opinion respecting alterations in this parish church.

Now that eighteen months have elapsed, and good feeling prevails, I venture to say a word as to the present and future. We are now actively engaged in pointing the walls, and erecting a new nave roof in accordance with the style of the church. The roof is from the plans of Mr. J. M. Hooker, architect, of Sevenoaks and London, who designed the oak seating, of which one-third remains to be completed.

The acoustic properties of this large church are greatly benefited, as well as the appearance improved, by the removal of the ceilings, and this is now generally admitted. Moreover, the present roof is unsound. As you will see by the enclosed papers, a further sum of 500*l.* is required to finish the roof, and complete reseating; and most happy shall I be to show the work, give any information, and receive contributions from any liberal friend of church restoration for a much-needed work.

DOUGLAS Y. BLAKISTON,
Vicar of East Grinstead, Sussex.

ROMSEY ABBEY.

SIR,—With regard to the remarks in the *Builder* on the east end of this most interesting building, I think there can be no doubt whatever that the lady-chapel was originally completed, and that it was destroyed in comparatively modern times. The two geometrical windows, which appear now to fit so well under the Norman arches in the east wall, were, a few years ago, at a higher level. When the lady-chapel was pulled down, these windows, taken, no doubt, from the outside walls, were very clumsily erected within the Norman arches, without properly calculating their height. There was

not, in consequence, room for the point of the tracery and the key-stones under the arch, and they finished in a very rude and unsightly manner. The vicar, the Rev. E. L. Berthon, who is a very clever mechanic (as well as astronomer), skilfully lowered both windows bodily, without taking them to pieces, and inserted key-stones, so as to give them their present complete appearance.

C. H. P.

CONCRETE FLOORS.

SIR,—I have read with much interest the discussion in your paper on "Concrete Floors," and have been surprised no mention has been made of the concrete and rolled-iron joist-floors in the Ecoscephoron, by Victoria Station, Pimlico. These floors must have been designed to carry the heavy weight of furniture which would have to be stored upon the same, yet, soon after they were finished, nearly the whole of the floors fell in about six weeks since, fortunately after the men had left, or, I understand, about fifty men would have been killed. Can the architect or builder of the job give some information as to the construction, or any explanation as to the cause, and who was liable? I am of opinion all who feel any interest in concrete floors and iron joists should survey at once the Ecoscephoron, for their future guidance.

CONCRETE.

ENDOWMENT OF GENIUS AND RESEARCH.

SIR,—"Meter's" letter teems with truth in every line. I have waited to see a reply from an abler pen than mine.

Sir, allow me to enter the arena, not to gain applause, but to point to the waste of lives, and millions, in foibles, squabbles, wars. Work at home we have in plenty to employ our men, and wealth in a hundred ways that pay to promote the public weal and health, viz., ships can be made unsinkable and uninflammable when out on the rolling deep. We want structures that will not carbonise contents or immolate inmates when asleep; also safety on the iron road, not hurry-scurry dash, that too oft ends in railway jam,—I mean a railway smash.

Oh, potentates and magnates! devote your means and time to the many thousand miners that are yearly blasted in the mine; and, Genius, you may solve the sewage problem, or burn the smoke of town; though you will never gain a diadem,—perhaps, not half a crown. "Meter," you laid and fired the first gun home, and true; if I can't hurrah with idle crowds, I'll doff my cap to you.

R. T.

HASTINGS BATHS.

SIR,—In the notice of the Hastings Baths contained in your issue of the 8th inst. (p. 661), I observe a statement that "some misunderstanding seems to have arisen between Mr. Adcock and the directors of the company as to his liability, and failing to arrive at an amicable settlement, he threw the contract up."

As this statement is calculated to injure me, I shall be obliged if you will put before your readers the whole truth, which is as follows:—

In the latter part of last year the work was advertised for tender, and two tenders were received, which were not considered satisfactory. The architects applied to me for a tender, and supplied me with bills of quantities for the work, in which there were no conditions.

I sent in a tender for the work early in December last, and enclosed in the same envelope was a letter in which were the following words:—"The only condition I wish to make is, that I must not be held responsible for the damage done by the sea,—I mean with respect to any part of the sea-wall being washed away by storm. I do not mean small damages, which may occur, more or less, every tide; I will be responsible for them. I do not think there is any risk; but I should not be willing to carry out the work with the unpleasant feeling that I might be ruined by a single storm."

This condition was, of course, a part of my tender. I afterwards attended a meeting of the directors, and was told by the chairman that my tender was accepted, and that I could commence at once.

When the draft contract was sent for my approval, I found, to my astonishment, that I was to be held responsible for all damage that might happen "by inroads of the sea, high tides, storms, or tempests."

As your readers will at once see, it was impossible for me to agree to this, as it was a direct variation of the terms upon which my tender was accepted. Considerable discussion took place, but the directors insisted on the altered terms, which I could not agree to. I have always been ready and willing to commence the works upon the terms of my accepted tender; and as new terms were sought to be imposed by the directors after such acceptance, I think you will agree with me that it is hardly correct to say that I threw up the contract.

W. J. ADCOCK.

Fall of a Wall.—About 20 ft. of wall, 18 ft. high, fell in Sheffield on Monday, killing a labourer named Langfoot, and burying and severely injuring several others. The road by the side was being lowered, and this caused the wall to tumble.

BREACH OF CONTRACT BY A WORKING BRICKMAKER.

At the Staines Petty Sessions, on the 10th inst., James Regan was summoned for 4*l.* damages, for breach of contract in leaving the service of Mr. Catling, brickmaker, of Shepperton:—

William Catling, jun., said he was foreman to his father. On the 4th of March an agreement was entered into with the defendant to work as a temperer. The agreement was read to him, and 6*s.* paid as hiring money. It was agreed that 1½*d.* per 1,000 bricks should be retained as security for the fulfilment of defendant's agreement, which was to be returned at the end of the brickmaking season. On Monday, the 3rd of July, defendant had some words with the moulder and left his work. Witness saw him, and after an explanation defendant said he would return to his work on the following day. He did not come till the Thursday, and then only worked for about an hour. Through the defendant's leaving, the whole "form" of seven men were unable to work. He estimated that through the defendant's conduct there were 8,000 bricks less on the week's return, which caused a loss to them of about 2*l.* They also had to pay another man a fee of 2*l.* to take defendant's place. They had put defendant on a month before he was wanted, on purpose to retain his services during the brick season.

Edward Catling also gave evidence in the case.

Defendant was ordered to pay the sum of 4*l.* as compensation to Mr. Catling, and 11*s.* 6*d.* before the 15th inst., or a distress warrant to be issued.

CHURCH-BUILDING NEWS.

North Petherwyn.—The parish church of North Petherwyn, near Launceston, was reopened on the 22nd ult., after restoration under the superintendence of Mr. J. P. St. Aubyn, architect. It exhibits work of almost every century since the Norman conquest. Originally it was a Norman cross church, and of this period the massive polyphant columns of the south aisle, and some of the work in the tower, remain. Opposite the columns were found the foundations of similar supports. Over the two columns that remain spring arches of the Transition period, with two lights of a later clearstory. The north aisle, beyond the Norman work, is continued, at a greater width, by post-reformation arches of granite, this part of the aisle occupying the site of the chantry chapel of the old Norman building. The great part of the wall of the chancel is Early English work, and the south aisle, divided from the nave by an arcade of four granite arches, almost semi-circular, is believed to be fifteenth century work. The many interesting features of the church were all but lost to view in the church in its pre-restored state. Much of the woodwork of the roofs was lost in plaster, the columns were covered with innumerable coats of white-wash, many of the windows had been partly built up, the pillars of the south aisle were from 15 in. to 18 in. out of the perpendicular, and the church was so damp that the walls were a bright green, and in a state of general decay. The restoration has been accomplished at the sole cost of the Duke of Bedford, the owner of most of the land in the parish. At first it was intended to substitute pointed wind-brace roofs of pitch-pine; but when the roofs of the chancel and aisles were uncovered it was found that they were of the wagon pattern, although lath and plaster had long covered up all but the ribs and bosses. In consequence of this discovery it was resolved to restore the work. The old open roofs are accordingly now seen, with new bosses and wall-plating richly carved in imitation of the old, wherever decay had set in. The roof of the nave was found to be modern work, and beyond repair; and it has been replaced by a strong hammer-beam and king-post roof of pitch-pine, with couplings between, resting on moulded corbels. Additional strength was here required to keep the south aisle in its place. The arcades on either side of the nave have had the whitewash removed, the stones repaired and re-axed,—in fact, restored to their pristine condition. A new east window of fair proportions has replaced a very mean opening, and the ancient window on the south side of the chancel, partly built up, has been restored to its original dimensions. Both the south wall and porch and the west end of the south aisle had to be taken down and rebuilt. The north porch has been rebuilt with the old material, the new roof being an open one of pitch-pine. Both porches have been fitted with heavy oaken doors. The tower has been opened up to the massive moulded girders of the new belfry floor of pitch-pine, and has been thoroughly restored. The whole of the work has been carried out by Mr. P. Blowey, of Buckland Monachorum, the cost being about 3,500*l.*

Northenden.—The parish church of St. Wilfrid, Northenden, Cheshire, has been consecrated, after having been entirely rebuilt, with the exception of the tower. It is believed that the present building is the fifth which has occupied the same site. There is thought to be no doubt that in Saxon times the church was dedicated to St. Wilfrid, and this, the original, church, was followed by a Norman structure, and in after ages by others. The new church is a faithful copy of the old one, and is in the Perpendicular or Third Pointed style. The old tower still remains, but it is to be hoped, according to a local paper) that although the energies and resources of the parishioners have been severely taxed already, this will soon be rebuilt, and the restoration made complete. The pews are open, of pitch-pine, stained and polished. The architect is Mr. Crowther, Manchester, and the contractors were Messrs. Clay & Sons, of Audenshaw. The cost of the new edifice will be about 8,000*l.* The nave and aisles have been erected by the parishioners, and the ancient chantry and chapels of the Tatton family have been rebuilt at the expense of the lord of the manor, Mr. T. W. Tatton, while the chancel has been restored at the sole cost of the vicar of the parish, Archdeacon Johnson.

Maud (N.B.).—A new Established Church has been erected in Maud, near the railway station, within the boundary of Old Deer. The church was opened on the 22nd ult. It was designed by Mr. James Laing, architect, Old Deer, and has been erected by tradesmen of the district. The mason's work was done by Mr. John M'Knight, New Maud; the carpenter's work, by Mr. W. Jack, Bulwark; the slater's work, by Mr. James Brown, New Maud; and the plasterer's work, by Mr. D. M'Pherson, Old Deer. The contracts for the building were,—for mason's work, 480*l.*; carpenter's work, 386*l.*; slater's work, 130*l.* 10*s.*; and plasterer's work, 58*l.* 10*s.*, giving a sum of 1,055*l.* The cost of enclosing-walls and gates has to be added, making the total outlay 1,200*l.* The church is in the Gothic style. It is wholly of stone of the district. The outer walls are partly in dressed block granite, and partly in blue whinstone. The principal elevation is the gable fronting the public road. The length of the church is 75 ft.; height of side-walls, 20 ft.; and from ground to apex of gable, 47 ft. The church is seated for 420. The whole fittings are of pitch-pine.

Clapham Junction.—St. Peter's Church, Clapham Junction, was consecrated by the Bishop of Winchester on the 29th ult. The style of architecture adopted is Early English, and the church has been built of coloured bricks, with Bath stone and red-brick dressings. There is a nave, north and south aisles, and apsed west end, north-west porch, south chancel, chancel aisles, two connecting vestries, with organ and choir-vestry over them, and a south-west tower and spire. The tower is of brick, and the spire is of Bath stone, intercepted by bands of brick, and terminating by a vane at the height of 150 ft., and is a striking object from whichever point it is seen. The north-west porch forms an annexe to the main building. A sculptured figure of the patron saint—St. Peter—occupies a position in a niche in its gable. The nave is exceptionally wide. The lean-to aisles are divided from the nave by arcades of five bays, and these are supported by clustered columns of Pennant stone, surmounted by richly-carved capitals. The arches are of moulded bricks. Above these is a clearstory. Springing from carved-stone corbels is an open-timbered roof of massive construction. The interior walls are of red bricks, save in the sprandrels over the arcades, which are plastered. The avenues and chancel are laid with encaustic tiles by Mr. Minton; amongst them seven large subject tiles are introduced. Under the seating, the floors are formed of herring-boned wood-paving. The open benches are of deal, stained and varnished. "The minstrels' gallery," wherein is the organ, corbels out over the vestry in the south side of the chancel, and has a front of open and carved work. The altar-desk is of brass, and is a present to the church by the clerk of the works, Mr. W. H. Williams. The font is situated upon a raised platform and base, consisting of several steps. These are in Forest of Dean, Dumfries, and Painswick stone, used alternately, and they are enriched by inlaid tiles and marbles. The font itself—that is, the stem and bowl—is made from one block of pale alabaster. The pulpit has a base of Forest of Dean and Dumfries stones. It is seven-sided on plan, and the main portion is of Caen stone, moulded and carved. The pulpit and font have been made and placed *in situ* by Mr. Harry

Hems, of Exeter, who, with his assistants, has also executed the whole of the sculpture and wood and stone carving in the church. The architect is Mr. William White, the builder being Mr. Carter, of Holloway. The total cost is about 10,000*l.*

Hawsker.—On the 29th ult. Sir Charles Strickland, bart., laid the foundation-stone of the new Church of All Saints, at Hawsker, three miles from Whitby. The new church will be built in the centre of a wide agricultural township. The design adopted for the building is that of Mr. E. H. Smales, architect, of Whitby, and the execution of it will involve an outlay of 1,500*l.*, or rather more. Sir Charles Strickland, in addition to being a donor to the building fund, gives all the stone required for the building of the church, from his local quarries. The church is to be built in the Early French style, with a tower and spire, and will contain seats for 300 worshippers. The interior will comprise nave, chancel, vestry, choir-vestry, accommodation for organ, &c. The contractors are Mr. George Winterburn, of Whitby, for the mason's work; Mr. R. Robinson, of Whitby, for the carpenter's work; Mr. Joseph Brown, of Whitby, for the plumbing, &c.; and Mr. T. H. Readman, of Whitby, for the painting and decorating.

Shottermill.—St. Stephen's Church, Shottermill, near Haslemere, Surrey, was reopened on the 22nd ult., after restoration. The church was formerly a plain square building, with no chancel, and with an entrance under a shingled tower at the west end. The works now carried out comprise a chancel, in the Early English style, and a convenient vestry adjoining. The roof of the old church was, to a great extent, of English timber of large span, and the walls were carried out in various directions. The old roof has been taken off and a new one added, with buttresses to resist the thrust. The western doorway into the tower has been closed. The place under the tower has been formed into a baptistery, a new entrance being made on the south side of the church. The works have been carried out by Mr. Pink, of Milford, contractor, under the superintendence of Mr. J. W. Penfold, architect, and Mr. C. Bridger, clerk of works.

Kinneff.—The parish church of Kinneff, which possesses matter of interest to every true Scotchman, has just been re-opened, after undergoing extensive repairs. The present church was built in 1738, on the site of the former parish church, which, in its turn, had been built on the site of an ancient chapel subject to the Abbey of Arbroath. The church was repaired in 1830, but repairs had again become necessary, and the minister and heritors of the parish, feeling that the church has a story, and that a national interest attaches to it, resolved that these should be executed in a liberal manner, and this has been done under the superintendence of Mr. J. R. Mackenzie, architect, Aberdeen. The galleries were inconvenient, and have been removed, a considerable addition has been made to the buildings, a new pulpit has been put up, and all the pews have been re-arranged. A new heating apparatus has been fitted up, and the interior may now serve as a model for a country church. The Regalia of Scotland were hidden in this church from 1652 to 1660, under circumstances described by Sir Walter Scott in his "Tales of a Grandfather." There are some curious old monuments in the church, which can now be seen to advantage. The chief of these is Grainger's monument, which is placed at the west end of the church.

National Competition Drawings.—The prize drawings from the various schools of art in the United Kingdom were on private view at South Kensington Museum on Wednesday. The works submitted in competition since the last exhibition number no fewer than 257,926, of which upwards of 1,100 are now hung in the Museum galleries. Ten gold medals, twenty-five silver, and sixty bronze, besides book prizes and other distinctions, have been awarded. Of all the schools that at Lambeth, of which Mr. Sparkes is master, would seem to have been the most successful in carrying off honours, as many as three out of the ten gold medallists having come from that institution. The drawings are of a very miscellaneous description. The names of the students who have obtained gold medals are as follow:—Samuel W. Fisher, Marie Prevost, Thomas Goodall, Lydia H. Haberson, William Logsdail, J. Kean, Herbert Seagrave, W. A. Jobbins, Robert Needham, and Robert R. Green.

DISSENTING CHURCH BUILDING NEWS.

Southleigh.—The foundation-stone of a new Wesleyan Chapel at Southleigh, near Witney, has been laid. The chapel is being erected as a memorial to the founder of Methodism (Southleigh Church being the place where his first sermon was preached). The chapel is to cost 500*l.*, and the contract for its erection has been taken by Mr. William Cantwell, builder, Newland. The architect is Mr. Charles Bell, of London.

Byker.—The corner-stones of a new Primitive Methodist Chapel and Schools at Byker were laid on the 27th ult. The site of the buildings is in the Heaton-road, a new thoroughfare recently opened out, and near its junction with Shields-road, the plot of ground forming the site measures 77 ft. in frontage, by about 131 ft. front to back, and the erections will comprise a chapel, measuring 64 ft. by 41 ft., and Sunday Schools, two stories in height, measuring 50 ft. by 33 ft., and four class-rooms and vestries, adjoining the latter on the north side of the site. The style adopted is Classic, freely treated. The chapel is intended to accommodate about 600 persons, and the schoolrooms 600 scholars. The total estimated cost of the scheme is about 5,000*l.* The buildings have been designed and will be carried out under the superintendence of Mr. Thomas Parker, architect, Newcastle-upon-Tyne.

Shavington. — The corner stones of a new Wesleyan Chapel, at Shavington (a suburb of Crewe), were laid on the 28th ult. The chapel is being erected on a site adjoining the new Board schools. The dimensions internally are 45 ft. by 30 ft., and the accommodation will be for about 200 persons. The plans also comprise a schoolroom capable of accommodating 100 children, but for want of funds the erection of this is postponed for the present. The style is Gothic of a free type, and the materials to be used are red brick and stone dressings. The building is being erected from the designs of Mr. George B. Ford, architect, Burslem; and the builder is Mr. Enoch Ellson, of Hough. The amount of the contract is 812*l.* 3s. 10d., which is exclusive of boundary fencing and warming apparatus.

Swansea.—A new Congregational Church, in the Carmarthen-road, Swansea, was opened on the 18th ult. The new chapel is of a mixed style of architecture, from designs by Mr. Williams. The wood-work of the interior is of pitch pine, with the exception of the front of the gallery and the platform, which are of white picked out with gold. The ceiling is also of pitch pine. The building is of local stone, with Bath stone dressings. The builder was Mr. Thomas White, of Swansea. The cost of the new structure is 2,000*l.*

Keith.—The work of re-roofing the United Presbyterian Church, Keith, Banffshire, has been entrusted to Mr. F. D. Robertson, architect, who is preparing sketches to lay before the congregation for their approval.

Sowerby.—The Wesleyans of Sowerby, near Halifax, have determined to replace the chapel destroyed by fire a few months ago. The plans for the new chapel have been designed by Mr. C. F. Patchett, of Halifax. When erected, it will stand on the old site, but by taking in space formerly occupied by vestries, will be a much larger building. It will be in the Italian style. It is proposed to commence building the schools beneath the chapel as soon as possible. The cost of these schools will be from 1,000*l.* to 1,100*l.*; when the chapel is erected, it will involve a total expenditure of about 4,000*l.*

Carbrook.—The memorial-stones of a new Wesleyan School Chapel at Carbrook have been laid. About three years ago Mr. Joseph Angus gave a plot of land in Carbrook-street, upon which a school chapel might be erected. Eventually a start was made, and the plans of Mr. J. D. Webster were selected. It was arranged that on the ground-floor there should be a large schoolroom, 51 ft. by 30 ft., and two class-rooms adjoining, each 14 ft. by 12 ft. On the first floor there will be rooms of corresponding dimensions to those named. The building will be of brick, with stone dressings and brick bands. Each of the schoolrooms will accommodate about 250 children, and the entire cost is expected to be about 1,800*l.*

Geddington.—The Union Nonconformist Chapel at Geddington has been rebuilt on another site. It is in the Gothic style, and is capable of seating about 100. Mr. R. W. Johnson is the architect; Mr. Mace, of Brigstock, the builder; and Mr. Buckby the painter and glazier. The cost has been about 700*l.*

Cridling Stubbs.—On the 21st ult. memorial stones were laid of a new Wesleyan Chapel at Cridling Stubbs, near Knottingley. The chapel will accommodate, when completed, about 120 persons on the ground floor. The works will cost about 500*l.*

Bellshill.—On the 20th ult. the foundation-stone of the Bellshill Free Church, Motherwell, which is in course of completion, was laid by Provost Swan, of Kirkaldy. The new church is a handsome structure in the Gothic style, from a design by Mr. D. Cluness, architect, Edinburgh. There is sitting accommodation for 1,000 people, and the estimated expenditure is about 3,000*l.*

SCHOOL BOARD SCHOOLS.

Great Dalby.—New Board schools at Great Dalby have been formally opened. The buildings are of brick, with white stone dressings; and a bell-turret surmounts the whole. The master's residence forms part of the block. The school has an open-timbered roof, and the interior walls are pointed. The roofs are all covered with blue slates, and have red ornamental tile cresting. The total outlay, including fittings and site, is 1,100*l.* The works have been carried out by Mr. Barnes, contractor, of Melton, from the designs and under the superintendence of Mr. R. W. Johnson, architect, Melton Mowbray.

Southampton.—New Board Schools in Bridge-road, Southampton, were opened on the 13th inst. The schools have been built from a design by Mr. E. T. Howell (the architect to the Board), by Mr. H. I. Sanders, of Southampton. The area of site is 791 square yards, and the accommodation in the schools is for 225 boys, 234 girls, and 309 infants, total 768 children, allowing 8 ft. for each. Average, 112 cubic feet of space per head in school and class rooms. The buildings have a frontage to Bridge-road of 50 ft., and to Latimer-street of 140 ft. On the ground-floor is the boys' schoolroom, with two class-rooms, having the entrance from Bridge-road. The girls' schoolroom, with two class-rooms, are situate on the first-floor, over the boys' school, with the entrance from Latimer-street. The accommodation for infants consists of a junior schoolroom with class-room on the ground-floor, and senior schoolroom with class-room on the floor above, with entrance from Latimer-street. The rooms are lofty and well lighted by large side and end windows, the upper portions of which are made to open for ventilation with Elsley's patent levers. The warming will be by open fires. Moon's dual desks for arranging the children in pairs are used. The cost of the building is about 7*l.* per child, the total cost being 5,200*l.*

Brighton.—The Pelham-street Schools,—the sixth erected under the auspices of the Brighton School Board,—were formally opened on the 12th inst., by the Lord Mayor of London. The schools, although not formally opened until the 12th inst., have been applied to their uses for above a month, and a description of them was given by us a few weeks since. It is, therefore, only necessary to repeat that they are built in the "Domestic Gothic" style of red kiln and white Suffolk bricks, with Doulting freestone dressings; that accommodation is given, in three distinct departments, for 250 boys, 250 girls, and 250 infants. The total cost, including ground and furnishing, has been 10,000*l.* Accommodation is provided for 750 children. Mr. Simpson is the architect, the builder being Mr. Bruton.

LEWES WATERWORKS.

SIR,—In the *Times* for Tuesday, 18th July, page 6, second column, and about thirty-seventh line down, the military correspondent, writing about the army movements, says,—"Neither can I think that Lewes has been judiciously selected as a point of concentration. It is true there are plenty of supplies in the neighbourhood; but were the steam waterworks destroyed, or out of order, there would be no water between the Ouse, or Oose, which passes through Lewes, and the Arun, which is some distance to the rear."

In the *Builder* for November 6th, 1875 (page 995), under head of "Lewes Waterworks," it says,—"Much care and foresight appears to have been used in planning this pumping station, so that there is little fear of any breakdown occurring through accidents; for if one engine failed, others would be used while repairs were being made, and the same remarks apply to the boilers."

"The supply of water is inexhaustible, for when pumping 1,050 gallons per minute, the water in the well stands at 12 ft. below ground level, and when pumping ceases it rises until within 5 ft. of ground line, at which level it stops."

This information was taken down while standing by one of the engines at work, and certainly ought to be correct; and if the *Times* military correspondent will make inquiries, he will find it is so.

I think it due to the town of Lewes, as well as the Waterworks authorities, that there should be no misunderstanding in the matter of water supply.

B.

STAINED GLASS.

Frome.—The east window of Trinity Church, Frome, has been filled with stained glass, in memory of its first incumbent, the late Rev. Alfred Daniel. The window has three lancet lights, the one being considerably longer than the others. In the upper medallion is portrayed the Ascension. Underneath it is a quatrefoil, in which are three angels. Under this is the principal figure, "The Good Shepherd"; and at the foot are interlaced triangles, as an emblem of the Holy Trinity. The left side light has three medallions—that at the top representing the call of St. Matthew; at the foot, St. Mark writing his Gospel from the dictation of St. Peter; and the centre comprising two large figures, viz., the Evangelists St. Matthew and St. Mark. The right side light has also three medallions, the upper one being St. Paul in prison being visited by St. Luke; that in the centre having two large figures of the Evangelists St. Luke and St. John; and the medallion at the foot depicting the call of St. John.

Coates.—A stained-glass east window, by Messrs. Lavers, Barraud, & Westlake, together with a handsome reredos, in mosaic and painted tiles, by Messrs. Powell, have just been erected in Coates Church. A memorial window to two of his children has also been erected for Mr. A. Cator, by Messrs. Lavers & Co.; and Messrs. Clayton & Bell have in progress still another window for the church.

Beaulieu.—Recent additions to Beaulieu Church, Hants, include a stained-glass window, by Heaton, Butler, & Bayne, in memory of the infant son of Lord and Lady H. Scott; a reredos of mosaic work, in glass, by Messrs. Powell; the new pavement of the sanctuary, with tiles which are copied (by Minton) from original Beaulieu Abbey tiles; and some gas-standards, by Messrs. Hart, Son, & Peard, those in the sanctuary and chancel being of polished brass.

Southdean Church, Scotland.—There have just been put up in this church a series of stained-glass windows. There are fifteen lights, all, with one exception, supplied by Messrs. Ballantine, Edinburgh, who fitted up the whole. In the north gable are two lofty lancets, with canopy designs; one, the gift of the Earl and Countess of Home, shows a full-sized figure of Moses, and the family arms below; the other, erected by tenantry of the Jedforest estate, in memory of the late Lord Douglas and family, presents Joshua in armour and royal robe, with the Douglas arms below. There are two canopy windows in the side. One of these has been erected by subscription, in memory of Thomson, the poet of "The Seasons." The Scripture subject is David as shepherd tuning his youthful lyre, and beneath is a likeness of the poet, as a young man, copied from an authentic portrait. The only other canopy subject is erected by Sir W. Elliot, Wolflee, in memory of his son. This has been executed by Mr. J. H. Bagnley, Newcastle, and contains a representation of Christ stilling the waves.

Hamilton Parish Church.—Mr. James Stevenson, Hamilton, has just caused to be placed in the old parish church a memorial window, in memory of his deceased wife. The subject chosen is that of Mary at the feet of our Lord, with Martha standing by. The full text from Luke x. 41, 42, is given in ancient characters round the margin,—"Martha, Martha, thou art careful and troubled about many things; but one thing is needful, and Mary hath chosen that good part, which shall not be taken away from her." Messrs. Ballantine are the artists.

Plymouth.—A stained-glass window has just been erected in the Plymouth Guildhall, representing the ceremony of opening the Guildhall by H. R. H. the Prince of Wales, Lord High Steward of the Borough, in August, 1874. The Prince is represented receiving the key of the building from the then Mayor (the late Mr. Rooker), and on either side are officers and others who were present on the occasion. The window is the gift of Mr. F. W. Gibbs, C.B., and was executed by Messrs. Heaton, Butler, & Bayne, from the design of Mr. J. Milner Allen.

Books Received.

The Englishman's Illustrated Guide Book to the United States and Canada, especially adapted to the Use of British Tourists and Settlers visiting these Countries, with full Information as to the best Routes of Travel, most Attractive Scenery. Third Edition. London: Longmans, Green, Reader, & Dyer. 1876.

SUCH of our readers as contemplate a run to the States may usefully fortify themselves by the study of this little (illustrated) volume. Some who take it up without any intention of that kind will probably make up their mind to go the first opportunity. An appendix includes an account of the buildings and grounds of the International Exhibition at Philadelphia.

Experiments on the Strength of Cement, chiefly in reference to the Portland Cement used in the Southern Main Drainage Works. By JOHN GRANT, M. Inst., C.E. London: E. & F. N. Spon, Charing-cross.

IN reply to some inquiries for information as to Portland cement, we cannot do better than mention that a new edition of Mr. Grant's book was published at the end of last year. Mr. Grant had excellent opportunities for investigation in connexion with the main drainage works, and made that good use of them which might have been expected from his known intelligence and skill. The bulk of the book was originally read at meetings of the Institution of Civil Engineers, and reports are given of the discussions which followed.

VARIORUM.

THE *Penn Monthly* for July contains a paper by E. Wrigley on "The Advantages of the Co-operative Feature of the Building Association, compared with other Plans of Saving." This is the last sentence of the article:—"A community of patient, diligent, frugal, and contented workers, recognising fully the power and the beauty of co-operative effort, are like an army of road-builders—they improve the barren places of the earth, and make them to bloom as the rose. In place of wasting their hours in empty repining, and their strength in useless opposition; instead of listening to the idle talk and empty theories of the 'poisoner' and demagogue, they unite, not for the purpose of overthrowing capital, but with the design of becoming in good time capitalists themselves. Thus my text points the way, and co-operation applies the means, of creating that almost millennial state of existence for the working classes which has been the dream of the reformer since civilisation first dawned upon the earth."——A writer in the *Manchester Critic*, commenting on "Queer Inventions," says, speaking of perpetual motion:—"The oddest thing about these perpetual-motion inventors is that they are fully aware of their ignorance of mechanics, and lament that 'their people' did not put them to the mechanical business. Their failures and the want of success of their inventions are all due to bad workmanship and ignorance, and they know it. 'But if my father had only made me an engineer!' they sigh. If you are a good-natured man, and have a little time at the moment, you endeavour to go through the alphabet of force, and try hopelessly to refute and disenchant this man, whose wife tells you he is 'wasting his brains away with thinking, drat 'em!' This requires great care, and after you have prepared his mind by asking him if he believes, as a Christian man, that there are sixteen ounces in the pound, and if he ever knew any pound to have seventeen ounces, you craftily ask him if he knows of a weight lighter than sixteen ounces that will balance a pound in the scales. He cuts short your endeavours by quoting from a poet you have never heard of, and of whom you have no desire to hear:—

> 'A few rude methods,
> And some rough rules have wrought
> More for mankind
> Than all the pride of intellect and thought.'"

——"Up the River from Westminster to Windsor" (Hardwicke & Bogue) is a well-illustrated *brochure* and pleasant reading; it gives, however, but the briefest introduction to the places named.

——Speaking of the architectural drawings at "The Centennial," the *American Architect* says:—"The three influences, English, French, and German, to which we owe our architecture, are pretty clearly shown and distinguished in the Exhibition; and their local distribution is somewhat significant. The English influence, represented by modern Gothic of the Victorian type, predominates in the Boston work, and is very prominent in that of New York. The French influence is stronger in the New York section than elsewhere, though it leaves some trace also on the Boston and other Eastern work. The German influence is most marked in the Western work, just as we know that in fact the Germans are a more prominent element in the Western than in the Eastern communities. In the New York work we find the English, French, and German tendencies shown more on an equality than in any of the other, as the make-up of the city is more cosmopolitan in all respects than that of any other part of the country. In the Philadelphia contributions, the German element is prominent also, as it is in the city; but the representation is so incomplete that it cannot be taken as an index of what is done in the city. It is to be remembered, in taking into account the influences which act upon American architecture, that the work which bears a German character is almost exclusively the work of Germans. German architects come here already educated, as German mechanics do, and practise in the German way; but Americans who become architects acquire very little of the German habit in design. If they go abroad to study, it is almost invariably to Paris or London,—commonly the former, almost never to a German city. If they study at home, it is commonly with Americans of French or English tendencies, seldom of German. Hence, as native architects come more and more into majority, and the proportion of imported ones grows smaller, it is likely that the effect of German training on our building will diminish, and the English and French influences have the field more and more to themselves, till some distinctly American character asserts itself; which seems not likely to be the case very quickly."——The Report of the Leicester Free Library shows that the present number of books in the library is 15,073,—in the lending department, 11,012, and in the reference, 4,063,—being an increase, since the commencement, of 5,900. In the lending library the circulation has been 106,237, being an increase of 993; the purchases, 412 volumes, 333 having been to replace worn-out books. In the reference department, 7,174 volumes have been issued, being an increase of 345 on the previous year. 92 volumes have been purchased, and 185 presented.——The July number of *The Quarterly* is a good one. The articles on "Ornamental and Useful Tree Planting," "The Orkneys and Rude Stone Monuments," and "South Sea Island Mythology," will commend themselves to a large proportion of our readers. The writer of the article on rude stone monuments will not accept Mr. Fergusson's theory, which would deprive them of any extreme antiquity.

Miscellanea.

Technical Education in Germany.—The programme for 1876-77 of the Technikum Mittweida has just been issued. Mittweida is coveniently and centrally situated, being half an hour's journey from Chemnitz, three from Dresden and Leipzig, two from Freiberg and Zwickau, and five from Berlin. The teaching staff consists of the director, professors of mathematics, mechanical engineers, teachers of languages and commercial matters, and assistants. The chief advantage of the Technikum, as compared with the School of Science, appears to be that in the former greater attention is paid to the arrangement of the classes in such a manner that no student is compelled to learn the higher branches of any given subject unless he is likely to require it in the particular branch of industry to which he proposes to devote himself in after life. By this means each is enabled to obtain more than usual of the particular kind of knowledge useful to him, although he may get a little less general scientific knowledge than might be acquired in the School of Science.

Supposed Romano-Celtic Remains in Oxford.—Mr. G. A. Rowell, in a letter to the *Oxford Journal*, says that during the recent drainage works in Titmouse-lane (leading from the Canal Wharf to the Old Castle) several iron horse-shoes of a peculiar form were found at about 15 ft. below the surface. One, from a sort of clay not far from the castle, is bronze-like in appearance, and, although somewhat worn, as bright as if just made; the others were from a mixed soil, and are more or less incrusted with it, but there is not a speck of rust on any of them, although it is probable they had been underground from Romano-British times. From Fleming's work on "Horse-shoes and Horse-shoeing," it appears that neither the Greeks nor the Romans, until a century or two after the Christian era, shod their horses with metal, or, at least, with such shoes as were nailed to the feet; but that horse-shoes similar to those now in question have been found, with the well-known Celt and other bronze articles, in Celtic and Gaulic graves on the Continent and in Great Britain, all such horse-shoes being small in size and similar in form, showing that the horses of these regions in those days were diminutive as compared with those generally of later times. The quality of the iron of one shoe has been tested by Mr. Neill, of Corn Market-street, who states that it is of the very best quality, and such as it would be difficult or hardly possible to procure in the metal market. The shoes (with a hoof-picker found with them, and in a similar condition) will be deposited in the Ashmolean Museum.

Street Architecture in Elgin.—We learn from the *Elgin Courant* that the eastward part of Dr. Mackay's property, beside the British Linen Company's Bank—to which is attached the well-known tower which no tourist wishful to see the lions of the old city passes by without inspection—has been dismantled. The tower is attached to the south-east extremity of the property, and its walls contain, in three different parts, the arms of the Leslies of Rothes, with date 1634, and the letters A. L., believed to be the initials of Andrew Leslie, who was, at that time, one of the magistrates of Elgin, and who purchased the estate of the Glen of Rothes. We are glad to learn that the old tower is to stand just as it is, and the new erection contiguous to it, and of which it will form a part, will be entirely in keeping with it, and in the Scottish Baronial style. Billings, in his "Baronial and Ecclesiastical Architecture of Scotland," makes the tower the subject of one of his engravings. The new building is to be three stories in height, with a shop on the ground-floor. The entrance to the new dwelling-house will be by the present door of the tower. The contractors are:—A Robertson, mason; A. Munro & Son, carpenters; J. Wilson, slater; J. Hunter, plumber; David Simpson, plasterer; John Kintrae, painter and glazier.

Fine Art Gallery and Industrial Museum for York.—Arrangements are in progress for the establishment at York of a permanent Fine Art Gallery and Industrial Exhibition or Museum. All the preliminaries are now said to be settled, and the future of the project is cheering. A large guarantee fund, amounting to upwards of 30,000*l.*, has been arranged, and the call of 20 per cent. on the guarantors is being promptly paid into the bank. At a meeting of the Executive Committee, on the 7th inst., Sir James Meek in the chair, Mr. Taylor, architect, presented a lithographed block plan, with elevation of the proposed permanent building. It is designed for the reception and display of paintings, sculptures, and other works of art, with accommodation for a technical museum. Negotiations have been concluded with the Commissioners of Woods and Forests for the acquisition of the site known as Bearpark's Gardens, and the meeting resolved that a cheque for 4,000*l.* be drawn to complete the purchase of the land and to obtain the grant from the Crown. A house adjoining the site has been purchased for 600*l.*, and the executive are now in possession of the whole of the property required.

Building Societies and Sanitary Associations.—Under cover of the interest which has been evoked with reference to improved habitations, various societies are being formed and projected. We will simply advise our readers at present that before taking shares in such schemes or otherwise joining any one of them they should satisfy themselves that trustworthy persons have the management of the undertaking.

Impure Ice.—The mixing of ice with light wines and other summer drinks has now become so general amongst the better classes of society, that some assurance of its purity seems necessary. What is termed Wenham Lake Ice is principally imported from Norway in large blocks cut out from the frozen fiords or lakes, the water in which is usually very pure, but owing probably to the annually increasing demand for this luxury, a large quantity of ice, apparently clear and transparent, is sold, which does not come from any such unobjectionable sources, and which, when melted, might fairly merit the designation of "dirty water." Dr. Whitmore, in his report on Marylebone, says,—"Some of this melted ice has been brought under my notice, in which I found a considerable amount of sediment, apparently of vegetable matter. Those who use ice are recommended to test its purity by dissolving a small portion in a wine-glass, and if the water is clear and bright, in all probability it is genuine Norway ice; but, if otherwise, it should be rejected." This warning is very necessary.

Proposed Winter Gardens for Leamington.—A public meeting was held at Leamington on the 13th inst., to consider the desirability of establishing winter gardens in that town. The mayor expressed his sympathy with the scheme, and his best wishes for its realisation. He then introduced Mr. Hyde, of Southport, who constructed the winter gardens in that place. That gentleman detailed his proposals, pointed out the success of the Southport Winter Gardens, and the great benefits which had accrued to the place through the establishment of such a resort, and showed that similar results might be expected to follow the provision of similar attractions in Leamington. On the proposition of Alderman Bright, seconded by Councillor Salmon, it was resolved that it was desirable to establish winter gardens in Leamington. A provisional committee was appointed to consider the scheme, which it is proposed to carry out by the formation of a limited liability company. Three sites are mentioned.

Newnham Paddox, Lutterworth.—The Earl of Denbigh is making great alterations to his mansion and grounds at Newnham Paddox. The north wing has been pulled down, and a new wing, 120 ft. long, three stories high, and containing seventeen suites of rooms, is to be erected. There will be a tower in the centre, and the whole will be built of brick, with stone dressings. The alterations are being carried out by Mr. J. Bromwich, builder, Rugby, from designs by Mr. T. H. Wyatt, architect. On the 11th inst., the Countess of Denbigh laid the foundation-stone of the new building. A portico is to be built over the iron gates that are to be removed from his lordship's Berwick estates. The gates will, it is supposed, cost about 1,000*l.* to remove to Newnham.

Glass from Slag.—At the quarterly meeting of the North of England Iron and Coal Trade, slag was shown in a fibrous form, and in the Barrow district a company is in process of formation to manufacture slag into glass, under a patent taken out by Mr. B. Britten. The slag is taken as issuing from the blast-furnaces, conducted into a tank, and there mixed with other materials, from which mixture transparent glass is made. It is claimed for the new glass that it is acid proof, and capable of use for all purposes for which the best bottle glass is suitable. Experiments have just been conducted at the Wellingborough Ironworks, and it is claimed that the saving in the process is so great that it is likely to bring about important changes in the glass manufacture.

The Birmingham Improvement Scheme. All the petitions against the scheme of Alderman Chamberlain, M.P., for the improvement of Birmingham, under the Artisans' Dwellings Act, have been withdrawn, and consequently there will be no opposition to the Bill in the House of Lords. The scheme will involve the purchase of property valued at nearly two millions sterling, and have the effect of sweeping away a very large portion of the slums and unhealthy dwellings in the town.

Bricklayers.—We are asked to say that technical classes for the instruction of bricklayers are now being held at the Artisans' Institute, St. Martin's-lane, being the result of the recent meetings held with the view of improving the condition of the trade, and that over thirty students have already joined. An architect is announced as president.

Sanitary Institute of Great Britain.—The Duke of Northumberland presided, on the 13th inst., at a large meeting convened in St. James's Hall, for the purpose of forming a society to be called the Sanitary Institution of Great Britain. The object of the proposed institute will be to direct public attention to all matters affecting public health. It will watch all measures introduced into Parliament relating to public health and sanitary reform, and it is intended to form branches in urban and rural sanitary districts in connexion with the central office in London. Are there not existing organisations which could be made to effect this?

New Skating Rink at Stafford.—A skating rink for Stafford, situate in the Newport-road, was opened on the 5th inst. The rink is a covered one, and is 165 ft. long and 56 ft. broad, excluding the offices. The gable ends are of brick and stone, while the sides and offices are of wood, with brick piers. The roof, which is supported with iron ties and rods, is lofty, and, together with the sides, is picked out in colours of various tints. The skating surface, which has been laid by the Val de Travers Company, contains 8,250 square feet. There is also a spacious promenade, a raised platform at one end, and a band-stand. The rink has been erected by Messrs. Hayes & Son, under the superintendence of Mr. W. F. Bagnall, architect.

Foreign Competition.—During the last few months, says the *Birmingham Post*, a French manufacturing firm has established an agency in Birmingham, and has supplied large quantities of hardware peculiar to Birmingham and its district, at prices considerably lower than those of native manufactures, such articles being, nevertheless, frequently made from Staffordshire iron and Sheffield steel. Another significant hint as to future competition, not only in foreign and colonial markets, but even on English soil, is the lists of prices of several American manufacturers who are supplying not only axes and steel forks, for which they have long been famous, but a great variety of hardware goods.

Accident to a "Steeple Jack."—On the 13th inst. an accident occurred to a man named William Woodruff, who is one of the men known by the nickname of "Steeple Jack." For some time past the chimney-shaft belonging to the Bone Grinding and Dust Company, Bromley-common, has been leaning, and the services of Woodruff were called in. He ascended for the purpose of sawing the shaft, and labourers were attaching a second sling, when a stone fell from the top of the chimney, striking Woodruff and smashing both thighs. The sling was then lowered, and the injured man was taken to the hospital, where amputation of the left leg was deemed imperative.

Proposed Tower Bridge.—At a public meeting held at the Vestry Hall, Minories, on the 10th of July, it was resolved,—"That this meeting having heard a description of Barnett's Patent for a bridge across the river Thames, from the Tower to Rotherhithe, explained by Mr. Le Fevre, hereby expresses an opinion that it is worthy of the consideration of the Bridge Committee of the Common Council, and that the site selected by the engineer is approved by this meeting." We are not able to persuade ourselves that the design will ever be carried out.

Proposed Public Buildings at Alnwick. Mr. F. R. Wilson has prepared three alternative plans for providing increased accommodation for Quarter Sessions business at Alnwick. The first plan provides a new court-house, extending from the town-hall to the corner of the Market-place. The second proposes to divide the Corn Exchange into courts and other necessary apartments by means of sound-proof partitions. The third plan is to provide the required accommodation by additions and alterations to the county premises in the Green Bat.

Swansea Master Builders' Association.—The members of this recently-formed association dined together on the 11th inst., when about thirty of the master builders of Swansea and one or two invited guests from Newport and Gloucester were present. Mr. Wm. Thomas (of the firm of Thomas, Watkins, and Jenkins), as the president of the association, took the chair, the vice-chairs being filled by Mr. Thos. White, vice-president of the Society, and Mr. Thomas Rees. Mr. William Williams, of Newport, proposed the toast of the evening, "Success to the Master Builders' Association of Swansea."

Matheson and Grant's Engineering Trades Report says,—"The iron and other staple trades of the kingdom which depend upon engineering enterprise for their prosperity afford at present the most conspicuous examples of the general commercial depression which has now prevailed in England for more than a year. The causes of this depression are various; but most of them are but incidents in the general reaction which is still taking place from the over-trading and speculation of 1871-2 after the close of the Franco-German war."

The New Edinburgh Infirmary Buildings.—At a recent meeting of the managers of the Royal Infirmary, Mr. John Bryce was appointed architect to the new infirmary buildings. In making this appointment the managers have had regard to Mr. Bryce's intimate acquaintance with the plans, in the preparation of which he took an active part, as well as to his knowledge of the late architect's intentions in regard to the completion of the buildings.

Gloucestershire Archæological Association.—The first annual meeting of this Association will be held at Gloucester on Wednesday, Thursday, and Friday, the 23rd, 24th, and 25th of August. The first day of the meeting will be occupied in visiting the cathedral and other ancient buildings in Gloucester, under the guidance of Mr. John Bellows. On the following day the Association will visit Tewkesbury and Deerhurst; and on the Friday Berkeley Castle will be inspected.

Great Eastern Railway.—The improvements which have been in progress at Stepney Station several months, and which were noticed by us recently, have been brought to a successful completion, and the passenger traffic which it was found necessary to suspend during the execution of the works, was resumed on Monday the 17th inst.

New Lunatic Asylum at Portsmouth.—A new lunatic asylum for the borough of Portsmouth, at Milton, has been in course of construction for several months past, and on the 11th inst. the ceremony of laying the foundation stone was performed. The builder is Mr. C. T. Quick, and the architect Mr. George Cake.

Death of the Borough Surveyor of Shrewsbury.—The death is announced of Mr. Thomas Tisdale, borough surveyor of Shrewsbury for the past quarter of a century. The Mayor, in moving a vote of condolence with the family, paid a high tribute to Mr. Tisdale's zeal and ability.

Drawings at the American Exhibition. Information reaches us that many of the drawings now in the Exhibition at Philadelphia are being much injured by the absorption of moisture. Who is looking after the English pictures there?

Surrey Archæological Society. — The annual excursion, under the presidency of Viscount Midleton, is fixed to take place on Thursday, the 3rd of August next, to Godalming, Thursley, Eastead, and Peperharow.

TENDERS

For banking premises and manager's house, Batley, for the West Riding Union Banking Company. Messrs. Sheard & Hanstock, architects. Quantities by the architects:—

Brier, Sons, & Wilson (masons, &c.)	£4,950 0 0
Thorpe (joiner)	1,649 15 0
Armitage (plumber)	444 7 6
Bagshaw & Son (ironfounders)	320 0 0
Rawsthorne (slater)	182 15 0
Kitchingman (plasterer)	150 0 0

For a semi-detached residence in The Avenue, Acre-lane, Brixton, for Mr. Henry Dann. Mr. W. H. Harding, architect:—

Crew (accepted)	£375 0 0

For sundry alterations to Church-road Wesleyan Schools, Homerton:—

Jarvis & Sons (accepted)	£545 0 0

For offices, Sugar Loaf-court, Leadenhall-street. Mr. Robert J. Worley, architect:—

Rudkin (accepted)	£1,215 0 0

For house and shop for Mr. Welch, Limehouse. Messrs. A. & C. Harston, architects:—

Hoarle	£595 0 0
Walker	485 0 0
Salt	483 0 0
Johnson	479 0 0
Reed	470 0 0
Harris & Wardrop (accepted)	445 0 0

For enlarging premises at 18, Great Marlborough-street, for Messrs. Small, Brothers. Mr. A. W. Galbraith, architect.

Allen	£420 0 0
Ryder (accepted)	410 0 0

For West Ham Union Schools, dormitories, and offices. Mr. Lewis Angell, architect. Quantities by Mr. T. Nixon:—

		Extra Block.
Judd & Hawkins	£20,436	£1,800
Rivett	20,385	2,069
Shurmur	19,586	2,117
Aitchison & Walker	18,455	1,785
Nightingale	18,287	1,882
Lunfield	18,250	1,730
Sheffield	17,968	1,876
Morter	17,727	1,758
Langmead & Way	17,770	1,750
Stephenson	17,130	1,717
Enor (accepted)	17,284	1,791

For execution of drainage works, &c., at Twyford, Winchester, for the Rural Sanitary Authority of the Winchester Union. Mr. A. W. Galbraith, surveyor:—

Clark	£1,321 11 9½
Cowdery & Sons	752 0 0
Allen	685 0 0
Croxford & Co.	681 11 0
Sibsey (accepted)	606 18 2
Egerton (sum total not given).	

For labour only to dwelling-house, Mapperley Plains, Nottingham. Mr. T. G. Alderson, architect:—

Lewin & Carter	£232 0 0
Binks & Knowles	227 14 5
Parnall, Brothers (accepted)	225 0 0

For erecting new music-hall and altering billiard-room, &c., at Three Cups, Bow, for Mr. Prideaux. Mr. James Broadhurst, architect:—

J. & H. Cocks (accepted)	£2,100 0 0

For formation of new roads on the Culverden Park estate, Tunbridge Wells, for Sir David Salomons, bart. (first portion). Messrs. Lander & Bedells, surveyors:—

Woodham, Brothers	£625 0 0
Skinner & Co.	548 0 0
Goldsmith	527 3 6
Hawkes	506 0 0
Perigoe	492 10 3

For ten blocks of buildings at North Hill, Highgate, for the Directors of the Highgate Dwellings Company. Mr. W. Ward Lee, architect. Quantities not supplied:—

Brown	£7,670 0 0
Southgate	7,514 0 0
Smale	6,989 0 0
Wheeler (withdrawn)	5,750 0 0

For new Congregational Church, Romford, Essex, in accordance with amended drawings. Mr. E. C. Allam, architect:—

Staines & Son (accepted)	£3,210 0 0

For alterations and additions to the Burlington School, Burlington-street. Mr. J. T. Wimperis, architect:—

Holland & Hannen	£5,350 0 0
Smith & Co.	5,300 0 0
H. & A. Bywaters	5,199 0 0
Scrivener & White	5,110 0 0
Patrick & Son (accepted)	5,045 0 0

For house at Hendon, Middlesex, for Mr. William Goode. Mr. J. T. Wimperis, architect:—

Fish	£4,103 0 0
Lawrence & Sons	3,982 0 0
Patrick & Son	3,824 0 0
Brass	3,697 0 0

For new wing, &c., to the Royal Free Hospital, Gray's-inn-road. Mr. William Harvey, architect. Quantities by Mr. Henry Smith:—

		Deduct for Bath Stone.
Eborall	£14,040	£750
Dove, Brothers	13,755	390
Smith & Co.	13,380	400
Hill, Higgs, & Co.	12,990	450
Kirk & Randall	12,876	490
Shepherd	12,450	485

For a pair of semi-detached residences at Walthamstow, Essex. Mr. Robert Blackmore, architect:—

Bullen	£1,030 0 0
Larter	900 0 0
Tubby (accepted, subject to alteration)	847 0 0
Luxford	805 0 0
Crabb	650 0 0

For bailiff's house and cottage at Kingswood, for Sir John Hartopp, bart. Mr. William Smith, architect:—

Keal (accepted)	£1,315 0 0

For rebuilding Poulstone Court, Fawley, near Ross, for Mr. R. Jones. Mr. H. Carr, architect. Quantities by Mr. George Hackford:—

Pearson	£5,195 0 0
Stephenson	5,018 0 0
Woodbridge	5,009 0 0
Welch	4,998 0 0
Everal	4,983 0 0
Stephens & Bastow (accepted)	4,974 0 0

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A. M. M.—Rev. D. B.—B. & Co.—S. R. F.—T. J. H.—M. P.—E. P.—J. M.—J. R.—B. & Co.—S. M.—R. P.—Q.—G. & B.—J. J.—H. St. J.—R. M. B.—S. & Son.—W. C.—H. K.—J. B.—R. B.—S. W. K.—W. D. & Co.—H. S.—An Old Builder (does not make his point very clear)—W. L. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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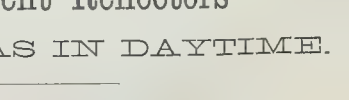
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The Additions to the National Gallery.

IN spite of Governmental promises and proposals and schemes, "the finest site in Europe" still retains its somewhat grim and dreary-looking northern boundary; the National Gallery front is still a discredit to a metropolis where such far more ambitious architectural scenery is devoted to the front of a railway hotel, and the architect who was led to hope for the opportunity of connecting his name with a striking and publicly conspicuous building on a grand scale, is still left to feed upon hope, and to reflect that the old warning against putting your trust in princes may be equally applicable to less autocratic forms of Government. Whether Mr. E. M. Barry's complete design for the proposed New National Gallery was altogether the best that could be made may be one question; it was, however, a scheme conceived on a grand scale, and with splendid opportunities for internal effect, and would have been the first step towards making Trafalgar-square more like what we all feel that it might be made: and it cannot be denied that there was, if not a compact, at least the equally binding force of what is called "an honourable understanding" with the architect, that he should have some compensation for his undoubted wrong in regard to another greater Government commission, by the opportunity of carrying out in full his scheme for a complete rebuilding of the National Gallery. This, however, still remains a castle in the air, and in place of the new façade and the group of saloons, arranged symmetrically around a grand centre, we have only one-half of the proposed arrangement of the back portion of the plan, tacked on behind the old and certainly, according to recent lights in architecture, very shabby-looking façade. We may be glad that anything has been done to house the national pictures more worthily, and to collect their forces in one building; but it is impossible to regard the present one-sided achievement with any particular satisfaction.

From the plan which we publish in our present number, it will be seen that the new buildings constitute a nearly square block attached to the east end of the present suite of rooms, and having their principal opening out of the room which, under the old arrangements, contained the pictures of the French and Spanish schools, the productions of Poussin and Claude, Murillo and Velasquez, and others. From the old entrance, therefore, the whole length of the long room in which used to hang the "Bacchus and Ariadne" of Titian, and other works of the great Italian painters, and the succeeding room, would have to be traversed to arrive at the new portion. But it is part of the new scheme that the east as well as the west entrance of the centre portico (formerly the Royal Academy entrance) is now to be utilised, so that there is a symmetrically arranged entrance-staircase to right and left from the centre doorway, the right-hand staircase leading up to the small room which was recently the abode of certain small Raffaelles and Filippo Lippis, and the Mategna procession and the little St. George of Giorgione, and taking the visitor, in fact, right through the wall on which hung the unfinished Michelangelo. Passing through this room, now a kind of vestibule similar to that on the west side, we see to our left through the new opening in the north wall of the next room the vista across the new octagon hall and two of its vestibules, the four of which form a Greek cross, into the main entrance of the large new north gallery. Advancing into the octagon, the vestibule to the right gives in like manner access to the side entrance of the east gallery, which has also an end entrance from the last room of the old range of rooms, and the north and east new galleries are connected by the new octagon room at the north-east angle. The re-entering angles formed between the arms of the cross are occupied by open courts. For those who have not paid attention to the complete scheme for rebuilding the National Gallery, of which this is a part, it may be explained that this octagon with its dome, now the centre part of the new building, would have been in the complete scheme one of its secondary points, subordinate to a grand central entrance and cupola occupying the centre of the space in rear of the façade, and having a similar corresponding feature to west of the central dome.* The present building is therefore so planned that it could be incorporated as part of the whole design for rebuilding, should that after all be carried out.

The central compartment has a glazed dome, octagonal on plan; the vestibules which branch from it are barrel-vaulted, with solid panels near the springing, and glass in the upper portion. The decorative effect is of a sumptuous but broad and massed character, derived chiefly from marble and a rather profuse use of gilding. The plinth is of Belgian black marble, which is also used for the architrave borders of the openings in which columns are not added, and which are plain semicircular-headed doorways with no break at the impost. The North Gallery was to have been entered from the vestibule by one of these plain doorways only; but the more liberal administration of "Works," which succeeded to the memorable reign of Mr. Ayrton, was induced to countenance a wider and columned opening to give a better climax to the vista from the entrance. The columns are of green Genoa marble, approaching, however, in most instances rather nearly to black in general tint. The floor of the centre octagon is of marble, with a wide border, formed of bars of the darker marbles, and a centre of lighter white and grey Sicilian marble in squares; in the border opposite each angle is a circular panel filled with yellow Siena marble in a five-petalled flower form, giving a good effect in colour, but rather falsifying the scale. The walls are crimson, and the cornices strongly gilt, with a frieze picked out with a simple ornament in two shades of green; in the two large galleries this frieze is a little more elaborated, and in the octagon, instead of the ornament, there runs round the frieze the following sentence (a quotation, we imagine, from Reynolds):—"The works of those who have stood the test of ages have a claim to that respect and veneration to which no modern can pretend." The original author is of course responsible for the grammar, which really implies a statement that the painters themselves referred to "have stood the test of ages," and not their works; but apart from that, it seems to us that a weaker inscription for such a position could scarcely have been found; if indeed it be quite harmless, for it involves what from some points of view may be thought a very questionable principle. Over the frieze come deep square panels divided by gilt mouldings, and filled, in the vestibules, where they form part of the ceiling, with a simple decoration in light greyish tones, or with gilt ornament in low relief; in the octagon, where the panelled portion forms the drum of the dome, the panels are more deeply sunk, and filled with large rosettes in high relief, also gilt. A heavy round moulding of banded leafage divides the panels, and runs up the ribs of the octagon cupola. In the lower portion of the octagon there is space for hanging four large pictures, one on each of the sides between the openings. In the eight spandrels of the arches above are to be seen, in lunettes, the busts of Michelangelo and Raffaelle, Reynolds and Turner, Titian and Rembrandt, Hogarth and Gainsborough. There are, as will be seen, two groups of foreign and two of English painters; those of Raffaelle and Michelangelo flank the north arch, which gives access to the room in which the principal works of the great Italian painters are to be collected; the rest have no significance in regard to position. They are perhaps sufficiently typical names, but as the National Gallery has no reference to English art more than that of any other country, and accepts all great works independent of nationality, it might perhaps be asked why the English painter's effigies should preponderate, to the exclusion of such a name as Leonardo, for instance? The smaller decorative arches in the diagonal faces of the octagon are occupied by a Classic device of griffins and a vase,—a decorative feature with a respectable pedigree. The ceilings of the two long galleries have large coves, with a semi-vault at the sides, and with a somewhat similar griffin design in the lunettes; there is a flat ceiling of glass, and the line of the flat ribs in the cove is carried across the ceiling by bands of

* A reference to the complete plan published in the *Builder* for 1867 (vol. xxv.), will render this clear.

ornamentally-leaded glazing. The decoration generally has been in the hands of Messrs. Crace. There are, however, special designs in sculpture, or at least in relief, in the semicircular panels in the end wall of each of the four "vestibules," above the cornice line; these have been designed and modelled by Mr. Wyon. The groups in the east, south, and west vestibules represent Architecture, Sculpture, and Painting respectively: the first-named was not placed at the time of our visit; Sculpture is illustrated by the visit of Pericles and Aspasia to the studio of Phidias; and Painting by a group representing Raffaelle in his *atelier* with his pupils. The remaining space is occupied by a representation of "Colour" and "Form," represented by two fat boys who are not beautiful, and who, if considered as infants, as their proportions and modelling indicate, are out of scale with the other groups: one holds a palette and the other a board, on which the long-exploded "line of beauty" is shown; and between them is the head of Queen Victoria in profile. Why her Majesty should be put between Colour and Form is not apparent; but the whole design is by no means a fortunate thing to see opposite to one on entering the new galleries, and we should seriously suggest the advisability of reconsidering it. The architect, it is to be presumed, is hardly responsible for the character of these designs.

The galleries, as at present constituted, contain no special provision,—we might say no provision at all,—for the exhibition of sculpture, which is of the less practical consequence just at present, as the nation possesses very little sculpture, specimens of which are no doubt more difficult to acquire than paintings. We could wish, however, that some effort were made to secure a representation of sculpture works in the national collection, and in that case there ought to be room to exhibit them properly. This would, we believe, be fully provided for, were Mr. Barry's plan carried out in its complete form. At present economically-minded members of the Government might have a logical basis for decrying the purchase of sculpture, because there is no place to put it. The "Hylas" group of Gibson is quite lost in its position in the little lobby between two of the rooms; we hope that, at least, some better place is to be found for it; at the time of our visit it stood in the old corner.

We have, some time previously, given details as to the fireproof construction adopted in the building*; beyond this there is not much in the practical part of the work to call for special remark. In the floor below the galleries there is plenty of accommodation in the shape of lavatories, &c., for students attending the gallery on studying days; the rest of the floor is mainly occupied by offices and residential rooms. A considerable space in the basement appears to be not yet appropriated for any special purpose. A lift is provided for raising pictures, brought in at an entrance arranged for that purpose, to the gallery level. While referring to the practical part of the work, we may here mention (though we have given the names before) that the contractor for the work was Mr. G. W. Booth, of Gosport and London, and that it was carried out under the immediate superintendence of Mr. Roome, as clerk of works. The architect, we need hardly remind our readers, is Mr. E. M. Barry, who was appointed in 1868.

As to the re-arrangement of the pictures, the new combinations brought out, the effect upon various works of their new light and new position, and the characteristics of the new works (the Wynn-Ellis collection) which have not yet been publicly seen, there may be something of interest to remark upon when the details of the hanging arrangements are finally carried out. At present we will only mention the general classification of schools which has been adopted. We may premise, in regard to this part of the subject, that considerable difficulty has been experienced in coming to anything like a system of classification, from the fact of the size of the apartments not necessarily fitting in with the precise space required for pictures of a special family, artistically or nationally. This, of course, is an inevitable difficulty in a case of this kind, because even if the rooms had been built for the pictures now in hand, a few new purchases would have disturbed the arrangements. As far as we can gather, the authorities over the pictures at the National Gallery would have preferred a succession of smaller rooms rather than the two long galleries, as it would then be more easy to break the pictures up into groups, connected by national or chronological relations, or by similarity of style and school, each of which could have been fitted to one room, so as to make that room the representation of a special division of the subject. The difficulty of the long room is illustrated in placing the works of the Italian painters in the north gallery. This gallery does not suggest, in its architectural treatment, any possibility of demarcation of the various Italian schools, or of chronological periods. The only alternative is to mass the whole collection as "the Italian schools," and arrange the pictures in a general chronological order, from one end of the room to the other. But the unity of even this general classification is interfered with, because the room is just not large enough for the whole series of Italian paintings; and the most important of the earlier works, including the specimens of Giotto and Orcagna, have to be placed quite apart in the south vestibule, instead of heading the line of painters who may be said to have descended from them. The endeavour is evidently being made to keep the arrangement of the whole works as systematic as possible; an endeavour which is again interfered with, on the other hand, by the terms of special bequests, which must be collected in one room. However, the general classification is briefly this: entering by the left-hand staircase (the old National Gallery entrance), the visitor will find in the vestibule certain works of the English school, and in the room immediately adjacent, where formerly hung the Angelicos and the specimens of Signorelli and Botticelli, he will find the collected studies of Turner, to which this room is now devoted. Passing through westward, he will find the two old Turner rooms devoted to the miscellaneous works of the English school, and the old English room,—the farthest room westward,—occupied by the Vernon Collection. Returning eastward through the Turner studies room, we find the long room, formerly devoted to the leading Italian pictures, now occupied by the Turner pictures. The small room eastward of it, and the vestibule at the top of the east staircase (the old Michelangelo and Mantegna room) are devoted to some of the older works of the English school. The next room retains some of the same works which it previously held,—the Poussins and Claudes, &c. The room beyond it, where the Peel collection hung, is occupied by later Italian painters, and the extreme east room by the Wynn-Ellis bequest: thus the earliest and latest of the bequeathed collections occupy the two corresponding rooms at opposite ends of the suite. Returning to the Claude-room, we find on the north of it, as mentioned, the breaking through into the new building; and the southern arm of the cross, or the south vestibule, is occupied by the works of the Spanish school. The west vestibule, as we noticed just now, contains some of the earlier Italian paintings; the north vestibule contains the works that were in what is now the east entrance vestibule,—the Michelangelo and the small Raffaelles, and others,—which are considered as thereby grouped with the main Italian school in the North Gallery, to which this chamber leads. In the east vestibule are hung the Peel pictures, and through that we may proceed into the long east gallery, which is occupied by the large pictures of the Flemish and Dutch schools chiefly. The door at the north end of this room gives access to the octagon room at the angle, which is occupied by the early Venetian and Umbrian pictures, which, being rather extraneous to the central development of Italian art, are not so ill placed apart from the main Italian room, or North Gallery. This latter we enter from the octagon room, and have then made the circuit, and return to the centre octagon through the door in the side of the north room.

We have thus given the general bearings of the new disposition of the pictures, the results of which, more in detail, we may take opportunity to glance at when the arrangements are finally completed; which will also be the best opportunity for forming a judgment as to the success of the lighting in the new galleries.

* In vol. xxxi. of the *Builder*, page 619, some information on this point, and on the general question of the advisability of wood or tile flooring for picture-galleries, will be found. The latter was recommended, on good authority, to the Government, but it was decided to adhere to the original contract for oak flooring.

North Bierley (Bradford).—At a recent meeting of the Local Board, Mr. H. Oliver Smith, of Oxford, was unanimously elected engineer and surveyor. The Board are about to carry out extensive drainage and other works.

THE BRUSSELS EXHIBITION.—A LAST LOOK ROUND.

IN resuming and concluding our notice of this remarkable Exhibition, it may be as well to point out the foreign models of especial interest to the British competitors. But it might be unfair to do this without a distinct acknowledgment of the classes against which, in a particular department, our Continental rivals had to contend. The classes we refer to, and which, during our visit, attracted a high degree of scientific, if not of popular, attention, are those referring to sanitary principles of construction, with particular reference to public buildings. Thus, nothing could be more evident than the anxiety felt to study the arrangements of the Portsmouth and Pentonville convict prisons, the new system of warders' quarters at Wormwood Scrubs, the improved accommodation for *détenus* and officials at police-stations, and so forth. It was gratifying, of course, to note the overwhelming admiration bestowed upon the Thames Embankment and the Holborn Viaduct; but it is still more instructive to observe of what kind are the foreign monuments—since monuments they have been from the hour of their completion—which can, in our own day, be set off against these. In the first instance, however, it should be clearly understood that such works come distinctly within the scope of the Exhibition, as one for minimising the infliction of pain and death upon men and upon animals. The Viaduct and the Embankment did both. Two-thirds of the ideas and inventions at Brussels, no doubt, are devoted to the alleviation of sufferings which have already been incurred, and they bespeak all sympathies; but the solid basis of precaution has many attractions for the mind nevertheless. It underlies a good deal that is shown, in the shape of safe house foundations, ship-building, sea-signals, and the drainage of swamps, where townships are intended to be erected; yet the administrators of the Exhibition confine themselves to no technicalities of local structure. The Germans, for example, insist that, in the mere laying out of a public promenade, certain principles should be observed which may be important, if not essential, to the health of a great city; and this is undoubtedly true, as has been demonstrated in Holland over and over again. They have awakened to the truth, moreover, upon another subject which, repulsive though it may appear, will not, by tens of thousands of persons, be regarded as more so than the facts which have called its discussion forth. The Royal Administration of Railroads in Hanover have collected a series of reports on the latrinaries at railway-stations in Germany, and nobody who has travelled on the Continent can say that such a reprobation of dirt, indecency, and abomination was not required. Details are unnecessary; but every highway-and-byway tourist will attest the value of the new system proposed. It may be said of the model hospitals from all quarters, in a group, that they in most instances, illustrate an ingenuity of idea, the practical application of which remains to be judged by the light of experience, while, in others,—French, Belgian, German, and Italian,—the demonstration is already complete, though in all the sentiment of humanity and the recognition of scientific necessities are most honourably conspicuous. Naturally the amateur genius intrudes itself into this as it does into all other classes; but it is everywhere harmless, and might possibly in due time supply a suggestion when one was wanted. If without inordinateness, any countries were selected as peculiarly represented in this department, England, France, North Germany, and Belgium would assuredly take the lead, although Russia, the Northern States, and Switzerland are not far behind them, leaving Italy, Spain, and South Germany disgracefully in their rear.

Next to treatment of the sick follows naturally that of the wounded; but with this it is hardly our province to deal, except in so far as they are hospital patients; nor is it our concern to discuss the disposal of the dead, unless to indicate the strange number and variety of proposals for mortuaries, cremation-furnaces, cemeteries, tombs, family graves, and so forth, which crowd upon the sight at this Exhibition of "Health and Safety." Suffice, that a very large and a somewhat enlightened view is taken by practical men of these questions, which might possibly result in the adoption of a definite theory, though at present little is obvious in respect of this topic at Brussels, beyond collapse and confusion. That the dead have still a

relation to the living, is unquestionably true; but it is equally true that the main sources of public health must be sought elsewhere. In the first instance, through the supply of pure water. This, in the old kingdom of Wirtemburg, has hitherto been an object most difficult to accomplish, and in those which are called the "Alban" districts especially, which are really deserts in one sense of the term. By a bold and ingenious plan, however, the difficulty has been overcome, and the supply of Wirtemburg is an encouragement to embarrassed engineers. So testify, at any rate, the specifications set forth at Brussels. The hydraulic works at Cologne, Dantzig, Dusseldorf, and so on, as far as Munich, are of equal interest; but we find very little of this in connexion with the Austrian empire, notwithstanding its long riverain coast. The Germans, however, do not rely upon the Rhine; they will not, in fact, draw upon its flow, never superabundant at any time, more than can possibly be helped. Neither Belgium nor Holland ever did so, dependent though both are, and the latter especially, upon "well-regulated inundations." France is scarcely under a necessity of considering the subject, and even Paris has long since abandoned the thought of depending for her supply upon the Seine. In the next class, that of drainage, nearly all the states of Europe appear eager to compete. We have a scheme from Dusseldorf expressly to avoid the pollution of the Rhine; nothing, under the same heading, from Austria or Hungary; and a urinary and water-closet apparatus, adapted from an English patent, from Brussels. Indeed, Belgium abounds in drainage, disinfecting, and cleansing projects,—as does Italy; but drainage, in the case of the Italians, scarcely means cleanliness, decency, or the health of towns, so much as the clearance of swamped lands from water. The French, however, leaving England for the moment out of sight, march in advance of every other nation. They are the modern Romans in this world of art and wisdom,—drainage. Theirs is a very simple "folio," accompanied by a very simple "atlas," which they exhibit beneath the châlet-roofs in the park at Brussels; yet it represents a labyrinth which is a world in its way. There are models, moreover, exceedingly ingenious and of universal interest. Paris contains two classes of "subterranean channels,"—sewers and reservoirs; the first passing beneath the streets, the second receiving their tribute, and rushing away with it rather like rivers than canals. M. Maxime du Camp compares this combination to the skeleton of a fish; the spine is the main drain, the lateral bones are the tributaries,—one on each side of the Seine; that running beneath the left bank actually engulfing a small though historical stream. In the architecture, as it may justly be termed, of this magnificent system this *cloaca maxima*, if the term has not been too much abused,—a grand amount of courage and genius is manifest, or, at any rate, is claimed by the exhibitors of models and drawings at Brussels.

There is another class, which, until recent years, was regarded as of no great importance in England. It is that of slaughter-houses, always a difficult subject for the general public to understand, but in connexion with cattle, sheep, and meat markets, vital to the common health. The Dutch, as might have been anticipated, show a building in which the preparation of hogs and pigs for human use may, without American extravagance, as illustrated at Chicago, be carried on without those offences to common feeling that, until lately, disgraced the wharfs of Rotterdam. They are not very far in advance of their neighbours, in other respects, possibly; but in this they outstrip the Germans entirely. The class, however, must be a restricted one under any circumstances, and the more so because its representatives hide themselves under cover of a good many models, the details of which are mercifully not explained. Nevertheless, all this, which is the unvarying characteristic of International Exhibitions, need not restrain a nearer and more particular view of the subject, in this special light, as it stands. From embankments, viaducts, drainage, *et hoc genus omne*, passing to the bird's-eye perspective of the general subject, as here exhibited, there are other domestic interests represented; thus, model dwellings for railway officials at Cologne, similar projects for the mechanics employed at the great and famous works of Bodelschwing, and a dozen miscellanies, the like of these, sanctioned by official approbation in Germany. It is gratifying to know that at length the principles of "home" and of "hygiene" are acknowledged as being synonymous all over the civilised world. For example, in our own British Court, in the plans and models, as we have hinted, of private houses, and a hundred other methods, if the term may be employed, of domesticating danger, and confronting it in a domestic manner, a hundred little contrivances might be set at work, with slight cost, and perhaps, at all events, with a rather more than commensurate results. Most of these "safety" inventions represent, indeed, if they could only be regarded in that light, the principle of insurance; and so much has been admitted to be true by every inventor of a grand project, such as illustrated at the Brussels Exhibition, keeping in sight the signal and particular purposes for which it was designed. It may not be, perhaps, that safety gas-retorts come within the prescribed scope, but they are clearly "structures," as are safety-lamps, boilers, and kindred appliances. For, it is evident that these experiments must not be confined to model workmen's villages, the ventilation of public squares, and hygienic lodging-houses. Their purposes must extend further. Nevertheless, one great class has to be held in view; the provision of sanitary abodes for the industrious, and, consequently, of the comparatively poor. The Germans show, ostentatiously, perhaps, though in a true spirit of kindly emulation, as though worn out by the spirit of war, from Berlin, a cluster of educational, benevolent, and gymnastic buildings, not quite capable of description unless drawings or models accompanied them. We have, however, perhaps, drawn sufficient notice to these sections, although, it may be feared, the Brussels Exhibition is not being appreciated at its true worth. In many ways, no doubt, the Exhibition is inconceivable without a guide; but, in many other ways, its suggestions are sufficiently distinct. Let us range, finally, through a few miscellaneous classes which appeared to interest the German mind beyond and above the glitter of flags, blazons, and even architectural provisions for the care and comfort of the sick and wounded. In others, however, its ideas stand, pure and emphatic, before every thoughtful mind. There may be, perhaps, a doubt concerning the admission of many miscellanies, of science, invention, and eccentricity, here exhibited; yet, taken for all in all, ought they to have been expelled from or forbidden entrance into such a field of emulation? We venture to think not. There are drains for houses, lightning-conductors, ventilating windows, winter gardens in model, processes to preserve wood from damp, and warming, heating, cooling, and cooking mechanisms beyond enumeration. It may be assumed that all this falls within the limit of "hygiene and safety," but there is a question whether sufficient attention has been paid to the main point at Brussels. It was far more interesting to study the models of baths, designed by his Royal Highness the King's brother,—who is a kind of Prince Consort in these affairs for the north of Europe,—or even to diagram the "cottages containing reliefs for the half-drowned" upon the waters of the Baltic Archipelago. Still, there is a class at Brussels to which too much attention can hardly be directed. We have already pointed it out, in a general manner, twice, and are happy to perceive that, in three or four instances, the press of Antwerp and Brussels have observed and acknowledged our remarks, and especially with regard to the railway models exhibited. "With the London *Builder*," says the *Echo du Parlement*, "we agree that the essential points are,—safety, celerity, comfort (including cleanliness), good signals, good breaks, points, stations, and,"—but what more could our contemporary add? Well, the *Builder* will not be responsible for its translators, especially when they translate *campagna* as "cockney"; but it is obliged to them, nevertheless, when they acknowledge its good will, "exhibited towards all the new and old architecture, the old and new sanitary ideas, of Europe." It may be that no such apology was needed. Whether necessary or not, however, it tells of a history which has no precedent and may never have a successor.

Paving.—The tender of the Brunswick Rock Asphalt Paving Company has been accepted for paving the following streets for the Plumstead Board of Works, viz., Marischal-road, Douglas-road, Clarendon-road, Handen-road, and Len.am-road. The names of the roads previously paved are Leyland-road, Eastdown Park-road, St. Stephen's-road, St. Stephen's-terrace, Belmont-road, Granville-road, Lawn-terrace, Brunswick-place, Upwood-terrace, Burnt Ash-lane, and Carston Mews, making a total of fifteen streets.

FICTILE IVORIES AT SOUTH KENSINGTON.

THE fine collection of ivory carvings in the South Kensington Museum, the handbook to which by Mr. Maskell we noticed in an early number this year (p. 47, *ante*), has been gradually supplemented and rendered more complete, so far as the illustration of style is concerned, by a collection of what have been termed "fictile ivories," a rather misleading expression, which refers to casts taken from original ivory carvings with a substance, and a finish in regard to colour and surface, intended to approach as near as may be to the effect of the originals. It is an instance of the thoroughness with which the elucidation of the art-objects illustrated at South Kensington is carried out, that this one branch of fictile ivories, of which the majority* occupy wall-cases in one corner only of one gallery in the building, has been made the subject of a *catalogue raisonnée*, forming a large, thick, and handsomely got up volume,† in which almost every specimen number has a full description with critical comments appended to it, and about 150 pages in addition are devoted to a description of the original ivories existing in Continental museums and collections, the inspection of which the writer has considered "a necessary portion of his task" in compiling this catalogue.

If our readers wish to know what is the nature of the process of producing what are here called "fictile ivories," we can give it them shortly from Mr. Westwood's preface, where it is fully described, the author having made the moulds for a good many of the copies himself. A mixture of gutta-percha and wax (the latter added to render the "setting" of the substance less rapid) is placed in hot water till it assumes about the consistence of putty, then moulded into the shape of a flattened plate rather larger than the object of which a cast is required, and then pressed carefully on to the original carving so as to force the gutta-percha into all the deeper-cut parts of the ivory, which must first be washed over with cold water, or with soft soap applied with a camel-hair brush. When cold, the gutta-percha is lifted carefully from the ivory, and as the wax in the composition gives it a certain degree of elasticity, this may with proper care be done, even in the case of deeply-cut ivories, without any injury to the latter; at least, it is stated that such injury is "very rare indeed," and we may admit that in that case the slight risk to any individual specimen is compensated for, as far as public interests are concerned, by the advantage of the reproduction of the design for those who might never see the original. Whether, if we were the private possessors of a very rare and admirable ivory, we should altogether care to see it subjected to Mr. Westwood's process, is another question. Of course, with under-cut ivories the under-cut parts must be "guarded," and the under-cutting in the cast done afterwards. With what the "guarding" is done the author does not mention. The casts are made from the gutta-percha matrix thus obtained, in plaster of Paris of the finest quality, the casts being, when hard, dipped in a "warm fluid stearine" (*Anglicé*, melted tallow, we presume), to harden the surface, and give them a greater similarity to ivory. When a number of casts of one object are wished for, it has been found better to have an electrotype made from the gutta-percha matrix, so that each subsequent cast may be as fresh as the first one.

* We say "the majority," as the whole of the objects catalogued do not appear to be in this situation, and it is one of the few faults that can be found with the practical management of the Museum, that there is often not a sufficiently distinct localising of certain classes of objects, so that one may know precisely where to go for them. It seems to be the frequent practice to separate some of the most striking specimens of a particular art from the rest, and place them in some special position in the building, where they may attract the more general attention of casual visitors. The result of this is, that any one visiting such a collection with a special object misses some of the most important specimens referred to, and must trust to hitting upon them by chance; for it is rarely that any of the ordinary attendants can give information as to their locality. We have looked in vain, for instance, for the plaque of "Diana and her Nymphs," photographed on page 339 of the new catalogue. We have noticed the same irregularity in the disposition of articles in other departments; furniture, for instance. As the real value of the Kensington Museum is for study, and not for amusement, we think that all articles of the same type, and included in the same special catalogue, should be rigorously kept together; and if the catalogues each contained a note of the whereabouts of the particular articles described, it would be all the better, and sometimes save time.

† A descriptive Catalogue of the Fictile Ivories in the South Kensington Museum: with an Account of the Continental Collections of Classical and Med æval Ivories. By J. O. Westwood, M.A., President of the Oxford Architectural Society, &c. Chapman & Hall.

The casts produced by this method are, considered as casts, remarkably sharp, clear, and minute in detail, though of course it must be obvious that impressions produced in a material which is (purposely) semi-ductile even when hardened, and from which again a second electrotype mould is made, and in which undercutting has to be done by hand afterwards, can scarcely be relied on for the minutest accuracy, though they may succeed in giving the character and style of the original completely, except in regard to that expression of the tool, so to speak, which casting can never really reproduce. But when it is claimed for these casts that they are in appearance almost equal to, and liable to be mistaken for, the originals, we must respectfully decline to endorse the statement. The author of the catalogue declares that "when properly made and carefully coloured by hand from the originals, it is next to impossible to distinguish one of these casts from the original," and he declares that his own copy of a celebrated specimen in the British Museum, treated thus, took in Dr. Waagen, who would scarcely believe that the specimen was not an original ivory. We venture to think that there is a little exaggeration here. At all events, taking the specimens at South Kensington, how any one could pretend to say these could by any possibility be mistaken for ivory, or be even said to resemble ivory, we do not understand; nor how such a statement could be allowed to find place in an official catalogue. They have neither the colour, the sharpness, nor (of course) the surface lustre of ivory, and to examine them with this idea in the mind, that they are meant as imitations of ivory, is almost a shock to the senses. That is why we objected to the term "fictile ivories." They are as different from ivory as chalk from cheese, and no such claim ought to have been put forward for them. In other respects, there is no doubt that the collection is one of great historical and artistic interest as far as the nature and style of the specimens are concerned, and that in many respects it is an advantage to study reproductions which give as nearly as possible the actual sinkings and relief of the design, instead of the mere effect, as a photograph would. Only, do not let the public be deluded into a belief that they are studying what is, for art purposes, as good as the original.

The remarkable point in this fictile collection is the amount of Byzantine and Early Christian work which it represents, and of which the former class in particular includes work not only remarkably interesting historically, in regard to style and feeling, but remarkable for its artistic power and effectiveness, in spite of the technical defects of the period. This class of work forcibly illustrates what was observed in these columns in our notice of Mr. Maskell's "Handbook" before referred to, that the real and effective use of ivory in the carver's art is not in the production of statuettes, but in small reliefs and in work of what may be termed the cameo style. Ivory statuettes tend to look only like miniature copies of statues,—toys, in fact. But for small compositions in relief, in which figure subjects are combined with delicate ornamental detail, it is a perfect material. Its hard texture and durability allow of the minutest detail, and its surface, with almost a natural polish and a semitransparent character, is precisely suited to give expression to a class of work which is the link between sculpture and ornamental art; and we cannot but remark, in looking at the numerous casts of Byzantine examples of early centuries here (sixth and seventh chiefly), what a true instinct is exhibited in the flat style of carving employed,—flat, but, nevertheless, in tolerably deep relief. What we mean is that, while the interspaces between the figures are sufficiently sunk for a powerful effect, the figures themselves have rather a flat section, and always seem to leave as much as possible of the original flat surface of the ivory incorporated in the figure. This is far more in accordance with the nature of the material than the high relief of the pretty subjects, for instance, by Fiammingo, of children playing, which approach sculpture in their treatment. Ivory is more or less a laminated rather than a crystalline substance, not bearing very heavy usage in cutting, and capable, as one of its most marked characteristics, of a lustre of surface which shows itself to most advantage in flat treatment, and which, in fact, is apt, in more rounded relief, to produce false lights interfering with the effect of the modelling. The Byzantine work is, of course, naïve and childlike in regard to the treatment of the figure, but this is far less felt as a drawback in these small semi-ornamental productions than it would be in work assimilated more closely to sculpture proper; and the decorative effect of the whole, especially in regard to accessory details, is rather improved than otherwise by the slight stiffness and conventionality of style,—what we now regard as conventionality, though possibly not so intended originally. A very fine instance is the square plaque with a sunk panel ('55—27) of the Saviour in the act of benediction, with a cruciform nimbus forming a decorative background, and the long flowing hair beautifully treated. This is a piece of tenth-century work; but other much earlier specimens are admirable in their way. Among the Byzantine objects should be noticed the very curious "twelve small plaques" ('58—242) described in the catalogue as "portions of a large Byzantine casket made up of small plaques separated by bars, composed of small circles, containing elegant roses, and occasionally with side faces of a very negro character. The plaques contain representations of single classical figures, generally in energetic attitudes." The work is tenth or eleventh century, and the directness and force of action in the small figures is remarkable, as well as the decorative effect of the whole. The "Back of the Cover of the Psalter of Princess Melisenda," photographed page 73 of the catalogue, and of early twelfth-century date, is a fine piece of Byzantine work; the very elegant border ornament shows a singular mixture of Classic and Gothic feeling, a characteristic even more marked and peculiar in the foliage ornament in the upper panel of the book-cover from St. Gall, of the ninth century ('65—104, photographed page 120 in catalogue). It is curious to compare the beforementioned "Princess Melisenda" design, however, with the Russo-Greek saucer of the seventeenth century ('73—56, and page 99), in which, except for their better preservation, the figures seem absolutely of the same school, and scarcely show the slightest advance in freedom and power; a striking instance of the intensely conservative nature of the religious art of the Greek Church.

Among the earlier productions are included some which, though coming under the head of "Classic" in the catalogue, have really more affinity in style and treatment with the Byzantine than with what we are generally accustomed to call Classic. A typical specimen of what we mean is the beautiful "portion of leaf of a diptych" ('58—7), described as Roman of the sixth century, the original being in the Brera, Milan. This is part of a "consular diptych," representing what one might be disposed to call a very ecclesiastical-looking consul, and the quasi-Gothic impression is further carried out by the treatment of the drapery with a small diaper worked on it, in most delicate and minute detail. Among other specially suggestive specimens are some of those classed as "North Italian" work, which in another date and in a somewhat different manner represent the same kind of blending of Classic and Gothic feeling which we notice in some of the Byzantine work. The English work seems to us to be distinguished from the rest by a great want of style, an uncouthness quite different from the artistic naïveté of the Byzantine work.

The traces of architectural design in some of the examples are not without interest. In one of the earlier French specimens ('58—13), a book-cover, the spandrels above the figure-subjects are occupied with a pile of buildings of most uncouth and un-European shapes, reminding one more of Indian "Raths" than anything else. In the bas-relief of "Christ disputing with the Doctors," ('73—92), a piece of præ-Gothic German work of the tenth century, the temple is represented by a roof on columns and arches, the arch over the principal group being lengthened out, however, into a segmental one of hardly stable shape, to suit the proportions of the composition; the next arch to it is narrow and stilted in a manner which, in conjunction with the treatment of the roof, appears to be an attempt at perspective. The English ivories seem more true and realistic in their treatment of architectural adjuncts. In the small bas-relief ('58—228) representing the murder of Beckett, the piece of painted wall-arcading behind, with its crocketed label, is sufficiently made out to lead one to be pretty sure that it cannot be twelfth-century work; it is described as "twelfth or thirteenth century" in the catalogue. A curious piece of architectural scenery is shown in one of the plaques, numbered '58—291, the "Nativity" and "Presentation," which take place under straight pieces of tiled roof, supported on rather long thin columns, of which it is difficult to say whether they are more like reminiscences of the Classic column or anticipations of the Gothic shaft. The piece is called "Carlovingian, or late Anglo-Saxon"; to our thinking the architectural detail is against the latter idea, for the shafts resemble nothing in known Anglo-Saxon work, still less the foliated border. In the extraordinary representation of the Nativity ('73—112, photographed page 158), Mary and Joseph sit in the midst of an enclosure, the features of which are evidently taken from the Mediæval Feudal castle, with castellated walls and towers at the angles; this evidently represents the town of Bethlehem, as outside are the shepherds with their flock; angels of a remarkably childish type of conception appear in different parts of the design; in the midst of the enclosure stands the manger, half-like a cradle in shape, but with a kind of rack above, through which are poked the heads of two specimens of cattle whose bodies are not accounted for. In the sky is the star, looking rather like a rosette stuck on the surface of the background. This curious piece is German, and assigned to the eleventh or twelfth century. Among the early Christian productions is one representing the women at the sepulchre ('58—179, photographed page 44), in which the representation of the sepulchre presents a singular combination of architectural structures of totally different scale and style; the lower part of the structure, the sepulchre itself, being distinctly Roman architecture, with the conventional lion's head and ring on the centre of one of the doors which have been burst open; the capitals are of an Early Romanesque type, looking more Romanesque and less Roman in consequence of the obliteration or omission of minute detail in the foliation of the cap. But on the flat top of this tomb stands a circular building of jointed masonry in small stones, with circular-headed windows and pointed roof, and without a trace of Classic detail about it; it recals such a building as the Baptistery of Nocera, only without the aisle. Probably it has some symbolic meaning; but the combination of these two not only in one scene, but almost in one structure, is very curious and unusual. Skipping from ancient to comparatively modern work, we may just revert, in connexion with this architectural part of the subject, to the Russo-Byzantine tablet of the sixteenth century (photographed page 101), in which the characteristics of Russian ecclesiastical architecture are elaborately shown in the background, with the most happy disregard of perspective and perpendicular, and on the whole considerably more clumsy in execution than the Early Christian work previously mentioned.

Although a little too much has in one sense been claimed for the fictile ivories, they are well worth attention, very interesting and very instructive as to art history, and will certainly be rendered more so by the publication of this fall and admirably got-up, and, let us add (a very important point), thoroughly indexed catalogue. Whether these books would not have been more practically useful had they been in a smaller and more compact form may be a question. Few are likely to study the objects on the spot with so heavy a volume in the hand; but as a book of reference it is unexceptionable.

Dorset Natural History Society and Antiquarian Field Club.—This society lately visited Portesham and Abbotsbury. The route taken was through the village of Nottington. The first halt was made at Portesham. About half a mile from the church stands the cromlech or Druid's altar, and this proved a source of great interest. This cromlech is locally known as the "Hellstone," and has been restored as far as possible to its original condition by Mr. Manfield. This remnant of antiquity is composed of nine erect stones, which support a large oval stone, horizontally placed, at an elevation of about 6 ft. from the ground. This stone measures 10 ft. 6 in. by 6 ft., and is about 2 ft. in thickness. All are in a rough state except the under-part of the horizontal stone, which seems to have been rudely chiselled. The tradition connected with these stones is that which obtains in many other places—that the devil flung them from Portland whilst he was playing quoits. At Abbotsbury, St. Catherine's Chapel was visited. After the party had finished their researches dinner was provided at the Ship Hotel, the president of the Association, Mr. Mansel-Pleydell, being in the chair.

THE COLLEGE OF INDIAN ENGINEERS.

ENOUGH is known in this country of the Indian Empire to prevent cultivated men, who have never set foot in it, from attempting to judge its system of government according to any home standard or European method of comparison, for those who dive into history cannot find any parallel to the English domination. The Romans in Gaul, and afterwards in Britain, began their work amongst peoples, or rather tribes, possessed of rude forms of language and religion, and to whom the refined arts were unknown. The English go to India, not as colonists to found a new empire, but as conquerors to rule an old one. Their mission is to acquire the languages, respect the codes of morality, and utilise the traditions and inherited genius of the conquered. But, unfortunately, the interest which the majority who compose the Departments of India feel in the country is rather that of speculators in short leases than of investors in freehold property. Their sentiment of patriotism is expended in love, not of the country to which they have migrated, but of that which they have left. Their aspiration is to achieve just enough success to enable them to return at the earliest opportunity. An Indian civilian's ambition—which, to a stranger visiting him at the Residency of some tributary State, might well appear to be boundless—is often confined to a seat in Parliament at home. The commander of an army which holds in subjection 200 millions of people is not unwilling to exchange his splendid responsibility for the charge of a fortress on the Mediterranean; nor is it to the interest of the governors — however it might accrue to the advantage of the governed—to prolong individual service in India. Great as are the rewards of meritorious officers, they must necessarily be of short duration. It would not be desirable, even were it possible, to keep a really great man there, always at his work. Indeed, Cicero's advice to Cœlius to "cling to the city," and that "all employment abroad . . . is obscure and petty for those who have abilities to make them famous at Rome," is only too readily accepted by Englishmen, in spite of the national character for migration. A system, therefore, which favours a continual and ever-changing supply of steady, well-to-do mediocrity has been found in India to produce the most useful results. Such are obtained by the departmental system. Thereby persevering dulness is often made to serve the State as effectually as genius, even though brilliant, or culture, even of a high order. In principle it is, perhaps, exclusively Anglo-Saxon, and its force is acquired from the possibility of always applying to it the proverb, "While there is life there is hope." Nor is its worth unsupported by historical evidence. Louis XIV. was a far greater sovereign than any of his English contemporaries, but there is still a monarch on the throne of this country. In the reigns of Akbar and of Sháh-Jehán, better and grander buildings were erected in North-Western India than by Englishmen, of their time, in England. But at the present moment, to the descendants of the latter alone remains the power of enriching with works of architecture both England and India. That that power has been often signally misapplied in the latter country none will venture to deny. But to judge from public criticism and professional doctrine, it has not been successfully applied even in England since the sixteenth century. Yet the Government has introduced into India something of the order and discipline under which the trade corporations worked in England in the Middle Ages. As there were then grades of masons and carpenters in the one country, so there are now grades of engineers in the other. The Indian Department of Public Works, properly ordered, and having all its members properly instructed, ought to resemble a grand fraternity similar to those of mediæval Europe. Really, under the peculiar circumstances of English rule in the East, we see no reason why eventually the men from Coopers Hill should not do for India what the men from Cluny did for this island at an earlier epoch. It is merely a question of time, of right direction, and of mutual patience.

The original English settlers in India—and they were worthy to be called settlers then—although they went ostensibly for purposes of trade, were compelled at times, in the interest of legitimate business, to transform their counting-houses into guard-rooms, and exchange a load of samples for a knapsack. Their agents and assistants were less bagmen than sporting and military characters. Fresh conquests added territory, which had to be guarded by more soldiers. The object of fighting being to overcome adversaries, and the object of attacking an enemy's position being to take it, our soldiers, whether amateur or professional, were so far practical as to sacrifice everything to the attainment of their end. They did not hesitate to occupy Benáres lest in so doing they should injure a Monkey Temple of either Dravidian, Chalukyan, or any other division of Hindú peculiarity or style. The military engineer who converted the fragment of a Búddhist lát into a roller might have shocked Plato, but he would have been commended by Bacon. The arts of peace—when it appeared for a time—had necessarily to be done by that portion of the army which devoted itself to scientific and technical subjects. Men who had surveyed the site of an encampment were called upon to plan a barrack and a hospital, and to superintend the execution of both. As the tide of conquest spread, until at length it covered the greater part of the peninsula, to these soldiers were delegated tasks in which, under similar circumstances, probably the most accomplished men in Europe would also have failed. But some of the earlier buildings erected by these soldiers were not unworthy examples of architecture, as it was then understood and practised in Europe. A Frenchman—General Martin—who died in 1800, founded and built at Lucknow a truly excellent edifice in brick and stucco, quite as good as the majority of châteaux which sprang up in France towards the close of the last century. Indeed, the Martinière, the ruins of Dilkúsha, and of other mansions in and around Lucknow, betray extraordinary talent on the part of the amateurs who built them, and who, if they did obtain designs from Europe, were certainly compelled to carry them out unaided and in their own fashion. Colleges, churches, governors' houses, all sorts of public buildings, fell within the province of the over-weighted military engineer. At last, after people at home had begun to discover their own shortcomings in the matter of architecture, the English in India awoke to the realisation of a similarly unpleasant fact. Meantime the natives had learned enough of the French and English adaptations of Italian architecture to caricature both at Tanjore, Trichinopoly, and afterwards at Lucknow. In Europe railways had made the grand tour. Similar means of communication were planned for the great Indian highways. But not before the Mutiny had been suppressed was the English power consolidated by the introduction of the locomotive. The return of order and tranquillity was the sequel for laying down iron rails, and with the utmost possible speed. Engineers were urged to go to India. Anybody who knew anything about bricks and mortar, who had traced plans in an architect's office, or helped to make a builder's estimate,—and who managed to get as far as Calcutta or Bombay,—was snatched up for the work. As the different lines approached completion many of these European assistants sought other employment, and sometimes even were invited to enter the Department of Public Works. Ten years ago, of the 600 officers, both military and civil, who helped to compose it, perhaps some of the best—and undoubtedly also some of the worst—had come from the railway works; and at the present hour many of them hold important posts in the Department, which now numbers more than 1,200 persons.

It is not too much to assert that, at one time, any European who possessed a superficial acquaintance with buildings of the most primitive kind was deemed, if not a welcome, at least a necessary, addition to the Indian Department of Public Works. Nor was the attention of the Government either in India or at home seriously attracted to the subject until certain buildings which had been erected in various parts of the country were condemned by special commissioners, sometimes as faulty structures, sometimes as totally unfit for habitation. Then every inducement was placed in the way of competent Englishmen to take engineering service in India; but with little if any success. Men who were worth anything at all would not consent to act under the thumb of military engineers. Although alterations were made in the discipline of the Department, rules and arrangements modified, opportunities of leave increased, and the position of civil engineers generally improved, it was still next to impossible to obtain useful candidates. Although every inducement was offered to educated young men to present themselves for examination in England, hardly five out of fifty annually invited were deemed eligible. At last a happy thought seized upon the Government of the day. They were training boys for the navy with increasing success, why not prepare men for an examination which but a fraction of the few who presented themselves were able to pass? A scheme for founding an engineering college was set on foot. A distinguished officer of the Bengal Engineers had just arrived in England. He had held a high appointment for several years in the Department at Calcutta, and had written a book on "Indian Polity." No better president of such a college could be found than Colonel George Chesney. Of course, it was inevitable that both the college itself and the suggested scheme of education should find plausible opponents. As soon as the Government had taken effectual steps to ensure suitable recruits for the Indian Engineering Service, instead of a batch of unsuitable applicants, it was felt that a species of monopoly was being created. The councils of King's College and University College protested against the scheme as mischievous and mistaken. They claimed the right of preparing young civil engineers for India, some of whom could not pass the necessary examination, as experience had too often shown; while others, who could perhaps have passed, would not go to India. An agitation took place in the press, and then in Parliament, of which it is needless now to treat. Suffice it that, at the present moment, the college is in full working order. The Indian Department of Public Works is being recruited with young men of good social position, and some technical education and special training. Far from creating a new monopoly, it allays the inconveniences of a long-standing abuse; and our satisfaction at the results attained at Coopers Hill is only tinged with a little regret that the first co-operative step in professional education should have been taken, not by architects, but by engineers, and under Government influence withal.

The code of honour to which the military man, perhaps sometimes with a little affectation, subscribes, finds similar acknowledgment amongst the covenanted members of the other services. *Esprit-de-corps* would have prevented any public appreciation of administrative abuse; and it is probably due to uncovenanted civil engineers, and to outsiders temporarily classed in it, that we in England have been enabled to learn what little we know about the Indian Department of Public Works. A member of it is a portion of a vast machine which must work according to set rules, any one part of it attempting to do more or less than it is required to do causing a disturbance of the machinery. To try to surpass a colleague is to infringe the code, if not of honour, at least of good fellowship. The responsibility of ill-doing, technically considered, and the credit of a good work, is no one member's prerogative. Discipline alone suffices to prevent the utterance of complaint or expression of regret at being ordered to quit, while still unfinished, a bridge or a building with which any engineer may have sought to identify himself. Yet, if such a state of things appear strange to the freer and more commercial member of a profession, there is still the mediæval precedent of Western Europe. The authorship of churches, cathedrals, and public buildings erected in this country during the Middle Ages is merged in a mass of workmen of many grades, superintended by authority which has left few individual records of existence. The works, however, these apparently-irresponsible corporations executed are now models upon which the responsible architect of to-day bases his projects and designs; and the modern custom is to put an architect, often better educated than all those he superintends, at the head, and render him responsible for the proper execution of the whole. This system, although it is often successful in France, and sometimes in England, is utterly impracticable in British India. There, to speak roundly, the officer of Public Works must be his own architect for the design; his own builder for the execution of it; his own engineer to calculate the weight and resistance of materials; and his own surveyor to measure and value them. He has no libraries in which to study, no authorities to consult, no European precedents of any value to apply. He is generally next to alone in a crowd of all classes of natives; and often after he has spent time and labour over the pending solution of some local difficulty, he is ordered to start on another job or errand, and transferred to a station 100, 500, or 1,000 miles away. That is the English and strictly constitutional system of providing architecture and architects (engineer-

ing and engineers, if you will) for all parts of India; and it is not unlike, as we have already repeated, the mediæval method. But in the Middle Ages workmen from the highest to the lowest, were in the right groove, and progressed in it. When the Indian engineer gets into an equally right one, he may similarly progress in it; and that he has not yet done so shall not prevent us from believing his arrival therein to be both possible and probable.

We have supported, from the beginning, the Royal Indian Engineering College, because we know only too well the difficulties and perplexities which now attend young men in their early pursuit of knowledge, be it professional, mercantile, or technical. Not a hundred years ago, in order to learn the mysteries of a profession, of commerce, or of a trade, a young man was apprenticed for a term of seven years to some citizen of reputation and experience. He was admitted a member of his master's household, and his parents or guardians paid for his board and education. He grew up to feel an interest in his master's affairs, and perhaps ultimately became a partner in the business. But, nowadays, the world lives so fast and thrives so quickly, that men can hardly afford time to be apprenticed. A little "public school," much boating and cricketing, two or at most three years of artiôled clerkship, and then, hey presto! the professional man emerges complete! and ready at the advent of one client to call himself a practitioner. That is the case in England; it was doubly the case in India, where, after a short "coached" examination at home, or a little experience as a subordinate on an Indian railway, men were forced into practice as architects of public works. We have never hesitated to record the accumulation of disaster which followed, and now we hasten to accept proofs of a change for the better.

The college at Coopers Hill, near Staines, was established under order of the Secretary of State for India in view to the special education of civil engineers exclusively for service in India. Admission to the college is obtained by competitive examination; and that for the present year is concluded. All British-born subjects of sound constitution, and free from any serious physical defects, are admissible. They must not, however, be less than seventeen nor more than twenty years of age, in July of the year in which their preliminary examination takes place; and this is held under the orders of the Civil Service Commissioners. The required number of candidates is fifty annually. Such of those who prefer to pursue their studies privately, elsewhere than at the college, are permitted to do so. They have merely to present themselves, three years after the first examination, to undergo the final test. But if the student prefer to enter the college, and follow the course of education extending over three years, he has to pay an annual charge of 150*l.*,—in all 450*l.* Should his parents represent their inability to defray the whole of this charge, payment of a part per annum may be deferred, and effected by deductions from the past student's salary during the first three years after his admission to the Government service. Under this arrangement the total charge for board, lodging, and instruction may be reduced to 90*l.* per annum, or 270*l.* for the entire course. Of the nine terms into which the college course is divided, one at least must be passed by the student under a civil or a mechanical engineer. The fees to such engineers are paid by the Secretary of State, and an allowance of 5*s.* a day is made to the student for lodging money and in lieu of "commons" while absent from the college during term time. Those fifty candidates selected at the preliminary examination,—both those who enter the college and those who study elsewhere,—who succeed, three years after, in passing the final test of qualification are immediately appointed to the Indian Department of Public Works, and given a free passage in the most agreeable of all steamers,—those of the P. and O. Company. Nine-tenths of the fifty are made Assistant Engineers, 2nd grade, and receive a salary of 420*l.* per annum. The remaining one-tenth are made Assistant Engineers, 3rd grade, with a salary of 300*l.* per annum.

At the college the students are distributed in sections, containing about fifteen each, under the personal charge of a resident instructor or professor selected as tutor by the president. Each student occupies a separate room, which is furnished, fuel, light, and attendance being provided, he having his bed-linen and towels to provide. His meals are taken in "Hall," and he has to pay extra for wine and beer. There is a chapel attached to the college, together with a chaplain. Each student has to go through a course of exercise in the gymnasium, and also of military duties; and to wear an academical dress.

The subjects of study at the college are, mathematics, with the mechanics of engineering; the theory and practice of construction; elementary principles of architectural design; surveying; mechanical drawing and descriptive geometry; chemistry, physics, and geology; Hindústáni and the history and geography of India; and accounts. While these are "obligatory," there are others which are "optional," but which appear to be simply an extension of the former. If we have any observation to make upon the subdivision of study, it is with regard to the relative computation seemingly attached to each by the number of marks allotted. Thus, while "descriptive engineering" is valued at forty marks, and "geometrical drawing and estimating" at forty marks, so comprehensive a subject as "architecture" is limited to eight marks. It is, however, easy to perceive that "descriptive engineering" comprises little but what in the last century would have come under the charge of architects, and a great deal which still remains, in Europe at least, a part of their special business.

But if we are willing to admit the excellence of the college course of study, it is impossible not to feel that the preliminary examination presided over by the Civil Service Commission is redolent of coaching, cramming, and every unnatural appliance to force frail humanity in that part of it which is worth very little indeed until after long and gradual development. That examination for this year embraced twelve items, the three first of which were compulsory. These items were as follow:—

1. English (composition, history, and literature).
2. Mathematics (pure and mixed).
3. Latin (translation from and into).
4. Greek (ditto).
5. French (translation from and into and dictation).
6. German (ditto).
7. Inorganic chemistry.
8. Heat and light.
9. Electricity and magnetism.
10. Geology and physical geography.
11. Mechanical drawing of geometrical figures, plane and solid, use and construction of scales, perspective.
12. Freehand (figure and landscape) drawing.

Although we are unable to give any of the particular questions of this year's preliminary examination, that of last year is described in the College Calendar of 1875-6, and it seems quite as formidable in detail as might be supposed from a general glance at the items of this year. It is not improbable that many excellent engineers and architects, of great practical experience, would have been ignominiously "plucked" had they attempted, without long preparation, to answer the prescribed questions, to translate and re-translate, to compose and indite, as the candidates of last year appear to have done with not less of confidence than success! Bacon's anecdote of Themistocles, the Athenian, who desired at a feast to touch a lute, said,—"He could not fiddle, but he could make a small town a great city," might happily be submitted with variations by these unfortunate candidates to their *dilettanti* task-masters. That kind of "fiddling" which succeeds by chance at a competitive examination, but which shows in the player neither sterling qualities nor special talent, is deemed highly valuable by the Civil Service Commissioners, to whom an essay by a young man, of seventeen years of age, on,—"Was Hamlet intended by Shakspeare to be really mad," probably offers an infinite deal of amusement. We may be pardoned, however, for believing that the most brilliant, refined, and varied hypotheses thereon can afford but a round-about test of qualification for the study of bricks and mortar. The power of rendering long passages from Cicero, Tacitus, Horace, Ovid, and Statius into pure English, or of translating one of Cowper's poems into hexameters, is an eminent acquisition to the wealthy scholar or a well-to-do bookworm. It is anything but indispensable to an engineer-student, although we fully admit the educational value of Latin; and for a Competition-wallah to perpetrate a classical quotation, under a punkah in Calcutta, is not likely to be received with complacency by the ladies, even though it escape the sneers of the men. These embryo-builders in clay and chunam are also invited to translate quotations from Homer, Thucydides, and Æschines, or, as an agreeable alternative, to render a bit of Shakspeare into Greek iambics. It would be infinitely better to ask them for a readable translation of a fable in Persian, Hindústáni, or Sanskrit. Such a form of preliminary examination as that which the Civil Service Commissioners impose upon candidates for mere studentry in engineering, is a remnant of last-century customs. It is absolutely pedantic at a time when no classical author is untranslated; and when the translation is lying open in libraries both public and private. Although Tom Jones whispered soft hexameters into his Sophia's ear, and Partridge flung scraps of Latin at his master, the engineer at his work in India need not make the forcible English he often talks to his subordinates more than strictly grammatical,—at least, for many years to come.

Happily the study of the Classics is not pursued at the college, or, to be more correct, it is not prescribed in the college course of instruction. But the Marquis of Salisbury, at the recent distribution of prizes at Coopers Hill, made a pointed allusion to one or perhaps two branches of the education acquired there by the students. After attempting to get just a chip of criticism out of the rose-coloured reports delivered by outside examiners, he hinted that, although Búddhist and Hindú monuments are excellent things to study at the proper time and when the mind is sufficiently formed to understand them, the many modes of combining materials artistically, of planning buildings and representing the same upon paper—besides correctly estimating the cost thereof—are more immediately important for the student to practise, if not master. That Indian engineers should understand and properly appreciate all types of Indian architecture is most desirable; but a few weeks' study of them, filched from three years devoted to an infinity of other subjects, can only serve to increase the confusion which must at times perplex the mind of even the most precocious aspirant.

The magnificent position of the college of Indian engineers is perhaps not the least of the advantages offered to students able and willing to accept them. Celebrated by Denham, the spot was afterwards made doubly famous by Pope, in his "Windsor Forest," in which he implores the "Sacred Nine" to bear him to "where ye muses sport on Cooper's Hill"; and adds the unpremeditated although prophetic puff:—

"On Cooper's Hill eternal wreaths shall grow,
While lasts the mountain, or while Thames shall flow."

Certainly no more charming retreat can be found than among the thick foliage in which the college is partly hidden—with Windsor rising at a short distance, and Runnymede and the river beneath. Perhaps, however, the building itself is a little incongruous. Originally a villa in the occupation of Mr. Albert Grant, who sold it to the Government, it was enlarged and transformed soon after the purchase. A plan and description of the college in its present state was published in the *Builder* a little more than five years ago*; and the architect who carried out the alterations is Sir Digby Wyatt. We can only add with regard to them that Mr. Grant's conservatory is now a "Theatre" in which lectures are delivered, speeches made, and prizes distributed; and we risk no contradiction in asserting that it is not fitted for the purpose to which it has been roughly adapted.

THE EXHIBITION AT WREXHAM.

EIGHT years ago, an Exhibition of Art and Archæology was opened at the little town of Ruthin, in Denbighshire, North Wales, with a success that surprised its promoters. Bearing this in memory, the friends of such displays have long contemplated a second display of the kind, within the limits of the Principality; but only six months have elapsed since the idea took a formal shape, when it was proposed that not North Wales only, but the border counties,—Lancashire, Cheshire, and Shropshire,—should be included also. The treasures of art accumulated in this wealthy quarter of the kingdom were familiar to the world; but a desire was felt that the public at large should be enabled to appreciate them, so far as it was possible in so comparatively isolated a town as Wrexham. Not but that "ancient Wrexham" possesses an

* See vol. xxix. p. 606.

interest of its own with whatever is left of antiquity in the historical church of St. Giles, a group of Roman relics, Judge Jeffreys's famous mansion, and examples of the Inigo Jones style in domestic architecture. The local sculptures of Roubilliac, moreover, once enjoyed a far-spread reputation, but no more than a few exceptional tourists have been known, of late, to turn from their beaten route to visit this commercial Denbigh town. It has, however, suddenly achieved a new reputation as containing one of the finest provincial art exhibitions ever brought together. When it is said that nearly 1,300 pictures have been selected, from upwards of 2,000 which were offered; that every available inch in an area exceeding 10,000 square feet has been appropriately occupied; and that the choicest works from the richest galleries in the four counties have been lent, without the slightest apprehension as to their safety, the suggestion is at once implied of a display in all respects remarkable. But the Exhibition is not by any means restricted to illustrations of painting or sculpture,—the latter, indeed, has been, perhaps, unduly subordinated to the exigencies of space; for, after the walls had been covered with canvasses and drawings by the Old Masters,—German, Italian, Spanish, Dutch, Belgian, and French,—besides a noble array of the English school; and a special cabinet had been dedicated to the genius of Richard Wilson, the distinguished Welsh artist, in whom his countrymen feel a legitimate pride, and after a separate allotment of accommodation had been made,—a little reluctantly, it would almost appear, of modern work, in addition to room for water-colours and etchings,—only one object of the projectors was fulfilled. In the original plan it was proposed, in emulation of the Leeds precedent, to arrange a special gallery of portraits representing the "Welsh Worthies"; but, if this has been done, they are not obtrusively conspicuous, though many are, no doubt, in miniature. There finally remained, in this department, to collect views, painted or engraved, of those old architectural structures and lordly castles in which, as is said by Mr. Chaffers, who has had charge of the entire scheme from the beginning, Wales abounds. These, of course, were the leading classes in the Exhibition, and they are, naturally, the most prominent, filling the largest area, and contributed to, it may be said, from every important collection in North Wales and its border counties. Criticism upon the pictures themselves would be superfluous, because they possess a fame as wide as the world itself; and it is rather late in the day to pass judgment upon Titian, Cuyp, Claude Lorraine, Parmegiano, Rubens, Vandyck, Hogarth, Van Ostade, Jan Steen, Gainsborough, Greuze, Reynolds, or even Turner himself. But a distinct merit of the Exhibition is that the several transitions, nationalities, and schools of art in Europe are clearly marked, both in historical sequence and as they show forth the characteristics of different styles; and here may be perceived the educational influence aimed at,—an influence generally exaggerated, and often marred by errors, if not audacities of opinion, yet one which, it may be conceded, does really operate. At all events, some knowledge upon the subject must be disseminated; and it is a mistake to assume that it concerns the working classes alone. It is not so long since, for a private individual, not moving in particular circles, it might be an effort of years to get a glimpse of the Grosvenor or Stafford, the Chatsworth or Alton-Towers collections, whereas now, by degrees, the pick of them has been publicly exhibited, at one time or another, and art-education has become, if a somewhat overdone, at least a practical topic of the day, and the contents of our royal palaces have been placed freely before the eyes of the student. It has been a principle at Wrexham, and one which, upon the whole, has been consistently followed, to admit no inferior work in any class; and, considering who the owners of the pictures, as a rule, were, their value could scarcely be doubtful. From this, as from every other class, all mere ingenuities and trivialities have been rigorously excluded; and, considering the extent and variety of the Exhibition, nothing more flattering could be said in its favour.

The Exhibition buildings are represented by a façade, consisting of two spacious houses recently erected in Hope-street, with a decorated arcade, adorned by two splendid gates belonging to the Duke of Westminster, who has contributed, indeed, to all the richest of the classes. This is gay with sculpture, shrubs, and flowers, and opens, along one side, upon a succession of refreshment-rooms, originally designed to be 100 ft. in length; but, in a few details, the first outlines have been varied, and in many they are not sufficiently complete to be altogether distinct. For instance, a glass and corrugated iron corridor, intended for a special display of a national type, is not yet finished; but, as usual, the choice lay between postponing the opening ceremony, which took place last Saturday, and allowing it to take place before the workmen had left. Referring to the corridor of approach, the official description says:—"This leads into a grand central hall and an art gallery, 150 ft. by 70 ft., fireproof, being, in fact, a saloon of zinc plates, with wooden supports and rafters, lighted from the roof,"—a doubtful security, it may appear to some. "The industrial annexes are quite distinct, and the whole is isolated from any surrounding tenements; hydrants are placed in the angles, and firemen are constantly in attendance." There is the usual arrangement of dais, orchestra, accessory rooms, offices, and so forth, and the decorations are creditable; but, of course, in so central a position, it was impossible for the structure to expand far in any direction, and it was unlikely, for many reasons, that such a building should be favourable to the performance of music,—a matter, however, of no great importance, since its main purpose is the illustration of archæology and art,—ornamental, plastic, and pictorial. The ornamental and antiquarian classes, according to the programme sketched by Mr. Chaffers, and to which considerable importance is deservedly attached, are arranged or distributed, so far as was possible,—they are often, of course, composite,—into material, and distinguished by epochs, illustrating the great periods,—as Grecian, Roman, Celtic, Anglo-Saxon, Norman, Mediæval, and Renaissance. Wrexham, as was its due, takes the lead with Roman, British, or Saxon work discovered by antiquaries in its own vicinity, and the enumeration then runs through a rich and long succession of cabinets:—Ancient glass specimens, and some not a little interesting and rare; enamels, including Mr. Boyd Baker's superb collection, said to be unique, and to two of which the value of 1,000*l.* is attributed. Gold and silver plate, much of which, representing the racing triumphs of the Duke of Westminster's stud, is rather more gorgeous than artistic,—the Pelican Cup from Hawarden; an elaborate abundance of brass, bronze, iron, and other metal-work; the arms and armour invariably conspicuous in the halls and castles of North Wales and the Welsh border; numerous curiosities of bijouterie, some of which are unquestionably foreign manufacture; clocks and watches, one of the latter that ticked in the fob of our first King Charles; engraved gems, which, notwithstanding the ease with which they may be lost, or "conveyed," have been liberally deposited in the glazed coffers,—so to term them,—of the Exhibition; and coins and medals. Some of these might give a hint, perhaps, to the numismatists of our national Museum. The carvings in wood and ivory are not, for the most part, remarkable; but in pottery and porcelain there are fine specimens. The textile manufacturers are present, with embroidery and lace, perfect of quality, if not in large profusion, and, with reference to the latter, it may almost be said that there has been a revival of recent years. Next are the cabinets of books and bookbinding, among which we are surprised not to find the works composed by Daffydd Benfras, or David with the Thick Head, since he was such a favourite at the Eistedfodd of last year. You pass on, among illuminated manuscripts, to municipal insignia, not a few of which are distinguished by a genuine historical interest; thence to musical instruments, from amid which the harp was certain not to be absent, in many a form, dating from many an age; and thence into a crowd of miscellanea, where less discrimination would seem to have been applied than in some other parts of the Exhibition. In contrast, the Oriental Museum was intended to contain "the choicest examples of Arabic, Persian, Indian, Chinese, and Japanese manufactures, as models of design and workmanship," as well as the antique art-works of Japan; but it will be evident that a close examination would be required to test their merits. Besides, the principal purpose of the scheme was, even archæology apart, to create a magnificent Fine Art Exhibition for North Wales, and this has been done, well and amply. The Wrexham galleries, beyond all question, are the richest and the finest ever opened within the limits of the Principality, and ought, whatever their direct educational value to "the working-classes," to promote a taste for the higher refinements of life, even among those by whom they cannot be otherwise than very imperfectly comprehended. Possibly, a more practical utility belongs to the decorative examples, as applied to manufactures and manual industry of other kinds, in which the two elements meet; but the pictures are, for the nonce, the real treasures of Wrexham, and they will constitute the true attraction and charm of its three months' Exhibition.

LONDON LABOURERS AND THEIR DWELLINGS.

IT has sometimes been said that none know so little of a town or locality as those who live in it, and who have done so all their lives long; and, without doubt, there is a great deal of truth in the saying, severe as it seems. That it is so in great London city is quite certain; for are there not thousands upon thousands of worthy people in it who have never seen, and hardly heard of, one-half of it? We could name streets and by-ways of renown, too, some of them which we are sure not one person out of ten has ever heard of, much less seen. This may seem somewhat strange, considering the fame of the vast city, and the place it occupies in the world's eye, and the historic memories which have gathered round and about it. But so it is. But more than this: if the very existence of so much of mighty London be an unknown quantity to so many living in it, then yet still more so in very many cases are the changes, and *pullings down* and buildings up, and neglects in so many localities unnoticed, and, as it would seem, all but unknown, even to those who live in all but sight of them! This is certainly strange enough.

We have been led to these reflections by the looking somewhat closely, and at no small inconvenience sometimes, at a phase of things which seems to have attracted but very little if any attention, conspicuous and noteworthy as it is. We allude to the fact of the perpetual occurrence, every here and there,—though house accommodation is so scant and costly,—in the outlying districts of London, and sometimes in the very heart of it, of large *blank spaces* and of waste ground, filled only with broken bricks, mortar-dust, and building *débris*, and with grass and weeds here and there growing out of it all. A map of London dotted over with indications of these neglected and unused spots would present, as we think, a somewhat strange aspect. These waste spots are not few in number, as many might suppose; but are perpetually to be come across, if you but turn a little out of the well-beaten and familiar highways. What are they, and why are they? They are to a considerable extent the *sites* of what are termed "rookeries"; that is, of groups or streets of houses and human tenements which have been by the powers that then were, or that be, *condemned* as no longer fit to house human beings. We have known some of these before pulling down, as we now know the sites on which they stood. What is a "rookery"—a word of ill omen, and telling of poverty, disease, and want? It means, simply, a crowd of dwellings more or less aged, ill-arranged, out of repair, and broken down, and, we are bound to add, not a little picturesque sometimes,—the abodes commonly of what are termed "labourers." The streets, and courts, and passages of a "rookery" are narrow, and, in some localities we could name, were the actual remains of Old London itself, and from a time long before the modern city was dreamed of. It must be confessed, indeed, that, apart from their "sanitary" state, to speak generally, such places are out of all harmony with our modern and improved ways, and seem to be adapted and fitted only for the special artistic proclivities of the Dorés, and Prouts, and Turners of the artistic and painting world; for what, it may be asked in passing, can or could such do with the quite new and evenly straight streets of neat houses, which are so fast making up what we may well term *new* London? With or without the "imaginative faculty," what can the poor painter do in a new and "improved" street? But to the rookeries. They are, as we have said, scattered about in all directions,—north, south, east, and west; Whitechapel, Drury-lane, Paddington, Bankside, Lambeth, the Borough, Shoreditch, the Tower round and about, and all the way from London Bridge to the very first glimpse you get of the Royal Observatory, Greenwich, as you may go to it through the narrow and darkened and tortuous ways by the

river-side, with occasional sight of river-side pictures seen down narrow openings. Here and everywhere are to be seen rookeries present, and sites of rookeries past, in plenty, and men, and women and children enough to fill them, and to more than fill them. Travellers tell us of spots on this earth's surface whereon it is at all times dangerous and perilous to dwell, no man knowing when or precisely where some great catastrophe may occur by earthquake or inundation. And so it is with a rookery, no one knowing when or precisely from what quarter the powers that be may find out its evil condition, and devote it to instant demolition and destruction. Away everything goes, people and houses, and the blank and bare ground with its brick and mortar *débris* is alone left to tell of its whereabouts. House accommodation for the growing thousands and thousands of London is yet a problem waiting solution, and it has well been said that anything tending to throw light on the difficult problems of pulling down and building up cannot well come amiss. In the first place it may be noted that it is not the simple question of more and more houses for the "poor," or the working man, or the labouring classes, that presents itself. What is good for one locality and order of working men is not so for another place and phase of labour. We could name spots wherein are and have been large spaces of vacant ground, the sites of rookeries, whereon such buildings as the Peabody Buildings would be all but useless, such accommodation, rent, and surroundings being all far too high and unfitted for those who must needs want them. So rough and foul,—there is no other word,—is the *labour* that the house must needs feel the influence of it. We are here referring more especially to the lowest class of "labourers," as they are termed. The skilled mechanic, though his work may be rough, is in a quite different position from such, and he may and does at times aspire to the Peabody standard of house accommodation; but even he, though he be under even school board influences, must not expect too much even here, for a Peabody building is not very well calculated to rouse fine art or "picturesque" ambitions. Truth to say,—and why should it not be said?—some of the house-building we have seen pulled down so mercilessly, though not before change was required, needed in reality only thorough repairing, rearranging, and detailed looking to. It has been as good as need be, and must have cost some brainwork in the building. We could name some such, specially, and have listened to the regrets of their inmates, who have sometimes asked, significantly, where a better was to be found for "such as us"? What is therefore to be done with these waste spaces, to be now found, as we have noted, all but everywhere, of all dimensions, from that which would hold a single house, to spaces well nigh big enough to receive a small town? It would almost need a specification to describe in detail the kind of dwelling which such labouring men and women, and children stand in need of, and it is only by a careful collocation of items, from now here and now there, that a true idea of it can well be got at. It must not be too good a thing, and yet is a something needed which but very few indeed would for a moment suppose those so rough and uneducated,—for such are not educated,—would for a moment care about, or that would even occur to them in any way. Not a little injustice is done, it may be noted in passing, and it throws some light on this subject, to the rough and untutored sense, and even "taste," of common humanity. It is all but universally supposed that "education" is to do everything, but not so; it does not and cannot bestow original or inherent, or individualised power, nor can it even implant a feeling or taste which does not exist. In treating in anything like useful detail such a subject as this, it is a little painful to think of the petty items and details that must, to do any sort of good, be noted items,—which you would suppose to be too familiar to need even to be glanced at. It is really surprising, and certainly painful, to glance sometimes at a condemned house standing in an out-of-the-way neighbourhood, and then to contrast it with another in a more favoured spot, and to note how little, if any, difference there is between the two. We could easily name many and many such; the pulled-down house has been better in all ways than the one in another more unnoticed locality left standing, and, what is more, the details of it, as cupboards, were far more to the purpose, and practically useful to such as are sure to occupy such tenements. The "ironmongery" again generally may be glanced at and examined by those who have patience for such matters. We here refer to simple utilities. We dare but hint at such necessities. What can be said of the art aspect of the question? He must be courageous indeed who will venture on it. Yet contrast, but for a moment, in the mind's eye, the aspect of a "Middle Age" street with one in suburban London, modern London, and balance the loss and gain. It is yet a question, we must needs suppose, in spite of all that has been written and said, as to how far "Art," even in common house-building, is a necessity. That poor people in poor neighbourhoods can exist without it is quite certain; but most surely they would be better with it, unconscious though they might be of the effect it had on them. But the first care must be healthfulness, fitness, and comfort.

We cannot help thinking, after some attentive study of the subject, that a part of the difficulty of providing increased and improved house accommodation for those who most need it in this modern Babylon, would be by the adding to, re-arrangement, and thorough repair of houses in poor streets, as they now exist. It is a matter of detail, and each house must be taken singly, and gone through from top to kitchen. Repairs simply,—plain and simple repair,—and in detail, no fine or smart work being thought of. It is of no use lamenting over what is past, however much we may regret it; but if the process of simple repair, and making sound house by house, had but been at least tried, in place of pulling down, there might have been less of trouble and difficulty than there now is, in finding house-room in localities where it is so much needed, and where the population is so dense and thick. Even as things now are, you must needs come every now and then to an uninhabited, and shut up, and condemned house, as black and grim as may be, in a poor and neglected street. You think it must needs be "in Chancery," but it is simply under the sentence of the sanitary doctor and "Board." You get sight of it, after some trouble, and of the houses right and left of it, and find that a thorough and honest repair only is needed to make it fit for the rough, and laborious, and unlearned beings who will be but too glad to take possession of it room by room. Infinite good, indeed, might be done by some benevolent man, and here and there has been done, say in one of the narrow streets out of Drury-lane, taking in hand but a single house, by way of example, and putting it all right, and giving to the tenants or lodgers in it the benefit of what was done. A clean water-cistern, whole windows, hinged doors, mended floors, a tight drain, a tight roof, a proper "convenience,"—so much, and yet so little to look at!

Too often, however, they are so blocked in, so entirely without the chance of pure air, that nothing can be done, and down they must come, to add another to the blank spaces still waiting to receive a re-arranged dwelling.

ON SOME OF THE LEGAL ASPECTS OF CONTRACTORS' CONTRACTS.

THE line of Pope that "a little learning is a dangerous thing" has become almost a proverb in the English language. That this is the case says little for the common sense of the world at large, for a little learning only becomes dangerous when its possessor imagines that he is fully endowed with knowledge. If a little learning has the effect of producing caution, and an appreciation of the width of every subject under the sun, it turns from a danger to a safeguard. Thus, if laymen who succeed in obtaining a knowledge of some of the principles of law, or some of the most usual facts to which they are applied, deem that they know sufficient to guide them aright in all legal matters, they will in all probability finally find themselves some day in an evil plight. If, on the other hand, it renders them cautious and careful, this knowledge may prove of very considerable service. It is in this light that we are desirous that the observations which follow should be regarded. The contracts of contractors, whether builders, or what are usually called "contractors" simply, are, of course, governed by rules more or less applicable to all other species of contracts. But the number of disputes which arise out of these agreements is not small, and we shall therefore proceed to give a few of the chief and most useful rules by which they are governed. Examples of these rules can easily be found in every number of the law reports. Let us presume that a contract has been made between a builder and a person desirous of having a house erected. The contract having been signed, is given into the custody of the future owner of the future house, or into that of his architect. It makes no difference into which of these two persons' charge the document is given, for it is almost invariably the case that the architect is regarded by the law as the agent of the owner. Thus it may in passing be well to put some little stress upon this point, because it may lay an architect open to lawsuits which he never dreamt of incurring. But the owner or his agent alters or spoils the document when in his custody. What is the effect of such an act? The document ceases in itself to be a valid one, but it does not cease to be evidence of the terms of the contract entered into between the builder and the owner, and thus the builder will be bound by its terms just as much as if the document existed in all its original force. As far as regards builders, this point was judiciously and directly decided in the course of last year for the first time. Moreover, the judges further hinted, though they did not absolutely decide the question, that the owner, if the document were thus altered or spoiled, would, supposing he desired to bring an action against a builder for, by way of example, bad building, be unable to sue him with success. It is, of course, highly imprudent to alter or erase portions of a document in this manner. But the case which we have selected as an example (Pattison *v.* Luckly, 44 *Law Journal*, Exchequer, 180) is an instance of such a thing having been done. A written contract having therefore once been made should in no case be altered by one of the parties; for if this be done he who alters it may be unable to take advantage of any of its provisions. At the same time this exception exists, that the party who does not alter it will be bound by its terms if he attempts to set up as his case that the contract under which work has been executed by him was in terms different from those mentioned in the written agreement. The second head of this subject deals with the work which is to be done under the contract, and the exact question is, whether or not the person with whom the contractor enters into an agreement impliedly warrants that the work to be done is feasible. Of course, if in such a contract the person for whom the work is to be done gives an express warranty that the plan will work practically, whilst on the contrary it is found to be a failure, then the contractor can obtain damages from this person for any delay or other consequence of an impracticable scheme; but if no such express warranty is entered into, then no court of law will imply any such warranty, and the contractor must bear any loss which may be incurred. In a very recent and important case with regard to the building of Blackfriars Bridge (Thorn *v.* The Mayor and Corporation of the City of London, 44 *Law Journal*, Exchequer, 62) this very question was decided after a most elaborate argument. It is one of great importance to all engaged in such occupations as engineering and building, because there is a certain idea very prevalent that the law implies all sorts of conditions in contracts. No doubt the law does this in many instances, but this generally happens only when "there is something not expressed which is clear to all men of ordinary intelligence and knowledge of business, must either have been latent in or palpably present to the minds of both parties when the contract was made, so that if they had been called on to express it everybody of ordinary intelligence or knowledge of business must have concluded that both would have expressed it in the desired form." Probably, as many readers of this publication are aware, the manner of performing the work at Blackfriars Bridge by caissons proved impracticable, and was consequently abandoned, and as a further consequence the contractor lost large sums of money by the delay which of course succeeded. Therefore, it must be borne in mind that no warranty will be implied in any contract to execute certain works unless it falls within the very clear rule which has been cited from a judgment of Mr. Justice Brett. The third and last head of the subject, so far as we propose now to touch upon it, is concerned with the terms of the original tender, and the subsequent and formal contract. It is almost a truism to point out that the actual signed contract is that by which the agreement between the parties is to be judged. As long as this contract is not tainted with fraud, or is not obtained by fraudulent or deceptive means, it

alone governs the relations between the contractor and the person for whom he engages to do certain work. If a man makes a tender, founds his estimate upon various quantities which are given to him, and then enters into an agreement to make a formal contract for the purpose, and then subsequently executes such a contract, which turns out to be different from that which he expected from the original tender, he must be bound by it. Those who are desirous of reading a very instructive example of this rule, will find one in the case of Kimberley *v.* Dick (41 *Law Journal*, Chancery, 38, 1872), where these occurrences actually took place. Of course, if, as has been pointed out, the subsequent contract was signed through fraud, or facts were wilfully concealed, it is no longer binding; but if, on the other hand, it is signed by a contractor with his eyes open, he is bound by it whether it turns out to be different from what he supposed or not. Moreover, should he discover in the middle of the work that the contract under which he is working after all is different from that which he originally contemplated, and that there is a variation in the working plans, he should at once cease from continuing his work, otherwise he does so at his own peril, and probably, as happened to Mr. Kimberley, to his ultimate cost. These rules which have thus been commented on are such as should be borne in mind by any prudent professional man, but that they are not always present to the mind is evident from the very instructive cases to professional men at large which have arisen within the last few years, and which may afford an example of the proverb that it is an ill wind that blows nobody any good. For, at any rate, they afford a warning to others which it is well to remember. To summarise briefly the three rules which have been commented upon in this paper:—A contract, though altered, is still evidence of the terms of the agreement; but is not enforceable by the person who alters it, and alterations are very reprehensible. Well-understood conditions may well be implied in contracts, and warranties as to the practicability of works must be expressly inserted; and, finally, when a tender and a contract differ, the contract, if not tainted with fraud, is the governing instrument by which all parties will be bound.

POLLUTION OF THE AIR OF GLASGOW.

THERE is good news,—we had almost said *good words*,—from Glasgow. The local authorities have initiated an elaborate series of experiments, having for their object the determination of the impurities in the air. In other words, Glasgow has commenced to analyse its own atmosphere!

Glasgow, it must be said,—and we say it with every mark of approbation,—is every day getting more and more alive to the evils of her sanitary condition. Some of these, indeed, she has nearly overcome. She possesses at this moment beyond comparison the finest and most ample supply of water of any city in the British empire, or if we except New York, in the civilised world. She has pulled down most of her ancient and abominable slums; and, conversely, has on a large and liberal scale erected, under Parliamentary authority, new houses for the displaced population. Sir John Hawkshaw has been entrusted with the purification of the Clyde; or has at least reported on the best method. And now, as we understand, she is proceeding to take some effectual and energetic steps to purify her polluted atmosphere. The nature of the movement is set forth with much clearness and perspicuity in the *Scotsman* of July 5th; and since we are going to add a few words of commentary, we cannot do better than print the gist of that article:—

> Dr. Russell, the energetic medical officer of health, has been entrusted with the prosecution of the inquiry, and he has secured the services of Mr. E. M. Dickson, a chemist who has devoted a good deal of attention to such matters These are not the first experiments of the kind that have been made in Glasgow and elsewhere. Some years ago, Dr. Angus Smith published an interesting and instructive work on "Air and Rain," embodying the results of an extensive investigation made by himself; but although important data have thus been brought forward regarding the air we breathe, there is really nothing about which the bulk of the community are so ignorant as the impurities of the atmosphere. Chemical science can detect with almost perfect accuracy any deleterious substances in water; owing, however, to the difficulty of dealing with a subject the study of which may be considered as yet in its infancy, comparatively little is known about the quality of air, though probably more disease has resulted from its impurities than even from unwholesome water. People are not always drinking water, but they cannot possibly avoid breathing air, whether pure or impure. This much may be said, judging from previous observations, that the condition of the atmosphere in Glasgow, especially in certain districts, is sufficient to cause some uneasiness; and it is unfortunate that alongside of the experiments now being made there cannot be placed an analysis of the air in other large towns, so as to show the relative condition in this respect of great centres of population.
>
> "Some uneasiness," we suspect, is too mild a description of the deep-rooted alarm and growing disgust which all who understand anything of the subject must feel; but let it pass. It is far better to feel uneasy than contented under such circumstances. To continue:—
>
> "The death-rate in Glasgow is still much above the average,—notoriously so in certain localities; and though there may be atmospheric agencies which cannot be grappled with, it may be possible to remedy, to some extent at least, unfavourable conditions which tend to increase the mortality. From a variety of circumstances the air of Glasgow must necessarily be more impure than that of many cities; but no doubt much might be done to improve it by opening up densely crowded localities. This has already been done to a large extent by the operations of the City Improvement Trustees, but until more power is given to the Dean of Guild Court in the regulation of buildings, the sanitary returns of the city must occupy an unfavourable position. The 'hollow square system' is at last attracting attention, and a movement is on foot to obtain power to prevent its extension. Its injurious effects can hardly be questioned, for the air at the front street has usually been found purer than that behind in squares where ashpits are situated. So long as the system of building on every available inch of ground is prosecuted, and the erection of what the Home Secretary calls the 'warehouse system of dwelling-houses' gone on with, the circulation of air cannot be satisfactory, and health must suffer accordingly."

There can be no question about that; and as far as he goes, the writer is accurate enough in his diagnosis. But why omit all reference to the state of the river, and the emanations therefrom, to the drainage, to the water-closets in the common stairs, to the privies in the courts? What about the tall smoky chimneys? Where are the manufactories? What place in the grim and begrimed equation is severally occupied by the huge distilleries, the soap-works, oil-works, bone-works (chiefly fossil), acid works, and alkali works, which go to make up the generic category of what are called chemical works? At this precise point of our history ("secret works" we remember they used to be called in our schoolboy days, but there are few secrets about them now) any of our readers who are interested in the question will find material enough of this description in our previous volumes, collected and detailed to account for a very large measure indeed of the poisonous elements in the Glasgow atmosphere.* To proceed, however, we now arrive at the experiments themselves, which are extremely interesting:—

> "So far as they have yet gone, the experiments made by Dr. Dickson have done little more than show the difficulties attending the inquiry. The *modus operandi* at first followed has, after repeated trials, been dispensed with as too tedious, and not capable of collecting a sufficient quantity of the impurities known to abound in the air to admit of anything like satisfactory analysis. After testing the samples obtained, the chemist could easily discover various foreign substances, but the analysis was not found adequate to determining the proportions of each. Dispensing with technicalities, the method which has been abandoned may be briefly described as air-washing by muscular power. [Human, of course.] The vessels in which the air was collected were two glass globes, about the size of ordinary cocoa-nuts, connected by means of a glass tube. One of the globes was about three-fourths filled, while the other contained a very small quantity of water. A man entrusted with one of these vessels was stationed in a certain district of the city, where it was desired to ascertain the quality of the air. When he allowed the water to pass slowly from one globe to the other, air of course filled up the vacuum, and when the water was run back again, the air, in passing through the liquid, left behind its impurities. This process was repeated for perhaps a day or two, when a fresh supply of water was introduced, the polluted water being carefully stored for analysis. Two men were engaged in this manner for about a fortnight, but when the analyses were commenced, it was found that a sufficient quantity of air had not come in contact with the water to afford a basis for exhaustive chemical tests. As soon as this was discovered, Mr. Dickson, while reporting the fact to the committee of the Police Board, at the same time put himself in communication with eminent chemists both in this country and on the Continent, with the view, if possible, of obtaining assistance. In reply to this application, information has been received from a French chemist which, it is thought, will tend to bring out the desired results. Instead of employing men to manipulate the experimental vessels, mechanical power will be brought into requisition, and a much larger volume of air dealt with than has hitherto been the case. A special vessel is being made for the purpose by Mr. Foulis, engineer to the Corporation Gas Company, into which air will be drawn through a small glass rose, something similar in shape to the rose of a watering-pan. In the new process, moreover, a much smaller quantity of water will be employed, and under these conditions Mr. Dickson is hopeful that the impurities will be laid hold of in such quantity that their relative proportions can be quantitatively ascertained."

We take it for granted that it was *distilled* water these muscular gentlemen were manipulating in their crystal cocoa-nuts for a fortnight; and that they did not smoke too much during work-hours (otherwise a trace of *nicotine* might have turned up at the analysis). For if distilled water were not the menstruum the results would in any case have been misleading. Without pretending to special skill in this recondite branch of chemistry, it is easy to understand that ordinary potable water, with its salts in solution, and surcharged with its normal quantum of air, would obviously supply false data for the quantitification, and the determination, for example, of the measure of carbonic acid. But, to be brief, there ought to be no difficulty about the analysis of air; although we must confess the French philosophers are our masters in the science. Half a century ago, for example, the celebrated Dumas analysed with great minuteness specimens of air brought from the Egyptian tombs at the summit of Mont Blanc, and from the atmosphere itself, collected, if we remember right, by Gay-Lussac in a balloon 2,000 ft. above the level of the sea; and, strange to say, they were found to be identical in their composition, and all of them pure. We need not dwell on this subject, however, which is beyond our province, and involves mere questions of chemical manipulation. The following paragraph has an interest beyond the parliamentary boundary of Glasgow:—

> "Before describing the process adopted in the present inquiry, it may not be uninteresting to quote a few facts from Dr. Angus Smith's book. The following table gives the results of his investigations, the amount of impurity being expressed in grains per million cubic feet of air washed at the places mentioned:—

	Ammonia.		Albuminoid Ammonia.
Innellan	24·945	...	69·328
London	26·780	...	65·947
Glasgow	34·169	...	133·264
A Bedroom	44·305	...	104·118
Manchester	53·583	...	116·544
Metropolitan Underground Railway	31·561	...	163·167
A Midden	146·911	...	181·624

> The air-washings in Glasgow were during February and March, 1870, and the localities from which the air was taken were a green in Elmbank-street, Union-street, Charlotte-street, Gallowgate, and Finnieston Quay. Commenting on these figures, Dr. Russell, in concluding a review of Dr. Smith's book, says:—'Our public analysts would probably do more good to the public health by accustoming the public to analyses of the adulteration of air than by confining their attention to food and drink, commonly so called. Health and life are not destroyed by the nauseous gross adulteration, but by the repetition of minute impacts on the vital fabric, which first quivers and then falls. A man may eat bad butter once or twice a day, but if the air is bad *he lives in it*, and he can no more free himself from its influence than Achilles could throw off the fatal garment of Nessus.'"

This is, we think, unanswerable argument. By the way, might we suggest to Dr. Russell that (after being well through with his air analysis, of course) he might do more than try his hand on the whisky! *On dit*, that the fine old Campbelton is grossly adulterated in the regions of Glasgow and Greenock—chiefly with vitriol and methylated spirit. To conclude, it is with the utmost satisfaction that we find some even preliminary steps being taken to abate what we must describe as the most gigantic nuisance of our modern city life. As our readers know, it is no novel subject to us. Many years have now elapsed since we first directed public attention to its important bearings on the public health; and it is only fair to say with respect to Glasgow that our criticisms on its sanitary condition—including this very question—although necessarily severe, were taken both by the profession, by the press, and by the public, in the true spirit. We pointed out then, as we do now, that the inhabitants of this great and populous city, comprehending of course their local government, seemed to labour under the erroneous conception that atmospherical impurity was a sort of correlative or rather a necessary consequence of commercial prosperity. One thing we have observed, although we do not lay much stress on it, is, that whatever zeal (and the zeal was great) which the bailies and other local justiciars displayed in shutting up the publichouses on Sunday, they did their spiriting gently whenever they had to deal with the Smoke Act, or the Alkali Act, or the Nuisances Removal Act. We can remember, for instance, pointing specifically to the atmosphere in the regions of Port Dundas, which was best described as a sort of earthly pandæmonium. Yet here, in the very head-quarters of the air demons, so to speak, there was, as far as we could gather, little or no interference on the part of the authorities, unless it were of the slenderest and most perfunctory character. Hence the immunity of the open and avowed perpetrators of the wrong; for such we must hold it to be. The poisoning of the atmosphere is, in our opinion, the deadliest of all social transgressions; and for this obvious reason, that although the simplest, it is, nevertheless, the surest and the most persistent means of destroying the vital energy and poisoning the main-springs of the

* See in particular our volumes for 1864 and 1870, under the head of "Glasgow."

blood. We need not expatiate on the sorrowful results; nor is it necessary, after what Dr. Russell has written, to estimate the comparative destructive values of bad water, bad food, and bad air as factors in the death-rate of the nation. Whatever we may do with respect to the two former principles,—and it should be noted that it is possible to kill even the typhoid germs in milk by the simple process of boiling it,—it is an indisputable truth that air is always with us. Consciously or unconsciously, our poor lungs will perform their allotted function in however uncongenial an element, and that is enough.

MASONS' MARKS ON THE RUINS OF ANCIENT ROME.

It is only within the last year or two that we have been able to trace out the exact line of the walls of ancient Rome, as built by the kings, and this has been owing to the building of the new city, and the excavations made for that purpose by the British and American Archæological Society's Exploration Fund, under the direction of Mr. J. H. Parker, C.B. To him we owe the important discovery of the Porta Capena and the line of the short *agger*, between the Cœlian and Aventine hills, in what is called the third wall of Rome, also the line of the second wall which surrounded the Palatine and Capitoline hills, and of the first wall of the original Rome, *Roma Quadrata*. Considerable remains of these three walls exist, but more particularly of the third or great *agger* of Servius Tullius, which defended Rome upon the eastern side. Unfortunately, from an archæological point of view, the authorities have destroyed great pieces of this in laying out the new quarter upon the Esquiline, and in building the new railway station. Some fragments of the stone facing are to be left, but they might have spared more. In demolishing this great *agger*, which consisted of a bank of earth seven-eighths of a mile in length and 50 ft. thick, it being faced with a wall 12 ft. thick, numerous masons' marks have been found deeply cut in the tufa stone of which the wall was built; and although the wall may be destroyed, it may be interesting to preserve copies of these marks.

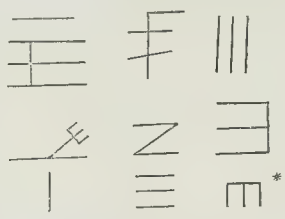
The marks found upon stone buildings of all dates in various parts of the world* are those of the masons or builders, who were from the earliest times banded together in guilds, none being admitted without serving a specified time; these, again, according to their ability, were divided into different classes, consisting of apprentices, fellow crafts, master masons, mark men, and architects, as distinct from the labourers, or men who prepared the rough stone, mixed the mortar, or carried the materials.

These bands, guilds, or lodges were presided over by the most competent, forming a brotherhood, and as such existing down to the seventeenth century. Many of these lodges had charters and privileges granted to them by various kings and emperors; and because their art was taught only to the freeborn, they came to be called Freemasons, which name is retained to the present day by the Masonic lodges, though they are not operative, but speculative, masons. Charlemagne and Hugh Capet granted such charters; also Pope Nicholas III. in 1278; in 1445 John de Medicis, duke of Florence, became Grand Master of Freemasons; and Pope Leo X. was Grand Master of the order, also Clement VIII. In our own country, St. Alban got a charter from the king and council for their protection; in 926 King Athelstan likewise granted a charter, and became Grand Master at York. Edward III. revised their constitution in 1358; in the reign of Henry VI. the House of Commons brought in an Act to prohibit their meetings, which passed, and was revoked in 1450, when the king and many lords and gentlemen of his court were made masons. But to return to the marks. These, I believe, were made by certain men of the old guild, called Mark men, whose duty it was to mark the stones with certain signs,—not so much to show where the stones were to be placed, for we find these marks on walls where the stones do not require any particular placement, and it is comparatively only a few stones that are marked, but they were so marked to show the amount of work done by that particular band, guild, or lodge, no two men having the same mark or sign; thus, in the Masonic lodges of the present day, called Mark lodges, each member of the lodge has a distinctive and peculiar symbol, which no other member of that lodge can take.

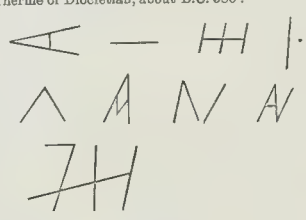
Although on different parts of the early fortifications in Rome we find masons' marks often repeated on stones close together, yet taking the existing remains which are at a distance from each other, we do not find the same marks repeated, with only one exception, a mark on the agger in the tower of Servius Tullius, B.C. 580, corresponds with a mark on the Palatine B.C. 753, and a curious trident mark here is also often found on the wall of Pompeii, near the Porta Romana.

Many of the following marks are used by the Freemasons of to-day. The Brethren will easily recognise them.

On the Palatine Hill, walls of Roma Quadrata, B.C. 753:—

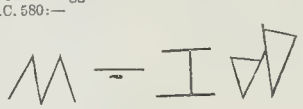


On the agger, near the railway station and Therme of Diocletian, about B.C. 580:—

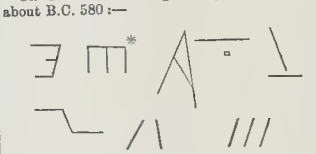




On the agger in the railway station, about B.C. 580:—



On a tower in the great agger of Servius, about B.C. 580:—



The above marks are often repeated.

On a small square building in advance of the Agger, built of the same material, but with smaller stones:—

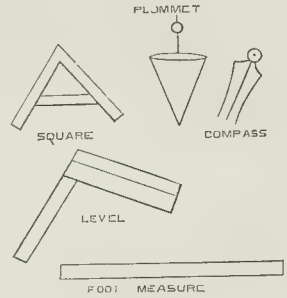


In addition to the above marks, we have other evidence of the masons in Rome, which may not be uninteresting, consisting of monumental stones of a later date. Thus we have marks and signs, to those who can read, upon the antiquities of Rome dating from the time of Romulus, B.C. 753, to that of Michelangelo, A.D. 1564.

In 1723 a Latin inscription was found at Chichester in which a college of masons is mentioned. It dates A.D. 52; and runs thus:—

"The College of Builders, and ministers of religion attached to it, by permission of Tiberius Claudius Cogedunus, the king, legate of Augustus in Britain, have dedicated at their own expense, in honour of the divine family, this temple to Neptune and Minerva. The site was given by Pudens, son of Pudentinus."

But long before this there were masonic lodges in the Roman Empire under the title of *collegia* and *carpora*. In the time of the kings, Numa, B.C. 700, established lodges after the Greek models, under the title of *Collegia Fabrorum* and *Collegia Artificum*, which existed to the fall of the Empire. We have in the Capitoline Museum monumental cippus, no doubt, of some members of these guilds with the working tools in relief, also one in the Collegio Romano. All these monuments were collected together by Pope Benedict XIV., and placed in the Capitoline Museum.



M. Aebutius, M. L.
Macedo. Pater
M. Aebutius. M. L.
Callistratus F
V. M. Aebutius. M. L. Eros
V. Julia. L. L. Berenice. | F
Julia. L. L. Hesuchium
Pomponia. L. L. Sellene
Clodia.) L. Anio cis.

Monumental Cippus of Marcus Aebutius.

A fragment of a column, with the level, pick, trowel, hammer, and compass, in low relief, was found in the Piazza Campo de Fiore.

The above is upon a house of the time of Michelangelo (probably built by him) upon the Capitoline Hill, called "The House of the Masons," A.D. 1560.

S. RUSSELL FORBES,
The British and American Archæological Society, Rome.

* See papers on this subject by Mr. Godwin in *Archæologia*, vol. xxx.; Transactions of Royal Institute of British Architects, 1868-69; the *Builder*, vol xxvii., p. 237, *et seq.*; &c.

* These two correspond.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

I am much obliged to "Meter" for giving the "instrument for the identification of persons and for measuring the proportions of the human frame" so capital a name as "Anthropometer," which expresses in one word its use and purpose, make what you like of the data it would furnish. The four questions "Meter" asks in your impression of July 15th, page 696, are most important, and could be conclusively answered if the inquiry were only taken up by the Royal Academy or the military authorities now at the Wimbledon camp, where more data could be accumulated in one day than an unauthorised person, like your humble servant, could collect in a year.

Some fifty years ago, when Sir Anthony Carlisle was lecturer on anatomy at the Royal Academy, he used to exhibit a remarkably fine specimen of an African (of whom some casts in plaster are still extant), and he used to remark the great length of the forearm of his model, and state that he believed it to be a feature of all the African races. The anthropometer could soon be made to answer this question, and the three others propounded by "Meter" as well as those relating to the laws of growth as affecting the dimensions of all the external divisions of the human figure, and many others respecting the influence of trade or occupation on the proportions during the period of growth, if only the anthropometer were adopted in the new schools and in police-courts for the purposes they now employ the ordinary 6-ft. rod, or scores on the wall of the office.

JOSEPH BONOMI.



DEAN MILMAN'S TOMB, ST. PAUL'S CATHEDRAL.—MR. F. C. PENROSE, ARCHITECT.

DEAN MILMAN'S TOMB, ST. PAUL'S CATHEDRAL.

HE to whom this memorial is raised has a fair claim to be ranked with the men of eminence of the present century.

Henry Hart Milman was born in Brook-street, St. James's, Westminster, on February 10th, 1791. He was the youngest son of Sir Francis Milman, bart., physician to George III., and of Frances Hart, daughter of Mr. William Hart, of Stapleton, Gloucestershire. He received the groundwork of his education from Dr. Burney, of Greenwich; from thence he was removed to Eton, and finally to Oxford. At an early age he showed uncommon talent, especially in the classics, and attracted attention in the literary world by his poetical works. He won several of the most important academic prizes, and was elected fellow of his college, Brasenose, at the age of twenty-four years.

In 1816 Mr. Milman entered the church, and was ordained deacon by Archbishop Howley, then Bishop of London, and was appointed to the curacy of Ealing. In 1817 he was nominated to the vicarage of St. Mary's, Reading; in 1821 elected professor of poetry in the University of Oxford; and in 1829 became Bampton Lecturer. In 1835 he was preferred to the living of St. Margaret's, Westminster, with a prebendal stall in Westminster Abbey; and in 1849 he was nominated by the Prime Minister, Lord John Russell, to the Deanery of St. Paul's, vacated by the decease of Bishop Copleston, and which he held until his own death in 1869.

His remains are deposited at the east end of the crypt, and a suitable memorial-stone was erected to his memory.

Mr. Milman was not only a scholar, but a laborious one, and, it would appear, was blessed with a healthy and vigorous constitution, which aided him greatly in his mental labours.

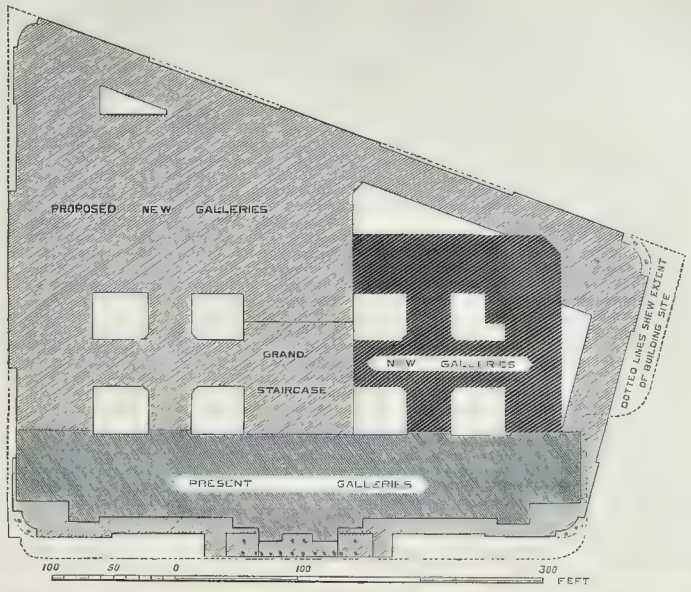
His literary works are numerous, and whilst yet at college he wrote the play of "Fazio," also an epic poem, in twelve books, entitled "Samor, Lord of the Bright City," the dramas called "The Fall of Jerusalem," "The Martyr of Antioch," "Belshazzar," and the tragedy of "Anne Boleyn." He contributed to the collection of hymns known as Bishop Heber's, and for a lengthened period contributed also to the *Quarterly Review*. He wrote the Life of the poet Horace, and edited anew his works. Amongst his other works his histories are the most prominent, and have obtained him the most fame. These are "The History of the Jews," which was amplified in a second edition; "The History of Christianity to the Fall of Paganism"; and "The History of Latin Christianity," which is his *chef d'œuvre*. At the time of its publication he was upwards of threescore years of age. He had, however, not grown weary, and when nearing his eightieth year he prepared his final work, viz., "The Annals of St. Paul's Cathedral," which has since appeared in print. Whilst he was dean he instituted the Special Sunday Evening Services, under the dome of the cathedral. These efforts were well responded to at the time by the public on account of their congregational character.

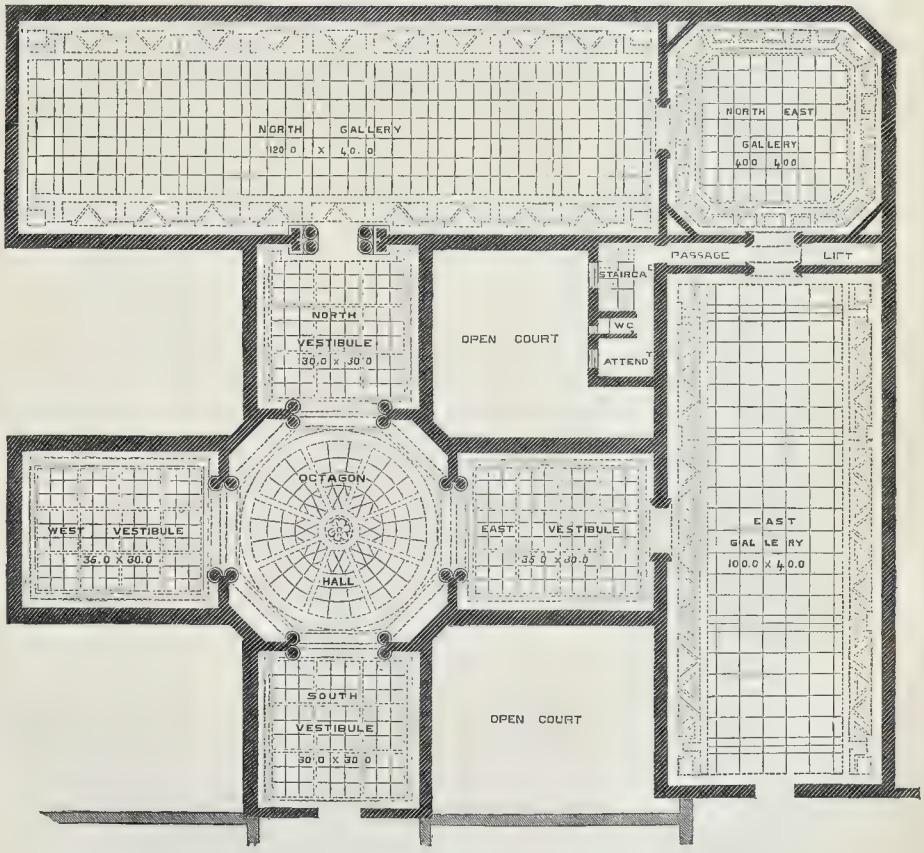
In his public capacity he exhibited decision, moderation, and independence of judgment,—and was conspicuous for the candour of his opinions. In his private life he was a lover of the domestic circle, and keenly appreciated the quiet charms of rural life and scenery. Lastly he obtained a name for the constancy of his attachment as a friend.

The accompanying engraving represents the tomb just erected to his memory in the Dean's aisle of the choir, by a committee of his most attached friends and admirers. It consists of a sarcophagus, formed in Roche Abbey stone, of the magnesian limestone series, in colour a light cream, and of fine texture. It has a bold projecting top or bier, which casts an effective shadow upon the mouldings and fluted consoles beneath. At either end, in "relief," are victors' crowns, with wings emblematic of eternity. On the sides or flanks are two inlaid panels, very beautiful specimens of Levant marble, of a rich greenish purple hue, polished, and set in a frame of white marble. The uppermost portion of the bier is splayed, and of Siena marble; this con-



ADDITIONS TO THE NATIONAL GALLERY.—PROFESSOR E. M. BARRY, R.A., ARCHITECT. (See p. 725.





THE ADDITIONS TO THE NATIONAL GALLERY.—*Plan.*

[See p. 725.

tains an inscription in Latin in double lines extending all round, finely cut in relief, and setting forth the dates of his birth and death, and briefly his gifts, and office as a minister, poet, theologian, and historian. Immediately upon this bier reposes the beautifully-sculptured effigy of the Dean lying in his canonicals, with his hands folded in the sleep of death. This figure, which is wrought in fine statuary marble, is the work of Mr. Francis J. Williamson, sculptor, of Esher, who has succeeded in obtaining a striking likeness of the Dean. It is a work of great merit, and reflects much credit on this comparatively young but rising artist. It may be mentioned that Mr. Williamson was a pupil of the late Mr. J. H. Foley, R.A. The sarcophagus or architectural portion of the tomb is from the design of Mr. F. C. Penrose, architect to the cathedral; it is well proportioned, Italian in character, and thoroughly in harmony with the building and its surroundings. This last has been carefully executed by Messrs. Henry Poole & Sons, at their marble works, Johnson-street, Millbank.

A ROMAN VILLA.

AT Pompeii are to be seen many specimens of houses formerly inhabited by Romans in the middle and lower ranks of life; and the younger Pliny has described, distinctly, the villa of a rich Roman nobleman. This description refers to his winter residence at Laurentinum, about seventeen miles distant from Rome, in the latter part of the first century. This is the description, which the ingenious reader may illustrate by a plan:—"My villa," Pliny stated, "is large enough to afford all desirable accommodation, without being extensive. The porch before it is plain, but not mean, through which you enter a portico in the form of the letter D, which includes a small but agreeable area. This affords a commodious retreat in bad weather, not only as it is enclosed with windows, but particularly as it is sheltered by an extraordinary projection of roof. From the middle of this portico, you pass into an inward court extremely pleasant, and thence into a handsome hall, which runs out towards the sea. On every side of this hall there are either folding-doors or windows equally large, by which means you have a view from the front and two sides, as it were of three different seas; from the back part you see the middle of the court, the portico, and rear; and by another view you look, through the portico into the porch, whence the prospect is terminated by the woods and mountains, which are seen at a distance. On the left hand side of this hall, somewhat farther from the sea, lies a large drawing-room, and beyond that a second of smaller size, which has one window to the rising and another to the setting sun. The angle which the projection forms with this drawing-room, retains and increases the warmth of the sun; and hither my family retreat in winter to perform their exercises. Contiguous to this is a room, forming the segment of a circle, the windows of which are so placed as to receive the sun the whole day; in the walls are contained a set of cases, which hold a collection of authors whose works can never be read too often. Thence you pass into a bedchamber through a passage, which, being boarded and suspended over a stove which runs underneath, tempers the heat which it receives, and conveys to all parts of the room. The remainder of this side of the house is appropriated to the use of my slaves and freedmen; but most of the apartments are neat enough to receive any of my friends. In the opposite wing is a room ornamented in a very elegant taste; next to which lies another room, which, though large for a parlour, makes but a moderate dining-room. Beyond is a bedchamber, together with its ante-chamber, the height of which renders it cool in summer, as its being sheltered on all sides from the winds makes it warm in winter. To this apartment another of the same sort is joined by a common wall. Thence you enter into the grand and spacious cooling-room belonging to the bath, from the opposite walls of which two round basins project sufficiently large to swim in. Contiguous to this is the perfuming-room, then the sweating-room, and next to that the furnace which conveys the heat to the baths. Adjoining are the two little bathing-rooms, fitted up in an elegant rather than in a costly manner. At the other end is a second turret in which is a room that receives the rising and setting sun. Behind this is a large repository, near to which is a gallery of curiosities, and underneath is a spacious dining-room. It looks upon the gardens and the gestatio (promenade) which surrounds them. Between the gardens and this gestatio is a banqueting-room. Two apartments run round the back part of it, the windows whereof look upon the entrance of the villa and into a pleasant kitchen-garden. From hence an enclosed portico extends, which by its great length, you might suppose, erected for the use of the public. It has a range of windows on each side; but on that which looks towards the sea, they are double the number of those next the garden. Before this portico lies a terrace perfumed with violets. On the other end of the terrace and portico stands a detached building in the garden, which I call my favourite, and, indeed, it is particularly so, having erected it myself. It contains a very warm winter-room, one side of which looks upon the terrace; the other has a view of the sea, and both lie exposed to the sun. Through the folding-doors you see the opposite chamber, and from the windows is a prospect of the enclosed portico. On that side next the sea, and opposite the middle wall, stands a little elegant recess, which, by means of glass doors and a curtain, is either laid open to the adjoining room or separated from it. Adjoining to this is a bedchamber, which neither the voice of the servants, the murmuring of the sea, nor even the roaring of a tempest can reach. This profound tranquillity is occasioned by a passage which separates the wall of the chamber from that of the garden; and thus, by means of that intervening space, every noise is excluded. Annexed to this is a small stove-room, which, by opening a little window, warms the bedchamber to the degree of heat required. Beyond this lie a chamber and ante-chamber, which enjoy the sun, though obliquely, from the time it rises till the afternoon." Rome is in lat. 41° 54′ N. and long. 12° 59′ E.

NEW DOCK AND HARBOUR WORKS.

Jersey.—Sir John Coode has (we learn from the *Jersey Express*) appeared before the "States" to tender some explanation with respect to the new harbour works. Deputy Durell questioned Sir John very closely on matters appertaining to the expenses incurred by the engineering staff, which he considered unnecessary, seeing that only one-half of the works were being carried on at the present time; but the putting of these questions appeared to call forth the disapprobation of several of the members. With respect to the question of Concrete *v.* Granite, Sir John produced a piece of the former, taken from the works at Holyhead, made twenty-five years ago, and gave it as his opinion that the longer concrete was in use the harder it became. The breakwater, he said, had not been in the least degree deviated from, but was being carried out in strict accordance with the Act of the States. True, he thought it advisable to extend the breakwater 300 ft., the additional cost of which would be about 26,500*l.* This, however, was necessary in order to obtain a secure shelter, which was the chief object of the States. In answer to questions, Sir John expressed his doubts as to whether the work could be done any better by tender than by day-work. He also informed the House that since his estimate there had been a material advance in the price of labour, in addition to which coal and iron had risen in price to the extent of 20 per cent., and this would naturally add to the original estimate.

Runcorn.—We learn from a Runcorn paper that the Bridgewater Navigation Company have done and are doing much to improve the port of Runcorn. In the year 1872, when the company took possession of the Old Quay, Bridgewater, and Runcorn, and Weston canals, and the docks at Runcorn, they found the dock accommodation of the port too small for the traffic, and decided to complete the new dock, which had been partially made a few years before by their predecessors, the Bridgewater trustees. That dock was opened with great *éclat* on the 22nd of July last year, and was named "Fenton Dock." Its length is 600 ft., and its width 150 ft.; and it made the total dock area 12½ acres. In connexion with this dock, powerful hydraulic cranes and improved hydraulic tips have been erected, and a railway siding laid along the dock, the result of which is that vessels can now be loaded in a few hours, instead of days as heretofore. On the south side of the dock three large covered sheds, 143 ft. long and 152 ft. broad, have been erected, and are divided into numerous bays, 15 ft. high, for the reception of China clay and other cargoes. These sheds are fitted with improved high-level tramways, on which, in trucks loaded and lifted by small hoists from the vessels, the cargoes are conveyed to their respective bays. At the south-west corner of the dock a large lock has been constructed connecting it with the Runcorn and Weston Canal. This lock is 120 ft. long, and 26 ft. wide, and will admit vessels drawing 15 ft. For the purpose of economising water, it is fitted with two sets of gates, reducing its length when a small vessel is passing to 85 ft. The foregoing undertakings are completed, and a large number of workmen are now engaged converting the Runcorn and Weston Canal (which by the lock, as stated above, is connected with the Fenton Dock) into a ship basin, into which vessels will be taken to discharge their cargoes on wharfs on the river side of the basin from Fenton Dock to the railway bridge near Weston Point. These wharfs will be bounded on one side by the railway running from Runcorn Station viâ Weston Point to the Alfred Dock, and on the other side by the new ship basin, and will cover an area of about three acres, and on them will be high level tramways for the loading and discharging of vessels. The whole of the work is expected to be completed in September next, and it is in contemplation afterwards to construct a tidal entrance from the river to the lock and basin. Mr. E. Leader Williams, jun., is the engineer-in-chief, and the work is being done under the personal supervision of the local resident engineer, Mr. F. Griffith.

Newhaven (N.B.).—The foundation-stone of a new harbour for Newhaven has been laid. The estimated cost of the harbour is 10,000*l.* It is to be erected by the Leith Dock Commissioners. The existing pier was built about sixty years ago, and, in order to afford additional shelter to the fishing-boats, a breakwater was laid down by the fishermen at their own expense about twelve years ago. Several schemes had been proposed for the improvement of the harbour, but none of them got beyond their initial stage until the Leith Dock Commissioners moved in the matter. The work they have undertaken includes the construction of a breakwater 540 ft. long to the west of the pier; and the extension of the outer arm of the pier westwards by 100 ft. The breakwater will be built of concrete, and will have a height above high-water mark of 5 ft., its average depth to the foundation on which it rests being 14 ft. 6 in. It will be 12 ft. in width. The harbour will be protected on all sides, the free-way left between pier and breakwater being about 70 ft.

Southampton.—The Southampton Harbour Board have granted their assent to the use by the Dock Company of a piece of land on the foreshore of the Itchen for a new graving-dock.

Buckie (N.B.).—A new harbour is now in course of construction at Buckie. The material used is concrete. The work has now been in progress for a twelvemonth, and it is expected that two years more will be required to finish it. The harbour altogether will cover eight acres, and the great feature of it will be its depth of water. All over the harbour it will give 4 ft. at low water, and at the entrance 10 ft.

Liverpool.—It has been settled by the arbitrators that the sum of 310,000*l.* is to be paid to the Liverpool Corporation by the Mersey Docks and Harbour Board for a piece of land which has been acquired by the Board from the Corporation. This is at the rate of 2*l.* 17*s.* 7*d.* per yard. The *Liverpool Post* states that, with the exception of the Duke's Warehouse and the George's Pierhead, the Docks and Harbour Board are now the proprietors of all the land on the Liverpool side of the river from one end of the town to the other.——A recent field meeting of the Liverpool Geological Society was held in the North Docks excavations. The party, consisting of about 100, were met by Mr. G. F. Lyster, the engineer, who courteously explained all the engineering details of the works now being rapidly carried out. Mr. T. Mellard Reade, C.E., F.G.S., the president of the Society, explained the geological features. He said that it was seldom possible to get such complete sections of the post-pliocene deposits of the neighbourhood as were presented in these works. At the southern end the uppermost member of the bunter formation was reached, but the most interesting part of the geology all lay above the trias. Between the trias and the first glacial beds lying upon them there was a great geological gap, during which the whole of the jurassic, cretaceous, and tertiary beds were laid down, great mountain chains uplifted, and the whole face of the globe, both physically and as regards the fauna and the flora, completely changed.

Poole.—Some time since the Poole Quay

Trustees accepted the liberal offer of Sir Ivor Guest, bart., to contribute 1,000*l.* towards the improvement of the entrance to the harbour, and the Mayor has since received a cheque for the amount. The work already done by the committee appointed by the Corporation is proving very effective, and already a greater depth of water has been obtained in the channel leading into the harbour. It is suggested that the Government should be asked to give assistance.

Aberdeen.—Mr. Dyce Cay, engineer of Aberdeen Harbour Works, has submitted a special report to the Harbour Commissioners, which is attracting considerable attention. The problem before the Harbour Commissioners is,—how to keep the waves from the east and the sand-drift from the north out of the harbour entrance, at the same time securing its convenience and safety for the entrance and exit of shipping. Mr. Dyce Cay's chief contribution towards the solution of this problem is a proposal to extend the North Pier 500 ft. beyond the extension sanctioned by the Parliamentary plans. At the point which this further extension will reach the depth is 20 ft. at low water of ordinary spring tides. The dredging statistics of the past nine years, as given by Mr. Cay, reveal the startling fact that the silting up of the channel has, during that time, been increasing, till latterly it has more than outstripped the dredging. Mr. Dyce Cay gives as the primary cause of this most unsatisfactory state of matters—"the attempt to deepen the channel without first curing the tendency to the formation of a bar at the entrance." The cost of the further 500 ft. proposed to be added to the north pier Mr. Cay estimates at 41,000*l.*, making the cost of the 1,000 ft. 85,000*l.* This estimate proceeds on the assumption that the work be pushed on without delay to its completion, which, it is calculated, might be reached in 1878. But if the extension were reduced in width at the level of the roadway from 30 ft. to 20 ft., as Mr. Cay thinks it safely might be, 15,000*l.* would be saved. The Harbour Trustees have not sufficient remaining borrowing powers for the proposed additional extension; and, if it is to be gone into, further powers must be obtained from Parliament.

Sunderland.—The River Wear Commissioners have under consideration proposals for improving the dock and harbour accommodation of Sunderland. Without carrying out the proposed lengthening of the piers, the outlay contemplated is from 120,000*l.* to 150,000*l.*

Anstruther.—A recommencement has once more been made to the new harbour works at Anstruther, and the Fishery Board intend now to carry them on to completion. The protection wall at the upper end of the new east quay, which was partly overthrown by the storms of November last, is being rebuilt, and concrete blocks are being laid down at the back of the outer section, so as to protect the pier more effectually from the sea during gales. The harbour is also to be deepened, and, finally, the entrance to the old harbour is, it is reported, to be built up. The new harbour is believed by the fishermen to be more dangerous to enter during gales than the old one, and it is stated that a *plébiscite* has been taken with the result that of the 255 papers returned, no less than 254 were against the closing up of the old harbour mouth.

LIFE IN CATANIA.

A FRIEND in Catania writes,—Without the least pretension to more knowledge of music than Byron's, "knowing what pleases me," I must give you my impression of an opera of Verdi's, new to London, "Il Forza del Destino." With too much of tragic incident, the music is charming and full of variety; it is sure to command popularity. One prayer made me think of that in Mosé in Egitto; a rataplan, that of La Figlia. An American prima donna, Miss Swift, well deserves the applause *Leonara* gained. The story gave her full scope for much dramatic and vocal talent; it is so sweeping an example of fatalism, that a burlesque of Tom Thumb is the only parallel I remember, in which one person only, if my memory serves, remains. Here the hero, with most virtuous intent, is found by the lady's father (who has just said "Good-night," with a modern candlestick in his hand) in her chamber, the discreet confidante studying the moon. Words and swords are drawn. The hero, to prove his devotion, throws his pistol on the ground, but it goes off and kills the father. The lovers fly together. The brother comes home, to find, as he supposes, dishonour and murder, requiring revenge. The lover sets off for the wars; there makes an eternal friendship with a cavalier who saves his life, thereby nearly losing his own; and, requiring to be carried on a kind of trestle previously to undergoing an operation, he confides to his friend, who turns out to be *Leonara's* brother, a modern portmanteau, his constant charge in action, wherein may be found his mystery. This duo proves his lungs sound, and he is carried off for his operation. The brother has a *scena* of scruples, then opens the portmanteau, finds his sister's portrait, listens to no explanation, waits ten minutes, when the operation is over and health restored, and challenges his whilome friend, whose evil destiny again obliges him to wound his adversary mortally. A monastery is near at hand, and applied to for ghostly aid. Monks come forth, amongst them the sister, who supposed lover and brother dead, and had in charming music persuaded the prior to enrol her amongst the brethren. Her brother kills her, and in the first representations the hero then stabbed himself; now he remains to become a monk. The minor parts are a Spanish friar, who mounts on a tub, preaches to the people in a capital recitative; a vivandière, who finds this too sad, and suggests a solo on the drum. She leads a rataplan chorus, very original and difficult, for it has no accompaniment. There is a scene where the poor go for soup to the kitchen of the monastery, very descriptive of common Spanish life; but the opera lasted five hours, and the gas was bad, lighted by a boy who passed from box to box with lucifer matches; and so the stage was lighted. Our box, the centre of the dress circle, cost 12 fr. for four; the stalls, 2 fr. each. We walked home as if in a city of the Arabian Nights, where everything is unlike all else of its kind. At six the streets are watered; a man drives a cart wherein is a barrel of water, to which is a big tube 2 yards long, with fine holes at the end. This a man holds by a long string, and wiggle-waggles from side to side most comically; soon after a street-organ in a barrow is wheeled along by one man rather quickly, while another runs by the side grinding it. The fruiterer opposite screams,—"By the soul of my grandfather, it is true! I am only charging so much for these figs." Another calls on her friends to run and see for themselves, roses are being sold at a price impossible. Going to the convent close by to see some nuns, a curious peal was rung, and I asked what service was going on. It was telegraphic bells, one may say,—"The nuns are high upstairs, who can go up when visitors come? Each nun knows her chime, and this one belongs to the sisters you want to see." A great triumph of skill was shown me in the Strada Garibaldi on Etnea; it was built in the lava itself, and had a rugged appearance, as each house rested on blocks of granite about 6 ft. from the ground. The houses were therefore propped up, while the lava blocks were dug out and a row of open shops or ground-floor rooms built in their stead. A vast improvement; but of such lengthy operation, owing to the quality of the material, as one must see to believe. Intense heat and such a martyrdom from musquitos and fleas as nearly to throw me into a fever, have hindered all earnest going about. From six to eight a.m., and five to eleven p.m., is all one can bear of outdoor life. Indoors, eating and sleeping, with futile attempts to subdue one's personal enemies, fill up the time. I have seen some collections of antiquities of great interest, engravings beyond price, where the collector has a marvellous knowledge of everything but the subject. I was shown one of the oldest extant, "Cain killing Abel." I suggested armour was then unknown, and soon discovered by the sling and stone on the ground the story was David and Goliath. Manners take the place of education, and *les convenances* are the first rule of life, in which I shall often fail. Our *salon* is 46 ft. long, and each visitor is escorted to the door by the whole assembled family. It is courteous, but tiresome. All public buildings are commenced on a scale too large for the funds. The theatre, which is to be open at the roof, stands half unfinished. The palace I write from has a marble staircase, and forty rooms on a floor, but the holes of the scaffold-poles are not filled up, nor is any stucco or whitewash apparent anywhere. So much is told of the intense heat which sets in, for a month from July 27th, that I am wondering what will become of my bones. At present it is almost insupportable, and while I can imagine no pleasanter place for a winter, only real business could make any one come here now. The country life has set in, as the empty boxes last night proved. All the men in the stalls had Chinese fans. Thunder to-day makes life cooler, and beautiful ices cost 3d. each. A visit to a country house for one day is in project. Much as I feel interested in seeing it, and pleasant as are my surroundings, I have no courage to undertake anything with half the energy I shall my return journey. M.

SOMERSETSHIRE ARCHÆOLOGICAL SOCIETY.

THE twenty-eighth annual meeting of the members of this Society commenced in the Banqueting-room at the Guildhall, Bath, on the 18th inst. The Earl of Cork, president of the Society for the past year, resigned his seat to the new president, Mr. Jerom Murch.

The annual report and balance-sheet, read by the Rev. W. Hunt, hon. secretary, stated that since July, 1875, the number of subscribers has increased from 434 to 453. The actual receipts have been in about the same proportion. Since the last annual meeting an important addition has been made to the property of the Society. A dwelling-house and garden, with a large frontage to the river, extending to the outer moat, and immediately adjoining the Castle garden, Taunton, were offered for sale, and the question of purchasing them for the Society was considered at a special general meeting of the members on the 17th of March last. The meeting was largely attended, and was unanimous in its determination to buy the property for the sum of 460*l.* The Council express their satisfaction at the purchase, and endorse the opinion that its possession will be of great importance, both in preventing any obnoxious business being carried on so near the museum, and also in its direct future utility to the Society. Nothing has been expended on the castle itself during the past year, beyond the cost of a few necessary repairs and fittings. All restorations have been postponed, until the building committee appointed in 1875 shall have examined and reported upon the fabric, but the Council are of opinion that, before long, certain outbuildings of modern construction which deface the appearance of the Castle Court ought to be removed.

Mr. Malet read the financial statement of the Society, which showed that the subscriptions received during the year amounted to 210*l.* 11s., and the other receipts, including a balance of 24*l.* 15s. 2d., to 100*l.* 8s. 9d. The expenses had been 294*l.* 1s. 9d., leaving a balance in hand of 16*l.* 18s. The Taunton Castle Purchase Account showed that there were still due to the bankers 1,123*l.* 12s. 1d. The report and accounts were adopted.

Officers and committee-men for the ensuing year having been elected, some discussion ensued as to next place of meeting, Glastonbury and Bridgwater both being suggested. The subject was referred to the Council.

Mr. Murch then proceeded to deliver his presidential address, which, after noticing the position and prospects of the Society, went on to give an interesting historical sketch of the coronation of King Eadgar, in Bath Abbey. A vote of thanks to the president for his address was passed, on the proposition of the Earl of Cork, seconded by Mr. Freeman, and the meeting adjourned.

At the invitation of the Mayor the company partook of refreshment in the Council-chamber.

The members having walked to the Pump-room, Prebendary Scarth informed them that they were then standing on what was probably the centre of the Roman forum, and that if they looked across the other side of the way they would see where Stalls Church formerly stood, in which was embodied portions of the Roman temple. In the Literary and Scientific Institution could be seen remains that were taken out when the vaults of that room were built. At the time the Pump-room Hotel was erected, during the process of excavation a great many Roman remains were come upon, amongst them the platform of a temple, particulars of which appear in his paper submitted to the evening meeting. It had been said that the Abbey Church was built on the site of a Roman temple, which was not at all impossible; but there was no proof that such was the case. Proceeding to the Borough Walls, the rev. gentleman directed attention to the wall there standing, which, he said, was of Mediæval character, repaired in more recent times, but built on the Roman

foundations, which were, perhaps, 25 ft. below the present pavement. The Roman walls had been destroyed until they were about 10 ft. or 12 ft. high, and then the Mediæval wall was constructed on the older work. The wall was the boundary of the city on that side, and outside it were found remains of interments. The only piece of the old wall to be seen was near the Institution. Having entered into the Mineral-water Hospital, the party was conducted to the vaults, where there is a piece of Roman pavement, which, it is explained, showed the ancient level of the city. The pavement, which was *in situ*, was said to be a coarse portion, being the external part of the room only. It gave a good idea how the level had increased in consequence of buildings being pulled down and only a certain portion of the *débris* cleared away. From the Mineral-water Hospital the members of the Society went to the Blue-coat School, where is another section of Roman pavement. Then the party proceeded through the Saw-close, New Westgate-buildings, and Westgate-buildings, to the Royal United Hospital, Prebendary Scarth on the way drawing attention to Chandos House as one of the former residences of Bath, and pointing out the position formerly occupied by the Roman wall. Around Bath there were the remains of some twenty-five or thirty villas. At Wellow there was a pavement worth opening, and he wished that the Society had time to visit it.

Mr. Moore suggested, as an explanation why the walls up to the floors of the Roman houses and the roof tiles only were found, and no materials of the superstructure, that the latter consisted of wood and plaster, the Romans not building substantial houses as we did. He also suggested the opinion whether the fact that these pavements were only found in this neighbourhood might not in some measure be due to the fact that the floors were constituted principally of cubes of white and blue lias, which were found here.

Prebendary Wilkinson agreed with Mr. Moore in his opinions as to the materials used by the Romans in building their houses above the floor level.

Prebendary Earle said there was a word used by the Saxons for that particular low wall on which the upper structure was built,—grundweall or groundwall,—a term which he believed still existed among some masons in the county. It was also equivalent to the podium of the Greeks.

Bishop Clifford said it was the custom in Somersetshire to build the walls to the ground-level of stone, and the upper part of "cob."

Colonel Pinney asked whether the pavement was the floor of a bath, and Prebendary Scarth stated that it was a living-room. Bishop Clifford added that such chambers with floors were common in Pompeii.

The members then went to the Literary and Scientific Institution, where Mr. Scarth described the various Roman remains that had been found in the city, and which, he said, were some of the most perfect to be found in the whole country.

Mr. C. Moore subsequently gave a short description of the geological formation of the district, with its fossils, some of which he exhibited.

The company then dispersed.

After the party left the pump-room, and before going to see the Roman remains, they went into the Orange-grove to look at the exterior of the Abbey. Mr. E. A. Freeman pointed out the main features of the building, and afterwards adjourned to the interior. He said they would see at a glimpse that it was of very small size amongst cathedral churches, the explanation of which was, that after it had been nearly ruined, towards the end of the fifteenth century, when Bishop King rebuilt, he built the new church on the site of the nave only of the older church. At the east end of the present one there were some remains of the Romanesque church, being a portion of the foundation of the great central tower and transept. Two things struck one—the peculiar shape of the tower, and the extraordinary height of the clearstory, which two things always went together. They belonged to a type of church of which there were several others in this part of England, as St. Mary Redcliff at Bristol, the Minster at Sherborne, and the Priory Church at Christ Church, in Hampshire. Both at St. Mary Redcliff and in the Bath Abbey the transept was singularly narrow, which was done in order to give a great effect of height in that part of the church. The result of the narrow transept was a central tower departing from the ordinary shape, not being square, but oblong. The pinnacles on the tower and the east end were not there many years ago, but merely battlemented turrets. They had a square-headed window in the last place in the world they would look for it—the east end. The building was commonly called Bath Abbey, and in that name he said he would comment on it, but it was really the secondary cathedral church of the diocese of Bath and Wells. As a Wells man he was bound to say secondary, and history bore him out in it. The bishop's stool in this diocese was originally placed in the church of St. Andrew, at Wells, but about the time of the Norman conquest originated a movement to remove the seats of bishops from small places to larger ones, as from Crediton to Exeter, Sherborne to Salisbury, &c. John de Villula was a bishop who despised Wells and came to Bath, and planted his bishop's stool there. With reference to the architecture of the building he said it was Late Perpendicular, with a small portion on the south-east of the church of John de Villula. The square head did not suit a large window like the east one, but it was quite right to reproduce it at the restoration. He confessed to have some desire for the retention of the old roof of the nave, although the present was a grand one, and made the church appear a perfect whole.

At six o'clock the members and friends of the Society dined together at the Grand Hotel, under the chairmanship of the president, Mr. Murch, who was supported by the High Sheriff of the County, the Mayor of Bath, and others.

The evening meeting commenced at half-past seven, Mr. Murch presiding.

Mr. Elworthy read an exceedingly interesting paper "On the Grammar and Dialect of West Somerset." This was followed by a paper "On Roman Military Roads through Somerset," by the Right Rev. Bishop Clifford, of Clifton.

Prebendary Scarth made a few remarks on the state of Sodbury camp, only half of which was left, the other probably having been carried into the Severn.

The Prebendary then gave an epitome of a paper he had prepared on "Roman Somerset, with special reference to Recent Discoveries in Bath." Want of time precluded the reading of the paper *in extenso*. To this we shall return.

On the second day, the 19th inst., the members assembled at the Guildhall to make an excursion to various points of interest. Bathampton was the first stopping-place, and here Prebendary Scarth gave some particulars of the church. The first thing noticed was an effigy in the east end wall, which he described, on the authority of Mr. Planché, as one of a bishop of very early Norman date (eleventh century). In the porch are two effigies of the time of Edward II. and Edward III. They, and the effigy in the east wall, formerly stood in the south aisle of the church, but were removed in 1754, when it was restored by Ralph Allen. The church had also been in the hands of the restorers within the last twenty-five years. It is dedicated to St. Nicholas, and consists of chancel, nave, south porch, south aisle, with tower at the west end. The tower is 50 ft. high, and the architecture Perpendicular, three stages, with angular buttresses. The party next proceeded to an adjacent field, where some excavations had been made by Mr. Moore. A number of specimens of Roman pottery and other remains of that period were displayed on tables.

After a drive through Freshford, the party, about one o'clock, reached Westwood, where they were received by Prebendary Jones, who said the church was a chapel-of-ease for Bradford. The earliest part of the building was the chancel, and at the east end was a double piscina.

The next place which the party visited was Bradford-on-Avon. The Rev. Prebendary Jones, rector of the parish, described the Saxon church, of which our readers have often heard. He stated that it was built early in the eighth century, by St. Aldhelm, and dedicated to St. Lawrence. He had recently discovered that its dimensions corresponded very closely with the original cathedral at Llandaff. The building was formerly occupied as two tenements, and was in the hands of two different owners. When the restoration was about to be made, on the removal of a stack of chimneys, the chancel arch was discovered, and subsequently a step leading down into the chancel. Mr. Freeman also made some remarks on the building, of the antiquity of which, in his own mind, he had no doubt. He controverted the opinions of those who stated that the English were incapable of erecting buildings of stone and mortar before the coming of the Normans, and said that people ought to remember that the first 600 years of English history were as long as any 600 after, and that very great changes had time to go on during that period. If they bore that in mind, he asked where was the difficulty of believing that they had an ancient church there, built in the days of St. Aldhelm. It was not Norman; it was not a building erected after 1066, and had not a feature of later Romanesque,—but had features of genuine primitive Romanesque. William of Malmesbury, an accurate architectural observer, said there was a little church at Bradford, which St. Aldhelm was said to have built to St. Lawrence. He (the speaker) did not say there was direct proof, but it came as near to it as possible, in the absence of documentary evidence. If anybody could produce a document showing that the church was built between the time of St. Aldhelm and William of Malmesbury, it would upset the presumption that the church belonged to the eighth century.

Mr. Batten drew attention to the fact that William of Malmesbury used the words, "said to have been," for he thought if he met with the words in any of the writings of Mr. Freeman that "he believed" a certain thing to have taken place, he might safely take it that he disbelieved it.

The party having left the church, Prebendary Wilkinson exhibited some Roman remains.

Prebendary Jones, in giving a brief description of the parish church, said the tower was built at the beginning of the sixteenth century, and a curious feature in it was the strut thrown out on which to construct the landing at the top of a newel staircase.

Prebendary Earle added a few words on the derivation of the word "newel," and suggested whether instead of having a Saxon origin, it might not have come from a French word, the Latin root of which was *nux*.

It was intended to visit the chapel of St. Mary on Tory, the Bridge chapel, the Barton farm, and the bridge, but the time did not permit, and the party proceeded to South Wraxall, and thence quickly to Bath (which they reached about seven o'clock).

CONNEXION OF DRAINS WITH SEWERS.

AT a meeting of the Metropolitan Board of Works on the 21st, Mr. Dalton introduced a deputation from the Council of the Society of Arts, and a memorial was presented on the subject of house-drains and their connexion with the sewers. The memorial set forth that the protection of public health from typhoid and other diseases demands that an amending Act of Parliament be passed as soon as possible to secure that all house-drains connected with public sewers in the metropolis, and towns having an urban authority, should be placed under the inspection and control of local sanitary authorities, who shall be bound to see to the effective construction and due maintenance of all such house-drains, pipes, and connexions. Provisions having this object in view exist in the Act constituting the Commissioners of Sewers in the City of London, in the Metropolis Management Act, 1855, and in the Public Health Act, 1875, but practically they seem scarcely sufficient for the purpose. That plans of such drains and connexions be deposited in the charge of the respective local authorities, who shall be bound to exhibit them and supply copies of them to the public on payment of a moderate fee. That the owners of houses be compelled by law to send to the respective local authorities within a specified time after the passing of the Act, plans of all house-drains on an appointed scale. The memorialists desire to point out for the consideration of the Board that, although considerable powers in this direction have been conferred by law upon local authorities, yet that in practice such powers are not sufficiently carried out at the present time, and require to be amended and enlarged, in order efficiently to attain the important sanitary objects for which they have been granted.

Sir Henry Cole, on behalf of the deputation, said the object of the Society was to press upon the Metropolitan Board of Works the necessity of taking steps for the prevention of typhoid fever in the metropolis. He lived in a neighbourhood where it was chronic, and the rating of the district was four or five times as much as

it was twenty years ago. A certain number of houses were never free from typhoid and scarlet fever; and with respect to the houses built before 1855, it had been found that the powers of the vestries to interfere were inoperative. The metropolis had been taxed to the extent of 4,000,000*l.* for putting drains right, and he hoped the Board would do something for the prevention of fever. It was the intention of the Society during the recess to petition the Local Government Board to take action on the subject over the whole country.

In answer to Mr. H. L. Taylor,

Sir H. Cole said the district he referred to (Kensington) was under the control of the vestry, and he had no complaints to make against that.

Mr. H. L. Taylor said the Vestry of Kensington possessed ample and extraordinary powers to deal with house drainage.

After a discussion, in the course of which some not very polite expressions were applied to the deputation, the memorial was referred to the Works and General Committee for consideration and report.

VALUE OF THE PROPERTY OF THE LIVERPOOL CORPORATION.

WITH the exception of London, Liverpool is said to be the richest corporation in England. It has an enormously large real estate, of constantly-increasing value. According to a return just issued by the Local Government Board, the Corporation received last year from rents on its property, 59,203*l.*; from the fines on renewal of leases, 36,215*l.*; and from the sale of property, 51,776*l.*; which, with 21,639*l.* received from tolls and dues, makes a total income from these sources amounting to 168,853*l.* In addition to this, the sum of 82,299*l.* was raised by rates, and 36,591*l.* was derived from what are called "other sources," not specified in the return. The gross income, including the allowance from the Government in respect of police and the maintenance of criminals, was 321,445*l.*, of which 120,168*l.* were spent on the maintenance and repair of public works; nearly 100,000*l.* in the cost of police and the support of criminals; 13,311*l.* in salaries; and 43,570*l.* in miscellaneous expenses. The real property of the Corporation, in addition to private houses and buildings situated in various parts of the borough, includes several public buildings of great value, St. George's Hall alone having cost more than 300,000*l.*; together with public parks having an aggregate area of about 900 acres. The rateable value of the borough is also much in excess of any other borough in England, the amount now returned being 2,940,333*l.*, as compared with 1,972,233*l.* the present rateable value of Manchester.

NOTES ON WATER SUPPLY.

Worthing.—The Worthing Local Board has resolved to make application to the Public Works Loan Commissioners for the sum of 16,000*l.*, to enable the Local Board to provide additional machinery for their waterworks, to erect a new engine and boiler house, and works in connexion therewith, and also to construct a new gravitation outfall sewer, with branch sewers for Newland-road and Broadwater-road.

Inverurie.—The first turf of the new works for providing a water supply for the burgh of Inverurie has been cut by Lady Madeleine Keith-Falconer. The supply is to be obtained from the Earl of Kintore's lands, and the aqueduct passes under part of the north avenue to Keith Hall House, where the first turf was cut. Mr. G. Gordon Jenkins, C.E., Aberdeen, is engineer for the works; and Messrs. Chalmers & Collie, Aberdeen, contractors for the section of the works now commenced.

Andover.—The newly-formed Water Company here has difficulties to contend against which it scarcely bargained for. At the advice of the engineers, Messrs. Russ & Minns, the present shaft was sunk 60 ft., and then a bore-hole was made 60 ft. further. It was thought that water sufficient for any requirement for a town of such a size as Andover would be obtained from this source; as a matter of fact, however, such has turned out not to be case, for although more than enough is found for the present requirements of the company's customers, still, when those customers increase, a larger supply will be necessary. The directors, therefore, have decided to sink another shaft close by the present one.

Perth.—Mr. Bateman, C.E., has recommended the Perth Water Commissioners to provide the additional supply of water necessary for the city by extending the present system of pumping water from the filter beds of the Tay, instead of resorting to any more distant source. The cost of the extension he estimates at 30,000*l.*

St. Leonard's.—Some dissatisfaction is expressed by laundresses and others, who require a large amount of water for their business, at the issuing of a printed notice by the Local Authority, stating that henceforth water supplied by the Authority will be gauged by meter, which will be supplied by the Authority, and must be fixed on the premises to gauge the water used for "trade purposes." Premises so supplied are to be assessed to the water-rate in the usual way, but if the amount be paid according to the meter (which will be read every half-year) reckoning at 1*s.* per 1,000 gallons, shall exceed the amount of the rate, the excess will have to be paid to the Authority.

Wellingborough.—Major Tulloch, one of the inspectors of the Local Government Board, has held an inquiry at Wellingborough respecting an application from the Local Board to borrow 5,000*l.* for the extension of the town waterworks. The rateable value of the town at the present time is 40,000*l.*, and altogether 21,000*l.* had been borrowed for different purposes, of which the sum of 10,000*l.* for the erection of the present waterworks formed part. The works have been in operation four years, and are now self-supporting. 500*l.* have been paid off, the principal and interest were promptly paid up, and there were now 100*l.* in hand from the water receipts. The present reservoir held 108,000 gallons of water, which was pumped from the well at the rate of 9,000 gallons an hour, during ten hours per day. Through the increasing demands for the water, 12,000 gallons an hour were required, and it was proposed to erect a reservoir for the storage of the water which, during the night, ran away. A smaller reservoir, and a duplicate reservoir, would also be required, also mains, tanks, &c., for the completion of the works.

Leamington.—The Local Government Board has sanctioned the application of the Leamington Town Council for leave to borrow 20,000*l.*, 17,000*l.* of which are to be devoted to carrying into effect the new waterworks scheme. The Local Government Board recommend the Public Works Loan Commissioners to lend the money at 3½ per cent. interest, and to extend the instalments in repayment over a period of fifty years.

Liverpool.—The Liverpool water committee have had under consideration a scheme lately projected for a supply from Haweswater Lake by Mr. Bintley, C.E., resident at Kendal. Owing to the great height of Haweswater above the sea level (694 feet), the pressure in the mains in Liverpool would, it is said, be sufficient to obviate the necessity for using steam-engines at fires, and could also be utilised to great advantage for hydraulic hoists at a very small cost. With regard to the quantity obtainable, the water-shed of the lake, as it stands, will yield 25 million gallons a day, which is above the highest estimated requirements of the town in 1885; but, by impounding other waters in the immediate district, and diverting them into the lake, which could be done at a comparatively small cost, the supply could be increased to 100 millions a day; and with this enormous quantity at their command, the corporation would be in a position to share it with other towns to which, by reason of their situation, it might be available. As to the quality of the water, it is stated to be equal to that of any other lake in the United Kingdom. There is, however, the question of cost, upon which a great deal will depend, and as to which Mr. Bintley has yet to satisfy the committee before the plan can be actively entertained. It is alleged that, in this respect, Haweswater compares most favourably with the Windermere scheme, and much more so with that of Ullswater.

Broughton-in-Furness.—Mr. S. J. Smith, C.E., has held an inquiry with reference to a petition presented by the Rural Sanitary Authority of the Ulverston Union to the Local Government Board for a provisional order to acquire certain water rights, enabling them to supply water to the town of Broughton West, and to borrow 2,100*l.* for carrying out the requisite works. The scheme proposed is to supply the town of Broughton West with water from a spring in a field on the Whallenrigg estate, belonging to the trustees of the late Thomas Williamson, and to construct a reservoir with a capacity of 250,000 gallons, a supply for thirty days, in the allotment belonging to the trustees of the Aulthurst-side school, about a mile and three-quarters from Broughton. It would require about two miles of pipe to supply the town. Half an acre of land would be purchased for the reservoir purposes. Additional supplies of water could be obtained from a source immediately adjoining, but the present supply from the spring was calculated to yield sufficient for the supply of the town. Mr. Goodison is the engineer. From evidence given by Dr. Page, Medical Officer of Health, there would appear to be great need of an improved water-supply. He said he had analysed water from thirty-three pumps, and twenty-six of the samples were quite unfit for domestic purposes.

Wakefield.—The Wakefield Town Council has resolved, "That the Council, as the Urban Sanitary Authority, purchase, subject to the sanction of the Local Government Board, all the rights, powers, and privileges, and all the premises and other property, of the Wakefield Water Company, on the following terms, viz.:—The Corporation to pay 48*l.* for each paid-up original 25*l.* share; 24*l.* for each paid-up original 12*l.* 10*s.* share; and 11*l.* for each paid-up 10*l.* share; and, in addition, the Corporation to take over the debts and liabilities of the Company existing at the time of purchase."

BUILDING ON THE CHELSEA EMBANKMENT.

THE several plots of building land which the Metropolitan Board of Works have on sale in front of the Chelsea Embankment, after having completed the works, are being rapidly disposed of, and mansions are now beginning to show themselves on the respective sites. One of the most conspicuous and prominent of these new structures is a very large residence which is in course of erection, and now nearly completed, for Mr. Matthey, the Government assayer. The building is situated at the angle of Queen's-road and Cheyne-walk, and has four elevations, all varying in their architectural details, the aggregate length of the several frontages being 250 ft. The Queen Anne style of architecture has been adopted, the materials used for the several elevations being red brick, with cut and moulded brick for window-heads, sills, keys, arches, string-courses, and general dressings. The north frontage, facing Queen's-road, contains, above the ground-floor, two and three irregular stories, some of the windows being of great height. At this frontage, in addition to one of the principal entrances, there is also an archway, leading to the stables. The height of this frontage is about 50 ft. The west frontage, overlooking Cheyne-walk, and the Chelsea Embankment Gardens, may be regarded as the principal elevation of the structure. It is nearly 80 ft. in height, with a lofty high-pitched hip-roof, above which, in the centre of the structure, there is a spacious open balcony, enclosed by balustrades. This balcony is approached by a staircase in the interior, constructed especially for the purpose, and its height gives a commanding and extensive view of the surrounding country. The ground-floor portion of this frontage is circular on plan, with a stone string-course immediately above, surmounted by a balcony at the foot of the first floor, which contains a range of seven windows, 14 ft. in height, with ornamental arched heads in moulded bricks. The second-story windows are uniform with those on the first floor, but not quite so lofty. Above the second floor is a coved cornice, 3 ft. in depth, in Portland cement, and it should be added that this cornice is carried round all the elevations. The cornice is surmounted by three dormers, 10 ft. in height, covered with projecting hoods in brown tile-work, uniform with the whole of the roofs. At the south-west angle of the Embankment and Cheyne-walk there is an octagonal frontage, containing ground and upper floors, the windows of the latter being 15 ft. high, and the elevation surmounted by dormers uniform with those on the west front. The South or Embankment frontage contains three stories above the ground-floor, with balconies at the foot of each story, and is surmounted by pediment dormers. The whole of the ornamental chimney-shafts are very lofty, one at the east end of the structure forming a square tower, and rising to a height of more than 100 ft. The building internally contains a very large number of apartments, including dining-rooms, drawing-rooms, billiard-rooms, and other reception and entertaining

rooms, which are intended to be elegantly finished and decorated. The architect is Mr. Norman Shaw, and the builder Mr. Charles Jarret, of Croydon.

Immediately to the east of the above building another mansion, having its principal frontage to the Embankment, is also in course of erection. It is in the same style of architecture as the structure just described, the variation being that the first and upper floors, which have narrow bay windows of great height, project considerably over the ground-floor of the Embankment frontage. On other portions of the Metropolitan Board's land a little further eastward, near the west boundary of the hospital grounds, two other large houses are likewise about to be built.

PROPOSED THOROUGHFARE UNDER CONSTITUTION HILL.—THE PARK LANE FOUNTAIN.

THE intimation recently made in Parliament by her Majesty's Commissioners of Works of their intention to form a new road between Hamilton-place and Grosvenor-place, has induced the St. George's (Hanover-square) Vestry to take action in the matter, and at a meeting of that body last week it was taken into consideration, when Mr. Hoby, one of the members, suggested a road alongside of Constitution-hill. This proposal, however, did not meet with general approval. Subsequently the surveyor submitted a plan for an opening in Piccadilly, half-way between Hamilton-place and Hyde Park-corner, the road going under Constitution-hill, and coming out into Grosvenor-place. After a discussion on the surveyor's plan, it was decided to appoint a deputation to confer with the First Commissioner of Works, and submit to him the desirability of adopting the surveyor's proposal.

At the same meeting attention was drawn to the present neglected state of the fountain by Mr. Thornycroft, sculptor, some time ago erected in Park-lane. Colonel Baring, in calling attention to the subject, said the opponents of local self-government could not have a better weapon than the present state of the fountain offered to them, for such opponents could say that the Committee of Works of St. George's had allowed this work of art to remain neglected for a long time. For the small sum of 120*l.* he understood that the fountain could be put into a proper state, and that being so, he moved that the surveyor do the necessary lighting and paving round the fountain for a sum not exceeding 150*l.* The proposal was adopted, and the necessary works will therefore be carried out.

PUBLIC WORKS LOAN COMMISSION.

THE first annual report of the Public Works Loan Commission, prepared in pursuance of the Act of last year, has just been issued. It narrates at some length the history and proceedings of the department from its origin, in the year 1817, and recounts the different Acts of Parliament which down to the end of session 1874 were passed with reference to the Board to make advances of money for works of public utility. As the Public Works Loan Act of 1875, under which the present Board was appointed, did not properly come into effect till the 1st of April last, it is explained that, except in regard to the regulations for the granting of loans under the statute, the transactions with which the report has reference are those of their predecessors. In an appendix to the report is contained a statement giving in detail the sums issued to the Public Works Loan Commissioners for the purpose of advances up to 31st March, 1876, bringing out a total of 30,582,679*l.* The sum advanced by them during the financial year 1875-76 amounted to 3,320,411*l.*; the total payments into the Bank of England in repayment of principal and for interest, to 796 159*l.*; and the balances of principal and interest outstanding at the date mentioned, to 14,715,365*l.* The number of new accounts opened during the year was 1,328, and the number open at the close of that period 5,238,—an increase of 1,189 over the same date in 1874. Grants of loans under the English Education Acts were given during the year amounting to 1,718,116*l.*; under the Scotch Education Act, to 666,383*l.*; sanitary loans recommended by the Local Government Board to 737,173*l.*; loans to Parochial Boards, Police Boards, and other borrowing authorities in Scotland, 79,000*l.*; for canals, rivers, and drainage, 125,000*l.*; and under the Harbours and Passing Tolls Acts, 70,000*l.* An abstract has been made and forwarded to the Treasury, showing the total sum which will probably be required before the end of the present financial year, as appears from the returns furnished by intending borrowers. The amount stated is 9,893,459*l.*

THE AMRAVÂTI SCULPTURES.

IN a recent issue we gave an account of Mr. James Fergusson's description, before the members of the Royal Asiatic Society, of such of the Amravâti sculptures as are arranged at the India Museum, South Kensington.* We have now to announce that the Government of India has given 1,000 rupees for the further exploration of the site of the *stupa*, and has instructed Mr. R. Sewell, acting head assistant collector of the Kristna district, to carry out the work. The whole of the *stupa* itself has been removed, even including its foundations, so as to form a circular tank, surrounded by a high mound. This mound will be the object of the new excavations, as General Cunningham believes that beneath it lie the remains of the double railing which at one time surrounded the monument. The General recommends that the work should be begun from the interior of the circle, the whole of the excavated earth and rubbish being thrown into the central tank. Of course all standing stones or stonework *in situ* will be left undisturbed until the exact position of each piece, and a general plan of the whole, have been laid down by a competent surveyor. General Cunningham also advises that a strict scrutiny should be made of all the carved stones in the town of Amravâti and its neighbourhood for some of the missing sculptures of the Amravâti *stupa*, and that impressions of all inscriptions found should be carefully made, and if possible photographs taken of them. In a recent communication to the Government of India on the subject, he says: — "I remember nothing in Colonel Mackenzie's map of the site of a single rock, near the bank of the river above the town, labelled Sasanam Rock. As this name suggests the existence of an edict engraved on one of the rocks, I strongly recommend that a careful examination should be made of all the rocks in the position indicated. In conclusion, I beg to express my opinion that inscriptions should be most diligently sought for, as it is to them we must look for the history of the *stupa*. We already possess more than a sufficient number of sculptures to show the style of art which prevailed when the *stupa* was erected. From the sculptures Mr. Fergusson has inferred that it must have been built in the fourth century A.D. From the inscriptions, on the contrary, I infer that it was erected towards the end of the first century A.D. As the forms of the alphabetical characters are a much surer criterion than the style of the sculptures for determining the date of any building, I trust that the importance of securing every fragment of inscription may be kept in mind." Mr. Sewell's explorations will also extend to the caves at Undavilly, the Bhattiphole Tope, and the hitherto uninvestigated circular mound at Pidugurala.

ALL SAINTS' CHURCH, SOUTH LAMBETH.

THE foundation-stone of this church was laid on Thursday, the 20th inst., by Col. Sir F. Fitzwygram, bart.; present also the Lord Bishop of Winchester, the Bishop of Guildford, &c.

The new church will consist of a nave 93 ft. long by 24 ft. wide, with north aisle 13 ft. wide, south aisle the same width and 77 ft. long; chancel, 29 ft. long and 20 ft. wide. The height internally of the nave from the floor to the wall plate is 37 ft., and its extreme height 59 ft. On the north side of the chancel is situate the organ chamber, and on the south the choir and ministers' vestries. The tower is placed at the south-west corner, and projects slightly before the west front of the nave. There will be a central west entrance, and a porch doorway on the north side, and an entrance also through the tower. The roofs to the nave, chancel, and aisles, are to be open, with framed principals at intervals, boarded, and covered externally with slates, and the timber stained in two shades, and lined and varnished.

The arcade separating the nave and aisles will have moulded arches supported on piers, alternately octagonal and circular in plan, of Portland stone. The chancel arch is similarly treated, with the addition of Aberdeen granite shafts corbelled out from the piers, and supporting extra moulded members.

Externally, the walls are to be constructed of brickwork, faced with Kentish Rag, with dressings of Bath (Box Ground) stone, while Corsham Down stone will be used for internal dressings of doors, windows, &c.

The tower externally is 18 ft. 6 in. square, and the height to the base of the spire 80 ft., the latter being 84 ft. high, making the total height to the top of the spire 164 ft.

The east end of the chancel is apsidal on plan.

In style the church will be that of the Decorated period.

The contract for the building has been taken by Messrs. Lucas, Brothers. Mr. Bedborough is the architect.

* See p. 691, *ante*.

SAFETY IN INDUSTRIAL OCCUPATIONS.

AN offer of a medal in connexion with this subject has been made to the Society of Arts by Mr. Benjamin Shaw, and has been accepted by the Council.

The medal will be of the value of 20*l.*, and will be awarded every fifth year. Mr. Shaw has directed a sufficient amount of Consols for the purpose to be transferred into the name of the Society.

The terms of the offer are as follow:—For any discovery, invention, or newly-devised method for obviating or materially diminishing any risk to life, limb, or health, incidental to any industrial occupation, and not previously capable of being so obviated or diminished by any known and practically available means." The first award will be made in May, 1877.

THE HANS-PLACE IMPROVEMENTS.

IF the building operations here are to be carried on with the celerity and intelligence which have been displayed in that part of the scheme which consists in the widening of the piece of road that runs between the gardens of Cadogan-place, our children may live to see the completion of the new quarter, though we shall not. This improvement, which consists in putting back the enclosure railing of the garden and forming a new path, has been in hand some months, and when completed will present an absurdity, for the added width of road opens "slap" against a house in Cadogan-place. It is difficult to look at it without laughing.

BREACH OF CONTRACT.

JENKINSON AND ANOTHER *v.* HAMMONDS.

THE plaintiffs in this action (which came before Mr. Justice Brett at the Staffordshire Summer Assizes on the 17th inst.) were Messrs. Jenkinson Brothers, carpenters and joiners, of Penton; and the defendant was a publican and bricklayer of the same town.

The action was brought to recover 25*l.* under the following circumstance:—The defendant having decided to erect five houses, and to do the bricklayers' work himself, entered into a contract with the plaintiffs to do the joiners' work for the sum of 261*l.* 18*s.*, one-third to be paid when the first floor was reached, one-third when the houses were roofed in, and one-third on the completion of the work. The execution of the work depended very much on the progress made by the defendant with the brickwork. He was very slow; but after many delays the work was nearly completed, when the defendant came to a dead stop, and the plaintiffs could neither get him to go on nor could they get the balance of their account. A lawyer's letter was sent to him, and he promised to pay the balance due; but not keeping his promise, this action was brought.

Mr. Wood, architect, Longton, gave evidence respecting some trivial deviations from the specification.

The defence was that the plaintiffs had left a considerable quantity of work undone without any default on the part of the defendant, and that they had used materials inferior to those specified for.

Mr. Hammonds, the defendant, having given evidence,

Mr. John Smith, builder, said it would take 15*l.* to make good the deficiencies of the plaintiffs.

His lordship having summed up, the jury returned a verdict for the plaintiffs,—damages, 27*l.*

ABERDEEN MASONIC HALL.

AFTER repeated extensions of time to the competitors for the design for decorating the Aberdeen Masonic Hall, the committee met recently to decide upon the best. When the selection was made the proposal was found to be by Mr. Louis Soder, of 30, Panmure-place, Edinburgh, the execution of which is entrusted to Messrs. George Dobie & Sons, with whom Mr. Soder is connected, and under his superintendence the work will be completed. The cost of the whole will be 306*l.*

A LARGE BUILDING SOCIETY.

AT the twenty-fifth annual meeting of the Birkbeck Building Society, held a few days ago, the report presented to the meeting showed that the receipts for the year were 5,296,691*l.*, and the total from the commencement of the society 27,287,385*l.* The total liabilities amount to 2,056,709*l.*, and the surplus funds (which are invested in Government, Metropolitan, and Indian stocks, City of London and Colonial bonds, gas and water, stocks and shares, freehold groundrents, and other convertible securities) amount to 1,220,386*l.*, exclusive of the cash balance of the bankers, which is 144,674*l.* In other words, the society's reserve now stands at 1,365,061*l.*, the proportion of reserve to liabilities being upwards of 66¾ per cent. The triennial division of profits has been made this year. The bonus declared will absorb 26,104*l.* The permanent guarantee fund is increased to 33,750*l.*, and the balance 8,920*l.* is carried forward.

The number of investors and depositors at the close of the year was 35,902*l.*

KENSINGTON.

SIR,—In your recent elaborate description of Kensington House, you notice the great improvement made by widening the roadway opposite, and opening up Kensington Gardens. Can you not help by your influence to obtain a still greater and more needed improvement? viz, the setting back of those irregular and protruding shops in the High-street, just by, which causes the Royal Western-road at that spot to be both highly dangerous and very unsightly. The pathway also in this important thoroughfare is in some places less than 5 ft. wide, and there is a very ugly gap opposite Palace Gardens. Surely this fashionable suburb should have its leading thoroughfare better arranged; and a few remarks from your powerful pen may lead to good results.

ARCHITECT.

MASTERS AND MEN.

Sheffield.—The strike of masons at Sheffield is at an end. The men struck some weeks ago for an advance of a halfpenny an hour, which is equivalent to an advance of 2s. per week. The masters have now conceded the advance, and the men have resumed work.

Chester.—The strike in the building trade in Chester still continues, and affairs seem as far off from a settlement as ever. The employers held a meeting on the 18th inst., but the result of their deliberations has not yet transpired. It is known, however, that several of the larger employers have already commenced to obtain the assistance they require from other counties.

Newcastle-on-Tyne.—After a struggle of thirteen weeks, the operative painters, having failed to gain the advances sought for, agreed on the 17th inst. to resume work, and the employers opened their shops on the 18th, and work was resumed subject to a set of working rules to be settled hereafter.

Willenhall.—The Willenhall lockmakers, who have been on strike for three weeks for an advance of 10 per cent. in their wages, resumed work on the 19th inst., the masters and men having decided to refer the question in dispute to arbitration.

Greenock.—The strike of joiners is now at an end, the men having agreed to return to work at the old rate of wages, with no bye-laws to be signed either by the employers or employed.

Glasgow.—The expected strike in the Glasgow mason trade has been averted for the present by the masters conceding the demands of the workmen, the wages now standing at 9d. instead of 8½d. per hour. A stipulation has been agreed to by both parties that three months' notice on either side shall be given before any alteration can be effected.——At a meeting of the operative joiners held last week, the chairman, Mr. M'Intyre, said he saw no reason, now that the masons and bricklayers had been granted their demands, why the joiners should be refused. He expressed the opinion that ere many days elapsed, the masters would be compelled to give in. Deputations were appointed to keep a vigilant watch on all "suspicious jobs" during the Fair holidays. The building trade in Glasgow just now is rather brisk, though there are large numbers of houses standing unoccupied.

Edinburgh.—A mass meeting of operative joiners of Edinburgh was held in St. Mary's Hall on the 20th inst., Mr. Thom in the chair. The meeting was called by request of the operative joiners of Glasgow, who appointed a deputation to explain the position and prospects in connexion with the present dispute in that city. A resolution was unanimously passed by the meeting pledging the joiners of Edinburgh to give their moral and material support to their brethren in the West.——At an aggregate meeting of the plumbers of Edinburgh, held in Adair's Hall, High-street, on the 20th inst., a communication was read from the Masters' Association relative to the demand which the operatives had made for an advance of 1d. per hour on their present rate of wages. The masters offered to compromise the matter by granting ½d. per hour additional on the present rate of 7½d.; and after some discussion it was carried by a majority that the men should accept this offer.

ROMSEY ABBEY.

YOUR correspondent, "C. H. P.," makes some remarks upon the supposed original completion of the Lady Chapel, which leads me to mention that a few years since an attempt was made to discover the foundation and extent of the chapel eastward, and it was attended with success. The zealous vicar proposed (if sufficient data could have been found to show the ancient lines of the chapel) that it should be reproduced as a fitting memorial to the late Lord Palmerston; the scheme, however, did not meet with the response which was expected, and sufficient money not being forthcoming it was reluctantly abandoned, and a statue in the market-place erected instead. It may be interesting, however, to state that the chapel was clearly defined by its foundations: the length from east to west was 30 ft., and its breadth 33 ft. The east wall showed the base of a respond answering to the existing one on the pier between the two windows referred to by "C. H. P." The chapel must have consisted of four quadripartite bays, the central clustered shaft was indicated by its base, leaving no doubt of the plan. Some fragments of ancient tile were found amongst the *débris*. The two Geometrical windows were no doubt removed from the east wall of the Lady Chapel when it was demolished, and clumsily rebuilt in the wall, filling up the Norman arches; probably the north and south walls of the chapel had couplet windows. The height of the chapel is known by the wall-ribs and springers of the groining, which are still remaining; so that as to the general proportion of the building no doubt could exist: it must have been almost unique, and could not in any way have interfered with the majestic and beautiful windows of the east end of the choir.

In a former notice of this Abbey Church, some strictures are made upon the colouring to the nave roof, which is attributed to me. I will merely mention that it was not coloured under my supervision or direction.

BENJ. FERREY.

MEETING OF MUNICIPAL ENGINEERS AND SURVEYORS.

SIR,—In your account of the proceedings of the above meeting, I am reported to have stated in my paper that Morrell's earth closets were to be adopted in Ipswich, instead of carrying out a system of drainage. This is not correct. What I stated was that towns, as a rule, could not dispose of their sewage by irrigation or chemical treatment. The former being in many cases impracticable either on account of cost or the difficulty of getting land, and the latter so expensive, with little or no return for manure produced, that town authorities were compelled, in connexion with general drainage, to have a system of interception for solid sewage, on what is known as the "dry system," to reduce the quantity of sewage, and the difficulty of dealing with it at the outfall, and where such duplicate plan is desirable Morrell's closet, in my opinion, is the best that can be employed, but no system of dry collection alone would meet the sanitary requirements of any town without drainage works.

E. BUCKHAM, C.E.

ART AND THE SOCIAL SCIENCE CONGRESS.

AN Art Section of the Social Science Congress, to be held at Liverpool in October next, has been organised, and Mr. E. J. Poynter, principal of the National Art Training School, South Kensington, has consented to preside over the section. The subjects for discussion include the following:—

1. On the desirability of the improvement of street architecture; especially as regards its connexion with public buildings, and of the encouragement of mural decorations, including frescoes and other painting.

2. The influence of decorative art and art workmanship in all household details and furniture upon society.

3. The influence of academies upon the art of a nation.

This section has been organised owing to the marked interest shown in Liverpool in the spread of art as a refining influence. The Art Club of that town has had a series of exhibitions, each devoted to a special subject, the last of which, a collection of the works of David Cox, was very successful; besides, there have been exhibitions of embroidery, of Oriental art, &c. During the Congress, the Club will have an exhibition of illuminated manuscripts and Mediæval miniatures, for which most satisfactory promises have already been received. There will also be an excursion to Wrexham to see the art-treasures exhibited there, and of which we speak on another page. The new Gallery of Art presented to the town by Major Walker will, unfortunately, not be ready for opening, but will be sufficiently near completion to show what it will be like. The question of mural decoration will be made a prominent one at the ensuing Congress, and it is hoped the agitation may have practical effects. Major Walker has most liberally commissioned Mr. Warrington Wood for three colossal figures,—Michelangelo, Raffaelle, and an allegorical figure of Liverpool, of which the models are completed. The result of the spirit and good taste of the Principality will not be one of the least enjoyable features of the Congress. The Art Section, therefore, may probably be one of the most popular of the Congress.

Books Received.

The Trade Unions: an Appeal to the Working Classes and their Friends. By ROBT. SOMERS. Edinburgh: A. & C. Black. London: Longmans. 1876.

MR. BRIGHT once said,—"A book, not a small one, might be made up of the strange doings of trade unions. Monopoly is hard to teach, and I fear the working men will only learn through suffering, and may do mischief which cannot be afterwards repaired"; and Mr. Somers has compiled and written the book named above with much the same idea and aim. It is an antagonist's view of the institution, and the tone of it would probably not gain the confidence of thick-and-thin supporters of trade unions; nevertheless, the book contains much which they may usefully read and reflect on.

Miscellanea.

Wonderful if True.—There is said to be much talk in American scientific circles about the Keely Motor. Mr. Keely, a working-man, declares that by means of a machine which he has invented, he can, without the use of fuel, and by merely turning a handle, generate out of water a vapour so much more powerful than steam that with a gallon of water he can drive a heavy train from Philadelphia to San Francisco; and with a hogshead he could impel a Cunard steamer from Liverpool to New York against a continuous westerly gale! The inventor, it is stated, has induced Mr. Collier, a patent solicitor, to examine into the matter, who was so struck with what he saw that he got a scientific man to verify it. Both agreed that Keely did actually produce extraordinary results, but they could not tell how these results were obtained. The Chief Engineer of the United States Navy, who witnessed the experiments, was equally assured that the thing was actually done, but equally at a loss to explain the doing of it. Mr. Collier then formed a company in New York. A small capital for carrying out the preliminary experiments was raised. Mr. Keely is said to have refused to receive a cent until the world has been thoroughly convinced of the reality of his invention, and until patents have been secured in every country. Well done, Keely!

Discovery on the Acropolis at Athens.—The Berlin Archæological Society, in their excavations on the south end of the Acropolis in Athens, are stated to have discovered a very important marble slab, with an inscription of eighty lines, containing the treaty made by the Athenians with Chalkis after the whole of Eubœa had been subjected under the leadership of Pericles.

Bursting of a Tank.—The *New York Times* says that early on the morning of the 24th ult. a stream of Croton water was turned into the large circular tank of the New York Aquarium, for the purpose of testing it. This tank, the same in which two white whales were placed some time ago, had never been filled before,—sufficient water only having been put in it on that occasion to keep the whales alive. It was 25 ft. in diameter, and about 6½ ft. deep, holding when full from 60,000 to 65,000 gallons. The bottom was of brick, covered with Roman cement, and the sides for about 2 ft. upward were of the same material, on which rested a heavy framework of iron in which were set plates of polished glass 2 ft. wide by 4 ft. long and half an inch thick. Just at noon, when the water had reached to within 6 in. of the top, and orders had been given to turn it off, a loud crash was heard, and about one-fourth of the wall or side of the structure gave way, flooding the whole of the space about it. One of the workmen, who was in the act of turning off a waste-cock at the base of the wall where the break occurred, was struck with the fragments, and thrown violently foward, receiving serious injuries about the hips and the body.

Bow-street Police Court (Site) Bill.—Mr. W. H. Smith, in answer to a question in the House of Commons, on the 20th inst., said:—There will be payable to the Duke of Bedford a ground rental of 1,300*l.* per annum for a lease of ninety-nine years. There will be also a sum payable to the present tenants in respect of their interest, which will be ascertained in case of difference under the general Act. It is undesirable at the present moment to state at what sum those interests have been valued. The above-mentioned expenditure will be incurred for the site both for police-court and police-station. The proportion which will be payable in respect of the site of each of these buildings cannot be stated at present, and it will have hereafter to be determined accordingly what portion shall be borne by the Board of Works and what by the Police Rates. The cost of the buildings is estimated at 12,000*l.* for the court and 8,000*l.* for the police-station, which will be charged to the separate heads of Public Works and Police Rates. These estimates for buildings are approximate.

Foreign Competition in the Iron Manufacture. — Reliable information received in London states that the Creusot Works in France have succeeded in obtaining the contract for the supply of locomotives for the important colliery railway company of the Donnets, in Russia. Goods engines, having six connected wheels, and weighing thirty tons each with the tender, are to be supplied at a price equal to 1,895*l.* 16s. 8d. in our money each. This, we believe, is the lowest quotation which has ever been made for a similar engine. A yet more serious circumstance deserves the attention of English ironmasters. We hear from Belgium that a M. Benit has tendered and offered to the Government of India steel rails of excellent quality, in quantity 2,950 tons, of a weight of 62 lb. per yard, at 228f. 82c. per ton of 1,000 kilogrammes (*i.e.*, about 30 lb. short of our English ton), delivered free on board at Calcutta; and also 200 tons and 26 kilogrammes per French mètre, at 23f. 45c. per ton of 1,000 kilogrammes.

Proposed Sale of the Friends' Burial-ground at Bunhill-fields.—A proposition has recently been made to sell the burial-ground belonging to the Society of Friends at Bunhill-fields, for the purpose of erecting some model dwellings for the operative classes in that densely-populated neighbourhood. As the ground contains the remains of George Fox and many of the early Quakers, the suggestion has met with a good deal of opposition, and on Tuesday last, at a meeting of the committee which has the direction of the matter, a modified proposal was adopted. That portion of the burial-ground in which Fox's remains are interred will be retained, and a comparatively small portion of the ground, the suitability of which has been interfered with by the London School Board, will be disposed of. On a portion of what is to be retained the Society propose to erect a mission-hall for the benefit of the poor of the neighbourhood.

The New Crown Court, Nottingham.—The new Crown Court, Nottingham, was opened on the 21st inst. Mr. Justice Mellor spoke in terms of commendation both of its appearance and arrangement. Mr. Sanders is the architect.

Proposed Museum of Science.—The President of the Royal Society (Dr. Hooker), Mr. Spottiswoode, Dr. Burdon Sanderson, and Dr. Siemens, had an interview, on the 17th inst., with the Lord President of the Council, the Duke of Richmond and Gordon, and presented to him a memorial in favour of the establishment of a museum of pure and applied science. The memorial was numerously signed by gentlemen who have been connected with the Loan Collection of Scientific Apparatus at South Kensington. The memorialists defined the proposed museum as one "to contain scientific apparatus, appliances, and chemical products, illustrating both the history and the latest developments of science; where the methods and results of investigations which have marked important stages in the advancement of science may be studied, and where also the most highly perfected instruments of the day may be found." His grace discussed the subject with the deputation, and stated that he would consult his colleagues.

St. Alban's Abbey.—The members of the Architectural Societies of Northamptonshire and Leicestershire visited St. Alban's on the 20th inst., and on the 21st extended their excursion to Hatfield House, the seat of the Marquis of Salisbury. On the evening of the 21st inst. a general meeting of the St. Alban's Architectural and Archæological Society was held in the Town-hall. A paper was read by the Rev. O. W. Davys on the choir of St. Alban's Abbey. Sir Gilbert Scott was present, and in the course of the evening gave a brief history of the abbey, and described the works of restoration being carried on. He stated that at the present time the funds were absolutely exhausted, nor was there any immediate prospect of an increase in them. It would be a shame and disgrace to the country should such a magnificent structure be allowed to fall into ruins. On the 22nd the abbey was visited, and descriptions of various parts of the building were given by Sir Gilbert Scott and Dr. R. Lloyd.

Social Science Congress, Liverpool.—The date of the Congress (elsewhere alluded to) to be held at Liverpool in October, has been changed from the 11th to the 18th to the 10th and 17th of that month. The special questions to be discussed in the Health Department are—1. What is the best mode of making provision for the supply and storage of water (1) in large towns such as Liverpool and Manchester; and (2) in groups of urban communities of lesser size, such as exist in the manufacturing districts of Lancashire and Yorkshire? 2. What further legal enactments, if any, are required with a view to arrest the spread of infectious fevers, and how far national and municipal registration is desirable as a means thereto; and, if so, what would be nature of such registration? 3. What amendments are required in the legislation necessary to prevent the evils arising from noxious vapours and smoke?

Noxious Vapours Commission. — The Queen has been pleased to appoint Lord Aberdare, Earl Percy, Viscount Midleton, the Hon. Wilbraham Egerton, Mr. James Cochrane Stevenson, Mr. Frederick Augustus Abel, president of the Chemical Society; Mr. Alexander William Williamson, professor of Chemistry and Practical Chemistry at University College, London; Mr. Henry Enfield Roscoe, professor of Chemistry at Owen's College, Manchester; and Vice-Admiral William Windham Hornby, to be her Majesty's Commissioners to inquire into the working and management of works and manufactories from which sulphurous acid, sulphuretted hydrogen, and ammoniacal or other vapours and gases are given off; to ascertain the effect produced thereby on animal and vegetable life; and to report on the means to be adopted for the prevention of injury thereto, arising from the exhalations of such acids, vapours, and gases.

Overbuilding in Glasgow.—A Glasgow paper states that the amount of property remaining unoccupied at the present time in Glasgow and the immediate suburbs, in the shape of dwelling-houses, shops, warehouses, &c., is unprecedentedly great. There are said to be no fewer than 6,000 houses, &c., without tenants, owing to the extent to which the reconstruction of old properties and the speculative building mania has been carried. In the outskirts of the town, as also in the suburbs, there is abundant evidence of the overbuilding to which we refer. Ranges of untenanted tenement houses may be noticed in almost all directions, and there are likewise many self-contained houses and villas in the same condition.

Stannah's Lifts.—More and more will lifts be used. More and more is it essential that any liability of danger which may have attached to them should be removed. The most alarming of these liabilities, now guarded against in various ways, is the possibility of disaster in the event of the rope or chain breaking. The "safety apparatus" used by Mr. J. Stannah, of the Southwark Bridge-road, consists in this, that two small wheels turning eccentrically are thrown forward in the event of the rope breaking, and clip the guides. The apparatus can be applied to lifts with iron or wooden guides, and has the advantage over some now in use, that its action will not damage the guides, so that the lift is ready for use as soon as the rope or chain is renewed. The arrangement acts perfectly in a lift we have examined.

Soho-square.—The hitherto gloomy appearance of Soho-square has just been greatly relieved by the substitution of new light cast-iron railings for the heavy rails which hitherto have surrounded the enclosure. The garden in the centre has been laid out, with gravelled walks and beds of flowers, diversifying the grass-plots. We understand that these improvements have been carried into effect, not out of the parish rates nor out of any public funds, but by a subscription among the inhabitants. The total cost of these improvements is about 1,200*l.*, including the iron railings, which cost 800*l.* The statue which formerly stood in the middle of the square has been removed to the grounds of Mr. Frederick Goodall, R.A., at Harrow-weald. The site of the statue is now occupied by an octagonal building, a cross between a tool-house and a summer-house.

Old Houses in Dysart.—The burgh of Dysart consists of a very old portion of the town in the locality of the Abbey Church, and of the modern part to the north and east. Most of the houses bordering on the precincts of the abbey are very large, surrounded by massive walls, and appear to have been nearly all self-contained at one time. The date of the buildings is cut out over the main entrance, with a text of Scripture or an old proverb and armorial designs. Many of the dates go back to the fifteenth century. A large block of houses in the old portion of the town has just been removed, to widen the Coalgate. These houses were built in 1660. Some of them possessed very deep and secret recesses for smuggling purposes, and it is not uncommon to find a draw-well in a house which at one time in Dysart was used for the contraband trade.

Promoting Technical Education.—The Glass Sellers' Company of the City of London have issued their report on the result of their efforts to utilise their funds in the promotion of technical education by the offer of prizes for superior workmanship in the manufacture of glass. The first silver medal for engraving and the gold medal for engraving, and the gold medal for the best workmanship in the exhibition, were awarded to Paul Oppitz, in the employment of Messrs. Davenport, of the Staffordshire Potteries, who took the prize for the best collection exhibited. Eleven other silver and thirty-five bronze medals were awarded. Messrs. Grun & Nephew, Messrs. Gibbs & Moore, Messrs. Cetti & Co., the North British Glass Company, Mr. G. C. Blackwell, and Messrs. Chance, Bros., & Co. are thanked for their contributions.

Gloucester Cathedral.—A new arrangement affecting those who may visit Gloucester Cathedral has come into operation. The principle of making a charge to visitors is required to be maintained, to secure the necessary services of a guide, and to insure proper order and decorum being preserved; but in order that it shall take the least objectionable form, the contributions of visitors, at the minimum rate of 6d. each, are placed in a box kept for the purpose, these being devoted towards the restoration of the Cathedral and other expenses by the Dean and Chapter, and the names of visitors, or one of a party, with the number of such party, are entered in a book.

Ornamental Ironwork.—The long and well known firm, G. B. Cooper & Sons, of Drury-lane, have issued a portly trade-book of designs for brackets, lamp-pillars, tomb-fences, railings, crestings, columns, balconettes, gates, stoves, and so forth, mostly very good and well drawn. As prices are given, and the variety is very great, the volume becomes an illustrated price-book of much value.

New Farm Buildings near Doncaster.—New farm buildings have lately been erected at Woodlands, Adwick-le-street, near Doncaster. The buildings are erected with old stone, resulting from the demolition of former buildings; the door and window jambs and arches being of red brick, as well as some horizontal bands; the roofs covered with slate. There are three foldyards, two of which are covered, and the other open. The cost of these buildings will be 1,986*l*. The designs for the buildings have been prepared, and the works superintended, by Mr. W. M. Teulon, architect, London; and executed, the general works by Mr. Alexander Clark, builder, of Adwick; and the cottages by Mr. Roberts, carpenter, of Adwick, and Mr. Fisher, of Carcroft.

The Haugh Bridge, Inverness.—The provost and magistrates of Inverness, together with Mr. Anderson and Mr. Manners (the representatives of the promoters of the Haugh Bridge), have agreed, at the suggestion of Mr. William Paterson, C.E., to raise the level of the bridge about 2 ft., to obviate any risks from high floods. Mr. Paterson reported the bridge as otherwise strong and sufficient, and the committee have agreed to recommend the Town Council to sanction its erection across the river as proposed. Mr. W. Smith, the contractor, has the materials nearly ready for erection. The workmen are now busily engaged on the foundations of the piers.

Thunderstorms as affected by Sanitary Operations.—The writer of the "weather forecasts and storm warnings" which appear daily in the *Morning Post* remarks incidentally that the thunderstorms over London from year to year have become less frequent and violent. This undoubtedly must be attributed to the purification of the Thames and an improved system of drainage. The course of the most violent thunderstorms now will be found over localities of polluted rivers, stagnant ponds, swampy grounds, and badly-drained towns, which yield large quantities of nitrous and sulphurous exhalations and other unwholesome vapours.

The Old Bridge at Bath.—After prolonged controversy, the Bath Town Council has, by a large majority, agreed to the adoption of the recommendation of the Borough Property Committee, that the old bridge should be put into thorough repair, at a cost of 2,200*l*. The subject was before the Town Council in April last, when the adoption of Mr. Richardson's plan for a new bridge was negatived by a narrow majority. The opinion largely prevails in Bath that not only is a new bridge necessary to meet the exigencies of traffic, but that the erection of a new structure would be the truest economy in the end.

Great Fire in St. Luke's.—A few nights ago, the steam saw-mills of Messrs. Bridgman, of Golden-lane, St. Luke's, were totally destroyed by fire. The mills are at one end of a turning leading out of Golden-lane, the baths and wash-houses being at the other end, and grave fears were entertained that the latter building would be sacrificed. The turning is so narrow that the heat from the mills broke all the windows on that side of the baths, burned out the window-frames, and scorched all the bricks to such an extent that they fell to pieces, and came in a shower upon the heads of the firemen below. The position of the men was very perilous.

Chester Cathedral Organ.—A subscription has been set on foot for supplying the organ at Chester Cathedral with such additional power as the enlarged condition of the building will require. The organ is now in a carved oak case, designed by Sir Gilbert Scott. It stands no longer in the centre of the building on a piece of solid masonry, but on a stone gallery, supported on sixteen marble columns, the whole of which is the gift of the Duke of Westminster. The precentor undertakes the responsibility of collecting contributions for the completion of the instrument. We shall give a view of the organ in our next.

Value of Land at Morpeth.—A sale of garden land, suitable for building, took place at Morpeth on the 19th inst. The land is situate in Oldgate-street, with dwelling-house and stables attached, which are built on the north portion. The garden ground extends towards the river Wansbeck for about 700 ft., the entire area being about two acres, all in the occupation of Mr. George Charlton. After a good competition, the whole lot was knocked down to Mr. Joseph Price, of Morpeth, for 1,360*l*.

The Mersey Tunnel.—It is stated that a movement is on foot for the reorganisation of this important project for connecting Liverpool with Birkenhead, and that some of our influential townsmen have consented substantially to support the undertaking in its new form. When it is considered that the projected tunnel from Dover to Calais will be twenty-one miles long, and cost upwards of 10,000,000*l*., for the accommodation of only 4,000,000 passengers, it is a marvel that a tunnel of less than a mile long for the requirements of 30,000,000, with an immense goods traffic in addition, has not long before been constructed.

Berkshire Archæological and Architectural Society.—This Society visited Stratford-on-Avon and Warwick on the 18th inst. Mr. Albury acted as cicerone at Stratford, the places visited being Shakspeare's house and Trinity Church, want of time precluding pre-arranged visits to Shottery, New Place, &c. At Warwick Mr. J. Tom Burgess was cicerone, and gave a sketch of the history of the castle. The excursionists having dined at the "Woolpack," visited the Church of St. Mary and the Beauchamp Chapel on their way to the railway station, and arrived in Reading at 9 p.m.

The Royal Archæological Institute.—The annual meeting of this Institute commences on Tuesday next, at Colchester. At a special meeting of the Hereford Town Council on the 20th inst. it was resolved to invite the Royal Archæological Society of Great Britain to hold its meeting in that city in 1877. The secretary to the Society had expressed its willingness to visit the town.

National Competitive Drawings.—In our enumeration (p. 721, *ante*) of those who have obtained gold medals in the competition amongst the pupils of the various schools of art, the name of Charles E. Goodfellow, who obtained the distinction for designs for wrought ironwork, was omitted.

Stealing Mortar.—On the 20th inst., at the Clerkenwell Police-court, Edward Taylor, a plasterer, of Islington, was charged with stealing a cartload of mortar of the value of 12s., the property of his employer, Mr. William Goodman, a builder, Wellington-road, Holloway. He was sentenced to six months' hard labour.

Somersetshire Archæological and Natural History Society.—A general index to vols. 1 to 20 of the Society's Proceedings, and index to the Wells Chapter Records, are about to be published by Messrs. C. T. Jefferies & Sons, of Bristol.

The Tyne Improvements.—In consequence of the rejection of the Tyne Improvement Bill in Parliament, the Commissioners have recently discharged about 1,800 workmen, and about 500 more will shortly be dismissed.

TENDERS

For the erection of two lock-up shops, for Mr. E. Madin, Chesterfield. Messrs. Rollinson & Son, architects:—

Wright	£1,155	0	0
Slim	1,023	0	0
Fidler	1,024	0	0
Stevenson	1,017	0	0
Barber	1,000	0	0
Forrest	982	0	0
Greenwood (accepted)	937	0	0

For main drainage works, Holbrook, Derbyshire. Messrs. Rollinson & Son, engineers:—

Littlewood	£888	0	0
Bolsover	850	0	0
Fidler	698	0	0
Stevenson (accepted)	644	0	0
Pattinson	632	0	0
Barber	630	0	0

For main drainage works, Ridgeway, Derbyshire. Messrs. Rollinson & Son, engineers:—

Littlewood	£455	0	0
Bolsover	425	0	0
Fidler	369	0	0
Pattinson	345	0	0
Barber	342	0	0
Stevenson (accepted)	335	0	0

For new shop-fronts and repairs to 313 and 315, High-street, Stratford, for Mr. R. Ireland. Mr. Geo. More, architect:—

Norton & Son	£515	0	0
Cheffins	505	0	0
Rivett (accepted)	489	0	0

For new shop-front, alterations, and repairs to No. 132, Curtain-road, Shoreditch, for Mr. W. E. Hardy. Mr. Geo. More, architect:—

Wood	£573	0	0
Smith (accepted)	530	0	0

For the erection of a new vestry, &c., with school-room over, at the Baptist Chapel, Sutton-at-Hone, Kent. Mr. William Theobalds, architect:—
Booker (accepted).

For rebuilding "Scots' Arms," Wapping, for Messrs. Truman, Hanbury, & Buxton. Mr. W. E. Williams, architect:—

Scrivener & White	£2,704	0	0
Anley	2,590	0	0
Hearle & Son	2,553	0	0
Ennor	2,525	0	0
Eaton	2,490	0	0
Marr (accepted)	2,442	0	0

For alterations to the "Weavers' Arms," Edward-street, Kingsland-road, for Mr. Monks. Mr. W. E. Williams, architect:—

Sharp	£227	0	0
Feast	178	0	0
Marr (accepted)	177	0	0

For fittings at the "Ship and Blue Ball," Boundary-street, Shoreditch, for Mr. Lake:—

Marr (accepted)	£250	0	0

For fittings at 65 and 66, Houndsditch:—

Drew	£1,195	0	0
Colls	1,100	0	0
Somerville & Smith	917	0	0
Salter	864	0	0
Nightingale	862	0	0

For works in the London-road, Enfield. Mr. T. J Hill, architect:—

Sabey & Son	£590	0	0
Fairhead	435	0	0
Patman, Brothers	410	0	0

For a residence, St. Mark's-place, Wolverhampton, for Mr. W. R. Hands. Bricks and lime supplied by the proprietor. Mr. Veall, architect:—

Wiley & Filkin	£488	10	0
Tatlin	465	0	0
Morris	457	0	0
Thompson (accepted)	450	0	0

For two houses on the Compton-road, Wolverhampton. Mr. Veall, architect:—

Talbot	£1,450	0	0
Wiley & Filkin	956	10	0
Thompson	928	0	0
Evans	878	15	0
Morris (accepted)	815	0	0

For a peach-house at Stockwell End, Tettenhall, Wolverhampton, for Mr. G. H. Perry. Rendle's patent system of glazing adopted. Mr. Veall, architect:—

Lovatt	£596	0	0

For alterations at the "Barnsbury Castle," Barnsbury Park, Islington. Mr. F. W. Lankeston, architect:—

Warne	£470	0	0
Clarke	410	0	0
Cook	390	0	0
Blackmore	372	0	0
Pearce (too late).			
Unwin (declined).			

For mills at Hammersmith, for Messrs. Pinchin & Johnson. Mr. T. C. Clarke, architect. Quantities supplied by Messrs. Hovenden, Heath, & Berridge:—

Grover	£5,305	0	0
Browne & Robinson	5,190	0	0
Adamson	5,090	0	0
Clarke & Bracey	5,056	0	0
Newman & Mann	5,021	0	0
Bangs & Co.	5,000	0	0
Morter	4,940	0	0
Macey	4,889	0	0
Chamberlain	4,423	0	0
Merritt & Ashby	4,412	0	0

For alterations and repairs at No. 10, Great Queen-street, Westminster:—

Newman & Mann (accepted)	£459	0	0

For alterations at "The Albion" Hotel, Blackfriars, for Mr. T. Parker. Messrs. Bird & Walters, architects. Quantities supplied:—

Ennor	£1,375	0	0
Anley	1,367	0	0
Nightingale	1,357	0	0
Curtis	1,355	0	0
Brown	1,325	0	0
Newman & Mann	1,287	0	
McLachlan	1,275	0	
Lawrence	1,250	0	0
Williams & Son (accepted)	1,236	0	0

For additions to a warehouse, Milton-street, Finsbury, for Messrs. Gibbs. Mr. T. E. Knightley, architect. Quantities supplied by Messrs. Batterbury & Hoxley:—

Ashby	£3,765	0	0
Holland & Hannen	3,696	0	0
Linzell	3,669	0	0
Newman & Mann	3,650	0	0
Kiddle	3,640	0	0
Bracher	3,516	0	0

For drying-shed, The Grange, Bermondsey, for Messrs. Bowron & Co. Messrs. George Elkington & Son, architects:—

Coleman	£1,489	0	0
Newman & Mann	1,462	0	0
Rider & Son	1,399	0	0
Greenwood & Son	1,378	0	0
Shepherd	1,365	0	0
Little	1,349	0	0

For repairs at No. 14, Bow-lane, for Mr. R. A. Notley, Mr. F. C. Notley, architect:—

Mansfield	£1,150	0	0
Hayworth	975	0	0
Newman & Mann	965	0	0
Greenwood & Son	933	0	0

For rebuilding warehouse at No. 4, Goldsmith-street, for Messrs. M. & N. Salaman. Messrs. Ford & Hesketh, architects. Quantities supplied by Messrs. Karslake & Mortemer:—

Merritt & Ashby	£3,244	0	0
Downs	2,190	0	0
Mark	2,186	0	0
Killby	2,135	0	0
Hobson	2,134	0	0
Newman & Mann	2,123	0	0
Brass	2,097	0	0
Crabb	2,089	0	0
Lawrence	1,999	0	0
Boyce	1,912	0	0

For repairs at the Great Hunter-street Schools, Bermondsey, for the London School Board:—

Nixon & Son	£246	0	0
Coles & Son	228	0	0
Hobson	184	0	0
Newman & Mann	175	0	0
Nightingale	155	0	0
Jerrard	137	13	0

For an additional story to a warehouse in Wood-street, E.C. Messrs. Ford & Hesketh, architects. Quantities supplied by Messrs. Karslake & Mortemer:—

Downs & Co.	£726	0	0
Newman & Mann	711	0	0
Brass	711	0	0
Merritt & Ashby	687	0	0
Browne & Robinson	682	0	0
Mark	676	0	0
Lawrence	668	0	0
Hobson	658	0	0
Killby	645	0	0
Boyce	622	0	0
Crabb	613	0	0

For works at Smith's-buildings, Leadenhall-street, for Messrs. Pound, Son, & Hutchins. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batstone & Son:—

Moreland & Nixon	£6,382	0	0
Spark	6,059	0	0
Waldram & Co.	5,943	0	0
Ashby & Horner	5,919	0	0
Abraham	5,898	0	0
Newman & Mann	5,712	0	0
Merritt & Ashby	5,459	0	0
Bracher & Son	5,434	0	0
Oliver	4,940	0	0

For the erection and completion of warehouses, offices, stables, &c., in Staple-street, Bermondsey, for Mr. Fisk, Messrs. Snooke & Stock, architects. Quantities supplied by Messrs. Lindsell & Giffard:—

Coleman	£16,790	0	0
Rider	16,680	0	0
Sharpington & Cole	16,455	0	0
Conder	16,362	0	0
Adamson	16,295	0	0
Newman & Mann	16,195	0	0
Patrick & Son	15,845	0	0
Perry & Co.	15,799	0	0
Stevenson	15,794	0	0
McLachlan	15,639	0	0
Shepperd	14,977	0	0
Greenwood & Son	14,940	0	0

For warehouse in Duke-street, for Mr. J. K. Farlow. Mr. R. P. Notley, architect. Quantities supplied by Messrs. Lindsell & Giffard:—

Perry & Co.	£4,065	0	0
Adamson	4,043	0	0
Faulkner	3,998	0	0
Bange & Co.	3,940	0	0
Newman & Mann	3,932	0	0
Brass	3,916	0	0
Morter	3,865	0	0
Browne & Robinson	3,857	0	0
Hart	3,821	0	0
Greenwood & Son	3,807	0	0

For rebuilding No. 56, Coleman-street, E.C., for Mr. M. Salaman. Messrs. Davis & Emanuel, architects Quantities supplied by Mr. Frederick Downing:—

Newman & Mann	£2,961	0	0
Mark	2,936	0	0
Downs & Co.	2,907	0	0
Ennor	2,857	0	0
Brass	2,831	0	0
Killby	2,830	0	0
Merritt & Ashby	2,743	0	0
Williams	2,667	0	0
Browne & Robinson	2,617	0	0

For new roads and sewers at Forest-gate:—

Killingback	£2,580	0	0
Thompson & Son	2,470	0	0
Keeble	2,191	0	0
Dunmore	2,079	0	0
Bloomfield	2,050	0	0
Pizzey	1,977	0	0
Jackson	1,955	0	0
Richardson (accepted)	1,933	0	0

For the erection of three houses, Cologne-road, Wandsworth. Mr. William Bradbear, architect:—

Rowles	£1,540	0	0
Shurmur	1,512	0	0
Steel, Bros. (accepted)	1,498	0	0

For the erection of villa residence, stabling, &c., at Eltham, Kent. Mr. William Bradbear, architect. Quantities by Messrs. Lamb & Church:—

Shurmur	£3,078	0	0
Outhwaite & Son	3,044	0	0
Steel, Bros. (accepted)	2,825	0	0

For warehouse, No. 149, Old-street, London. Mr. Starkey, architect:—

Crabb	£1,095	0	0
Kerr	1,078	0	0

For the erection of school-rooms, and various alterations to the meeting-house, Ship-street, Brighton, for the Society of Friends. Messrs. Holford & Clayton, architects:—

Newnham	£1,937	0	0
Barnes	1,724	0	0
Card & Son	1,698	0	0
Bags, Bros., & Allen	1,695	0	0
Lockyer	1,651	0	0
Patching & Webber	1,650	0	0
Bruton	1,650	0	0
Cheesman & Co.	1,620	0	0
Wells	1,540	0	0
Botting	1,495	0	0

For the erection of the Tenby and County Club, Pembrokeshire, for the Directors. Mr. W. Newton Dunn, architect:—

Sheldon	£2,895	0	0
Noot	1,750	0	0
Davies	1,730	0	0

For additions to the seamen's rooms, Tenby, for Miss Forde. Mr. W. Newton Dunn, architect.—

Edmunds & Beynon	£329	15	0
Davies	310	0	0

For painting and repairs to The Oaks, Shortlands, for Mr. Henry Green. Mr. W. Newton Dunn, architect:—

Clemence	£285	0	0
Dowsing	238	0	0

For coachhouse and stabling, with coachman's cottage, &c., for Mr. John Simson, Ashmead road, New-cross. Mr. W. T. Hunt, jun., architect:—

Allpress	£580	0	0
Alwin	535	0	0
Slade (accepted)	515	0	0

For warehouse, Charterhouse-square. Mr. Couts Stone, architect:—

Richard	£8,670	0	0
Mark	8,450	0	0
Elkington	8,340	0	0
Crabb	8,250	0	0
Moreland & Nixon	7,975	0	0
Scrivener & White	7,940	0	0
Sharpington & Cole	7,937	0	0
Bange & Co.	7,893	0	0
Lawrence	7,750	0	0
Killby	7,683	0	0

For Memorial Mission Church and Cottage at Buckhurst-hill, Essex. Mr. J. Edward K. Cutts, architect:

	Church.	Cottage.
Bentley	£960	£330
Egan	745	352
Morter	767	360
Dabbs	765	372
Rivett	776	382

For new boiler-house and joiners' shop at the General Steam Navigation Company's Works, Deptford. Mr. Alex. R. Stenning, architect:—

Lee & Son	£5,623	0	0
Brass & Sons	4,888	0	0
Ashby & Horner	4,765	0	0
Webster	4,650	0	0
Sabey & Son	3,954	0	0
Woodward	3,625	0	0
Jerrard	3,593	0	0
Holland & Hannen	3,382	0	0
Macey	3,142	0	0

For new greenhouse, and for repairs on the Bromley Palace Estate, Bromley, Kent. Mr. Alex. R. Stenning, architect:—

Sabey & Son	£2,309	0	0
Woodward	2,306	0	0
Arnaud	1,942	0	0
Grubb (too late)	2,511	0	0

TO CORRESPONDENTS.

W S (if particulars are sent, they shall be duly considered).—Fire (seven investors have requested us to call upon them during the past week to see their infallible mode of extinguishing fire. Any particulars sent will have consideration).—T H (the recipe will be found in an earlier volume).—A. D (next week). One who knows (next week).—Solo (next week).—Mr. P. (thanks).—T. L.—B. W. W.—J. E. K. C.—Sir J. W.—W. B.—T. W. G.—J. O.—D. W.—J. S—B.—C. A.—A. S. P.—J. B.—G. D.—Messrs. L.—S.—R. M.—W.—W. S.—T. R W.

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The Builder.

VOL. XXXIV. No. 1748 SATURDAY, AUGUST 5, 1876.

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Chester Cathedral, and its Restoration.

HESTER CATHEDRAL had fallen into a state of dangerous disrepair. We can remember gazing with wonder and regret, twenty years ago, on its honeycombed walls, its absent mouldings, and tottering buttresses. In 1868, the energetic Dean of Chester, Dr. Howson, announced the intention of the chapter to proceed in the work of restoration without delay, under the direction of Mr., now Sir, Gilbert Scott, and invited help from the country at large. From that time to this the works have been carried on steadily at a cost of over 70,000*l.*, and by the time that these lines reach our readers, the completed building will have been publicly opened for service.

Soon after the commencement of the works, 1870, Sir Gilbert Scott read a paper before the Architectural and Archæological Society of Chester on the architectural history of the cathedral, part of which we venture to condense as an introduction to the view we give of the organ and gallery now in the north transept* :—

Unlike the majority of great Mediæval churches, its origin and the date of its foundation are unknown. Chester having been a Roman city, it follows that it must, during the last century of the Roman occupation,—when the empire was Christian,—have possessed churches, and one may have stood upon this site. The same may be said of the interval between the departure of the Roman legions and the Anglo-Saxon conquest; a period prolonged in this instance through the district which includes Chester having been held much longer by the Britons than most parts of England. They were Christians, and must have had churches, and one may have stood here. Whenever founded, the original church is said to have been dedicated to St. Peter and St. Paul; and Mr. Parker conjectures it to have been Romano-British. During the Anglo-Saxon period, however, the dedication of the church was changed from St. Peter and St. Paul to St. Werburga and St. Oswald. This was, at least, as early as the reign of Athelstan, as he and several later kings are recorded as having paid their devotions at St. Werburga's Church, and probably about the year 908, during the time of Ethelred, Duke of Mercia, whose wife, Elfleda, was the daughter of the great King Alfred, and resembled him both in piety and valour.

A century and a half later we find the church to have become ruined, probably during the second great Danish invasion, and restored or rebuilt during the reign of King Edward the Confessor, by Leofric, the wise and great Earl of Mercia, and his pious Countess Godwina or Godiva, of famous memory. The restored English rule thus again did homage to the memory of their royal saints; nor, when our country fell once more under foreign dominion, was their memory dishonoured, for the first Norman earl, Hugh Lupus, sister's son to the Conqueror, and his Countess Ermentrude, refounded the church on a far greater scale, converting it from a church of secular canons (just such a collegiate body as now exists) into a Benedictine monastery; and that, not at the instigation of the English alone, but of the great foreign ecclesiastic, St. Anselm, then Abbot of Bec, but soon to become Archbishop of Canterbury.

Not only was it customary with the Normans, while dealing with the ecclesiastical structures of their predecessors, to make a clean sweep and reconstruct them on a greatly enlarged scale, but the change from a comparatively small collegiate institution to a great monastery of necessity involved this. It is, therefore, not to be wondered at that no vestige of the older buildings remains. Our architectural investigation must consequently commence with the new foundation, begun by Hugh Lupus about 1195. The previous church, if only a restoration of the older Saxon edifice, was probably of no great dimensions; though, if it was actually rebuilt by Leofric, it would be contemporary with the Confessor's work at Westminster, and might therefore have been of large size. We have, too, a work remaining, partly erected by Leofric, at Stow, in Lincolnshire, which might afford some suggestion as to the probable scale on which he would have been likely to build; but all such speculations are useless. Of the Norman structure, however, we have enough remaining to give a very fair idea of its dimensions and arrangement. The parts of it existing above-ground consist of the lower portions of the north transept, of the wall of the north aisle of the nave, and of the north-western tower. The plan, which may be in a great measure deduced from existing evidences, is not unlike that of some others of the churches built by the early Normans in England. It may, perhaps, be specially likened to that erected by Lanfranc at Canterbury, itself an almost exact copy of St. Stephen's at Caen, founded by the Conqueror, and over which Lanfranc had presided. Possibly this, in its turn, may have been imitated from the great abbey of Bec, in Normandy; and, if so, it was natural that this church, refounded under the influence of Anselm, and his nominee, Richard, the first abbot, himself a monk of Bec, should also bear some resemblance to it. Its characteristics are a nave of moderate length, whose aisles were terminated westward by towers, and unaisled transepts of only two bays in length, from which, on their eastern side, projected chapels of, probably, an apsidal form. There was, of course, a central tower, beneath which, and extending probably one bay into the nave, were ranged the stalls of the choir. The eastern arm, as at Canterbury and at Caen, was aisled, was small in length, and apsidal in its eastern termination. Here, however, the resemblance would seem to have ceased, for, though the older eastern ends have been removed both at Canterbury and at Caen, it is not generally supposed that the aisle passed continuously round their apses, or that they possessed radiating chapels, both of which are seen to have existed at Chester. For the types, then, of our eastern end we must look elsewhere. At Gloucester, Tewkesbury, Chichester, Leominster, Norwich, and in many other Early Norman churches, we have the aisle continuing round the apses, round which the arcade and its range of columns is also continuous; and from the aisles radiate the chapels to the east, north-east, and south-east. In all these cases, however, the chapels projected boldly from the aisle, while at Chester there seems to have been a unique modification of this arrangement, the side chapels not projecting directly from the aisle, but being partly cut out of its width in a very curious manner.

It would not appear that the entire church was completed at a single movement. As was usually the case, it is probable that the parts first needed were earliest built. These parts would be the eastern arm, the central tower (as high, at least, as its interior formed a part of the church), and probably one bay of the nave. This would give the choir and the chapels—in fact, the parts absolutely requisite to divine service. Accordingly, we find in the transept the earlies (English) type of Norman, while in the western tower we find the style in a more advanced form. This feature, so far as it exists, is particularly fine. Its date is conceived by Sir Gilbert Scott to be about 1120. In a line with it, and bounding the western side of the cloister, is a very fine structure of considerable size, vaulted throughout upon a central range of Norman pillars. This formed the substructure of the abbot's hall, and was probably of the same date with the tower, though the narrow chamber between them, forming the passage from the abbot's lodging to the cloister and supporting the abbot's private chapel above, is later; in a style, probably, as late as quite the middle of the twelfth century. These substructures are found in all early works of a semi-domestic character. It was the custom of the period for persons of rank to have their living-rooms well raised above the ground. We accordingly find almost every important room in dignified residences of these early periods placed on an upper floor, and vaulted substructures placed beneath them, which were used for stores, cellars, and for other less important purposes. Even private chapels were often similarly raised for the convenience of being on a level with the living-rooms. It is so with th

* See pp. 760, 761.

Abbot's Chapel just mentioned, and this is the reason why St. Stephen's Chapel at Westminster, and the Sainte Chapelle at Paris (both the private chapels of the palaces), were erected over crypts. We see the same in the Prior's Chapel at Ely, in the chapel at Ely-place, London, in the chapel of the Tower of London, and in many other instances.

We know nothing of the history of the fabric for a considerable time after the erection of the Norman church. All we read is of the places where the abbots were interred; and six of these are still marked by arched recesses in the northern wall of the nave, facing the cloisters. These are of different periods during the twelfth century. Towards the end of this century, that is to say about 1105, the eastern parts of the church appear (from some malconstruction probably) to have become dilapidated and to have threatened actual ruin. It seems to be said that the choir had been rebuilt from its foundation by about 1205; but as the Norman foundations of both the outer wall and the columns of the eastern arm still exist, this expression must either have been an exaggerated one, or the use of the term "choir" must have been limited to the central crossing where the actual choir—that is, the monks' stalls—were placed. Probably, however, there was some considerable reconstruction of the eastern part, though not literally from the foundation.

From the lugubrious tone in which the monks make petitions for pecuniary aid, and the exaggerated style in which they describe the ruin of the church and their own poverty, Geoffrey the Abbot must have been much like his contemporary at St. Alban's, John De Cella, whose high artistic aspirations, united with unbusiness-like habits, are so humorously described by Matthew Paris. Geoffrey describes the choir of his church as "intolerably threatened with ruin, and threatening with danger of death those who assisted at the divine offices." He boasts of having rebuilt it at great cost from the foundations, yet we find within a century all had been rebuilt again, and not a vestige excepting one small chapel left of his work. We find that in 1211 the choir and tower of Chester were finished. The relics we possess of his work are scanty in the extreme, but, like those of his contemporary at St. Alban's, they are of a very high merit. About 1240, the number of the monks was increased, which probably led to the rebuilding of the chapter-house; and in the time of Edward I., or somewhat earlier, they again undertook what was called at the time "the great work of rebuilding the church," for the choir also must have been found too small. In 1259, the monks met to consider the rebuilding, though only fifty years since it had been before rebuilt. In 1281, they came into possession of considerable property. In 1284, the king made a grant of venison from his forests at Delamere and Wirral; and a memorandum in the margin of the grant says that it "was for the monks engaged in the great work of rebuilding their church."

The very important works of which we possess this scanty information were carried on during the abbacy of Simon de Albo Monasterio, or Whitchurch—a prelate apparently of great ability, who ruled the monastery from 1265 to 1289. He freed the abbey from sundry lawsuits, obtaining decisions very much to their advantage, and it is clear that he must have at least commenced the reconstruction of the entire eastern arm of the church, including the lady chapel.

It is evident that the older parts (to say the least) of the choir were not at first carried up beyond the level of the triforium; for whatever may be the difference of age in the arcades below, the clearstory is throughout of later style. The style of the clearstory is rather advanced, though still not late, Decorated. The choir was, like most parts of the church, designed for vaulting, but never completed, the present groining being of lath and plaster.

The next great work undertaken was the reconstruction, on a most extraordinary scale, of the south transept; and simultaneously (as is supposed) with it, of the south aisle of the nave. This transept and the nave were prepared both for vaulting and for flying buttresses, but neither was carried into execution. Mr. Parker is probably correct in assigning this work, with the commencement of the reconstruction of the nave, to Abbot Richard Synesbury, who held the abbacy from 1349 to 1363, and was deposed for wasting the goods of the monastery. Perhaps the erection of this vast transept for the parishioners of St. Oswald may have been a part of this alleged waste, and truly it must have been a costly work. Its character is of the latest variety of the Middle Pointed or Decorated style, and it is an excellent work of its period. The shattered fragments of the southern ends of its aisles are as fine as any work we possess in this style. The nave and transept are said to have been finished by Abbot Simon Ripley, between 1485 and 1492, who is also said to have erected the northern arcade of the nave in imitation of the southern one of a century and more earlier date.

The windows of the west aisle of the transept and the south aisle of the nave, though of the Decorated period, did not receive their tracery until after the establishment of the succeeding style. The latter have, however, within the last few years, been renewed in the earlier style. The earlier documents frequently speak of the "Campanile," which Sir Gilbert imagines to have been the south-western tower. This was taken down by Abbot Birkenshaw, and the foundation of a new tower laid in 1508, when a new west front was also commenced. He only succeeded, however, in carrying up his tower to one stage of its intended height, and with this work, including the west end and the south front, closed the Mediæval building of St. Werburg's Abbey Church. The great central tower has been already rebuilt, though at what period is uncertain. It is attributed to Abbot Ripley. It is a very fine structure, and was prepared for a lofty spire, which would have added greatly to the dignity of the church.

The decay of the external stonework throughout the cathedral was most lamentable. In many parts, in fact, it was impossible to retain any portion of the old stones, so that restoration meant renewal. Such has been the case with the eastern clearstory, with almost the whole of the Lady Chapel, and with the central tower. The decay had gone deep into the stone and left its courses projecting, rounded and shapeless, like the layers of a mouldering rock; so that it was only by accident, here a little and there a little, that it was possible to trace out the ancient design, which has been further hidden by many barbarous reparations.

The late Dean, not contemplating the general restoration that has since been undertaken, wished to enlarge the choir, and he brought out the stalls to the east side of the crossing. Over was the organ, and the side arches were filled up with glass, to prevent draughts. But it did not do so, and the draughts were very inconvenient. Early in the restoration it was determined to take down all this glass, and open the view from end to end; and it was resolved to bring the stalls back to the east from the west side of the crossing. As to the organ, it was now seen that it would not do to put it up again where it had been, and they decided to place it between the two piers of the great arch of the north transept, and an organ-screen, the gift of the Duke of Westminster, has been constructed. The organ is practically available for the choir and the nave, and there is an uninterrupted view through the building from west to east. At the same time they did not desire to cut away the return-stalls, but they opened the panels behind them, so that they could see through up to the lady chapel. We reserve our own opinion as to the position of the organ.

At the eastern end of the choir there is a mosaic of the Last Supper,' executed by Messrs. Salviati, after a design by Messrs. Clayton & Bell, who have also decorated, with their usual skill, the choir roof, in which the four greater and twelve lesser Prophets are shown in the two eastern bays, while angels, with musical instruments, are in the western bays of the roof, immediately over the choir-seats. Wood from Palestine has been employed both in the retable which frames the mosaic and in the holy table itself, on which the chief plants connected with our Lord's Passion have been carved by Mr. G. F. Armitage, of Altrincham, after a plan suggested by the Dean. On the broad western step is a representation of the Passover in incised marble. On the open space of the floor below this step are heads of the Apostles, round the lectern, and in the corners heads of two doctors of the Western and two doctors of the Eastern Church,—Ambrose, as representing Church Music; Augustine, Theology; Athanasius, the Creeds; and Chrysostom, Preaching. The tile-work has been furnished by Messrs. Craven, Dunnill, & Co. The bishop's throne and the pulpit (on which are carved the building of the Hebrew temple, the preaching of St. John the Baptist, and the vision of the Heavenly Jerusalem) are the work of Messrs. Farmer & Brindley. The sedilia have been restored by Mr. Thompson, of Peterborough, who (besides all the works completed some time ago in the nave) has also executed the reparation of the stall-work, the structure of the choir roof, and the pavement under the tower. The organ (provided with all modern improvements) has been enlarged and rebuilt by Messrs. Whitely, of Chester, the organ-case being the work of Messrs. Farmer & Brindley.

The restoration of the sedilia (a work of great archæological interest) has been effected at the cost of the Freemasons of the western division of Lancashire, and the structure of the choir roof at the cost of Mr. Platt. The stalls have been contributed by separate donors.

Amongst the decorations of the cathedral must be mentioned some stained-glass windows, which are placed at the extremity of the south aisle of the choir, in memory of the late Mr. Brassey; the large window at the east end of the chapter-house, by Messrs. Heaton & Butler, representing historical events and historical persons connected with St. Werburg's Abbey and the cathedral church, and placed in memory of the late Dean Anson; and also windows in the lady-chapel, representing thirty scenes from the life of St. Paul.

Painted glass for the large window in the north transept is to be given by friends in the United States, the subjects selected being the Seven Deacons and the Seven Churches of Asia.

On the north of the church, in contiguity with the east walk of the cloister, a great improvement is in progress, by the clearing out, repairing, and bringing again into use, of a vaulted chamber, which has long been choked with rubbish and concealed in the dark. This change will supply a much-needed vestry.

We must not close this notice, brief and imperfect though it be, without a regretful allusion to the recent death of Mr. Frater, the clerk of the works. For critical remarks on the work done, another opportunity will present itself. We shall in an early number give views of the pulpit and episcopal throne.

STUCCO.

We have it on very good authority that the British public in one of its periodical fits of morality is a ridiculous spectacle. That small portion of it which sacrifices at the shrine of Culture, as the priests of that goddess have depicted her,—that small portion which settles the fashion in things artistic,—betrays perhaps the biggest indignation in its chronic stand against the untruthfulness of much that contributes to mundane happiness, and springs from mundane success. The man who whitewashed the painted walls of too many a church and cathedral while the plague was playing high jinks in the metropolis, has probably had an opportunity of explaining to his companions in Hades how he did it with the best intentions, and the reports of the most recent *convoi* of churchwardens have probably confirmed him in the ignorant assumption that what he attempted for sanitary reasons has been since successfully accomplished for artistic ones. But, happily, that man, as far as British humanity goes, is as extinct as the dodo, and as little likely to reappear by any sort of reversion as that remote ancestor from whom he and his posterity are said to be descended. The small portion of the community to whom the country is indebted for a just appreciation of æsthetic sensation not only stands in his way, but guards every approach to the maze of modern architecture—to the centre of which no key but Truth is now enabled to penetrate. For of what value is an æsthetic sensation if it be not thoroughly genuine? A Pilate might ask jestingly—What is Truth? and be careless of the answer; but more modern judges live in such an atmosphere of artificiality that they are bound not only to put the question with the strictest sobriety, but also to answer it themselves according to the sternest definition. It is quite useless to urge upon them the dictum of a great French exponent of imitation in the fine arts—quite superfluous to urge with him that, in every art there must be some fiction with respect to truth and something incomplete with respect to resemblance. They take the letter of the law, which they translate in accordance with the terms of a particular vocabulary—all other translators and vocabularies being hopelessly at fault. Although for long years the world has been led to believe that the art of con-

cealing art was approved by gods and men, the cultivated Mrs. Grundy (the goddess Ydgrun of Erewhon) objects to any sort of concealment whatsoever. She has not only fished up from the bottom of a well, Truth, that had modestly sought refuge there, but persists in exposing the unsophisticated fugitive to the public gaze; and were the latter ungenerous enough to retaliate, there would soon be an end of the "vain opinions, flattering hopes, false valuations, imaginations as one would and the like," without which, as Bacon said, the minds of men would be "poor shrunken things"; and an end too of all further possibility of making up that "bundle of inconsistencies and contradictions" which, according to Swift, help to compose the life of man from youth to old age. Mrs. Grundy, with Truth in leading-strings, would make the Lares and Penates of modern communities almost Japanese in unadorned starkness; and in denouncing the works of the Evil One she has included stucco amongst them. She has not only prayed to be kept honest, but, moreover, to be surrounded during her lifetime with honest brickwork, and her prayer has been heard. The bricklayer, the carpenter, the joiner, in churches, schools, and houses, have since bared their bosoms to the multitude. The sculptor has discarded finish or refinement in order to show mankind that he has been working with a tool; the painter has so dispersed his groups as to allow spectators the gratification of seeing between them the kind of material upon which they are depicted. Oak has been gilded on condition that the grain of the wood could work itself through; or it has been painted whenever the ingredient which renders paint durable and efficacious could be omitted. The pursuit of purity has extended to the head of a nail, the cut of a screw, the adornment of a nut. The rivets of an iron plate were never so hidden or so loftily placed but the architectural purist has displayed for them his loving care; and at the close, when new stone, new brick, and new wood appeared unblushing and innocent, the happy architect has turned round to receive the applause of Mrs. Grundy and her troop of followers; and, like "Truthful James" of Bret Harte's poetical fancy, he has been enabled to say, but in the most ordinary prose, "Ladies and gentlemen, there is no deception."

Then it was discovered why architecture had been an admitted failure since the revival of classical learning reformed the world. It lacked truth! Modern marble and stone were not marble and stone, but stucco! Then it was resolved that the principles of architecture must no longer be violated with impunity; and, as stucco had audaciously laughed them to scorn, it was necessary for the English artist to teach his less happily inspired countrymen the importance of artistic purity and truth. Stucco, therefore, acknowledged the power of the greatest number and retired into obscurity,—only issuing from it at intervals to improve a fallen neighbourhood or renovate an economical palace.

We are not going to break a lance on behalf of stucco and its wrongs; nor could we, even if so disposed, hold a brief for chunam, scagliola, gypsum, or any kind of cement; but the temper of Mrs. Grundy is so far moderated now as to permit a reasonable remonstrance against the prolonged ostracism of a material which gives to the rough nature of bricks something of that softness which manner gives to the rough nature of man. Addison, who, though an incompetent critic of the former, was a good judge of the latter, said,—"The very design of dress, good breeding, outward ornaments and ceremony were to lift up human nature and set it off to an advantage." If the "noble savage" scorned a lie, he also objected to many of those modern observances the disregard of which banishes some men from society and involves others in a temporary loss of liberty. Swift was probably only half-laughing at the world when he told it that "Good manners is the art of making those people easy with whom we converse," and surely to do that requires the effort sometimes of no small an amount of tact, if not of deception. The reproach of the Frenchwoman to an indignant lover, that people thought the things he said, but never said them, is perfectly consistent with even the highest morality. Although speech may *not* have been given to man to conceal his thoughts, it is certain that with speech he conceals them; and so admirable sometimes is modern training, that even an ingenuous countenance can be feigned; whereas, as Queen Isabella of Spain, in Bacon's time, used to say, "Whosoever hath a good presence and a good fashion carries continual letters of recommendation." Surely this good presence and this good fashion are but a covering to that material of which all men are composed,—a stucco, which, like that on "honest" brickwork, makes it smooth to the eye and soft to the touch. It is a covering also which admits of all sorts of adornment, both in the one and in the other; for what wit can effect for human, colour can effect for material, polish. You are no more justified in banishing stucco from your walls because upon some of them it has been falsely applied, than to condemn suavity of manner because it has often favoured the artifices of a knave.

It is very much to be doubted whether the ancients, having built a rough stone wall, ever refrained from improving its appearance by covering it with a coat of stucco lest the critics should accuse them of lying. On the contrary, they often made with rough stone and brick, covered with a coat of some kind of plaster, beautiful works of art; and such, according to Quatremère de Quincy, "have rather given birth to theories than theories to beautiful works." The Greek plaster, however, must have been a very superior description of covering; for from the walls of Grecian houses, according to Vitruvius, the decorated covering was often detached and carried by rich Romans to Italy to be incrusted in the walls of their town and country mansions. It is well known that at Herculaneum were discovered squares of plaster adorned with paintings, which had evidently been detached from some other place, and which the workmen had not had time to incrust in the walls of the house where they were found. The ruins of antique edifices in Rome, such as the Baths of Caracalla, of Titus, and of Diocletian, have shown a thickness of stucco of from 4 in. to 5 in. Mr. Newton, in the course of his explorations at Halicarnassus, discovered some fine specimens of stucco made of lime and pounded marble with ornaments painted on them; and at Rhodes he found similar fragments, which still retained their painted ornaments after long exposure to weather and rough treatment. Indeed, it is quite superfluous to attempt proving that the use of stucco is as old as architecture. Sometimes sun-dried bricks in early Egyptian monuments were coated and painted just as the walls of coarse tufa or travertine in the beautiful city of Rhodes were coated and painted, and as our modern walls are treated, though these with less valuable material and a less artistic mode of decoration. Coloured marbles were imitated in stucco by the ancients; and, in the Middle Ages, red lines were traced upon it to imitate, in perhaps a conventional fashion, the jointing of a stone wall. A stucco covering of some sort was spread over both the inside and outside of many ordinary stone buildings erected by the Greeks. On the outside it was comparatively thin, and frequently, if not always, coloured. On the ruins of a temple at Agrigentum there are now standing columns composed of several drums of rough stone covered with a thin white stucco of uniform thickness, hard, and beautifully smooth. Similar ruins, similarly stuccoed, are to be seen at Pæstum. In the Temple of Vesta at Tivoli, although the flutes of the column are made in the stone itself, their finished form is obtained by the stucco which covers it. Some Mediæval churches in England were stuccoed on the outside, and parts of the original coat have been found clinging to them. Many Italian masterpieces, with which the names of celebrated architects are associated, bear on their faces, pilasters and similar ornamental accessories, as defenceless in principle as those on the housefronts of Bloomsbury or Belgravia; and Mr. Ruskin is too honest to evade the fact that some of the "marble palaces" of Venice are faced with stucco; but he says it is "confessed and understood, and laid on the bricks precisely as gesso is laid on canvas in order to form them into a ground for receiving colour from the human hand,—colour which, if well laid on, might render the brick wall more precious than if it had been built of emeralds." The palace at Madura, the ancient capital of Southern India, is built of stone and brick, plastered, to which fact, according to Mr. Chisholm, is due its present existence.* Cairo, which has been the theme of so many rhapsodies about Oriental gorgeousness and beauty, is, as a whole, principally plaster and paint; and the palaces of Chowringhee, which astonished Macaulay as much as our "magnificent Regent-street" delighted him, are stuccoed from basement to roof.

The story, known to all, and frequently quoted by the more youthful, of that singularly acute member of our craft who, after having cut his own name on a stone wall, stamped that of the king, his master, upon the stucco which covered it, is eminently suggestive to moderns, who are often invidiously compared with their brethren of the past. The giants of those days seem all the greater now that every trace of their contemporary pigmies has disappeared. The dignity of history prevented us knowing, until the days of the most delightful of historians, many petty details about the mass of our countrymen, such as, in his own words, "how the parlours and bedchambers of our ancestors looked." It has, therefore, been the fashion to consider that since the "monuments" of antiquity and of the Middle Ages have resisted so long the ravages of time, the workmanship of the ancients and of our ancestors reached a degree of excellence which cannot now be approached. That it was superior no one is audacious enough to deny, but neither can it be disputed that all their bad work has disappeared. Philæ the Beautiful, the Athenian Acropolis, the Coliseum, the ruins of many a French and English castle, were surrounded in the time of their strength by a more or less teeming population contented with shelter of a comparatively perishable nature, which demanded constant attention at the hands of the inhabitants. Neither Phidias nor Praxiteles sought on the hill of Pentelicus the materials of their own abodes. The Athenian citizen was noted for the modesty of his dwelling-house; and far from building a home for posterity, or, as the French workman says, for eternity, he built a rough wall, which he left those who succeeded him to renovate with a new coat of stucco, or revivify with another and perhaps a different story. The modern weakness has long consisted of an attempt to imitate earlier public buildings in our domestic dwellings, with the sole result of bringing down our public monuments to a level with private buildings. The riches of the earth, say, have contributed to render the walls of a town-hall or a church brilliant with all the colours of the rainbow; therefore, unless you can command the former you must not hope to enjoy the latter! You must not hide the materials which compose your wall, according to the purists; you must not cover rough stone or coarse brick with plaster, for thereby you produce an effect of homogeneity the possibility of which is precluded by the numberless horizontal and vertical joints of a brick or stone wall. If you want colour you can get it out of the bricks themselves, and you may paint upon their surface. Even if the wall be of concrete, purists have objected to a coat of cement without, or a coat of gypsum within. They have always had at their command such missiles as "sham effects," "veneering," "imitation ornament," to fling at those who attempt to reason with them. Mr. Pullan, a short time ago, very naturally thought that to decline to hide the face of honest but ugly red brickwork with a coat of plaster is puerile. "I must confess," said he, "that I think it perfectly justifiable to use either veneer of marble, variegated scagliola, or coloured stucco, for the purpose of obtaining colour in cases where funds do not allow of the purchase of blocks of marble," and he added a hope that before long many of the dismal-looking churches erected in London during the last two centuries might be enlivened with polychrome. Mr. Penrose appears to entertain a similar opinion, for on the same occasion he was glad to hear that the coloured bricks often used in the interiors of churches are simply "ground" for future painted decoration! "In themselves," he added, "they appear crude, unfinished, and distracting, though sometimes used with great cleverness." But he denied that in all cases such a decorated colouring was intended, because, said he, "I have seen several restored churches in which I have grieved over walls left so rough after the removal of the plaster as not even to be suitable for garden fruit walls." Mr. Pullan's calm assertion shared with the rash impulsiveness of Mr. Penrose an equal fate. No less a person than the then President of the Institute of Architects fell foul of both. "It may be," he indignantly exclaimed, "that those who have so nobly lifted up their voices against this gangrene of modern architecture have fallen into the opposite error of purism; but surely in these days when every kind of counterfeit adulteration and practical

* Mr. Chisholm says, somewhat obscurely, that "had the design been carried out in stone, nothing would now remain but a mass of shapeless ruins."—Transactions, R.I.B.A., 1875-6.

falsehood pervades every branch of business, of art, and of manufacture, ... it is not the time to jeer at those who may possibly over-strain their protests against the practical vices of the age." No one will dispute the justice of Sir Gilbert Scott's remarks or dare to doubt,—even without the fear of Mr. Ruskin before his eyes,—the possible creation of Utopia. The ancient philosophy pretended to make all men virtuous; and virtue as the highest good is preached to all, properly enough, at the present hour. Mr. Disraeli in one of his novels has described a young gentleman who set himself the task, on entering Parliament, to abolish poverty,—success in which, one would think, might have helped to make truth universal. But, on the other hand, riches are known to be the impediments of virtue; and there is hardly a comedy of recent times which does not enlarge upon some text taken from the Great Book of Snobs. The purists have dozens of apt quotations at their command. Take only the indignant shopkeeper in the "Maison Neuve," where he upbraids his ambitious nephew and laughs at *salons* which lie from the mouldings of their doors to the ashes of their hearths; which are stucco looking like marble, pasteboard looking like sculpture, pear-tree looking like ebony. And then he points the moral,—"Rub and it comes off, strike and it chips! Hired lackeys that you call '*mes gens*,' friends that you do not know! . . . . . Familiars chosen like your furniture above your means, and, like it, second-hand! Everywhere, morally, physically, varnish, veneer, pasteboarding, and imitation-bronze." Surely, Mr. Penrose and Mr. Pullan, you must have forgotten that this was the stucco of an Empire which began with a *coup d'état* and ended with Sedan! Ought you not to thank our purists for pointing out faults which might drag this home of constitutional liberty and Portland-cement through the confusion of a similar fate?

Nevertheless, all the arguments and remonstrances against the use of stucco will not alter the fact that in this country we have comparatively little stone and less marble; and that even if we had a great deal of the latter, the climate is not favourable to its employment either on the outside or the inside of our houses. We have magnificent granites, and know how to polish them better than any other people in the world, but they are far too expensive to be used as mere wall lining; and the most we can hope to do is to make our columns and other important points of support of such materials. But in the modern rage for honesty it often occurs that a brightly polished granite shaft is placed in close proximity to a rough brick or a rough stone wall. The hesitation to hide this roughness with a smooth coat of plaster arises probably from a logical disinclination to mix up a thing so truthful as polished granite with a thing so false as stucco. Again, having very little stone, we found out how nature went to work to make it, and have succeeded in making a similar substance; but, with this difference, that the one is nature-made and the other art-made, and that while we are obliged to cut the former we must cast the latter in a mould. Suppose then that we go to work with nature's ingredients to make a stone wall—*sur place*; and that we have built the heart of the wall in Portland-cement concrete, can there be any objection to putting a covering upon it similar to the crust which is formed upon natural stone? Portland cement is one of the great facts of the day, and it is ashlar formed by hand upon the wall itself instead of being cut by hand in a workshop and inserted in the wall—with the exception, of course, that Portland-cement ashlar is often ½ in. thick, and Portland-stone ashlar often 3 in. thick. Strangely enough, although objection is made to stucco, none is made to mosaic. There are shafts of columns at Pompeii composed of brick covered with small cubes of marble; and these mosaics are nothing more than stucco concealing a core of inferior material. Bricks and terra-cotta blocks are after all only a species of stucco which has been baked and thus made ready for insertion in a wall instead of being run against it; and as the late Mr. J. W. Papworth said in one of his admirable papers, "if moulded terra-cotta is a truthful material, run plaster cornices are also legitimate." But putting the æsthetic part of the question on one side, and forgetting the *pros* and *cons.* of it, there can be no doubt that a great deal more plaster and paint, more stucco and mosaic wall-coverings, might be used with advantage in the insides of our houses; and that wainscoting and wood linings,—which the Greeks never used, and which in countries like India, for instance, cannot be used,—harbour vermin and insects; while paper even of the best kind is known to possess, in a sanitary point of view, absolutely dangerous qualities. If uncompromising truth in architecture be carried to its logical conclusion, painting and sculpture, which on a building are its subordinates, must often be positively false; for a painted perspective upon a flat surface, and a bas-relief in marble, are both attempts to deceive. The trunk of a tree should be carved in wood, a musical instrument inlaid with brass, and drapery worked in some kind of stuff. Probably Pope had a glimpse of the future, at least as far as the æsthetic development of "purism" goes, when he wrote,—

> "That live-long wig, which Gorgon's self might own,
> Eternal buckle takes in Parian stone."

The pages of this journal are not sufficiently encyclopædic to catalogue the many different sorts of stucco that, for the last two thousand years, have been used to envelop walls composed of materials quite as "honest" as any which, in this era of virtue, are too frequently left naked and unprotected. The MS. of Professor Donaldson's exhaustive treatise upon stucco, printed in the "Encyclopædia Metropolitana," lies open to all in the Library of the Institute of Architects. The *tectorium opus* of the Romans, with which Vitruvius has familiarised his readers, and the *chunam* of the Hindus, are probably of equal antiquity. At the present moment the preparation and application of the latter is best understood in the Madras Presidency. The plaster coats, on ancient Greek and Roman walls, consisted generally of three layers of mortar composed of lime and sand, and three others of stucco, composed of powdered marble and lime—the powder of marble being finer as each layer was applied until in the third it was exceedingly fine. Chunam is of two kinds; that used in parts of the interior of India being prepared from a gravelly kind of limestone, dug out of quarries, while that used along the coast is made from shells washed out of the salt marshes; and the latter is thought to be the more durable of the two. But the excellence of both depends undoubtedly on the mode of preparation and manipulation. The columns in the interior of Government House at Calcutta are coated with the very finest description of stucco, and it is affirmed that the materials (excepting, perhaps, the quartz sand) for making good shell-chunam are better in that part of India than in Madras, only in the latter Presidency the "elbow-grease" is more effectually applied. This shell-chunam is a fine impalpable powder, while the stone-chunam is a coarse sandy one. Both one and the other are mixed with clean sharp sand, in various proportions, according to the use for which they are intended. Mr. Chisholm has explained the process for which Madras is famous. He says:—"The first coat generally consists of three parts of river sand to two parts of shell-lime laid on roughly by trowel and hand-float. The second coat is composed of ground quartz, sand, and shell-lime in equal proportions, brought to a surface by Derby floats in the ordinary European manner. The third coat is a similar mixture, ground very fine to the consistency of cream. This is trowelled on, and polished with agates. After applying the creamy mixture, the workman continually rubs the surface with the agate held in the right hand, while with the left he occasionally dusts the surface with fine dry powdered quarts, contained in a small linen bag." If any one be imprudent enough to doubt the force of "elbow-grease," not only in the matter of good stucco, but of all materials with a "face," let him watch in Eastern India, native workmen polishing an oak floor with empty beer-bottles. The modern tendency, however, in this country, is not to obtain smooth or polished surfaces so much as to destroy dead ones, and this deadness is sought to be removed by stamping patterns upon it. We take it, on the contrary, that our English climate in general, and our London atmosphere in particular, demand the means of throwing off, rather than of harbouring, dust and damp, which, once combined, form dirt.

We said at the beginning that we held no brief for any kind of stucco; but if we have taken up its defence with a will, and have by any chance proved stucco to be right, we have proved ourselves wrong; for, undoubtedly, as the great mass of people have used it, do use it, and will continue to use it, it is irretrievably wrong. Witness the article in the *Penny Cyclopædia* of the year 1842, and compare the custom of to-day after thirty-four years of culture to boot:—"Much will depend upon the skill and care with which stuccoing is executed, on its being made to resemble stone as closely as possible both as to tint and the grain or surface; and in order to render the deception as complete as possible, it is important, though it is not always done, that lines should be made on the face of the wall indicating joints and courses of stonework. If perfectly well executed, stucco will be nearly equal in appearance to stone, and even superior to that of stone of inferior quality. There are some who protest against the use of stucco altogether, as a spurious and meretricious mode of building with sham material, but . . . it has been favourable to architectural design, and promoted a taste for it by allowing it to be executed when stone would be too expensive a material, or where, if stone were employed, the same extent and degree of enrichment could not be afforded." Happily there are not wanting thousands amongst the millions who inhabit these islands to understand the utter falseness of such an argument and the gross injustice thereby done to an excellent building material; and having such a warning before our eyes, some captious reader may well ask, why we wrote about stucco at all? Why not let sleeping dogs lie? Why stir mud any more than pitch?—for though stucco is neither mud nor pitch, the slime of the Tiber has helped to make one kind, and the slime of the Dead Sea another. Those, however, who love stucco will probably admit the excellence of any argument we may have used in favour of it, and those who hate it may recall a witty anecdote. When some good-natured friend told Stella how beautifully Swift had written regarding her rival she expressed no surprise, for she knew the Dean had also written finely about a broomstick. Many worthy people have, doubtless, long thought about stucco in a spirit similar to that which urged the satirist to treat of a broomstick; and so, perhaps, it is necessary now and then to say a word to such—not finely, but in a homely fashion—concerning an ancient material which in proper hands may be made just as artistic and lovely as it is comfortable and clean.

ROYAL ARCHÆOLOGICAL INSTITUTE.

The annual session of the members of this Association commenced on Tuesday last at Colchester, the reputed Camulodunum of the Roman period. At mid-day the Mayor and Corporation received Lord Talbot de Malahide (president) and the members of the Institute, and bade them a hearty welcome.

After luncheon in the Corn Exchange, Lord Carlingford, the president of the meeting, delivered an inaugural address, in which he showed the value of archæological researches, and traced the ancient history of the county and the borough.

We have so much archæological matter in our present number that we must postpone a report of the proceedings of this Institute.

Proposed Centennial Monument.—Lithographs are exhibited in Philadelphia of Mr. Story's design for the Centennial Monument to Liberty, which is to be erected in Independence-square, and for which subscriptions are invited. The *American Architect* says:—"They show a tall pedestal, surmounted by a colossal statue of Liberty, wearing the Phrygian cap, and carrying a flag, the staff, tipped with an eagle, in her right hand, her left hand resting on a shield. Around the upper part of the pedestal moves a continuous procession of female figures,—forty or so,—which typify the different States and Territories of the Union. The choice of Mr. Story is one of the many judicious selections by which the men of Philadelphia have shown their wisdom. It is, of course, impossible to judge of the effect of the sculpture from the somewhat rough lithograph that is published. The only means of showing it would be a sketch-model from the sculptor's own hand; and we have not heard that any such has been received. The figure of Liberty must be treated with much grandeur, in order to avoid the commonplace. To design the forty figures which encircle the pedestal, with the requisite variety and character, is an equally difficult task, one such as few sculptors of our day set themselves; and we can think of no American sculptor, except Mr. Story, in whose hands we should feel that it was safe."

"MERCANTILE ARCHITECTURE."

"Tomkyns,—Manchester Goods," is the inscription on the front of one of the warehouse designs given in Mr. Ogden's book, published under the above title,* and the inscription is not a bad indication of the character of the designs contained in it. Architecturally speaking, they are "Manchester goods"; and even if the author did not date his preface from that city, no one acquainted with the style and feeling of a good deal of its recent shop and warehouse architecture could fail to recognise the same characteristics in this collection of elevations for buildings of that class. The love of "chamfering" in all its most recondite and highly-developed forms, the desire for something clever and out of the way, the almost total absence of real taste and refinement in style and detail, combined with a considerable degree of cleverness and originality,—the qualities, in fact, which distinguish the type of modern Manchester architecture referred to,—seem to be systematised in this volume.

We are not on that account decrying Mr. Ogden's publication unreservedly. On the contrary, there is a good deal of ability in some of the designs, and the systematic consideration of mercantile architecture has not been much undertaken by architects, so that there is reason to praise at least the good intentions of a member of the profession who assists in drawing more attention to it, and indicating it as a special field for architectural treatment. If he appears to derive his style too exclusively from local influence and taste, that is a defect which may be corrected hereafter. And though many, we fear we must say the majority, of the designs in the book contain much that is offensive against good taste, some are good, and others are characterised by a degree of ingenuity and inventiveness which, though somewhat misapplied, must have due credit, when we consider what a "fearful wild-fowl" a blank sheet of paper, ready to receive "ideas," really is, and how much labour and contrivance of hand and thought must have gone to fill the fifty sheets this book contains with the (mostly) elaborate designs which they now exhibit.

The subject of warehouse architecture is really a rather extensive one, and includes problems beyond what are touched upon by Mr. Ogden. The word "warehouse" has, in fact, a somewhat varying signification. In many places, more especially in seaports, a warehouse is a building for the stowage of goods on a large scale and in their rough state, cargoes of bales brought straight from the ship's hold, &c.; a building for the stowage, but not for the exhibition, of goods. A considerable proportion of what are called warehouses in London are of this type, which in Liverpool and other large ports is the only class of building designated by that term. In Manchester a warehouse means, we believe, in the majority of cases, not a building for the stowage of raw goods, but for the stowage and exhibition of manufactured goods for sale. The two classes of buildings are perfectly different in their requirements and associations, architecturally speaking. The warehouse for stowage of heavy goods not immediately to be required, of course is naturally a much more plain and massively-constructed building than that for manufactured goods which are to be displayed, or which are in course of regular sale on the premises. In fact, the stowage warehouse used to be considered a mere matter of building thick walls, and hanging strong floors in them; and some large seaport towns are fearfully disfigured by the enormous cubes of unsightly brickwork with barred windows, which seem to be considered the necessary and normal type of the warehouse. Lately it has been perceived that such buildings do in fact, offer opportunity, at little extra cost, of realising a great deal of very fine, though stern, architectural expression, and may even be made to produce something far superior, in dignity and massiveness of effect, to what we are generally able to achieve in civil and domestic architecture. This has been, to a certain extent, recognised in London, and attempts, creditable both to owners and architects, have been made to render this class of building a means of adding to the architectural interest of a neighbourhood, instead of defacing it. More may be done in this way than has yet been accomplished; the great desideratum being that nothing pretentious or ornate should be aimed at; that the architectural effect should result simply from the frank treatment of the building so as to emphasise its strength where strength is most wanted, and so as to give to its practical features their most effective grouping and treatment without descending to mere ornamental additions. Far more in the way of really fine architecture is possible with a building of this class, treated in this way, than we generally get; it demands, more than most things, the perception and feeling of a true architect, whose consideration and taste need not be considered as thrown away because expended on a building for so practical—we will not say so prosaic—a purpose, for we do not regard commerce as prosaic. We may just allude to the fact, which some of our readers may remember, that one of the very best things ever done by a contemporary architect whose name has been spoken of most in connexion with the art side of architecture, was—a drysalter's warehouse. Since then we can recall having noticed warehouse designs, of the same class, among some of the best things in the architectural room at the Royal Academy, so that some at least among the cleverer members of the profession have "gone and done likewise."

The warehouse for manufactured goods admits of more decorative treatment. It is, in fact, a sort of commercial palace, intended to indicate by its outward richness of treatment the wealth of the owner of the stock; so, at least, we have always considered the Manchester "warehouse," corresponding perhaps to the American "store," to be so intended. This type of building is evidently contemplated in the warehouse designs in the present volume we are speaking of. They are both too ornate in style, and too deficient in solidity and mass, for warehouses for stowage of heavy goods. Regarded in the former light, some of the designs have considerable merit; chiefly those in which the least effect is aimed at. Some of them have been made for special situations, such as where there is a narrow street, and it is important to cut off as little light from above as possible; or where rights of light affect the upper story though not the lower, &c. The strong point in the best of the designs lies in the manner of grouping and disposing the windows, in which considerable originality and perception of effect are evidenced. In this respect the elevations shown on plates 38 and 41 are good and suggestive; and plate 36 shows a sensible and suitable front, of a plain unpretentious type, with the two upper stories contrived so as to fall back from the line of front and allow of light passing. In many of the designs there are points which are suggestive, and which, if worked out with more refinement, would produce some novel and picturesque results. But as treated here, the vulgarity of some of these designs is astounding. The author deliberately professes, in his preface, to have aimed at producing designs "entirely eclectic" in character, "preferring to select and combine features of beauty and utility from any available source, all picturesqueness of grouping or detail save that springing from evident and natural requirements being avoided." Now, there is a good deal to be said for eclecticism in one point of view; but, to be worth anything, it must be the result of a study of various styles till their principles are mastered, and till the designer, taking into account what there is in common between them in essentials, is able to modify their characteristics so as to meet each other half way, if one may so put it, and make a congruous whole. We do not say this is often done with success; but it may be and has been accomplished with very good effect and originality. But deliberately to take features of various styles and bundle them together, as Mr. Ogden has done, is only the way to produce monstrosity and a sort of architectural chaos,—a result which he has most successfully accomplished. Anything more deliberately hideous than the design on plate 34, for instance, it would be difficult to imagine; and some others are nearly as bad. In some which are not so objectionable otherwise, such as plate 50, the tenuity of the piers, presuming them to be, as they apparently are, of stone, destroys the effect of the whole. Plate 45 shows a better instance than some of them of the combination, to a certain extent, of Classic and Gothic detail; an experiment which has been not unfrequently tried, and which is sometimes successful, as in this case, when the Gothic forms are not very pronouncedly Gothic, and the Classic features are somewhat modified to harmonise with them. The author seems to have a great fancy for playing clever, or at least odd tricks with string-courses and window-labels, especially of making the latter interpenetrate and cross each other, in a manner which is essentially unarchitectural, and makes these features seem mere bits of ribbon-work stuck on to the surface of the building, instead of integral features of the masonry; and in several places he makes the crowning mouldings of the raking cornice on a dormer window mitre and cross each other, and continue past the apex in two horns, like the angle of an "Oxford" picture-frame. The effect of this, even in the drawing, must be seen to be appreciated; in execution it would be still worse. No designer possessed of a particle of what may be called architectural morality would perpetrate such a thing. Even in some of the better and soberer designs, we doubt whether the author has realised what would be the effect in execution and in perspective of some of the "dodges" which he draws in elevation. How does he think, for instance, that the ground-floor piers in plate 38 would look, cut up on both sides into such large and irregular chamferings? They would appear very twisted and awkward, and very insufficient for the superstructure; for the eye would judge of their width, in perspective, by the breadth of the flat surface left on the wall plane, a mere strip compared with that of the flat pier of the story over. In putting in chamfers in elevation, designers often seem to forget that what appears to strengthen a feature when drawn in elevation, by the adding of lines, weakens it in execution, both really and apparently, by removing material. Chamfering is a glorious way, no doubt, of manipulating the lines of a design and giving it piquancy, *on the drawing-board*: it has become almost a special art now, with such innumerable varieties as to seem to merit a special treatise to itself,—"The Complete Chamferer," for example. Only unfortunately these piquancies have a tendency to look very different in execution from what their appearance on paper would lead the unsophisticated mind to expect.

The designs given for offices do not seem to us to differ materially in treatment from those for warehouses, except in having, in some cases (but not in all), a larger proportion of window space. On the whole, they include the best things in point of design, though containing, also, some things that are fearful and wonderful. Entire want of repose is a quality which no cleverness can atone for, and which is painfully illustrated in some of these designs. Plate 19 shows an office design, one of the best in point of taste, which is referred to in the preface as "calculated for a position requiring additional means of light." Apparently this is understood to be provided for by the arrangement of the windows on the plan of a rather flat bay-window. As we have several times met with this odd idea that a projecting bay-window gives more light to an apartment than one in the plane of the wall, it may be as well to point out, what one would have thought was obvious to any one, that you can get no more light into the room than the opening in the plane of the main wall will admit, and that, in fact, a bay-window (unless made with a glass roof) rather operates in depriving a room of some of its light, by the amount which its roof cuts off. Any one seated actually in the bay of course gets more light than through an ordinary flat window, but the room itself gets less.

We take the author of "Mercantile Architecture" to be a young member of the profession; and under such a supposition the work which he has produced is, in some points, undoubtedly creditable to him. Its title is too ambitious, and it does not touch upon the special style of mercantile building, the "warehouse" properly so-called, which gives opportunity for the most marked and distinctive architectural treatment; and there are a good many designs in it which the author will probably condemn himself before very long. But there is a certain spirit, cleverness, and originality about even some of the more objectionable ones, which is, perhaps, more promising than merely dull good taste running in a well-worn groove.

* Studies in Mercantile Architecture: comprising Fifty suggestive Designs for Warehouse, Shop, and Office Dwellings, suitable for the Commercial Districts of large Cities. By W. Sharp Ogden, architect. London: Batsford.

Albrecht Durer.—"The Personal History of Albrecht Dürer, of Nürnberg, his Works and Times," which was in course of preparation by Mr. Henry F. Holt at the time of his death, has been completed by his widow, and is about to be published.

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AMERICAN "COTTAGE" ARCHITECTURE.

Our American cousins seem willing to let us know that they are not asleep about architecture, and volumes illustrative of the progress of the art, and the attention paid to it, in the States, reach us "quite" frequently. The publication* which forms the latest instalment exhibits remarkably one accomplishment in the way of getting up a book in which we are by no means so proficient on this side of the Atlantic: we allude to the manufacture of title-pages. The title-page of the book before us is itself a literary effort. It includes over 180 words, and would fill about a quarter of our column if reprinted in full, even in "close order." In it we read that, in addition to the general plans and designs of houses engraved, there may be found "a great variety of designs for cornices, brackets, windows, window-caps, doors, piazzas, porches, bay and dormer windows, observatories, towers, chimney-tops, balconies, canopies, scrolls, gable and sawed ornaments, fences, stairs, newels, architraves, mantels, plaster finish, &c., &c." "That's your sort," as *Goldfinch* says in the play. One almost gasps on reaching the final "&c., &c.," and contemplating the possible vistas of further information thereby suggested. The list reminds one of the advertisements of Messrs. Flashman & Co., who invite you to "furnish throughout" from their celebrated establishment. We fear the parallel may be carried further, and that persons going to build, who endeavour to furnish their brains from Messrs. Bicknell's publication, will find the real contents of the establishment sadly at variance with the grandiloquence of the advertisement.

The book is, in fact, a jumble of designs, among which all the articles enumerated in the title-page may be included (we do not see where "towers" come), but which, in fact, offer very small choice to any one looking for hints or precedents. Such a publication is utterly useless in England, as the few things in it that are at all good are only adapted from contemporary English work; and few persons of educated taste in this country would find anything to admire in the ornamental designs, which, though not altogether devoid of merit, are mostly, not to say entirely, in a very commonplace style. The volume may have a certain amount of interest as indicating (if we are to take it as indicating) the progress of taste in domestic architecture in the Northern States; but we are inclined to doubt its being any fair test of this.

The main title of the book is itself puzzling, as one cannot see why "detail, cottage, and constructive architecture" should be severally enumerated as separate branches. Cottage architecture must also be constructive architecture, so that the division is unmeaning. It would seem, from a comparison of the contents of the book, that the term "cottage architecture" is used in a wider meaning than with us, and is applied generally to the class of houses for which we have no better name than "villas," including dwellings of some considerable size. Among these it may interest English architects to see what is termed in an American publication a house "in the Domestic Gothic style" (pl. 15), and its details on the next page. Some of the details of woodwork based on Renaissance forms are better, and are rather fanciful and effective; indeed, it seems that in assimilating or using up the styles of the Old World, American taste in design harmonises better with Renaissance than with Gothic feeling, and makes more out of it. Whenever anything like Gothic detail is given in American architectural publications, it seems to be mostly of the Batty Langley type, or reverting to that. There are exceptions; and there are not wanting eminent and cultivated members of American society who have carried back to their own land from Europe a true perception of what makes the real excellence of Mediæval art, and whose influence may be felt in time; perhaps is already felt more than we know of here. But as far as we can judge from the architectural publications which reach us from America, the standard of taste and knowledge in these matters is either still low, or is inadequately illustrated. Publications of the kind we are alluding to seem, moreover, to be too little under educated professional control, too much under mere publishing influence. The present work, like one we recently noticed at some length,† seems to be the enterprise of a publishing firm only, and no professional or architectural editor's name appears in connexion with it; nor have the designs any designer's name, except that in the case of a few general views and plans of houses the architect's name is appended.

Among the designs for houses, almost the only two which we can like are two geometrical elevations in a more masonic and less "Swiss-cottage" manner than the rest; one a design for a house in flats on the French system, the planning and lighting of which, by the way, are rather ingeniously though simply contrived, except that we cannot make out the W. C. provision, or whether there is any at all; and the other a page of designs for some ordinary three-storied street houses, which are simply but effectively and suitably treated. Some of the details for woodwork are not bad, though in a rather common-place taste, and without sufficient profile sections and constructional detail for a book which professes to fulfil a practical object. The designs for "cottages and villas" on a smaller scale, are of a sadly gimcrack type. In one point, however, we have learned a more dignified phraseology. We notice that in the plan of the house in flats before mentioned, what we should call the "lifts" for tenants and for coal have a nobler nomenclature, and are lettered as "passenger elevator" and "fuel elevator." That is the one thing we can profess to have learned from Messrs. Bicknell & Co.'s publication; and we hope that in future a lift will always be spoken of, by all educated architects and builders, as an "elevator."

Let it be distinctly understood that we have no desire to banter American architectural works, as such. We know that there are very able and clever architects in America; we read occasionally admirable addresses and papers delivered at professional meetings in the States, and reported in professional papers. But our complaint is that we can find little evidence in American architectural publications,—such, at least, as reach us,—that the members of the profession in the States are exercising any important or serious influence on the taste of the general public, unless it be through some of their buildings. Architectural publications seem to be left to the enterprise of publishers, and as a mere matter of business, and got up in a popular rather than in a really architectural spirit. We see and know of no such works as are frequently brought out by English architects; works dealing ably, both scientifically and artistically, with important branches of architecture and archæology, and illustrated in a first-class manner by the pencil or under the direct superintendence of the author. Of archæology there is, of course, necessarily little for the American architect, in relation to his own country. But, unless architecture is more empirical, more destitute of guide or landmark, in America, than we should wish to suppose, we cannot understand why the publications illustrative of the art which reach us from the new country should be so far inferior in every respect to those we are accustomed to see here. There is surely something for the American architects to do in this respect; some room for them to make further efforts towards rendering the art better understood and appreciated, by illustrative and critical publications somewhat less commonplace in matter and style than what we have hitherto seen; publications in which the subject is treated of with the comprehensiveness, accuracy, and artistic feeling of a trained professional mind, and not with the shallow empiricism of a trading firm making a book. If we have appeared somewhat harsh in our comments on this and one or two previous publications brought out in America, it is because we feel that the work is being done there by the wrong hands and in the wrong way. Let any of the really able men in the profession in America illustrate their art in publications in which their best ability and research are shown, and which bear the stamp of professional authority, and they may be sure of a hearty welcome and an appreciative criticism in our columns.

* Detail, Cottage, and Constructive Architecture, &c. New York: A. J. Bicknell & Co. London: Sampson Low & Co.

† "American Interiors:" see *Builder* for June 3rd of the present year.

KINEMATICS OF MACHINERY.*

Formerly a machine was considered as a whole, but Professor Willis, in his "Principles of Mechanism," separated the ideas of force, time, and motion, and considered motion without reference to the other two, calling the study thus separated the science of pure mechanism, and hitherto writers have examined mechanisms as a whole, without attempting to analyse them, or to investigate their mode of formation; but the translator (who is professor of mechanical and civil engineering in the University College, London) says in his preface that the author,—Professor Reuleaux, of Berlin,—has followed a better method, which, in the following remarks, we merely indicate, and by no means fully explain. Every one who has or thinks he has invented a machine should study the principles laid down by the author, before taking proceedings to obtain a patent; and in any case the study will be useful in enabling the inventor to simplify the movements of the working parts, and so enhance the value of the machine. Practical John Bull must study principles more than he has done, in machinery as well as in other things. "Theory and practice," says the author, "are not antagonistic, as is so often tacitly assumed. Theory is not necessarily unpractical, nor practice unscientific, although both of these may occur. The popular antithesis should rather be between theory and empiricism."

Kinematics is commonly defined as the science of motion,—of pure motion; the word is used by the author in the limited sense, for the science of constrained motion, that is, motion as it occurs in machines, without reference to the ideas of either time or force; but the translator says that in this country it cannot now be adopted in that limited sense, for it has obtained a firm hold in a much more extended sense, and one which is, moreover, quite legitimate; and he has therefore changed the original title *Theoretische Kinematik* to "Kinematics of Machinery." As yet, he says, we have no word for the study of motion as change of position merely; he suggests Metastatics for the purpose.

The aim of the author is to determine the conditions which are common to all machines, in order to decide what it is, among the great variety of forms, that essentially constitutes a machine, and shows that the proper definition of a machine is "a combination of resistant bodies so arranged that by their means the mechanical forces of nature can be compelled to do work accompanied by certain determinate motions"; and kinematics is thus "the study of those arrangements of the machine by which the mutual motions of its parts, considered as changes of position, are determined." The difference between this definition of Kinematics and that which Ampère (who invented the name) indicated, is that it is made to belong essentially not to mechanics, as with Ampère, but to the science of machines.

Searching back in history for the origin of machines, and still further back into the past, the author contradicts the popular notion that the lever was the first machine. "In taking the lever as the first machine, we think of men's attempts to deal with or overcome great resistances. It is not this, however, which first attracts the opening consciousness, but is much rather the accompanying phenomenon, *motion*. The child shows the most lively interest in the sails of a windmill, in the mill-wheel, and other such portions of machinery as have distinctly regular motions; at first, however, he thinks nothing of the forces applied or brought into action by them. The separation of the idea of force from that of motion is a very difficult mental operation, and we find it occurring late and gradually. We find, accordingly, that the machines coming first from the unaccustomed hands of their makers are those in which forces play a comparatively subordinate part,—for they do not exceed the exertions which the worker himself makes, imperfectly conscious of what he is doing. This really lies at the root of the continual recurrence of the problem of perpetual motion; certain minds are always irresistibly attracted by the motion itself, by the first impression gained solely from external appearances, from the overpowering influence of which even the most accomplished cannot boast themselves to be entirely free."

Geiger, says the author, in his excellent little work on the origin of tools and the production of fire, comes to the conclusion that rotary motion was the first that men produced by any arrangement which could be called machinal. A piece of wood, roughly pointed at one end, is placed perpendicularly upon another, in which a small hole or recess has been made, and is caused to twirl rapidly backwards and forwards by the hands until the shreds rubbed off the wood, or some fibres of cotton or fragments of pith placed upon it, catch fire. (Tylor, "Early History of

* The Kinematics of Machinery. By F. Reuleaux. Translated and edited by Alex. B. W. Kennedy, C.E. London: Macmillan & Co. 1876.

Mankind." London, 1870, § 241; and Klemm, vol. ii., § 66, are referred to.)

"The discoveries made in recent excavations allow us to conclude with great certainty that primitive nations used some such arrangement" as a cord wound round a twirling stick, its ends held in the hands and pulled backwards and forwards, the upper end of the stick being sharpened, and the required downward pressure given to it through a third piece of wood similar to the under-piece, held and pressed down by a third worker "for working those borers with which to our astonishment they were able to drill holes in wood, bone, horn, and even very hard stone." The secret was that sand and water were used along with the boring-pieces.

In a machine, the moving bodies are prevented by bodies in contact with them from making any other than the required motion, and "*a machine consist solely of bodies which thus correspond, pair-wise, reciprocally.* These form the kinematic or mechanismal elements of the machine." The shaft and the bearing, the screw and the nut, are examples of such pairs of elements. The kinematic elements of a machine are not employed singly, but always in pairs, and the machine cannot so well be said to consist of elements as of *pairs of elements*. A large number of motions can be obtained simply by pairs of elements, and the combination of pairs of elements is called a chain, or more fully a kinematic chain. The body which is formed by the junction of the elements of two different pairs is then a link of the kinematic chain, and when all the links are constrained to execute determinate relative motions the kinematic chain is said to be closed, the whole forming a linkage returning upon itself like an endless chain; but to obtain absolute and definite motion one link of the chain must be fixed in position relatively to the position of surrounding space assumed to be stationary. The relative motions of the links then become absolute. A closed kinematic chain, of which one link is thus made stationary, is called a mechanism. A kinematic mechanism is moved if a mechanical force or effort be applied to one of its movable links in such a way as to alter its position. The effort thus applied performs mechanical work which is accompanied by determinate motions; the whole, that is to say, is a machine.

Having, in 128 sections of the book, occupying 486 pages, and with the help of 355 figures (some of which are elaborately defined), examined the machine as a combination of constructive elements, and also investigated the nature of the latter individually, the author arrives at his final problem,—the examination of the machine as a whole. He first examines the way in which it has been usual to treat the subject. The usual conception of a complete machine has been that it consists of three parts or groups of parts, viz.,—(1) The receiver of energy, or the receptor; (2) the parts transmitting motion, or the communicator; (3) the working parts, or tool.

The part or group of parts constituting the receptor is generally understood to be that upon which the natural force driving the machine acts directly; the tool is the part by means of which the energy received by the machine is directly expended in producing the required change in or in connexion with the body to be worked on. As the motions of these two sets of parts are seldom identical, the second group of parts is required to transmit motion from one to the other. But if we look, says the author, more closely at this idea, we shall find that we are treading upon very uncertain ground, for if every complete machine must have some motor,—must be driven by steam, air, water, gas, &c.,—then evidently the lathe and planing machine cannot be complete. Scarcely any of the machines in a factory, indeed, could be considered as complete. The common usage, therefore, in which they all receive the name "machine," must be entirely inaccurate; and he goes on to show that the tool is not an essential part of the machine, it is accidental to it only. Then, as to the receptor, he is led to the conclusion that it does not form an essential part of the complete machine, being that part to which water, wind, steam, gas, a weight, a spring, or a living agent, directly imparts the energy by which the machine accomplishes its work; the receptor is a link in the kinematic chain,—the piece through which the driving effort is introduced forms a part of the kinematic chainage of the machine.

In his closing remarks the author says it is very noteworthy that all the principal problems of machinery are connected with a comparatively very small number of kinematic chains; these are the screw chain, the wheel chain, the crank chain, the cam chain, the ratchet chain, and the pulley chain. The problems not covered by these chains are all more or less inferior in importance.

SIR GILBERT SCOTT, R.A., ON ST. ALBAN'S ABBEY.

The Architectural Society of the Archdeaconries of Northampton and Oakham visited St. Alban's on the 19th and 20th ult., when Sir Gilbert Scott gave a *viva voce* explanation of the architectural history of the abbey, which, he said, was founded in early times by Offa, but no remains of the original building existed, except a few materials which were used up again in rebuilding the church, viz., some turned balusters of Saxon origin. It was known in the history of the abbey that the three last Saxon abbots had intended to rebuild the abbey on a grand scale, and had collected materials for that purpose from the ruins of Verulam. The task was inherited from them by the first Norman abbot, Paul, cousin of Lanfranc. He set to work about the building some few years later than Lanfranc set about building Canterbury Cathedral, and he made it very much larger than the contemporary church of Canterbury, but it was very much shorn of beauty in consequence of the untractable nature of the materials collected by his predecessors. The parts remaining of Abbot Paul's church were very massive, very noble and very grand, but were almost as entirely without architectural detail as any great engineering structure of the present day. The tower was the most perfect part remaining of the Norman church, and they would see the arches of a great part of the interior of the church still retaining the form then given them. Some little work was done by later Norman abbots, particularly at one of the transepts. At the end of the twelfth century one of the abbots, John de Cella, conceived the very ambitious idea of rebuilding the nave and west front. Many of them might have seen the account Matthew Paris had given of his extraordinary failures in carrying out this project. He could not obtain funds, and a good deal of what he rebuilt fell down, but a small portion of his work still remains, showing that his design, if it could have been carried out, would have resulted in the erection of one of the most magnificent structures of which this country could boast. He did not know any Early English work existing which was finer in its details than these unfinished remains he had left us. The work was taken up after his death, in 1214, by his successor, Abbot William de Trumpington, who carried out five bays on the south side of the nave, and four on the north. Trumpington's Early English work fell very short in beauty of that of Abbot John de Cella. The next work was done by Abbot John de Hertford during the latter half of the thirteenth century, when the eastern arm of the church gave way. The work was continued by his successor, Roger de Norton, to whom they owed, no doubt, the whole reconstruction of that part of the church at the end of the thirteenth century. This abbot prolonged the abbey towards the east, and there he (Sir Gilbert) would be able to show them some most beautiful chapels De Norton commenced and nearly finished, and the lady-chapel which he commenced, but did not nearly finish. During the abbacy of Hugh de Eversden, who finished the lady-chapel, a catastrophe occurred in the nave. Several Norman bays which had been left by Abbot Trumpington suddenly fell, and Hugh Eversden built them, or rather began to rebuild them, with the beautiful later decorations of his period, but with a boldness which hardly belonged to that period. He appeared to be rather carrying out the idea of the bolder work of Trumpington. The work went on for a considerable time, and was at length completed. This, he believed, nearly completed the outline of the history of the structure; but to be added to that was the erection of innumerable tombs and screens, and magnificent works of various kinds, of the history of which it was no use attempting to give any outline. He would only, in conclusion, say two or three words about the restoration which had been going on for the last four or five years. It was originated, he might say, by a very alarming occurrence—the appearance of some terrible cracks in one of the piers of the central tower, at a time when he had a little work going on in the abbey. His clerk of the works, Mr. Chapple, he believed first noticed them, and pointed them out to him and others. Steps were immediately taken to save the tower, which was in imminent danger of falling, and a small fund was raised for this purpose. This work turned out to cost a great deal of money, but it was done in time to save the tower, which he believed was now as strong as ever it was. The restoration was afterwards continued through to the eastern arm of the church, and partially into the eastern chapels beyond. Those chapels were taken in hand by Lady Salisbury, and they had been saved from absolute ruin chiefly by the aid of subscriptions collected by the ladies of Hertfordshire towards her fund. That fund had ceased for the present, but he hoped it would shortly be set on foot again, and these magnificent chapels restored to their pristine beauty. They had also carried on the work as far as the rood-screen, which separated the choir from the nave, but they had not had funds sufficient to make it perfect. The money had, he believed, been spent thoroughly well, and not a shilling had been wasted on what any one could fairly wish had been left undone. The building had been placed, as far as the funds would go, in a perfect state of repair, and a great many antiquities had been brought to light during the progress of the restoration. One thing especially had occurred which he ought not to leave unmentioned, viz., the recovery of the substructures of the shrines of St. Alban and St. Amphibalus. There were some blocked up arches at the east end of the church. The late rector, Dr. Nicholson, commenced the opening out of these arches, and in doing so found a great many beautiful marble fragments. At first he did not know what they were, but on reference to documents relating to the abbey he believed them to be portions of the shrine of St. Alban. Nothing more was discovered until 1872, when, perhaps surreptitiously, for they were never commissioned by the committee to do so, they opened out all these arches, and found upwards of 2,000 fragments of the marble shrine of St. Alban. These fragments were very skilfully and ingeniously fitted together, and the structure set up again in the place where the sockets still remaining showed that the shrine formerly stood. The shrine of St. Amphibalus, fragments of which had also been discovered, was only partially restored, but they still had an immense quantity of material, and hoped to be able to make it as perfect as the shrine of St. Alban itself. He would only add one or two words. Their funds were absolutely exhausted, and he did not know that they had any immediate prospect of obtaining fresh funds, but he thought he might say that if they were not forthcoming, and that pretty rapidly, and on a large scale, the country would be disgraced, and that magnificent fane would be left in a half-ruined state, a witness of shame to the nation that had suffered it so to remain.

On the following day, Sir Gilbert described the sites of the apsidal chapels formerly at the end of the transepts. The visitors then proceeded to the south side of the abbey at the east end, and afterwards to the west end of the nave, where the examination of the interior was commenced. Sir Gilbert Scott again referred to the attempted reconstruction of the western part of the abbey by John de Cella (1195–1214). This abbot, though a man of great artistic taste and skill, was unfortunately not a man of business, and, having demolished the vast Norman façade, he exhausted all methods of obtaining money (including that of sending a monk about the country who declared he had been raised from the dead by the relics of St. Amphibalus) and was unable to carry on the work of rebuilding it. At the request of Sir Gilbert Scott, Mr. Ridgway Lloyd read the account given by Matthew Paris of De Cella's failure, and Sir Gilbert remarked that the account was a very good specimen, not only of Mediæval history, but of Mediæval joking. The abbot appears to have been victimised by his first builder, Hugh Goldcliff, "a man deceitful and false, but an excellent workman," and he was forgetful, writes Matthew Paris, "of the admonition mentioned in the Gospel to him who is about to build to compute the cost, lest all is about to build to compute the cost, lest all begin to jest at him, saying, 'This man began to build and was not able to finish.'" The work was for a time abandoned, and fell into decay, "the ruins of the flowers and images provoking the beholders to laughter." John de Cella was ultimately obliged to limit himself to the erection of the three beautiful portals of the western front, with their exquisite marble columns and carved capitals, which were most probably de-

signed by his second architect, Gilbert de Eversbot. This work, Sir Gilbert said, was as perfect of its kind as any work in existence in this country, and there was very little at all equal to it. The succeeding abbot, William de Trumpington (1214–1235), resumed the work of rebuilding, which De Cella had been forced to relinquish, but he cut down and modified in a remorseless manner the details of his predecessor's designs, as may be seen by examining the work of the one abbot and that of the other at the points of junction. By this means he was enabled not only to complete the west front, but also five bays on the south side and four on the north, besides other works of minor importance. Abbot Trumpington's work is an exceedingly fine example of Early English, but, to quote Sir Gilbert's Scott's expression, is less *spirituel* than John de Cella's. He probably, however, used up several details already prepared by Abbot Cella, including some marble columns with rich capitals. The visitors next proceeded to examine the five bays on the south side of the nave, which continued the work of Abbot Trumpington, and Mr. Ridgway Lloyd read the account left by Walsingham of the sudden fall of the Norman piers on this side of the church during the abbacy of Hugh de Eversden (1308–1326). This abbot began their reconstruction in the style of his own time, but so far modified as to bring it as much as might be into general harmony with the older and simpler work of Abbot Trumpington. In the lady chapel, which was also for the most part the work of Hugh Eversden, we find the same style of architecture carried out without restraint and with more lavish profusion of ornament. The work was continued by his successor Richard de Wallingford, who, however, suspended it in order to devote his attention to the construction of an astronomical clock which denoted the fixed stars, the course of the sun and moon, and the ebb and flow of the tide. When remonstrated with, he remarked that there were plenty of men to build a church, but there was no other man living who could make such a clock.

A short account of the series of ancient frescoes on the Norman piers which were brought to light in 1862 was given by Mr. Ridgway Lloyd. Those representing the Crucifixion have been supposed to indicate former position, of altars, but the more probable theory is that they were "stations of the Cross," notwithstanding that they represent the Crucifixion instead of a series of incidents terminating in the Crucifixion. Among the other frescoes is a gigantic figure of St. Christopher, carrying the infant Saviour in his arms, and the figure of an Archbishop, supposed to be St. Thomas of Canterbury. It may be mentioned that in a temporary vestry at the west end of the nave were exhibited a number of the engravings from the drawings of St. Alban's Abbey, by Mr. James Neale, F.S.A., for which he last year obtained the Pugin Travelling Studentship and the medal of the Royal Institute of British Architects. Sir Gilbert stated that these beautiful drawings formed part of the work on St. Alban's Abbey now in course of publication by Mr. Neale.

After finishing the inspection of the nave the party proceeded to the presbytery, and having taken his stand under the tower, Sir Gilbert Scott explained the arrangements of the choir. In the course of his remarks he said that until he heard Mr. Davys's interesting paper he imagined that the two doors of the rood-screen were those by which, in former times, the people were in the habit of entering the choir, but Mr. Davys had shown that the people did not come through those doors, but only the priest officiating at the great altar of the nave, the arrangement being the same as at the eastern end of the church. He understood Mr. Davys to conclude that this was the usual arrangement in the churches of Benedictine monasteries. This would be an interesting subject for discussion. The Rev. O. W. Davys then made some further remarks on the subject, especially in reference to similar arrangements of the choir in other churches. He said that if the choir of St. Alban's was restored, as he trusted it might be, in accordance with the ancient ground-plan which had been preserved, it would be simply impossible to have a more splendid choir for the celebration of the choral services of the Church of England, while space would be left open as at Westminster for the accommodation of a large congregation. The sacrarium would be the grandest possible place for ordinations and great diocesan services which might from time to time be held there.

Sir Gilbert Scott said he had already referred to the fact that the reconstruction of that (the eastern) part of the church (which had previously terminated in a Norman apse) was begun in the reign of Henry III. (the Early English period), by John de Hertford, and continued by his successor, Roger de Norton. Now it was recorded in the annals of the monastery that Abbot Norton was buried in the middle space before the high altar, and his heart before the altar of St. Mary of the Four Tapers, in one of the eastern chapels. His burial in the place of highest honour was a moral proof that he rebuilt that part of the church, and the burial of his heart before the altar of St. Mary of the Four Tapers, was also a moral proof that he founded the little chapel thus dedicated. The receptacle of the abbot's heart has been recently discovered. It was enclosed in a small wooden box of Oriental workmanship, with an inscription on the lid, which has been examined by Sir Henry Rawlinson, who pronounced it to be a genuine Arabic inscription, and who had deciphered one word,—the name of the Almighty. A curious instance, said Sir Gilbert, of the way in which structural antiquarianism sometimes illustrates documentary antiquarianism was afforded by the fact that the discovery of this box led (through the suggestion of Mr. Lloyd) to the discovery, on his examining the original MS. at the British Museum, of an error in the printed text of the annals of John de Amundesham, viz.: the substitution of the words *cujus corpus* for *cujus cor*. The architecture of the eastern part of the church was exceedingly beautiful. The painting on the presbytery ceiling was probably done by Wheathampstead; but traces of an earlier painting underneath (as on the choir ceiling) were discernible. Mr. Davys then said a few words about the great altar (or Wallingford) screen, of which John of Wheathampstead was the original architect. He also referred to the beautiful tomb which is generally believed to have been built by his successor as a memorial of that great Abbot, though Mr. Ridgway Lloyd concludes from a passage in the records of the monastery that, notwithstanding the inscription and the wheat-ears on the tomb, it is the tomb not of Wheathampstead, but of Abbot Wallingford himself, and he conjectures that Wheathampstead was buried in one of the southern extra-mural chapels.

The visitors afterwards passed into the south transept, where a vast number of fragments of mouldings and sculpture, which have from time to time been discovered in various parts of the abbey, were arranged in chronological order. Here Sir Gilbert Scott pointed out the Saxon balusters in the triforium, to which Norman capitals and bases have been added. The slype was then inspected. On each side of it is a range of intersecting semicircular arches, with elaborately-carved capitals,—the only example of the Later Norman work to be found in the church. On arriving at the Saint's Chapel, Sir Gilbert Scott called the attention of the visitors to the newly-discovered substructure of the shrine of St. Alban, which was erected in the time of John de Marynes (1302–8). Upon this pedestal formerly rested the *feretum* or shrine proper, containing the saint's relics, and covered with silver and precious stones of inestimable value. A monk was stationed day and night in the watcher's gallery to guard the shrine and the offerings which were placed on it.

THE DRAKE ESTATE, DEPTFORD.

Deptford, with its Royal Dockyard of former days, as the residence of John Evelyn, the distinguished diarist and author of "Sylvia," and the temporary residence of Peter the Great, is rather rich, directly and indirectly, in historical associations. W. Wickham Drake, esq., better known in the locality as Captain Drake, of Brakspear, Harefield, Uxbridge, Middlesex, suggests reminiscences of an historical character. Captain Drake may be taken as lord of the manor of the regions of New Cross and Brockley, in which, and in other parts of the parish of St. Paul, Deptford, he is the owner of the large areas of valuable building land upon which, in recent years, many wide roads and streets have been laid out, and hundreds of houses, of a superior and substantial class, have been built. Captain Drake is the successor in the occupation of Brakspear Hall of Nicholas Brakspear, or Adrian IV., the only Englishman that ever wore the papal tiara, who, if infallible in one sense, was not invulnerable, if it be true, as tradition has it, that his five years' pontificate came to an end by his being "choked by a fly." Adrian rose to the dignity he achieved from a lowly condition, and in spite of formidable obstructions to his advancement. In history he is noted for his missionary success while legate to Denmark and Norway. He was honoured by Henry II. (*temp.* 1154), to whom he issued a bull making him master of Ireland. He had the honour also of having his stirrup held at Sutrium by the Emperor Frederick I. of Germany. The pope's successor at Brakspear Hall is also a Catholic, but of a different type from that of Adrian IV. and his successors. Captain Drake has been a munificent donor to the numerous places of worship, Church of England and Dissenting, that have of late years been built upon his estate. In these good works he has had a zealous squire in his agent and surveyor, Mr. J. T. Jenkins, who has died recently, much and deeply regretted. The spacious roads and ranges of imposing buildings to the south of Lewisham high road, embracing Brockley, Manor, Wickham, Brakspear, Tressilian, and Tyrrwhit roads, with other districts, were all laid out with admirable judgment by the late Mr. Jenkins, who was highly esteemed by all who had business or social relations with him. A number of gentlemen connected with the building trades, occupying three broughams, followed his remains, although uninvited, to the Nunhead Cemetery. There have been many candidates for the vacant office of surveyor and agent for the Drake estate, and charge of the office. The experience, character, and capabilities of Mr. J. J. Jenkins, son of the deceased, pointed him out as well qualified for the post, and much satisfaction has been given by his appointment to fill it.

THE PENGE NEW VESTRY HALL.

The Penge Vestry have agreed upon the plans which have been prepared by Mr. Elkington, architect, for the new vestry-hall which is about to be erected, subject to their approval by the Metropolitan Board of Works, to whom they have been submitted. At a special meeting of the Vestry, held last week at the Parochial Offices, Anerley-road, Mr. Elkington attended, and laid his plans before the Board. The design is Italian in its architectural character. The height of the front elevation of the proposed building is 40 ft., and its width 60 ft. The hall will be at the rear of the building, and will be 60 ft. in length, by 27 ft. in width, and capable of seating 300 persons. The ground floor will contain the hall and offices; the first floor will also contain offices and committee rooms; and the upper floor will be set apart as the keeper's rooms. The building will be in Kentish rag, with Bath or Portland stone dressings. It was stated with respect to the site that it had not yet been finally decided upon. Several sites had been under consideration, and one adjoining the new Congregational church at Anerley would have been selected, but the parties could not agree as to the quantity of land required. A site near the North Surrey Schools is now before the Vestry, and will in all probability be selected.

PROJECTIONS IN BRIXTON.

For several months past there has been a dispute between the Lambeth Vestry and Mr. Philips, in respect of a number of houses and shops which Mr. Philips has been erecting in that part of Loughborough-road near its junction with the Brixton-road, and on Friday in last week the surveyor to the vestry, acting upon the instructions of the latter, brought a number of workmen upon the spot, who at once cleared away the hoarding which enclosed the buildings, and having taken forcible possession of them, commenced taking down the structures, entirely demolishing the front elevation, together with the interior walls and timbers, to a depth of about 7 ft., the distance which it is alleged Mr. Philips has encroached beyond the street-line as laid down by the Metropolitan Board of Works. The buildings are three stories in height, but from front to back not more than about 16 ft. deep, and the owner states that the small portion which now remains renders the property valueless, and altogether unfitted for shops or other business premises for which they were intended. The buildings were erected in part upon an open area in front of the former old structures, which

were taken down, and it appears that when Mr. Philips commenced to build he received notice from the local authority that he was encroaching upon the line of front in contravention of the Metropolitan Building Act, and that he must not proceed. He, however, disregarded the notice, and continued the works until the buildings were entirely up, contending that he was building on his own land, and that the local authorities had no right to interfere with him. This led to his being summoned before Mr. Ellison, the Lambeth magistrate, for an infringement of the Building Act, when he appeared by counsel, and contested the point. The magistrate had some difficulty in arriving at a decision, but after making a personal inspection of the premises he decided adversely to Mr. Philips, ruling that he had encroached upon the street frontage, and ordering him to take the buildings down. He subsequently received the usual notice under the Act, from the surveyor, but refused to comply with it, the result being that the Vestry, as representing the Metropolitan Board, have demolished the buildings as above stated. We understand that Mr. Philips, under the impression that he is in the right, and that his property has been illegally destroyed, intends to institute legal proceedings against the authorities for the recovery of damages.

A BISHOP AND ARCHÆOLOGISTS.

At a dinner of the Durham and Northumberland Archæological Society, at which fifty ladies and gentlemen sat down, at the White Hart Hotel, Hexham, Northumberland, the Rev. Canon Greenwell, of Durham, as chairman, replied to some strictures made by the Bishop of Durham on a late occasion. The Bishop, in speaking of the Durham and Northumberland Architectural and Archæological Society, had called them an "impertinent and meddlesome body," and his lordship had further directed his clergy to resist that "body" to the best of their ability, and not listen to the suggestions that might emanate from it with regard to church restoration.

"The occasion," said the Chairman, "that called forth these remarks was in connexion with the ancient church of St. Giles, in the city of Durham,—a church that in some respects required reparation and enlargement, and it was at the same time generally desired that its ancient features should not be destroyed. They heard, however, and there was no doubt the report was a true one, that it was the intention to totally destroy that ancient church. Therefore their Society took action, and, as he believed, very proper action,—action which had on former occasions been taken with like good effect. As the result of this intervention, the parishioners had resolved to preserve the best parts of the building. Their Society had hitherto exercised what influence they had for the preservation of such remains, and he hoped that, in spite of attacks made upon them, whether by canons, rectors, vicars, or even by bishops, they would not pay much attention to that, when they were perfectly satisfied that in the action they took they were perfectly right."

The speaker's observations were warmly applauded by the clergy and laymen present, and some remarks were passed on Bishop Baring's opposition to antiquarian pursuits of a like wording to his lordship's remarks on the Society in question.

SOUTH KENSINGTON AND THE DRAINS.

The following resolution was passed at a meeting of the Vestry of Kensington, held on the 26th ult.; the Rev. W. D. Maclagan, M.A., vicar, in the chair:—"That the statement made by Sir Henry Cole to the Metropolitan Board of Works, that 'typhoid fever is chronic in South Kensington,' has no foundation in fact; for no death has occurred from that cause in South Kensington during the present year, and the medical officer of health of the parish is unacquainted with any cases of illness from the same disease."

Sir H. Cole replies thus:—

"The resolution of the Kensington Vestry, affirming that typhoid fever is not chronic in Kensington, because no death has occurred during the present year, is not logical. Their medical officer of health may be unacquainted with any cases of illness from that disease, and yet they may exist.

Bad house drainage and escape of sewer gases do exist, and the Vestry may have no power to remedy them or to prevent them, and have no means of affording any information to a would-be tenant who wants it before he takes a house. The best of houses in Kensington and throughout the metropolis, and elsewhere, are exposed to diseases insidiously generated by sewer gases,—a palace as well as a cottage may be liable to them. My object is to prove the fact, and to find out some cure for it, and the Kensington Vestry ought to do their best to help me, and I have no doubt will do so in time."

EXTENSION OF THE LONDON GAS COMPANY'S WORKS.

The London Gas Company are about to carry out works of an important character in connexion with the extension of their premises at Nine Elms, and in addition to new buildings and gasometers to be erected, they have obtained the sanction of the Battersea local authorities for the construction of a bridge across Nine Elms-lane to carry a tramway which they are about to make from their wharf at Nine Elms to the works for the carriage of coals from the steamers. The height from the centre of the roadway to the underside of the bridge is not to be less than 22 ft., and the parapets of the bridge to the openings over the road, and each side, are to be close-fenced with wood to a height of not less than 6 ft. The bridge is also to be encased, and otherwise constructed and maintained, so as to render it noiseless and water-tight. In consideration of being permitted to construct this bridge over Nine Elms-lane, the company have undertaken to widen the road over Millpond Bridge, and, as far as their wharf extends, by setting back their wall from 5 ft. to 6 ft., and to pave the road as widened at their own expense.

SOME OLD HOUSES AND THEIR STORIES.

THE HOUSE IN WHICH JEREMY TAYLOR WAS BORN.

In Cambridge, in the August of 1613, there lived, in the old house we represent upon the next page, a barber named Taylor. The joyous new-found hopes with which the unhappy Puritans had regarded the death of Queen Elizabeth had died away in bitterness and despair; and so also had the gleeful prognostications of the once not less hopeful Romanists. King James had openly and definitely announced his intention of sweeping back the Atlantic. He had the Royal besom in readiness. He would be no half-king, ruling the bodies of men whose souls were governed by the Pope, and, above all, he would have no subjects who refused to obey his pets, the bishops. "No bishop," said he, "no king." Of Dissent generally he had exclaimed, "I will have none of that! I will have one doctrine, one discipline, one religion in substance and ceremony." Thus far and no farther should come the great rolling waves of religious thought and feeling, for a new Canute, who doubted neither his power nor the divinity of its origin, had planted his throne upon the wild sea-shore, oblivious of coming storm.

It was only a few months after the poor blameless Scripture-reader, Bartholomew, legate of Essex, had been burned to ashes in Smithfield as "an obstinate, contumacious and incorrigible heretic," and the horrible death of Edward Wightman, of Burton-on-Trent, for the same offence, and these terrible doings were still much talked of throughout England.

We have no clue to the Cambridge barber's opinion of these events. He was probably a worthy man, and he certainly came of a very worthy stock, and he was proud to number amongst his paternal ancestors one who had been the friend of Cranmer, Dr. Rowland Taylor, rector of Hadleigh, in Suffolk, one of the most amiable of men and best of Christians, who was cruelly burned to death by the Papists in the year 1555. The Taylors had been a family of distinction in Gloucestershire, but had "fallen into the portions of weeds and outworn faces," as the third son of this Cambridge barber, Jeremy, the most illustrious of his race, afterwards said.

The barber of that day differed widely from his modern representative. He not only shaved, but dressed wounds, drew teeth, and practised bleeding,—was, in short, both barber and surgeon. Before the Reformation the clergy had stigmatised his calling as so brutal and degrading that they refused him their benediction, in obedience to the edict of Pope Honorius III. But it was becoming far more respectable in the year we have mentioned. In ancient days, when the priests, who afterwards anathematised play-actors, were dramatic authors, players, and managers, they also monopolised the arts of healing. But after the Pope had prohibited them from undertaking all operations which involved the shedding of blood, the functions of which they had before been proud and boastful were given over to uneducated hirelings acting under their instructions, the barbers who had tonsurated the clerical skulls. And when these skilful barbers became an independent fraternity, as surgeons, the priests, affecting to abhor their doings, denounced them as cruel, sanguinary, and brutalising, and pronounced surgeons and barbers irrevocably damned, in language as strong as that now used by those who shrink in disgust from vivisection. In process of time the barber-surgeons had become divided into two classes—those who, like the barbers of the old religious houses, were ignorant and uneducated, forming one; and others, who were specially trained and educated men, constituting the other. Taylor, the barber-surgeon of Cambridge, was amongst the latter.

When Jeremy was growing up a quiet, thoughtful child, his father determined to give him all the educational advantages he could command. He remembered well enough how, in days when the Church of Rome held sway, barber-surgeons were excluded from all academic privileges and honours, and refused admission to the University, and, blessing the change, he determined that Jeremy should have the fullest advantages of it. He himself taught his boy the rudiments of grammar and mathematics, and, when he was older, sent him to the Free Grammar School.

Those were the old days of story-telling, when the long hours of winter were wiled away in the chimney-corner by much talk of by-gone days and cherished memories. We may fancy, with every probability in favour of its being true, that we see little Jeremy, with open mouth and tearful, distended eyes, full of solemn reverence, listening to the affecting story about his martyred ancestor. How Dr. Rowland Taylor preached at a very ancient place called Hadleigh, in Suffolk, where he lived a life of exemplary virtue and piety, beloved by the poor and esteemed by all, a learned, wise man, a kind, good father, and an affectionate husband. How, when Queen Mary began to reign, a wicked Papist, a lawyer, named Foster, and one John Clark, on the Monday before Easter, strove to eject Dr. Taylor from his church, and place a Popish priest, to perform mass, in his place. How the brave doctor protested against this with manly firmness and much vigour of speech. How there came a terrible summons from the Lord Chancellor, Bishop of Winchester, commanding Dr. Taylor to present himself before him, and give an account of his offence; and how, despising the advice of terrified friends, who urged him to seek safety in a foreign land, he mounted his horse, and bidding his family a sad and lingering adieu, rode calmly away to face his enemies in London. Little Jeremy's face flushes as he hears of the coarse insults and harsh, cruel threats which were heaped upon the resolute Protestant by false, fierce Gardiner, who said, "I thank God I am come home again to our mother, the Catholic Church of Rome, and so I would thou shouldst do." Whereupon Dr. Taylor replied emphatically, "God forbid!" The boy's face grows more intensely sad as the story goes on to say how they sent the good man to a foul cell in the King's Bench prison, "commanding him to be straitly kept," and how after repeated examinations "he was adjudged and condemned as an heretick, and delivered to the secular power"; how his poor heartbroken wife and his son Thomas, with their servant, came weeping to his new prison in the Poultry Compter, and how on the 5th of February, 1555, his enemies conveyed him to the town of Chelmsford, in Essex, where they delivered him to the sheriff of Suffolk, who received him sorrowing, commending his goodness, piety, and learning, and most earnestly begging him to recant, and not to throw away in its prime a life so valuable to them all. The sheriff then drank to him lovingly, and so did the rest of the pitiful company, and of the wine they gave a cup to the poor doctor, to cheer his sad heart, and he, before drinking, to them said, with a mournful smile,—

"I heartily thank you for your good wishes. I have considered your counsel, and, to be plain with you, I do perceive that I have been deceived myself, and am yet like to deceive a good many in Hadleigh." And when, in their joy and hopefulness, they urged him farther, he explained the ghastly jest. He had deceived himself merely by supposing he should die at home in his bed, and be buried in Hadleigh church-yard, in the ground of which there were many worms whose long-cherished expectation of feeding on the body of such a portly man as himself he should perforce deceive.

Little Jeremy's face is stricken with an expression of horror, and the tears roll down his cheeks, and the barber-surgeon's voice falters and grows low, as he tells how silent pale-faced crowds lined the streets of Hadleigh on either side when the good doctor rode forth for the last time on his way to die a cruel death. There was not a dry eye amongst them as he went by, and they "cried out lamentably, 'There goes our good shepherd, who faithfully taught us, and had a fatherly care for us. Good God, comfort and strengthen him!'" When he came to the almshouse he distributed amongst the weeping inmates all the money he had. When he reached the common the crowd was so great that he did not recognise the spot, until being told it was there he was to suffer, he alighted from his horse and said "God be thanked! I am even at home." Then little Jeremy heard how when he knelt down to pray amidst the breathless silence of that horror-stricken crowd, a poor frantic woman burst through the guards, and, despite their ill-treatment, would persist in kneeling down and praying with him, and how when stripped and placed in the tar-barrel they bound him with chains to the stake, the heart of Richard Donigham, the butcher, who had been chosen to set up the faggots about him, failed him, and he obstinately refused to do the work. The concluding horrors of that tale must have haunted the boy like a nightmare dream, as it has crept out from the nightmare pages of Fox's horrible Book of Martyrs to haunt so many since. The memory of that old house must have come back to him with this dreadful old story with which his childish mind had been so strongly impressed many a time before, in 1647, he wrote his famous discourse, "showing the unreasonableness of prescribing to other men's faith, and the iniquity of persecuting differing opinions." This has been described as "perhaps of all Taylor's works that which shows him farthest in advance of the age in which he lived, the first distinct and avowed defence of toleration which had been ventured on in England, perhaps in Christendom." When he wrote thus, Jeremy Taylor had seen the kingdom of Great Britain convulsed by one of the most terrible of civil wars. The storm had arisen, and the great waves which the Scottish Canute had so arrogantly threatened with his sceptre had overturned the throne. He had seen religion made the vehicle and the excuse for indulgence in the worst of evil passions. The Puritans had cried, "Cursed be he that keepeth back his sword from blood!" and, with bigotry and ferocity as blind and savage as that which had condemned his ancestor to the stake, had asserted that "it is better to see people wallowing in their blood than embracing idolatry and superstition."

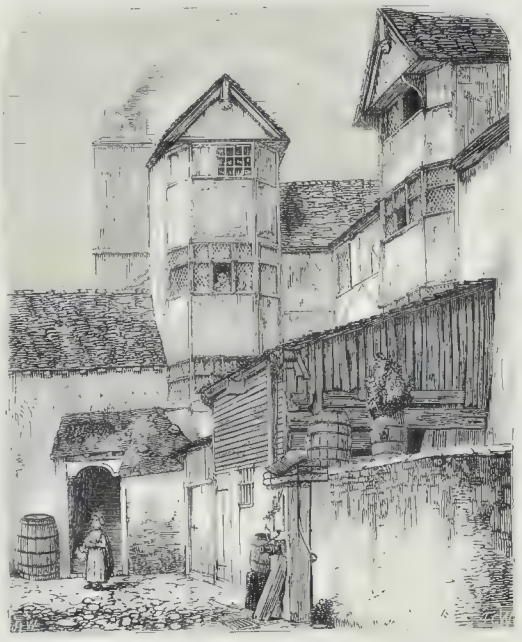
We cannot realise what the appeals of Jeremy Taylor for Christian compassion and long suffering patience were to our forefathers who had witnessed the scenes whereby his heart was so powerfully moved and his mind so strongly inspired. His arguments against the damnatory portions of human creeds in favour of a palpably divine doctrine of love and mercy were new to them; but they had wept and made moan over miseries; had shrunk in disgust and horror from deeds of blood and torture, which to us have the weariness of oft-told tales, and are removed by distance of time far beyond our active sympathies or fears. And the fruit our forefathers reaped from his teaching, and the seed they put in the ground for our benefit, may have owed much to that story of Rowland Taylor's martyrdom to which Jeremy listened so often when a little child in the old house of our sketch.

That house has other stories connecting it with our hero of the seventeenth century. It was still his home when after being educated *per decennium* at the grammar school founded at Cambridge by Dr. Stephen Perse, he passed at the age of fifteen through the Gate of Humility to Gonville and Caius College as a *pauper scholaris* or sizar on the 18th of August, 1626. Seven years after he was still in Cambridge, and obtained a Perse Fellowship, receiving a stipend which ended in 1636, when he had left Cambridge for Oxford, where he was very fortunate, securing the friendship of Archbishop Laud, who made him his private chaplain, acquiring a fellowship of All Souls' College, and becoming rector of Uppingham, in Rutlandshire.

In 1639 he abandoned the fellowship for the privilege of marrying the sister of a friend who had been his pupil in Cambridge (Miss Phœbe Landisdale), who bore him three sons in as many years, and in the last year died. Then the great storm of civil war was raging fiercely, and it became every true man's duty to stand at any risk honestly, fearlessly, and openly, by his convictions. Jeremy Taylor's chosen cause was that of the king, and as chaplain in ordinary to Charles I., he attended that monarch in some of his campaigns, writing at intervals the while in defence of the English Church. Drifting to and fro in the wild turmoil of blood and strife, he soon after found himself in Wales, where he met and loved a lady named Bridges, whom common report described as a natural daughter of Charles I. There he thought he would escape the fierce storm, and cast anchor in a little boat in which he hoped to ride it out in calm security. But in a battle fought before the castle of Cardigan, it was his fortune to be taken prisoner by the Parliamentary army. Being soon after released, he hurried back to his lady love, whom he married, hoping to enjoy rest and quietness in some humble capacity. The Earl of Carbery, of Golden Grove, Carmarthenshire, befriended him, and by the exercise of his ministry, and the aid of his wife's income with that derived from keeping a school in conjunction with William Nicholson, who was afterwards Bishop of Gloucester, and William Wyatt, who subsequently became prebendary of Lincoln, he supported himself, his wife, and his three sons. In August, 1647, Taylor had a last interview with his royal master, and received from him in token of regard his watch with a few pearls and rubies. This was the year in which the work we have already alluded to as a plea for tolerance in religion was published. In 1650 Taylor exchanged his residence in Wales for Ireland, his passport being granted to him by Cromwell himself, who sent therewith many expressions of personal esteem and kindness. To this step he was instigated by Lord Conway, who gave him an asylum on his estate at Portmore, near Lisburne, in the county of Down, and desired him to take charge of the spiritual interests of his tenantry. Taylor often used to allude to this as a period of tranquil happiness.

In 1654 some fervent unguarded expressions uttered by Taylor, prejudicial to the Commonwealth, resulted in his being made a prisoner, and committed to Chepstow Castle. Soon after his liberation he removed to London to officiate as minister to a small congregation of Loyalists. In 1658 he accepted an alternate lectureship in the town of Lisburne, returning to the north-eastern extremity of Ireland. From Lisburne he removed to Portmore, where he found a safe retreat during the interregnum, and brought to a conclusion another of the various great works he had up to that time produced — the "Ductor Dubitantium." When the Stuarts came back to the throne he was amongst those whose signatures were affixed to that memorable "Declaration of the Nobility and Gentry," which pledged the coming government —alas! so vainly—to bury "all rancour and former animosities."

Almost immediately after the accession of Charles II. Jeremy Taylor was presented to the bishopric of Down and Connor, to which was afterwards annexed that of Dromore, "on account of his virtue, wisdom, and industry." Honours and preferments now flowed in upon him thick and fast. He was soon after made Vice-Chancellor of the University of Dublin, and a member of the Privy Council. The composition of several polemical and practical treatises, together with his diocesan duties, seem to have filled up the concluding years of his existence. To the last his thoughts went lovingly back to his old college home and friends in Cambridge; and when he had the deanery of Armagh at his disposal it was offered to his old friend, Francis Marsh, of Caius College, and his own dean was another of his early friends in Cambridge.



Birth-place of Jeremy Taylor; in the Petty Cury, Cambridge.

On Aldham Common, on the spot where Jeremy Taylor's brave ancestor suffered martyrdom, was placed a stone, on which, roughly inscribed, were the lines,—

"Anno 1555,
Dr. Taylor, for defending what was good,
In this place shed his blood;"

and the volumes which were the life-work of his great descendant are the records of a spirit as earnest, indomitable, and brave; records which will be read with glowing hearts by thousands, when the martyr's rude memorial-stone has been forgotten for ages, and no man knows the place on which it stood.

Jeremy Taylor died on the 13th of August, in the year 1667. Coleridge spoke of him as "a spirit . . . . burning with Christian love; a man constitutionally overflowing with pleasurable kindliness, who scarcely, even in a casual illustration, introduces the image of a woman, child, or bird, but he embalms the thought with so rich a tenderness as makes the very words seem beauties and fragments of poetry from a Euripides or Simonides."

South Kensington Museum.—The attendance keeps up well. The visitors during the week ending 29th July, 1876, numbered 29,674, the average of the corresponding week in former years being 16,541.





CHESTER CATHEDRAL: NEW ORGAN GALLERY AND CASE, NORTH TRANSEPT.—Sir Gilbert Scott, R.A., Architect.

[See p. 749.

ROMAN SOMERSET, WITH SPECIAL REFERENCE TO RECENT DISCOVERIES IN BATH.*

It will be remembered by some here present that when the Somerset Archæological and Natural History Society met in Bath, on the 21st of September, 1862, the fourth year after its foundation, I had the honour to give a brief account of the Roman remains that were preserved in the Museum of the Literary and Scientific Institution. The paper read on that occasion was published in the proceedings, and the interest taken in the subject led to the expansion of it into a quarto volume, published twelve years afterwards (1864). Twelve years have since elapsed, and in the course of those years something has been added to the information thus brought together. I purpose, therefore, now to supply a notice of what has been acquired; but this notice must necessarily be brief, and can only indicate what may be done by careful observation and collection and preservation of remains when found, and may serve to show how necessary it is to note down every remnant of antiquity which may come to light. If another edition of "Aqua Solis" were put forth, it would contain much matter that has accumulated, and rectify some errors which in years past it was impossible to avoid. The study of Roman remains, and especially of inscriptions, has, within the last fifteen years received increased attention, and a great impetus has been given to it by the publication of Dr. McCaul's "Britanno-Roman Inscriptions, with Critical Notes," in 1863, in which Somerset inscriptions form an important part,—by the publication of Bruce's "Lapidarium Septentrionale," or inscriptions found in the line of the great northern barrier, or in the neighbourhood of it; but the chiefest and most important part is due to German industry, and that is the seventh volume of the "Corpus Inscriptionum Latinarum," put forth by the Academy of Letters at Berlin. This volume contains all the inscriptions found in Britain, brought together, and edited by Professor Hübner, under the title "Inscriptones Britanniæ Latinæ" (Berlin, 1873, Reimer). In this very scholar-like work Bath has received due attention, and the readings of the inscriptions are very accurately given, while the comments upon them are exceedingly valuable. Professor Hübner has paid two visits to England, and the Roman remains of Bath were on one occasion very carefully examined, when I had the pleasure of seeing and conversing with him, and have since been in frequent communication. He has availed himself of all the authorities who have written of British-Roman remains, consulting them with great care, always acknowledging their use, and pointing out wherever they have fallen into any error. The first subject to be noticed is the ancient name of Roman Bath, which has always been a fruitful subject of discussion. Is it *Aquæ Solis* or *Aquæ Sulis?* Professor Hübner decides in favour of the latter, on account of the altars bearing inscriptions to the Dea Sul, but acknowledges that there is good authority for Aquæ Solis. To myself it appears a point very difficult of solution, for Sul in the ancient Gaulish language seems to have been synonymous with Sol. Sul was the eye of the world, the universal soul, or soul of the universe. The word "soul" is from the Saxon, but in some of the cognate languages it approaches very near the word Sul. The word soul expresses inward illumination. And if you note, Sul is connected with Minerva on two of the Bath altars. Minerva, the goddess of wisdom, is coupled with Sul, the goddess of illumination. Leaving, however, our hearers to select whichever name they would like, I pass on to a point of not less importance,—the rank held by Bath among the Roman cities of Britain. Aquæ Solis, or Aquæ Sulis, is distinguished from another *Aquæ*, the position of which, though generally believed to be Buxton in Derbyshire, has only lately been confirmed by lapidary evidence. Some years ago (1862) a Roman "miliaria," or milestone, was discovered in the immediate neighbourhood of Buxton. This gives the name of one of the Roman stations mentioned by the Chorographer Ravennas as the next to "Aquæ," and at the same time the distance between the two places is given, and so we are enabled to fix the position of "Aquæ" at Buxton, where the remains of Roman baths have been found (see *Archæol. Journal*, vol. xxxiii. p. 54). We have, therefore, the remains of two watering-places famous in Roman as well as in modern times, "Aquæ," and "Aquæ Solis or Sulis"; but our Somersetshire city appears to have been most famous, according to the account of Solinus, and judging from the remains that still exist. Indeed, if I may quote the words of Professor Hübner, "omnis vero regio illa vestigiis vitæ Romanæ abundat: ut apparent loca etiam hodie amœnitate cœli non minus quam aquarum salubritate clara inde ab initiis dominationis Romanæ precipue culta esse." I hope this testimony of a German to the charm of the climate of Bath, as well as to the springs and the Roman remains, will have due weight with some who dwell here, and who, it is to be feared, little regard the privileges of place, country, and clime. We see that Professor Hübner regards the antiquities found in Bath for the most part as of early date, and this is certainly borne out by the discovery of the "Lamina," and pigs of Roman lead, bearing the Imperial stamp, in the district of Mendip, one as early as A.D. 44-48, found at Blagdon, and the latest found at Charterhouse (in 1874), being of the date C, A.D., 166. From the coming of Vespasian into this island, in the time of the Emperor Claudius, to the end of the second century, we may probably date the chief remains found in this city. Yet Bath itself does not appear to have been a military station. There was a military station at Combe Down, as the inscription found there in 1854 clearly proves, but Bath itself was a place of resort for recovery of health in Roman times as well as at present. Professor Hübner observes, "milites ex universa provincia huc convenisse valetudinis recuperandæ causa consentaneum est: unde non mirabimur titulos aut votivos aut sepulcrales hic repertos esse legionariorum legionis ii adjutricis, ii Augustæ, vi victricis, xx valeriæ victricis, item equites Hispani in ala Vettoniana militantis." We have evidence of soldiers of four legions coming hither, and of Spanish cavalry, but we have a total absence of Roman tile or brick bearing the stamp of any legion. These remains are abundant at Caerleon, Chester, York, and elsewhere, and would have been found in Bath had there been any stationary camp. There are no traces either of a Roman municipality: the decurion or magistrate, whose monument was found here, belonged to Gloucester (colonia Glevum), not to Bath. The discovery in 1854 of the inscribed stone at Combe Down established the fact that "principia" or Roman "officers' quarters" were situated there, and the remains since found of columns, coins, pottery, and glass, show that dwellings existed there, though no traces of a fortified camp have been found, yet such may have been obliterated by quarrying, as all the grounds around have been much disturbed, and a large portion of land built upon. There are some traces of a fortified camp on Berewyck-hill, near where the fosse road entered Bath, but here also the operation of quarrying renders it very difficult to trace the entrenchments. The sculptures once seen in the ancient walls of the city, but now lost, which are recorded by Leland, and drawn and published by Dr. Guidott, have been recently confirmed by the discovery of drawings also made of them by Dingley, in the time of Charles II., whose MS. has been published by the Camden Society (1867). There is an additional sculpture given in Dingley's MS. of a figure bearing a palm-branch in the right hand, and a wand in the left. The authority for these sculptures has sometimes been doubted, on account of the representations given in Guidott's work being somewhat un-Roman. In the pen-and-ink sketches made by Dingley, the Roman characteristics are better preserved, and no doubt is left of the authenticity of the sculptures. It is much to be regretted that all these stones have perished. They had been built into the Mediæval walls, as relics of a power that had passed away, but alas! in the removal of the walls in later times no care was taken to preserve them. In the autumn of 1867 and spring of 1868 the old White Hart hotel was removed to give place to the present Pump-room hotel. In digging out the foundations, Roman remains were found at a depth of 16 ft. nearly opposite to the Pump-room, and on the opposite side of Stall-street was found a basement of concrete 24 ft. 3 in. east and west by 20 ft. 3 in. north and south. Attached to this were large stones laid as a foundation. At a distance of 15 ft. west the foundations of walls were laid bare, and 39 ft. still further west foundations of other walls. These seemed to have formed an ambulatory or covered walk round the building, the two lines of parallel wall being 10 ft. 6 in. apart. The entire width of the court in which this building had stood was 112 ft., but the foundations of the wall 15 ft. from the mass of concrete seemed to show that it had been surrounded by a portico or colonnade. Happily, an accurate plan of these remains was made, and notes taken by Mr. Irvine, and an account sent to the *Archæological Journal*, March 5th, 1868. Many interesting remains were found above these foundations, especially a fine piece of embossed glass, several coins, and some portions of sheet window glass. This is found in abundance all over the ancient city when the Roman level is reached (see "Notes by Mr. Irvine on the Remains of the Roman Temple and Entrance"). The removal of the old White Hart led to the confirmation of an idea which had been current previously that after the Roman evacuation of the city it had been abandoned and allowed to fall into ruin. The site was found to be covered up with mud, vegetable remains, and drift wood, the deposit being in places almost converted into peat. This is the description of Mr. Moore, who carefully examined the site during the process of clearing away the foundations for the new Pump-room hotel. Mr. Earle, in vol. ii. of the Proceedings of the Bath Field Club, has given a very interesting paper on "An Ancient Saxon Poem of a City in Ruins," supposed to be Bath (read 15th March, 1871). This poem is from an old Saxon book preserved in the Chapter Library at Exeter. The description well applies to Bath, and can indeed belong to no other place, and this is a confirmation of the fact, that the Roman city was probably abandoned for a century or more after the battle of Dyrham, A.D. 577. We are many of us acquainted with the work of Samuel Lysons, published in 1802, containing drawings of the chief Roman remains found in Bath, and entitled "Remains of Two Temples and other Antiquities discovered at Bath." He has attempted the restoration of two temples from the fragments preserved. Since the time of this publication others have come to light, and, by the aid of these, Mr. Irvine, who was some time resident here (having the oversight of the works needful for the restoration of the Abbey Church), has given a more detailed restoration of the Roman Temple in the Proceedings of the Archæological Association for the year 1873. He has with great care and diligence succeeded in placing every fragment in its proper location, and has given two architectural drawings of the temple and another building in their original condition. We have the pediment, the frieze, the entablature, and the columns all reproduced in scale, and the places assigned to the sculptures still extant; also he has found out the probable position of the stone containing the sculptures of Hercules and Bacchus. He supposes that the building called by Mr. Lysons the smaller temple was the entrance to the Roman baths, and in the proposed frontage which he gives, he finds the true position for the sculptures of the "Four Seasons," and also for the inscription, the fragments of which are placed in the passage of the Literary and Scientific Institution, together with the conjectural restoration. "This building," he says, "was erected probably later than the temple," and as part of the Roman baths, and he has computed the area covered by them at a length of 500 ft. by a depth of 100 ft. I need not say how much the labours of Mr. Irvine have tended to elucidate the Roman vestiges still remaining in Bath. I have mentioned the inscription in the passage of the Institution, which has called forth the learning of eminent men in conjecturally filling up the missing spaces; Mr. Lysons gives a conjectural restoration, and for further conjectures I would refer to "Aquæ Solis." Professor Hübner is the last authority who has put forth an opinion, and his conjectural restoration is well worth our attention. He says,—"In Bath, anno 1790, in Stall-street, detectæ sunt reliquiæ templi operis tectonici optimi, quæ servantur in musæo. Litteræ sunt optimæ et alte inciæ sæculi puto secundi." He supposes the restoration of the temple of Sul-Minerva to be the work of two priests of that goddess. If this restoration of the temple was carried out in the second century, as Professor Hübner seems to think from the form and execution of the lettering, "Litteræ sunt optimæ et alte incisa seculi puto secundi," it is another proof of the early settlement of Bath as a Roman town, for the inscription commemorates a restoration. Most of the altars hitherto found in Bath are dedicated to the goddess Sul, Sul-Minerva, and the Sulivæ. One is dedicated to Mars Lucetius and

* By the Rev. Prebendary Scarth. Read before the Somersetshire Archæological Society on the 18th ult.

Nemetona, but there were found in 1870 in removing a portion of the buildings of the Bath market, adjoining the Guildhall, two portions of an altar dedicated to the "Genius Loci." The inscription had consisted of six lines, the first and last alone being distinctly legible. The other portions can only be restored conjecturally. The altar seems to have been erected in the time of the Emperor Hadrian, probably from A.D. 119 to 135. This is an addition made to the city collection of remains for which we have to thank Mr. C. E. Davis, the city architect. An altar bearing the same inscription, DEO GENIO LOCI was found at York in 1875, in making the new railway station. It is a curious inference to be drawn from the discovery of this altar dedicated to the "Genius Loci," that the goddess Sul seems to have had other and distinct attributes. Although the tutelary deity presiding over the springs, she was not the "Genius Loci," unless it be supposed that the "Genius Loci" was only another title of the goddess Sul. "Not only the individual," says Professor Döllinger, "but each and every place had its genius. There were countless genii of places." "Why talk to me," says Prudentius, "of the genius of Rome, when your wont is to ascribe a genius of their own to doors, houses, baths, and stables, and in every quarter of the town, and all places, you feign thousands of genii as existing, so that no corner is without its own ghost" (Prud. adv. Symmach, 11, 444). "No place," says Servius, "is without a genius, generally manifesting itself in a serpent. The people, the curiæ, the centuries, the senate, the army, the different burgher companies, each and all had their genius. There were even genii of particular deities" (see Döllinger's "Gentile and Jew," vol. 11, p. 62). We may, therefore, infer that this genius had presided over the locality where the altar was found, or over some company. What a medley of belief do these remains open out before us! The goddess Sul or Sul-Minerva seems to have presided over the springs, and her tutelary guardianship to have rested over them. Thus it was at the head of the spring of the hot bath, near to the site of St. John's Hospital, that the small elegant-shaped altar dedicated to the DEAE SVLIMINERVAE, by SOLINVS MATVRI FIL, was found, and with it were found many coins deposited there, no doubt as votive offerings. At the source of the Seine, which rises near Besançon, around the principal spring were found the foundations of a Roman temple, with bath, statues, and ex-voto offerings, as arms, legs, hands, carved in stone, also a vase containing votive offerings in bronze and silver, and as many as 830 coins, reaching from Augustus to Magnus Maximus. The vase was inscribed,—

DEAE SEQVANAE RVFVS DONAVIT.

A votive altar also, dedicated by Flavius or Flavianus,—

AVG SAC DEAE SEQ,

"To the August and Sacred Goddess Sequana,"

PRO SAL[VTI] NEP. SVI,

for the health of his nephew. As late as February, 1875, there were found at Bourbonne-les-Bains, department Haute-Marne, France, in cleaning the reservoir of thermal waters, above 4,000 bronze coins or medals, and a few gold coins. These were, no doubt, *ex voto* offerings to the divinity of the spring, also small statuettes, beautifully wrought, and a stone pillar bearing inscriptions,—

BORVONI ET DAMONAE, BORMONIAE DAMONAE
APOLLINI BORVONI ET DAMONAE.

We have here the local deity Borvo dignified with the prefix of APOLLO. Apollo precedes Borvo, but at Bath Sul precedes Minerva; the barbarous goddess precedes the Roman; we never find *Minerva-Sul*. Borvo, however, was happily united to a wife, or female companion, called Damona; but we do not find the goddess Sul, or Sul Minerva, to have been blessed with a husband. I am, therefore, disposed to regard *Sul* as only another form of *Sol*, and as combining the attributes of male and female. It is interesting to find, in different lands, remains of the same grateful custom of making votive offerings for recovery of health. The altar in the Literary Institution dedicated to the DEAE SVLI by AVF LEMNVS PRO SALVTE ET INCOLVMITATE AVF MAXIMI, whose freed man he was, is a very pleasing record of gratitude. I cannot but look upon the noble Mineral Water Hospital in this city, open to all the sick poor of the British Empire, where the cases of sickness can receive benefit from the healing springs, as a fitting monument,—a votive altar,—on behalf of a Christian people, a grand evidence of Christian love and charity, in obedience to the divine command that "he who loveth God loveth his brother also." Among the amended readings of the Bath inscriptions, where the lettering upon the stone is doubtful, made by Professor Hübner, is one which deserves attention. In the Sydney Gardens was found the monumental stone to the priest of the goddess Sul, C. CALPVRNIVS, who died at the age of 75. The memorial is erected to him by his wife TRIFOSA, but the letters following this name are much obliterated. Professor Hübner has, however, given what appears to be the true reading, viz., "LIB(ERTA) et conjuge,"—"freed woman" who had become his wife, and probably nursed him in his good old age, and been comfortably provided for by him, or she would not have erected the memorial stone, for monumental stones were generally tokens that means were provided for their erection. Thus in the mutilated inscription (probably of the first century) to a soldier of the 20th legion, who had served his time, and was probably of Nicomedia, the monumental stone is erected by G. TIBERINVS, "heres," his heir. To the Romans belong preeminently the credit of inventing the will. It is doubtful whether a power of testation was known to any original society except the Romans. "Rudimentary forms of it," says Maine, in his treatise on ancient law, p. 194, "occur here and there, but most of them are not exempt from suspicion of Roman origin. The Athenian will was no doubt indigenous, but it was only an inchoate testament. Similarly the rudimentary testament which the Rabbinical law of the Jews provides for has been attributed to the Romans. The original institutions of the Jews have provided nowhere for the privilege of testatorship." In addition to the memorial stone to the priest of "Sul" found in the Sydney Gardens, other interments have since been found, but no inscriptions. A stone coffin, mentioned in "Aquæ Solis," p. 101, and since then in February, 1866, when a pit for gravel was opened near the boundary fence, which separates the college playground from the gardens, many fragments of black earthenware and pottery, together with two flint arrow-heads, were found; ashes and burnt matter were also found, and stones reddened by the action of fire. During the month of August the same year another gravel-pit was opened in the same ground, and at the depth of 10 ft. below the surface, two stone coffins lying side by side were discovered. The one contained a skeleton supposed to be that of a male, and the other the head of a horse. The head of a horse interred in a stone box or cist was also found at Combe Down, when the inscription there was discovered. Many interments both in sepulchral urns and in stone coffins have been found at the foot of Bathwick-hill in preparing sites for villas, and this leads to the belief that this south side of the river was used as a place of interment, and that probably a Roman road here passed up the hill, or along the river side. Roman interments have been found on every side of Bath, especially where the lines of ancient road passed out of the city. In digging the foundation of the Church of St. Andrew, beyond Catherine-place, a stone coffin was found in 1870, also the remains of several interments. The traces of the Roman road which passed out of the city in the direction of Bitton were also found. This line of road has been called the Via Julia, and came from Marlbro', the Roman Cunetio, and passing down Bathford-hill, and through Batheaston into Bath, passed out by way of Weston to Bitton, and on to Sea Mills and the Severn, at Aust. An account of this road will be found in vol. i. of the Proceedings of the Bath Field Club. But the most important Roman road entering Bath and traversing Somerset was the Foss-road, coming from the sea coast at Seaton, passing through Ischalis, Ilchester, on towards Shepton Mallet, where it crossed another great line of Roman road which traversed the Mendip district, and passing by Camerton, entered Bath by Holloway, and left the city again by way of Walcot-street and Batheaston, and passing up Batheaston-hill in the direction of Colerne went on in a direct line to Cirencester. Along the course of this road the sites of many villas have been traced, and the pavements and hypocausts laid bare, as at Wellow, Camerton, Newton, St. Loe, Combe Down, Batheaston, Colerne, South Wraxall, and Langridge. These are enumerated in "Aquæ Solis," p. 112 and following, — but since the publication of the work another has been opened near Tracy Park, in October, 1865, under the direction of the Bath Field Club, and a full account of this is given in the first volume of their proceedings. Somersetshire is rich in the remains of Roman villas, and these lie chiefly in the direction of the great Roman roads. There are three principal lines of Roman road in Somerset, the *Foss*, the *Via Julia*, and what has been called the *Via ad Axium* which passed from Sarum, near Salisbury, to Shepton Mallet, where Roman pottery kilns have been discovered, to the mineral district of the Mendip Hills, where many vestiges of Roman mining are now being unearthed. The vestiges of Roman mining are here very abundant, and portions of inscriptions have been found cut in stone, as well as stamped in leaden lamins. These works go back to the time of Claudius. Scattered throughout the proceedings of this Society will be found notices of the tesselated pavements which have been opened in various parts of the country. It would be too long to attempt more than to mention those found at Pitney, at Chard, at Coker, at Ilchester, at Somerton, but it is time that some steps were taken to collect and put together details of Roman Somerset, the roads, villas, Roman stations, coins, pottery, inscriptions, accompanied by a map noting the exact position where such relics have been found. This Society might devote something from its resources for the publication of such an account, and this should be done throughout every English county. Private efforts have accomplished much, but these ought to be seconded by public spirit, and the burden lightened from those who, if partially assisted, might accomplish much in the illustration of their country's antiquities.

ON THE CONSTRUCTION AND MAINTENANCE OF THE PUBLIC HIGHWAYS.*

THE construction and maintenance of highways must form at all times a most important work of sanitary authorities, not only because of the increased comfort to the community of well-kept roads, but because of the increased cost of locomotion and cleansing and discomfort of badly-maintained roads. Unfortunately, the construction and maintenance of highways is a subject that few surveyors of the present day give much attention to. It is popularly supposed that the mere covering of a road with broken stone is sufficient to form a good and permanent highway; this being the view taken by a large number of those who have the control over roads, the consequence is that in many cases throughout the kingdom the roads are in a bad state of repair, and cost a larger amount annually than is necessary for cleansing and watering. Roads, too, are frequently maintained by committees, who have but a slight and imperfect knowledge of what their duties are; and I take it to be the duty of every surveyor of highways not only to advise his committee of the quantities of materials that are required to maintain these highways under their direction, but further to inform them of the best known means of maintaining the roads in a maximum efficiency at a minimum cost. Thus the surveyor secures the valuable aid of disinterested persons living at all parts of the district, in supervising the repairs, and indeed, without a large and expensive staff, with anything like a long mileage town roads cannot be kept as they should be unless the surveyor is thus assisted. I therefore propose in this report, as briefly as possible, to point out the cardinal points to be observed in the construction and maintenance of roads in Urban Districts such as Derby.

The direction of roads is usually determined by private capitalists, but it should, in my opinion, form the subject of legislative enactment, that all new roads should be laid out in certain directions, especially in rapidly increasing towns; for were a preconcerted plan to be carried out piecemeal by owners of property, not only would a large amount of money be saved, but public convenience would be served in a much greater degree than it is at present, where every owner of property makes roads to suit the fancy of his surveyor or himself, acting frequently in ignorance, when he would only be too glad to follow out a plan which, in nine cases out of ten, would cost him no more money, become as available for his own purposes, and be of much greater convenience to the public

* By Mr. E. B. Ellice-Clark, C.E., Borough Surveyor of Derby, read at a recent meeting of the Association of Sanitary Engineers, already referred to.

at large. I am therefore strongly of opinion that where new roads are projected the sanitary authority should exercise their discretion not only as to the constructive portions of the roads, but also as to their direction; for we must not forget that all these new roads ultimately form part of that network of highways which is the only means of communication from one part of the district to another, and where roads are judiciously laid out at first, the stoppage of one street like South-street, by the Great Northern Railway, would be a matter of slight instead of great and permanent inconvenience.

The next thing to be considered is the gradients of roads. All roads should be as nearly level as possible. To illustrate this, I may cite the instance of Bridge-gate. Suppose from its lowest point to the summit at King-street we had a perfectly level roadway instead of having a gradient of 1 in 32, as we have, every horse drawing a load would be able to draw one quarter more than it does now; and as we have 1,268 carts passing up this street daily, one half carrying 1½ ton each, 238 more tons could be taken to and from the town with the same amount of horse-hire each day. Then, again, roads with steep gradients cost fully one-third more to repair than flat roads. In the case of Bridge Gate it is three times more than London-road; consequently it is difficult to form an idea, without going into detail, of the increased cost to the community of steep roads, which should in all cases, where practicable, be avoided, and any extra expense in making urban roads level at the first outlay will fully repay the authorities by the ultimate diminished cost of cleansing and repairing, to say nothing of the saving to the community by the increased weight that can be drawn with the same amount of horse expenditure. One of the most important matters in forming roads is the cross section, *i.e.*, the shape from kerb to kerb. The prevailing profile now adopted is that of an elliptical projection, high in the centre, and sloping gradually to the channels,—a section which is, in my opinion, the reverse of what it should be for roads sufficiently wide for four vehicles to pass abreast; and no main roads should be made a less width than this. My objections to the existing section for such roads as Friar-gate or London-road are, that if the road is made sufficiently flat for carriages to run easily over all parts of the roadway, the gradient is not sufficient to carry away the water which lies in the centre, and renders the crown rotten. In suburban roads the traffic is nearly always in the centre, consequently they are worn down most unevenly; this is manifestly a wrong result, as roads should be of such sections as no preference would be shown to any portion of their surfaces.

The prevailing section of roadways comes about by engineers following the footsteps of Telford, who constructed all his roads to the elliptical section; but the conditions existing in his time are most dissimilar to the conditions and exigencies of our day. Telford's roads were highways from city to city, having few vehicles running on them. The great objects then were not what they are now, to present over the entire area the hardest and least slippery surface, to give the firmest foothold to horses, and to stand the daily wear and tear of thousands of vehicles heavily laden, but to keep the roads dry and sufficiently hard in their centres to bear the traffic of a few vehicles, rarely exceeding a hundred daily; the elliptical section suited those times and requirements; vehicles rarely meeting, consequently the inconvenience arising from the steep sides of roads was not felt, nor was the centre worn away, as the traffic was trifling. My own opinion is that all main roads should be made sufficiently wide for four vehicles to pass abreast, and where the traffic is considerable, and the rainfall is such as to necessitate pitched channels and storm-water sewers, the channels should be in the centre instead of at the sides, thus obviating the tendency of vehicles to slide down the sides towards the kerb; the slopes to the centre channels from the kerbs need only be very slight, especially where the hard metal is used to coat the surface, in which cases a maximum of 1 in 40 might be adopted. The advantages claimed for the section of road with channel in the centre are:—

1st. In the case of a macadamised road with gullies and pitched channels, half the cost of both these serious items would be saved.

2nd. The gullies need not be trapped, but be left open as sewer ventilators.*

3rd. Carriages would use all parts of the road surface except the channel, producing a uniform wear.

4th. The "slop" which is now swept to the sides of the road, thrown up to the carts, frequently bespattering pedestrians, would be swept to the channel in the centre, and be the farthest possible distance attainable away from the foot-passengers and shops.

5th. In the case of a crowded thoroughfare, the channel would divide the up and down traffic without the aid of police.

The objections that have been raised to this section of roadway are:—

1st. The carriages slide down towards each other, especially in frosty weather.

2nd. A large stream of water washes away the metal at the channel.

My answers to these are, that the slope of the road to the centre will only be slight, just sufficient to carry away the water, and not sufficient to cause the tendency of vehicles to slide to the centre to have any foundation in practice.

The second objection is overcome in the case of sewered streets with frequent gullies, for the water disappears down these before it has assumed sufficient volume to become a stream having velocity enough to wash away the metal.

I am quite aware that this section of roadway is contrary to all the practices and prejudices of surveyors in this country; but I believe, if tried, we shall obtain better roads at less cost both in construction and maintenance, better lighting, and a more effectual mode of ventilating our sewers, all objects of paramount importance to Sanitary Authorities.

The next important matter in connexion with roads is the nature of the materials of which they are formed and coated. The ordinary mode now in practice is to lay in a bottom of hard core, rammel, foundry cinder, or some such kind of material, to a depth varying from 9 in. to 1 ft., without any uniformity as to size. The practice of the first road-makers in the world, viz., the Romans, and also the great road-makers at the commencement of the present century, was to lay courses of large-sized stones by hand on the road-bed to form a foundation, which, as a matter of fact, was the actual road, the next coating of broken stones being merely a covering to take the traffic wear, and prevent the road proper beneath from being worn into holes. The advantages of this method of forming a road are, that as it has to sustain great pressure from heavy loads and "violent percussion," it forms a solid foundation which is necessary to resist these. In the case where the tyres of the wheels are narrow and the loads heavy, the modern system of roadmaking is most pernicious. Under the old system, this kind of traffic* is dealt with much more economically, as the weight is distributed over a much larger area, thus preventing clay and other soft material from "spewing" up when the road has become out of repair and soddened with wet. We have an excellent example (?) of this in the Mansfield-road, near Little Chester Church, where the surface has been raised very high from constant metalling on a bad bottom, but which no amount of metal short of re-making will form a good road, and where, in spite of frequent repair and scavenging, the road is never in good order.

Another great advantage of forming a rough pavement like the one I speak of is that it forms a drain for the water, which finds its way through the top coating of broken stone,—an especial advantage on a clayey soil like that of Derby. A road formed in this manner will cost but a little more than if formed by the prevailing mode, as stone of a much more inferior quality and less costly character may be used; it will bear a much greater amount of weight; the bottom will not be influenced by the most severe frosts and rapid thaws, and a less quantity of broken stone may be used than if the bottom is of small stone or hard core thrown down at random. In addition, the covering of broken granite or other hard stone will last much longer on a foundation of this sort, and the expense of repairing and scavenging will be considerably less. Sir John Macneil, from actual experience, computes the saving by forming a road like this at least one-third the expense of repairs annually, and I believe this to be within the mark.

I should like to say a few words on the use of small round stones (boulders) used on some outlying roads, and state my objections thereto. These small stones, unbroken, being pressed by vehicles against each other, find no "bed" when they come into contact. By such pressure they move, and thus form hills and depressions on the surface; and the joints being large, gaping in fact when compared with those of cubical stones, a large portion of the exposed surface joints becomes filled with horse-dung and mud, which must give an offensive effluvium, and be prejudicial to health. The illustration of McAdam to a Parliamentary Committee, when explaining the advantages of using cubical instead of spherical stones, is conclusive: he had two basins, one filled with marbles of broken stone, the other with spherical stones, and requested the members of the committee to thrust their clenched hands into each basin. They thus had demonstrated to them that they could plunge their hands to the bottom of the latter basin with ease, and the marbles "spewed" up, while the greater the pressure in the other basin, the tighter and more compact were the contents; and thus it is on a larger scale with roads. I therefore recommend you to discontinue the use of all unbroken stone, however small.

I have hitherto been speaking of suburban roads, and if I have digressed somewhat from the original intent of this report, it has been an attempt to show that a large saving in cost, and a greater efficiency in construction and maintenance, may be obtained in the future on those roads where the traffic is not so great as to require paving on the surface. Let me now deal with roads where the nature of the traffic is such as precludes the use of a broken stone surface. Premising that it is difficult to determine where Macadamising should end and pitching or paving commence,—where it is cheaper to cover a road with small unfixed broken stone or to pave the entire surface with fixed blocks, it would appear, at first glance, that that road which has the greatest number of vehicles passing over its surface should determine this, but I am of opinion that such is not the case. The mere enumeration of the vehicles passing a given point on a road will not enable us, without other considerations, to draw a hard and fast line where it is more economical to pave roads in preference to Macadamising them. We must also take into account (*a*) the class of traffic, subdividing this into heavily weighted, spring, narrow-tyred vehicles, and carriage traffic; (*b*) the gradient; (*c*) the nature of the bottom; (*d*) the width, and the height of the buildings. In three of these considerations (*a*, *b*, and *c*) the Wardwick has superior conditions to Bridge Gate: we thus see why the former is a more economical road to maintain than the latter; therefore, every street must be treated on its own merits.

To ascertain whether it would be a saving to pave certain streets, I have endeavoured to obtain the cost of repairing and cleansing the same. I have left the watering out of the estimate, as I cannot even approximately obtain figures sufficiently reliable to enable me to produce them here.

The traction on level roads has been ascertained to be nearly as follows:—

Roadway asphalted	1·0
„ paved, dry, and in good condition	2·0 to 1·5
„ paved, and in mediocre condition	2·5 „ 2·0
„ paved, but covered with mud	2·7 „ 2·0
Macadam in good condition and dry	3·3 „ 2·5
„ wet	3·3
„ in mediocre condition	4·5
„ covered with dirt	5·5
„ with the stones loose	8·2 „ 5·0

This is a low estimate. Some careful experiments give, taking the maximum load a horse can draw on a gravel road as a standard:—

On a best broken stone road	3 times as much.
On a well-made pavement	4½ „
On the best stone trackways	11 „
On railways	18 „

Here we see that there is a loss of more than 100 per cent. of motive power between macadam in a mediocre condition and a roadway paved and in good condition, and assuming that 951 tons are daily carried along a certain road 300 days in the year, and the average friction is 1·20th of the weight, the cost of transporting this burden is 1,664*l.* per annum. If we reduce the traction by one half, as above, we reduce the cost of transport on this road to 832*l.*; but, assuming this to be a theoretical supposition, and we take it at half, viz., 416*l.*, this would practically be the actual sum saved in horse-hire alone, by having the street properly paved.

* See the Report of the Borough Engineer of Leeds.

* Omnibuses, railway vans, &c.

We now come to the question of cost of cleansing, &c. Taking the number of square yards of its area at 3 000 in round numbers, we have ascertained that the cost of cleansing the street is 80*l.* 10s. per annum. From careful observation it has been ascertained that four loads of mud or slop are removed from macadam per 1,000 yards of surface to one load per 1,000 yards of granite-paved surface, which is reduced to one-third of a load on a surface paved with wood. I will, however, take the quantity at one-half, as we purpose to use granite as the material for paving this street hereafter; this will save 45*l.* 5s. for cleansing. This calculation does not include the carting of the slop to a shoot, which would bring the total up to 100*l.* a year while macadamised, and the saving in cleansing if paved to 50*l.* a year. The saving in maintenance will be this:—the original cost per yard, including concrete, will be 13s., the cost of maintenance I have estimated at 4d. per yard per annum, the life of the road I have estimated at twenty-five years. This gives us a total cost of a little over 10d. per yard per annum, or 125*l.* for the whole, as against 216*l.* 6s. 6d., the present cost, thus effecting a saving of 94*l.* per annum; add this to the 416*l.* and the foregoing 50*l.*, and we effect a saving of no less than 560*l.* per annum to the community at large, to say nothing of the freedom from dust and the increased comfort to every person using and living in the road.

From careful observation I should say, all other things being equal, it is cheaper to pave a roadway having a traffic of one thousand vehicles per diem over its surface than to macadamise it, and this would be the minimum number to commence paving with.

We must now inquire and specifically lay down what are the requirements for such paved streets. The engineer of Birmingham has admirably set them forth in a recent report to the Council of that borough. He says:—"They should be even-faced, firm, hard, as noiseless as possible, able to bear any burden, with sufficient foothold for horses, and capable of being easily cleansed so as to diminish as much as possible the annoyance arising from mud and dust; the nearer these objects are attained, the less will be the wear and tear of the roads as well as of the vehicles; property and health will be less injured, and the comfort of pedestrians increased."

These, then, are the desiderata of Highway Authorities, and, as will be seen at a glance, most difficult of attainment. To obtain noiselessness and the least friction the surface must be smooth; to obtain a firm foothold for horses the surface must have a certain amount of roughness (I use the word in place of a better one which I cannot find, though it hardly expresses my meaning), so that two of the desiderata are inverse to each other, for as we decrease the noise and friction we increase the slipperiness. To endeavour to make these meet the material should be as hard as possible, providing it gives the requisite amount of roughness of surface by attrition.*

* To be continued.

KENT ARCHÆOLOGICAL ASSOCIATION.

The annual meeting of this society was held on the 26th and 27th ult., the head-quarters being located at Gravesend, where, at the Literary Institution, a temporary museum was formed, under the care of the Rev. R. P. Coates, the Rev. F. Southgate, and Mr. Homewood, a principal feature of the exhibition being the collection of charters and deeds relating to the borough of Gravesend, lent by the Corporation. The excursions were under the direction of Mr. F. C. J. Spurrell.

The first day's proceedings commenced with a drive to Cooling Castle, which the owner, Mr. John Murton, had thrown open for the nonce. With few exceptions the upper parts of the castle have vanished altogether; but from the ruins that remain it is easy to judge of the appearance of the building when in its prime. Marshalled to a vaulted chamber, whose masonry would be the utter despair of modern builders of the suburban villas which adorn "residential properties," and on whose massive roof trees were growing, the assembled archæologists held a business meeting. The report, read by the secretary, the Rev. Canon Scott Robertson, began by acknowledging the cordial reception the Association had experienced from the Corporation of Gravesend, and went on to lament the loss which it had sustained during the past year in the deaths of Earl Stanhope, Lords Fitzwalter and Sondes, and other valued members. The Society, however, was more flourishing than at any previous period, thirty-three members having been elected in the course of the year, while the names of twenty-six gentlemen were to be submitted to that meeting.

The report was unanimously adopted, and the twenty-six new members proposed. Mr. John Monckton, of Maidstone, was added to the council. Auditors and other officers having been elected, and the business satisfactorily disposed of,

The Rev. Scott Robertson read a paper on Cooling Castle. Cooling was a manor of the lords of Cobham, and here, in the fourteenth century, they had a pleasant manor-house, which would probably have remained a simple manor-house as long as it existed at all, but for a circumstance not generally known to the students of English history, and which may possibly have been suppressed as not altogether to the national credit. In the year 1379, it appears, some French vessels sailed up the mouth of the Thames, nearly, if not quite as far as Gravesend, and a motley crowd of Frenchmen and Spaniards having landed from the piratical craft, overran the surrounding country, plundering the people and burning the villages. John de Cobham, third Lord Cobham, with the view of preventing a repetition of this disgrace and danger, obtained from the king a licence to fortify his manor-house of Cooling, and by the year 1385 the castle was completed, receipts being still in existence showing the amounts paid from time to time for masons' and plumbers' work. It was then a very imposing building, surrounded by a deep moat, well calculated to resist an enemy, to afford protection to the surrounding district, and to maintain a garrison which would effectually check the ravages of ordinary maranders. The ruins which now stand, and over which Mr. Robertson subsequently conducted the excursionists, attest at once the vast extent of the castle and the completeness of all the preparations for defence: while on one of the towers at the entrance gateway are some lines in enamelled letters, almost as perfect as if they were the work, not of five centuries, but of five years ago, stating the object with which the fortification was erected. Mr. Scott Robertson seemed to think, especially as the lines were in English and not in Latin, that the inscription was placed on the tower for the purpose of assuring the peasantry that the castle was not built for the purpose of tyrannising over them; but inasmuch as school boards were then unknown, to say nothing of the fact that the keenest eyesight could scarcely from the ground decipher the lines, which are placed at a considerable height, the proposition is open to dispute. One part of the outer wall of the castle is ornamented with black and white stonework in the chess-board pattern,—a style which Mr. Robertson says is not at all uncommon in East Anglia, but is almost unique in Kent.

Before leaving Cooling Castle, on the motion of Sir Walter Stirling, seconded by Dr. Carr, a very cordial vote of thanks was given to the Rev. Scott Robertson for his valuable paper; and to Mr. Murton, the hospitable owner of the Castle, who entertained a very numerous party to luncheon.

A visit was then paid to Cooling Church, an edifice of a rather remarkable character, seeing that its chancel is, if anything, larger than the nave,—a nave, by the way, destitute of aisles,—and that it contains twelve stone canopied stalls. On whose account those stalls were placed in the little chancel of the little church it is impossible to say, but Mr. Scott Robertson's conjecture that a religious community once existed here, of which all trace,—except the canopied stalls,—has disappeared, is probably the right one. The chancel is of the time of Edward I.; the nave was erected in the reign of Edward III.

Cliffe Church was next visited. It is very large, and seems to suggest that at some period Cliffe must have been a place of importance, or else that a considerable religious brotherhood made its home in the neighbourhood. The chancel is a fine one, there is an ancient screen of carved oak, and the side aisles are divided from the body of the nave by some really fine arches of the Early English order of architecture. The many interesting features of the church, which has been partially restored of late, were pointed out in a paper by the Rev. J. Grey Lloyd.

The excursion terminated with a brief visit to Higham Church, and at five o'clock, with commendable punctuality, the party arrived at the Gravesend Assembly Rooms, where dinner was served, the chair being taken by the President of the Association, Earl Amherst, who was supported by the Mayor of Gravesend (Mr. W. Lake), Sir Walter Stirling, bart., and others. The speeches were few and short, as they should be on such occasions.

After dinner an evening meeting was held, when Mr. G. M. Arnold read a paper "On the Early History of Gravesend." The author pointed out that although Gravesend could not boast the castellated buildings of the neighbouring city of Rochester, she could lay claim to association in the past with much that was of archæologic note. The site of the ancient church of St. Mary had long since become secularised, and at present had houses built upon it. In 1497 the townsmen had provided a chapel-of-ease, which was the germ, and occupied the parish church of St. George. The immediate neighbourhood of Gravesend was not without interest. Southfleet and Springhead were very rich in Roman remains, and Roman pottery was discovered there until this day. The well-known archæologist, Mr. Charles Roach Smith, had spoken of Springhead, while writing upon the subject of a Roman villa near Maidstone, as surrounded by all the requirements of an ancient Roman station. The existence of a direct military road to Rochester was one of these. Referring to the struggle against Norman and Dane which had taken place, the writer pointed out that these periods of unrest naturally caused the inhabitants to take extraordinary precautions in securing their money, and thus within recent date there had been discovered in the vicinity of the ancient church of St. Mary a hoard of 552 Saxon silver coins, since deposited in the British Museum. They were dated 814. Deposited in a secure place by terror-stricken individuals, they were destined, after the lapse of over a thousand years, to be restored to the light of day. While on the subject of discoveries, the writer mentioned the disclosure of an interesting cave during sewer excavations in Perry-street. References were made in the Domesday Book to the manors of Gravesend, Parrock, and Milton, now included in the two parishes of Gravesend and Milton, and it was a pity that the Domesday Book of King Alfred was not still extant to the inquirer, as other interesting information might have been found therein. Proceeding to speak of Milton Church, the writer remarked that the site of this edifice, near to the river bank, did not appear to have undergone the change which he had mentioned in the case of the church at Gravesend. No Norman work was observable in Milton Church, and it was probably rebuilt, with the exception of the roof, in 1350. The original roof appeared to have been removed during the reign of Henry VIII. Cruden stated that the roof was subsequently restored with a waste of money only commensurate with the want of taste. The writer next went on to deal with some of the distinguished events which had taken place in the neighbourhood.

Earl Amherst having conveyed the thanks of the meeting to Mr. Arnold for his paper, the proceedings of the first day were brought to a close.

On the second day the party visited Shorne Church and Cobham, passing, *en route*, Chalk Church, over the porch of which there are some singularly grotesque carvings in stone. The church, which is dedicated to St. Mary, is about undergoing restoration, and contains a very ancient and curious stone font. The church of St. Peter and St. Paul at Shorne possesses a very interesting altar-tomb, with effigies in full armour of Sir Henry de Cobham, surnamed "L'Oncle," to distinguish him from his nephew, Sir Henry, of Cobham Hall, who, being five times sheriff of Kent, was knighted by Edward I. for his gallant conduct at a famous siege. Here there is an octangular Decorated font, wrought with Scriptural subjects, and a number of brasses, notably that of William Pepys, 1468, a former vicar, and supposed ancestor of the "Diarist." A pleasant drive to Cobham Park, entering by Brewer's Gate, brought the party to Cobham Hall, which had been kindly thrown open for the occasion by the Earl of Darnley.

Cobham Hall stands in a hollow, surrounded by wooded hills, and is approached by a grand avenue of lofty trees. Two extensive wings of red brick, with lofty turrets at the angles, bearing the dates of their foundation, 1582 and 1594 respectively, with mullioned windows, ornamented doorways, and cornices in the

Tudor style, are connected by a central building in the Italian style, designed by Inigo Jones, the apparent incongruity only increasing the picturesque appearance of the building. The deep red colour of the bricks, the bold outlines and gables, the singular fashion of the chimney-shafts, and the lights and shadows of the deep bay windows, produce an effect which, as a whole, is pleasant and harmonious. The wings and southern front were built by Sir William Brooke, Lord Cobham, the centre by the Earl of Lennox towards the reign of James I. Visitors are ushered into the hall through a vaulted passage, designed by John Wyatt, where they are shown a bath of Egyptian granite; thence they proceed to the dining-hall, which has panelled walls and ceiling, and where there is a grotesquely-carved chimneypiece in black and white marble. The picture-gallery and library contain, in addition to many valuable works of art, portraits of great historical interest. The duties of *cicerone* were performed by Mr. F. G. Stephens, the architectural details and history of the hall being dealt with by the Rev. J. Scott Robertson.

A drive from the hall to Cobham Church opened up to the visitors fresh scenes of sylvan beauty. The halt was made near the old Leather Bottle—immortalised in the "Pickwick Papers." Cobham Church, which stands directly opposite this hostelry, is situate on a gentle slope at the entrance of the village from Gravesend, and is dedicated to St. Mary Magdalene. It has a fine tower and chancel, with three spacious aisles. The walls still retain traces of the frescoes which once adorned them. The altar-steps are paved with encaustic tiles. Amongst those who there lie entombed, and to whose memory monuments or brasses have been erected, we find Sir John de Cobham in his shirt of mail, died 1354; Sir Thomas de Cobham, died 1367; Maude, wife to Reginald, Warden of the Cinque Ports, died 1370. There is an inscription to another Maude, of which nothing but the name is legible; and Margaret, wife of John, Lord Cobham, 1395. This Lord Cobham was the founder of the church and college adjoining, and his reputation as saint and warrior survives him. Joan, mother of the founder, has here a monument to her memory, which bears a French inscription. There are also brasses to William Tanner, 1418, John Gladwyn and John Spratt, 1498, former masters of the college, which was founded 1342. An ancient gateway and some ruins still remain. The present structure, which is built in a quadrangular form, is divided into almshouses, occupied by a number of aged men and women. A blackened roof and oak-screen in the hall are subjects of interest to visitors. The various monuments and brasses, and other objects of interest, were described by Mr. J. G. Waller.

From Cobham the visitors proceeded to Swanscombe, where the ancient church, rich in Saxon remains, was inspected, the various objects of interest being explained by the rector (the Rev. T. H. Candy) and Mr. Ross.

From thence the party proceeded to Northfleet, where, at St. Botolph's, the Rev. F. Southgate, vicar, chaperoned the party. Here there are some very fine monuments. The examination of this church concluded the business of the meeting.

ARCHITECTURAL SOCIETY OF THE ARCHDEACONRIES OF NORTHAMPTON AND OAKHAM.

The annual summer excursion of this Society took place on Wednesday and Thursday, the 19th and 20th ult. The programme set forth that on the former day the towns and churches of Leighton Buzzard, Dunstable, Luton, and Wheathampstead would be visited, and that the day's journey would terminate at St. Alban's, where, in the evening, a public meeting would be held at the Town-hall.

Leighton Buzzard.—We glean from the *Northampton Herald* that a goodly company assembled at the church of this town about noon, and were met by Dr. Lawford and the Rev. Canon Haddock, the latter of whom conducted the party round and through the building, and directed attention to, and discoursed upon, the principal points of interest both of its exterior and interior. The church is cruciform in plan, and consists of a nave, chancel, north and south transepts (with a central tower and spire), north and south aisles, north and south porches, with, north of the chancel, an ancient sacristy, surmounted by a *domus reclusus*, or domicile of a priestly recluse. The tower, of which the plan dimensions are unusually large, is of the Early English period, and the massive spire is probably of only a little later date; both were originally built upon severe designs, but have been modified by subsequent alterations and insertions. The tower is built of "clunch," a cretaceous limestone, and the spire (of which the condition is surprisingly unimpaired) probably of an oolitic limestone. The chancel also is in great part of Early English date; the transepts, originally Decorated (fourteenth century), have Perpendicular windows. A door in the south transept is covered with fine wrought-iron scroll-work, the original portions of which are precisely similar to the iron scroll-work (the artificer of which is known) of the tomb of Eleanor Queen of Edward I. in Westminster Abbey. The nave is surmounted by a remarkably fine Perpendicular clearstory, the large beautiful three-light windows of which are arranged in couplets. In the interior, the beautifully and elaborately carved Perpendicular roof of the nave, of unusually high pitch for the style, is very fine. From the church, the party (which, in the meantime, had received many accessions, including members of the Bedfordshire and Leicestershire Societies) proceeded to the Cross, in the High-street. This is a handsome erection of the fourteenth century. It stands upon a base consisting of a plinth or pedestal, and a series of four steps. It comprises two stories, an elevated crocketed pinnacle finished by a weather-vane surmounting the upper one. The lower story is pentagonal in plan, and consists of five open two-pointed arches supported on angle buttresses, enclosing a massive central column. The upper story has also a pentagonal plan of smaller dimensions, and consists of five cinquefoil-headed canopied niches, surmounted by foliated finials, separated by angle buttresses, also terminating in foliated finials, and outstanding disengaged buttresses, similarly decorated and connected with the inner ones by flying buttresses. In each of the five niches is a life-size statue. Three of these statues are modern copies, and were substituted for the originals at the restoration of the cross, which was effected some years ago. The mistakenly displaced and only partially impaired original statues have been judiciously erected in front of the public reading-room hard by, which looks down the High-street.

Dunstable.—The first view of the surpassingly beautiful fragment of the western façade of the priory church struck every one who now gazed upon it for the first time with surprise and admiration. Only about two-thirds of the original front remain. It partakes more of the character of the western front of some Continental cathedral, than that of an English church. A very large semicircular-arched and deeply-recessed central doorway, of Norman (or perhaps semi-Norman) architecture, with numerous bold, rich, and successively-receding mouldings, gives admission to the church. Above this, in the west wall of the nave, are two good Early English, single-light, lancet windows, and between them is inserted a bold and ornate statue niche, exceeding 12 ft. in height, and having trefoil cusping, of Early Geometrical Decorated date. On the north side of the central arch is a wall-space, enriched by a semi-Norman pointed arch, containing intersecting semicircular arches, having a very bold and peculiar filleted roll-moulding; nearly identical filleted moulding occurs also in arcades of intersecting arches in the passages south of the south transept of St. Alban's, which formerly led to the chapter-house. This wall-space separates the central from a smaller yet fine doorway, also recessed, the jambs of which are Early English, and composed of the usual range of slender columns, having richly-carved capitals of stalked foliage. The arch is pointed and composed of many deep mouldings of a little later style, three of which are enriched by fine and peculiar undercut foliated carving. Over this doorway and arched wall-space is a late Early English arcade of seven recessed arches, in each of which is a pedestal for a statue; and the spandrel-shaped portions of wall surface beneath are covered with the exquisite diapering so characteristic of Westminster Abbey. Over the Early English arcade is a still bolder arcade of very excellent work, consisting of six trefoil-headed arches, each nearly 12 ft. in height, and of the same date as the niche over the great central door, which arcade is an open gallery leading from the tower stairs to the northern triforium of the interior. Over the half of this arcade, to the right hand, is a smaller blank arcade of five lancet arches, which have been supported by slender shafts; and above this, and surmounting the front nave wall, is an embattled parapet of much later date. The wall over the other half of the arcade recedes with a roof-like incline for several feet to the west wall of a massive tower (the base of which on that side is hidden by the façade, although exposed on the north side); and immediately above the junction is a string-course or band of quatrefoils. The top story of the tower is the bell chamber (containing a fine peal of eight bells), on each side of which are two two-light Decorated windows arranged in couplets. Attached to the north-west angle is an octagonal staircase, consisting of three receding stages; on three faces of each of the lower two are large niches, of the same date as those of the façade, in some of which are still fragments of statues; these stages are surmounted by an octagonal turret, running up to a greater height than the tower; the turret is based by an arcade of six blank arches, of the same date as the niches below. All corresponding portions of the west front south of the great central door have disappeared. The great doorway is partially filled in by the insertion of a square-headed door with carved spandrels surmounted by a triform niche, and dating either towards the end of the fifteenth or in the beginning of the sixteenth century. The Rev. Frederick Hose has been for many years the incumbent of Dunstable, and for all that time has made the restoration of the fine ruin which he found a labour of love. He met and welcomed the party at the great door of the church, described the exterior, directed attention to the chief points of interest in the interior, and explained what he had done, and how, in the restoration, and what he intended to do. The work has been chiefly effected under the care of Mr. Somers Clarke, architect. Already 10,000*l.* have been expended,—raised entirely by the exertions of Mr. Hose, who said he had now in hand 1,000*l.* to be devoted to further work. The interior consists of the nave of a fine Norman church, with north and south aisles. The ancient choir does not remain, although its foundations might probably be found grass-covered on the eastern exterior of the church. The piers of the nave arcades are very massive and grand,—much more so than those of St. Alban's, and are probably equal to those of Peterborough: these are surmounted by a triforium, consisting of an arcade of bold arches, subdivided into two smaller arches in the usual manner. Over these are a series of semi-Norman or Early English clearstory windows. The south aisle is Norman, and vaulted; it has been wholly restored, about two-thirds (with the exception of the nave piers) having been almost wholly re-erected, but in exact repetition of the ancient forms. The restoration of the north aisle has not yet been commenced, but is the next work to be undertaken. The nave and outer walls on this side can only be kept standing by abundant shoring. This aisle contains a series of fine Perpendicular windows. The western wall of the nave is enriched in the interior by an arcade of five lancet-headed arches of different heights, the central one being lower than that on either side; two are pierced as windows. The font is new, but is an exact repetition, both as to size and ornament, of the ancient one. It is circular and very massive, the huge bowl being supported upon a base of nearly its own dimensions, and without any apparent division. Bands of Norman ornament encircle both bowl and base.

Luton.—The church here is large and interesting, but the condition of the exterior has been, and in part still is, in a lamentable state of dilapidation, although a long-continued process of reparation has been going on. The party were met in the churchyard by the incumbent (Mr. O'Neil) and the Rev. Canon Haddock, who again acted as cicerone. The church is a cross church, and consists of chancel, nave with north and south aisles, north and south transepts, north and south porches, and a large addition north of the chancel called the Wenlock Chapel; the tower is at the west end of the north aisle. The masonry of the exterior is very peculiar; it consists of chequers of "clunch" and flints, each chequer being nearly a square foot in size, and the wall surface presenting a very draught-board kind of appearance. In the east end have been inserted three lancet windows, with slender columns and foliated capitals, stated to be the work, many years ago, of an architect now of

considerable eminence, but it is of so poor a character as to be altogether unworthy the reputation he has since obtained. This offers a complete foil to the bold and effective, although dilapidated, Perpendicular work of the adjoining east gable of the Wenlock Chapel. The most striking object in the interior is the baptistery, which stands in the centre of the west end of the nave. This is an octagonal erection of very beautiful Decorated design, which contains and canopies the font; it is about 19 ft. high and from 10 ft. to 12 ft. in diameter, and is sufficiently capacious to hold nine or ten persons round the font, which is plain. Each side is adorned with a traceried arch. The compartments are divided by eight buttresses, terminating in crocketed pinnacles. Below the arch in each of seven sides (the eighth side is an entrance containing steps), and between each pair of angle buttresses, is an embattled wall, about 4 ft. high, on the face of which is an arcade of two cinquefoil arches, with crocketed hood-mouldings and finials, and crocketed pinnacles. The workmanship of this unique structure is not equal to the design, but it may have suffered deterioration by having been several times moved. About ninety years ago it stood under the third arch from the west end in the south nave arcade. At that time it was moved to nearly its present position. About 1822 it was moved to the south transept, and some years ago back to its present position. The baptistery is figured as the frontispiece in "Simpson's Fonts," published in 1828. Towards the west end, in the wall of the south aisle, in a canopied recess, is the effigy of a priest in his robes. These are defined with great particularity, and were fully described by Mr. Bloxam, F.S.A., who stated that the effigy dated from the 15th century.

Wheathampstead.—The Rev. Owen Davys met the party at the station at 4.15 p.m., and conducted them to his beautiful church. This is built of flint, with limestone quoinings and dressings. The church is a cross church of no great size, and a peculiar and effective if not beautiful leaden spire of some elevation rises from a tower of no great height at the intersection of the transepts. There is a built-up Saxon door in the wall of the south transept, but the chief portion of the present church is Early Decorated. There is a south porch; but the principal entrance is by a highly-ornamented and good doorway in the west end. Historically, Wheathampstead is connected with St. Alban's by the fact that John of Wheathampstead was abbot of that great abbey from (with an interval) 1420 to 1451.

St. Alban's.—An evening meeting was held in the Town-hall, at which the Rev. W. J. Lawrance, rector of the Abbey Church, in the name of the Hertfordshire Society, welcomed the members present of the Northamptonshire and Leicestershire Societies. This compliment was acknowledged by the Rev. N. F. Lightfoot and the Rev. J. H. Hill, hon. secs. respectively of these societies. A paper of great research upon the former choir arrangements of the St. Alban's Abbey Church was read by Canon Davys.* Sir Gilbert Scott followed with a very interesting *viva voce* explanation† of the early history of the abbey, and of the dates and character of the different portions of the building, in which he took occasion particularly to distinguish the rich semi-Norman work of the abbot, John de Cella, of the close of the twelfth century, from the more economical Early English work of the abbot, William de Trumpington, of the beginning of the thirteenth century,—two of the most important contributors to the building of the abbey. Sir Gilbert also directed attention to the various discoveries made in the course of the work of restoration, and to the many other matters of interest in which St. Alban's Abbey is so rich. Mr. Neale (who is about to publish an account of the history of the abbey, and a detailed description of its distinctive portions and contents, illustrated by engravings of his numerous exquisite drawings), then read an able although concise paper, giving in very condensed form much of the matter which will be published *in extenso* in his work. Mr. Matthew Bloxam followed with an explanation of the important discoveries which he had made twenty-three years ago, in what might then almost be termed the abbey ruins; and he was followed by the Rev. J. T. Barker, rector of Rushden, who feliciously offered thanks on behalf of the numerous visitors for the welcome and hospitality with which they had been received, both by the members of the Hertfordshire Society and by the inhabitants of that ancient town, so soon to become a city; and he took advantage of the occasion to protest (in reference to a tendency too prevalent in the present age) against ancient truth being permitted to be swamped by the discoveries and conclusions of modern science.

On the following day, Thursday, the 20th ult., a numerous company assembled at the west front of the abbey, and were conducted round the exterior by Sir Gilbert Scott, who explained as he proceeded. A long dissertation upon the mythical, traditional, and historical incidents in connexion with the Abbey of St. Alban—such as the martyrdom of St. Alban (said to have taken place during one of the persecutions of the Christians by the Emperor Diocletian early in the fourth century), the building of a Christian church on the site of his martyrdom, said to be that now occupied by the present south transept, &c.—was given in the garden of the rectory close by. After this, Sir Gilbert Scott, Mr. Ridgway Lloyd (who has published a detailed account of the shrines, altars, monuments, and tombs in the abbey), and Mr. Neale, accompanied the party throughout the abbey, and with great pains pointed out *in situ*, and explained, all matters particularly worthy of note.

Hatfield House was visited in two parties—one courteously conducted by the rector, and the other by the house chaplain. The great banqueting-room, the dining-room, the library, the chapel, drawing-room, ball-room, billiard-room, royal bed-room, state bed-room, Queen Elizabeth's room, Duke of Wellington's room, the Cromwell bed-room, other bed-rooms, and the private drawing-room and morning-room of the Marchioness of Salisbury, with all their varied and valuable contents, were minutely inspected.

* To this and some others we shall return.

† A report of this is given on p. 755, *ante*.

EXCURSION OF THE ARCHITECTURAL ASSOCIATION.

THE scene of the seventh excursion will be Winchester and the neighbourhood. The course of it will be as follows:—

Monday, August 14th.—Winchester Cathedral. The party will be conducted over the cathedral by Mr. John Colson, F.R.I.B.A.—The College buildings will be explained by Mr. C. R. Pink, A.R.I.B.A.

Tuesday.—Ashley, King Sombourne, Romsey Abbey, and Hursley. At Romsey Abbey the party will be conducted over the building by Mr. James Fowler, F.R.I.B.A.

Wednesday.—Christchurch. The party will be conducted over the building by Mr. Benjamin Ferrey, F.S.A.

Thursday.—Cheriton, East Meon, Warnford, Corhampton, and Meon Stoke.

Friday.—Salisbury.

Saturday, August 19th.—The Hospital of St. Cross, the County Hall, the new Law Courts, St. John Baptist, and St. Peter, Cheseshill. At the County Hall and the new Law Courts the party will be conducted by Mr. Matthew Wyatt, A.R.I.B.A; at St. John Baptist and St. Peter Cheseshill, by Mr. C. R. Pink, A.R.I.B.A.

THE INDIA MUSEUM.

A DEPUTATION of delegates from workmen's clubs of London, headed by Mr. Hodgson Pratt, chairman of the council of the Working Men's Club and Institute Union, waited upon the Lord Mayor at the Mansion-house on the 26th ult. to ask his co-operation and support of the proposal to establish a museum for India and the Colonies on the Victoria Embankment. The Lord Mayor acknowledged the importance of the question, and expressed his willingness to head a deputation to the Prime Minister, and do all he could to obtain the support of the Government. A memorial, drawn up by a committee appointed at a meeting of the working classes of the borough of Finsbury, and forwarded to the Prime Minister, runs thus:—

"As artisans desirous of improving our artistic taste and industrial knowledge, your memorialists consider it highly desirable that we should have free and ready access to the admirable specimens of Indian workmanship to be found in the India Museum. The natural products and manufactures of that collection throw great light upon handicrafts in which we are engaged, and are calculated to promote our technical knowledge. For some years past we have, in common with all other members of the working classes in London, observed with regret that many valuable collections are, to an increasing extent, removed to South Kensington. That quarter being at the extreme end of the metropolis, and at the end furthest removed from the districts inhabited by workmen, great numbers of our class are altogether precluded from visiting the collections there, or, at least, very rarely and hastily. The very considerable distance not only adds to the expense, but often consumes half the limited time at our disposal. Your memorialists have therefore learnt with the greatest satisfaction that there is a site, the property of the Crown, close to Charing-cross, and situated on the Victoria Embankment, where the present Indian collection might be placed and arranged in suitable buildings. Your memorialists very earnestly trust that Her Majesty's Government will take such steps as may be necessary to secure the site in question for these museums."

It may or may not be desirable to put up a building on the Embankment for the Indian collections, but there is an immense amount of humbug in the assertion that the working classes will not go to see them at South Kensington, and will if they are lodged on the Embankment. The same thing was said in respect of the Architectural Museum. How many of the working classes go to "study" that collection now it is in Westminster? The working classes will be just as likely to go to the Indian and Colonial Museum if it be established at South Kensington as if it be located on the Embankment.

STATUES.

The Prince of Wales.—The *Manchester Guardian's* London correspondent understands that Sir Albert Sassoon, who intends to present an equestrian statue of the Prince of Wales to Bombay, has transferred the commission for this work to Mr. Boehm, in consequence of the death of Mr. Noble, to whom it was originally entrusted. The statue will cost 5,000*l.*

Mr. John Bright.—A movement is on foot for the presentation to the Manchester City Council, of a marble statue, by Theed, of Mr. John Bright, which, it is hoped, may be placed in the new Town Hall. Mr. Bright has already given several sittings to the artist. The statue, which will cost about 1,000*l.*, will be life size.

Earl Canning.—Mr. T. Brock's equestrian statue of Earl Canning for Calcutta has been inspected by the committee. It is expected to be exhibited in London prior to its removal to India.

Mr. John Stuart Mill.—It is stated that Mr. Woolner, R.A., has nearly completed the full-size model for the statue of the late John Stuart Mill.

The Right Hon. C. P. Villiers.—Mr. W. Theed, the sculptor, has just completed a full-length statue of the Right Hon. C. P. Villiers, M.P., which is about to be offered to the Town Council of Manchester, to be placed in one of the galleries of the New Town-hall.

Mr. Plimsoll, M.P.—The movement originated by a committee of working men in London "for erecting a statue of the true and noble-hearted friend of the sailor, Samuel Plimsoll, esq., M.P.," is progressing favourably, and Mr. R. Belt, the sculptor, has been commissioned to execute the work, which is rapidly approaching completion.

Mr. Adam Black.—An accident has happened to the sculptor's model for the statue of the late Mr. Adam Black, which must occasion considerable delay in the completion of the work. The commission, it will be remembered, was entrusted to Mr. John Hutchison, R.S.A., who was bound to have the statue completed within nine months. Proceeding on this understanding, the sculptor had worked with such assiduity that he was enabled to give the finishing touches to his model in rather less than eight months from the date of its commencement. The model was executed, according to Mr. Hutchison's usual practice when working for bronze, in a reddish clay. Finished on the 14th ult. the statue was seen to be all right at nine o'clock on Sunday evening, the 16th, when one of Mr. Hutchison's assistants looked in for the purpose of moistening the clay. At seven o'clock next morning, when the workmen entered the studio, it was found a ruin, great masses of clay having fallen away so as to expose the wooden framework on which the model had been built. The explanation had been suggested that the occurrence might have been due to the expansion of internal air by the excessive heat of the weather, the thermometer in the studio on Sunday having marked a temperature of 90°. Much sympathy is felt for the sculptor, who has lost the fruits of eight months' arduous labour. The memorial committee have granted an extension of time for the completion of the statue.

BATS.

SIR,—Will some of your numerous readers suggest a mode of getting rid of or abating the nuisance occasioned by numerous bats which have taken up their abode amidst the timbers of a painted Perpendicular roof? J. B.

BUILDERS' BENEVOLENT INSTITUTION.

The twenty-ninth annual meeting of this charity was held on Thursday, the 27th ult., at Willis's Rooms, St. James's, Mr. George Dines in the chair. The report for the past year (read by the secretary, Major Brutton) showed the Institution to be progressing in prosperity and usefulness. During the year the directors have purchased the sum of 750*l.* stock Three per Cent. Consols, making the Relief Fund amount to 15,701*l.* 6s. 10d. Steps are being taken to add the amount of the Building Fund (3,531*l.* 0s. 5d.) to the Relief Fund, it having been decided not to build almshouses, the pensioners invariably preferring to live with their friends. Five new pensioners were elected during the year. The report expressed special thanks to the president for the past year (Mr. John Aird) for his services, whereby the funds were considerably augmented; to Mr. J. T. Bolding, for his services in connexion with the ball (which realised a profit of 90*l.*); and to Mr. Thomas Stirling for his services as secretary *pro tem.* The balance-sheet showed the total receipts (including balance in hand last year and interest on investments) to be 2,922*l.* 8s. 3d., the expenditure being 2,398*l.* 10s., leaving a balance in hand of 523*l.* 18s. 3d. The report and balance-sheet were unanimously adopted. Votes of thanks were given to the directors and office-bearers for the past year, and the officers for the current year appointed, Mr. Charles B. Waller being elected president. Section 6 of Rule II. was amended by the insertion of the words, after the word "election," "For every such 20*l.* bequeathed and actually received," so that the rule now reads as follows:

"That should an executor, paying a legacy, or any other person having the discretionary disposal of property, contribute to the funds of the Institution a sum of 20*l.* or upwards, he shall be entitled to two votes at all elections for every such 20*l.* bequeathed and actually received; should there be more than one executor preference shall be given to the one named by his co-executor."

A HILL OF MARBLE; BEETHAM FELL, LANCASTER.

It will be news to some that marble in quantity and quality equal to any imported is to be obtained in our own country, "marble which takes a polish much superior to any now in use,"—at least, so says a correspondent who sends us an account of the place. It is called Winscar, and is owned by Mr. Wilson, of Dallam Tower. The men are squaring blocks of the rock, and we are told that it is marble, of which the hill is full. There is something peculiar about the formation of the rock, and we stop to examine it. No matter how small a piece is picked up, it is most beautifully marked. There are three quarries on this hill, and although they lie within the space of 100 acres, each quarry yields a distinct kind of marble. The first, which is called "The Agnes Quarry," lies on the side of the hill nearest to Milnthorpe, and contains, perhaps, the best marble of the three. It has a reddish appearance, but it might, more strictly speaking, be said to be of a mahogany colour. About 10 ft. from the surface of this quarry, in a broad fissure in the rock, there is a vein of copper, which will, doubtless, ere long be got. The second quarry is called "The Sisters." The characteristic which first strikes the visitor to this quarry is the extreme roughness of the upper layer of rock. No one who sees it need be told (for it speaks for itself) that for thousands of years pebbles were washed across its surface, and that this was the real cause of the roughness. The second layer is remarkably smooth. This quarry is not only of fossil formation, but the marble has a pinky hue. It is said that this peculiar colour has never been found before. The third quarry is called "Winscar," the marble from which is whiter than from the others, but is beautifully marked. It ought to be stated for the benefit of those who are not aware of the fact, that there is a deposit of fossil formation at Dent: that is a dark grey fossil without a particle of red in it. There was one in Derbyshire also, but it is worked out. In Ireland there is a similar kind of fossil to those two named. We (says a Lancaster paper) were somewhat anxious to know how it happened that the coral fossil formation found in such abundance on this Fell had only just begun to be turned to account, and who was the enterprising individual. We learn that a gentleman about two years ago came to reside at Yealand with his family. He soon became known as a mineralogist (although we believe he would himself disclaim any such designation), and he was shown some specimens of rock from Beetham Fell. With his geologist's hammer in his pocket, he, at the latter end of last year, rambled over the hill, and applied the hammer to several bits of rock. He was surprised and delighted at what he saw, and when he discovered the nature of the limestone he began to think of a way of utilising it. He entered into an arrangement with Mr. Wilson, the owner of the Fell, and "The Beetham Fell Marble Company" began operations about five months ago. Much of the work so far has been of a preliminary character, and it might be deemed bold to hazard an opinion as to the amount of marble which will be got per annum. But we believe Mr. Baynes (for that is the name of the gentleman who discovered the value of the rock) is now very sanguine that there will be a good demand for the marble. Polished specimens of it have been sent to some of the largest dealers, who have expressed themselves very highly pleased with it; some has been sold; and there will next week be a block of the marble at Mr. Wilkinson's, Castle Hill, Lancaster, to be formed into a tombstone.

THE BAYEUX TAPESTRY.

Sir,—There is probably no more genuine and historical work of art, and none more interesting to the English people, than the record of the invasion of England by William the Conqueror, the Bayeux tapestry. Some years ago, at much cost and trouble, a full-sized facsimile of this piece of needlework was taken by the Science and Art Department. It is generally exhibited to the public in the Kensington Museum, on the east side of the south-east architectural court. So little do the authorities of the Kensington Museum appear to appreciate this interesting work, that for the second time they have concealed the tapestry by the somewhat feeble and monotonous drawings of the students of the schools of art, for which ample space could have been found, with a little ingenuity, in other parts of the Museum. Allow me to express a hope that Mr. Poynter will look to this, and, if possible, remedy it. I take the liberty of suggesting that a facsimile of this tapestry would be an attractive and useful prize of the Art-Union of London. A Ghost.

ENGINEERS AND ARCHITECTS.

Sir,—In the interest of those few engineers whose special business it is to design and construct "fireproof floors," I am glad your correspondent "Concrete" has drawn attention to the mistake at the Ecoscevephoron at Pimlico; for it may be thought that some one of them is sadly at fault, though such I understand is not the case; however, the architects can best set that point right.

Floors constructed wholly of iron and concrete can be, and are, made perfectly indestructible by fire, and capable of sustaining any weight. It seems a folly that architects should be so shy of engaging the services of an engineer when they would be so relieved of anxiety they have no need to incur, and save their clients many scores of pounds often spent in patching up a weak or badly-constructed floor.

The floors your correspondent refers to I believe are about to be made good and strengthened by the addition of girders, which would have been wholly unnecessary had the iron joists been of proper strength at first.

The discussion at the Institute of Architects on concrete floors was by no means exhausted, for several systems largely adopted, and reported on by able men as good, were not even mentioned, and I know of a fact that gentlemen would have attended the Institute and described these systems, not from any commercial interest, but from purely scientific motives, were it not for the peculiar affection shown for a class and grade (I am not advocating, nor would I, the admission of any tradesman of any kind) and for the snubbing so frequently visited upon the unfortunate creatures below the rank of F.R.I.B.A. Not so the Civil Engineers, where *every* member is cheerfully and cordially welcomed and even invited to discussion, and where he is listened to, though he may differ in opinion from the "powers that be"; and I would, moreover, observe that the talk is not kept always in the hands of the same few as it is night after night at the Institute.

I am afraid my digression will be unpalatable, but permit me to add that architects should take a lesson from their brethren in construction, and then we might hear less of floors giving way, and see fewer girders cruelly distorted by an unfairly superimposed weight. I appeal to those architects (and there are a few) who do engage an engineer on their ironwork difficulties, to say if they do not find it the most satisfactory and the *cheapest* plan. One who Knows.

LYME REGIS, DORSET.

Sir,—A subscriber to your paper for over sixteen years, I have found that a few hints given through its medium often have the desired effect; and you would greatly oblige me, and at the same time would be doing a social good, if you would wake up the inhabitants (or those who are in authority) of the town of Lyme Regis.

Although one of the prettiest watering-places on the South Coast, and commanding most extensive views both on sea and land, romantic walks and salubrious air, yet the town itself is in a most fearful state as to sanitary and other matters, though naturally well-situated for the carrying out of good sanitary measures.

Certainly there are stench-traps inserted, connected with the main sewerage drain in one or two principal streets, for the carrying away of superfluous rain-water; but at other times they are ventilators for sewage gas, which is very offensive.

As to the houses in which the working-class lives, one-half would be condemned by an inspector; they look more likely to fall on passers-by and their occupants than to stand, leave alone in many instances a family of six to eight sleeping in one room.

The supply of pure water is much needed also for the poorer class; although abundant, there is no supply or provision for them; and I may say one-fifth of the population have to resort to the *river* for their requirements, into which about twenty closets and drains empty, to say nothing of the vegetables and refuse from houses thrown in to decompose.

Better measures also are required to enforce education here. Children are running the streets semi-nude, and their language is often as offensive to the ear as the stench from drains is to the nose.

I hope this hint will be taken in good part by those who are in power *locally*, before they force those who are disinterested to insist on measures, probably at a greater cost than would be agreeable. Solo.

AUCTIONEERS' VERBIAGE.

Sir, Just now, when manufacturing, commercial, and financial stagnation prevails, and reflects on all industries and interests, would it not be well that the increased numbers of vendors of household property and "auctioneers" should discard the old Robinsian absurdities, to say nothing of criminally-erroneous descriptions and conditions of sale of "White Elephant Estates"? One of the most glaring of these absurdities in this intelligent age is to be subject to the twaddling nonsense (from a Tokenhouse yard rostrum) of equality in value of a tumble-down house, with all its wear and tear associations, and British Consols!

That a number of intelligent grown-up men, of business experience, should be constantly hammered at by verbal stuttering, stammering, and disjointed descriptions of country "mansions," "sloping" green fields, "within a ring fence," &c.; "talked" to by some youthful "knight of the hammer," as if they were mere schoolboys ready to spend their pocket-money for "lolly-pop cheaps," is really worse than ridiculous,—it is quite offensive to the age of 1876. Can you not say a word to reform it, as well as to exhibit the totally fake value (by rents) of house property at this present moment of general financial and industrial depression? An Old Builder.

DECORATED STONE WARE.

Sir,—We observe in your notice of the *soirée* of the Institute of British Architects (p. 704) you speak of certain decorated stoneware as a leading feature in the exhibition "executed by Messrs. S. Belham & Co."

We feel sure you will allow us space to correct this, as we executed the pulpit, reading-desk, font, and capitals and bases of columns in decorated stoneware from designs by Mr. J. P. Seddon. They were sent to our depôt at Mr. Belham's, and he forwarded them to the rooms in Conduit-street for the *soirée*. Bailey & Co.

Pulham.

COST AND CONSTRUCTION OF SEWAGE TANKS.

Sir,—Referring to the paper read by myself at the meeting of the Municipal and Sanitary Engineers' Association, and of which a notice appeared in the *Builder* (p. 703, *ante*), I shall feel obliged if you will permit me to acknowledge, through your paper, the fact of my being indebted to Thos. Dawson Ridley, esq., A.I.C.E., for the formula used, it being a modification of one given by that gentleman in a paper read at the Institution of Civil Engineers on the 8th November, 1870. Thos. W. Grindle.

Books Received.

Algebra Self-taught. By W. P. Higgs, M.A., D. Sc., A.I.C.E. London and New York: E. & F. N. Spon. 1876. Crown 8vo., cloth, price 2s. 6d.

The directions to perform certain calculations by symbols are so plainly stated that he who runs (through the book) might read, were it not that a few literal errors,—two on page 12,—are interposed to prevent the pupil going too fast; for learners are apt to pass gaily over what is easy, without sufficiently retaining what is intended to be taught, whereby "the doubts of imperfect faith rather than the confidence of rational conviction" ensue. But in algebra thought and consideration are necessary in order to master the subject.

"We should bear in mind that the simple execution of analytical operations acquired by dint of practice and experience is a mere common species of labour, often merely mechanical; whilst a distinct apprehension of the specific object and meaning of the operations, and a contemplation of the clearness and beauty of the various arguments employed, constitute the intellectual lore that gratifies and enriches the mind, and stimulates its energies with an ardour after the investigation of truth."

The author shows in a most logical manner how desired results are attained, but proceeds in a way different from the usual one. He considers multiplication, involution, and exponents together, and the use of exponents as logarithms, proceeding to a definition of logarithms, and their common use; of compound multiplication and the binomial theorem; of divisions, fractions, and ratio; of continued proportion, of square and cube roots, and of equations, the mastery of which by the student will enable him to work out any technical formulæ he may wish.

Railway Appliances. By John Wolfe Barry, M. Inst. C.E. London: Longmans & Co. 1876.

This is one of Messrs. Longman's useful series of text-books of science. The "permanent way" of railways holds a kind of separate existence, and a middle position between the works of the line and the "appliances"; but the author includes, and thereby gives more interest to the book, the permanent way amongst the appliances, beginning with the formation-level, and describing generally the ballasting of the line, as well as the sleepers, chairs, and railways, with their spikes, trenails, fish-plates, bolts, and other fastenings. Since the Wigan accident the public have heard much about *facing-points*, and these are here described.

The public, or, as we are more inclined to think, a small section of the public—a few over-anxious persons—demand fast as well as frequent trains, and where the traffic is large, and there are but two running-lines of way, it is not easy to work the line without facing-points; but if these same over-anxious people knew the smallness of the difference between safety and danger in passing over facing-points they might be inclined to abate somewhat their urgent demands, and allow railway companies to conduct the traffic more leisurely. A railway engineer, of course, cannot allow that facing-points can be dispensed with, but the author urges the utmost precaution in the construction of the permanent way, and in the appliances belonging to it. "In the case of facing-points, any want of accuracy in adjustment is most serious, as by merely moving the points 2 in. one way or the other, the direction of a train can be altered, and if, of two lines connected by facing-points, one line be clear and the other be already occupied by trucks or carriages standing on it, an approaching train can be directed either to safety or to destruction by this small amount of motion. . . . . Every engineer avoids, as much as possible, inserting them on a main line. They cannot, however, be dispensed with altogether, as it would be impossible to conduct the present traffic of railways without them."

But there are other causes of liability to accident at facing points which are of less measurement than 2 in., and these concern the gauge of the rails, which, for safety, requires to be about ¼ in. narrower at points and crossings than at other parts of the line.

Of the rolling-stock of railways one hears, perhaps, more of wheels and axles than of other parts, and these are fully described and illustrated; but so, indeed, are all parts and all appliances, and notwithstanding the peculiarities of construction of railway appliances, this small volume will, we expect, be of general interest. Mr. Wolfe Barry has done his work very well.

Iron and Steel. By W. Mattieu Williams, F.C.S., F.R.A.S.
Copper Smelting. By J. Arthur Phillips, F.C.S., F.G.S., M. Inst. C.E.
Brass Founding, and Tinplate and Zinc Working. By Walter Graham.

These are practical little treatises, and form the first volume of a valuable series entitled "The British Manufacturing Industries," carefully edited by Mr. G. Phillips Bevan, F.G.S., and published by Mr. Stanford, of Charing-cross, price 3s. 6d. each volume.

There is much to be expected in the results of the diffusion of knowledge such as these volumes promise to convey; but as they will occupy important ground, it will be very necessary to their usefulness that the best information,—that is, such as is founded on principles of universal application,—shall be given, rather than such as is of merely local application and usefulness. To do this concisely, practically, yet generally, will entail upon the authors much study, time, and labour, however conversant each may be with his subject.

VARIORUM.

Nature (July 27th) has an account and view of the gigantic organ, comparatively little known, in the Hall, Primrose-hill, London. It was built by Messrs. Bryceson & Morten.——Messrs. G. W. Bacon & Co. have published a new map of the Isle of Wight, a careful reduction from the new 6-in. Ordnance Survey, being, we believe, the only map of the island published since that survey. Tourists will find it very satisfactory.——Messrs. Bemrose have added to their series of cheap "Panoramic Railway Guides," one to the "Great Western Railway," edited by R. Kemp Philp.——Mr. Charles Geoghegan, of Dublin, architect, is circulating a pamphlet, showing what has been, and what ought to be, done in that city for the provision of artisans' dwellings. He says,—"An able professional writer, when alluding to the necessity of providing homes for the London poor, recently declared that as yet they had not been able to erect suitable tenements for working men at less than 150*l.* each dwelling, 43*l.* per room being the average outlay on each room in Cobden's Buildings, Bagnigge Wells, while our first attempt in Dublin has shown what can be effected at 80*l.* each dwelling of three apartments and sculleries; and for their suitability, comfort, extent, and appearance, a visit of inspection will amply satisfy the inquirer. We have yet before us a task demanding the Lamp of Aladdin to throw a wonderful light upon:—How to provide a good commodious room, replete with every requisite for the convenience and salubrity of the occupier, for the very poorest of the poor, at such cost as to return the investor a fair and reasonable interest for his capital. To accomplish this will be to extend the helping-hand to the outcast, and treat even him to the happiness of cleanliness and decency. That such may be done I am fully convinced, and the task shall not be abandoned until the case has been given over by the financial faculty as hopeless."

Miscellanea.

The Highfield Branch Free Library, Sheffield.—This building, which has been erected by the Corporation of Sheffield at a cost of 6,000*l.*, was opened on Tuesday last, the 1st inst. The building is substantially built. Over the entrance is some carving, together with a marble slab, on which is an appropriate quotation from Carlyle,—"That there should one man die ignorant who had capacity for knowledge, this I call a tragedy, where it happens more than twenty times in a minute, as by some computations it does." On either side of this slab is a carved stone female figure, one representing mechanical science and the other literature. These are by Mr. Cooper, of Cambridge and Sheffield. Inside everything is plain and useful. The entrance leads directly into the lending-room. The books, which number about 6,500 volumes, are arranged on shelves on the walls. The shelves even now appear to be well filled, but there is room still left to accommodate over 10,000 volumes.

The Ownership of Land.—A summary of the returns of owners of lands in England and Wales (exclusive of the metropolis), giving a classification according to the extent of their holdings, of the numbers of owners, together with a similar return for Scotland, has been laid upon the table of the House of Commons at the instance of Mr. Bright. From this it appears that in England and Wales, exclusive of the metropolis, there are 703,289 owners of less than one acre, the extent of their lands being 151,171 acres, and the gross estimated rental 29,127,679*l.*; above 1 and under 10 acres 121,983 owners, extent 478,679 acres, and gross estimated rental 6,438,324*l.*; above 10 and under 50 acres 72,640 owners, extent 1,750,079 acres, gross estimated rental 6,509,289*l.*; between 50 and 100 acres 25,839 owners, extent 1,791,605 acres, gross estimated rental 4,302,002*l.*; between 100 and 500 acres 32,317 owners, extent 6,827,346 acres, gross estimated rental 13,680,759*l.*; between 500 and 1,000 acres, 4,799 owners, extent 3,317,678 acres, gross estimated rental 6,427,552*l.*; between 1,000 and 2,000 acres, 2,719 owners, extent 3,799,307 acres, gross estimated rental 7,914,371*l.*; between 2,000 and 5,000 acres, 1,815 owners, extent 5,529,190 acres, gross estimated rental 9,579,311*l.*; between 5,000 and 10,000 acres 581 owners, extent 3,974,724 acres, gross estimated rental, 5,552,610*l.*; between 10,000 and 20,000 acres, 223 owners, extent 3,098,674 acres, gross estimated rental 4,337,023*l.*; between 20,000 and 50,000 acres, 66 owners, extent 1,917,076 acres, gross estimated rental, 2,331,302*l.*; between 50,000 and 100,000 acres, 3 owners, extent 194,938 acres, gross estimated rental 188,746*l.*; above 100,000 acres 1 owner, extent 181,616 acres, gross estimated rental, 161,874*l.* There were also returned 6,448 owners of acres not being specified, with gross estimated rentals amounting to 2,831,452*l.*; and 113 owners, with a total acreage of 1,423 acres, but without any rental being given.

The Timber Market as affected by Expense of Transit.—Mr. A. Peebles, prize essayist on agriculture, has an article in the *Timber Trades Journal* on "The Timber Trade in Hants and Berks," in which he says:—Many varieties of timber are annually sold by us at a sacrifice simply because they cannot be economically converted or utilised at home. This is much to be regretted, as it prevents us from realising full value for the produce of our woods and plantations, and limits trade and commerce in our midst. A few examples of how the value of timber is influenced by the locality in which it is grown will illustrate this point. Colliery timber grown in Ireland for consumption in England will realise more money than if grown in Hants or Berks. This is owing to the expense of transit from Dublin to Liverpool, or from Belfast to Maryport, being less than from the south of England to the midland or northern counties. In the vicinity of collieries prop wood of scotch or spruce firs sells readily at from 5s. to 7s. 6d. per 100 lineal feet. In this neighbourhood the same description of trees, averaging 12 ft. long would not exceed 30s. per 100 trees. Sycamore of large dimensions, used principally for printing blocks, will realise 4s. per foot within easy access of manufactories. In the south this valuable tree is seldom planted, either for ornament or profit. Soft woods, such as poplars and willows, used extensively for lining coal carts, trucks, and waggons, and for railway brakes, command 2s. per foot in Lancashire. With us it must be of superior quality to exceed the half of this sum. Alder and birch of various dimensions, used in the north for clog blocks or wooden soles for shoes, is in good demand at from 1s. 2d. to 1s. 6d. per foot. The same quality of timber in the south is not worth more than 8d. to 10d. per foot cube.

Burns and Scalds.—Dr. R. H. Allnatt writes,—"The late lamentable accident on board the *Thunderer* recals to my recollection a remedy for burns or scalds which was suggested to me some years ago by Lord Ebury. As an old medical man, and from personal observation, I can vouch for its efficacy, and in the absence of professional assistance the application may prove of inestimable value. The remedy is simply this,—The common whiting of commerce, reduced by cold water to the consistence of thick cream, is to be spread on light linen rag, and the whole burnt surface instantly covered, and thus excluded from the action of the air. The ease it affords is instantaneous, and it only requires to be kept moist by occasional sprinklings of cold water."

Assessment Case.—Lately, at the General Assessment Sessions, the following cross appeals were heard, namely,—the East and West India Dock Company (appellants), the Poplar Union Assessment Committee (respondents), and the Overseers of the Parishes of All Saints, Poplar, and Bromley St. Leonard's (appellants), the Poplar Union Assessment Committee (respondents). These were appeals under the provisions of the Metropolis Valuation Act. At the last quinquennial revision of the assessment lists, the overseers of the parishes, under the advice of their surveyors, placed the "gross value" of the property of the Dock Company at 172,388*l.*, and the annual "rateable value" at 116,840*l.* The Dock Company being dissatisfied with these figures, objected to them before the Assessment Committee, and contended that the rateable value should be altered to 54,000*l.* The Assessment Committee determined the sums at 106,154*l.* gross value, and 91,756*l.* rateable value. Against these figures both parties appealed to the Assessment Sessions, the Overseers of the parishes on the ground that they were too low, and the Dock Company because they considered them to be too high. When the matter was last before the Court it was stated that the investigation would involve a protracted inquiry into the accounts of the company, and that, as many surveyor witnesses would be called, it was arranged between the parties that the matter should be referred to Mr. Pownall, who now attended with his report, and stated that after several sittings, at which the Solicitor-General and other counsel appeared for the Dock Company, and the Hon. A. Thesiger, Q.C., and others for the parishes, and having taken very important evidence of eminent surveyors and others, he had decided to advise the Court to fix the gross value at 138,424*l.*, and the rateable value at 99,554*l.*, 12-13ths of which are in respect of the portion of the docks within the parish of Poplar, and 1-13th in respect of that portion within the parish of Bromley. These figures the Court adopted, and altered the assessment lists accordingly. The appeals have been the source of considerable interest. The surveyors advising the Dock Company were,—Mr. Vigers, Mr. C. Lee, Mr. Stephenson, and Mr. Clifton; whilst on the part of the parishes were—Mr. Morris, Mr. Harston, Mr. Marshall, Mr. Bracebridge, Mr. Hooper, and Mr. Castle.

Paper Mills and River Pollution.—According to evidence given in a case submitted to arbitration under the High Court of Justice, Exchequer Division, between Messrs. Wm. Drew & Co., of Keysham Mills, near Southampton, on the one part, and Mr. Carl Heinrich Roeckner, of the Royal Arcade, Newcastle-on-Tyne, on the other, it would appear that, so far at least as the paper manufacturer is concerned, waste liquors can not only be rendered innoxious, but that this can be done to the manufacturer's profit. Mr. Roeckner's claim against the defendants was, that as the patentee of a process for preventing the fouling of rivers by waste products from paper manufactures, he had supplied certain appliances to them, under an agreement entitling him to receive a stipulated percentage of profit upon their satisfactory use. This profit was obtained by recovering from the liquid in which Esparto grass, straw, or rag, was boiled for paper-making, the chemicals used in their conversion. Evidence was brought forward in which it was stated that at Messrs. Piris's, the largest paper-mills in the country; at the Culter Paper Works, Aberdeen; and also at a well-known Irish mill, Mr. Roeckner's patent was in use with the most satisfactory results. The arbitrators came to the conclusion that Mr. Roeckner was entitled to the sum of 1,000*l.* in satisfaction of his claim.

Encouragement of Planting.—The law in New York State making provision for planting shade-trees along the highway is as follows:—"Any inhabitant liable to highway tax who shall transplant by the side of the public highway any forest shade-trees or fruit-trees of suitable size, shall be allowed by the overseers of highways, in abatement of his highway-tax, 1 dollar for every four trees set out; but no row of elms shall be placed nearer than 70 ft., no row of maples or other forest trees nearer than 50 ft., except locust, which may be set 20 ft. apart; fruit-trees must also be set at least 50 ft. apart, and no allowance as before mentioned shall be made unless such trees shall have been set out the year previous to the demand for said abatement of tax, and are living and well protected from animals at the time of such demand."

Proposed Canal between the English Channel and the Mediterranean.—The Paris *Temps* states that the improvements proposed in the scheme for a canal between the English Channel and the Mediterranean are likely soon to be adopted. The delegates of the Chambers of Commerce of Marseilles, Cette, Nîmes, Bordeaux, Avignon, Lyons, St. Etienne, Dijon, Rouen, Honfleur, Elbœnf, and other centres of industry have formed themselves into a Commission to promote its execution, and have had an interview with several members of the Government. The Minister of Finance asked for a sketch of the necessary works and the cost, and the Minister of Public Works acknowledged the advantage of a canal serving for vessels of 250 or 300 tons, adding that the financial question was the only thing to be considered. The Commission, adopting the estimate of State engineers, put the cost at 65,000,000f.—namely, 10,000,000f. outlay on the Lower Seine, 5,000,000f. on the Upper Seine and Yonne, 10,000,000f. on the Burgundy Canal, and 40,000,000f. on the Rhone. The depth would be 13·5 mètres on the Rhone, and 2 mètres elsewhere. Transshipment would in any case be necessary only at Lyons. The locks would be uniformly 133 mètres long and 12 broad on the canals. The works would be completed in six years.

Plant Impressions.—M. Bertot, of the Paris Academy, has just made known a simple method of taking impressions of plants, requiring only a large sheet of paper, some olive (or other) oil, blacklead, ashes, and resin (or colophony). The paper is first lightly oiled on one side, then folded in four, so that the oil may filter through the pores, and the plant may not come into direct contact with the liquid. The plant is placed between the leaves of the second folding, and in this position pressed (through other paper) all over with the hand, so as to make a small quantity of oil adhere to its surface. Then it is taken out and placed carefully on white paper; another sheet is placed above (since two impressions can be taken), and the plant is pressed as before. On now removing it an invisible image remains on the paper. You sprinkle over this a quantity of blacklead (or ashes, &c.), and distribute it in all directions, as in applying sand to writing; the image then appears in all its parts. With an assortment of colours the natural colours of plants may be reproduced. To obtain fixity, resin is added to the blacklead (previously) in equal quantity; the impression is fixed when it is exposed to a heat sufficient to melt the resin.

Artisans' Dwellings in the Midland Counties.—"The Midland Improved Dwellings Association" has been incorporated under the Companies Acts, 1862 and 1867, and proposes to issue, by instalments, 20,000 5*l.* shares. The Association has been formed for the purpose of providing more commodious and healthy dwellings, which are urgently needed, for the industrial and labouring classes in Derby, Nottingham, Leicester, Chesterfield, Burton-on-Trent, and other Midland towns. It is proposed to accomplish this by erecting blocks of buildings and cottages in situations where they are required, by building improved lodging-houses, and by the purchase or leasing of existing property to be adapted to the objects in view. The society intends to commence operations in Nottingham, and a plot of land in New Beck-street and Coal Pit-lane has already been purchased.

A Chimney-piece Found at Newbury.—Mr. Walter Money, who represents the British Archæological Association in Berkshire, has made public a list of antiquarian "finds" during the excavations for the new municipal buildings at Newbury. The most notable object is a chimney-piece of the fifteenth century, in Bath stone, found (in portions) 7 ft. or 8 ft. below the surface, the mantel or frieze being 7 ft. 6 in. by 15 in., and arranged in traceried panels, within six of which are a series of carved shields in relief (probably at one time emblazoned), one of which is ornamented with a Y or Tau cross, and on the adjoining panel is represented a square, enclosing on the sinister side two nails. This Mr. Money thinks may be intended for a rebus, frequently introduced in such work at that period. The original *locale* of this piece of masonry is at present in doubt.

Death of a Scottish Artist.—The *Scotsman* announces the death of Mr. R. T. Ross, R.S.A., an artist who has long been well known as a painter of cottage interiors and the out-door life of fishing villages.

Improvements at Chetham Library.—Considerable improvements have just been made at Chetham Library, Manchester, by Messrs. Clay & Son, builders, under the direction of Mr. Alfred Waterhouse, architect. One of the chief alterations effected is the acquirement of five large rooms on the ground-floor at the west side of the main building, which up to the time of the Reformation were occupied by the Roman Catholic priests resident in Manchester, and for whose use, in fact, the buildings had been specially erected. The premises afterwards passed into the hands of the Derby family, and were occupied by the wardens of the city. During the Civil War they were taken possession of by the Commonwealth, but were soon afterwards purchased by the executors of Sir Humphrey Chetham, and adapted in conformity with his educational scheme. The alterations, which have cost 1,000*l.*, will be finished in a few days.

Old Bricks.—Some interesting additions have been made to the Elamite antiques in the British Museum by Colonel Ross, our Political Resident at Bushire, on the Persian Gulf, and as soon as the fragments have been re-united, and catalogued, they will be exhibited to the public. The first portion of the collection consists of about thirty bricks of unbaked clay. Some of them are of a considerable size, and all, according to the almost uniform custom in the Euphrates and Tigris valleys in ancient times, as well as in that of the Nile, bear royal legends. One name impressed on these Elamite bricks, as upon many others found long ago on the same site, viz.,—Susa, the Elamite capital,—is Tar-kha-ak, who reigned about B.C. 700. Next to the bricks, among the objects transmitted by Colonel Ross, is a large vase made of sun-dried clay, containing human remains.

Colne Valley Water Company.—The works of the above Water Company, which have been carried out under the superintendence of Mr. J. F. Bateman, were formally opened on Thursday, the 3rd of August. One of the great features in the undertaking is the softening of the water by Dr. Clarke's process. The scheme is the first on a large scale that has been completed near London. The pumping station is situated in the Bushey Meadows, near Watford, and the water is drawn from the chalk at a depth of 235 ft. After being softened it is pumped up into a covered reservoir on Bushey Heath, the elevation of which, 518 ft. above ordnance datum, is such that the water can be supplied to the highest land between London and Watford by mere gravitation.

The Canal Population.—Mr. George Smith (Coalville) writes:—"I beg to inform you that I have this day received a copy of the following resolutions, passed on Friday in last week at a meeting of the Rugeley Ruridecanal Conference:—1. That to better the present miserable condition of the canal population, the Conference is of opinion—(1.) That women and children, except under stringent regulations, should be prohibited from living and working in the boats; (2nd.) That the Factory, Workshops, and Sanitary Acts should be extended to the boating population on the canals. 2. That Sunday traffic on the canals should be limited as far as possible. 3. That so long as the law does not prohibit children of school age living in canal boats, homes should be provided where such children can be boarded and educated."

The Working Classes in New York.—We learn by telegram from New York that 1,500 working men met in the park on Monday morning, and heard inflammatory denunciations of the city authorities. They then marched in a body to the City Hall, and demanded from the acting Mayor, the Public Works Commissioner, and the Controller, employment on the public works. The Mayor, Mr. Wickham, whom they held responsible for the reduction of wages, discountenances public improvements, and was purposely absent. The working men asserted that it was the duty of the Government to continue the public improvements, and provide employment for the starving working classes.

Proposed New Public Offices at Yarmouth.—A committee of the Yarmouth Town Council have resolved to recommend the Council to build a new public hall, court-house, and public offices upon the site of the present town-hall. The proposed site is undoubtedly the finest site in the town, and a local paper assumes that the Council will take care that the structure is one which shall be an ornament to the town, and worthy of the historic traditions of the old borough.

Proposed Testimonial to Mr. C. J. Palmer, F.S.A., of Great Yarmouth.—In the "Perlustration of Great Yarmouth" Mr. C. J. Palmer has made a valuable addition to his former contributions to literature and to the history of that important town. The completion of this work appears to many of his friends a fitting opportunity for expressing not only their personal feelings of esteem and regard, but for making some public recognition of the value of his services during the last fifty years, and a committee for this object has been formed.

Muchelney Abbey, Somerset.—We hear that interesting discoveries have been made here of late, the foundation of the north transept of the ancient Abbey Church having been unearthed. A fourteenth-century monument, some ornamental tiles of the same period, two skeletons, a large quantity of Early English, Decorated, and Perpendicular mouldings, bosses, and tracery were also discovered. The excavations are being conducted under the personal superintendence of Mr. Long, the lord of the manor.

Ludworth Village.—The *Darlington and Stockton Times* says that this village is in a most shocking unsanitary state. There are 227 colliery houses, independent of those belonging to tradesmen, without ashpits or drains; and many of the dwellings are greatly overcrowded. Taking each house to contain five inmates, there are no less than 1,200 people congregated in one spot, without any sanitary appliances at all. It was in this village that the cholera first broke out in Durham in 1848.

A Sanitary Authority and its Medical Officer.—The recent dismissal of Dr. Deville by the Harrogate Improvement Commissioners, for reading a paper before the Yorkshire Association of Medical Officers of Health having a special bearing upon watering-places, has been brought under the notice of the President of the Local Government Board, who has decided that the Sanitary Authority of Harrogate were not justified in giving notice to Dr. Deville of their intention to dismiss him.

Water-Waste Preventer.—Provisional specification lodged by J. G. Jennings, Lambeth, and A. W. Pocock, Westminster, describes a water-waste preventer, consisting of a cylinder with a loose piston working therein, and of valve apparatus for controlling the admission and escape of water, by which each time the handle of the closet is raised a volume of water equal to the contents of the cylinder is discharged into the pan, and when the handle has been put down another similar quantity of water is discharged.

Exhibition of Paintings at Peel Park, Salford.—An exhibition of paintings and other works of art was opened on the 28th ult., at the Royal Museum, Peel Park, Salford, by the Mayor of the borough (Ald. Richard Harwood). It is really a continuation of a series of exhibitions of a similar character, the last of which was held about seven years ago, and the Mayor by his influence has obtained the loan of 250 pictures, the value of which is put at 50,000*l.*

Sheffield Society of Artists.—At a general meeting of members, held on the 25th ult., the following were elected associate members:—W. D. Barker, Trefrin, North Wales; J. T. Cutts, H. S. Dale, Robert Hudson, sen., David Payne, J. C. Ragg, Jonathan Taylor, Wainman Topham, E. A. Harmington, and George Wright, all of Sheffield; W. M. Greaves, Leeds; and James Swanston, Bakewell.

The Mersey Tunnel Scheme.—A Liverpool paper states that the Mersey Tunnel scheme is not to be allowed to fall into the limbo of forgotten projects. A number of influential capitalists in London and Liverpool have determined to take it in hand, and they are not without good prospect of success.

A Testimonial.—Mr. J. F. Coles (foreman of carpenters to Messrs. Lucas Brothers, the contractors for the Royal Aquarium) has been presented by Mr. S. Coleman, managing director, on behalf of himself and other officers of the Society, with a gold chronometer "as a recognition of his unceasing labour at that institution."

New Bonded Stores at Swansea.—The foundation stone of some new bonded stores, about to be erected by Mr. Rees, builder, under contract, for Mr. George Bradford, wine and spirit merchant, was laid on the 27th ult. The stores, which will also comprise a suite of shops, are situate in Waterloo-street.

New Knights.—The dignity of knighthood has been conferred upon Mr. D. Macnee, president of the Royal Scottish Academy, and upon Mr. H. A. Hunt, Board of Works surveyor.

National Antiquarian Museum, Edinburgh.—The catalogue of antiquities in the National Museum of the Society of Antiquaries of Scotland has just been issued.

Industrial Exhibition in Denmark.—The King of Denmark on the 13th ult. opened an Industrial Exhibition at Aarhuus, the largest town in Jutland.

TENDERS

For alterations and repairs to No. 14, Bow-lane, City. Mr. Frederick C. Notley, architect:—

Mansfield & Son	£1,150 0 0
Hayworth	975 0 0
Newman & Mann	965 0 0
Greenwood & Sons	933 0 0

For the erection of a second pair of villa residences at Wandsworth-common. Mr. Frederick C. Notley, architect:—

Hayworth (accepted)	£1,800 0 0

For foundations for new offices at Steventon Manor, Hampshire, and enclosure walls, &c., to kitchen garden. Mr. R. Morrison Marnock, architect. Quantities by Mr. George Fleetwood:—

	Foundations.	Garden Walls.
Wilkes	—	2,438 0 0
Brass	1,399 0 0	2,122 0 0
Hale & Sons	1,045 0 0	1,960 0 0
Hill, Higgs, & Hill	1,087 0 0	1,930 0 0
Holland & Hannen	935 0 0	1,843 0 0
Bull & Son	1,013 0 0	1,749 0 0

For a pair of cottages at Steventon Manor, Hampshire. Mr. R. Morrison Marnock, architect.

Wilkes (accepted)	£480 0 0

For repairs to St. Olave's Grammar School. Messrs. Snook & Stock, architects:—

Rider & Sons	£633 0 0
Pitman & Cuthbertson	579 0 0
Homan	570 0 0
Heeps	567 0 0
Brighton	565 0 0
Greenwood & Sons (accepted)	555 0 0

For a house at Thornton Heath, Croydon, for Mr. W. H. Sandy. Mr. Frederick West, architect:—

Hyde	£1,650 0 0
Mason & Bristy	1,371 13 0
Coles	1,369 0 0
Waller	1,250 0 0
Taylor	1,195 0 0
Marriage (accepted)	1,190 0 0

For making the proposed roads on the Greyhound Estate, Sydenham, under the superintendence of Messrs. Harvey & Davids, surveyors:—

Wootton	£936 0 0!
Cowdery & Sons	945 0 0
Woodham, Brothers	705 0 0
Wainwright	702 14 8
Porter	640 0 0
Hopkins	570 0 0
Taylor & Brown	536 0 0
Brewitor	512 0 0
Heath	470 0 0
Love	457 17 0
Lyons	435 0 0
Goodair	395 0 0!

For Wilberforce Memorial, St. Luke's Church, Camberwell. Mr. J. Edward K. Cutts, architect. Quantities by Mr. J. O. Abbott:—

	Church without Fittings.	Church with Fittings.
Brass	£7,627 0 0	£8,390 0 0
Manley & Rogers	7,585 0 0	8,283 0 0
Downs	7,537 0 0	8,237 0 0
Adamson & Son	7,468 0 0	8,248 0 0
Ennor	7,457 0 0	8,167 0 0
Lathey, Brothers	7,432 0 0	8,160 0 0
Stoner	7,239 0 0	7,777 0 0
Colls & Son	7,190 0 0	7,932 0 0

For erection of lunatic asylum for the borough of Nottingham for 250 patients. Mr. George J. Hine, architect. Quantities supplied:—

Fish & Son	£36,480 0 0
Oxley	35,920 0 0
Maw & Ingle	35,249 0 0
Hodson & Facon	35,000 0 0
Vickers	34,120 0 0
Marriott & Wartnaby	34,083 0 0
Stevenson	33,915 0 0
Bell & Son	33,762 0 0
Bradley & Barker	33,193 0 0
Ward	33,060 0 0
Harris (accepted)	32,000 0 0
Slim	31,221 0 0

For alterations, &c., at Normanhurst Court, Battle, for Mr. T. Brassey, M.P. Messrs. Cross & Wells, architects:—

Vidler	£2,450 0 0

For sanitary works at Normanhurst Court, for Mr. T. Brassey, M.P. Messrs. Cross & Wells, architects:—

Bloss	£394 0 0

For alterations to Nos. 1 and 2, Paragon-buildings, Hastings, for Mr. Wellington Williams. Messrs. Cross & Wells, architects:—

Champion	£818 0 0
Ditch	800 0 0
Eldridge	756 0 0
Vidler	739 0 0
Geary & Brown	730 0 0

For detached residence, Holmesdale-gardens, Cornwall's Park Estate, Hastings, for Mr. G. A. Keyworth. Messrs. Cross & Wells, architects:—

Howell & Son	£1,959 0 0

For pulling down No. 133, Holborn, and re-erecting same, and making sundry additions and alterations to Ridler's Hotel, for Mr. Edward Ellis. Messrs. Farebrother, Ellis, Clark, & Co., architects. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Scrivener & White	£2,104 0 0
Merritt & Ashby	2,050 0 0
Sharpington & Cole	1,987 0 0
Morter (accepted)	1,873 0 0

For new billiard-room, Putney, for Mr. W. B. Dick. Mr. D. Haylock, architect. Quantities by the architect.

Gibbs	£1,095 0 0
Avis	1,087 0 0
Adamson & Sons	989 0 0
Aries (accepted)	940 0 0
Pearce (withdrawn)	774 0 0

For new warehouse, Wapping, for Messrs. Middleton & Co. Mr. Charles Dunch, architect:—

Bayes, Brothers, & Allen	£1,387 0 0
Watts	1,385 0 0
Judd & Hawkings	1,345 0 0

For alterations to the Griffin Public House, St. Leonard-street, Shoreditch, for Mr. Naylor. Mr. Harris, architect:—

Thoms	£325 0 0
Judd & Hawkings	391 0 0

For farmhouse, South Leigh. Mr. William Eve, architect:—

Bartlett	£1,555 0 0
Claridge	1,535 0 0
Orchard	1,497 0 0
Dover	1,390 0 0
Wilkins	1,385 0 0

For cottages, South Leigh. Mr. William Eve, architect:—

Bartlett	£640 0 0
Claridge	605 0 0
Orchard	530 0 0
Dover	490 0 0

For residence, Theydon Bois. Mr. William Eve, architect:—

Sheffield	£1,492 0 0
Salt	1,449 0 0
Herser	1,300 0 0
Hammond	1,085 0 0
Clarke (accepted)	1,000 0 0

For constructing the Isham, and four small sections of St. Marychurch, Devon, main drainage scheme. Messrs. Tarring, Son, & R. L. Wilkinson, surveyors:—

Shaddock	£8,500 0 0
Matthews	5,233 0 0
Wilcox (accepted)	4,775 0 0

For works in painting and decorating Hemingford House, Hunts, for Mr. Bateman Brown, J.P. Messrs. J. Tarring & Son, architects:—

Phillips & Son*	£325 15 7

* Exclusive of men's travelling expenses and lodgings.

For new wing, &c., to Dale Park Estate, Sussex, for Mr. J. Fletcher:—

Webb	£3,271 12 0!
Beach, Brothers	3,063 0 0
Dover & Co.	2,850 0 0
Horn	2,623 0 0
Bysh	2,579 0 0
Stephenson	2,397 0 0
Coles	2,332 0 0
Haylor	2,213 0 0
Allen	2,188 0 0
Longley	2,178 0 0
Wells	2,022 0 0
Reynolds	2,011 0 0
Gibson	1,981 0 0!

£13 added to each for plumber's work.

For alterations and additions to the Convent, Roselands, Upper Walmer, for Monseigneur Danlewskie. Messrs. C. W. & P. Pugin, architects:—

Demie (accepted)	£2,170 0 0

For new presbytery, Sheerness, for the R. C. Bishop of Southwark. Messrs. C. W. & P. Pugin, architects. Quantities by Mr. R. O. Harris:—

Geere & Gaily (accepted)	£1,008 0 0

For new schools at Lower Bullingham, Herefordshire, for the Superioress of the Convent. Messrs. C. W. & P. Pugin, architects:—

Welsh (accepted)	£700 0 0

For new chancel to Our Lady's Catholic Church, Birkenhead, for the Rev. Edward Slaughter. Messrs. C. W. & P. Pugin, architects. Quantities by Mr. R. O. Harris:—

Woolley (accepted)	£1,800 0 0

For new chancel and sacristies to the R. C. Church, Widnes, for the Rev. James Clarke. Messrs. C. W. & P. Pugin, architects. Quantities by Mr. R. O. Harris:—

Middlehurst (accepted)	£1,393 0 0

For new presbytery at Bootle, for the Rev. Edward Powell. Messrs. C. W. & P. Pugin, architects:—

Hughes (accepted)	£2,390 0 0

For new skating-rink at Ramsgate, for Mr. W. G. Owen. Messrs. C. W. & P. Pugin, architects:—

Accepted tenders, £700.

For the erection of a lodge at the Metropolitan Convalescent Institution's Home, Norbiton. Mr. H. Saxon Snell, architect:—

Bamford	£375 0 0
Wall, Brothers	374 0 0
Howard	365 0 0
Morris (accepted)	332 10 0

The Builder.

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Blackfriars.

IN spite of repeated attacks upon its integrity, the district of Blackfriars still retains numerous relics of the past which keep alive the memory of the days when it was making its history. In 1760 the western extremity of the precinct was broken into in order to form a proper approach to the new Blackfriars Bridge. In 1863–4 still further demolitions were made on the same side to obtain space for the Ludgate Station of the London, Chatham, and Dover Railway, and the southern side has now been cleared for the new Queen Victoria-street. Yet Time has dealt kindly with the interior, and the little courts and alleys remind us of what occurred in the place two and three centuries ago. Playhouse-yard points to the site of the theatre in which Shakspeare acted; Ireland-yard is called after William Ireland, whose name appears in the deed of conveyance to Shakspeare of a house in that place; and in Church-entry is a monument to the memory of the minister of the parish when Shakspeare frequented its streets. Most parts of London have an interesting history, but few can compete with Blackfriars in the variety of incidents that go to form that history, or in the length of time over which the history has been spread. The situation of the district at the extreme south-western corner of the City made it a position of importance, and it appears to have been esteemed as such by the Romans. In 1843, when excavations were made for the purpose of improving the sewers, a portion of the old wall was discovered which offered so great a resistance to the destructive efforts of the labourers that it had to be tunnelled under. Here a Roman monument was discovered which had been erected to the memory of a soldier who held the office of *Speculator*, that is, one who preceded the legion and watched the movements of the enemy. The name of the man was Celsus, and he belonged to the Second Legion. The Roman wall, when originally built, extended in a direct line from Ludgate to the Thames, but when the Dominican Friars were given the district they were allowed to take in a portion of ground farther west, and the wall was rebuilt so as to extend to the Fleet river.

One of William the Conqueror's Norman followers, the Baron of Mountfiquet, built a castle on the banks of the Thames, between the Fleet River and Baynard's Castle, which was afterwards coveted by King John, who banished the builder's successor, Richard Mountfiquet, and took possession of his castle.

In the year 1215 Dominic de Guzman founded, at Toulouse, the order of Preaching Friars, the members of which have been named Dominicans, from their founders, Jacobins from the Convent of St. James, in Paris, and Black Friars from the colour of their garments. Thirteen of these friars came over to England in 1221, and being favourably received, they settled on a piece of vacant ground in Holborn, where they built themselves a house. This lasted them for about half a century; but at the end of that period they had so largely increased in numbers that they began to look about for a larger residence. Fortunately for them they were very popular, and had secured a host of influential friends, who obtained for the fraternity a large piece of ground suitable for the purpose of building a more spacious church and residences for the prior and brethren of a more convenient character. In consequence of this grant the friars moved from Holborn, and transferred themselves to the banks of the Thames. Their old house was given to Henry Lacy, Earl of Lincoln, and its site is still known as Lincoln's-inn.

In the year 1276, Gregory Rokesley, mayor, and the barons or aldermen of the City, granted to the Black Friars, and gave in trust for their use to Cardinal Robert Kilwarby, Archbishop of Canterbury, "two lanes or ways next the street of Baynard's Castle, and also the tower of Mountfitchit, to be destroyed." Greater favours were still in store for them, and a few years after they had obtained this grant of ground, Edward I. allowed them to pull down the old City wall, and to take in all the land to the west as far as the Fleet River. Moreover, the king intimated to the mayor and citizens his desire that the new wall should be built at the expense of the City. He wrote to them as follows:—"Whereas we have granted you, for the aid of the work of the walls of our City, and the closure of the same, divers customs of vendible things coming to the said City for a certain time, we command you to cause to be finished the wall of the said City now begun near the Friars Preachers, and a certain good and comely tower at the head of the said wall, within the water of the Thames," &c. The wall was rebuilt, as appears by the grant to make a circuit inclosing the entire precinct "along behind the houses from Ludgate to Fleet Bridge, thence along the Fleet River to the River of Thames." Edward I. heaped favours upon the friars, and when his beloved wife Eleanor died, her heart was deposited in the church previously to the burial of her body at Westminster. The list of eminent persons whose bodies were buried in the Black Friars' Church is an extremely long one, and one reason for the strong desire that was exhibited by the noble and wealthy to sleep their last sleep under the shadow of the convent-walls may be found in the belief that "to be buried in the habit of the order was a sure preservative against the attacks of the devil." The church was large and handsome, "richly furnished with ornaments within," and the fraternity, who came over to England under vows of poverty, had surrounded themselves with the various signs of wealth. Stow mentions some of the historical occurrences that have made the friary famous; for instance, a parliament of Henry VI. was held here in the year 1470, and the Emperor Charles V. lodged at the Prior's house in 1522. When he was invited by Henry VIII. to come to England, the Palace of Bridewell was prepared for his residence, but when he came, he placed his attendants there, and preferred himself to lodge with the Black Friars. In consequence of this determination a gallery of communication was thrown across the Fleet, and an opening cut through the city wall. In 1524 a Parliament was begun at the Black Friars, and as it was adjourned to Westminster amongst the black monks, and ended in the king's palace there, it gained the name of the Black Parliament. As the object of the Parliament was to demand a subsidy of 800,000*l.* to be raised on goods and lands, the namers probably had a double meaning in so calling it. The most interesting scene enacted in the Black Friars was one which the pen of Shakspeare has made familiar to all. On the 21st of June, 1529, the two Cardinals, Wolsey and Campeggio, sat in judgment upon the question of the proposed divorce of Henry VIII. and Catharine of Aragon, but the haughty Wolsey shortly afterwards took a lower place in the same hall, and Catharine had her revenge, when a few months later a sentence of *præmunire* was passed against Wolsey by a Parliament which held its sittings in Black Friars.

A few years more and the Act for the suppression of the religious houses throughout the kingdom took effect. The Black Friars had to leave their home, and the precinct that still retains their name knew them no more. Some names, such as Pilgrim-street, Creed-lane, and Holiday-yard still exist to remind us of the time when the place was under the government of a religious body. It is probable that the pilgrims who passed through London *en route* for the shrines in various parts of the country rested in this convenient spot, as all kinds of offerings could be bought in the neighbourhood, and those who were bound for Canterbury could easily cross to the opposite shore of Southwark, which was the starting-point for that place. Before taking final leave of the Dominican, it is worth noting how various have been the estimates of the virtues of the friars at different periods. When the country was overrun by the mendicant orders, in the thirteenth century, they came as reformers, crying out against the indolence of the monks; in course of time, however, they became rich and fell into worse repute than those they censured. Literature, as illustrated by Piers Plowman and other works, is full of denunciations against the evils that the people suffered

from their presence, yet after the dissolution, when trouble had overtaken them, a change took place in public opinion, and we find in Shakspeare's pages the friars held up as models for our esteem. This was not merely Shakspeare's own feeling, because the estimable qualities of Friar Lawrence are depicted in the poem upon which the dramatist founded "Romeo and Juliet."

The privileges attached to the great Home of the Black Friars formed a constant source of contention with the outer world. On one occasion a prior was forced to pave the streets without the wall joining to the precinct, and after a time a cage, or small prison, was set up there by the City. This the prior pulled down, saying,—"Since the City forced me to pave the place, they shall set no cage there on my ground." Immediately after the dissolution, the City, thinking the troubles were over, instructed their Mayor to set forth their claim to the liberties; but Henry VIII. soon put his foot down on this interference, and telling him not to meddle, said that "he was as well able to keep the liberties as the friars were." In consequence, the precinct, with its sanctuary, was a thorn in the side of the Corporation for many a year. Edward VI. sold the hall and prior's lodgings to Sir Francis Bryan, and granted to Sir Thomas Cawarden, Master of the King's Revels, "the whole house, site, or circuit, compass, and precinct of the late Friars Preachers within the City of London." The Master of the Revels was an officer of the Royal household, whose business it was to keep the tents and pavilions belonging to the king, which were often (if not always) sent with him on his removes or progresses. In the first year of Edward's reign the properties were removed from Warwick Inn "to the late dissolved house of the Blackfriars." The Office of the Revels was afterwards removed to the old hospital of St. John of Jerusalem, but during Sir George Buc's incumbency that house was taken from him, and given by James I. to the Lord Aubigny. The new office was then situated on St. Peter's-hill. One of the duties of the Master of the Revels was to superintend the movements of the various companies of actors, and when the children of the King's or Queen's Chapel performed before the king or queen, it was he who provided them with dresses.

Sir Thomas Cawarden pulled down the Friars' great church and also the lesser one of St. Ann, which had been built within the friary and made parochial for the use of the lay inhabitants of the place. In Queen Mary's reign, however, Cawarden being forced to find a church for the inhabitants "allowed them a lodging chamber above a stair," which fell down in the year 1597. In Elizabeth's reign a new church was erected and dedicated to St. Ann, but that building being burnt in the Great Fire, the parish was united to that of St. Andrew by the Wardrobe.

During the time that the friars were in possession, when the precinct was walled in and had its four gates, there were many shops there, the occupiers of which were allowed to carry on their trades, although they were not free of the City. After the dissolution many great persons seem to have taken up their residence in this quarter. Lords Buckhurst, Cobham, and Hunsdon were among the most distinguished of these early residents, and the *Calendars of State Papers* contain several notes of these noblemen. On August 13, 1571, we find notice of a letter from Lord Buckhurst to Lord Burghley, which "gives an account of his receiving the French ambassador at the Blackfriars, where he landed." Under date Feb. 28, 1572, is registered the "deposition of Ro. Higford, relative to certain letters Mr. Thos. Cobham had shown him in Lord Cobham's house, of which he had abstracted two." In April, 1580, there is a "note of such liberties as the inhabitants within the precincts of the late dissolved houses of the Black and White Friars claim to have exempt from the City of London; showing the queen's interest therein, and the names of the honourable and worshipful persons now inhabiting the same." The names are as follow:—"The Earl of Lincoln, Lord Admirall of England; the Bishop of Wigorne; the Lord Cobham; the Lord Cheynie; the Lord Laware; the Lord Russell; the Lord Clinton; Sir Ambrose Jermyn; Sir Nicholas Poynes; Sir Thomas Gerrarde; Sir William Morgan; the Lord Buckhurst; the Lord Chief Justice of England; the Lord Chief Justice of the Common Pleas; the Master of the Rolls; the Queene's Sollicitour; Mr. Thomas Fanshawe; Peter Osborne; Mr. Powle, of the Chancery." On June 24, 1582, is the following note:—"Examinations of several persons touching the affray at the Blackfriars between the servants of the Earl of Oxford and Mr. Knevet. Gastrill, the Earl's man, hurt." Queen Elizabeth often visited one or other of her courtiers in the Blackfriars. On one occasion, in 1600, she attended the wedding feast of Lord Herbert, son of the Earl of Worcester, who married the heiress of Lord Russell. She was met at the water-side by the bride, and was carried to the house of rejoicing in a litter borne by six knights. On the same day she supped with Lord Cobham, who had prepared a mask of eight ladies for her amusement. "Mistress Fitton went to the Queen and wooed her to dance." Her Majesty asked what she was. "Affection," she said. "Affection," answered the Queen, who was thinking of Essex, 'Affection is false." But we have still to mention the glory of the Blackfriars,—that is, the theatre where many of Shakspeare's marvellous dramas were performed, and in which the poet himself acted. It has usually been supposed that the Blackfriars Theatre was built for Burbage, in the year 1576; but Mr. Halliwell Phillipps has discovered a very remarkable document, viz., the deed of feoffment from Sir William More, of Loseley, co. Surrey, to James Burbage, of Hallowell, in the county of Middlesex, gentleman, February 4th, 1596, conveying to the latter that portion of a large house in the Blackfriars which was shortly afterwards converted by him into a theatre. Sir William More was executor of the will of Sir Thomas Cawarden, and was thus in a position to make this sale. The deed specifies very fully what the property really was,—for instance, "Seaven greate upper romes as they are nowe devided, beinge all uppon one flower, and sometyme beinge one greate and entire rome, with the roufe over the same covered with lead," "Also all that greate payre of wyndinge stayres, with the stayre-case thereunto belongeing, which leadeth upp unto the same seaven greate upper romes out of the greate yarde there, which doth lye nexte unto the Pype-office." The building appears to have been situated between the mansion of Lord Cobham, then Lord Chamberlain, and that of Sir George Carey, afterwards Lord Hunsdon.

The information contained in this deed is corroborated by "A Petition to the Privy Council from the Inhabitants of the Blackfriars, Nov., 1596, against the theatre which was then about to be established by Burbage," in which it is directly stated "that there hath not at any tyme heretofore been used any comon playhouse within the same precinct; but that now all players being banished by the Lord Mayor from playing within the Cittie by reason of the great inconveniences and ill rule that followeth them, they now thincke to plant themselves in liberties." The petitioners give various reasons against the proposed opening of the theatre, such as the general inconvenience to all the inhabitants, "both by reason of the great resort and gathering togeather of all manner of vagrant and lewde persons that, under cullor of resorting to the playes will come thither and worke all manner of mischeefe, and also to the great pestring and filling up of the same precinct, yf it should please God to send any visitation of sicknesse as heretofore hath been, for that the same precinct is allready growne very populous, and besides that, the same playhouse is so neere the church that the noyse of the drummes and trumpetts will the greatly disturbe and hinder both the ministers and parishioners in tyme of devine service and sermons."

We thus have complete evidence that there was no theatre in Blackfriars before 1596, and yet we know that plays were acted in the precinct long before that year. Stephen Gosson, in his "Playes confuted in five Actions," published about 1580, expressly mentions the comedies at the Blackfriars, and Lyly's "Sapho and Phao," which was acted before Elizabeth, in 1584, "by her Majesties Children and the Boyes of Paules," was also performed in the Blackfriars. It is probable that, as in other places, the stage was erected in some inn yard, or in the house of one of the noble inhabitants; but further information on the subject would be of considerable interest. According to "An order by the Corporation of the City of London, date January 21st, 1618-19, for the suppression of the Blackfriars Theatre," we learn that the Lords of the Privy Council had forbidden the use of the theatre; but under the plea that it was a private house, the proprietors were able to keep it open. In 1598, Ben Jonson's "Every Man in his Humour" was brought out there, and Shakspeare himself was one of the actors in that play. Shortly afterwards Burbage leased the theatre to one Evans, whose company consisted of the children of the Royal Chapel, and for some years the King's servants (the company to which Shakspeare belonged) acted only at the Globe. It seems so unnatural to us that men should have acted the female characters of the early drama, that it is not easy to realise the fact that actresses were not introduced on the English stage until a comparatively late period. The first attempt to naturalise them which was made at the Blackfriars Theatre was a signal failure. In 1629 a mixed French company of men and women played there, and "were hissed, hooted, and pippin-pelted from the stage." It is to them that Prynne refers in his "Histriomastix," 1633, when he writes of "some French women, or monsters rather [who] attempted to act a French play . . . . an impudent, shameful, unwomanish, and graceless attempt." In 1655 the theatre was pulled down, and it now only lives in the name of Playhouse-yard, the identical place where the multitude of private and hackney coaches, so much complained of as hindering the passage of the inhabitants to and from their homes, were turned in and the coachmen sometimes laid by the heels.

We have already noted some of the grand folks who lived in the precinct, and we will now mention some of the celebrities of another kind. Ben Jonson dated the dedication to his "Volpone" "from my house in the Black Friars this 11th day of February, 1607"; and Shakspeare bought a house here, but he is not supposed to have lived in it. Nat Field, the poet and player, and Dick Robinson, the player, were here near at hand to the place where they earned their living. Van Dyck, Cornelius Jansen, and Isaac Oliver, painters, and Faithorne, engraver, were living in the midst of their patrons, and Charles I. often came by water to see the first-named in his studio. It is necessary to mention that the Earl and Countess of Somerset were living here when Overbury was murdered, but it is more congenial to our taste to hurry from them in order to mention one old worthy who was connected with the place for many years, and whose name can still be read by the passer-by upon a monument in Church Entry. Dr. William Gouge, the popular minister of the parish of St. Ann for forty-six years, was a man of some mark in his day. As he was appointed to the living in 1607, he may have had dealings with Shakspeare, but as he was a bit of a Puritan it is not probable that he esteemed the dramatist very highly.

There is much more of the history of Blackfriars still to be told, but we can now only hurriedly notice a few of the most interesting incidents, beginning with the fearful accident which occurred in 1623 at the house of Count de Tillier, the French ambassador. A large and mixed congregation of Protestants and Roman Catholics had gathered together one Sunday evening to hear Father Drury (a converted Protestant) preach. As many as were able crowded into the room on the upper floor for that purpose, but those who could not get in were contented to remain on the floor below and listen to a preacher on the sacrament of Penance. The floors were not constructed to bear the immense weight that was placed upon them, and they both gave way. A large number of persons were in consequence precipitated to a great depth and killed, both preachers being among the dead. As might be expected, the judgment-mongers found in this accident a striking proof of the truth of their belief, and in a rare pamphlet, entitled "The Fatal Vespers," Samuel Clark, pastor of Benet Finck, gives "a true and full narrative of the signal judgement of God upon the Papists." The odd part of the matter is that Drury had used the same argument that misfortunes are judgments from God in his sermon. He inveighed bitterly against Luther, Calvin, and "Doctor Sutton, a reverend preacher, some time of St. Mary Overy's in London, who travelling beyond the seas was drowned." The preacher said that "the sea swallowed him because he was not worthy the earth should receive him. At which words the house sank." Among the broadsides belonging to the Society of Antiquaries is one entitled "The Dismall Day at the Black-Friers; or, a deplorable Elegie on the Death of almost an Hundred Persons who were lamentably slaine by the Fall of a House in the Blacke-Fryers, being all assembled there (after the manner of their devotion) to heare a Sermon on Sunday night, the 26th of October last past, an. 1623. By Nath Rhodes."

The name of Glasshouse-yard recals the memory of the manufactory which was set up

there by a Venetian in Elizabeth's reign, and against which all the glass sellers of London raised their voices as an infringement of their rights. In Decker's "A Knight's Conjuring," 1607, we read of the "Glass-house furnace in Blackfriars."

The situation of the *Wardrobe*, a house built originally by Sir John Beauchamp (whose tomb in old St. Paul's was mistaken for that of "Good Duke Humphrey"), and afterwards sold to Edward III., is marked by the quiet little old-world *Wardrobe Place*, with its stunted trees. It was, as its name implies, a receptacle for the clothes of the kings which were worn upon great occasions, and is called by Fuller "A library for antiquaries therein to read the mode and fashion of garments in all ages."

The old houses of the British and Foreign Society, in Earl-street, possessed an interest which the new one in Queen Victoria-street has not, for it stood upon the site of the premises in which the Committee of Translators of the Authorised Version of the Bible met to revise their work in the reign of James I.

Printing House-square, noted for its association with the *Times* newspaper, takes its name from the office of the King's Printer, which was situated here until the year 1770, when it was removed to its present position.

Apothecaries' Hall still remains in the situation so fully described by Garth in "The Dispensary":—

> "Nigh where Fleet Ditch descends in sable streams,
> To wash his sooty Naiads in the Thames,
> There stands a structure on a rising hill,
> Where tyros take their freedom out to kill."

Such are the chief features of Blackfriars, and it only remains to mention the old bridge and its approaches, the forming of which made the first clearance in the district. Mylne's bridge was opened in 1769, the first stone having been laid in 1760, and the subscribers had the satisfaction of finding, on the completion of the works, that their architect had executed his undertaking at 163*l.* less than his estimate. The tolls were bought by Government in 1785. It was at first called Pitt Bridge, in honour of the "great commoner," and an inscription to that effect was engraved upon a tablet, but the name was not long-lived. William-street, Earl-street, and Chatham-place, however, still remain to connect the memory of the elder Pitt with the place, and to point to the time when he was the most popular man in England.

The building of the bridge was the foundation of Mylne's successful career. He was only six-and-twenty years old when his design was chosen against those of such formidable competitors as Smeaton and Dr. Johnson's friend Gwyn. He lived to make friends of his rivals, and was buried in St. Paul's Cathedral, of which he was for many years surveyor, yet 100 years only have passed, and his work has perished. His bridge has been pulled down and a new one erected in its place, and his home (afterwards the York Hotel) has been swept away to make room for the Ludgate-hill Station of the London, Chatham, & Dover Railway.

THE BRITISH MUSEUM AND ITS COLLECTIONS OF SCULPTURE AND ARCHITECTURE.

Very many and important alterations and additions are now progressing at the British Museum, some of them not a little needful; and there are others equally needful and useful, or even more so, but which do not seem to have suggested themselves. It would seem an opportune time for naming one or two of them, and this we would venture to do in, we trust, a good and fair spirit of inquiry, and with an earnest wish to help matters. If our remarks do no good, they certainly need do no harm, and may help here and there to solve a difficulty, and to make the vast collections more useful and intelligible than they now, as things are, can be. The whole subject of our national collections is one of the very utmost possible importance, and may be viewed in more than one new light.

It is to be noticed, in the first place, that the British Museum, and its multiform contents, in this year of grace is in a very different position, as respects the public, from what it was in the year of its foundation, 1753, when the Act of Parliament was passed which enacted that the collections formed by Sir Hans Sloane, and the Cotton and Harley MSS. together, should be placed in "one general repository," and to be there preserved for public use to all posterity. All and grateful thanks, then, to these men for having founded for us the British Museum, though the idea of it was then so crude and limited. It was divided into only three parts,—printed books, manuscripts, and natural history. Montague House, a quaint Dutch-looking building, was the house selected to hold this nucleus of a collection. The present by George III. of some Egyptian antiquities, and the purchase of the Hamilton and Townley antiquities, added art and the "antique" to the general idea. Afterwards came prints and drawings, medals and coins, and, finally, the acquisition of the "Elgin" marbles, in 1816, fairly and completely filled Old Montague House with "curiosities" and books. Then came the new buildings, as we now find them, built by Sir R. Smirke, and after his death added to by his brother, Sydney Smirke. The great library collected by George III. was presented to the nation by George IV., the circular reading-room being the last building addition made. Botany came next, and then geology, including palæontology and mineralogy, and then zoology; a heterogeneous mass of materials truly, and hard enough to put into scientific shape or order. At this moment the whole Museum is divided into twelve "departments," thus, and it is important to note this, viz.:—Printed books, manuscripts, Oriental antiquities, British and Mediæval antiquities and ethnography, Greek and Roman antiquities, coins and medals, botany, prints and drawings, zoology, palæontology, mineralogy, and maps, charts, plans, and topographical drawings. Each of these departments is under the care of an "under librarian" as keeper, designations odd enough, as must be plain, but curiously indicating how old-fashioned usages and names last. The books are, in the Museum, looked on as the one and chief item of it, all the rest of the collection being subservient to these books. It would be curious to compare, and to balance, the Greek antiquities, the architecture, and sculpture, with and against the books in the library which have been written to describe and to elucidate them.

It must be observed, while looking at the list, that such a division has but little claim to any strictly scientific basis. It is a sort of accidental arrangement and division of what at best, if scientifically looked at, is a very imperfect gathering of this world's wonderful things. Architecture, as a distinct item, and *per se*, has, in the British Museum, no existence. Architectural fragments, as a matter of course, there are in abundance, but they are regarded as mere fragments, or "antiquities," and as altogether subservient and secondary to "sculpture." A curious practical illustration of this crude idea may be noticed in the Elgin Room, where, in the awkward and unsightly glass cases round the room, and in other places as well, may be seen a vast number of mere "fragments" of sculpture and architecture, all heaped together without idea, as it would seem, of the fact of their being quite distinct items. This, surely, is a very great and most momentous oversight; for the antique sculptured forms did not give rise to the architecture, but the architecture gave birth to the sculptured forms; and the greatest works in sculpture which the world has ever produced were so produced as decorative work, and to "ornament" and to give life to the architectural forms and masses,—to write on them a something to read, when printed books were not! How this unfortunate oversight has influenced the arrangement and placing of the objects in the Antiquity Department may be seen in numberless instances. You see cornices on the floor of the room, and must therefore needs look down on them instead of up at them; cornices again, as that long length of cornice from the Erechtheum, at the end of the Greek room, nearly on a level with the eye, and mounted, unhappily, on a bright red painted basement or rest. We must needs, too, look down on the "cap" of the Parthenon, and not up at it, whether we feel interested in the curve of it or no; all the striking effects of its light and shade being thus, too, utterly lost. We would earnestly urge on those who have control to raise this finely-cut capital so as to be above the eye level, though not so high as to be beyond detailed examination. Much depends on the mere position of objects in a museum of antiquities. We might thus go on and note in detail very many of these fine fragments of past art, from its most polished and world-famous time, but must forbear. We cannot, however, help observing that where there is so much that is unique, and to be seen nowhere else, almost any amount of thought and painstaking cannot be thrown away.

The best of the work of the great sculptor Phidias is here in this Greek room,—and he certainly deserves a whole room to himself, looking to what the world owes him; and no mere question of proper and appropriate museum "fittings" should arise to mar his work. Might not the cornices and some other architectural details find an appropriate place and position on a stout stone shelf immediately above the Parthenon frieze, running, as it does, all round the gallery and at a convenient distance from the eye? All the "architecture" is totally lost as it is now placed in this Greek saloon!

We have many more notes in detail, and can hardly get away from the consideration of them; for there are other fragments here of combined architecture and sculpture from other temples. A vast heap of broken fragments from a column of the colossal Temple of Diana at Ephesus, recovered by Mr. J. T. Wood, architect, in 1871, is conspicuous. Also another fragment from a "sculptured column," as the guide-book has it, not a little remarkable, and which has been illustrated in our pages. It is circular on plan, but stands, awkwardly enough, on an oblong base or stand. Much of the architectural expression is surely lost in this way. A draped statue, by the way, close to it, from the Pandroseion, stands on the fragment of a column. And many other incongruities, but all quite easy to put right.

There is so much here in this antiquity department to note, and to wonder at, that we know not what to pass by. One thing there certainly is that has yet to be cogitated: viz., how best to light a museum of antiquities, so that there shall be light enough, but still not too much light,—a vast problem in itself, and not a little important too. You may have too much light, and a too evenly and widely distributed light, thus negativing all shadows. A notable example we may cite of this, but involving an evil happily in this instance easily remedied. If the simple alteration we suggest be effected, art will have got a something by this note of it. The Museum possesses, it is certain, very many things of mark; but no one object better or more striking, at least to a few, than the magnificently sculptured head and bust of the Egyptian, Sesostris,—Rameses II.,—from the Memnonium, Thebes. It is numbered 19. It was found by Sale and Burckhardt in 1817. It stands in the north-west corner of the Egyptian central saloon, and faces, unfortunately, the dull light of the west windows, where all the direct daylight is obscured by the circular library building in the court-yard. Nothing can be well worse. Now by simply turning the head round, so as to face the south, the light, such as it is, from the windows, would so strike it as to throw shadows, and thus mark the wonderfully soft and calm expression of the face, in which there is so much life and force. This head is a marvellous result of artistic skill and power over the apparently intractable granite out of which it is cut, and evidences the power of the old Egyptian artist-workmen in a striking way. It is worth placing where it can be seen.

We have thus hinted at a few matters out of a multitude needing attention, and have necessarily left the "book" department, hoping to return to it. Generally, it may be affirmed that so vast and heterogeneous a collection can hardly exist, in a scientific sense, under one roof, however spacious, the objects being so diverse. It would seem a subject well worth further consideration, as to how far such a collection could be most usefully and scientifically divided and separated. All know that, as it is, the natural history section of the museum is to be transferred to South Kensington, when the new building there is ready for its reception. Books and manuscripts, with maps in number infinite, are of themselves well nigh enough to fill any one building, and to exhaust the energies of any, however active, management and superintendence to arrange and classify, and to make the most of; while the antiquities, as they are termed, *i.e.*, fine art and architecture, sculpture and decorative painting, are, however looked at, sufficient to tax the capacity, and to try the acquired knowledge, of any one. These should not be separated, or be suffered to clash. Well might the whole of the ground-floor of the museum be devoted to them, and indeed it must be, if but those individualised styles of architecture and sculpture be in time as fully illustrated as those which are now there. We refer to such styles as the Hindoo and the Continental and Eastern Gothic in all phases, and the "Renaissance" generally. Now that so many changes and alterations are in

progress the time would seem to be favourable for a re-consideration of many matters here, both artistically and otherwise. But the changes, whatever they are, must come from the outer world, and must be strongly indicated.

NEW HALL FOR THE CARPENTERS' COMPANY.

The foundation-stone of a new hall for the Carpenters' Company was laid on the 1st inst. By the demolition of much property in London-wall, a new thoroughfare has been opened up by this company and the Drapers', between that thoroughfare and Throgmorton-street. This has been named Throgmorton-avenue. At the extreme London-wall, or the eastern, end of it, the new hall is to be erected. The contract for its construction has been taken by Mr. Brass, who will work to the designs of Mr. W. W. Pocock, architect. The entrance will (according to the *City Press*) be in Throgmorton-avenue. The entrance-doors admit to a loggia ornamented with coupled columns, from which the waiting-rooms and the offices of the clerk have ready access; thence to an inner hall, which leads to the court-room (38 ft. by 26 ft.), and other apartments, together with a staircase leading to the drawing-room (42 ft. by 30 ft.), and the livery-hall on the first floor. This latter will be a spacious saloon, being 76 ft. by 38 ft. wide, and 36 ft. high. The intention is to reproduce in this the ceiling of the old hall, a fine example of the style of Inigo Jones, if not an actual work of that artist. The lofty basement and several mezzanine floors will contain the usual accessories.

The style of the building is Palladian, and the material to be used is Portland stone. The order is Italian, and consists of entire columns being raised on a deeply-recessed and boldly-panelled basement, and the spaces between the columns will be occupied by arcades and pedimented openings, the whole being surmounted by a balustrade. Each front will be from 84 ft. to 87 ft. long, and, being at a corner, the building will be advantageously situated. In making the excavations, so far as they have gone, the workmen have found many traces of Roman occupation, the most notable being a well lined with chalk.

THE FISHMONGERS' COMPANY'S MODEL DWELLINGS AT WALWORTH.

A good object is being carried out in Paragon-row, Rodney-road (formerly known as "Lock's Fields"), Walworth, by the Fishmongers' Company. On one side of the street ten sets of blocks of dwellings on the "flat" system are being erected, realising to some extent, the idea of the cottage character, and replacing old and dilapidated houses of a small class. The dwellings have a street both in the front and rear, and have perfect ventilation through the houses. On entering the staircase common to all the dwellings in the block, eight sets of apartments are approached, comprising four stories, six sets of the blocks of dwellings containing in each set of apartments three rooms, the remaining blocks containing four rooms, some few sets of apartments in each block having necessarily two rooms, space being given up for passages and access to the rear. These apartments contain a main living-room and a ventilated recess fitted for a bed in same, a bedroom, and a scullery. On a small back gallery, and approached from the external air, are the offices, a dust-shoot being also provided here, conveying the dust to the ground level, where there is a receptacle capable of being frequently cleansed, and the contents can be carried away through a gate or door in the rear, and across the open yard or drying-ground without coming through the houses in any way. Each set of apartments is fitted with a cottage-range, a copper, a sink, coal cupboard, pantry cupboard, ventilated from without; also with dwarf upboards in the sitting-rooms. One large cistern furnishes each block of the dwellings, water being supplied to each part of the offices throughout, and gas is provided on the staircases. The apartments are approached by fire-proof staircases, open to the air by recessed balconies, guarded by railings, on each landing, the staircase being divided by a central wall to prevent children playing on same and meeting with accidents. Externally the houses are built in stock brickwork, partly gabled and relieved by string-courses and arches of red brickwork; the roofs are tiled, and have dormers breaking forward. At the end of the buildings next the main thoroughfare, two shops have been provided, and some slight variation of the general plan meets a public improvement in widening the street. The whole scheme will accommodate seventy-nine families, the intention of the company being understood to be that the dwellings be let so as to make a fair return on the outlay, without unduly raising the rents. The contract for these buildings, which are now approaching completion, was taken by Messrs. Merritt & Ashby at a little over 13,000*l.*, Mr. T. Chatfeild Clarke being the architect, and the works have been carried on up to the present time without accident of any kind.

The *City Press*, in concluding a notice of these buildings, says:—"To those City companies who possess land in poor localities in the outskirts of the City, there can scarcely be a wiser expenditure of money, under careful control and management, than by such means."

THE STRAITS OF BROMPTON.

MARLBOROUGH ROAD.

Of the three great western London roads,—Bayswater, Kensington, and Brompton,—it would be hard to decide which has the most traffic; but it is clear that of these three routes, that by Brompton to Fulham is most used by the omnibus, which also takes this line for Chelsea.

At Knightsbridge the Kensington line forks off, and about a quarter of a mile farther, at the Bell and Horns, the grand boulevard of the Cromwell-road opens out a vista extending three-quarters of a mile. The noble building, the Natural History Museum, will now be soon complete, and will add dignity to the ranges of spacious mansions previously erected and judiciously planned around these extensive grounds, which bid fair to supersede even Belgravia, and to invite still farther westward the steadily increasing hordes of wealth and fashion; between this and the old Fulham-road many new and open thoroughfares have been already completed, and at the point of junction from the end of the Albert-road, Mr. Freake, the great projector of improvements in this district, has laid open the plan of a grand line of communication with the Fulham-road, and even further in extension to Chelsea.

Viewing the rapid progress of embellishment throughout the metropolis, and the ardour and activity of our Board of Works, from the Thames Embankment to Mile-end, it is wearisome to think of the somnolence of our ancient vestries, who are utterly regardless of our "antiquas vias," and heedless of the routes which formerly (say fifty years back) only led to the Bishop's Palace, or to Putney Bridge.

In the long range of the Brompton and Fulham roads, extending half a mile from Ovington-square to Sydney-street, there are only three streets leading southward,—Marlborough-road, Keppel-street, and College-street. Of these Marlborough-road is the principal, being 70 ft. wide from house to house for the greater portion, and 60 ft. in its mean extent, leading direct to Chelsea Hospital and to the Duke of York's School; but at its junction with the Fulham-road two houses have been built on the direct line of causeway, projecting across the entrance 27 ft., and barring access from the main route. One is a draper's shop, and the other a butcher's, having together a frontage of 36 ft. to Marlborough-road. Besides this there are four small forecourts, with shops and stalls, occupying a narrow angular space between Walton-street and the Fulham-road. These represent a scalene triangle, from the corner of Walton-street 75 ft. to the butcher's frontage, where it takes the whole depth, being advanced but 4 ft. at the south end. The blocking of this, the most open and frequented thoroughfare, is daily becoming a most serious grievance, as traffic increases; but now that the spacious new route from Sloane-square is already formed and about to be thrown open from Pont-street to Walton-street, and as the latter issues out into the Fulham-road just at this point of central communication, surely it is of the greatest importance that the Chelsea and Kensington Vestries should at once look into the facts and consider the practicability of a vast improvement at a comparatively small outlay. The draper's shop belongs to Kensington, the rest is in Chelsea parish.

From Belgravia to the Hans Estate this will be the direct leading thoroughfare to the Exhibition and western districts; but unless the street, of only 110 ft. in length from Walton-street, be opened out, the magnificent boulevard now formed across the Pavilion Estate will be excluded from the rank it should hold in the world of fashion.

The opening herein suggested would enhance the value of this otherwise ornamental part of the road, whilst it would afford to the numerous tributary outlets of Chelsea appreciable advantages.

Quondam.

DWELLINGS IN COREA.

It may be within the cognizance of our readers that about six months ago, a treaty was signed between Japan and Corea at Kôk'wa, the Corean capital. Mr. Miyamoto, one of the chief secretaries to the Japanese commissioners, who conducted the negotiations, is evidently a gentleman of some observation, and on his return to Yeddo, having been interviewed by the editor of one of the native journals, he communicated to him some interesting information regarding the little-known country which he had just visited. It would appear that there is a law in Corea limiting the size of the houses of the common people, as they are all domiciled in dwellings about 10 ft. or 12 ft. square, and little better than dog-kennels. The walls consist of a mixture of stone and earth, and the roofs of rice-straw thatch. Plaster, such as is used in Japan, is unknown, and there is but a scanty display of wood, the principal building material being pine. Even of this there is a scarcity, and an attempt to procure a cedar log of 20 ft. in length was a failure. The floors of the houses are made of compact hardened earth, and over this oiled paper is placed, and on it people sit. The Coreans put paper to as many strange uses as do the Japanese themselves. Ceilings are rare; but when they do occur they are made of paper stretched between the uprights supporting the roof, and the shops are provided with paper doors on which are inscribed "sayings of a graceful nature" in the Chinese character. Under the house-floors, and extending throughout their entire length, are horizontal passages, at one end of which fires are lighted, and the smoke and heat passing through these tunnels the houses are thus warmed. This mode of heating is, however, both difficult and dangerous; for it is next to impossible to maintain an even temperature, and the soot hanging about the eaves, there is great risk of the thatch taking fire. The houses are not built in rows, but are scattered here and there, and are only 6 ft. or 7 ft. in height. Indeed, Mr. Miyamoto rather contemptuously observes:—"The houses very much resemble the stoves used in Japan for roasting the sweet potato." The Government offices have tiled roofs, and being built of brick are recognisable at a glance. They all have two gates, an outer and an inner, and, we are told, in some respects resemble the temples of Japan; but the tiles are of bad quality, and the woodwork shows no skill. The frames of the paper doors (*i.e.*, windows) are so clumsy and heavy that but very little light is admitted into the rooms. In respect of conveniences, all these offices are very deficient, and the public thoroughfares are filthy. The widest roads are from 15 ft. to 20 ft. in breadth, the narrower ones from 8 ft. to 9 ft. Respecting them our informant states that there is no provision at their sides for carrying off the rain, and they are apparently never repaired or improved. The streets are dirty, and are decorated with monuments raised to departed local officials. The city walls of the Kôk'wa "Fu" are about five miles in circumference. They are only from 2 ft. to 3 ft. in height, and are partly constructed of mud and stone, and partly of brick. There is a gate on each of the four sides which seems to have been carefully painted in days long past; but these gates have been allowed to fall out of repair. The houses within the walls are scattered irregularly, and are not built in rows. There are no regular burying-places. It is said that stone monuments are erected to men of distinction; but under ordinary circumstances a heap of earth is thrown up over the grave, and when this has disappeared through natural causes, which it does in thirty or forty years, the soil is again brought into cultivation.

The proposed Naval Cadets' College.—The Parliamentary Committee appointed to inspect sites for the proposed Naval Cadets' College are to look at Devonport, Dartmouth, Weymouth, Portsmouth, Anglesea, and the Isle of Wight.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT COLCHESTER.

As briefly announced in last week's *Builder*, the annual meeting of the Royal Archæological Institute commenced at Colchester on the 1st inst. At half-past twelve the Mayor and Corporation received Lord Talbot de Malahide (president) and the members of the Institute at the Town-hall, and bade them a hearty welcome. The town clerk (Mr. Sayers Turner) read an address of welcome, in which the several matters of archæological interest connected with the borough were set forth, and a wish was expressed that the visit might result in settling many moot points in connexion with ancient local history. Lord Talbot de Malahide, in reply, said he was delighted to hear that the inhabitants and the Corporation of Colchester valued their old castle, which was unrivalled, and deserved their attention; and he hoped that it would be preserved from farther decay, and that it might escape the much-abused process of "restoration." Having made some remarks on the value of archæology as an aid to the elucidation of ancient history, he vacated the chair in favour of Lord Carlingford, the president of the meeting. Formal addresses of welcome were then read from Archdeacon Ady on behalf of the clergy; from Sir Thomas Sutton Western on behalf of the magistracy; from Mr. King, secretary, on behalf of the Essex Archæological Society; and from Mr. James Round, M.P., on behalf of the country gentlemen of Essex. These addresses were duly responded to by Colonel Pinney, by the Rev. C. W. Bingham, and by Mr. J. H. Parker. The Mayor of Colchester (Mr. Philip O. Papillon) next invited the members and visitors to a public luncheon in the Corn Exchange, and about 250 ladies and gentlemen accepted the invitation. An adjournment was then made to the Town-hall, where

Lord Carlingford proceeded to deliver his inaugural address, in the course of which he said: I should like to point out to you the value of the associations and the lessons read to us by the association, in the programme of this Institute, of architecture with history and with archæology; for, as Tennyson says on another subject,—

> "These are three sisters, friends to man,
> Which never can be sunder'd without tears."

And while, on the one hand, history gets on very badly, and has made many blunders without the help of archæology—that is to say, the science of monuments and books has got on very badly in the hands of men who have not had eyes to see, or who have not taken the trouble to examine the records left on the face of the land by our forefathers,—on the other hand (and this strikes me most forcibly) architecture has done a good deal of mischief when separated from history and archæology. I know, from what I have heard in the course of the day, I am getting on rather delicate ground; nevertheless, I must say what I have to say on this point, and it seems to me that one of the foremost duties of this Institute is to endeavour to propagate throughout the length and breadth of the land what I may call the historic sense—the historic sentiment—a reverent feeling for the works of our forefathers. That propagandism seems to be our especial duty, and I feel perfectly certain that the object, and, I hope, the effect of such meetings as this will be to add new interest to our homes, fresh interest to our walks and our journeys, possibly to enhance our affection for our country. But more than that, it ought to, and I hope it will, teach many of us a reverent care for the works that have been handed down to us from our ancestors—the desire to preserve them against all dangers, including that which I am bound to call the great peril of architectural restoration. We know the ravages that have been made by enlightened architects in what is called the restoration of ancient buildings, and, of course, especially our ancient ecclesiastical buildings. It is not only, as is ordinarily the case, a smattering of architecture that is dangerous, but even a knowledge of architecture, without an apprenticeship to what I call the historic sense, the historic sentiment; that knowledge and that fancy have led to many lamentable deeds, and the sweeping away of what were supposed to be incongruities in a building—probably a church,—and in the endeavour to reduce all to some fancied standard of architectural correctness. We may hope, I think, that things are already very much improved in this respect; we may hope that the days have passed in which such things were done, as, for example, many thousand such acts as one which is denounced by my friend Dr. Freeman in that same great book—and it has a connexion with this neighbourhood—when he tells you that the tomb of the hero of the battle of Assandune, the tomb of that hero in Ely Cathedral, was swept away, demolished, and his ashes scattered by what the historian calls "the savages of the eighteenth century." Such a deed as that, I believe, will never happen again, but I feel convinced that our only security for minor mistakes and ravages is that historic sense and feeling to which I have referred. It is not enough, it seems to me, to feel, with Wordsworth,

> "The memorial majesty of time,"

in the case of great buildings and noble monuments; one wants to have the same feelings carried into all matters, small and great. One wants a certain tenderness for "old, unhappy, far-off things," and even for old and ugly things. Without that feeling I believe we shall have no safety in the work of restoration. Of course, there will be doubtful cases, and ugliness sometimes reaches a point which becomes unbearable; but still, upon the whole, the only safety is to listen to the muse of history, and she will always say "Let it alone." In connexion with that there is a question which I cannot pass before I sit down without one word of notice. It is the question of State interference in the preservation of our national monuments. This is a matter of practical, and, I may say, Parliamentary, interest. It was only to-day that I heard from the highest possible authority, Mr. Parker, that the Government of Italy had utterly outstripped us in this matter. The Government of Italy has recognised the duty of the State to preserve these national monuments, and has fulfilled the duty in a trenchant manner, which is undoubtedly alien to our English ideas, and which I shall not attempt to recommend, at all events in a manner which I should not have the pluck to stand up and support in either the House of Commons or in the House of Lords. But a great English antiquary has been endeavouring to preserve these national monuments in an extremely cautious and prudent way—I mean Sir John Lubbock; and I confess I find it absolutely impossible to fill even for a moment the honourable position of temporary president of this Institute without saying a word of appeal on behalf of Sir John Lubbock's Bill. I do not know what the object and duty of such an institution or of such a meeting as this is if we do not do something in behalf of that measure. I am sorry to say, and I do not think it creditable to the House of Commons, that the measure has failed again; it has not been rejected, and therefore there is every hope for the future; but it has not succeeded. Of course, we know the difficulty with the noble British sense of the rights of property, but we know that that wholesome feeling can be, upon occasions which seem to the public sufficient, made to give way to the public interests, and whenever one-fiftieth part of that feeling, which overrides the right of property for the sake of a new railway, a road, or a drain, shall be applied to our national monuments, this measure of Sir John Lubbock will pass without any difficulty.

At nine p.m. the Historical Section was opened, when Dr. E. A. Freeman delivered an address on the Early History of Colchester and the country of the Trinobantes, drawing an analogy between that and the West Saxon district, and especially Cardiff and its surroundings, and tracing the important influence and bearing of both the East and West Saxon races in the building-up of the future kingdom. In point of antiquity a certain priority might be accorded to the East Saxons, inasmuch as Camulodunum was the earliest Roman settlement of importance. The claim of Maldon to stand as the city of Camulodunum could not be for a moment entertained; it had its own source of fame in later times in the resistance offered to the Danes; and the name of Maldon was so unmistakeably Saxon that there was no room for doubt in the matter; whereas the Roman Colonia, the British Colon, the Saxon Colonceaster, became eventually Colchester, which, he maintained, did not obtain its name from the river, but the river, he considered, might have taken its name from the town. For the early history of Camulodunum we had the best authority in the pages of Tacitus, who recorded the important part which that city played in the days of Boadicea. As to the birth of the *Bithynian* Princess Helena, he begged to be allowed utterly and entirely to reject the tradition of her birth in Camulodunum, as well as all the stories about King Coel and King Coel's kitchen, Constantine, &c. Neither would he admit the Roman origin of the castle: it was Norman, in his belief, built, it might be, and was, of Roman material. Neither did he think that the town walls were *Early* Roman: they were of later, though evidently Roman, construction, and were one of the best specimens, in some respects, which we had in England; for while the masonry was not so perfect as in York, its full extent round the town was more intact. Dr. Freeman concluded with a slight sketch of the history of the town after the departure of the Romans.

On Wednesday morning, at the early hour of 8·30, the first general excursion started by special train for Sudbury, Castle Hedingham, Little Maplestead, and Earl's Colne, reaching Sudbury at 9.30, the Mayor (Mr. George Smith) formally receiving the visitors. The history of the town dates from about 799, and its charter as a borough was granted in 1553. The visitors at once proceeded to inspect the few remains of a Dominican priory (temp. 1272), said to have been built for the Black Preaching Friars. The Church of All Saints was next visited, its chief points of antiquarian interest being noticed by Mr. J. H. Parker. It was described as being of the periods of Henry III. and Henry VII., and only noticeable on account of the number of shields upon the arches. The next church visited was St. Gregory's, mention of which is found in the year 790, after which it was given by the Countess of Clare (temp. King John) to the Prioress of Eton, and was subsequently purchased of the nuns by Simon of Sudbury when Bishop of London. Mr. Parker had previously remarked upon the want of colour in All Saints Church, but here he had to complain of the opposite, some young ladies of the parish having been allowed to decorate the very long chancel in all the colours of an Alhambra Court. He wished it to be known that it was always the practice to colour the walls of our sacred edifices, Scriptural subjects being used, and he was glad that the old custom was being revived in a most satisfactory manner. He cited a case where at Oxford a church in which Wesley formerly preached had been so restored, to the gratification alike of Churchmen and Wesleyans. St. Peter's Church, next visited, was a more complete edifice in design, but possessed few features of prominent interest. The roof was unique, but Mr. Freeman pointed out that the general character of the architecture was that common to East Anglia, which was very different to that of the West of England. On the way the party took a passing glance at "Gainsborough's House," and a fourteenth-century erection, which was formerly "Salters' Hall," and belonged to the corporation, but which is now the residence of Canon Molyneux. At the town-hall an entertainment was provided by the mayor and corporation, and they received the formal thanks of the members for the reception given.

The party, which had been considerably augmented, took vehicles at Sudbury for Hedingham Castle, the seat of Mr. Majendie, M.P. This old Norman keep, which Lord Talbot de Malahide and others described as the finest of the sort in England, was inspected with much interest. The hon. owner acted as cicerone, and gave an outline of the history of the castle. Mr. Parker again added some general remarks. He desired especially that it should be known that late researches had made it palpable that these stone Norman keeps had no existence previously to the eleventh century. At the invitation of Mr. Majendie, the party had luncheon in the banquetig-hall. The next move made was for the Round Church at Maplestead, near Halstead. The edifice was restored some years ago upon the lines of the old building, which it is said was erected by the Knights Templars, who had a preceptory here. This church, one of four of the type, is of later date than the other three, and is of the form of the church at Jerusalem. Continuing the journey, the party visited the church of Earl's Colne and the Priory at the same place, where a portion of the company accepted the hospitality of Mr. Carwardine, in whose possession are the tombs of the De Veres; the remainder visited the residence of General Marsden. A short ride (marred by the upsetting of one of the vehicles) to Chappel Station, whence train was taken to Colchester, brought an agreeable tour to an end.

The Architectural Section was opened in the lecture-room of the Literary Institution, at ten o'clock on Thursday, and in the absence of the president of the section (Mr. Beresford Hope, M.P.), the chair was occupied by Mr. J. H.

Parker. There was a fair attendance. The first paper was read by Mr. Charles Forster Hayward, the subject being, "The Nunnery of Layer Marney," better known, perhaps, as Layer Marney Tower. Running rapidly over the history of this building, he traced the genealogy of the Marney family, who, he said, lived at Layer Marney for centuries preceding the year 1500 or 1525, when the present building was commenced, but never finished, for the family became extinct at the period when the portion which now stands was completed, and thus what was evidently intended to be an enormous quadrangular pile is merely a tower and wing. The building is principally of brick, but the windows and some portions of the tower have a thin layer of terra-cotta over them; and the parapet of the tower was described as exhibiting some exceptionally beautiful work in a most beautiful building. Mr. Hayward gave some interesting particulars of the church and the tombs of the Marneys which it contains, including one of terra-cotta, which includes some of the details of the parapet, and of many other works of terra-cotta of the period in different parts of the kingdom.

Mr. G. A. Lowndes mentioned St. John's College, Cambridge, which was built at about the same period, as being similar in style. In this Mr. Hayward agreed.

The Chairman asked if Mr. Chancellor knew of any other examples of terra-cotta work, like the present instance, in ecclesiastical buildings in Essex; but Mr. Chancellor replied in the negative, quoting, however, several examples of moulded brickwork which had evidently had a coating of terra-cotta.

Lord Talbot asked whether in the cases of brick towers the interior as well as the exterior was of that material. Mr. Chancellor replied that as a rule such was the case. He mentioned one instance,—Chignell Smealey,—of a church which was not only entirely of brick, but which had a brick font. The place was called by the country people Brick Smealey,—a very significant name.

After some further discussion,

Mr. F. Chancellor, of Chelmsford, read a paper on "the Chapel of Saint Peter-on-the-Wall, at Bradwell," with the object of determining whether this curious church was built in the Roman, the Saxon, or the Norman period, or even later than that. As to the Romans, Mr. Chancellor thought it was impossible that they should have built it, because the edifice is out of character with the military fortifications, a feature which would have been found in the castellation; and, besides this, though Roman materials enter into its construction, they are not used in the manner that the Romans would have used them. As regards the Saxons, the first-named objection to its Roman origin applies equally to them, and there are also no long or short quoins which are to be found in Saxon work. As to the Normans, the buttresses which are to be found in the building forbid the belief that they constructed it in their earlier times, and Mr. Chancellor leaned to the opinion that it was built from the remains of the Roman wall upon which it stands, at the transition period between Norman and Early English, probably in the twelfth century. Mr. Chancellor then described the building and its characteristics. In the course of some discussion, the chairman said his first impression of the building was that it had been built at an earlier period than the twelfth century, but Mr. Chancellor had established his point by the evidence brought forward. He had been examining Holy Trinity Church that morning, and he had no doubt that that also belonged to the close of the eleventh century. The church of the earliest date in the county was Assington. The walls of this church were 8 ft. thick, and it was a good type of the Anglo-Saxon period, having been built by Canute in 1010 or 1020. The chairman also mentioned the fact that after the year 1000 there was an immense revival of religious life; so much so, indeed, that an historian of the period spoke of all Europe as "putting on a new white robe," so numerous were the churches erected, in anticipation of the end of the world, or at least the millennium.

The Historical Section held a second meeting in the Town-hall at ten p.m. on Thursday, Dr. Freeman presiding, when the Rev. Barton Lodge read a concise memoir of Eudo Dapifer. Mr. Lodge commenced by telling the members that Eudo was a great benefactor to the town, that he was a founder of the Abbey of St. John, Magdalen College of King James, and was spoken of as the builder of the castle of Colchester, which is nowhere mentioned in Domesday Book. He also explained that the castle was repaired after it had been ravaged by the Danes. Eudo was called Dapifer, which has many *aliases*, such as major domo, steward, seneschal, or marshal; dapifer meaning the man who brings in the viands. It appeared that the first stone of St. John's Abbey was laid by Eudo Dapifer, the second by Rohesia his wife, and the third by Earl Gilbert, her brother. Mr. Harnard inquired whether there was any evidence that Eudo built the castle, as the late Mr. Jenkins, of Stanway, had pronounced strongly in favour of the castle belonging to the Roman period. Mr. Parker said it was a Norman castle, and to say it was Roman would be absolute nonsense. The archway was a very good specimen of the commencement of the twelfth century, with all the ornamentation of the end of that period. The chairman observed that the legend concerning Eudo being appointed Dapifer was of no general value, but purely local; it was simply one that nobody now believed, and he characterised the incident of W. Fitz Osborn as absurd. He was sorry to hear the old scandal of Goodwyn brought up; of the rightful claims of Robert there were none, and that the castle was a temple of Claudius was an absurd notion.

Thursday afternoon was devoted to the perambulation of Colchester. The party started from the town-hall about half-past two. The first object of examination was St. Martin's Church, which possesses a fine carved chancel roof, which has just been uncovered at the expense of Sir Gilbert Scott. Sir Gilbert favoured the company with a description of this roof, which, he said, was now brought to light for the first time in two centuries, and was five centuries and a half old. He pointed out its various striking features, and mentioned that, although it had borne the brunt of 550 years or more, the oak carving was as sound as ever. The roof, however, was not, he said, quite complete, as some very excellent tracery work had been removed, probably by the workmen when the panelling was taken away. [Sir Gilbert subsequently stated that he had received information which hardly bore out this statement, and he accordingly withdrew it.] The church was one of those rare instances in which the nave, chancel, and the sanctuary were distinctly shown, and the sanctuary arch exhibited some excellent carving. In reply to the rector (the Rev. W. Laing), Sir Gilbert said the pulpit appeared to be composed of eighteenth-century framework, but the panels were seventeenth-century work. Mr. Parker subsequently drew attention to the squint, or hagioscope. St. Runwald's Church was next visited, and from thence the party proceeded to Holy Trinity Church, where Mr. Freeman said it was absurd to call the tower Saxon, an act which implied that the East Saxons did not still exist in a district which still continued, and he hoped long would continue, to be East Saxon. Mr. Freeman then called attention to the principal features of this part of the sacred edifice, and remarked that there were evidences in it which clearly pointed to the fact that it was built on to a more ancient edifice, though the remaining portions of the church were purely modern. St. Peter's and St. Mary-at-the-Walls were next inspected, and a thorough examination was then made of the remains of the old Roman wall in Balkerne-lane, on some portions of which there are good specimens of the original facing; and of the admirably preserved Decuman Gate at the top of Balkerne-hill, the only existing Roman gateway and guard-house. Here some of the party diverged under the guardianship of the Mayor to the piece of ground between the Colchester Union and Blatch-square, where, at the instigation of Mr. Laver (who, on the commonly received belief that the old Roman way to Londinium from the Balkan or Decuman Gate crossed to the London-road at the point where the Hospital now stands, conjectured that Roman remains might be found), a party of sappers and miners had excavated and discovered the pavement of an old Roman villa. The soldiers had been retained for the arrival of the party, who found a large amount of tesselated pavement laid bare on the very spot selected for exploration, and the pick-axes of the soldiers revealed further proofs of Roman work. Proceeding to Beverley-road, Mr. George Joslin's Museum of Roman Remains was examined, Mr. Joslin stating that they were all discovered within a radius of a quarter of a mile of his house. The party then proceeded to Lexden Park, where refreshments were provided by the hospitable owner of the mansion, Mr. G. H. Errington, High Steward of the borough. Under the shade of the trees, the Rev. Prebendary Scarth read a paper which, he said, he trusted would once and for all establish beyond controversy the long-disputed site of Camulodunum. After enumerating the various theories afloat concerning the Ancient City, which Camden had placed at Maldon, and others had fixed in Yorkshire, the Western, the Midland, Counties, and even in Scotland, Mr. Scarth cited passages from Pliny and Tacitus, which, taken in connexion with the many coins of Cunobeline found at Colchester, and the existence of such a vast and splendid collection of Roman remains as the town affords, together with the earthworks, over which Mr. Errington would shortly conduct them, went to prove, he considered, incontrovertibly that Colchester was the *Roman* Camulodunum, and Lexden and Lexden Heath the *British* Camulodunum, Camulodunum embracing a circuit of some three miles or more. Remarking on the absence of any certain history with regard to the exact spot where Boadicea fell, he expressed his strong conviction that it lay somewhere between Lexden and London. After several other interesting observations, the company were led by Mr. Errington round the beautiful park, over the earthworks, held to be the work of the early Britons, commanding an exquisite view of the valley and house below, towards a tumulus, discovered some years ago, and now planted with shrubs. The afternoon perambulations then terminated.

In the evening, a *conversazione* of the members of the Institute, and of the Essex Archæological Society, was held in the castle, when a distinguished company was brought together within the old walls. The museums were the actual centres of the gathering, but the whole castle, including the vaults, the cells, &c., were brilliantly lighted up with duplex and other lamps. During the evening, the Rev. C. L. Acland, head-master of the Royal Grammar School, gave an interesting notice of that foundation, which dated, he said, from 1637. At the conclusion of the paper, Mr. Stephen Tucker (*Rouge Croix*) expressed an opinion that the records of the Grammar School should be published, and quoted, as an instance of the value they were, the fact that he had, within the past few days, been enabled to solve a mystery he had been trying to unravel for months, through the agency of the *Liber Scholæ* of the Colchester Royal Grammar School.

On Friday, an excursion was made by road to Copford, Layer Marney, Beeleigh Abbey, and Maldon, the party starting from the Town-hall at nine a.m. Copford Church was the first stoppage, and here Mr. C. Forster Hayward described the building, and the mural paintings with which the chancel is adorned. The church, he said, was of a beautiful example of Norman architecture, and was originally vaulted, but, whether from the insecurity of the vault he did not know, at all events, pointed arches were substituted. The screen was a specimen of Late Perpendicular style, and had no relation to the original building. The roof, no doubt, was a very beautiful piece of work, and if the plaster could be removed and the woodwork shown, it would probably turn out to be similar in character to that just discovered in St. Martin's, Colchester. Quantities of Roman brick were to be found in the walls, and had, no doubt, been used because ready to hand; and the church itself, with most of the churches in this district, had probably been built by the masons who wrought for Hedingham Castle. Turning to the paintings, Mr. Hayward said some portions of them, especially the architectural ornament, might belong to the eleventh century; but the chief part was probably restored in the fourteenth century. The scheme of the painting is as follows:—In the arch of the chancel over the window is a majesty. Christ is represented seated on a throne, with a rainbow behind it, and clouds beneath his feet. His right hand is in the attitude of benediction, and his left arm rests on a book. The wounds are visible in his hands and feet. Below the majesty are angels, and in the background are the towers of the New Jerusalem. On each side of the window stand four apostles under canopies. Along the main soffit of the chancel are represented the signs of the zodiac, with the sun and moon at the ends. Only a few of the original figures were found, and the rest are conjectural restorations. Among the former was Virgo with a nimbus, said to represent the mother of our Lord; but this was not to be relied upon, as Satan himself was often represented as having a nimbus, and it therefore could not be taken altogether as a

badge of holiness. These paintings were discovered by the plaster, which had hidden them, peeling off the wall. Exact tracings were taken at the time, and served as a basis for the restoration; and Mr. Hayward offered to exhibit these on application. The present generation ought, Mr. Hayward said, to be very thankful to those who were apparently barbarous enough to whitewash the paintings, for they were unable themselves to appreciate their beauty, and the whitewash, so far from destroying them, simply preserved them for a more appreciative generation. There was a tradition that the whole of the church was similarly painted, and, perhaps, in the future, this might also be ascertained, and if they existed the paintings might be restored. Mr. Daniel Bell, the artist who had restored the paintings, deserved the highest commendations, for they were most faithfully done; and a set of careful plates had been prepared by Mr. Parish, of Colchester, which, if sufficient subscribers could be found, were to be published, but Mr. Hayward warned those who were preparing them not to let them go forth to the world as authorities of what was done in Mediæval times. They would never be that, but must be looked upon rather as a restoration, carefully worked out by a conscientious modern artist.

Mr. J. H. Parker, C.B., remarked that the restorations had been done in a most interesting and satisfactory manner, and showed no signs of those innovations misnamed restorations. It must be borne in mind that the whole of our churches were decorated, or intended to be decorated, in order to teach ignorant people by the eye, instead of, or as a supplement to, the ear; and it was thus that in old times people who could not read were taught. There had been a sort of Puritanical objection raised to paintings, but where only Scriptural subjects were used, and legends were excluded, no Christian ought to have any objection to them. Alluding to the architecture of the church, Mr. Parker said it was a remarkable Norman church, and had originally a chantry-chapel attached. There had also been a rood-loft. The design was evidently of the twelfth century, but the church generally, including the paintings, had been touched up in the fourteenth century.

Sir Gilbert Scott next said a few words, remarking that the paintings were a most surprising and valuable discovery. Excepting the chapel in Canterbury Cathedral, he had never seen anything like it. He thought the original design of the church dated from the early part of the twelfth century, and the porch was the most beautiful specimen in the country.

Layer Marney was next visited, and, under the guidance of Mr. Hayward, the party were conducted over the tower, the wing, the dormitories, and the church. In the tower, the splendid oak newel, which runs up the entire staircases, the terra-cotta work on the windows and parapet, and the moulded brick chimneys, were the principal objects of interest; but the loftiness of the chambers, and the massive oak beams which supported the floors, were much admired.

The Mayor of Colchester asked whether the terra-cotta work was of Italian, Flemish, or English origin, as an impression prevailed that it was English?

Mr. Hayward said he should be very glad if he could attribute the work to English artists, but there was very little doubt that it was either Flemish or Italian. With regard to the entire building, Mr. Hayward said there was no doubt that the entire front and the chimney either was, or was intended to be, covered with a coating of plaster. The church, Mr. Hayward said, was built by the same hands as the tower—which he believed to be the gateway of an immense quadrangular range of buildings,—and of the other buildings, but the soil was bad, and hence the number of cracks in the walls, which opened and contracted as the weather was wet or dry. The church contains the tombs of some of the Marneys, notably one in terra cotta, bearing many features (especially the parapet) of the tower and building generally. This tomb is that of Sir Harry, afterwards Lord Harry Marney, the founder of the buildings, who died in 1525, and his death being closely followed by that of his son, the family became extinct, and the buildings were never completed. There is also an alabaster tomb of one of the Marneys.

In reply to a question, Mr. Bloxam said the terra-cotta tomb bore striking evidences that it was not of English workmanship, but of Flemish or Italian; and in this he was supported by Mr. Hayward; and Mr. Tucker (*Rouge Croix*), who said that the badge of the Garter which the effigy bore was not portrayed as an English artist would have portrayed it.

The hospitality of Mr. Sampson Wood, who occupies the wing of the building, having been partaken of, the party proceeded on to Maldon, where, after taking lunch at the Blue Boar, the party visited the town-hall, the churches, Dr. Plume's library, and Beeleigh Abbey, where are to be seen some groined and carved roofs, &c., and started on their return journey about five o'clock. Of the subsequent proceedings we may give some record next week.

THE PARIS EXHIBITION OF 1878.

As some of our readers doubtless already know, the Senate have, within the last few days, voted the amount of 6,000,000 francs towards the construction of the Exhibition, and within this week it has been officially announced that the works were about immediately to commence. On visiting the other day the Champs de Mars, that well-known rectangular space, in expectation of seeing an oasis of workmen in that Sahara-like area, it presented precisely its ordinary appearance, with its customary lines of cavalry going to and from the École Polytechnique, but, not a single incident to indicate that any change was about to disturb the sandy level. The Trocadero also, which will take so conspicuous a part in connexion with the Exhibition, is still as dull and as green as usual, in possession of the patient man with the enormous telescope, whose only hope is in the bright and beautiful Saints' Days.

Whether the enormous column which is proposed to be erected on this height will be finished is a question. The Acrobile, as they intend to call it, will be a permanent monument in iron, 260 mètres (fancy, more than 800 ft.!) high, which will serve at the same time as observatory, as lighthouse, and as a building suitable for experiments upon the velocity of light and the fall of bodies. Its altitude will exceed, by more than 300 ft. the highest monument of the world, which is, up to the present moment, the Pyramid of Cheops, and by nearly 380 ft. the steeple of the Cathedral of Strasburg. But the building in the Champs de Mars will be a reality,—a beautiful reality,—although we can scarcely expect in the Exhibition of 1878 anything more perfect than the Histoire de Travail of that of 1867.

The general disposition of the Exhibition that is to be adopted is that proposed by Messrs. Krantz and du Sommerard. In the centre of the palace a vast building will be consecrated to the exhibition of the fine arts; here will be found reproductions of the great works of antiquity, which will serve to illustrate how much of the old material goes to make up the freshest novelty of life. On each side, two vast galleries will be constructed to receive the products and industrial machines of all nations. Perpendicularly to these, there will be large vestibules richly decorated, which will serve as show-rooms for objects of magnificence, and in which will be found also all the necessary indications of the contents and map of the palace. The classification of the objects exposed will be made according to their nature and nationality; on one side France, on the other foreign countries. The *allées* of the garden, which will separate the palace of the fine arts from the galleries of the Exhibition, will be covered with a vellarium of incombustible material. As to the Trocadero, *restaurants* and *cafés* will be established there, near the exhibition of products from distant countries. The vast rotunda (capable of holding 10,000 persons) which will be constructed here should have a very fine effect. A bridge will be built (the project is due to M. Eiffel), which will join the Champs de Mars to the Trocadero; it will be placed below the Pont d'Jéna, which itself will be comprised in the Exhibition.

As we have said, the final plan of the Exhibition has been agreed upon. The type adopted is M. Baudot's, modified in its details by those of the eleven other plans which were rewarded, and principally by those of Messrs. Eiffel, Coquart, and Davioud. The final execution is confided to Messrs. Krantz and Viollet-le-Duc, who will take from the project of M. Coquart the garden, from that of M. Eiffel the bridge referred to above, and from that of M. Davioud the atrium. The total expenditure is calculated at 35,000,000 francs, of which 18,000,000 will be devoted to the buildings on the Champs de Mars, 7,000,000 for those of the Trocadero, 2,000,000 for the widening of the Pont d'Jéna, and 1,500,000 for the necessary machinery for construction and other purposes.

The area covered by the Exhibition will be no less than 720,000 mètres, thus divided:—Surface covered, 270,000 mètres; annexes and gardens, 450,000 mètres. The Great Exhibition of 1851 occupied a superficies of 90,000 mètres, of which 75,000 were covered and 15,000 devoted to gardens. That of Paris of 1855:—Surface covered, 133,150 mètres; gardens, 25,000 mètres; total, 158,150. That of London, in 1862:—Surface covered, 110,000 mètres; gardens, 50,000; total, 160,000. That of Paris, 1867:—Surface covered, 149,000 mètres; gardens, 250,000; Billancourt, 50,000; total, 449,000 mètres. That of Vienna, 1874:—Surface covered, 120 000 mètres; gardens, 300.000; total, 420,000 mètres. That of Philadelphia, 1876:—Surface covered, 198,200 mètres; gardens, 400,000; total, 598,200 mètres. The surface covered in 1878 will be the quadruple of that of the Crystal Palace, which seemed gigantic to the visitors to the Great Exhibition of 1851. This is the house that Paris is building, and which already here begins to take a place in our daily interests.

Those who remember the inconvenience of getting away from the Exhibition of 1867, will be delighted to hear that another capital point has been resolved upon, that of the stabling of the carriages. The city engineers have marked out the ground in the 7th and 16th arrondissements, where all the arrangements will be fully considered. We are assured, indeed, this time that means of locomotion will not be wanting, a supplementary service of river steamers and omnibuses will be organised, by the request of the city, by the respective companies, without counting two new lines of tramway and a metropolitan railway, on the London model, which it is affirmed will be opened, in so far as the part that concerns the Exhibition, in time to be of use for the visitors who will throng Paris in greater number than ever. The quays of the Seine will be lowered, and lifts, placed at the Pont d'Jéna, will raise the passengers brought by the tramways and steamers.

By the time all this is done, and the Exhibition ready to be opened, Paris will have undergone great changes, many of which will improve greatly the already beautiful city, and materially assist the comfort and enjoyment of those who visit it; but the great point that will strike those visitors who have not seen Paris for some time will be the completion, probably by the time the Exhibition opens, of the great Avenue from the New Opera House to the Place du Théâtre Français, and many a narrow and dear old street will have passed away in reality, and remain but in the memory of the oldsters.

Paris.

NOTES ON ST. ALBAN'S ABBEY.*

The ancient city of Verulam once stood just to the south-west of the present town in which we are assembled, and it was from within this city that Alban, Britain's proto-martyr, was led forth to be executed, as Bede mentions, on a "little hill covered with wood," about A.D. 303. Upon the site of this little hill now stands the town of St. Alban's, and the precise spot of the martyrdom is said to be in the north transept of the Abbey Church. From Dugdale it seems that the early Christians built a church upon the spot of the martyrdom; but there is nothing of importance recorded until Offa II., king of the Mercians, who, repentant of his many sins, and as an atonement for a murder, was guided by a Christian mind to found a monastery in honour of St. Alban, A.D. 795. The monastery was placed under the rule of St. Benedict, and contained 100 monks, who vowed to live exclusively for the service of God, also to give shelter to travellers and all who should seek relief. Offa himself is recorded to have placed round St. Alban's skull a circle of gold, with an inscription signifying his name and title; he also caused the chapel to be enriched with gold, silver, and other ornaments, until a structure of greater magnificence could be erected. This was in the year 791. It seems most probable that Offa really built his monastery contiguous to this early church, for we find within a few years that Ealdred, the eighth abbot, commenced to collect materials for the rebuilding of the church. A famine prevailing throughout the country, Leo-

* By Mr. James Neale, F.S.A. Read at St. Alban's on the 19th ult., before the Architectural Societies of the Archdeaconries of Northampton and Oakham.

fric, tenth abbot, sold these materials, also the plate belonging to the church, in order to buy food for the poor. The rebuilding was delayed until William the Conqueror, in 1077, appointed Paul of Caen to the abbacy. Paul was a relative of Lanfranc, archbishop of Canterbury. Lanfranc was previously abbot of St. Stephen's, of Caen, and rebuilt Canterbury almost upon the model of St. Stephen's; but, according to Sir Gilbert Scott, Paul, who was simply a monk at St. Stephen's, but more ambitious, built St. Alban's on a scale vastly exceeding the new metropolitan cathedral,—not unlike that church in general plan, but exceeding it in size in every direction; for whilst at Canterbury the nave was but nine bays in length, he made St. Alban's thirteen. The choir at Canterbury had but two bays besides the apse, St. Alban's had five, and while either transept at Canterbury had two bays and a single apsidal chapel, those at St. Alban's had each three bays and two chapels; the entire length of Canterbury was about 290 ft., and St. Alban's 460 ft. It is obvious the materials had much influence in the design and plainness of the church, for Paul collected and used the old tiles from the ruined Verulam and the existing eastern bays of nave, tower, and transepts are the remains of Paul's church. The church was consecrated in 1115, when King Henry I., his Queen, and nobles were present. Having just briefly glanced at the early history, we will turn to our more immediate subject, and commence with the plan of the church as at its consecration in 1115, and gradually trace out the various alterations until we leave the building as we see it at the present time. I presume in 1115 it consisted of nave, transepts, choir, and sanctuary, with apsidal termination; two western towers, also one huge tower at crossing of transepts. The apse terminated where the present ante-chapel now is, and beyond this we have no proof that any other chapels existed. The whole of the church was built with tiles, averaging 16 in. by 12 in. by 1½ in., bedded in mortar, having the joints almost as thick as the tiles themselves. The mortar, I think, was composed of rough burned ballast and lime; and I will ask you to notice tomorrow the marvellous hardness of this mortar, even after the lapse of 800 years. We cannot say as to whether we have in this church any remains of Offa's building, but there are some columns in the transepts which, it is evident, are of an earlier date than the Norman Church, and, as I will point out at the abbey, they have served at one time a different purpose. About the year 1151 Robert de Gorham repaired and beautified the Early Shrine. He also rebuilt the chapter-house and part of the cloister. The chapter-house is entirely destroyed; but, fortunately, we have a portion of the cloister on the south side of the south transept, and it is just this small remnant that connects the link between the Norman work of Abbot Paul and the alterations of De Cella. The transition from Norman to Early English. The cloister, which is now commonly called "The Slype," separated the church from the chapter-house, and led from the main cloister to the monks' burying-ground. Matthew Paris gives a lengthy history of the supposed finding of the body of St. Amphibalus, whose relics were transferred to St. Alban's in 1186. With a lapse of over 100 years from the accession of Paul to that of John de Cella architecture had made a rapid stride, and in the new style De Cella conceived the idea of re-building his church. He pulled down the west front of the Norman building; however De Cella, although a man devoted so truly to his art, was not enabled, owing to bad management and want of funds, to complete more than a small portion of his design. It was his intention to lower the floor-line of the porches and commence the ascent eastwards by a range of steps to the nave. This was evidently done to give more prominence and dignity to the high altar. The original floor-line is now exposed in the north and south porches. We see, again, he commenced at the northern side: this would be owing to the monastic buildings being on the south, and it is my opinion that De Cella did nearly if not entirely complete the north porch. The abbot left the work in despair, and shortly afterwards died. Trumpington, his successor (1214–35), continued and finished the west front, and it is to-morrow we shall trace at the building how this, the business man, cut down the soul-conceived (or as he may have thought extravagant) work of De Cella. Thus in finishing the south porch he omitted the "dog tooth" and other enrichments we find in the north porch; a pier prepared with bases for eight clustered marble shafts he reduced at the caps to four; he also continued the work upon the floor level. Trumpington made extensive alterations besides the west front, including four bays on the north and five on the south of the nave, also many other details which I shall be better able to explain at the abbey. Even in Trumpington's work we can follow much how that his ideas or first intentions were gradually abandoned and reduced in richness in execution. Commencing as he naturally would on the north side, even though in the first instance he impoverished the work of De Cella, yet Trumpington intended to vault the nave. We still see the marble groining shafts to the four bays on the north side, the beautifully carved capitals designed to carry three other shafts clustered round the moulded nosing of the alternate triforium piers; also the clearstory itself shows evidence of this intention, but before the work had proceeded beyond a few bays he was obliged to reduce the number of shafts, and eventually abandoned the idea of vaulting the roof, and was compelled to leave the flat Norman ceiling. The two clearstory arches at the east end on the north side have the dog-tooth ornament. The mouldings to the two eastern bays on the south side vary from the rest, and I think there is little doubt these two bays were erected some few years later than those on the north, and together with the two next bays; after the idea of groining had been abandoned, we cannot suppose that Trumpington rebuilt the eastern part of the church, though it is evident he made many alterations here, and very probably did panel the Norman work with arches and intermediate arches, and we shall see a fragment of this design in the south aisle of the sanctuary. I said that we cannot suppose Trumpington entirely rebuilt this portion, for within a few years, during the rule of John de Hertford (1257), it was found necessary, owing to a gaping crack, to pull down the eastern part. We are indebted for the previous history to the writings of Matthew Paris, but he died about 1259, and the other chroniclers, though industrious enough in reporting all that concerned its worldly goods and disputes, were singularly remiss in recording what was done as relates to the structure of their church,—so although the whole of the eastern chapels were erected we have hardly any record of such work being in progress. Most likely the sanctuary was commenced by John de Hertford, but is more particularly the work of Roger de Norton (1260 91). It will be noticed that the sanctuary at St. Alban's is not open to the aisles, as is generally the case, but is really panelled in arcading. In fact, it seems in making these alterations the architect did not take down the Norman walls for fear of the great tower, but left the walls standing, and ingeniously arcaded them to agree with the other work of his date, and thus the walls really form a buttress to the tower. It was originally intended to vault the sanctuary in stone, but wood being substituted, the flying buttresses were not required and the preparations left, as at present seen, on the north and south sides. I am inclined to think the eastern chapels were commenced at the same time as the sanctuary, and continued by John de Berkhamsted (1291 to 1302), who completed the nave of the ante-chapel as high as the springing of the groining, and the whole of the lady-chapel to the level of the strings just under the window-sills. This seems to be clear, for similar arcading to the ante-chapel also continues through the lady-chapel. It is somewhat peculiar that on the south side the arcading has rich cinquefoiled heads, while that on the north is trefoiled; and each design terminates on either side of the altar of the Virgin. The work now seems to have been in abeyance for some years, but was resumed upon the accession of Hugh de Eversden (1308–26), though in the altered style. Hugh did not finish the groining of his predecessor, but cut away his springers, and substituted a flat, panelled ceiling. He also omitted the central piers, and thus entirely altered the intentions of Norton and Berkhamsted. But he seems to have devoted his genius to his own individual work in the lady-chapel. Sir Gilbert Scott says this group of chapels, now completed, offers as exquisite examples as it is possible to find of the two great phases of English Middle-Pointed architecture. I would especially draw your attention to that beautiful window at the east end of the south aisle of the ante-chapel. During the time of Eversden (1323) some pillars of the Norman work on the south of the nave fell. Eversden commenced the rebuilding, and it is to him we are indebted for the five bays of even more exquisite design than his lady-chapel. It is worth notice, and I think clearly proves these to have been the work of the same abbot; for, in the small niches to the jambs of the lady-chapel windows, I find exactly the same mouldings to the bases and caps as in the work just mentioned in the nave, although these bases to the niches are only 1 in. high, and those in the nave about 17 in. Again, the carving is precisely the same design; the way the hair is worn, also the moustache and beard, is contemporary with that of the heads in the nave. I find the carving in the nave much bolder, and worked with a firmer and more decided hand, than that in the lady chapel; this, with many other points of detail, would lead me to say that these five Decorated bays in the nave are rather later than the lady-chapel, although, as I said previously, designed by the same abbot, and much of the work here is now almost as perfect as the day it left the artist's hands some 550 years ago. During the time of Berkhamsted the body of Eleanor, queen of Edward I., rested at St. Alban's on its way to Westminster, and shortly afterwards a commemorative cross was erected in the High-street, close by the site of the present clock-tower. This cross was destroyed in 1702. During a visit of Edward II. to the abbey, John de Maryne caused a new shrine to be constructed (1302–8), and it was during the restoration in 1872 that about 2,000 fragments of this shrine were discovered, built into the eastern arches as common rubble masonry, and now wonderfully put together under the guidance of Sir Gilbert Scott. At the time of the fall of the Norman work, or south of the nave, much of the Norman cloister was destroyed. Eversden commenced its restoration, which, however, was not completed until the time of Mentmore, his second successor, 1335–49, and even alterations were made at a still later date at the time of the insertion of the beautiful south door of the choir,—these we shall see, and be able to define more minutely at the building. John, king of France, who was taken captive by Edward the Black Prince, at the battle of Poictiers, 1356, was for some time a prisoner in this monastery. During the rule of De la Mere (1381) the insurrection which broke out in Richard II.'s reign, under Wat Tyler and Jack Straw, threatened destruction to the Abbey. Upon the insurrection being quelled, the king held a court at St. Alban's, and stayed eight days in the monastery. Thomas De la Mere died 1396, and his monumental brass is still preserved in the chantry generally known as Wheathamsted, on the south side of the sanctuary. It is considered the finest brass in England, and worked during the abbot's life by a Flemish artist. We will now rapidly pass the screens and later work. The holy rood-screen divided the nave from the choir, and is ten bays, or 214 ft. from the west end. It is of the latter half of the fourteenth century, and at one time continued right across the aisles, thus entirely separating the church of the laity, which was the nave, from that of the clergy. The watching-chamber in the Saints' Chapel was erected by Wheathamsted about 1430. The monks from this chamber continually watched the shrine both by night and by day. The reredos or screen at the back of the high altar is later than the rood-screen, being the work of Wallingford, 1476–84. Wallingford also removed the Norman windows, and inserted the huge Perpendicular ones in the end of the north and south transepts. These windows measure about 26 ft. wide by over 30 ft. high, and are divided into seven flights. There is also a similar window inserted at the west end of the nave; this, like most of the work now done, was a great deterioration to the architecture of the structure. The rage for restoration was at this date felt throughout the country, and as you can now hardly enter one village church that has not some Perpendicular work, so now again the excitement for restoration is so prevalent that in many years to come there will hardly remain one building but will show its mark of the nineteenth century. The whole of the high-pitched roofs were now removed, and a long range of windows inserted in the Norman triforium arcade, which had originally opened to a chamber in the roof, as at Peterborough, Westminster, &c. The aisle windows in the nave were inserted by Wheathamsted, who also decorated and filled a great part of the church with painted glass. There are some good specimens of this glass remaining in the window behind the organ. The lamb of St. John the Baptist and eagle of St. John the Evangelist were the cognisances used by Abbot John of Wheathamstede. On the

war breaking out between the houses of York and Lancaster, the first blow was struck at St. Alban's, 1455, in the battle fought, it is said, in Key Field (south-east of the town) between Richard Duke of York and Henry VI. The king was made prisoner and led to the shrine, and thence to London. Many of the notoriety who fell in this battle were buried in the lady-chapel. In the second battle, fought on Bernard's Heath (north of the town), the king and queen, being victorious, proceeded to the shrine of the martyr to return thanks. Caxton, upon bringing the art of printing into England, set up a press at St. Alban's, and issued from it the first historical work printed in this country; a copy of this work is still preserved in the British Museum. During the time Cardinal Wolsey held the abbacy printing was discontinued, Wolsey saying if the clergy did not in time suppress printing it would be fatal to the church. This was 355 years since. Richard Boreman was the last and fortieth abbot. His appointment, in 1538, seems to have been made solely with the view to the surrender of the monastery to the Crown; and on the 5th of December, 1539, the whole of the vast pile was made over to Henry VIII. Dugdale says "the abbey and all the lands united together is worth at this day (1722) in rents of about 200,000 pounds, according to the improved rents of this day." The conventual seal is still in the British Museum. Cole, in one of his manuscripts, has preserved the following from a paper in the handwriting of Elias Ashmole, dated 26th August, 1868:—"Mr. Shrimpton, of St. Alban's, died about sixty years since, aged 103. He lived when the abbey flourished, and remembers most things relating to the monastery, amongst others that in the great hall there was an ascent of fifteen steps to the abbot's table, to which the monks brought up the service of plate, and staying at every fifth step (which was a landing-place) they sang a short hymn. The abbot usually sat alone in the centre of the table, and when any nobleman or strangers of eminence came thither, they also sat at his table towards the end. After the monks had waited awhile on the abbot, they sat down at two other tables placed on the sides of the hall, and had their services brought up by the novices, who, when the monks had dined, sat down to their own dinner." The greater part of the site of the monastic buildings was granted by Henry VIII. to Sir Richard Lee; the conventual church, however was excepted, and subsequently sold by Edward VI. to the inhabitants of St. Alban's as a parish church, in lieu of the destroyed chapel of St. Andrew, for the sum of 400*l*. The ante and lady chapels were divided from the church. The lady-chapel until recently has been a public school, having the ante-chapel for its playground. I think now we have gone rapidly through the chief incidents as touching upon the foundation and architecture of this, one of the most interesting buildings in the kingdom, and a lasting memorial of England's conversion to Christianity, and we have seen, as the mind became enlarged, educated, and refined, so also did the architecture advance step by step from the rude rough plastered work of the Early Normans until it reached the glory and perfection of English art at the latter part of the fourteenth century, and illustrated in the abbey by the exquisite, delicate, and beautiful carving both in the nave and lady chapel. I think I may safely say that this church must from the architect claim pre-eminence over any other in the land, in that it represents every phase of architecture from the Saxon to Late Perpendicular, and is truly a mine of inexhaustible wealth both to the archæologist and the architect. We must approach the building with feelings different from that of any other cathedral in the land, and in meditating in and around its hallowed walls, o'er which some 200,000 suns have set—think of the part it has played in the religious and social history of this our happy England.

Royal Association for the Promotion of the Fine Arts, Edinburgh.—The annual meeting of this Association was held in the Queen-street Hotel, Edinburgh, on the 29th ult. Mr. H. W. Cornillon read the report of last year, which stated that the year closed with a subscription list of 5,232 members, and that there had been an increase in the number of subscribers in Edinburgh. The actual amount subscribed was 5,493*l*. 12*s*. The aggregate value of works to be distributed amounted to 1,887*l*. The report was unanimously adopted, and the drawing of prizes then took place.

GREENWICH ROYAL NAVAL SCHOOL AND COLLEGE EXTENSIONS.

Since the "old salts" were dispersed, a few years ago, to become out-pensioners on the Hospital funds, in lieu of their maintenance as residents, numerous important alterations have been effected in connexion with the Hospital buildings. The four principal blocks to the north of the highway are appropriated to the uses of the Royal Naval College students and professors, and to the Royal Naval Museum, the most complete of its kind probably in existence, that may now be considered as nearly as possible perfect in scope and details. Two of these blocks, as may be well known, contain, opposite to each other, the famous painted Hall, with its fine collection of paintings of naval actions, and portraits of naval heroes, and the beautiful chapel of the Royal Hospital. Westward are detached buildings, including the Seamen's Hospital, for seamen of all nations, transferred from the *Dreadnought*, well remembered as an imposing object moored in the river off Greenwich. The present Hospital serves additional and important uses as a place to which sufferers from accidents are freely admitted and treated without question or hindrance. Other detached buildings on the western side of the grounds do not call for particular remark.

The adaptation of the old buildings to the uses of the College and Museum involved much work and ingenious contrivance in internal alterations, rather than in new buildings. One new structure, however, of an imposing and highly ornate character, has been commenced, and one wing completed, near the north-west corner of the college grounds. This is a racquet-court, 74 ft. long by 32 ft. 6 in. wide, with walls 28 ft. 6 in. high to the tie-beam of the roof. The entrance-hall has a dressing-room on one side and a marker's room on the other, with a gallery for visitors over them, extending the width of the court. The front is of Portland stone highly enriched in its members, and with a profusion of admirably executed stone carving by Mr. Raymond Smith, of Marylebone. The recessed central compartment is divided by pilasters into three bays, the lower portion of the face being in French rusticated work. Projections at the ends are made by pairs of advanced Ionic columns, with pilasters behind. The entablature and work above the cornice, with the altar-pieces, are highly encriched, the enrichments including large alto-relievo medallions in stone, of the naval heroes, Nelson in the centre, St. Vincent on the right, and Howe on the left. This effective structure is only one wing, or less than a third part of the frontage of the building to be erected, which, when completed, will have a large fives-court in the centre, and another building, the same as the one now finished, at the opposite end. The roof of the racquet-court is of wrought iron, with open principals, and is louvred at the crown. The work has been executed by Messrs. Geo. Smith & Co., contractors, of Westminster.

The most important building operations and extensions in connexion with the Hospital during the last few years have been in accessories to the Royal Naval School, on the south of the highway. These have included extensive laundry, bakery, and other premises for work; more recently a splendid gymnasium, and now a new wing, by which accommodation is provided for 200 additional boys, that will bring up the complement to 1,000 in all, which will probably be the ultimate limit of accommodation. The additional buildings above referred to were described in the *Builder* at the time they were completed, and need not be herein further referred to; but another important recent work should be mentioned,—the covering in with lofty walls and a louvred roof of the spacious swimming bath, adjoining St. Mary's Church, at the corner of Greenwich Park. The new wing runs alongside of the swimming-bath, and is 187 ft. long by 37 ft. wide, with an entrance-hall 22 ft. square, that is reached by a spacious flight of steps. Projecting from the back of the main building is a new kitchen, 41 ft. square, that will be furnished by the most approved appliances for culinary operations on a large scale. Part of the kitchen is covered by two floors; the other portion is open to the roof. The basement of the new wing is well lighted and ventilated, and only about half-sunk below the outside surface. It has a wide sloped space to the foot of the walls all round. The area is divided into a pupil teachers' dining-room and lavatory, sufficiently separated from a large scullery and two very large washing-rooms, with a boiler-house, coal-cellars, &c. The principal floor of the new wing is a very fine room, 187 ft. long, by 37 ft., and will be furnished with fifty-seven cross tables, providing accommodation for the whole of the 1,000 boys and their superintendents. Along the two side-walls are well-contrived racks for spoons and plates, with drawers under the ledge for knives and forks. The height of the room, from floor to floor, is 21 ft. Internally, as well as externally, the building is divided by the windows, with pilasters, between, into 15 bays. The box-girders, which are the principal supports of the upper floor, are shown in the ceiling of the dining-hall. On one side of the hall, and opening upon it, is an organ-gallery over part of the kitchen. The flooring of this room seems excellent work. A third of the space in the centre is laid diagonally with narrow oak boards, closely enough jointed and smooth enough to serve for a skating-rink. The sides are of red battens, laid in the ordinary way. The whole work is close up, and presents an excellent surface. The windows throughout are opened for ventilation by Elsley's patent fittings, upon which, by the way, Mr. Godfrey, resident clerk of the works, has made a valuable improvement.

The upper floor is a great dormitory, containing 117 beds, and is well furnished with means for obtaining light and fresh air. Ornamental gratings are extended along each side, at the foot and the middle of the slope of roof. Four ventilators are placed on the crown of the roof for the escape of the vitiated air. At each end of the dormitory there are two rooms for the occupation of the masters in charge. At the side of the large sleeping-room are lavatory and closets over part of the kitchen. The dining-hall and dormitory are warmed by hot water pipes and fitted with gas chandeliers and pendants.

The new works are designed by the Admiralty Director of Works, Messrs. Hill, Higgs, & Hill, of Lambeth, being contractors; Mr. Loughborough, chief clerk of works; Mr. Godfrey, resident; and Mr. Houghton, general foreman to the contractors.

MOVEMENT IN INDIA.

At the suggestion of the Prince of Wales, the Collector of Cawnpore, assisted by the Cantonment magistrate, has marked out the site of General Wheeler's entrenchment by stones sunk into ground level with the surface, and it is intended to plant the lines with cypress trees. The site has naturally been very difficult to trace after the lapse of so many years; but it is believed that the task has been successfully accomplished.

The post of Superintendent of the Madras Harbour Works, vacant by the death of Mr. May, C.E., has been given to Mr. Beach, C.E. Meantime the sea is playing sad havoc with the new works, and in order to prevent the encroachment of the waves, large gunny-bags filled with sand and stones have been piled up in front of the roadway at Royapoorum, where the damage has been done.

It is said that the Madras Government has decided on substituting an establishment of Superintending and Executive Engineers for the present one of District Engineers. There will also, it is stated, be a Chief Engineer for Irrigation, and a second for Communications and Buildings; besides one of a lower grade for Railway Affairs. This is merely a return to a system which was in vogue some years ago.

Some person of a calculating turn of mind asserts, as the result of much arithmetical toil, that the State in India has spent, up to the year 1872, the sum of 100,000,000*l*. in making 5,500 miles of railway; 10,000,000*l*. in about ten years in providing improved accommodation for European troops; 3,000,000*l*. in constructing transport vessels to convey troops to and from India, including an iron floating dock to repair these vessels; 10,000,000*l*. on irrigation works; and at least 10,000,000*l*. in erecting Government offices.

According to the *Madras Mail*, elaborate plans are now ready, and will shortly be despatched to the Secretary of State, of the new public offices which are to be erected at Simla. It has taken over three years to decide on the purchase of the site, and will, in all likelihood, take three years more before the plans now sent home will be approved. The question is therefore propounded,—"When that approval is received, how long will it take before the Public Works

Department of notorious slowness succeeds in finishing the buildings?"

Mr. Rice, the Director of Public Instruction for the Southern Presidency, has found among the rock inscriptions which he has lately been engaged in translating one which contains the vows of those ascetics, both male and female, who form such a peculiar feature of Hindoo religious life. They are said to be extremely curious, and will be printed.

It is announced by the *Times of India* that:—"To perpetuate the memory of the late Tukhutsingjee of Bhownugger, his mother has resolved upon erecting a palace of modest proportions at a cost of 15,000 Rs." What a Tukhutsingjee is we have not the remotest idea; but it must be something very important when the fact of being one elevates a 1,500*l.* house to the palatial dignity.

As a piece of Eastern news, we have the authority of the *Pekin Gazette* for stating that the fortifications at Sin-cheng on the bank of the Peiho, between Taku and Tientsin, by which the Chinese imagine that the ascent of the river is effectually barred, are completed. We are told that the work has occupied 10,000 soldiers for three years, and, most curious of all, that it has been achieved at the expense of the men as well as by their hands:—"They have consented to submit to reductions in their pay amounting to upwards of 500,000 taels for the purchase of the material requisite, and thus, without a single disbursement from the Imperial treasury, or calling upon the people to supply a single labourer, this fortress of extraordinary size and strength has been successfully completed." Could patriotism further go, and who would have expected to find it thus developed in the "heathen Chinee"?

A Ceylon paper, writing of the Colombo Breakwater, now in course of construction, says that the root seawall mound has stood the monsoon well. It is 750 ft. long, by 55 ft. broad, by 15 ft. deep, was deposited in 9 ft. of water by tip-wagons, and has absorbed 28,000 tons of rubble. An additional 8,000 tons have been deposited as a backing to the harbour-wall to prevent silting. About 200 ft. of the breakwater-wall have been built, or about a third of the whole; and the manufacture of the concrete blocks needed for the remaining portion of the structure is being carried on vigorously.

A "Northbrook" Hall is about to be erected at Dacca. Nearly 4,000*l.* have already been collected for the purpose. Sir Richard Temple is expected to lay the foundation-stone during this or next month.

A committee is sitting at present to consider the advisability of amalgamating the Irrigation Branch with the Public Works Department proper of the North-west Provinces under the Secretary to Government, the administration of the branches being left to chief engineers. The revenue from irrigation last year was 14 lakhs of rupees.

An Ootacamund paper notes that most of the thatched huts in the Kaity Valley have disappeared, and substantial tiled buildings have taken their place. It says,—"The red and white on the ground, and the blue canopy above, aided by the deep green foliage of the valley, now renders this part of the Neilgherries a perfect picture." Sanitary reformers have long urged the improvement of the villages as the present want of India, and have even advocated the construction of model villages here and there at Government expense to stimulate native rivalry. Voluntary effort of this sort is, however, best, and it is to be hoped that the example of the Badagas will be soon and widely followed elsewhere.

The administration report of the Madras municipality for the official year just closed, says:—"Mr. Clark, the experienced drainage engineer, was engaged for some four months in laying out a drainage scheme; and in the beginning of the present year he submitted his report, with a detailed estimate amounting to 234,800*l.*, for draining Black Town, the Fort, Pursewalkum, Chintadripett, Triplicane, Royapett, and Mylapore; it is satisfactory to be able to state that his scheme has met with the approval of the Government. It is hoped that the next annual report of the municipality will show that at least some progress has been made in carrying the scheme into execution." The *Madras Mail* adds, by way of comment:—"We trust it may; and we hope also that information will be afforded of how the 23¾ lakhs are to be found for the purpose. It seems too probable that the water-supply project, by the time the water is made wholesome, will represent a liability of 20 lakhs, and this sum, added to 23¾ lakhs for the drainage, *plus* a fair allowance for expenditure over estimate, may land the town in the uncomfortable position of owing half a crore of rupees, or 500,000*l.*, without any visible means of paying interest thereon, much less of forming a sinking fund to liquidate the liability in the course of a generation."

LARGE PROFITS ON THE NEWINGTON DUST DEPOT.

The large dust depôt, which the Newington Vestry a few years ago constructed and opened at Walworth, alongside the London, Chatham, and Dover Railway, appears not only to have proved a great success in a sanitary point of view, but has also become a source of profit, whereas before the depôt was established the vestry were put to a considerable expense in removing and clearing away the dust. At the meeting of the vestry last week, Mr. Barker, in moving the confirmation of the proceedings of the depôt committee, stated that at the end of the quarter it was found that 944*l.* 8s. 6d. had been realised by the sale of the dust, and, deducting from that, carriage 586*l.*, and various other expenses, there was a profit of 102*l.* 10s. 7d., or at the rate of 400*l.* per year. Dr. Cortis said it would be satisfactory to other parts of the metropolis to hear of the successful working of this depôt. The dust, setting aside its collection, was practically got rid of for nothing, as he did not estimate the cost of collecting it and bringing it to the depôt was more than the profit. Some members of the vestry having questioned the correctness of this statement, the clerk observed that it was as Dr. Cortis had stated it to be. The profits on the sale of the dust, separated from the sweepings, would clear absolutely the collection of the dust for the year. On this Dr. Cortis said it was a very gratifying result, when other parishes and their difficulties in the matter were considered. St. George's was paying 2,000*l.* per year, and had only half the number of houses. In their own case the contractors first paid for the dust, then they gradually charged for it more and more, and had not the vestry taken its collection absolutely into their own hands, the contractors would at this time have been charging the parish some 2,000*l.* or 3,000*l.* for what was now being practically done for nothing. The figures were, therefore, interesting to others besides the parish of Newington.

GREENWICH UNION INFIRMARY.

This building has been erected from the designs of Mr. William Wallen, architect, for 250 patients, upon a site of about three acres. The façade and general features are characterised by extreme unpretentiousness.

The general plan embraces three distinct blocks, united by corridors, each block consisting of three stories, with the exception of the centre, which has a basement in addition. The central, being the administrative, contains the doctor's, matron's, and steward's apartments, also a dispensary, a room set apart for the minister, and a committee-room; and further to the south, being a continuation of the same block, are the kitchen, scullery, and a detached washhouse. Under the whole of this portion of the building there is a basement, containing offices.

To the east and west are the female and male wings respectively, the receiving and isolated wards abutting on the corridors. The southern portions of both the male and female wings are occupied by the principal wards, each containing thirty-four beds, and measuring 106 ft. by 25 ft. The northern, together with the north-eastern and north-western, portions are devoted to special cases.

The upper floors, as far as these wings are concerned, are planned precisely as the ground-floor plan. Food and coal lifts are provided, also linen shoots. The staircases, passages, landings, and corridors are of fire-proof construction. The lavatories and water-closets are built outside the wards, and united by a necking.

Attention seems to have been paid to the subject of ventilation, for not only is the whole plan subordinate to this matter, the windows everywhere being opposite one another for the purpose of cross ventilation; but in addition to this, air-bricks, with the usual bit-and-miss gratings, are placed under every window, and air-flues are taken from the basement to the roof, with Sherringham's ventilators inserted near the ceiling line. The stoves also have a current of air passing from the outside to a warm-air chamber at the back, which can be introduced into the room at pleasure by turning a handle in front of the fireplace. The hot-water coils standing in the wards have also a current of external air conveyed to them, through pipes under the floor, which, upon coming in contact with the coils, becomes heated, and is diffused throughout the wards. The second-floor wards are further ventilated by ceiling ventilators, taking any vitiated atmosphere that may be left into the roof; and on the ridge are fixed Howarth's ventilators, the principle of which is an Archimedian screw.

The warming of the several floors is chiefly dependent upon the system of hot-water flow and return pipes, although open fireplaces are introduced, with warm air through the rear of the same, as before mentioned.

The pump is fixed over the new artesian well, and is a three-throw crank pump of Messrs. Baker & Son's manufacture.

The washhouse has fittings worked by steam power, comprising Bradford's patent washing machines, and rows of wooden washing-troughs, every alternate one being fitted with a perforated copper pipe, the steam from which boils the clothes; and hot and cold water is supplied to each. Then there are Patent Hydro-Extractors to drain the clothes, and wooden strainers, slate steeping-tanks, and waste or condensed water-pipes conveyed to drains. There is also a gas stove having two large roasting ovens, and hot plate, with rings for stewing and boiling.

ART HONOURS AT DULWICH COLLEGE.

Speech-day and the delivery of prizes at Dulwich College last week enabled the Rev. Dr. Carver, the principal, to make some interesting statements with respect to art studies at the college. He stated that as regarded the drawing and art schools they had been especially fortunate. In the list of last year's distinctions the number of honours gained at the Royal Academy by Dulwich boys was most remarkable. He attributed that first to the ability and energy of the master, now the oldest in standing at the college, and to the connexion of the college with the picture-gallery. Though the influence of the latter might be only indirect, yet that influence, by means of early associations, gave to the boys incentives and inducements to the study of the art, which they could obtain in no other way. After showing the distinguished university honours which scholars and former scholars of the college had won within the last twelve months, he added that they had obtained two studentships (one of them architectural) at the Royal Academy of Arts; the bronze medal of the Royal Geographical Society, four silver medals at the Royal Academy of Arts, and seven gold, silver, and bronze medals for drawing at the Science and Art Department, South Kensington.

THE AGED PILGRIMS' ASYLUM, HORNSEY-RISE.

An illustration of the first portion of this building appeared in the *Builder* for Nov. 12, 1870. Recently, owing to the generous liberality of an old supporter of the Aged Pilgrims' Friend Society, to which this asylum is attached, forty new rooms, a dining-hall, kitchen, and new committee-room have been added. The new rooms are on the "corridor" principle, as referred to in the original description, and provide for each pensioner a sitting-room, fitted with a cooking-range, a recess for a bed, an inclosed scullery, with coal-box filled from the outside corridor, shelves, and cupboard. The dining-hall, reached by covered ways, is for the purpose of enabling the pensioners to dine together occasionally, when the liberality of friends provides the means, and for which the attached kitchen, with service hatch, scullery, larder, &c., provides ample requisites.

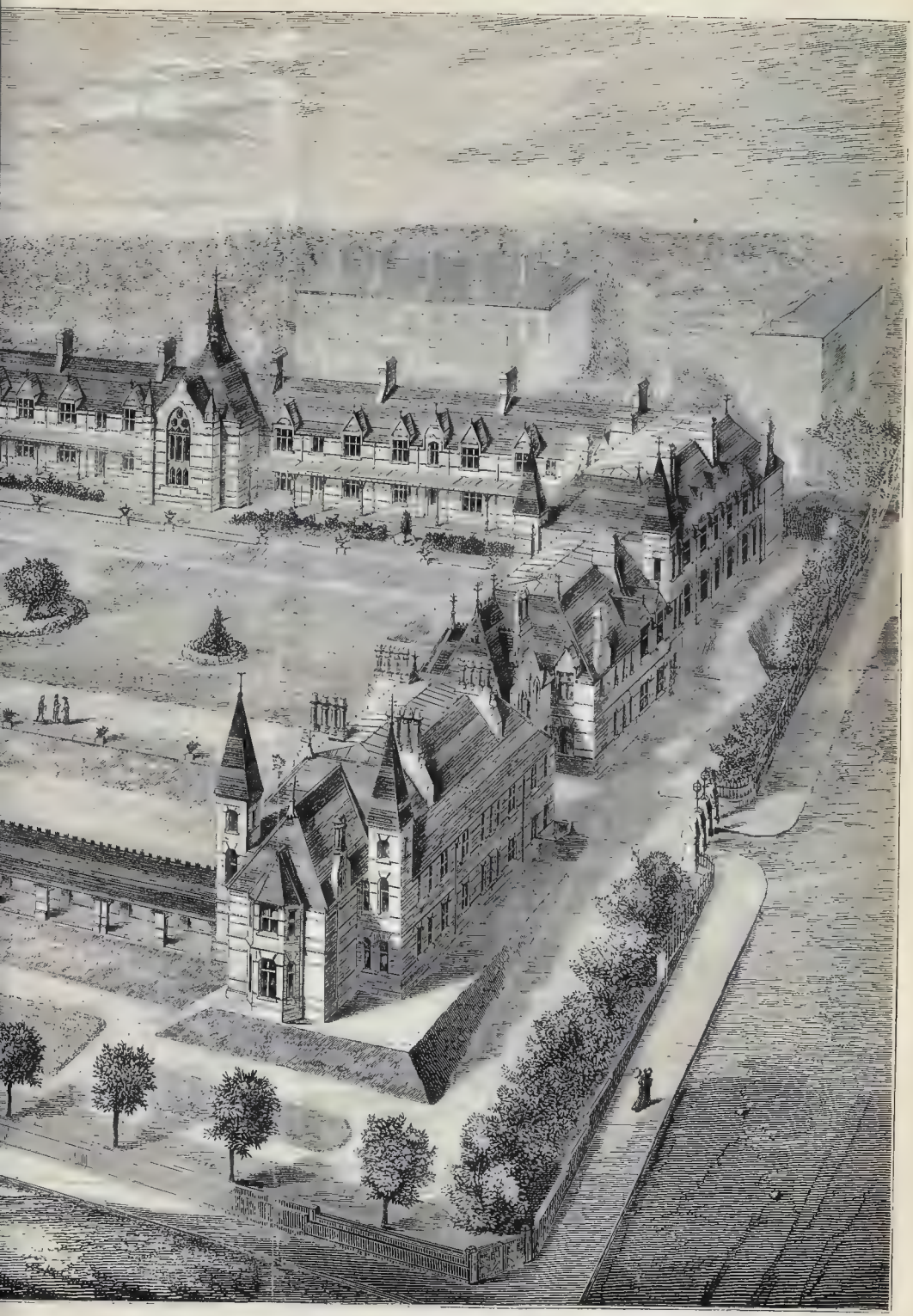
The committee have availed themselves of the occasion of the new works to add, in certain directions, to the accommodation of the original buildings.

The total cost of the buildings (providing accommodation for 120 pensioners), as represented in the engraving, is 19,800*l.*

The first portion of the work was carried out by Messrs. Hill & Sons, and the latter by Messrs. Niblett & Son; the architect in both cases being Mr. F. Boreham, of Southampton-buildings.



AGED PILGRIMS' ASYLUM, HORNSEY R



NDON.——Mr. W. F. Boreham, Architect.

ON THE CONSTRUCTION AND MAINTENANCE OF THE PUBLIC HIGHWAYS*

You are aware that during the past few years various materials have been introduced to supersede stone for paving streets having large traffic and heavy burdens; and though the experience gained by the engineers of London, Liverpool, Birmingham, and Bristol, and other large towns, is of much value, I think we may fairly say that the period of time over which their observation has extended in reference to asphaltes and wood is insufficient to enable them to come to a final conclusion as to the merits of these respective materials. That this is so may be gathered from the very opposite opinions given, nearly all based upon short-timed observation or theories. As to the durability, cost, noiselessness, and slipperyness of materials for roads, there should be no doubt whatever; but these can only be ascertained by actual observation, extending over a period of years, in streets with varying traffic as to number and nature of vehicles and weight of loads, and it would be unwise, most unwise, to reject a well-tried material for others, some of which have been pushed into the market without trial of any sort whatever. On the other hand, it would be unwise to expend large sums of money in laying stone pavements if there are other obtainable materials more suited to paving purposes. I shall therefore suggest that trials be made with certain materials. Previously, however, to my so doing, I will proceed to examine their qualities. For this purpose I have communicated with the engineers of most of the large towns, and have personally visited several. If durability and cheapness only had to be considered, so far as my observation goes there can be no question as to the superiority of granite over all other materials used to pave streets with, more especially if laid so as to form a tram or trackway for the wheels of heavily-laden vehicles to run along. And this opinion is shared by all those who have lengthened experience of the requirements of busy streets; but these are only two of many considerations to be borne in mind. There are also safety to horses, noiselessness, easy traction, freedom from mud and dust. Hence the attempts to supersede the use of granite as a paving material. Probably the desirability of decreasing the noise caused by the vibration of vehicles in business thoroughfares has had more influence than anything else in these attempts to supersede the hard granites, and we must bear in mind that however desirable a perfectly noiseless pavement may be, in some thoroughfares it is a question that we can afford to discard, if purchased at too high a cost, in some streets, where neither the occupations of the inhabitants nor the pedestrian traffic is such as to force this desideratum forcibly upon us.

So far as I can ascertain, wood blocks, squared like granite pitching, appear to meet more of the requirements than any other of the newly-introduced materials, if we are prepared to put on one side the question of cost altogether; though, on inquiry, I find a host of objections urged against its use, some of which are worthy of attention,—the first being its permeability to wet, the separation of its fibres, and consequent absorption of "dung and putrescent matter," which are said to become "highly noxious." Again, it is urged that the blocks are separated by concussion, thus opening the joints and permitting the wet to reach the foundation; the wood thus being constantly wet, in hot and dry weather gives off, in evaporation, very foul matters, which taint the atmosphere sufficiently to injure health. These are allegations difficult of refutation; indeed, by actual observation in some of the London streets I am convinced the entire area of wood pavement is constantly saturated, and that it wears down very rapidly when compared with granite, under the narrow tyres of continuous omnibus and railway-van traffic. How far the objections as to tainting the atmosphere are valid I must leave those who are more competent to judge to decide, and confine myself to its actual cost, durability, and general suitability as a paving material.

In Bristol, one, or a portion of one, of the main streets was laid down, and eleven months after the borough engineer reported that:—"The general appearance and surfaces of these pavements continue up to present time in much the same condition as when laid, but I have caused portions of the Wine-street paving to be removed at either end of the street, in order to ascertain its state, and can find no perceptible difference in the same at either opening, there being no appearance of decay, and the wear of the surface of the blocks is scarcely perceptible, but at the Union-street end of Wine-street the surface-water has percolated through the joints of the wood to the foundation, this has rendered the pavement at this end of the street less rigid, and the constant working by the passing of the traffic over it caused several of the blocks to split or crack, and it is probable will necessitate the relaying of this end of the street before long."

Two years' experience enabled Mr. Ashmead to confirm his opinion as to the leakage of the joints destroying the pavement, for he says:—"Although nearly twelve months have now elapsed since my last report on this subject, the general appearance and surfaces of the pavements in Wine-street, Broad-street, and the Exchange, still continue in much the same condition, nor have the portions of Wine-street (relaid by the company) been much improved thereby, as the surface-water finds its way through the joints, and a larger proportion of the blocks in this street are split or cracked; but the pavements of Broad-street and the Exchange appear to be wearing well, and are more rigid and firm, and free from the defects of the Wine-street pavement. This last paving has now been laid about twenty-three months, and Broad-street and the Exchange about seventeen months.

Writing personally to me, Mr. Ashmead says, "The wood will require repair in four or five years, but the comfort is so great that some people prefer paying for the luxury; but there is nothing like granite for durability and economy." How far we should be justified in laying down certain streets with a costly and luxurious article out of the general rates it is for the local authorities to determine.

The evidence of Mr. Deacon, C.E., the engineer of Liverpool, is to the effect that the pavement laid in Bold-street, in September, 1874, has worn but little.

The borough surveyor of Birmingham says that wood "presents an even surface, affords good foot-hold for horses, is pleasant for riding over, free from noise and mud,—dust, however, rising rapidly; it is capable of being easily cleansed, but, like all other pavements, it is somewhat slippery in certain states of the weather."

I have made observations on the condition of wood pavement in London; they are several, and I have extracted from a recent publication descriptions of them:—

Croskey's Wood Pavement.—Several plans of wood paving have been of late years proposed. One by Mr. Croskey was to manufacture cross-grained planks of wood of any length, which, being placed side by side, are forced together by pressure, so as to form a compact homogeneous surface of wood, which was to be laid upon concrete. This plan does not seem to have been tried, at least in this country.

Harrison's Wood Pavement.—This system consists of a concrete foundation, upon which strips of wood, 2 in. by half an inch in thickness, are laid. Wood blocks 3 in. in breadth, are placed upon these wooden strips, and heated asphalte poured into the joints, which penetrates under and adheres firmly to the blocks.

Henson's Wood Pavement.—The main principle on which Mr. Henson proposes to construct his paving, is placing *felt* on the bed and between the joints, thus giving, as he asserts, an elasticity to the road, and allowing by the felt jointing for the expansion and contraction of the blocks; in one roadway they are levelled on the top edges, in another at every fourth or fifth block. And in another a V-groove is to be cut down the centre of the block, the object of this last being to prevent the surface-water from soaking down the joints to the foundation.

The Ligno-Mineral Wood Pavement, which is laid in Gracechurch, Fore, and Coleman streets, possesses certain peculiarities, and differs from others in that it is mostly composed of hard wood, such as elm, oak, beech, or ash, which has been subjected by hydro-carburetted oils to a treatment termed mineralisation. The blocks, which are 9 in. long, 3 in. wide, and 6 in. deep, are sawn at an angle of about 60 deg., the object of this being to expose the fibre obliquely to the wearing face, and to distribute the weight of the traffic from the one block to those adjacent to it in the line of thrust. On the sides of the blocks, near their bases, a groove is cut, which is filled with an asphaltic mastic (pitch and tar), during the process of laying. The blocks are laid on a concrete foundation, the angle of each course being in an opposite direction to the previous one. The remainder of the joints to the surface are filled in with a grouting of lime and gravel.

Carey's Wood Pavement is perhaps that which can be most rapidly laid down and repaired, and is formed as follows, viz.: the blocks are cut 4 in. wide by 9 in. long, and to the depth of 5 in. or 6 in. according to traffic; these blocks are shaped with alternate convex and concave ends, and are laid on a bed of ballast or sand, averaging 2 in.; the joints which have been left about ⅜ in. wide, are filled with a grout of lime and sand. The advantages claimed for this pavement are, that by the peculiar shaping of the blocks they will not be shifted from their positions; and further, that the weight that may be put on each block is thus dispersed over an extended area.

Messrs. Mowlem & Co.'s method of laying wood paving is to form a foundation of concrete, varying in thickness according to the nature of the subsoil and the traffic; then to pave with blocks of yellow deal, 3 in. wide and 6 in. or 7 in. deep; the joints, which vary from ⅜ in. to ½ in. are filled in with sand and lias lime, and the surface is afterwards indurated by strewing it with shingle.

The Improved Wood Pavement is formed of two layers of 1-in. boards laid transversely and longitudinally on the old road foundation, which is made up with sand or dry earth to the proper curvature; on these boards wood blocks are placed, the longitudinal joints being kept three-quarters of an inch apart by a fillet (which is nailed to the flooring) and the heading joints butting. The joints from the fillet up to the surface of the road are filled in with fine ballast, run with a liquid tar, and caulked with a machine made for the purpose: the road is then strewn lightly with small gravel and is ready for use. The principal advantage claimed for this system is that the flooring of planks forms an elastic foundation, and tends to distribute the weight equally over the whole pavement, while the additional elasticity will lessen the wear of the blocks.

The Asphaltic Wood Pavement.—The mode of laying this system of wood paving is as follows, viz.:—A concrete foundation, composed of blue lias lime and ballast in proportions of one part of lime to five or six parts of ballast, is laid to a thickness of 6 in. and to the correct curve of the road. Over this is laid a layer or bed of mastic asphalte half an inch in thickness, upon which wood blocks are placed in transverse courses with the grain of the wood upwards, a space of half an inch (or more if desired) being left between each course. Into the spaces, or joints as they are more usually called, heated asphalte is poured to a depth of from 2 in. to 2½ in. up the block.

These are the pavements of wood, tried in London and elsewhere, and one cannot but be struck with the fact that only one attempt has been made in the metropolis to preserve the timber chemically, by such processes as Kyan's, Burnett's, Renwick's, or Boucherie's.* In my inquiries I have only found another instance where any such attempt has been made, and that is at Sunderland. Here I find, from a report of the borough surveyor, dated 17th December, 1875, that as far back as October, 1867, a strip 6 ft. wide was laid with creosoted Baltic red wood; a strip of 3 ft. wide with creosoted beech; and a strip of 6 ft. wide with uncreosoted oak; and it appears that after eight years, with a daily traffic of 1,300 vehicles, the total cost of repair was 101*l.*, which was equal to a cost of 6½*d.* per superficial yard. For the last five years, in those portions where the creosoted Baltic and beech, and uncreosoted oak were laid, no repairs have been necessary. The average vertical wear of the entire pavement has been ⅜ of an inch, the Baltic has been ⅜ of an inch, the beech ⅜ of an inch, and the oak has not appreciably worn at all. The creosoted timbers are said to be harder than when first laid; the beech and oak are spoken of as being too hard and slippery. The surveyor says that the use of creosoted setts dispenses altogether with the cost of watering. This deduction is questionable, though the results are certainly the most favourable I have obtained, both as to wear and cost of wood pavements.

The method of laying a wood pavement by

* By Mr. Ellice-Clark. See p. 764, *ante*.

* Kyan saturates the blocks with a solution, a bichloride of mercury; Burnett with a solution of chloride of zinc to be absorbed in a vacuum; Renwick boils the blocks in coal tar; and Boucherie uses impure pyrolignite of iron.

having longitudinal and transverse boards beneath for a foundation, is, to my mind, a faulty one. In the first place, by personal observation, I have seen a heavily weighted vehicle produce a depression of an inch as it passed along the pavement, which sprang up to its original form as the burden left it. Again, the "elasticity" which is claimed to be an advantage is, to my mind, the reverse. If the pavement sinks beneath the load it has to carry, it is like having a surface of indiarubber; with this depression an inclined plane of 1 in 7 is formed with a wheel 4 ft. in diameter, and one-seventh of the load must be raised this inch, and this is continually going on with such a bottom. It is next to an impossible thing for the numerous joints in the area (a diameter about 18 in. under 3 tons) thus affected by each wheel to remain watertight, be they made with asphalte or pitch, and the water must pass through them on to the planking below, which, sooner or later, must be rotted. These open joints in the end must wear the edge of the blocks round,—a fact I noticed in Birmingham, on close examination, which caused a most unpleasant vibration as a light springed vehicle crossed them.

I am certainly at a loss to understand this insistance of some surveyors for elasticity in a paved road, unless it be for the preservation of the horses' feet, which do not last so long on the "stones" as on a softer road. As for the mechanical effect of traction, it is totally opposed to all laws of mechanics for easy traction; and McAdam's theory, of the top stones rubbing against a concrete bottom, and thus wearing round, and being displaced, and from whence I imagine the present desire for elasticity comes; as the top pavement is a fixture,—is untenable. I think it might be laid down as a rule that the harder the bottom of a road is the better, whether for wood, asphalte, granite, or broken stone, and if you do not start with this initial you will never have a sound roadway. The difficulty to be overcome appears to be in keeping the wet from percolating through the joints, which are made wide so as to give a better foothold for horses. I think it is a questionable mode of laying pitchers, whether of wood or stone. I prefer having the joints closer than I have hitherto seen them for wood; first, because there is less chance of the water finding its way to the foundation; secondly, these joints always wear away quicker than the blocks, leaving innumerable places for the lodgment of horse-dung and filth; thirdly, the traffic wearing the pitchers round. A demonstration of this can be found easily. A small joint, so long as it is a perceptible joint, is a preventive to slipping, and enables a horse to rise if it falls.

There now remains an examination of asphalte as a material for paved roads.

The most noted of these is that of the Val de Travers Company, which is described as limestone, containing about 12½ per cent. of bitumen, obtained exclusively from Neuchatel, Switzerland. It is claimed for it that neither "atmospheric heat nor frost affects it." In laying it for roads, it rests on a bed of concrete sufficiently thick to stand the traffic. The asphalte in its natural state, reduced to powder, is brought to the works hot, and compressed with heated irons and rollers uniformly over the entire area to be covered, leaving no surface seams or joints. It is laid about 2 in. to 2½ in. in thickness.

The next asphalte that has attracted attention is that termed Limmer. This, like the previous material, is laid on concrete. It is brought from Hanover; mixed with a certain proportion of sand and bitumen (the company say that the asphalte contains from 17 to 20 per cent. of bitumen); heated in caldrons and laid on to the concrete about 2 in. in thickness, and then is smoothed with irons to the requisite surface.

There are several other asphaltes that have been tried, but only to a limited extent, except, perhaps, Barnett's, which appears to be a mixture of pulverised iron ore and mineral tar made liquid by heat, and spread as the other asphaltes, about 2 in. thick.

The battle of the materials is almost as fierce as the "battle of the gauges." The promoters of asphalte and wood pavements both claim the same merits, and there appears to be a diversity of opinion amongst those competent to judge, as to which is the better material of the two. The engineer of Bristol says,—"My experience of asphalte is not large nor favourable: the first cost of Val de Travers was 16s. 6d. per yard, but it has not lasted here more than six years, and is now in a very bad condition; the wood will require repair in four or five years."

No asphalte is to be laid in the Birmingham roadways, as the gradients are so unsuitable.

As a material for footpaths, Mr. Till, C.E., the borough engineer, says,—"I cannot speak favourably of its durability."

The City of London engineer, Mr. W. Haywood, C.E., has prepared an elaborate report on the subject, setting forth in detail the result of his experience of both wood and asphalte; and as no one has either had such opportunities or facilities to come to fair conclusions in the matter, I extract these conclusions *verbatim* from his report. They are,—

"1. As regards convenience.—That asphalte is the smoothest, driest, cleanest, most pleasing to the eye, and most agreeable pavement for general purposes, but wood the most quiet.

2. As regards cleansing.—That wood may be kept cleaner than it hitherto has been, but will be more difficult and expensive to cleanse effectually than asphalte. That as both pavements require occasionally strewing with either sand or gravel, there is not much difference between them in that respect.

3. As regards construction and repair.—That asphalte and wood, taking all seasons and all weathers into account, can be laid and repaired with about equal facility, but that the smallest, neatest, cleanest, and most durable repairs can be made in asphalte.

4. As regards safety.—That whether considered in reference to the distance which a horse may travel before it meets with an accident, or the nature of the accident, or the facility with which a horse can recover its footing, or the speed at which it is safe to travel, or the gradient at which the material can be laid, wood is superior to asphalte.

5. As regards durability and cost.—That wood pavements, with repairs, have in this City had a life varying from six to nineteen years, and that with repairs an average life of about ten years may be obtained; that the durability of the asphaltes is not known, but that under the system of maintenance adopted, they may last as long as wood; that contrasting the tenders for laying and maintaining for a term of years the two best pavements of their kinds, wood will be the dearest."

We must remember that Mr. Haywood is speaking of ordinary fir timber unpreserved in any way. Probably his opinion would be materially altered if he was aware of the durability of the creosoted timber in Sunderland.

Mr. Haywood, in reporting on the comparative safety of these materials, says that a horse would travel 132 miles before a fall took place on granite; 191 miles on asphalte; and 446 on wood. This is the experience of London streets; but we cannot be guided by that in Derby. It is the practice in London to move all railway vans, and a large proportion of heavily-weighted vehicles, at a trot. With us such vehicles are transported at a walking-pace, and as accidents increase *pro rata* with the speed and load, we should not be liable to anything like so many.

My own comparisons of these materials are that for a very large number of streets where the roadway is fairly wide, where there are few shops, and where the occupation of the inhabitants is such as noise would not be a great objection, granite is the cheapest and best material that can be used. That in streets of business, where absence of noise is a desideratum, preserved wood paving is the best, though it is expensive. That asphalte is an impracticable material to use in our town, where it would frequently have a greasy surface, unless there is some means of making it less slippery in damp weather. I have had submitted to me a model by the Val de Travers Co., which shows an introduction of small iron studs on the surface, with asphalte between; but my experience goes to prove that the mixing of two materials differing so essentially in their toughness and hardness is quite wrong; that the studs would in a few years be left so high by the wear of the asphalte as to be dangerous, and I cannot recommend you to lay any large area with this, though the Val de Travers Co., of Birmingham, are willing to lay a trial piece and charge nothing if it is not successful, and it would only be fair to give them a trial.

Royal Architectural Museum.—The Royal Academy have voted 100*l.*, and the Clothworkers' Company twenty guineas, towards the special fund now being raised by the Architectural Museum, Westminster, in aid of its School of Art, &c.

THE CHOIR OF ST ALBAN'S ABBEY.*

It is upon the choir, beside the great altar of which John of Wheathamstede rests, that I have to speak. That most noble choir, surmounted by the grandest of ancient lanterns, is now, I am thankful to say, at length in a state of safety, and it may be hoped that in the future it will become one of the finest cathedral choirs in the kingdom, while its restoration on its old lines will make it most interesting to antiquaries, as the only perfect reproduction of the Benedictine arrangements once so common in our large churches, which, through modern alterations elsewhere, can now be seen. While it seems little short of providential that the great church of St. Alban should have kept its roof on during all the troubles through which it has passed, it is truly wonderful that here only, as far as I know, is there continued perfect the ancient arrangement of the screens. I have actually heard persons advocate the destruction of the western screen of St. Alban's choir, and so the turning of this noble church into one great tunnel, but as this is work for a mining engineer, and not for church architects, we may dismiss this question entirely at the present moment, merely pausing to say that, by means of this screen, the great church is divided into two noble and available churches, one for cathedral and the other for parochial use in any future arrangement. It appears to have been general in Benedictine churches to bring the choir screen forward several bays into the constructive nave, and to use the great transept as the choir transept; this was a very grand arrangement, and may be seen at Westminster, Winchester, Norwich, and several other great churches of note at the present time, so far as the actual limits of the choir is concerned; though none possesses *in situ* the perfect westward termination of the choir indicated by the screen at St. Alban's. In many of the cathedrals, such as Salisbury, Lincoln, and I may add on a small scale at Rochester, the present, as well as the original, site of the western choir-screen is across the eastern arch of the central tower. In all these cases, however, the church is an original cathedral church, and we find a separate choir-transept provided distinct from the great transept of the church; but in Benedictine arrangement the great transept itself is included in the choir arrangements, to which, with its lantern, it proves a noble addition. There could never have been any serious doubt about the correctness of this arrangement at St. Alban's. Now, most happily, in the preparations for laying the new floor of the choir the exact original ground-plan of its fittings was discovered, and all question as to the lines of its future construction set at rest. I shall hope to show you to-morrow, in the choir itself, the exact position of the stone foundations for the stalls and tabernacle work, as they were discovered on the removal of the modern floor. These foundations exactly explain what has never been hitherto exactly understood. They show what is meant by the apparent double-screen arrangement shown to the westward of the choir of Peterborough in Bridges's plan; they show why the western face of the present screen of Winchester was left as it was left, till, eighty years or so back, it was cased with modern stonework, which has now given place to modern woodwork, which, had the double screen remained, would not have been required; and, in fact, these discoveries give us on the spot the exact ground-plan of the west end of a Benedictine choir. The stall foundations of St. Alban's choir were found to begin at the easternmost piers of the great central tower, to cross the north and south arches of the lantern, and to be continued over the pier arcades towards the west to within one arch of the present rood-screen; at that point the foundations were returned, giving space, as it appeared, for a stall north and south for the abbot and prior of the establishment. There was thus provided the vestibule of which I spoke at Northampton in commenting upon Bridges's plan of the ancient Peterborough choir, a kind of ante-chapel, as we should say, comparing the vast chapel of a great monastery with a college chapel of present days, probably kept as a procession path, at all events forming a valuable and convenient approach both from the cloisters to the south, and for such of the officiating clergy as had to enter the choir from the nave-altar on the west side of the rood-screen. But con-

* Substance of a paper read before the Architectural Society of the Archdeaconries of Northampton and Oakham, at St. Alban's, on the 19th of July, by the Rev. Owen W. Davys.

venient as was this ante-chapel, so to speak, and necessary for adaptation in any future arrangement, we must look for the noblest effect in the ancient, as it will undoubtedly be in the modern choir of St. Alban's to its eastern end; there, unencumbered by woodwork, stood, and stands, a noble sacrarium. A screen, similar in character to, but surpassing in size, those of Winchester and the beautiful Hampshire Christ Church, a screen which, I need not say, I do not like the less because Abbot John seems its original architect, with a central space for a silver cross, long stolen, and elaborate ornaments now much defaced, formed such a reredos as never was before designed for the principal altar of this church. On its right and left are placed elaborate shrines, a miniature king or Henry VII.'s chapel, to the memory of Abbot Ramryge on the north, while on the south an appreciative successor marked his veneration for John of Wheathampstead with a richer shrine than John had designed for himself in the south aisle of the presbytery, and while he laid his body to rest on the right hand of the altar, failed not to bestrew his tomb with the wheat-ears of his native valley, and to garnish it with the departed abbot's favourite legend, "Valles habundabunt." This great altar-screen then, and its flanking shrines, formed in the past, as they do in the present, the great eastern termination of St. Alban's choir, leaving a noble space now happily clear, and laid with original brasses, and other monuments of great antiquarian value and historical interest, among which will shortly repose, I trust, on its original site, the largest and most elaborate brass in England,—the great and well-known brass of Abbot Delamere. A noble flight of steps, laid to the original levels, leads from the lantern up to the sacrarium; and the grand vault of decorated wood above, with John de Hertford's and his successor's exquisite, though simple, clearstory, completes a work once unrivalled. The roof of the sacrarium was always, with its beautiful decorations (the work of Abbot John again), open to view, but a great discovery was lately made of the roof over the western arm of the choir. On this, as my friend—a colleague in the secretaryship of the St. Alban's Architectural Society,—Mr. Ridgway Lloyd has lately read a paper before us, which is now in course of publication, and will point out its features on the spot, I hope, to-morrow, I need not now say more than when the uninteresting boards of the roof, as they then appeared, came to be cleaned, rich panels appeared, beautifully decorated, and most appropriately so for a great choir, with the verses of the *Te Deum*. I have thus far limited myself to ancient arrangements, and recent discoveries, in the choir of St. Alban's, but I cannot close my paper without recollecting that as St. Alban's, we trust, will now, with very little further delay, become a cathedral, it will be necessary soon to construct upon the ancient monastic lines a modern cathedral choir. Now, in talking of monastic lines, and Benedictine arrangements, I have no fear of being misunderstood by the members of those joint societies whom I have the honour of addressing, but it may be needful to guard against misapprehension out of doors, for I really believe that such antiquarian terms receive sometimes a very modern interpretation, and that a restorer of St. Alban's, who admits them into his vocabulary, might be held, by certain persons, as desiring an immediate importation of a Benedictine abbot and monks into their old quarters. I need not say that I have no such project in view; an arrival of excellent gentlemen of that description might enliven the town, but I do not think that they would be the men to promote its best welfare; the Abbot of St. Alban's might be its valued ruler once, but his glory has departed to return no more. The abbot and monks declined; it will be necessary for the future working of the choir of St. Alban's to have a choral, possibly a collegiate staff, and therefore on a provision for the accommodation of such a staff, when it can be appointed, let me make a few concluding suggestions. Nothing would work better, I am convinced, for a modern church arrangement here than the reproduction of the ancient ground-plan of this choir. The western vestibule, or ante-choir, of which I have spoken, would form a convenient and effective approach to it; to the north and south of this ante-choir, the organ, divided, as at Westminster and St. Paul's, should be suspended, the keyboard being attached to one of the sections, and the connecting action carried under the floor; the effect of an organ thus placed would be not only musically good, while, architecturally, it would not cut the central view from the nave to the choir, but its convenience and economy is obvious, one instrument thus serving for the services of both the choir and the nave. The return stalls at the west end of the tabernacle work might serve, as at Ely, for the bishop and the head of the collegiate establishment respectively, who will doubtless be at first identical with the rector of the church; the remainder of the stalls, with tabernacle work, which might be carried on to the westernmost piers of the central tower, being appropriated to the other members of the collegiate church establishment, including the honorary canons, the minor canons, and the precentor. It would seem practically admirable, while carrying on the stalls themselves to their original boundary at the eastern piers at the central tower, not to continue the tabernacle work above them. That this tabernacle work was originally so continued, and that the choir of monks filled the whole, is evident, not only from the recent discoveries made, but by the record of a miracle, as supposed by the chroniclers, whereby the second big bell, Albinus by name, having burst from its holdings, was marvellously kept from falling on the heads of the monks in choir assembled by the apparently feeble help of two broken beams. Doubtless, then, the large monastic choir of St. Alban's filled the whole space indicated by the recently discovered stall foundations. But it need not be so now; for a choir charged with the celebration of the cathedral service of the English Church the space westward of the cross would be ample, while the transepts would be available for congregational use, as at Westminster, at times when the space proper for the choir was found to be insufficient. To the eastward the grand sacrarium would afford a structure unrivalled for the great offices of the Church, especially for the ordination of her ministers. Much has to be done at St. Alban's, and the agencies to do it are at present most insufficient, more money and more men both being wanted. When money has been found to restore the stalls of the choir, money will be still wanted even for the barest remuneration for the services of the men to be put into them; and while we are talking of the choir, the nave is said to be falling. As the noblest and most useful buttresses to the base, would that the cloister could be restored, and adapted with its refectory and adjacent buildings as a training college for schoolmasters, like St. Peter's College, Peterborough; we could then show our friends from Peterborough diocese next time they come, not only, I trust, a restored choir, but a body of singers therein to be valuable hereafter, not only to St. Alban's, but the whole church, who with their superintending clergy, and perhaps some few others, might form the choral and collegiate staff which the new cathedral would require. This suggestion I cannot but think is practicable, as it would be found most useful to the new cathedral and diocese; and it need not exclude the project of a divinity college, of the idea of which some have already spoken. But while education is in every man's thoughts, and while an increase in the number of suitable training colleges is more and more demanded, what better opportunity could be embraced for securing one for the new diocese of St. Alban's by the side of its own cathedral? But I must not further venture to pierce the veil of the future; in the hands of Sir Gilbert Scott, to whose skill we must mainly look for the reproduction of the stall-work of St. Alban's choir, I feel sure that its arrangements are safe: to the wisdom of the great Orderer of future events we must devoutly entrust those further efforts which may cause the great choir of St. Alban's daily to resound with noble praises, rising to heaven from one more cathedral.

THE LAMBETH SCHOOL OF ART.

The distribution of prizes in connexion with the Lambeth School of Art took place last week, at the Society's premises, Miller's-lane, Kennington, the Rev. Canon Gregory presiding. The several prizes were awarded for productions in drawing, together with models and pottery designs of a varied character. Mr. Yeames, A.R.A., in the course of an address to the students, said that men who had thought about works of art laid great stress on students who wished to become artists practising composition as a means of developing their inventive and imaginative faculties. They must have ideas to express when they began a work, and the greatest proficiency would not give them an atom of idea unless they jotted down things which struck them in nature. As a means of developing the imaginative faculties, he advised the students to sketch from memory any attitude that might strike them in the street or in their houses, groups that they might often see talking together, with the landscape behind as a background. By constantly doing this they would soon have an accumulation of facts, and find no difficulty in considering any subject they might feel disposed to choose. The various prizes having been delivered, Canon Gregory next presented a testimonial to Mr. Sparkes, who has been teacher at the school during the last twenty years, but who has now become head master of the schools at South Kensington. Before presenting the testimonial the Canon observed that the school was not merely a theoretical school, as evidenced by some of the subjects for which prizes had been gained, but it was also practical, teaching people to direct the talent they might possess in an artistic direction to stimulate a love for beauty for its own sake, and to cultivate a taste for the beautiful in art. By so doing, he thought they helped to advance the civilisation of the country, and to develop that taste in many people who knew not what art was in its abstract form. Referring to Mr. Sparkes, he said they were all extremely grateful to him for not severing his connexion with them now that he had become head master of the schools at South Kensington. He had the greatest pleasure in presenting the testimonial as a proof of the regard and respect in which he was held by the school. Mr. Sparkes, in acknowledging the testimonial, said he should always take an interest in the welfare of the Lambeth School of Art.

"MODEL HOUSES ASSOCIATION."

A Vice-President of this Association wishes to know why we did not mention their last annual meeting, which took place on the 26th of July. He says "we had a bishop in the chair (Bristol), a prince of the other church (Manning) to speak for us, and a distinguished sanitary doctor to back him up. The Duke of Cambridge is our president, and we have a wonderful list of vice-presidents." That is just it. They *have* a long list of vice-presidents; and for a year or two past we have seen constant announcements in the newspapers of how this or that distinguished individual has joined the society, and of what great things the society was to do. We examined the balance-sheet distributed at the meeting in question, and have looked at some of the "model" property, and, truth to tell, have no compliments to offer to the managers. The actual good result of the large amount of money spent on officials, and of the continual trumpet-blowing, is altogether incommensurate. We are disposed to believe that any clear-headed individual in a purely commercial way could have done what the Association has done, without loss, and without calling on the public for a shilling.

LLANTONY ABBEY.

The Worcestershire Naturalists' Field Club visited Llantony on the 11th ult., when Mr. E. Lees read a paper "On the History of Llantony Abbey," from which the following particulars are gleaned:—

According to ancient legends, St. David, the uncle of King Arthur, and patron saint of Wales, wandering hither, became so delighted with the spot, as congenial to meditation, that he built a chapel in this sequestered recess, and settled down as a hermit. The poet Drayton says of him in his "Polyolbion":—

> "He did not only drink what crystal Honddu yields,
> And fed upon the leeks he gather'd in the fields;
> In memory of whom in the revolving year
> The Welshmen on his day that sacred herb do wear."

The chapel was abandoned after St. David's death, but in the reign of William Rufus, the Norman, when Hugh de Lacy, Earl of Hereford, was hunting in this direction, one of his retainers chased a deer to the ruined chapel, and, struck with the sanctity of the place, became, it is said, so impressed, as to resolve to abandon the world and all evil deeds, and make prayer his business in this solitary glen. Hermits were esteemed for sanctity in those days, and some time after, this retainer of Earl Hugh was joined by a priest named Ernesi, a chaplain to the Queen of Henry I. They then united their influences upon the piety of the earl and the queen, and persuaded them to found a priory at this spot for regular canons of the Augustine order, and this effected, Ernesi became the first prior, in

A.D. 1103; but a strange history followed. During the wars of King Stephen's reign, the Welsh, always ready for mischief, attacked the exposed monastery and pillaged it. The monks fled in dismay to Gloucester, which, finding a pleasanter place for comfort than among barren mountains, they got pious friends to aid them, and instead of returning to their mountain home founded a new monastery at Gloucester, which they also, called Llantony, to save appearances, and some relics of which yet remain. After a time, however, they sent a prior and four monks to repossess the old place; and here, also, any members of the Gloucester fraternity who, for "irregularities" from the monastic rule deserved penance, were exiled to live on herbs, bread, and water. Mr. Lees humorously suggested that if some of the present company had been monks at Gloucester in those good old times, perhaps some little "irregularity" on their part might have caused them a pilgrimage to Llantony. The buildings here must have been renovated after the Welsh attack, but as the abbatial remains show a mixture of the Pointed and Norman styles, they are evidently of Transition date, and were, therefore, completed before the Norman style was entirely disused. The Abbey Church is cruciform, and though not of large dimensions, was admirably proportioned, its length from the western door to the eastern extremity being 212 ft., the breadth 50 ft., and the length of the transepts from north to south 100 ft. The structure is at present in a very ruinous state, but the nave shows a double row of elegant pointed arches resting upon massive piers that separate the side aisles, while above is a triforium of circular arcades. The roof has fallen in long ago, and the choir is entirely demolished, but two lofty arches still sustain a massive portion of the square central tower, that must have been once a noble object rising in this lonely valley. The transepts also remain, showing that they were lighted by narrow round-headed windows. The west end has a remarkable appearance, exhibiting the relics of two towers, which may have been constructed with a defensive view, as the monastery was so near the Welsh border. The southern tower has been utilised in connexion with a modern dwelling-house, and converted into bed-chambers very neatly fitted up, and tempting to a tourist to repose in after a tiring mountainous ramble or a day's angling in the adjacent clear and rapid river. Mr. Lees closed his paper by quoting Southey's descriptive lines intended to be inscribed on a monument in this mountain-environed vale of Ewias:—

"Here it was, stranger, that the patron saint
Of Cambria pass'd his age of penitence,
A solitary man; and here he made
His hermitage: the roots his food, his drink
Of Honddy's mountain stream. Perchance thy youth
Has read with eager wonder how the Knight
Of Wales, in Ormandle's enchanted bower,
Slept the long sleep; and if that in thy veins
Flows the pure blood of Britain, sure that blood
Has flow'd with quicker impulse at the tale
Of Dafydd's deeds, when through the press of war
His gallant comrades followed his green crest
To conquests. Stranger! Hatterel's mountain heights,
And this fair vale, Ewias, and the stream
Of Honddy to thine after-thoughts will rise
More grateful, thus associate with the name
Of Dafydd, the wild deeds of other days,
And desolate Llantony's ruin'd pile."

TECHNICAL EDUCATION AT THE CRYSTAL PALACE.

On Saturday last the summer term of the Crystal Palace School of Practical Engineering was closed by the presentation of certificates to the successful students in the south tower of the Palace, in which their workshops, drawing-office, and lecture-room are situated. Prior to the presentation of the certificates, the drawings and work of the students were examined by a large number of visitors. These were of the same character as those exhibited on former similar occasions, and have been already described in the *Builder*.

On Saturday last, an exception to the state of things indicated, and an interesting novelty, was presented by the students in the new Colonial section now in operation in connexion with the school. For ten days previously to the break-up the students had been "camping out" upon an island in the Geological Lake in the palace grounds, and had erected between the island and the bank of the lake, a very strong double lever spar-bridge, with a span of about 40 ft., and a planked roadway 9 ft. wide. The bridge and camp greatly interested a large number of visitors by whom they were inspected, among whom we noticed Mr. Edward Woods, member of Council of the Institution of Civil Engineers; Messrs. J. H. Tolme, C.E., and G. E. Gavey, C.E., F.G.S., students' examiners; Colonel Pasley, R.E., Admiralty Director of Works; Major Suars, R.E, Mr. R. Jacomb Hood, C.E., &c. The camp accommodation consisted of a conical tent for sleeping in, and a small marquee for victualling; the fire-place was provided by a hole in the earth, lined with a few bricks, on which the fire-bars rested, the draught being caused by a short chimney built with sods. The camp larder and beer-cellar was such as is not likely to be readily met with by colonists—the capacious and airy cavity in the image of a mastodon close by. In addition to the bridge itself the Colonial students had made a very good model of it on a scale of 1 in. to the foot. Although made of very slight materials, the model bore, without sustaining injury, the load of a 56 lb. weight upon the centre. Accompanying the model was a well-executed working drawing of the bridge, and a written description of the method of construction. These were, we believe, by the leading student in this section, Mr. Howard Newton, formerly an officer in the 1st Middlesex Engineers. The other work of the students in this section embraced some very good carpentry in dovetailing, mortising and tenoning, mitreing, &c.; also, a water-wheel, and a number of large-scale models of framed houses, with two rooms on each floor; area, 30 ft. by 20 ft., with a lean-to 12 ft. square. Bound doors, plain, and French windows glazed, are provided complete. The frame work is covered with weather boards. In addition to the work in the colonial section, some other novelties were presented in several very fair original designs for bridges of 15 ft. and 20 ft. span respectively, the span being all the information supplied to students.

During the last term there have been fifty-nine students in attendance, including eighteen in the civil engineering section. The number of students has increased continuously since the school was opened. Mr. Edward Woods presided at the meeting after inspection, and presented the certificates. Mr. Shenton, superintendent of the Science and Art School, read the examiners' report to the directors, which was of a highly satisfactory character. It appeared that thirty-four students had attended lectures during the term, that twenty-four of these had obtained a sufficient number of marks for lecture questions to be eligible for examination on "Railway and Dock Work." Of the twenty-four, certificates were awarded to twenty, each of whom had a certificate for drawing, or other work, the speciality of his term. A. B. Black was first, with 199 marks, out of a possible 232, with another certificate for work in the fitting-shop; A. T. Bean second, with 195 marks, and first for general surveying and preparation of plans for Parliament. The marks of the remaining eighteen students ranged from 178 to 101. In the drawing-office ten certificates were awarded,—A. Jones, first; G. S. Firth and H. Wollaston, equal seconds. In the pattern-shop and foundry ten certificates,—S. R. Locock and H. V. R. Read, equal firsts. In the fitting-shop, twelve certificates,—E. R. Royston, first; L. Wilson, second. In the civil engineering section, first term, eleven certificates for general surveying, &c.,—A. T. Bean, already mentioned, first; F. S. Richardson, second; second term, for calculation of strains and the preparation of general and working plans, specifications, and estimates of a railway and dock, seven certificates,—H. E. Read and H. S. Vogan, equal firsts.

THE MARGATE AQUARIUM SKATING RINK.

The skating-rink at Margate, in connexion with the aquarium and concert-hall about to be erected at this popular watering-place, has been formally opened with much ceremony and a large number of spectators. The site of the rink is at the Fort-green point of the land reclaimed by means of the sea wall. It is partly open and partly covered in, and the entire area contains 25,000 feet. The portion under cover is about 180 ft. long by 60 ft. wide. The floor is constructed of the Wouldham Company's Portland cement, and in order to prevent any unpleasant dust odour arising, the floor is to be flooded every night, and the water to be let off again early in the morning, ready for skaters during the day. It is stated that by this means an even and hard floor will be maintained, and that the more it is worn the more highly polished the surface will become, the powdering of the cement and the consequent clogging of the skate-wheels being obviated by the flooding process. At one end is the orchestra, and at the other end refreshment and dining rooms. On the north side of the covered portion of the rink is a lounge for the accommodation of spectators. The rink has been constructed from the designs and under the superintendence of Mr. A. Bedborough, who is also the architect for the aquarium buildings, which it is expected will be completed and ready for opening in about twelve months.

THE MIDLAND RAILWAY COMPANY'S NEW SHIPPING DEPÔT AT BLACKWALL

CONSTRUCTION OF WHARFS AND WAREHOUSES.

The Midland Railway Company are about to construct extensive new works on the banks of the Thames at Blackwall, for the purpose of carrying on the export and import shipping trade in connexion with their ordinary railway traffic between the districts of Lancashire and Yorkshire and the metropolis. For this purpose they have just purchased one of the large ship-building yards at Blackwall, on which they intend to form a shipping dock and river outlet, together with the construction of other works and buildings for carrying on this new branch of marine traffic. The shipbuilding premises which they have purchased nearly adjoin those of Messrs. Wigram & Co., and are upwards of seven acres in extent. The last vessel built there was launched some weeks ago, and within the last few days the company have obtained possession of the property, which is immediately to be converted for its future intended use. The works which the company are about to execute include, in addition to a water area and river outlet, a new river wall, with wharfs for loading and unloading purposes, and the storage of merchandise, together with sheds and warehouses. Several lines of rails will also be laid down in connexion with the company's main line, which will admit of the railway wagons coming direct alongside the vessels within the depôt for the purpose of loading and discharging goods. The company intend to obtain access to the river and depôt by the construction of branch lines from the Midland Company's main lines to form a junction with the North London Company's railway, and thence with the Black-wall line.

THE TOWN-HALL, BIRMINGHAM.

Extensive alterations and decorative works have been carried out at the Birmingham Town-hall, in view of the forthcoming musical festival. In the basement adequate cloak-room provision has been provided for both ladies and gentlemen, and to effect this object two additional flights of steps have been constructed,—one on the right hand and the other on the left. The partitions which form the cloak-rooms can all be removed, so as to leave the basement clear for other purposes should it be required. The approaches to the orchestra, especially that at the Ratcliff-place side, used on the occasion of concerts by the principal performers, have been widened, and for singers waiting a "turn" or *encore* a small additional green-room has been provided. The staircase leading to the upper seats of the orchestra has been widened. With regard to the lighting of the hall a great improvement has been effected. The old gas-pipes, which have been in use since the building of the Town-hall, have been removed, and a new service laid. An extra special service can also be laid on when occasion requires. The three chandeliers which depend from the ceiling have been lowered 18 in., and gilt brackets have been affixed to the walls. It has also been sought to improve the ventilation of the hall. The work of decoration was not entrusted to a professed decorator, but the designs were drawn by Messrs. Martin & Chamberlain, architects, and, under their superintendence, carried out by Mr. Seers, of Broad-street.

Regardless of the voices of the singers, the pitch of the organ in the Town-hall has (according to the *Birmingham Gazette*) been sharpened three times since it was built, to suit the continual raising of the pitch of the instruments in the orchestra. The remonstrances of the great vocalists have, however, at last had the effect of bringing about a much-desired change.

The instruments and the organ will, at the forthcoming festival, be at a uniformly lower pitch than on previous occasions. Sharpening the pitch of the organ was a somewhat simple operation, as the pipes had only to be cut shorter, but, to lower it, nearly all the principal pipes had to be lengthened, each metal pipe having a tube of the same calibre and quality soldered on its top. All pipes under 1 ft. in length were transposed by introducing a new pipe of 1 ft. in length, and by taking away the top note. The number of metal pipes alone thus pieced is 1,349. There are also new centres to levers of manual actions, the brass wire having decayed. The 32-ft. diapasons and trombone are completed to the top of the register. Messrs. Hill, of London, the builders of this magnificent organ, presented Mr. Boesward with the pipes, &c., for this part, in order to ensure the same quality of tone throughout.

THE NEW COUNTY ASSIZE COURTS, NOTTINGHAM.

The new County Assize Courts at Nottingham, to which we made a brief reference recently (p. 746, *ante*), have been completed and opened. As to the Criminal Court, we learn that it was laid down by the Visiting Justices as a governing principle that, whilst every consideration was due to the public, yet that the court was erected for business purposes, and therefore the convenience of the executive was the chief consideration, and this idea has been throughout insisted upon by the Visiting Justices. Acting upon it, a table of adequate dimensions occupies the centre of the court: on one side of it are seats for the leading counsel, with rising tiers of seats for the juniors, whilst immediately behind the leaders, and between them and the juniors, is a sunk seat for solicitors, who will thus be enabled to be in direct communication each with his own counsel. On the other side of the table immediately opposite to the counsel is placed the jury-box, and next to that is a box expressly appropriated to reporters. At the end of the table is a raised and spacious bench for the judge, with his officers conveniently near him, whilst close to the judge, and between him and the jury-box, is the witness-box. At the other end of the table, immediately opposite the judge, is placed the prisoners' dock, in full view of all concerned; and the combined effect of these arrangements is that nothing intervenes between any one person and another engaged in the matter before the court. The judge, counsel, jury, witness, prisoner, and reporters are brought into full view of, and, as it were, face to face with each other, with no obstruction between any of them. The grand-jury gallery opens direct from the grand-jury room, and affords easy communication with the judge's bench. The sheriff's gallery, for the public, is opposite the grand-jury gallery, and at the west end of the court is a gallery for the jurors in waiting, whilst in the front, but on a low level, are spaces for the witnesses in waiting and the general public. The heating and ventilation have been carried out by Messrs. Haden & Co., of Trowbridge.

The work was originally begun by Mr. George Johnson, but he having relinquished his contract, the works have been completed by Messrs. Fish & Son. Mr. Sanders is the architect, Mr. Tate having acted as clerk of the works.

WALLASEY FREE GRAMMAR SCHOOLS.

These schools, from the designs of Mr. T. Mellard Reade, C.E., architect to the Liverpool School Board, have just been completed, and were opened on Monday, the 7th inst. The plans were chosen in a limited competition out of eight sets, and the building is considered to be very suitable for the purpose of a middle-class grammar school.

The portion now built contains accommodation for 200 boys, divided into 100 seniors and 100 juniors, with two school-rooms and three class-rooms. The entrances, which are from the play-grounds, are porches containing lavatories and cloak-rooms. The two schoolrooms can be thrown together by sliding screens, and they then form a very fine room for public meetings, lectures, &c.

The plan is arranged so that when the buildings are completed accommodation will be obtained for 400 scholars, with master's room and physical laboratory in addition to six class-rooms. The whole of the walls are of local sandstone, and the joiners' work of pitch pine. The style is an adaptation of Early Gothic. All the work has been satisfactorily executed by Mr. James Ridehalgh, of Liscard, the sole contractor.

CORNWALL: CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

The papers promised are very numerous, and have due reference to the locality. Our readers may judge for themselves, for here is a list of them:—

Thomas Morgan, F.S.A., "On the Fleets of the Ancients in Cornish Waters."

E. P. Loftus Brock, F.S.A., "On Cotehele House and its Architecture, St. Neot's and Temple Churches," &c.

Rev. Dr. Margoliouth, "The Pros and Cons. on the Etymology of certain Words in the now obsolete Cornish Language."

J. R. Planché (*Somerset Herald*), "On the Earls of Cornwall."

W. de Gray Birch, F.R.S.L., "On the Local MSS."

S. I. Tucker (*Rouge Croix*), "The Duchy and Dukes of Cornwall."

George R. Wright, F.S.A., "On Legends connected with some Cornish Families."

J. T. Burgess, F.S.A., "On the Tribal Arrangements of the Gaels and Celts."

Henry Jenner, "On the Ancient Cornish Language."

Rev. W. S. Lach Szyrma, M.A., "On the Spanish Descent upon Newlyn"; "On the History of the Land's End"; and "On the Sennen and St. Just Churches."

Rev. W. Jago, B.A., Local Secretary for Cornwall, Society of Antiquaries, "On the Antiquities of Bodmin," and "On the Crosses of Cornwall."

T. Q. Couch, F.S.A., "On the History of Restormel Castle," and "On the Holy Wells of Cornwall."

Rev. Prebendary Kinsman, M.A., "On Tintagel Church and Castle."

Rev. Prebendary Scarth, M.A., "On the Roman Roads of Cornwall."

Rev. J. J. Wilkinson, M.A., "On Launceston Castle."

J. S. Phené, LL.D., "On the Κάρυξ, or Horn of the Keltic People, and its various Applications." "On the Dragon of Cornwall."

Rev. S. M. Mayhew, M.A., Jottings on Cornwall."

Rev. William C. Lukis, M.A., "On the Cornish Megaliths."

C. Lynam, "On the Churchyard Crosses of Staffordshire."

R. N. Worth, "On the Ancient Boroughs of Cornwall, with Notes on their Arms and Devices."

Thomas Cragoe, F.R.G.S., "On King Arthur and the Knights of the Round Table."

Thomas Kerslake, "On the Early Saints of Cornwall."

H. Sewell Stokes, Hon. Local Secretary, "A short Account of Cornish Histories and Books on the County."

J. Noye, "Curiosities of Modern Cornish Speech."

ESSEX ARCHÆOLOGICAL SOCIETY.

The annual general meeting of this Society was held on the 1st inst., at Colchester, in conjunction with the visit of the Royal Archæological Institute, and was of a purely formal character.

The report of the Council points to:—

"The continued prosperity of the Institution, which now numbers (including thirteen corresponding associates) about 230 members, showing (notwithstanding some inevitable yearly lossess), an increase of more than fifty during the last four years.

The financial statement to the 30th of June shows a balance of 207*l.* 3*s.* 3*d.* in favour of the Society. Bills more recently discharged have reduced this to 172*l.* 6*s.* 8*d.*, which, with two years' interest on 100*l.* stock, invested on account of life compositions, and since received, will remain to meet the cost of publication and other expenses of the current year.

The Council regret that the appeal made for aid to enable them to publish, partly by subscription (not limited to members of the Society), illustrations of the remarkable series of mural paintings discovered at Copford, has not met with the success which they had so confidently anticipated. Only 11*l.* 0*s.* 6*d.* have been actually received, but subscriptions to about twice that amount have been promised, a sum, however, wholly inadequate to permit the work to be proceeded with."

The secretary (Mr. H. W. King) and other officers were re-elected, and Sir Thos. Western, bart., of Felix Hall, was unanimously chosen as president for the ensuing year.

Several new members were elected.

COMPETITIONS.

New Cemetery, Tyldesley.—At a meeting of the Burial Board, held on the 26th ult., the competitive designs for cemetery chapels, lodge, &c., were again under consideration, and were then reduced to three in number, viz., those submitted by "Ecce," "Beta," and "As you like it," the latter being ultimately awarded the first premium of 50*l.* The successful design was submitted by R. Knill Freeman, architect, of Bolton-le-Moors.

New Schools at Tuxford. -At the monthly meeting of the Tuxford School Board, on the 4th inst., the design for the intended new school buildings and master's house, submitted in competition by Messrs. Innocent & Brown, of Sheffield, was unanimously adopted, and the authors were instructed to prepare working drawings and specifications for submission to the Education Department.

SURVEYORSHIP ITEMS.

Lavenham.—Mr. Jackson, surveyor of the Lavenham Highway Board, died very suddenly a few days ago.

Richmond.—At a meeting of the Richmond Select Vestry on the 25th ult., the highway committee recommended that a surveyor be appointed at a salary of 200 guineas per annum, and that Mr. Brewer be offered the appointment for one year. Mr. Maxwell proposed the adoption of the report, but on the suggestion of Mr. Dermer, J.P., the motion was deferred until the next meeting, by which time it was stated the duties of the surveyor would be properly defined.

Luton.—Mr. W. H. Leet, of Luton, has been unanimously elected surveyor to the Town Council and Sanitary Authority of Luton. There were three applicants for the office.

Derby.—At a meeting of the Derby Town Council on the 17th ult. the resignation of the borough surveyor (Mr. Ellice-Clark, who, as already announced in the *Builder*, has been elected surveyor to the Hove Commissioners) was accepted. An attempt was made by a section of the Council to reduce the salary of Mr. Ellice-Clark's successor to 400*l.*, but a large majority of the members refused to stultify themselves by such a procedure in view of the certain increase in the responsibilities and duties of the post by reason of the rapid growth of the town. In the course of the discussion Mr. Clark's ability, energy, and business aptitude were testified to, but it was questioned whether he could be allowed to resign then, seeing that his appointment only dated from September 29th last. Mr. Stenson contended that it was an annual appointment, made for twelve months, and that if a gentleman engaged to serve them for twelve months at a fixed salary, he ought, on public grounds, to be kept to his engagement. An amendment to the effect that Mr. Clark should be compelled to retain his office until the twelve months had expired fell through for want of a seconder.

MASTERS AND MEN.

Bath.—On the 20th ult. the masons employed at the Great Western Goods Station, Lower Bristol-road, Bath, struck work on account of having been required to fix stone which had been prepared away from the work. During the day, however, this matter and others in dispute were considered, and an understanding arrived at, which resulted in the men recommencing work.

Gateshead.—After a struggle of thirteen weeks, the operatives having failed to gain the advance sought for, they have agreed to resume work, and the employers have opened their shops, subject to a set of working rules to be settled hereafter.

Nairn.—A portion of the Nairn operative masons came out on strike on the 18th ult., with the object of compelling the employers to pay them at the respective works on every alternate Saturday ere they cease work; in other words, to receive payment of wages in the masters' own time, and not oblige the operatives to call at the respective offices. The point has been yielded.

Mold.—The proprietors of the Mold Tin-plate Works having recently suspended payment, the large body of workmen have met, and have, it is stated, decided to show their sympathy with their employers in a practical form, by pledging themselves to work one week in every month until Christmas, for the benefit of their employers, without expecting any return in wages. Such consideration for employers is not too common amongst workmen.

Greenock.—Last week the operative masons in the employment of several firms were locked out in consequence of a dispute about "brick-work."

Glasgow.—On the 24th ult. a meeting of the operative joiners on strike was held, when it was stated that the men were prepared to fight the battle with the employers for eight weeks yet, by which time it was alleged that several of the masters as such would cease to exist.——The master wrights of Glasgow held their usual weekly meeting on the 27th ult. Mr. James Henderson, of Kinning Park Saw Mills, in the chair. Reports from the districts were submitted, showing that in the five districts there were 893 men working on the masters' terms, 757 working on their own terms, and 2,163 still on strike. The chairman stated that the returns were highly satisfactory, and that the number of

operatives working on the masters' terms was daily on the increase.

Manchester.—The Manchester Plasterers' Labourers' Strike Committee on the 22nd ult. declared the strike closed. All the men are now employed at the rate of wages claimed, viz., 28s. per week. The strike has lasted sixteen weeks, and fifty firms have granted the concession claimed.

Bristol.—A mass meeting of the builders' labourers of Bristol was held on the 20th ult., to consider the steps to be taken in regard to the approaching expiration of their notice to the employers for an advance of three farthings per hour to their present rate of wages. The following resolution was unanimously carried:—"That the general secretary at once write to the masters' association, respectfully requesting them to send by their secretary, at their very earliest convenience, a direct and explicit answer of their intentions on the first Monday in August.

Canada.—A novel case has arisen in Canada, under the laws regulating trade unions. A stone-cutter in Montreal, who did not belong to the Stone-cutters' Union, accepted work from a firm employing union hands, but at less rates than the union exacted. The trade unionists then, by threatening a strike, compelled his discharge. The stone-cutter has now sued the trade union, which is a regularly incorporated body, for actual and prospective losses caused by its action, and has laid his damages at 200*l.* He has engaged eminent counsel, and expects to pursue the suit vigorously.

Southport.—On the 24th ult., at the Southport Petty Sessions, a joiner, named Thomas Jones, who is out on strike, was charged with intimidating and assaulting another joiner, named Thomas M'Govan. For some time past the joiners of Southport have been on strike, and fresh men have been brought to the town by the masters, the complainant in the case being one of them. On the 15th ult., the union "picket" had been watching the complainant for about an hour, after which time the men accosted him in Chapel-street, when high words and blows followed, M'Govan having told him that he was determined to remain with his employers, Messrs. Wishart & Irving. The defendant was fined 10*l.* and costs. Notice of appeal was given.

Willenhall.—After the rim and mortise lock-makers of Willenhall were out on strike three weeks for an advance of 10 per cent. on their wages, the masters consented to refer the dispute to the arbitration of the Rev. G. H. Fisher, the vicar of the parish. He awarded the men 7½ per cent. On the 26th ult. the customers of the employers affected by this award received circulars announcing that the employers, believing they had a good case, consented to refer the matter to arbitration; but, to their surprise, the umpire has awarded the men 7½ per cent. advance, to take place at once. Much against their wish, they (the employers) are compelled to advance their goods 5 per cent., including orders now unexecuted.

THE WELSH SLATE TRADE.

PRICES DURING THE PAST TEN YEARS.

A CORRESPONDENT of the *Mining Journal* gives the following table, showing the prices of slates, first quality, per thousand, of the sizes most in request, and for a period of ten years. The prices are determined by the leading quarry proprietors or their agents at the commencement of each year. Progressive prices, he says, indicate, of course, corresponding demands, and the slate-producing areas being practically limited it is difficult to foresee any diminution in the present demand, or that any equivalent will be adopted combining the lightness, durability, and inexpensiveness of the Welsh roofing slate. Slate quarrying, from its nature, may be suspended without any pecuniary loss, and is, consequently, freer from the serious disadvantages of strikes or trade combinations than perhaps any other branch of British industry:—

PRICE PER THOUSAND (FIRST QUALITY).

NAME.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s. d.	£ s. d	£ s. d.
Princesses (24 in. by 14 in.)	11 0	11 0	11 0	11 0	11 0	11 5	11 5	11 5 0	12 5 0	13 10 0
Duchesses (24 in by 12 in.)	9 10	9 10	9 10	9 8	9 8	9 8	9 10	9 12 6	10 5 0	11 10 0
Lg. Countesses (20 in by 10 in.)	6 10	6 15	6 15	6 15	6 15	6 15	6 15	6 10 0	8 10 0	7 15 0
Viscountesses (18 in. by 10 in.)	5 5	5 5	5 5	5 5	5 5	5 5	5 5	5 5 0	5 10 0	6 7 6
Viscountesses (18 in. by 9 in.)	4 0	4 0	4 0	4 3	4 3	4 3	4 3	4 8 0	4 15 0	5 10 0
Short Ladies (14 in. by 8 in.).....	2 5	2 5	2 5	2 2	2 2	2 3	2 3	2 5 0	2 12 6	3 0 0

THE CARLISLE STATION EXTENSION WORKS.

ANOTHER section of Messrs. Ward & Co.'s great undertaking in connexion with the Citadel Station Extension Scheme was completed last week, when Mr. C. P. Hardy set the keystone of the arches of the new Nelson Bridge. The first stone was laid on the 22nd of June, and within a month the three arches, comprising some 76,930 cubic feet of ashlar and masonry, have been successfully completed. The arches are semicircular in shape, each having a span of 36 ft., and a rise of 18 ft., while the weight of stone used represents something like 5,150 tons. Mr. Hemberow is engineer for the contractors, and Mr. Martin foreman of the masonry branch of the work. In the keystone was a small crevice, in which was deposited a bottle containing a few ears of wheat and oats, a copy of a local paper, and a document, on which was written the following:—

"The old Nelson Bridge was built by subscription. The foundation-stone was laid by the then Mayor (Thomas Nelson, esq.), on the 25th of June, 1832, and it was completed and opened in the following year. The new structure was designed by Messrs. Blyth & Cunningham, civil engineers, Edinburgh; it was erected by Messrs. Robert Ward & Co., contractors, of Glasgow, at the cost of the Citadel Joint Station Committee. The new bridge was commenced on the 22nd of June, 1876, and the keystone of the last arch was set by C. P. Hardy, Esq., on the 22nd July, 1876."

Mr. Hardy congratulated Messrs. Ward & Co. on the auspicious termination of this important part of the work. As many of them would perhaps be aware, it was now something less than two years since he was honoured by being called upon to cut the first sod in connexion with the railway extension scheme, and such had been the intelligence and energy brought to bear upon the work since that time, that the progress made seemed almost incredible,—a state of things which redounded to the credit of the contractors and the staff in their employ.

NEW PUBLIC BATHS.

Dundee.—A large first-class swimming-bath has been opened at Dundee by the baths committee of the Town Council. The cost, with other baths completed or in progress, has been upwards of 5,500*l.* The bath just opened is 68 ft. by 30 ft. There are two other baths, 54 ft. by 28 ft. and 56 ft. by 28 ft. respectively. The plans were prepared by the city surveyor.

Hertford.—A new swimming-bath has been opened at Hertford. The contractors were Mr. Potter (London) and Mr. Green (Stanstead).

Chatham.—The question of providing public baths for the inhabitants of Chatham and Rochester, which has been before the public for a number of years past, would appear to have entered on another phase, the trustees of Watts's Charity, who, under the scheme settled by the Court of Chancery, was the body charged with providing the baths, having decided at their last meeting to relegate the powers they possess to the Corporation of Rochester, the trustees handing over to the latter body the sum of 2,000*l.*, which they were authorised by their scheme to expend in providing baths, and paying the corporation a further sum of 200*l.* annually for maintaining the baths. The portion of the scheme for providing washhouses will not be carried out, the arrangements being for baths alone.

Wednesbury.—The Wednesbury Local Board propose to borrow 2,000*l.*, for the erection of new public baths, in conjunction with which will be a free library, proposed to be provided at an additional cost of 1,000*l.*

Chester.—A company was formed last year for the purpose of providing a large floating bath on the Dee, with thorough swimming and private bathing accommodation. The Duke of Westminster headed the share list, and warmly commended the scheme. The second annual general meeting of the shareholders has been held. The directors' report stated that they were now in a position to commence the work. They had abandoned the old design, and now submitted one by Mr. Rae M'Kaig, of Liverpool, which provides for a swimming-bath only, 70 ft. by 30 ft. wide. This modification of the original scheme, it was explained, was due to the unwillingness of the public to come forward with the necessary capital. The secretary stated that 467 shares had been taken up, amounting to 2,335*l.*, and that the estimated cost of the bath was 1,950*l.*, and incidentals, 350*l.*

Scarborough.—The new baths which are being erected by the South Cliff Bath Company in Ramsdale-road, are now nearly completed. The Turkish bath is a very important feature in the arrangements. The architect is Mr. John Petch.

Rotherham.—For many years a great want has been felt by the working classes residing in the Chapeltown district of a suitable place in which to bathe. This difficulty is now removed through the enterprise of Mr. Thomas Ogden, who has opened a new bathing saloon at Charlton brook. The water is conducted in pipes from the centre of the Charlton dam. The baths will be known as the "Victoria Baths."

Doncaster.—A new swimming-bath has been opened near the Marshgate railway crossing, Doncaster. The bath proper is 90 ft. long by 40 ft. wide. Its depth ranges from 3 ft. to 7 ft., the bottom being covered with hard smooth cement. At the east, west, and south sides is a pavement formed of cement, 12 ft. wide, and adjoining the wall on the south side has been erected a bench or form for bathers to sit on. On the northern side of the bath there is a pavement 6 ft. wide, the remainder of the space being taken up by a row of dressing-boxes, twenty-seven in number.

MINTON'S TILES.

HOLLINS *v.* CAMPBELL.

THIS case came before Vice-Chancellor Malins on the 31st ult., when

Mr. Glasse, Q.C., moved, on behalf of the plaintiff, Mr. Michael Daintree Minton Hollins, to restrain the defendants, Mr. Colin Minton Campbell, M.P. for North Staffordshire, and Robert Minton Taylor, formerly partners in the firm of Minton Hollins & Co., at Stoke-upon-Trent, from carrying on any part of the business or manufacture of encaustic tiles or tiles used for flooring or pavements at No. 27, Walbrook, London, so long as any part of the business of Minton & Company should be carried on there under the name of "Minton," or that name should be affixed to the house or circulars, and business letters should be issued from that address under that style, and to restrain them from using the information relating to the tile business which might be contained in any letter addressed to Messrs. Minton & Company, Stoke-upon-Trent, and which might come to their hands.

After hearing Mr. Cotton, Q.C., for the defendants,

The Vice-Chancellor said that on a very full argument of the case, the defendants, Campbell and Taylor, had already been restrained from using the name of "Minton" as connected with flooring tiles. On the dissolution of the partnership between them it had been agreed that Mr. Campbell should have the exclusive use of the name in connexion with the "china" trade, and Mr. Hollins the same user in connexion with the "tile" business. Since the order in May, 1875, letters had been addressed to the firm of "Minton & Co.," at Stoke, in reference to flooring tiles, and it seemed that those letters, instead of being at once forwarded to Minton Hollins & Co. (which was, perhaps, what the plaintiff could not insist upon), the plaintiff complained that they were returned to the writers with this intimation,—"We do not make flooring tiles, but when we want them we apply to Campbell's Brick and Tile Company." Those letters were written by a firm of which Mr. Campbell was the senior partner, two gentlemen of the name of Minton being associated with him, and the question before the Court was whether that was a proper course to adopt. His lordship was decidedly of opinion that it was not a proper course, but would not then say anything more, not having before him the firm of Minton & Co., by whose authority the letters complained of were written. It seemed strange that a gentleman who was member for the county in which the works were situated should not have disdained such devices of trade. There would be leave given to amend the bill, and the motion would stand over to the second motion day in Michaelmas sittings, to be treated as the hearing of the cause.

PLASTERERS AND OVERTIME.

THREE journeymen plasterers,—Shaw, Harland, and another,—were summoned by their employer, a contractor for plastering work, for damages alleged to be sustained by reason of their not fulfilling their contract.

Mr. Murray, the plaintiff, said that on June 30 he went to Newcastle to look for some plasterers, and engaged the three defendants at a wage of 1*l.* 19s. per week, and overtime if convenient. The contract was to last for six weeks, and the men were also to have their fares paid to their place of work, and all three started work.

A week afterwards they asked to be put on overtime, when witness told them if they got it his other men would want to be placed on the same footing, and he could not give overtime at all. Next week they again applied for overtime, and on being refused, all three left work at once. In consequence of this, witness had suffered damage, caused by having to pay labourers. One labourer served two plasterers, and when the defendants left so summarily, witness had to pay labourers for doing prac-

tically nothing. He had lost 3*l.* by each, and 3*s.* 3½*d.* for each railway fare.

The defendants urged never being engaged for six weeks, as it would have been against the Union rules. The plaintiff, they said, had promised to let them work as much overtime as they liked, and finding they could not get overtime, they gave the usual one hour's notice, and left work.

The magistrates adjudged the two first men to pay 2*l.* 3*s.* 3½*d.* damages, and costs each, and the third man had left the town.

ST. JOHN'S GATE.

SIR,—My attention has just been called to a statement in your reporter's *resumé* of my paper on St. John's Priory, Clerkenwell, before the Architectural Association. It is said there, in your issue of July 1st, that Sir Edmund Lechmere, bart., M.P., who has bought the gatehouse, has fitted up one of the upper rooms as "a chapel." As this is not the case, and as such a report did not certainly originate from me, perhaps you will kindly insert this contradiction. GEORGE H. BIRCH.

FAC-SIMILE OF THE BAYEUX TAPESTRY.

SIR,—Some time ago, having just read Freeman's "History of the Norman Conquest," I became very desirous of seeing a *fac-simile* of the Bayeux tapestry. Finding that one had recently been exhibited at the Alberti Hall, I went there, but ascertained that it had been returned to the South Kensington Museum. I inquired at the Museum of every person I came across who seemed to possess any authority there, but could not obtain any information about it. The prevailing opinion was that it had been lent to some provincial exhibition. I was therefore compelled to give up my search in that direction. I had no idea, nor had any of those of whom I inquired, that it was covered with other drawings, as "Ghost" tells us is the case. I may add that I think it an admirable suggestion of his that a *fac-simile* should be brought out by the Art-Union of London. A READER.

"FAIR MEASURE."

SIR,—In your impression of the 15th ult. a correspondent (Mr. J. Robson) has deemed it necessary to caution builders against the "sacking" propensities of lime merchants. As a member of an establishment which supplies the article in question to most of the extensive works of the metropolis, I trust you will do me the favour of allowing me to make one or two observations on Mr. Robson's letter.

In the first place, permit me to say that it is not the practice of my firm to send out for a yard of lime seven sacks measuring 3 ft. 6 in. by 44 in. in girth, nor has it ever been so, and I should gravely question whether such a practice can be otherwise than most exceptional. For years past the measurement of our sacks has been 35 in. in length by 44 in. in girth, *ten* of which well filled are delivered to the yard, and I can prove to demonstration (for the lime always rises a good deal above the mouth of the sacks) that if fairness be observed in the measurement there is no deficiency.

But Mr. Robson seems to question whether the use of sacks is for the convenience of the builder. Had he known, or had he borne in mind, that the value of the sacks per yard approaches very nearly to the value of the lime itself; that the use of sacks is not paid for; that builders' labourers commonly appropriate them to their own purposes, chiefly for backing hats; that numbers are lost for which the merchants can never be reimbursed; and that it takes double the labour to load a cart with lime in sacks as compared with that which is required without them,—he could hardly have conveyed the implication that sacks are used for the merchant's advantage.

There is, however, one passage in Mr. Robson's letter which leads me to make a remark in the interest of the smalle dealer. He says:—"It is quite certain there is no reason why 27 cubic feet should not be served to the yard." Legally speaking, he is right. But Mr. Robson seems to imagine that a yard of lime can be certified under all circumstances, with as much accuracy as a ton of coals or a bushel of potatoes. This is not the fact. Let me tell him for his information that a yard of lime in the merchant's shed is not a yard of lime in the builder's yard. Moreover, I can assure him that a yard of lime, such as no one could legally question, at the burner's works would not generally weigh more than 8½ cwt.; that a yard taken directly out of a barge would weigh over 9 cwt.; and one taken out of the merchant's shed would weigh about 10 cwt., the difference being accounted for by the broken pieces, &c., filling up all the interstices. For a practical illustration of this I would ask Mr. Robson to conceive of a cubic yard of cannon balls. When he has weighed it, let him fill up all the vacant spaces with small shot, and though he will then have no more than a cubic yard of spherical metal, he will obviously have a denser and more valuable measurement.

In making these remarks, I offer no apology for dishonesty; on the contrary, I would encourage builders, in common with all other buyers, to be on their guard against sharp practice. But I think I have said enough to show that lime measurement is somewhat exceptional; that the harsh application of the legal maxim, *caveat emptor*, cannot here be so rigorously pressed as if weight were the standard; and that the use of sacks, so far from being an advantage to the merchant, is, as a rule, regarded by him as a nuisance, to be avoided wherever it is possible. A. DALE.

PLATE CLOSETS.

SIR,—Having erected a fire-proof plate-closet, I shall be glad for some advice from your many practical readers as to what the shelves should be made of. I think terra-cotta or fire-clay, if the lengths could be obtained, would be best.

EBORACUM.

THE DERBY CENTRAL SCHOOL OF ART.

On the 1st inst. the Baroness Burdett-Coutts laid the foundation-stone of the new buildings about to be erected on Green-hill for the purposes of the Derby Central School of Art. The central building will consist of two wings, having an open court-yard between them, so arranged as to obtain a north light for all the drawing-rooms. The wings are united at the east and west ends by corridors connected with all necessary offices, staircases, and entrances. The whole of the elementary schools devoted to the teaching of the younger students are on the ground-floor, so that the more advanced pupils only need have access to the first floor. The several rooms are planned with a view to keep the sexes as distinct as possible, all rooms for the sole use of the ladies being in the front of the building, and near their entrance. The rooms used in common are accessible from both ends by separate doors, and those on the first-floor by separate staircases also. Only the wing on the north side is to be at present built, the plan being so arranged that the buildings may be erected in sections without impairing the usefulness of any portion. The ground-floor consists of a porch and entrance-hall in the centre of the building, facing Green-hill, opening on the front corridors, but shut off therefrom by means of an inner glass screen. Communicating with the front corridor on the north of the entrance are the principal stairs, ladies' elementary room, and a passage to the machine drawing-room and back corridor. On the south side of the entrance are the secretary's room, store-room, elementary room, and cottage for curator, this latter being so placed that the curator may have easy access to the front door and all other parts of the building.

The construction of the roof of the Antique and Painting Rooms is peculiar, and especially adapted for the admission of uninterrupted light, as it partakes of one great curve from the height of the sills of the windows to the apex of the roof, the roof of these rooms and the windows therein being carried on curved iron principals, to allow of this form of construction being adopted; the result is, that in these windows all the advantages of the ordinary skylight and perpendicular side light are obtained, without the great disadvantage of the block caused by the wall-plate at the juncture of the two. This form of construction has also been adopted by Messrs. Waller & Son, the architects, in the School of Art at Gloucester, and has, it is said, been found to answer extremely well, and to be of great practical benefit to the schools.

The fronts towards Green-hill and Deggestreet will be of stone.

The cost of the present section, with land, architects' charges, &c., will be at least 7,000*l.* Messrs. J. & E. Wood, of Derby, are the contractors for the work.

Scientific Museum at South Kensington. Mrs. Griesbach has presented to the Lord President of the Council, for the proposed Scientific Museum, a valuable collection of acoustical apparatus, invented and made by her late husband, John Henry Griesbach. This apparatus is now exhibited in the loan collection of scientific apparatus.

UNHEALTHY DWELLINGS AT JARROW.

At the Jarrow County Petty Sessions, on the 11th ult., a case in which Mr. Drewett was summoned for being the owner of the houses, Nos. 1, 2, 3, 4, and 5, Bensham-square, and Nos. 27 and 29, Dog Bank-row, Jarrow, which were alleged to be unfit for human habitation, and a nuisance injurious to health, was heard before Messrs. J. B. Dale and A. Leslie, and the case was at this time adjourned. The decision of the Court was subsequently delivered at the South Shields Petty Sessions. The decision was as follows:—

"After giving the evidence in this matter our careful consideration, and, at the request of both parties, personally inspecting the premises, we have come clearly to the conclusion that they are—both from the dampness of the walls in the lower rooms, and the want of air ventilation in the upper rooms—in such a state as to be a nuisance, and injurious to the health of the parties residing therein. Except for the observations of the Lord Chief Justice and Mr. Justice Hannen, in giving judgment in the case of the Great Western Railway Company *v.* Bishop, we should have doubted whether sub-section 91 of the Public Health Act, 1875, did not require, in order to give us jurisdiction, that there should be a nuisance injurious to public health, or, at all events, to some member of the public other than the occupier; but the judges there point out that injury to the health of some person is sufficient. We, therefore, order that the nuisance should be abated within fourteen days; and further, the nuisance being such as to render the houses and buildings, in our judgment, unfit for human habitation, we prohibit the using thereof for that purpose until they are rendered fit, and we order the defendant to pay the cost of these proceedings."

Mr. H. E. Duncan, who represented the defendant, gave notice of appeal.

DISPUTED ARCHITECTS' CHARGES.

HADFIELD AND SON *v.* GAINSFORD.

THIS case, which we reported at the time, was part heard at the County Court, on the 28th of June last, and was down for further hearing on the 9th (Wednesday). Messrs. Hadfield & Son, however, having been informed that the defendant had paid into court the amount of their claim, and the full costs of the suit, requested their solicitor to stay further proceedings.

CHURCH-BUILDING NEWS.

Colliston.—The chapel-of-ease to the parish church of St. Vigean, Colliston, built only a few years ago, from designs by Messrs. M'Laren & Aitkin, architects, Dundee, is being enlarged, under the direction of the same architects. The original building, which seated 250 persons, was oblong, about 50 ft. by 28 ft. The east gable was removed, and a new building of about the same dimensions as the present is in course of erection across in the transept form. This will seat another 250, or thereabouts. At the same time, taking advantage of a natural declivity at the east end, a vestry and other offices have been provided under the transept. A portion of the new plan consisted in raising the walls of the present church fully 3 ft. As this involved, under ordinary circumstances, the removal of the roof, which was as good as new, the idea was caught of lifting it bodily, and building the additional height under it. This idea has been successfully carried out, under the management of Mr. Scott, builder, and Mr. Welsh, joiner, the contractors.

Airdrie.—A new church at the village of Greengairs, Airdrie, has been formally opened for public worship. The building is in the Norse Gothic style, from plans by Mr. Alexander M'Gregor Mitchell, architect, Coatbridge. It is well lighted, comfortably seated, and will accommodate about 400 worshippers.

Birtsmorton.—Efforts are being made to restore the ancient and historically-interesting church of Birtsmorton, which stands at the south end of the Malvern Hills. The edifice, we are told, imperatively demands restoration, and fully 1,000*l.* will be required to do all that needs to be done. The church and court have special points of interest in connexion with the times of Wycliffe.

Tarporley.—The work of restoring the parish church of Tarporley is progressing towards completion, the work having been going on for nearly eleven years. The first step towards the restoration was taken in the chancel, which, after being almost entirely rebuilt, was re-opened in 1867; the nave, after similar treatment, was re-opened in 1871; and now the last portion of the work has been commenced in the rebuilding of the tower, the foundation-stone of which has been laid by the Countess of Haddington. The entire cost of the works of restoration already completed has been—for the chancel, 1,427*l.*; for the nave,

2,896*l.*; for the organ chapel (built by the Earl of Haddington), 1,000*l.*; re-seating, 300*l.*; and lighting, 100*l.*; and now it is expected the restoration of the tower will cost about another 2,550*l.*, making a total of 8,273*l.* The church, although of considerable antiquity as regards its foundation, has a history which is very uneventful and purely local. The architect for the tower is Mr. Crowther, of Manchester, who has been the architect for the rest of the restorations, and the contractor Mr. James Fleet, of Tarporley.

Broxted.—The parish church of Broxted, near Dunmow, has been re-opened, after restoration. The work has been carried out under the direction of Mr. J. Clarke, diocesan architect, and the contract taken by Mr. W. Smith, of Eldon Works, Kennington, for the nave, in the sum of 1,320*l.*, of which 900*l.* have been secured. A special contract was entered into for the chancel for 800*l.*, which has been restored at the sole cost of Mr. Richard Benyon, of Englefield House, Berks, the lay impropriator of the parish.

Geldeston.—The chancel of Geldeston Church has lately been re-seated with carved oak benches from designs by Mr. Penrice, of Lowestoft. The work has been executed by Mr. Botwright, of Bungay. Captain Kerrich, of Geldeston Hall, the liberal donor of the altar-rails of brass, has enriched the church with these seats. He presented six oak trees from his estate at Geldeston for this purpose, one of which, a splendid tree, afforded two tons of bark. The contract for the work was 80*l.*

Beaminster.—After an examination of the walls and roof of the tower of Beaminster Church, Mr. William White, of London, reports to the churchwardens that he finds "Considerable substantial repairs necessary for the preservation of the structure." For the due execution of these, including scaffolding and incidental expenses, he estimates the cost at about 350*l.* He further reports that "There are also various restorations (such as the pinnacles and the decayed enrichment of the tower) which are very desirable for the sake of appearance and of completion." The cost of these he estimates at about 650*l.*, including scaffolding and incidental expenses. A committee has been appointed to collect funds to carry out the work.

Earl's Barton.—The works connected with the restoration of the well-known Parish Church at Earl's Barton have been discontinued. We learn from the *Northampton Herald* that up to the present time nearly 5,000*l.* have been expended upon the restoration. The nave, chancel, south aisle, and porch are finished, and the Perpendicular screen has undergone repair, the old damaged carving having been replaced, where required, with new material. A portion of the screen has been elaborately decorated, "causing it to appear scarcely in keeping with the other parts of the sacred edifice." The north aisle has not yet been brought under the hands of the restorers, and the tower (well known as a specimen of Saxon work) remains at present untouched. The architect under whose directions the work of restoration has been carried out is Mr. Carpenter, of London.

Ilfracombe.—The Church of St. Philip and St. James has been enlarged. Various plans were suggested, but ultimately Mr. James Fowler, architect, of Louth, Lincolnshire, who is at present engaged in the restoration of Georgeham Church, was consulted, and he saw that a north aisle might be added to the chancel with advantage. The church, which is situated under Capstone, was originally built (about thirty years ago) from the designs, and under the superintendence of Mr. Hayward, of Exeter, and its architecture is of the Perpendicular period of Gothic. Referring to the details of the work which has been done, we may say that externally the new aisle is built with materials from the old north wall, the three stained glass windows being reinstated precisely as they were taken out,—two of them in the south side, the other in the east end. A new doorway adjoining the tower gives admission to the worshippers. The roof, of pitch pine, is open, and consists of four principals, supported by wall-pieces, resting on stone corbels, with rafters between them, boarded and covered with lead. A new arcade of three arches in Bath stone occupies the place of the old north wall, supported on two columns of polished Devonshire marble, 8 ft. 3 in. high and 1 ft. 9 in. in diameter, and surmounted by caps carved in natural foliage. The total cost of the work, including the bells, is estimated at about 1,200*l.*, of which about 300*l.* are still to be obtained. Mr. Pulford, of Barnstaple, is the contractor for the whole of the work; under him, Mr. Gammon, of Barnstaple, has done the woodwork; Mr. Collins, of Ilfracombe, the wall masonry; and Mr. Harding, of Ilfracombe, the plumbing and ironmonger's work.

DISSENTING CHURCH-BUILDING NEWS.

Walsall.—The memorial-stones of a new Wesleyan Chapel in course of erection in the rapidly-extending and populous district of Caldmore were laid on the 11th ult., the site fronting to Corporation-street. The building, which is to be cruciform in shape, is designed in the Early English style, and the external elevations are to be executed in red selected bricks, jointed black, with Hollington stone dressings. Internally, the dimensions will be,—length, 80 ft.; width across the nave, 42 ft.; and across the transept, 66 ft.; height to ceiling, 35 ft. The architects are Messrs. Loxton, Brothers, Wednesbury; and the builders are Messrs. Rowley & Lynex, who have taken the contract at 6,332*l.*, including boundary-walls and palisades.

Elloughton.—The foundation-stone of the new Congregational church at Elloughton, which is being erected upon the site of the old edifice, was laid on the 6th ult. by Mr. Evan Fraser, M.R.C.S. Mr. S. Musgrave, of Hull, is the architect, and Mr. J. Musgrave is the contractor, the amount of whose tender is 1,380*l.*

Landore.—The foundation-stone of the new Siloh Congregational Chapel, Landore, has been laid. The new chapel, which will have a north aspect, will be built in the Lombardic style, from designs by Mr. Thomas Freeman, architect, of Brynhyfrid, and the tender of Mr. Thomas White, builder, has been accepted for its erection. It is intended to afford sitting accommodation for 1,000 persons. The contract price is 4,700*l.*, but some extras, such as the surrounding walls, &c., will swell the entire cost to 5,000*l.* The front will be built of native blue stone, relieved with Bath stone pilasters and dressings, and with Mansfield arches and columns to the windows.

Hatfield Heath.—The opening services of the new Congregational chapel at Hatfield Heath were held on the 19th ult. The edifice has been constructed from designs by Mr. Banks, architect, the contractor being Mr. W. C. Cornwell, builder, of Bishops Stortford. It is in the form of a parallelogram, having a staircase at each of the four corners. To a certain extent the Gothic style has been followed. The exterior walls are faced with flints, relieved with Bath-stone dressings to the windows. A flèche used for ventilation rises from the ridge of the roof. The interior arrangements allow of sitting accommodation on the ground floor for 250, and a gallery runs round the sides and one end of the building, giving room for 200 more. An organ-chamber and choir-gallery occupy the other end, where the pulpit also rises into prominence. The total cost is 4,000*l.*

Romford.—The first step towards the erection of the new Congregational chapel, in South-street, Romford, was taken on the 24th ult., by digging the trenches for the foundations. Messrs. Staines & Co., of London, have been commissioned to carry out the designs of the architect, Mr. E. C. Allam. The building is to be of Gothic character, and surmounted by a small slated spire. The cost will be 3,210*l.*

Cupar.—On the 19th ult. the foundation-stone of the new Free Church now in course of erection on an elevated site north-east of the Bonnygate U.P. Church, and about fifty yards back from the street, was formally laid by Lady Baxter, of Kilmaron. The church is built by the legacy of 7,500*l.* which was left to the congregation for the purpose by the late Sir David Baxter, of Kilmaron. From a number of competing plans a design by Messrs. Douglas & Sellar, architects, Glasgow, was selected by the Deacons' Court, to whom the congregation deputed the duties of procuring a plan and seeing after the erection of the edifice. The church, which is to be of the mixed Gothic style, will be a commodious structure, and will be surmounted by a spire, 135 ft. in height.

Newport.—The memorial stones of a new Wesleyan chapel in the Cemetery-road, Newport, were laid on the 17th ult. The chapel, with school and class rooms, is to cost 1,500*l.*, of which about 900*l.* are now promised or in hand. Messrs. Bidlake & Fleeming, Wolverhampton, are the architects, and Mr. Ashley, Newport, is the builder.

Rawtenstall.—On the 15th ult. the foundation-stone of a school-chapel for the Baptists of Rawtenstall was laid by Mr. John Crabtree. The cost of the new building will be about 1,000*l.* Land has been secured for a future chapel, and the schoolroom is being erected at the back of the plot. Accommodation is provided for 250, and in a gallery over the vestries is provision for 80 children. Messrs. Tate & Popplewell, of Manchester, are the architects; and Mr. James Walton, of Rawtenstall, is the builder.

Worksop.—The new Congregational church at Worksop was opened on the 18th ult. The building is in the Free Gothic style, with a nave, side aisles, and apse. The roof is open timbered. The length of the church without the apse is 68½ ft. with a width of 40 ft. The apse is 17½ ft. deep by about 14 ft. wide in the front. The whole of the space inside the apse is occupied by what may be called "the minister's platform," in the front of which is the reading and preaching desk. The seating of the church is of pitch pine, stained and varnished, and will accommodate about 450 persons. The school in connexion with the church is not yet finished. It will have a short frontage in line with the church, and will be in its design in keeping with the church. The contractors for the buildings are Messrs. Redfearn & Son, of Worksop.

Books Received.

Building Construction: showing the Employment of Brickwork and Masonry in the practical Construction of Buildings. By R. Scott Burn. W. Collins, Sons, & Co., London and Glasgow. This book is intended to form a sequel to an elementary volume on the same subjects previously published by the author. "Like the preceding volume, this concerns itself with much that is also elementary, and this in order to be in conformity with the syllabus of the Department of Science and Art, on which its arrangement is based; but it takes the student several steps further on in the study of the subjects. In these he is introduced not only to a higher and wider class of practical work, but to the consideration of the introductory elements of the theories upon which certain departments are based." This is the author's description of his object, which the book fairly fulfils, though more in the way of practical example and suggestion than of theory. It is not, however, very systematic in arrangement, and it is difficult to say for what class of readers it is precisely suitable. Those who wish to get some general insight into the processes of building will find plenty of information and diagrams, perhaps more than they care to go through: those who take it up as a text-book for serious study of the subject will hardly find that it meets their requirements. As it seems to us, a book of this class should be either purely rudimentary, or it should be thorough and exhaustive; a treatise that is neither the one nor the other it is difficult to find a proper place for. The book is, moreover, somewhat old-fashioned in some points; the employment of bond timber in walls, for instance, is admitted to be considered objectionable by many authorities, but as much observation is devoted to it as if it were a necessary part of the subject, instead of being, as it is, a practice entirely condemned by experience. In the remarks on pointing it is stated that "some prefer to point the outer joints at the same time as the building progresses,—that is, while the mortar is soft; others after the wall has been for some time completed, and the mortar is hard"; to which the author adds, "this latter is the better practice," but gives no reason for saying so. As a matter of fact, the process of filling the joints with mortar for show, after the working mortar is dry, is one of the most silly fashions of modern building; and whatever advantage of effect it is supposed to have is short-lived, and requires the trouble and expense of frequent renewal. The chapter on arches is most specially open to the objection we have raised above; it professes to go into the subject, but in so empirical and illogical a manner as to be of little use. In a chapter on "miscellaneous illustrations of work in stone" we have specimens of the various styles of Gothic window, though there is no possible reason given for picking out this special feature in Gothic architecture and no other for illustration; it only seems as if the author thought some Gothic windows would look well on the page as illustrations. The drawings convey no idea of the real spirit of Gothic work, and give no sections of mouldings; and the speci-

men given of a window in what is called the "transitive" style (by which we suppose "transitional" is meant) is like nothing in heaven or earth. This, however, is the usual fault with practical books when their authors attempt dealing with the art side of the subject. The best part of the treatise is the description of the various species of brick bonds, and of masonry; and information about foundations, concrete building, and qualities of different stones, is given in a compact form. But as a whole the treatise is a specimen of the art of what is called "book-making."

Technologisches Wörterbuch, in Französischer, Deutscher, und Englischer Sprache. By Alexander & Louis Tolhausen. Leipzig: Tauchnitz.

This is the German-English-French version of an international dictionary of equivalent technical terms in those three languages, compiled by Herr A. Tolhausen, translator at the Patent Office in this country, and revised by Herr L. Tolhausen, French consul at Leipzig. The compilation of such a dictionary must have been a work of immense labour, as the reader may imagine when we mention that it contains nearly 950 closely printed three-column pages, giving the equivalents in three languages of every class of technical expression used in arts, trades, and commerce (*die in Kunst, Gewerbe, und Handel vorkommen*). The usefulness of such a book, to those whose business or profession leads them from one country and from one language to another, can hardly be over-rated; especially as many of the terms used are ignored, almost necessarily, in ordinary dictionaries of language compiled from the literary point of view. We owe the more debt to those who have taken the trouble to compile such a book, inasmuch as it is one of those works in which the consciousness of having done good service must be the author's chief reward; a publication of this kind, though involving a great deal of hard and uninteresting labour, seldom bringing much of either fame or profit to those who have toiled over it. To pronounce authoritatively whether the book is accurate and full in its treatment would almost involve going over again the labours of its compilers; but as far as we have had time to examine it we can testify that it bears every mark of care and thoroughness in treatment. The authors print as a motto on the cover the inscription placed on the Bell in Schiller's celebrated poem,—"*Concordia soll ihr Name sein.*" We hope the value of the Technological Dictionary will be recognised, and that it will prove widely useful. We may observe that no English publisher's name is appended to the copy sent to us: we presume this is an oversight.

Roads, Streets, and Pavements. By Q. A. Gillmore, A.M., Lieut.-Colonel U.S. Corps of Engineers. New York: D. Van Nostrand. London: Trübner & Co.

On such a subject as this the author necessarily borrows the experience of European countries. He is, however, able to give as much as he takes, especially in the matter of street railways, and he here gives the chief particulars of certain horse-railway companies for the year 1873, the examples being selected so as to afford information respecting the operation of such railways in the crowded streets of cities as well as on ordinary roads. The particulars are given first in respect of the cost of construction of the railways; and, secondly, of their maintenance, including the working expenses and the amount of the revenue; and in estimating the cost of maintenance and working, here or elsewhere, the facts obtained from the experience with existing roads are the only safe guides.

Grosvenor House Gallery.—The Duke of Westminster is desirous that designers, artisans, and the like, employed in any branch of art applied to productive industry, should have the opportunity of inspecting Grosvenor House, with its works of art, daily, including Sundays, during the months of August and September, 1876, from two p.m. to six p.m. He regrets that, for want of room, he cannot extend the admission beyond the persons specified. Various manufacturers and others engaged in the production of decorative art have consented to issue tickets of admission, according to the restriction which it has been necessary to lay down.

Miscellanea.

Proposed Alterations at Southwell Minster.—After many years' delay, the Ecclesiastical Commissioners some little time ago resolved that the work of restoration at Southwell Minster, Notts, should be proceeded with, and brought to a speedy conclusion. Their architect, Mr. Christian, forthwith furnished a plan, the main feature of which appeared to be the removal of the choir stalls, throwing open to their full length the chancel aisles, which he proposed should be fitted with chairs. It was supposed that by this arrangement there would be accommodation in this part of the church alone for about 700 people, and that this number would scarcely be exceeded on ordinary Sundays. Mr. Christian further suggested that the nave should be reserved for special occasions. The estimated cost is 22,000*l.* According to a correspondent of a Nottingham paper, the Commissioners, having examined these proposals, forwarded them to the bishop of the diocese for his opinion. The bishop consulted Mr. G. E. Street, R.A., who could not endorse Mr. Christian's plans, believing that æsthetically and ecclesiastically they were wrong. Mr. Street's proposal is said to be to retain the choir stalls, so to lighten the screen as to make it as little of an obstruction as possible both to seeing and hearing in the nave; to place the pulpit so that the preacher shall be visible and audible in the chancel and nave at the same time; to place the singing men and boys where, he says, they were originally intended to be, on the screen; to have a small organ on each side, and to remove the great organ to some place which could easily be provided for it. The bishop, at a recent gathering of clergy and gentry, wished any person who was competent to express an opinion on such a matter. Only one gentleman did so at the time, and he did it with clearness and force. He advocated the separation of choir and nave, as now, partly because, in his judgment, they were always intended to be separate; partly because, since the human voice ordinarily reaches only about sixty yards forward and half that distance backward, a great deal of space would be lost, so far as preaching is concerned, if the pulpit were placed, as it is proposed by Mr. Street to be, somewhere in the transept.

Nijni-Novgorod.—The great Russian fair, which sixty years since was transferred to Nijni-Novgorod from its ancient locality in the meadows near the monastery of Macarieva, comes to a close early in September. Mr. Doria, secretary of the British Embassy at St. Petersburg, reports that it is calculated that a million persons visited the fair last year, and about 150,000 of them were resident at a time, for a longer or shorter period, during the fair. The value of the merchandise actually sold at the fair has risen from 49,000,000 roubles in 1847 to 165,090,000 in 1874. In the last-named year upwards of 6,000 shops were let. The wholesale trade in iron, in different forms, amounted at the fair in 1874 to 5,557,800 poods of 36 lb. each, sold for 15,935,000 roubles, equal, at 33d., to 2,193,812*l.* Tea of the value of upwards of 10,000,000 roubles was also sold. Along the banks of the lake enormous pyramids of chests of tea are heaped upon the ground, covered only with matting made from the inner bark of the birch tree. These chests of tea, called "tsibiki," are so packed as to be impervious to rain or damp. Outside the ordinary wooden chest is a covering of wicker-work of cane or bamboo, round which, at Kiakhta, raw bull-hides are tightly stretched, with the hair inwards. These chests arrive at Nijni from China. Large sales are made of corn and of leather at the fair, of fruits from Persia, of madder and wine from the Caucasus, and of coffee and skins from Bokhara.

Wooden Houses.—The Fowlis-Wester correspondent of the *Perthshire Constitutional* writes that the Messrs. J. & T. Wilson, wood merchants, Bonnybank Sawmills, Denny, have now commenced to cut and manufacture the timber in the Back Wood purchased by them some time ago. They are allowed five years to cut the wood. Houses have been erected on the moor for their workmen, the sides and gables of them being clad with lining on both sides of a 4-in. standard, and the intermediate space filled with sawdust. The roof is covered with sarking deals, with felt on the top. These houses are lighted by means of small windows placed in the sides.

The Haseley Waterworks.—A Leamington paper states that these works have *again* come to a standstill, the contractor having discharged the whole of his men, and taken up the position of *non possumus*. This position is said to be owing to the decision of the engineer. The contractor maintains that he undertook to lay the iron main between two given points, about a mile, in accordance with the plans and sections furnished to him, which show that the main was to be laid with a uniform gradient towards Warwick. Part of this line is in running sand, at a considerable depth, of which some 350 yards remain to complete. To avoid the heavy expense, the engineer proposes to jump over this bed of sand by means of a syphon, and orders the contractor to carry it out under the powers given to him in the contract. The contractor, it seems, disputes this power, but will carry out the work on condition of indemnification for results, and compensation for his outlay. This is the second contractor for the work who has stopped, the first contractor having stopped on account of a dispute as to the price to be paid for working in hard strata. (See *Builder*, Dec. 11, 1875, p. 1015.) Legal proceedings are pending, a writ having been issued against the corporation at the instance of the first contractor.

"Wide" Tendering.—At a meeting of the Bethnal-green Board of Guardians on the 1st inst., one item of business was the opening of tenders for the carrying out of certain works for the preservation and adding to the security of the large water-tank at the top of the workhouse infirmary, which, according to a report recently presented by the surveyor, weighs when charged about 50 tons. The tenders submitted were as follows:—

Marshall	£132	0	0
Purnell	80	0	0
Stamp & Bowtle	49	0	0
Wire	30	0	0
Judd & Hawkings	25	0	0
Thomerson	17	10	0

A short conversation took place, in the course of which surprise was expressed at the great disparity in the amount of the tenders, and Mr. Thomerson's representative was called in, and asked whether he had carefully gone through the specification, and was prepared to execute the work for the sum named, to which question he returned an affirmative reply. The tender of Mr. Thomerson was accepted.

An Incident in a Life.—A correspondent writes:—"On Sunday, July 9th, there entered Christ Church, Cork, and took a seat where his family (an English family, some time resident in that city) a very long time ago worshipped, a white-headed man, who held in his hand a Prayer-book, one of those presented to the young of both sexes by the 'association' formed at the beginning of the century (and still existing) 'for Promoting the Knowledge and Practice of the Christian Religion.' It contained his name and an engraved tablet; for it was awarded to him as a prize at a competitive examination in that church, and bore the date 1812. Sixty-four years have passed since then. He had kept the prayer-book all that time. He read from it the service, substituting the name of Queen Victoria for that of King George III., and gave thanks to God for blessings of a long, a successful, a happy, and a very busy life, the fruit, these blessings may have been, of seed planted by the book given to him sixty-four years ago. The white-headed man was Mr. S. C. Hall."

Surrey Archæological Society. — This society held its annual meeting on the 3rd inst., at Godalming, under the presidency of Viscount Midleton. The party proceeded in carriages to visit Thursley, Elstead, and Peper Harow. A paper on the antiquities of Godalming was read by Mr. Ralph Nevill, F.S.A., after which the parish church was visited, and some remarks made by Major Heales, F.S.A. Thursley Church was described by Mr. Nevill, and Mr. Charles Baily gave an explanation of the old timber construction. At Elstead an interesting paper was read on "Elstead and its Church," by the Rev. Charles Kerry. At Peper Harow, the residence of the president, the Hon. George Brodrick read a paper upon its antiquities. The church was also visited, and some notes on the monumental brasses were given by Major Heales. In the evening the party dined at the Public Hall, Godalming.

New Municipal Buildings at Leicester.—New municipal buildings, erected at a cost of about 50,000*l.*, were opened at Leicester on Monday last by the Mayor.

The Proposed Vestry Hall at Penge.—The *South London Press* learns from a circular issued by Mr. Elkington, who, it will be remembered, was lately appointed architect of the new Penge vestry offices, that after the remarks made by a vestryman at a recent meeting, alleging that some of the members were taken by surprise in the matter of his appointment, and that with further opportunity for discussion a different result might have been arrived at, he has determined "to discontinue acting any longer under the authority of the resolution passed on the 26th ult." (June). By removing every obstacle as far as he is individually concerned, he wishes to afford the Vestry the opportunity of dealing hereafter with the appointment of an architect as freely and unfettered as if the resolution had not been passed. To a statement that prior to the Vestry meeting held on the 26th of June he had announced himself as the architect of the new buildings, he gives the most unqualified and positive contradiction.

John O'Groat's House: The New Hotel. A new hotel is now in course of completion at John O'Groat's, so that visitors to the "end of the world" may have adequate accommodation for rest and refreshment. The new hotel is built facing the east, with an octagonal tower reaching a considerable height, the rooms in the interior retaining the "John O'Groat's House" shape. The proprietor of the Duncansbay property, Mr. Thomson Sinclair, has planned and erected the hotel, which, though not very extensive, affords a very considerable amount of accommodation, and is exceedingly comfortable. There are three good public rooms well finished, and affording a splendid prospect, the tower-room having windows on five sides of the octagon. There are six comfortable bed-rooms and other conveniences. When everything is completed there will be abundant stabling and other outhouses.

Ordnance Survey of Derby.—The Ordnance survey of the town and county of Derby, by the Royal Engineers, is progressing satisfactorily, and a station, or "crow's-nest," of timber has been erected at the summit of All Saints' Tower for the purposes of the survey. The staging of timber on the top of the tower has been erected by a detachment of civil assistants in the employ of the Government at Southampton, under the superintendence of Mr. Buckle, and upon it will be fixed a tent, or observatory, containing the instruments necessary for the undertaking.

The Water Question at Hastings.—A few days ago the solicitors of the Rev. J. A. Hatchard applied to the Home Secretary, stating that their client felt so apprehensive of his safety that he dared not enter the borough even to apply for a warrant. A reply was sent by the local authorities that there was no reason whatever to fear a breach of the peace. Telegrams from some person or persons were also sent from London to the local authorities, and to private residents of the town, that an attack with Greek fire and catapults was meditated on Mr. Hatchard's property.

Reredos at St. Stephen's, Clewer.—A new reredos has just been erected at the east end of the chancel of this church, at a cost of about 400*l*. It is the gift of two anonymous donors. The subject is the Vision of St. Stephen. At the bottom are two medallions, in one of which St. Stephen is represented praying for his murderers, and in the other, he is being carried by devout men to his burial. The painting of "The Good Shepherd," which has hitherto been affixed to the east wall as an altar-piece, has been removed.

Judges' Lodgings for Swansea.—The *Cambrian* calls attention to the utter absence of a suitable residence for her Majesty's judges when visiting Swansea. It would appear that the want has long been admitted, and that not only has the site been selected and approved, but plans have been prepared and sanctioned. Strange to say, however, nothing more appears to have been done. Meanwhile, the town is in danger of losing the assize sittings altogether, unless adequate accommodation be provided.

Royal Horticultural Society.—The meeting last week resulted in the adoption of a resolution moved and seconded by the Hon. C. S. Butler and Mr. Shirley Hibberd, advising the Council to make the best arrangements in their power to effect a complete separation of the Society from her Majesty's Commissioners, and to dissolve the connexion with South Kensington.

Beggar's Knap, Dorchester.—The Lords of the Treasury have given their sanction to the scheme of the Corporation of Dorchester for leasing a portion of the land known as Beggar's Knap for building purposes. Their lordships, however, expressed the hope that, in deference to the strong feeling entertained by the inhabitants, some condition should, if possible, be attached to the grant of the leases by which all the trees, or, at any rate, those worth preserving, should be left standing.

Whitworth Scholarships.—The following is a list of candidates successful in the competition for the Whitworth Scholarships, 1876, in connexion with the Science and Art Department: Henry S. H. Shaw, engine-fitter, Bristol; Robert Greenhalgh, mechanical engineer, Atherton, near Manchester; John Ryan, engineering student, Newport, Monmouthshire; William H. Williams, draughtsman, Swindon; John W. B. Wright, pattern maker, Hull; Jerdan Nichols, mechanical engineer, Over Darwen.

An Old Servant.—We are told of the death of Mr. Thomas Sharp, head foreman to the well-known firm of Messrs. T. & H. Hartley, of the Westminster Marble Works. He died suddenly on Saturday, the 5th inst., of heart disease, after the long and faithful servitude of more than forty years. In consequence of the great and varied experience he acquired during this long period, he was looked up to as an authority in his craft as a marble mason.

Hygeopolis is to be the name of the "City of Health" projected by a joint-stock company to carry out the proposals of Dr. Richardson in his address on the Hygienic Utopia last year. It is asserted that a site has been selected on the coast of Sussex, and operations are to be commenced forthwith. We hope it is not a merely speculative "dodge" which the amiable doctor has been drawn in to cover. It looks very like it.

Sawing Machinery.—At the Aberdeen show of the Highland and Agricultural Society of Scotland, Messrs. Wurr & Lewis, of 16, Walbrook, London, were awarded a first-class prize-medal for recent improvements in their patent combined circular and band sawing machine for hand-power. The same firm also exhibited a new combined general joiner and band-sawing machine, a most useful tool, and one which seems capable of turning out a large amount of work.

The Sewerage of Winchester.—The Town Council of Winchester have decided to adopt sewerage for the city at an estimated cost of 32,500*l*. The system to be adopted is intermittent downward filtration, supplemented by irrigation, according to plans by Mr. J. Lemon, C.E. If found advisable, the sewage will be conveyed from the outfall by steam power.

Cambrian Archæological Society.—The annual meeting will be held at Abergavenny, on Monday, the 14th inst., and the four following days, when excursions will be made to all parts of interest in the county, and meetings in the evening for the purpose of hearing papers read. A temporary museum is also being formed, to be held at the Town Hall during the week.

Polytechnic Institution.—A very pleasant and useful account of the Philadelphia Exhibition, fully illustrated, is given at the Polytechnic, by Mr. B. J. Malden, F.R.G.S., who went to America for the purpose. Professor Gardner, too, delivers a very good lecture on Combustion. "More Wonders in Wonderland" seems to us a little under the mark, though Mr. George Buckland is a practised hand.

Liverpool Corporation Exhibition of Pictures.—The autumn exhibition of pictures, which has now become one of the "institutions" of Liverpool, will (according to the local *Journal*) be opened to the public on the first Monday in September. It is anticipated that the exhibits of this year will quite equal, if they will not surpass, those of former years.

New Law Courts for Liverpool.—The *Liverpool Journal* understands that the Government have given notice that they will require the land on which Victoria Hall stands given up to them on the 31st inst. The land was purchased by the Government as a site for new law courts, and it is presumed that the erection of the courts will be proceeded with immediately.

Toughened Glass, according to the *Gardener's Magazine*, is promised by a method differing from that of M. Bastie. It is the invention of Herr Pieper, and consists in tempering the glass, while red hot, with superheated steam.

London and County Bank.—The report of the London and County Banking Company for the half-year to June 30th, states that after paying all charges and allowing for rebate and for bad or doubtful debts, there is a profit of 130,988*l*., or, with the balance brought forward, 145,719*l*. An interim dividend at the rate of 16 per cent. will absorb 120,000*l*. of this, leaving 25,719*l*. to be carried forward.

William Dawbarn & Co.'s Trade Book. As this firm are slate, timber, tile, and iron merchants, their trade book, published monthly, becomes a tolerably comprehensive "Builders' Price Book." Moreover, it includes a considerable number of illustrations.

The First Commissioner of Works.—It is stated by the London correspondent of the *Birmingham Gazette* that Mr. Gerard Noel will succeed Lord Henry Lennox at the Board of Works.

TENDERS

For additions and alterations to the Rose and Crown, Stoke Newington. Mr. Williams, surveyor:—

Hanley	£740 0 0
Eaton	690 0 0
Marr	677 0 0
Hearle & Son	664 0 0

For alterations and additions to the workhouse in Bancroft-road, Mile-end, for the Guardians of the Hamlet of Mile-end Old Town. Mr. J. M. Knight, architect:—

Webb (Hanover-road)	£7,295 0 0
Webb (Stratford)	5,657 0 0
Grieves	5,547 0 0
Perry	5,178 0 0
Judd & Co.	5,089 0 0
Ennor	5,044 0 0
Co-operative Builders' Society	5,000 0 0
Hearle & Son	4,738 0 0

For taking down and rebuilding the Cherry Tree public-house, St. Leonard's-road, Bromley. Mr. J. M. Knight, architect:—

Ennor	£2,216 0 0
Palmer	2,211 0 0
Judd & Hawkings	2,191 0 0
Hearle & Son	1,875 0 0

For the erection of a dwelling-house, &c., at Bromley Kent, for Mr. Thomas Roberts. Mr. Geo. T. Howell, architect. Quantities supplied:—

	Dwelling-house.	Billiard-room.
Crabb	£3,765 0 0	£288 0 0
Patrick & Son	3,750 0 0	290 0 0
Richards	3,655 0 0	297 0 0
Toms	3,500 0 0	272 0 0
Co-operative Builders' Society	3,161 0 0	246 0 0

For alterations and additions to the Gothic, Highgate-road, for Mrs. Gover. Mr. A. Bradley Rooke, architect. Quantities supplied:—

Temple & Foster	£705 0 0
Henning & Son	697 0 0
Axford	665 0 0
Dainton	597 0 0

For alterations and additions at No. 45, Kensington Park Gardens, for Mr. Arthur Arnold. Mr. C. N. Beazley, architect:—

Staines & Son (accepted)	£350 0 0

For pulling down and rebuilding new beerhouse, St. Dunstan's-road, Stepney, for Mr. Wingfield. Mr. Wm. Scott, architect:—

J. & H. Cocks	£593 0 0
Sheffield	593 0 0
Palmer (accepted)	587 16 0

For alterations and additions to the Fountain public-house, Clapton, for Mr. Lincolin. Mr. William Scott, architect:—

Sheffield (accepted)	£530 0 0

For residence at Cliff's-end, Thanet, for Colonel Whitehead. Mr. William S. Barwick, architect:—

Horne	£3,879 0 0
Brown	3,810 0 0
Harrison	3,593 0 0
Paramor & Son (accepted)	3,220 0 0

For rebuilding the Red Lion, Duke-street, Manchester-square, for Mr. Raemena. Messrs. W. E. Williams & Son, architects.

Hearle & Son	£1,795 0 0
Ennor	1,680 0 0
Anley	1,630 0 0
Eaton	1,598 0 0

For alterations to the Falcon Tavern, Knightrider-street. Mr. W. Nunn, architect. Quantities not supplied:—

Hyde	£1,181 0 0
Veale	1,175 0 0
Drew	1,125 0 0
Lamble	829 0 0

For building a gardener's cottage in Gensing Gardens, St. Leonard's, Hastings, for the Hastings Urban Sanitary Authority. Messrs. Jeffery & Skiller, architects. Quantities supplied:—

Parks	£723 18 0
Eldridge	720 0 0
M'Connell	717 15 0
Livermore	696 0 0

For erecting house and studio, for Mr. Colin Hunter, Holland Park, Kensington. Mr. J. J. Stevenson, architect. Quantities supplied:—

Pritchard	£5,289 0 0
Scrivener & White	5,190 0 0
Nightingale	5,183 0 0
Hearn	4,900 0 0
Tyerman	4,594 0 0

The Builder.

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The Suez Canal.



WHEN the generation which quarrelled over the merits and possibilities of the French scheme for piercing the Isthmus of Suez has passed away, the world will probably take an independent view of the matter, and one opposed to that contained in blue or yellow books, newspapers, or even the letters of M. de Lesseps. As millions of French children have long been taught a history of their country essentially different from that recorded of it by any English historians, so, perhaps, a version of the later history of Egypt is already prescribed by authority for the instruction of rising Frenchmen. The materials of our own more prosaic version are ready to hand; but they are not quite pleasant reading. Those who specially devote themselves to the arts of diplomacy and commerce may doubtless be not unwilling to pay a compliment to English shrewdness and patience, and the good luck which has attended both; but those Englishmen who have had an opportunity of watching the game from a French as well as an English point of view, and of seeing the results in the land of promise itself, are not likely to feel unalloyed satisfaction while perusing the story, they can only too well authenticate, of the Suez Canal. It is a poor compensation to know that statesmen in both countries, while estimating the value of changes which science and enterprise have accomplished during the last forty years, have been equally short-sighted and proved equally at fault. If, by the pen of Lord Clarendon, an English Liberal Government declared in 1855 the cutting of the Isthmus to be "physically impossible,"—if, in the same year, Lord Stratford de Redcliffe said at Constantinople that it would take 100 years to execute, and that the moment chosen was inopportune,—with similar blindness, M. Thiers opposed the original project for, we think, the Western Railway from Paris to Hâvre, asserting his belief that such a system of travelling would never "take root in France"; and as time, the avenger, enabled the Minister of Louis Philippe to traverse Europe from one capital to another after allies to help his unfortunate country against united Germany, so now each new circumstance swells the bill of indictment already written against the policy and judgment of an English majority. Of course, recent events in Europe have strengthened the undeniable revulsion in British public feeling, although that revulsion had begun before France received the blow at home, which, it is useless to conceal, has crippled her efforts abroad; and the more recent Government purchase of the Viceroy's rights in the Canal itself has induced the people of this country to turn their eyes towards Egypt, rendered all the more interesting by the numerous hypotheses with which the prolific imagination of Continental journalists received the news of the unexpected investment. When years have rolled over the sands of Suez, and new buildings have surrounded the remnants of antiquity which dot them here and there, another and more powerful race may rule Egypt; and a great canal, of which the present one may be the mere shadow of its banks, may be then in course of construction, just as, at the present day, the successors of Clive govern countries which first witnessed the conquests of Dupleix. But the most skilful of historians cannot offer any other interpretation of fact than that, in the projection and construction of the Suez Canal, to France and French engineers is due all the merit; and that upon this Canal, the commerce of which is almost entirely British, with France and Frenchmen remains the dominant administrative power.

If England justly claims priority in the scientific application of steam and iron to the internal highways of Europe, France has an equal right to the honour of having overcome the obstacles of nature, and connected seas with the canal, just as at a later period kingdoms have been joined with the railway. The great Canal of Languedoc, begun in 1666, and continued uninterruptedly until 1681, is one of the grand works of the reign of Louis XIV. It connects the river Garonne with the Mediterranean Sea at Cette, where a port was constructed expressly for the purpose, thus joining the waters of that sea with those of the Bay of Biscay. This, the Canal du Midi, having a width of 20 mètres (about 66 ft.) at the surface, was constructed on a scale of magnificence which, to Englishmen even in an age of railways, may doubtless seem extravagant. At its highest point it is 719 ft. above the Mediterranean, between which and the highest point there are forty-six locks and eighteen more between that point and Toulouse. Oddly enough, it was not of any practical benefit until a short time before the railway was opened. Nevertheless, this great work of Paul Riquet was begun ninety-four years before (Voltaire says it was begun in 1664, which would make ninety-six years before) Brindley in England began the Bridgewater Canal; and a monument to Riquet, erected by his descendants in 1825, stands on a hill near the town of Montferrand, and not far from the summit-level or highest point of the Canal. Fired probably with some very natural enthusiasm for a kind of enterprise which constituted one of the monuments of the French Augustan age, the promoters of the scheme for uniting the waters of the Red and the Mediterranean seas sought, in the vanity rather than the cupidity of their nation, support for an undertaking which the best precedents and the most liberal calculations sufficed to brand with the stigma of financial failure; for though consummate tact and much engineering skill have been constantly exercised during the steady progress of the works, the Suez Canal owes as much to the force of French vanity as it does perhaps to the energy of British inactivity. Throughout, from the beginning to the end of the half-romantic story, one man's name is prominent—Ferdinand de Lesseps. He has treated with an emperor in France, and with ministers in England, in the tone and bearing of a monarch unattached. "You have done well," said Napoleon III. to him soon after he had obtained the firman of concession from the Viceroy of Egypt, "in not admitting other Governments to your enterprise; and you will do well not to relinquish this plan. If I assist you now there will be war with England; but when the interests of European capital, and especially of French capital, are engaged, every one will assist; and I first of all." Lord Clarendon, with whom M. de Lesseps conversed in Paris on the 13th of April, 1855, formally repudiated the idea, in the name of his colleagues and in his own, that England feared commercial competition, or would oppose a maritime advantage by which she would be the first to profit; but soon afterwards, in an interview with Lord Palmerston, M. de Lesseps heard from the lips of the Prime Minister that it was not only "impossible to make the Canal," but that "he knew more about the question than all the engineers in Europe," and that he frankly opposed the scheme. There is something excusably magnificent in the Frenchman's letter to M. Barthélemy Saint-Hilaire, describing Lord Palmerston's manner and reasoning. He wrote:—"As I listened to him, I asked myself from time to time whether the man before me was a maniac or a statesman." Guizot was dead before that letter was given to the world, or he might have compressed his hard lips into a harder smile at the thought that one of his countrymen should be enabled thus to speak exultingly of him who had preached "*civis Britannicus sum*" under the very noses of Louis Philippe and his obstinate adviser.

It is more than probable that the writings of Herodotus have been scanned over and over again in search of hints or allusions regarding the geography and perhaps geology of Egypt. But the father of history, who was doubtless still alive in B.C. 408—the exact date of his existence being uncertain,—talks about "the ancients," and speculates upon what might happen in 20,000 or even 10,000 years with such manifest composure as to disconcert a poor modern who is taught to believe in the antiquity of Herodotus. The reference derived from his descriptions and his arguments is, to use his own mode of expression, that 20,000 years before he was born there would have been no necessity to pierce the

Isthmus of Suez, inasmuch as no isthmus then existed; but, says he, "there is in the Arabian territory, not far from Egypt, branching from the Red Sea, a bay of the sea . . . . . and I am of opinion that Egypt was formerly a similar bay; this stretching from the northern sea towards Ethiopia; and the Arabian bay which I am describing from the south towards Syria; and that they almost perforated their recesses so as to meet each other, overlapping to some small extent." That the Egyptians were aware of the advantages to be obtained by a through water-passage from the Mediterranean to the Red Sea is proved by the traces still visible of the canal which was commenced by Neco, king of Egypt, and finished—perhaps restored or repaired—by Darius, the Persian, who came to the throne of Persia B.C. 521. This canal is described by Herodotus in the following words:—"Its length is a voyage of four days, and in width it was dug so that two triremes might sail rowed abreast. The water is drawn into it from the Nile, and it enters it a little above the city Babastes, passes near the Arabian city Patumos, and reaches to the Red Sea. The parts of the Egyptian plain that lie towards Arabia were dug first; above this plain is situated the mountain that stretches towards Memphis, in which are the quarries. Along the base of this mountain therefore, the canal is carried length-ways from the west to the east. . . . . In the part where the shortest and most direct passage from the northern sea to the southern (i.e., the Isthmus of Suez) . . . . . is the most direct way; but the canal is very much longer, in that it is more winding, in the digging of which one hundred and twenty thousand Egyptians perished in the reign of Neco." M. de Lesseps, in a minute drawn up by himself for presentation to Mohammed Said, then (1854) Viceroy, declares with a fervour which loses nothing from the strokes of an imaginative pen, that the idea of uniting the two seas had occurred to Sesostris, Alexander, Cæsar, the Arab conqueror Amron, Napoleon I., and Mehemet Ali. Under the ancient Egyptian dynasties, the canal, *viâ* the Nile, to which Herodotus alludes, existed for an unknown period of time; it afterwards existed, again according to M. de Lesseps, "from the Roman conquest to about the fourth century before the Mohammedan era, and again during 130 years after the Arab conquest.

It was Napoleon the Great who, during his campaign in Egypt, first took steps to reopen the old route. He appointed a commission, and M. Lepère then said that he would require 10,000 men during four years, and thirty or forty millions of francs for the restoration of the old indirect passage from the Nile to the Red Sea; but he half advised the direct route from Suez to the ruins of the ancient city of Pelusium; and this advice was acted upon fifty years afterwards by M. de Lesseps. To this gentleman the present canal was a mere dream in 1849, although the idea had attracted his youthful fancy as early as 1832, while staying in the country itself. Indeed, his connexion with Egypt is of an almost hereditary character, and deserves to be told in his own words:—"In 1803," he says, "my father was political agent for France in Egypt; and Bonaparte, then First Consul, gave him instructions to find a Turkish chief of sufficient energy and intelligence to be proposed at Constantinople for re-investiture of the dignity, then almost nominal, of Pacha at Cairo. Mehemet Ali, a native of Macedonia, and commander of some thousand Bashi-Bazouks, but who could neither read nor write, became the guest and friend of my father, who aided him with his advice. . . . Fifty years later the son of Matthew de Lesseps, long the friend of Mehemet Ali's son, advised the latter to undertake a scheme which will render his reign illustrious." The glory of that scheme, however, will rest, in the eyes of posterity, with the prince who assisted at its accomplishment rather than with him who aided in starting it; and in spite of the fact that both their names are for ever associated with the Canal. The former has given his to Port Said, the future great city at its northern mouth, and the latter his,—Ismail Pacha, the reigning Viceroy,—to the charming inland port on the shore of Lake Timsah, and called Ismailia.

M. de Lesseps was engaged on the 15th of September, 1854, upon the scaffolding of his residence in France, adding "a story to Agnes Sorel's old manor-house," when some of the workmen handed up to him a packet of letters, one of which announced the death of Abbas Pacha, who had declined to entertain any scheme for cutting through the Isthmus of Suez. His successor was no other than Mohammed Said, whose early youth had been passed in the society, and perhaps a little under the guidance, of M. de Lesseps. The latter, therefore, hastened to write his congratulations to the new Viceroy, and said that he would go to pay his respects to him in "dear old Egypt" where he landed, at Alexandria, on the 7th of November, 1854. His reception by Said Pacha was precisely of a character likely to be agreeable to M. de Lesseps. The Viceroy talked about his youthful grievances, and the early unhappiness often alleviated by his sympathetic French friend; and when the latter paid a morning visit, we are told by M. de Lesseps himself, that "the Viceroy left his apartments as soon as he heard of my arrival." They travelled together to Cairo; and, on the way, the scheme of the canal was broached; to which, after several objections and some arguments, the Viceroy at last said,—"I am convinced; I accept your plan. . . . . Consider the matter settled. You may rely upon me." They soon afterwards took water, and continued their journey to Cairo in the steam yacht which Abbas Pacha had obtained from England at a cost of 200,000*l.*,—a piece of extravagance which Said Pacha would not have been guilty of, although he chose to profit by it. "It would be impossible," writes M. de Lesseps, "to convey an idea of the luxury of the arrangements, paintings, and furniture of this vessel: doors of oak and citron, locks and hinges of silver, medallions, stairs with silver balusters, divans covered with cloth of gold, a saloon 40 ft. long, dining-room, boudoir, bedrooms, all furnished in the style of the grandest palace." They landed at Boulak late at night, and the next morning proceeded to Cairo, where M. de Lesseps's entry appears to have been a sort of triumphal procession. He was lodged in the Palace of Muçafirs,—the Foreigners' Palace,—which was the home, as he is careful to note, of the Institute of France during the French Expedition. As he passed through the crowded streets his grooms and runners administered the usual Oriental blows, right and left, to an admiring populace, who merely muttered, "Glory be to God, here's a great lord,"—which circumstance afforded an opportunity to M. de Lesseps of recalling Joshua's massacre of the women, children, and asses of Jericho, of which the Scripture saith:—"So the Lord was with Joshua, and his fame was noised throughout all the country!" *

Next month began the first practical survey of the Isthmus. M. de Lesseps, and two engineers† started with a few friends along the road, then just macadamised from Cairo to Suez, where they arrived the day after, having done the journey of thirty-two French leagues through the desert much as they might have done, years ago, the journey from Paris to Orleans. From the window of the hotel, M. de Lesseps got, as he imagined, a foretaste of India and China. He noticed that at Suez people moved more languidly than in other parts of Egypt; and he found out that they had only brackish water to drink. "Our canal," he writes, "will give them both the water and the animation they need." The surveying party made an excursion that Christmas-day to see the remains of the old Canal of the Pharaohs, the banks of which they found distinctly visible; on the 27th they examined the port and the Suez mouth of the intended canal, and, landing on islets, they saw what were called rocks, but which they recognised as the remains of masonry; and, on the 30th, the caravan of camels and dromedaries was got ready for starting, the tents being set up between the gate of the town and "the ruined citadel of the ancient Colysma," at the further end of the port. They rose by moonlight the next morning, and proceeded for three hours along the bed of the ancient canal; pitched camp at sunset, and next day rounded the dry basin of the Bitter Lakes, which is said to have been originally a part of the Red Sea. "The ancient bed," writes M. de Lesseps, "is strewn with pieces of salt looking like broken ice." They ascended a hill upon which they found a monument erected presumably by Darius, in commemoration of the completion of his canal. Some granite blocks still remained, one of which bore cuneiform inscriptions, another the representations of a vulture, with outspread wings, and also of the Egyptian sceptre. They then continued their journey, leaving the Bitter Lakes on their right; the next morning they passed a second Persepolitan monument, and rode along the dyke of the original canal, arriving at two o'clock at their third encampment, near Lake Timsah. "We are now," enters M. de Lesseps in his journal, "in the land of Goshen," and he takes out his Bible, but in more of an antiquarian spirit than from any sudden burst of piety. He had passed the spot where the Israelites "crossed" the Red Sea,—crossed, he says, "the last lagoons of the Red Sea by the fords, much as the Bedouins still do at low tide, near Suez. Pharaoh's generals, as those of Said Pacha now are, were ignorant of the existence of these passages." It would appear that the Israelites passed the night, after having crossed, in the low-lying districts between Lake Timsah and the Bitter Lakes,—it being low tide,—and the next morning the Egyptian troops who were pursuing them "were overthrown in the waves of the sea and the quagmires of the valley." Who does not remember the wonderful pictures of this very natural event which adorn the walls of various European galleries?—with the ocean conveniently parted into two huge cliffs, like a railway cutting, or the natural walls of the Avon below Clifton? The land of Goshen which M. de Lesseps had just entered, and was to traverse during the next two days, is thus treated by him:—"Goshen, in Hebrew, signifies 'pasturage,' and it is remarkable that the Arab word for pasturage is *guess*. The ancient Ethiopian word for shepherd is *sos*, and the name of Suez is probably derived from it. So that the land of *Goshen*, the land of *Guess*, and the Isthmus of Suez, would be one and the same country"; and the conclusion he drew out of sundry quotations from the verses of Exodus is, that the land of Goshen, when it is permeated by his fresh-water canal, will become as fertile as it was in the days of Moses, when "all the cattle of Egypt died, but of the cattle of the children of Israel died not one." On the 3rd of January the surveying party visited the ruins, as M. de Lesseps is pleased to say, of Rameses, which was the chief city of the land of Goshen. Suffice it: they saw statues on which a hieroglyhic inscription said that the figures represented Rameses II. and his two sons. The next day they went round the eastern side of Lake Timsah, and soon afterwards a storm arose similar to that which enabled the Israelites to escape from their pursuers, and it was not until the 7th that they made for the north of Lake Timsah, which was then the centre of the isthmus, and is now the centre of the Canal, and its internal port. It was Linant Bey who first suggested that the basin should be an internal port. Surrounded by hills, it forms, according to M. de Lesseps, "a splendid natural harbour . . . . . Vessels anchoring in it will be able to reviotual." Indeed, we remember revictualling ourselves at the excellent hotel close to the railway station of Ismailla, and can endorse his description of the lake, which is now alive with ships and passengers,—the latter quite careless of the proximity of a neighbourhood so renowned as that of Goshen. Lake Menzaleh, filled partly by the inundations of the Nile and partly by the Mediterranean, was sighted on the 8th; and from the top of a hill, which is the site of a fortress, they saw the beach of Pelusium. M. de Lesseps, the future conqueror of the land he had just passed over, looked from his eminence, and tried to see on his right the spot "where Pompey was killed, and, on the left, Damietta, where St. Louis landed."

We have told the story of this first survey of the Isthmus of Suez, as M. de Lesseps has told it in letters and in his journal. These have been translated into English; and more than one publisher has enabled people in this country to judge for themselves of the numberless petty difficulties encountered by the original actors in what, some twenty years ago, was really an amusing comedy. The early letters and documents descriptive of the Canal have been translated by M. N. D'Anvers, and they form a very readable book.* How at last the Canal was completed and opened in the presence of the Empress Eugenie, with the approbation and congratulations of the whole world, including England, is known to all. Although one of the great works of the century, its only claim to be called a wonder of the world is the wonder that it should have been made in opposition to the power which alone has reaped any benefit from

* Journal, November 25th, 1854.

† Linant Bey and Mougel Bey, the former of whom, in 1854, was the director of the canal works in Egypt, and had held the office for thirty years. The latter was director of works at the *barrage* of the Nile, and chief engineer of the "Ponts et Chaussées."

* The Suez Canal. By Ferdinand de Lesseps. Translated by N. D'Anvers, author of "The Elementary History of Art." Henry S. King & Co., London. 1876.

its achievement. Its inauguration was almost immediately followed by the humiliation of France and the overthrow of that dynasty whose founder had first conceived the possibility of re-uniting the two seas; and when, in 1872, we entered the harbour of Port Said, the French boatman who rowed us ashore, and who wore an Infantry soldier's overcoat, made the same speech that was made to Thackeray by another Frenchman on the field of Waterloo. We asked whether he had assisted in the then recent war, to which he replied "*Pas si bête*"; and we confess that the sentiment contained in those three little words lessened the enthusiasm every man entering the Canal must experience when about to test for the first time the advantages of a piece of engineering which would seem to have been accomplished by the French for the especial benefit of a rival and inappreciative nation. We were not rendered so blind, however, to the importance of what M. de Lesseps has achieved as not to feel some little indignation at sight of the "monument" which disfigures one of the quays at Suez, and which is said to be a bust of the great projector. Possibly M. de Lesseps may think it but a poor compliment to hear his name pronounced in the same breath with that of Darius, but his work is at least as great as, and likely to produce greater results than, that of the latter; and no monument but an imperishable one formed of granite from Mount Sinai can be deemed worthy of the man whose name it should record. If readers of his letters and journal have been forced to smile sometimes at his magniloquence, they none the less admit his tact and energy, and attribute his success to the possession of those qualities rather than to the celestial influences and omens which he rejoices in describing, before or after any event of importance connected with his project. One day an eagle hovered over his tent in the Libyan desert; he fired, and it fell at his feet. Another day he saw a rainbow, the ends of the arc dipping east and west, and he argued that this "sign of the covenant" ensured his success, because on that very day Said Pacha had accepted his plan. A similar rainbow appeared a fortnight after on the first day of his survey of the Isthmus, when he laid, as he says, the foundations of the union of the East and West. Nor does he seem to have been less confident in the luck of a date or a name. The report of the Viceroy's engineers was signed at Cairo on a 20th of March,—a day of historical omen to the Bonaparte family; and, in his own words, he sought to bring his bark to the port which was to be called "Said," the name of the then-reigning Viceroy, and Arab for "fortunate."

The probable consequences of the Suez Canal to the world at large, and to England and the Indian Empire in particular, are not yet considered, or perhaps even suspected, by many of the statesmen and politicians of this country. These gentlemen are, or profess to be, too practical to indulge in speculation concerning the future relations of the great commercial depôts which form a chain of communication between London and the cities of India, China, and Japan. The late M. Guizot, who, from his retreat in Normandy, used to take from time to time a shrewd penetrating glance at affairs, wrote about the Canal, then only existing in M. de Lesseps's imagination, to the Count d'Escayrac thus:—"I much desire the accomplishment of the design. I wish it for the benefit of the civilised world, and a little from selfish motives also. It will be the realisation of one of the schemes which, I will not say I had dreamt of, but had foreseen, and had even in some degree commenced. . . . Neither I nor any other person can say what the Mohammedan East will become. . . . but in any case the Canal through Suez will change the relations between Europe and Asia." That these relations are in course of transformation all who have travelled as far east as Bombay or even as far as Suez are ready to admit. The intervention of any Christian power at Constantinople, which should lead to the expulsion, even at a remote date, of the Turks from Europe, would cause a change in the political position of Egypt the importance of which could not possibly be disregarded by this country. It is not our privilege to examine the political phases of such a question as the relations of Egypt to India and England; but the mutual advantage which the two last-named countries have derived from their connexion ought not to escape those who have at heart the welfare of the Egyptians—a people whose early habits and monuments of architecture bear so many traits cognate to those of Hindustan, as to hint at the probability of an original connexion between the inhabitants of parts of Africa and parts of India; and between whom the description of the Egyptians by Herodotus furnishes more than a superficial resemblance.

While the Greek historian affords moral evidence of similarity between the manners of the ancient Egyptians,—or rather of the people he met in Egypt,—and the Hindus, the Nubian temples and some of the Egyptian obelisks are strangely alike in execution, and perhaps purpose, to monuments of the same kind in India. These same Egyptians, who possessed more wonders, according to Herodotus, than any other countries, wrote and ciphered by moving the hand from right to left; they observed their ancient customs, but acquired no new ones; they saluted by letting the hand fall down as far as the knee; they paid particular attention to the linen garments they wore, which they kept constantly washed; and the priests washed themselves twice every day and twice every night. They drank from cups of brass, and their priests had sacred food cooked for them. The Egyptians paid a greater reverence to the cow than to any other animal; and they had a custom relating to brutes, each kind being fed separately by a different superintendent, whose son succeeded his father in that office. They were also divided into classes or castes, and took their names from the employment they exercised, the son succeeding the father. They held public festivals several times a year; and at these both sexes assembled together and sang, while the women had castanets on which they played. They had a festival of lamps, a great number of which were lighted on a certain night; and on this and similar occasions the image or god was placed in a gilded wood temple, which was lifted upon a wheeled carriage and drawn by the few who had charge of it. The traveller may see customs and ceremonies almost identical in Hindustan, at the present day, among the Hindus. The great obelisk at Axum, in Abyssinia, is (according to Mr. Fergusson) evidently Egyptian, but its details are Indian. In Egypt-Proper and in Nubia the Egyptians excavated monuments from the living rock, so did the Hindus at Ellora, and many other places; and it is not improbable that the Egyptian tombs, when first excavated, were intended as "dwelling-places for the living to be afterwards appropriated as sepulchres for the dead," just like the later fashion of the Indian Moguls. If fate or circumstance should ever impose upon the present rulers of India the regeneration of Egypt, the traditions of the one country may be depended upon to elucidate those of the other; and the parallel between them perhaps be indefinitely prolonged.

CORNWALL CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

The Congress has commenced most auspiciously. The visit to Cotehele was most enjoyable. The dinner at Bodmin, at which Lord Mount Edgcumbe presided, was attended by a large number of persons, who afterwards assembled at the Guildhall, where the Mayor and Corporation presented an address, and the President read an inaugural paper. The Rev. W. Jago gave a lucid account of the Antiquities of Bodmin, in the midst of a most interesting assemblage of ancient relics and an excellent collection of prints and drawings illustrating Cornish worthies. On Tuesday an excursion was made to Tintagel. We reserve a report of the proceedings for our next number. We append, however, part of the President's opening address:—

I hope I may infer that your first impressions of our county are somewhat more favourable than those of Gilpin, who, in his tour in the West of England towards the close of the last century, entered Cornwall by the Launceston route, and thus summarily disposed of its attractions:—"From Launceston we travelled into Cornwall as far as Bodmin through a coarse, naked country, and in all respects as uninteresting as well can be conceived. Of wood, in every shape, it is entirely destitute. Having heard that the country beyond Bodmin was exactly like that we had already passed, we resolved to travel no farther in Cornwall, and instead of visiting Land's End, as we had intended, we took the road to Lescard, proposing to visit Plymouth on our return." In your route you have avoided the rugged backbone of the country, which extends for nearly seventy miles from east to west, and which so disgusted Gilpin; and I may call on you as witnesses that there are some patches of sylvan scenery in Cornwall which might have pleased that prince of landscape gardeners, and that we possess valleys and rivers which may challenge comparison even with those of our charming sister county. But you come to explore not our combes and streams, not our crags and headlands, which no one has yet disparaged, but our antiquities, and I hope you will not return disappointed. And, speaking of antiquities, I think I may assume that to be an antiquary, to be capable of instructing or guiding others in historical or archæological research, is not regarded by this Association as an essential attribute of the president of its annual congress. I shall not attempt, for this night only (as they say in the play-bills), to appear before you in the character and "make-up" of a student of archæology, but shall address you merely as one who, perhaps, by reason of his very ignorance, feels a certain pride in his native county, believing it to have special characteristics and points of interest of its own, but who is too much of a borderer to be able to speak of those characteristics with the same vividness and familiarity with which others whom I see here will be able to place them before you. Those fragmentary pages in the history of the Cornish people which will, perhaps, specially interest you, the rude monuments, legends, and names by which they are illustrated, have been the subject of much controversy, and perhaps even still, if I may be allowed to quote the words of a poet whom we all should know,—

> "Afford full scope for antiquarian guess,
> Which oft, when all is doubt, decides with firmest stress."

Let none suppose that I apply these words to the work of such an association as this, any more than our genial, though occasionally satirical, friend did when he penned them. On the contrary, one of the great advantages of such associations is, that they bring together many minds to converge upon one point, to check the eccentricities and challenge the accuracy of individual theorists. Mr. William Copeland Borlase, who has by his "Nænia Cornubiæ" shown himself fully worthy to bear the name of the author of "The Antiquities of Cornwall," says at the commencement of that admirable essay,—"Archæology, whatever may be its pretensions to be called a separate science, can never fail to be of the greatest value when it seeks to rest the vapoury superstructure of theory or tradition upon the firm basis of observed fact. The geologist may have puzzled himself into the conclusion that for his purposes time is no object; but with the antiquary the first care must always be to affix, where he sees a possibility of so doing, an appropriate date, at least, to each individual object that comes under his notice." And, if it be felt that the rough stone memorials of early Cornish are so rude and so simple as to make it a hopeless task to glean from them any further information, I would refer to the last chapter of the same work to show what patient and intelligent research has been able to effect even within the last few years. The fact that coins of the later Roman Emperors have been found in several interments show how knowledge may unexpectedly be gained step by step. The presence of flint implements in similar monuments had previously given an impression of greater antiquity, but those primitive weapons can scarcely, I suppose, be regarded as peculiar to any particular age. In England they are regarded as pre-historic; in Australia they have been used and manufactured in the nineteenth century; and no doubt a stone-headed spear may constantly be found in the hand of a native with coins of Queen Victoria in his pocket, if he has such a thing. A similar juxtaposition in a Cornish tomb may, therefore, only indicate that the Cornish were old-fashioned in their habits even in those days. You will very likely find us an old-fashioned people still, and I hope, as archæologists, not like us the less for that. Perhaps you will find us also a somewhat prejudiced people—inclined to cling to old traditions and to rely upon our local knowledge, but not, I hope, too proud to be taught or untaught by those who are better informed. With this slight prelude of warning I will sketch the programme provided for your excursions. To-morrow you will proceed through the castle or camp of Pencarrow, which you will find, not like Edie Ochiltree's ditch, but a fine and grand earthwork. You will rest for a pleasant interval at Lanteglos, and see the church and other objects of interest there, and partake of the Rev. J. J. Wilkinson's hospitality; and then you will

make your way to the ruins of Tintagel, on its bold and wild promontory by the Severn Sea There you must expect to see only shattered arches and crumbling walls, scarcely distinguishable from the rocks on which they stand, *débris* from which it needs the fancy of no mean poet to build even a castle in the air, while all your archæological skill and experience will be tested to determine the original plan and style of the actual building. I hope, however, that even here, under the trustworthy guidance of the Rev. Prebendary Kinsman, the rector of the ancient church of Tintagel and custodian of all that remains of the great castle, your researches will not be altogether barren; and, at any rate, it will interest you to visit a spot whose name has ever been associated with the grand legends of the blameless king. In reproducing those legends the Laureate sought inspiration from Cornwall, as other poets and novelists have done before. He has visited the county several times, and was a guest of the late vicar of Morwenstow before any of the "Idylls of the King" were published. Mr. Hawker, in his "Quest of the Sangreal," emulated not unsuccessfully, or perhaps anticipated, the Laureate's fine fancies, and in some of his ballads he has done justice to other memorable scenes, characters, and incidents in Cornish history, and although you will not place too much reliance on those who, when facts are wanting, can so freely draw on imagination to supply the missing links, you can but feel and admire the spell which genius has cast over many of the places in your route. In Cornwall local myths and legends, like so many Cornish names, have been sadly vulgarised by popular traditions, and invested with a grotesque character which is almost as much removed from the sublime as some of the tales of the Cornish hero, Jack the Giant Killer, and which I venture to think they cannot always have worn. The identification of the malignant giant Tregeagle with Lord Robartes's dishonest steward of that name in the seventeenth century must surely be a perversion of some more interesting fancy. The tale of his haunting Dosmare Pool, which he is compelled to empty with a pierced limpet-shell, is a very different conception to that of the mysterious form whose arm, "clothed in white samite, mystic, wonderful," rose from the middle mere, to catch King Arthur's sword Excaliber. The story of the same Tregeagle being hunted by the devil, and throwing down his sack of sand on the bar which separates Loe Pool, near Helston, from the sea, sounds also a whimsical tradition. The name Tregeagle itself has an absurd sound, and the personality of the devil, although it has only recently been a subject of litigation, has from time immemorial been associated, more or less, with the grotesque and ridiculous; and yet am I too fanciful in thinking that this legend, treated as the older ones of Eastern origin have been by Professor Max Müller, might wear a nobler and more characteristic aspect? Might we not regard it as impersonating the ocean giant, the natural symbol to the dweller on such a coast of all that is powerful and ruthless, lashed by the howling demon of the storm, and casting down his burden of sand upon the bar, only to be carried back at the changing will of his resistless tormentor? The programme of Wednesday embraces a variety of objects. First, what was once the monastery of St. Bennet, where the present proprietor, Captain Serjeant, has kindly promised to meet you. Next you will enter the fine avenues of Lanhydrock, and see the fine old mansion and remarkable gallery there, which the noble owner will throw open to your inspection, and the old church immediately adjoining. Then you will go through one of the loveliest valleys of the West to Restormel Castle, which is one of the finest objects in the county, is associated with historic recollections from a very remote period, and has descended from Edward the Black Prince,—the first Duke of Cornwall,—to his Royal Highness the present Duke of Cornwall, who has so graciously consented to become our patron under that title. Mr. Couch, of Bodmin, has promised us a paper on Restormel, and he will be your competent guide when you visit the castle. In the town of Lostwithiel, to which you will descend from the ivied keep through a wooded vale by the banks of the Fowey, you will be received by the authorities of that ancient borough, who will show you their charter, the old Stannary buildings, and other objects deserving inspection. That I should feel a special interest in this beautifully-situated, but now, unfortunately, disfranchised borough, you will think but natural, after the long connexion of my ancestors with it in the good old days when Cornwall returned about forty members to the House of Commons, I believe, instead of thirteen, with which we are now obliged to be satisfied. You will then go up along the banks of the Fowey through Glynn Valley to St. Neot's, commonly pronounced St. Nyot's, the second largest parish in Cornwall. The church there is one of the finest in the county, and its series of painted windows have long excited the curiosity and admiration of the antiquary. In a meadow near the church you will see the very well in which the venerable saint—brother, some say, of Alfred the Great—obtained an inexhaustible supply of his frugal diet, from the trout which was marvellously kept up to the number of three, provided he took only one trout at a time from the well. The catastrophe which happened when the saint fell ill, and his imprudent cook took out two trout from the spring, is narrated in amusing verse by your local secretary, whose versatile music can turn so lightly from grave to gay, if he wishes to stir the heart or raise a smile:—

> "The well remains, and if you doubt,
> Come and perhaps you'll see the trout,
> And learn to cypher to your gain,—
> Take one from three and three remain."

On Thursday you will traverse the same moors, and nearly the same roads, which dismayed Gilpin. In your way you will pass the forlorn church of Temple, built by the Knights Templars, but now consisting only, I believe, of a ruinous arch and roofless walls, within which an ash-tree has taken firm root. Thence skirting Roughtor and Brown Willy, our highest hills, you will pass near and possibly have time to visit the largest of our lakes or tarns, Dosmare Pool. The name Doz-mare—drop of the sea—is supposed to refer to the idea that it communicated at an unfathomable depth by an underground channel with Falmouth harbour. You will then soon leave the moors, and will with every mile get into a more fertile and wooded country, until at last at some distance you see the magnificent keep of Launceston on its high mound, with the town clustering round its base. There you will be received by the Mayor, and I venture to think you will be repaid for your long journey, as the Rev. J. J. Wilkinson guides you among the antiquities of the place, which are of special interest to archæologists; and there, too, you will procure the refection so needful for appetites sharpened by moorland air and breezes. On Friday you will journey westward, and in the fair town of Truro, the best built and probably largest of our towns, you will be received by Mr. Jonathan Rashleigh, now president of the Royal Institution of Cornwall, by Dr. Barham, Dr. Jago, and other members of that society, who will show you their museum, which is in some respects, I believe, the most complete this side of Bristol, and in which archæological treasures have been gathered and protected from time and the more ruthless hands of the destroyers. The Institution, which was founded in 1818, has done good service to the county by its meetings, lectures, and archæological excursions to different parts of Cornwall, and by the reports in which the proceedings are faithfully registered. Some of the members of the Institution will accompany you, if time permits, to the church on the sands at Perran. On Friday afternoon you will proceed through the heart of the mining district, both of modern and ancient time. You will already have observed indications of tin streaming,—a practice extending into primitive ages. I hardly know if I may refer to our trade in tin with the Phœnicians. Nor would I venture to lay any stress upon the evidences of Phœnician intercourse which is supposed to be afforded by the peculiar cream you have had an opportunity of tasting. But when we know how universally bronze has been used in place of iron during the early period of civilisation, and how few are the known sources from which tin,—that essential ingredient of bronze,—could then be obtained, we cannot doubt that it must have been largely exported from Cornwall in very early ages. Though you will see the vast and extensive mining works of recent skill, you will not fail to notice, also, that in consequence of foreign competition, many a mine-stack has ceased sending forth smoke, and that many engine-houses are in ruins. From so many scenes of active industry you will pass to the region of legend and romance:—

> "Where the great vision of the guarded mount
> Looks toward Namanco's and Bayona's hold."

The striking position and the romantic records of the Mount, and of the picturesque edifice with which it is crowned,—now a monastery, now a fortress, now a mansion,—are too familiar to you to require any description from me. You will see in its construction, in going over the building, the evidence of changes corresponding with the different eras of its existence; and Sir John St. Aubyn, who will receive you there on one of the following days, has followed the example of others through whose hands it has passed during its chequered career in making extensive additions, which will add not a little to the credit of Mr. J. P. St. Aubyn, the architect. I need not tell you that you will receive a hearty welcome in the town of Penzance, which is not the less renowned for its hospitality than for its commercial enterprise and prosperity. Of the attractions of the district between Penzance and the Land's End, I cannot attempt to speak to-night. Its most interesting relics will be shown to you and carefully explained by Mr. W. Borlase and others who are at home in that Eldorado of antiquaries. That the programme provided for you is ample, that it will be archæologically interesting, I have no doubt. During the last three days you will find an opportunity of tracing the evidences of the Cornu-Britons in their dwellings, their circles, their interments. You will have your attention called to the early works in menhir and cromlech; to the holy walls and oratories of the first missionaries, which cannot be detached from the fact that Christianity was brought into this country before St. Augustine came. You will have seen some of our famous churches with examples of earlier work and some specimens of laborious decorations, although most of them were built in the fifteenth century. The fact of such universal restoration in that epoch is interesting as a proof of religious zeal; and even in the sad time when ministers of the Church were sunk in apathy, the Wesleyan chapels which may be seen in every village and hamlet afford evidence that the religious feeling of the people of Cornwall had never died out. The Church is now awakened again, and is placing her house in order. You will have visited or seen from the distance the only three Edwardian castles we possess, of which two were used once more for military purposes,—one for the king and one for the Parliament, in the Civil War of which, for a time, this county was one of the most active scenes, and in connexion with which you will note an interesting record of Cornish loyalty and Royal gratitude in the letter addressed by King Charles to his faithful subjects in this county, which is, or ought to be, preserved in our churches.

STATUES.

The Prince Consort Memorial, Edinburgh.—The bronze equestrian statue which forms the central and dominating feature of the Prince Consort Memorial, Edinburgh, was on the 9th inst. placed on the pedestal, round which had been previously fixed the bas-reliefs and subordinate groups which go to complete this national monument. The statue was unveiled by her Majesty the Queen on Thursday last, the 17th inst.

King Robert the Bruce.—A meeting of the committee for erecting a statue to King Robert the Bruce on the Esplanade at Stirling Castle was held recently, when a discussion ensued as to the desirability of changing the statue from bronze to durable Binnie stone, as the funds were so far short for erecting it in bronze, which would cost about 1,000*l*. It was resolved that the opinion of the subscribers should be elicited.

Thomas Campbell.—The executive committee for the erection of a monument to the memory of Thomas Campbell, the poet, have accepted a design by Mr. John Mossman, sculptor, Glasgow, who has represented the poet in the costume of the latter period of George IV.'s reign, with a cloak drooping over his left side and arm. In the left hand is a scroll, while the right holds a pen. The statue, which is to be cast in bronze, will be 8½ ft. high, and will be placed on a pedestal of granite 12 ft. high. The monument will, it is expected, be placed in George's-square, and will, it is said, be completed by the centenary of the poet's birth, which occurs in July, 1877. Mr. Brodie and Mr. Ewing submitted designs for the work.

Society of Engineers.—Arrangements have been made for a visit of the members and associates of this Society, on Tuesday, the 22nd instant, to the Royal Victoria Victualling Yard, Deptford.

THE NATIONAL GALLERY PICTURES.

In a recent number we described and criticised at some length the architectural additions to the National Gallery. The re-opening of the Gallery to the public, after the long period of closing necessary for carrying out the new works, brings for the first time under general notice the new collection of pictures, or rather the selection from the pictures bequeathed to the nation by Mr. Wynn-Ellis. These, as we have before mentioned, are placed collectively in the south-east room, forming the end apartment of the old range of rooms. Some information as to the general contents of the new collection, and its principal points of interest, may be acceptable in the first instance.

The strength of the collection in question lies almost entirely in paintings of the Dutch schools, and, in fact, no other school is much represented. There is a good copy of a good Raffaelle, which, in its way, makes a pleasing feature in the collection. The only Italian work we noticed that is of real interest is a curious little Pollajuolo,—not more curious perhaps than many of the artist's works, but at least bearing his characteristics very strongly; it represents Apollo and Daphne. The nymph, clad in a dark robe, has just been seized by the god in his arms and lifted from the ground, and her upraised arms have already sprouted into two laurel bushes, showing nearly black against a golden sky; the rest of the laurel is "to follow." The picture is striking, not only for its quaint conceit, but for the richness of colour which it displays; it may be termed a decorative picture, and, in fact, has a little of the character of illumination design. Besides this specimen of Italian art, there are several Canalettos (or should we say Canaletti?), one of which is a work of some size and importance, representing the Maundy Thursday procession at Venice, with the Scuola di San Rocco as the background to a crowd of figures put in by Tiepolo; the building, which makes the real picture, being by Canaletto. A little of Canaletto, to our thinking, goes a long way; and we cannot regard this large "front elevation," very carefully but not very brilliantly delineated, as a very telling specimen of the painter, who is quite adequately represented already in the National Collection. However, there is a certain individuality and importance of aim about the work which make it worth having, though we think it has been over-praised.

Having paid our debt to the great Italian strain of painters, so far as represented in the Wynn-Ellis collection, we may turn (in this instance) with more satisfaction to the far larger proportion of works of Northern art. Among these the first that every visitor will look at, since it is impossible to pass over so extraordinary a production, will be the "Money-changers" of Quintin Matsys (944), one of several variations on the same theme performed by this brilliant executant. In this edition the two misers wear most extraordinary head-dresses, one red, the other green, which might have been suggested by an extension of the idea of a cock's comb; their thin wrinkled faces are painted with the utmost minuteness; the one to the right, stretching out a hand towards the heaps of coins, shows a face that, what with the corrugated brows and the wrinkled lip drawn up from over the teeth, is scarcely human in expression, and certainly incomprehensible. The picture (a strange contrast to the calm and conventional specimen of religious art by which the painter is represented in another room in the building) is, in short, the product of an utterly unhealthy and exaggerated taste; but, however disagreeable, it has an unquestionable power, and is a valuable acquisition as a typical specimen of the artist's later and highly individual style. To the works of another painter, also previously represented by only one picture, we can turn with much greater satisfaction. In the note to the single work by Vander Capelle, in the existing National Gallery catalogue, he is described as "a marine painter of Amsterdam, of whom scarcely anything is known." The new bequest at least gives us the further information that he painted several other pictures, besides the one we already possessed, which are well worth having. He runs always on the same tack; all his scenes here are of lazy calm seas, with still more lazy craft floating on the surface; "A River Scene, with State Barge" (965), and "A Sailing Boat and Barge" (967) are particularly good, broad in style, and full of light and air; and though Vander Capelle repeats himself, he repeats no one else, and is quite distinct in style and feeling from other artists who have made the same style of subject their own,—W. Vandevelde for instance, with whom Vander Capelle may compare here as a painter of calms very favourably. There are several works of the former painter in the collection, including two under the same title,—"A Calm—Vessels Saluting," of which the smaller (980) is the finer in quality. "Ships in a Storm" (981) with a black mass of cloud behind, and a foaming sea under the bows of the ship in the foreground, is very powerful in effect, but surely speaks more for the painter's artistic power than for his seamanship. By Adrian Vandevelde there is a notable little work called "A Bay Horse and Goats" (983), the interest of which, however, lies more in the general composition and effect of the scene than in the animal painting. Near this, a small Vander Heyde (993) is very questionable, or must have been much manipulated, if we compare the treatment of the buildings with the artist's usual remarkable hardness and minute finish. We find amends at the other side of the room, in the interesting picture called "Gothic and Classic Buildings" (992), showing, in Vander Heyde's usual minute style of workmanship, a brick domestic Gothic building, very picturesque, grouped irregularly with a Classic pedimented structure, of which we only see one end, and which seems to be a triumphal arch. As a specimen of architectural grouping and contrast by a painter this little work is very interesting. Near it hangs a hard, artificial, but brilliantly executed architectural picture by Dirk von Deelen, a kind of apotheosis of "Renaissance Architecture," and looking, to say truth, a little more like a well got-up and telling competition perspective than a picture painted for art's sake alone.

The collection includes not a few Boths, of some size, but not very Bothy specimens of the artist; or at least having affinity in composition rather than in colour to his well-known and salient specimens. There is one which is remarkable as quite out of his usual line of subject, "On the Banks of the Tiber, Outside Rome" (958), with a most characteristic group of uncouth bits of building of all ages and outlines receding in perspective from the foreground. Also, 957 is a very beautiful work; a still pond and cattle in the foreground, and a rise of the ground behind, which cuts off all but one small triangular slip of hazy distance. But Ruysdael and Hobbema are very finely represented. Of the former artist there are one or two of those typical specimens (such as 987), which would be more admirable were they not all so much alike. But no such remark applies to the noble "View over a Flat Country" (990), which is perfectly free from manner, and a very powerful work; some ruined fortifications give an interest to the foreground, and the distance is mostly in shadow under a cloudy sky, save a gleam of light in the middle distance, which is most telling in effect. Over this hangs a good De Kôning, not, however, equal to one which we already possess; but the Ruysdael is a real treasure; and the smaller one next it, "Watermills" (989), also a very charming and individual work: and the visitor should on no account overlook a very small Ruysdael, "The Old Oak" (988), a powerful, thickly-painted work recalling the feeling and style of Dupré. Of the Hobbemas which are included in this collection there is, perhaps, none so distinctive in subject and character as that old favourite in the gallery, "The Avenue at Middelharnis," of which it might be said that no one in the world but Hobbema could be the author. But the large specimens in the Wynn-Ellis room show the painter on a grander scale and with more ambitious aims. No. 995 is a very fine broad study of forest scenery, and the "Castle of Trondhiem" (996), is a very impressive landscape on a great scale, and more extended and grandiose in character than is usual with the artist. Comparing them with the Cuyps and Boths in the same room, one is reminded of a recently propounded theory as to the effect of the constitution of the eye on the perception of colour in painting. Compare these two large Hobbemas, for instance, with the large Cuyp, No. 960: does it seem possible to believe that the painters of these two pictures, living in the same climate and in similar scenery, and painting from nature, could really have seen the tones of Nature in the same way? The Cuyp in question, we suspect, must have faded a good deal; but if so, its contrast with the cold greys of Hobbema would have been only more striking when it was new. We can hardly say this Cuyp interests us much; it is dingy-looking, though warm in tone, and the scene is not interesting. The other large Cuyp (961), a cattle picture, with a town in the distance, is, in the main, a very fine specimen of the artist; we cannot believe, however, that it is untouched, or that the cattle have not been considerably "freshened up," and a consequently harder and lighter effect imparted to the whole. Compare it with the old National Gallery Cuyp, No. 53, for example. Near it there hangs a picture about which there is no mistake, a "classical landscape," by Claude (1,018), and as veritable a Claude in its beauties and shortcomings as one could see. This seems quite untampered with, and is an acquisition in its way. The painter's usual architectural "properties" are worked up very completely,—an angle of a building in the foreground (the upper part of which is very much out of perspective), a kind of modified Pantheon further back, and in the middle distance the stumpy, round tower on one side, and the taller round tower opposite. It is one result of the pure "picture-making" which Claude practised, that it is almost impossible to fix any local character in his scenes; they seem entirely abstract and unreal. This is, however, a very pleasing specimen of his placid dreamy art. Among the other landscapes, scarcely any are more interesting than the three small works of Wynants, one of those thoroughly original artists whose works can never be confounded with others or with each other. "Dead Trees" (972) is a study in his hard, iron, precise style, of the greatest interest; and the rather more elaborate landscape, 971, is an admirable work; but of the three none is perhaps so original as the small and simple painting called "A Sandbank, with Bathers" (973), a work in which the interest lies in the barrenness and loneliness of the scene, and the truthfulness with which its limited range of tones is treated by the painter; it is a very remarkable little picture. Two large village scenes, by the elder Teniers, "The Conversation" and "Playing at Bowls," are very interesting, and, moreover, supply specimens of an artist hitherto unrepresented in the galleries; the first-named represents the back of a straggling village bordering on a broken piece of common land, with two or three figures in talk in the foreground; the scene is dismal enough, and not improved by the heavy and dead colouring of the artist, different enough from the style of execution which his more brilliant son perfected. There are two small Wouvermans, of which one, "The Stag-hunt," is remarkable for the picturesque composition and treatment of the landscape.

A Paolo Veronese, "Mary Madalene taking off her Jewels," interests us not, and is not worthy of the painter's fame. But among the figure-pictures is a small half-length by Mabuse, a portrait of a man in a brown furred cloak, which is well worth attention. There is a very interesting portrait, life-size, by Dobson, an English painter, also hitherto unrepresented in the national collection; it is the half-length of a man in rather *dégagé* costume, with his sleeves partially turned up, leaning carelessly against a pedestal; there is a great deal of character and remarkably natural and easy expression and pose in the face and figure; through some association of ideas it recalled to us Mr. Clayton's impersonation of *Hugh Trevor*. Among other works, each somewhat unique in its way, are Schalcken's "Woman scouring Copper Vessels," in which the copper vessels claim the principal attention; Patinir's curious and mechanically-executed Holy Family in the midst of a very metallic landscape, and Memling's portrait of himself, a small half-length (543) of a figure in red gown and cap, with a thin angular face and large eyes; this is one of the most original and artistically valuable items of the collection. The Patinir, by the way, has evidently undergone the tender mercies of "the cleaner," and is as bright and shiny as a new shilling, comparing curiously with the other specimens in the Gallery. A beautiful flower-piece, by Von Huysum, is also a valuable addition to the stock of still-life paintings: and we were nearly forgetting an admirable Metsu, "The Drowsy Landlady," and a small single figure, by Teniers, "The Toper," which are among the best things of the kind in this or any collection. To sum up, we may say that, though the Wynn-Ellis collection may seem a little disappointing at first sight, it must be studied to be fairly appreciated, and that the conclusion from a careful examination is that a considerable proportion of the collection is of high excellence

and value, and that it contains works of special and unusual interest.

Coming to the general arrangement of the pictures, on which a great deal of care and thought has evidently been expended, it is interesting to note some of the points of the new arrangement, and the way in which some old friends seem to come upon us with new faces. Coming up the west staircase through the original entrance, we find ourselves, in the first small room, among some old worthies of English art, whose fame is not what it was:—West's "Christ healing the Sick"; Smirke's illustrations to "Don Quixote," clever, but deficient in humour; and poor Haydon's "Punch," which, we fear, modern criticism must pronounce to be a very bad picture. On either side the door is a male and a female nude study by Mulready; there is a certain significance, whether intentional or not, in thus putting at the threshold the raw material, as one may call it, out of which art is made. In this entrance, too, is Thomas Seddon's "Jerusalem,"—a picture which, whatever its exaggeration of style, will always command the respect of those who know by what serious purpose the artist was inspired, and what arduous toil he put into his work. The room opening from this, as we before mentioned, is devoted to the Turner studies; and going through into the next room westward, we find ourselves among some rather faded reputations of the English school again; Shee's portrait of Lewis the comedian occupies the centre of one wall, and Jones's "Battle of Borodino" another. The latter is flanked, however, by two Constables, which keep the balance a little; and on the south wall opposite are the Wilkies. Stothard's "Bathers" retreat modestly into one corner, and in another corner are his "Greek Vintage" people, who, if they are a little drunken and amorous, are so (as the painter himself would have been) in a most decorous and proper manner. One or two stray Turners linger here in their old haunt, and a Sir George Beaumont reminds us how little it once took to make an "eminent landscape-painter." In the next room Etty is disposed on the south wall, and his smaller works, grouped round the "Youth and Pleasure," produce at least a rich decorative effect. With them are grouped Shee's "Boy and Grapes" and Hilton's "Cupid Disarmed"; clever works, having affinity with Etty. Eastlake's "Christ" and the "Flight of Carrara" occupy corresponding angles very worthily, and a row of Mulreadys adjoins the latter. Mulready's colour, however refined, looks cold in the same room with Etty and Eastlake. The large end-room is effectively arranged by way of contrasts. The three central pictures are Rosa Bonheur's "Horse Fair" (south wall), Maclise's "Hamlet" opposite, and Frith's "Derby Day" at the end. Is this latter by way of climax or anticlimax? Two large Wards find place on either side of the Bonheur; one of them the "South Sea Bubble," the work which will best vindicate the painter's claim on posterity. Two Landseers, the "Maid and the Magpie" and "Comus," hung at opposite angles, suggest how much more really versatile were the faculties of this gifted artist than he allowed himself and the public to realise. He might have done better things than dogs and horses, splendidly as he painted those. Superior in emotional interest to anything he has left is the small "Clarissa Harlowe" of his relative, Charles Landseer, which we regret to see hung so high. As a realisation in painting of an important character in fiction, this is one of the most perfect things in feeling and conception that we know of; it is Richardson's heroine completely, and seldom have feminine purity and fortitude been represented with such real though simple pathos: it is a work fulfilling the highest ends of painting, and as such should have a place of honour.

What was the largest and centre room of the original National Gallery is now entirely occupied by the oil-paintings of Turner; and it is worth while for any who are interested in regard to the decorative effect of paintings to notice how completely different the room looks now, and how much larger than with the collection of figure-paintings of the Italian schools that formally hung here. By a happy thought, the bright and "prismatic" paintings of the artist's later period have been kept on the north wall, where they get the sunlight, and the darker works, such as the "shipwreck" and the "Apollo and Python," are hung on the south wall, in comparative shade. The effect when the sun shines brightly into the room is very striking. The Turner pictures certainly show to better advantage here than formerly, and are hung and grouped with great judgment so as to be collectively effective. The "Téméraire," "Snowstorm," and "Express Train," hang vertically in a line, and a remarkable group they make. "Rome, from the Vatican," hangs at one end of the room, and at the other end we look up on high to the "Gardens of the Hesperides," and below upon the more earthly scene called "Crossing the Brook." Some of the small "prismatics" are rather out of sight, and the remarkable composition called "The Burial of Wilkie" seemed to us rather unduly cornered.

If, instead of going in the first instance up the west staircase, we had ascended the east one, we should have been first greeted by Haydon's "Raising of Lazarus," which hangs on the staircase. The position is not favourable to this, the work on which the artist relied most; it can be properly seen from no point; but Haydon, it must be confessed, almost put himself out of doors by the size of his canvasses. The small entrance-room at the top of the stairs contains, along with some "roba," four little works of Richard Wilson, hung in a row, which make us love the memory of that porter-drinking man of genius. How strange that a man who lived in so coarse a world of realities should have painted such refined and tender landscapes, hallowed yet more by the associations of classic antiquity with which they are connected. Opposite to these hangs Wright of Derby's "air-pump" picture; a curious neighbour to the Wilsons, and rather startling in its contrast; it hardly needs to be so near the eye, in fact, and did better in its old position. It is but a coarse kind of art, after all. Passing through into the next room, the one to the eastward of the Turner room, we find the "Mariage à la Mode" facing us, and over it Gainsborough's large portrait group of the Baine family, and to the left Reynolds's three young ladies personifying Graces or Muses, as young ladies used to do then: a prettier employment, perhaps, than clamouring for votes and seats. Gainsborough is gloriously prominent on the east wall of this room with his "Watering Place," and "Mrs. Siddons" and the "Parish Clerk" on either side of it; the brilliant portrait of the great actress is so hung as to face the door from the Turner Gallery, and is visible along the whole vista from the Turner Studies room. Passing eastward into the next room, we find the celebrated Turner and Claude rivals side by side again (if any one now thinks them rivals), balanced by another Turner and Claude hung "to match." The large Poussins hang here, and contrast well with the placid serenity of the Claudes. On either side of Poussin's "Abraham" landscape hang the two Bacchanalian scenes of his teacher and brother-in-law, the undisguised drunkenness and lasciviousness of which form a curious contrast to the respectable Paganisms of Stothard and other English artists. The moral is, if you mean to do a thing do it thoroughly; if you will be Pagan be as Pagan as possible. The French are the only modern painters who venture to be thoroughly Pagan in treating subjects of this kind, in which it may be admitted they sometimes show more force than discretion.* The next room eastward contains some of the works of secondary interest of the Italian schools: Salvator and Bassano are there represented, but we will rather turn northward to the new galleries at this point. Having just passed Haydon's "Raising of Lazarus" on the stairs coming up, we notice, as a coincidence, that the vista across the octagon into the new north gallery is closed by Del Piombo's picture of the same subject. In the south vestibule we find the Murillos, and Velasquez's remarkable painting of the "Dead Warrior" in a position more worthy of its merits than before; and Zurbaran's dismal "St. Francis" looking more dismal than ever. The octagon is occupied by early Italian works of rather secondary interest, and obviously selected for this position as a matter partially of decorative effect. The west vestibule contains Giotto and Cimabue, and Orcagna's "Coronation of the Virgin" occupies its west wall; and now, if we turn round and look eastward across the octagon and the east vestibule, and through into the east gallery, we may run down nearly the whole gamut of art in a moment, for we find the vista closed by Rubens's "Abduction of the Sabine Women" (the title of which, by the way, we once heard a workingman read out seriously to his companion as "*Education* of the Sabine Women"). From Orcagna to Rubens—what a step! Before taking it, we may notice a significant contrast in the two works of Giotto and Cosimo Tura hung on the return walls on each side of the arch of the west vestibule. As representing Gothic and Renaissance decorative painting respectively, these two works are very suggestive. The shape of the organ which two angels are playing in Tura's picture is worth notice; the pipes are arranged on a spiral frame, circular on plan, looking like a "centre-piece" for a table. Crossing over to the east vestibule, we notice that the Peel Collection is advantageously displayed here, and that Dr. Johnson and the fair heroine of the "*Chapeau*" still regard each other from opposite sides; a curiously assorted pair. It may be a question whether some of the smaller pictures of this collection do not require a small room and a side light to do them justice: such a position for small pictures has been strongly recommended on high authority and experience; and it is certainly a deficiency in the National Gallery buildings, as at present carried out, that there is not even the opportunity for trying it. Going through to the east room, we find the large Rubens pictures looking all the better for more space and better light; the "Brazen Serpent," for instance, seems to develop qualities which were not apparent before; and the whole of this part of the National Collection is seen to far more advantage than formerly; the Rembrandts and all the Dutch and Flemish paintings, except the Peel Collection, find place here. At the north end of the room the earlier religious works of Van der Weyden, Memling, and others, are collected, and make a sort of connexion between this and the small north-east room. In this last-named room is the large Crivelli Altar-piece; on either side of the doorway are the two Piero della Francescas, one of which, "The Nativity," long stood uncomfortably on a separate easel in the long room of the old gallery. At one angle of this room Pinturicchio's "Return of Ulysses" hangs, and under it Filippo Lippi's mischievously-conceived saints (evidently portraits of brethren of the cloister); in a corresponding position we have Signorelli's "Triumph of Chastity" and Lippi's "Annunciation." The two long Venus pictures of Botticelli (in which Venus looks like a Sunday-school teacher) have not managed to get symmetrically placed, as one would think they should if possible. Mantegna's "Triumph of Scipio," with its grand Free Classical style, it must be confessed, looks out of place, as it is of course out of date, in this room, and makes a very curious pendant to Angelico's picture of "Christ and the Army of Saints." This is a very interesting room, containing so much that is special and peculiar in style and feeling. Through it we come to the largest room of all; the north room, which contains the bulk of the Italian paintings; and a noble roomful of paintings it is, and one on which we may well pride ourselves. And here we must notice four new comers; all portraits. The first is by "Il Moretto," a portrait of a chivalrous-looking gentleman leaning in a slightly affected attitude on his right elbow, clad in a rich and picturesque costume, which is fully but not too elaborately made out; it is a very pleasing though not powerful work. The other three are by Moroni; the first we come to is a very brilliant portrait of a handsome military-looking man dressed in a corslet of chain armour, over which is a leather breast and back piece without sleeves; his nether man is encased in black velvet; he stands with his hand on a helmet, which rests on a pedestal. The execution of the various parts is most powerful and brilliant; the picture as a whole would strike one more if it were not so palpable an attempt to imitate or emulate Titian as he appears in such works as Lord Radnor's "Armed Man in Black" (in the Loan Exhibition of 1873), the *motif* of which is obviously copied here, but without the same chivalry and dignity of aspect. Farther on we find a portrait of a lady seated, with a very Dutch face to see in an Italian painting, in a crimson dress, and holding something which may be a fan, though of peculiar construction. It is painted with much force, but the attitude is a little stiff and constrained, and the countenance uninteresting. The remaining Moroni, on the opposite side, is a much soberer work in style; it is a three-quarter

* Etty, who dabbled in Paganism, painted one picture, and only one that we remember, that was thoroughly Pagan,—the large painting of two Satyrs glowering at a sleeping "nymph"; this was at one of the "Old Masters'" exhibitions, and might have ranked with the best things in the same way by Rubens, and far before most of Etty's other works; not, of course, because the subject was both sensual; but because, being so, it was thoroughly so. Etty was very seldom "thorough"; the *juste milieu* of his character and artistic temperament being in reality quite at variance with the class of subjects he was led to take up.

length of a bearded man in a black robe and with a cap on, holding a letter in his hand; its artistic qualities are admirable, perhaps more genuine, though less brilliant, than in the other two. These Moroni portraits form a valuable illustration of an admirable artist; it may be doubted, perhaps, whether any one of the new ones is equal in individuality of character and in the highest qualities of execution to the celebrated "Tailor" which has been so long a prized possession of the National Gallery.

We have only space to add that the larger pictures in this north gallery are placed mostly on the north side, the largest at nearly regular intervals down the room, with smaller ones between. The large Veronese of the "Family of Darius" occupies the end of the room most effectively, and Giulio Romano's "Assumption" occupies the old place over it; it is needless to say that both works are far better seen than in their former position, where it was impossible to get far enough from them. The main arrangement is chronological, but is determined in detail a good deal by school and subject. The two Titian "Holy Families" are placed on either side of the Sebastian del Piombo, which, as before mentioned, occupies the centre of the north side, and in the vestibule opposite we find, what we have always regarded as the gem of the national collection, the "Bacchus and Ariadne" of Titian, which, we are glad to say, is in a far better light for seeing its real effect than before: there is less glare on it. Its *vis-à-vis* is the unfinished Michelangelo ("The Entombment"),—not a very fortunate arrangement, it seems to us; the works are almost too violent a contrast in subject and style: the arrangement seems to be suggested (as in the case of the Angelico and Mantegna) rather by the size and shape of the pictures than by any fitness of style or association. Giorgione's little "St. George" finds place by the side of the Titian; the two make this a very precious corner of the building.

We should add that the general aspect of the large room is very good now that the pictures are all arranged, and that we think there is every reason for satisfaction in regard to the lighting in the new portion of the building. The general arrangement of the pictures, notwithstanding one or two little points we have mentioned that seem open to improvement, is more than satisfactory: it is admirable, and shows evidence of most conscientious and careful consideration, under circumstances of no little difficulty. However we may regret that only a part, and not the whole of the proposed scheme, has been carried out, what has been done is an immense improvement in the exhibition of the national pictures; and it is well worth while, even for those who have long been familiar with all the principal works, to call and see them in their new home.

THE MINOR ARTS IN FRANCE.

The Jury of the French *Salon*, for 1876, have awarded first-class medals for lithography and engraving. This acknowledgment of those which, without disparagement, may be termed the Minor Arts, is all the more creditable, inasmuch as it was long and rancorously opposed. This is not the first year, indeed, in which the concession has been granted; but lithography was too long regarded, in comparison with engraving, as a merely mechanical process,—an idea dispelled, once for all, by the splendid works of Raffet, Giacomelli, Burty, La Combe, and Charlet, not to speak of Senefelder, who introduced this art to our essentially artistic neighbours. Lithography is a practice, so to speak, capable at once of a great development, and of a great abuse. It is almost the easiest medium of caricature and of satire; it is also, —as the works of Charlet and Gericault show, and even those of Gavarni,—a most effectual ally of the pencil. The comparatively new invention of chromolithography, remarkable rather for its elaboration than its taste, must approach considerably nearer maturity before it can dispute the awards of a Paris jury, and simple lithography itself labours under many disadvantages. It cannot, by any effort, by any fancy, be made really picturesque. It can never even emulate the lights and shadows of engraving; nevertheless, it is an Art, though one, it may be conceded, of the second order, and the French Academy has done well in recognising its importance. A lithograph is a suggestion rather than an idea, unless it be a copy, and then it becomes little more than an outline. But, as M. Delaborde says, during the last fifty years it has been a great writer of history, a sketcher of the follies as they fly, a critic and censor of manners and fashions, and very valuable in all these respects. That so much is true has been demonstrated by the fact that many lithographs, scarcely forty years old, command extraordinary prices in the market-places of art. The question then occurs how, since 1816, has this perfectly modern art acquired, in so short a lapse of time, so high a place in the sight of the critical French, who knew nothing about it until after the year 1816, when it had been invented, and was beginning to flourish, in Germany? It is true that previous experiments had been tried, by the pupils of David and Denon; and that a M. André, in 1802, had tried to establish a patent on an idea which was, on his part, a plagiarism and an imposture, since his stone drawings were simply copies from Senefelder's works at Munich; but these were no more than guesses at the possibility of a process that might take form, and grow into an actual art, at a future day. Few discoveries come altogether suddenly upon the world. Thus, long before André the Pretender was heard of, a poor Bavarian musician, attached to the Theatre Royal at Munich, had scrawled his score on a stone, and multiplied impressions of it by means of printers' ink, laid on, as he says, "with a thick pencil." But he thought nothing of the circumstance, and not even his name has been preserved. The Vernets, Gericault, and Charlet undertook to make an art of the notion which this humble leader of an orchestra had in a moment conceived and forgotten. Here was a process which, in its execution, must be perfect at once or not at all. It admitted of no second thoughts, of no re-touchings; whatever it did was indelible, and could not be improved. Hence, the earlier artists in lithography went timidly to their tasks, and rubbed out their designs far more frequently than they endeavoured to develop them. "It is a thankless affair," said Vernet, "this making pictures on stone, and the critics will never allow it any worth." He did not live to see the distribution of medals in May, 1876; but he half belied his own disbelief when he reproduced so many of his own battle-pieces in this form, with all their complicated groups, effects of gloom and light, dim distances, and fiery foregrounds—though nothing rich or brilliant is capable of expression by lithograph. Moreover, it was his distinct prediction that the new art would result in trophies equal to the purest master-pieces of drawing, and be, in fact, the successful rival of wood-engraving, as being more susceptible of softening and toning, if not of distribution between illumination and shadow. It is impossible to deny that in the choicer pencillings of Gericault this promise has been more than fulfilled; but a noticeable incident is that the first prize at Paris, for both lithography and engraving, has fallen to a single artist—M. Biot. The difficulty of judging, however, must be extreme when from a single pencil 1,100 examples compete. How many of them are translations, so to speak, from oil-paintings, or sculpture, or architectural designs? We can be positive of this,—that "The Defended Flag," the "Horaces," and the "Romulus," have been sold over and over again, and have no pretence of original art about them, any more than that highly-praised composition, "The Grenadiers at Waterloo,"—the favourite of Parisian picture-dealers' windows. It is said, however, that lithography, if it can render no account of the colour, can interpret the spirit of a picture better than even a steel engraving. In this opinion two essentially different things appear to be confounded. No steel engraving is worth anything unless it be a faithful reproduction from an historical, or, at any rate, a fashionable canvas. And, in this country, at least, these steel engravings have, in no degree, been superseded by lithographs, which, on the contrary, are often representations from the original pencil. Indeed, while some authorities, in a contemptuous sense, declare that lithography is only good for ground-plans and sections, others say that, under the hands of Bourgeois, Bacler, D'Albe, and their compeers, it may be the source of infinite suggestions. The works of Bonington and Decamp illustrate this opinion. So do those of Greuze and Chardin, in the plainest lithograph, yet charming beyond exaggeration. It is singular, then, that such a process should obtain such a tardy recognition and naturalisation in so artistic a country as France. It was, to commence with, condemned and despised as a vulgar mechanical trick, unworthy of a nation of artists; it was treated, indeed, as engraving was at the outset by our own Royal Academy. Speedily, however, a reaction took place in favour of this disparaged process. How else could so easily be hit off, or circulated, a bulletin, an announcement, or a satire? Engraving, at its best, is tedious and costly; in lithography, writing and drawing can be made equally rapid and distinct; and we know what a literature it aided, when the songs of Beranger and the pamphlets of Paul Louis Courrier appeared, in every quarter of Europe at once. Such is the art which has been honoured in our latter days by the express acknowledgment of those bodies by whom it was originally mocked. In the view of some, it was not fitted for military illustrations or satirical allusions, but rather, in the days prior to those of photography, for eclectic collections from the great galleries of European art. In this opinion the Paris jurists do not coincide. They regard the art as an independent one, and as by no means servile to any other. It can, in fact, no more reproduce a painting, than can a tracing on paper. Its use is essentially different, as Ingres himself avowed, when he applied himself, during a few short months of his too short life, to stone-drawing. "For," he wrote, "nothing gives more freedom or courage to the artist's hand." "We," he added, "may practise lithography, but without an encroachment upon engraving on wood or steel." And the best testimony to his good faith in the utterance of this avowal was a declaration that his "Odalisque" would never have become famous, except for M. Sudre's lithograph, which adorned every artistic wall in Paris. Lithography, in a word, is the supplement of all completed, and the auxiliary of all rising, reputations in the struggling artistic world of France, and its prize medal has been conscientiously won. To it, the historians of architecture are greatly indebted, as, for instance, to Bonington, an Englishman of French education, on account of his "Picturesque Journeys through Old France," without which many a fanciful Norman and Franche-Compté edifice might have mouldered away without a record. It is curious to remark, however, how, in a certain period, this lithography, now crowned at Paris, becomes blended, more or less, with daguerreotype and photography, the latter outrunning, though not obliterating or superseding, the former. Nothing short of a painting by the most accomplished of our modern Canalettis can surpass Bonington's "Street of the Big Clock," at Rouen, or his "Church of St. Gervais and St. Protais," at Gisore. These were never even outlined on paper, they were drawn on the stone whence the impressions were taken; but the temptations of colour were overpowering for this artist, and he ventured to take copies of his own productions, and, secretly, to tint them—even his full and half-length portraits. The golden age of the arts, writes an enthusiast, had now passed away, but he, doubtless, did injustice to the capacities of chromo-lithography at a time to come. And he forgot the wonderful *crayons* of Decamp, which, scandalous as was their political significance, certainly kept alive the daring genius of Delacroix. His annual "album" was a veritable treat to connoisseurs, and he enjoyed the uncommon distinction of having his lithographs, "The Little Savoyard and the Monkey," "A Visit to the Pawnbrokers," and "The Poor Black," among others, copied on canvas, in oil. But the French, there is no denying, are the liveliest lithographers in Europe, and it is not surprising that their representative artist in this department has been medalled. Historically, the later names are those of Charlet and Horace Vernet, already quoted; of Bellange, who gave himself up to the glorification of the first Emperor; and of the second Raffet, who also delighted in perspectives of military pomp. Then came that humorist who lithographed that favourite of French camps, "You must not Smoke, but you may sit down!" and, at some distance after him, Gavarni, the Balzac of the studio, as he was termed. Never was the lithographic press put to so incessant, so eccentric, so various a use, as by him; he seemed to have an idea for every hour of the day; he began by tracing and colouring figures for the fashion-books; he drew every costume of Paris with variations; he made dresses look more charming, on ideal figures, than ever they would look on promenades or in ball-rooms; he traced, upon his fine Caen stone surfaces, men, women, and children, with equal lightness and ease; and he it was who advanced lithography in France until, at length, it has been accepted and medalled among the arts. He, the French Hogarth, under-

stood the highest purposes of the work to which he applied himself; but laughingly prophesied that it would come to assist in the decoration of play-bills, fans, and bon-bon boxes; but he affirmed, always, that its uses would mount higher and higher, until they reached the tribunes of the Academy itself. It is so, now, in France; though not in Italy, and not in Spain, and only to an inconsiderable extent in Russia. We can well afford to bear the strictures of the Parisian jurists upon the English achievements under this head, remembering the "Alhambra" of Mr. Owen Jones, Mr. Gally-Knight's "Ecclesiastical Art in Italy," and Mr. Gould's "Birds of Australia." It is true, however, that both Germany and Holland are very far behind in the matter; and that the coloured specimens in the galleries of Dresden are deplorably poor. Nevertheless, it cannot be admitted, as the Parisian jurists claim, that lithography is essentially a French art. It is not so historically, because the earliest experiments were tried at Prague 105 years ago, when Senefelder perceived the effect of a greasy ink on a calcareous stone. Since his time, discoveries have been made in many directions, yet none have superseded that first process of writing on the Kelheim slab; and, for a long while, it was found difficult to match the quality of that peculiar quarry. Eventually, however, others were fixed upon,—at Solenhofen, near Pappenheim, on the Danube, especially, but also in the French department of L'Indre; in England, near Bath and at Stony Stratford; in Canada, the West Indies, and Silesia; though none of the finest substance. According to the judgment of the Parisian jurists, this ingenious art ranks upon an equality with engraving, and its principal proficient has been, therefore, rewarded. These minor arts, as we have styled them, are of no slight utility in the cultivation and encouragement of a national taste; for they are what popular is to classical music; and the multitude, after all, must take its Art, for the most part, at second hand. A faithful interpretation is the most that can be expected, or, if original genius condescends to work upon stone, it is generally rather a process than an idea that is put to the test. For all that, M. Biot deserves his laurel.

HOLIDAY IN HAMPSHIRE.

This year the Architectural Association has not had the assistance of Mr. Edmund Sharpe in preparing for and carrying out the annual excursion. After originating it and making it a success for six years, Mr. Sharpe has been compelled to give up his leadership for the year 1876. A much-regretted domestic loss may be mentioned as among the reasons. The young men of the Association have, however, as Mr. Sharpe had hoped, continued for and by themselves the pleasant outing that he showed them how to take in company, and to render so useful in their studies of the ancient art of their own and of other countries. The ambitious exploration of an architectural province has not been attempted. The La Charente journey of last year, novel in every way—bringing to light results new even to French antiquaries and architects,—followed a general taking-stock of the best buildings of the north-east of France in the previous year (1874). This year comparatively well-known ground has been selected, and an attempt made to bring back the excursion to its earlier form. The younger members are to visit in company, and have well explained to them at some length, a few important monuments in their own country. They are also to reach some villages not quite on the main lines of traffic, and to spend no more money in these journeyings than modest purses can well afford.

The meeting-place was at the west front of Winchester Cathedral on Monday morning last. At the appointed hour the band assembled at the rendezvous—gathered from various English and Irish towns. Mr. John Colson, the cathedral architect, the Right Reverend F. T. McDougall, and Canon Carus received the party; and an historical sketch was given of the cathedral and its surrounding buildings. Mr. Colson then accompanied the members in a lengthy survey—from crypt to tower and tower-roof—of the whole of the cathedral. Several new items of discovery and of conjecture were put forward, of which notes may be given hereafter. One little point, welcome to lovers of exact statistics, need not now be omitted. The total length from the external face of the most projecting portion of the west front to the end of the buttresses of the east of the lady-chapel has been carefully ascertained, and is now given as 555 ft., a felicitous combination of numbers for the weak of memory. The length has been heretofore given as 520 ft., Ely being 560 ft., St. Alban's, 548 ft., and Canterbury, 525 ft. A somewhat rigorous examination, and the application personally of tests, would make a reputation for a persevering and exact investigator who would undertake the somewhat uninviting task of telling the world the precise truth about the sizes of some score or so of the world's noteworthy structures.

In the afternoon the College was visited, and very fully described by the Bursar, his explanations being illustrated by a general plan by Mr. Pink, by D. Loggan's seventeenth-century general view of the College, &c. The old buildings, and thereafter the modern buildings,—now no inconsiderable section of the whole (in recent times wholly under the charge of Mr. Butterfield)—were all carefully looked over. The bad foundations in these level fields by the Itchen have, not recently only, played havoc with the ponderous walls. The refectory seems to be settling westwards; the walls are cracked in several places. The queer rough old auditrooms, with many other things here, carry back the looker-on at least three centuries without any strain on his imagination. In the walls of these rooms are rents in which the hand of a Goliath might be inserted. The rebuilding of the fifteenth-century tower about ten years ago would be a good precedent if other works of the same sort prove necessary. The whole was carefully marked, pulled down, stacked in the open to the south of the cloister, and brought back, bit by bit, to its old position,—not a bad example of pains and skill well applied to the literal conservation of an ancient monument, and of all its historic authenticity.

Tuesday was occupied by Ashley and King's Sombourn Churches and Romsey Abbey Church. A drive in carriages to the north-west of Winchester, led past Week and Lamston, up among the highland downs, and Ashley Church was reached, in a road overhung with foliage,—the church itself covered with ivy. The church has for distinctive features one of the smallest of Norman chancel arches. The whole church is of no considerable size;—the breadth of the chancel being under 11 ft. The chancel arch is 4 ft. from jamb to jamb, and 6 ft. 7 in. from the floor to the top of the impost cap,—of plain Norman. This too severe seclusion of the chancel was dealt with in the Perpendicular period, probably, when a small opening was pierced on each side of the central arch. The two bells in two little arches opening through the west gable are rung from the floor of the nave, and a certain portion of the height of the western portion of the church is inclosed with floor and partition at the east end. This space is now the home of a colony of owls, to whom bell-ringing is no longer a thing of terror,—but regarded as among the ordinary accidents of life. This arrangement of the bells is said to exist at Littleton Church, also in Hants (but there the little arches are now walled up). The church contains also a quaint little seventeenth-century alms-box, a post of solid oak reaching up from the floor, hollowed out for the receipt of money, and notably provided with money-slit too narrow for the copper coinages. King's Sombourn Church, with the picturesqueness of almost hopeless decay, gives points of detail, but no outlines worth classing as architectural,—a pier or two, a window or two, a founder's tomb of about 1325 on the north of the chancel, and a recumbent figure, the beams of Gothic detail of 1633 inserted in the nave, high ruinous pews, galleries, and all the features of pre-restoration times, and nothing further. Foundations of the old (destroyed) house, known as John of Gaunt's palace, may be seen and traced in the field to the south of the churchyard. These foundations also supplied stone enough to build the parish schools not many years ago. Garden earthworks, site of fishpond, farms once belonging to the domain, Fawns' Pond,—the haunt of deer at one time, and other names still lingering in the popular use and memory, are pointed out.

The valley of the Test river being reached, the river was followed under the chalk hills, till the mass of the Abbey at Romsey came into view. We have, however, recently* devoted some attention to the Abbey buildings, and will not now go over again the story we told then, nor add at this present any further details with reference to the discoveries of the vicar, Mr. Berthon, the laborious investigator of the history of his church, and hard-worker in aid of its restoration. The buildings were described by Mr. James Fowler, of Louth, and by the vicar. Through long wooded ranges of more and less gentle hills, Hursley was reached as the shadows from trees and church were lengthening. No better time for a visit to the scene of so much of the life of the singer of "soothing influences," nor better words in which to take leave for the present of the Association on its travels than Keble's,—

> "Yet wears the pure aërial sky
> Her summer veil, half drawn on high,
> Of silvery haze, and dark and still
> The shadows sleep on every slanting hill."

* See p. 654, *ante*.

A SUMMER MEMORY OF OLD BUILDERS.

The present burst of sunshine recalls many memories of years, we care not to say, how long passed away. The haughs and holms of the river Tweed belong especially to the Border, the debatable country of two centuries ago. The hills that bound the valleys through which it rushes and rolls are not imposing in their grandeur; their beauty is visible in the birch trees and the broom and whin that clothe their gentle acclivities, and in the purple bloom of the heath-bell and the heather that spread with a maidenly blush up to their grand swelling brows. But that is only one portion of the beauty of Tweeddale. Come from North or come from South, and descend these hills to the side of the Tweed, and valleys that recall the poet's dreams of Fairy Land spread out on all sides; and quiet wind-sheltered nooks where the earliest primroses blow and the blue bells ring out their chimes in honour of the summer. But, as Dan. Chaucer says, "Why sermon more" about the beauty of Tweeddale? The day we write of was the loveliest day in August, the sunny blue skies were flecked with silver clouds in consequence of which beautiful atmospheric effects we had wandered, fishing-rod in hand, along the banks, vainly attempting to allure the trout from its streams and pools, and were returning home. We had passed through a scrub of a thicket which was once a miniature forest, until it was cut down to defray the gambling debts of the Duke of Queensberry, better known as "Old Q.," and had sat down on a grassy bank to shut shop; in other words, to pack up tackle and unjoint the fishing-rod. A gentleman, not commanding in appearance, but pleasant to look upon, sat down beside us. Though his hair was grey, his eyes were bright, and the rose-tint of health was on his cheeks. We were too bashful to open the conversation, which he at once did. High above the spot on which we sat rose a rocky declivity, crowned by the ruined and ruinous walls of a castle which might more properly be termed a Border Keep on a gigantic scale. Our self-elected friend asked us the story of the old towers and battlements. We were so far equal to the occasion, for, from earliest childhood, we had heard the story told by old men and women in the off-shoot nooks of Tweed Bridge,—the nooks exist no more. The story ran thus:—There is an old and a new Castle of Neidpath. Why it was called so no one can say, unless it got its name in the old times, when the Romans had their camps and stations on all the hills round about, and the only possible way between the lower and upper vale of the Tweed was through the pass, unused before, which afterwards was named, in old British, the Niwydd, or new path. How many years have passed away since Neidpath crowned the craig no chronicle records. Sir Walter Scott refers to its position in "Marmion,"—

> "Away hath pass'd the heather bell,
> That bloom'd so late on Neidpath Fell,"—

but he makes no mention as to its antiquity. Certain it is that in an early part of the fourteenth century, Simon Fraser, if he did not build, occupied the castle. This Simon, though an ancestor, had nothing in his blood of the cowardly vacillating temperament of his namesake who was done to death on Tower-hill after the "'45." On the contrary, old Simon, along with John Cummin, defeated the army of Edward of England three times in one day on the moor of Roslin. Does not the affable cicerone of Roslin Chapel tramp his double-soled shoe on a stone-slab in the cloister, and, while the tomb below gives forth a hollow tone, tell the believing pilgrims that underneath lie the bones of the

brave St. Clairs, of Roslin, to the number of six or seven, according as his memory of the tradition serves, who fought side by side with the Frasers and the Cummins on the day of the three great battles? Sir Simon had two daughters, the eldest of whom was married in 1320 to Sir Gilbert Hay, the descendant of the De la Haye who at the pass of Lancarty turned the tide of fight against the Danes when swooping down on the fertile plains of Perthshire. One of the great-great-grandchildren of this union married Joanna Gifford, daughter and heiress of Lord Gifford, of Yester, and became Lord Yester. The proof of such a union remains to this day carved in stone on the keystone of the archway which gives access to the court-yard of the castle. On the keystone is the carving, not quite obliterated, of a goat's head over a coronet, the crest of the Lords Yester, once the Earls of Tweeddale, and immediately under a bunch of strawberries, symbolical of the Frasers, for with a bunch of strawberries on his casque, in lieu of a plume, the Norman ancestor of the family had joined the ranks of William the Conquestor.

More than three hundred years after the days of bold Sir Simon, when in 1654 Oliver Cromwell fought and conquered in the "Black day of Dunbar," the Lord Yester of the period, who was a Covenanting loyalist, fortified Neidpath Castle, but the cannon of Old Noll battered down the more ancient portion of the castle. "And to what later date does the new portion of the castle belong?" asked my companion. To within a few years of the days of the great Sir Simon. But let us ascend the crag, and enter the courtyard. Before us was a large doorway, which was led up to by a semicircle of steps, above it were glazed windows of a goodly modern size, and entering the doorway was a spacious staircase. This modern display puzzled our companion, until we pointed out to him that the entrance had been pierced through a wall, 11 ft. in thickness, and that the thickness at the windows was scarcely less. This boring and blasting work had been carried out by the son of the Lord Yester who stood out against the Protector. Passing up the staircases (date 1646) we reached the bartizan, where doubtless in the days of Flodden the sentinel had paced to and fro watching for the smoke by day or the flame by night, that telegraphed a summons to the Border spears to march upon the Southerner. In the east rose the Lee Pen, the beacon on whose summit could flash a warning to the valley of the Leithen, to the "lads of Gala Water," to Lower Tweeddale, and even to "the grey metropolis of the north"; to the south, the mountains that tower above the springs of Quhair, whence the flame or smoke would summon forth the "Braw, braw lad of Yarrow Braes" and the Ettrick spearmen; and to the west the hills that look down on Annandale and Clydesdale, from whose bald tops may be caught glimpses of the distant sea.

We descended from the bartizan by the ancient access, termed in Scotland a turnpike stair, and modelled after the fashion of a corkscrew; this led us to the ancient doorway, through which two persons could with difficulty pass abreast. Before crossing its threshold we groped our way through the dungeons, aided by the light of a stable lamp, and our guide setting fire to a bunch of straw, dropped the blazing mass into a deep pit, which once had been the draw-well of the castle; down went the flames, until the depth or the foul air extinguished them. Then we went out into the sunshine down the steeps, from which had not passed away

"The heather bell";

and as we wandered down the side of the Tweed to the little town of Peebles, our mutual destination, he told us stories of castles in far-off lands a hundred times larger than Neidpath, built on rocks a hundred times higher, that had been strongholds when Neidpath Fell was but the home of the wild bee; of towers and temples across the Atlantic that had been built by nations whose very names were forgotten, and of the "mystery" of the old builders who, taking the solid rock for a foundation, so skilfully manipulated their work that their building became part and parcel of the rock. Reaching the town he invited us to drink tea with him at his inn. Much more talk on his part of the towers and castles of the olden time followed, and at an early hour we parted. He was to start by an early coach on the following morning for Edinburgh. The morning came, we went to the inn from which the coach set out to bid him good-bye. The coach had gone. We went into the booking-office to make inquiries as to the gentleman's name. The clerk consulted the way-bill. The name of our companion of the previous day was Washington Irving.

CHARACTERISTICS OF MEDIÆVAL AND MODERN CRAFTS AND CRAFTSMEN.*

Trade marks by many have been considered quite modern adoptions by makers and manufacturers, but identification of work by certain open or occult symbols is as old as history itself. The early Masonic craft had their own peculiar marks, and several of the trade guilds of the Middle Ages enforced a certain distinguishing mark being cut, stamped, or engraved by workmen of their crafts on the work they executed or offered for sale. Many instances occur in the civic records of London. In one relative to the "*turnours*," or turners, 21 Edward III., 1347, we have certain makers of wooden measures for wine, ale, &c., coming before the mayor and aldermen to account for "manifold falsities and deceits." On this occasion it was enacted, after some injunctions were given to makers of these measures, that "in future not to make any such kind of measure of any other wood than dried, and that the measure when so made by them must agree with the standard of the alderman in whose ward each measure shall be used, and by the same standard be examined; and that each of these makers should have a mark of his own [the marks are given], and should place such mark upon his measure, or the bottom thereof without, when by the standard they should have been examined; that so, when any measure made by one of the makers aforesaid shall in any tavern or brew-house be found to be false or defective, these, as well as the person by whom such measure shall have been made, or he who shall have sold by such measure, shall incur the punishment at the discretion of the mayor and aldermen for the same." This was a wholesome enactment, and it would be well in these days if the manufacturer and user of light weights and measures, and the importer, wholesale merchant, and retail dealer of adulterated foods and drinks were severally held amenable. Among the old Mediæval crafts are found also more than one instance of an enactment prohibiting one maker from using the marks of another on pain of certain penalties. In the articles of the "Heaumers" (makers of helmets), in the same year as that of the preceding trade enactments, we have it laid down "That each one of the makers aforesaid shall have his own sign and mark, and that no one of them shall counterfeit the sign or mark of another, on pain of losing his freedom until he shall have bought the same back again, and made satisfaction to him whose sign he shall have so counterfeited; and, further, he shall pay the Chamber 40s." This was something tantamount to damages in our courts of to-day for infringing certain patents. There was no patent-office in 1347, but there was protection for trade-marks notwithstanding. How slow, after all, have we moved in this country in the registration of trade-marks! It appears by the articles of the "Heaumers" that there was scamping in their trade as well as others, for it is stated before the mayor and aldermen, in the articles of the said trade as accepted at the suit and request of the men of the trade, that,—"Forasmuch as heretofore some persons coming in who are strangers, have intermeddled, and still do intermeddle, in the making of helmetry, whereas they do not know their trade, by reason whereof many great men and others of the realm have been slain through their fault, to the great scandal of the said trade; it is ordained that no person shall from henceforth intermeddle or work at helmetry, if he be not proved to be a good, proper, and sufficient workman, by the wardens of the said trade, on pain of forfeiture to the use of the Chamber."

These were the days of bows and arrows, pikes, lances, swords, and skull-crushers, when helmets for the head needed to be strong, and armour for the body almost impenetrable. Doubtless, the "scamps" of the trade made helmets that were easily pierced or battered in, and hence the great men of the realm and others spoken of were often slain. Some good regulations are included in the articles of the "Heaumers" similar to those already given in other trades. In the articles of the hatters in the same reign (1347) there are also several commendable regulations enacted for the good of the trade. We learn that bad hats were made, and mostly through allowing work to be done in the trade by night, and it was ordained that no one in future should do work "but only in the clear daylight." Wardens were appointed to make searches after hats that were "defective and not befitting, and in deceit of the common people." We learn from the "articles" of the trade that "divers manners of hats," by foreign folks of divers counties (outside London) were brought into the city and hawked about the streets in these early times, and by the articles of the trade strange persons (those who were not resident freemen or free of the trade) bringing hats into the city for sale were forbidden to sell them by retail and only by the gross, and then only to freemen of the city, on the pain of losing the same. The other rules and regulations of the trade were similar to some already described. In the ordinances of the Pewterers, 22 Edward III., 1348, there are certain special points set out respecting good work and materials, and from the requirements and acquirements needed it may be seen that the pewterers went in for a degree of technical education as absolutely indispensable to the proper practice of their handicraft. The ordinances of the trade start in the first place in this manner:—"Seeing that the trade of pewtering is founded upon certain matters and metals, such as copper, tin, and lead, in due proportions of which three metals they make vessels, that is to say pots, salt-cellars, esquelles [deep plates, or porringers], platers, and other things by good folks bespoken, which works demand certain mixtures and certain alloys, according to the manner of the vessel so bespoken, the which things cannot be made without good knowledge of a pewterer, well taught and well informed in the trade; seeing that many persons not knowing the right alloys, nor yet the mixtures or the right rules of the trade, do work and make vessels and other things not in due manner, to the damage of the people and to the scandal of the trade: the good folks of the trade do pray therefore that it may be ordained that three or four of the most lawful and most skilful in the trade may be chosen to oversee the alloys and the workmanship aforesaid, and that, by their examination and assay, amendment may speedily be made where default has been committed." Certain vessels of pewter and tin are described, and the proportion of alloy to be used in their manufacture. It may be interesting to state now that in 1348 the proportions of the alloy were to 1 cwt. of tin 22 lb. of lead, and articles so made were called "vessels of pewter."

The ordinances of the pewterers were very strict. Every one was to be accountable for his workmanship in the trade, and that it was of the proper materials. Journeymen or apprentices injuring their masters, or privily in the way of larceny, were punished for the first and second offences; and, if offending the third time, were ousted from the trade. No one was to be "so daring" as to work by night at the trade upon articles of pewter, "seeing that they have regard among themselves to the fact that the sight is not so profitable by night, or so certain as by day—to the profit, that is, of the community."

The ordinances of the pewterers, like some other trades mentioned, forbid the enticing away of workmen from one master for another. Journeymen, serving-men, and apprentices were obliged to fulfil their covenants, and the assent of the master was needed before a journeyman, bound by any agreement, could transfer his services to another master. How unlike 1348 in the trade is 1876. In the ordinances of the Glovers, same reign (1349), similar rules were laid down respecting day-work and night-work, apprentices and journeymen, good materials, bad workmanship, and the defrauding of masters, as in the former trade. We learn that it was a common practice for persons, not of the trade, to entice the servants of folks in the trade and to set them to work in secret in their houses, "and make gloves of rotten and bad leather, and do sell them wholesale to strange dealers coming into the city, in deceit of the people, and to the great scandal of the good folks of said trade." Fines and other punishments followed such and like infringements when the evil-doers were unearthed.

In the ordinance of the Shearmen (shearers of the nap of cloth), same reign (1350), nearly identical rules were laid down for observance as in the two preceding trades. There is one point, however, worthy of notice in respect to the shearmen, which is stated thus:—"Whereas heretofore, if there was any dispute between a

* See p. 380, *ante*.

master in the said trade and his man (vadlet), such man has been wont to go to all the men within the city, of the same trade, and then, by covin and conspiracy between them made, they would order that no one among them should work or serve his own master until the said master and his servant, or man, had come to an agreement, by reason whereof the masters of the said trade have been in great trouble, and the people left unserved." It was ordered in future such disputes should be settled by the wardens of the trade, and workmen not submitting to be tried before such were to be arrested by a sergeant of the Chambers at the suit of the wardens, and brought before the mayor and aldermen. Punishment followed at their discretion. The "covin and conspiracy" among the shearmen and other trades was nothing less than a "strike," and previously to 1350, and down to our own time, history has been continually repeating itself. In the same year we find a petition presented by the master shearmen of the trade respecting the scale of wages. They allude to the former ordinances, and say that they are well contented therewith, "Save only that they desire that they may have their servants and journeymen at the same wages that they used to have; for in old time they were wont to have a man to work between the Feast of Christmas and Easter, at 3d. per day and his table, and between Easter and St. John at 4d. per day and his table, and from St. John to the Feast of St. Bartholomew at 3d. and his table, and from the Feast of St. Bartholomew to Christmas, in the case of a good workman, at 4d. and his table, for day and night. And now the said men will not work otherwise than by the cloth (piece-work or a certain price for a certain piece of cloth), and they do greatly hurry over the same, but they do great damage to the folks to whom such cloths belong, by reason whereof the masters in the said trade have great blame and abuse, and take less than they were wont to do. The masters in the said trade do therefore beg of you that it will please you [the mayor, sheriffs, and aldermen] to order that the said men may be chastised, and commanded, under a certain penalty, to work according to the ancient usage, as before stated, as a matter of good feeling [*charitee*] and for the profit of the people."

Here we have an early instance of the piece-work system being adopted by the workmen and opposed by the masters, no doubt for reasons well known to themselves. The case of a "good workman at 4d.," points to a system of classification.

It is plain, however, that "scamping" was carried on, and that much bad work was the consequence. It is not stated that the prayer of the master shearmen was granted. The ordinances previously passed in respect to the trade continued in force; they were confirmed by the Chamber, and subsequently by command of the king. Piece-work, it appears, was agreed upon, or a certain price for a certain piece of work, by these ordinances, which were cried at the time through the city.

In the same year, 24 Edward III., 1350, owing to constant disputes "by reason of masons, carpenters, plasterers, tilers, and all manner of labourers who take immeasurably more than they have been wont to take," a number of regulations and prices in the city were drawn up. These regulations included numerous trades, and settled the rate of wages and the prices of materials, work, goods, victuals, wares, articles produced or on sale. Weights and measures were also taken cognisance of, and any infringement of these regulations were met by certain fines, and in some cases imprisonment and forswearing the city for ever. It would appear that in 1350, when the Corporation moved in the matter of these "Regulations," trade malpractices were rife, and were going on for a long time unchecked, and that the public were the principal sufferers. The workmen of the building crafts seemed to be in advance of their fellows, and were not disinclined to ask, take, or insist upon more wages than what they were wont to take years before. It was a common failing, however, and other crafts followed suite, if they did not, indeed, show the example themselves.

In the articles of the Furbishers, 1350, good workmanship and good materials were enjoined, and scamping punished. No one of the trade was to make in his house, or allow to be made, "pommels or hilts of swords if they be not of good pattern and steel, and the scabbards must be made of good calf leather." False work brought punishment to the found-out offender. Broken swords were not allowed to be repaired or made up again, to the deceiving of the people, nor new work executed for "any great lord or other person" if the workman was not perfect at his craft. Perils, we are told, "may befal the lords of the land and others among the people through false workmanship, to the great scandal of the folk of the trade." Doubtless then, as now, many mishaps occurred through scamped work. Doughty and valiant knights depended on the temper of their broad or narrow gauge swords, and lost their temper or their lives through such dependence. In the 27th Edward III., 1353, a royal mandate was issued to enforce the return of several skilled workmen and labourers who left the king's works at the Palace of Westminster. All persons were forbidden to employ these hands, and receivers of them not yielding them up were to be sent to the Tower of London. This was a royal "strike" with no "lock-out," but a lock-up for those who disobeyed his Majesty's orders.

In the ordinance of the Braelers, *i.e.* the makers of braels or braces (1355), we find the friendly society principle recognised somewhat like that mentioned in connexion with the White Tawyers (1346). "If any serving-man of the said trade who has behaved himself well and loyally towards his masters whom he has served shall fall sick, or be unable to help or maintain himself, he shall be found by the good folks of the said trade until he shall have recovered and be able to help and maintain himself." Journeymen in this trade were expected to be skilled in their art, and if any one was found of the calling working who did not know his trade he was to be ousted therefrom, unless he elected to be apprenticed to learn his trade. Working by night was forbidden, on the pain of cumulative penalties for each offence. At this trade, too, no one was to be so daring as to set any woman to work at his trade other than his wedded wife or his daughter. We see by this that marriage was no bar in the fourteenth century to the wives of mechanics or other tradesmen working. The wives of working men and master-workmen were then help-mates as well as help-eats. No work was to be done on Saturday by the Braelers, or on the eve of a double feast "after None rung in the parish in which he is residing." Other regulations in the trade were similar to some already described. In the "Regulations" for the trade of masons, 30 Edward III., 1356, we find disputes cropping up almost identical with the ones that exist at the present day in the trade, and which caused more than one "strike" in our memory. The masons who were hewers could not agree with the light masons and setters. One infringed on the others' prerogative or alleged prescriptive rights, and hence there was a settlement necessary to be arrived at before a meeting of the mayor and aldermen, &c. At this meeting certain rules or articles were ordained for the better conduct of the trade, and among others "that no one shall take work in gross if he be not of ability in a proper manner to complete such work." Work in the gross meant wholesale or by the job, lump or contract. Whether looked upon in the light of a large or a small contract this work, by the gross was, after all, little short of piecework, or an estimated or agreed-upon price for a certain amount of work. A builder's contract in the present day is work in the gross. His contract includes piecework, or pieces of work of many trades, but while he is glad to do this piecework at a lump price his workmen resent doing it save at so much per day or hour. Apart, however, from the burning questions on the workmen's side, and the equal dissatisfaction in cases on that of the employer, the "tender" subject is becoming a bugbear to the unprotected public and the architects' clients. It is becoming clearer and clearer every day that many contractors of work in the gross do not carefully or conscientiously estimate. They rather glance at the specifications and drawings and by roughly comparing one job with another previously executed by themselves or their brethren, they dash down a price or prices, hit or miss. If they do not estimate by the rule-of-thumb system, wherefore have we the highest tender double the lowest in jobs ranging from a few hundreds to several thousands? It would appear by these "Regulations" connected with the mason craft in 1356, that piece-work was acknowledged as practised in the trade, and classification also, for these "Regulations" say "that the said masters so chosen shall oversee that all those who work by the day shall take for their hire according as they are skilled and may deserve for their work, and not outrageously." There were other good rules for the guidance of the trade and for the due execution of work undertaken, and those who refused to be ruled or directed for the good of the trade were "chastised by imprisonment and other punishment, that so other rebels may take example by them to be ruled by the good folks of their trade."

We have not exhausted our subject, for in connexion with other of the building trades untouched and outside them, there are points deeply suggestive and worthy of reproduction and particularisation. Between the trade guilds of 500 years ago and upwards and the trade unions of to-day, though there is much difference, yet a great deal of the spirit, the practices, and malpractices in the former survive in the latter. Trades are not now as exclusive and hedged-round as were the crafts of old; still there is a spirit of exclusiveness rampant in the unions.

THE NEW THEATRE IN ATHENS.

Although Athens has had a theatre the last thirty years, its size is not at all adequate to the requirements of the rapidly-increasing city, the population of which has grown, within forty years, from 6,000 to 55,000. Ten years ago already, the subject of building a more spacious theatre was mooted. The realisation of this idea, however, for want of funds, had to be postponed until recently, when the capital and the whole country began to be in a more prosperous condition, consequent upon the restoration of peace and order, and the final annihilation of the numerous robber bands which had infested many parts of Greece for a number of years. Thus in the Piræus (the port of Athens), for instance, nearly thirty manufactories of different descriptions have been erected since 1868. Athens itself has very little trade and industry, and only the fact of its being the capital and the centre of education explains the great activity in building. Since the solution of the vexed question of the Laurium Mines, by which in reality the original association has been instilled with new life, besides leading to other beneficial results, another factor has made itself felt; wealthy Greeks are returning from abroad, who settle at Athens, and invest their capital in industrial undertakings.

Thus the erection of a new theatre was made possible. A joint-stock company was formed, which commissioned, in 1872, Professor E. Ziller, who has built already two theatres in Greece (the Apollo Theatre at Patras, and the Town Theatre at Zante), to furnish plans, and appointed him, on these being approved, the superintending architect. The works were commenced immediately, and the building will be opened for theatrical performances in the course of this year.

The new theatre is situate on the west side of the Ludwig-square, which has on its southern side the Grand Hôtel d'Athènes (also built by Professor E. Ziller), while it is bounded on the east by the building of the National Bank of Greece, and on the north by the Hôtel de la Couronne. A large fountain, deriving its water from the new municipal waterworks which now supply Athens abundantly with that commodity, is to be placed in the centre of the square, and the newly laid-out grounds will, besides their pleasantness, serve the practical purpose of enabling foot passengers to approach the fliers of the principal entrance of the theatre without being incommoded or endangered by vehicles entering by either of the two carriage approaches.

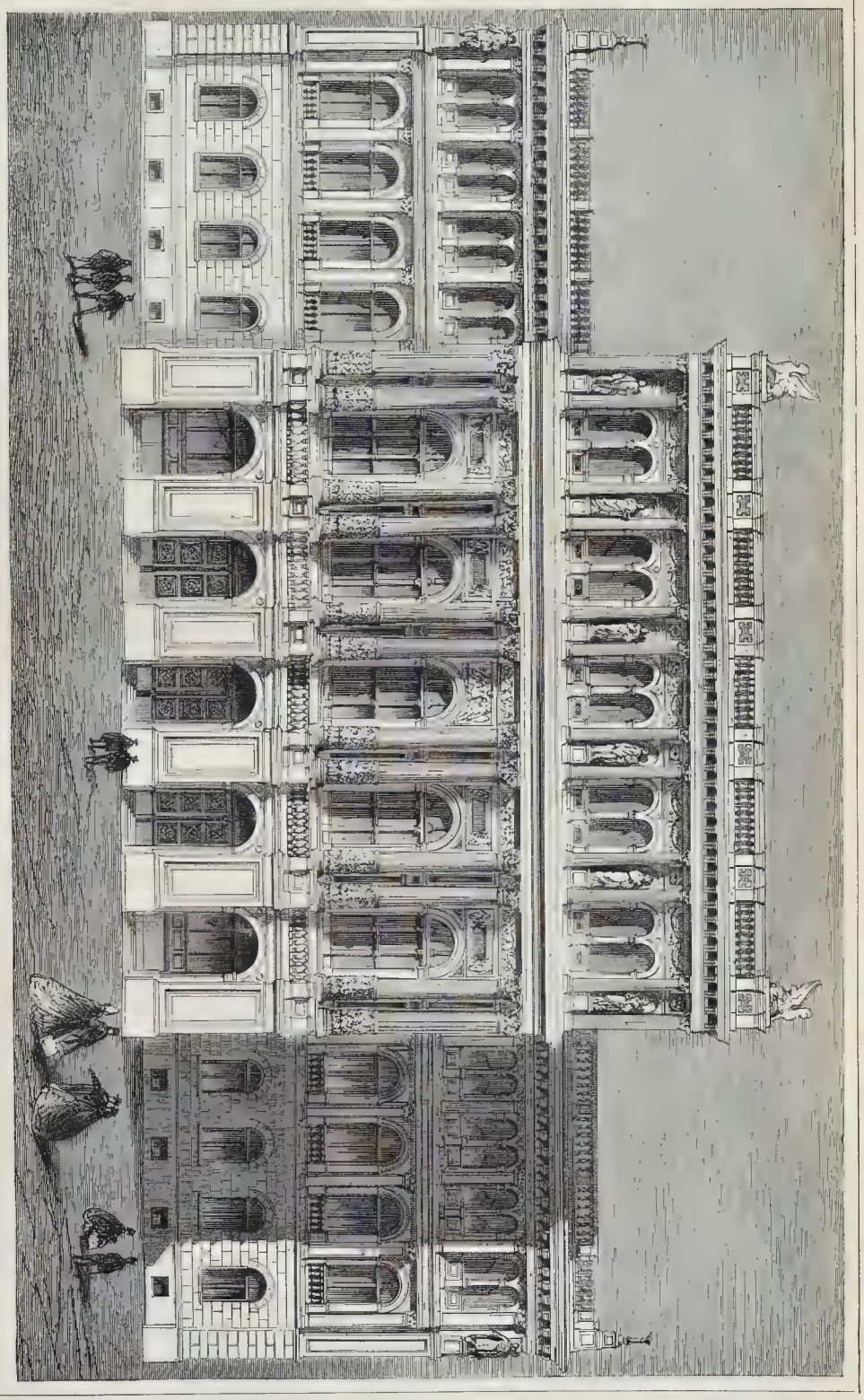
The edifice appears, looked at exteriorly, as represented in our illustration, to consist of three parts, the centre building and two wings. In the first are the stage and the auditory, the latter of which accommodates 1,800 persons, as well as the great vestibule and the foyer. The projecting loggie interpose, so to say, between the proportions of the building and the square, and serve also for the adornment of the principal entrance. The group in the gable represents Apollo and the Muses. The fliers are to be adorned by Centaurs, with amorettes. In the wings are the smaller vestibules, accessible from the carriage-approaches, and connected by stairs with the great vestibule. On both sides of the latter, principal stairs lead to the boxes and pit, the *foyer*, and the refreshment-rooms. Surrounding the stage are the dressing and rehearsal rooms, as well as all the other necessary offices. The entrances to the galleries are entirely separated from those leading to the



THE NEW THEATRE IN ATHENS.—Professor E. Ziller, Architect.



THE CINISELLI CIRCUS, ST. PETERSBURG.—Herr W. P. Kenell, Architect.



THE HUNGARIAN ACADEMY, PESTH.—Herr Stules, Architect.

other parts of the house, and are under the loggie.

The rusticated architecture of the ground-story is executed in grey Pentelian marble; while for the Ionian and Corinthian columns, as well as for all the stairs, white Pentelian marble has been used.

THE CINISELLI CIRCUS IN ST. PETERSBURG.

This building, in course of erection, of which we give an illustration, is the work of the architect, W. P. Kenell. It is to replace the old wooden structure near the Simionoff Bridge, over the Fontanka Canal. Its present site has been granted to the owner of the circus, M. Ciniselli, for forty years, after the expiration of which term the circus becomes the property of the city. Building operations were commenced last year, and the contractors have bound themselves to complete the circus by September 1st of this year, supposing that no untoward obstacles that may present themselves in the course of construction prevent them from completing their contract by that time.

The new building is much larger than the old wooden one. It is placed with its principal façade in the Karavannaya-street. Its form is elliptic, the building being surrounded by a row of balustrades. The projecting principal entrance is well adorned, statues being placed in its arches, 16 ft. high, and at its sides groups of Atlantes. The frieze bears the inscription, "Circus Ciniselli." Below the groups of the Atlantes are groups of children supporting the arms of the city. Upon the entrance is placed a group of horses, with the inscription, "Fame to Genius." The two-storied circus is 60 ft. high; the axis of the greater ellipse being 156 ft. long, and of the smaller one, 96 ft. long. A characteristic feature of the new circus is the *foyer* of the principal entrance, behind the imperial state box. There are eleven rows of seats, and two rows of private boxes. Spacious stables have been provided, as well as ample accommodation in the shape of living-rooms for the attendants and other *employés* in the rear part of the building.

The contract price of the building is 160,000 roubles (26,000*l.*), but further 90,000 roubles (14,625*l.*) are required for completely fitting up the circus.

Ornamental grounds will be laid out around the building.

THE HUNGARIAN ACADEMY, PESTH.

The idea of establishing a Hungarian Academy of Sciences was mooted already in the last century, but it was not realised until 1830, when, principally through the exertions of Count Széchényi, a sum of 45,000*l.* was raised by public subscription. The fortunes of the new academy fluctuated until 1858; in that year a fresh appeal was made to the public, resulting in the collection of further 80,000*l.* Of this sum, five-eighths were devoted to the erection of the academy buildings, the want of a home of its own for the institution having long been felt; the remaining 30,000*l.* being added to its endowment fund.

The academy buildings, the subject of our illustration, are from the designs of the architect Stüler, of Berlin. They occupy an area of 34,308 square feet, on the Kettenbrückenplatz, a square named after the chain bridge over the Danube. Its principal front, facing the square, is 203 ft. long; that towards the Danube, 104 ft.; and that facing the Akademiegasse, 109 ft. The centre building has a height, without the balustrade, of 90 ft.; in its wings of 70 ft. It is faced throughout with a hard native sandstone, marble being introduced in some parts. Its three façades are all in pure Renaissance style. The column shafts of the centre are richly ornamented in their lower parts, the panels between each two columns being filled in with green Hungarian marble. Marble tablets bearing inscriptions, and supported by genii, are also inserted over the large front windows, while over the middle aperture the Hungarian arms in relief are set in. The parapets of the upper story, as well as the double pedestals of the balustrade, are also inlaid with marble. The corners of the centre building are crowned by winged sphinxes. In its upper story, in niches between each two columns, six statues, representing the six classes of the Academy,—Jurisprudentia, Physiographia, Mathematica, Philosophia, Philologia, and Hystoria,—are placed. In the centre of the Danube front four other statues,—those of Archæologia, Poesia, Cosmographia, and Politica,—are mounted. Finally, statues of celebrated men decorate the corners of the building; on the Kettenbrückenplatz façade are placed Raffaelle and Révay; on the Danube front, Newton and Galileo; and on the side facing the Akademiegasse, Leibnitz and Descartes.

The interior of the edifice is appropriately adorned. The three great entrances of the principal façade lead into a vestibule supported by sixteen columns of grey Silesian marble, with capitals of white Tyrol and pedestal of red Salzburg marble. Twelve steps of marble bring us into a gallery-like corridor, 15 ft. wide, in the central axis of which rises the great staircase, of grey Karst marble. From the left of the corridor the rooms of the library are reached, consisting of a large public reading-room and two private reading-rooms for members of the Academy, as well as three large vaulted book-rooms, supported on iron columns, on the Danube front, and a very large room towards the court-yard, with ante-room, and a room for collections of antiquities. On the right of the corridor are three lecture-rooms for the several sections, and a laboratory, all which rooms are connected by a smaller vestibule, which may be reached by carriage, with the great vestibule.

From the great staircase, the centre flight of which consists of marble steps of 13 ft. 6 in. long, and the two side flights of which have a width of 9 ft. 6in., the corridor of the first story is reached. The corridor, the ante-room, so to say, of the great hall, is richly decorated by Ionic columns, standing close to the wall, but free, and receiving the ribs of the groined vaulting. Three niches filled with statues strike the eye here, and have columns of green Fünfkirchen marble on each side of them. From this corridor, the galleries of which are supported by twenty-four columns of Salzburg marble, the great hall is entered by two richly-adorned doors. The hall itself is 96 ft. long, 54 ft. wide, and extends through two stories. Over the entablature of the marble columns, decorated with stucco, caryatides are arranged over each column, supporting the groins of the ogival vault. The ceiling of the hall is vaulted to a mirror-like boss, between great iron girders. The walls are of stucco-lustro; the doors, as well as the high wainscoting, of mahogany. The hall receives its light through five large windows, divided by columns, the windows opening on to a balcony extending the whole length of the great hall.

On the left of the corridor are a large hall for the physical section, with corridor for experiments with light, also a large ante-room, and the hall for the weekly meetings, of 34 ft. wide, and 44 ft. long, with vaulted ceiling, both wall and ceiling being richly decorated. In connexion with this room is a hall, separated by three large openings, for the auditory. The offices are in connexion with this hall.

In the second story are the entrances to the gallery of the great hall, and on the left of the corridor, some of the rooms containing the Esterházy picture-gallery, four large rooms with side-light, and a study. By the side of these rooms stairs of greenish Hungarian marble lead into the principal rooms, over the great hall, of the Esterházy gallery. Further towards the Danube are rooms for the permanent exhibition of the Pesth Fine Arts Society, consisting of a room with side-light and four rooms lighted from above, with ante-rooms.

In the centre building, finally, accessible by the stairs from the picture-gallery, and over the great hall, the great corridor, and the principal staircase, are the great rooms of the Esterházy collection, consisting of four greater rooms with skylights and five rooms with side-light, and representing, with the rooms of the second story, a wall-surface of 15,000 square feet.

A YOUNG PORT.

About three years ago, in an account we gave our readers of Mr. Picton's agreeable Memorials of Liverpool, we outlined the gradual rise and development of that wealthy town, from its insignificance in the days of Queen Elizabeth, when only twelve vessels belonged to its merchants, to its affluence and commerce of the present time, when upwards of 20,000 vessels enter the port annually. We are now going to notice the formation of a new port in our own day from a similar small beginning. Without assuming that this young Victorian venture will assume the dimensions of its Elizabethan example, we may watch its foundation and progress with interest, and possibly with advantage.

The young port we are about to describe is at the mouth of the Coquet, in Northumberland. It is so young it has scarcely yet consolidated itself sufficiently to be certain of its own name; for, while generally called Amble, it is officially entitled Warkworth, and the harbour offices are lettered "Warkworth Harbour Offices." Thirty years ago, however, there were only two good houses and a few cottages near the mouth of the river, and this little group of habitations was known as Amble. In an old garden behind the houses in the new main street is a short length of an ancient wall, in which there is a traceried window blocked up, proving the correctness of local records that attest the existence of a small religious house here in the Middle Ages. With these exceptions, wherever the eye rests in Amble all is new. There are new streets, new roads, crisp to the tread with pebbles from the shore, a new church, new schools, a new vicarage-house now building, a new bank, new shops in all sorts of unfinished corners, a new harbour, a new pier, new quays, new tramways, new brick-kilns, new houses building in various directions, and all so new that nothing appears to be quite finished. Glancing down some of the new streets, we note there is no pavement, or it only extends along part of the length of the street; in one we perceive the stumps of the hedges and bushes that grew there a short time ago, or the great root of a tree, still *in situ*; in another, an open burn, with only a few old planks thrown across it for people to walk on; and we note that the tramways for the coal-wagons cross the public roads and pathways without the least protection. But this incompleteness is by no means the result of idleness or indifference; every one is intelligently and briskly busy, and there is not a lounger or a beggar to be seen in the place. It is simply owing to the rapidity and recentness of its growth, and press of attention to other matters.

As we have said, the whole population is heartily at work. Little steam-tugs puff in and out of the harbour, tugging great ships that glide silently after them; long lines of coal-wagons tear along the tramways from the collieries to the quays, and tilt their loads into the holds of vessels waiting to receive them; fishing-boats come and go, and carts come to meet them; a huge dredging-machine is always at work, dredging up pebbles and sand from the bottom of the harbour, and discharging them into trucks that are to carry them away; ballast is also unshipped and taken away in trucks; and every one on the spot seems to take the liveliest interest in what is going on; while, less than three miles up the river, is the lonely Hermitage of Warkworth, as silent and still and deeply shadowed with trees as it could have been when the unhappy hermit lived in it, who fed upon his tears day and night; and less than two miles up the river stands the grand castle of the Percies, ruined and roofless, and as still and silent as the Hermitage.

The cause of the sudden outburst of human activity at Amble was the discovery that the coal seams worked at Ratcliffe, a pit about a mile away, were of such immense extent that they were, so to speak, inexhaustible. It occurred to some minds as original and far-seeing as that of the Mayor of Liverpool in Queen Elizabeth's days that, if a harbour could be made at the mouth of the river, this coal could be disposed of profitably. A company was formed in London, and the scheme set on foot. Many lent themselves to the venture, and the pit, once the small property of the unfortunate Earl of Derwentwater, was adequately worked with powerful machinery, and the harbour was also commenced. Another colliery, about three miles away, at Broomhill, was rapidly developed, and all seemed prosperous. But many difficulties arose. The bed of the river proved to be very shallow, and notwithstanding the unceasing labours of the dredging-machine, is not yet deep enough; the pits were the property of rival companies, who competed with each other rather than worked together; there were three long miles of distance to the nearest railway; considerable depression set in; the large population suddenly drawn together without adequate house accommodation brought its own evils; there were outbreaks of fever; and those who advanced the money sunk in the undertaking did not enjoy the fruits of their pains. The sum expended upon the harbour works is spoken of, roughly and sadly, as a quarter of a million of money. But now the enterprise has changed hands, and all things have adjusted themselves on the new basis, and settled to work well. The two collieries are now

in the same hands, there is a prospect of two other collieries shipping their coal from the port; and there is a general air of hope, and even certainty, of great things.

Not one house in this little Victorian port is more than two stories in height; and all of them are on the south side of the river. The main street runs from one end of the town to the other, and has been laid out to be 40 ft. wide; but, unfortunately, there is a sudden bend half-way down it that gives it the character of two distinct streets; otherwise it would have been a very satisfactory setting out. The western end of this thoroughfare is called High-street, and the eastern end is named Queen-street. It is approached from Warkworth by a steeply ascending way called the Wynd, and then comes on and on till it comes to the two old substantial houses we have mentioned, when it takes the sudden bend half-way in its length, and then goes on again till it stretches itself through the whole length of the town, and dies into the sandy coally flat, traversed by wagon-ways, that lies between the town and the harbour. South and north of this main street run parallel streets, not continuously yet, but in various lengths; and from the east and from the west are openings to short streets, containing a few new houses in each; and, again, with less system than here indicated, there are new houses of exactly the same type building in isolated spots that have yet to be connected with any roads at all. Out of all these new buildings only three have any architectural pretensions. These are the church, the bank, and the vicarage-house now in course of erection, which all present an ancient French character, and are the designs of the same architect. All the streets of small two-storied houses exhibit no design, except a desire on the part of the masons and joiners who have erected them to do so at the smallest cost compatible with durability for the proposed accommodation.

In this little port, house accommodation does not include a supply of water, nor a system of drainage. Out of all the houses, all day long, come people with cans and pails to carry water from three wells, and out of nearly all the houses, all day long, people throw all their slops and refuse upon the nearest ash-midden. A small line of drain has, indeed, been laid down in one part of the town, but it does not answer the purpose of proper sewerage. Busy, intelligent, and enterprising as they are, the residents have not taken time, apparently, to consider that the water would come to them if properly managed, and the sewage and slops depart from them all, if properly conducted; or, if they have looked at the matter, they have not been able to surmount the difficulty the question presented to them. However, the outbreaks of fever made it apparent to the Rural Sanitary Authority of the union to which Amble belongs that a system of sewerage is imperatively required, and this is shortly to be laid down. But the water supply has not yet been handled; and all day long handy men, women, and children run with the pail to the pant for a hand-to-mouth quantity.

The formation of the harbour has left in the rear of it a low-lying brack, formerly covered by the tide. The present proprietor proposes to fill up this piece of land claimed from the ocean to a suitable level for building purposes, and to cover it with streets. Towards this end all the ballast brought home by the ships that take coal away is discharged upon it, and it is gradually rising high and dry above the shore.

Already thirty-two ships belong to the little port, three of which were built in Amble. Twenty-one of them are of Sunderland workmanship, and one of Prussian building. These figures, however, give no idea of the coming and going, the tugging in and out of gallant ships, as the vessels from foreign parts visiting the harbour are much more numerous. In Liverpool, only two centuries ago, the largest vessel belonging to its merchants was 40 tons burden. In this little Victorian port, now so rapidly rising out of the waters, the largest ship is of 714 tons burden, and the smallest, the *Sea-flower*, is 155 tons burden.

As Amble is not on the road to any other place, there is but very little wheeled traffic in it. The streets are comparatively quiet, owing to the absence of carriages, wagons, and omnibuses. Accidents are rare on the land, but, on the other hand, the sea furnishes its quota, and instead of street casualties, there are fishermen lying because they have been swept overboard and hurt, and sailors sick unto death brought into the little hospital. This institution, by the bye, is but a small house in the Wynd, and might be considerably improved by a better situation, which opinion will be doubtless shared by the occupiers of two or three bright little villa residences with gay flower-gardens in this same wynd, as well as by the tenants of the adjoining cottages.

From the windows of such of the rows of houses as face the north are superb views of the wide open country, with Warkwork Castle standing up like a great sentinel in the middle of it, and with the placid Coquet winding about through the meadows in it. From the windows of many of the other houses are splendid views of the North Sea, with Coquet Island, with its lighthouse glittering upon it like a great jewel, and black and white ships silently and dimly appearing and disappearing all day long in the horizon.

FREE THOUGHTS ON ART AND HANDICRAFT.

Art is the evolution of handicraft. Ordinarily speaking, the child essays to walk before it attempts to articulate. So handicraft, or skilled physical labour in one form or another, has always been the precursor of art, as defined by always been the precursor of art, as defined by rules, and guided by mental studies. No man is born into the world an artist, though in his person he may possess the constituent elements of one, and no matter what may be his earlier studies, his approach to the profession of an artist, whether painter, sculptor, or an architect, will evidence more or less of the characteristics of the craftsman. Art is imitative as well as creative, and so is handicraft; for both are the offspring of design, and amenable to what we call taste, as apart from the varying impulses of fashion. Much has been written upon art, *per se*, and hundreds of volumes will yet be produced, dealing with the subject in the concrete and the abstract. Yet the present writer is of opinion that very hazy notions are and will be current in relation to it, so long as men continue to deceive themselves by the subtle charm of words, which excite the fancy instead of convincing the reason. Nature seldom or never deceives; art often does so, and by some it is considered to be the peculiar province of art to conquer by illusion. The mere reproduction of forms in nature, trees, flowers, fruits, mountains, and rivers, on canvas, with the fidelity of a photograph, minus its colour and process, is art, though it may be not of the highest order. Apart from the reproduction of an existing reality in nature, there is still the art of the executive artist to be taken into consideration. The artist in question would probably feel grievously offended if we made any comparison between his work (a work in which hand as well as mind were united), and that of his craftsman brother, who made a design for a new piece of furniture or house decoration, and with his own hands produced the design embodied in workmanship. The artist, in the first instance, copied from nature; the craftsman, to some extent, may have imitated nature too in the carving or ornamental portion of his work. The former sketched with a free hand, and painted in; the latter may have combined free-hand drawing with the use of instruments; but his finished workmanship was the result of the manipulation of his skilled hands, from which, however, mental thought or the government of the mind was not absent during its execution. If we come to the work of the sculptor and the architect, we may draw other similes, and, perhaps, more forcible ones; and what do these go to prove? They go, we think, to prove that it is most difficult to define the boundary-line between art and artistic and educated handicraft. Between the higher forms of art and handicraft there are close and inseparable relations, and between the lower forms of art-reproduction and handicraft there is much that is very common, and "of the earth earthy." Pictures are now turned out almost with the rapidity of bricks from a mould. So are tables, chairs, and so-called natural foliage and other carving. Systematic reproduction, in which there is little thought and not much more real executive workmanship, is neither art nor handicraft. It is a species of compound manufacture, stamped, stencilled, moulded, cast, and sold wholesale and retail, and for exportation.

Handicraft is coeval with all history, and, of course, it is the forerunner of all art. We may imagine through what steps it passed before it was systematised, though we have no reliable records for tracing its progress, except what is evidenced in antiquarian "finds," ancient statues and buildings, and the earliest writings existent thereon. Whether a distinct class of draughtsmen or craftsmen-artists existed in Egypt, Assyria, or Greece, or that the craftsman-architect was the executive workman and artist at the same time, we are left in doubt, though we incline to the latter opinion. Whatever way we view the subject, the workman and the artist in early times appear to be inseparable, and art and handicraft did not suffer from the union. Coming down to more modern times, we are afforded clearer evidence of the creation and acknowledgment of certain defined classes of draughtsmen and craftsmen. Mallet, in his "History of Denmark," Wormius, Sibbern, and other writers, give us wonderful accounts of the talents of the Northern people at carving, and with no better tool than a knife, the universal resort of all amateurs now as well as in more ancient times. We have also an account of the painting with clays by the same people, done with different colours. The use of painting or colouring earths and clays was common among the early Britons. The inhabitants of the British islands, up to the twelfth century, made a large use of painting clays in the art of design, and numerous also were the plants and trees, both in leaf and bark, utilised for dyeing purposes. The Britons adorned their skins with ornamental punctures of birds, animals, flowers, and other pictures that fancy suggested. Of these same people, we have evidence of a class of artists called *Artifices plagarum*, and among the latter there were master draughtsmen or designers who not only taught but practised the art of drawing. We have no record showing that Greece or Rome could boast of such a distinct class of men, although we know she must have possessed architects, sculptors, or operative artists. We spoke of the talent of the Northern people in the use of painting clays, and we may remark here that Tacitus notices the last fact of the German people. In Pagan Britain and Ireland, as well as under Christianity, we have evidence of the advance of the people in certain arts, governed by design and certain applied rules. The talents of the early British people were by no means confined to personal decoration, for the relics that have reached us prove they were employed in designing or making objects for worship or religious veneration, both in Pagan and Christian times. We have superb specimens of the goldsmith's art and of bronze work, and of the art of illumination dating back to very early times. In connexion with our early architecture in these islands we have fine specimens of statuary and sculpture, and our Mediæval architecture is rich in ornamentation. Whether the master workman was the architect, or several of the executant craftsmen were artists as well, we are left to divine. In the absence of positive, we have negative evidence which goes to prove the close unity that must have existed in the matter of art and handicraft, for if there was not a distinct class of craftsmen-artists, the artists and workmen were to some extent one and the same. The building workman, who was a master of his art in Mediæval times, we must opine must have been an artist, a sort of "three-branch hand," an architectural draughtsman, a monumental sculptor, and a skilled mason. The timber roofs of the Middle Ages go to prove that the carpenter, joiner, and carver were also one, and that the principles of design and art were inseparable from the practice of his calling. Modern times have led to the organisation and distribution of labour, to the concentration of thought in design, and to the division of labour in execution alike in painting, sculpture, and architecture.

A Craftsman.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT COLCHESTER.*

Beeleigh Abbey, which was visited on the 4th inst., is situate about a mile from Maldon. It was founded in the twelfth century, and was no doubt originally a noble structure, but it has changed,

"As all things change here,"

and all that is left of it now is a wretched-looking building, occupied by a gardener. The interior, however, will well repay a visit. The Refectory has a fine groined roof, as also has the Chapter-room. Mr. Parker was inclined to believe that the refectory fire-place and its "canopy" were contemporaneous with the building itself. The Monks' Dormitory excited much interest, Mr.

* See p. 752, *ante*

Parker affirming that it could only have accommodated twelve monks, which was a number altogether inadequate for so large an establishment, and he was, therefore, inclined to the belief that it must have been originally twice the length. The roof is constructed with chestnut wood, which a lady present said was inimical to the formation of cobwebs. The roof is not exactly wagon-headed, nor yet barrel-shaped. Mr. Parker said that although comparatively little remained of the Abbey, what there was was remarkably good. The timber roof was probably put in in the time of Henry VII.; the remains are Early English. The doorway at the west end of the Chapter-house retains some wall-paintings,—flowing lines of deep red on a cream-coloured ground.

On Saturday, the 5th, there was an excursion to the Church and Priory of St. Osyth, taking Wyvenhoe and Brightlingsea Churches *en route*. There is no very great archæological interest attaching to Wyvenhoe Church. It is an Early English building, but it has undergone such an entire change in the course of time at the hands of the restorer that but few traces of the original remain. The principal objects of interest to the visitors were some monumental brasses. Leaving Wyvenhoe, the visitors proceeded, *viâ* Alresford, to Brightlingsea Church, a building with a lofty and battlemented tower. It is intended, as soon as practicable, to take in hand certain alterations of the church, "with a view to rendering the interior more seemly in appearance, and fitter for the purpose of public worship." The party having made a cursory inspection of the building, assembled under the shade of a spreading tree, where Dr. Freeman proceeded to point out the principal features. He said the church was a good specimen of an Essex church, all the churches in East Anglia being very different from those met with in the West of England, though there was much Perpendicular in both. The style here was largely ruled by the material. There being little stone to be got they had to use flint, with facings of fine stone. This was the characteristic treatment of the churches of the district. The church consisted of a western tower, nave of five bays, chancel, and north and south aisles. It was perfectly clear, from the buttress on a level with the chancel, and one hidden by the vestry, which were of an earlier date than the rest, that it was a church of the fourteenth century (some parts of it probably a little older, but he would call it a fourteenth-century church) which was changed at the end of the fifteenth or the beginning of the sixteenth century into a characteristic low-roofed church and battlement of the later style. The church was lengthened and widened on the north side, and the present grand tower added, probably late in the fifteenth century, and the tower was certainly one of the finest of its kind extant. After remarking upon the fact that whereas here there was only one large window in the belfry stage, in the West of England they would probably see a number, Dr. Freeman said the one window much better suited the material they had to use in this district. In the course of some further remarks the speaker expressed an opinion that there had been no clearstory in the church, but he said that some one afterwards cut a dormer window into the roof of the nave, such as was not uncommon in Herefordshire. Being subsequently informed that there had been a clear-story, which, with the roof of nave and chancel was said to have been taken down sixty years ago, "and the present poor and incongruous roof substituted," the Doctor said it might possibly be so; it only made the matter the more curious. Although the builders had probably never seen a Herefordshire church, they must, in arranging for giving some light for a high-pitched roof without a clearstory, have themselves hit upon the dormer window. It was curious how thoroughly like causes produced like effects in all times and places. Inside the church Dr. Freeman pointed out some further peculiarities. Leaving Brightlingsea, the party proceeded on to St. Osyth, and went at once to the church, of which a hurried inspection was made. Mr. Parker stated that it was perfectly easy to see that there had been an earlier church there, of the thirteenth or fourteenth century, some of which work remained. He thought the re-building of the church on a grand scale was commenced in the time of Henry VIII., but the work appeared to have been cut short for want of funds. He especially pointed, in proof of this, to two unfinished piers with the hagioscope or "squint" in each, and to the unusually rich character of the nave and the roof, the north aisle of which was of the time of Henry VIII. Attention was drawn to the very clean state of the roof of the nave, and Mr. Parker being asked if it was a fact that a roof made of sweet chestnut was never affected by spiders or other insects, replied he believed that it was so with regard to some kinds of wood. Dr. Freeman, who was appealed to for his opinion of the building, pointed out one or two of the more striking features, remarking that it looked as though there was originally a cross church with large transepts, and very much narrower than it was at present. Among the objects of interest in the church are tombs of the D'Arcy family with recumbent figures, one having the arms of D'Arcy impaled with Rich, and the other the arms of D'Arcy impaled with De Vere; also a mural tablet to the memory of the fourth Earl Rochford and his wife, whose hatchments remain on the opposite wall. The oval altar-rail is almost unique, and it is probable that, just after the Reformation, the communion was administered to the congregation by the table being moved out into the body of the church. Having left the church, the visitors were hospitably entertained by Sir John and Lady Johnson at the Priory, and afterwards left for Colchester, where the Mayor and Mayoress held a *conversazione* in the town-hall.

On the following morning (Sunday) a special sermon in connexion with the meeting was preached by the Bishop of Rochester, at St. Nicholas's Church, recently restored by Sir G. G. Scott.

On Monday, the 7th inst., the Historical Section held its third meeting (Dr. E. A. Freeman in the chair), when Mr. Clement Markham read a paper on "The Siege of Colchester." The discussion which followed was, to put it mildly, rather "lively," Mr. Piggot warmly contesting the accuracy of a statement made by the chairman that Lucas and Lisle, the Loyalist commanders, broke their *parole d'honneur*. The discussion was followed by an interesting paper, by the Rev. C. R. Manning, on the "Monuments of the De Burgh and Ingoldsthorp Families in Burgh Green Church, Cambridgeshire." These monuments have been more or less noticed by Gough, Lysons, &c., but (according to Mr. Manning) have never been accurately described, and from the somewhat retired situation where they remain, are in a sadly neglected and injured condition; yet they are fine and interesting examples. The church of Burgh has little in it to interest beyond these monuments. There was formerly a chantry chapel on the north side of the chapel belonging to the family of De Burgh, from which some of the monuments were removed. Following on Mr. Manning's paper was one by Mr. S. Tucker (*Rouge Croix*) on "Variations in the Petre Arms." Mr. Waldene came next with some remarks on "Havelok the Dane," and endeavoured to throw some light on carvings at Bures, and carvings recently discovered at Ipswich, which he had no doubt illustrated the very marvellous story recorded in French and English, yclept, "Havelok the Dane," the rhyme (long missing) having been discovered in the Bodleian library in 1828, and was the oldest French composition, save those of a religious character. It also existed in English, and formed one of the most popular stories, written simply for the people, during the Middle Ages, and was one of those tales which the Puritans laboured to destroy, as they classed such literature as "fables and old women's tales." It was the story of Grim (whence Grimsby takes its name, as seen by the Corporation seal).

Mr. H. Stopes directed the attention of the Institute to the fact of the existence, in the low-lying marshes fringing the Colne and Blackwater, of a series of remarkable mounds, which had apparently hitherto escaped the notice of archæologists, as no mention of them occurred in any publication of which he was aware. They reached for miles, and were of varying width. The portions he had examined were from 100 to 200 yards wide, and about 4 ft. thick. They were composed almost exclusively of burnt red earth, mixed very abundantly with fragments of a coarse kind of pottery, or earthenware of an extremely rude type, and contained quantities of ashes and charred bones.

In the afternoon, the perambulation of the eastern portion of the town was made. Starting from the town-hall, the party at once made for the castle, where, in the quadrangle, or great courtyard, Mr. Parker gave a description of the building. It was, he said, most distinctly a Norman castle, built at the end of the eleventh century. A book by a modern architect (Mr. George Buckler), sought to show that the castle was a Roman erection; but in the walls there were fireplaces, and whoever heard of fireplaces in the Roman period? The building, he repeated, was unquestionably Norman, but as was usual at the period, of a very plain, though substantial style. The ornamentation, however, was added fifty years later, at which time also the grand Norman gateway must have been built. There was not a vestige of Roman work about the place, except the materials of which it was composed, and which were utilised in consequence of their being to hand, and were doubtless the ruins of the Roman wall. Some said that the bricks were not Roman at all, but were in imitation of the Roman, but one brick he pointed out was evidently of the fourth century, and undoubtedly Roman. There were some subterranean passages beneath the castle, and these, he said, were Norman cellars. The castle was not, as was supposed, a "keep," but a large Norman castle intended to assist a small garrison in keeping a large and discontented town in subjection; and was after the same style as that at Rochester, which was of fifty years' later date. There were two court-yards, the one in which they were assembled, and a smaller one on the east of the building, and a centre wall ran across the large one. (Lord Talbot de Malahide asked if there was not originally a row of columns across the great courtyard, but Mr Parker said it was most probably a solid wall). All the apartments in use were on the second floor; the hall, of which the fire-places still remained, was above the great courtyard. The upper floor was most probably lighted by a gallery with windows, no traces of which, however, now remained. The present museum was a chapel. There were no remains of the kitchen, but it was probably in the small court-yard, where were a number of fireplaces in a good state of preservation. On the north wall of the castle Mr. Parker pointed out a buttress, which, he said, placed beyond doubt the Norman build. Proceeding through the Holly-trees garden, where evidences existed of a wall which once skirted the castle, the party went on to examine, in the paddock of the same grounds, a Roman *cloaca* or drain, in excellent preservation. Following the line of the Roman wall, at the back of all that is left of the Botanic Garden, through Land-lane and Priory-street (or More-lane (as it was formerly called), and examining the wall at intervals on the way, the party at length arrived at St. Botolph's Priory. Here Mr. Freeman gave an interesting history of the priory. He pointed out that although Colchester possessed thirteen churches in the Norman period, there were no large ecclesiastical buildings within the walls, the Abbey of St. John and St. Botolph's Priory, or the Church of the Austin Canons, being both outside the walls. The Priory of St. Botolph was a remarkable instance of the use made of Roman materials for building, and, singularly enough, in it these materials were used for the ornamental part, as might be seen on the west front. It was probably built by Ernulf, prior to the reign of Henry I., for there was a charter granted to the then existing priory in that reign. It was evidently utilised as the Church of the Austin Canons, and as the parish church as well, a solid screen of brick dividing the two at a subsequent period; and up to the time of the siege was used altogether as the parish church; but at that unhappy time it was most unfortunately situate, being between the fires of the besiegers and besieged, and it was then reduced to the state in which it now existed. The western part of the building was of a much later Norman than the rest, and there were upon it the remains of two fine arcades, and the splendid Norman gateway. Arrived inside the walls, Mr. Freeman said the original building consisted of a nave, a central tower, a transept, and a choir, with probably an eastern limb and an apse; but they could only guess what the building may have been at the Dissolution. He also remarked upon the massive round piers which supported the nave, and which distinctly marked the structure as Norman. Mr. Parker made a few remarks upon the character of the bricks employed in the Priory, which, he said, were of several different periods, the greater part being of the fourth century, but some of them were earlier. The perambulation was then continued through St. Botolph-street and Mersea-road, following the Abbey wall, at the south-east corner of which Mr. Parker pointed out some bricks of the first century, less than an inch

thick—the smallest he had ever seen. He remarked that a rumour had reached him of a wish of a majority of the Town Council to pull down this portion of the wall, in order to widen the road, and made an earnest appeal for its preservation, it being extremely interesting, as showing what the city once was. Crossing the Abbey Field, the Abbey gate of St. John was next visited. This building, which is all that remains of a once large and handsome abbey, had been, Mr. Parker said, partially and very well restored. The Abbey was built, he went on to say, in the reign of Henry II., and the material used was mainly Roman brick, from the same source as the Castle. The church of St. Giles, the next place visited, excited considerable interest, being the burying-place of Sir Charles Lucas and Sir George Lisle, and other members of the Lucas family. The perambulation concluded with a visit to East Hill House, the garden of which is flanked by a considerable portion of the old town wall.

In the evening the third and final *conversazione* of the members of the Institute and of the Essex Archæological Society was held, and a paper was read by the Rev. S. Baring-Gould on "Ancient Historic Fables."

Tuesday, the 8th inst., was the last day of the meeting. In the morning a paper by Mr. B. H. Cowper on "Earthworks in Epping Forest" was read (in the absence of the author) by Mr. J. Burtt, the hon. secretary of the Institute. In the course of a conversation which followed the paper, the hope was expressed that steps would be taken to preserve the earthworks in Epping Forest, and Mr. Piggot said that England was the least civilised of all countries in the preservation of ancient remains. Mr. Burtt (in the absence of Mr. W. T. Watkin) next read a paper on "Roman Inscriptions found in Colchester," which gave rise to a long discussion, in which Lord Talbot de Malahide, Mr. J. H. Parker, the Rev. Prebendary Scarth, and others, took part. After discussing the etymology of "Colchester," the Rev. Barton Lodge read a paper upon St. Mary Magdalene, Colchester, and other leper hospitals, and the company adjourned to the large hall, where votes of thanks were passed to the mayor and corporation of Colchester for the reception accorded to the Institute, to those who had shown their hospitality during the excursions, to the presidents of sections, to the local committee and secretaries, to Lord Carlingford for presiding, and others.

The formal business of the congress then closed; but in the afternoon the company divided, some going to Felix Hall, Kelvedon, where they partook of the hospitality of Sir Thomas Sutton Western, bart.; and others to the residence of Mr. Bourdillon, Great Horkesley Park, where they were cordially received. The *Essex Standard* (from whose very copious reports of the meeting our *resumé* has been mainly derived), says the local honorary secretaries, the Rev. C. L. Acland and Mr. G. Gard Pye, were most assiduous in promoting the success of the meeting.

The place of next year's meeting of the Institute has not yet been finally arranged, but the choice lies between Hereford and Northampton.

FORTY YEARS' SANITARY PROGRESS.

At the fourth general meeting of the British Medical Association, held at Sheffield on the 4th inst., Dr. Alfred Carpenter delivered an address, in which he said that a Parliamentary leader had spread far and wide the proposition: *Salus populi suprema lex.* They were bound to believe that when he uttered that sentiment he honestly gave adhesion to the principle involved in it. Nay, the harassing legislation which a belief in its correctness helped to promote had assisted to bring about the ebb tide in the promotion of sanitary work which they were now witnessing. It was scarcely more than forty years since the first national platform was established upon which satisfactory observations could be made and successful operations carried on in the cause of preventive medicine. The statistics which had been prepared by Wm. Farr had been true pioneers of sanitary work. He would by no means decry the observations made by the older sanitarians. The compulsory appointment of medical officers was preceded by a permissive stage,—permissive, first, in the application of sanitary work to a particular district,—permissive, in the way in which that work should be applied, but at the same time accompanied by the stern resolves of the courts of law that in applying those works, and bringing them into practice, the rights of individuals should be respected. Was it not natural that those who desired healthy and satisfactory progress should prefer to see the suggested enactments in operation, and that they would wish to have an opportunity of studying their effects before committing the Legislature to a course of action which would have to be retraced if it happened to be projected on wrong lines? Hence the value of permissive measures; the promoters of antagonistic schemes for the improvement of the health of the people had had a fair field. The principles upon which these schemes were based might have been correct, but unfortunately the advice of the medical expert had been but too often only half acted upon. The principles which governed the application of sanitary law had been only half understood by those who had had to carry them into practice, and had been only half applied. Medical men are not acquainted with the first principles of engineering work. To engineers had been most naturally entrusted the duty of devising and carrying out the works which were required for the removal of the causes of disease, with the too frequent result of partial failure in effect because sanitary law as a study of biology had not been the guiding star of the engineer; whilst the medical adviser, being totally ignorant of the requirements of the former, had unwittingly passed over serious defects in the proposed schemes. The lesson which has been learnt was that the medical officers of health must know something of the first principles of sanitary engineering, so that they might be able to detect any grave defects in the works which a local authority might determine as requisite to be carried out in a given district. . . . . An idea now present in the minds of the ruling powers was that they did not intend to be doctor-ridden. They had done a great piece of satisfactory work; they had made the appointment of medical officers of health compulsory. Some local authorities had even conscientiously performed their duty, and had appointed efficient officials. The medical officers so appointed had zealously set to work to find out the sanitary defects which existed in their district, and had made elaborate reports regarding the same. Many were astonished to find that although appointed to do certain work, and to make certain suggestions for action, no action was taken, and things remained much as they were before the appointment was made. There was nothing very extraordinary in this. It was the rule in every-day life. The reports of medical officers of health lay on the table, and very little concerted action has been taken for the removal of those causes of disease which had been so ably and clearly pointed out. The first principle of sanitary work was *motion*. Any plan which entailed stagnation as part of its scheme must have the cause for that stagnation very clearly expressed and a sound reason given for it, or the scheme was bad in design, and not calculated to effect the object for which it was proposed. This was a canon law with reference to the first great purpose of the sanitary officer. From the moment of excretion until it was utilised, motion of such excreta was the first sanitary law. If the excreta of carnivorous animals were kept moving, those combinations which produce epidemic disease were not forthcoming. For this purpose sewers were required in crowded localities. They were the necessary evils which followed upon the aggregation of individuals into crowded communities, though they were quite out of place in the village and the isolated mansion. Any sewer so constructed as to allow of stagnation of any of its contents in any part of its course was wrongly made. Deposit must not be allowed to take place; sewers must flush clean. The engineer who constructs sewers so that a deposit was probable in the invert of the arch had failed to effect the object for which he was engaged, and had erected an elongated cesspool. Sewage could not be retained in a sewer or anywhere else for more than twenty-four hours without producing a chance of evil; long before that time had elapsed it ought to be on its way to be utilised. The moment utilisation of sewage had properly commenced, from that moment the evils which might result from sewage receded into the far distance, became ineffective as foci of infection. At present, nineteen-twentieths of the sewage produced by the thirty-two millions of Great Britain was cast into the sea, or allowed to decompose, after it had set up an immense amount of disease. Some of it became food for fishes, but the major portion was lost for ever by its reduction to its original elements. It was not assumed that the utilisation of sewage by irrigation was possible in every place. It was, however, simply a matter of cost. The utilisation of sewage by agriculture was one of the most important actions which the political economist, as well as the sanitary officer, could promote. It was a large field for the investment of superabundant capital, which must bring a handsome return to the inhabitants of the land in which it was invested, even if the investor failed to get a large premium. If one-tenth part of the sum which had been lost in Turkish, Egyptian, Honduras, and other worthless securities had been invested in sewage utilisation, tens of thousands of acres of land which were now comparatively useless might be bringing in a yearly revenue of 5*l.* an acre to the present owners, whilst the produce raised upon it would assist to reduce the famine price of butchers' meat, and be a boon to the country. Experience had taught them that in dealing with sewage there were two other canon laws which were simple and absolute in their character, and which could not be departed from without danger. One had reference to the communication between the house and the main sewer. No matter how careful the architect or the sanitary engineer might have been in his plans, the drainage portion of the work was carried out by a class of workmen who habitually slurred over their work, and the common laws of hydraulics and pneumatics were studiously ignored. To obviate this danger, no sewer should have any direct communication between it and the interior of the house. No water-pipe conveying potable water for use into any house should ever come into direct contact with a sewer or house-drain in any part of its course, especially at the orifice of discharge. After speaking on the origin of diseases, Dr. Carpenter said that motion as opposed to stagnation, simplicity as opposed to complexity, should be their cardinal points; and if to this they added peremptory utilisation of animal *débris*, the sting of epidemic and infectious diseases would be taken away, and in the words of the Psalmist, "We need not be afraid of the pestilence which walketh in darkness, nor of the destruction which wasteth at noon-day." It was their duty to strive to reach this point of perfection. It could be obtained only by educating the people, as well as themselves, aright, and they must trust to Providence for their reward.

COMPLETION OF THE NEW METROPOLITAN POULTRY MARKET.

The Corporation are about to complete the new Metropolitan Poultry Market buildings, which were recently opened. When the market was inaugurated, an area at the south side, at the angle of Snow-hill and King-street, a portion of which is intended to form a part of the market, was left incomplete in consequence of the leases of upwards of forty houses, shops, and other premises not having been run out. The Corporation have now obtained possession of these premises, and the materials of the several buildings having been sold, they are now in course of demolition, and the whole of the site will be cleared within the next fortnight, when the works for the completion of the market will be at once commenced, and the south elevation, from Snow-hill to the east boundary of the Metropolitan Meat Market, near Charterhouse-square and Aldersgate-street, will be thrown open uniform with the elevation in Charterhouse-street, on the north side. In addition to the increased space which will be given to the market by the works about to be carried out, the approach to it on the south side will also be much improved by King-street being widened to almost double its present width from its junction with Snow-hill.

A Vexed Question not Settled.—At a meeting of the Manchester City Council, on the 2nd inst., the question of "Town-hall" or "City-hall," as the name of the new municipal buildings in Albert-square, came up for discussion on the following motion,—"That the name of the new municipal buildings in Albert-square be the 'City-hall.'" After debate a division was taken, when the numbers recorded were, for the motion, 28; against, 28. The mayor gave his casting-vote in favour of the motion. The "Town-hall" is a much better name.

NEW METROPOLITAN IMPROVEMENTS.

PROPOSED EXTENSION OF THE THAMES EMBANKMENT.

The Metropolitan Board of Works contemplate further improvements of an important and extensive character in different parts of the metropolis, and for the purpose of carrying out these works the Board have decided to introduce an Improvement Bill in the next session of Parliament. The improvements which the Works and General Purposes Committee recommend should be included in the Bill will involve an outlay of nearly 1,200,000*l.* Amongst the most prominent and expensive of the proposed improvements is a new street from Abingdon-street to Millbank Prison, together with a continuation of the Thames Embankment between those points, commencing at the boundary of the Embankment just completed on the south side of the Victoria Tower of the Houses of Parliament. The estimated cost of this improvement is set down at 333,000*l.* The contemplated improvements in Bermondsey are also on a large scale, the estimated cost being 438,000*l.*, of which sum it is proposed to spend 232,000*l.* on the widening of Tooley-street to Dockhead, to the extent of 50 ft., by taking down the north and south sides of Tooley-street, the south side of Fair-street, and the south side of Thornton-street. Another of the Bermondsey improvements is the widening of Bermondsey-street from Snow's-fields to Star-corner, at a cost of 148,000*l.* It is also proposed to expend 192,000*l.* in the widening of the thoroughfare near Camberwell-green, High-street, Camberwell, and High-street, Peckham. The other proposed improvements are the construction of a new road from St. George's Church, Borough, to Southwark Bridge-road, at a cost of 73,000*l.*; the widening of the approaches to Deptford Bridge, at a cost of 54,000*l.*; the widening of Mare-street, Hackney, 34,830*l.*; widening of the roadway at the corner of St. John-street-road, Goswell-road, and City-road, near the Angel Tavern, 16,400*l.*; widening of Kentish Town-road and Montevideo-place, 115,870*l.*; and widening of Union-road, Rotherhithe, 10,000*l.*

In addition to the above-named improvements, the engineer and architect are preparing plans and estimates of the cost of making a better means of communication between Tottenham Court-road and Charing-cross, the widening of Gray's Inn-road from Holborn to Liquorpond-street, and the widening of Little Gray's Inn-lane from Gray's Inn-road to Mount Pleasant. These plans and estimates are to be considered by the Board, and, if approved, are to be included in the Improvement Bill to be submitted to Parliament.

NEW BANK BUILDINGS IN WEST SMITHFIELD.

For some time past a large block of buildings has been in course of erection for Messrs. Lacy, Son, & Hartland, the old-established bankers, in Smithfield, and during the last few days they have been completed and opened for business. The new premises are situated at the north-east side of West Smithfield, the main elevation overlooking St. Bartholomew's Hospital. The new building, which stands out prominently amongst the surrounding premises, is about 55 ft. in height, and 30 ft. wide, and contains, in addition to a deep basement and a ground-floor, 16 ft. in height, three stories. The ground-floor portion of the structure is carried up in Portland stone, with a cornice in the same material, 3 ft. in depth, terminating at the foot of the first floor. There are bold piers at each angle, and also in the centre of the ground-floor elevation, with bases in polished granite, the piers being surmounted by carved and moulded capitals. The upper portion of the elevation is in red patent brick, with Portland stone dressings, window-heads, mullions, and sills. Each story contains a range of three large square windows, in two and three divisions, and the elevation is surmounted by a bold cornice in Portland stone, uniform in design and character with that above the ground-floor. There is a spacious porch-entrance to the bank at the north side of the elevation, and at the south side an archway leads to the rear of the building. The interior of the premises has been constructed so as to be thoroughly fire-proof, the whole of the floors of the several stories being of iron, with hard-wood facings. The ground portion of the building contains the banking-house, a spacious and lofty apartment, elegantly fitted up and decorated, with the manager's private office, and a wide circular staircase leads to the upper portions of the building, the first floor containing the general business offices, and the upper floors consisting of the managing partner's residence. The whole of the fire-proof fittings have been furnished by Messrs. Milner, the safe manufacturers, of Liverpool and London, this firm having also erected two large strong rooms in the basement. These strong rooms are each about 7 ft. in height, 7 ft. wide, and 8 ft. deep. They are built into the walls, lined with iron, and contain double iron doors several inches in thickness.

The architect of the building is Mr. Robert Walker, and the builders are Messrs. Sewell & Sons.

HEXHAM ABBEY.

The Cumberland and Westmoreland Antiquarian and Archæological Society lately visited Hexham Abbey, which was inspected under the guidance of the Rev. Canon Greenwell, Mr. W. H. D. Longstaffe, and others. Mr. Longstaffe read a paper on the fabric, in the course of which he said that the church was much more interesting before the work of restoring it began, and remarked that the "pitman's cottage style" of seating the church was much against the fine effect of the architecture. The history of Hexham Church dates as far back as 674, when it was built by St. Wilfrid. At this period it is said to have been the finest building on this side the Alps. After a period of four years, Hexham was raised to the dignity of an episcopal see, and in 860 it was united to the see of Lindisfarn. Mr. Longstaffe, in his paper, went as far back as the time of St. Augustine, and traced the history of Hexham Church down to the present time, besides giving a detailed history of Hexham itself. The present building is supposed to date from the time of the Priorate of St. Bernard, in the early part of the thirteenth century. The only portion which Mr. Longstaffe would undertake to say was of St. Wilfrid's building was the crypt. The south transept, in which there is the sanctuary chamber, reached by a broad flight of steps, he described as one of the fine-t works of the kind to be found anywhere. The north transept, although very good, had about its decoration a certain coarseness. The architecture at that portion was beginning to run into a very florid decorative style, and that of the north transept was of a tentative kind. With reference to the nave the tradition was that it was destroyed during an incursion of the Scots in 1296. That an incursion of the Scots took place, and that the church was burned, admitted of no doubt. The transepts showed considerable signs of fire, and it was probable that the marauders began their work of destruction with the nave. It might be concluded that the nave, which was the parish church, was very considerably injured in 1296, but he did not think that it was altogether destroyed then, because in 1310 we still hear of the parish church of Hexham and its chapels. Not far from where Mr. Longstaffe read his paper—on the north side of the choir—was the Freed stool or sanctuary chair. This stone seat was the "chair of peace," which, when reached by any flying fugitive, secured him most effectively against all comers. In describing the decorative work, which was completed in the new church from 1479 to 1499, Mr. Longstaffe observed that it might interest Carlisle friends to know that there was a peculiar kind of woodwork introduced—only to be found also, so far as he knew, at Carlisle, Jarrow, and Brancepeth at the present day.

Canon Greenwell subsequently read a paper descriptive of the various kinds of Saxon sculpture extant, a few specimens of which were found in the building. He traced the origin of what was called Saxon stone to Ireland, whence it spread to Scotland and Northumbria with the settlement of the early monks. It also found its way thereafter to Westmoreland, Durham, Yorkshire, and Derbyshire.

Derby Free Library and Museum.—At a meeting of the Derby Town Council on the 2nd inst., Mr. Hobson said the working plans and specification of the intended new building for the Free Library and Museum had been supplied by the architect, and it was proposed to insert advertisements for tenders for the work, and he hoped to come before the council in a month's time, and obtain their sanction to the building being proceeded with.

WORCESTER GUILDHALL.

At a meeting of the Worcester Town Council on the 1st inst., a report by Sir Gilbert Scott, dated the 29th ult., respecting the proposed alteration of the Guildhall, was read. Sir Gilbert says:—

"I have acted in communication with your surveyor, Mr. Rowe, and have taken his proposals—made some time since—as the basis on which I had, in a greater or less degree, to work. That plan appears to me, in the main, to embrace and to provide for the objects to be aimed at. The leading points on which I have in any degree differed from them are:—1. The more entire devotion of the wing buildings to public purposes than had perhaps been in the first instance intended; and 2ndly, a different provision for the magistrates' retiring room, and the room for the magistrates' clerk in connexion with the Magistrates' Court; which rooms I have placed on the site of the workshop now existing at the back of the left wing building.

As regards the actual appropriation of these wing buildings as to their internal rooms and arrangements, I have not, at this stage, ventured to make any proposals; as it must clearly depend on the demands of public convenience, which will require a good deal of consideration on your part, as being practically acquainted with the details of such requirements. I feel, however, convinced that, to whatever purposes they may be devoted, and however arranged, it is of importance to keep them in absolute connexion with the Guildhall, and to devote them henceforth to the purposes of public business. The mode of dealing with these wings from an architectural point of view seems to me to be open to two alternatives; either they may be taken mainly as they are, subject to improved architectural features, such as the dressing of the windows, &c., or they may be rebuilt on a greater scale of heights, in which case it would probably be thought desirable to reduce their width by a few feet for the sake of widening the entrance to the street on the left-hand side. I have given drawings for *both* of these alternatives: the first on the accompanying front elevation and perspective sketch; the second by fly-leaves attached to the first-named drawings.

The relative merits of these alternatives seem to me to be as follow:—The second brings the wings to more nearly the scale of the principal building, while the first, by leaving them on a smaller scale (especially of height), has, perhaps, the advantage of throwing up, and by contrast giving greater prominence to, the design of the central building. Besides this, there is a considerable saving in cost, and the preservation also of the interior of the existing wings, which is in a rather good style.

In dealing with the exterior of the first scheme for the wings, I have, as the windows, &c., are at present undoubtedly too plain, proposed to add to them stone dressings of a more ornamental character, though still in precise accordance with the general style and date of the entire structure; indeed, I have, in adding these details, followed some excellent old examples of a corresponding date.

In dealing with the *second* scheme I have not deviated much from the details just referred to, though they would be on a larger scale, and the front windows on each floor would be *three* instead of *four* in number.

The old iron railing in front of the building has been an excellent and characteristic example of the ironwork for which that period was famed, and though hopelessly decayed, I would recommend its reproduction.

In dealing with the interior of the main building, I follow pretty closely Mr. Rowe's proposals.

I have not gone afresh into the question of estimate, which, however, Mr. Rowe will no doubt be ready to do in the event of your either approving the scheme suggested, or suggesting improvements upon it. There are, no doubt, some points which would modify his former estimate, which will also be influenced by the rise in labour which has since taken place.

The Survey, Property, and Buildings Committee of the Town Council met on the 9th inst., when it was determined, well nigh unanimously, to recommend the least expensive of Sir Gilbert Scott's plans for adoption; and Mr. Rowe (the surveyor) was directed to prepare the necessary estimates in connexion therewith.

THE BISHOP OF DURHAM, AND DURHAM CATHEDRAL.

The Bishop of Durham, having been asked by the Dean and Chapter to preach on the occasion of the re-opening of the cathedral in October next, has declined to comply with the request. In a letter to the Dean he says:—

"It is with sincere regret that I am constrained to decline the request of yourself and the Chapter that I would preach on the 19th of October, on the occasion of the re-opening of our cathedral. But I cannot consistently take part in a service to inaugurate the completion of the recent alterations in the noble mother church of the diocese, when I have frequently expressed my regret that these alterations have been undertaken. I yield to no one in a sincere desire that our cathedral should be preserved in all its original, chaste, and simple beauty and grandeur, and should deem any reasonable sum of money well spent in effecting substantial repairs, or in rendering it more convenient for Divine Worship. But all this had been already accomplished at a considerable cost before the recent alterations were commenced. Nor should I have objected to the large expenditure on these alterations, if they had been undertaken by some private individual, or if the Chapter were obliged by their statutes to expend the money at their command exclusively on the cathedral. But the funds are church funds, placed at the disposal of an ecclesiastical corporation which is intimately connected by property and patronage with a considerable number of parishes in the diocese, in which the population has immensely increased during the last few years. With this increase of population there has been a proportionate need of an increased supply of churches and clergy, and the claims for aid on the funds of the Dean and Chapter have been, to my knowledge, many and urgent. Thus, to take but one instance, you look down from the cathedral

on the parish of St. Oswald, in the patronage of the Chapter, in which two new churches are urgently needed, one of which, at least, might have been built for the sum now expended on an Early English screen and Italian pavement hardly in harmony with the simple grandeur of the Norman edifice. Unhappily, the large expenditure on the alterations of the cathedral has seriously diminished the amount at the disposal of the Dean and Chapter for the spiritual good of the benefices in their patronage. And, if I am rightly informed, more than one member of the Chapter has objected to the recent lavish expenditure, on the ground that this outlay has compelled them materially to reduce the grants which would otherwise have been made with greater liberality towards churches and schools connected with benefices in the patronage of the Dean and Chapter. Whilst therefore, as visitor of the Cathedral, I shall be always ready to support any measures for its improvement which I can conscientiously approve, as Bishop of a diocese in which the population, and consequent spiritual wants, are increasing at a more rapid rate than in any other English diocese, I cannot give my countenance to an expenditure of church funds which, in my judgment, has been unwise and wasteful.

SURVEYORSHIP ITEMS.

Assistant County Surveyors' Salaries, Ireland. The Grand Jury empannelled at the Londonderry Assizes, having received an application from the assistant surveyors requesting a recommendation, by resolution or otherwise, of the application they are about to make to the Chief Secretary for Ireland to introduce a Bill to empower Grand Juries to increase their salaries and grant them superannuation allowances, it was resolved:—"That we recommend the application about to be made by the assistant county surveyors to the favourable consideration of the Chief Secretary for Ireland, and we request that he will take the necessary steps to introduce a Bill to empower Grand Juries to comply with their application."

Sevenoaks.—At a meeting of the Sevenoaks Local Board, on the 31st ult., a letter was read from Mr. Macdonald, the surveyor, announcing his resignation, which was accepted, subject to the usual three months' notice.

Wednesbury.—At the last meeting of the Wednesbury Local Board, a report was brought up, recommending that in the event of the surveyor consenting to give up private work, and to devote all his time to the Board, his salary should be increased to 300*l.* per annum. The motion was carried.

Carmarthen.—Mr. George A. Hutchins, C.E., has been appointed surveyor to the Corporation and Urban Sanitary Authority of Carmarthen, *vice* Bright, resigned.

Wigan.—Mr. John Law Hunter, engineer and surveyor for the borough of Wigan since 1850, died at his residence, Chorley, on the 9th inst. Mr. Hunter was associated with Mr. Rawlinson in the construction of the Wigan reservoirs and sewerage works. He was brought up as a pupil in the office of Mr. Stephenson, the railway contractor.

Bangor.—Mr. Thomas Lloyd Edwards has been presented with a silver cruet-stand and an address by the workmen in the employ of the Bangor Local Board, on his appointment as principal surveyor and engineer to the Aberdare Local Board and Urban Sanitary Authority.

Chester.—The salary of Mr. Isaac M. Jones, borough surveyor of Chester, has been advanced, by unanimous vote of the Town Council, to 200*l.* per annum.

Birmingham.—Mr. James Norrington has been appointed deputy-surveyor to the borough of Birmingham. There were over sixty candidates.

County Derry.—Mr. W. B. Fawcett, of Carlow, has been selected, out of twenty-seven applicants, as deputy-surveyor of the county of Derry.

"NEW CONCRETE BRICKS."

Sir,—It will interest some of your readers to know that Seleuitic Lime, besides its use for ordinary plastering, brickwork, and concrete, has been successfully employed in conjunction with Mr. Wood's patent slag sand for making bricks. Nearly a million of bricks have already been thus made.

The Manager of the Patent Selenitic Cement Company.

New Municipal Buildings at Dorchester. The lower story of the Corporation premises, Dorchester, has been remodelled by the borough surveyor, Mr. Norman. In accordance with his design two spacious rooms with large windows have been provided. One of these is for the accommodation of the borough magistrates, who have hitherto used the Council-chamber. The other is for the borough surveyor. The building work has been executed by Messrs. Davis & Son, Mr. B. Grassby having been entrusted with the carving.

AN ARCHITECT'S CLAIM FOR COMMISSION.

MERCER *v.* BANKS.

In this case, heard in the Bedford County Court on the 10th inst., before Mr. Edmond Beales, judge, and a jury, Mr. J. T. Mercer, architect and surveyor, of Bedford and Wellingborough, sought to recover upwards of 33*l.* of Mr. P. H. Banks, surgeon, Risely, as commission for surveying, preparation of plans, &c., for the enlargement of a house at Risely.

Plaintiff, being unlimited, according to his own statement, as to the amount, prepared plans and received tenders for the work; subsequently modified the plans, adopting a sketch of defendant's; and the tender of Mr. L. B. Moore, for 619*l.* 10s., was accepted. Mr. Banks, admiring the original plans, took them to show to his brother, who had means of comparing them with the other plans; but ultimately defendant preferred a plan of Mr. Rootham, carpenter, of Risely, who executed the work. Plaintiff sent in his claim for surveying, and commission on the first tender, but Mr. Banks not only refused to pay until he was compelled, but rejected an offer of arbitration, although paying 10*l.* 10s. into court in respect of the modified plans and surveying.

The rules of the Royal Institute of British Architects were put in and spoken to by Mr. J. Usher.

Defendant swore that he limited plaintiff as to amount, and claimed exemption as to the consequences of excess.

The jury found for plaintiff for the full amount claimed.

CLAIMS BY CONTRACTORS.

SHAW *v.* FILKINGTON.

This was an action, tried at the Liverpool Assizes on the 5th inst., in which the plaintiff, David Shaw, contractor, St. Helen's, sought to recover for work done, the defendants being a firm of glass manufacturers at the same place.

In March, 1875, the plaintiff contracted with the defendants to do some excavations at the defendants' works, and to construct an embankment for a railway siding leading to the London and North-Western Railway, and he alleged that after the work was begun the nature of the job was so altered by the defendants that he could not carry out the contract. He now claimed 176*l.* 3s. 10*d.* for the portion of the work he had executed. The defendants, on the other hand, asserted that the plaintiff had, without cause, refused to complete the works, in consequence of which they had to enter into a contract with another person at an increased price, and for the difference in price between the two contracts they made a counter claim upon the plaintiff.

The jury found for the defendants.

TAYLOR *v.* THE LONDON AND NORTH-WESTERN RAILWAY.

This action, also tried at the Liverpool Assizes on the same date, was brought to recover the sum of 46*l.* 2s. for unnecessary delay in the delivery of goods.

The plaintiff, Mr. Richard Taylor, contractor, of Rainhill, alleged that on the 14th of February he sent to the defendants at Rainhill, for conveyance to Ormskirk, some materials used in the sinking of wells and pits. Part of the goods were lost, and the remainder were not delivered until a week afterwards, when it was found that some of them were in a damaged state.

The defendants paid 8*l.* into court, and the jury gave a verdict for the plaintiff for 23*l.* in addition.

THE CORPORATION OF PRESTON AND THEIR WATER-WORKS CONTRACTORS.

ACTION AGAINST SURETIES.

After a discussion, in the course of which there was much difference of opinion amongst the members, the corporation of Preston have just decided to take legal proceedings against the sureties of a late contractor in respect of the execution of some new works in connexion with their water supply. The case is of a somewhat curious nature. It appears that about six years ago the corporation advertised for tenders for the construction of a new conduit, and received eight. There was a remarkable difference between the highest and the lowest,—the highest being 58,000*l.* and the lowest 29,000*l.*, which was sent in by Mr. Robert Carlisle, of Blackpool. This tender was ultimately accepted by the corporation, although it appears that the engineer gave it as his opinion that the work could not possibly be executed for the amount named, and that the contractor must have made a mistake in his calculations. Mr. Carlisle undertook to complete the work in two years, and three sureties became responsible for 10 per cent. on the amount of the contract. The work proceeded very unsatisfactorily, and, in June, 1871, the contract was determined, the corporation taking possession of all the contractor's tools and plant, which were valued at 1,600*l.*, and, as is stated, exonerating the sureties. In the meantime Mr. Carlisle died. The corporation again advertised for tenders, the lowest being 46,000*l.*, which was afterwards withdrawn, and the corporation then proceeded with the work with the assistance of their own engineer, under the powers of Mr. Carlisle's tender. The works were finished twelve months ago, and cost about 55,000*l.*, the deficiency between the amount of Mr. Carlisle's tender and the actual cost of the works being 26,000*l.* It is stated that the works could not have been completed for less than they have cost, and that the corporation, having got possession of the late contractor's plant without payment, have secured the works at less than their actual cost. In justification of the course which they are pursuing, however, they state that, although they are anxious to show every consideration to the sureties, to let them off *in toto* would be destructive of all value of suretyship in respect of contracts for such works. On the other hand, it is said that the sureties intend to dispute their liability on the ground that they were exonerated at the time when the contract was determined. The amount claimed is 3,600*l.*

MASTERS AND MEN.

London.—On Monday in last week a conference was held in Albion Hall, London-wall, City, for the purpose of discussing and arranging the plan of a national federation of the Builders' Labourers' Unions of the United Kingdom. Mr. P. Kenny, secretary of the London Amalgamated Union, took the chair. There were delegates present from unions in Manchester, Birmingham, Liverpool, Bristol, Portsmouth, Northampton, Worcester, Cambridge, Sheffield, and several London lodges. It was resolved "That in the opinion of this Conference, representing Builders' Labourers' Associations in London and the provinces, the time has arrived when a clear and comprehensive system of national federation should be established between all our associations in the United Kingdom." During the discussion it was stated that while men in Yorkshire got 5s. 3d. a day, Devonshire men received only 2s. 8d., which was due to want of organisation in the southern counties. The conference then went into details, the principle laid down being that the Federation should be on the basis of the Miners' Association, each district governing its own affairs. Resolutions were passed in favour of the Workmen's Compensation Bill and of the establishment of conciliation boards.——A meeting of delegates was held on the 9th inst., at Albion-hall, to agree upon the rules of the new Federation. The rules, which simply involved matters of detail, were agreed to. Then a deputation from the newly-formed executive committee waited upon Mr. Samuel Morley, M.P., in Wood-street. Mr. Kenny explained to Mr. Morley what the object of the conference had been, and said that while 300,000 men were employed in the building trade as labourers, not half that number, or anything like it, were members of any society. What they wanted to do was to cement a great union between the bricklayers' labourers in England, Ireland, and Scotland. Mr. Morley subscribed 10*l.* to the funds of the Federation, but counselled the men to act with prudence and moderation, and never to overstep the mark.

Amalgamated Society of Carpenters and Joiners.—On the 8th inst, the General Secretary of this Society (Mr. J. D. Prior) issued his quarterly returns. There has been an accession of nineteen new branches during the quarter, principally in the Northern and Midland counties. The total number of members is 15,705, of whom 733 have been admitted during the last quarter. The financial statement shows a balance of 60,791*l.*, being an improvement of nearly 500*l.* over the previous quarter, and nearly 4,000*l.* over the previous year. The number of members on the sick fund is 245, and on the unemployed benefit fund 91.

Glasgow.—According to allegations made at a meeting by the Glasgow operative joiners on the 29th ult., the number of men at work on the employers' terms is 350, instead of 893 as stated by the masters, and the number working at an advance, 1,738, instead of 757; while there are only 484, not 2,163, still on strike.——The master wrights of Glasgow have agreed to hold a conference with the operatives, to consider the present relations between the employers and employed; but they emphatically decline to meet in conference on the restrictive basis suggested by the workmen. It is questionable whether the joiners on strike will acquiesce in this proposal.

Bristol.—The master-builders of Bristol having refused to concede the demand of their labourers, a strike took place on Monday, the 7th inst.,

when 700 labourers ceased work. The strike temporarily stopped all building work within a radius of four miles from the centre of the city. Some of the employers who are not connected with the Masters' Association have since conceded the advance required, viz., ¾d. per hour, and others have offered ½d. per hour, which is said to have been very generally accepted.

Musselburgh.—The master joiners here have granted an advance on the wages of their *employés* of ½d. per hour.

THE ST. LUKE'S PAUPER INFIRMARY.

DISPUTE WITH CONTRACTORS.

At a recent meeting of the Holborn Union Board of Guardians, the principal question brought forward had reference to the course to be taken by the Board with reference to legal proceedings that had been instituted for the purpose of compelling payment of upwards of 3,000*l.*, which Messrs. Capon & Kennard allege remains due to them under the terms of their contract for the erection of the new Infirmary at St. Luke's Workhouse, and fronting to Shepherdess-walk.

The facts appear to be (according to a local paper) that, in the first instance, the guardians entered into a contract with Mr. John High, who undertook to execute the work for the sum of 16,380*l.*, and Messrs. Capon & Kennard became his sureties for the fulfilment of the agreement on his part. He failed, however, to accomplish his task, and found it necessary, whilst the works were in course of progress, to suspend business and call a meeting of his creditors, whereupon Messrs. Capon & Kennard entered into a fresh contract with the Union authorities to finish the job for 7,612*l.*, subject, as usual, to additions or deductions for extra or omitted work according to a schedule of prices. The building having been duly completed and handed over, the contractors aver that a balance of 3,000*l.* remains due to them, whilst, on the other hand, Mr. H. Saxon Snell, having measured up the whole of the work and calculated it according to the schedule, maintains they are only entitled to receive 1,743*l.*, and even this is subject to certain deductions amounting to about 600*l.* Messrs. Capon & Kennard, however, maintain that it was never intended that the schedule of prices should be applied to the main work, but only to extras and omissions, and they have appealed to the law in support of their claim to payment according to the terms of their contract. There are also other matters in dispute, the architect proposing that certain payments to tradesmen for heating apparatus, hydraulic lift, stoves and gas fittings, should be paid direct by the guardians, although they were included in the specification upon which the contract was based, and the Clerk, after submitting a statement of account prepared by Mr. Snell, said he was informed that Messrs. Capon & Kennard were now willing that this should be done. He (the Clerk) had been through the matter with Mr. Snell, and amongst the deductions which it was proposed to make was a sum of 665*l.*, being a penalty of 5*l.* per day for non-completion of the work within the time specified in the contract.

After much discussion, it was resolved that the architect and the solicitor be requested to meet the contractors and their legal adviser at a committee of the whole Board.

Wesleyan Chapel Building during the Past Year.—At the Wesleyan Conference just held at Nottingham, the committee on Chapel business held a meeting, and reported that, during the year, chapels, schools, ministers' houses, or other residences, to the number of 271, had been completed, at a total cost of 345,595*l.*, being an increase on the previous year of 52,000*l.* Besides the above, 393 erections and enlargements had been sanctioned by the committee during the year, and were in progress towards completion at a cost of 353,112*l.* The entire outlay in new erections, and in reduction of debt for 1876, amounted to 387,179*l.* Of the proposed new chapels, 51, to accommodate 13,288 hearers, are to be erected in places where there were previously no Wesleyan Methodist chapels, and 84, estimated to provide accommodation for 25,422, are to supersede former buildings, which, according to returns, provided 14,011 sittings. The total additional accommodation to be provided in the proposed new chapels is, therefore, 24,309. The chapel enlargements will give 1,901 more, making the total accommodation proposed, 26,210 sittings.

NEWCASTLE-ON-TYNE PERMANENT CIRCUS.

Plans have been passed by the Newcastle Corporation, and a limited liability company is being formed for the building of a handsome and commodious erection, mainly designed for the housing of the various circus companies visiting the town. The site, which gives a superficial area of over 1,600 square yards, is situated towards the northern end of the town. The building will be Classical in style. Its main front will look out upon the Haymarket, at the top of Percy-street, where the temporary buildings for circus troupes visiting the town have been erected for many years past. The front elevation will be built of stone, and the side elevations of brick, with stone facings. Internally, the building will be constructed to accommodate upwards of 3,000 people, and the fittings will be so arranged as to render it suitable for entertainments of various kinds when not wanted as a circus.

THE "MODEL HOUSES ASSOCIATION."

Sir,—I have noticed your remarks upon the "Model Houses Association," in last week's *Builder*, which cannot be considered encouraging to a body of gentlemen who, desirous of doing good to their fellow-creatures by mitigating, in however small a degree, a terrible evil, work courageously without fee or reward, and at a sacrifice of time and money, to attain an object which you yourself, sir, have been so long advocating. I cannot but regret that you should not have thought proper to have made some inquiries, which would have been willingly answered, before you made a statement which cannot but damage an Association which, though it may not have either done much work, and that, for various reasons, not superlatively well, is still capable of accomplishing incalculable benefit to a very large community. I can scarcely admit that any of your strictures are deserved.

Had you read the report, you might have there seen that the expenses had been most materially reduced, and that the reins of government have been placed in abler hands. Indeed, it was only on mature consideration, and deliberation with several noblemen and gentlemen in high positions, who were made acquainted with all the details of the past management, and, after many meetings had been held, that we agreed to hold the public meeting to which your article refers. With regard to the "incommensurate trumpet-blowing," I fail to see how this has taken place. If acknowledging subscriptions in the *Times*, and the publishing of paragraphs announcing the fact of Royal and influential adhesion to a noble and humane cause, *published at the discretion of the Press*, are to be designated by such terms, the sooner we, who desire to do some little good in our spare time, retire from our position as members of the Council of the Model Houses Association, the better. In conclusion, I cannot but say that the attack upon us is unwarranted and unmerited, and it was with pain that I read the paragraph in the columns of the *Builder*, which has done so much towards improving the dwellings of the poor, and which will, I trust, be followed up in the future by our Association, in a way worthy of the numerous and eminent noblemen and gentlemen who have voluntarily ranked themselves amongst its supporters.

THOMAS DYER.

*** We hope so too, and the Association will then have our support. To those who can "read between the lines," Sir Thomas Dyer's letter itself will serve to show the justice of the comments objected to.

AS TO THE INDIAN AND COLONIAL MUSEUM.

Sir,—I not only believe with you, adversely to the idea of the working classes not being likely to go to South Kensington as readily as to the Thames Embankment, if an Indian and Colonial Institute were to be established at Kensington; but I believe that the general public, as well as those few working men who prefer self-culture to public-houses, would resort to such an institution if established in the present Exhibition building. In this respect I regret being at variance with Dr. Forbes Watson, from whom I have received obliging courtesy.

In connexion with this subject, I beg to call to your notice a remarkable and astounding article in the *Pall Mall Gazette* of the 4th inst., suggesting that the twenty-three acres of public land, known as the Horticultural Gardens, should be sold for building purposes, because there is no call for a public garden at South Kensington. Now this land is, as you know, entirely enclosed by the Exhibition building, having contiguously the Albert Hall to the north, with access to it; the new Natural History Museum to the south; and Kensington Museum and Schools of Art to the east.

I believe that the Exhibition building could not be more beneficially adapted for national purposes than by being used as schools and museums in the cultivation of science and natural history; in other words, as a Scientific and Natural History Institute, as well as for an Indian and Colonial Institute, and in connexion with those twenty-three acres of garden land, as horticultural, botanical, and zoological gardens.

JAMES STRIDE.

PLATE CLOSETS.

Sir,—For the information of your correspondent, "Eboracum," I may say that fireclay slabs (or shelves) are made in this district (Buckley, near Chester) as stock size, 36 in. by 12 in. by 3 in., and they might be made of the same breadth and thickness up to 4 ft. long.

JOHN M. GIBSON.

MONUMENTAL.

Lord Rich.—It is proposed to restore the mortuary chapel and tomb of Lord Rich, the founder of the Felstead Grammar School. The Rev. J. C. Cox, the vicar of Felstead, and the Rev. Delaval Shafto Ingram, master of Felstead School, have undertaken the superintendence of the work, for which 2,000*l.* have been collected. It is proposed to carry out the plans of Mr. Woodyer, the architect, by the complete restoration of the founder's chapel, which is attached to the church, and which, with the tomb itself, is in a very deplorable condition. The estimate for this part of the work is 500*l.*

Cullen (N.B.).—A monument has been erected in the Cullen Cemetery to the late Provost Smith. It consists of an obelisk standing 14 ft. high on a square pedestal, the whole formed of grey granite, polished throughout, with chiselled margins. The monument was furnished by Mr. Petrie, of the Aberdeen Bon-Accord Granite Works.

Traquair.—Mr. Steell, the sculptor, has lately been engaged on an alto-relievo, to be erected in Traquair parish Church, as a memorial to Miss Tennant, a daughter of Mr. Tennant, of the Glen.

Great Baddow.—A monument has recently been erected in the churchyard of this parish in memory of the late Mr. T. W. Greene, Q.C., of Baddow Hall, and of his eldest son. The monument consists of a base of stone, from which rise three blocks of the same material; from the topmost springs a massive stone cross, about 6 ft. in height, bearing the monogram, "I.H.S." The work has been executed by Mr. Wray, of Springfield.

Stratford-on-Avon.—The monument erected by Mr. R. N. Philips, M.P. for Bury, to the memory of his late brother, Mr. Mark Philips, who for many years represented Manchester in Parliament, has been completed. The structure is 12½ ft. high, and stands on a hill adjacent to Welcombe House, near Stratford-on-Avon, the residence of Mr. Robert Philips. Its erection has occupied more than twelve months, and its estimated cost is 5,000*l.*

Forgue.—There has recently been erected in the churchyard of the parish of Forgue a memorial of the late Mr. Alexander Morison, of Bognie and Mountblairy. Roughly speaking, the monument consists of three parts:—First, the base; next, the shaft or column of polished granite; and third, an ornamental cross surmounting all. The monument is of Aberdeen granite from base to summit, and is about 20 ft. in height. The first part of the base is a square block of roughly-hewn stone, and over it a narrower square of dressed granite, sloping upwards to a square block with polished granite pillars at the four corners, each side of the square containing a polished panel. The execution of the work was entrusted to Messrs. Macdonald, Field, & Co., Aberdeen.

HOSPITALS.

Lincoln.—On the 27th ult. the foundation-stone of the new County Hospital at Lincoln was laid by Earl Brownlow, the lord-lieutenant of the county. On the occasion of the centenary of the old hospital, celebrated in 1869, the inadequacy of the building for the growing wants of the district formed a prominent subject of discussion, and the question of erecting a new hospital was freely spoken of, a sum of 2,000*l.* being set apart at this time (out of 3,000*l.* collected) as a nucleus fund towards the cost of another hospital. In 1874 a committee was formed to carry out the new scheme, and promises of support came in readily to the amount of 23,000*l.*, this being only a few hundred pounds short of the contractor's estimate. A suitable site was procured for the new building in a field close to Cottam's walk, above the Arboretum, and plans for the building were prepared by Mr. H. Graham, of London, the contractors being Messrs. Barnes & Wright, Lincoln. The new hospital will be about double the capacity of the present (being furnished with about 130 beds), and will stand facing due south. It will consist of one centre block and two wings, provision being made for the addition of two other wings to the north, should such be found necessary. The kitchen department will be on the basement story, the ground-floor being elevated about 6 ft. above the level. The hospital, which will take two years to complete, will be built of Lincoln bricks, faced with Ancaster stone dressings. The amount at which the contract has been taken is 23,205*l.*

London.—The foundation-stone of a new wing to the Royal Hospital for Diseases of the Chest, City-road, was laid on the 19th ult. by the Princess Louise. Accommodation will be provided for fifty additional in-patients in the proposed new buildings. The new wing will be a part of the greater scheme for the new hospital, and when completed will not have to be interfered with whenever the other part of the scheme is carried out. The cost, including land, will be 15,000*l.* Mr. John O. Abbott is the architect.

Birmingham.—New infectious wards are in course of erection by way of enlargement of the Children's Hospital, Broad-street, Birmingham. The buildings will consist of two detached fever wards, to contain ten cots each, one diphtheritic croup ward, with four cots, and a quarantine or reception ward, with four cots. These wards will all be detached, with sufficient space round each for the proper circulation of air. The wards will be connected with the present hospital by a long passage. At the front will be erected a dining-room, 16 ft. by 12 ft., on the left-hand side, and a nurses' house, of nearly the same capacities, on the right. Leading from this building to the wards will be a covered way, open at the sides. At one end of the way is the quarantine ward, and at the other the croup ward. Crossing the way from the entrance is a spacious garden, on each side of which is a scarlet-fever ward, 40 ft. by 20 ft. each, both furnished with a bath-room, lavatory, &c. At one corner of the ground is the mortuary, and at the other the laundry for infected linen, wash-house, store-room, &c. The plans have been prepared by Messrs. Martin & Chamberlain. Messrs. C. Jones & Sons are the contractors. The cost will be about 9,000*l.*——In connexion with the new Homœopathic Hospital in Easy-row, the out-patients' department, with rooms above, comprising, on the ground floor, a large waiting-hall, with entrance from the street, were opened some time ago. The hall is 24 ft. by 37 ft., and 17 ft. in height, divided in the centre by an arcade of stone columns, with carved capitals and moulded bases. Leading from the waiting-hall are two consultation-rooms and other offices. This department is complete in itself, and not in any way connected with the hospital. The first floor contains a large ward, with its accompanying day-room for women, besides bath-room, service-room, and other offices. The ward is 14 ft. high, and is lighted on two sides, there being an oriel window in the principal elevation to the street. The day-room is similar in character, though of less dimensions. The second floor comprises a large room to be used as a children's ward, and also the laundry. The style is Gothic, and the material red brick and Ancaster stone. The entire works (which form but a portion of the complete design) have been executed by Mr. B. W. Smith; the ventilation by Messrs. Hill & Hey, of Halifax; and the warming, with the water service and the laundry works, by Mr. Parkes; the whole being under the supervision of the architect, Mr. Yeovill Thomason, of Bennett's Hill.

SCHOOL BOARD SCHOOLS.

Cowpen.—New Board Schools at Cowpen Quay, Blyth, were formally opened on the 24th ult. They are the first completed of the schools in course of erection by the Board, under the superintendence of their architect, Mr. Thomas Oliver, of Newcastle. The buildings consist of a large mixed schoolroom, with four class-rooms, an infants' school with two class-rooms, together with hat and cap rooms, and lavatories for the boys, girls, and infants, and private rooms for the teachers, with separate conveniences. A house for the caretaker is also provided. The buildings are carried out in red pressed brick, with stone dressings. A lofty brick and stone bell-turret rises from a central position. The school furniture is from Messrs. Colman & Glendenning, Norwich. The stoves are Galton's. The schools accommodate about 520 children, and, together with the caretaker's house, &c., have cost about 5,200*l.* The contractors were—Messrs. White & Sproat, for the carpenter and joiners' work; Messrs. R. B. Charlton & Co., for the plumbing; Mr. Montgomery, for the plastering; Mr. R. Walker, for the painting and glazing; Messrs. Walker & Emly, for the ironfounders' work; and Messrs. Dawber & Son, for the slating. Mr. Wm. Winship acted as clerk of the works.

Glanton.—New schools were opened by the Glanton and Shawdon School Board at Glanton, on the 24th ult. The new school-houses are situated a short distance to the west of the village, on the road leading to Eslington Park, and occupy an elevated and most picturesque situation. A dwelling-house for the master is attached to the school, the whole being surrounded with garden and playgrounds for the scholars. The architect to the Board is Mr. F. R. Wilson, Alnwick, and the contract for the masons' work was let to Mr. Sample, South Charlton; the joiners' work, Messrs. Dryden & Son, Glanton; the slating, plastering, &c., Mr. Fortune, North Sunderland; and the glazing, painting, and plumbing work, Mr. Mackintosh, Glanton.

Cannock.—At a meeting of the Cannock School Board on the 26th ult., Mr. Scrivener, of Hanley, the architect of the proposed Walsall-road Board Schools, attended with amended plans of the schools. In these plans the tower and Board offices in the original plans were cut out, and teachers' houses built up to the schools, which are to accommodate 450 children. The estimated cost is 4,359*l.*, being about 2,000*l.* less than the original plans. After some discussion, the plans, with slight alterations, were agreed to.

Potton.—New Board schools have been opened at Potton, Bedfordshire. They have been erected by Messrs. Langmead & Way, from plans by Mr. G. J. Raynes, architect, London, the amount of contract being 3,535*l.*

Hailsham.—At a meeting of the Hailsham School Board, on the 25th ult., the only business was the consideration of the reduced tender, for the school building, of Mr. Perigo, of Tunbridge Wells, and this, amounting to 2,700*l.* was accepted, subject to the approval of the Education Department. The following firms tendered:—

Orley	£3,370 10 0
Peerless	3,370 0 0
Stonestreet	3,459 0 0
Longley	3,292 0 0
Perigo	3,150 0 0

Covington.—On the 26th ult. the new Board school at Covington was opened. The school was designed by Mr. W. Lewis Baker, architect, of London; and built by Messrs. Smith & Adams, of Raunds.

Edinburgh.—At a recent meeting of the Edinburgh School Board, a report on the plans of a proposed new school for the Canongate district led to a discussion on the general question of the expenditure in connexion with the building of schools; and a remit was made to a committee to inquire, among other things, how the Glasgow Board could erect schools at a cost of 12*l.* 10*s.* per scholar, while in Edinburgh the average cost was 18*l.* 10*s.* It was agreed to ask sanction for two loans of 20,000*l.* and 15,000*l.* each for the completion of the schools which are in progress, and for the erection of others contemplated.

Roade.—New Board schools at Roade, Northants, were opened on the 3rd inst. The building, which is situated at the top of the main street, is of simple Gothic character. At the north end is the master's house, with parlour, sitting-room, kitchen, and scullery on the ground floor, and three bedrooms above. The rest of the building is divided into the schools for boys and girls mixed, and infants, of which the boys' entrance lies near the centre. Each school is finished with a gable, the main gable, which forms the centre of the building, being ornamented by a bell-turret. Over the infants' porch, which is on the south-west corner of the building, there is a low tower. Mr. T. H. Vernon, London, is the architect, and Mr. Goode, Roade, the builder. The schools will accommodate in all 140 scholars.

DISSENTING CHURCH-BUILDING NEWS.

Conisborough.—Memorial stones of a new Wesleyan chapel and schools have been laid at Conisborough. The new chapel is being built of pressed brick, with stone dressings, and is to accommodate 530 persons. The schoolroom will give accommodation for 350 children. The total cost will be about 3,500*l.*

Canterbury.—The foundation-stone of a new Congregational church in Guildhall-street, Canterbury, was laid on the 10th ult. by Mr. Samuel Morley, M.P. The building is to be erected, from designs prepared by Mr. J. G. Hall, of Canterbury, by Mr. Naylar, of Rochester, whose estimate of 3,836*l.* was accepted. The total cost, including land, is 5,250*l.*

Mold.—The memorial stones of the new chapel for the Welsh Baptist congregation at Mold were laid on the 17th ult. The plans are issued from the office of Mr. J. Humphreys Jones, of Mold.

Shieldaig.—The foundation-stone of a new Free Church and manse at Shieldaig was laid on the 25th ult. Mr. Joass, of Dingwall, is the architect, and Mr. W. Sutherland, of Loch-carron, is the contractor. The total cost will be 3,000*l.*

Reading.—In consequence of the great increase in the numbers attending the services of the Augustine Congregational Chapel, held in the school-room in Friar-street, Reading, it has been resolved to proceed at once with the erection of a church on the site in front, and the committee have accepted the designs prepared by Messrs. Wm. & J. T. Brown and F. W. Albury. The contract has been taken by Mr. Elliott, of Newbury, and the cost will be about 3,000*l.* The style adopted is Early English, the material being red brick, relieved with Bath stone. There will be a gallery across the north end; the roof will be partly open-timbered, of pitch-pine. Accommodation will be provided for about 700 persons.

Little Thurrock (Essex).—On the 19th ult. the Wesleyan Chapel, lately erected by Messrs. Paton & Sullings in this village, was opened. The building is capable of seating 400 persons. The cost has been 450*l.*

Wark.—On the 19th ult. the new Presbyterian Church and manse at Wark, North Tyne, the gift of Mr. George B. Bruce, London, were opened. The church has been built from the designs of Mr. W. L. Newcombe, Newcastle, and the style is Gothic of the lancet period. The site for both structures was given by Mr. H. Taylor, Chipchase Castle.

Northenden.—Memorial stones of a new Wesleyan Chapel for Northenden have been laid. The building, which is to supersede the old structure, will be built of brick, with stone facings; will have a vestry, class-room, and school-room; and will seat about 400. The estimated cost of the entire work is 1,800*l.* Mr. H. F. Slater, of Manchester, is the architect; and Messrs. Foreman & Todd, Manchester, the builders.

Stoke-upon-Trent.—The memorial stone of an enlargement of the Congregational Chapel at Stoke-upon-Trent has been laid. The new buildings will consist of four class-rooms for senior scholars, and a lecture-room for week-evening services. A choir and organ gallery are to be added to the chapel, and some minor structural improvements will be made. Mr. Nathan Barlow, of Stoke, has taken the contract at 647*l.*, and Mr. Sugden, of Leek, is the architect.

Eastbury.—A new Wesleyan Chapel at Eastbury has been opened. The building is of red brick, with white brick quoins, and covered with slate; the porch is of pitch pine, varnished. The interior is fitted up with open pews of pitch pine, and has a rostrum, Communion-rails, and a small vestry. The roof is open, close-boarded, stained and varnished. The old chapel has been repaired, and furnished for use as a day and Sunday school. The whole of the work has been carried out under the direction of Mr. E. Bew. The total cost has been 350*l.*

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Dungannon. — The new Roman Catholic Church of St. Patrick, Dungannon, has been solemnly dedicated. The building, which accommodates 4,000 persons, is French Gothic of the thirteenth century in style, and measures 126 ft. long by 65 ft. wide, and is composed of nave and aisles. It is divided by lofty cut-stone arcades, supported by massive columns and carved capitals. The stone used is from the neighbouring quarries. The building was commenced by the Very Rev. Dr. Slaine, in 1868, from drawings prepared by Mr. J. J. M'Carthy, architect, Dublin, under whose superintendence the work has been carried out by Messrs. Thomas Byrne & Sons, Belfast.

London.—The Church of the English Martyrs, situate in Great Prescott-street, Tower-hill, has been opened. The building is designed in the Early Decorated style, and consists of a chancel, nave, aisles, transept, triforium, and galleries, the latter of which are reached by a staircase. The total length of the church is 104 ft. by 60 ft. wide. It is built of brick, with Bath stone dressings, the interior pillars being of Bessbrook granite. It will accommodate 1,200 persons, and cost about 12,000*l.* to build, the whole of which sum is not yet raised. The design was by the late E. Welby Pugin, and has been carried out by his brothers, Messrs. C. W. & P. Pugin, the contractor being Mr. Lascelles, of Bunhill-row. At present the high-altar is not completed.

West Grinstead.—The new Roman Catholic Church of Our Lady of Consolation, at West Grinstead, has been consecrated. The church possesses a painting by Coxoyen, a pupil of Raffaelle, a chalice of the fourteenth century, and two of the sixteenth century. The present edifice, though far from complete according to the original designs, is of the thirteenth-century style, and it is intended to build the chancel and elevate the roofs of the aisles when the funds will suffice. The church was formally opened by Dr. Danell, the R.C. bishop of Southwark.

Ilkeston.—The Roman Catholic Chapel in Regent-street, Ilkeston, having become too small for the accommodation of the congregation worshipping there, it was decided a year or two ago to make a considerable enlargement of the building, and the work was entrusted to Mr. William Warner, builder, of Ilkeston, under whose superintendence it has been completed, at a cost of about 500*l.* The chapel has been brought out several yards at the east end. A schoolroom has also been erected in close proximity to the chapel, which will obviate the necessity of using the latter as a week-day school, as was formerly the case.

Market Harborough.—A new Roman Catholic church is in course of erection at Market Harborough, from plans by Mr. C. G. Wray, architect. Mr. Cave is the builder, the amount of his contract being 4,900*l.*

SCHOOL-BUILDING NEWS.

Castle Cary.—New voluntary schools for Ansford and Castle Cary have been opened. They are erected on land in South Cary, given by Sir Henry Hoare, bart., and adjoin the old schools built in 1840, and which are now to be set apart solely for infants. The new building is of local stone. The cost is about 1,300*l.* Mr. H. Hall was the architect, and Mr. Francis the builder.

Parkmill Gower. — On the 24th ult. new schools, erected at a cost of upwards of 2,500*l.* by Mr. T. Penrice, of Kilvrough, Gower, were formally opened.

Folkestone.—The foundation-stone of a new Congregational Sunday School in Tontine-street, Folkestone, was laid on the 19th ult. Mr. Gardner is the architect.

Gray's Inn-road (London).—On the 10th ult. the foundation-stone of new schools in connexion with Trinity Church, Gray's Inn-road, was laid by Lord John Manners. The new schools are being constructed by Messrs. Langmead & Way, according to the designs of the architect, Mr. Charles H. Cooke, to accommodate 600 pupils. The cost will amount to 3,000*l.*

Wistow.—On the 2nd inst. the foundation-stone of a new parochial school at Wistow, near Selby, was laid. The school is being built from plans furnished by Mr. E. Taylor, architect, York, and will cost 1,000*l.* The contractors are Messrs. J. & G. Woodall, bricklayers, and Messrs. W. & H. Jackson, joiners, Wistow.

Bridport.—New National schools were opened at Bridport on the 20th ult. Their construction was commenced about fifteen months ago, a design of Mr. R. Cornick, architect, having been adopted. The foundations are of concrete, with Bothenhampton stone plinths. The walls are composed of stone from Loders. Mr. H. Gerrard was the general contractor. The painting, staining, and glazing have been done by Mr. Slader, the ironwork was entrusted to Mr. A. Samson, the gas and water fittings to Mr. Lowe, and the Ham-hill stone was supplied by Mr. C. Trask. The works have been carried out under the superintendence of Mr. W. Adams. The cost has been 2,000*l.*

Greetland.—On the 22nd ult. the memorial-stone of a new Wesleyan school at Greetland was laid by Mrs. Stott. The architect is Mr. Ely Furness, of Greetland, and the contractors for the mason work are Messrs. Drinkwater, Taylor, & Co., Greetland; joiners' work, Mr. Ely Furness, Greetland; plumbers' work, Mr. J. Stafford, Sowerby Bridge; and for the slaters' and plasterers' work, Mr. John Firth, Halifax.

York.—The opening of the York Certified Industrial Boys' School took place on the 18th ult. The new buildings have been erected at a cost of 3,000*l.* The architect is Mr. Wm. Atkinson, Micklegate, York, and the contractor is Mr. Dennison, Marygate.

Sutton Valence.—The tercentenary of the Sutton Valence Grammar School was celebrated on the 27th ult., part of the proceedings consisting in the laying of the foundation-stone of a new wing, which ceremony was performed by Mr. James Wyld, Master of the Worshipful Company of Clothworkers. The school was founded in 1576 by William Lambe, citizen and clothworker, who was a native of Sutton Valence, and at his death the Clothworkers' Company became the governors of the school. The architect of the new wing (which will cost between 5,000*l.* and 6,000*l.*) is Mr. Frederick William Porter.

NEW PUBLIC BATHS.

Canterbury.—The Canterbury Swimming Bath Company opened their large bath on the 3rd inst. The bath is situate on the Whitehall-road, and is one of the largest, if not the largest, in England. The sides, bottom, ends, and paths are constructed of Portland cement concrete brought to a plain surface. The bottom is formed of an inverted arch. The total length is 357 ft. by 133 ft., with depths varying from 7 ft. to 6 ft. 6 in., and from 6 ft. 6 in. there is a gradual rise up to 2 ft. 3 in. The cross section varies from 7 ft. to 5 ft. The paths all round are 10 ft. in width, with sufficient dressing-boxes at the sides as well as seats at the junction of the embankment. The bath is screened from view by turfed embankments, thrown up on all sides, 9 ft. in height, which will be planted hereafter with dwarf shrubs. The bath has been constructed from the drawings and under the superintendence of Mr. J. G. Hall, architect, of Canterbury, by Mr. John G. Gaskin, builder, of the same place. Mr. Gaskin's tender was 1,795*l.* 10s., and the cost of the land was 375*l.*

Rugby.—New swimming-baths have just been added to Rugby School, at a cost of between two and three thousand pounds. They are the gift of Dr. Jex-Blake, the head master.

STAINED GLASS.

Winchester.—Three new stained-glass windows, forming part of the historical decorations of the County Buildings at Winchester, have just been completed and fixed in the recently-restored Shire Hall, by Messrs. Hardman, of Birmingham. These three windows, together with two already completed and three in progress, are to be arranged chronologically, commencing with the one on the west end of the south aisle and running round to the opposite angle. Those already completed are the first and fourth, and include in their painted panes a series of British and Saxon worthies from Arthur to the sainted Edward, enshrined at Westminster, and all of whom, inclusive of St. Swithin and the Great Alfred, are with our annals "indissolubly knit." The fourth window contains the "arms" of kings, prelates, and nobles, who wielded the sceptre, the crozier, and the sword (the pen was not strong then), from 1216 to 1322. Each window contains the name, title, and blazon of twelve Hampshire and Winchester "worthies," who are thus made instructively as well as ornamentally memorable. The three windows just completed have a selection of notabilities ranging from the period just before the Norman Conquest down to that of the conqueror of the French on St. Crispin's day, 1415, and have been produced under the direction of Mr. Melville Portal.

Ryhope.—The large west window of Ryhope parish church has been filled with stained glass, to the memory of the late Mr. William Nicholson Taylor. The window consists of four divisions, each about 15 ft. high. In the upper part of each light are figures of Abraham, Moses, Elijah, and Melchisedec, and these are placed under very elaborate canopies, chiefly composed of white and yellow glass, and underneath the pedestal, carrying each figure, are subjects from their lives, those selected being "The Sacrifice of Isaac," "Moses striking the Rock," "Melchisedec blessing Abraham," and "The Translation of Elijah." The detail surrounding those subjects is also composed of canopy work. In the tracery, angels with texts and ornaments, fill each light. The work was designed and carried out by Mr. Baguley, of Newcastle.

Southampton.—A memorial window is being prepared for erection in the parish church of St. Mary, Southampton, in honour of the late Right Rev. Samuel Wilberforce, D.D., Bishop of Winchester, the contributions coming mainly from persons who had been confirmed by him. Mr. Basil Wilberforce, the late bishop's son, is the present rector of the parish.

Birmingham.—The painted east window in St. Paul's Church, Birmingham, has been restored to its original state. The work has been attended with much anxiety to those who have undertaken it, lest in removing the varnish and encrusted dirt which covered the panes the colours should be dimmed or injured by the preparations used in its cleansing. The first step taken was to remove the originally transparent glass window, which by exposure and the acids used in the works in the surrounding neighbourhood had become brown and almost opaque. The varnish being partially dissolved, it was taken off without injury to the colours, which seem to be burnt in. The window was designed by Benjamin West, and executed by Francis Eggington 1789-90. The north compartment represents Saul, full of zeal under the Roman standard, "hailing men and women." The centre and large compartment represents the scene of St. Paul's conversion. The south compartment contains a figure of Ananias, an aged man, with one hand on St. Paul's eyes, the other pointing upward and delivering his message. The work of renovation was entrusted to Mr. James Lakin.

Frome.—The new east window at Trinity Church, Frome, in memory of the late Rev. Alfred Daniel, designed and painted by Messrs. Horwood Brothers, has been completed. The window has three lancet lights, the central one being considerably longer than the others. In the upper medallion is portrayed the Ascension. Underneath it is a quatrefoil, in which are three angels. Under this is the principal figure, "The Good Shepherd"; and at the foot are interlaced triangles. The left side-light has three medallions—that at the top being the call of St. Matthew; at the foot, St. Mark writing his Gospel from the dictation of St. Peter; and the centre comprising two large figures, viz., the Evangelists St. Matthew and St. Mark. The right side-light has also three medallions, the upper one being St. Paul in prison visited by St. Luke: that in the centre having two large figures of the Evangelists St. Luke and St. John; and the medallion at the foot depicting the Call of St. John. The ornamental ground-work of the lights is in the Early English style, and each light is surrounded by a border.

Newcastle.—Some time since it was decided by the parishioners of St. Nicholas to place a stained-glass window in the parish church, in testimony of the esteem in which the late vicar of Newcastle, Mr. Moody, was held. Several firms of glass-painters were invited to send in designs, and we understand that the drawing submitted by Messrs. Powell, Brothers, of Leeds, has been finally selected, and they have been commissioned to carry out the work.

Portbury.—The south chancel of Portbury Church has recently been filled with stained glass, designed and executed by Messrs. Bell & Son, of College-green, Bristol. There are three lights in the window: in the centre is a figure of Our Lord, and on either side figures of Moses and

Elias, all under rich canopy work. In the tracery in the principal opening is an angel with a scroll; and in that of the smaller ones, foliated patterns with the sacred monograms in the centre. The window has been erected in memory of Mr. Abraham Parnell and his wife.

Miscellanea.

Enclosures.—The result of the thirty years' work of the Enclosure Commissioners to the close of the year 1875 is stated succinctly in a Parliamentary paper recently issued. The quantity of land enclosed in England and Wales under the sanction of the Commissioners is 590,000 acres, comprising 176,000 acres of commonable lands not subject to public allotments, and 414,000 acres wastes of manors subject to such allotments. The saleable value of these wastes in their natural state is estimated at 6,140,000*l.*, taking the 214,000 acres in high country at 10*l.* per acre, and the 200,000 acres in low country at 20*l.* an acre. The whole 590,000 acres enclosed have been dealt with as follows:—526,890 acres have been divided among 21,810 common-right owners, averaging 24 acres to each; 27,600 acres, 1-15th of the wastes, have been divided among 620 lords of manors, averaging 44 acres to each; and 35,450 acres have been sold to 3,500 purchasers, averaging 10 acres to each. Thus 25,930 separate estates have been created There have been also 14,107 acres, all out of the best land, and worth 20*l.* an acre, set out for various public purposes—namely, 1,758 acres for exercise and recreation, 2,195 acres for field gardens, 1,168 acres for fuel, 622 acres for schools and churches, 106 acres for burial grounds, 7,350 acres for public roads, 2,000 miles in extent, and 908 acres for public quarries and gravel-pits and miscellaneous purposes. But the agricultural area of the country has, in the thirty years, been abridged to a greater extent than the addition made to it by these enclosures, owing to the increased acreage occupied by towns and railways.

New Ironmaking Process.—The members of the Manchester Scientific and Mechanical Society recently paid a visit to the Standard Iron and Steel Works Company (formerly Bolckow, Vaughan, & Co.), Gorton, to inspect a new process for making iron and steel, patented by Mr. Samuel R. Smyth. About six or seven tons of common scrap iron were melted in an ordinary cupola, and run into a Bessemer converter, the current of air from the blowing engines being used to introduce certain chemical compounds and reagents into the molten metal for the purpose of eliminating impurities. This was done (according to the *Manchester Examiner*) at a sacrifice of only a small percentage of iron. The process of refining and purifying occupied between nine and ten minutes, and the quality of the production appeared to be in every way satisfactory. Both gray and white iron can be produced of a high specific gravity and of great density. A number of test bars made by Mr. Smyth's process from gray iron were submitted for inspection. The cast-iron test bars were 1 in. square and 4 ft. 8 in. long, and at the time of testing were placed upon supports 4 ft. 6 in. apart. The weight was suspended in the centre upon a knife edge, the deflection measuring every 100 lb. up to 600 lb. The total deflection was found to be 1·375 in. The weights were then gradually removed, and when all were off the deflection was found to be about 0·062 of an inch only. The weights were again placed in the scale, and the deflection again taken. When 720 lb. was registered the deflection was 2·078 in. The average breaking-weight of five samples was 733·6 lb. The material is said to work as easily as ordinary cast iron.

Public Works at Wednesbury.—At a meeting of the Wednesbury Local Board, on the 7th inst., the tenders of Mr. C. W. Graham, of 540*l.* for the erection of public stabling, and of Messrs. Trow & Son, 3,348*l.* 16*s.* for the free library and baths contract, were accepted. It was agreed that the contract should be signed and sealed, and the limit of time fixed for building the baths and library was twelve months, and the stabling three months. The chairman stated that the work of channelling and re paving the streets would commence at once, and that it was the intention of the Board to spend 1,000*l.* a year upon it, and to complete it in three years.

Flat Roofs as Playgrounds.—On the 4th inst. Dr. Wilberforce Smith read a paper before the British Medical Association at Sheffield, on "The Flat Roof as a Recreation-place in British Towns." In opening he alluded to the playground on the roof of the charity school in East Parade; but added, that such a plan had been rarely adopted in this country, although it was common in other lands. He showed that if such a scheme were generally adopted, thousands of acres of open space would be secured in crowded towns, and recovered from the exclusive possession of the house sparrows. He maintained that the air circulated more freely over the house-tops, and was fresher than that below, and that the access of the sunlight on the roof was greater than in the streets. The additional cost of such playgrounds would, he was assured by builders, be very small. One objection to the proposal was, that our climate was not so suitable as it was in warmer lands; but the same objection would apply to all open spaces. It was said, too, that smoke would descend on the roof; but it would only do so in bad weather, which itself was sufficient to keep the people indoors. One of the greatest difficulties was that referring to the noise which the children would make overhead; but that could be obviated by a space filled with sawdust or concrete being provided between the roof and the ceiling.

The Lead-Miners of Weardale.—In Weardale it has been estimated (says *Capital and Labour*) that above 1,200 men are employed in the lead mines, by far the greater proportion of whom are paid in the peculiar mode which seems universally to prevail in the northern lead-mining dales. Both in Weardale and Teesdale, as well as others, the practice prevails of "bargains" or contracts being made with the miners for stipulated periods, with pay accruing at a certain rate for the ore raised or fathom worked. From this gross sum, in certain cases, deductions are made for mining necessaries supplied to the men—gunpowder and candles, &c., the washing of the ore, and other like charges,—and the miner is credited at the period of settlement with the net amount. As, however, the periods of settlement are sometimes long—up to three or four years ago in one dale the periods of settlement were only yearly,—a demand arose for what in the dales is called graphically "subsistence money," or, in brief, "subsist." This subsistence money, thirty years ago, was only 30*s.* a month in Weardale, but it has been largely increased—it approaches to nearly double that amount now—and its retention has been often urged by the men on the ground that it enables them to live whilst engaged in that system of speculative mining which they believe to be beneficial.

The Gibson Gallery.—A "Puzzled Countryman" recently wrote to the *Daily News*:—"Being at Oxford the other day, I took the opportunity to visit the Gallery of Chantrey's Works, which reminded me that I should have an opportunity of seeing the works of the late Mr. Gibson in London. I remember reading his life some years ago, and that he was now dead ten years; and that he had left 40,000*l.* to the Royal Academy to build a gallery in which to exhibit the works he left to that body. But when I inquired at Burlington House no such gallery was open. It is probably unpardonable curiosity to desire to know how that mysterious and august body, the Royal Academy, performs its functions. Still it would be satisfactory to know when this gallery will be ready for public inspection; what the Academy have been doing in this matter for the last ten years; where Mr. Gibson's works are; and how the capital, and the interest, which must now amount to at least 16,000*l.*, have been spent. I saw a drawing of Mr. Millais's new house in the *Builder* a few weeks back, but I would rather see one of the Gibson Gallery; but I suppose building, as well as charity, begins at home."

"Hygeopolis."—In reference to our notice in last week's *Builder* (p. 796) we have been asked to state that Dr. Richardson's name is not being used to "cover" any speculation. Dr. Richardson has already stated in the *Times* that the proposed design for erecting a model town on the Sussex coast has been laid before him, and that he considers it promises well, but he has no official connexion with it, and has not inspected the site. We are informed that the public announcement in the newspapers of Dr. Richardson's connexion with the company as sanitary adviser was "an error," and was made without his knowledge or consent.

Medical Officers of Health.—At the annual meeting of the British Medical Association, held at Sheffield on the 1st inst., Mr. Bartolme, the president, delivered an opening address. With reference to the appointment and removal of medical officers of health, he said that if these officers were rightly chosen, and placed in independent positions, they were destined to change before long the character of disease throughout the nation, and save future generations from much misery. No officer of health ought to be appointed or dismissed without the concurrence of the Local Government Board, and, indeed, it would be better if that Board took the whole business into its hands. Medical officers might then look forward to promotion and reward. In the Public Health Section a paper was read by Dr. Driver, of Leamington, in which he pointed out the unsatisfactory position of the Poor-law medical officers by their being under the control of boards of guardians, many of whom were illiterate and of no social standing. He, however, said that the country should be mapped out into divisions, which should be presided over by a council of magistrates and medical men, to whom alone medical officers should be responsible.

Preston Churchyard, Sussex.—Preston Churchyard was inspected on the 1st inst. by Dr. Holland, the Medical Inspector of the Burial Acts Office; and it is stated that the result of his inspection was that he will report that it ought to be forthwith closed, with the exception of the existing vaults, and that an order in council will be shortly issued to this effect. Such a step as this has long been called for, according to the *Brighton Herald*. The churchyard is some 600 years old, and every inch of ground in it has been made, over and over again, the depository of human relics. The cavalry barracks being situated in Preston, a great many soldiers have been buried here, and the pretty rural character of the churchyard has led to its being chosen for a last resting-place by many non-parishioners. It is stated that, by neglecting to provide additional burying-ground when it could have been procured, the Vicar of Preston finds himself, by the closing of the old ground, mulct of his burial fees.

Proposed Railway to the Albert Hall.—A branch line from the South Kensington Station of the Metropolitan District Railway to the Albert Hall is stated to have been projected. The arrangement is that the new branch line will diverge from the District line a short distance east of the South Kensington Station, and, proceeding in a northerly direction, will be carried underground, skirting the west side of Thurloe-square. It will then pass under Alfred-place and the Old Brompton and Cromwell roads, both of which it will intersect a little to the west of South Kensington Museum. It will thence be continued direct northwards under the site of the Exhibition buildings of 1862 and Exhibition-road, terminating between the north side of the Horticultural Gardens and Kensington-road, at the east side of the Albert Hall, where there will be a station. The Metropolitan District Company is stated to have contributed 10,000*l.* towards the cost of the line.

Art Scholarships for Birmingham.—Some time ago it was announced that a munificent friend had offered to give 10,000*l.* to the Birmingham School of Art on condition that a scheme should be prepared by the committee for the appropriation of the endowment to specified objects, and that it should be approved by the donor. The *Birmingham Gazette* now states that although this scheme is not yet finally completed, sufficient progress has been made to enable the committee to announce that a series of free admissions and scholarships have been endowed, and that they are now prepared to receive the names of candidates for the first fifteen free admissions to the school under this endowment. The object of these scholarships is to encourage the systematic study of art in the school, to induce students to spend a longer time in the school than the majority of them have hitherto done, and to encourage general culture among them.

Demolition of a City Church.—The ancient church of All Hallows, Broad-street, is again threatened with destruction. The old church was burnt down in the Great Fire of London, and subsequently rebuilt. In that church Milton was baptised, and the register still preserves the entry of the event. There are very few residents in the parish, the houses having been chiefly converted into warehouses.

The Builder.

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A Hot Season in London.

IT is written somewhere in one of the ponderous tomes of Stowe and Strype that "in this place (London) the calmness of the air doth mollify men's minds, not corrupting them with lusts, but preserving them from savage and rude behaviour, and seasoning their inclinations with a more kind and free temper"; and that, indeed, the only absolute pests of the town are "immoderate drinking of idle fellows, and often fires." Happy ancestors that could write thus of their own time! As they once had an opportunity of holding a fair on the frozen Thames, so we, some coming hot season, may yet feel the breath of the punkah within sound of Bow bells. Under our temperate sky we are unprepared for any eccentricity of climate. Our normal state is rain. In countries nearer the sun, the inhabitant knows that he will have a few months of uninterruptedly fine weather, a few of intense heat, and then several of continued rain; but in England, a warm sunshiny day may happen in the midst of winter, snow may fall in June, and then, some weeks after, when Sirius rages, Londoners may be penning letters to the newspapers to suggest not only the substitution of sandals for boots and pith helmets for hats, but the introduction of a reformed building-act by which no town-house shall be considered complete without its *stoa*, and no country villa without a verandah; while instead of tiles and chimney-pots there shall be terraces and hanging gardens. For the last two months, Anglo-Indian wits upon furlough have had a prolonged opportunity of distinguishing themselves at home. Their great, their time-honoured, their unique joke, which is practised upon every freshman arriving in Hindustan during the six fine months of the year, refers to the weather. The wallah, or visitor, as the case may be, struck with the continued serenity of a cloudless sky, is plied, as day succeeds day, with the apparently natural remark:—"Well, old fellow, another fine morning, eh?"—the final query containing the bait which the wallah nibbles with some such profound opinion as "it can't last," or "the country wants rain." How, lately, morning after morning, London has risen to find the sun glaring down upon it with unrelaxed severity of countenance, that same London sun which a caustic pen called the moon of Venice, is a still fertile topic of discourse with the large mass of the community whose talk depends almost exclusively upon meteorological observation; and who, in the recent "severe season of the burning dog-star," were a prey to conflicting and irregular emotions: helpless and out of temper, dry with thirst, and wet with perspiration. Nevertheless, in spite of the languid body and damp garments, any one who has used his eyes and perambulated the town must have remarked how a bright dazzling sun gave bits of the capital an aspect of unfamiliar beauty, almost sufficient to establish in the mind of a foreigner who saw them for the first time an artistic reputation for Englishmen.

What a grand sight it is, that view of London from Charing-cross Railway, when Somerset House and Waterloo Bridge, with St. Paul's Cathedral towering over everything in the distance, are lit up with rays of real sunlight!—not the sunlight we are accustomed to, but such as we have lately experienced. What a delightful river this Thames of ours! What a quay, even with its stupid useless blocks of granite, this Embankment! Are there any men of forty who, in their youth, dreamed that, in their time, the Middlesex shore between Blackfriars and Westminster would be the healthy, open, agreeable highway it now is? Then take Pall-mall, what a noble line of buildings graces each side of it!—when their façades have been strongly shadowed and the dirt upon them gilded or bronzed by the sun's rays. Not so the cement fronts. No blue sky is so intense, no light so brilliant, as to impart life and beauty to them; and, strangely enough, this peculiarity of cements is not shared by the French plaster or the Indian chunam. Plaster fronts in Paris have a sort of cracked laugh in the sunshine; but, in this city, cement houses never relax their frown, even while a brick or a stone neighbour is wreathed with fantastic smiles. Just remember what the streets were like during the late hot weather, how clean, and the pavements how white and bright they appeared! And was it entirely due to the sun? Perhaps indirectly it was; for the sun made even the kitchen fires burn low, and therefore very little smoke issued from the chimneys; and there was no rain to fall from the housetops and fancy-ridden cornices, to convert the dust into mud. Consequently, it has occurred to a great many people that if something could be done to prevent the smoke of fires from polluting the atmosphere, and the rain from acting in any other fashion than as a purifier and cleanser of houses and streets, the crowded parts of London might become quite as charming a place of residence as some travelled inhabitants honestly thought them during the recent hot weather. Take, for example, the busy, troubled, dirty Strand. Why are its pavements and its roadway a horrible slough after a day's rain? One reason is that those who are officially in charge of it allow the law to be broken or evaded. We can mention a dozen houses, on both sides of the Strand, in each of which the iron pipe carrying rain water from the roof discharges its contents upon the pavement itself,—upon the feet of pedestrians,—instead of being carried as the law directs under the pavement into the gutter. Why, in rainy weather, are deep pools of water to be found at every few yards between Charing-cross and Temple-bar? Because the paving-stones are irregularly laid, and are constantly being pulled up and laid down again carelessly. Since this time last year the wood and asphalt alongside St. Mary-le-Strand Church has been pulled up more times than we choose to tell; and each new patch to a roadway of wood or granite inevitably leaves some irregularity of surface. Another cause of London dirt is the material of which the house-fronts are composed, and another the many absurd excrescences which occur on them. Some strange custom leads many architects and builders to contrive huge horizontal projections with flat surfaces along the fronts of houses, which are called cornices, and which serve absolutely no purpose except to collect dust in dry weather, and rain when it is wet. And then the smoke! Is it really beyond the invention of man to devise some means of using it, or, at least, of depriving it of its foulness before reaching the outer air? But men who are proud, and properly so, of the Metropolitan and District Railways, are not likely to be fastidious in the matter of smoke. Perhaps, during the recent heats, the most extraordinary instance of physical endurance has been given by those who travelled underground. They inhaled of a morning the bad air generated the preceding night. For in the majority of carriages used in an underground railway there is no chance of changing the air. To keep out the sulphur each relay of miserable sinners shuts itself in; and, at the end of the day, the air in each compartment is carefully preserved until the next morning by closing up every door and window during the night. It may safely be asserted that some at least of these railway carriages never receive a complete allowance of fresh air from one year's end to another.

Recent letters to the public journals have contributed some seasonable remonstrances to those British holiday-seekers who pretend that fresh and cool air in summer is obtainable nowhere except out of not only their own city but their own country. Some of these holiday-seekers of a week will cheerfully spend three or even four days in a railway carriage. Of course it is better to see Paris for a few hours only than never to see it at all, as young ladies have been made to sing "Better be courted and jilted, than never be courted at all." But it is much to be questioned whether the hasty trip to France or Belgium or Germany of an untried Continental traveller produces in him any beneficial result other than to strengthen an innate love of his own country, and a superstitious prejudice against foreign nations. Parisians used to say that in August only dogs and Englishmen were to be encountered in the Champs-Elysées during the day-time, and probably this piece of statistics has applied even to the present year. Those Englishmen who, to avoid the "horrors" of a

native summer, travel hundreds of miles in a crowded cushioned compartment may possibly remind the cynics who stay at home of two or three of Voltaire's creations. Like the Princess of Babylon, fate or the oracle of domesticity has decreed that they shall be forced to "courir le monde"; and only after they have done so do they find out, with Pangloss, that man was put into the Garden of Eden to dress and keep it, and that Candide advocated the best means to the best end in the best of all possible worlds when he said,—"Mais il faut cultiver notre jardin." It would be a difficult and not an amusing task to attempt a calculation of how much ground is even now being traversed by our countrymen to obtain barely glimpses at other nations' gardens; how many stomachs are being tortured by the relentless waves of how many seas in the hope of reading in the faces of other men and other countries not a new story, but a story that is new to the reader; and how much "philosophical" speculation is being expended over living griefs and joys and material sights surveyed from the window of a railway carriage or the door of an inn.

The poets from time immemorial have done their best to increase the natural discontent of citizens in general with the things which immediately surround them. Homer, Virgil, and Horace, have all sung with twofold force and melody the joys of a rural existence, and the griefs of a town life; and as soon as a London street is happily adorned with a shadow, the Londoner with classical fervour aspires to leave it for the open country. There was possibly some excuse for Horace—perhaps more than a poetical one—to urge Mæcenas, when the sun brought round the thirsty season, to leave "yon pile of buildings approaching near the lofty clouds—to cease admiring the smoke and opulence and noise of flourishing Rome;" for, probably even in his time marsh fever had already put in an appearance on and around the Seven Hills. But there are few excuses for the modern who discards the shaded parks of London for the burning shingle of such places as Margate or Southend; or depreciates the flowers and foliage of Hampton Court to extol the sands of Versailles, the desert of Marly, or the ruins of St. Cloud. The muses, having always been described as Sylvan maids, the newest contributor to the most recent journal or review may be forgiven for believing that his wooing of them should be done in the country, and far from the haunts of men, as Milton describes them,—

"In populous city pent,
Where houses thick, and sewers annoy the air."

Whether, however, works of the imagination are evolved with more ease in the seclusion of a populous city or in the bright solitude of meadow and mere—under the frown of dull houses or the shadow of green leaves—may continue the open question it has long remained. People have always mistrusted, and with some reason, the collegian who travels to "read," or the tourist who pretends to thumb other Classics than Baedeker and Murray. Yet Addison has declared that students of the polite authors are doubly entertained with the country, because "it revives in their memories those charming descriptions with which such authors do frequently abound." He inhabited the town, when fields and hedgerows were attainable within walking distance of his dwelling-house. There was not a bush, he wrote, within a mile of him with which he was not acquainted; and early in the morning he loved to divert himself "among the meadows while the green was new and the flowers in their bloom." No one will dispute the poet Cowper's assertion that "God made the country and man made the town"; nor will any one deny that God also made the marsh, which ingenious man has subsequently drained; and clergymen who live in the Fens will not be unready to admit the benefit which, in their locality at least, prosaic hands have conferred upon poetical Nature. Horace was probably badgering the steward of his woodlands and little farm when he dogmatised.—"I pronounce him the happy man who lives in the country, you him who lives in the town." Shakespeare entitled that play "As You like It," in which the pleasures of a country life were lauded in preference to those of a city one. Swift's recollections of servitude at Moor Park, and of Sir William Temple's apricots, must have sufficed to settle his opinion upon the subject. Boswell, who had travelled as near to Greece as the island of Corsica, held decided opinions concerning London and the idol he worshipped there. He pronounced Fleet-street to be more delightful than Thessalian Tempe, for which Dr. Johnson proposed to read Mull. But it may be suspected that those who have pretended to prefer streets and alleys to hills and vales, especially with a chance of climbing Ossa, Olympus, and Pelion,—even those who believe with the Doctor that "there is in London all that life can afford," may be often disposed to repeat Pope's adieu to the capital, at least with variations, and cry

"Dear, dash'd, distracting town, farewell,
Thy fools no more I'll tease,
Now mouth, in peace, ye *authors* dwell,
Ye *neighbours* sleep at ease."

As we said at the beginning, the Londoner is totally unprepared for any temperature except a temperate one. The maxim of his climate, as well as of his character, is moderation, or the golden mean. If in winter snow falls continually for several days, he is thereby rendered helpless; scavengers then take a holiday until the elements have caused the snow to melt, so that it can be swept down the gulleys in an orthodox fashion. If in summer the sun is hotter and more constant than usual, neither house nor costume nor the habits of an Englishman are fitted to enable him to undergo the ordeal. As a rule, he has no balcony on which to sit and take the air; and most of the balconies which do exist in parts of the town are so constructed as to make wise men afraid of venturing on them. His windows are so contrived as to admit plenty of light, but only a modicum of air, and that at top and bottom. In the heart of town servants hesitate to open them, lest the dust enter as well as the air. There are houses in central London where the windows facing the street are never opened except to be cleaned; besides which, the ordinary sash-window is not intended to look out of. The Londoner's kitchen is usually exactly under his dining-room; and the solid portions of the flooring or horizontal division between the two rooms being composed of 1 in. of lath-and-plaster, 1 in. of deal boarding, and ½ in. of carpet, the heat of the lower room naturally penetrates to the upper apartment. Then his dress,—as far as his outer garments go,—is of an unwashable material, which, after the continued wear of a few days in the sun, becomes as disagreeable to his neighbour as to himself. His hat is as little serviceable as a protection against the sun as against the rain, it being even more shapeless in a utilitarian point of view than it is ugly in an artistic one. During the recent heats correspondents from the country have suggested the insertion of a cabbage-leaf under the brim of the modern hat. The London cabmen and others compelled to remain out of doors have been similarly inspired, and have utilised their pocket-handkerchiefs as sunshades, retiring under a portico whenever these familiar adjuncts of dress were required for legitimate and traditional purposes. Indeed, puggarees of many colours, divers lengths and forms, have given a more or less oriental character to the insular garb,—we say more or less, advisedly, for flowing puggarees are rarely seen in eastern countries where the sun is really dangerous. Some ladies, who have already adopted in their *coiffure* the old-fashioned Greek knot, but just revived, have resorted to the broad-brimmed straw and long tails of ribbon in puggaree fashion; but with the majority, the chignon, although reduced to a mere rudiment—the word is used in its Darwinian sense—is still a practical defence from the too penetrating rays of a hot sun. Then, lastly, as to the daily routine of life in this temperate corner of the temperate zone—what more unsuitable for a temperature when it chooses to approach that of the tropics in May? In India, the Englishman is galloping over the plains an hour before sunrise, and fast asleep at 10 p.m.,—very often dozing for an hour or so in the afternoon. At Cairo the custodian of the bridge over the Nile shuts his gates and turns-in to repose at 2 p.m., when British visitors returning from the pyramids may knock to no purpose until at least four in the afternoon. At Naples, while the sun is high, all the shops are closed, and reopened when business recommences at sunset. Paris is hard at work at six in the morning; so was London in the days of Mr. Secretary Pepys. Indeed, to a foreigner, the London householder and his dependents appear the laziest of mortals. Often, only at half-past nine, in the mornings of summer, scavengers are carting away the Strand refuse of the preceding day; and not until four hours after an August sun has tipped Primrose-hill with red and gold does London get into its bath,—many of the Great Unwashed remaining in their beds until an equally advanced hour.

SARACENIC ARCHITECTURE IN INDIA.

In previously noticing at some length Mr. Fergusson's volume on Indian and Eastern architecture, we inferred (p. 407, *ante*) that something more might be said in regard to that section of the book which treated of Saracenic architecture in India, and which we were then obliged to defer going into.

Archæologically, this branch of the subject of Eastern architecture is of less importance or interest than that of the more purely Indian styles. These latter go so much further back chronologically, and are, to European eyes, so strange and startling in their forms, as to give them a deep interest even for those who cannot share the admiration for this "school" of architecture evinced by the critic who may be said to have invented it for European students. The Saracenic architecture comes nearer to our European ideas and associations; for, even admitting what has been said as to the "pliancy" which the Saracenic architects showed in adopting the styles of the various people among whom they were settled, it must be conceded that this pliancy consisted a great deal in translating the style of the Indian forms of building into their own, and that, however much the Saracenic architect may have been indebted to the structures of the people he invaded, he always put his own handwriting upon it in the distinctest manner, whether he was working in Spain or in Hindostan. Whether it be because the European eye and sympathy is thus already engaged on behalf of the Saracenic style of architecture, or whether it is the inherent superiority of the style, in point of artistic finish and expression, to the more barbaric profusion and confusion of much of the pure Indian architecture, there may be opposite opinions. We suspect, however, that the majority will be entirely with us in saying that the qualities of Indian Saracenic architecture, its refinement of detail and (for the most part) constructive and æsthetic truthfulness, place it far above the Indian styles which we have been so earnestly invited to admire on architectural as well as on historical grounds. Independently of its artistic beauty, there is also an interest in the Saracenic styles of India as affording a new and comparatively unworked field for architectural study and investigation; and there are circumstances in connexion with some of its principal monuments which are interesting and significant as compared with analogous incidents in the development of some of the styles of other countries.

The extent of this little-explored province of architectural study promises plenty of work for those who may undertake in due time the task of systematic illustration. Mr. Fergusson enumerates, as a rough classification, about thirteen styles of Indian Saracenic architecture. This approximate classification, of course, may be subjected to much alteration on further research; it may either be still more extended, or very possibly be made more general and comprehensive. The whole of our classification, and even nomenclature, in regard to Indian architecture and art seems to be in a transition state. For the present, however, we are assured that every one of these thirteen styles deserves a monograph, though nothing of the kind has been attempted in regard to any but two, those of Bijapur and Ahmedabad, concerning which illustrative works were published by Mr. Fergusson himself, in conjunction with Mr. T. C. Hope and Colonel Meadows Taylor, in 1866. Here, therefore, to begin with, is work for eleven architects, had we a Government as liberal and enlightened as that of France in illustrating ancient monuments, and thereby finding useful and worthy employment for men eminent in the profession. But even the means of information which come in the way of Government under ordinary circumstances are neglected. It is a continual subject of reproach that when military movements (not in time of war) are undertaken, which bring our officers into the neighbourhood of the most interesting and un-edited architectural remains, no effort is made to utilise the occasion by the collection of sketches or notes of the remains of the district, though it may be assumed that generally some one either is or might be attached to an expedition who would be capable of collecting valuable information. Of course, military men may reply that the object of military move-

ments is not the study of archæology. But this is just one of the ways in which officers in time of peace may have frequent opportunity of rendering a real service to their country, in adding to the stock of knowledge, and contributing new facts for students to work upon. And to some military explorers we are already deeply indebted. But it seems to be too generally the case that the military element in India is, in regard to its ancient monuments, destructive, or at best neglectful, rather than conservative or illustrative.

How much may turn on the further investigation of some of these various families of Saracenic remains is suggested in the few remarks made by Mr. Fergusson in relation to the architecture of Ghazni, not strictly speaking in India, but which he regards as having formed the stepping-stone by which the architecture of the West was introduced into India, and the connecting link between the styles of the Eastern and those of the Western world. "It would consequently be of the greatest importance in enabling us to understand the early examples of the style in India proper, if we could describe this one with anything like precision; but for that we must wait till some qualified person visits the province. . . . . In the meantime, it is satisfactory to know that between Herat and India there do exist a sufficient number of monuments to enable us to connect the styles of the West with those of the East." There, at all events, is an object worth the best exertions of an architectural explorer. Not the mere elucidation of a style on its own merits is the reward, but the production or piecing of the missing link connecting Eastern with Western architecture. Where is the "qualified person"? Him we take to be a professional architect of independent means; *rara avis in terris*, certainly, but indispensable for this kind of work, as long as Government does so little, and in so grudging a spirit, to assist private effort of this kind.

The next in order of the "thirteen" Saracenic styles, the Pathan, has its peculiar position also, illustrating to a great extent the adaptation of Jaina buildings to Mahommedan uses and Mahommedan ideas of ecclesiastical architecture. This adaptation of the temples of the old faith for the ritual of the new is not an uncommon phenomenon in architectural history, which, in regard to this and some other practices, has a tendency to "repeat itself." The most important example is the mosque at old Delhi, of which the pillars in the court-yard are Jaina, and the walls Saracenic. In the precinct of this building, it will be remembered, is the remarkable structure, between a tower and a minaret, called the Kutub Minar, an effective coloured sketch of which was included among Mr. Simpson's Indian sketches, as we observed when commenting on them. Few architectural objects in existence can be more individual and special in their style and aspect than this structure, which seems the conglomeration of a tower, a minaret, and a Chinese pagoda. A pillar, remarkable in a more practical manner, is also found at Kutub, an iron pillar 22 ft. high, standing alone and as an ornamental object, with an elongated capital, or finial, containing very Persian features. The remarkable point, however, is that, seeing that the inscription on this column has caused it to be ascribed with tolerable certainty to about the end of the fifth century at latest (some placing it as early as the third or fourth century), it proves a power of working iron on a large scale which has not usually been supposed to have existed at that date. The manner in which the column has lasted is also a striking point for consideration, now that iron is so increasingly used in large constructions. "It is almost startling," we are told, "to find that, after an exposure to wind and rain for fourteen centuries, it is unrusted, and the capital and inscription are as clear and sharp now as when put up." This is certainly a contradiction of our belief and experience in this country in regard to what may be called the "staying qualities" of iron, and so far as it can be taken as any criterion, is certainly a satisfactory incident. We were rather in want of some evidence as to how long iron used on a large scale in building operations really will last, and this gives us a more favourable answer than we could at one time have anticipated. It has to be fully considered, however, that the column in this case is carrying no weight or strain; doing, in fact, no work at all, and that the climate of India may be more propitious to iron than ours. Certainly we can hardly imagine a piece of elaborate ironwork lasting for centuries unimpaired in this climate.

These Jaina-Mahommedan mosques of the Pathan style exhibit not merely the conglomeration of two different styles and dates in the altered buildings, but the still more interesting and unusual combination caused by the execution of the design of one race of people by the workmen of another race. Thus in the arcaded screen walls which the Mahommedan conquerors caused to be built across the "Mecca side" of the Jaina courtyard, to suit it for the Mahommedan ritual, the ogee arch of the Mahommedan designer is built in horizontal courses by the Hindu mason, with the very singular and most unsatisfactory effect shown in Mr. Fergusson's illustration from the Mosque of Ajmir (page 512); the effect may have been less objectionable, certainly, when the masonry was new and the joists less obtrusive: as a matter of construction, it seems wonderful that these so-called arches should have stood as well as they have; they seem, however, to be more stable than some modern erections built with Hindu materials. It appears that one example of the care of English officials for ancient structures was shown when Lord Mayo visited the neighbourhood of the Ajmir Mosque, and sundry of the Hindu pillars of the mosque, which the Mahommedans had first made use of *in situ*, were dragged from their places and set up to carry a triumphal arch; which, however, the loyal European official had contrived so badly that no one dare go under it, and the Governor-General and suite walked round it. The story indicates a fine combination of the loyal, the archæological, and the architectural spirit in one and the same representative of British rule in India. The slight glimpse which we gain from Mr. Fergusson's chapter as to the further development of the Pathan style indicates how much there may be found to illustrate the development of styles, among these remains, and what curious analogies they present to what we are more familiar with in the history of European architecture. We have on one page the sketch of a tomb showing the Mahommedan pointed and bulbous dome mounted on a substructure of square Jaina columns, with their bracket capitals; on another the same form of dome on a substructure of pointed arches of true Saracenic appearance, but with heavy coupled square columns, the form of which may be traced to the influence of the Jaina column. One is almost reminded of some of the early Basilican churches, with their colonnades of classical columns stolen from earlier buildings, and their subsequent development into the pure arcuated style.

Another parallel in architectural history is implied in what we are told of the Saracenic style of Gujerat, the head-quarters of which are at Ahmedabad. Here the Mahommedan conqueror had forced himself upon "the most civilised and most essentially building race at that time in India, and the Chalukyas conquered their conquerors, and forced them to adopt forms and ornaments which were superior to any the invaders knew or could have introduced." To compare small things with great, one is reminded here of what has been said about the influence of the architecture of the Greeks upon their conquerors the Romans; at least, if we accept the view here inferred as to the manifest superiority of the Chalukyan style to "anything the invaders could have produced." The justice of this criticism we doubt; but the result of the Mahommedan conquest certainly seems to have been the erection, at Ahmedabad and elsewhere, of mosques retaining to a remarkable extent the characteristics of Jaina architecture in detail, though with the Saracenic pointed arch and dome; in fact, if it were to be generalised in one expression, one might say the style appears to represent a Hindu base with a Mahommedan superstructure. Here, of course, as in all Mahommedan temples, the leading point in the architectural effect consists in the architectural screen forming the boundary of the courtyard towards Mecca, and giving access to the wide, shallow, covered temple, the shape and plan of which are so peculiar to, and so expressive of, the nature and feeling of Mahommedan ritual. The elevation of this screen in the Jumma Musjid at Ahmedabad presents as singular a mingling of two distinct motives in design as one could desire to see; and here again we are reminded of the history of Roman architecture, in the illogical blending of the Hindu column with the Mahommedan arch, the columns running up beyond the springing of the arches, either between them, or actually cutting into their soffits. The fact that the Pointed ogee arch has a sacred significance in Mahommedan ritual may in part account for its employment in this way in defiance of the constructive design of the rest of the screen. Of the beautiful and rich detail of some of these remains at Ahmedabad we gave an illustration in the traceried window engraved on p. 408, *ante*.

It is curious to note the various forms which the Mahommedan idea of a temple—an oblong court-yard with a sanctuary filling up one end of it—assumes in different localities, in these Indian examples of Saracenic building. In the building just mentioned at Ahmedabad, there is a façade before the sanctuary, with a grand central feature, facing the entrance-gate of the court, consisting of a centre and side arches on a great scale flanked on either hand by a colonnade or arcade (for it is a mixture of both) filling up the rest of the space up to the angles of the court. In the mosque at Mandu, representing another phase of Indo-Saracenic architecture, the Mecca side of the court continues the same arcade, which runs round the other three sides, so far as the external face of the design is concerned; the requisite prominence is given to the temple portion by three domes which rise behind the arcade, but with which the front of the design is in no way connected; indeed, by continuing the spacing of the arcade at even intervals all across this front, the architect has got himself into a difficulty about the domes, the springing of which requires, strictly, a wider spacing of the supports opposite their centre faces; for want of this consideration, the domes are made to spring from an octagon, narrower on its cardinal than on its angular facings. As this mosque is entirely Saracenic, an arcuated building throughout, the discrepancy must be traced either to unscientific method on the part of the builders, or to a preference for outward uniformity of design rather than logical planning and construction. The remarkable and extraordinary mosque at Kalburgah, also a purely Mahommedan building, illustrates another and rare form, in which the whole of the great court is covered over, instead of being left open all except the sanctuary, the roof of the centre portion is carried on a number of small domical vaults, with four larger domes at the angles of the quadrangle; the symmetrical arrangement being only broken by the introduction of a large dome in the centre of the Mecca side, to give the required prominence to this portion. The internal effect must have been remarkable, when the building (210 ft. by 170 ft. in dimension) was complete. If we turn to the plan of the Jumma Musjid at Bijapur we find another and very effective variety of planning, in which nearly one-half of the Mecca side of the quadrangle is covered in and vaulted, with a beautifully constructed dome in the centre, the design of the front of the covered portion being carried round the other three sides of the court as a cloister, one bay in depth,—that is to say, it would go round the three when complete, but the entrance side, which was no doubt intended to have a grand gateway, never was completed. The dome alluded to is of that remarkable construction which was subsequently carried out on a larger scale in the tomb of Mahmûd at Bijapur, where the weight of the system of pendentives, hanging inwards, is made to counterbalance the thrust of the dome outwards. It is really instructive to see, in comparing even the few examples given in Mr. Fergusson's volume, how much variety in plan and design may be applied to the treatment of so simple a general scheme of architectural arrangement as that of the Mahommedan mosque. Why is not the same latitude and variety of interpretation given to the plans of our churches?

Of the brilliant and splendid development of architectural art introduced into India by the Mogul emperors, and of which the Taje Mehal is the central jewel, more is known than of the other varieties alluded to; and, indeed, until recently a description of the Mogul style "would have been supposed to comprise a complete account of Mahommedan architecture in India." On the remarkable union of profusion with delicate and refined taste in ornament exhibited in the buildings of Akbar, at Futtehpore Sikri, we commented before, and reproduced (p. 408) the engraving of the carved pillars in the Sultana's kiosk, of which there is a cast at South Kensington. The mosque at Futtehpore gives again a fresh variety of treatment of the typical Mahommedan plan; and Mr. Fergusson comments in terms of admiration, which no one will say are too high, on the splendid and effective manner in which the problem of giving the greatest dignity and grandeur to an entrance doorway, and yet keeping the true scale of propor-

tion to the human figure in the actual entrance, has been solved here by the Mahommedan architect, in making the entrance a grand semi-octagon porch under a lofty arch spanning the centre or widest diameter, while the real door is contained in the further side of the octagon. As a contrivance for the grand portal, this may be compared with the front of Peterborough, which in another portion of his architectural history Mr. Fergusson has characterized, if we remember rightly, as the finest portico in the world, a praise which he seems now rather disposed to bestow on the gateway at Futtehpore. As a matter of architectural grandeur of style in an entrance, we think the English building certainly carries off the palm; but as a combination of effective general treatment with delicacy and refinement of detail the Saracenic architect has the best of it. His architecture, though less grand, is, in fact (however profane the criticism may seem to English modern-Mediæval architects), more civilised.

Before concluding these few notes on the aspect which the Saracenic architecture of India presents under the most recent exploration and criticism, we may direct attention to some remarks on the peculiar position which the style assumes in its decadence. Since the period of British rule in India, the Mahomedan style of the country has been or is being destroyed, it seems, by what Mr. Fergusson calls, not without reason, "the fatal imitation of a foreign style"; which means, we suppose, the adoption at third or fourth hand of Classic architecture, copied from us by the Indian, as we copied it from the Italian architects, who again copied from the Romans, who copied from the Greeks. (The vice is, at all events, one of respectable antiquity.) Independently of this, however, it seems apparent that the Indo-Saracenic style, even had it not been disturbed by these foreign influences, was getting into its period of decadence, and would have fallen into decay by a natural process, just as the Mediæval styles in Europe. One of the specimens of what the style was coming to is given by Mr. Fergusson, in the view of the tomb of the late Nawab of Junaghur, which looks rather like a toy to be carved in ivory; or, as Mr. Fergusson puts it, "every detail would be more appropriate for a sideboard or a bedstead, or any article of upholstery, than for a building in stone." The moral specially pointed is, that in tracing the history of architecture as practised within the limits of India, "we have been walking in a circle. We began by tracing how, two hundred years before Christ, a wooden style was gradually assuming lithic forms, and by degrees being elaborated into a style where hardly a reminiscence of wood remained. We conclude with finding the style of Hullabid and Bijapur, or Delhi, returning to forms as appropriate to carpentry, but as unsuited to masonry, as the rails or gateways at Bharhut and Sanchi. It might some time ago have been a question worth mooting whether it was likely it would perish by persevering in this wrong direction"; but the ground for that inquiry, as observed, has been removed by the different conditions introduced by the "fatal" foreign style. We may observe, however, that this criticism, a specimen of one of the broad and comprehensive generalisations which make Mr. Fergusson's writings so suggestive to the architect, brings together two things that are not quite analogous. There is a manifest distinction (at least, we should say so) between the mere clumsy use, in an incipient stone architecture, of constructive forms derived from a previous wooden style, and the over-refining and multiplying of minute detail, until we feel that some more delicate material than stone is required to do justice to the design, and that its abnormal decorative development has quite overgrown and obliterated its original constructive basis. We can hardly call this moving in a circle. It is a direct development in one direction, from bare and uncouth forms to a rich and yet subordinated system of decoration, the continual effort to refine upon which leads to its over-development, and to an absolute forgetfulness of its constructive origin. Such a design as the tomb at Junaghur, just mentioned, has no more affinity really with wooden construction than with stone construction, or with architectural construction on a large scale of any kind. It simply conveys the idea, not of a thing built up on mechanical and architectural principles, but of a pretty toy "cut out"; and hence we should be disposed to call it an ivory style. But a wooden style, in the sense in which the Tope of Sanchi or the tombs of Asia Minor represent a wooden style, it certainly is not. The author's desire for a brilliant generalisation has in this case a little impaired his critical perception.

It is, however, for many most useful and suggestive, and, in the main, thoroughly critical generalisations, based upon long and indefatigable study, that students of architecture have especially to thank Mr. Fergusson. And it is in this respect that his general view of the field of study open in regard to Indo-Saracenic architecture is calculated to be of the greatest service, if, as we hope, the investigation of this branch of architectural remains is to be pursued. The details given as to many of the styles into which Mr. Fergusson divides this branch of architecture are necessarily very slight. But he has accomplished the most important step of giving a classification, a boundary, and an approximate nomenclature to the Indo-Saracenic varieties of architecture; and has thereby immensely facilitated the work of those "qualified persons" from whose investigations we are to expect fuller details in due course of time. Such persons, instead of having to generalise and make a system for themselves, have now the far more straightforward task of collecting information and illustrations, and applying them to filling up the outlines here traced for them. Such investigations may lead, of course, to some readjustment of the classification at present put before us. But classification need only be approximately correct to be a most important assistance in study. And we again draw attention to the fact that there is in India a most important group of architectural remains of the highest artistic and historic interest, at present comparatively unexplored, and in all probability rapidly disappearing under the combined influences of human and vegetable spoliation.* The English author of the "History of Indo-Saracenic Architecture" has done his part towards facilitating the study of its monuments; we hope that those of his countrymen whom circumstances lead to the actual sites of these monuments will do their part in furnishing details for filling up the outline of this branch of architectural study and archæological record.

* The rapidity with which old buildings are fairly pulled to pieces in India by certain trees, when once they fasten on a deserted structure, is several times referred to in Mr. Fergusson's pages.

THE MANCHESTER GASWORKS COMPETITION.

We learn from the *Manchester Courier* that the premiums offered by the Manchester Corporation for the best designs for the gasworks proposed to be erected on the Bradford site have just been awarded. The first premium of 500*l.* has been given to Messrs. Mangnall & Littlewood, architects, of Manchester; the second of 300*l.*, to Messrs. Stephenson (of Westminster) & Paull (of Manchester); and the third of 200*l.*, to Messrs. Newton & Chambers, Sheffield. The only condition specified by the Corporation was that the plans should provide for the production of as large a quantity of gas as was possible from the size of the site, and consequently the designs show a great diversity of treatment. The various designs, twenty-seven in number, are now on view at the City-hall. Messrs. Mangnall & Littlewood's designs are exhibited under the motto of "Hydro Carbon." They provide for four pairs of retort houses, each pair of which represents a separate section of the works, and is capable of making 5,054,000 cubic feet of gas in twenty-four hours. Each house is 365 ft. in length by 70 ft. in width, and 33 ft. high, and contains thirty-eight benches of retorts, or seven to each bench. Cannel stores are placed between each pair of retort houses, and they are estimated to hold 12,500 tons; and extensive covered storage for cannel is arranged across the end of each retort house, capable of holding about 50,000 tons. Over the centre portion of each building will be fixed a condenser or cooler, the size of each being 325 ft. by 22 ft., and 5 ft. deep. Each section of the works will have a purifying house 215 ft. in length and 60 ft. in width, and there will be sixteen purifiers. There are to be altogether fourteen gasholders, six of 150 ft. in diameter, one of 135 ft., four of 120 ft., and three of 100 ft., the total capacity being 19,800,000 cubic ft., giving an average of as nearly as possible five million cubic feet to each section. The buildings, exclusive of laying out the land, and the formation of the arching along the railway, is approximately estimated at 250,000*l.*; and the cost of the whole of the machinery and plant, including retort setting, gasholder tanks, railway sidings, and other work, is put down at 500,000*l.*, making a total of 750,000*l.*

The plans which obtained the second premium were sent in under the *nom de plume* of "Thorough." The authors submit two (alternative) sets of plans. The first set (A) provides for the production of 20,800,000 cubic ft. per diem of twenty-four hours, and the storage of 8,600,000 ft.; the second set (B) for producing 15,600,000 ft., and for storing a like quantity. By the adoption of extraordinary measures, such as placing the purifiers in two or more stories, Messrs. Stephenson & Paull say it would be possible to arrange works upon the land so as to yield the full 20,000,000 ft. per diem, but the heavy outlay and increased working expenses preclude such measures. The A plans are estimated to cost 586,093*l.*, and the B plans 644,766*l.*

The authors of the plans to which the third premium was awarded (motto: *Omne trium perfectum*) have designed the works in three sections, each capable of being erected at one time respectively and separated from the other sections. Each section is estimated to be capable of producing, purifying, and storing five million cubic feet per twenty-four hours, which would be fifteen millions for the complete works. They estimate the total cost at 830,000*l.*, or about 276,000*l.* per section.

The estimated cost of the other designs differs considerably. *Comme il faut* estimates the cost at about 189,292*l.*; "Rainbow" at 200,012*l.*; *Ex fumo dare lucem* at 208,250*l.*; *Totaque vagatur urbe* at 580,000*l.*; "Courage" at 633,376*l.*; *Tuum est* at 712,000*l.*; "Excelsior" at 758,000*l.*; while "Constanza" puts it down at 1,620,000*l.*

STATUES.

The Prince Consort.—A statue of the Prince Consort, executed in white marble, has arrived at the Cambridge Fitzwilliam Museum. The Prince was the Chancellor of the University, and is represented in his robes. The statue (which is by Foley) will be removed to the Senate House, where the unveiling, it is said, will take place in November.

Colonel Akroyd. — The Akroyd statue at Halifax has been unveiled. The statue was originally designed and partially modelled by the late Mr. J. Birnie Philip. After his lamented death, the work was taken up and has been completed by Signor Fucigns, professor of sculpture in the Royal Academy of Carrara, and now resident in London. The figure, which is of bronze, weighs about 2 tons, and stands 9 ft. from the top of the pedestal. The latter is 10 ft. 6 in. high, and is strictly proportionate to the size of the statue it carries. The figure has been cast by Messrs. Masefield & Co., of Chelsea. There are four panels at the foot of the statue. That on the south side is filled in with Colonel Akroyd's coat of arms, and the simple inscription,—"Edward Akroyd, erected by his fellow-townsmen, MDCCCLXXV." Above the shield are two bosses, from which depend festoons of flowers and fruit. The whole panel has been treated in the Cinque-cento style, from full-sized drawings by Mr. Swinden Barber, architect, by whom also the pedestal was designed. This is of granite, from the Penryn Quarries, and has been worked by Messrs. John Freeman & Sons. The three alto-relievo panels, representing events in the life of Colonel Akroyd, have been designed and modelled by Professor Fucigna. All have been cast by Messrs. Young & Co., of Pimlico. The first of these represents the cutting of the first sod of the Leeds, Bradford, and Halifax Railway, 1846. Another panel represents the laying of the corner-stone of All Souls' Church, 1856, the persons represented including Mr. (now Sir) G. Gilbert Scott, the architect. The remaining panel is emblematic of Colonel Akroyd's connexion with the Volunteer movement. He is represented on horseback.

South Kensington Museum.—The pictures lent by Earl Spencer, K.G., from the valuable collection at Althorp, were opened to public view on Monday last. The selection comprises 114 pictures, including examples by Titian, Paul Veronese, Murillo, Holbein, Rembrandt, Rubens, and Vandyck. The English school is represented by Dobson, Hogarth, Gainsborough, and other masters, and there are eleven examples by Reynolds.

THE CORNWALL CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

The Corporation of Bodmin, in the address with which (on the 14th inst.) they formally welcomed the British Archæological Association to their ancient town, said:—"Situated within a short distance of the actual geographical centre of the county of Cornwall, Bodmin possesses within its municipal limits many evidences of its great importance in early days. Ancient British remains still exist in the locality, and implements of stone and bronze have been found, and Roman and mediæval coins are occasionally discovered. From the sixth century Bodmin became the seat of the famous Benedictine Priory of St. Mary and St. Petroc. It was also the very early seat of the Cornish bishoprick, and a Franciscan Priory occupied an important position of the town, and within the parish on the border was a hospital for lepers. There were many ecclesiastical establishments and trade guilds. Bodmin parish church, dedicated to St. Petroc, is the largest in Cornwall. The town has its historical associations, and contains some objects of general interest. The ivory reliquary of Moorish work now in the hands of this Corporation has attracted considerable notice. It is said to have been brought from France to Bodmin in the twelfth century. It has been exhibited to the Society of Antiquaries and to the Archæological Institute. It has also been brought under the notice of the authorities of the South Kensington Museum. The municipal charters and other documents are ancient and curious. The lists of the mayors and members of Parliament have been traced down from the thirteenth century. In the districts surrounding Bodmin are to be found very many relics of remote antiquity, which we have reason to believe will present very considerable attractions to the members of your Society."

Bodmin and its Antiquities.

At the close of Lord Mount-Edgcumbe's address, the pith of which we printed in our last, the Rev. W. Iago, in response to a call from the chair, made a very interesting statement concerning Bodmin and its antiquities. It was at present, he said, the county town, and had a number of institutions connected with the management of the county. The whole place sprung from a fount of clear water. Before there was any town there was this splendid spring of water, and the saint who came there to teach Christianity selected a spot beside it for his cell. This cell was built by St. Gueron, the saint of Bodmin, near the stream of water close to the church. St. Gueron did not remain there long, for St. Petroc, whose effigy he (Mr. Iago) had copied from the priory seal, took possession of the cell, and brought companions with him. These established themselves in a hermitage, and afterwards founded the great Priory of St. Petroc, which grew by degrees, and became the greatest in the neighbourhood. It owned a great deal of the lands of Cornwall, and became of wide-world fame. St. Petroc was very learned, having been educated in Ireland; and so great was the fame that became attached to his name that when he died his bones were stolen and taken away from Cornwall to Brittany. Being held in such veneration, it was thought by the thieves that a great deal of benefit would attach to the French monasteries, on account of the saint's bones being preserved in that land. The bones were, however, recovered, and there was on the table before them an ivory box, in which they were supposed to have been brought back to Cornwall again. They were stolen in the twelfth century, and the ivory box answered the description given by the historian of the time, and there appeared to be no doubt that the box was one of the twelfth century.* St. Petroc having founded a monastery, houses began to spring up around, and there was, of course, a necessity that those who supplied the monastery should be provided with accommodation. Accordingly the town called Bodmin was built. The word meant "the monk's house or monastery." The first half of it was Cornu-British for "house," and with the second half it was supposed to signify "a house for the monks." Sir John Maclean, nevertheless, thought that this second half should bear a different interpretation, and that the name meant "the house among the hills." There were amusing histories of many of the lives of the monks, some of whom were very fiery, and waged war on their neighbours. Many of the antiquities were in a good state of preservation, and some of them dated from the fourteenth century. The guild of St. Petroc was the guild of the glovers, although afterwards there were other guilds belonging to the town. After the Priory had been built the town increased in size, and had a large church. The Priory originated in the sixth century, and lasted until the dissolution of the monasteries. The church which was built had now nearly disappeared, only a few stones occupying their original positions being left. The bells from the great tower had been sent to the neighbouring parish of Lanivet, and there was a document still preserved showing when they were so removed. The Grey Friary sprung up in the fourteenth century, on a place called Mount Folly. It was a Franciscan Friary, but now, with the exception of one or two pillars, it had entirely disappeared also. These were dug out from some premises near the Friary. Bones had been repeatedly found, even of late years, near the place where the Friary stood. There were some interesting stones, too, in the garden at the back of Mr. Collins' house. Then they had a lazar-house or leper hospital on the confines of the parish. This was at St. Lawrence, and some small remains thereof might even now be found. They had a seal of the hospital,—St. Lawrence holding a gridiron and the leper beneath his feet praying. This seal had been lent them by Mr. Collins. The funds arising from the lands were now assigned over to the Truro infirmary, which undertook to deal with all cases (should they occur) which in olden times came under the care of this hospital. The parish church of St. Petroc was erected for those who could not go to the Priory or Friary. They had dug stones out of the walls of Bodmin church, which denoted the transition changes of various sorts of architecture. The church was now undergoing restoration. It was almost Perpendicular, but it had an interesting west-door, a sketch of which had been kept by Dr. Borlase. The church was almost entirely built into its present form in the fifteenth century. Some of the old woodwork still remained, but it was in a very rotten condition. In one of the panels they had a representation of a fox in a pulpit, wearing a cowl, and around were seven geese, to which he was preaching. There were other representations of the same kind in the county. He had in his possession the building accounts of Bodmin Church in the year 1470. There was still a very curious font in the church. It contained upon the bowl representations of dragons, supposed to be personifying evil spirits departing; the tree of life; angel's heads; and representations of serpents. There were barrows on the Beacon, and a triple entrenchment near the town. There was also a camp at Dunmeer, a Roman camp at Tregear, and various other camps in the neighbourhood. Coins of Vespasian and Antoninus Pius had been found. Pieces of Roman pottery and Samian ware had also been discovered. Several celts had also been found, and the neighbourhood possessed many other pre-historic and Mediæval antiquities. The Anglo-Saxons did not appear to have made much progress in Cornwall, although in later years they conquered the Scilly Islands.

On the following morning (the 15th), the members started at nine o'clock for a long excursion under a blazing sun, not returning till past nine at night. A report of the business of the nine days occupied by the Congress would fill a volume: we have no intention of giving even a complete *résumé* of the proceedings. We will note, however, the more salient features of this day's work as a specimen of the distances travelled and the work done.*

As Lanteglos was approached, the rugged outlines of Rough Tor and Brown Willy came into view, and the rocks known as the Devil's Leap, connected with a legend of St. Michael having chased the "old gentleman" with a red-hot poker, were seen. At the rectory, the rector, the Rev. J. J. Wilkinson, and his lady warmly welcomed the party, and soon led the way to the lawn in front of the rectory, where Mr. Wilkinson had set up a Saxon pillar which was found supporting some outbuildings at Castle Goff. It is about 8 ft. high, and on the face were two lines reading "ÆLSELTH N GENERTH WOHTE THYSNE SYBSTEL," and on one of the sides the complementary line, "FOR ÆLWYNES SOUL N FOR HEY," and "SEL" turning round the corner. This rendered into English was "Ælselth and Generth wrought this family pillar for Ælwyne's soul and themselves." Mr. Wilkinson gave an account of the stone, and the Rev. W. Iago, who took a leading part in deciphering the inscription, traced the letters, and added that it was the only stone in Cornwall that had the peculiar forms of W and TH, all the other stones having Latin or Roman forms. The stone was assigned to early eleventh century, and the names on it were the same as those found in the deeds of the Anglo-Saxon priory. At the head of the pillar was a cross, which Mr. Wilkinson explained did not belong to it, but was found near the same place. It would be better elsewhere. Proceeding to the church, which has no unusual feature, the rector mentioned that it was dedicated to St. Julietha, and suggested that the name of the same saint occurred in the corrupted form in "Jetweil's,"—a holy well which existed till within thirty or forty years since, and was about to be restored. Originally the church was a cruciform Norman structure. Mr. Bloxam expressed his belief that the church was entirely rebuilt in the fifteenth century, and mentioned the existence of an interesting Elizabethan chalice. In reply to Mr. Hine, he said the two large niches in the chancel were sedilia, the floor having been lowered from them. Mr. Loftus Brock, F.S.A., traced the history of the various churches in the evidence afforded by the building itself. From time immemorial the site had been occupied by a church of great antiquity. He spoke of the pointed tower-arch, with its three first stones as horizontal courses, as probably belonging to the second or third building, and heralding in the Pointed style in this country about 1150; but Mr. Godwin differed from him, considering it could not be earlier than 1220, and might be later. Mr. Bloxam agreed in this. On the way back Mr. Wilkinson called attention to a cross of about the eleventh century, of very plain and unusual type, which he had set up in the shrubbery. He explained that he had heard of the existence of such a cross, but was unable to find it. One day his attention was drawn to a stone at which the village blacksmith was binding his wheels, and he was very much surprised when 10s. was offered to him for it. Digging it out, Mr. Wilkinson found the lost cross.

A move was then made to the lawn, where, under a spacious marquee, the rector entertained the whole of the company at a sumptuous luncheon, after which Mr. Godwin, on behalf of the party, warmly thanked Mr. and Mrs. Wilkinson not only for the exceedingly handsome reception they had given the Association, but for the care the rector had taken of the antiquities of the district. The rector, responding, said he felt it a great honour to have had the privilege of entertaining the society. Mr. E. Vivian, Torquay, responding for "The President and the British Archæological Association" in humorous style, backing the table spread for them by Mr. Wilkinson against any "round table," before clotted cream and junket were discovered, or chickens had developed into such favourite food. Before the company left, a visit was paid to the library with the ancient volumes and portrait left to his successors by Dr. Lombard, as profound in his scholarship, as he was innocent of the ways of the world.

At length the very pleasant visit to Lanteglos came to an end, and at the blast of the indefatigable Mr. George Wright's horn the party started for

Tintagel.

It may be remarked that the local pronunciation, "Dundagil," has been adopted by the Laureate—

> "There came a day as still as heaven, and then
> They found a naked child upon the sands
> Of wild Dundagil, by the Cornish sea."

Tintagel Church was first visited. It is exceedingly interesting, and the question raised by the Vicar, Prebendary Kinsman, as to whether any portion of it was Anglo-Saxon work, excited a good deal of discussion. The Vicar first called attention to the font, expressing his belief that it was either Saxon or pre-Norman work. At the corners it is supported by pillars set obliquely round a central shaft, but Mr. Kinsman inclined to the view that they were a later addition. The bowl has at the corner angels' heads (?), and around the bowl are serpents interlaced. In support of his belief that the north wall was Saxon he pointed to the Norman work of the south wall, and contended that the former was much earlier than the latter, and therefore was at least pre-Norman. The north doorway was

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* There seems no reason to doubt it.—Ed.

* Intelligent reports of the proceedings appeared day by day in the *Western Mercury* and the *Western Morning News*.

pointed out as specially interesting, and though it might be Norman it was much older than the south door, which was undoubtedly Norman. The original central tower, when it fell, was rebuilt at the west end after the same design. The south transept was pointed out as peculiar, it being very much longer than the one on the north. A portion had been screened off, and his belief was that the portion within the screen was formerly the chapter-house of the monastery which once existed on the site of the vicarage, and to which the church belonged. Stone seats around seemed to him to support this view. The same transept also had two peculiar windows—each consisting of two lancets with very small cusps, and without being pierced at all. Compared with the Decorated window in the north transept, it showed how gradual was the change from the Early English to the first Decorated style. At the end of the south transept was a very interesting stone coffin, and a brass containing the effigy of Johanna, the "good mother" of a dean of a collegiate church near St. Columb. The transept arches had entirely disappeared.

Mr. Godwin remarked that whilst he was most anxious to maintain the age of our monuments, he was bound to say that he could not see the slightest evidence of Saxon date. Prebendary Kirsman said Tintagel was among the churches mentioned in the Oxford Glossary as showing Saxon work. Mr. Godwin quite believed that there was a Saxon church there once, but doubted if any part of it now existed. Mr. Bloxam quite coincided with Mr. Godwin, and fixed the date of the earliest part of it at about 1120. The stone coffin with a sculptured face and a cross below was of the fourteenth century, of the same date as the sepulchral arches in the chancel. Mr. Brock's belief was that the church was Saxon in plan, but of very early Norman work done by Saxon workmen accustomed to Saxon plans. He pointed out that whilst the chancel arch was pointed, there was Norman work on the impost. The stone altar *in situ* and having on it five crosses in the curious little vestry opening out of the chancel might be Saxon. Before leaving the churchyard visits were paid to the tomb of the late well-known editor of the *Saturday Review*, Mr. Douglas Cook.

The party now sallied forth on foot to Tintagel Castle. The outlook was glorious, and the sea beautifully calm,—too calm, in fact, to develop the grandeur of the view. "He must have eyes," says old Norden, "that would scale Tintagel;" and the company fully appreciated the difficulties of the precipitous ascent to the great cliff island towering 400 ft. in air, on which the main portion of the castle stands. Prebendary Kinsman, who is the castle Constable, pointed out the most interesting points in the ruins, and expressed his belief that though now separated by the chasm from the mainland, originally there had been full connexion between the island and the cliff line. Tintagel is mentioned by Geoffrey of Monmouth, and its earliest memories are interwoven with the grand myth of King Arthur, the traditional hero of the ancient British, who finds a name and a home in every corner where his race were driven. But whatever may be untrue of the legendary connections of Arthur and Tintagel, this at least may safely be assumed, that the island was once occupied by one of those ancient cliff castles, the almost perfect remains of which will be found in the far West. The strength of the position renders this as certain as any deduction from custom and association could be. No castle of Tintagel is mentioned in Domesday; and it is probable that the structure to which the present crumbling fragments belonged was erected by that magnificent noble, Richard, King of the Romans. The buildings were never very extensive, and the importance of the place consisted in its natural strength. It was dilapidated within a hundred years of its erection, and when it was surveyed by Sir Richard Grenville in 1583 it had long been in a state of utter ruin. In the fourteenth century it was used as a State prison. There do not appear to be any records of actual warfare in connection therewith. The great problem to be solved is whether the island was once an island proper, or, as now, a peninsula, with a very rugged isthmus. In the days when the castle was erected the communication, however, between the outworks on the main cliff and the body of the castle was by a drawbridge; and the idea that the island was originally a detached rock, and that the isthmus is chiefly caused by falls from above, has certainly strong semblance of likelihood, though not held by the reverend and gallant Constable.

The Association were "tea'd" at Camelford, and welcomed to that town by the Rev. Mr. Wilkinson, who is one of the oldest aldermen. The borough was not without interest. Until 1832 it sent members to Parliament, and it was by Camelford that Lord Brougham had been first returned. Lord Lansdowne had sat for it. The first charter was granted by Richard, King of the Romans, and a subsequent charter was given in the reign of the first Charles. Many kind things were said of bright Mrs. Wilkinson before the Association left Camelford.

Jews in Cornwall.

Although the members did not return, as already mentioned, until past nine, it was resolved to hold the usual evening meeting, and a good audience assembled in the Guildhall.

The Rev. Dr. Margoliouth read a paper "On the Jews and clues of the etymology of certain words in the now obsolete Cornish language." In it he claimed to trace philologically four distinct periods during which the Jews lived in Cornwall. He quoted several sentences in old Cornish, and, contending that they could not be traced back to Celtic, Latin, Saxon, Norman, or German, he explained them by a reference to a Semitic origin—the Hebrew tongue. These he claimed as vestiges of early Hebrew settlers in the county at different times. He fixed the first period by finding in Archaic Cornish certain sentences from the Book of Psalms; the second period by sentences from the Book of Proverbs, which became incorporated with the Cornish language; the third period by passages from Jeremiah, being frequently on the lips of the old Cornish people, descriptive of the scattering of the Jewish nation; and the fourth period by discovering passages from the most ancient liturgical services of the Jewish Book of Common Prayer. These Cornish words were similar in form and meaning to the Hebrew, but the word "God" was translated into "the intelligences." Tre, Lan, and other words were said to have a Hebrew origin. Incidentally the author mentioned his belief that the Cornish tin mines contributed in no small degree to the glories of Solomon's temple. Mr. J. Jope Rogers mentioned that Mr. Copeland Borlase had found in the celebrated Bodmin gospels the entry of several undoubted Jewish names. Mr. Godwin, who presided, and Mr. S. I. Tucker (Rouge Croix) spoke of the paper as valuable and interesting, but open to discussion.

Traces of Dan. onia Iegio. Cornwall.

Mr. Kerslake, of Bristol, contributed a paper on "Early Cornish Saints." Among the 200 known dedications of ancient churches in Cornwall, about three-fourths are national or Celtic, and the names are of so local a character, that if met with in any other part of England they would have an uncommon sound, which would excite special inquiry. This large majority was undoubtedly more ancient than those common to all Christendom, and had come in by later influences. They were chiefly intended to honour the memory of some benefactor, who had endeared himself by the conversion of a district, or martyrdom in the attempt. Among the ancient Celtic dedications in Cornwall, besides what might be probably called Damnonium or native, were found a considerable admixture of Armorican, Cambrian, and Irish. The Armoricans and South Cambrians, indeed, seem to have had many of these saints in common; whilst those of Ireland were more the result of missionary settlements along the great south-western estuary of the Severn. They found not only Cornish dedications surviving under West Saxon rule, but those of the other Anglican kingdoms of what was called the Heptarchy, which commemorate the names of saints that were the peculiar favourites of dynasties, which were early distinguished and forgotten. All over the land there were names of men and women that had, from 1,000 to 1,500 years, been grafted into the soil upon which their deeds of patriotism or other acts had been performed. A detailed analysis of the topographical distribution of the dedications within the present century would most likely yield some valuable results. It would, probably, show the first missionary centres in relation to their surrounding offspring, besides bringing to light some other incidents in the ethnical history of the people. Even among the other fourth part, which, at first sight, might appear to be catholic and not national, some had owed their adoption to national influences, or their introduction to ancient intercourse with other Celtic peoples with whom they had already become favourites. The catholic or non-national dedications would probably yield some instructive results by a comparison of their frequency in Cornwall, and in England and in Wales. The Rev. W. Lach Szyrma, of Newlyn, mentioned that the saints of the churches of the shores of Mount's Bay were chiefly Breton, whilst those on the north coast were Irish.

Restormel and St. Neots.

On Wednesday, 16th, shortly after nine o'clock, the archæologists proceeded to St. Benet's Priory, the residence of Captain Searjeant, who hospitably entertained the party, after they had inspected the house and the old tower and archway behind.

Mr. Couch said the house and the round tower were apparently of the Perpendicular period. The tower archway was very much earlier. One authority considered that the place was subordinate to a "foreign convent." Dr. Oliver thought it was nothing but a chapel of "special devotion,"—a mortuary chapel, or something of that sort, as proved by a document of 1335. There was, however, really no history about the place. Mr. Bloxam was of opinion that the remains were of the fourteenth century. Mr. Couch remarked that the house had been connected with the archway by buildings which were removed to furnish building stones for some houses just beyond. Mr. Hine pointed out that the thirteenth and fourteenth-century work was not done in granite in Cornwall, and, therefore, as the tower was granite, he had doubts as to the correctness of the date given. This work was generally in freestone of some sort.

The church of Lanivet has some points of interest. During the last restoration several very curious wall-paintings were destroyed. *Fac-similes* were, nevertheless, preserved by Mr. Borrow, the rector, by means of tracings, and these were described by the Rev. W. Iago and Mr. Couch. One of them represented the Passion, and another was a picture intended to illustrate the release of the imprisoned spirits from the mouth of a terrible monster,—Hades. The remains of the ancient screen were also inspected.

In the churchyard are a couple of fine crosses, both very high and well preserved. One of them displays some curious knotwork, and the figure of a man with one leg, with the toes turned in different directions. This odd figure was ornamented with a kilt, and there was a nimbus above the head. The date is supposed to be the eleventh century, and a stone coffin near the church is credited with the same antiquity.

The members of the Association once more entered the carriages, and at last reached the romantic Castle of Restormel, over the ruins of which they had a delightful ramble.

Mr. Couch stated that Restormel had no mention in the Domesday-book, as its eastern neighbours, Dunbeved and Trematon, had; nor had even the old and respectable stannary town of Lostwithiel a place in that great survey of England, though many of the neighbouring manors were mentioned. Indeed, the name of the town indicated to the Celtic scholar that "Lios," "Llys," is a place or residence, and "Gwyddell," of the woods, points to it as once having been a simple and well-wooded village, where people dwelt who lived a wild and wandering life, in contradistinction, said Mr. Fenton, to the Gâl who lived on cultivated ground. The castle of Restormel in the remotest times of which he had record belonged to the Dinans, or, as they were afterwards called, Cardinans, an opulent and important family in Devon and Cornwall. Isolda de Cardinan, heiress of this baronial family, married Thomas de Tracy, and endowed him with the castle and other great possessions. This Tracy surrendered it and the barony of Cardinan to Ralph Arundell, to be held for Simon de Montfort. In or about 1259, Isolda, in her widowhood, conveyed the manor of Cardinan and other property to Oliver de Dinan, probably a relation. Soon after this Restormel became the property of the Earls of Cornwall. The astute and grasping Richard, King of the Romans, somewhat remarkable for his skill in arms, but still more for his rapid advancement in wealth and honours, obtained from his pusillanimous brother and sovereign Henry III., this castle, with the stannaries and mines of the county, and other large gifts, for the service of two knights' fees. He could not

find that this Richard dwelt there. The custody of the place was entrusted to successive governors, among whom they found the names of Thomas de la Hyde, William de Bottreaux, and John de Carminow, two of them well-known Cornish families, and the last name ultimately connected with these parts. Henry, eldest son of Richard, rightful heir to the earldom, and possessor of the castle, was slain by Guy de Montfort, son of the great Earl Simon, in revenge for his father's death. Edmund, a younger brother, succeeded, and, according to William of Worcester, sometimes resided there; but dying without lawful issue, soon after transferred the earldom to his nearest kinsman, King Edward I. This monarch's incapable son, Edward II., bestowed it on his gallant, but thriftless and audacious favourite, Piers Gaveston, the Gascon. But after his pursuit and murder by "the black dog of Arden," the castle, with its revenues, became the property of John of Eltham, a younger brother of Edward III. This monarch erected Cornwall into a dukedom; and there was ample proof that Edward the Black Prince, and first Duke of Cornwall, visited this castle twice. Since that time the title and large possessions annexed to it were settled on the first-begotten son of the reigning monarch, from the time of his birth. Restormel was built on a natural knoll of the hill, which was much modified by the necessary excavations of the deep moat which surrounds the keep. It was circular, and consisted of two concentric walls, divided by radiatory partitions; the lower rooms apparently for the domestic requirements, the upper for the state apartments. Staircases led to the battlements, from which a fine outlook was obtained. Mr. Couch said he had prepared plans of the castle for verification or alteration. One was from Borlase, which they would find inaccurate in many particulars; the other prepared by himself, which might require correction. He asked them to go further with their friend, Mr. Stokes, in his graceful and airy castle-building, where,—

> "The hall is roofed once more, the stars
> Are turned to lamps, the mullion bars
> Are hung with Norman tapestry,
> And to the sound of minstrelsy,
> Many a gorgeous-vested knight,
> And many a lady rarely dight,
> Over the tesselated floor,
> The mazes of the dance explore."

From Lostwithiel the party intended to visit Llanhydrocks, but at the last moment the route was changed, and they drove through Boconnoc Park, the seat formerly of Pitt, Lord Camelford, but now of Mr. G. Fortescue; and thence to St. Neots, where they visited the handsome church and once holy well named after that saint, though, perhaps, scarcely in a pilgrim spirit. The party went there, however, as antiquaries; and it is the privilege of antiquaries to inquire and to doubt as well as to believe, to sift legends and not to accept them too readily. The painted window of St. Neots Church, though inferior to those at Fairford, in Gloucestershire, are very fine and perfect, and embody the whole history of St. Neot, from his infancy down to the day when, having established a small religious house in Cornwall, he went off to Rome to receive the formal blessing of the Pope. This and other windows, which represent the work of Creation in detail, and the history of Noah and the Deluge, were commented on by Mr. Loftus Brock in a paper which he read in the church to a very attentive audience. There are one or two modern windows; but there are fifteen or sixteen filled with Perpendicular glass, which has been allowed to remain "uncrazed" (to use the Cornish word), in spite of the distinctly un-Protestant character of the subjects. One of the windows gives the story of the Creation, and of the sacred narrative to the death of Adam. In one compartment Enoch is seen placing three grains from the tree of life under the tongue of the dying Adam—grains from which were to spring the tree to be formed into the cross of our Lord. In the adjoining window is the story of Noah. In another is that of St. George, and in another the whole legend of St. Neot is told in a series of small compartments, each with its legend. There are two windows with subjects from the history of our Lord; and the rest are recorded gifts from the "sisters" and "wives" of the parish, and from various persons whose names are mentioned, including one from Ralph Harys; "ex dono et sumptibus Radolphe Harys et ejus labore ista fenestra facta fuit." We have here, therefore, the name of the maker of this, and of many of the other windows, since the style is alike in them. The date is about 1530. Harys's window, and those which immediately resemble it, consist of full-length figures of saints, with a predella below, having a small kneeling figure and a scroll with an "ora pro me." The clearness with which the story is told in all the more elaborate windows, and the manner in which white and neutral tints are largely mixed with colour, deserve special notice, and might well be imitated by modern artists. The windows were in a state of extreme disrepair when they were "restored" by Hedgeland in 1829, at the charge of the then vicar, the Rev. R. G. Grylls. The modern patches are evident; but it is possible that entire destruction was only thus averted, and in any case we cannot be too thankful for what has been preserved to us. Ralph Harys was a good workman.

Cornish Histories.

After the return of the excursionists from St. Neots, at the evening meeting, a valuable paper was read on Cornish histories by Mr. H. Sewell Stokes.

Mr. Herman Merivale, in 1857, pronounced the Cornish histories unsatisfactory, but since then, Mr. Stokes said, Sir John Maclean had nearly completed the parochial and family history of Trigg Minor, and Mr. Lake, of Truro, had published a popular history of the county, containing extracts from authorities, and additional information. These works proved the unabated interests of Cornishmen in their county, and that there was no lack of diligence and industry in authors or of enterprise in publishers. A complete history of a county, as Mr. Merivale looked for, may still be a desideratum, but they were grateful for what they possessed, and some were disposed to think that the historians of Cornwall, whether in former times or in these days, would not suffer by comparison with those of other counties. Richard Carew, of Antony, who disputed with Sir Philip Sydney, at Christchurch, dedicated his faithful and really delightful "Survey of Cornwall" to his cousin, Sir Walter Raleigh, who was their last Warden of the Stannaries. John Norden's historical description of Cornwall was a part of the "Speculum Britannia," and contained maps of the hundred and views of the Church of St. Germans and other places, and a list of names and seats of gentlemen. It was dedicated to James I., and the author borrowed from Carew often, and paraphrased, without improving, many passages. Still, Norden's book was one without which no Cornish library can be complete. Abounding in personal scandal and irrelevant matter was the Parochial History, by William Hals, of St. Wenn, who was diligently engaged on his work from 1685 to 1736. No complete copy of the MS. was known: it was published down to the letter L, and the remainder was lost by the printer at Exeter. It might, however, be possible to complete it. Mr. Davies Gilbert, in his history, gave all that he deemed essential of the MS. Lysons related that the publication of Hals' MS. was suspended by the printer at Exeter for want of purchasers, occasioned by the scurrilous anecdotes it contained and the reflections thrown on some of the principal families. With all his faults, Hals compiled a valuable, and, for the most part, trustworthy history. Mr. Tonkin, of Trevaunance, St. Agnes, a contemporary of Hals, with whom he quarrelled, also wrote a history, copying largely from Hals. Sir John Maclean had his (Mr. Stokes') copy of Tonkin's MS. Next in sequence was the Rev. Daniel Lysons' reference to Cornwall in Magna Britannica, which was still regarded as *the* history of the county, and it certainly was well written, illustrated, and generally accurate. The antiquarian and natural history of Cornwall was published by Dr. Borlase, rector of Ludgvan, in 1754 and 1758, and a new edition was promised, with additions by Mr. W. C. Borlase, who had inherited the antiquarian tastes of his ancestor. Next occurred the name of the Rev. Richard Polwhele, vicar of Newlyn, whose history, contained in two quarto volumes of 1,200 pages, in small type, and extracts in a type still smaller, is a stupendous collection of matter relating to the antiquities, biographies, and history of Cornwall, with original portraits and illustrations of places and monuments. It is scarce. Its defect is the want of a good index, which he had heard was to be supplied. In 1804 Mr. Whitaker published "The Ancient Cathedral of Cornwall," which contained an account of the introduction of Christianity into Cornwall, its saints, &c. Mr. S. C. Gilbert, a druggist, of Plymouth, wrote a historical Survey of Cornwall, collecting the materials, which he afterwards digested in two quarto volumes, in his business journeys through the county. Its publication, in 1817-20, involved him in pecuniary difficulties. It was deservedly regarded as one of the most valuable and reliable of their county histories. Not less deserving commendation was the work of Mr. F. Hichens, St. Ives, and Mr. S. Drew, St. Austell, the latter really being the author. It was published in parts from 1815 to 1824. The chief value of Mr. Davies Gilbert's history was the extracts from the histories of Hals and Tonkin, and the appendix of the fourth volume containing all that was left of the MS. of Mr. W. Scawen, a learned man who represented St. Germans in Parliament, and was Vice-Warden of the Stannaries in the reign of Charles II. The MS. contained a dissertation on the Cornish tongue, as exemplified in a MS. entitled "Passio Christe," in the Bodleian Library; the Itineraries of William of Worcester and Leland; the passages on Cornwall in Drayton's "Polyolbion," &c. Mr. Lake's history has valuable supplementary papers, including extracts from Domesday, and a paper derived from he could not say where, intituled "Personal Campaign of Charles I. in Cornwall during the Civil War of the Seventeenth Century." Besides these histories, there were works on special subjects,—Mr. Wallis's "Register of Cornwall," full of reliable statistics; the Rev. R. Warner's tour in 1809; an itinerary of the late Cyrus Redding, of Helston, beautifully illustrated; Mr. Blight's interesting works, faithfully and skilfully illustrated by his own hands; Mr. W. C. Borlase's "Nemo Cornubia," a valuable contribution to English archæology; Reports of the Truro Institution, which had done excellent work; Mr. Jonathan Couch's "History of Polperro," nearly as pleasant as Gilbert White's Selborne; Mr. Bond's "History of the Two Looes"; Mr. Allen's of Liskeard; the Cassiterides of Dr. George Smith; Trelawny Collins's "Account of the Lost Church of Perranzabuloe"; Mr. Polaue's illustrated edition of "Harvey's History of Linkinborne"; Rev. G. Harvey's "Mullyon"; late Mr. Pedlar's "Episcopate of Cornwall"; Thomas's "History of Falmouth"; Dr. Paris and Mr. Courtney's Account of the Penzance District; Max Muller's Cornish articles on "Chips"; Mr. Halliwell's "Rambles in West Cornwall"; Tregellas's "Haunts and Homes of the Rural Population of Cornwall"; Botterell's "Traditions and Hearth-side Stones of West Cornwall"; and "The Footprints of former Men in Far Cornwall"; and the spirited ballads of the late Vicar of Morwenstow. Respecting Cornish mines and miners, mining usages and customs, there were the pages of Dr. Borlase and Dr. Pryce; Pearce and Tregonning on the Stannaries; the Appendices to the Report by the late Vice-Warden, Sir Edward Smirke, of the case of Vice *v.* Thomas; the works of the late Mr. Jory Henwood, and of Mr. Robert Hunt. The first volume of "Bibliotheia Cornubiensis," published by Messrs. Courtney & Boase, had 400 folio pages, containing the names of the authors of works connected with Cornwall, and another volume of probably larger bulk would soon be published.

Mr. T. Morgan, F.S.A., mentioned that Mr. Stokes had omitted all notice of his own valuable contributions. The Chairman (Mr. Godwin) hoped the visit of the Association would impress on the whole of the inhabitants a sense of the importance of preserving the monuments of past ages which so abounded in the county, and which in so many cases, by unthoughtful conduct, had been damaged. Mr. Stokes, responding to a vote of thanks, mentioned that he had found valuable information connected with Cornish history in out-of-the-way places, such as in Nugent's "Life of Hampden," and in Clarendon's Rebellion.

Three days of incessant hard work under a broiling Cornish sun rather knocked up some of the party; and therefore on Thursday, while the omnibuses and carriages took away to Launceston two-thirds of the company, the other third agreed to remain behind, and, under the guidance of the Rev. Mr. Iago, to visit the temporary local museum, and explore the parish church of Bodmin and some of the ruins which remain to tell how many were once the chapels and religious houses in this "Bod-min," the "Home of Monks."

Accordingly at eleven o'clock a detachment of the archæologists met together at the town-hall, where they were gratified by a leisurely inspection of the interesting specimens of antiquity which had been brought together in

it, the hall being converted into a temporary museum. The walls were hung around with a large array of rubbings of monumental brasses, and of inscriptions taken from the many monoliths and crosses which abound among these Cornish hills, while under these again was a fine exhibition of portraits of Cornish worthies, mostly from the collection of Mr. Stephen Tucker (Rouge-Croix), of the Heralds' College. The town-hall contained also other treasures, which had been carefully selected and arranged for inspection, the greater part of them being loans from gentlemen connected with the county and duchy of Cornwall. Among them were about five-and-twenty fine rubbings of Cornish stones, mostly monumental, and of the Romano-British period. Among the chief of these were the "Men Scryffa" (or inscribed stone) of Madron, near Penzance; another from Slaughter-bridge, near Camelford; another from Bleu-bridge, near Gulval; the Phillack Stone, the Lanivet stone, the Mawgan (Roseworthy) stone, the St. Clement's, Doidon, and Cardinham stones, mostly with Romano-British legends; and also the Castle-Goff stone, with a legend in Anglo-Saxon. In another part of the room were shown the breastplate of one of the Bevills, several querns and mullers of the British period, the original ivory "ciste," or chest, already mentioned, which once contained the bones of St. Petroc, and in which they were brought back from Brittany when stolen, towards the close of the twelfth century. This, perhaps, is the most interesting reliquary now to be found in England. There is one of a similar character in the South Kensington Museum, but smaller. A curious measure of bronze or bell-metal, of the reign of King Charles, has the Scriptural legend, "With what measure ye mete, it shall be measured to you again."

From the town-hall it was a walk of only two or three hundred yards to the parish church, built over the original well of St. Gueron, and on the site of the monastery, which is said to have been occupied by St. Petroc. The water from this well flows without intermission, summer and winter, and is never known to fail. The church itself is the largest in Cornwall, and is at present undergoing a substantial restoration, from the west to the east end, at the estimated cost of about 6,000*l.*, towards which only about 1,200*l.* has been collected. The edifice dates from about 1490, and is a fair specimen of Perpendicular architecture. The works appear to be at a standstill.

A large party started for Launceston, intending to visit Dozmare-pool on their way. Their road lay along the "backbone" of Cornwall, the high moorland which so discomposed Gilpin. The views, however, are grand, and the air so bracing that, in ordinary weather, the journey would have been delightful throughout. The halfway house, the Jamaica Inn, was reached safely, and while the horses were resting some of the company set out for a walk of about two miles over the moor to Dozmare. This and the return to the inn had barely been made out, when a thunder-storm, which had been for some time threatening, broke out, accompanied by heavy rain. One or two had lingered at Dozmare, and had walked thence back to Bodmin. These saw the enchanted pool under the most striking, if not the most agreeable, circumstances:—

"The many knotted water-flags,
That whistle stiff and dry about the marge"

were lit up by zigzagging flashes of lightning, and the thunder rolled over the mere as though the giant Tregeagle, who haunts the place, was angry at the invasion of his territory. In spite of the storm the journey was pursued to Launceston, where the mayor received and welcomed the Association, and where the castle was visited and explored so far as the rain would allow. A paper on the Castle of Launceston had been read by the Rev. J. Wilkinson, at the Jamaica Inn, to those of the party who did not dare the adventure of Dozmare. The return to Bodmin, in rain and thunder, was safely accomplished at about half-past nine. In the evening the mayor of Bodmin welcomed the Association, at the Guildhall, and a *conversazione* was held.

A short paper "On the Horn of the Celts" was read by Dr. Phené. Compliments were duly exchanged between the Mayor of Bodmin and the Archæological Association, and the Bodmin portion of the Congress was concluded.

Truro.

On Friday the members proceeded by omnibus to the Bodmin-road station, and thence by special train to Truro, where carriages in waiting conveyed them to the Royal Institution of Cornwall. There they were received by the President (Mr. Jonathan Rashleigh), Dr. Jago, and Dr. Barham. The former bade the Association a hearty welcome to the town and to the museum, which contained many curiosities illustrating the antiquities of the county. It was a very great privilege for them to receive the visit of a learned body such as the Association, who were interested in those subjects which attracted the attention of the members of the institution. He trusted that a great deal of benefit would be derived from the visit of the Association, and was of opinion that much advantage would result from the light thrown by the members of the Association upon matters which must always to a great extent be shrouded in mystery.

Mr. Rashleigh then drew attention to a number of curiosities displayed on the table. One was a large block of tin in the form of an astragalus (or knuckle-bone), being 2 ft. 11 in. long from the extremities, 11 in. wide, and weighing 158 lb. This was dredged up at the entrance of Falmouth harbour, near St. Mawes, about the year 1822. The chief interest attaching to this block was because of its pecular form. Diodorus Siculus, the contemporary of Julius Cæsar and Augustus, said that the inhabitants of the promontory of Bolerium (the most western part of Cornwall) cast the tin into the form of astragali, which they carried to an island in front of Britain, called Ictis, which was left dry at low tides, and whence the tin was taken to Gaul, over which it travelled in about thirty days to the mouth of the Rhone. This Ictis was generally supposed to be St. Michael's Mount, and the finding of this peculiarly-formed block confirmed the supposition. The peculiar form made it well adapted for transmission either on horseback, as the ballast of a boat, or by the hands of men.

Upon leaving the museum, the party proceeded to Truro Quay, and in the steamer *Lyoness* cruised down the Fal. The trip was a highly enjoyable one, and universal admiration was expressed at the beautiful scenery and the lively surroundings. Carriages were in waiting to take the visitors to Pendennis Castle, which frowned out commandingly above the noble peninsula.

After a dinner at the Royal Hotel the members of the Association proceeded by the last train to Penzance.

Dr. Jago, during the stay at Truro, favoured some of the members of the Congress with an inspection of his beautiful collection of Spanish tapestry of the time of Charles I., brought over by General Jones at the last war, and which are heir-looms in Dr. Jago's family. There were several yards of silk needlework laid on black velvet, showing beneath Roman arches, and a number of birds and animals, the characteristics of which were well preserved; pieces of tapestry of a similar character, the details being remarkable for their drawing and the extremely accurate manner in which the botanical characteristics are given; and a quantity of lace of various patterns, and a number of old garments apparently belonging to the last century.

With regard to Dozmare, mentioned above, with its legends of Tregeagle and his hol(e)y limpet; and its mythical association with the death of King Arthur, so touchingly and beautifully told by the laureate, and so quaintly set forth by the fine old author of "Mort d'Arthur," Sir Thomas Malory, all who have read Tennyson know of the arm which,—

"Clad in white samite, mystic, wonderful,"

flashed from the bosom of the lake to receive the famous Excalibur flung therein by the reluctant knight. Few, however, are acquainted with the tale as told by Malory, who recounts how, after Sir Bedivere had twice essayed to throw Excalibur, in obedience to Arthur's command, into the water, and twice, tempted by its nobleness and richness, had hid it, and told the dying King that his will had been obeyed, and there was nought to see, but the water wap and the waves wan; and how then, touched by the rebuke of his master, "Sir Bedivere departed, and went to the sword, and lightly took it up, and went to the waterside, and there he bound the girdle about the hilt. And then he threw the sword into the water as far as he might; and there came an arm and a hand above the water, and met it and caught it,—and so shook it thrice and brandished. And then the hand vanished away with the sword in the water. So Sir Bedivere came again to the King, and told him what he had seen. 'Alas!' said the King, 'help me from hence, for I dread me I have tarried over long.' Then Sir Bedivere took King Arthur on his back, and so went with him to the water's side. And when they were at the water's side, even fast by the bank, hoved a little barge with many fair ladies in it, and among them all was a Queen." And thus Arthur went away from Dozmare into the vale of Avilion.

On Friday night the Association reached Penzance, and slept opposite beautiful Mount's Bay, with St. Michael's Mount to the left. On Saturday morning they started to visit the Land's End;—the land of ferns and boulders.

There was no lack of antiquities on the way. At Trembath was seen by the roadside one of those ancient crosses which, in the fourth, fifth, and sixth centuries, were placed on the paths leading to the church. This now stands near the church-path of Madron. Afterwards, just inside the hedge, was seen a monolith, locally called a piper, and which, according to the legend, is one of the pipers who, whilst running away, were turned to stone, with the maidens, for dancing on a Sunday at Boscawen-un.

The pre-historic remains at Boscawen-un were exceedingly interesting. Mr. W. Copeland Borlase, F.S.A., described it as a typical circle for this part of Cornwall, and 70 ft. in diameter, consisting of the usual nineteen stones. Generally, however, the Cornish circles had a pillar-stone at the side; but here it was within, but not in the centre, being a little to the south-west, and inclined. Another remarkable thing about the circle was that in the east there was a cromlech, which some time ago was opened by the Penzance Natural History and Antiquarian Society, nothing whatever being found. In the remains of a barrow they found in a cavity, under a flat stone, resting on the natural soil, burnt human bones and bronze rivets, apparently of a dagger, sometimes found in the Cornish barrows. Just beyond the circle was one of the most interesting barrows in the county. It consisted of a circle of stones, and the centre was a square-looking and very large rock, with a flat top, and in the centre a hole. It was called the Money Rock, and people said that at the time of the plague people brought their money and passed it through the hole to some one else. Mr. Borlase, however, did not credit this story; for it seemed to have been the place were bodies were burnt; for on opening the barrow, then very much dilapidated, and showing the surface of the centre stone, a great quantity of burnt earth was found on the stone, and in the trench between the circle and the stone were discovered the remains of three Celtic urns, with the usual chevron pattern. The circle was mentioned in history, in a Welsh triad. There were traditions and traces of a battle having been fought at this spot, and the circle might have been erected to commemorate it, and used afterwards as a place of burial.

At Carwg-an-wra was seen a cross similar to the one at Trembath, and at Mayon, the Maen table-stone, on which, according to tradition, seven Saxon Kings once dined. The same story predicts that when a similar event happens again the world shall come to an end! Sennen was soon reached after this, and the party left the carriages and crowded into the little church, where Mr. Symons, the churchwarden, mentioned that the remains of an old chapel still existed at Sennen Cove. In 1807, 400 Roman coins of copper and metal were discovered. Attention was directed to a singular wall painting on the south aisle discovered in the recent restoration. The design is identical with the corporate seal of Marazion, and Mr. Symons suggested that it formed a background to some memorial of the St. Aubyn family, who hold considerable property in the parish. Mr. Bloxam said the painting was of the fifteenth century: this corresponded with the age of the main body of the church, which appeared to have been built in the fourteenth, and remodelled in the succeeding century. In the north transept was a statue very much mutilated, but which, he thought, represented the Virgin Mary with the infant Christ in her arms. It was observed that the church did not stand true east and west, but in a line with the rising and the setting of the sun, not on St. John's Day, the 24th of June, but on the 29th of August, the day of the saint's decollation. Attention was drawn to a long stone filling a slit in the south wall of the chancel wall, through which, according to a tradition cited by Bishop Jenner, a tithe of milk was paid. In the north wall of the churchyard was seen a peculiar stone, which might have been a socket of an ancient

cross, and in the hedge of a field opposite the church a very good specimen of a holed stone, which has never been recorded. Mr. Symons suggested that the joining of hands in the hole made a contract binding between the ancient inhabitants.

Land's End: its History.

In a few minutes the Land's End was reached, and the scene of its impressive grandeur was before the Association, who were not slow to appreciate the beauty of the downs, clothed in heather, gorse, and thrift, trending down to cliffs presenting a stern, broken front to the restless sea, foam-fringed; and of the bright sea, beautifully coloured near the shore, and dotted with ship and steamer beyond. Just off the land were seen the Armed Knight, the Longships, and the Brissons, and faintly on the horizon lay the Scilly Isles. When all were seated on the boulders, on the edge of the cliff, in full view of this delightful scene, the Rev. Mr. Lach Szyrma read "Notices of Land's End in History."

The reason why the spot whereon they stood—the westernmost point of Great Britain—should not abound in antiquities was not, he said, difficult to discern. In ancient days there were two main reasons which fixed population: first, fertility, that was the means of living; and second, safety, that was the natural strength of the place. The latter perhaps availed more even than the former, and hence they had their cliff castles, such as Treryn, or hill castles, such as Castle-an-Dinas, which, though now deserted, were marked with remains of a past population. A moment's glance would show how neither reason availed at the actual Padn-au-Lase. It was now certainly a spot of no fertility, and from its blunted form of not very great natural strength. Tintagel or Treryn was immensely superior for a cliff castle. So, probably formed as it now was, their remote ancestors thought the Land's End a most unattractive place. Still it was mentioned in the Classics. He really thought it must be the Bolerium of Ptolemy, and perchance Cape Cornwall over yonder, was the Antivocotium of the writer. There then on yon waters the Roman and possibly the Phœnician ships must in ages gone by have sailed. The tin ships more than a thousand years ago may have passed over those waters. The fleet of Agricola almost certainly in their circumnavigation of Great Britain must have gone round those capes. The splashing oars of the galleys, the beaks of the tiremes, must have been once seen from where they stood. As to the Saxon invasion, the legend talked of Athelstan in Buryan and at Scilly. Of the Danes there seemed to be more than legend. The neighbourhood of the Land's End would seem particularly suited to the hardy Vikings. Sennen Cove would seem just the spot the old sea kings would love. So remote, so sheltered, so hidden by hills, such a capital strand to pull up their galleys there for them to land and commence depredations. And so tradition presented a colony of Danes, whose blonde hair marked them from the Celts around, to have settled in Sennen. In many parts of Penwith the aspect of the people shows a mixture of Scandinavian blood quite distinct from the Celtic aspect of the inhabitants of the mining districts, where the true Cornish is to be found. Perchance some of the Newlyn fishermen who sailed in a common fishing-boat to Australia had some of the Viking blood in them. The Norman Conquest had not much to do with the Land's End. Those moors were not rich enough to be recorded in Domesday, though the estate of Eglosberrie, belonging to the canons of Buryan, was there recorded. The mysterious statement so often repeated in the county history, that King Stephen landed at Land's End, he could not verify, and though he had not found definite evidence of it, the story of King John's landing, on his return from Ireland, would seem more authentic, as John certainly gave a charter to Helston, and was, as Earl of Mortain, connected with the county, as also his son Richard, King of the Romans, Earl of Cornwall. If it might be doubted that real kings did honour the Land's End with their presence, a would-be king, Perkin Warbeck, was either there or at St. Ives. If there was any foundation for the legend of the visit of a queen to Bur-nu-hal, might it not be Catherine Gordon, who stayed at St. Michael's Mount, as a queen, during her husband's campaign to Bodmin, and thence into the heart of England, ending by his defeat, imprisonment, and, ultimately, execution. The "White Rose" was taken prisoner by Lord Danbury, and pardoned by Henry VII. Sennen Church, like so many of the West Cornish churches, was erected during the wars of the Roses. During the middle ages an iron spire stood on the rock "The Armed Knight." Some thought it was put up by the Romans, others by Athelstan, but it was most probably mediæval, and in 1647 a great storm knocked it down and a great part of the rock with it.

The Land's End delighted all; and here the Mayor and Corporation of Penzance charmingly entertained the company. On the turf immediately cresting the rock masses which guard this grandest of British coasts rose a tent, which seemed full of agreeable promises. But the reality, when at last disclosed, left all such promises far behind. The Mayor, in his "collar of gold," presided over a feast which, on that wild spot, reminded one of the banquet supplied to Aladdin on the rubbing of his magic lamp. Soups and entrées, iced pudding and creams,—to say nothing of champagne and claret,—are comforts and consolations which no one expects to find springing up in a wilderness of rock and water. But here they were; and whatever memories of their visit to Cornwall may be carried to their homes by the archæologists, they will surely retain grateful recollections of the Mayor of Penzance, and of his most welcome hospitality.

Once more away; so that Penzance may be reached in time for an evening meeting. There is no rest for the wicked (any more than for the good) amongst archæologists with a programme.

In St. John's Hall accordingly at night Mr. R. N. Worth read a paper entitled,—

The Ancient Boroughs of Cornwall, with Notes on their Arms and Devices.

Years turned politics into history, and made partisanship archæology. Had the British Archæological Association been in existence and a congress held in Cornwall half a century since, this subject must have been avoided. Angry passions would have been roused by the merest hint thereon, and the meeting whereat it was introduced would have been far more lively than pleasant. But the old system had been dead so long, that the peculiarities which made Cornwall famous in the electoral history of England were in the recollection of very few. Prior to the date of the first Reform Bill, Cornwall swarmed with Parliamentary constituencies. He would not say that every fishing village and every hamlet sent representatives to the House of Commons; but the diggiest and meanest did. Before the disfranchisement in 1824, the most shameless bribery and corruption prevailed in the village of Grampound. Cornwall contained twenty-one Parliamentary boroughs, and with the two knights of the shire returned forty-four members, one less only than the representation of the whole kingdom of Scotland. In two instances what was practically one town was, by an ingenious process of subdivision, made to return four members. The total population of the twenty-one borough constituencies half a century ago did not reach 40,000; and they had between them less than 2,000 voters. In only half a dozen instances were there more than fifty voters to a borough, and in two cases there were less than ten. This very remarkable endowment of political power arose entirely from the connexion of the county with the Crown through the duchy, as Borlase in "Antiquities" clearly proved. Originally Cornwall was not more favoured than other counties, and only seven towns therein contributed to the Parliaments of Edward I. Five of these still retained their privileges; while of all those added subsequently only two survived. The ancient constitution was thereby substantially sound. From the time of the early Edwards no change was made in the Parliamentary representation of the county worthy of note, until Edward VI. commenced borough making, which was continued during the next two reigns, the duchy in all three vesting in the Crown. Enough, however, of politics.

On Relics of Baal-Worship.

On this subject, the Rev. S. Mayhew read a paper. The ages connected with the mystic circles and logan stones of Cornwall, with cromlech and hut village, with Druidical rule and rites, affected them by a peculiar power. Their monuments of a grey antiquity acknowledged a rivalry only in the solemn relics of the wastes of Anglesea. But the lingering traditions of ancient Cornwall do more than the monuments of Mona's Isle: they bring us in presence of those days when "the first ships of Phœnicia cast anchor on those shores, bearing to the western isles, with articles of barter and the price of trade, the elements of a religion destined to unite the coasts of the tideless Mediterranean with the sea-vexed isles, and rites destined to survive in form and popular custom, more or less obscure, in eras of a pure faith and promulgation of a divine revelation. Surely, then, some notices of a worship dating its origin probably before the Noachian deluge, flourishing with fast hold on eastern nations, and lingering still amongst Christian peoples in shadows and echoes, cannot be uninteresting or out of place in this county—its cradle and scene of its youth and strength. In Penzance it was a custom on the 23rd of June to light a bonfire, and when it was consumed the illumination was continued by blazing torches carried in procession until the "eye" was formed through which passed the long line of these Midsummer revellers. This custom was but a degenerate observance of ancient Baalitic worship—wrought out in other places and days more remote to a more complete resemblance of the festival by spreading beneath the open sky a table laden with provisions, to which the torch-bearers were invited. The antiquity of the worship and service of Baal was proved by the inspired record, as well as its rapid growth among the Israelites, until the image of Baal occupied or usurped the throne in the holy sanctuary, and houses dedicated to the sun. The worship was celebrated chiefly on high places, where an emblematic fire perpetually burned, or the rays of the morning sun fell first on the elevated temple. The western progress of these idolatries brought them amongst people rude and uncivilised, losing entirely the original, and substituting cruel and inhuman rites. The worship of the life-giving element was lost in that of the destructive. This demanded fiery purifications and immolation of human victims—and the postulant for holiness was passed between two fires or through the flame itself. At first the object of adoration was presented without material form on many a hill-top—priest and worshippers greeted the rising lord of day. Hence arose hereafter his hill altars. The fearful Moloch of Kinnom, and African coast, the calf relics, found in recent excavations in Jerusalem, the tops of the horns of young bullocks found in the cottages of the western Irish with ascription of mystic powers, and three previous relics (produced) of Celtic reverence and Phœnician idolatry exhumed far below the streets of London, were all telling the same story of Baalitic worship. The second part of the rev. gentleman's paper, which was exceedingly well received, was a recital of facts of singular interest, illustrating the "ingraining of Baal" with popular custom, particularly in Ireland, where the annual farm-rents were still called by the farmers "Cios na Beltaine"—the rent of Baal's fire.

A discussion followed. The Rev. W. L. Lach Szyrma pointed out as curious that whilst there were no remains of the floral worship described by ancient writers, there was no record of that fire-worship of which in Cornwall and elsewhere there were remains. Too much dependence could not be placed on the frequent occurrence of the word bal or bel in Cornwall, as bal simply meant a mine or work. Mr. R. N. Worth, F.G.S., mentioned that at Polperro now, at the summer solstice, fires were lighted, and the children ran through the fire. Bal was originally applied to stream-works and hael to pit-works. Mr. W. C. Borlase asked if the relics found in Cornwall, and reputed to be Phœnician, could be identified with relics found in other places where the presence of the Phœnicians was more certainly established than in Cornwall? The Rev. Mr. Mayhew said the objects he had produced were all found at places which had remains of Baalitic worship in local customs. Dr. Phené, F.S.A., stated that in French museums were to be seen examples of those articles which they had been in the habit of considering Phœnician, and which were found on the track taken by the Phœnicians, when, after the destruction of their fleets, their trade in tin with England was carried across France from Brittany to Marseilles. All people who had any religious worship worthy of the name were in the habit of dedicating all they considered valuable to their deities, and was it not probable, therefore, that the Phœnicians, who traded with the Cassiterides for tin, which was the grand important article required for Roman arms and armour,—and as valuable as gold is now,—gave to the source of their wealth the name of their god Baal, and hence bal, a mine-work? The Rev. Mr. Mayhew believed that the stone circles

visited that day were erected for the worship of the sun, and Dr. Phené fully concurred.

A paper by Mr. Henry Jenner was also read, on "The Ancient Cornish Language," but we cannot now afford more space to the Association, so we must break off, and try and find room in our next for the remainder of the record.

THE UNIVERSAL EXHIBITION OF PARIS, 1878.

M. Krantz (not M. Krautz, as printed in the last communication) has now been appointed engineer-in-chief of the Paris Universal Exhibition of 1878, and he has under him other commissioners to direct the construction of the various departments of the building. Now may be seen on the Champs de Mars six firmly placed stakes, about 3 ft. or 4 ft. high, marking the level of the enormous flooring of the future Exhibition, a level which precisely corresponds with the lowest step of the Trocadero. So far the Exhibition builders have fairly broken ground, but it will not be until the 1st of September that further works will be proceeded with on the spot, when the first erections will consist of the offices of the administration, which are now temporarily occupying No. 4 of the apartments of the Palais de l'Industrie, and where a staff of officials is already accumulating, from whom much information may be obtained.

It is possible that M. du Sommerard, who in 1867 was delegate of *beaux-arts*, and, as will be remembered, general commissioner for London in 1870, will hold a very conspicuous place in the administration of this enormous transaction.

There is no chance here in Paris of any of that either real or affected indifference which has existed, or appeared to exist, in England on the subject of great exhibitions, since the memorable year of 1851. Here, one never finds people complaining that exhibitions bore them; they are here a delight to all, and few manufacturers complain of their losses, while the whole industrial and pleasure-seeking world rejoices at the prospect of a sight which it is expected will surpass the glories of the Imperial world's show. Prince Bismarck, however, is not of this opinion, for we hear that the other day, on his receiving a deputation of Prussian workmen, who sought his advice with regard to their action in contributing to the Paris Exhibition, he received the deputation coldly, and snubbed in the most decided manner any idea of the German government giving its recognition to the project.

From this moment until the 1st of May, 1878, not a day will be lost by the methodical organisation that is already developing itself. Officialism here partakes of the beauty that surrounds one everywhere, and out of the utmost disorder it contrives to develop a system that seems to work admirably.

The Minister of Agriculture and Commerce (M. Teisserenc de Bort) has addressed from Versailles a model circular to the various *préfets* throughout the country, calling upon them to immediately put themselves in communication with the heads of every branch of industry throughout their department; and in this way every *arrondissement*, every *canton*, and every *commune* will be able to contribute information relating to the interests of the Exhibition.

It was the Exhibition of 1867 that made Alma Tadema's splendid work familiar to us; that at Kensington in 1872 brought Regnault's two great pictures to England,—the portrait of Prim, and the "Headsman;" and who knows but that this forthcoming Exhibition may show us another Regnault, to whose memory, by-the-bye, the Parisians have just erected a monument at the École des Beaux-Arts, inaugurated by M. Waddington; and from Henri Regnault, regarded as the highest development of modern French art, down to the smallest workers in mechanical dexterity, creative activity will reign everywhere, down to the smallest ingenious contriver who is certain to bring out something which we hope may be more amusing, it can scarcely be more general, that the little miserable musical instrument (we suppose we must call it so), the *cri-cri*, which is now in the hands of two-thirds, perhaps, of the Parisians. By the time of the Exhibition the *cri-cri* will have long since given way to some other popular trifle, although we fear that we have in England in the meantime to endure its wretched chirp; for its inventor, who, shame to the profession, is a musician himself, has patented it for all civilised countries.

In the allusion to the proposed tower (p. 779, *ante*) on the Trocadero, its name was misspelt, it should have been the Acrobète; but little is said about it, and it is not likely, we hear, that it will be erected by 1878,—if ever.

Paris.

NEW MONUMENTS IN EDINBURGH.

Last week two public monuments were inaugurated in Edinburgh,—one in honour of the Prince Consort, and the other of Dr. Livingstone, the African explorer.

The Prince Consort Memorial was designed by Mr., now Sir, John Steell, R.S.A., the arrangement and grouping having apparently been suggested by the monument to Frederick the Great at Berlin, being an equestrian statue surrounded by subordinate groups at the angles upon a lower level.

The entire height from the ground to the crown of the head is 32 ft. The pedestal, which is 17 ft. high, is composed of polished Peterhead granite, in large blocks, and is perhaps the finest example of the kind in this country. It is adorned on its four sides by bas-reliefs and insignia in bronze. The horse and figure, which together are 15 ft. high, and the bas-reliefs, were executed by Sir John Steell himself; the other portions he entrusted to brother-artists.

The site chosen for the monument is a most appropriate one, in the centre of Charlotte-square, and as seen from the east, along the vista of George-street, with St. George's Church as a back-ground, the effect is highly satisfactory.

The Prince is represented in a field-marshal's uniform, seated erect in the saddle; his right hand hangs by his side, and holds his plumed hat, and in his left he holds the reins of the steed, which stands on all fours, with its neck, gracefully arched, showing just sufficient action to take away any feeling of stiffness, and, as seen from all points of view, the lines compose gracefully. The statue is represented looking to the south, and the bas-reliefs represent respectively the marriage of the Queen and Prince, the Royal pair in the domestic circle, the opening of the Exhibition of 1851, and the Prince distributing prizes to distinguished students. These bas-reliefs strike us as the least effective and satisfactory part of the work. At the base of each of the bas-reliefs are ornaments in bronze, representing the badges worn by the Prince, his heraldic bearings, and the emblems of peace and war. The four angle groups each consist of three figures of the size of life, and represent different grades of society paying their tribute of respect to the memory of the Prince, by placing wreaths upon the pedestal of the monument. Although designed by others, they were subject to the approval and suggestions of the original designer, so that the whole should be in harmony. Two of these have been entrusted to Mr. D. W. Stevenson: that at the south-east represents a labourer, his wife and child; that to the north-east the professor, the artist, and the student. The group to the south-west is by Mr. W. Brodie, R.S.A., and consists of the figures of a peer in his robes, his wife and child; and in that at the north-west angle we have a soldier, a sailor, and an engineer. These groups are all composed so that the lines carry the eye inward and upwards towards the principal figure, but they display considerable action and individuality of treatment, the first and last-mentioned especially.

The promoters have no reason to regret the long delay which has occurred in carrying out the monument, which is a worthy addition to the attractions of the city.

The proceedings at the inauguration by her Majesty passed off in the happiest manner, and the general feeling is that the honour bestowed upon the sculptor is deserved.

On Tuesday, the 15th instant, the statue of Dr. Livingstone, the African traveller, was unveiled by the Lord Provost of the city, in presence of a number of the subscribers and others. The statue is placed in the Prince's-street Gardens, immediately to the east of the Scott monument, and at once strikes the eye as being too small for the situation, being only about 8 ft. in height. The explorer is represented in a free and easy sort of costume, such as he may have worn during his travels,—something like the Garibaldi uniform, with the addition of a short loose cloak over the left shoulder. In the broad belt which encircles his waist is stuck a revolver, and a small courier bag is slung by a strap from the shoulders; substantial laced boots encase the feet, and leather gaiters protect the lower limbs. In the right hand is held a Bible, and the left rests upon the shaft of an axe. Stability is given to the figure by the stump of a palm-tree, over which is thrown a lion's skin, and on the ground lie a sextant, an elephant's tusk, and other accessories.

As seen right in front, the figure appears well posed, and the action energetic without being violent, but from other points of view,—especially from the lower elevation of the Waverley Bridge,—the lines do not combine so well, and, as already stated, the situation is not a happy one for a figure of the size. The pedestal too, which is almost a cube, adds to the effect of littleness; one circular on plan, and rather higher, would, we think, have been more suitable. Placed in a more confined space, such as a quadrangle, the statue, which is boldly modelled, would have appeared to much greater advantage, and the effect of littleness would not have been so apparent. Mrs. D. O. Hill is the sculptor.

UNDERGROUND RAIL IN PARIS.

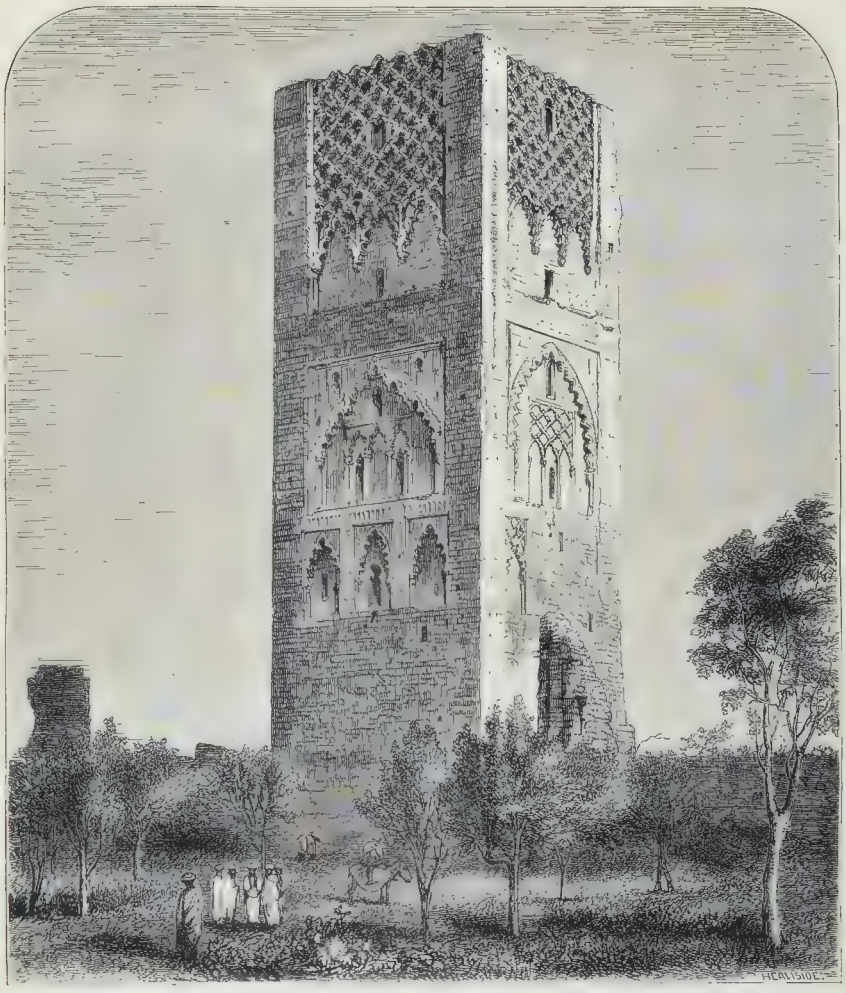
A committee, under the presidency of M. Ferdinand Duval, has been appointed to study the possibility of constructing an underground railway in Paris, and several meetings have been held to that effect. Five schemes were submitted and discussed, each proposing to unite the chief railway stations of Paris to a number of lines which would terminate at some central station, to be built either under the Louvre, the Halles, or the Opera. It is suggested that the railway should run under the boulevards, the faubourgs Saint Martin, Saint Dénis, Montmartre, and the Rues de la Chaussée d'Antin, de Rivoli, &c. The chief impediment is the difficulty of crossing the Seine, and the commission is in favour of building three covered bridges over this river. Such are the vague outlines of the schemes which have found most favour, and which will probably be brought before the public at no distant date. The committee is now studying the details elaborated in more minute plans. We should mention also that several eminent engineers came over to London during the months of May and June to visit our metropolitan railway, with a view to the construction of some similar means of communication in Paris. Among these gentlemen we were able to note the presence of M. Alphand, Director of the Travaux de Paris; MM. Buffet, Grégoire, and Huet, Ingénieurs des Ponts et Chaussées; and M. Hochereau, Chief of the Public Thoroughfares Department.

THE COST OF WIDENING THE HARROW ROAD.

The widening of Harrow-road is amongst the improvements which are about to be carried out in different parts of the metropolis, and the large sum which it will cost was incidentally stated at a recent meeting of the Paddington Vestry. Mr. Braid, one of the members, complained of the delay which had taken place in carrying out the improvement, and urged that the Metropolitan Board of Works should be pressed in the matter. Mr. Roche, the representative of the vestry at the Metropolitan Board, observed, in reply, that the improvement was one of a series of improvements the cost of which would exceed two millions. No time had been lost respecting the Harrow-road improvement, the claims sent in in connexion with which amounted to 168,000*l.*, and settlements to the extent of 123,000*l.* had taken place. Almost all the properties had been acquired, and absolute possession of the whole must be given by September 29th. The houses would then be sold, and the work commenced.

THE TOWER OF HASSAN, RABAT, MOROCCO.

In our present number we give a view of the Tower of Hassan at Rabat. This edifice, beside being a fine example of Moorish art at its best period, is of extreme interest from its historical associations, it being one of three similar towers built in the twelfth century by the Sevillian architect and mathematician, Al-Geber, by order of the renowned sultan, Yakûb-al-Mansûr, the companion towers being the Koutoubyn tower in the city of Morocco, and the well-known "Giralda" at Seville. The cost of the erection of these towers, the magnificent mosques of



THE TOWER OF HASSAN, RABAT, MOROCCO.—Twelfth Century.—Al-Geber, Architect.

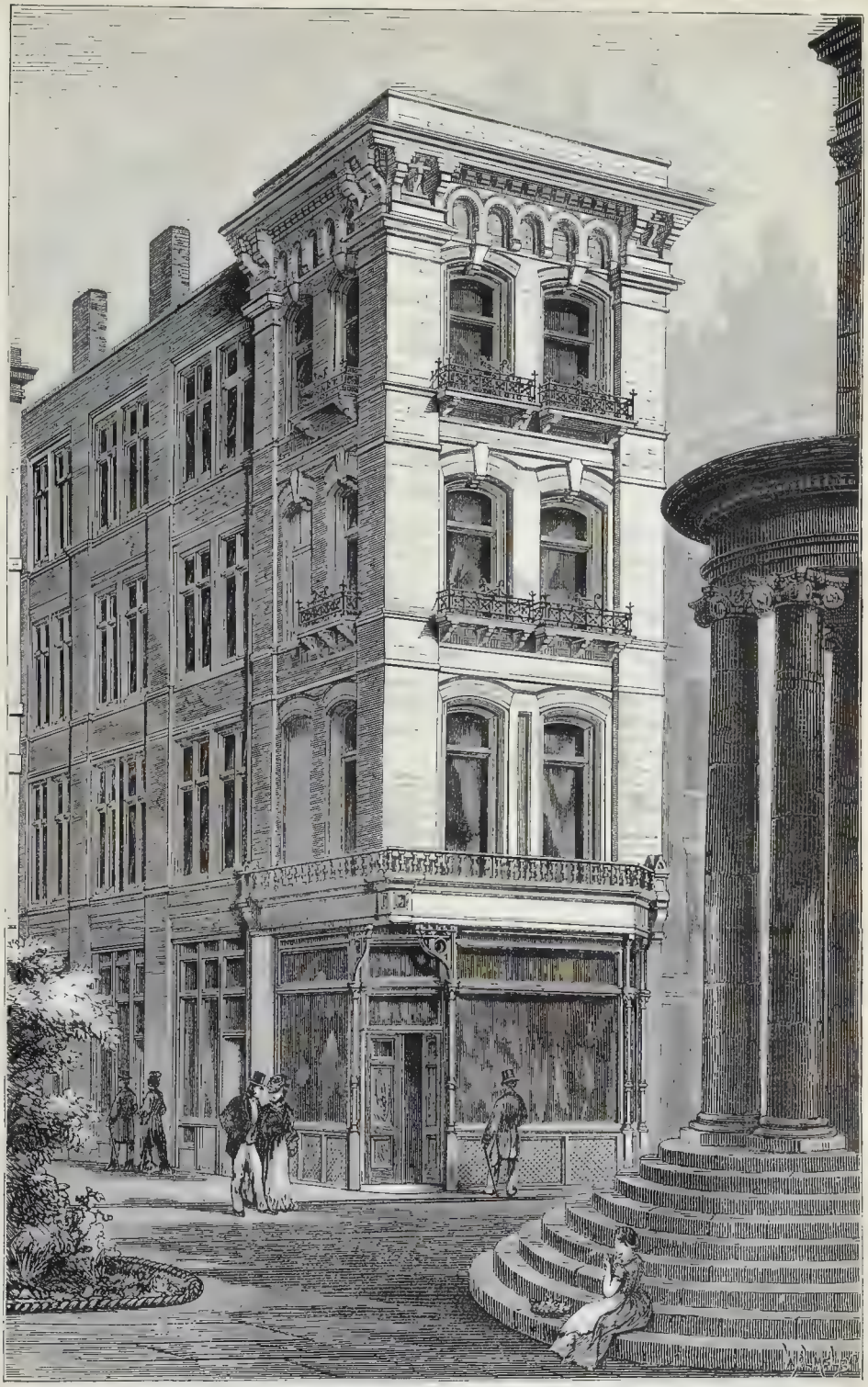
which they formed the minarets, the city of Rabat and the citadel of the city of Morocco, was defrayed from the booty captured from the Spaniards at the battle of Alarcos in 1194, which was of such value that we are told that no more than a fifth part was required to pay for these great public works, in the erection of which forty thousand Christian slaves were employed, to whom freedom was granted on their completion.

The Hassan tower is situated about a mile from the mouth of the river Bou-Regreg, which runs between the towns of Salee and Rabat, and being on high ground, it may be seen from many miles to seaward. The ruins of the mosque, of which it was an appendage, still occupy a large area on the south side. The roof of this mosque was supported by three hundred and sixty columns, many of which are still standing, though the greater number are lying prostrate, and overgrown with trees and shrubs. The walls of the tower, which are of hewn stone throughout, are of great thickness, and externally decorated with those richly-carved arabesques which, in the sister tower at Seville, have been aptly compared by a recent writer to Mechlin lace petrified. Light is admitted to the interior by a number of windows and loopholes differing in form in each story, but all equally elegant in design and workmanship. The interior of the tower is composed of five square apartments, having ceilings of stucco, richly ornamented in patterns similar to those in the Alhambra at Granada. The ascent past these apartments to the summit of the tower is by means of a spiral inclined plane, such as in many such edifices takes the place of stairs, so that a horse might be easily ridden to the top,—a feat which is said to have been performed at Seville by a Scottish knight, who in this manner ascended the Giralda, and proclaimed from the gallery, whence the mueddin had been accustomed to call the faithful to prayer, the capture of the city by the Christians, under San Fernando, in 1248. This inclined plane in the Hassan tower is, indeed, so wide that three horses might go up it abreast, or a carriage might be driven to the top.

The tower was in perfect preservation in the middle of the last century, but since that time it has suffered much damage from lightning, as well as from the destructive propensities of the Moors, who unscrupulously destroy their most interesting national monuments for the sake of the building materials of which they are composed. It is nearly 60 ft. square at the base, and its present height is somewhat under 200 ft. When complete it was probably 100 ft. more lofty, most likely being surmounted by a smaller tower or steeple terminated by a staff bearing metal globes similar to those which still decorate the summit of the sister tower at Morocco, or to those which terminated the minaret at Seville until they were thrown down by the earthquake of 1395, after which they were replaced by the vane whence the tower derived its present title of the Giralda (*Anglice*, a weathercock).

From Al-Geber, the architect of the Hassan tower, the science of quantities, first introduced into Europe by the Arabs, received its name. Though known previously, algebra, like many other branches of science, was more successfully developed by them than it had been before, and there is reason to believe that it was he who first introduced the system among his countrymen in Spain. The three towers of Seville, Morocco, and Rabat, are the chief existing works which are universally acknowledged as owing their origin to the genius of Al-Geber; but there can be little doubt that among the splendid relics of Moorish architectural art still remaining in Spain and Morocco there are many, especially in the neighbourhood of Rabat, the merits of which are due to his taste and skill.

The engraving is from a sketch made on the spot by Mr. Trovey Blackmore, who has recently returned from a journey in Morocco, when he spent some time in an investigation of the many interesting historical monuments in that little-frequented land.



STREET ARCHITECTURE: NEW HOUSE IN THE STRAND.—Messrs. J. & S. F. Clarkson, Architects.



PLAN OF NORTH-EAST PORTION OF ST. MARY-LE-STRAND.

A. A. Boundary of parish.
B. No. 317, Strand.
C. The Blacksmith's house.
D. Old timber house, No. 88, Drury-lane, formerly the "Cock and Pye." Nell Gwyn's lodgings in 1667, according to Cunningham.
E. Site of the Cross in the Strand; afterwards of the Maypole, till 1718. The Maypole-alley, against the Olympic Theatre, is, of course, a pretender. Bailey's Hackney Coaches stood here from 1634.
F. Pettyford-court, formerly Wilson's-court.
G. "Craven's Head public-house, No. 99, Drury-lane.
H. Old buildings (Craven House).

ST. MARY-LE-STRAND.

BUILDING AND REBUILDING.

From the Thames the parish extends northwards a short quarter of a mile, till the frontier of St. Martin's is reached. From Newcastle-street, on the east, to the Savoy, is about the same distance. Although these are not magnificent dimensions in London, they suggest, when used of an old parish in its centre,—ranged over at large,—not a little fulness of exposition. A full resounding line of well-composed bourgeois might be put round the boundary of such a parish, and leave much of the story untold. The text of Mr. Diprose's pleasant, chatty "Account of St. Clement Danes,"—the neighbour-parish to the east,—would reach (the result of careful survey) a well-measured mile, and leave a good fraction of surplusage. Therefore, it will be as well to keep near the buildings shown in the view, page 833, and not get out of sight of the eastern boundary of the parish. This runs near by Newcastle-street into Wych-street, along the centre of Drury-lane to White Hart-street, and then turns to the westward. It may not be amiss to begin by repeating the story which brings back green fields within reach of a loud shout from the Strand.

In Elizabeth's time, the way from the open country north of the village of St. Giles to the Strand and the Thames, started southwards from the straggling houses of Broad St. Giles, not yet reached by the western buildings of High Oldborne. To east and west of the southward trending lane [Drury-lane] were the open fields. These lasted on the east side down to Drury House, which, with its outbuildings and gardens, filled up the obtuse corner formed by the lane and the Via de Aldewych [Wych-street], leading to St. Clement's Church. After the fields on the west side came the Convent Garden. Buildings, not so very densely packed,—if in those respects Aggas's maps are to be taken seriously,—filled the interval southwards to the Strand. The Strand itself was reached by the narrow way,—then probably without a name,—since known as Maypole-alley, Little Drury-lane, and (now) Drury-court. In the reigns of the first James and the first Charles, the village of St. Giles joined itself to London without a break. The lane,—quasi-rural a century before,—was in 1658 (the date of the map of Faithorne and Newcourt) lined solidly with houses on both sides for its whole length. St. Martin's-lane had also been lined with houses; but from the west and north the fields came up to them and to St. Giles's. The road to Oxford ran through the fields, after passing through the village. [New Oxford-street was opened in 1847]. After the Restoration, some noblemen lived in the lane,—as the Earl of Clare (Clare Market, &c.), and the Earl of Craven (Craven Buildings, &c.). This sort of resident ceased to live here in William's reign.

A resolute inquirer might find researches rewarded, and enable future topographers to make less misty the early history of the mansion-house of the Drurys, that gave the name to Drury-lane. Stow (1598) does not mention it.* Yet, if built by the Sir William Drury, Knight of

* A Dreury House is mentioned by Stow,—"of Sir Drewe Drewrie [Dru Drury was a name in frequent use among the Hawsted Drurys] a worshipful owner thereof . . . . of old time an great house pertaining to the Abbot of Ramsey." This was in Beech-lane, Barbican: in the time of Charles II. the residence of Prince Rupert.

the Garter, a notable commander in the Irish wars, it must have been in Stow's memory. Sir William was marshal of Berwick, 1573, president of Munster, 1576; assisted Henry Quatre in France, and was killed in a duel there in 1589; the cause—"that, being a Knight of the Garter, he claimed precendency of [Sir John] Boroughs, who was the younger son of a baron." The Drurys were lords of the manor of Hawsted, Suffolk, three or four miles south-west of Bury St. Edmunds, from 1505, for about 150 years. The papers are, no doubt, in existence from which the Rev. Sir John Cullum, bart. (in 1784) drew his very detailed information for the lengthy Tract (in vol. v. of "Bibliotheca Topographica Britannica," 1790). Unfortunately it did not occur to him to connect his story with that of the house bought, and much built to, by the Earl of Craven (died 1697), then called Craven House, finally taken down in 1803. It furnished a site for the Olympic Theatre, and suggested the names of the present Craven-buildings, Craven-yard, and "Craven Head."

A bit of the parish church shows to the right of the view. The original church, pulled down in 1549, by Somerset, stood, Stow says, in a

"faire cemitorie (or churchyard) . . . . [on the south side of the Strand the north portion of the east of the quadrangle of the present Somerset House] called of the Nativitie of Our Ladie, and the Innocents at the Strand, and of some by meane of a brotherhood kept there, called of S. Vrsula at the Strand."

The Protector promised to build a new one for the parishioners, but did not live to do so. They were obliged to join themselves to the Church of St. Clement Danes, and afterwards to the chapel in the Savoy, until a new church was built. James Gibbs was the architect of the "new church in the Strand." First stone laid 25th of February, 1714; steeple finished, 7th of September, 1717; consecrated, 1st of January, 1723; architect's estimate, 8,997*l.*; cost, 16,341*l.* Gibbs's "Book of Architecture," in which the church is given, was published 1728. It was the first and not the best of Gibbs's buildings. The change of design of the west front during execution is seen pretty clearly in the work, and explained in its designer's book. The peculiar modelling of the steeple, setting in by stages with free columns, on two sides only, its leanness in angular perspective, and some of its stiffness, may be credited to one of those changes of front in the face of the enemy which architects are,—nowadays as heretofore,—not seldom compelled to execute:

"There was at first no steeple designed for that church, only a small campanile, or turret for a bell, was to have been over the west end of it." [In the course of execution came the demand for a well-developed steeple.] "The building being then advanced 23 ft. above ground, and therefore admiting of no alteration from east to west, which was only 14 ft., I was obliged to spread it from south to north, which makes the plan oblong, which otherwise should have been square."—*J. Gibbs*, 1728.

The church looks its best in the view from the direct west. Perhaps we have reason to be satisfied that the design favoured by Gibbs was set aside. He could at times carry baldness and dryness to some perfection.

In the designs, the semicircular portico at the west end has, where the flaming vase is now,—on the summit of the semi-dome,—a statue of Anne, backed by a deep semicircular barrel-vault with coffers. In the actual building the glass of the west window is on the outside, and the recess within.

Gibbs's design for a column "250 ft. high, at the distance of 80 ft. from the west front, intended in honour of Queen Anne, at the top of which her statue was to be placed," was approved, and stone brought to the site for the foundation. But it was put aside at the Queen's death, otherwise it would have outdone the other efforts of the sort up to the present time. The Monument is 202 ft.; Nelson column, 145 ft.; the Duke of York's, 124 ft. high.

The site lives in every memory as the scene of the "high heroic games,"—of poets, critics, patrons,—booksellers,—directed personally by the Goddess of the "Dunciad."

"Amid that area wide they took their stand,
Where the tall maypole once o'erlook'd the Strand;
But now (so Anne and Piety ordain)
A church collects the saints of Drury-lane."
Book II.

Sticklers for accuracy, respectability, and the parochial system have, doubtless, fiercely resented such trifling by Mr. Pope, and protested that only inhabitants of less than one-eighth of the Lane's length (and only of its western side) would find their parish church in St. Mary-le-Strand.

Little Drury-lane [at one time Maypole-alley, and now Drury-court],—

"which from the Straud runneth up to Great Drury-lane: this part being but narrow is troublesome by the passage of coaches and carts [now, 1876, it is flagged and not used for vehicles, which pass down Newcastle-street], it being a great Thoroughfare, and the Houses being but ordinary, makes it to be ill inhabited; on the east side is a small Court called Wilson's-court [now Pettyford-court]."—Strype's Stow, 1720.

Mention of Maypole-alley ought to lead to some discourse about the maypole itself, its putting up and pulling down, and the disposal of the last at Wanstead. The 1661 maypole is said to have been raised by the father of Ann Clarges "to commemorate his daughter's good fortune in arriving to the dignity of Duchess of Albemarle." Its length was 134 ft.,—obviously all too lengthy a matter for introduction here. The cross in the Strand which the maypole superseded, the stand for Captain Bailey's hackney-coaches, at the Maypole in the Strand, in 1634 (some of the earliest in London), and other subjects not a few, belong also properly to this corner of the parish, brimful of histories of great things and small.

Pepys, on May 1, 1667, makes entry:—

"To Westminster: in the way meeting many milkmaids, with their garlands upon their pails, dancing, with a fiddler before them; and saw pretty Nelly standing at her lodging's door, in Drury-lane, in her smock sleeves and bodice, looking upon one: she seemed a mighty pretty creature."

The worthy Samuel was brought to Nelly at the King's—[play]—house by his friend, Mrs. Knipp, and treated to kissing of "the mighty pretty soul" on the 23rd of January, 1666-67 (his wife was by:—"I kissed her and so did my wife.")* "Pretty witty Nell" was not the king's mistress till 1669 (nineteen years old). Pepys was then living in Seething-lane (Great Tower-street, City); so that he would pass the end of Little Drury-lane in his way to Westminster. Therefore the conjecture that the milkmaids were at the maypole, and Eleanor's lodging in (what is now) Drury-court, does not seem unreasonable. Cunningham lodges her in the old house, the Cock and [Mag] Pye,—the northernmost of two now standing on the west of Drury-lane, facing towards Wych-street. An illustrative cut (p. 39 of his "Nell Gwyn") shows the milkmaids gamboiling in the open space in front. But why is the communicative Clerk of the Acts accused thus of untold deviations?

It has been believed, and printed in bound volumes, that No. 317, Strand (or else what was No. 1. Drury-court), was the Forge in St. Clement's Danes, which formerly belonged to the City (but no longer exists)†, in respect of which suit and service is duly done each year for the sheriffs of Middlesex. Six large and old horseshoes lying on the table, and then sixty-one hobnails (supplied fresh every year), must be counted, the number declared twice, and the Remembrancer say "good number." To undertake labours in respect of tenements yielding no profits, is anything but a sign of the much-vaunted exclusion of the imagination from the management of house property. Many, no doubt, derive special satisfaction from believing that the St. Clement's forge had the ingenuity to be in another parish—all Drury-court is in St. Mary-le-Strand—as well as non-existent.

A house in Drury-court is by tradition, and written and printed record, associated with a bit of English history. Till pulled down just recently, No. 1, Drury-court was occupied by Mr. Henry Smart, a smith. This house was of the seventeenth century type, still to be found hereabouts—with an eyebrow of about 2 ft. above the ground-story,—wood-panelled upper stories, and a couple of gables. It is asserted that it had been used in the same trade for generations. Why not, the argument goes, in unbroken succession at least from the middle of the seventeenth century? At that time in this court, and on the east side of it, a smith lived—his name Clarges—and his daughter was the wife of George Monk. She became Duchess of Albemarle in June, 1660, and was mother of the Duke of Albemarle, who succeeded the General in his titles. "He was prisoner in the Tower," says Aubrey, "when she was kind to him, . . . it must be remembered that he then was in want, and she assisted him. . . . She was not at all handsome or cleanly. . . . Her mother was one of five woemen barbers." This imprisonment would seem to have begun in 1646, and continued some time. Pepys was candid, as Aubrey himself, when plain words could do no hurt,—trusting in confidence to the cipher of his diary. March 8, 1661, he was with "high company; among others the Duchesse of Albermarle, who is ever a plain homely dowdy"; and a few years later he was "mad at the cursed words of the Duchesse [speaking against his patron, Lord Sandwich], a very ill-looked woman." The marriage with Monk was in 1652. She was then Mrs. Radford, having been first married in 1632-33. Her family's way of showing satisfaction—and gaining some reflected lustre—in 1661 has been mentioned above.

This place and building, hanging in the front in Monk's memory,—reminders of his wife and her ambitions,—not improbably played a part among the secret personal influences which led to the resolution that brought Charles to Dover on 25th May, 1660, and somewhat changed the course of our history.

Aubrey's statement about the house occurs thus,—"his [Monk's] semstres Nan Cl. . . . . (a blacksmith's daughter)."—with the note thereto. "The shop is still of that trade; the corner shop the first turning on ye right hand as you come out of the Strand, into Drury-lane; the house is now built of brick." Brayley—"Londiniana," 1829,—remarks in a further note,—nd doubt written after personal examination,—"The house alluded to is probably that at the right-hand corner of Little Drury-lane, now a butcher's, and whitened over." This would make out that the house was No. 317, Strand. But Aubrey's description cannot apply to a house at the corner of the Strand and Drury-court. He probably made no personal examination, and his informant, "Mrs. Linden, his [Monk's] kinswoman, a Devon woman, whose name was Monk," no doubt lacked the training of an exact topographer. All this may be true, and, in addition, the passage may have been "putt in writing tumultuarily." The lives were for Anthony à Wood's use in the Athenæ Oxonienses; sent to him with a friendly letter (15th of June, 1680). In that letter his work is depreciated in this characteristic phrase of self-contented modesty. The absolute identification of the house is incomplete, and it would only be possible to pursue the matter farther by means of a literature of conjectural emendations. The no-doubt worthy, —and certainly wordy,—Thomas Gumble, D.D., "one of his chaplains," published 486 pages of panegyric of his Lordship the year after his death (1671), but made the details about the Duchess scanty to excess. In his book there is absolutely no mention of her parentage, and no gossip about the father's forge.

No. 317, Strand (the house at the east corner of Drury-court and the Strand), and No. 1, Drury-court (the timber house adjoining), of both of which there has been talk above, have been pulled down within the last year or so. Previously to demolition they had (especially No. 317) been attaining decrepitude. In their place a new building of brick and Portland stone has been erected. It has been carried out by Mr. James Macey, of Milford Wharf, Strand, under Messrs. J. & S. F. Clarkson, of Great Ormond-street, the architects. Stanchions, iron shop-front, balconettes, &c., have been very well executed by H. Young & Co., of Eccleston Iron-works, Pimlico. Mr. Learwood was the foreman. The extreme dimensions on the ground story are 75 ft. (north to south) by 23 ft. The north portions are lighted from Pettyford-court and Drury-court, and the south portions from the Strand and Drury-court. The ground-story accommodates the shop and wholesale departments of Mr. Henry J. Vickers, publisher and bookseller, and the basement is used in his business for storage and packing of goods; also contains some of the lavatories, water-closets, &c. The three upper floors, built for letting as warerooms or show-rooms, are 13 ft. and 12 ft. high. The ground story is 14 ft., and the basement 10 ft. 6 in.

The notice of Mr. Vickers's new house of business would be incomplete without some slight notice of the business itself,—one of the peculiar growths of the "tuberosity of modern civilization." Retail traders are here supplied with all periodicals and magazines as received from the publishers. The premises are a sort of universal publishing-house for reviews, magazines, periodicals—literary, religious, technical, various,—gathered from every quarter, in huge heaps, immediately after the press has produced them. The convenience to the retailer is enormous,—time is saved, and labour of messengers. Some very large numbers of much-looked-for publications are at times brought in, and almost immediately dispersed. Thousands of copies are carried away in a single afternoon.

* Sir Walter gently hinted,—"It is just as well that Mrs. Pepys was present on this occasion."

† "Where the tenements and lands are situated no one knows, nor doth the City receive any rents or profits thereby."—Sherill Moore, MS. Journal, 1741-2; quoted by Timbs.

The business was carried on from 1837 to 1853 by George & Henry J. Vickers, who continued what their father had started in 1834. In the "thirties" about thirty periodicals supplied the popular wants of London, practically of England. The "Penny Magazine" of the Useful Knowledge Society (1832–45), and their "Penny Cyclopædia" (1833 43, &c.); the Society for Promoting Christian Knowledge's "Saturday Magazine" (1832 to 1844); the "Mirror" (to 1849), were among the earlier serials, now all at an end. "Chambers's Journal" started in 1832, and still flourishes. The *Builder*, now nearing its eighth lustre, joined, in 1842, a select company of technical journals. The survivors number about a dozen,—almost all started in the five previous years. Now the serials published in London number near upon 800, not counting, of course, daily newspapers and local journals, but reckoning the whole of the periodicals from one-halfpenny to the quarterly reviews. London boasts at present of over thirty halfpenny monthlies. In 1853 the business divided itself into town and country, and the brothers separated, Mr. George Vickers taking the country trade, and Mr. Henry Vickers town and suburbs. To him, and his son Henry, who is to succeed him, may properly be wished good fortune as of old. Large numbers of the *Builder*,—and, of course, of our contemporaries no stint,—will, we hope, be taken for many a year in and out of the good-looking new house.

THE CHURCH AND ANCHORITE OF ALDRINGTON, SUSSEX.

The Bishop of Chichester has recently laid the north-east corner-stone of the parish church of St. Leonard, Aldrington, which, after having been for centuries in ruins, is now, through the liberality of the chief landholders in the parish, to be rebuilt.

The ruins are close to Portslade Station, on the South Coast line of railway, and stand in the wide bare fields between it and the sea, screened from the westerly gales by a row of stunted wild-looking elms. Indeed, so solitary and forgotten do the ruins appear, that, after passing out of Brighton by way of Cliftonville, and its rows of thickly-peopled squares and terraces, it is difficult to realise that the "poore fishing village of Brighthelmstone" once depended on Aldrington harbour for its prosperity! Yet Aldrington, now numbering but some forty inhabitants, was once a very important place; for it stands, so it is believed, near the site of the Roman "Portus Adurni," where the river Adur flowed into the sea; as did also Portslade, which derives its name from the "lade," or trackway, to the port.

In Norman and Mediæval days, Aldrington prospered; but at the beginning of the last century, owing to the opening to the new port and outlet of the Adur at Kingston, near Shoreham, it had dwindled down to some 200 inhabitants, who lived in houses fronting the sea; but unfortunately, from time to time, the sea encroached on them, as it was then doing, and still does, all along the coast from Selsey Bill to Beachy Head; and finally, in 1703, came that memorable gale which Defoe describes as having thrown down the Eddystone lighthouse, blown down flat the market-house of Shoreham, and shattered Brighthelmstone, and in this tempest almost all the village of Aldrington was swept away.

In 1724 the parsonage-house and church alone remained, and doubtless from this time the church became a ruin, and the living a sinecure for a non-resident rector. But now again Aldrington is reviving, and, curiously enough, the old river-bed has again become a harbour for the vessels which now supply its old neighbour, Brighton, with coal.

The Church of St. Leonard, built in Norman days as the parish church of "Eldritune," was, in the time of Henry III., given by its then owner, with that of Portslade, to the Premonstratensian Abbey of St. Radegund, of Bradsole, in Polton, near Dover, who appointed their canons as its rectors.

The ruins of the church consist of the lower part of the west tower, a portion of an east wall, and the lower part of the south wall. The interior was filled with the flints and *débris* of the ruined walls, and the foundations of the north and other walls which were dug up some thirty years ago. All are built of flint and mortar of great hardness, with quoins and dressings of Caen stone; the tower buttresses exist in a shattered state, and the jambs of the tower archway. There are also the remains of one of the south chancels, and a perfect one in the east wall, besides the half of another, which has a jamb and head of a different and later date of moulding. In excavating for the foundation of the north-east corner-stone, the foundations of the east wall were found to be almost on the surface of the ground, while the trench of the north wall foundations, some depth below, was discovered to run eastward of it more than 40 ft., thus showing that some centuries ago the church had been shortened by pulling down either the canon's choir or lady-chapel, and building up a new east wall with the old materials of different dates. Within the area of the nave have been found a Norman monumental stone, and some moulded monumental slabs of Purbeck marble of thirteenth or fourteenth-century date.

It is, of course, intended in the rebuilding to carefully preserve untouched the old ruins, and to incorporate them with the new walls, and to found the designs on the old lines, and on the details of the existing remains, and on any others yet to be discovered. The architects engaged are Mr. R. Herbert Carpenter and Mr. B. Ingelow, of London.

As regards the Anchorite of Aldrington, some very interesting documents have been explained, in a paper by the Rev. E. Turner, communicated to the Sussex Archæological Society. It appears that William Bolle was "included" as an Anchorite by the Bishop of Chichester. He had been a chaplain or canon of the Abbey of St. Radegund, and rector of Aldrington; the "inclusion" service had been performed on the 20th day of December in the cathedral church. Now, it seems in those days that the ancient very strict rule of discipline was much relaxed, and instead of avoiding the villages and towns as of old, the "anchorages," probably for the sake of the alms and benefactions, were then attached to them. Moreover, the Bishop would be responsible for the anchorite's support were he not before the inclusion to satisfy himself that there were other and available probable means of support. Other anchorages are known to have existed at Norwich, Coventry, Pagham, Houghton, Northampton, &c., but of none are the facts so well preserved as that of Aldrington.

There is preserved the petition of the Dean of Chichester (Johannes Maydenhithe) and his chapter, dated June 2, 1402, to the Bishop of Chichester, reciting that William Bolle, having resigned his rectorship, and become a recluse, and his resignation having been signed by Richard Swetapale, the public notary, and that his action, not being by compulsion, but by his own will, inspired by God,—that on a space in the cemetery of Aldrington, on the north side, in an empty corner (*angularem vacuum*) an habitation should be constructed for him with a means of access "*in capellam Beate Marie eidem loco contiguam.* To this the Bishop returned answer by issuing his licence from his Manor House of Amberly, on the last day of May, 1402, in which he conceded their petition, and confirmed to William Bolle the place asked for an habitation, and he further directed it should be built *continentem in latitudine viginti quatuor pedes, et in longitudine viginti novem pedes . . . cum suis pertinenciis*; and that after the *recessum vel decessum* of the said William Bolle, it should return to his disposal or that of his successors in the bishopric.

As this interesting document so clearly defines the position and dimensions of this curious addition to the lady chapel and church of Aldrington, any traces of the foundations or their trenches will, we understand, be searched for, and, if discovered, will be carefully preserved in remembrance of the old rector, canon, and anchorite William Bolle.

THE PROPOSED NEW INFIRMARY FOR MARYLEBONE.

The proposal of the Marylebone Vestry to erect a new infirmary beyond the parish is meeting with considerable opposition from a number of the residents. At a public meeting, held at the Marylebone Court-house, on Friday evening, the 11th inst., at which Sir Thomas Chambers, Q.C., M.P., presided, a resolution was passed to the effect that the meeting learnt with surprise and alarm the action of the Marylebone guardians in their attempt to squander 100,000*l.* of the ratepayers' money for the site and construction of an infirmary out of the parish, notwithstanding the extensive expenditure now going on in the reconstruction of the workhouse, and the crushing burthens the ratepayers have to bear.

FROM CATANIA.

Reading in the *Builder* of meetings whereat some of your antiquaries find "sermons in stones, and good in everything," one wonders why they do not invade Catania. The antiquary who knows his calling must be well repaid. The tyro anxious to learn could never commence under more tempting influences. Etna has destroyed the town seven times. Earthquakes have done still more harm, so there are layers of treasures, and the Greek era, 700 B.C., soon becomes a familiar epoch. No one knows the exact date of the theatre, but according to Thucydides, Alcibiades, in his second expedition to Sicily, persuaded the people they required a second. The walls were lined with sculptured marble. The corridors, boxes, and porticos used by the Romans show that a subsequent restoration took place. The result was a theatre twice the size of that of Athens, which was the first of its era for magnificence of decoration and luxury in its fabrication — the only one with columned boxes, portico, and corridor; it was the theatre enriched as an Odeon, similar to that in Rome, Laodicea, Smyrna, Carthage, Ephesus, Corinth, and Athens, entered by a grand staircase, altogether significant of its great importance. It is supposed to be in date of the second Olympiad, constructed from the spoils of the Athenian fleet captured by the Syracusans. The theatre of Catania measured 339 Sicilian palms—that of Athens, 311—and was capable of holding 7,120 persons, while that of Athens held but 3,277. The richness of all the mural decorations, of various marbles, especially of rosso antico, increases its interest. This building was, it is supposed, first partly destroyed by the eruption of Etna, and then by an earthquake; afterwards it was reconstructed by the Romans. What ruins are excavated give such an idea of how much more remains to be known, that all art-lovers desire earnestly to see more brought to light. The columns of the stage being perfect, and of great value and number, have been utilised for the façade of the Church of St. Agatha, in which is a wonderful painting, representing the eruption as vividly as if painted recently. Would it not be worth study—as to the preservation of its colours — how much is due to art, how much to climate or nature? It was painted, it is thought, in 1669, by order of the bishop Bonadias, whose tomb with bust is under the painting, which has a second value in the exact plan of the city it portrays. There are many tombs in this church of the Byzantine epoch, of great interest; and the history of Agatha, patron saint of the town, is marvellously set forth in wood carvings, in the chancel, known as dating from the "buona epoca." In another part of the town are more ruins of baths, wherein are bas-reliefs, the triumph of Bacchus, well shown. For the comfort and arrangement of the baths, no modern establishment surpasses them: there were rooms for hot and cold, douche, vapour, and shower baths; and it is supposed that although distant half a mile from the first-named, these formed one large whole under the city. The Benedictine monastery has the grandeur of a royal palace, and was only half-destroyed in 1669,—a miracle seems to have taken place, according to tradition, as you are shown the black lava which stayed its course within a few yards of the building. The earthquake was not so stayed, and the reconstruction of the upper story was necessary. The altars are of antique vert, and of stalactite of unique perfection. To this convent is attached a most interesting museum, with findings from each eruption, manifold; besides these, there is a revolver of the sixteenth century, said to be unique, and which suggests the origin of the so-called new invention. Amongst the pictures, one must admire most those of the Flemish and Dutch schools, some very good of Caravaggio, others of the best of Pietro Novelli, Sieur Monrealese, and one magnificent example of Antonello, of Messina. A great collection of the minerals of the country, especially in sulphur specimens, enriches the museum. Is there not temptation and reason why the antiquary and archæologist should hither wend his way? for I have very feebly described what awaits him. September is to see the Bellini Festival, of which I shall send the details as soon as known.

In this fearful heat one only goes out late in the day, or so unnaturally early, that with blinking eyes little can be understood, and ears play a secondary part where the guide only explains in the *patois* of the country or a French all his own. There is a meat market in construction like one

at Milan; over each shed, or meat-house, is a marble head of the beast, bull, sheep, calf, &c., for whose remains it is designed. It was found the butchers of the place kept their meat from day to day by immersion at night in cold water; inspectors now visit the shops, and compel the holders to send it to the public market. There is also a new public washing open stream, running down to the sea—a kind of large trough, divided in compartments; the women presiding seemed very comfortable and cheerful. Again has our *concierge* been very tipsy; whenever he goes off to drink he says he has only been to kiss the hand of his mother-in-law! M.

August 16th.

THE TRANSACTIONS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Sir,—A short time ago Mr. H. H. Statham wrote to you with reference to the sort of music it is usual to provide at an annual *soirée* of the "British Architects." He urged, with enthusiastic propriety, that such native chants as "Tommy, make room for your Uncle" and Mr. Justice Sullivan's melodious summary of "How I came to be a Judge" were hardly suited to an entertainment which, in an artistic point of view alone, argued the presence of some slight social cultivation in both members and their guests. The object of this letter is of a similar nature; and although I am unable to clothe my words with the modest and becoming demeanour of Mr. Statham's language, I would venture to ask those members of the Institute who undo their copies of the "Transactions" to examine the number they received last Saturday, and to look carefully at pp. 256 and 257. Therein the President, whose address to M. Duc, the gold medallist of the year, was admirably worded, is made to talk in the following ambiguous manner:—"We remember, also, the talent of the man who could carry off the grand Prix de Rome in 1825, the Decennial (*sic*) prize, of several thousand pounds, given, in 1869, by the late Emperor, and who has directed and restored the buildings of the Palais de Justice, and whose unselfish love for his art prompted him to devote half of it (*sic*) to prizes for the encouragement of young architects."

Now, according to a leading article in the *Builder*, some months ago, the "cent mille" was to have been given every five years, and, in 1864, the year of its inauguration, it was not awarded; but in 1869 M. Duc received the 100,000 francs from the Emperor Napoleon. M. Duc afterwards gave 40,000 francs (not half his art) to the foundation of an architectural prize. That the President's speech is incorrectly reported in our "Transactions" is evident, seeing that your report, sir, of June 17th omits the word "decennial," and renders the sentence to which I have referred not only not obscure, but almost correct.

In the same number of our "Transactions," M. Duc's speech is given in French; and just as the Institute music annoyed your former correspondent, the Institute French annoys me, who have been accustomed to think, as well as talk, in that language. I will complain little of the absence and misuse of accents, grave, circumflex, or acute; but at the same time they are quite as important in French words as, I need hardly add, are dots or a cross to letters in ours. In the Institute report of M. Duc's speech, the cedilla has been entirely omitted, even in such a word as *Français*. Therein, poor France, instead of being *désintéressée*, is described as "dés interissée"; poor Greece, instead of being qualified with the adjective used by M. Duc—the adjective *infime*—is declared to be *infirme*; the word *apportée* is rendered "apportie"; *on* is printed instead of *en*; *qui* instead of *que*; "pouvous" instead of *pouvons*; and while *confrères* has received sometimes a grave, sometimes an acute accent, the word *confraternels* has been made to afford compensation, thus—"confraternèls." As for the report of the telegram from the French architects assembled in congress, it is equally disfigured with similar blunders—the names of the immediate senders which you, sir, published, together with a word-for-word translation of the speech four days after its delivery—being entirely omitted. These blunders must not, on any pretence, be ascribed to the printers, but to the secretaries. Indeed, if the Parisian *Figaro* had printed the same amount of English "copy," it could not have surpassed our "Transactions" in clerical errors. What, however, may be forgiven to a Frenchman, who has never journeyed further from his capital than Asnières, is unpardonable in travelled Englishmen, who, moreover, have had more than nine weeks in which to correct their proofs—the speech of M. Duc having been delivered upon June 12th, and posted to the members of the Royal Institute of British Architects on August 19th of the same year.

William H. White.

HOUSE FOR THE LONDON FEMALE PREVENTIVE AND REFORMATORY INSTITUTION.

In the early reports of this Institution, the committee issued a feeling address and outline of progress. In September, 1857, operations were commenced in a comparatively small house in Grafton-place, Seymour-street. At the expiration of the first six months, it became necessary to take larger premises, which were offered at 200, Euston-road. Here, again, prosperity attended the efforts of the managers, and, in the autumn of 1858, it was resolved to take an additional house at 18, Cornwall-place, Holloway, for the accommodation of more inmates, which desirable object was accomplished early in the year 1859, since which period additional homes have been provided, and on the 19th instant the ceremony of laying the foundation-stone of the new home at Parson's-green, Fulham, was performed by Mrs. Holt Yates, the widow of the founder, Dr. W. Holt Yates, F.R.A.S. An address, written on parchment, framed and glazed, was presented to Mrs. Yates, and a copy of the address, on parchment, and other records, were placed in a glass cylinder hermetically sealed, in a cavity on the top of the stone. The usual silver trowel, inscribed, was, after the ceremony, handed to Mrs. Yates, placed on velvet in a glass shade. The company were much interested, as usual, with the Masonic part of the ceremony; but

> "They ne'er can divine,
> The word or the sign,
> Of a Free and an Accepted Mason.
>
> 'Tis this, and 'tis that,
> They cannot tell what,
> Why so many great men of the nation
> Should aprons put on,
> To make themselves one,
> With a Free and an Accepted Mason."

The building will be in the Italian style of architecture, and contain, on the ground floor, an entrance-hall and staircase. On the right of the entrance-hall will be the reception-room and chapel. On the left of the hall, the matron's and inmates' sitting-rooms. Attached to the building are a coach-house and laundry. On the first floor are the matrons' and inmates' bedrooms, corridor, infirmary, lavatory, &c. Over the coach-house and laundry are the laundress's sitting and bedroom, and laundress helper's room. On the second floor are an assistant's room and dormitories, 30 ft. by 16 ft. and 16 ft. high, with lavatory. Upon the basement floor are the dining-room, kitchen, storeroom, coal and coke cellars, &c. In the rear of the building are projected the water-closets. The architect is Mr. W. P. Griffith, F.S.A., and the builder, Mr. James Pocock. The cost will be about 2,000*l.*

AVEBURY.

On the 16th inst. the Newbury District Field Club visited Avebury, where Professor Rupert Jones, F.R.S., discoursed upon the singular stones known as the "Grey Wethers," from their resemblance, when viewed from a distance, to a flock of sheep. These huge stones, he said, were but the remnant of thousands that had been scattered all over those Downs, particularly in the valley portions. The Professor reminded his auditory that, in order to understand the circumstances under which these great irregular blocks of stone were formed and deposited, they must for the moment forget their geography, and bear in mind that, in bygone ages, there were in that district sand-beds rising at least 100 ft. above their heads, and that this region was covered by a sea. The water, charged with silex, filtered among the sand-grains, hardened them, and made these great blocks of stone, which, accordingly, formed irregular sandstone beds, interrupted by spaces in which no concretionary action went on. These concretionary quartz sands are called the Bagshot sands, from the place in which they were first studied; but they are met with near Newbury, at Reading, and also in the Sandhurst district. The sands known as the Woolwich beds were also concreted. The sudden melting of snow, and the sudden fall of rain, had tended to collect these stones more in the valleys, as they saw them to day, than on the hills; and such a piece of ground as that on which they were then standing ought certainly to be preserved as a place of national interest. The Professor, replying to the Rev. C. Soames (Mildenhall), said he had seen the Sarsen stones with their original surface; but nearly all that remained had undergone change by the action of rain and dampness.

Mr. Soames said he had seen a fine sarsen stone at Mildenhall, in its original mammillated form.

The Rev. J. Adams said the name by which these stones is generally known is "Sarsens" or "Sassens," and the commonly-received derivation is from Saracen, the name which the Saxons applied to Pagans or heathens in general, and to nearly everything connected with Pagan worship. The late Professor Phillips supposed it came from the Latin word "saxum." This word expresses exactly what sarsen commonly means, and being, doubtless, the word by which the Romans designated the stones, it is not impossible that the Belgic Britons of these regions may have borrowed it from them, and handed it down to their descendants, corrupted into "sarsens." Mr. Adams, however, thought he had hit upon the proper derivation in the Saxon words "sar," grievous, troublesome; and "stan," a stone,—meaning together a troublesome stone; and there could be no doubt about these sarsens having been very troublesome to the Saxon cultivators of the soil.

Mr. J. H. Parker spoke at some length in reference to Silbury Hill, an immense mound, of conical shape, believed to be the largest of its kind in the world. Mr. Parker referred to the sinking of shafts that had taken place in 1849, unattended by the discovery of any human remains, and drew the inference that it was not a barrow, but that it was used to fortify the Roman road that passed close by. It had been urged that there was a deflection in the old Roman road to avoid the hill. The Ordnance Survey maps do not show such a deflection, but supposing there was a deflection in the old Roman road, he did not think that would afford sufficient evidence to say the hill was there before Roman times.

The Rev. Bryan King (Avebury) considered that the mere fact of no human remains having been discovered when the shafts were sunk, should not be taken as final evidence that it was not a burial-place. The hill was 5 acres and 34 perches in extent, and to look for human remains was something like looking for a needle in a bundle of hay. Small barrows had in some cases been opened two or three times before the human remains they contained had been found. He dissented from the opinion that the hill was raised as a fortification, and said it was almost impossible to conceive that a sound, wise, and practical people, as the Romans were, would have been so insane as to have undertaken a labour so immense as this must have been, when they had natural fortifications on the spur of the downs near at hand. There was Oldbury Castle on one side, and Barbary Castle on the other, both within a day's march of the heavy-armed Roman legion. There was no doubt a system of telegraphy on the fortified eminences in the country, by which the Roman legions could be summoned from one part of the country to the other. He had no doubt that the Roman engineers, in planning this road, which crossed the Devizes Down, instructed the workmen to make for Silbury Hill. Nine years ago excavations were made in a field known as Thornhill, and in twenty or thirty places the old Roman road was uncovered.

At a subsequent period of the proceedings Mr. Parker took occasion to make some remarks in reference to the Temple at Avebury. He considered that what the mound was mainly intended for was to enable the people to look at what was going on in the centre. He thought they must study the record of the early religion of the Jews if they would understand the religion of the early inhabitants of this country. If they would take the trouble to look at the use of the word Gilgal from its earliest mention in the Bible, when stones were carried and made into a great place for religion and justice, and followed the use of the word, they would find it did not only mean a place where religious rites were performed and justice was administered,

but also where leagues were solemnly entered into between people of different nations. Great solemnity was necessary, and it was by no means difficult to imagine that at Avebury one set of deputies walked with their priests and lawyers - who were one and the same persons—up the grand avenue of stones leading from the great western road, while another set from another tribe approached from the great eastern road, to the central circles, where justice was administered and sacred rites were performed, watched by the ordinary people who sat around. He had no doubt but that those stupendous stones were raised for very important religious ceremonies.

THE SCOTCH BUILDING TRADE.

The position of the building trade in Scotland is apt to be misunderstood in the present uncertain condition of the industrial occupations of the country. Almost everywhere in the north stone and lime workers are busy; new buildings are in progress in the provincial towns as well as in the cities; the men in several districts have succeeded in getting wages raised and stringent rules complied with; and yet in the face of all this, it is a fact that the general trade of the country is suffering from a depression, more severe, perhaps, than any that has existed since before the Crimean and American campaigns. In the commercial metropolis of Scotland (Glasgow) the other day, the Dean of Guild Court, which grants warrants to erect buildings, passed plans which, carried out in their entirety, will involve an expenditure in connexion with the building trade of 160,000*l*. The buildings intended to be erected do not include any public edifices; and it is patent to all that a very formidable list of new structures receives sanction fortnightly from the Glasgow Guildry. But it is not in Glasgow alone that the activity exists. In Edinburgh, Greenock, Dundee, and other towns similar tales could be told; and evidence of the briskness in building may be gathered in the meantime from some of the smallest towns in the north.

That the state of the building trade is inflated to a very high degree cannot be denied; and circumstances are not far to seek sufficient to show in what way a time of prosperity has fallen to that industry in a dull season.

OPENING OF THE GREENWICH AND NORTH KENT EXTENSION RAILWAY.

The opening of the new line of railway between Greenwich and Maize-hill, which takes place on Friday next, the 1st of September, will confer upon Greenwich highly important advantages as regards railway communication with the county of Kent, from which it has hitherto been entirely isolated, although it is not a little remarkable that Greenwich was the first place to which a railway was made from the metropolis, the London and Greenwich Railway having been constructed and opened upwards of forty years ago, not very long after the opening of the Liverpool and Manchester Railway—the first steam *passenger* railway in England. Notwithstanding that the London and Greenwich line was the pioneer railway from London, it has never, until now, been extended further into its own county, Greenwich having remained a terminus whilst new lines have been constructed in almost every direction in Kent. The South-Eastern Company, who are now the owners, have, however, at length extended it to the North Kent line, *viâ* Maize-hill, Charlton, and Woolwich, which places Greenwich in direct railway communication with Gravesend, Chatham, Maidstone, and other districts in North and Mid-Kent.

It may be remembered that the old London and Greenwich line is carried entirely on arches, and on a high level. The extension line about to be opened diverges from it near Deptford Creek, and is thence carried, in a north-easterly direction, along a descending gradient, until it arrives at London-street, which it passes under, immediately on the south side of the parish church. In constructing this portion of the line, about 150 houses had to be purchased, and as the whole of one side of a thoroughfare was also absorbed and diverted, the company have had to construct a new street, with a roadway under the new line leading into Greenwich-road. At this point a heavy outlay has likewise been incurred by the company in the diversion of about 1,700 ft. in length of the main sewer belonging to the Metropolitan Board of Works, near London-street. The new sewer, which is carried at a considerable depth under the railway level, is 11½ ft. in width. It is circular in form, and lined at the bottom with blue Staffordshire brick, and all round with white gault brick. There are staircases at intervals for the purpose of descending into the sewer from the street. The cost of this sewer was 52*l*. per yard. From London-street, Greenwich, the line is carried forward in a tunnel, 26 ft. in width and half a mile in length, which passes under the Royal Naval Schools. The original intention of the company was to have taken the line in a more southerly direction, under Greenwich Park, but this was objected to by the authorities at the Admiralty, on the ground that the vibration of the trains would disturb the action of the instruments in the Observatory. The consequence was that the original plans had to be abandoned, and the line was diverted northwards, so as to pass under the Royal Naval School. At the end of the tunnel the line is carried on to the Maize-hill Station, through a cutting, which is walled in throughout its entire length. The portion of the line from Maize-hill to Charlton and Woolwich, where a junction is formed with the North Kent line, was opened nearly two years ago. The entire length of the line from Greenwich to Woolwich is between two and three miles.

For the present, the booking-offices at Greenwich will be on the north side of the line, where a temporary station has been erected on the low level, nearly opposite to the old high level station. The last-named structure is built upon arches, and during the present week scaffolding has been in course of erection for the purpose of taking it down, preparatory to erecting a new one on the same site, but which will be on the general street level, with a spacious area fronting the Greenwich-road as a carriage approach. The platforms of the new station will be spacious and convenient, the up platform being 560 ft. long, and 21 ft. wide, and the down platform 515 ft. long, and 16 ft. wide. There will also be ladies' and gentlemen's waiting-rooms, and all the general conveniences of a first-class station.

The whole of the works have been designed by Mr. Brady, the company's engineer, and executed by Messrs. Lucas & Aird, the contractors.

THE VALUE OF A LEASE IN SMITHFIELD.

A compensation case in connexion with the building of the new Poultry-market came before the Lord Mayor's Court on Saturday. Mr. Parker, a provision dealer, claimed compensation from the Corporation for the compulsory purchase of his premises for the completion of the Metropolitan Poultry-market. It was stated on the plaintiff's behalf that his premises had entrances in West and King-streets, Smithfield, and that he had a lease of them from the Clothworkers' Company, granted for fourteen years from Christmas, 1870, leaving eight years to run at Christmas next. He laid his damages at 7,879*l*., a portion of which was for a twelvemonth's average loss of net profits, estimated upon the difference between two sums of 2,500*l*. and 5,491*l*., which his books showed were the net profits derived from his business in the years 1871 and 1875. Witnesses being called in support of this statement, the counsel for the Corporation intimated that no witnesses would be called on their behalf, but that the case would be left in the hands of the jury, who awarded the plaintiff 5,125*l*., viz., 3,125*l*. for the lease, and 2,000*l*. for the loss of business.

LLANTHONY ABBEY.

ARCHÆOLOGICAL SPARRING.

At the recent meeting of the Cambrian Archæological Association, the first excursion was made to Llanthony Abbey on Tuesday, from which the party arrived about six o'clock, and there was a meeting at the Assembly-rooms after dinner, at which Mr. E. A. Freeman, the President, took the chair.

Mr. Parker gave an account of the proceedings of the day. He described the church of Llandeilo Pertholey (which was inspected on the way to Llanthony) as picturesque in the exterior, and curious in the interior. It was apparently built in the fourteenth century,—a long narrow church, with tower and two chantry chapels, to which others had been subsequently added. These were singular in having wooden arches and columns instead of stone, and were probably of the time of Henry VIII., and were almost unique in character. The chantries having had the partitions removed had become aisles—a common result. The exterior of the tower was very curious; it was built of rubble stone, but the corners were of cut stone, and the peculiarity in the build was the character of what was known as long and short work—*i.e.*, long longitudinal stones like beams and uprights introduced. This characteristic was usually considered as Anglo-Saxon; his own belief was that the greater part of them were of the eleventh century.

Mr. Freeman had at the Priory of Llanthony been the *cicerone* to the party, and commencing at the gate-house (now turned into a barn), he traced the outline of the walls of the whole of the Priory. Outside of all was still, at the very entrance to the Priory, the old parish church of Early Norman architecture. Mr. Freeman pointed out the cloisters, which not one of the party, probably, had ever noticed before, and the two towers at the west end, now converted to the uses of an inn and a farmhouse. That portion of the church Mr. Freeman regarded as very late Norman, the eastern part having been begun first. At the east end the whole construction of the building was pointed out. The nave, often used as a bowling-green, was covered with short green turf. The blind story and clearstory were pointed out; the latter was destroyed, but there was enough to show that it was a regular Norman church. In the choir and transepts the vaulting of the church was completed, but not in the nave. A wide segmental arch, opening into the nave, had been opened by taking down two nave arches of the twelfth century and building up a new wide one of the fourteenth century. As usual in transition buildings, some of the arches were pointed and some circular. The dedication was in 1104, the very earliest beginning of the Norman style, but the church was probably not built until later. That church was destroyed, the existing remains being later.

Mr. Parker having stated that there was somewhere in the Saxon Chronicles an order for the building of churches of stone and lime,

The President asked Mr. Parker to point out where the order was and by whom it was made. He had never met with it.

Mr. Parker said no doubt Mr. Freeman was right, but he was always under the impression that such an order was given.

The President rejoined that he had found it a practice to make a statement at random, and then to put it down to the Saxon Chronicles, and he protested against the practice, which he met with every day. He thought Mr. Parker was labouring under a pure delusion; there was nothing of the kind to be found.

ALLEGED FLOODS THROUGH BUILDING OPERATIONS.

In a recent report to the Hackney District Board of Works, Dr. Tripe says:—The enormous increase in the number of inhabitants of Hackney since 1801 has, of course, very materially changed the character of the district, and transformed it from a rural place of residence into almost a large city. The class of inhabitants has also changed, as in the earlier periods the majority of houses were large, and occupied chiefly by persons who had retired from business or who were otherwise possessed of a good income. Now, however, a majority of the houses are comparatively small, as in 1869 more than half were assessed below 25*l*. a year. With this alteration in the character of the houses there has been a corresponding change in the class of residents, so that there is now a large proportion of poor receiving parochial relief, as well as a very considerable number of those who depend for their subsistence on their weekly wages. A greatly-increased density of population has also obtained, so that instead of less than four persons to the acre in 1801 and nearly 11 persons in 1841, there are now about 38 inhabitants to each acre. The extension of streets and houses into the fields has gone on so rapidly that there are but few fields left in the district, or even large grounds belonging to any of the houses. The substitution of houses and comparatively impermeable roads and footways for fields or open spaces covered with trees, has rendered the district more liable to floods, partly because the removal of trees diminishes the ordinary rainfall

and induces a liability to occasional storms and floods, but chiefly because most of the rain runs into the sewers instead of soaking into the ground. Dr. Tripe therefore fears that when the outlying portions of the northern districts are more nearly covered with streets and houses, that some of our low-lying places will be occasionally injured by the flowing back of the flood-waters from the sewers. The planting of trees in streets and open spaces, especially on the highest ground, will assist in keeping the rainfall more equable than it otherwise would be.

NEW STREET FROM WHITECHAPEL TO LIVERPOOL STREET.

The Whitechapel Board of Works are taking steps for the construction of a new street between Whitechapel and Liverpool-street, which they state will, if carried out, be one of the most useful improvements which have been made in the East-end for many years past. The line of the proposed new thoroughfare is that of the extension of the Metropoliton railway now in progress between Liverpool-street and Aldgate, and it is stated that if the undertaking can be carried out along with the new railway, and in conjunction with the scheme now preparing for the rebuilding of the network of courts in the locality under Mr. Cross's Act, the cost would be much economised. It is urged in favour of the new street that it would be an exceptionally important improvement, as it would afford a thoroughfare for traffic direct east and west through London, whereas now all the traffic is made to dip very much towards the south.

ENLARGEMENT OF THE ISLINGTON WORKHOUSE SCHOOLS.

The Islington guardians are about to make several enlargements of the schools in connexion with the workhouse. The most important additional works are the erection of new wings to the central portion of the structure, the estimated cost of which is upwards of 7,000*l*. New probation and reception wards are also to be erected; likewise alterations on the centre of the old building, at an estimated cost of 750*l*., and the construction of a new swimming bath, at an estimated cost of 500*l*., the New River Company having undertaken to supply the bath with water for 30*l*. a year. The present wood fencing round the grounds is also to be replaced with a 9 in. brick wall, and the garden ground is to be paved with tar paving, the estimated cost of the new wall and the paving being 900*l*. The aggregate estimated cost of the whole of the works is about 10,000*l*.

THE SOCIETY OF ARTS AND HOUSE DRAINAGE.

At a meeting of the Camberwell Vestry on the 9th inst., a letter was received from Mr. H. T. Wood, assistant-secretary of the Council of the Society of Arts, transmitting a memorial presented by the Society for the Encouragement of Arts, Manufactures, and Commerce, to the Metropolitan Board of Works, to which the Vestry is referred, and requesting to be informed if the Vestry possessed plans showing the drains of every house in the parish before they reached the sewer, and also their connexion therewith, and how many houses were built before 1855, and if there were any plans showing the drainage of such houses, and if such plans were accessible to ratepayers, and under what regulations; and further requesting to be favoured with any remarks on the memorial, or any suggestions as to the best way of carrying its recommendations into effect.

It was resolved "that the vestry clerk do reply, and state that the information required is already in detail in the surveyor's office, and open to the inspection of all ratepayers during office hours, and that all the objects embraced in the memorial have been carried out by the Vestry in this parish, and their proceedings duly registered."

Mr. Dresser-Rogers commented severely upon the Council of the Society of Arts, and said that this was a memorial of a "poke-your-nose-into-other-people's-business" character. They found things were improving so rapidly that they had nothing to do, and then they wished to open fresh ground. He hoped that the committee would give such a reply as to show the Society that the Vestry were perfectly capable of doing their business without any interference from them.

At the meeting of the Metropolitan Board of Works, on the 11th inst., the Works and General Purposes Committee presented a further report on the memorial from the Council of the Society for the Encouragement of Arts, Manufactures, and Commerce, on the subject of house-drains and their connexion with the sewers; and recommended that a communication based upon the report be addressed to the Council in reply to such memorial.

The committee gave at length the law on the points in question, and in conclusion said:—

"It will thus be seen that an examination of all the statutes relating to this subject points to the conclusion that the vestries and district boards have ample powers as regards the matters complained of by the memorialists, but should they be able to demonstrate to the Board that there is a deficiency of such powers, your committee apprehend that no difficulty would be made by Parliament in granting all needful amendments."

Mr. Richardson moved the adoption of the report.

Mr. Dresser-Rogers said he had been given to understand that the Society of Arts had sent a communication similar to that presented to this Board to all vestries and district boards in the metropolis. The parish of Camberwell, after giving the subject due consideration, had replied, stating, very plainly, that they did not require the Society's help, and offering to show the plans, &c., which are at the Vestry-hall, and he thought the sooner and stronger the other parishes spoke out in the same way the better.

The motion was agreed to.

OBITUARY.

Mr. J. F. Lewis, R.A.—The death is announced of Mr. John Frederick Lewis, R.A. Mr. Lewis, who died on the 15th inst., at Walton-on-Thames, was born in London on the 14th of July, 1805, and was thus upwards of seventy years of age. His father, Mr. F. C. Lewis, was an artist and engraver, and John Lewis commenced his career in the same way, by engraving his own pictures. He exhibited frequently in his earlier years at the Royal Academy and the Society of British Artists, and soon gained a high reputation. His Spanish pictures—the work of the years 1833 and 1834—were published in lithograph, and his drawings from the Alhambra, from long personal study of the palace, will be remembered. In 1855, he was elected President of the Society of Painters in Water Colours, an office which he held until 1858, and in the following year he was elected Associate of the Royal Academy, the higher distinction of "R.A." being conferred upon him in 1865.

Mr. G. J. Miller—The death of Mr. George J. Miller, the sculptor, took place, after a brief illness from typhoid fever, on the 18th inst. Mr. Miller was a gold medallist of the Royal Academy, having achieved that honour in 1857, when his group, "The Good Samaritan," was selected. Perhaps the most remarkable of his monumental works was that erected to the memory of the late Marquis of Hastings. Mr. Miller leaves a number of important commissions in an unfinished state.

Mr. C. F. Angell, F.S.A.—The death of Mr. C. F. Angell, F.S.A., took place after a short illness, at his residence, Grove-lane, Camberwell, at the age of 75.

TILE-PAINTING: CARDIFF CASTLE.

Considerable works have been going on here for some time past. Amongst the latest are some decorative tile-paintings representing incidents in the history of the prophet Elijah, which have been executed for the Marquis of Bute, under the direction of Mr. W. Burges, from designs by Mr. H. Walter Lonsdale, for the peristyle of the Bute tower in the Castle, by Messrs. W. B. Simpson & Sons, of 100, St. Martin's-lane. There are twelve subjects, taken from 1 Kings xviii. as follows:—

1. Ahab giving instructions to Obadiah; 2. The meeting of Obadiah and Elijah, the meeting of Ahab and Elijah (two subjects in one picture); 3. Carrying the Wood and Water up Carmel; 4. The prophets of Baal with bullocks for sacrifice; 5. The Sacrifice on Mount Carmel (the most important of the series, and a fine design); 6 and 7. Slaying and Drowning the Prophets of Baal in the brook Kishon; 8. Ahab refusing to Eat; 9. Elijah running before Ahab's Chariot; 10. Jezebel's Threat towards Elijah; 11. Praying for Rain; and 12. Jezebel's messenger to Elijah, and the Angel comforting Elijah.

There are side panels to all the above, small subjects of landscape, &c. of much beauty and feeling, designed in concordance with their respective figure panels.

An inscription in Hebrew of texts from the verses used carries down the colour of a top border, and divides the figures from the dado, which is powdered, so to speak, with birds, beasts, fishes, and insects, symbolising the landscape of the panels under which they come. The top border alluded to is less to our taste than other parts of the decoration, both form and colour having a touch of commonness.

The figure-panels (the figures being two-thirds life-size) are painted on the bisque, are fired to white heat to develop the under-glaze colours, and finished in enamels to procure the delicate tints which cannot be got in the hard fire. The dado being white upon a brilliant red ground is painted "pâte-sur-pâte," and fired to the glaze heat, and finished in enamel also. This is the most important work of the kind that has been executed, and does credit to those concerned in its production.

We may fairly add, by the way, that Messrs. Simpson's new works and show-rooms, in St. Martin's-lane, where these paintings have been exhibited, include some interesting specimens, and are worth a visit.

SURVEYORSHIP ITEMS.

Newington.—At a recent meeting of the Newington Vestry it was unanimously resolved to increase the salary of Mr. Gledhill, the surveyor, from 275*l*. to 300*l*.

Shrewsbury.—Mr. Butler has been appointed to succeed the late Mr. Thomas Tisdale in the borough surveyorship of Shrewsbury. The two offices of inspector and borough surveyor have been united for the purposes of this appointment, with an increase of 50*l*. per annum upon Mr. Butler's former stipend as inspector.

MASTERS AND MEN.

Chester.—Notwithstanding that the masters have offered "Liverpool terms" in every respect, the men still remain out. Some of the smaller employers have, it is stated, acceded to the terms of the men, but the more influential employers in the trade still remain firm. It is believed that the masters are willing to refer the matter to arbitration.

Glasgow.—A meeting of the operative joiners of Glasgow was held on the 15th inst., when reports were given in by deputations who had been appointed to wait upon men working upon the employers' terms. A number of the men so working appeared at the meeting, and others had promised to withdraw their labour immediately. The operatives unanimously agreed to abide by the decision arrived at, not to submit to the terms of the masters. It was mentioned by the chairman that several additional employers had signed the by-laws, which would reduce the number on the strike-roll by 200. At a meeting of the masters, on the 16th inst., it was agreed to adhere to former resolutions resisting the demands of the operatives, and the district committees were empowered to take what steps they might consider necessary to strengthen the employers' position.

AN ARCHITECT'S CLAIM FOR PROFESSIONAL SERVICES.

FRESHWATER *v.* ROBERTS.

This case was heard in the Kingston County Court on the 18th inst., before Mr. Patrick Leonard, Q.C., deputy-judge.

The plaintiff was an architect living at New Malden, and the defendant was a schoolmaster living at Lewisham, Kent. The claim was for 17*l*. 17*s*. for professional services rendered in the year 1875, when the defendant contemplated building a new school, and he asked the plaintiff what he would prepare the necessary plans, &c., for, and 15*l*. 15*s*. was agreed upon. The residue of his claim, 2*l*. 2*s*. was for the plaintiff's expenses from Herne Bay, when sent for by the defendant.

The defence was that the work was not finished. The defendant said the only plans which the plaintiff supplied were two ground plans of the building and two small elevations.

It appeared that 11*l*. 16*s*. had been paid into court, and his honour said that had it not been for that he should have nonsuited the plaintiff, as his contract was not finished. He, however, considered that 11*l*. 16*s*. covered the work done, and he found for the plaintiff for the amount paid into court, and allowed defendant his costs.

It was agreed by mutual consent that the contract between the parties should be considered at an end.

ART-UNION EXHIBITION.

The works of art selected by the prizeholders of 1876, and now on view in the gallery of the Institute of Painters in Water-Colours, Pall-mall, include a number of very charming pictures, and form an interesting exhibition. The chief prizeholder, a colonist, has secured Mr. E. M. Ward's admirable and touching picture, exhibited at the Royal Academy, "A Year After the Battle: Scene at Dinan, Brittany." The picture which has been engraved for subscribers of the coming year, "Joseph and Mary," a fine work by Mr. E. Armitage, R.A., will form the chief prize in the next distribution. It may be seen in the gallery.

MULBERRY LEAVES WANTED.

Sir,—Thinking that in the neighbourhood of London there must be many fine old mulberry-trees, I venture to ask you to insert this appeal for contributions of leaves, in order to enable us to preserve the fine old race of black silkworms, which being nearly extinct in Europe through disease, has come to us regenerated by the heat of Australia.

I send you a copy of an article in the journal of the Society of Arts, which shows the value of our work; and I hope the growing of grain (not silk), in England, which has hitherto been only a pastime, may become a source of profitable occupation for ladies. Cocoons of a good colour, and hard, are selected for grain. Ladies could, next year, make considerable sums by their grain. As it requires very great care for the grain to be fit for market, the manager of the Australian Silk Depôt will undertake the graining of good cocoons, if sent to the depôt six or seven days after spinning. Inferior and pierced cocoons could be made up into stocking yarn, the manager charging expenses and commission only. Specimens of the cocoons reared on Lord Lytton's trees, at Knebworth, and others reared in London, are exhibited for a few days, by the kind permission of Messrs. Lewis & Allenby, and Messrs. Marshall & Snelgrove, at their respective establishments, also a beautiful skein of Australian silk reeled in France. Disease is prevalent to such an extent in all the old silk-producing countries of Europe and the East, that France, Italy, and the Colonies would rejoice at a supply of sound grain. A banker in Turin is anxious to obtain as much Australian grain as possible. The ladies of Victoria (Australia) deserve credit for having started a company for the production of silk. The directors are all ladies (unpaid), and it is now proposed to increase the capital to 50,000*l.*, in 1*l.* shares. French merchants do not object to do business with ladies. The sacrifice of a bonnet will enable a lady to become a shareholder (limited liability of course), and should the company prosper, the ladies may be congratulated on their successful establishment without the help of the Stock Exchange, and for once set an example to the lords of creation. Three English ladies of rank have recently put down their names for 100 shares each. Full particulars of the company may be obtained at the Australian Silk Depôt, 7, Charles-street, Grosvenor-square. Lady Dorothy Neville, so long known in connexion with the Ailant silkworms, has kindly undertaken to rear as many of our black worms as she can, and contributions of leaves sent to her, at 45, Charles-street, Berkeley-square; to me, at 25, York-place, Portman-square, or to the manager at the depôt, will be most gratefully received.

A considerable amount of leaves can be sent by post, between a cabbage leaf and brown paper, for twopence. S. F. Neill.

DEATH IN THE SEWERS.

Several cases have of late come under our notice of the death of sewer workmen and flushers by suffocation from the poisonous atmosphere of our metropolitan sewers. Manholes are too distant, and ventilating shafts few and far between. Added to this, a most reprehensible and criminal practice is at present in full swing: foul refuse of the most poisonous description, fluid and semi-fluid, is poured in in one continuous stream from a number of factories where noxious trades are carried on. As the law makes it incumbent upon manufacturers to consume their smoke, we hold it should also compel those engaged in noxious trades to adopt some process by which their refuse would be rendered innoxious and incapable of destroying human life by its exhalations. We have in several quarters of the metropolis hot reeking streams of various coloured fluids pouring day and night all the year round into our public sewers. Ordinary sewer gas is foul and dangerous enough, when arising from common sewage matter; but the danger is more than quadrupled when such a mixture as we have indicated takes place. With defective sewers no human dwelling or human life is safe in London while abuses such as we describe are allowed to continue. In connexion with our public sewers, some time ago we pointed out the necessity of having some appliances in the nature of a chain fastened to rings in the brickwork between each manhole, as a means of protection for sewer workmen, who are ever in danger of being swept away by a freshet or sudden flood. We believe that one of our metropolitan vestries has adopted our suggestion. Several men within the last few years have been carried away by sudden floods in our sewers, as well as poisoned by the foul gas always present in them. To be forewarned is to be forearmed, so we hope this counsel will be acted upon, and that death in our public sewers in future will be rare. 'Tis said that "accidents will happen," but the proverb cannot be accepted as an excuse for death through criminal neglect.

HEALTH OF WATERING-PLACES.

At the Brighton Congress of the Social Science Association last year, a resolution was passed recommending the Council of the Association to suggest to the local sanitary authorities of watering-places the desirability of establishing a system by means of which owners of lodging-houses and hotels should be enabled to have their premises inspected, and certified if found in a generally healthy condition with reference to drainage and other sanitary arrangements. The Council solicited the views of the local authorities on the subject, and received a number of answers in reply, which have been considered, and on which is founded the following report:—

"(*a*).—That it is desirable that the system, in the first instance, should be a voluntary one, and that owners of lodging-houses and hotels should be invited by the sanitary authority of the town to apply to the medical officers of health to certify that the drainage and other sanitary arrangements of their respective houses or hotels are satisfactory, and generally that the same are in a healthy, habitable condition.

(*b*).—That these certificates be renewed every three months, or more often if the sanitary authority think it desirable, but that it shall be the duty of the medical officer of health between the renewals of his certificate to visit the premises so certified as occasion may require, in order to ascertain that the same remain in the sanitary condition to which the certificate applies.

(*c*).—That a minimum charge, at the discretion of the sanitary authority, shall be made for the issue of such certificates.

(*d*).—That a register shall be kept at the town-hall, or other public office, of the certified houses and hotels, open to inspection without charge during usual office hours; and that local authorities should exercise their best efforts, by advertisement or otherwise, to inform the public of the regulations herein suggested.

(*e*).—That the owners of the certified hotels and lodging-houses should be required to produce the certificate when called upon, and should exhibit the same in some conspicuous part of the house, and that this should be a condition of registration."

The report has been forwarded to the local authorities of the several watering-places and health resorts in England and Wales.

LORD FALKLAND'S MONUMENT.

Sir,—It is announced in public print that a monument is to be erected in honour of Lord Falkland. The information further states that the work in question will take the shape of a "handsome Gothic structure." In the name of common sense, I would ask in what manner an art, bye-gone and sapless in Falkland's day, can associate itself with, or represent, a time dating some two hundred years after the period of its own extinction? Falkland's name, and the history in which it is conspicuous, offer probably as complete an antagonism as can be conceived to Mediævalism in art or aught else.

If the past is to be laid under contribution for the style of a monument to Falkland, why not adopt for it that phase of English Renaissance which marked his time?

A choice such as this would find a yet stronger justification in the fact that, whatever its intrinsic merits, the style is still in vitality with us, and is the only one in architecture showing its own life in vital kinship with the current painting, sculpture, costume, and habits of our time. Historicus.

BLACKFRIARS.

Sir,—The very interesting account of Blackfriars in your paper may be supplemented by a fact which probably very few even of those living close at hand know. There did exist within a few years, and probably does so still, a doorway of an old church, either that of St. Ann or the great church of the Blackfriars. It is so built over and around as not to be visible from any public way. It is situated at the back of the churchyard in Church-entry, and access to it is from Ireland-yard. I send you a plan of the neighbourhood made twenty-five years ago, which contains lithographs of that and other antiquities.

A buttress and doorway (remains of the Blackfriars Monastery) might be seen about four years ago by the passers-by in Queen Victoria-street, on the spot now covered by the new buildings occupied by the *Times* newspaper office.

There is a great difference in the level of the ground about here. On the higher level are several courts, one named Gloucester or Cloister-court. F. H. McLauchlan.

HOUSES FOR SINGLE MEN.

Sir,—The late Mr. Stewart, of Boston, in my humble opinion, distinguished himself by building houses for single men, women, and children. If you, sir, only knew the character of the houses in many districts, you would set to work in half-a-dozen places immediately. I am thankful you have noticed this matter. I have for years, in my poor way, put this before public men. The overcrowding is beyond anything known. What a beautiful single man's home is at Ware! Cannot the love of Christ and the three per cents induce men to act? Take this district (worse than Sodom), Ann's-street, a purlieu near Westminster Abbey. Would to God a fire would break out and demolish it entirely! Oh! that you would send some one down. Here is honour. I do trust you will occasionally try and induce action. I am sick of talking. The gain to society would be simply invaluable. A. B.

THE PAVEMENT OF MILAN.

At this moment, when the "battle of the pavements" is still engaging public attention and dividing and puzzling the members of vestries and local Boards, a few words to describe the excellent system adopted at Milan may be welcome to all who are interested in this important question. On each side of the streets there are two lines of flag-stones, sufficiently broad to bear the wheels of every sort of vehicle. Between these parallel lines the pavement consists of small unequal stones, on which the horses may step with security and without the least fear of slipping. On the other hand, the wheels of the carriage revolve easily, smoothly, and without the slightest noise, on the even surface of the flag-stones. Of course, these slab-stones and the smaller pavement are kept on the same level, so that a carriage may be driven off the line, to turn, or outstep another vehicle in front, without the least impediment. Practically, and as far as we are aware, this system has given rise to no inconvenience, and combines the rival advantages of pavement and asphalte; but we should recommend visitors to the Corso at Milan to judge for themselves.

SCHOOL BOARD SCHOOLS.

Peckham.—New schools in the Lower Park-road, Peckham, were opened on the 24th ult. by Sir Charles Reed, Chairman of the London School Board. The building, like most of the Board's erections, is in the quasi-Queen Anne style, with three floors for, respectively, boys, girls, and infants. It is calculated to accommodate 548 children, and the total cost has been 3,045*l.* for site, and 9,800*l.* for building. There is a roomy, open playground attached to the school. The cost per head, covering all expenses, is estimated at 16*l.* 2*s.* 5*d.* Mr. E. R. Robson is the architect.

Hailsham.—At a meeting of the Hailsham School Board, on the 25th ult., the only business was the consideration of the reduced tender for the school building of Mr. Perigoe, of Tunbridge Wells, and this, amounting to 2,700*l.*, was accepted. The following firms tendered:—Mr. James Peerless, Eastbourne, 3,870*l.*; Mr. Oxley,

Steyning, 3,484*l.* 10*s.*; Mr. B. Stonestreet, Hailsham, 3,450*l.*; Mr. James Longley, Worth, 3,292*l.*; Mr. Perigoe, Tunbridge Wells, 3,150*l.*

Shipston-on-Stour.—New Board schools have lately been opened in Shipston-on-Stour. The contractor for the building was Mr. Chas. Denner, of Banbury. Messrs. Bland & Cosins, of Birmingham, were the architects. The cost, including site, has been about 3,400*l.*

Gray's-inn-road.—A new school, in Laystall-street, Gray's-inn-road, was opened by the London School Board on the 31st ult. The building, of which Mr. E. R. Robson is the architect, is intended to accommodate 502 children, at a cost of about 10*l.* per head.

Grimsby.—New Board schools are in course of erection at Grimsby. Mr. Charles Bell is the architect, and Mr. J. M. Thompson is the builder.

Long Eaton.—New Board schools have been opened at Long Eaton. The contract for the building was 4,383*l.*, but the total cost has amounted to about 6,000*l.* The schools are divided into three departments, viz., for boys, girls, and infants, each department consisting of a large hall and two class-rooms. The building is capable of accommodating 647 children, viz., 208 boys, 208 girls, and 231 infants. The style is Gothic. The contractor was Mr. W. Slim, of Nottingham, the sub-contractor Mr. George Daunt, joiner, Nottingham; the plumbing work has been done by Mr. Flewitt, of Nottingham; the painting by Messrs. Pollard, Bray, & Son; and the masonry by Mr. Johnson, Nottingham; while the ironwork has been supplied by Messrs. Goddard & Massey, of Nottingham. The schools have been built from designs of Messrs. Clarke & Son, architects, Nottingham.

Shacklewell.—A new Board school was opened at Shacklewell on the 17th ult. by Sir Charles Reed on behalf of the London School Board. The cost of its site was 2,921*l.* 9*s.* 9*d.*, and that of the building, 7,366*l.* 8*s.* 11*d.* Mr. E. R. Robson is the architect.

Newcastle-on-Tyne.—New Board schools at St. Peter's Quay, Newcastle-on-Tyne, were opened on the 24th ult. The plan of the buildings may be likened to the letter L. The infants' department occupies the basement of the west wing, and the fall of ground enables a covered play-ground for boys to be obtained on the same level under the large mixed school. In addition, separate covered play-sheds are erected for the girls and infants; these are all laid with cement flooring. At the east end, on the first floor, are placed rooms for the caretaker. The infants' department consists of large school, 51 ft. by 34 ft., for 207 children, and four class-rooms capable of containing each forty-seven children, or a total of 395. The height of the rooms is 14 ft. 6 in., and the rooms in most cases have windows on two sides. The girls' and boys' department consists of two mixed schools, each having three class-rooms attached to them. No. 1 school is 82 ft. 6 in. by 33 ft., arranged for eight groups of desks, against opposite walls, each containing thirty-six children. The three class-rooms opening out from this school are respectively 31 ft. by 20 ft., 20 ft. by 20 ft., and 20 ft. by 18 ft., with accommodation for 124 children. No. 2 school is 36 ft. by 84 ft. 6 in., with four groups of desks for 120 children, and three class-rooms, two of which are 21 ft. 8 in. by 17 ft., and the other 21 ft. 9 in. by 21 ft. 8 in., accommodating 117 children, giving a total for the department of 649 boys and girls, or a grand total of 1,044 children. The mixed schools have open roofs, ceiled at the collar, with arched and braced principals resting on hammer-beams, and secured by tie-rods. The desks for the school-rooms are 7 ft. 6 in. and 9 ft. long, and dual desks (for two children each) are used in the class-rooms. They have all been supplied by Messrs. Colman & Glendinning, of Norwich. The infants' department has three galleries in the main school and two in two class-rooms. The style is Tudor. The walls are of snecked stone rubble-work, with ashlar dressings. The schools have been erected from the design and under the superintendence of Mr. F. R. N. Haswell, of North Shields. The contract for the work was let to Mr. George F. Shotton, of South Shields.

The late Mr. Matthew Noble.—The will, dated June 23rd, 1876, of Mr. Matthew Noble, the eminent sculptor, of No. 43, Abingdon-villas, Kensington, who died on June 23rd last, has been proved under 2,000*l.*, by Mrs. Frances Mary Noble, the widow, the sole executrix, to whom he gives all his property, real and personal.

SCHOOL-BUILDING NEWS.

Astwood Bank.—The Wesleyans here are erecting rooms to accommodate their scholars. Satisfactory progress is being made by Mr. R. Pollard, the builder. Mr. E. Day, of Worcester, is the architect.

Harton.—New buildings in connexion with the Harton National Schools, at Harton Colliery, have been opened. The new buildings adjoin the old schools, and comprise two departments, one for girls and the other for infants, each having a class-room attached. The buildings are of brick, each department being about 51 ft. in length by 18 ft. width. The architect is Mr. Fowler, of Durham, and the contractor is Mr. Robert Allison, of Whitburn. The cost was 1,240*l.*

Bedford.—We learn from the *Bedfordshire Times* that the Harpur new elementary schools, Bedford, were opened on the 8th inst. The buildings are in the Early English style, of local red brick with tiled roofs, the front elevation being relieved by three gables with triplet windows in each, the centre being surmounted by a bell-turret. The works have been carried out from the plans and under the personal superintendence of Mr. H. Young, architect, Bedford, the contractor being Mr. S. Foster, of Kempston. The contract amounted to 3,050*l.* The schools have been erected under the direction of the Governors of the Harpur Charity.

Wick.—Three new schools have been erected at Stirkoke, Tannach, and Thrumster. Stirkoke school and teacher's house, which is designed to meet also the wants of the Bilbster district, is a substantial erection, and has cost 1,198*l.* It comprises, in the teacher's house, parlour, kitchen, scullery, and pantry on the ground floor, and three bedrooms in the flat above. The school is intended for eighty children, and one of the rooms has a gallery for the children. Tannach school is of similar size, but differently arranged. The estimated cost is 1,162*l.*, and it has been built for eighty-five children. The Thrumster school-house, with teacher's house, is situated on the Sarclet-road, and is estimated to cost 1,427*l.* This school will accommodate 200 children. The architects are Messrs. Brims & Gray.

Gateshead.—The memorial-stone of new Sunday schools in connexion with the Congregational Chapel, Gateshead, was laid on the 7th inst. by Mr. D. H. Goddard, J.P. The buildings are situated immediately behind the church, and will consist of a hall 60 ft. by 30 ft., an infants' class-room, and chapel-keeper's house. The cost will be about 1,000*l.*

DISSENTING CHURCH-BUILDING NEWS.

Wolverhampton.—The Baptist Chapel in Waterloo-street, Wolverhampton, has been reopened, after alterations and decorations, which, including a new organ, have cost upwards of 1,000*l.* The painting and decorating was done by Mr. Tatlow.

Bayswater.—The foundation-stone of the new Westbourne-park Baptist Chapel was laid by Sir Henry M. Havelock, Bart., M.P., on the 10th ult. The site, which is situate opposite the Royal Oak station of the Metropolitan Railway, is 120 ft. by 64 ft. The cost of the freehold has been 2,560*l.* The chapel is to be built from designs by Mr. J. Wallis, architect, of Harrow-road, and will be in the Early Geometrical style. The interior will be divided into a nave with two side-aisles. The total width will be 47 ft., while the nave will be 90 ft. long and the aisles about 70 ft. Two side galleries will also be provided, with one at the end of the building. In the whole it is intended to give accommodation for 1,000 persons. Schoolrooms are to be provided in the basement. There will also be a number of class-rooms, &c. Instead of a pulpit, it is intended to have a platform, from which the services will be conducted. In front of this will be room for the communion-table, and behind the platform will be the baptistry. The construction of the edifice has been entrusted to Messrs. Riley & Holsworth, and will cost about 8,000*l.*

Bridgwater.—The foundation-stone of a new Bible Christian Chapel at Bridgwater has been laid. The new chapel is to be substituted for the iron chapel on the Bath-road, and will be erected at the corner of Polden-street and Monmouth-street. The architect employed is Mr. Down, and the contractors are Messrs. Harris & Tapscott. The cost will be about 500*l.*

Buckland Newton.—The memorial-stones of a new Primitive Methodist Chapel, at Buckland Newton, were laid on the 31st ult. The chapel which is to accommodate nearly 200 persons, will cost, including site, about 400*l.*, and the contractor is Mr. W. T. Kingsbury, of Buckland Newton.

Llandrindod Wells.—The memorial-stone of a new Baptist Chapel, at Llandrindod Wells has been laid. Messrs. Pritchard & Son, of Llanyre, are the contractors. The building will be constructed of bricks from Ruabon and Sarn, and the style will be Gothic. The walls will be relieved by strings of ornamental bricks, and the "reveals" of the windows will also be of ornamental bricks. The roof will be of slate, with an ornamental ridge. There will be a small gallery at one end of the building, and the chapel will accommodate over 400 persons. The cost will be between 800*l.* and 900*l.*

Redbourn.—On the 7th inst. the foundation-stone of a new Wesleyan Chapel was laid in this village. The total estimated cost, including site, is about 800*l.* The amount of the contract, which has been obtained by Mr. Henry Platt, of Redbourn, and which includes the erection of a chapel and schoolroom, is 525*l.*; and for this sum a chapel is to be obtained 44 ft. by 33 ft., capable of accommodating 350 persons, and a schoolroom of the same size underneath chapel.

Congleton.—The foundation-stone of a new Congregational Chapel has been laid at Congleton. The new chapel, the site of which is in Antrobus-street, is estimated to cost 5,500*l.* The architect of the building is Mr. Sugden, Leek, the contractor being Mr. Stringer, of Sandbach. The building will be of Geometrical Gothic character, and built of a hard grey local stone with Hollington stone dressings. Its plan is that of a parallelogram, 80 ft. long inside, by 40 ft. wide; to which are added, at the front, a circular side projection for the gallery stairs; and at the rear two slight projections, which may, at some future day, be extended to form transepts of 20 ft. in width, separated from the chapel by arches springing from moulded stone piers; and there is a further extension lengthwise of the chapel for the semi-octagonal choir, 20 ft. wide and 25 ft. deep. At the rear, and at right angles to the main block, is the infants' school-room, with classrooms and vestry above. All the interior exposed woodwork is of pitch-pine and varnished, without staining. The chapel is to provide accommodation for about 600 persons.

Artamford (N.B.).—The foundation stone of a new United Presbyterian Church was laid at Artamford, New Deer, on the 2nd inst. The site of the new church is not far from the old, and close to the manse. Its cost will be about 1,400*l.* It is in the Gothic style. The lower part is seated for 320, while the gallery will accommodate 100. Attached to the church will be a vestry and session-room. The architects are Messrs. Marr.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

London.—After a lapse of three hundred years, mass has been said in the crypt of the ancient Church of St. Etheldreda, Ely-place, Holborn. The church and the premises connected with it formed until about a century ago part of the palace of the Bishops of Ely, and last year, being sold under an order of the Court of Chancery, it was bought for 8,000*l.* by the Fathers of Charity. The upper church, which now presents the appearance of disorder incident to the initial part of the work of restoration, is 96 ft. long by 43 ft. wide. The walls are 5 ft. thick, those of the crypt below being 7 ft., and the foundations extending far down beneath the soil. The roof is of chestnut, being secured with oak trenails, not a single iron nail having been found, and when restored it will resemble the roof of the Sainte Chapelle at Paris. The side windows have suffered greatly from time and neglect, but the tracery of one of them, near the handsome east window, is still almost perfect, at least in outline, as is also a bit of the sedilia and a carved corbel, which originally bore a figure with a canopy; and Mr. John Young, jun., to whom, in conjunction with Mr. Whelan, has been committed the work of restoration, appears confident that with these valuable aids he will be able satisfactorily to revive the chief features of the ancient structure. The crypt, or undercroft, which lies a little below the road-level of Ely-place, has been already sufficiently repaired to be used regularly for public worship.

Chester.—The Roman Catholic church of St.

Werburgh, Chester, was formally opened for the performance of religious worship on the 13th ult. The church is situated adjoining the Grosvenor Park, and has occupied about four years in erection. The exterior is of grey stone, with a high gabled roof, and the interior consists of a nave and side aisles, divided by massive pillars of red sandstone, the ceiling being of stained wood, and the walls covered with white plaster. The seats, which will accommodate about 300 persons, are open, and of pitch-pine, varnished.——On the 16th inst. the new Franciscan Monastery at Chester was opened with much ceremony. The edifice (a plain brick-fronted structure) cost 2,500*l.*, the whole of which, with the exception of 700*l.*, has been raised. On the ground floor there are two reception-rooms, one on each side; a refectory, a library, and, behind, a kitchen. On the first and second floors are seventeen cells. Mr. J. J. O'Byrne, of Liverpool, is the architect.

Swansea.—The Roman Catholics of Swansea are making provision for the accommodation of their poorer co-religionists at Greenhill, by the enlargement and renovation of the Conventual Church of St. Joseph, and the erection of a priests' house near the church. On the 3rd inst. Bishop Hedley laid the foundation-stone of the new sanctuary. The new chancel is to be erected at the east end of the church. The chief entrance to the church will then be at the west end of the building.

Books Received.

Sanitary Work in the Smaller Towns and in Villages. In Three Parts. By CHARLES SLAGG, Associate of the Institute of Civil Engineers. London: Crosby, Lockwood, & Co., 7, Stationers' Hall-court, Ludgate Hill. 1876.

THIS is a very useful book, and may be safely recommended. Part 1 treats of some of the more common forms of nuisance, and their remedies; Part 2 of drainage; and Part 3 of water supply. These are again subdivided as, for example, in Part 1:—Pigstyes; slaughter-houses; privies and cesspools; bad air in houses; dirty houses; dampness of houses; storage of rain-water; and contamination of well-water. The book is superior to some others of the same kind, for this very good reason: that the author, Mr. Chas. Slagg, has had practical experience in the works of which he treats. He is, moreover, a practised writer, and so can convey clearly to others the knowledge he possesses. There is a great deal of work required to be done in the smaller towns and in villages, and this little volume will help those who are willing to do it.

Miscellanea.

The Proposed New Water Supply for Liverpool.—The Water Committee of the Liverpool Town Council, notwithstanding the decision come to some time ago, has again taken steps to bring under the notice of the Town Council the Bleasdale scheme for a new water supply. From a letter written by Alderman Bennett to the *Liverpool Journal*, it appears that a special meeting was held on the 17th inst., at which the resolution that all further expenditure with respect to Bleasdale should cease was rescinded, and power practically given to the sub-committee to recommence boring. The reason for this course being taken is not stated. The discussion by the Town Council on the Water Committee's report was postponed, chiefly with the view of enabling the committee to make inquiries respecting the probabilities of getting a sufficient supply from Haweswater. In the first report, Bleasdale found favour with the committee; then Windermere was the chosen spot; after this the committee asked for time to report upon Haweswater, and it would appear that in the end it feels inclined to throw the two latter places overboard, and return to its first love,—Bleasdale.

Proposed Winter Garden in Leamington. The proposal to establish a winter garden in Leamington is receiving much favour and support. The Corporation has decided to recommend the acceptance of the offer of Messrs. Hyde Brothers, of Southport, to give 10,000*l.* for the pump-room site, or to take it on lease for a term of 999 years at an annual rental of 450*l.*

Fatal Fall of a House in Southwark.—On Wednesday last Mr. Carter, the coroner, resumed an inquiry as to the death of a boy named John David Evans, who was killed on the 11th inst. by the falling of a house in Glasshouse-yard, Gravel-lane, Southwark, the property of the South-Eastern Railway Company. Amongst the witnesses was Mr. T. Roger Smith, the district surveyor, who said that he made a survey of the centre block situated in Glasshouse-yard on the 23rd of June. He found the houses in a dangerous state, and so reported to the Metropolitan Board. He visited the spot a second time, and reported that nothing had been done in pursuance of an order made. The houses ought to have been pulled down in seven days after the order was made. Mr. Thomas Greenstreet, surveyor to the St. Saviour's Board of Works, said that on the 12th of June he examined the buildings, and reported to the Board of Works that they were in a dangerous state. They were all empty at that time. After reporting to the Metropolitan Board of Works, his duties ceased in the matter. The jury returned a verdict of "Accidental death," and expressed an opinion that the Metropolitan Board of Works should have taken immediate steps towards the security of the house that fell upon the receipt of the notice as to its state from the surveyor, Mr. Greenstreet, of St. Saviour's Board of Works.——On Tuesday last the railway company was summoned to show cause why they had not taken down or made secure the houses in Glasshouse-yard. Mr. Roger Smith having given evidence as to the dangerous condition of the buildings, the magistrate made an order for the houses to be pulled down or properly secured.

Enlargement of the Charing-cross Hotel. The South-Eastern Railway Company are about to make extensive additions to the Charing-cross Hotel, and for this purpose they have purchased, at an outlay of 50,000*l.*, a large block of property on the east side of the existing hotel buildings, extending from Villiers-street to Buckingham-street. The property so purchased is situated at the rear of the houses and shops fronting the Strand, and consists of premises extending from York-place, Villiers-street, to Buckingham-street on the north side, and from Duke-street, Villiers-street, to its junction with Buckingham-street on the south side. The block which the company have purchased covers an area of 12,000 ft., and on the site stand about thirty tenements, chiefly of an inferior character, all of which are to be taken down, as the works are to be at once commenced now that the company have obtained parliamentary powers to connect the intended additional portion of the hotel by a bridge across Villiers-street 30 ft. above the roadway. The enlargement about to be carried out will consist chiefly of additional bed-rooms, but it is stated that the intention of the company ultimately is to extend the Strand frontage of the hotel from Villiers-street to Buckingham-street, which will involve the purchase of several costly properties, and the entire absorption of York-place.

A New Canal Scheme.—Mr. Hamilton Fulton is reviving an old project for constructing a ship canal from Manchester to the sea. It is proposed to make use of existing waterways, widening, deepening, straightening them, and dispensing altogether with locks. From Warrington, which is on the upper tidal portion of the Mersey, to the fair-way at Liverpool, the scheme is to make a direct and permanently defined low-water channel, by which the ebb and flow of the tide would be brought to one course. The minimum depth of the canal, it is estimated, at high-water neap tides, would be 24 ft. The maximum depth of cutting from the level of the proposed quay walls to the present surface of the ground would be 45 ft. The width of the channel between the quay walls at Manchester would be 450 ft., so that there would be room for ships to turn round. The ordinary width of the bottom of the channel would be 72 ft. The estimated outlay for the construction of the canal is 3,500,000*l.*

The Late Lady Augusta Stanley.—A monument has been erected in the south transept of Dunfermline Abbey, to the memory of the late Lady Augusta Stanley. It is composed of a bas-relief cut in white marble, from a design by Miss Mary Grant, of London. In the centre panel there is a figure representing Lady Augusta Stanley being carried upward by an angelic group.

Infectious Diseases and the Liverpool Plumbers.—A deputation from the Plumbers' Association of Liverpool have had an interview with the Workhouse Committee, on the subject of the spread of infectious diseases. On behalf of the plumbers it was represented that members of their trade had frequently to work in fever and small-pox wards, and that thereby themselves, their families, and the inmates of other houses to which they might be sent to do some job immediately after leaving one of these wards, ran considerable risk. The question was asked whether this risk could not be lessened, and, as a practical suggestion, a member of the deputation thought a special suit of clothes should be provided for plumbers while employed in the wards, and that they should be allowed a bath on leaving in the evening. The committee promised to consider the matter, but they did not seem to think (according to the *Liverpool Journal*) that the plumbers were in any worse case than joiners, painters, and other tradesmen, who were exposed to similar hazards. As to suits of clothes and evening ablutions, the chairman thought a plumber might provide himself with a change of raiment if he thought it necessary, and Mr. Wilkie, the governor, intimated that any plumber inclined that way might at any time have his choice out of eight baths, which would be at his disposal.

The Clarkson Memorial at Wisbech.—The erection of the monument to the memory of Thomas Clarkson, the promoter of the slave emancipation movement, at Wisbech, his birth-place, has been delayed by a slight difficulty as to the site on which it should be placed. The committee, acting with Sir Gilbert Scott, the designer of the memorial, selected an open space in the centre of the town, near the bridge, and made application to the Town Council for permission to proceed with the erection. Objections were raised to the site on the ground that it would be an obstruction, and that the open space having been obtained by the outlay of a large sum of money, it was not desirable to place anything there which would impede the traffic. A conference of the Council was held, with the Rev. Canon Scott, the chairman, brother of the architect, and the members of the Memorial Committee, who urged that the monument would not be any obstruction, and after a long discussion the Council decided to hold a public meeting in September to decide the matter. About 1,000*l.* have been raised, and 500*l.* have been promised conditionally on the monument being placed on the site selected by the committee. [A view of the proposed memorial was given in the *Builder* for October 9, last year.]

Trade Union Congress.—The following are among the subjects mentioned for consideration at the forthcoming ninth annual Trade Union Congress, which will commence on Monday the 18th of September, at Newcastle-on-Tyne.—A bill to amend the law of compensation in cases of accident, so that workmen or their families may sue an employer in the event of injury or death from accidents due to negligence; a workshop regulation bill for women and children; the extension of the Factory Acts to bleaching and dyeing works; reform of the patent law; an Act to prevent "Truck," by making compulsory weekly payments to workmen in the current coin of the realm. As an appendix to the programme there is a list of additional questions set down for discussion, including the following:—Representation of labour in Parliament, and the best manner to obtain it; co-operation in its relation to trade unions; piecework, overtime, and apprenticeships; arbitration and conciliation in trade disputes; the urgent necessity of providing a sufficient staff of efficient and practical inspectors to enforce the various acts relating to the regulation of mines, factories, and workshops; and a consideration of the best means of securing the efficiency of all persons taking charge of either engines or boilers.

The Boring Machine in Cornish Tin-Mines.—We hear from Camborne that the boring machine at work in Dolcoath mine has made much greater progress throughout the past week. The first week of the first experimental month 3 ft. only of the end were driven, but in the first week of the next month 8 ft. of the end were cut through. Manual labour would average 1½ fathoms a month; in the first four weeks of its labour the machine accomplished 2 fathoms; now it is working at the rate of 5 fathoms 2 ft. a month.

Co-operative Cottage-building.—At a Co-operative Conference recently held at Banbury, the subject of co-operative building was discussed. According to one of the speakers, the question with the larger co-operative societies was what to do with their surplus capital, and many of them in the north had answered the question by building cottages, and where societies had a surplus capital, this was one of the best ways of investing it. This had been done at Oldham, Accrington, and other places, but there was no kind of uniformity in the method by which it was done. At Oldham they built cottages out of the store funds, and sold them to their members at a profit of something like 5 per cent. At Leicester they were trying to build cottages for their members, the rate of repayment being one halfpenny per week for every pound advanced, which would be something more than ordinary rent, and in about thirteen years the property became their own. At Derby it was proposed to build 200 houses, which would be balloted for amongst the members. It was resolved: "That in the opinion of this meeting it is expedient that every co-operative society ought, at as convenient and early period as possible, to provide cottages for its members."

Metropolitan Board of Works.—An Act has just been printed to amend the statutes relating to the raising of money by the Metropolitan Board of Works. Up to the 31st of December, 1877, the Board is empowered to expend for general improvements a sum not exceeding 100,000*l.*, and for the purpose may create consolidated stock; for the purposes of the fire brigade, 20,000*l.*, so that the sum does not exceed, with the former amount, 55,000*l.* With regard to vestries and district boards, the sum was limited to 100,000*l.*, and is now extended to 200,000*l.* A vestry or district board, under the Metropolis Management Act, 1855, may borrow money of the Board, and such advances are not to exceed 150,000*l.* The Board is also empowered to lend to guardians 120,000*l.*, and also to corporations, burial boards, &c., 50,000*l.*, to be paid, as in other applications, with interest. The Board also may, up to the end of next year, advance to the managers of the Metropolitan Asylum District other sums, as authorised by the Local Government Board, not exceeding in the whole 100,000*l.* All sums received by the Board in respect of interest on, or principal of, any loan made by them under this Act shall be carried to the Consolidated Loans Fund.

Social Science Congress, Liverpool.—It is stated that there is a possibility that the usual sanitary exhibition in connexion with the Congress will not be held this year. This arises from the difficulty of finding a place in which it can be held. The assistant-secretary, who has been to Liverpool to make arrangements, reports that there is but one place there suitable, the Victoria Hall. This is a temporary structure, which was erected for Messrs. Moody and Sankey's services. It stands on Government property, and the lease falls in on the 15th of September, while the meeting does not commence till the 10th of October. The site is chosen as the place for the new county court, and, according to present arrangements, the removal of the Victoria Hall will be commenced without delay, and will probably have entirely vanished before the Congress meets. Official application has been made to her Majesty's Office of Works to allow the structure to remain till after the meeting of the Congress, and a formal refusal has been sent in reply.

The Plasterers' Company.—The prizes offered by the above company, to encourage technical education in the industry they represent, have recently been awarded. This is the twelfth annual competition for prizes given by the company. As on previous occasions, the examinations were conducted by the Department of Science and Art at South Kensington. According to the report, the competition was thoroughly satisfactory; and the offers of the company evidently act usefully in stimulating the efforts of the students in the direction of architectural decoration. The number of competitors was fourteen for the prize for modelling in plaster, and sixteen for the design in monochrome. The following were the successful competitors. For a model in plaster:—First prize, W. J. Merritt, National Art Training School; second prize, J. Huskisson, Nottingham School of Art. For a design in monochrome:—First prize, F. Gibbons, Cirencester School; second prize, Edward Gibbons, National Art Training School.

New Fire Brigade Stations for the Metropolis.—The Metropolitan Board of Works a short time since agreed to purchase for 35,000*l.* the site of Winchester House, Southwark Bridge-road, nearly two acres in extent, for the purpose of erecting a large central station in lieu of the Watling-street establishment. A new station is to be established in the Isle of Dogs, and a new building is now in course of erection, at an estimated expenditure of 3,987*l.*, on ground in Gomm-road, Rotherhithe, near to Southwark Park. A station will be established on Shooter's-hill, the War Office having granted the land at a nominal rent; and another will be constructed on land purchased in Grove-street, Greenwich, in substitution of the existing station in Blisset-street. A station will also be erected in Brook-green-lane, Hammersmith. During the past year a new station in Commercial-road, Whitechapel, which is the chief station of the C or eastern district, was opened, and the old stations in Well-close-square and in Church-lane, Whitechapel, closed. The new workshops for the brigade in Waterloo-road were also completed and opened, at a cost of 2,499*l.*

Oleaginous Stones. — The *Gazzetta dell' Emilia* states that the police, a short time ago, arrested a woman because, having on different occasions sold wax to grocers, she refused to say where she obtained it. At last she declared that she had procured it from a certain species of stone. Two days after, a professor of chemistry happened to be in the office of the examining magistrate, who laughingly related the fact. "Do not smile," said the *savant*, "for in several localities of Galicia and Moldavia there is found an oleaginous stone which resembles wax, and which melts with the heat of the sun. Chemists call it ozocerite, and a large trade is done in the article. Why may not the same sort of stone exist in our mountains?" The magistrate at once ordered that the woman should be again brought before him, and she declared that the facts were precisely such as the professor had supposed.

The Commissioners of Patents, and Trade Marks. — The recent decisions of the Commissioners of Patents, who are now, for all practical purposes, final authorities in such matters, are to the effect following:—A royal crown, regarded either as a public emblem of royalty or as an emblem denoting quality, cannot be considered by them as sufficiently distinctive to form part of a registered trade mark which has not been used in the ordinary way of business before Aug. 13 last, when the Registration Act passed into law. The like inhibition extends to public buildings, national arms, flags, &c., the arms of boroughs, and so on. Further, no exclusive title can be conceded by the Commissioners to any words whatsoever of quality or advertisement, such as superior, finest, cheapest, warranted, patented, &c., as belonging to new marks, nor can they in connection therewith be recorded in the official register.

Painting by Machinery.—Mr. J. C. Paget has on view at the Great Western Hotel, Birmingham, working models of a machine for painting large surfaces. The main feature of the invention, which has been patented, is a self-filling brush, which paints with considerable rapidity, and is moved by treadle or hand. The appliance, moreover, may (according to the *Birmingham Gazette*) be developed so far as to admit of its being moved by steam power. The process of painting is frequently attended with serious injury to the health of the operator, but Miss Paget (the patentee) proposes to obviate this disadvantage, and reduce the labour and expense involved. The machine is about to be tried by a large ship-building firm on the Thames in competition with hand labour.

The St. Gothard Tunnel.—The report of the works at the St. Gothard tunnel shows that from the 1st to the 30th of June last 312 ft. had been pierced at the northern or Gœschenen inlet, and 133 ft. at the opposite, or Airolo extremity. Up to the last-named date the whole distance tunnelled was 10,779 ft. at the northern end and 10,001 ft. at the southern end; leaving yet to be pierced 28,176 ft. in the centre, the whole length of the tunnel being 48,956 ft.

A New Museum for Birmingham.—The Museum of Arms, Newhall-street, just presented to the Corporation of Birmingham by the gun trade, is now open free. The museum is well worth careful examination, as it contains a complete set of specimens of fire-arms from the earliest periods, together with other weapons, many of which are interesting as works of art.

Labourers' Dwellings in Ireland. — In the House of Commons, on the 14th inst., Sir Michael Hicks-Beach (in reply to Mr. Butt) said that during the last few years a great improvement in the labourers' dwellings in Ireland had been made, but still their condition was by no means what could be desired. He had paid some attention to the subject, and was disposed to doubt whether any legislation he could recommend would lead to any material improvement, unless, indeed, it were effected by some alteration in the sanitary laws which would enable the sanitary authorities to insist upon these dwellings being healthy habitations. He would look carefully into the matter during the recess.

The Society of Engineers.—The third of the inter-sessional visits of the Society of Engineers for the present year took place on the 22nd inst., when the members and associates visited the Royal Victoria Victualling Yard, at Deptford. There were present, among others, Mr. R. P. Spice, one of the vice-presidents; Mr. C. Barnard, Mr. Jabez Church, Mr. Copland, Mr. Schönheyder, Mr. Addenbrooke, and Mr. P. F. Nursey, secretary. In the absence of the superintendent, Mr. Grant, the visitors were received by his deputy, Mr. McKain, by whom, with the engineer to the yard, Mr. Storrar, they were conducted over the establishment.

Breaking into a Sewer.—At the Hammersmith Police-court, on the 12th inst., Henry Stock, a builder, was summoned by the Fulham Board of Works for unlawfully breaking into a public sewer. Mr. Jones, clerk of the Board, said the defendant had broken into the sewer without the consent of the Board. He had rendered himself liable to a penalty of 50*l.* The sewer was lately constructed in Walham-grove, Fulham, at the expense of the owners, but it was invested in the Board. The defendant broke into the sewer to connect it with his house drains. The defendant, in reply to the complaint, said he did it in ignorance. He paid towards the construction of the sewer. The magistrate fined the defendant 5*s.*, and 2*s.* costs.

Shaftesbury Cottages, Seacombe.—On Saturday, the 12th inst., a number of prizes for the best cottage garden were competed for by the tenants in the Shaftesbury, Stanley, and Derby Cottages in Wheatland-lane, Seacombe. These cottages are the property of Mr. John Ellis, and are built on a plan before now referred to by us, by which each six houses are built in a sexagonal block, with a central chimney for each block. The space occupied by the Ellis House is less than that usually allotted to a house of a similar class when built in rows. The tenants of the model blocks at Seacombe speak in good terms of the dwellings.

Robbing the Stonemasons' Friendly Society.—At the Southport Police-court, on the 16th inst., a man named John Merry was charged with embezzling the sum of 14*l.* 1*s.* 11*d.* the moneys of the Southport branch of the Stonemasons' Friendly Society. The prisoner was in June last appointed secretary of the branch, when the receipts and cash-books were handed over to him, and he had them in his possession on July 31st. The accounts for the latter date were not entered in the books, which had since been audited by three parties, there being a balance now due as stated above. Prisoner pleaded guilty; but, as he was in a state bordering on *delirium tremens*, he was remanded.

The Remains of the Burlington House Colonnade.—Visitors to Battersea Park may have seen, when entering it from the Albert Bridge-gate, the disjointed masonry which once formed the colonnade at Burlington House. Year after year this stonework remains idly wasting away. The *South London Press* suggests that the masonry be utilised, and at the same time preserved, by using it for the erection of architectural entrances or gateways to the park.

Proposed Retreat for Decayed Gentlemen, Roehampton, Surrey.—A limited competition has lately taken place to decide as to the architect to be employed in erecting some buildings for the above purpose at Roehampton. We understand the design of Mr. Francis T. W. Miller, of the Wool Exchange, was chosen. The site is given by, and the buildings will be erected at the sole cost of, Colonel A. Angus Croll.

The Bethnal-green Museum.—During the repairs about to be executed at Dulwich College, the collection of paintings known as the Dulwich Gallery is being removed for temporary exhibition at the Branch Museum, Bethnal-green.

The Builder.

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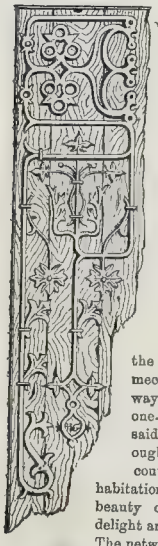
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Railways and the Picturesque: Derbyshire.



EVERY one who has read or remembers the history of the great railway development in England during the last half-century, remembers also that among the dismal prophecies of evils which were to follow in the path of the locomotive, was that which foretold the destruction of the charm of rural scenery by the invasion of the steam engine, and the defacement of the country by the processes of cutting, embanking, &c., necessary to provide the level roadway which the mechanical conditions of railway travelling demanded. If one-half of what was then said had been true, England ought by this time to be a country nearly unfit for the habitation of all to whom the beauty of natural scenery is a delight and a treasured possession. The network shown on Bradshaw's map seems to leave scarcely any considerable district uncontaminated. And in some respects the influence of railways on the country, or on certain tracts of it, has been undeniably dismal: but these influences have been rather indirect than direct. The increased impetus given to iron manufacture, for example, has here and there blackened and blighted the face of the land in a manner only too well known. Old and picturesque but once busy towns have had their life drained away from them, and are left high and dry, to lament over the days of their former prosperity: for, whether it were the result in the first instance of opposition to an existing line of locomotion, or of the fact that the line of country best for coaches is not always best for railroads, the pertinacity of the railway system in upsetting the old coaching centres and setting up new centres of its own cannot but be remarked. And the architectural character developed in the then new centres of locomotion, or impressed on the old ones, under the influence of railways, is not by any means beautiful or desirable, for the most part. It is the architectural expression of the desire of speedy return for outlay, of the least possible expenditure or thought in regard to anything which will not yield a good percentage. Such a spirit is certainly directly at variance with Art, which, rather than Nature, is influenced or interfered with by the centres of railway traffic, in regard to most of which Nature has been long out of the question. And if we travel in imagination from the centres along the routes of traffic which, extending through more or less wild and rural neighbourhoods, do come into direct relation with natural scenery, it must also be admitted by every one that a railway in process of construction is a terrible eyesore in the prospect. A straight deep trench freshly cut through a wooded slope—a great bank of newly-piled earth and *débris* obtruding its raw surface and straight lines into a green winding valley, accompanied by all the unpicturesque jumble of ugly objects included under the general head of "plant"—such incidents are certainly no addition to the charms of a "romantic" prospect. But these drawbacks are only what attach more or less to every building or construction while in operation. The architect as well as the engineer is *pro tem.* the despoiler of Nature. He cannot build a country villa without for the time rendering the site hideous,—a place of trampled vegetation, and dirt, and disorder; although eventually his building may really be an addition to the scene. Over the work of each, Nature before long lays her covering of beauty and harmony. The last vestiges of the contractor disappear; the clay or soil embankment becomes covered with verdure, and the arch which spans the stream is stained and lichened into harmony with the rest. The railway features after a little time become part of the landscape; even those who have seen the work in operation forget its past in its present aspect, and to those who have not known the place in its former state the railway embankment or viaduct takes place as a part of the natural picturesque element of the scene. This is the history of a number of instances in which the entrance of the railway upon the landscape has been scouted and opposed as utter ruin to the prospect, which in the end has scarcely been affected by the intruding power in any appreciable way whatever. Of the social and even moral changes brought about in a retired place by the introduction of the railroad we are not here speaking; but in regard to the effect of their work on the aspect of Nature, railway companies and their engineers have suffered under a great deal of what is really misplaced reprobation, and have been accused of mischief which it is not only not in their will, but even beyond their power to commit; for it may be said that a scene which can be permanently and seriously spoiled by a railway running through it cannot have had very much in it to spoil.

And this, we are inclined to think, is the tacit admission of most persons who have originally looked with alarm or indignation on the intrusion of steam into their private haunts,—

> "Their daily walks and ancient neighbourhood,"

after they have had time to become acquainted with and reconciled to the intruder. But the subject is worth a word, because, in spite of this general experience, the opposition to railroads on "picturesque" grounds seems constantly to crop up and to be renewed at every new invasion of rural territory by the locomotive. Indeed, the scheme for a new engineering work of any kind usually brings its batch of objections on the score of sentiment and association and picturesque effect. Some readers may remember the opposition that was made, and that by well-educated people, in deliberately-written pages, against the first proposal to bridge the beautiful ravine at Clifton by (to borrow a stage term) a "practicable" suspension-bridge, in place of the old aërial ferry that was plied with a rope and basket. Bitter at that time were the sarcasms launched against the promoters of the new bridge and the engineers who profanely proposed to tamper with the rocks at either side to provide bearings. Yet is the said bridge now (not to speak of its practical convenience, or rather necessity) a favourite spot from which to view the scene to the best advantage. The desecration of the same scene by the railway along the river side was also a fruitful source of lamentations, though we do not find that the charm of the scene is lost to visitors at the present period. A more recent instance of rail-phobia occurred when the line that now skirts the southern portion of the New Forest was proposed as a straight route nearly through the centre of the Forest, and all the exertions of the fortunate occupiers of country houses in that district were successfully employed to push the intruding line from them, and to compel its projectors to give it a circuitous course, far from their Lares and Penates. It is, however, whispered that, now that the railway is an accomplished fact, and the dreadful idea has become familiarised, the opponents who thus thrust it from them are beginning to regret their enthusiasm for Nature, and to feel a certain envy against those who live within more convenient distance of the iron highway. And it is not very long since we noticed a characteristic expression of opinion, on the part of a writer of genius, in regard to the sacrilege committed against one of the most beautiful districts in England, by the line carried by the Midland Company through the Bakewell valley, and down to Buxton. The line has been made some time, and even those who may have regretted it at first have mostly had time to get used to the idea, if they required such using. But the divine anger of the author of "Fors Clavigera" is more abiding, and it is a comparatively short time since we were told, on his high authority that the district in question had been utterly ruined for all true lovers of Nature by the railway being driven through it, with not the slightest compensation beyond the bare fact that now "any fool" could get from Bakewell to Buxton in half an hour.

Whether the very numerous class of persons thus referred to have or have not a right to be considered and assisted in their designs for rapid locomotion, we need not attempt to decide here. That a large number of human beings coming under that category do use the Bakewell Valley Railway is probable enough. We have a recollection of once travelling through the most beautiful part of it, on a lovely summer's day, in the accidental company of a "professional brother," who utilised the occasion for a discussion of the details of a plumbing specification, and was utterly puzzled at a suggestion that the time would be better employed in looking out of the carriage window. Such experiences, however, are no proof of the justice of Ruskin's denunciation, the reference to which is so far apropos to these remarks, that they were occasioned by the contemplation of the effect of part of the very

line of railway thus denounced, on the *genius loci* of one of the most romantic places in its route, the beautiful winding glen known as "Miller's Dale," which gives its name to the junction station between the main line of the Midland Railway and the Buxton branch. Now, if railways are to be regarded as a spoliation of the landscape, it might be said that of all places through which a railway could be carried, Miller's Dale was one of the most likely to be thoroughly injured by the intrusion. Most persons who are familiar with that slice of conventionality, stuck down in the midst of a wild country, which is called Buxton, will be acquainted with Miller's Dale, a recognised ramble of the district. The receipt is as follows:—Take a carriage four miles out along the high road (unless you prefer walking); take one or two ladies who do not mind a little scrambling,—they will be found to furnish picturesque groupings at certain points of the walk;* and on reaching the required point in the road (after having admired the dashing trout-stream which skirts it and the light iron skew bridges by which the railway crosses and re-crosses the road at very acute angles), take the path that follows the margin of the said stream for some three miles. The Dale is a deep, narrow winding valley, in great degree formed by the immemorial action of the water cutting into it and deepening its bed. The brook, which is the very ideal of a brook, brown, clear, and rapid, now runs through shallows under high sloping banks, now between steep rocks, in some places hollowed out and overhanging the water, now beneath the shade of trees, and at one turn of its course makes a noble sweep round between lofty perpendicular walls cut down with almost artificial regularity to the level of the water. And how does the railway look upon the scene? Well, we would put it to any unprejudiced person with an eye for the picturesque, whether the railway does not improve and heighten the effect rather than otherwise. The brook and boundaries of the dale turn and wind continually; the railway runs straight through all its windings, high above the water-level; now on a gallery at one side, then disappearing in the rock to reappear on a bridge leading to another cavern, and thence to emerge on a gallery on the other side of the glen. Occasionally the glen and the railway part company altogether, to join again at an unexpected point. In one or two of the reaches of the glen the railway embankment, quitting for a moment the natural boundary of the scene, seems to shut in the wanderer from all further progress, till at a bend of the stream we find the outlet, and the brook and the wayfarer pass side by side under a triumphal arch 50 ft. high into the next stretch of the glen. Now, to say that the railway spoils all this is absurd. The railway, in fact, makes some of the most effective and picturesque points of the walk: let those who doubt look for themselves. And as to the passing train and its disturbance of the quiet of the scene, to our thinking there is always a kind of mysterious charm in that sudden and momentary apparition, in a remote spot, of a part of the great caravan of the busy world, which just serves to remind us of our connexion with it, and yet almost intensifies the solitude and retirement of the place as it darts away again out of sight and hearing. This may be a fancy of our own merely, and to others the train may be regarded as a nuisance; though we venture to say that such a feeling is rather an indication of a prosaic than of an imaginative temperament. But the point impressed upon our mind, in connexion with the lamentations that have been raised about the direful and anti-picturesque effect of railways upon this and other romantic districts, is that, however great a "mess" railway operations necessarily make in a rural district while in progress, when completed and assimilated to the landscape the railway is, in many, not to say in most cases, an addition to, rather than a detraction from, the picturesque character of the scene, and even supplies a new element of what may be called the mental or moral picturesque. A kind of mystery is involved in its windings and burrowings, a sense of the triumph of science in its unchecked progress through and under and over all obstacles, an association with distant scenes and people with whom this bond of civilised life connects us. All which is worth considering in view of the opposition which has continually been made, and will be made again, whenever it is proposed to take a railway through a new and beautiful district; an opposition often foolish and uncalled for, and nearly always useless, since when the interest of two centres of population demand that they should be connected by a railway, through whatever sort of country, the supply must inevitably follow, sooner or later.

We have been so far referring chiefly to the more strictly engineering portion of railway works; the provision, in the way of cutting, embanking, and levelling, for securing a level road over the face of the country. It is this portion of railway work which most concerns its relation on a large scale to the landscape through which the line passes. Something is to be said, however, on that branch of the subject which is more immediately connected with architecture. Railway buildings and structures, in the shape of station-houses, sheds, and bridges, form an immense aggregate of what is, in a certain sense, architectural work, all over the kingdom. The bridges form the connecting link between the engineer's and the architect's work; and it must be confessed that, considering what may be made of a bridge, and how picturesque an object it may almost always be, the average of railway bridges are by no means the addition to our scenery which they might be. The deficiency of the picturesque element in such structures arises, however, from two nearly opposite causes, one or other of which operates against the effectiveness and beauty of most railway bridges. Where the engineer uses what may be termed architectural materials, stone and timber (the former especially), he is very apt to weaken and impair his structure, so far as expression goes, simply in the attempt to give it what is supposed to be an "architectural" appearance: that is to say, to clothe it with certain features in the way of ornamental moulding and panelling, which may be in place in edifices of a different kind, but which are quite at variance with the expression of strength and endurance which should especially characterise railway structures of this kind—structures which are not, like houses, placed within an artificial surrounding and built for elegance and comfort as well as for utility, but which are often in direct contact with the ruggedness of Nature in her wilder aspects, and are built for strength and endurance beyong anything else. This is an old story against the railway engineer. Pugin pointed out, years ago, and illustrated his point, how picturesque and powerful a thing an ordinary railway arch over a road might be, if it were built simply and frankly in the strongest manner, and with the strong points, or rather the points doing the heaviest work, emphasised, instead of being smoothed down into a pilastered and panelled building under the notion of making it architectural. Some very able engineers, we have reason to know, have (or at least express) a strong sense of this value of a frank and massive treatment of their work, but we must presume they do not get their own way, or do not care to go out of the beaten track; for it is the fact that an ordinary stone or brick railway bridge is almost invariably a structure looking a great deal weaker than it actually is:* a result completely at variance with the true picturesque, and which arises simply from the effort to apply to it a conventional treatment and expression quite foreign to its objects, and derived from structures of quite a different class. We fear it is little use calling attention to this, and in any case it is rather late in the day to repeat the exhortation; but we do wish that those concerned in structures of this kind would either take a hint or suggestion in the way of design from some one with a knowledge of what really constitutes architectural expression; or, failing that, that they would refrain from any attempt at "design" (so-called), and content themselves with simply putting together the materials in the strongest and most enduring manner. That the first hint should be followed we scarcely expect, for the jealousy of engineers in regard to what they call architectural interference is really almost unaccountable, except on the general principle that people dislike a man who professes to have any perception in regard to taste and feeling, which they themselves have not. We knew a case in which an architect of talent and reputation asked permission to offer some details for an important viaduct, not "in the way of business," but simply from interest in the scene of the construction and a desire to see something better than engineering detail generally is; but to no purpose; it was considered "of no consequence," though the ability of the person who made the offer was not disputed. But if the engineers will not take architectural suggestions, let them only keep off the architect's domain altogether, and they will be much more likely, especially in the case of railway works in romantic districts, to produce something not out of harmony with the scene, than by fiddle-faddling with pilasters, and finials, and parapets. The truth of this is illustrated often in the cases where circumstances lead to the employment of timber bridges on railways. These are not frequently made now, and are generally small affairs for crossing a brook or a footpath in an out-of-the-way place. Under such circumstances little or no trouble is taken about "designing" them, except so far as constructive stability goes. They are generally a collection of plain balks of timber properly trussed and strutted; and really these are among the best and most picturesque-looking railway constructions one sees. Some of the wooden viaducts on the Cornish line are particularly picturesque.

The opposite kind of failure seems to us to occur when the railway engineer comes to the use of the material which, for the present, is specially his own, and has little or no architectural association connected with it at all. In the use of iron, what we have to complain of is not so much the attempt to engraft a sort of sham architectural physiognomy on the work, as the absolute ignoring of the whole question of picturesque or pleasing expression, the mere aim at bare constructive necessity. This principle, which, in the use of a natural material, such as stone, may, as we have pointed out, produce sometimes the best result, becomes quite a different thing when applied to a completely artificial material like iron, which, having no reference to, or harmony with, anything in nature, requires to be made pleasing by artificial means, or in other words, by deliberate "design," of course in due relation to its qualities and the object of the work. It is not always easy, perhaps, to accomplish this; it is certain that little enough is attempted. It would be scarcely possible to name any more hideous structures than the Bangor and Conway "tubes," for example, or than the London, Chatham, and Dover bridge over the Thames at Blackfriars. What it would have been possible to have done with the tubes we can hardly undertake to say; they form certainly an ungracious problem enough. That the Blackfriars Bridge might have been vastly improved, and even made an agreeable and pleasing object, with the expenditure of some thought and perhaps an inconsiderable extra cost, we have no doubt. To return to our Derbyshire suggestions, we may recal, also, the light iron skew-bridges which fly across the turnpike-road leading out of Buxton, and which, from the acute angles at which they cross, and the consequent oblique setting of the abutments, have quite a picturesque aspect in themselves, taken generally; they only required a very little finish and consideration in regard to the detail of the ironwork to be as pleasing objects as anything iron can be made in a rural and romantic district. In regard to single-span bridges over roads (or even longer river bridges), however, we cannot but regret that timber should not be more used in English railway constructions.

It is true that by the neglect to keep up adequately the growth and supply of the splendid oak indigenous to the country, we have interposed a considerable economical barrier against the use of timber in constructions where strength and durability are required. Yet even as it is, we doubt if there be not much to be said in favour of timber for bridging in many situations, from a practical point of view, and there is at least the advantage that you can see far better what it is doing than you can with iron, and that it is less subject to sudden failure from an unsuspected flaw or deterioration at a critical point than iron. As to the question of appearance, of "picturesque," there is absolutely no comparison of the two materials, save only in the case of the iron suspension bridge, which is out of the question for railway constructions. We might fairly plead at least for a more extended use of timber construction in districts where the question of assimilating the railway constructions to the character of picturesque scenery is to be considered. Iron constructions are, from their artificial character and their hard thin lines, absolutely at variance with Nature; and, as usually carried out in connexion with

* One only, we believe, is sometimes preferred; but that is a matter of individual taste.

* It is worth notice that in most cases no difference is made in the design or the apparent strength of bridges carrying the railway over a road and of those carrying a road over the railway, though the constructive necessities in the two cases are so utterly different.

railways, are equally inimical to the picturesque of cities. We need only, indeed, recal the Blackfriars Viaduct, before mentioned, and the too celebrated Ludgate-hill bridge, to justify the conclusion that, whatever may be said about the spoliation of rural scenery by railways, no rural district we know of has suffered so much disfiguration from the structures connected with them as we have to complain of in London itself.

The buildings connected with railways, such as station-houses, of course come as nearly as possible under the heading of ordinary architectural work. The terminal station, on a large scale, is now almost invariably, as far as its frontage is concerned, merged in a hotel, which must, as far as one can see, be architecturally treated much as other hotels are. Where this is not the case, however, the street front of the terminal station ought to offer a great deal of suggestion for special treatment which it has very seldom received; a treatment which, while expressing in its solidity of style the nature of the great work with which it is connected, should also, in the detail of its design, have more distinct reference to what is behind it,—to the wide area covered by a roof, the outline and proportion of which should be rendered evident in the design of the front. A mere screen of building with windows and doors arranged in the ordinary fashion, is a poor and characterless facing for a railway terminus; but this is all that is generally attempted. The picturesque on a grand scale might be realised, and a very new and effective feature in town architecture developed, if any competent persons would have the spirit to substitute something really characteristic, and arising out of the circumstances of the case, in the place of the group of "offices" usually found as the mask to a terminal station, in cases when the hotel is omitted. There is something new to be done in railway architecture in this respect. The question of country station-houses brings us once more in direct relation to the picturesque as affecting scenery. The country station is often in a conspicuous situation in the landscape; and no position could be more suggestive for effective treatment than that of a station-house on the side of a lofty embankment. We are not without pretty stations on some lines of rail; the usual fault seems to be a tendency to mere prettiness and villa character; whereas everything in connexion with a railway should be pre-eminently solid and enduring in appearance. The increasing habit of adopting one particular design and character for all the stations along a line of route tends to increase the mechanical and artificial aspect of a railway, which is just what, in the interests of the picturesque, we are anxious to see broken through and varied; moreover, such a way of building tends to make the railway structures independent of all the changes in the character of the country through which the line passes, which is exactly what ought not to be. The use of the materials most peculiar to each district, in place of a uniform repetition of the same materials along the whole line, would in itself tend to give distinctive character to the various stations, and impart a more picturesque effect to them individually, as well as affording greater variety and interest to the traveller who successively passes them, than if they were all a family of similar erections, built on the same model and with the same materials. The wearisome effect of this on some lines is very strongly felt. A station should have something to distinguish it from others besides its name on a board. Finally, we would hint that something might be made out of signal-cabins, which, both from their outline and construction, as overhanging chambers poised aloft on supports, and most frequently of timber construction, afford every suggestion for picturesque outline and character. They usually have the prevalent defect of railway structures, of looking much more weak and flimsy than they really are, and would be capable of being made far more pleasing objects without probably the slightest additional expenditure over the average of what is now bestowed upon them. The consideration of the subject in regard to such auxiliary structures in connexion with railways it is not too late to urge. The great proportion of viaducts, bridges, and other supports of the "permanent way," are provided for years to come; but the rebuilding and altering of railway edifices is continually going on, and there is consequently the opportunity for their improvement in an architectural point of view, as there is every room for it.

THE CORNWALL CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

BEFORE picking up the thread we dropped last week, we step back to give a note of a paper on

The Keltic Horn, or Trumpet, the Karnon of Hesychius,

read, as we have mentioned, by Dr. Phené, F.S.A.

The different kinds of ancient horns were first referred to. These were attributed to a supposed original Keltic source; and, while it was shewn that for general purposes, or those requiring a larger number of instruments, the natural horns of animals were used, examples were given, when, for more solemn and special occasions, a metallic instrument of artistic make was employed. Thus: the procession before Jericho was characterised by a number of rams' horns; while, for more sacred purposes, silver trumpets were used. The ordinary horn of the Kelts was a natural one, which, indeed, was used by the Saxons also to comparatively recent times, as described by Sir Walter Scott. But the more royal instrument was a highly-wrought piece of metal-work, as shown in the trumpets found in the peat-bogs in Ireland. As with the ancients, everything that attracted their special observation, or occupied their special study or labour, was considered worthy dedication to some or one of their deities, the horn assumed a mystic significance, and became identified with the crescent moon, or Astarte, in the one case, and Jupiter Ammon in another. The Feast of Trumpets, and its connexion with the new moon festivals among the Hebrews, was referred to, and some unusual expressions shown to connect the poetical ideas of the Hebrews with the nations around. Thus: while horns were used or referred to, to represent rays or wisdom, a Hebrew writer refers to them as issuing from the hand, instead of the brow, and so clearly identifying them with the rays, or arrows, of Phœbus or Apollo, and the Assyrian Asshur. Parallel poetical ideas were shown, by a comparison of the Great One who came from "Mount Paran," and the Deity of Mount Soracte, in which cases the language used was very similar:—

> "Summe Deum sancti custos Soractis Apollo,
> Quem primi colimus, cui pineus ardor acervo
> Pascitur, et medium freti pietate per ignem
> Cultores multâ premimus vestigia prunâ."

From this reasoning the Karnon, or Keltic horn, was considered by the author to have been a sacred instrument dedicated to the Karneian Apollo, and places to have been sometimes named after it. The policy of Mahomet, in retaining the double horn, or crescent, the original emblem of the Sabian worshippers of the various Oriental nations, was pointed out, while, returning to more familiar usages, it was shown that the custom of demanding surrender of a stronghold by a summons of trumpets, or announcing any great and important event, was a *remanet* of the Hebrew custom of blowing the trumpets on the opening of the doors of the Temple. Local matters were then referred to—as in Brittany, Cornwall, and Oxford—in which horn-blowing, and festivals in honour of Flora, were still connected with certain churches, or sacred places, haunted by evil powers, by which it was argued that Flora, as Light or Beauty—in short, Spring—being announced, Darkness, or Winter, fled away. Their esteemed fellow-Cornishman, Professor Robert Hunt, F.R.S., had, in consideration of long friendship with him (Dr. Phené) given him some manuscript additions to Mr. Hunt's interesting work on "The Romances and Drolls of the West of England," which enabled him to connect the furrey dance and horn-blowing still kept up at Helston with that at Magdalen College, Oxford, through information received from Dr. Bloxam, of Oxford, both the festivals being in honour of Flora. The name Belerium conveyed, he thought, the Roman recognition of Bel or Baal worship in this district, and the Cornu-Wales the horn, crescent, or Astarteian worship in its original popular sense in ancient times.

Buryan Church,

which was visited on the road to the Land's End, described in our last, is noticeable for some Norman work, an arch and a half arch, with pier, built up in the north wall of the chancel, and very sensibly left exposed by those who recently restored the church. There is also an elaborate, though coarse, carved rood-beam, as well as parts of the screen,—the whole formerly painted and gilt. There is the head of a churchyard cross on the top of a high flight of steps in the churchyard; and on the village-green are parts of another cross.

Sunday was, of course, a day of rest; but in the afternoon Mr. Borlase invited the members of the Association to visit his museum at Castle Horneck, about a mile from Penzance, where they examined at leisure the remains which Mr. Borlase has disinterred from time to time on the hills and downs of the Land's End district, and which he has described in his "Nænia Cornubiæ." Among them are fragments of an urn found in a kistvaen within a barrow on the hill of Morvah. On the top of the earth in the kist lay a third-brass Roman coin, and several other late Roman coins were afterwards discovered in the kistvaen. The pottery is thick and rude, though well baked, and is ornamented with a chevron pattern placed between double lines of indentations. Mr. Borlase considered it to be Romano-British; but Mr. M. H. Bloxam and Mr. Tom Burgess were both inclined to regard it as Anglo-Saxon. If they are right some very difficult questions are raised. How did Saxon pottery get into Cornwall at such a period? For the special delectation of ladies of antiquarian tastes Mr. Borlase had laid out a selection of foreign and English lace, including several specimens taken from the robes of French ecclesiastics, and some English lace of the fifteenth century, which represented Adam and Eve in Paradise. Here, too, was a lace cap worn by Margaret of Anjou, and given by her, as a token of gratitude for services rendered to her in distress, to a maternal ancestor of the Borlase family. Then there was a carved trousseau-chest, of formidable size, from Holland, dated about 1620, and capable of holding all the clothes of a young lady even of the present day. Its three panels were "charged" with a representation of scenes from the story of Esther and Mordecai, in bold relief. Then the party were shown a variety of cinerary urns and other sepulchral and domestic furniture, celts and flint weapons, mostly taken from barrows opened by the host in the far west of Cornwall (though some few came from Oxfordshire and elsewhere), blocks of tin from the Jews' House, near Marazion"; roughly-modelled lamps, used by Cornish miners about the reign of King John; stone jars, containing coins of Constantius, supposed by Mr. Borlase to belong to the third century (though Mr. Bloxam, it is only fair to say, dissented from this opinion); specimens of Roman, Samian, and Etruscan pottery, iron spear-heads, hammer-heads of stone, certainly anterior to the Saxon times; stone lacbrymatories or tear-bottles, Roman lamps, scarabæi, necklaces, bracelets, clasps, and other articles for the fastening of female apparel, &c. With these were several ecclesiastical antiquities, the most interesting of which, perhaps, was a small wooden crucifix, roughly and rudely carved, which is said to have belonged to the Prior of Lewes, in the time of the Conqueror, and is thought by Mr. Bloxam to be at least as early as the eleventh century in date. We were also shown a piece of human skin, probably that of a sacrilegious Dane, which had been nailed, some eight or ten centuries ago, on a church-door in Essex. We say nothing of the miscellaneous assortment of iron spear-heads, and of flint instruments of war, of the chase, and of agriculture, but will only add that the gem of the whole collection seemed, by general consent, to be a magnificent vase of Etruscan workmanship, far larger than any specimen in the British Museum, adorned with pictures of animals.

On Monday, the 21st, there was an excursion to

Chywoone and St. Just.

The pre-historic remains at Chun, or Chywoone, lie in the midst of some of the most rugged scenery of the Western peninsula,—not so rugged, indeed, as in the wild bleak district still further to the north, but still marvellously attractive in its simple grandeur to the mere unscientific lover of nature, and doubly so, therefore, to an archæologist.

Chywoone, or Chun Castle, occupies the summit of a hill, on the slopes of which are numerous remains of ancient dwellings. It consisted of two ditches and two concentric walls. The outer ditch was 20 ft. wide, and the outer wall was 6 ft. or 7 ft. thick, and in the time of Dr. Borlase was in some places 10 ft. high. The inner ditch was over 30 ft. wide, and the inner walls about 12 ft. thick, and Dr. Borlase supposed, from its appearance in his time, that it was originally about 75 ft. high, but from the immense quantity of stone that had fallen

down on each side, he could not help thinking it might have been much higher than that. There were two concentric walls, and there was a small inner wall, also concentric, and joining them were transverse lines of stone. These must have formed the huts of the occupiers of the castle. There were eleven or twelve huts, and in some cases the doorposts were standing round. On the north side was the old well, and in Dr. Borlase's time there were stone steps going down to it. There was no cement in the masonry; some of it seems to have been faced, but whether it had been worked by a tool he would leave them to judge. The outer wall was connected with the inner wall by three or four transverse lines of walls, and they could have served no other purpose than ways over which the soldiers passed without crossing the moat. Mr. Borlase asked them to see in this castle a connexion between the earth fortifications of Castle-an-Dinas and other places and the Norman castles, for the ground-plan of this castle was precisely similar to that of the Norman works. The habitations of the soldiers were in the centre, with inner and outer walls and ditches and a single gateway. The area of the inner wall was 180 ft. by 170 ft., nearly a circle. The plan of the entrance gateway was curious. The gateway through the outer wall was faced on each side, and was 6 ft. to 8 ft. wide, and opposite to it was the strongest masonry in the inner wall. Mr. Borlase referred with very great regret to the sad wreck and havoc that had been made of the castle since the time of Dr. Borlase. Notwithstanding all that was done by the proprietor, stones were carried surreptitiously away for building purposes to St. Just and Penzance. He only hoped that this ancient fortification, which was unique of its kind, might be included in Sir John Lubbock's Bill. It would be too much to include all the barrows in that Bill, for they provided the best manure the farmers could find, but still he hoped Chun castle and cromlech would be thought worthy of being included in the Bill. Chun cromlech had a curious relation to the castle, and probably was of about the same date. Of old the builders of the castle so respected it that they did not use its stones in their buildings, and if of later date than belonging, as it seemed, to the hut village or villages, it would bring cromlech building down to a later date than it was generally supposed they were erected in. The cromlech was about the only perfect one in Cornwall now; in the interior was a kistvaen 7 ft. high. About half a mile from the castle, and connected with it by a paved stone road, was the British hut village of Bosullo,—a very good specimen. In the village had been found the usual pottery and a mill-stone of the usual British type. The only thing known to have been found in Chun castle was a stone bowl, now in the Truro Institution, but it had never been very carefully searched. He thought it would be worth while to search the well and dig into some of the little huts. Mr. Bloxam spoke of the dry masonry as very much like that seen in Somerset.

Here a paper by the Rev. W. C. Lukis

On the Cornish Megaliths

was read. The principal cromlechs in the district, the writer said, were those of Lanyon, Chywoone, Mulfra, and Bosporthennis. The capstone of Lanyon cromlech was an imposing slab; but, compared with many of the French monuments, with those in the Channel Islands, and with a few British examples, these Cornish megaliths were insignificant structures. They all appeared to belong to the kistvaen class. The largest and finest of the cromlechs, that of Lanyon, was, unfortunately for purposes of archæological study, nearly valueless. What had remained of the original fine monument fell to the ground in 1815, and the existing cromlech was constructed in its present form in 1824,—it was simply, therefore, a modern erection, composed of ancient materials, arranged in a new form. Before the collapse there were four upright slabs; now there were but three. Chywoone cromlech was said to be the most complete kistvaen existing in that part of England. It was an instructive example, because it clearly exhibited the various features which commonly belonged to chambered barrows in a state of partial dilapidation, and seemed to demonstrate what the perfect monument was. It was a kistvaen, closed on the four sides. Remains of the covering mound, 32 ft. in diameter, still existed, and a circle of small upright stones surrounded it. Mulfra cromlech was a kistvaen, sadly ruinous. Bosporthennis cromlech was a small kistvaen, once inclosed in a mound, not wholly removed. These examples of Cornish cromlechs supplied ample evidence in support of a principle of considerable scientific importance,—that when these and other cromlechs were erected, they were invisible externally because a mound of earth inclosed them. It could never have been the intention of their builders to erect exposed sepulchres, unsupported externally, as some persons had imagined. Fifty years ago cromlechs were considered Druid altars. Careful investigation undermined this, and suggested sepulchral attributions. By degrees the denuded monument was pronounced a kistvaen or chamber, more or less exposed to view by the removal of the barrow. The circles of Boscawen-un and Rosemoddress were both of moderate diameter. The primary destination of circles was still a vexed question. Some writers inclined to the sepulchral enclosure opinion, others to the notion that they were places of assembly. It was not easy to arrive at a satisfactory conclusion. As they were frequently associated with graves, the presumption was that they were enclosures in some way connected with the burial of the dead. A circle in Brittany had been explored with remarkable results, the entire area being thickly strewn with potsherds, broken stone axes, pounding stones, flint scrapers, and knives, and burnt animal bones. They seemed to discover in the bones the remains of funeral feasts, and in the fractured vessels and broken implements tokens of grief that thus found expression. Single menhirs were at once suggestive of memorials to departed chiefs, and pillars in many instances were probably thus employed. They were commonly erected in the vicinity of barrows and circles, but were also met with at a long distance from such monuments in imposing and silent grandeur, resting upon rocks with no soil about them that could cover an interment. It might be, as suggested, that they were symbols of a supreme Being, or commemorative of great deeds. Local traditions, which associated them with battles, were altogether undeserving of attention. The Maen-an-Tol, or holed stone, was a striking and mysterious object, so remarkable that the eyes of the beholder rested on it to the exclusion of other stones with which it was associated, and with which it seemed to stand connected. He had seen two sepulchres which probably would assist in the interpretation of this monument,—a chambered barrow in the Isle of Man, and one at Kerlescomb, in Brittany. These sepulchres were divided into two compartments separated by stones whose contiguous edges had been chiselled away, so as to form an oval opening of sufficient dimensions for a man to creep from one to the other. If they supposed the enveloping mound, the capstones and side walls to be removed, and one stone at the extreme end of each compartment, together with the partition stones, to remain standing, they had a monument closely analogous to the Maen-an-tol. If this had actually occurred in the Cornish monument, it was the remains of a cromlech of two compartments, and the holed stone was the doorway between. There was a prostrate stone, which might have been a wall slab, and a bank of earth, which might be a portion of the barrow. The superstitious practice of creeping through the hole would simply be the traditional use of the doorway handed down from a time when the monument was more complete.

After the reading of the Rev. W. C. Lukis's paper,

Mr. Borlase said he wished that Mr. Fergusson and Mr. Lukis could have met in Boscawen-un circle. Then it would have been a battle-field, if it had not been one in the days of the ancient Britons. Mr. Lukis had never visited this part of Cornwall; if he had, he would see there were two different kinds of cromlechs,—the common form and the cenotaph,—and would change his views.

The castle having been inspected, a short walk across the down brought the party to the "quoit," which had a table covering stone 12½ ft. long, 11 ft. wide, and 36 ft. in circumference; side supporters about 8 ft. long, and with the end stones formed a kistvaen. A low barrow surrounded the cromlech, from which it rose about 4 ft. By this time Mr. Hobley, of Penzance, was ready with a capital luncheon, laid under a tent close by the ruined gateway of the castle; this was enjoyed by all; and then they moved off to

St. Just.—Miracle Plays.

Here, standing on the remains of the amphitheatre—plain-an-guare—the Rev. Lach-Szyrma read an interesting paper on St. Just. He was, he said, inclined to think that there were few parishes in England where there was a greater variety of historical curiosities and reminiscences of a peculiar kind than in this parish. Here was a complete museum, so to speak, of curiosities of every type, and the historical associations about them were curious enough. This was seen a generation ago, when the parish of St. Just was one of the first to receive the dignity of having a book written about it—Mr. Buller's history. Among the points of interest were the curious group of Keltic antiquities around Carn Kenidyick, the so-called Phœnician mines of Botallack, Chapel Carn Bray, with its many memories, Cape Cornwall, the "Antivaestium" of the Classics, Pendeen Van and House, &c. As to the name of the parish he was inclined to think there was a mystery about it, though commonly believed to be derived from St. Justus, St. Augustine's companion and afterwards Archbishop of Canterbury, dying 617; but he was inclined to think that a Keltic St. Just, whose history was quite lost in a cloud of legend of possibly heathen origin, was the real patron. In the taxation of 1292 the church was mentioned as Eccles: Sti Juste *St.* The high altar was dedicated by Bishop Grandisson, in his celebrated visit of July, 1336, when within a week he consecrated four parish churches—Madron, St. Just, Paul, and Ludgvan. The present is probably a new church. The tomb of Silus, or Silenis, was possibly one of the oldest tombs in English parish churches. But the most interesting thing in St. Just was the remains of its plain-an-guare, the plain of the play, where the Cornish miracle plays used to be performed. Probably the amphitheatre was a reminiscence of Roman occupation. One of the most interesting relics of Cornish Mediæval literature, as the only one not on a scriptural but on a local topic, was the long drama of St. Meriasek, recently discovered among the Hengwrt MSS. in Wales. Its scenes were probably enacted within the amphitheatre in which the Association was then standing. There is not much known of the way in which these plays were performed; the stage was probably in the open air. There could hardly have been much scenery, but there were numerous stage directions representing tents, mounts, houses, &c. At the beginning of the play of the Creation there was a direction that hell should gape when it was spoken of, by which it would seem that the infernal regions were represented by the mouth of a monster. There were also directions as to clouds, &c., which would indicate a far more advanced state of theatrical art than was prevalent in later times when labels were stuck up to tell the spectators what they were to believe. The plain-an-guare was an oval in one case 120 ft. long, with several tiers of turf benches. Here, as at Ammergau, the background of hills and rocks, with the sea as well, might have been made of service in giving grandeur and effect to the grand stories represented. The plot of St. Meriasek was very complex; in fact, a combination of three distinct plots, the legendary life of St. Meriasek; the legend of the conversion of Constantine the Great, very different from the records of authentic history; and the legend of the mother and her son from the Miraculo de Beato Meadico. These three plots were strangely commingled, but not without art. Quoting Borlase, who, writing in 1762, described the amphitheatre as an exact circle 136 ft. in diameter, the bank inside 7 ft. high, and outside 10 ft., the seats consisting of six steps of 14 in. wide, with the rampart at the top some feet wide. Mr. Lach-Szyrma regretted that more care had not been taken to preserve so interesting a memorial.

The party then repaired to the church, where the Rev. H. S. Fagan, vicar, pointed out the most interesting objects. Built in the wall of the north aisle was a shaft of a cross with interlaced work, which is generally regarded as Saxon. Mr. Bloxam said it might date from the eleventh century — perhaps earlier — not later. In the chancel was an inscribed Romano-British stone of from the sixth to the ninth century. On it were the words "Seiuo ic iacit," with "ini" over the "Sel," and a sort of pastoral cross which might be an emblem of a bishop or a monogram of Christ. The arcades of the nave between both aisles were of a freestone not found in Cornwall. It was not Caen, and was probably brought from Somerset by sea. They showed fine specimens of Decorated work, of about 1400, every one of the capitals being of a different pattern; the bases were of granite cut to match. The east windows of both aisles were

of a good Flamboyant style—probably French or Flemish. The side windows of the aisles were Perpendicular. It was observable that although it is known the church was dedicated in 1336, the style was later, which seemed to suggest that considerable alterations were subsequently made.

Chapel Euny cave dwellings were afterwards visited. Their plan, the cyclopean character of the work, and their adaptability as a place of hiding, were at once apprehended. Mr. Borlase explained that above these curious subterranean structures was a British village. Not far off was the usual castle—Caer Bran, which meant the Royal or raven castle. All that remains of the castle are a few mounds of earth. Down in the valley was a very good kistvaen, covered by its barrow, surrounded by stones which keep back the earth and is perfect. Urns had been found in other barrows, and a small gold torque. Not far off was the ancient chapel of Carn Brea, and on "the hill of lights" a circular enclosure consisting of three small rings not concentric, but touching. The chapelry of St. Euny, which gave the name to the place, could only now show pieces of worked stones and arches. A well was close by.

Mr. Borlase's explanations at Chapel Euny showed the manner in which this subterranean dwelling was formed. A trench about half the required depth had been sunk in the natural soil. Within this the building had been completed to its full height, and earth then heaped over the whole. When Mr. Borlase conducted his investigation he found that the long chamber had been (purposely, it appeared) filled with earth, and among the objects found therein were a fragment of Samian ware, an iron crook and spear-head, a spindle-whorl, whetstones, mullers; red and black pottery, some glazed, all wheel-made, and apparently parts of culinary vessels; and a considerable quantity of rich fused tin. From these discoveries it was evident that the place was occupied in Romano-British times; while the tin indicated that the occupiers were smelters, and possibly that the cave itself was used for smelting. There are the remains of ancient and extensive stream-works in the valley below, and local tradition pointed out the place as one where the ancients had smelted their tin.

Mr. Borlase's description of a perfect barrow excited the archæologists to such an extent that, at the risk of being late back, it was resolved to visit it, and on the way home the party would fain make a further stoppage at Sancreed to inspect a cross in the churchyard, and the remains of the old rood screen preserved in the vestry. The carving of the latter was very elaborate, and there were traces of colouring. The cross was in fine preservation—the best that the Association had seen. The head had the Cuthbert-cross character, and beneath the crucifix the design of a lily growing out of a vase. It was pronounced to be an undoubted Saxon cross of the eleventh century, and we will raise no objection just now.

At the evening meeting Mr. T. Morgan, F.S.A., read a paper on

The Fleets of the Ancients in Cornish Waters.

We can quote only the commencement of it:—The name of Anti-Ostiæum, given by Ptolemy to the Land's End, indicated its lying over against the Ostiei, a people of that name located in Brittany. The intercourse between the two coasts was frequent before the time of Diodorus, who reckoned the distance as four days' sail. They need not adopt the statement of Diodorus, that nothing was known of the island before the days of Caius Cæsar. Diodorus added that neither Hercules nor Bacchus (the personification of the first colonisers) had been heard of in Britain before that event. In Ptolemy's brief account of the land of the Damnonii, the first place mentioned was the promontory of Hercules, or Hartland Point. The two gods, Hercules and Mercury, had many attributes in common, but the former was the great favourite in this country of navigators. The ancients considered Britain as a triangle with irregular sides, Cornwall forming one corner or angle of the base and Kent the other. There were visible remains of the occupation of Cornwall by the Romans, which dated, perhaps, from as early a period as the fifth campaign of Agricola. Tacitus seemed to denote the presence of the Roman fleet around the coast. Probably the second legion was at a later period quartered on the south-west coast, and the estuary of the Tamar would be made use of by the Roman fleet. The Romano-British cemetery, described by Mr. Spence Bate in the "Archæologia," was evidence of Roman influence in the neighbourhood of Plymouth. There were many evidences of Roman occupation in Cornwall in camps, roads, inscriptions, coins, and other works. Modern criticism and the block of tin found in Falmouth harbour had identified sufficiently St. Michael's Mount with the Ictis of Diodorus and the Mictis of Timæus, quoted by Pliny.* Julius Cæsar was prudent enough not to select the western corner of Britain for his invasion; for its ports were filled with seamen who had checked and well nigh defeated him in that naval engagement on the coast of Brittany, of which he has left such a graphic account. It was also four days' sail between Brittany and Cornwall, and the stormy seas were ill-suited for the Greek and Roman war-galleys of that time. C. J. Cæsar's misfortune on the coast of Kent on his first invasion must have turned the attention of the Romans to the improvement of their system of ship-building. Agricola, in his fifth campaign, sailed round the coast, conquered nations before unknown, and garrisoned that part of West Britain which looked over against Ireland. Cornwall had a fair claim to be the country alluded to.

Dr. Phené followed with somes notes on

The Dragon of Cornwall: The British Dragon.

This paper opened by showing that the subject would yield very little result from a superficial examination, as the folk-lore and traditions of Cornwall were not nearly so prolific in the matter of the Dragon as those of Brittany. The author considered this as indicative rather of an original locality of the Dragon influence (whatever might have been the primary meaning of that influence), and that the multiplicity of dragons in Brittany showed rather an imported tradition which each place was desirous to appropriate to itself; while Pendragon was supreme in Cornwall. He considered that North Britain had a still stronger claim to the early traditions, but that all had their source by being introduced into Britain from the East through an ancient immigrating people. He would not, however, occupy their time with traditions but facts. Camden, referring to the Dragon device of England, had treated the matter somewhat slightingly; but information that was not within Camden's reach was now open to inquiry. It had been obtained by great labour and research, which was liberally compensated by the State, and was of undoubted authenticity and value. Although the facts thus procured were, in the author's opinion, perfectly conclusive, as to the device of the great Keltic section in Britain being a dragon, it was not directly traceable to Cornwall, but, as it was quite impossible to separate Cornwall from the parts of Britain occupied in the earliest times by the Keltic people, it was clear that the device would have been the same, and indeed it was emphatically claimed for Cornwall in the title of *Pen*-dragon. Authentic devices of a purely dragonistic character were traced back to nearly a thousand years, and even then appeared as the representatives of a still ancient national emblem. Internecine strife and opposition had led to the destruction of these devices to so great an extent that the evidence in some cases depended on a single example as a link in the chain; rare as they were, such links had happily been obtained. It appeared that the Roman *Draconarius* was not used till after a full acquaintance with Britain; and it was pointed out as being not improbable that such device of the Romans had been adopted in Britain. It was curious that the white horse and the dragon seemed to blend in the south, in the vicinity of Cornwall. They were evidently importations from the East, being the two great sacred objects referred to in the Indian poems. Hence the dragon of the Christian Arthur became the white dragon, which is described by Drayton, in his Polyolbion, as fighting with, and tearing or conquering, the red dragon, evidently the still-retained emblem of Paganism. The sword which enforced the new religion became identified with the cross; the new religion itself, like the early Indian legends, having reached this country from an Oriental source, and been adopted by the more enlightened leaders in the West and North. Hence the Latin missionaries who christianised England found, on their penetrating to the Keltic and other ancient tribes, that Christianity had already been established among them for a long period. The devices referred to could not, from the circumstances, be considered heraldic. They were the way by which these people chose to be represented, and the emblems had, no doubt, portrayed deities. The Keltic dragon sank into disuse under the influence of heraldry, though revived again by a rare and special seal of Queen Elizabeth, in the author's possession, showing the vitality of the Welsh, and consequently of the Cornish, Dragon. From such early national, and probably deified, devices had no doubt originated the heraldry of chivalry and of modern times.

In the discussion which followed, Mr. Planché expressed himself as being interested in this paper, from the large amount of valuable evidence on a subject of great interest; and the suggestive parts gave him a field upon which he should set vigorously to work.

St. Michael's Mount.

On Tuesday, 22nd, the main point of the day was a visit to St. Michael's Mount, and places of interest in the locality. Marazion reached, the party dismounted, as the tide was rapidly receding, thus enabling the visitors to pass over to the Mount on foot. When on the sands, and whilst, for the comfort of the ladies, it was desired that the tide might go out still further before they went across, the Rev. W. S. Lach-Szyrma read a description of the Mount from Leland's Itinerary. The crossing was then effected, and at the entrance to the Mount the company were met by Sir John St. Aubyn, Bart., M.P., who was accompanied by Captain the Hon. Charles Eliot. Mr. Borlase lead the way up the winding paths until that portion of the Mount where the guard-house used to stand was reached, and here the company were welcomed by Sir John.

Mr. Borlase remarked that the Mount was eighteen acres in extent, and that the total height from the sands to the top of the tower was 238 ft. Geologically speaking, it was a granite "tor" or "outcrop," whose hardy material had resisted the denudation which for ages had been stripping the sides of the softer rock which once rested on them. By some authors it was not without great reason identified with the "Ictis" mentioned by Diodorus the Sicilian, who described the inhabitants "who dwelt near the promontory of Belerium," *i.e.*, the Land's End, carrying their tin in carts over the isthmus, dry only at low water, to sell it to the merchants. In the sixteenth century there were at the base several fishermen's cottages, but in 1700 it was so far deserted that only one cottage, inhabited by a widow, remained. In 1726 Sir John St. Aubyn, the third baronet of that name, constructed a new pier, and the present little town was the result of the trade which ensued. The first resting-place in the ascent was the Giant's Well, reminding them that they were indeed in the land of legend and romance. Passing upwards, the first gate in the castle, long dismantled, was reached, and on the right was a small platform with a stone sentry-box of the Edwardian period. Right above was the castle, entered through a massive doorway with a sham portcullis within. The castle was originally a priory of Benedictine monks, endowed by King Edward the Confessor, in 1044. The chapel and the dining-hall, or Chevy-chase room, were the principal apartments in the building. A few steps on the south side of the chancel led down into a singular little apartment, with a window blocked up; and a skeleton having been found there, proved its use as a vault.

Sir John St. Aubyn expressed his belief that the skeleton was that of Sir John Arundel, Sheriff of Cornwall, who was described as a fine man, and the skeleton was that of a man 7 ft. high.

Mr. Borlase observed that a rood screen, with a painting of the Passion, had been lost. He concluded by quoting the words of Dr. Borlase, written in a letter describing the Mount: "The lower parts for instance are dedicated to trade and merchandise, the sides to the service of the King and country, and the summit to the worship of God."

The Rev. W. S. Lach-Szyrma afterwards read a paper on the military history of the Mount, dealing with its five captures and recaptures. The paper included a very interesting account of the rising, consequent on the execution of Mr. Kitter, of St. Keverne, for murdering the King's Commissioner for destroying images. The mining districts were in a ferment; the people were jealous of the acts of the Government, and its interference with their religious opinions. Many

* It should be remembered, however, that a good fight has been made for the Isle of Wight. We incline to St. Michael's Mount.

rough acts were done in the name of religion. The miners and fishermen, looking for a leader, at length found one—a Cornish gentleman of old family, wealth, and influence, and no bad soldier, Sir Humphrey Arundell, Governor of St. Michael's Mount. At a sign from him Cornwall burst into insurrection. Arundell left the Mount, which by a rapid stroke was taken by the magistrates and country gentry who were threatened with violence. Arundell, determining to regain the Mount, sent a division to effect that purpose. When the tide went down the lower part was stormed with little trouble.

The party was then conducted through the castle by Sir John, the visit being made interesting by his descriptions, and the critical observations of Mr. Borlase, Mr. Loftus Brock (who worked hard throughout the Congress), and Mr. Bloxam. The crucifixion chapel, with the tower at the crossing and the rose windows both at the east and west ends, was very interesting. The date of the building is early fifteenth century, most probably after the time when the alien monastery was suppressed and given to Zion monastery near London. There was no trace of the Saxon church at all visible, but the early date of the foundation was adduced by the presence of several so-called Saxon crosses, the best of which was on the south side, outside the building and directly facing the sea. It is a very remarkable one, having the Greek cross in the head with a rude representation of the crucifixion under, and below a Latin cross. It was very possible the old roof of the chapel existed under the present plaster. The refectory still existed in the shape of the present dining-hall. A little of the original arch was visible and part of the open roof (middle of fifteenth century), but the building had been very much modernised in the seventeenth century.

At length Sir John assembled his guests in the dining or Chevy-chase room, and whilst refection was partaken of, Sir John gave particulars about the room called Chevy Chase, from the frieze around the room representing hunting scenes, some of which are very curious. The elaborate oaken roof, the usual refectory recess, and the collection of metal work, were spoken of. Sir John, responding to the thanks tendered to him on behalf of the Association, said the regret that so little really of the Mount had been seen, was lightened by the hope that it would be an inducement for them to visit it again. The party now recrossed the causeway, and were soon in their carriages, with the horses' heads turned to Chysawster, where the celebrated hut-village of that place was examined under the guidance of Mr. Borlase, by whom a portion of it had been excavated, the rest being left purposely *in statu quo ante*. Arriving at Chysawster Farm, the visitors made their way between huge granite boulders, and over at least two stone walls, to the site of those curious habitations of a date almost prehistoric. They occupy the entire hill-side, and, including the whole of the more scattered ones, they cover as much as fifty or sixty acres of ground perhaps. On these wide and open moors, however, the distances and sizes of objects are very apt to deceive one. "That portion of the hut-town which still remains," writes Mr. Borlase, "consisted, as far as can be made out at present, of eight or ten hut-clusters, placed in close proximity to each other, with a view to greater security." Each and all of these show exactly the same arrangement in the ground plan, as in all the inner chambers, originally covered over with large stones in the shape of a beehive, open into a central court, which may or may not have been open to the light of day. In many of these chambers, which are circular, oblong, and curved, varying in length from about 7 ft. to 16 ft., pottery, tin, charred remains of wood and bones, &c, have been found, together with fragments of utensils, which would seem to argue that the huts were used not merely as storehouses, but as subterraneous dwellings. They are about 6 ft. or 7 ft. in depth, and are constructed of large loose stones, without cement or mortar. Mr. Borlase said that other underground dwellings, precisely the same in plan, but composed of far smaller stones, have been found in Wales. To the classical scholar, these subterranean dwellings are no matter of surprise; for, speaking of the Britons of his own time, Virgil writes in his Georgics :—

> "Ipsi in defossis specubus secura sub altâ
> Otia agunt terrâ: congestaque robora, totasque
> Advolvere focis ulmos, ignique dedere."

Two of the most interesting antiquities in the district were then visited,—the Maen-an-tol and Maen-skryfa. The Maen-an-tol is in Cornwall unique. The name simply signifies "holed stone"; and the monument consists of three stones set in a row, the middle stone having a large hole wrought through it. The custom still remains of drawing children through the hole to cure them of pains in the back. Like everything else in the district, and, indeed, like prehistoric remains very generally, this has been set down to the Druids. But the balance of probabilities is strongly in favour of the theory of Mr. Lukis, that the remains are those of a chambered barrow, and that the Maen-an-tol proper was the door stone between the two compartments. The same view was advanced some years since in a paper by Mr. Dunkin, published in the Transactions of the Royal Institution of Cornwall. Within half a mile of the "Maen-an-tol" is the "Maen-skryfa," as its name implies, a written or inscribed stone. The inscription is "Rialobran-Cunoval Fil," so that it originally marked the grave of Rialobran, the son of Cunoval. Who Rialobran was is not certainly known, but the language of the inscription shows that he lived in the Romano-British period. The author of one of the papers at the Congress denounced with vigour the ignorance of those who spell Maen as given above, instead of mên. However, the local *savans* are satisfied that the former usage is, at least, the more nearly correct. Carew's word is Main, or Mayne; and we have the same word in Mayon.

Lanyon cromlech, next visited, forms a remarkably picturesque object, the elevation of its site rendering the monument visible afar. It consisted, previous to its fall in 1815, of a large cap stone, or "quoit," on three slim pillars of unhewn granite, the top stone being placed sufficiently high from the ground to allow of a man on horseback sitting beneath. It was set up again in 1824; but the supports were then sunk so deeply in the ground that it is now not half its former height, only 5 ft. It was explored in the last century by digging, the owner of the property being induced thereto by a dream, and directly under the quoit a simple grave was discovered cut in the natural soil. Here, then, the interment was by inhumation, and not by cremation; and, as Mr. Borlase observes in his "Nænia," in Cornwall well authenticated instances of inhumation are very rare. At Lower Lanyon there are the remains of another cromlech, which was discovered in removing the incumbent barrow. Near the Lanyon cromlech proper is a long barrow. On being opened this was found to contain a ring of stones set on their edges, as in a barrow 100 yards or so distant, which was removed a few years since. The long barrow had been opened previously, and nothing remarkable was found. In the barrow last-mentioned were the remains of a burnt interment.

The last objects of interest inspected were Madron Holy Well and Church.

Touching the term "quoit" applied locally to the cap-stone of cromlechs, we may perhaps find in it the derivation of the name applied to a well-known monument of the kind in Kent, Kit's Coty (quoity) House.

"Murray" gives a full and interesting account of all this neighbourhood and its antiquities; and we may here say to such of our readers as may propose to visit Cornwall, that they will find the little red book devoted to this county and to Devon a valuable companion in their journeyings.

The evening meeting brought the Congress to a close. It was protracted to a very late hour, and Lord Mount Edgcumbe came down from Plymouth to preside over it. The members of the Association and their visitors were nearly all present, and St. John's Hall was filled, and papers were read by the Rev. Mr. Lach Szyrma, on "The Spanish Descent upon the Cornish Coast at Newlyn," and by Mr. T. Cragoe on "King Arthur and the Knights of the Round Table." The author of the latter paper avowed a firm belief in King Arthur as a real historic personage, coupled with severe criticisms on the Poet Laureate for having surrounded him with a sort of haze, instead of making his character and those of his Court and contemporaries stand out in his poetry as do the lifelike portraits of Shakspere and Sir Walter Scott. The paper caused some discussion, but Mr. Cragoe obtained no backers.

Mr. Planché (Somerset Herald) then read a paper on

The Earls of Cornwall,

which, as usual, he made as entertaining as instructive. The first was Robert, half-brother of William the Conqueror, who, at the conquest, had the greatest share of the spoil. In Cornwall alone he possessed 248 manors, and 75 in Devon. In all he had 797 manors with two castles in Cornwall, one at Dunhevet, the other at Trematon. He joined the pestilent prelate, Odo, in a conspiracy against William Rufus, but was pardoned. He was succeeded by his only son William, sometime previously to the year 1097, the date of his uncle Odo's death at Palermo, for in that year he claimed the earldom of Kent as heir to Odo, in addition to those of Mortain and Cornwall. Making what taken literally was a childish threat, Henry I. not only refused him the earldom of Kent, but called upon him to prove his right to what he already possessed. The earl indignantly departed for Normandy, and there broke out in open rebellion. Henry seized all his estates, and deprived him of the earldom of Cornwall, which he conferred on Stephen, who was subsequently King of England. The deposed earl was brought a prisoner to England, and died a monk at Bermondsey, though the date of his death was as uncertain as his father's. Reginald de Dunstanville, natural son of Henry I., was the fourth earl. We cannot, however, follow Somerset through the list. Suffice it to say in conclusion that in 1227 Henry II. appointed his brother Richard King of the Romans—an important personage, not only in English but in European history, who died in 1272. Richard was the first Earl of Cornwall of whose armorial bearings they had undoubted authority, though whether the border bezantine represented Cornwall or Poictou was a point on which the author had not been able to satisfy himself. The romance of history contained few pages occupied by records of a more brilliant career than that of Richard, King of the Romans—the greatest of all the great men who had worn the coronet of the earldom. Of his son and successor, Edmund, nothing grand was recorded but the funeral, and then Piers Gaveston, for a few years, the greater portion passed in merited exile, disgraced the title. Edward III. bestowed the earldom on his brother, John of Eltham, and on his death in 1334, erected it into a duchy, and gave it to his son, Edward, the Black Prince.

Then followed Mr. S. Tucker (Rouge Croix) with a paper equally interesting locally, an account of

The Dukes of Cornwall.

He said:—The lands constituting the earldom of Cornwall had but recently reverted to the king (Edward III.) by the death of his brother, John of Eltham, when, by charter dated the 17th of March, 1337, the various lordships, castles, &c., in the county, and various lands, &c., in others, were erected into a duchy and conferred upon Edward of Woodstock, better known as Edward the Black Prince, the first born child of Edward III. and Philippa of Hainault. The prince was then seven years old, but had previously (1333) been created Earl of Chester, and invested with the land attendant on that honour. The limitation of the dukedom of Cornwall was an irregular and remarkable one, containing as it did "a shifting clause"; and although it cannot be doubted that the intention of the king was to perpetuate a title and endowment for the heirs-apparent of the English crown, it was so worded as to prove inapplicable in several instances to those who subsequently stood in that position, necessitating in some cases special re-creations, and in others the adoption of different readings of the clause to that which it strictly conveys, which, translated, is simply this: that the duchy was conferred on the Black Prince and his heirs who should be the eldest sons of kings of England. The Black Prince predeceased his father, but the dukedom of Cornwall did not *ipso facto* descend to his son who, although his heir, was not the eldest son of a king of England. The Black Prince was born at Woodstock on the 15th of June, 1329-30. In 1337 he became the first duke created in England, and on no one throughout the entire roll of British worthies could the highest degree of nobility have been established and conferred more appropriately than on this distinguished man. He was the second Prince of Wales, but was not created to that dignity till 1343, when he was invested with a coronet, a gold ring, and a silver rod. As Duke of Cornwall he was invested with a sword. It is said that Edward III. designed the honour of the French expedition for his son, who, then only in his sixteenth year, must have early evinced qualities of an unusual character to have justified

such forebodings even in a parent. The king knighted him on his landing, and placed him as the leader of the vanguard at Cressy on the 26th of August, 1346. Here, indeed, he fully won his spurs. The cognisance of the Feathers, said to have been taken from the casque of John of Luxembourg, King of Bohemia, by the victorious prince, and the motto or mottoes "Ich Dien" and "Houmout" were, by his direction, placed on his tomb, where they still remain, at Canterbury. We have, however, no certain, or even ordinarily satisfactory origin for them, and it must not be ignored that they are found on seals of various members of the Houses of York and Lancaster, who were not Princes of Wales. The Black Prince won the victory at Poictiers in 1356, and died at the Palace of Westminster on Trinity Sunday, the 8th of June, 1376. Richard of Bordeaux, the second but eldest surviving son of the Black Prince, was ten years old at his father's death. He did not inherit the dukedom of Cornwall, the special limitation barring him, but his grandfather, by charter dated at Havering, on the 20th of November, 1376, created him Prince of Wales, Duke of Cornwall, and Earl of Glo'ster.

Mr. Tucker then commented on all the other holders of the title, concluding thus:—The eighteenth duke was George Augustus, son of King George I., who was born at Hanover, 30th of October, 1683, had livery of the duchy in 1714, and held it until his succession to the throne, 11th of June, 1727, when his son, Frederick Lewis, afterwards Prince of Wales, became Duke of Cornwall. He was then not of age, having been born at Hanover 20th of January, 1707. The duke died at Leicester House in 1751, and was buried at Westminster. He died in his father's lifetime, leaving a son—heir-apparent to his grandfather and the throne. Here was another break as to the dukedom of Cornwall, and the lawyers were again at work, not only as to this succession, but to those of the dukedom of Rothsay, earldom of Carrick, &c. It was considered that all those dignities had reverted to the Crown. An Act of Parliament was drafted to meet the difficulty, but nothing was done in it, and the young prince was deprived of his duchy for the few years between his father's death and that of his grandfather, when he became George III. Though not amongst the Dukes of Cornwall he was Viscount of Launceston, which title he inherited from his father. George Augustus Frederick, Prince of Wales, was twentieth Duke of Cornwall. He was born at St. James's 12th of August, 1762, but did not take possession of the revenues of the duchy until he attained his majority in 1783. He was for fifty-eight years Duke of Cornwall, and succeeded to the throne as George IV. 29th of January, 1820. His Royal Highness Albert Edward, Prince of Wales, was thus not the sixteenth, as made in the latest printed history, or the seventeenth, as by a statement issued by the duchy, but the twenty-first Duke of Cornwall, and Premier Duke of England. No future roll of the Dukes of Cornwall will be written in which a distinguished place and notice will not be of necessity and truth assigned to him.

Lord Mount Edgcumbe, at the close of the papers, addressed the meeting, and recapitulated the work of the Association as it stood in the printed programme, and as it had been accomplished. He congratulated the Association on the week of fine weather which had attended their steps, and hoped that Cornwall had not been deficient in the hospitality for which it had so long been proverbial. He trusted, also, that the visit of the Association to the far West had not been other than mutually beneficial, opening up new scenes and new subjects of inquiry to the members of that learned body, and fostering in the Cornubians a spirit which would tend first to induce a right estimate of the value of their local antiquities and relics, and afterwards a determination to preserve them. He fully believed that the visits paid by the Association to the churches of Central and Western Cornwall would be found useful by the clergy, on whose ecclesiastical antiquities it had helped them to place their true value, and on the other hand he thought he might say that the members of the Association would not go back to London without having gained some addition to their stock of knowledge from what they had seen in that region of cromlechs and monoliths and hut-villages.

We fully believe this to be the case, and that the Cornwall Congress may be regarded as one of the most successful held by the Association. It is but bare justice to add that the untiring energy and undeviating good humour of the excursion-secretary, Mr. G. R. Wright, materially contributed to bring about this agreeable result.

THE ROOFS AND VAULTS OF WINCHESTER CATHEDRAL.

HOLIDAY IN HAMPSHIRE.*

We left the Architectural Association at Hursley, on Tuesday the 15th ult, at Keble's church, and house, and grave, and ready to remember his words,—

> "Light be the hand of ruin laid
> Upon the home I love:
> With lulling spell let soft decay
> Steal on, and spare the giant sway,
> The crash of tower and grove:"—

and then to proceed to Winchester. Once back again, the Cathedral seems to claim precedency of other chroniclings. There are, for instance, some words to be said anent

The Saxon Cathedral.—If the church of Walkelin, commenced by him anew from the foundations, and consecrated in 1093, was wholly completed before the Saxon church was pulled down,—the earlier church must, of course, have stood outside and to the eastward of the walls of the building which superseded it. The easternmost of these walls was that of the apse of the lady chapel, reaching about as far as the arch entering the present lady chapel. The Cathedral was lengthened to the eastward to its existing shape in the first quarter of the sixteenth century by an extension of the lady chapel. Up to that time no doubt the end had been in line with the east walls of what are now known as the chapels of the Guardian Angels (east end of the north aisle), and of Bishop Langton (east end of the south aisle). The sixteenth-century work has a crypt over its whole area,—intermediate columns supporting the church floor. In the west portions of the north and south walls of this latest crypt are masses of rough walling,—which have not been the subjects of conjecture till Mr. Colson, the Cathedral architect, recently suggested that they might very possibly be part of the Saxon church. He suggested that the inner faces might be part of the circle of a western apse, such as was the lady chapel, which held the bishop's throne in the Saxon cathedral at Canterbury in 950. Whether crypt or foundation,—whether sole remaining relics of a not inconsiderable monument of the tenth century, or outliers of a larger system still waiting to be exposed,—whether curiosity can be set at rest or satisfied fully,—must be determined by the pickaxe. These short segments must be followed up as far as the masses of masonry to the westward will permit. The true diameter of the circle must be found. Thereafter, undestroyed walls might be fished for in good hope in that pleasant patch of greensward outside the east wall of the lady chapel.

Something may also be written about

The Timber Roofs;—with much timeliness just now,—when there are scaffolds inside and outside the south transept, and piles of new wood on the ground, and the sound of workmen, and many of the bare timbers of the roof of the nave of this Norman transept standing well in view. This is the roof which has often furnished an excuse for telling of Walkelin's edifying methods, of William's opinions thereof, and of the Hanepinges (now Hempage) wood,—which one finds to-day as Hampnage in Ordnance maps, a mile to the west of the Alresford-road, at about four miles east of Winchester. The daylight is now well inside once again; but does not enable the roof to tell a clear tale about its date and history. It certainly was a powerful consumer of timber. If gotten with greedy haste, and kept long in store, it was used at last with very cheerful liberality. The great ties are in single lengths. In the clear between the walls the span is 36 ft. 6 in., bearing of tie at each end 3 ft., scantling 18 in. deep by 12 in. broad. The rafters are, on the average, 10 in. deep by 11 in. broad,—1 ft. 6 in. to 1 ft. 9 in. apart. The collars about half-way up the rafters vary from 10 in. by 10 in. to 9 in. by 8 in. Braces from the rafters to these run about the same scantling, and the upper collars also,—all morticed, tenoned, and pinned together. Old sole pieces 10 in. by 10 in.; inner plates 12 in. by 9 in.; plate in centre of wall 9 in. by 9 in.; thickness of wall 6 ft. 3 in. The pitch of the roof is a little over 45 degrees, and fits exactly the pitch of the old weathering in the south wall of the tower.

* See page 804, *ante*.

The ties are placed properly on the tops of the Norman columns which run up from the floor of the transept. These are arguments which probably do not leave much doubt that the earliest roof is, at any rate, not badly represented to-day. About 1820 both the transepts were treated to boarded ceilings—both alike. These ceilings were constructed by placing intermediate bearers between the great ties and above their level;—ceiling joists were run longitudinally into these new bearers notched over the old ties. Boarding was fixed below—much of it of scanty thickness; and the great ties were cased completely at bottoms and sides. Moulded ribs to form panels and geometrical figures in red, on ground of blue, and filled with yellow, complete a well-intentioned and not offensive decorative effort.

The failures in this roof led lately to serious talk about superseding it entirely. The northernmost of the free ties—(there are five in all, three free and two at the walls) has rotted at its bearing, till it has three thin walls surrounding a cavity at least 5 ft. deep. The plates being the only longitudinal ties, the whole length of the roof has beeled over, collapsed at the ridge. The southern pair of rafters have inclined about 2 ft. 6 in. from the vertical towards the tower, and the other pairs have done the same,—of course in gradually diminishing degrees. The backs of the rafters are hollow, 5 in., 6 in., 7 in., &c. Under such discipline most of the joints have sprung out of their old form. When at a previous date the rafters were packed, and couples and jury rafters put in the south cavity, perhaps some irreverent workman thought that material had in other times outdone skill. When he was making reflections, a little bit of change was made in the tower. Very old lead work remains (built in probably) under the bed of the raking string, which originally projected to assist the flashing that hung down from its lower edge. A line, seemingly a guide-line for an earlier finish, remains at 6 in. below this raking bed. Packing on the roof raised the abutting line. The projecting weathering was *chiselled* off; all the surrounding stone-work has the axe marks of the Norman masons. Then the more modern flashing was tucked into the joint at the top of the course, and will no doubt again be dressed down to cover the turn up of the roof lead. As, notwithstanding all its defects, it has been decided to retain the old roof,—the decayed tie will be replaced, rafters spliced and sandwiched, collars bolted to rafters with wrought-iron bolts, braces bolted to collars. Ridge piece will be put, also 1 ft. by 10 in. oak plates at the rafter-feet, and between ridge and plates great braces, starting from the tower side, and inclined southwards. These plates at the rafter-feet will be tied together with 1¼ in. wrought-iron ties, about 8 ft. apart. Rafters will be notched on the braces, and 1¼ in. boarding prepare for lead covering on something like true planes.

The special character of this transept roof will justify this pretty full description of its nature and defects, and even a sketch of its future condition,—not unlike a demoralised Specification. The other roofs will also repay examination. They afford, in common with the roof that is in hand,—examples,—mainly of what to avoid.

The roof of the north transept is wholly unmoulded, and not very smoothly finished; but is a characteristic framework of ties, collars, and shaped braces, which might, no doubt, be seen from below when the time comes for removing the modern ceiling.

In the nave roof is to be collected plenty of evidence as to the treatment of the Norman structure, which is so special a feature of this nave. Many of the columns on which the Norman beams rested remain intact; and others are no doubt standing in the thickened walls. Some of the Norman beams (*i.e.*, *some* timber beams) have been sawn off flush with the wall faces, and the ends left exposed. The present roof has its yet unexplained mysteries. The tie-beams are not placed over the Norman columns. The five divisions of the roof at the west end have been completely reconstructed at some time,—after a fire (date not recorded),—when the next roof couples to the eastward were left charred along their edges. The rest of the roof is not of Norman date,—the pitch does not fit in with the preparation in the tower; the apex rises above the string under the tower window cills. It is a remarkable example of the misuse of handsome timbers. Tie-beams,

1 ft. 9 in. by 10 in., do not deserve the marvellous tearing which at the present time has deprived them of the power of carrying themselves, and forced them to rest in the middle on the stone vaulting. This might be perilous. It is anything but soothing to the imagination. The vault at some date (unknown) must have been carefully repaired. Iron straps were put on the back of the filling-in, and the bosses tied to them with iron bolts:—a work not to be done without a scaffold below, one would think. These are probably some of the bosses of the filling-in ribs,—which have no very onerous duties to perform. As usual with underworked men as well as bosses, the wish to slip away from all burdens soon developed itself. The irons do not appear on the ridges. The rafters of the nave roof are 9½ in. deep by 10 in. wide,—on an average 2 ft. apart. There was, therefore, a good provision of solidity. Yet the rafters are cut short at the feet at the inner face of the wall, a newer plate put and strutted up, and the lower lengths made out with independent rafters. One is led to imagine a time of impending ruin when the weather attacked freely the whole of the lower portion of the roof. Evil influences of some such kind must have had a period of virulent domination. The action on the walls of all these imperfect and crippled framings must be severe, and the extent to which distortion shall be carried a mere question of time. It has been proposed to put, as soon as possible, entirely new girders from wall to wall, midway between the present ties, or where the solidest bearing piers can be got. Then the roof could be brought into shape. Longitudinal trussed bearers could be contrived, the present ties secured to them, and the whole crutched up. For a complete perambulation of the insides of the main roofs Bishop Fox's Presbytery must be visited. The vault thereof has built oak ribs, the filling-in of boards. It is a self-supporting structure in theory, though in practice strung up in an instance or two to the roof-trusses. Decay has set in here also,—the timbers going to powder. The roof-tie is placed high, to allow the rise of the vault to the centre, and boldly bracketed,—treated altogether with ingenuity. But the way in which the wide roof of the presbytery is drawn inwards, to fit the narrowed eastern gable, beyond the cants which make this end half a (very irregular) hexagon, is not a triumph of shapely contrivance. Some modern churches where similar eccentricities are indulged in might be regarded by critics with less oblique regards after good experience of Bishop Fox's architect.

The Lantern.—From Bishop Fox's wooden vaulting to the (very curious in its way) specimen of 1634 wooden fan-vaulting, immediately over the great arches supporting the tower, is a natural transition. Not that any one wishes to linger long over it. Most of us have eyes which would fain pierce through and rest in the space above. Designed to be seen from the church's floor,—but cut off so completely, and delivered over to bells, dust, and bellringers, and reached by awkward stairs,—it is possible that a frequenter of the cathedral may exist who has not taken pains to realise the effect of the open lantern. The side of the upper stage internally is 36 ft. The height from the floor of the church to the timbers of the top flat is over 130 ft.; the four sides are alike on all the stages. The upper stage has twelve great windows 3 ft. 6 in. by 20 ft. Below these comes a gallery with wall passages; then a piece of wall space; then triple arcades (over 20 ft. high); then a piece of wall and the four great arches are reached. The whole is boldly designed in the vigorous style promised by the external windows of the tower, enriched with chevrons, billets, cushion-caps, and the like. Such was the inside of the lantern to which, from the twelfth (probably) to the seventeenth century, eyes were lifted up at the great crossing. The windows poured a great body of light into the choir. Perhaps on the score of mere lighting this arrangement is less a necessity now than then; even Bishop Fox's great presbytery windows and the lantern together cannot have over-windowed this space when glass, such as that which remains, attempered the light with its storied panes. But the windows need not be kept in white glass for ever, one would hope. Still, these are propositions for which time does not appear to be ripe. When the subject was discussed a few years ago, the bell difficulty came into prominence; and it was proposed to erect a great bell tower in some such position as at Chichester,—north of the west bay of the nave, reaching it by a cloister from the north-west door of the aisle. Can it be that the Cathedral had no bells from the time of Bishop Edingdon's meddling with the west end and taking down the upper parts of the Norman towers, down to the reign of Charles I., when the lantern was ready to receive them,—say near upon 300 years? Or can it be that the Norman towers were never more than foundations of towers, and the bells entirely wanting? The earliest of the bells are three of 1734.

Stone.—Complete notes on the nature, and a history of the materials and masonry of a first-class cathedral, would often fill a note-book that would fill a pocket such as no well-educated coat-artist dare permit. Walkelin, the Norman Bishop of Winchester (1070-97) used the grey—coarse, shelly—Quarr Abbey (Isle of Wight) limestone. William of Wykeham (1366-1404), and Edingdon, his predecessor (1345-66), used it also; but by preference Beere stone for moulded and carved work. They found this easier to work, and fitter for the delicate parts of their architecture. It is supposed that no fresh Quarr stone was brought here after Wykeham's time, although Prior Silkstede (1498-1524) filled in the west windows of the north transept with tracery in Quarr. The great reredos seems of Tisbury. Beere stone was used by Bishop Fox (1500-28). When the west front was restored, about 1860, Caen stone was used. It matches well in texture and not badly in colour with the Beere stone—a lot of which had decayed into shapelessness. It remains to be seen whether Beere stone, now being used in London, will behave differently there. At Winchester it is of pleasant colour. But in the north parapets of nave, and of the nave south aisle, it has a peculiar look of melting sugar. The Caen stone mentioned above has already begun heartily to decay. Under parts, especially of strings, have become shapeless; bits of little pinnacles of niches are missing; large jamb and plinth-stones are subjects for the dry dragged brush of the colourist. Doulting stone is now being used in all external works at the Cathedral. A new set of pinnacles on the north aisle of nave buttresses are in hand. At present, of course, there is no happy blending with the old work, but it may weather into not unpleasant slight contrasts. Among drawbacks are vents in large blocks, calling for patching in carving and mouldings. It must be kept in hand in moderate quantities. Any long exposure after getting increases the work upon it fearfully.

But even the ranging over near upon two acres of floor area and full 800 years of time must not tempt us now into another column. Let us note, however, that the Excursion came to a close very happily, with due thanks to clergy and other helpers, and, of course, to the secretaries. Of good wishes for many such a meeting in such pleasant quarters as the cozy "Royal" at Winchester there were also good store.

GARDENING IN THE MIDST OF HOUSE BUILDING.

GARDENING, says Lord Chancellor Bacon, "is the purest of human pleasures." A better aphorism there cannot be. There can be no doubt that it is so, as many doubtless can testify who by chance and opportunity have at all taken to it. And if the act of cultivating a garden be a delight, then most surely is the pleasure to be derived from the sight of one, if but now and then, a no less gratification. But what is a garden? We confine ourselves just now to town and city gardens, and more particularly to London gardens, for there are multitudes of gardens even in the smoke of London town, though we may see but so little of them. Maps of London do not throw much light on London gardens: they indicate the squares and parks, but do not show where the small plots of grass, gravelled paths, and plots of flowers, are to be met with, even when they face the public road and border the pavement, still less when those are to be found at the backs of so many London dwellings, and on which sometimes a great deal of money is yearly spent. But yet are London gardens worth a map mark and a glance, and we may, perhaps, wonder that a good deal more is not done with them in a vast variety of ways; and the closer the subject is looked into the greater the wonder will appear. We here confine our remarks to the gardens in London, and as surrounded by bricks and mortar, and do not touch on the surrounding ring of market gardens and green fields; for even London, huge as it is, has its limits, and you come to the green fields and hedgerows at last.

We need but touch on the "parks" which have, fortunately for Londoners, been set aside and preserved from the powerful hands of the house-builder. A coloured map of London would show but very little of green shading were it not for these, and large spaces north and south show nothing but ever-increasing masses of dull brick houses and waste plots for more and more of them,—gardens and squares certainly not forming items in the minds of those who lay out these extensions of great London city. A walk through, and up and down, one or more of these new, and long, and quite straight streets of evenly-built little rows of small houses is about as dismal a one as can well be imagined; bald "utility" can no farther go. Yet at the backs of even these small "useful" houses there are, as often as not, little plots of ground called gardens, in all stages of desolation and weedy waste, and with, as often as not, the ground trodden down into hard lumps, and all vestige of grass and plants, or even weeds of any kind, utterly gone: market gardens, be it noted, formerly occupying the ground on which these houses stand. Thus we have yet in brick-and-mortar London three, at least, distinct kinds of garden ground, to wit, the parks,—and there ought to be yet more of them,—the "squares," and the plots of garden ground scattered about by accident here and everywhere, though for the most part hidden away behind the houses to which they severally belong. To these we may perhaps add, for it is difficult to duly classify them, such plots of grass and tree-covered ground as the grounds of Chelsea Hospital, the Artillery ground, and one or two others. So that London has its green spots.

It is in the older and less-improved parts of London that these little garden-plots are most to be found and best seen; indeed, it may be said generally that our grandfathers seem to have thought a little bit of a garden, even in front or in the rear of even the smallest house, a necessity, and a thing of course. In out-of-the-way localities, now thrust into the background, you may go down little narrow courts, with really pleasant bits of green-covered spots,—small enough, certainly, but a pleasant relief when contrasted with the long, dull, length of a street of to-day's build, consisting of houses of the same kind, and intended for the like sort of tenants. We could catalogue many such not yet improved out of existence; but few would care to look for them in such out-of-the-way spots.

We may, however, remind the reader that in the New-road, as it used to be called, the Marylebone-road that is, the Euston-road, and the City-road, garden-ground is yet to be seen, and here and there some goodly trees thrive. We may note, too, in passing, that Charles Dickens lived in a pleasant house in this road for some years, and it may interest a mortal here and there to know that he never suffered the sunblinds at night to be drawn down, so that you could in passing always see into his pleasant-lighted rooms. A better place in London town he could hardly have found. The house had and has trees in front of it, but yet not many enough to hide it. Improved house-building in all ways is the order of the day; but a good deal has yet to be done, and perhaps first said, before in a quiet way better Englishman's house-building than such as this is likely to come about; and green spots and trees ought surely to form an item in the problem.

But the green trees are just now in such fine state of luxuriousness and plenty that before they take their autumnal tint of yellow and begin to fade, it is well to note how even a single green and full-leaved tree tells in a dull and quiet brick-built street, and how curiously some of them have been allowed to retain their places, and grow to huge dimensions sometimes, and where they might be least expected. Cheapside is right full enough of shops and trade, and small room would there seem to be for tree growth; but, as all know, there is one, and a fine tree too, in the very midst of it. Cheapside is one of the "picturesque" streets of London, and this tree growth in its midst most certainly helps it, and adds to its pictorial effect, as much so as does the fine spire of Bow Church itself. It is, without doubt, one of the advantages of an old nucleus to a new city that such spots as these exist in it. The dead uniformity of a cut and dried plan is thus broken up, and the good fortune in this instance is that a green tree does it. Many others, but in more out of the way spots, might be named, where this "memorial" of the past of things breaks the modern uniformity of to-day's work. Islington,

Clerkenwell, and Chelsea have still many of such, though they are fast disappearing, as new buildings take the place of the old. In and about the Inns of Court, too, goodly trees are to be met with, where you might never go to look for them; and many a dull narrow way is cheered by the tree-top looking over a dead wall. How long will even these last?

There is one special and curious "phenomenon," we may well call it, connected with this garden subject, not a little suggestive and noteworthy, though we doubt whether it has before been noticed. It seems to have escaped the glance even of that industrious gardener, the late Mr. Loudon. It is this. Go through and attentively note the state of the vegetation generally, and of the trees especially, in any well-looked-after and carefully-cared-for square or garden,—we are speaking of London localities,—and note the thin and attenuated look of the trees, and the sparseness of the leafage, and bareness of the tree trunks. The trees on the Thames Embankment show this in a striking and but too obvious way; and these trees have as much attention paid to them, and they are as carefully looked to, as would seem well possible. The park trees too, as the ground becomes clear, and every square yard of it of value as recreation ground, show this, though not quite so prominently perhaps, the trees being for the most part of older growth. The Temple Gardens may also be studied with profit by those at all interested in this hitherto neglected subject. Indeed, to generalise; go where you will, in and around the green spots in London, and the same will be found to hold, that in proportion to the care and pruning annually, and the keeping of the ground clear and clean, the trees, whatever they are, and of whatever age, would seem in some mysterious way or other to suffer by it. The leafage gets to be poor and thin, and less luxuriant in tone and character, and the tree looks sickly, and as if planted in a wrong soil, and so would not or could not grow!

Nature is at times, it is certain, not a little mysterious in her operations. Now, to reverse this, go by way of contrast into some unkempt, and utterly neglected, and out-of-the-way spot of ground, but still in the very heart of the great brick-and-mortar wilderness, and look at the vegetation to be seen in it. In the first place, there will, of course, be the ground thickly covered with thick-set grass and rank weeds. Weeds, though looked upon at times with all but horror, be it observed, are to this hour, in spite of our advanced science, a botanical puzzle, and of nature's many mysteries not the least. The scientific botanist still crying out,—what is a weed, and whence does it come? But be weeds what they may, the waste and neglected earth is found covered with them, and some of them, by the way, of extreme beauty. The very earth itself, rank as it may be, and which would so surely refuse to grow the dainty and almost artificial flower, and grass plots, would seem to welcome the thick-set and humble weed. But it does more than this: the tree, whether large or small, young or old, seems to thrive in exact proportion to the neglect it experiences. Leave the tree, of whatever kind, in a waste and unkempt bit of ground, with a high wall to block it up, and the result is, not death, as might be imagined, but the most vigorous growth, and luxuriance of leafage. So thick, indeed, does this last get to be from years of neglect that no sky can be seen through it, reminding one of forest-tree growth! Park-tree growth is a something *per se*. This fact, for fact it is, as may be seen by those who will look for it, is worth careful note.

We would, by way of another glance at a really important subject, hint at an "improvement" or two that might be made in one or two localities where expense certainly would not stand in the way. Shop-filled streets are not the places for trees, that is certain; but such broad ways as Portland-place,—the street of streets at one time, and before Belgravia and Tyburnia rose into note,—would seem to be specially adapted for them, for quick-growing luxuriantly-leaved trees. The carriageway here is broad, and but sparsely occupied, and the pavement wide, and is in a direct line with the broad walk through the Regent's Park. It would seem a pity that a like walk does not run through Park-square, at the top of it, thus to form a pleasant, and indeed in London town, unique vista. But be this how it may, trees on either side of this aristocratic way would help to "improve" the baldness of its plain brickwork.

Trafalgar-square, too, surely would be improved by the addition of a few trees. The asphalte which now covers it looks cold and bare and cheerless enough, and any sort of ground covering would seem to be better, and what better than a grass-covered space, with fountains to help it and complete it. How much there is to be done in great London city!—not indeed by the expenditure of vast sums of money, but in a quiet way, every here and there, and sometimes, indeed, without any money cost at all, by the simple process of saving it, and leaving things alone, and at least by allowing the very earth itself to do its kindly work.

STAINED GLASS AT THE CENTENNIAL EXHIBITION, PHILADELPHIA.

JOHN HARDMAN & Co., Birmingham, exhibit a four-light window. In reality this is a "picture," divided by mullions, representing the interior of Simon's house, with the woman anointing our Saviour's feet. Our Lord is represented in the foreground, reclining on a couch in front of a table on which a meal is set. To the left is a mediæval fireplace with dogs. On the right and forming the background is a gallery; above this a small cusped two-light window with diamond-shaped panes. The ceiling is panelled. The drawing of the figures is good, and what colour there is, is harmonious, but the details are incongruous, and the treatment of the subject utterly unsuited to the material.

Wm. Ramsey, London. — Window screens, arms on shields and in circles, and classical and Scriptural subjects. The principal subjects are "painted and stained on white cathedral rolled," and are examples of the surface decoration now so much in vogue.

Thomas Baillie & Co., London.—Two small panels, "Virgin Mary; style, fourteenth century." A servile imitation of old glass which has turned out dingy. It is impossible to judge of the sex of the figure. A "Female figure, Autumn; style, present century," is a very pleasing example of domestic glass.

Mr. Hughes, Soho.—Wheel window, Christ coming in his glory, surrounded by angels. The design is good and well coloured, although the treatment is somewhat severe. Panel of domestic glass, "Industry." Three female figures and the conventional bee-hive.

W. H. Constable Cambridge.—Two lights, "Mary hath chosen the better part; a scene in Martha's house, and "Feed my Lambs." This has a background of distant mountains, while the sky in both lights, and the ground of the lower inscription panels, are of bright blue. A second panel, St. Margaret, is more successful.

J. Powell & Sons, Whitefriars.—Three lights, heavily canopied, with panels filled with scenes in the life of our Lord, after the Resurrection. The lower panels have the emblems of the Apostles. Single-light, with panel in grisaille, "The Good Samaritan," well studied.

E. Matthews & Sons, Oxford-street, London, exhibit at their stand a stained-glass window for a mansion or public hall. The centre is a medallion portrait of Charles Dickens, surrounded with smaller portraits of Mr. Pickwick and his three friends, while above and below are panels filled with pictures of scenes taken from the author's works. This firm also exhibit an assortment of tiles in secondary colours, and a large memorial brass. This latter would be better without the gilt and red and blue filling.

CANADA.

J. C. Spence, Montreal.—A rose window, "Christ as King." Two panels, with scenes from the early life of Christ, and some grisaille and domestic glass.

J. McCauseland, Toronto.—One light, "The Woman anointing our Saviour's Feet." A very fair sample of drawing and colouring.

NEW SOUTH WALES.

Lyon Cottier & Co., Sydney.—Frame filled with domestic glass hung from tie-rod of roof too high for examination. The principal panel represents Captain Cook, the great discoverer.

UNITED STATES.

F. O. Falck & Co., Boston.—Three-light window: "The Prodigal Son." The lower panels have medallion scenes representing the wanderer's extravagance and fall.

S. Slack & Co., Orange, N. J.—Specimens of ecclesiastical and domestic glass, well drawn.

S. West, Boston.—Figure subjects and arabesque designs in enamelled glass.

G. Gibson, Philadelphia.—"St. Michael." This is unfortunately placed against the dado of the gallery, so that only the upper part can be seen.

C. Booth, Orange, N. J.—Memorial window: "Out of Egypt have I called my Son." A "picture" with crescent moon, and pyramids in the background. Some panels of domestic glass are well drawn.

A. Fitzpatrick & Co., Staten Island.—"Christ in the Temple," "St. George," and "St. Augustine," are fairly put together. It is a mystery how the same firm were allowed to exhibit the fearful monstrosities entitled: "The Holy Family, modern style," and "The Adoration of the Magi and Shepherds."

M. Mittermaier, Brooklyn.—"Christ in the Temple," a three-light picture, finely drawn and coloured.

S. West, Boston.—"St. Paul," after Raffaelle's St. Cecilia. This, like a few others, is turned "inside out."

McPherson & Co., Boston.—"A Knight in Armour," after Giorgione's picture in the National Gallery. A successful attempt at real glass mosaic, with treatment well suited to the climate.

James Baker, New York, shows, in a room in Memorial Hall occupied by part of the Belgium exhibits, a window filled with designs of patriotic subjects and coats of arms. "The Landing of Columbus," "Washington crossing the Delaware," and "Lincoln emancipating the Slaves." The drawing is weak, the background of sky; and in the case of "Washington crossing the Delaware," sky and stars are "gotten up" in a most wonderful manner.

FRANCE.

In the French Art Pavilion of G. Lichtenfelder, an end window is filled with glass by P. Bitterlin representing "Charity." The Virgin is seated on a canopied throne, with the child Christ at her feet, and is supporting a kneeling woman. On each side of the throne are circular-headed windows, through which appear the towers of Notre Dame and Rheims.

Bitterlin & Son, Paris, exhibit in the main building numerous panels of painted and enamelled glass of very bright colour.

In a pavilion occupied exclusively by ecclesiastical wares, A. Lorin, of Chartres, exhibits four large three-light windows, executed for New York Cathedral. Each window is filled with one subject, viz., "St. Henri," "St. Bernard," "St. Laurent," and "Benoit XIII. et Frères de la Doctrine Chrétienne." With the exception of some "impossible" clouds, the drawing and colouring of these windows are excellent.

Beysens & Beckers, Paris.—Small panels of grisaille and painted glass.

GERMANY.

F. V. Zettler, Munich.—Two circular lights for Mahommedan and Persian temples, respectively, well coloured and leaded. A lofty five-light window is the finest of its kind exhibited. It rises to the height of 35 ft., and has been purchased by Archbishop Wood, of Philadelphia, for 3,000*l*. The three centre lights show three panels, one above the other,—the Birth, Crucifixion, and Resurrection of our Lord. In the outer lights twelve smaller panels represent the principal scenes in the life of our Lord. In the tracery, "Christ as King surrounded by Angels."

AUSTRIA.

A. Neuhausen & Co., Innspruck.—Life-size medallion portraits of the Archduke Rudolf IV., and of Andrew Hofer, the Tyrolean patriot, also various coats of arms, well executed. Surrounding these subjects are 108 tints of cathedral glass in small squares. The collection of stained glass is, on the whole, disappointing, being so widely scattered, and, except in the case of M. Lorin, having no special provision made for its display.

The British and foreign firms have kept fairly up to the standard, but the natives have yet to discover that *glass* is not *canvas*. The English exhibit was forwarded here without any definite space being assigned for its reception. In the early part of the year the British executive sent a telegram asking for further applications, as a certain space had been reserved. This space was in the south gallery, exposed to the glare of a tropical sun, and the majority of the glass sent is only suited to our dull English climate. To make matters worse, a school exhibit is crowded into the same gallery, while some firms have to be content with spaces on the north side among the carpets.

THE PARIS UNIVERSAL EXHIBITION OF 1878.

LAST week, when the Prince of Wales was in Paris, the Minister of Agriculture and Commerce (M. Teisserenc de Bort), visited him personally, and obtained from his Royal Highness his consent, which he gave with great warmth, to preside over the English section of this Exhibition. He expressed the interest he should always feel in such projects, and referred to the active part his father had taken in the London Exhibition of 1851, at which time Prince Albert, then President of the Society of Arts, when first the Exhibition in 1849 was projected, spoke in these terms,—"Now is the time to prepare for a great Exhibition, an Exhibition worthy of the greatness of this country; not merely national in its scope and benefits, but comprehensive of the whole world, and I offer myself to the public as their leader."

The ambassadors of nearly all the foreign countries have promised their earnest support, and, notwithstanding Prince Bismarck's reported snub to the undertaking, the Crown Prince has promised to preside over the German section.

So far affairs are progressing favourably, but, as might be expected, there have been some hitches of a somewhat regrettable character in the preliminary arrangements, and Messieurs du Sommerard and Viollet-le-Duc have retired from any active management, and the whole directorship now reposes with M. Senator Krantz. All the heads of the sections under his direction are now filled up, and much time will be saved by appointing, as they have done, to the various departments, those gentlemen who were concerned in the great Exhibition of 1867.

The journals publish the following note from the Ministry of the Interior:—

"The different services of the Universal Exhibition are definitely constituted. The *Journal Officiel* will register shortly the decrees of nomination. It only remains to provide for the secondary situations, and to complete the bureaux which are at present acting. . . . The organisation comprises, besides the General Commission, four great directions:—Direction of the Works, Direction of the French Section, Direction of the Foreign Section, and the Direction of Agriculture. The services dependent on the General Commission are:—Secretaryship: general secretary, M. C. Krantz; the financial service, the service of the archives, and the medical service.

The Direction of the Works comprises the construction, the keeping up of the edifices and the palace, the parks and gardens, and the installation of the machinery. The director who has been designed for this post is M. Duval, engineer-in-chief of bridges and causeways. M. Duval will have under his orders several civil engineers, engineers, and constructors of bridges and causeways, and architects. The architect of the works on the Trocadero is M. Davioud; the architect of those on the Champ de Mars, M. Hardy.

The Director of the French Section is M. Dietz-Monin, a former deputy and a municipal councillor. To him is joined M. Giraud, Conseiller, Général of the Department du Nord.

The Director of the Foreign Section is M. Georges Berger, and the secretary M. Charles Verger, auditor to the Conseil-d'Etat. The Director of the Fine Arts is M. le Marquis de Chennevières.

The Commissioner-General's first care has been the classification and general arrangement. The documents pertaining to these heads are ready to be printed, but they will not be definitive till they have received the approbation of the Minister of Commerce, and they will be published by a decree of the President of the Republic.

In the preparation of these documents the bases adopted in 1867 have been preserved. The classification then employed, and experience has shown it, is much clearer, more logical, and more commodious for the disposition of the galleries, than the classification adopted at Vienna and at Philadelphia, both of which were a little confused.

The principal modifications relate, first to the old group 10, which had for its title objects specially exposed in view of ameliorating the physical and moral condition of the population. The end which the Imperial Government proposed to itself in creating this group, the title of which is so vague, entered into the programme of social studies to which the Emperor sought to give importance. This end has not been attained, and it has been resolved to fuse into the nine groups of the new classification all the matters which had found a place in the tenth group, and which had been artificially extracted from them. Secondly, to the importance to be given to education. The three classes of primary, secondary, and superior instruction will have a special representation. This will be of a characteristic importance.

'A class of the second group will comprise military questions, and one of the sixth group, the *matériel* and the processes of military engineering, of artillery, and fortification; on which point the classification of 1867 remained intentionally dumb. The first group is reserved to the fine arts. The actual works for the foundation of the palace on the Champ de Mars will commence on the first of September."

In the arrangement of the gardens and cascades M. Alphand will hold some position. The eminent qualities of this gentleman entitle him to the epithet of the Capability Brown of France. To him will be entrusted the scheme that is now seriously proposed, of joining the gardens of the Louvre with the Champs Elysées, unpaving and planting the Carrousel, and the Place de la Concorde. Some purists even express a hope that the Obelisk of Luxor might be removed to the Bois de Boulogne, but whether or not desirable as a matter of taste, this is certainly not likely to be done in time for the great Exhibition. If the plan of this park be effected, and the Place de la Concorde gives way to a pleasant garden, there will be few inhabitants of Paris who will regret the change. The place has sad associations.

It will be remembered that the late Sir Charles Wheatstone, who died in Paris, came here with the view of arranging an Electric Exhibition for 1877. It is now determined that this shall be deferred till 1878, in the Exhibition of which year it will justly form a prominent feature.

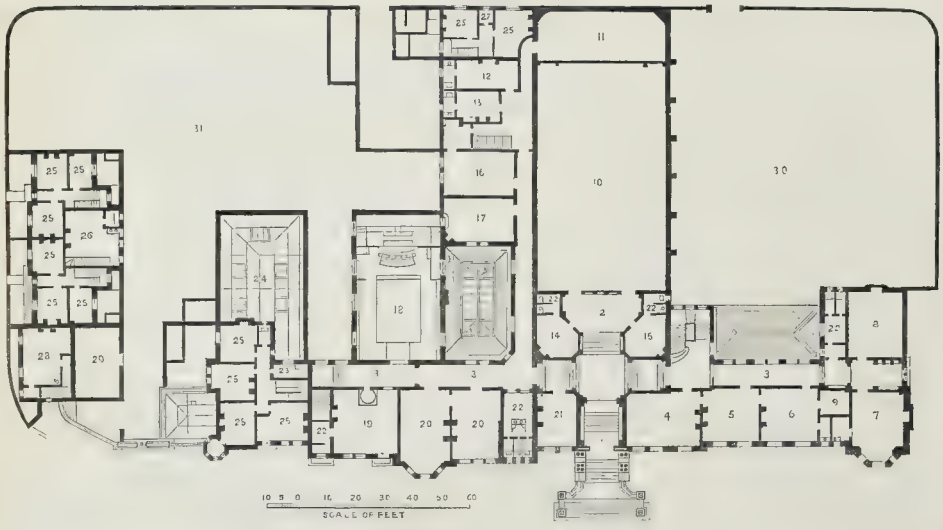
Apropos of electricity, it is stated that M. Bartholdi's already well-known colossal figure is to be erected on the highest point of the Trocadero, whence it will throw its light for many miles around, and will serve the 20,000 Americans, who are expected to be in Paris at that time, not only as a light, but as a substantial reminder of their energy and enterprise, of which they are so justly proud, and also show to the world, what is not so generally known, that they entertain a sincere love and acknowledgment of the value of the fine arts.

Paris.

THE NEW TOWN-HALL AT ST. HELEN'S.

THIS building, representing as it does an important element of improvement in a rapidly-increasing and prosperous borough containing 50,000 inhabitants, was opened recently with great *éclat*. The foundation-stone was laid on the 7th November, 1873. The entire area covered by building and open spaces in immediate connexion with it is 6,000 square yards, with a frontage of 200 ft. It is approached by either Cotham-street (in which it stands), Parade-street, Hardshaw-street, or Birchley-street. It has an imposing appearance, though some finishing touches have to be put upon it, and some few additions to be made. The style is Gothic, but adapted to modern purposes. The building consists of a central portion, indicated by clock-tower and principal entrance, containing porch, vestibules, main corridors, assembly or concert-hall, council chamber, mayor's parlour, waiting-rooms, &c. This portion of the building is three stories in height. The remainder of the building, which is two-storied, — is divided into, municipal offices, consisting of town clerk's, general, chief clerk's, town clerk's private offices, mayor's parlour, waiting-rooms, and committee-room, treasurer's offices, rate-collector's and nuisance inspector's offices, private, general, and drawing office for surveyors. Below the assembly-rooms are a large fire-engine house, lamp and gas-testing rooms, also office and dwelling-house for superintendent of fire brigade. A library and reading-room and keeper's apartment are also there. There is a court-room 50 ft. by 29 ft., and a fire-engine depôt. The police buildings, entered from Cotham-street, comprise public office, clerk's office, store-room, superintendent's office; several cells with prisoners' exercising yard, and a parade-room for police. To these must be added kitchens with cooking apparatus, and hoists for the supply of banquets, &c. In the central portion is a square tower 85 ft. high, from which springs a slated spire, the vane of which reaches the height of 130 ft. The principal entrance to the right of this tower consists of stone piers and twelve clustered red granite shafts supporting an arched gable-piece which is surmounted by the arms of the borough; these arms are also borne upon the sides. This entrance is approached by a flight of stone steps 35 ft. in width at the lowest riser. Four lamps on stone piers will stand right and left on ascending the steps. In the gable, at the corner of Hardshaw-street, is placed a niche containing a figure of St. Helena, the patron saint of the borough, over which is a crocketed pediment. An iron railing surrounds the building, supported by stone piers, and at the Hardshaw-street corner, a handsome lamp will be placed. Entering through large oak folding-doors, with light above, there is a spacious porch, having groined ceiling, and ascending another flight of steps, the main corridor is reached, which crosses at right angles, and from which several chambers are entered, which are devoted to public purposes. Crossing the main corridor, a vestibule screen of glass, in gilded diaper, divides us from the concert or assembly-room, which being 96 ft. long, and 45 ft. wide, by 45 ft. high to ceiling, will accommodate comfortably 800 persons. The effect produced upon entering this room is very striking, principally owing to the semi-circular form of roof, developed more particularly above the raised platform at the north end, and terminated by a deep ornamental cornice. The walls are covered by agreeable neutral tints, which give the effect of distance. The platform is arranged for organ and orchestra, and is capable of accommodating a full complement of performers, and from it immediate access is obtained to private dressing-rooms for both sexes. At the south end a gallery confronts the platform. Six three-light windows on each side admit daylight, and three noble corona gaseliers, each having fifty-eight jets, painted in green and chocolate, and tipped here and there with gilding, give light by night. The roof, composed of seven pitch-pine principals, with laminated ribs, springs from stone corbels. Egress from the assembly-room to the lavatories and refreshment-rooms is obtained by means of folding-doors, opening into a wide corridor running the whole length of the room, and which communicates with the stage approaches in one direction and the principal entrance in another. The ventilation is carried on through the ceiling. Passing from the assembly-room, we find a staircase, having an oak hand-rail and ornamental iron balusters with pierced oak-guard (which is an entirely novel feature), running between the steps and the handrail. This staircase, which is of ample width, leads to the Council-chamber. This is in the centre of the main building, and is immediately over the vestibule, is 42 ft. long by 32 ft. wide, the ceiling being of pitch-pine, framed and panelled, and is lighted by twenty raised and framed side-lights, and ventilated by twenty-four perforated plates. The entrances to this chamber from the corridor are by two pairs of folding-doors, and there is communication also by folding-doors with the gallery or orchestra which overlooks the assembly-room. At each end there is an ornamental stone mantelpiece, bearing the arms of the borough, and the motto, "*Ex terra lucem*," on scrolls. These mantelpieces are flanked by small circular marble shafts. The hearths are of tiles. The furniture is in character with the style of the building. Between this chamber and the gallery there is a panelled partition, carrying a frame which is, for the present, filled in with ground glass, but which will, doubtless, give place to something of a more elaborate character. Descending the stairs, the Mayor's parlour is reached, with retiring-room attached. The walls are covered with a neutral embossed paper, and the splays of ceiling carry ten blank shields on each side, which are intended to receive the crests of successive mayors. An ornamental cornice, picked out with gilding, runs round, the ceiling being cream-coloured. The mirror frames are picked out with gilding also. The hearths are laid in encaustic tiling, with which the splays of hearth-places are lined. The offices contain arrangements for telegraphic communication (Moseley & Whittaker's patent). The original estimate was something over 28,000*l.*, but this has been slightly exceeded. The principal contractor was the late Mr. George Rowe, of Liverpool, and the architect, who has designed also the whole of the furniture and fittings, is Mr. Henry Sumner, of Rumford-court, Liverpool. Mr. Wood was clerk of the works.

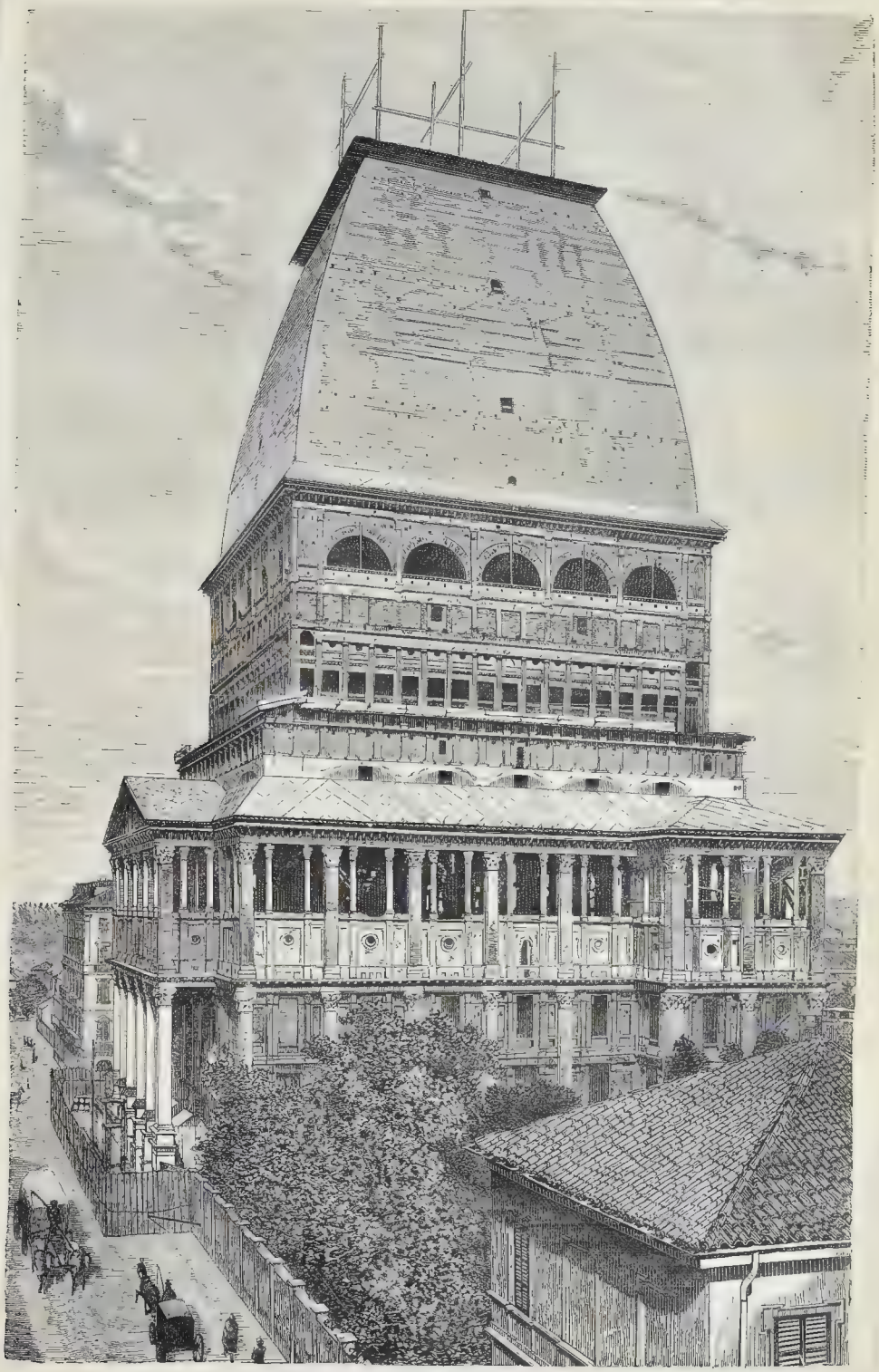




PLAN OF PRINCIPAL FLOOR

THE NEW TOWN-HALL, ST. HELEN'S.—Mr. Henry Sumner, Architect.

1. Porch.
2. Vestibule.
3. Corridor.
4. Town Clerk's general office.
5. Town Clerk's chief clerk.
6. Town Clerk's private office.
7. Mayor's parlour.
8. Committee-room.
9. Strong room.
10. Assembly-room, 96′ × 45′.
11. Platform, 45′ × 18′.
12. Gentlemen's retiring-room.
13. Ladies' retiring-room.
14. Gentlemen's cloak-room.
15. Ladies' cloak-room.
16. Refreshment-room.
17. Magistrates' retiring-room.
18. Court-room, 50′ × 29′.
19. Witnesses' waiting-room.
20. Office.
21. Waiting-room.
22. Lavatory and W C.
23. Bath-room.
24. Roof over parade-room.
25. Bed-room.
26. Single men's bedroom
27. Closet.
28. Assistant overseer.
29. Hay loft.
30. Fire-brigade yard.
31. Police parade-yard.



A JEWISH SYNAGOGUE IN TURIN.—Signor Antonelli, Architect.

A JEWISH SYNAGOGUE IN TURIN.

A TRAVELLER approaching Turin sees towering above the mass of buildings of the city a kind of pyramid cut off at the top, and open like a colossal oven. From its singular shape,—its bareness, its apparent solidity, want of aperture or windows around it, any sign of roof or covering,—the idea of its being what it is,—the cupola of a Jewish Synagogue,—would never suggest itself to any mind.

On nearing the building, situate in Via Montebello, it is found detached from the adjacent houses. A sextile portico, with Corinthian capitals, covers a double staircase, with two accesses to them on the façade. This part alone, by its enormous dimensions, dominates over the neighbouring houses, by the size of its six granite columns, erected on bases which are designed and executed with elegance and skill. Two rows of Corinthian pillars, placed one above the other, each having within them other columns of different orders, constitute the main body of the building; and above it, restricted to the dimensions of the grand meeting-hall, rises the drum, which serves as a base to the cupola, and which is minus the Corinthian gallery which was to adorn it.

Strange though it be, this building reveals itself as the work of one of a small band of masters who display their power, not in ornamental accessories, but in the organic construction of a building,—its boldness and extraordinary framework instantly striking the beholder.

From different points the sky is seen shining through, although the building is constructed as one single square, without inside courts, and measuring 130 ft. From one point no walls are seen, only thin columns; so that the drum and the cupola appear only slightly propped up, and a prey to every gust of wind. From another, looking up to the cupola, the construction appears so ponderous that it seems threatening to fall and crush the observers. Hence the cupola alone, in general, makes any impression on the looker-on.

The idea of raising a temple, with localities adapted for schools, infant asylums, and to erect this in a manner that should claim public admiration, came to the Jews of Turin when that city seemed to have been destined to remain the capital of Italy. The idea of constructing it as we have described it arose in the mind of Antonelli of Novara, in the spring of 1864, in Florence, while visiting the cathedral of that city. After having admired the exterior of that sumptuous Florentine edifice, Antonelli mounted the interior of the great cupola, examined minutely its wonderful arrangements, its fine lines, happily-conceived proportions, its means of support, its marvellously-adjusted strength, and left with the statistical adaptations and arts used by Brunelleschi stereotyped on his brain, and of these he made use in the erection of the temple at Turin.

The greatness of Antonelli's project, the unusual boldness of the structure designed by him, frightened the Israelitish committee. Turin ceased to be the capital of Italy, the expenses exceeded the supplies. In 1869, when the building had reached the state represented in the engraving, the Jews of Turin decided on ceasing the work, and the municipality did not come forward to aid in the accomplishment of a monument which it was thought would have been a great ornament to the city. No sooner had the work ceased, than reports were spread that the work of the clever but somewhat crazed architect would shortly be seen to crumble to dust. The municipality,—who, at the beginning had accorded a subsidy to the Jews towards the erection, in proportion to that granted to the Roman Catholics for their churches,—now held a council of men of art and science to deliberate on the subject. These, after strictly examining the work, decided in March, 1871, in writing, that the building had nothing the matter with it, but needed only a "hat and shirt" to protect it against the wind and rain; that the only things needed were the termination and covering of the cupola, and the adornment of the drum with an exterior gallery, since "without that the edifice would appear a disproportionate heap, and an intolerably ugly deformity." Antonelli being interrogated, declared that 60,000 francs would be necessary for the completion. Nothing, however was done. A destruction of the cupola was suggested, but protested against. In 1872 the President of the Jewish University proposed the ceding of it to the municipality, but ten days after the Jews held a general meeting, at which they voted for the finishing of the temple, provided the cupola were demolished. This the municipality refused to allow; and, after divers other offers and refusals, the building was allowed to remain as it was.

Time has given the casting-vote to the Antonelli project. For six years the edifice has been left to the caprices of the weather and the fury of the winds; the walls were left uncovered without plaster, the conduit-pipes and chimneys the same, the rain irrigating everything within and without the building, penetrating every corner, yet not a crack, not a yielding, is seen in any part; and the so long-contested cupola, with its wall inclined seven mètres inward, spreads its four wings to the air firmly and unflinchingly, as if able to withstand all attacks.

THE MADRAS HARBOUR WORKS.

FROM time to time, since Mr. Parkes's scheme for the construction of a harbour at Madras was sanctioned by the Local Government, we have noted the progress of the undertaking, accepting and often quoting the local journals as our authority for the statements which we made. The work in itself is one of more than ordinary importance and magnitude. The Supreme Government of India has recognised the pressing nature of its claims upon the State by authorising an expenditure of 500,000*l.* upon it at a time when retrenchment is being unsparingly effected in the Public Works Department; and Lord Hobart, while he lived, regarded it as the *magnum opus* of his governorship, and hoped that his name, by being associated with it, would be entitled to an honourable place among those of the benefactors of the Presidential city. Unfortunately, he only survived to witness the inauguration of the project, and since his death the harbour works have been treated with official neglect. Hence, what the Madras papers, and we in turn copying from them, have recorded, as progress has scarcely been worthy of the name, and although the figures and facts given have been absolutely correct, they have been subject to qualifications which have not been made, and which, if made, would have given the whole affair a different aspect. At last, the *Madras Mail* has broken silence on the subject, and asserts that "The harbour works, as far as they have gone, are a costly delusion and a farce, a public scandal, and so significant of indifference and ignorance at local head-quarters, that the Supreme Government should at once stop supplies, and demand explanations."

It would be absurd to suppose that the conductors of an influential journal, in a populous city, should make such assertions with respect to a local enterprise without good grounds for so doing; and certainly if one-half it asserts be true the *Madras Mail* makes good its case. It points out, first of all, the folly of the Local Government in determining to carry out departmentally a novel work, and solve a problem which some of the ablest living engineers regard as a particularly complicated one, instead of throwing the undertaking open to competition; and it considers the folly so much the greater, inasmuch as it had already had ample cause to distrust the ability of the Department of Public Works to undertake a great work of this sort. It then proceeds to show how advantage was taken on all hands of the negligence and incompetency of the officials, how "job" succeeded "job," and how the public money has been squandered while the work has been left practically undone. First, as to the material employed. Nine miles south-east of Madras, we are told, there are little hills of a granite that would resist the action of the sea until the end of time, and the South Indian Railway skirts this locality and runs thence into Madras. But at Ambatoor, about the same distance off, there are hills composed of a coarse, disintegrated half-clay laterite, to which when in small blocks the sea must soon prove destructive. The soft laterite was selected and the adamantine granite rejected. Blunder number one in the choice of material was succeeded by blunder number two in the mode of conveying it to its destination. Again without inviting tenders from responsible parties, a contract was entered into with a native to quarry and deliver this stuff on the beach in Madras for 13 annas a ton. It was not stipulated, however, either with him or with the railway company, that special rolling stock should be employed, and consequently the old high-sided wagons used in constructing the line were brought into requisition, and these being incapable of being tipped, a second contract was rendered necessary, with a second native, for the transfer by hand of the contents of the high-sided waggons into the small waggons that run from the beach to the end of the groyne. This was effected for 2½ annas, so that the Government pay almost a rupee a ton for quarrying and delivering the rubble for the work, and the contractors are believed by their friends and countrymen to be rapidly acquiring fortunes. Another oversight was that no agreement was made as to the size of the blocks to be delivered—the only stipulation being as to the gross weight per diem. The contractors therefore spared themselves the necessity of costly machinery for cutting out the laterite in large blocks and of cranes for lifting it, and the writer of the article before us says,—"We have positively seen the coolies engaged on the beach in the act of breaking with hammers blocks that they found disagreeably heavy in the handling." The consequence is that the groyne is composed of small stones, which the sea sweeps away at its pleasure. We are assured that the shore end of the northern groyne (which is the only one yet taken in hand) had not progressed a yard in a fortnight, although about 1,000 tons had been tipped in. This is attributed in part to the intermittent character of the work. Instead of being prosecuted without cessation, Sunday and week-day, day and night, at six o'clock every evening all operations are suspended, and the sea quietly undoes the day's work, scattering the stones along the north beach. It is pointed out that if the same action goes on during the south-east monsoon, and the south beach be strewn with blocks of laterite, the masoolah boats, for which Madras is famous, will be unable to reach either the Custom-house or the mercantile quarter, as they can only be beached on a sandy shore, free from stones and pebbles, a possible contingency which certainly calls for the prompt attention of the Government. The groyne, including the curves, according to the latest information, was 930 ft. from end to end; but, we are told, "as the sand on the south side has steadily followed the sea end of the structure, its actual length for purposes of harbour shelter is not 50 ft." Its existence has caused an enormous accumulation of sand on its southern side, and the shore end of the pier has silted up 100 ft. in four weeks. It is hoped that when the currents change with the monsoon the sea will scoop out the sand on the south of the groyne, and carry it round that work, depositing it in the angle formed by the north side of the groyne and the shore. But this is mere guesswork, and the laws which regulate the sea, the surf, and the currents are very imperfectly known. The *Madras Mail* says it might add a good deal to the above details, and more than hints that not only is it nobody's business to hurry on the completion of the enterprise, but that certain individuals may find the prolongation of the work profitable. It concludes a long article in these words,—"It is not our wish to blame individuals employed upon the work. The Government have, without the requisite energy or knowledge, most unwisely taken the work into their own hands, instead of engaging a professional man, under adequate guarantees and penalties, to do it for them; and they are carrying it out in so costly and foolish a manner that we feel bound to enter a protest against their accepting any further responsibility in the matter. The failure of the scheme is not likely to cause the members of Government the smallest pecuniary loss or the slightest inconvenience; but to the city of Madras it may mean something alarmingly like ruin."

ARCHÆOLOGICAL CONDUCT.

SIR,—*Ne soyez pas étonné, mais,—allons!* You may possibly be astonished at receiving an abrupt communication from a person of my position; but at this season of bucolic stupidity the papers one reads are so preposterously dull, that the other day I looked *into* the *Builder*,—the outside page of which I have seen at the club for more years now than I care to mention,—and waded through the reports of "archæological" excursions, which appear to have lately taken place all over the country. Although I have never, thank God! been forced to attend any of these meetings, I am convinced, from a mere superficial examination of the reported proceedings, that something is wanting to them —a want that is greatly felt, and that no one as yet has had the good sense to acknowledge; and I mean to give you my opinion, which

I trust, will enlighten you upon the subject. You are, doubtless, unaware, in the obscure recesses of Catherine-street, that the annals of my family are part of the history of this country, from the time of Boadicea to that of my Lord Beaconsfield,—all honour to the latter, say I, who love pluck, even though it be plebeian!—but you cannot be unaware that the literary productions of my uncle created some stir and amazement at the period in which they fell upon the town. They were edited by a late writer named Thackeray, who reaped the whole merit and pecuniary profits of their publication. George Savage Fitz-Boodle, a younger son, like myself, appealed to the unemployed younger sons of the *noblesse*, and offered them the opportunity of adopting two new professions. Had he lived in our time he might have suggested a third; and with what *force* and *verve* might he not have written about it! My poor uncle's parable was taken up, not long ago, by a Mr. Carlyle, who is known as the author of a pamphlet called "Shooting Niagara"; and which I read half through, thinking it was a sporting novel. He mentioned "a kind of enterprises, hypothetical as yet, but possible, evidently more or less, and in all degrees of them tending towards noble benefit to one-self and to all one's fellow-creatures;" and then, as far as I can make out from his frightful English, he suggested that noble lords with nothing to do should take up "sanitary regulation," and cause "the divinely-appointed laws and conditions of health" to be "at last humanly-appointed as well." This, of course, is simply absurd; but there *is* a really honourable, healthy, and remunerative profession for them which has been now long ready to hand—that of a master or leader of archæological pilgrimages. Such a man would devote a part of the hunting season to exploring a particular district, noting curiosities, and the different buildings or other remains of interest. He would have under his orders a staff of measurers and delineators to make diagrams of any antiquarian enigma likely to afford food for discussion and contradiction. He would, with his own hand, prepare a minute of the programme to be eventually carried out, and, accepting the entire responsibility, be the sole and absolute master of it. Then, when the time for the pilgrims to arrive at the scene of conflict came round, he would be there to receive them *tout-à-fait au courant* of everything that had been, is, and likely to be,—monarch, in fact, of all he had surveyed.

It is, perhaps, necessary for me to assure you that no ordinary man could fill such a post with any hope of success. He must be one of irreproachable birth and fashion; he must speak French, German, and Italian easily, and be a lively and elegant man of the world,—neither a mere fribble nor an empty *flâneur* of St. James's or Pall-mall, but one of vast, and yet select, social experience. Xenophon, Agamemnon, Julius Cæsar, and those sort of people, were leaders of men, but not fitted for the position of a master-archæologist. More is required in such a character. He must be a leader, not of men only, but of men and women; for I take it that in these gatherings there is usually a large female contingent; and although this may be swollen neither by extreme youth nor frivolous maturity, a leader or ruler such as I conceive him to be must not be overshadowed by the sere and yellow leaf. He should be slightly and prematurely bald, tall, upright, and have long eyelashes; for intellect in petticoats, as I have too frequently experienced, is averse neither to masculine grace nor manly sentiment. This leader's word must be the law. The pilgrims may doubt, discuss, disagree, but HIS *fiat* once delivered must settle everything, if not for ever and a day, at least till the close of the excursion.

This discovery that I have made is, as you have no doubt already perceived, a valuable one; and one by which my position in and above the world of fashion prevents me from profiting. But how many younger sons could, if they chose, earn a large income—paid by fees from each member—by simply acting as master of the ceremonies alone? Sir, I grasp the whole scene at one comprehensive and universal glance. For the first few days you are all constrained—deucedly awkward even—and one or two are *gêné*'d through the whole pilgrimage. You require to be brought together, gently but surely, by that tact which is only to be witnessed among us; you should be imperceptibly *frictionné* with the social brush, wherewith plebeian pimples are eradicated, *bourgeois* asperities softened, and professional vanities appeased. As I said before, I see you all, standing round the ruined remnants of a Roman rampart, or mayhap, the mediæval monument of mangled martyrs; you, all, have your individual opinion upon every point connected with them, and stick to it with native strength, firmness, and endurance. Perhaps some youth of artistic and æsthetic aspirations, but like the Psalmist, "small and of no reputation," is earnestly examining a sculptured fragment; near him stands a maiden who was twenty-eight last birthday. He, in trembling accents, whispers, "Norman-Byzantine." She looks imploringly, "First-Pointed." An intruder, ignorant of the effect that the words of a third person often produce under unexpected circumstances, points out frigidly that the stone is "decorated" with "horizontal" and "perpendicular" mouldings—thus a conversation of deep import, originally restricted to two timid beginners, becomes general; and at last the bystanders hint courageous doubts of a "debased" character, mingled with fears of "flamboyant" possibilities. Then it is that the master—the accomplished ruler of men and women—should step in, glance carelessly at the object of perplexity, and introduce the combatants by name to each other. Then it is that he should aver the truth, not with "firmest antiquarian guess," but with decisive urbanity; and explain perhaps that the fragment in question is "Early nineteenth-century—transitional George and William."

Why, Sir, Gracious Powers! When one learned antiquary,—*homme convaincu*,—said, "It is," and another learned antiquary,—*homme positif*,—said, "It is not," the pilgrims appear to have merely smiled, and nothing came of the exciting *contretemps*. That is not the way an affair of the kind would have been passed over in my uncle's time. *Mais, cependant, nous avons changé tout cela*; and, therefore, the master-archæologist becomes an innovation of necessity. A superior being, he would occupy five minutes in settling the apparent difference,—he would explain to the disputants that though relatively at variance in theory, they were morally one in results. Indeed, how much more extended and valuable would these results be were the various pilgrimages led as I have forcibly explained to you! At present men's minds, and even mine also, are a jumble of styles and dates. One is always finding some ancient or mediæval peculiarity cropping up, on some principle of reversion, in modern productions of art. Even that *Romanus Romanorum*, that last of the wits, has succumbed to the popular ferment of chaotic antiquarianism in *Punch's* cartoon of "Empress and Earl." He showed, years ago, that he could draw a classical pedestal with exactness and propriety, but now,—or is he satirising the modern taste?—he composes a fantastic *mélange* of rounds and hollows to form a moulding which resembles nothing that is, or ever has been, in the creation of pedestals. I am disposed to discuss this point fully hereafter. I shall merely say now that the old landed families have not gained anything by the revival, thanks to you archæologists, of feudal fashions. Before archæological pursuits became popular, they really were possessors of genuine and original *châteaux*, which it was possible to distinguish from modern ones; but now a brand-new *bicoque*, erected for some successful *épicier*, is often made to look like an ancestral dwelling repaired. Take my word for it, Sir, forty years hence, that cathedral, or that church, or that hall,—if any one even now exist,—which can show the whitewash that your great-great-grandfathers daubed over it, or the edges that Cromwell's soldiers managed to chip, will be considered the only really valuable remnants of antiquity in England. You have restored everything old off the face of the land, and I dare say you are sighing for further trophies to re-patch. Even Fitz-Boodle Hall is no longer recognisable. The top story, which in my poor uncle's time had vertical sides and a flat ceiling, is now transformed into two *étages* of attics; and, the other day, in the abominable bedroom reserved for me, I had to get on a chair, in order to put my head through a "five-cusped trefoil" hole, whence I could perceive nothing but a gutter full of broken slates.

But this letter is already a long one. If the partridges permit, I will write to you from Norfolk a series of well-considered articles,—and I pledge my sacred honour that I never wrote a word of print before,—two of which, "The effect of Gothic Mouldings upon the private feelings of the Aristocracy," and "The influence of the Pointed Arch over the deliberations of the Upper House," have been long in the mind of

BOODLE FITZ-BOODLE.

CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

On Friday, the 18th ult., an excursion was made to Usk and Raglan. On the way to Usk the church at Bettws Newydd was inspected, chiefly for its rood-loft, which is considered a very fine one. The priory church at Usk is an interesting building. There is also the castle, which was first visited.

The Rev. Stephen Cattley Baker, vicar of Usk, gave a brief historical account of the castle. In Domesday Book Twrstain Fitz Rolf is mentioned as holding certain lands, including this place. Professor Babington said the castle was admirably situated as a place of defence, and pointed out which was probably the great hall, where the lord's family dined. He also spoke of its towers as being habitable parts of the building. The keep was only inhabited in case of emergency. The major part of the interior was of wood, and no doubt if the walls were bare they would be able to see how the timber for the roofs was fixed to the walls. Of course, the woodwork was the first to disappear when the castle was deserted. Regret was expressed that Mr. G. T. Clark, of Dowlais, was not able to be present. After some general conversation, the party walked to the church.

Within the church the President (Dr. Freeman) gave a description of its architecture. He said that the priory grounds were now in the hands of a person who stood in the way of other people, and shut up the grounds from those now visiting the church. If the grounds had been thrown open, the owner would not have been harmed, and it would have done good to the visitors. He then said they would at once see the peculiarity of the church. The tower stood at the east end. The explanation was that the building was originally both a monastic and parochial church; but although they were under one roof and formed one building, the parish church was as distinct as though it had been miles away. In churches of this kind, where the eastern part belonged to the monastery and the western to the parishioners, when the Dissolution came the part belonging to the monks went to the king, and sometimes it was pulled down, and sometimes sold, or it was added to the parish church. In this case the eastern part had quite gone. This case differed from Abergavenny, because the priory church and parish church were in different parts of the town. Here the Priory church was destroyed, while the parish church remains. It was a singular phenomenon, with a tower at the east end. The chancel was marked off by the rood-screen which they saw before them. The church was in what is called structurally the nave of the building. The present church was rebuilt in the thirteenth century, with later alterations. The Norman remains outside the tower were spoken of by Dr. Freeman, who concluded his observations by stating that there is an inscription in the church which had puzzled all who had endeavoured to decipher it.

The Vicar read several translations which had been given of the inscription. From an old document reprinted it is gleaned that in the 26th year of the reign of Henry VIII. the gross value of this priory was rated at 69*l.* 9*s.* 8*d.* and the income at 55*l.* 4*s.* 5*d.* Ellen Williams was the prioress in 1535. Leland, in his Itinerary, says, "Uske, a priory of nunnes at fair Uske, on the river side, a flite shot from the castel. It is a V miles upward on the river from Cairlleon." "A flite shot" would appear to mean a distance which might be covered by the flight of an arrow, as that would be about the distance which an arrow would fly if shot from the castle walls. The prioress and convent were the patrons of Raglan, Mykenny, Usk, Langrinon, Lampadok, and Lanvyhangel. It was a priory of five Benedictine nuns before 1236. From Usk the party had a pleasant ride to a picturesque spot called Llangwm, where there is a pretty church that has been restored recently by Mr. J. P. Seddon. The chief attraction was in the remarkable rood-screen.

Mr. J. P. Seddon read a short paper on the church. He said its name signified the church in the vale. It was said that a Roman general was quartered in the district, and was converted to Christianity. He built a church in consequence. Langam and its two churches existed 900 years ago, and there were two prebendal stalls in Llandaff cathedral connected with it. The two churches were not far from each other, and were Langam Uchs and Langam Isha. They were dedicated to St. Jerome

and St. John. That now before them was the church of St. Jerome, and consisted of a nave, south porch, chancel, and tower. The form was particularly beautiful and appropriate for the site. He described the general features of the building, and called particular attention to the rood screen which is of oak. Fifty or sixty years ago the Rev. Dr. Cooke, an eminent antiquarian, visited the church, and was so struck with the screen, that he wished to buy it in its entirety and take it away. This was declined. When the Rev. W. Price came to this parish, the nave had to be rebuilt, and then the screen was carefully dealt with, in order to preserve it as perfect as possible. The middle portion is gone altogether, and the lower part has been restored in keeping with the general character of the richly-carved oak.

The party then proceeded on to Raglan, where they saw the church (restored a few years ago), and then walked to the castle.

The proceedings of the meeting were brought to a close by an assembly at the Town-hall, when one or two papers were read.

The *Western Mail* complains of a great lack of order during the proceedings. "No one seemed to know what to do and where to go, and, consequently, some persons had the trouble of going twice over the same ground simply because there was no one to direct."

FROM CATANIA: MUSICAL FESTIVALS.

THE festa of the patron saint, Agatha, is just over, and no expectation is concentrated on the coming Bellini Festival, of which the programme is just published. A native of Catania, he died and was buried forty years ago at Paris. It is decided by his adoring townsfolk to bring his relics home in a manner worthy of his name and their honour. A French frigate will, on September 22nd, convey his ashes to their resting-place, to be received with a salute of twenty guns, fireworks at sea, and a general illumination of the city, with an apotheosis of Bellini, a dramatic scene in music, by Pacini, opposite the University. On the 23rd, the representatives of this and other Italian cities will assemble, preceded by their respective bands, at twelve a.m. in the town-hall, to hear a discourse by Signor Ardizzoni, and receive commemorative medals; at four, the transport of the remains to the cathedral, with a grand *cortége*, accompanied with appropriate music, by Mercadante, Coppola, Gandolfo, Platarni, and Frontini. A chorus, for 100 voices, by Coppola, will be sung on the arrival at the church, wherein the grand Symphony of Mercadante will be given; a concert at the Villa Bellini in the evening. On the 24th, a grand Requiem Mass, by Coppola; inauguration of the sepulchral monument; the apotheosis of Pacini to be repeated in the evening in the University-square. To this festival Prince Humbert and Princess Marguerita are invited. Should they come, a ball is proposed, and many other honours and entertainments are projected. The intense heat will have passed, and Catania will be no disappointment to travellers.

It has been my exceeding good fortune to hear on three consecutive days the oratorio of "Judith," by Pacini. His operas of "Saffo" and "Il Giuremento" gave me expectations fully realised. He also is a Catanese, and ten years ago composed and presented to his town this charming work; so, to do honour to its saint, a public *al fresco* performance has taken place Sunday and Monday evenings, in the magnificent square. To sit at a table of the *café* opposite, with ices and cooling drinks, illuminations in good taste, a crowd of elegantly-dressed people, mixed with country-folk, admiring everything in perfect good-humour, with no drunkenness or visible police, increased our enjoyment. Why should not out-door concerts succeed in England? again and again occurred to my mind. The committee for the festa elected as president Cavaliere Signor Paolo Cardaro, to whose courtesy I owe a box at the Opera during rehearsal, with better means of judging, therefore, the merits of the performance. The American prima-donna Swift was engaged, and gave unqualified satisfaction. The first part gives a solo by the tenor to the terror-stricken people of Betolia, at whose gates *Holofernes* is encamped. He advises resignation to their coming fate; but *Judith* enters, and counsels prayers to heaven for courage, declaring her conviction of personal inspiration the same evening. The prayer following is beautiful, as is her inspiriting solo. The second act is *Holofernes* in the Assyrian camp, declaiming his warlike and vengeful intentions, to whom enter messengers. An audience is begged by a woman of evidently great position. She enters. Her beauty insures his attention at once. She deplores the state of misery to which her people are reduced, as a probable just punishment for past sins, and hints at the expediency of betraying the gates, to end it. He promises her rewards and honours from Nebuchadnezzar, beseeches her to appoint their next meeting; the next night is named. The third scene is Betulia again. *Osio* and the people still await their fate. She enters, with a triumphant burst of song. They ask her for details. Shouts are heard. People rush in to say how *Holofernes* is found headless. She tells and shows how his head has fallen by her sword. Her song of praise is like Deborah's for grandeur, and a glorious march concludes the oratorio. The sooner it is well-known in England the better,—I shall try to get a copy,—but this is only the second time of performance. A great mass was given at the cathedral in honour of St. Agatha. The music had various beauties; yet to hear a chorus of "Lucrezia Borgia" given by the choir jarred on many. The Archbishop, it is known, objects to secular music with sacred words, but, as yet, is over-ruled. Brilliant fireworks last night ended the rejoicings, and I came home much inclined to agree with the modern philosopher who said, "Life would be very charming if it were not for its amusements." M.

THE CONGRESS OF THE BRUSSELS HYGIENIC AND LIFE-SAVING EXHIBITION.

THIS Congress is announced to be held in the Ducal Palace, from the 27th of September to the 4th of October.

The programme has just appeared, and is divided into three sections:—Hygiene, Life-Saving, and Social Economy. We quote some of the headings from

First Section.—Hygiene.

This section comprehends:—1. Public health and salubrity. 2. Hygiene, as applied to industry. 3. Domestic and private hygiene. 4. Medicine, surgery, and chemistry, in relation to hygiene.

Questions proposed for Discussion.

1. What are the advantages of water supply, and the best means of obtaining it in populous centres?

What is the effect of taking the water from hydrographic basins; and what is the consumption of water per head of the inhabitants?

2. Which is the most practical system of removing fœcal and putrescent matters and mud from towns? Means of purifying sewage, of utilising drainage waters, of preventing the pollution of watercourses by the refuse of factories and works, and of neutralising the bad effects of dungheaps near dwelling-houses; the choice of disinfectants and antiseptics? . . . . .

4. What are the causes of the excessive mortality of new-born infants and young children, legitimate and illegitimate?

Discuss the supply of nurses in great towns, and the subject of infants brought up by hand; the advantages and the inconveniences of the use of perambulators; the utility of special hospitals at the seaside for scrofulous children, and the opportunity of establishing hospitals for rickety children, and the opportunity of establishing special schools for rickety children.

5. How is it possible to reconcile the interests of liberty and of the public health:—(1) in the case of quarantine and lazarets; (2) in that of hydrophobia and other diseases which may be transmitted from animals to man; (3) what are the best precautions against epizootic diseases?

6. What are the best systems of heating and ventilating places to receive a great number of persons, such as factories, theatres, schools, hospitals, &c.?

7. What are the proper conditions of salubrity for (1) hospitals, infirmaries, and lying-in hospitals; (2) temporary hospitals and civil ambulances?

8. What are the means of obtaining:—(1) uniformity in all countries in the statistics of mortality for the various professions and occupations, taking account of the habits of the working classes and of the substances with which they have to deal; and (2) of employing the means at the command of the State in obtaining such statistics?

9. What is the hygienic value of woods and plantations, and of the reclamation and drainage of marshes and other lands? . . . . .

Third Section.—Social Economy.

This section comprises institutions for improving the condition of the working classes:—

1. To consider the conditions of private houses, with regard to morals and health, aspect, heating, ventilation, lighting, water supply, and drainage; to seek the economic solution of the above in relation to houses for the working classes; the best types and the best mode of enabling workmen to become owners; and to compare the results of co-operative and limited liability societies, and private firms.

2. To what extent should instruction in gymnastics be introduced in primary and middle schools for girls and boys (1) in towns; (2) in the country? . . . . .

8. What is the organisation of arbitrations established in England, and of the syndical chambers of employers and workmen existing in France and Belgium? What results have flowed from these institutions?

THE WATER SUPPLY FOR THE TROOPS AT WOOLWICH, AND THE WAR DEPARTMENT.

WITH the view of superseding the ordinary process of the mechanical filtration of water, the War Department have recently erected machinery at Shooter's-hill for softening and purifying the water for the use of the troops at Woolwich. The water used in the process is pumped up by steam from artesian wells from fissures in the chalk formation. Having been filtered through the Kent chalk-beds, the water is stated to be of unusual purity, but of great hardness, which requires to be dealt with before it can be used with advantage, and this is effected, and the hardness of the water reduced, by mixing a concentrated solution of lime with the artesian well-water in the proportion of 9 oz. of soluble lime to forty gallons of water. These two previously clear fluids being mixed together, a muddiness immediately supervenes in the water, the abstraction of the carbonic acid rendering the hardening principle (bi-carbonate of lime) insoluble. The lime water, if used perfectly clear, also possesses the property of coagulating dissolved organic matter into white flocculi. The mineral and organic impurities being thus converted into precipitates of greater specific gravity than the water, they settle to the bottom in the course of four or five hours, leaving the superfluent water pure and soft, the same benefit being obtained as would result from the water being boiled two hours, the hardness being reduced from 21° to 6°. At the Government Waterworks referred to, it has been demonstrated that the chemical purification and softening of water on a large scale far surpasses in simplicity and thoroughness all systems of filtering, a million or ten million of gallons being as easily and quickly purified and softened as a single gallon; and the process now in operation at Shooter's-hill is stated to be an entire success.

IRISH NATIONAL MONUMENTS.

THE report of Mr. T. N. Deane, superintendent of national monuments in Ireland, gives a full account of the work done at the ancient cathedral church of Cashel, situated on the Rock of Cashel, and commonly called by that name, and which he says is perhaps the finest ecclesiastical structure in Ireland. The buildings consist of Cormack's chapel, of the date of 1135; the Cathedral proper, 1260 to 1270; the Bishop's palace or fortress, 1450; the House of the Vicars Choral, 1500; and the enceinte and bastion towers, 1550. The length of the Cathedral from east to west, internally, is 167 ft.; north to south, 133 ft. As with nearly all the ecclesiastical buildings in Ireland, a restoration was effected in the fourteenth century, more or less of a military character. The eaves of the Early English church were replaced by the embattled parapet; the long lancet windows were curtailed in length; the western end was converted into a strong fortress; and, finally, the whole was enclosed by a loopholed wall. Mr. Deane submits, as an interesting question for consideration, what was the change in habits or

circumstances which caused the monks thus to protect themselves. Among many points of interest, he notices "the crolts," and says that these curious apartments deserve much attention. Round the larger of the two rooms a flue runs, communicating with an aperture which leads to the south tower. The legend is that St. Bernard lived in the chamber, and stoutly refused to have a fire in it, whereupon his brother monks, fearing that he would die of cold, warmed the room. Mr. Deane expended 839*l.* upon the works at Cashel in the course of the year, and 1,478*l.* had been laid out before the commencement of his superintendence; 120*l.* had been expended on the churches at Glendalough. The Norman chancel arch at St. Saviour's Priory fell a few years ago, but it will be restored. Nearly all the ring stones have been found among the rubbish. The works at Ardmore Cathedral and round tower have been completed at a cost of 359*l.* The works at Ardfert are in progress.

THE DURABILITY OF IMPREGNATED SLEEPERS.

At the late meeting of German railway engineers at Constance, Privy Councillor Fünk communicated some facts regarding the preservation of railway sleepers by impregnation. From observations made on the Cologne Minden Railway and on the Hanoverian State Railways, it appears that the durability of sleepers depends very much on the different methods of treatment to which they are subjected before laying down. The results obtained at the above railways showed that—

Pine sleepers, impregnated with chloride of zinc, after being in use for twenty-one years, required renovation in the proportion of 31 per cent. of those laid down;

Beech sleepers, impregnated with creosote, after a use of twenty-two years, in the proportion of 46 per cent.;

Oak sleepers, not impregnated, after seventeen years' use, in the proportion of 49 per cent.;

Oak sleepers, impregnated with chloride of zinc, after seventeen years, in the proportion of 20·7 per cent.

In all these cases the observations were made under exceptionally favourable circumstances, viz., the sleepers were imbedded in good and clean ballast, perfectly drained.

Pieces cut out of sleepers remaining in the permanent way, after the lapse of the above periods of observation, showed perfectly sound cross sections.

In connexion with the above highly-satisfactory results obtained with impregnated sleepers on German railways, it may be mentioned that similar observations have been made for a number of years on an Austrian railway,—the Kaiser Ferdinands-Nordbahn. It appears from them that renovation was found to be necessary with—

Oak sleepers, not impregnated, after a use of twelve years, in the proportion of 74·48 per cent.;

Oak sleepers, impregnated with chloride of zinc, after seven years, in the proportion of 3·29 per cent.;

Oak sleepers, impregnated with tar-oil, containing creosote, after six years, in the proportion of 0·09 per cent.;

Pine sleepers, impregnated with chloride of zinc, after seven years, in the proportion of 4·46 per cent.

The impregnated pine sleepers upon which the above observations were made were put down in 1869, in the stations of the Mährisch-Schlesische Nordbahn. Since 1869 and 1870, only oak sleepers, previously impregnated with chloride of zinc or with tar-oil containing creosote, have been in use on the Kaiser Ferdinands-Nordbahn.

ON THE DETERIORATION CAUSED BY FIXING IRONWORK TO STONE WITH SULPHUR.

During the past twenty years it has been the custom with builders and stonemasons to affix iron railing and work of a similar nature to stone by means of a tamping of sulphur.

This practice has been followed, not merely in the case of light and cheap work, but frequently where durability should have been the first requisite. A case of this kind may be seen in the railings surrounding the Bath Mineral Water Hospital, where, of eighteen iron abutments used to support the heavy railing in front of the establishment, fourteen have more or less shattered or cracked the stonework in which their lower ends were imbedded, on account of combination with the sulphur used to fix them.

From the known affinity of sulphur to iron it might, from the first, have been anticipated that such a combination could not be so lasting as the more old-fashioned mode of tamping with lead; but from no immediate apparent injury resulting, the method has become almost general, much to the detriment of all work affixed in this manner.

The first drops of moisture which fall on the spot where the sulphur touches the iron, sets up a chemical action between the two, and in a few years the greater part of the sulphur has united with iron and moisture, forming a true hydrated sulphide of iron.

During the formation of this compound, the whole mass swells greatly, and to such an extent that one of two things must happen. Either the hydrated sulphide of iron is forced upwards out of the hole, or the stone itself gives way, an incipient crack first showing itself, followed by two or three others radiating from the hole to the edge of the stone; or, when a number of rods are set in a line, the stone splits in two longitudinally.

It is not merely the softer stones which are thus ruptured, as granite itself cannot withstand the gradually accumulating force, stones of 18 in. by 18 in. by 9 in. being frequently broken in this manner.

From fifteen to twenty years are usually required before the stone actually breaks, but the action may be followed during the whole period, at first by the sulphur becoming discoloured by what appears to be iron rust, but ultimately by turning into a very hard dark-brown mass, which is a mixture of sulphur with the sulphide of iron.

Its composition, in one instance, is shown by the following analysis:—

Uncombined sulphur, per cent.	36·91
Uncombined water	3·06
Combined iron	31·72
„ sulphur	18·12
„ water	10·18
Total	99·99

Showing that the substance consisted of

Sulphur	36·91	per cent.
Sulphide of iron (hydrated)	60·02	„
Water uncombined	3·06	„

Of course, the proportion of sulphur and sulphide of iron varies with each sample; another specimen gave 37·2 per cent. of free sulphur, and 62·8 per cent. of hydrated suphide of iron and water; but sufficient has been said to show that, at least in our damp atmosphere, sulphur should never be used for affixing iron to stone, for when the stone does not split the iron is deteriorated, being frequently corroded within the stone to the extent of one-half its diameter.

J. W. Gatehouse, Lecturer in Chemistry.

THE NEW ARCADE, BIRMINGHAM.

The new arcade which has been for some time past in course of erection over a portion of the Great Western Railway between Monmouth-street and Temple-row, Birmingham, was opened on Monday last, the 28th ult. The style of architecture adopted is Italian freely treated, the elevations, which comprise four stories, rising about 90 ft. from the ground to ridge of roof. The frontages, especially the one in Monmouth-street, have an imposing appearance, though both are similarly treated. A distinguishing feature in each of the elevations is the entrance, which consists of a lofty archway 30 ft. high by 15 ft. wide, flanked by richly foliated and diapered columns, and fitted with handsome and massive iron gates. The spandrels of the arches contain bold carvings of allegorical figures. The continuation of this story on either side is marked by columns similar to those already described, having foliated capitals, the lower portion of the columns being richly carved and diapered, and surmounted with a dentil cornice, which completes the lower story. The upper portion of the elevation is finished with pediments and pilasters, surmounted with vases at the angles and at convenient points along the front. Crowning the whole is a Mansard roof with an ornamental iron crest.

The arcade, which comprises ninety-four shops and offices (nearly all of which are already let), has a glazed roof, divided into bays by massive moulded ribs or principals, filled in with moulded framing, each pane of cast plate-glass being fixed in the frame in single sheets, without bars. The spandrels of the dome, and all the principal woodwork of the roof, have received a due amount of ornamentation. At night the arcade is lighted by means of a large chandelier (placed in the dome, and about midway between the two entrances) of forty-two lights, arranged in two tiers of twenty-four and eighteen lights respectively. The chandelier is 8 ft. in diameter, and 14 ft. long in the bodywork, and weighs nearly one ton. In addition, there are forty-four four-light candelabra, and forty-four three-light pendents, with opal globes, arranged along either side of the arcade. The whole of the lamps used in the lighting of the arcade have been manufactured and supplied by Messrs. Best & Lloyd, of the Cambray Works, Handsworth. The service-piping and the pipes for the water supply have been provided by Mr. Thomas Parkes, Broad-street. The architect is Mr. W. H. Ward, of Birmingham, and the builder is Mr. H. Lovett, of Wolverhampton. The cost is stated at upwards of 60,000*l.*

SIR JAMES FALSHAW, BART., AND SIR JOHN STEELL, R.S.A.

Of the gentlemen whom the Queen has honoured in connexion with the unveiling of the Albert Memorial, Edinburgh,

Sir James Falshaw, Bart., is the only Lord Provost of Edinburgh who has been created baronet since 1838. Sir James Falshaw was for a good number of years a railway contractor, having been in partnership with the famous Mr. Brassey.

Sir John Steell, the sculptor, is a native of Aberdeen, where he was born in 1804, and where his father, Mr. John Steell, followed the occupation of carver and gilder in Long-acre. We learn from a Scotch paper that after receiving such fine art education as Edinburgh afforded, the young sculptor went to Rome, and after studying there for some time, returned to Edinburgh, where he soon attracted attention by a colossal design of Alexander and Bucephalus. About that time he was strongly urged by Chantrey to remove to London, on the ground that no commission for an important public statue in bronze or marble had up to that time been entrusted to a sculptor resident in Scotland. Mr. Steell, however, elected to remain in Edinburgh, and his steadfastness was not long in meeting its reward. In a public competition, his design was selected for the statue of Sir Walter Scott; and among the important works he has since executed, besides the Prince Consort Memorial, are the equestrian statue of Wellington, and the pedestrian statues of Lord Melville, Professor Wilson, and Allan Ramsay, for Edinburgh; statues of the late Marquis of Dalhousie and the Right Hon. James Wilson for Calcutta; and a replica of the sitting Scott for New York.

WHITWORTH'S MEASURING INSTRUMENTS.

Sir Joseph Whitworth specially visited the South Kensington collection of instruments on the 27th of July to explain and show in action his measuring machines. He began with the foundation and source of all truth in mechanism—true planes. Sir Joseph's true planes (No. 210 in catalogue) are hexagonal plates of metal suspended by three points. They are thus obtained: An hexagonal plate is planed as smooth as it can be, and it is then rubbed against another plate similarly prepared. A little oil and rouge is smeared over the surfaces, and the friction removes the colouring matter from all points that are raised. These are worked down with a hand tool, and the planes are again tested on one another. These are then rubbed against a third plate, because, although the two might fit accurately, one might be slightly concave and the other convex. When all three, however, can be in turn rubbed on one another, and no colouring matter removed, it is certain that true planes are prepared. When one of these is let fall on another, no metallic sound is heard, in consequence of the intervening "cushion" of air. Indeed, one will move about on another so easily as to appear to float. It is only after considerable pressure and movement that the air can be squeezed out, and then the contact is so close that one can be lifted up with the lower one adhering. These true planes are used as standards for several other instruments. The

next machine referred to (No. 211) was the measuring machine for making different gauges. The micrometer-wheel represents 1-10,000th of an inch; and Sir Joseph showed by a practical test that one quarter of a division, viz., 1-40,000th of an inch, could be measured in the diameter of a cylinder of metal. This is for "rough workshop use." Another more delicate machine (No. 215) measures to the millionth of an inch. The screw of this machine has twenty threads to the inch, the screw-wheel 200 teeth, and the micrometer-wheel is divided into 250, therefore each division represents the one-millionth of an inch. The end of the fast headstock and the end of the movable headstock are true planes parallel to each other; the ends of the piece to be measured must also be parallel true planes; the feeling piece is a piece of steel about 2-10th thick, its sides being parallel true planes, and is introduced between the standard to be measured and the true plane at the end of the fast headstock; when the proper adjustment has been made, the movement of the micrometer-wheel one division, viz., one-millionth of an inch, will cause the feeling piece to be suspended—friction overcoming gravity. The power of measurement and the true plane are the two great elements in practical mechanics. An idea may be formed of the millionth of an inch from the fact that if a sheet of foreign letter paper were divided into 4,000 thicknesses, each thickness would represent the millionth of an inch. Sir Joseph said he would not attempt to show the measuring of a millionth, because it had to be done in a room at a temperature of 62°. He actually made, however, the measurement of 1-200,000th of an inch.

SUBJECTS FOR PRIZES.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers invite communications, of a complete and comprehensive character, on certain subjects included in a list, as well as on other analogous questions. We give a few of them:—

The Triangulation Survey, and Mapping of Countries and Districts, including the astronomical observations required for latitude and longitude, the measurement of bases, the description of the different instruments and methods employed, the reduction of the observations, and degree of accuracy of the results.

The Levelling of Countries, either by spirit-levelling, vertical angles, barometers, or the boiling-point of water: with a description of the instruments employed, the reduction of observations, and degree of accuracy of the results.

The Varieties of Clay, and their respective values and treatment, for brick-making, for puddle, and for the construction of Embankments, whether for railway purposes, reservoirs, or dock walls.

The Application of Steam Machinery for excavating, and the cost as compared with hand labour.

The Construction of Warehouses and other Buildings for Storing Goods, with the special view of resisting fire, and the relative merits of stone, brickwork, iron, and timber for that object.

Road-making, with special reference to the methods adopted in large towns, or where the traffic is heavy, including a comparison of the first cost, maintenance, and durability of the different systems.

The different systems of Sinking Wells for foundations in gravel and sandy river beds, and the best mode of obtaining foundations where the sand extends to depths of from 60 ft. to 80 ft.

The arrangements for Erecting large numbers of girders, of 100 ft. to 200 ft. span, over rivers whose beds are almost dry for one-half the year, and are flooded for the remainder of the year.

The Design and Construction of Masonry Dams of great height for retaining water in Reservoirs.

The Storage and Filtration of Water, both natural and artificial.

The Distillation of Water for drinking purposes.

The Constant Service of Water Supply, with special reference to its introduction into the Metropolis, in substitution for the Intermittent System.

A History of any Fresh-water Channel, Tidal River, or Estuary,—accompanied by plans and longitudinal and cross sections of the same, at various periods, showing the alterations in its conditions,—including notices of any works that may have been executed upon it, and of the effect of the works.

SUGGESTED EXHUMATION OF SHAKSPEARE.

MR. J. PARKER NORRIS, a well-known American Shakspearean, contributes the following article to the *Philadelphia Press* of the 4th of August:

It has been suggested that an examination of the remains of Shakspeare should be made by opening his grave at Stratford-on-Avon. Shakspeare died in April, 1616, and he has, therefore, been dead and buried just 260 years. Many will exclaim, "Of what benefit will this be after such a lapse of time? Nothing but dust would be found there." Are we sure of this? Very often the features and clothing of the dead are preserved for hundreds of years after burial, and on opening their graves wonderful sights have been seen. In a few minutes all crumble away, and nothing but dust remains, but for a short time the illusion is wonderful. A friend, residing near Stratford, writes us:—

"Some graves of the Shakspeare date were opened at Church Lawford a few years ago, and the figures, faces, and dresses were perfect, but, of course, in half an hour were mere heaps of dust. Shakspeare's grave is near the Avon, but doubtless he was buried well (in a leaden coffin, probably), and there is scarcely room for a doubt that, with proper precautions, photographs of his face might be taken perfectly. Surely the end does justify the means here. It is not to satisfy mere idle curiosity. It is not mere relic-mongering; it is simply to secure for posterity what we could give,—an exact representation of the great poet as he lived and died. Surely this is justifiable, at least it is allowable, in the absence of any authentic portrait. Surely such a duty might be almost reverently done. I doubt, after all, if it will be; but I am very strongly in favour of the trial, and if no remains were found no harm would be done, the 'curse' to the contrary notwithstanding. People who have pet projects about portraits would not like to have all their neat and logical arguments rudely knocked on the head, but where *should* we *all* be if no Shakspeare at all were found, but only a bundle of musty old MSS. in Lord Bacon's 'fine Roman hand?' After all, I am rather nervous about the result of such an exhumation. But, seriously, I see no reason why it should not be made. A legal friend here long ago suggested (humorously, not professionally, of course) that the 'curse' might be escaped by employing a woman ('cursed be *he*'), and women would compete for the honour!"

There have been many graves opened, in cases where their tenants have been buried far longer than Shakspeare, and very often the features and clothing were recognisable; and still more often were the skeletons perfect. It is true that they soon crumbled to dust, but they remained whole long enough for photographs to be taken of them. History furnishes us with many cases where the tombs of kings and queens have been opened, and their bodies appeared quite perfect for a short time. William the Conqueror died in 1087, and in 1542 a *post-mortem* examination of his body was made by the Bishop of Bayeux. Miss Strickland (from whom we take these references) says:—"On removing the stone cover, the body, which was corpulent, and exceeding in stature the tallest man then known, appeared as entire as when it was first buried. Within the tomb lay a plate of copper-gilt, on which was engraved an inscription in Latin verse. The Bishop, who was greatly surprised at finding the body in such perfect preservation, caused a painting to be executed of the Royal remains, in the state in which they then appeared, by the best artist in Caen, and caused it to be hung upon the abbey wall, opposite to the monument." ... Open the grave reverently, have the photographers ready, and the moment the coffin lid is removed, if there be any, expose the plates and see what will be the result. Then close up the grave, and if nothing is accomplished no harm would be done, and people would rest satisfied.

LIVERPOOL LABOURERS' DWELLINGS COMPANY.

THE annual meeting of the Liverpool Labourers' Dwellings Company (Limited) was held on the 23rd ult., Mr. Charles T. Bowring in the chair. The report of the directors was as follows:—

"The directors beg to present their fifth annual report, together with the balance-sheet and profit and loss account, for the year ending the 30th of June, 1876, which Mr. Chilton has been kind enough to audit. The result shows considerable and satisfactory improvement in the amount of rent received, which it will be noticed has increased from 1,633*l.* 1°s. 7*d.* in 1875 to 1,709*l.* 19s. 9*d.* in 1876. On the other hand, the unavoidable increase in the amount expended for repairs, and the increase in the gas accounts, have absorbed the greater part of the increase in the receipts, and this, with a slight increase in the remaining expenses, has reduced the net profit to a sum slightly below that of last year. The balance of profit on the present year's working amounts to 703*l.* 3s. 4*d.*; adding to this the sum of 36*l.* 11s. 8*d.* brought forward from last year, there remains a sum of 739*l.* 15s., which is available for dividend. Of this sum the directors recommend that 717*l.* 19s. be applied in payment of a dividend of 8s. 6*d.* per share, being at the rate of 4½ per cent. per annum, and that the balance of 36*l.* 16s. be carried forward to next year."

The superintendent, Mr. Gardiner, in his report from June, 1875, to 22nd August, 1876, on the sanitary condition of the 132 cottages of the company, inhabited by about 1,000 persons, stated that there had been ten deaths, viz, one an adult female, from consumption; an infant, from fever; two from accidents, and six of infants from ordinary diseases. There had been four cases of scarlet fever, in all of which the patients had recovered.

White Lead.—Mr. E. Milner, of Warrington, has patented a method of manufacturing white lead by forcing carbonic acid gas into basic salts of lead held in a solution of chlorine to a definite result as indicated by tests.

SUCCESS OF THE PADDINGTON BATHS AND WASHHOUSES.

AT a meeting of the Paddington Baths and Washhouse Commissioners, held on the the 22nd ult., it was resolved to establish a gymnasium in the first-class swimming-bath during the winter months. Incidentally, the chairman said the time had arrived when it became necessary for them to pay off the half-yearly interest upon the money borrowed, amounting to 1,066*l.* 7*s.* 9*d.*, and they had applied to the Vestry for that amount; but the patronage they had received had been so great, there having been 200,000 bathers and washers since January 1st, that the Commissioners would be enabled to pay the amount out of their receipts, and consequently would not have to spend the money from the rates. Such a state of things must, he felt sure, be highly gratifying to the Commissioners, more especially as the great success of the establishment realised their expectations.

ACTIONS BY JOINERS FOR ALLEGED WRONGFUL DISMISSAL.

ON the 23d ult., three cases were disposed of at the Edinburgh Small Debt Court, which arose in connexion with the recent demonstration of Foresters in the city. The pursuers were joiners in the employment of Alexander Clunas, builder, West Gilmore-place, and they claimed, in the first place, payment of sums due for work performed between the 2nd and 8th of August; and, secondly, a week's wages in lieu of alleged wrongful dismissal.

The case of the pursuers was founded on evidence to the effect that on the forenoon of the 7th ult. they asked the foreman for permission to attend the Foresters' demonstration, and that this liberty was granted by him. On the following morning, however, a notice dismissing the workmen who had absented themselves was received from Mr. Clunas and communicated to the pursuers by the foreman.

In defence, evidence was adduced to show that Mr. Clunas had visited the workshop on the morning of the demonstration, that he then intimated to the workmen that he had a pressing job on hand at Leith, and that therefore the pursuers might consider themselves dismissed if they neglected their work in order to witness the demonstration.

Counsel having been heard,

The Sheriff pointed out that the question of permission to attend the demonstration had been raised in the workshop while Mr. Clunas was present, and that, in such circumstances, the men were not entitled to proceed upon the leave said to have been obtained from the foreman. His Lordship accordingly held that the defender was justified in dismissing two of the pursuers,—John Stevenson, Upper Grove Place, and Andrew Davies, Caledonian Crescent,—who had remained away the whole afternoon. In each of those cases 31s. of expenses was allowed to the defender, but decree was given to the pursuers for the wages due to them in respect of work performed. In the third case,—that of John Slater, Dairy Park Terrace,—the sheriff decerned for the amount claimed, without expenses, in consideration of the fact that the pursuer had only been half an hour absent from the workshop.

THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

ILLUSTRATIONS showing the general plan of the buildings to be constructed for the use of the American Museum of Natural History, on land adjoining the Central Park, New York, and now approaching completion, are given in the *American Architect*.

An appropriation of five hundred thousand dollars was made by the State Legislature, to be expended on this building under the direction of the Department of Public Parks; and the ground formerly known as Manhattan-square having been selected as a site, plans adapted to the prospective needs of the institution were prepared in consultation with the trustees, who are the owners of the collections which the building is intended to contain. The design by Messrs. Vaux & Mould, as accepted, contemplates the construction of twelve sections corresponding with the present one, and connected together by an octagonal hall, by a building in the centre of each front, and by a group of buildings at each angle.

"Every section is intended to contain a ground-floor, a principal floor with gallery, and a third floor, for exhibition of specimens; also a fourth floor, subdivided into rooms, for the use of advanced students. The arrangement for the introduction of daylight is novel in one particular. In each of the cases for the exhibition of specimens, on the two principal floors, the usually dark end close to the wall is to be glazed with ground glass, and lighted through a comparatively small slit, left for the purpose in the pier between the windows. The building is fireproof, and of granite and brick exteriorly."

The elevation published gives no suggestion whatever of the purpose of the building, and is inferior as a design to some other works by the same very capable firm.

ROMAN SOMERSET.

THE *Times* of October 23, 1875, on Imperial Antiquities, says,—"Few Englishmen have realised the extent to which Britain had once become Roman." Many a tombstone is preserved, such as parents raised to the *manes* of the most dutiful child, or the sweetest daughter (filia dulcissima). The mythology preached on these remains is, perhaps, the most interesting thing to trace in them. But we are often enlightened about it. I, for one, being a native of Somersetshire, and knowing the beautiful city of Bath from my childhood, experienced a return of that peculiar hereditary pride which, as a cosmopolite, I have not cultivated, on reading the Reverend Prebendary Scarth's very able paper on "Roman Somerset" in the *Builder* of the 5th ult. It states that the first thing to be noticed is the ancient name of Roman Bath, which has always been a fruitful subject of discussion. "Is it *Aquæ Solis*, or *Aquæ Sulis*?" There are altars inscribed *Deæ Sul*, and there is as good authority for *Aquæ Solis*. *Sul*, in ancient English, seems to have been synonymous with *Sol*,—the eye of the world, or soul of the universe." *Nunquam dormio*, I beg to add. The word *soul* is from the Saxon, and in some of the cognate languages approaches very near the word *Sul*, and expresses inward illumination. *Sul* is connected with *Minerva*, the Goddess of Wisdom, and Minerva with *Sul*, the *God* (*not Goddess*) of Illumination. I have not Bosworth's Anglo-Saxon Dictionary at hand, but I have my "old Bailey," wherein I find that *Yapl*, or *Yupil*, is the Saxon for soul; *Siel*, Danish; *Seele*, Dutch; *Seele*, Teutonic, the principle of life. Now the *Sun*, the soul—source of life, ever was (and probably ages anterior to tree and serpent worship, the most ancient religion of the world. *See* Fergusson's great work on "Tree and Serpent Worship") deified in some religious form as the great attribute of universal life. And now I turn to the *Builder* of the 7th of August, 1875, for elucidation from the second article on "The Basilica of St. Clement's, Rome." I collect that the god *Mithras* is of very ancient date, and that the Mythraic mysteries were performed in some form, as was tree and serpent worship, ages before the Mosaic chronology was compiled; and that the Mythraic worship was in its essence a deification of Nature, and was first introduced into Italy by the fleet of Pompey, when it returned to Ostia in 687 A.M.C., after finally defeating the pirates of Cilicia, but that it was not well known till the second century A.D. It was derived from the Persians, who worshipped the *Sun* under the title of *Zor-Aster*, and they on their part derived it from the Chaldean Magi. *Mithras*, whose symbol was fire, and who was supreme in the movable planets, was a mediator between man and Hormisdas, the benignant deity; and his principal work was to offer expiatory sacrifice for the human race. The Romans dedicated altars to *Mithras*, invariably, *Deus Sol invictus Mithras*,—*Sole invicto Mithræ*. And in the reign of Adrian the worship of the Sun was substituted for that of all the gods. And, says the *Times*, already referred to, "a common dedication, even when the soldiers are not Orientals, is to the Sun-God *Mithras*." An inscription frequently occurs "to the ancient gods" (Dibus Veteribus), as if the worshippers who used this remarkable dative protested against the approach of a new, and, as they held it, pernicious superstition, the worship of *Mithras or Christianity*. It is doubtful if at this time the ancient heathen ornament—the cross, was adopted as a Christian symbol. From Burnouf's "Essai sur le Veda," we obtain a beautiful passage,—"Natural objects were only adored as manifestations of *Brahm*: the Supra, the immutable, the eternal, of whom it was said, One sovereign ruler pervades this world. He is called Indra, *Mitra*, Varuna, Agni, that which is one. But the wise called him by many names, of what they believed to be his greatest manifestations, his various personifications.

From Lieutenant H. Cole's valuable work,—"The Archæological Survey of India," I collect that the ruined temple of *Martland*, in Kashmir, Ranapurasswami, or Ranesa, though not the most ancient, is the most impressive and the grandest, and not more ancient than A.D. 360, whereas the most ancient temple Bye-shesswara on the Takt-i-Isliman-hill at Kashmir, dates B.C. 330. The temple at Martland has been the subject of much controversy in respect to its age and dedication. But there seems to be no doubt that it was dedicated to the Sun *Matan*: Matan being a corruption of the Sanskrit *Martland or the Sun*,—whose worshippers were devotees of Siva. JAMES STRIDE.

A NEW THOROUGHFARE.

SIR,—I hear that the Metropolitan Board of Works have given instructions to their engineer and architect to prepare plans for a better thoroughfare from Tottenham-court-road to Charing-cross. It would, I think, be a good opportunity of making a West-end boulevard. To that effect, if they made the new thoroughfare 110 ft. wide, viz., 60 ft. for road and two footpavements of 25 ft. each; and a row of trees planted at the curb, at either side of the new street, it would be a grand improvement.

In Paris they allow more width for foot-pavement than we do here for planting of trees, so as not to give darkness to the rooms. I think that inconvenience will be found with Northumberland-avenue in a few years, when the present trees will have grown to a moderate size.

J. W.

Northampton.—"J. B." says: Some time ago I noticed in the *Builder* an account of a resolution made to rebuild the church at Northampton (I am staying here for a few days), and I see they have commenced already. Messrs. Hale & Sons, of Salisbury, are the builders.

THE COST OF ERECTING BOARD SCHOOLS.

MR. FORSTER'S Elementary Education Act has been the cause of some activity in the building trades. From a report just presented by the Committee of Council on Education, we learn that:—"Up to Michaelmas, 1875, 616 schools had been erected, and 113 enlarged, at a cost of 2,721,587*l.*, providing accommodation for 264,485 children, at a cost per head of 10*l.* 5*s.* 10*d.* There were in course of erection 480 schools, and in course of enlargement 48, which, when completed, would provide accommodation for 189,569 additional scholars, at an estimated cost of 1,917,657*l.*, or 10*l.* 2*s.* 4*d.* per head. So that the addition to the school provision of the country, when the schools in course of erection and enlargement at Michaelmas last are completed, through the agency of School Boards, will have been 454,054 children, at a cost of 4,639,244, or 10*l.* 4*s.* 4*d.* per head."

THE CABMEN'S SHELTER MOVEMENT.

Leeds.—On Monday week the Leeds Town Council resolved without discussion to apply to Parliament for powers to enable the Corporation, as Surveyors of Highways, to permit the erection of suitable buildings on the highways within the borough of Leeds for the shelter of persons engaged in driving conveyances used by the public.

A correspondent writes as follows on the above:—So far as I can learn, Leeds will be the only place in the United Kingdom which (if the powers are granted) will have Parliamentary authority for permitting the erection of cabmen's shelters on the highways.

MASTERS AND MEN.

Importation of Stonemasons from America.—It is stated that 200 stonemasons have sailed from New York for Glasgow to work for a Scotch builder.

Southport.—In consequence of the inability of the operatives to carry it on any further, the joiners' strike at Southport, which has lasted since the 1st of April, has now come to a close. The matters in dispute were alterations in rules, and an advance of 1d. per hour in wages. The employers first made an offer of 8½d. per hour on the 1st of April, and 9d. on the 1st of August, which, being refused by the men, was withdrawn; after which the masters took their stand at 8½d., and resolved to go no further. The men, finding that if they did not do something towards a settlement they would be placed in the position of having their places filled up by other men at the masters' terms, have resolved to close, after having been out since the above date.

Bristol.—The strike of builders' labourers at Bristol, which commenced on the 7th ult., terminated on the 26th ult., an advance of a halfpenny per hour being accepted. Three-farthings had been demanded.

Glasgow.—At a meeting of the joiners on strike in Glasgow on the 22nd ult., it was stated that one of the large employers of labour had signed the bye-laws, and that the number of operatives now on strike did not exceed 200.

Warrington.—The glasscutters in the employ of Mr. Edward Bolton, the proprietor of the Orford-lane Glass-works, have struck work. For some years they have been engaged on "day-work," but recently a notice was given to the men that they would have to work by the piece, and they were served with a fortnight's notice. The men presented a list of prices to their employer, but it was rejected as exorbitant. Subsequently, on a consultation with the Birmingham delegation of the Flint Glasscutters' Association, seventeen of the ninety-eight articles, with their scale of prices, were accepted. The men, however, refused to go in unless the whole of their prices were accepted, and their master refuses to alter the terms of reconciliation which he has proposed.

Fatal Fall of Buildings at Sheffield.—A few days ago a large portion of some buildings which were in course of removal to make way for the new Firth University buildings in Bow-street, Sheffield, fell with a great crash, burying beneath them the contractor, Mr. John Battersley, who had just called to inspect the work, and slightly injuring his son on the leg. Mr. Battersley was killed instantaneously.

CHURCH-BUILDING NEWS.

Babcary.—The parish church of the Holy Cross, Babcary (near Somerton) was re-opened on August 9th, after the erection of a new north aisle (accommodating fifty-five worshippers), the putting a new roof to the nave, and the re-arrangement of the chancel, besides other smaller improvements hereafter particularised. The west gallery, also, which formerly blocked up the interesting Edwardian tower-arch, of much earlier date than the rest of the church, has been taken down. The new aisle is divided from the nave by three segmentally-pointed arches, with pillars of quatrefoil section. This aisle has an open-timber roof, with moulded purlins, and is covered with lead, having a parapet. The ancient Perpendicular windows on the north side of the nave have been reset in the new aisle. The seats are of pitch-pine, with solid moulded square ends. The walls are built of local stone, with Ham-hill dressings. The windows to the nave, tower, and aisle, have been glazed with rolled cathedral glass, of different tints, contrasted with plain white glass. The nave roof is an open one. The church is warmed by one of Porritt's underground stoves. Externally the roofs are covered with the local stone slating. The cost has been about 870*l.* Messrs. Merrick & Son, of Glastonbury, were the builders, and Mr. Ferrey, F.S.A., and Mr. Edmund B. Ferrey, the architects.

Brownsover.—On the 22nd July, the little chapel-of-ease of Brownsover was re-opened for divine service, after restoration at the hands of Sir Gilbert Scott. Although seven-eighths of the chapel is entirely new, the general aim has been to retain and to restore all the old features, in order to show what the building has been, and the old materials have been re-used as far as they possibly could be. In the chancel, the sedilia on the south wall of the nave is made sufficiently wide for two seats. Massive oak stalls, to seat three persons on either side, have been provided, in addition to the clergy seats. The old pulpit has been replaced by a specimen of Belgian art. The panels are of carved oak. In the south side, near to the pulpit, a window was found in the wall, and this has been carefully preserved and replaced. All the windows of the church are the narrow lancet shape. The roof is new, not a vestige of the original one remaining, and is of oak, to harmonise with the remainder of the building. The whole of the work has been executed by Mr. J. J. Fast, of Melton Mowbray, under the superintendence of Mr. G. Hannaford, clerk of the works.

Privett.—A new parish church at Privett, near Alton, Hants, is in course of erection, at the sole cost of Mr. W. Nicholson, of Basing Park. The new church, which occupies the site of the old one, is in the Early English style of architecture, and will have seats for about 300 persons. The spire will be 170 ft. high. Mr. Blomfield is the architect.

Leatherhead.—A new chapel for St. John's Foundation School, Leatherhead, is in course of erection. The chapel is to be Gothic in style, with flint and stone dressings and stone inside, and will seat about 250 persons. The probable cost will be 4,000*l.*, and 1,500*l.*, are still required. The architects are Mr. Benjamin Ferrey and Mr. J. H. Good; and the builders, Messrs. Goddard & Sons, of Farnham and Dorking.

East Knoyle.—The church of St. Mary, East Knoyle, has been re-opened, after restoration at a cost of 1,000*l.* The church is remarkable externally for its square grey weatherbeaten tower, which rises to the height of 66 ft., and is built of Tisbury and green local stone. The edifice, which was originally cruciform, had in 1829 and 1845 two aisles added on the north and south sides, and at the same time an addition was made to the large western gallery. The Rector, the Rev. R. N. Milford, having, with the unanimous consent of the parishioners, obtained a faculty for the removal of the gallery, the re-seating of the church, and the erection of an organ-chamber, these improvements have been carried out according to the plans of Mr. Arthur Blomfield.

Wimborne.—The Bishop of Salisbury consecrated the new church of St. John the Evangelist, at Wimborne, on the 17th ult. The new edifice has been built and endowed by the Rev. Carr J. Glynn, of Witchampton. The structure has been designed in the Early English style. The outside walling is of red Fareham brick, pointed with black mortar, and dressed with Doulting stone, and the inside walls are

stuccoed, the interior stonework being of Bath stone. The church consists of a nave 71 ft. long by 24 ft. wide, with a north and south transept each 16 ft. long by 24 ft. wide. The roof is open, and filled in with plaster between the rafters, which are varnished. At the east end there is an apsidal chancel, and a double bell-cot crowns the roof at the west end. The cost of the church and fittings, which are complete, amounted to 2,500*l*. The architect was Mr. W. Fletcher, of Wimborne; and Mr. A. Green, of Blandford, was the builder.

North Piddle.—The parish church of North Piddle, Worcestershire, has been re-opened, after rebuilding. The old church had become so dilapidated as to preclude the idea of restoration; it was therefore determined to take down the old and erect a new church on the same site. The new structure is Early Decorated in style, and its superficial dimensions are much the same as the former one. It consists of a nave, 35 ft. by 18 ft. 6 in., and chancel, 19 ft. by 16 ft. 6 in., the latter being divided from the nave by a moulded arch supported upon red Mansfield stone shafts, having corbels and richly-carved caps. The ancient font, as well as the piscina and credence table, having undergone careful restoration, are replaced in their former positions. These, with the exception of the old walling stone, were the only parts of the original structure that could be adapted for re-use. The church provides for 100 sittings. The design provided for a vestry, but its erection, owing to a want of funds, is deferred for the present. The whole of the work has been carried out by Mr. Warner, contractor, of Malvern Link, from the designs and under the superintendence of Mr. Henry Rowe, architect, Worcester. The total cost, including internal fittings, is about 1,250*l*.

Handsworth.—On the 9th ult. the Earl of Shrewsbury laid the foundation-stone of the new buildings in connexion with the restoration of the parish church at Handsworth, with full Masonic rites. The portions of the old structure pulled down are those erected in the beginning of this century. The earliest portion of the old building was of Norman construction, and was probably erected when the manor of Handsworth was held by the Parles family, in the twelfth century. The church differs from the usual style of village churches in having the tower placed at the eastern end of the south aisle, instead of being either central or western. The next oldest portion of the church was the chancel and the south aisle of the nave, which had the distinguishing features of the Decorated period. These portions of the church are supposed to have been erected when the manor was held by the Somerys, Lords of Dudley Castle. Of the original nave little can be traced, the arcade separating it from the north aisle having been removed during alterations made in 1820, when the westward end was taken down and rebuilt. The Watt Chapel will not be touched, and the east elevation of the chancel and Wyrley Chapel will not be interfered with. The old windows on the south side will be restored, and the wall taken down and rebuilt, it being considerably out of the perpendicular. The church will be extended 23 ft. westward, and the nave will be 23 ft. 3 in. in width, by 89 ft. 6 in. long; the chancel wall 25 ft. long. There will be two north aisles, 84 ft. long, with the Wyrley Chapel in addition; and a south aisle 65 ft. long, at the east end of which it is proposed to put an opening into the tower. The old tower arch will be restored, so that the present vestry can be available for seats. The church will accommodate, when finished 1,000 persons in open seats, without galleries. The work is being carried out by Messrs. Wilson & Son, builders, Sohohill, from plans prepared by Mr. J. A. Chatwin, architect, Birmingham. The cost is estimated at between 7,000*l*. and 8,000*l*.

Witton Park.—The foundation-stone of a new church at Witton Park Iron Works, in the county of Durham, has been laid. The new ecclesiastical district which the church has been formed out of is the ancient parish of Escomb, and contains a population of about 10,000, all of whom, with the exception of two or three families, have been brought together within the past eight or ten years by the opening of the iron works belonging to Messrs. Bolckow & Vaughan, of Middlesbrough. The church, which is situated within a few minutes' walk of the railway station, will be in the Early English style, and will consist of a nave, chancel (apsidal in form), vestry, and organ-chamber. There will be seats for about 300; and the cost is estimated at 2,200*l*., exclusive of site, which has been given by Messrs. Bolckow & Vaughan, who also contribute 200*l*. towards the cost. The architects are Messrs. Ross & Lamb, Darlington; and the contractors, Messrs. Simpson & Cowling, of the same town.

Burwarton.—The new church at Burwarton, nine miles from Bridgnorth, erected at the expense of Viscount Boyne, was consecrated on the 10th ult. The church is built of warm-coloured freestone, quarried from Burf-hill. The style is Gothic. The length of the church from tower to chancel, is 88 ft., and from the north aisle across the nave to the extreme wall of the south aisle it is 56 ft. in width. The chancel and organ-chamber arches are supported by Purbeck marble columns, supplied by Lord Edon. The reredos is in mosaic. There is also a richly-carved sedilia and piscina, supported by three marble columns. The roof is covered with a fine white stone shale, from Swanage, in Dorsetshire. The tower is about 70 ft. high, and has a fine peal of six bells. Mr. Salvin, of London, was the architect; Messrs. George Smith & Co., of London, the builders; Mr. Dayman, also of London, executed the stone carving; and the organ was built by Messrs. Nicholson, of Worcester.

Coldham.—On the 29th July the new church for the parish of Coldham, Isle of Ely, was consecrated by the bishop of the diocese. The church is dedicated to St. Etheldreda, and consists of a chancel, a nave with a double bell-turret at the west end, a south porch, and a vestry on the north side of the chancel. The style is that of the early part of the fourteenth century; the walls are all faced externally with Northamptonshire rubble stone from Elton, and the masonry is executed in Bath stone. The roofs are all open timbered, and covered with Staffordshire tiles. The seats are oak, and will accommodate 174 persons, and the floor is laid with Minton's tiles. One of the windows on the south side of the chancel has been filled with stained glass, representing St. Etheldreda. This was presented by the architect, and executed by Messrs. Gibbs & Moore. The pulpit is of stone, with polished alabaster cornice. The building was designed by Mr. W. Smith, of London, and the work has been carried out by Mr. Farrow, of Wisbech.

Northenden—The ancient parish church of Northenden has been re-opened, after rebuilding, with the exception of the tower. The new church has been built on the site of the ancient parish church, which was dedicated to St. Wilfred, one of the Saxon saints, and the fabric just consecrated is the fifth structure which has been erected there. The plan and general proportions of the new structure closely follow those of the ancient fabric. The style of the new building is Perpendicular Gothic of the characteristic Cheshire type. The ancient tower is still retained, but it is intended to replace it as soon as possible. The internal arrangements are of the most modern character. The north and south aisles, which were ancient chantry chapels, founded by the Tatton family, and still belong to them, have been rebuilt at the expense of Mr. T. W. Tatton, of Wythenshawe. The chancel has been erected at the sole cost of the Venerable Archdeacon Johnson, the rector of Northenden, and the nave and aisles have been rebuilt by the parishioners. Mr. J. Crowther is the architect, and the contractors were Messrs. Clay & Sons, of Audenshaw and Manchester. The amount of contract was 7,500*l*.

Branston.—All Saints' Church, Branston, Lincolnshire, has been re-opened, after restoration. The gallery at the west end, which shut out the view of the tower arch, has been swept away, and to avoid the diminution of sittings that would have been created by this alteration, a new north aisle has been added by means of a second arcade of the Perpendicular period. This has been built to follow in every way the character of the other portions of the edifice. The exterior of the tower has been pointed, and bears some *quasi* long-and-short work. The restoration has been carried out by Mr. Lovlee, builder, Branston, under the direction of Sir Gilbert Scott, at a cost of over 1,700*l*.

Royal School of Mines.—The professorship of geology at the Royal School of Mines, Jermyn-street, which has been relinquished by Professor Ramsay, has been accepted by Mr. J. W. Judd, who, from 1868 to 1872, was on the staff of the Geological Survey while Professor Ramsay was director for England.

DEATH OF MR. SKINNER PROUT.

MR. SKINNER PROUT, the artist, died on Tuesday last, after a lingering illness of many months' duration. The deceased was born in Plymouth in 1806, and was consequently in his 70th year. Like many other painters who have gained the highest reputation in their art, he was entirely self-taught. He was but a mere lad (says the *Daily News*) when the fame of his uncle, Samuel Prout, was already beginning to establish itself; but at that early age he had already given evidences of talent, which indicated that he would one day do honour to an illustrious name. He was encouraged, indeed, by his uncle to apply himself seriously to art, and while still very young had adopted it as his profession. The direction of his talent was shown in two works, "The Antiquities of Chester" and "The Antiquities of Bristol," which he published almost at the commencement of his career. It was in subjects similar to those indicated by the titles of the works named that the talent of Skinner Prout found its truest expression. The crumbling old towns in Normandy and Brittany had a peculiar fascination for him. He occasionally varied his artistic journeys by visits to the picturesque cities of Belgium and the Rhine. The Cathedral of Chartres was a subject which to the last he was fond of treating. Early in life he visited Australia, and resided for some time at Sydney and at Hobart Town. The collection of drawings from sketches he made there was exhibited a few seasons ago at the Crystal Palace. Mr. Prout had been for many years a member of the Institute of Painters in Water Colours.

BETHNAL-GREEN MUSEUM.

THE collection of pictures so well known as the "Dulwich Gallery," which, as already mentioned, has been lent by the governors, while the gallery is under repairs, to the Bethnal-Green Museum, will be open to the public on Monday next, the 4th September.

The collection consists of nearly 300 oil paintings of the Flemish, French, Italian, Spanish, and English schools. It comprises works (amongst other great masters) by Rubens, Rembrandt, Ruysdael, Hobbema, Vandyck, A. Ostade, Teniers, Wouvermans, Both, and Cuyp; the Poussins, Claude, and Watteau; A. del Sarto, Guercino, Guido, Annibale Caracci, S. Rosa, P. Veronese, and Titian; Murillo and Velasquez; Reynolds, Gainsborough, and Beechey.

SURVEYORSHIP ITEMS.

Llandudno.—Mr. T. T. Marks, C.E., who has held the office of town surveyor at Lowestoft for six years, has been appointed clerk, surveyor, and engineer of Llandudno, at a salary of 300*l*. a year. There were 125 candidates.

Gorton.—Mr. B. Bell has been appointed surveyor to the Gorton Local Board and Urban Sanitary Authority.

COMPETITIONS.

The Manchester Gasworks.—Since our notice of the Manchester gasworks competition, in last week's *Builder* (p. 824), we have learnt that the premiums were awarded in accordance with the recommendations of the professional referees consulted by the Corporation. The referees were Mr. Thos. Hawksley, C.E.; Mr. William King, of the Liverpool Gasworks; and Mr. Geo. Livesey, of the South Metropolitan Gasworks.

St. Pancras Baths.—The first premium for designs for new baths and wash-houses for St. Pancras has been awarded to Mr. H. Gundry, of the Adelphi.

"THE SANITARY STATE OF LYME REGIS."

THE Medical Officer of Health for Lyme Regis, Dr. Skinner, has replied, in our esteemed contemporary the *Sanitary Record*, to the strictures on the sanitary state of Lyme Regis, which we published some little time ago under the signature "Solo."* We may suppose either that Dr. Skinner is careless as to the opinion of the readers of the *Builder*, or that he thought it wise to keep his reply as much out of sight of the original complainant as possible. We should not be surprised if the latter were the truth, for the

* See page 769, *ante*.

reply is very weak and unsatisfactory. He denies, as to the houses of the working classes, that "*one-half* look likely to fall," but admits that some of them seem likely to do so. Surely he would be doing his duty better by endeavouring to bring about improvements where necessary than in bolstering up an obviously unsatisfactory state of things.

STAINED GLASS.

Houston.—Five stained-glass windows have been inserted in Houston Parish Memorial Church, which was lately built by Mrs. Ellice, mother of the late Captain Spiers, M.P. The figures were all executed in London.

Jesmond.—A stained-glass window is in course of execution by Mr. Baguley, of Newcastle, for the east end of Jesmond Church. Each of the five lights is intended to be a separate memorial.

Polmont.—Two memorial windows have just been placed in the parish church of Polmont. One is the gift of Mr. Scott, of Glendronach. The subject is the announcement to the shepherds. The other window is the gift of Mrs. Salvesen, of Polmont House. Both were executed by Messrs. Ballantyne & Sons, Edinburgh.

Bath.—A Munich window, presented by Mr. W. W. Kettlewell, as a memorial to his late father, has been placed in Bath Abbey Church. The centre compartment will contain a figure of the "Angel of the Gospel" standing on a rock; those on the right will represent the Apostle Paul preaching at Athens, while the spaces on the left will depict the Miraculous Draught of Fishes (Luke v. 8). The window is supplied from the royal factory at Munich.

Bloomsbury.—After the death of the Rev. W. Brock, D.D., who for twenty-four years was pastor at Bloomsbury Chapel, there was a general desire felt by the congregation to place within the chapel some memorial of a minister whom they had so long held in affectionate esteem. To give effect to this desire, a committee was formed to consider what shape the memorial should take, and a decision was come to that a stained-glass window should be placed in the chapel, and a design having been agreed upon, the work was entrusted to Messrs. Powell & Sons, of Whitefriars. At the western end of the chapel, under the organ gallery, three small windows have been filled in with stained glass. The left-hand window represents John preaching in the Wilderness, the centre one the Sermon on the Mount, and the right-hand one Paul preaching at Athens.

Ballymoney.—A stained-glass window has just been erected in Ballymoney parish church, as a memorial of the late Mr. John Fry, organist of the church. The window has two figures, the Psalmist David, and Charity. The first represents "the sweet singer of Israel" playing on the harp; the second is a female figure, in her arms a child, and at her feet a girl in a suppliant attitude. The work was executed by Mr. MacIvor, of Cork.

VITRIFIED BRICKS.

THE exhibits of some of our countrymen in the Brussels Hygienic Exhibition are obtaining golden opinions from the local papers. Here is what the *Belgian News* says of the Staffordshire vitrified blue bricks exhibited by Mr. Joseph Hamblet, West Bromwich:—

"Bricks again. But here we have quite another form of the ordinary oblong masses of clay in the blue bricks and copings sent by Joseph Hamblet, of West Bromwich (cl. v. 102). They are designated as vitrified, and certainly give the impression that instead of baked clay, molten iron must be the component of which the tiles, copings, clinkers, paving slabs, &c., here arranged are made. The close cohesion of their manufacture, which must evidently be carefully attended to, is seen in the metallic surface that the slabs present, and their durability and adamantine strength can be estimated, both by the touch and the clear ringing sound that the terra metallic imperishable pavings give forth on being struck one against the other. In its way this is an excellent and noticeable exhibit."

The Sunday Society.—The object of this Association is to obtain the opening of museums, art galleries, libraries, aquariums, and gardens on Sundays. On Sunday afternoon next, through the liberality of Mr. Henry S. Bicknell, the members will visit Cavendish House and grounds, Clapham-common, to view his collection of pictures. Under the title of *The Sunday Review*, the Society are about to publish a quarterly journal in furtherance of the object they have in view.

VARIORUM.

"Lapidarium Walliæ." Under this title the early inscribed and sculptured stones of Wales will be delineated and described by Professor J. O. Westwood, M.A., for the Cambrian Archæological Association. Part I. will be ready in a few weeks. The author says:—"It is now more than thirty years since I commenced the search for these venerable relics of ancient times. The desire to investigate their palæographical and ornamental peculiarities originated in the desire to discover how far many of them, which tradition had connected with the early British Church, agreed with the styles employed in, and corroborated the dates given to, the earliest religious MSS. known to have been executed in these countries. To these it had been usual, previously, to give the name of Anglo-Saxon, but which a careful investigation of the MSS. of Ireland (published in my 'Palæographia Sacra') had shown are of Celtic rather than of Teutonic origin." —— We get from the *Technical Educator* for September the following as to *The Nail District of Birmingham in the Olden Time*:—"On a murk winter's night, when the sky was all aglow with the fires from the blast-furnaces, and the lurid flame, invisible by day, of some ignited pit-mound, the music of the nailing-hammers might be heard all the country round. From the little huts or sheds, dotted here and there upon the broken landscape, with an utter absence of order or convenience, as though the mighty geological operations underneath had shaken them into the most unlikely places, the gleam of the hearth-fires would shine from the open shutters, and the merry songs of the workers, male and female, sung at the very topmost pitch of their voices, might be heard a mile away. Up to ten or eleven o'clock at night would these sounds continue—no uncommon circumstance in a district where labour never seems to rest, but where the roaring furnaces and the great rolling-wheels go on unceasingly day and night. Through the open loophole the whole art and mystery of nail-making could be witnessed by any passer-by. The nailer would have the ends of three or four rods in the fire, and taking out the one which had been in longest, after a pull or two at the bellows to bring it to a welding heat, he would taper down the point upon his anvil, at the same time making a shoulder for the head. He would then hold it over a chisel or cutting-punch, stuck upright at the side of his anvil, and giving it one tap with his hammer, cut it half-way through, an iron stop in front of the punch giving him the exact gauge for the length. He would then turn down the point of the half-severed nail into a steel instrument called a *bore* (the top of which formed a mould for the head), and twist it off, and then, with a few smart blows, he would beat it down till the head was spread out sufficiently, and assumed the required shape, the nail just turning from red to black as he gave it the finishing tap. As his rods got too short, he would weld or "shut" two of them together, and put a new rod in the fire; and so on, with the regularity of clock-work, probably in a thousand nails not once varying the number of blows upon each."——According to "Old and New London," the "Horse-Shoe" is a rare sign. Mr. Walford says:—"Adjoining the entrance to Messrs. Meux & Co.'s Brewery is the 'Horse-shoe Tavern,' so called from the shape of its original dining-room,—a shape doubtless assumed for a reason which will presently appear. By absorbing the adjoining premises, and erecting large additions, the modest tavern has lately grown into a monster hotel, where the *table d'hôte* system has been introduced, on a plan similar to that which we have mentioned in our account of the 'Langham.' The sign of the 'Horse-shoe,' though common in combination with other subjects, as Mr. Larwood tells us, in his 'History of Signboards,' is rarely found by itself. Its adoption here is due, doubtless, to the large horse-shoes nailed up at the entrance of Meux's Brewery, and conspicuous both on the trappings of the dray-horses of that establishment, and also as the trade-mark of the firm. There was formerly, and perhaps may be still, a 'Horse-shoe Tavern' on Tower-hill, and another in Drury-lane, because it is mentioned in connexion with Lord Mohun's attempt on Mrs. Bracegirdle, as the place where he and his comrades drank a bottle of sack while they lay in wait for that lady. It is also mentioned by Aubrey, in his 'Anecdotes and Traditions,' as the scene of a bloody duel. There is, or was till lately, a 'Horse and Horse-shoe Tavern' in Great Titchfield-street." To this list may be added "The Horse-shoe" in Clerkenwell-close, which is just now in course of repair and enlargement, with conveniences and a music-hall, under the direction of Mr. Henry Godwin, architect.——"A Plain Guide to Good Gardening; or, How to grow Vegetables, Fruits, and Flowers." By Samuel Wood (Lockwood & Co.), has reached a second edition, and received considerable additions. Mr. Wood is a practical man, and has produced a practical book: he gardens better than he writes.——Practical again. "Jenkinson's Practical Guide to the Isle of Wight" (Stanford, Charing-cross) includes separate maps of the different sections of the island, and a considerable amount of information for tourists. Archæology is not the writer's strong point: but it is a nice little book.

Miscellanea.

Royal Portraits.—The parishioners of Greenwich are much dissatisfied at the fate of four royal pictures formerly in the parish church of St. Alphage. These pictures consist of life-size portraits of Queen Elizabeth, Charles I., Queen Anne, and George I. Becoming by lapse of time dingy and faded, they were stowed away as lumber in the organ-loft of the church, and ultimately sold by the churchwardens. The portrait of Queen Anne went to the Painted Hall, Greenwich, for the sum of 10*l.*, the permission of the Lords Commissioners of the Admiralty having been obtained to pay that sum for it. The portraits of Queen Elizabeth, Charles I., and George I. were sold to a general dealer named Dyer, living in New-cross, for 20*l.* 15*s.*, and were subsequently sold by him at a profit of 50*s.* to Messrs. Pratt, of New Bond-street, who are restoring them, the renovation of King George being completed. It is described, in its improved form, as a magnificent portrait. The value of the picture is estimated to be over 500*l.* The portrait of Charles I. was 10 ft. square, and is supposed to be the work of Sir Peter Lely. The painting represents the king in a prayerful attitude, and is believed to be even more valuable than that of George I. A committee appointed by the Vestry is investigating the subject and trying to get the portraits back again. It is thought that there will be no difficulty in accomplishing this so far as regards the Admiralty, and the opinion of Dr. Spinks, Q.C., has been taken with regard to the other paintings, the question raised being whether, being church property, a sale could be negotiated without a special faculty from the bishop of the diocese.

Pollution of Rivers.—The new Act for making further provision for the prevention of the pollution of rivers (39 & 40 Vic., cap. 75) has just been printed. The principal object of the statute, as declared by the preamble, is "to prevent the establishment of new sources of pollution." There are twenty-two sections, divided into six parts. The first relates to prohibiting the putting of solid matters into streams, the next as to sewage pollutions, then as to the manufacturing and mining pollutions. The fourth part has reference to the administration of the law, and sanitary authorities are to afford facilities for factories draining into sewers, and those authorities have power to enforce the statute, as also the Lea Conservancy Board. The other provisions relate to legal proceedings, &c. Offences are to be restrained by summary orders of County Courts, with right of appeal to the High Court of Justice. The inspectors of the Local Government Board have similar powers as the inspectors under the Public Health Act of last year; they are to give certificates as to the best practical means for rendering harmless any sewage matter falling or flowing into any stream. There are provisions as to the execution of the new law in Scotland and Ireland. Under this Act, sanitary authorities and the Local Government, by active exertions, may prevent the pollution of rivers.

Purcell's Gravestone.—Mr. H. F. Turle reports, as to Purcell's gravestone, that Messrs. Henry Poole, of Westminster, have done the work in their best style, and "the inscription may be expected to last for centuries, since, instead of being merely engraved, it is formed entirely of solid brass characters let into the black marble ledger." (Whether this is a *sequitur* we are not sure.) "The monument to Purcell has also been repaired and relettered, and is securely fixed to the column from which till lately it threatened to fall."

The Duke of Beaufort as a Conserver of Ancient Monuments.—The *Gloucestershire Chronicle* says that archæologists are under greater obligations to the Duke of Beaufort than perhaps they are aware of. His Grace not only gives them *carte blanche* to inspect the noble ruins of Tintern Abbey and Chepstow and Raglan Castles, but he is at considerable expense yearly in endeavouring to arrest, as far as possible, the effects of weather and time on these noble ruins. At Tintern, especially, his Grace has been to much expense in preventing the walls from crumbling away, and encouraged by the success which has followed the efforts made here, he has adopted similar mean at Raglan Castle. Recently the architectural beauties of Raglan have been hidden under the accumulated ivy. The ivy has been removed, and the beauties of the castle now stand revealed in their noble proportions. In the course of the protective works which have recently been adopted here some very interesting discoveries have been made. A system of sewers has been found underneath the buttery, and in them have been found encaustic tiles bearing the *fleur de lis* (one of the heraldic devices of the Beauforts).

The New Trade Union Act.—An important alteration is made in the recent Act (39 & 40 Vic., c. 22) as to the definition of "trade unions." It is now declared that the term "trade union" means any combination, whether temporary or permanent, for regulating the relations between workmen and masters, or between workmen and workmen, or between masters and masters, or for imposing restrictive conditions on the conduct of any trade or business, whether such combination would or could not, if the principal Act had not been passed, have been deemed to have been an unlawful combination by reason of some one or more of its purposes being in restraint of trade. By the 9th section in the Act a person under the age of twenty-one, but above the age of sixteen, may be a member of a trade union, unless provision be made in the rules to the contrary, and may, subject to the rules, enjoy all the rights of a member, except as provided, and may execute all instruments, but is not to be a member of the committee of management, trustee, or treasurer to the trade union.

A New Fire-proof Dress.—Experiments have been made in the grounds of the Alexandra Palace with a new fire-proof dress which Mr. Oersberg, a Swedish mechanician, claims to have invented, and Captain Ahlstrom, a compatriot, to have matured and fitted for practical use,—a dress, which, it is stated, will enable the wearer to dash with impunity into the fiercest fire for the purpose of saving life or property. The dress, which very much resembles that worn by divers, is made of strong canvas, double, and so quilted that water can run freely between the outside and inside in all directions. The inner dress has a space between it and the body of the wearer, and Captain Ahlstrom claims for the air that fills this space the character of a perfect non-conductor of heat. Hose worked by the Palace fire brigade were attached, one to the back of the dress and the other to the top of the helmet, and when all was ready the apparently very hazardous performance commenced. A large fire, made with pieces of old wood steeped in petroleum, was lighted, and Captain Ahlstrom, protected by his dress, walked through it without injury.

Opening of Copt Hewick New Church Sunday School.—The new Church Sunday Schools at Copt Hewick have been opened by the Bishop of Ripon. The building has been erected entirely at the cost of Mr. J. S. Hurst, of Copt Hewick Hall, for the use of the parish, both for a church and Sunday schools, and consists of nave, chancel terminated with semi-circular apse, porch, bell-cot, and spiral ventilator; the roof is open-timbered, stained, varnished, and stencilled; the floors are laid with Minton's tiles with centre squares, with encaustic tile border. It also has an oak altar-table, lectern, and reading-desk, designed by the architects, and also an altar-cloth supplied by Messrs. Seary, of Oxford. Screen doors have been arranged in the chancel arch, which slide in the wall for the purpose of shutting off the chancel during school hours. The architects are Messrs. Lewis & Brodrick, of Ripon and Thirsk. The contractors were:—Trees & Son, stonework, brick, plastering, and slating; Smith, Sharrow, carpenter and joiner work; Dalton & Son, plumbers; Scott, painting; and Boddy, lectern and prayer desk.

Palestine Exploration Fund.—The Committee of this Society have received from the Foreign Office a copy of a Vizieral letter, in which the Governor-General of Syria is directed by the Porte to recover from the people of Safed the whole of the amount claimed by Mr. Consul Moore on account of damages and expenses caused to the fund by the attack on Lieutenant Conder's party last year. The survey party are now working at the Royal Albert Hall on the map, Lieut. Conder giving his attention chiefly to the preparation of the voluminous memoirs which will accompany it. In examining his notes, he has made a large number of discoveries in addition to those already published in the Society's periodical. Among these may be mentioned a new site for Emmaus, hitherto a much-disputed spot. He finds the name preserved in a corrupt Arabic form at the exact distance, "about threescore furlongs from Jerusalem. Ancient ruins are observed there, and it lies close to an old Roman wall."

Church of England Young Men's Institute, Norwich.—The foundation-stone of a new building for the Norwich Church of England Young Men's Society, has been laid. The building is Gothic in style, and will have a frontage of 42 ft. on Little Orford-street. It is to be constructed entirely of red brick, with the exception of a large tracery window in the front gable, which will be of red Mansfield stone, whilst the rest of the windows, string courses, cornice copings, &c., will be of moulded Cossey bricks. The main entrance will be in Little Orford-street, communicating through a vestibule with a reading-room and a stone staircase to a lecture-room. On the ground-floor will be the reading-room, 30 ft. by 25 ft., with class and committee-rooms, lavatory, and other conveniences attached. The lecture-room on the first floor will measure 50 ft. by 25 ft., and will have an open-timbered roof, and windows glazed with cathedral tinted glass, in lead quarries. The contractor is Mr. George E. Hawes, and Mr. Edward Boardman, of Norwich, is the architect.

Architecture and Landscape in Fifeshire.—A Scotch paper says that natives of Fifeshire who have been absent only two years are very much puzzled upon their return at the new buildings that have considerably changed the topography of nearly the whole of the county in that time. Tourists, too, are very much struck with the new schools that have shot up from so many commanding sites, and which appear in the distance as so many new mansions of the Gothic style, with their high turrets. Almost in every parish there are one or more new schools or large additions to old parochial and subscription places of education. Also many churches have been erected during the last few years, whose spires can be seen at great distances. The schools and churches add beauty to the poor landscape of Fifeshire, and relieve the monotony and tameness of the great mineral field, stretching from Leven to Torryburn, a central belt of thirty miles.

The Colchester Town Walls.—It would seem that the recent visit of the Archæological Institute to Colchester was not altogether unneeded for the enlightenment of some of the inhabitants, according to a letter which appeared in the *Essex Standard* some time ago. The writer says:—"It is much to be deplored that the practice of pulling down portions of the old town wall has not yet ceased. It appears to be thought, by persons anxious to obtain building material at a cheap rate, that because the old walls belong to the Corporation, to abstract portions of them at their own sweet will is not stealing." It is, therefore, satisfactory to know that the Town Council has appointed a special committee to report upon the condition of the town wall and on encroachments thereon, and inquiries thereto, with recommendations for preserving it from further detriment and preventible dilapidations.

Yorkshire Archæological and Topographical Society. — This Society visited Halifax on Wednesday last, the 30th ult. The Museum of the Halifax Literary and Philosophical Society will be permanently enriched by the event, the Yorkshire Society and its indefatigable secretary, Mr. Fairless Barber, F.S.A., having sent for the occasion, and for subsequent permanent deposit in the museum, several of the finest specimens of the Roman work discovered at Slack, the ancient Roman camp of Cambodunum.

National Freehold Land Society.—The half-yearly meeting of the members of this society was held on the 25th ult. From the report for the half-year ending the 31st of July last, it appeared that with a balance of 16,293*l.* carried from the account of the previous half-year, the total receipts during that period had been 779,544*l.*, which was made up of the following items:—Subscriptions, 297,951*l.*; advances repaid, 162,168*l.*; British Land Company, 93,357*l.*; convertible securities, 297,359*l.*; entrance fees, 205*l.*; and fees for surveying property, 118*l.* The payments had amounted to 769,736*l.*, being:—Withdrawals, 262,326*l.*; advances, 144,800*l.*; British Land Company, 27,575*l.*; convertible securities, 320,965*l.*; interest on completed shares, 11,283*l.*; and sundry expenses, 2,534*l.*; leaving a cash balance in hand at the end of the year amounting to 9,808*l.* The liabilities amounted to 1,260,208*l.*, consisting of members' capital, 1,206,282*l.*; reserve fund, 21,000*l.*; interest on completed shares, 1,604*l.*; and undivided profits, 21,000*l.* The assets amounted to 1,250,400*l.*, consisting of freehold and leasehold property, 520,501*l.*; British Land Company, 310,204*l.*; and convertible securities, 400,508*l.*

Sewage Works in the Darlington District.—At a meeting of the Darlington Rural Sanitary Authority, on the 21st ult., tenders for the drainage of Middleton-one-Row and Hurworth were opened. The contract for 2,228 yards of 12-in., and 1,024 yards of 9-in. sanitary pipes in the township of Middleton-St.-George, James Prior, for 858*l.*, was accepted. There were fourteen tenders, the highest being 2,557*l.* The tender for bricklayer's and mason's work in building cottage, stable, and sewer tank to contain 20,000 gallons, at Middleton, of Messrs. Fawell & Gardener for 265*l.* 7s., was accepted; for the joiner's work, Mr. R. Elliott, at 89*l.*, the highest tender being 190*l.*; the plumber's and glazier's work, Mr. T. Johnson, 83*l.*; the highest being as much as 390*l.* Mr. J. Kiernan's tender for the slating at 30*l.* 9s. was accepted. For laying 878 yards of 12-in. and 1,060 yards of 9-in. sanitary pipes and other work in connexion therewith at Hurworth, the contract of Mr. James Prior, for 550*l.* was accepted; the highest tender was 950*l.* The building of a tank to contain 20,000 gallons was given to Mr. R. Oliver for 169*l.* 4s. 9d.; the highest tender being 268*l.* 15s.

The British Museum.—The trustees of the British Museum have issued a return of the total expenditure on the institution since its foundation in 1753 up to the end of March, 1875,—nearly a century and a quarter. The charges are classified under their distinct heads, and include,—For the staff and building, together 3,621,731*l.*; for new buildings and repairs, 1,300,085*l.*; for rates and taxes, 41,472*l.* The charge for the staff alone during the entire period for salaries, wages, police, and pensions, is 1,473,987*l.* (this item in 1874-5 reached the sum of 55,016*l.*). From the staff and building charges also must be deducted the cost of book-binding and preparing and printing the catalogues, &c., all of which is executed on the premises, and also the sum of 6,416*l.* for the publication of the cuneiform inscriptions. During the corresponding period the entire cost of purchases amounts to 1,070,934*l.*, or considerably less than one-third of the cost of maintenance. The expenditure on antiquities, including excavations, has been,—In Assyria, 18,108*l.*; in Ephesus the large sum of 377,633*l.*; on manuscripts, 123,032*l.*; on music, maps, and books, 322,915*l.*

Vandalism by Tourists at Stonehenge.—"Druid" writes to the *Times* from Penzance:—"On the 14th inst. I visited Stonehenge, and was much surprised at the way in which that most interesting relic has been mutilated, the lower portions of the stones being much disfigured. Upon arriving, I found a party of ladies and two gentlemen (?); the latter were busy with chisel and hammer detaching portions of the ruins to keep as specimens, and regretting their inability to obtain larger pieces in consequence of their being provoked with a carpenter's, instead of a geological, hammer. Surely some steps might be taken to preserve this national monument from such selfish barbarism. With what feelings of indignation would the public regard the chipping off of portions of any of our cathedrals to adorn the private collections of individuals! And yet we have many cathedrals, and could better spare portions of them than of our one Stonehenge."

The Ascent of Steep Railway Gradients by Locomotives.—An interesting series of experiments has just been carried out on the High Peak Railway, of the London and North-Western Company, in Derbyshire. The object was to test the practicability of working heavy traffic on steep gradients by Mr. Henry Handyside's method of conducting the traffic up steep inclines by locomotives, instead of by stationary engines. The inventor for many years held the office of Assistant Provincial Engineer to the Government of Nelson, New Zealand. The conditions of the development of this enterprising colony impressed him with the necessity of providing railways at a greatly less cost than is required to construct the even tracks which are insisted on for the main lines of this country, and the first condition clearly was to be able to work the traffic with considerably steeper gradients.

The Defences of London on the Thames are approaching completion, and heavy guns are being shipped from the Royal Arsenal to supply the remainder of their armament. The new works and extensions of old ones which have been effected within the last few years have added greatly to the protection of the Thames. Many guns of 25 tons have been mounted at Tilbury Fort, and its companion work, New Tavern Fort, on the Gravesend side. The New Shornmeade Battery, lower down the river, is fully furnished with a dozen guns of the same weight, throwing projectiles of 600 lb.; and on the opposite shore, at Coal House Point, an array of heavy artillery equally formidable is being accumulated. These two pairs of fortifications, each pair constructed to operate in unison, and deliver a sweeping cross-fire, are regarded as rendering the river approach virtually impregnable.

A New Thames Tunnel.—The construction of a new tunnel under the Thames was commenced at Woolwich on the 23rd ult. The work began by boring on the north side of the river, and it is expected to be completed within six or nine months, it being assumed that the ground under the river consists of a bed of chalk, and therefore favourable for the purpose. The new tunnel is being constructed, under contract, by Messrs. Sharpe, of Cannon-street, City, under the superintendence of Mr. Gilbert, engineer. It will open a subterranean communication between the two counties of Essex and Kent. The scheme originated in consequence of nine men being drowned on a foggy morning while crossing the Thames to their work in a small boat.

The Great Northern Railway in Derby. The entrance of the Great Northern Railway into Derby is causing considerable inconvenience to Derby dwellers. Whole streets of houses are being pulled down, and (according to local papers) other houses are not to be obtained. Land is even rented before it has been enclosed with four walls; and it is of no unfrequent occurrence to see families in new tenements before the windows have been glazed. The foundations of the Derby Great Northern Station of the future have been laid, and the outline of the building is beginning to show itself. The neighbourhood of Darley Grove is in a state of "wreck." Big cuttings, navvies' huts and pit carts, huge mounds of brown soil and yellow clay, and what not, have totally dispelled the peacefulness of that pastoral district.

The Artisans' Institute.—The new session commences to-day (Saturday, September 2nd) at Castle-street, St. Martin's-lane, when a *soirée* will be held, and an address will be given by Dr. Bartlett, F.C.S., on "The Progress of Scientific Discovery, from the days of the Alchemists and Conjurors to the present time." Mr. J. Mainwaring Brown, B.A., of Christ's College, Cambridge, has engaged to deliver lectures at the Institute during September. The programme for the session includes a number of practical lectures, which ought to be very useful to those for whom they are prepared. We notice that the attendance of skilled workmen is specially invited at a meeting to be held in the hall of the Institute on the 6th of September, at eight o'clock, when several gentlemen will address the meeting.

Public Works for Leeds.—On the 21st ult., the Leeds Town Council resolved to apply to Parliament next year for a Bill enabling them to borrow 250,000*l.* for gas extension, about 100,000*l.* for the extension of waterworks, to buy Hunslet Moor for an additional pleasure park, and to make a large number of street improvements.

The Loss by One Strike.—The disastrous effect of strikes is well illustrated (says a Birmingham paper) in a calculation just made by Mr. Frith, one of the secretaries of the South Yorkshire Miners' Association. The recent strike of the colliers in the South Yorkshire district cost the workmen, according to Mr. Frith's estimate, 250,000*l.*, and the masters 500,000*l.* The loss to the railway companies in diminished traffic amounted to 122,000*l.*, making a grand total of 872,000*l.* That the loss of this enormous sum is balanced by no prospective advantage to the men is obvious from another statement made by Mr. Frith to the effect that in the present state of the coal trade, reductions in wages are inevitable, and he implores the men to make up their minds to meet the inevitable circumstances.

Building Operations in Sheffield.—Mr. Coghlan, the borough surveyor of Sheffield, has made a return of the houses and other buildings erected in Sheffield during the financial years from September 8th, 1872, to September 7th, 1875. Notwithstanding the increased cost of materials and labour, building operations were carried on more extensively last year than in any previous year. There was a large increase in the number of dwelling-houses and shops; but fewer workshops and stables were erected. Taking the totals, there were 564 more buildings put up in 1875 than in 1874, and 718 more than in 1873; the total number in 1875 being 1,773.

The Royal Birmingham Society of Artists.—The private view of the Autumn Exhibition of this society took place on the 26th ult., and the galleries were opened to the public on Monday last, the 28th ult. It is stated that the collection is by far the best that has been seen in Birmingham for many years past. The great number of important works contributed has obliged the society to open an extra room. Pictures by J. R. Herbert, R.A.; J. E. Millais, R.A.; W. P. Frith, R.A.; A. W. Hunt, J. E. Hodgson, A.R.A., and many other painters of repute, add to the attractions of the exhibition.

The Greenwich and Woolwich Railway. The new line of railway between Greenwich and Woolwich, although ready for traffic, was not opened, as anticipated, yesterday (Friday), in consequence of the South-Eastern Railway having decided to carry out some suggestions of the Board of Trade for the laying of an additional line between the divergence of Deptford Creek and the new Greenwich Station. This will necessitate the removal of the old station and delay the opening of the new line for some time.

A Testimonial.—At the firm of Benham & Sons, engineers, Wigmore-street, on the 25th ult., Mr. J. H. Callaway, ten years foreman of joiners, having resigned, the workmen and his friends presented him with a marble timepiece, with engraved silver tablet, and a pair of bronze figures, as an expression of their esteem for his character and ability. We are told he holds five prizes for art workmanship, and three Queen's prizes for science.

The Boucicault Memorial.—Plans for the Boucicault memorial have been laid before the Council at Huntingdon. It was proposed and carried that the fountain be placed in front of the County Hospital, and not in the Market-place, as previously suggested. The fountain consists of a stone base, with a rockwork of granite, surmounted with a figure representing a female drinking out of a shell. The cost is to be 200*l.*

Japanese Enterprise.—It is stated that a Leeds engineering firm has some work in hand of a very exceptional kind, viz., providing the plant necessary for the introduction of the iron trade into Japan. The firm alluded to is sending off for this purpose plate, rail, and guide-mills, steam-hammers, shears, lathes, cranes, and all other necessary appliances, of the most modern construction.—*Ironmonger.*

The Coventry Water Supply. — The Coventry Town Council has decided to cover over the water-tanks, Mr. Hawksley, C.E., having reported that the existing impurities in the water supply are due to a growth of vegetation in the tanks, which covering would obviate.

Vieille Montagne Zinc Roofing Company. We understand that Mr. Henry Wood, of No. 17, Great George-street, Westminster, has been appointed architect to this company, in the place of the late Mr. R. G. Fisher.

The Yarmouth Aquarium is to be opened next Tuesday (5th), by Lord Suffield.

TENDERS

For schools for 830 children, with teacher's residence and board-room attached, for the Tamworth School Board. Messrs. R. J. & J. Goodacre, architects :—

Hutchinson & Son	£11,157 0 0
T. & H. Herbert	10,987 0 0
T. & S. Orchard	10,683 0 0
Mottram	9,998 0 0
Watton & Son	9,765 17 0
Fox Brothers	9,266 0 0
Nicholls	9,259 8 0
Bromwich	9,053 0 0
Clarson & Son	8,724 0 0

For the erection of Pembridge livery stables, Westbourne-grove, for Messrs. Fonuereau & Hudson. Mr. Walter Graves, architect. Quantities by Mr. Henry Raven :—

Temple & Forster	£3,797 0 0
Hook & Oldrey	3,695 0 0
Grieve & Littlejohns	3,600 0 0
Scott	3,537 0 0
Beach Brothers	3,472 0 0
Aitchison & Walker	3,195 0 0
Snowball	3,080 0 0

For taking down the house No. 6, St. James's-road, Old Kent-road, and erecting a new house with a gateway entrance, for Mr. C. Turner. Mr. Joseph Gale, architect :—

Brown (accepted).

For the construction of the Hovingham waterworks and drainage. Mr. Wise, engineer :—

Wise, Reed, & Co.	£1,300 0 0

For rebuilding Huskisson's flour mill at Lower Shadwell. Mr. Charles Dunch, architect :—

Ashby & Horner	£2,876 0 0
Ennor	2,699 0 0
Palmer	2,655 0 0
Rivett	2,547 0 0
Judd & Hawkings	2,539 0 0
Newman & Mann	2,500 0 0

For alterations, &c., to St. Martin's Tavern, Prattstreet, Camden Town. Mr. Furniss, architect :—

Hyde	£499 0 0
Chapman	460 0 0
Hancock	397 0 0
Steed Brothers	375 0 0
Gould & Brand	361 0 0
King	348 0 0
Annett	308 0 0

For pulling down and rebuilding the Bell Inn and four cottages in Priory-street, Colchester, for Messrs. A. T. Osborne & Co. Mr. Horace Darken, architect :—

Everitt & Son	£919 0 0
Garwood	888 0 0
Start	874 13 0
Shepherd	859 0 0
Chaplin	853 0 0
Diss	805 10 0
Pitt (accepted)	800 0 0

For alterations at the Fox Inn, East Mersea :—

Pitt (accepted)	£250 0 0

For a villa residence at Oaken, for Mr. Henry Hill. Mr. J. R. Veall, architect :—

Groves	£944 15 0
Morton (accepted)	865 15 0

For a new billiard-room at Oaken Manor, for Mr. J. Langley. Mr. J. R. Veall, architect :—

J. & W. Cockerill (accepted)	£213 0 0

For new shop and dwelling-house at Sutton, for Mr. W. R. Church. Mr. W. H. Culverhouse, architect. Quantities by Messrs. Fuller & Deacon :—

Tribe	£2,433 0 0
Broadbridge	2,290 0 0
Potter	2,101 0 0
Neal (accepted)	2,070 0 0

For alterations to Pier Hotel, Worthing, for Messrs. Tamplin & Son. Mr. Geo. Tuppen, architect :—

Holden (accepted)	£691 15 0

For rebuilding the Free Butt, Brighton, for Messrs. Tamplin & Son. Mr. Geo. Tuppen, architect :—

Parsons (accepted)	£495 0 0

For alterations to the Three Compasses, Eastbourne, for Messrs. Vallance, Catt, & Co. Mr. Geo. Tuppen, architect :—

Botting (accepted)	£273 0 0

For alterations to the Stag Inn, Brighton, for Messrs. Vallance, Catt, & Co. Mr. Geo. Tuppen, architect :—

Botting	£135 0 0
W. & T. Garrett (accepted)	120 0 0

For repairs to stables in Atlingworth-street, Brighton, Mr. Geo. Tuppen, architect :—

W. & T. Garrett	£186 0 0
Coleman (accepted)	£178 0 0

For alterations to the Duke of Edinburgh, Brighton, for Mr. C. Catt. Mr. Geo. Tuppen, architect :—

Coleman	£260 0 0
Colwell (accepted)	249 0 0

For additions to Dew Drop, Eastbourne, for Messrs. Vallance, Catt, & Co. Mr. Geo. Tuppen, architect :—

W. & T. Garrett	£319 0 0
Botting (accepted)	305 0 0

For building a new house in Ship-street, Brighton, for Mr. C. Lamb. Mr. Geo. Tuppen, architect :—

Lockyer	£1,198 0 0
Cheeseman	1,192 0 0
W. & T. Garrett	1,095 0 0
Patching & Webber	943 0 0

For building new schools and teacher's residence at Patcham, for the Patcham School Board. Mr. Geo. Tuppen, architect :—

Lockyer (accepted)	£1,365 0 0

The Builder.

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Public Safety.—Three Recent Calamities.



FATAL casualties, three in number, each tending to open a new chapter of alarm and terror, have recently attracted public attention. It is becoming more and more evident that the inquisition of a coroner,—a wise and enlightened safeguard to public safety when a bludgeon or a hammer was the most likely instrument for the sudden termination of life,—is but ill fitted to cope with those profound and delicate questions which the advance of modern science suggests on occasions such as those of the explosion on board the *Thunderer*, the Radstock collision, or the leap into space made by the "Flying Dutchman." It is the more necessary that whatever we know of the result of experience, or the habit of profound investigation into mechanical cause and effect, should be taxed in order to throw light on incidents so menacing to our tranquillity.

With regard to the collisions by land, they are unfortunately not altogether without precedent. They are cases of what are called railway accident; but they are chiefly to be regarded as they affect, on the one hand, the public who travel by rail, and, on the other hand, the railway companies, on whom so heavy a cost is entailed by any failure in their working arrangements. As far as the officers and servants of the railway companies are concerned, it cannot be said that any new cause for personal alarm has been displayed by either of the two disasters in question. With regard to the explosion on board the *Thunderer*, the case is in some degree different. The public were not the immediate sufferers. The marvellous transformation which our war navy is undergoing has turned what used to be the hold of a ship into a floating engine-room. Numerous and complicated machines, fed by an adequate number of boilers, consuming large quantities of coal, and evolving an enormous pressure of steam, are set afloat and propelled through the sea at a high velocity. When a new and costly apparatus of this nature comes to so fearful a breakdown on its first essay, there is no small danger that the crew may be discouraged. The question is natural, in default of competent knowledge,—Has the fact that the engine-room is afloat, instead of being on dry land, anything to do with an explosion so unprecedented? If not, is there such careless neglect and want of due knowledge and care on the part of the naval authorities, or those whom they employ, that no one is safe on board a Government steamer? We do not state, as a fact, that such questions have been raised. On the other hand, nothing can be more likely,—or, we may say, to a certain extent, more proper,—than that such should be the case; and if the men who form the class from which the engineers and stokers of our war and mercantile marine are selected do not put these questions, or do not even anticipate that they may be put, none the less is it the duty of those who in any way represent or care for the interests of this very important class of English workmen to see that no doubt is left on the points in question.

With reference to the Ashton catastrophe, the verdict of the coroner's jury is such as to impose but little reserve on a full discussion of the case. The main point to be kept in view is the prevention of the recurrence of a like disaster. It is difficult to see how this is assured, or even promised, by anything which has occurred on, or since, the inquest. The great question of the proportion of the maximum velocity that can be safely introduced on a railway to the structure of the line has not been adequately brought into view. It is of primary importance that this should be done. The velocity of the "Flying Dutchman" train was a broad-gauge velocity. The broad-gauge railway, as conceived and carried into effect by Mr. Brunel, was a mechanical contrivance differing in many important respects from the narrow-gauge railway, as designed and carried out by Messrs. Stephenson, especially by Mr. Robert Stephenson. Of the minute care, constant attention, and unstinted cost, both of time and money, that were devoted by Mr. Brunel to the perfection of his line, no one who had not the experience of working under his eye can form any conception. It was not the idea of the engineer of the Great Western that a railway could be made haphazard, and entrusted to the care of inspectors, insufficiently supplied with labour and materials, while engines and trains, controlled by some one else, were driven over them at a speed fixed by the superintendent of the line. On the contrary, the way and the locomotive were constructed by Mr. Brunel as corresponding parts of one great system, the object of which was to ensure the safety of a high speed of transit such as no careful man would attempt to rival on a less aptly constructed line. The gauge or width between the rails originally adopted by Mr. Stephenson was increased by one half by Mr. Brunel. By this means greater space was given for all the working parts of the engine, and the centre of gravity was kept proportionately low. But this was only part of the design. The permanent way was constructed on a totally new system. On the London and Birmingham line stone blocks, which were regarded as permanent fixtures, were provided for the cuttings, and wooden sleepers were laid on the embankments, with the view of being replaced by blocks as the earthwork became consolidated, and as the sleepers were out or decayed. It proved that the blocks were so rough and so liable to displacement, that sleepers were afterwards introduced everywhere, as permanent fixtures of the line. On the other hand, the original design of Mr. Brunel was to construct a solid timber framework, secured to piles driven into the bed of the railway, on which rails of the well-known Great Western section were bolted down, packing-pieces of hard wood being inserted between the longitudinal beam and the rail. This plan proved not more practically successful than the blocks of the London and Birmingham, as each pile was felt as a point of resistance on the passage of the train. Mr. Brunel therefore substituted heavier longitudinal timbers, framed together with transoms, to which the rails were bolted by the very admirable mechanical contrivance of the fang-bolt, and the way depended principally on its own weight for being kept in position. The sleepers, on the narrow-gauge lines, were embedded in the gravel, or in what was called the ballast, spread over the level bed of the railway. In the broad-gauge system the longitudinals were only slightly embedded in the ballast—the drainage of this part of the work receiving the most careful attention. Thus, a portion of broad-gauge railway, in order to obtain the certificate of Mr. Brunel, had to be as accurate and almost as stable as a lathe-bed. It was maintained in a perfect state by the most unsleeping watchfulness, and allowed of the passage of a locomotive, constructed with the like originality, and the like adaptation of each part to a general purpose, at the rate of seventy miles an hour, where the way was straight and level, with perfect steadiness and safety. Where a curve occurred, the centrifugal force which tends to throw the train off the rails was counteracted by raising the outer rail according to a table of curves and cants suited to the speed which the engine-driver was directed to maintain over that portion of the line; and not left to the mere whim of a common ganger, but carefully levelled by the sub-engineer.

When this careful practical preparation for maintaining a high rate of velocity was first carried into execution, the London and Birmingham Railway Company was building four-wheeled engines, which, at any excessive speed, had a tendency to leap from the rails. The desire to rival the broad-gauge speed led to the invention of Stephenson's and Crampton's six-wheeled engines with very long bodies, by means of which evaporative surface was increased, and a supply of steam was produced adequate to a more rapid velocity than was attainable by the original four-wheeled locomotive. But the corresponding alterations of the way were confined to the adoption of heavier rails and fittings. The original rough outline of the old tramways was materially improved upon; but its essential principle was unchanged. The best and most costly narrow-gauge line was never to be compared, as a mechanical arrangement for facilitating extreme speed, with the broad-gauge line, as Mr. Brunel not only designed it, but took good care that it should be carried out and carefully maintained.

It is now seventeen years since the death of Mr. Brunel. Mr. Stephenson was not very long his survivor. Those men who have the highest claim to be considered the followers of these great engineers will be the first to admit that they follow at but a humble distance; and one proof that this is the case is to be found on every occasion when what is erroneously called accident sets in movement the extremely clumsy machinery of the coroner's inquest. Agents, and inspectors, and station-masters and signal-men there are in abundance, and engineers who declare that they are not responsible for an under-supply of men and materials during the critical operation of laying a third rail; but the firm, intelligent control of the engineer-in-chief, responsible for the making, the maintaining, and the working of the line, is nowhere apparent. This is an unwise economy on the part of the company, and the result, at least one result, is here before us.

It is useless to say a word that would tend to reopen the gauge controversy, which is now settled, not as matter of engineering, but as matter of fact; but it is evident that when a third rail is introduced into the broad-gauge system, however this is effected, the original conditions of the way, on which safety at high velocity was made dependent, are materially affected. The whole structure of the permanent way has been, not only altered, but patched, and the mechanical disadvantage of throwing double weight on one rail, and thus requiring a still more careful inspection and maintenance of the line, has been coupled with the economical disadvantage of a stinted supply of labour and of materials. The only wonder, then, is, that disaster such as that we now witness has not occurred long before.

The first lesson to be drawn from this short summary of a long experience is, that to attempt to maintain the speed for which Mr. Brunel constructed his way, as well as his engines, without carefully maintaining the excellence of both of these elements, is not only foolish but mischievous. It will be stopped, sooner or later, if in no other way, by public indignation, or by the recurrence of repeated calamities. To drive a train as fast as it can be driven, in order to compete with another line of route, is all very well from the point of view of the old coaching masters. Such was the case with the stages on many a well-remembered line of country. But in these cases the speed was limited by the actual physical endurance of the horse. Some sixteen miles an hour was the utmost speed attained by the competing coaches, and that only in rare and favourable cases. That the way should be, both in its original design and construction, and as matter of maintenance,—more especially if any material interference with the original design has been introduced,—suitable for a given velocity, is a primary requisite of safety. It is not too much to say that it does not appear to have been so regarded in the present case. The original transoms, we are told by a railway official, "had to be cut, for the 4 ft. 8½ in. road, and new short ones inserted between that and the 7-ft. road. The fastenings, instead of being fang-bolts going through the balks of timber, appear to have been simply spikes driven into them. With one part of the road old, the other part new, the original transoms all being severed, and the reframing of the timber holding the mixed gauge together,"—what was the chance of the safety of a train of 300 tons weight driven at sixty miles an hour? We think that the question should not have been left to the solution of chance. But to that solution it is still left, so long as such a speed is maintained on such a road.

With regard to the Radstock collision, the partition of blame is a matter into which we do not propose to enter, except in one particular. There is a known and frequently used method of working a line which renders such an accident physically impossible. Why was not that method employed? It is all very well to talk of the block system, and an admirable system, when properly worked, it is. But in the case of a heavy traffic, complicated by special trains, it is evident that the degree of telegraphic correspondence which is forced on so many officers,—to say nothing of the new functions of a crossing agent,—is such as to test the energies of more educated and more highly paid men than those to whom this important duty is entrusted. As to all that, however, it is needless now to speak. Whether the crossing agent can be electrically omnipresent or no, the key to safety should not be neglected. That key resides in what is called the staff system. In lines where this is faithfully carried out, the collision of an up and down train on one line of rails is absolutely impossible. A staff or ensign of some kind is delivered to the driver of an engine over the portion of single line between two crossings, which are also stopping-places. Without this staff in his possession, no engine-man is allowed to take his engine on this section of the line. There is only one staff. There can, therefore, be only one engine on the line of rails. By equal consequence there can be no collision. The certitude is absolute, logical, and indisputable.

One objection,—and, so far as we can see, but one,—can apply to the staff system. It may be urged that it involves a loss of time. If a train goes from A to B, no train can follow it until a train, or, at all events, an engine, has run back from B to A, because, when the second train reached A, there would be no staff for the station-master to give to the driver. Therefore the second train must wait, and loss of time will ensue. But the reply to this objection is perfectly obvious. If the traffic be too heavy, the line should be doubled. The question lies between the establishment of a rule that will absolutely prevent the occurrence of collision and the arrangement of the time-tables. Can it be doubted that it is the latter which should give way, and that public safety should be preferred to the saving of so many minutes in the travelling arrangements of the company?

With regard to the explosion on board the *Thunderer*, we shall endanger no interests, and wound no susceptibilities, in saying that it has become clear, from indubitable scientific investigation, that the very accuracy and excellence now attained by our lathes involves a hitherto unexpected danger. It is, so far as we are aware, a new observation that plates of metal when heated in contact seem to acquire an adhesive tendency by such heating. Such a fact, however, is by no means inconsistent with what is known as to the adhesion of polished surfaces. Not only so, but we think it admits of explanation. In the gradual rise of temperature, the particles of air lying between such surface, as between those of a highly finished valve and its seat, are likely to escape. Thus a more perfect contact is insensibly produced, and there seems to be little doubt that it may become a contact of so intimate a nature as to introduce that degree of attraction which is known to exist between homogeneous particles at extremely minute distances apart, and which approaches much more nearly to the mutual relation of the particles of the same body than to the ordinary attraction between two separate bodies. Something of this nature would account for the fact, of which distinct testimony has been offered, that a valve very tightly fitted to its seat may develop an adhesion altogether unexpected. If it were a mere case of tightness so great that while there was enough play when the metal was cold, there would be absolute wedging when heated, this would be perfectly intelligible. But it seems to be probable that there may be something more than this—that a valve which, if dropped into its seat when steam is up, would act properly, may refuse so to act if heated *in its seat*. That is a matter of great interest, and will have to be fully tested and brought into our every-day practice. There seems to be no doubt of the excellence of the materials and workmanship in the fittings of the *Thunderer*. There is no doubt that nothing like the hair-brained practice—which we have not only heard of but witnessed, in American engineers—of overweighting the safety-valve, is entirely out of the question in the case of the *Thunderer*. A scientific reason is offered, which seems in itself to be adequate; but as to the absolute truth of which we must reserve any opinion. Not so, however, as to the absence of any such blame as attributes to scamped workmanship, or palpable neglect.

There is, however, one general feature present in these three very different cases. It is a feature of our national character,—one in which there is a strong difference between our own habitual action, and that of foreign nations. If we were to call this feature recklessness we should be wrong; yet it has the effect of recklessness. If we should call it want of a sense of responsibility we should be wrong, and yet it does seem to consist in the absence of drilled, organised, inflexible responsibility. Thus, take the case of an engineer or stoker who is responsible for the safety of a steam boiler. The natural, and as far as we know the almost invariable habit of such a man, when he is getting up steam (especially in a boiler with which he is not familiar), is to try the action of the safety-valve when he has raised steam. Such a step is dictated by the most ordinary prudence. As the engineer or stoker would be the first person to suffer from an explosion, the public has so far a pledge that he will not neglect his duty, to the detriment of himself and his neighbours. But, on the other hand, in any public service such a thing should not be left to inference, to heart, or to confidence that a man will take due care. It should be an established part of a code of standing orders, and for obedience to such a code the whole hierarchy of the service should be responsible. The stoker should be directed, at certain stages of his work, to ascertain whether the guarantee of safety on which all depends was present,—in other words, whether the safety-valve was acting, or was ready to act. This is so essential a point that it can only have been omitted to be made a positive order from its implicit necessity, which was such as to lead people to take it for granted that it was done. But it has come out, not so distinctly on the trial as in the subsequent correspondence on the subject, that the safety-valves were so enclosed, in order to prevent the escape of steam into the stoke-hole, that the man in charge of the fire could not see whether they were acting. The whole theory lies in these words. Two safety-valves existed. Both of them stuck. The stop valve connecting the boiler with other boilers and their safety-valves was closed. These three stoppages of the steam were the direct causes of overpressure being obtained. The gauge intended to show the pressure was broken. Even yet there was required another hitch in the arrangements, and this was expressly provided by the disposal of the safety-valves in such a manner as to place their action out of the observation of the stoker. This must be regarded as a positive and very grave fault of construction, involving serious responsibility.

But the responsibility does not stop here. The duty of the chief engineer should involve the ascertaining whether all the items of the code of safety had been carried out. And so, in the case of a steamship, with the officer under whose orders the chief engineer is placed. At each step there should be plain, positive, adequate responsibility. It would not then be the case, in the event of disaster, that no one would be to blame. On the contrary, in such a case as we have put, no matter whether it were repair of line, obedience to signal, a testing of conditions of working safely, *everybody* concerned would be punished. If the code of working instructions were adequate,—as it ought to be made,—there would be a check at every step, so far as risk of human life was concerned. Mischief, or danger of mischief, would thus be detected at each step. In any case of failure on the part of a subordinate no harm would result unless the superior of that subordinate also failed in his distinct written duty. At each step penalty should be made the certain consequence of failure. And if the whole service were so heedless, so rash, or so stupid, as to neglect such a code, and consequently to cause disaster, no question as to division or shifting of responsibility could ensue. Each would, in his grade, be responsible; each would be blameable; each and all would accordingly be liable to be punished.

It can only be by the introduction of careful system; the reduction to writing of all rules; the inspection, by men of competent experience, of such rules, followed by the certifying (in good time to prevent mischief) that they are adequate to prevent all preventible danger; the rigid application of such rules, and the infliction of definite penalties for their neglect and infringement, that safety of human life can be guaranteed. How constantly do we see rules made only to be broken. How frequently is this the case, in almost every railway station, as to the one important safeguard of crossing the line of way. This is usually prohibited, on the proper ground that if no one is allowed to cross the rails no one can be run over by an engine; and yet, with what *sang froid* do we see, always the porters, and often the passengers, lounge across the rails just in advance of a train? Until we introduce an inflexible and well-ordered discipline into the great army of steam, we may expect results such as would occur in every military force if the duty of each officer were left vague on the general idea that as his own life was at stake he would be sure, under any possible circumstances, to act for the best welfare of the army.

ART AND CIVILISATION.

THE writer of an interesting article in the current number of the *Edinburgh Review*, on "The Letters and Works of Michelangelo" (chiefly *apropos* of Mr. Heath Wilson's work, to which we devoted considerable space a little while since) prefaces his analysis of the subject by some remarks on art and civilisation, which, though not advancing anything new, touch upon the relation of art to national life and morality from a point of view which it is well to be reminded of, and which none who are concerned with art can afford to overlook. When we say the relation between art and national morality, we should, perhaps, more correctly say the want of relation, for that is the point brought out by our contemporary. A great deal has been said by modern critics (pre-eminently by Mr. Ruskin, for instance) in favour of the connexion between good art and good morality, and sometimes, though less positively, between high art and high civilisation. The theory is one which is pleasant both in a moral and in a logical point of view. It is gratifying to think that what we admire in art as a source of intellectual pleasure should also be connected with, and in a measure spring from, the highest moral feeling, and there is a logical completeness and unity in this view of all good things as necessarily linked together, which is at the same time satisfying to the intellect. This agreeable view of the matter the *Edinburgh* reviewer attacks in a few pithy sentences, and with a "damnable iteration" of historical facts in contradiction of it, in a rather cruel manner. It is well, however, that we should be invited to turn round and look at the truth about these questions now and then; and the somewhat positive manner in which the writer in question puts the case provokes, on the other hand, the question how far he himself is in the right, and whether his deductions are not a little too sweeping.

The question really has two sides, according to the meaning we attach to the rather vague term "Civilisation," which may either mean a general high standard of life and principle in everything, or it may mean merely a high degree of material luxury and comfort in the mode of living. In using the expression "*true* civilisation" ("the condition which gives birth to art is precisely that in which true civilisation has never yet flourished"), we presume the *Edinburgh* critic refers to the highest or moral civilisation.

Without undertaking to say that civilisation (in this sense) and art are incompatible, he brings together in one paragraph the most telling historical confirmations of such a view. "Art, respectively Ancient and Modern, never attained such perfection as under an elaborately-organised idolatry and a sumptuously-supported superstition." And carrying the question further into the condition of public morality in the great days of Italian art, our attention is invited to the fact that:—

"While the artists of Italy were advancing with sure and rapid steps to those heights where Michelangelo stands pre-eminent, the country to which such men were born was hastening to a condition farthest removed from real civilisation. The very dates of Italy's proudest achievements in the art of painting are identical with those of the foulest iniquities in her high places, and of the deepest misery of her people. The "Last Supper" by Leonardo da Vinci was being executed at the time when the traitor Sforza invited a French army across the Alps, and when a Borgia represented Christ upon earth. Michelangelo's Sistine ceiling was commenced in the same year with that first transaction of European diplomacy, the League of Cambray, an alliance unmatched in history for rapacity, cruelty, and perfidy, and the signal for a ten years' reign of devastation and carnage. Raffaelle's most creative years were contemporary with the period when two foreign armies vied with each other in ravaging the Peninsula—the sublime decorations of the Vatican coincident with the worst passions and blackest deeds that ever laid a great people in the dust."

Here be truths, no doubt; and not new ones, of course, to any educated readers. And, unquestionably, such instances do seem to put an absolute stopper upon all the well-meant platitudes one often hears about the connexion between art and moral elevation of character. And yet it would be a mistake to make too sweeping a deduction from such a category of contrasts; and the manner in which they are brought forward and marshalled by the reviewer is calculated to create a false impression that times of social and political licence are especially favourable to art. It would be quite open, however, to those who believe in the essential purity of art, to say that these facts merely proved that art was perfectly separate from and unaffected by the social and political circumstances of the day. And in regard to the other influences of idolatry and superstition just before referred to, the writer does point out (what people are now beginning to see) that the Greek Pantheon and the Romish ceremonial had nothing to do, as used often to be supposed, with calling into existence artistic power; all that can be said in regard to those influences is that, "when once the sacred spark has been kindled, the lowest worship and the most worldly aims can fan the flame,—they can do no more." And this idea that art, however connected with the personal character of the artist, is entirely above and unconnected with the social and national morality of his day, could hardly have a stronger support than is afforded by the life and character of the man whose biography gave rise to the remarks above quoted. It is scarcely possible to deny that the superior greatness, and we might say moral grandeur of Michelangelo's art, arises in part from the entire superiority of his life and character and principles over those generally prevalent in his day. If this moral superiority did not in any way develop or occasion his artistic power, it at least operated in leading him towards the lofty path, the search after the highest and noblest ideal, which pre-eminently distinguishes his work from that of even the greatest of his contemporaries.

Our friend of the *Edinburgh*, however, really hits the point, as it seems to us, in his remark, in explanation of the supposed antagonism of art and civilisation, that "Art is the heritage of the *natural man*," quite irrespective of his creed, social, political, or religious. But this explanation of the dilemma is merely hinted at in passing, without being applied further. The real application of it, and the real explanation of the development of artistic creative power simultaneously with the political excesses and crimes referred to, is, that both are the offspring of a time when the minds and passions of men are strongly aroused, and in a state of excitement which leads them to break through the ordinary routine of action and sensation, and impels them to mental activity and restlessness, which may find vent,—with one in new artistic aspirations, with another in new political efforts. Either of these may or may not be praiseworthy from a moral point of view; for it is possible for art to show great power and yet to be very immoral and very cruel in its tendencies. But in either case it is the intellectual activity, not the morality or immorality, which is the essential condition; only as the state of intellectual activity really includes the fuller development than usual of the "natural man," to quote the expression before used, it is quite possible, and even in the nature of things probable, that the natural man may not always "do his spiriting gently," and that some of the superfluous energy aroused may expend itself in a very violent manner, and in a direction which may justly be said to be opposed to "true civilisation." We have the same kind of phenomenon in connexion with other branches of imaginative creation. The great new impulse in English poetry and imaginative literature, which was coincident with the French revolution period, for instance, is recognised now as only a part of the same movement of the European mind which brought about the revolution,—the determination to break old barriers and find fresh openings for human energy and activity in every form. Here, again, the political activity which accompanied the creative activity of the period, was characterised by much violence and immorality. We have, however, a brighter example in the history of the one art which has been pre-eminently developed in this country. The Elizabethan drama is to England what the Renaissance painting is to Italy; and this time of splendid creation in our drama was also a time when the energy of the nation in other directions was at its highest point; when everything was, as it were, alive and stirring, and the strongest passions expressed in the drama were only a reflexion or a parallel development of those which were finding vent in other ways in the great conflict against the Spanish and the Papal aggressions. This we take to be the true explanation of the apparent paradox which the *Edinburgh* reviewer calls attention to, of the frequent co-existence of artistic activity with periods of violence and turmoil. The conditions of creative energy in art demand that the minds of men should be in a state of activity and restlessness rather than of quiescence; and this same restlessness and desire of change exhibits itself, often simultaneously, in other channels; with less beneficent results, it may be; or sometimes, on the other hand, with even higher results than art *per se* can lead to. The aspiration for political power and liberty among the Greeks was much more closely connected with their artistic supremacy than was the accidental fact of their having a Pantheon of deities to furnish subjects for their art. The same national energy and desire of supremacy gave birth to both their political and artistic strivings. A period of quiescence is favourable only to the *study* of art; it is the period of Academies; but a period of restlessness, ambition, and intellectual tension is the period of artistic creation; and our own quiescence and want of enterprise for some time past may go far to account for the fact that our art is at present a toy for dilettantism rather than an expression of national feeling in any way worth speaking of.

If we look at the question for a moment in regard to a narrower meaning of the word "civilisation," and take this only in its material sense as referring to the mode of life and the provisions for securing comfort in its conditions and surroundings, we may, however, recognise a distinct antagonism between art and civilisation. Art being, to repeat the phrase once more, "the heritage of the natural man," it is only in accordance with this theory that when social luxury and social formulas have paramount influence in determining the manner of men's lives, and even the modes of their thought, the free and unconstrained development of art in its nobler forms should be checked and stunted in so uncongenial an atmosphere. Art must have free space in which to use its wings, and cannot endure to be hemmed in by the barriers of an intricate social conventionality. With the Germans, lyric drama, for instance, is a living and important art, because in their less artificial scheme of life it is cared for for its own sake; with us it is a mere toy, forming part of a conventional system of the movements of society. Other parallels will present themselves, and in such a sense it is that civilisation is really and directly at variance with art, in substituting transitory and conventional interests for the broader genuine sympathies of human nature, to which alone all true art appeals, and by which it must ultimately be judged.

THE NEW "BOULEVARD HENRI IV." AT PARIS.

DISAPPEARANCE OF THE OLD CITY.

SIR SALAR JUNG, on passing through Paris on his return to Hyderabad, remarked, so the correspondent of the *Times* informs us, that he was much struck with the severe aspect and the incessant activity of London, which had left in his mind the recollection of the capital of a people with a steady destiny, while Paris seemed to him to have been created for pleasure, rather than for enduring any serious enterprises. It is gratifying to find our Indian friend appreciating the capital of his Empress so favourably.

With regard to Paris being a city of pleasure, the remark is somewhat trite, and has no sting for the Parisians, who are perfectly willing that the whole world should regard their city from that point of view; but that Paris undertakes nothing enduring or serious is far from the fact. Indeed, it may be said that no city in the world, not excepting London, is at present elaborating more serious or weighty enterprises.

As to the enduring character of what meets the eye in comparison with London, surely the beauty of the stone, which is almost plastic under the workman's hand, and the careful finish manifested throughout all that they are now doing, must compare favourably on the score of durability with our best work in England; and indeed Time, or a miserable Communist rule, would find it difficult to destroy M. Garnier's New Opera House, or a thoroughfare like the Boulevard Haussmann.

Even where old Paris has to give way, as it is now daily doing, to the new Paris, which is rising above and by the side of it, we find traces of the old asserting its durability.

In the Boulevard Henry IV., still new, although it was commenced in 1868, the demolition of a portion of one of the oldest and most interesting streets of Paris is just now taking place, and at the moment of this writing the

old Hôtel de Lesdiguières is being destroyed. Still, with its workmen busy at its destruction, it exhibits from almost any point a characteristic appearance, and especially from the corner where, before the Communist days, stood the old Arsenal. The view makes one regret very deeply that so interesting an object should have to give way.

The destruction about to take place in order to complete the line of the Boulevard Henri IV. cuts diagonally through half the Rue de la Cerisaie.

This street, which has lately been described as one of the oldest in Paris, is certainly one of the most interesting, though not by any means one of the oldest. It is not marked in the *Plan de la Tapisserie, fac-similed* by Mauperché at the beginning of this century. In fact, the place as a street did not exist till 1516, when Francis I. sold the Hôtel St. Paul, which Charles the Dauphin, Regent of France, afterwards fifth of that name, had caused to be built. The ground on which this famous residence was to rise, which took its name from the neighbouring church of St. Paul, was occupied at the time by a number of private residences, bought by Charles in 1361, at the time that King John II. was a prisoner in England, having been made captive at the fatal battle of Poitiers (1357). At his death, the new king united the property to the crown domains, and designed it in the edict under the title of "Solemn Hôtel of Great Diversions" (*Hôtel Solennel des grands Esbattemens*). It was not long after this that the Hôtel de Sens (1365), St. Maur and Puteymuce (1398) were taken into the building. It was in that portion where had formerly stood the Hôtel de Sens that the king's apartments were placed, while that occupied by the Hôtel St. Maur was inhabited by the Dauphin Charles, and Louis, Duke of Orleans. As is to be expected in so large a mansion, extending as it did from the Rue St. Antoine down to the banks of the Seine, there was a large garden, amply filled with vines, cherry, pear, and apple-trees, in the midst of which grew lavender, rosemary, and other herbs and plants. Nor was this all, for there was also a menagerie, where, with a royal love of rarity, lions and wild boars were kept. The spot where this stood is still marked by a street bearing the name of Rue des Lions. As to the garden, the street which is the subject of this article, the Rue de la Cerisaie, can without doubt be said to have got its name from the alley of cherry-trees which there existed.

The successors of Charles VI., however, abandoned the Hôtel de St. Paul, to dwell at that of the Tournelles; and about the year 1516 Francis I. sold a portion of the property to one Jacques Genouillac, grand master of the artillery. It was not, however, until 1551 that the rest of the property was sold to various private individuals, who soon commenced to pierce and build a number of streets, many of which took their names from parts of the now ancient Hôtel de St. Paul. For instance, as we have above mentioned, the Rue de la Cerisaie took its name from that part of the garden planted with cherry-trees; and the Rue de Beautreillis, so some say, from that part where the vine trellises were situated; while the corrupted name of the former Hôtel Puteymuce gave rise to the modern Rue du Petit Musc.

Thus we come to almost the year of the foundation of the present Rue de la Cerisaie, whose history, though the street was only then a *cul-de-sac*, commences at this point.

The first mansion that was built here was that of the financier, Sebastian Zamet, whom fortune having in every way favoured, found himself, at the accession of Henri Quatre, the distinguished favourite of that amorous monarch. With a tact which was natural in a court favourite, he proceeded to fit up his house in luxurious taste and elegance, suitable for the reception of his sovereign; in fact, we find Sauval speaking of his hôtel as the largest and most "*logeable*" in Paris. Here it was that Henri used to meet his beloved Gabrielle d'Estrées; and here were contrived entertainments which Paris, even then, was artful in getting up; Venetian and Milanese *chefs* emulating each other in promoting the voluptuous life that led to this mansion obtaining the name of the Palais d'Amour.

It was at this palace of love that, during the Lent of the year 1599, the beautiful Gabrielle d'Estrées, Duchesse de Beaufort, came to dwell, as the exactions of the court obliged her to absent herself; and here, we are told that, after having dined heartily on the Maunday Thursday, she assisted at the office of the *ténèbres* at the church of the Petit Saint Antoine; and having returned home, went to stroll in the extensive gardens of the Hôtel Zamet. It was then that, having eaten of a peach—some say an orange or other fruit—she was seized with the most dreadful pains, and, having declared that she had been poisoned, demanded that she should be taken away from the house. She was taken to the hôtel of the dean of St. Germain de l'Auxerrois, where, on Saturday, the beautiful Gabrielle breathed her last in the agonies of child-birth (1599).

Henri Quatre, however, did not abandon his visits to the Hôtel Zamet, sadly though they brought back the recollections of so many happy hours, and though the meetings were of a more serious character, especially after his marriage with Marie de Medicis (1600); he continued to come and see his old favourite until his death. Under the regency, though Zamet had died (1614), his children did the honours to the Queen-mother, until at length they consented to give up the house to Francis de Bonne, Duc de Lesdiguières (1543–1626), the last Constable of France. On the death of the Dowager Duchess of that name, the vast mansion, now the Hôtel de Lesdiguières, passed into the hands of the family of Villeroy, and it was in his second visit to Western Europe, when he came to Paris in 1717, that Peter the Great stayed at this mansion. Though some magnificent rooms had been prepared for his reception, that practical and far-seeing monarch preferred to live more at his ease, and accepted the Marshal de Villeroy's invitation to stay at his hôtel; though finding this too sumptuous, he was at least freer in his actions than at the Louvre.

A story is told connected with a matter of etiquette while on his stay here. The morrow of his arrival, May 8th, the regent, the Duke of Orleans, came to pay his homage to the Czar, and two days after this, Louis XV., now seven years old, came also. A question of precedence, however, arose on the occasion, which the ready wit of Peter solved in the following manner. Not wishing to allow Louis to precede him, and unwilling on his part to be the first to enter, the Czar took the boy in his arms, and having placed him on a seat at his right-hand side, he embraced him, and they both sat down together.

For more than a month the Czar remained in Paris, making a complete and searching examination of the capital, its men, its manners, its institutions. Before leaving, he was asked what he thought of Paris? He paused for some time, and replied, "If I were sovereign I should burn it."

In 1782 we find Jaillot, in his "Recherches Critiques sur la Ville de Paris," mentioning that "the hôtel was sold some years ago to a number of private individuals, who have pierced the Rue de Lesdiguières. The hôtel has been demolished, several houses having taken the place of it."

The block of sombre architecture, built about the latter part of the reign of Louis XV., and bearing the stamp of that period, was, however, soon neglected, and before the end of the century the tide of respectability had flowed on farther west, leaving the old place, with all its reminiscences of royalty and grandeur, to be occupied by a number of industrious manufacturers of chairs and kitchen utensils. It is this building which is now about to be pulled down, and ere long the picturesque roof line, the gables, the beautiful gate, and the square courtyard, will have disappeared under the ruthless blows of the pick and shovel.

On the same side of the street as the block of building just mentioned, at what was No. 22, lie the remains of a number of dwellings built on the site of the original house which the celebrated Philibert Delorme (1518–1577) constructed for himself. But the work of the distinguished artist had been sadly disfigured, and in vain one would have sought for the two elegant porticos with their arcades which he had erected on each side of the principal building; for the octagonal flags which paved the court; and the interior disposition of the rooms which he presided over with so much care. All this had given way to a number of ruinous dwellings, though to the careful observer a building retaining much of the style of the Renaissance, spared from the general destruction on account probably of its solidity, was discoverable. The architecture was more sober in its ornaments, less detailed, less tormented, so to speak, than most of the monuments of that epoch,—a fact which is easily explained by the end which the illustrious architect pursued. He wished a dwelling-house which should at the same time be agreeable and commodious,—a dwelling, in fact, which he did not wish should rival those royal buildings on which he had expended all the riches and luxury of art.

But before we leave the old street, let us mention the house now marked No. 13, which will not give way to the general demolition which is taking place all round it. It stands exactly opposite the site of the Hôtel de Lesdiguières, and is easily recognisable by the medallions and other remains of an older building, let into the walls of the more modern edifice. It is here, though some doubts have been suggested on the subject, that Titon de Tillet (1677-1762) lived, for we find Jaillot remarking in 1782 that "*vis-à-vis* the Hotel de Lesdiguières was the house of M. Titon de Tillet, who, in perpetuating by his Parnasse Français the memory of our most celebrated poets and musicians, has merited that his name should pass to posterity." This Parnasse Français, now at the Bibliothèque Nationale, at Paris, was a group in bronze, executed in 1718, by the orders of Titon de Tillet, representing the Mount Parnassus, at the summit of which was Louis XIV. in the figure of Apollo, while under him were three celebrated ladies of the period, typical of the graces, and under them again nine of the famous poets and musicians* of the day, representing the Muses.

This house of Titon de Tillet (with its exceedingly picturesque and well arranged *rez-de-chaussée*), together with some few others in the Rue de la Cerisaie, will long exist as a delightful contrast to, and within a few feet of, the new Boulevard Henri IV.

AN EXHIBITION FOR SOUTH AFRICA.

THE South African International and Intercolonial Exhibition will (says the *Manchester Courier*) be opened at Cape Town, on February 15th, 1877. The building will be in the gardens of the Masonic Lodge of the Goede Hoop, adjoining the House of Assembly. The land has been freely placed at the disposal of the committee by the ancient and wealthy Lodge of Freemasons to whom it belongs. The promoters of the Exhibition, merchants and members of the Legislative Assemblies, do not sin on the side of ambition on the programme they have put forth. No attempt is made to cause the Exhibition to be an art gathering. Utilitarian objects, and such as are usually sought in the infancy of a vigorous colonial community, are pursued. The Exhibition will include manufactures of all kinds, which are at present largely imported into the colonies from the several countries of Europe, and it will include the various kinds of material for manufacture which form the colonial produce. The sixth class is devoted to hardware, edge tools, cutlery, metal work of all the kinds known to Sheffield or Birmingham, such as nails and screws, knives and forks, bolts, locks, latches, hinges, pulleys, galvanised iron, hollow ware, tin ware, fireproof safes, doors, &c., telegraph and tram wires, bells, wire, and wirework. The tram wires are an article largely used in working the diamond mines. The seventh class comprehends all kinds of machinery except agricultural, — cranes and hoists, road-engines, weighing-machines, pumps, manufactured parts of buildings, as sash-blinds, mantels, bricks, tiles, cements, sanitary appliances, &c. Lightning conductors, which are extremely necessary in those colonies, and particularly in Natal, will be entered in this class. Gold and silver medals and diplomas of merit will be given to successful exhibitors.

Goods intended for the Exhibition should be shipped from London not later than the first week of December, 1876. Mr. Edmund Johnson is the Commissaire Délégué of the Exhibition in Europe, and the central European offices are at No. 3, Castle-street, Holborn.

The building is being prepared in this country of glass and iron, in the style of the 1851 Exhibition. With the materials will go out workmen to put them together, as the demand for labour in the colony for railways and agriculture leaves few hands to spare either for manufacture or construction.

Slates from America.—The *Mining Journal* understands that a cargo of slates has been sent from New York to Lowestoft. They are stated to be equal in quality and much cheaper than those brought from the Welsh quarries.

* Corneille (1606—1684), Molière (1622—1693), Racan (1589—1670), Segrais (1624—1701), Racine (1639—1699), La Fontaine (1621—1695), Chapelle (1626—1686), Boileau (1636—1711), and Lully (1633—1687).

THE ART VIEW OF ARCHÆOLOGY.

THE Tree of Knowledge of good and evil in things architectural, which, in early times, when it was fenced round and protected from the intrusion of the multitude, yielded such tempting and delicious fruit, has hardly of late years, —and after the removal of the fence,—produced results worthy of original promise and the current miracles of learning and investigation which are now performed under its extended branches. The prevailing rage to know everything concerning, not only the private life of distinguished contemporaries, but also that of their ancestors from the earliest period, is reflected in the sayings and doings of those large numbers of people, through the length and breadth of England, who, during the last few weeks, have been in pursuit of change, pleasure, health, and archæological knowledge, both historical and artistic. Let it not, however, be supposed that this is the beginning of an attempt to depreciate the value of such sayings and doings, or to ignore the great diligence, unbounded hospitality, and natural enthusiasm, which have characterised several recent excursions. But it is only right that the critics, who have looked on at a distance, should try to gauge results, or at least comment upon some of the suggestions, possibilities, and facts produced by the actors at any immediate scene of local excitement.

That "prejudice for antiquity," as it has been called, which more particularly distinguishes a portion of English society at the present day, is to be met with in most of the ancient writings; but, because undoubtedly our means are more ample, we go further than our ancestors, and illustrate by practice what they only advanced in theory. Indeed, the enormous sums that have been spent upon the "restoration" of large churches and cathedrals, sometimes situated in the heart of small towns of no commercial importance and of slight population, while the country around—sometimes a mining district—has been left without a sufficient number of clergymen to take charge of it, has been the cause of just dissatisfaction amongst many very good conservators. The inestimable example, however, which is set, often to a whole county, by a well-tended and well-preserved cathedral, must be patent to all, although the Bishop of Durham is courageous enough to think and act in opposition to the almost general sentiment. It is probably with some well-defined intentions that he refused to assist in the service at his cathedral held on the completion of works of restoration just effected there; and the apparent difference which has arisen between his lordship and an archæological canon of Durham itself, supported by a large number of local clergy and laymen (so runs the report), would seem to show that the fathers of the Church are not all arrayed on the side of antiquarianism and the affected revival, in an age of School Boards, of many things which are necessary only to those who can neither read nor write.

The manner in which the works of the Middle Ages were but recently regarded,—the almost contemptuous reference to the arts and learning of their Mediæval forefathers made by the Augustan worthies of a hundred years ago, both in France and England,—is probably at the bottom of the reaction which set in amongst a limited few at the beginning of this century, and which is now at the very height of its successful and triumphant career. When it is remembered how much abuse, both in prose and poetry, had been levelled at the "Goths and Vandals,"—the barbarians who had laid low the civilisation of Europe, and whose descendants pretended to refinement in the arts!—it is easy to understand the feeling amounting to enthusiasm with which the light of our time broke upon the "dark ages." Dryden, who had sung the glories of Greece and Rome, closed his eyes upon the world until "Raffaelle's age," and wrote of the interregnum, when—

> "Long time, the sister arts, in iron sleep
> A heavy Sabbath did supinely keep."

Addison, in his "Vision of False Wit," "discovered in the centre of a very dark grove a monstrous fabric, built after the Gothic manner, and covered with innumerable devices in that barbarous kind of sculpture." He described the deity of the place as a monk, "with a book in one hand and a rattle in the other." On another occasion he made a comparison between the mental effect produced by buildings constructed in the classical and the Mediæval manner. "Let any one reflect," said he, "on the disposition of mind he finds in himself at his first entrance into the Pantheon at Rome . . . . . and at the same time consider how little in proportion he is affected with the inside of a Gothic cathedral, though it be five-times larger than the other, which can arise from nothing else but the greatness of the manner in the one, and the meanness in the other." Then, again, so consummate an observer of human nature as Fielding talked with the rest of "centuries of monkish dulness, when the world seems to have been asleep"; while Dr. Johnson, who held very decided opinions upon the utilitarian character of architecture, and expressed them in his own uncompromising phraseology, maintained that sculpture consumed labour disproportionate to its effect. A fellow," cried he, "will hack half a year at a block of marble, to make something in stone that hardly resembles a man. The value of statuary," he continued, "is owing to its difficulty. You would not value the finest head cut upon a carrot." Even technical books published less than seventy years ago ignored, as in the case of Rondelet's celebrated "Art de Bâtir," the Mediæval methods of construction, and barely mentioned a pointed arch or a high-pitched roof. Yet a few thoughtful persons had already acquired some insight into the character of these despised marvels of the building art. They began to talk of them with something of the same diffident admiration that Philibert de l'Orme displayed while discoursing about the same things in the sixteenth century. But although Horace Walpole had built a cloister, and a tower, and an octagon room, and was living in them in 1770; although Windsor Castle was re-arranged about 1830, and made to combine the external effect of a fortress with the internal comforts of a modern residence, the popular recognition of the great building truths left on record by the workmen of the Middle Ages did not take place until the present Palace of Westminster was half-way to completion. Then raged the great Battle of the Styles,—a war, which (and is it not a strange and significant fact?) no provocation from either ranks of the original combatants can now rekindle. Then the "Goth" exulted over his undoubted victory; "so that now," to quote the ever-consistent language, when discussing this subject, of Mr. Fergusson, "there is not a town, scarcely a village, in the length and breadth of the land which is not furnished with one of those forgeries (Mediæval churches); and so cleverly is this done in most instances, that if a stranger were not aware that forgery is the fashion instead of being a crime, he might mistake the counterfeit for a really old Mediæval church."

Nevertheless it is certain that this passing period of revival, due to the study of old stones, has been the means of collecting, sifting, and analysing information which must for ever be useful, if not indispensable, to the students and practitioners of a no remote future. In fact, so large is the accumulation of archæological matter, so numerous are the books of reference, so varied and extended the illustrations, that they are at once the triumph of modern architects and the ruin of modern architecture; for it is no longer necessary to think, when all the thought of the past is portrayed in convertible characters upon a thousand pages, ever open for the public use.

But the archæological mania, so to speak, has a technical aspect, which, even in its abuse, is not altogether disadvantageous. The present generation has been brought up to feel a learnedly superstitious veneration for, — not alone antiquity, but—antiquated things. While a neighbouring nation is under the constant fear of encountering an inevitable political deluge, the youth of England are taught to fix their eyes upon an artistic creation dating, if we are to judge by reports of recent papers and speeches, from the infancy of Alfred the Great. To possess a church which contains Saxon remains is the highest aspiration of the English antiquary; and why not, may well be inquired, if only to preserve love of country and race, in all its present force and integrity? The authentic history of England possesses few memorials earlier,—and those are scattered or so mutilated as to be of small value,—than, say, to be on the safe side, the Heptarchy. It is quite right that we should study, compare, and discuss them; and, moreover, as has been just done, inquire into the habits and character of the people,—of giants, saints, martyrs,—they remain to commemorate, whose history and sometimes effigies are offered to the adoration of a section of the scientific world which subsists by an inherent desire to believe. It would, however, be well not to entirely forget that hundreds of years before our era of recorded antiquity there existed, at a distance from our shores—not giants, nor saints, nor martyrs, as we understand them—but ordinary flesh and blood like ourselves, men who thought and acted as we do in this year of grace; sculptors, painters, architects, who did as well as, if not much better than, we have done throughout our thousand years of national existence; historians, poets, burlesque-writers; senates, and assemblies; communities of politicians; as well as schools of philosophy, on which is founded the amended thought of the modern world. Of course those who have lately melted over grotesque carvings in the Eastern Counties, or the prowess of Tre, Pol, and Pen in a western colony of Phœnicia, are aware of these facts. They are merely hunting up local traditions, historical spots, and rare old stones, for the sake of improving an acquaintance with their own country, and adding it to a reserve store of information relating to the great thinking eras of Greece and Rome. Of course, they do not uncover pet bits of herring-bone walling, or zig-zag ornament on coarse Romanesque arches, for the purpose of reproducing similar effects in "Saxon Revived," or some yet-to-be-evolved resuscitation of a Norman style. Men go, and architects in particular, to improve their knowledge of original native art; to ferret out objects which must at any cost be preserved; and to protest, in sometimes strong language, against the possible vandalism of society outside the archæological pale.

Archæology pursued by the few is an entirely modern study, not much older than the century; pursued by the many, it is a co-operative recreation of our own time. It has produced, what Lord Carlingford, at Colchester, very truly said was wanted,—"a certain tenderness for 'old, unhappy, far-off things,' and even for old and ugly things." This tenderness has been strengthened by a little knowledge of the things in question; and thus all classes of the British nation have been induced to touch old walls and images with a soft hand; to regard a ruin with veneration; in fine, to respect that which, if not always the common property, imparts in one way or another wholesome pleasure and instruction, and also a kind of refinement to all people, high and low. But although this same tenderness for historical monuments has been exhibited in indignant pity for the manner in which they were once treated, this same knowledge, even where most exalted, has not been deep enough (the ancient philosopher spent a lifetime in learning that he knew nothing) to prevent sometimes destruction practically as complete as that caused by the much-abused ignorance of the last century, and even the iconoclasm of an earlier period. We have said that archæology is a modern science; but it is also, and it must of necessity be, an ephemeral one. Imagine a learned society, engaged four hundred years hence, in analysing the great architectural works of the present day, referring to our pages for information concerning the architects who designed them and the artisans who worked upon them; imagine the perplexity of the situation when a question arose as to what was genuine and what restoration in a real Mediæval church or cathedral! All the affection that the modern artist is capable of feeling has been expended upon the successful task of translating a native building, five, six, or seven hundred years old, into a state of completion such as none of its numerous builders would recognise could they see it at the present moment—into such an entirety perhaps as never before existed at any given period of its chequered history. And this—the once benefit, now bugbear of Restoration—is the result of diving into the past; ay, more, it is the only means, in the present complication of artistic traditions, of acquiring knowledge. You cannot have your cake and eat it too. You cannot filch treasures from the buildings of the past and maintain those buildings in their historical integrity. The archæologist has loved and lived, and a brilliant future is awaiting the architect, or engineer, or whatever another century may choose to call him. It seems as if the great changes of the European world, deciphered by its monuments, could be counted by cycles of four hundred years. See Greece four centuries before Christ; Rome in His time; then, at the beginning of the fourth century, the triumph of Constantine, and, at the close, the division of the Roman Empire, perhaps afterwards relative happiness, seeing that history records little of

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that age; the eighth century and the advent of Charlemagne, who, with

> "....his brave peers, each with his visor up,
> On their long lances lean, and gaze awhile
> When the Venetian to their eyes disclosed
> The wonders of the East;"

—the twelfth, and mutiny amongst the workmen of Western Europe, "Renaissance en Occident," as M. Viollet-le-Duc has called it, and the beginning of the great architectural era in France, Germany, Spain, and England; the sixteenth, and that sudden discovery of the ancient literature and learned amazement at the wealth of Greek and Roman civilisation; and lastly the twentieth—it is not many years off—when it shall be the custom for Englishmen not only to read and write and talk, but also to build, in the language of their own time.

NOTES DURING A TOUR IN GERMANY.

Aix-la-Chapelle.—The restoration of the cathedral here is progressing, under the superintendence of M. Bethune, the Belgian architect. All the plaster has been stripped off the walls of the circular portion of the church, and this has brought to light some remains of the ancient mosaics. A portion of the mosaic in the dome has been restored. A high altar, surmounted by stone baldacchino, has been erected in the choir apse, and another altar, with lateral curtains suspended from metal rods supported upon brass columns, at the west end of the choir. Both are fair in design, but it seems to us that the order of things should have been reversed, and that it would have looked far better had the baldacchino altar been placed at the west end of the choir, and the altar with the suspended curtains been erected in the apse. The great north transept has been restored and decorated tolerably well. Some new statues have been placed in the niches of the choir buttresses. They are excellent, and amongst the best examples of modern Gothic sculpture we have seen anywhere. The front of the town-hall is being restored pretty well. A great number of new houses are being erected all over the place. They are alike detestable in design and construction: worse examples of domestic architecture are not to be found, even at Bayswater!

Cologne.—The west front of the cathedral is approaching completion. The great western window and gable are finished. The south-western tower has been carried up as high as the arches of the windows in the octagonal lantern, and the north-western tower is only a few feet lower. We are sorry to say that the nearer this great façade approaches completion, the less satisfactory is its effect. There is an entire want of that repose and quiet dignity which we are accustomed to see in the west fronts of our own cathedrals. Nor is this replaced, as is the case in the great French west fronts, by a magnificent effect of light and shadow. Instead of the solemn gloomy grandeur of the great portals of Amiens or Rheims, we find at Cologne nothing but tameness and correct architectural insipidity. It is a great pity that the modern architects of Cologne Cathedral did not take advantage of the lesson taught by their Mediæval predecessors at Strasburg, Antwerp, and Vienna, and carry up *one tower first*. They would then have seen, as did those great artists, that the single tower was quite sufficient for the effect of the building, and would have abandoned the idea of carrying up the second tower, and thus they would have avoided the painful monotony and uniformity which render this front so exceedingly uninteresting. That the Mediæval builders had abandoned the idea of carrying out the design now being executed is proved by the fact that the small portion of the north-western tower which they *did* build varied considerably from the ancient drawing and also from the south-western tower, proving that they foresaw the monotony of effect which would arise from too close adherence to the original design, and determined to avoid it. The terrace which surrounds this church, except upon its south side, is now completed, and is as great a disfigurement to the building as we always predicted that it would be. It is either too wide or too narrow,—viz., it is too wide to form a basement-table to the church, as is done at Ratisbon; and too small and insignificant to convey the idea of the church being constructed upon a solid platform, after the manner of the classical temples. It is, in fact, simply a mistake and a disfigurement, and we sincerely hope that it will be cleared away and replaced by a grass slope, or an incline covered with flag-stones. The meaningless fountain at the east end, just under the noble apse, is another feature which might well be removed and carted off to the garden of the nearest *restaurant*. Some ancient glass of various dates has been placed in the windows of the west aisle of the north transepts, which forms an interesting addition to the vast store of ancient stained glass adorning this noble cathedral.

The restoration of the church of St. Mary "on the Capitol" is now nearly completed, and is, perhaps, the finest example of modern decoration in Germany. The whole church has been covered with really fine painting in the Romanesque style. A noble pulpit of granite and marble, supported upon columns which rest upon the backs of very Venetian-looking lions, has been erected. Two beautiful side-altars, the reredoses of which are formed by various small subjects engraved on copper gilt, surrounded by borders of enamel, with large crystals marking the corners, have been set up against the eastern columns of the crossing, and the whole of the floor of the church is being laid down in mosaics of black, white, and red marble. This restoration is in every way a highly commendable one, as not a single object of interest of any date has been removed out of the building; and although the style adopted is Romanesque, in accordance with the general style of the building, yet all the furniture and additions of a later date have been carefully retained, even the Renaissance altars and screens.

The church of St. Martin the Great is now undergoing a complete restoration, and is being decorated by Kleinertz, the clever decorator of St. Mary zu Capitol, already mentioned.

Our readers who recollect picturesque old Boppard will be horrified at the rows of new houses facing the Rhine, and the once quaint old villages of St. Goar, St. Goarhausen, Caub, Bingen, and Rudesheim look as uninterestingly neat when seen from the Rhine as our own Margate or Ramsgate.

The fine old Romanesque parish church at Baccarach, which was burnt down about three years ago, has been rebuilt, except the tower, which still remains a ruin, and the elegant spire, which formed such a picturesque object, is now looked for in vain.

The cathedral at *Mainz* is undergoing a restoration at the hands of the well-known Dutch architect, Mr. Cuypers, of whose works we have so frequently spoken in terms of the highest praise, especially his excellent restorations, and as this is the case we feel no scruple in finding fault with what he has done here. We cannot conceive what could possibly have induced him to replace the beautiful fourteenth-century octagonal lantern, which rose so gracefully over the eastern choir, by the present heavy-looking Romanesque structure. We have always praised Mr. Cuypers's restorations as being so remarkably conservative, but really this is one of the most destructive pieces of restoration that has ever come under our notice. We should be glad to hear what reasons could be brought forward to justify what, we must say, at present, seems to us a most barbarous act of destruction. The interior of the eastern choir and the south aisle of the nave are also undergoing restoration, and of this portion of the work we can speak in the highest praise. A new altar in the old German style, with great painted doors and gilded canopy work, is an excellent example of modern church furniture, and forms a singularly pleasing and picturesque object.

Würzburg will cause great lamentation among the artists; its picturesque old walls, gates, moat, and glacis are all being involved in one sweeping act of destruction, and their places are being occupied by rows of the most hideous houses that could ever have haunted Prout in his worst nightmare. Amongst these, *a sham castle painted chocolate colour* is a *neat* example of modern Bavarian taste! The fine old garden of the palace here has been very much spoilt by modernisation. A German friend of ours, an old inhabitant of Wurzburg, deeply regretted these tasteless alterations, and told us that all over Germany there seemed to be a spirit of indifference to matters of art, and that where men a few years ago took a pride in making their houses and towns beautiful, now all that is thought of is to realise as much money as possible with the smallest possible outlay, and certainly a comparison between the houses erected in Germany twenty years ago and those now being built will convince any one of the truth of this remark.

The interior of the churches of St. Mary (Marienkapelle) and St. John the Baptist (Stiftshaus) has been creditably restored.

The suburbs of *Nüremberg* are growing more and more, but the so-called "Mediæval style" adopted here is perhaps even worse in its Brummagem vulgarity than the utter want of style adopted at Würzburg. Ratisbon is at present little altered, but the old Danube bridge is threatened, and the old gate-tower is unfortunately shortly to fall a victim to the demon of modern "improvement." The restoration of the exterior of the cathedral here is complete now, and we are able to speak of it in terms of great praise. The west front is far finer than that of Cologne, and the spires are in good proportion and not too large for the church. The beautiful stone of which they are built has already assumed a look of antiquity, so that they harmonise well with the rest of the building, and add greatly to the beauty of the distant views of this most picturesque town.

The interior of the old Scotch Benedictine church of St. James has been restored, the plaster and whitewash which disfigured it are removed, and a new high altar of metal work, in the Byzantine style, has been erected. We cannot, however, praise either the decoration of the choir or that of the roof of the nave. The new building for the cathedral clergy residence is simply detestable; it is in the very worst modern Nüremberg style, and the new seminary is in the worst Würzburg style, or *no* style. We are sorry to have to say so, but what we have seen in this tour through a considerable part of Germany does not encourage us in the hopes which we once entertained for the future of German architecture. Nothing which we have seen shows any advance upon what was being done ten or twenty years ago, whereas mean, paltry, cheap building is greatly on the increase. Where honest brick and stone used to be employed, stucco is now brought into requisition, and the pretty decoration for which the Germans were well known has given way to whitewash and stone colour.

ANCIENT MASONRY.

THOSE who attended the Archæological Congresses just ended must have been struck by the many specimens of ancient masonry presented to their notice, as well as by the various and exceedingly diverse opinions expressed thereon by well-known experts and skilled archæologists. To the looker-on as well as to the student of antiquity this conflict of opinion must be exceedingly disappointing and unsatisfactory, yet it shows how much still remains to be done to make the classification of masonry understood, and to enable even experienced eyes to say this is Roman and that is Norman, this is British and that is Saxon. Much of this uncertainty is due to archæologists working in isolated fields of research, and from the examples constantly before their eyes, judging of work executed in other places and under other conditions at the same period.

The first discussion on ancient masonry commenced at Colchester. Again and again has Colchester been the theme of antiquaries. There is always some one who, knowing Colchester history, and reading of Camulodunum Colonia,—of its defence by the veterans of the legions when attacked by the revolted Iceni,—see in the solidly-built keep of the castle Roman work, and proclaim it to be the Temple of Claudius erected in the first century, whose site was consecrated by the lives of the first Roman colonists. In vain is it pointed out that the plan of the castle is essentially Norman in its character, and though it has brick bonding courses, and much brick and tile has been used in its construction, there are other examples in churches of known date to prove that the Normans, in a country where stone is scarce, availed themselves of the most common material, and erected their edifices *more Romano*, as it is called by old writers, as far as material is concerned, but still keeping to their own elevations and ground plans. Those who took the trouble to compare the oldest portion of Colchester walls, which are undoubtedly Roman, with the *castle*, would see a marked difference in the workmanship and mode of construction, though the walls have been repaired at different dates. More than a generation ago Mr. Matt. Bloxam published, in the *Archæological Journal*, a dissertation on the combination of brick and stone in ancient buildings, and then, as now, this veteran archæologist could not assign the keep of Colchester to the Roman, or even the Saxon, period. The resuscitation of the

exploded idea that Colchester Castle was "the templed citadel of Claudius Cæsar" shows how strong is the tendency of local feeling to give weight to shadowy allusions, and to create a theory out of an illusion. The emphatic expression of opinion of Dr. Freeman and Mr. J. H. Parker that the Rev. H. Jenkins and Mr. Buckler have been misled by apparent likenesses, will be accepted by many as settling the controversy in favour of the present edifice being constructed by Eudo Dapifer.

By a curious coincidence, not later than Thursday, the 24th ult., a similar controversy was raised on the summit of the inner vallum of Old Sarum, respecting the age of a piece of masonry—the only piece of ancient masonry which exists above ground outside the fosse of the Norman keep. Here, broad and general antiquaries of experience, like Roach Smith and J. H. Parker, found themselves at variance with those who, without irreverence, may be called local men. Mr. Roach Smith pointed out the curious fact that though this was undoubtedly one of the *oppida* captured by Vespasian and occupied by the Romans, scarcely a vestige of Roman occupation had been found; yet, like Stukeley, he thought the fragment of masonry, with its wide-jointed ashlar work and characteristic set-off, was part of the Roman castrum erected in Sorbiodunum. The Rev. J. G. Joyce and the Rev. Prebendary Jones argued the absence of bonding courses of tile in construction, and of pounded tile in the mortar; and though it would not appear strange to use chalk rubble on a chalk hill, they leaned to the opinion, evidently, that the masonry was part of a wall that encompassed the top of the mound built in Norman times. Mr. Roach Smith doubted that such a wall ever existed; but the tenant, Mr. Marsh, said the foundations were yet to be seen. Time did not permit of excavations, which would have decided that one point, at any rate.

The examination of ancient masonry by archæologists cannot be too carefully done, when there are conflicting circumstances, and neither moulding nor date to guide the experienced eye. Those who went to the Cornwall Congress of the British Archæological Association, and joined the Salisbury meeting of the Wiltshire Society afterwards, had a fine opportunity of inspecting some of the most ancient masonry in the kingdom. The fortifications at Worle, near Weston-super-Mare, and at Chune Castle, near St. Just, are amongst the best examples of rubble fortifications which remain to us. There is no cement, no mortar, nor signs of any having been used. The stones have been collected, arranged, and piled one on another with skill, and according to a definite plan, for the purpose of refuge and defence. More inhospitable spots could scarcely be chosen. Both have signs of circular dwellings within the compass of their inner walls, and have their entrances so arranged as to afford the defenders every advantage. These castles never had their ramparts cased in earth, like those in Leigh woods or the one on Edge Hills, in Warwickshire, at Nadbury, where the stone rampart is supported by earthen banks. The stonework in the neighbourhood of Chune is very interesting. The cromlech in the immediate neighbourhood of the castle, known as Chun Quoit, has a table-stone, 12 ft. 6 in. in length and 11 ft. 6 in. in width, forming the roof of a kistvaen, formerly surrounded by a barrow or cairn of small stones similar to those forming the ramparts of the castle. This is a different arrangement to the larger Lanyon Quoit, the table-stone of which is 47 ft. in girth, 18 ft. 6 in. long, and 9 ft. in width. This immense stone is not supported on slabs, but by three stone pillars, and, in Mr. Borlase's opinion, was never surrounded by either a cairn of stones or an earthen barrow, though the latter is probable. There is some reason to believe that the underground dwellings at Cairn Uny may belong to the era of the cromlech. The passages are built of stones, and the roof is formed of slabs of granite, and, indeed, a cromlech, surrounded by the stone barrow, is to be seen a few fields off, a good example of the manner in which the stone kist was preserved from the intrusion of animals and the influence of the weather. There is no doubt that these structures date from a far-gone age.

Perhaps the most curious point discussed was the age of the circular rubble walls which enclosed the stone circle known as the "Nine Maidens," at Boscawen-Un. The discovery of another circle during the visit of the British Archæological Association, which is surrounded by a similar wall, and which is as yet unexplored, will throw considerable light on this question; for, if the circular wall is contemporaneous, or even of an early date, it will go far to support the opinion that if these stone circles were not originally sepulchral, they were used as places of sepulture at a very early date, as instanced by the rude pottery and implements found within them. It should be observed that not one of these stones bears the mark of any tool or signs of any dressing whatever. This is far different from the vast stones which form the circle on Salisbury Plain.

Stonehenge must be taken to be the oldest example of worked stone in England, if not in Britain; yet here we have a series of monoliths, unworked, of stone foreign to the locality, surrounded by a circle of local Sarsen stones fitted with tenons which hold a mortised stone impost, the tenon and impost being carefully worked; indeed, one of the fallen imposts shows yet the mark of a tool, but whether metal, flint, or stone, no one has determined. An inner arrangement of "foreign" stones in the shape of a horse-shoe is also supported by corresponding trilithons, and what is called the altar-stone is from a different quarry altogether. It is doubtful whether the inner horse-shoe stones have been worked with tools to their present pyramidal form, but the foreign stone which lies on the left-hand side of the entrance has had two cavities worked in it for some purpose, and is therefore remarkable. So remarkable is it, that in some of the attempted restorations of Stonehenge, it is assumed to have been one of three imposts of foreign stone; but there is nothing to justify this assumption. If the newly-discovered stone circle in Cornwall turns out to be in its primæval state, the outer circle of rubble may have some relation to the outer circle at Stonehenge.

It was during the Colchester Congress that Mr. J. H. Parker made some pertinent remarks respecting what is called "herring-bone work." He pointed out that it might be of any age, but, curiously enough, the dated examples at Rome are of the eleventh century. As we frequently find "herring-bone" work in the foundations of old churches, and as there is a fine example in a narrow causeway over the fosse at Tamworth Castle, attributed to Æthelflæda, the daughter of Alfred, we should bear this remark of Mr. Parker's in mind. At Silchester, however, there are specimens of herring-bone work in the outer wall, which appears to have been a whim of the individual mason.

Skilled archæologists are always chary of placing fabulous dates on old masonry. Yet nothing is so common as to hear assertions made of this being Saxon or the other pre-Norman, whenever an unusual arrangement is seen, when, in reality, the variation and ruder shape are caused by the difference in hardness of the material used and the position of the district. We should never forget, when speaking of masonry, the researches of M. de Caumont, who, on investigating the castles of the Norman barons who accompanied the Conqueror, came to the conclusion that none of those prior to the eleventh century were constructed of any other material than brick and wood. The earliest stone keeps of Norman date were those of England; and the one built by Gundulph at West Malling, in Kent, known as St. Leonard's Tower, was said by M. de Caumont to be earlier than any similar building in Normandy itself.

THE UNIVERSAL INTERNATIONAL EXHIBITION OF 1878.

IT cannot be said of this project that it "drags its slow length along"; and the rapid progress it is now making, on paper at least, already supplies an *embarras des richesses* to those seeking information relating to the leviathan.

Any one visiting the systematically-arranged offices at the Palais de l'Industrie within the last few days, must have observed—especially if he were not himself warmly interested in any "tender"—the evident anxiety displayed on the generally well-governed countenances of the host of contractors on their way in and out of the various departments. And well may the contractors feel some anxiety, for the work they have before them between this date and the end of next year is indeed no light business.

We have under our eyes at this moment the book of general conditions and clauses imposed on the contractors.

Clause 1 comprises the conditions to be fulfilled, in order to be admitted to the adjudications, consisting of certificates of capacity, bail, &c.

Clause 2 forbids the contractors to undercontract without authorisation; it regulates the order of service for the execution of the works; exacts the presence of the contractor on the ground; throws on him the responsibility of the choice of his clerks, foremen, and workmen; it indicates the quality of the materials, their dimensions, and disposition, &c.

Clause 3 establishes the regulation of the expenses.

Clause 4, the payments.

Clause 5 occupies itself with the difficulties and disputes that may arise between the chief engineer and the contractor.

It has been owing to these preliminary arrangements, which are not yet completed, that the actual work on the Champ-de-Mars is still uncommenced, and no later than yesterday might be seen, for the last time however, the accustomed manœuvres of the military.

Notwithstanding that most of the journals here have announced that the ground had long since been broken, the only work that has yet been done has been the levelling to which we have already re'erred; but that levelling is but geometrical, and has been made to assist the work of laying down the canals of irrigation, the gas conduits, and other underfloor contrivances, which in themselves will exact several months' labour.

Within the last two days the official plans have been distributed, and we reproduce from the *Rappel* and the *Gaulois* the following intelligence, which we hope will be useful to our readers, as here in Paris the rest of the world is expected to contribute largely.

The *Gaulois* says in its issue of the 2nd inst.: "The regulation of the Universal Exhibition of 1878 will appear in some days. . . . . We have been able to procure this important document before its appearance, and we will give several extracts which it is important that the public and the exhibitors should know as promptly as possible.

Article 7 states that the Foreign Commissioners constituted at the demand of the French Government are invited to enter into relation with the Commissioner-General as soon as possible.

Art. 9. In each section consecrated to the exposers of the same nation, the objects exhibited will be divided into the following nine groups:—1. Works of art; 2. Education, instruction, material, and processes of liberal arts; 3. Furniture and its accessories; 4. Tissues, clothing, raw and worked-up products; 5. Extractive industries; 6. Tools and processes of mechanical industries; 7. Alimentary products; 8. Agriculture; 9. Horticulture. A special room is reserved to retrospective and ethnological exhibitions.

Art. 10. A methodical and general catalogue of the products of all nations, indicating the places which they occupy in the palace, parks, or gardens, will be got up by the care of the Commissioner-General. Each nation, however, will have the right to make, at its own expense, and in its own language, a special catalogue.

Art. 13. The French or foreign exhibitors will have no rent to pay for the space they will occupy in the Exhibition.

Art. 16. Are admissible to the Exhibition, the works of French and foreign artists executed since May 1st, 1867."

Here is what the *Rappel* says on the plan of the Exhibition:—"The quadrangular form has been adopted. It has, over the ovoid form employed in 1867, the advantage of rendering the construction more easy and more rapid, and permitting the materials after the demolition to be more easily carted away. It facilitates for the machines the transmission of the movement. Lastly, the *coup d'œil* which the galleries will offer will gain incontestably by it. The view, instead of having nothing before it but arcs of circles, and a consequently circumscribed horizon, will see in all its length, and at one time, the display of the different rooms.

The quadrangular form will not hinder one from traversing the Exhibition as in 1867, either in the order of the nationalities or in the order of the products. The nationalities will be distributed in the longitudinal galleries, and in each of these galleries the similar products, ranged in a like order from one extremity to the other, will be distributed according to the order of the transversal galleries. One can then, according as one will take these in one direction or another, visit either the whole of the exhibits of one

nation, or the whole of the similar exhibits of all the nations.

In the interior of the Exhibition the Fine Arts will occupy the central part, separated from the other bays by a passage open to the air, sheltered by awnings. Two large vestibules, ornamented with statues, will be erected at the two extremities of the building, one looking towards the École Militaire; the other, towards Trocadéro. They will be 25 mètres broad and 16 mètres high. They will be constructed in freestone. Their ceilings will be painted. The cafés, restaurants, *brasseries*, and bars will be excluded from the palace, and situated either in the gardens or on the Trocadéro.

In the *annexes* in the lateral gardens on each side of the Exhibition, will be disposed the services of administration, the smaller *matériel* of agriculture, and the alimentary products.

The space covered will be 240,000 mètres square. It was only 153,000 in 1867. The park between the palace and the Seine will have a superficies of more than 10,000 square mètres. As to the Trocadéro, and the bridge which ought to traverse the river, the definite disposition are not yet agreed upon."

It has been suggested here that England and English-speaking countries have on other similar occasions been backward in their expression of a desire to participate in such great undertakings, and on former occasions England has deferred until a late hour taking any active steps to avail herself fully of the advantages here offered. In high quarters, and in cases where the loan of rare objects is sought for, the objections connected with delay are less, owing to the consequence that can be attached to a Government desire, backed up by authoritative and influential requests.

The manufacturers and the artists in England, however, seem disposed not so much to regard such exhibitions with indifference, as to procrastinate with almost an appearance of a wish to back out from a competition which, if readiness and confidence were shown in their desire to contribute, might lead to very unexpected and advantageously enduring results.

Paris, September 3rd.

BARROW-IN-FURNESS.

RIVALLING some of the new-born towns on the north-east coast, Barrow-in-Furness has strong resemblance to Middlesbrough. With the sites both of these towns there were associations of the dim past; looking back two score years both of them could count their inhabitants by a few hundreds, and both now number more thousands than they did then hundreds. At both, the iron trade has made the fortunes of the new town; the practical greatness of each, and the resources around, have been developed by foreigners; and without exhausting the points of resemblance, these may be closed by affirming that each has well repaid its obligation in the latter respect.

Surrounded with antiquarian associations, in a district boasting of old towns like Cark and Cartmel, with Swarthmoor preserving the remembrance of Simnel, and its ancient hall enshrining the memories of the first Quakers, with Dalton boasting of its Roman castle, and the glorious ruin of Furness Abbey telling of the princely style of its abbots and monks, Barrow passes largely unheeded by historians, but the curious who care to picture the desolate scene of its site two centuries ago may see the details in the journals of the early Friends. Suffice it to say that thirty-six years ago, the site of the town was only occupied by an inn, a farmhouse, and half a dozen cottages; that a score of years ago the place was an "inconsiderable hamlet"; and that, but not till 1859, the value of the mineral deposits around it began to claim attention. Even since then, one of our best "Gazetteers" deemed that all worth saying about Barrow was said when it recorded the fact that it was a "village and chapelry in the parish of Dalton-in-Furness, and that the living was a curacy in the gift of the Duke of Devonshire valued at 140*l.* per annum." A less brief description will be demanded of future describers. In a sentence, pregnant figures may hint at the development of the town and its trade, by recording the growth of its population, which in 1847 was 235; in 1861, it was about 3,000; in 1864, it had grown to 10,068; in 1871, it was 18,245; and that mushroom rate of growth is more than continued, for a census of the corporation states its population this year at 41,000. And just as Middlesbrough owes its increase to the Cleveland iron ore, so Barrow dates its progress to the working of the vast stores of hematite iron which, though worked for hundreds of years, yet, within the memory of the living, only afforded employment for "half a dozen old men" who "scratched up a little of the best" of the ore, leaving to this and future generations the raising of millions of tons.

Scrivenor's "History of the Iron Trade" (1841) quotes from West's "Furness," it is true, a passage, to the effect that "three miles to the west of Ulverston is Whitrich, the Peru of Furness," where iron ore is found, which, raised at "3s. 6d. and 4s. per ton," pays "1s. 6d. to the lord of the soil," is carted to vessels at a further charge of 3s., and sells at "from 11s. to 12s. per ton." And the same authority, in a table of charcoal furnaces in existence in Great Britain in 1790, credits "Cumberland" with having a dozen miles from Ulverston one furnace at Duddon; whilst Lancashire had one at Backborough, ten miles from Ulverston, stated to have been built as early as 1705, and one also at Newlands, one mile from Ulverston, built in 1750. Each of these is returned under the head of Cumberland, as working, about the year 1800, with an average yearly make of 373 tons per furnace. From this date, trace seems lost, and they probably met the common fate of the charcoal furnaces of the day. Ore was found at Lindal, it is true, but it was much as described in the quotation we gave, and the past bequeathed the "commercial discovery," practically, of the Furness ore to the present. And it left also to Barrow the legacy of the manufacture of steel to an extent giving employment to thousands of workmen, and yielding a production of pig-iron estimated at a quarter of a million tons annually. That great industry pervades Barrow, penetrates to Ulverston, is the support of Lindal, which it yet undermines, has driven agriculture from a wide tract of land, and places its ruddy marks on all emerging from its bounds, even to the stream that runs through the grounds of the abbey, and ever fresh fields are added to its domain.

Barrow itself is one vast hive. Approaching the town, the vast works of the new docks are seen, and the air resounds with the clangour from the great works of the town. Chief amongst those are the Hematite Iron and Steel Works. The first furnaces were built by Schneider & Hannay, in 1869, and to these others were added, till sixteen furnaces may now send out the quantity above named. To these works were added those of the Barrow Steel Company, and in times of normal prosperity 10,000 artisans are employed in the conjoint establishment; and it is best described as one of the few producing pig for the Bessemer process, and as having the largest steel works in the country. A second era in the history of Barrow was at the opening of the docks in 1867, since which, till dulness descended upon the iron trade, there has been no check to the growth or the prosperity of Barrow. It has planted new trades, until the products of its jute-mills, its shipyards, and other constructive works, are as well known as the rails and the pig-iron it produces. As the result of the growth of these, other and allied industries have been born, each of which is tributarial to the greatness of Barrow. Docks of magnitude have been and are being constructed; and even in these times of depression there are rumours that new trades are to be introduced into this "Chicago of the West." Around it the land is ruddy with the results of the search for the hematite iron ore, which is the natural wealth of Furness. Where Lancashire produced a scanty supply of iron, it now yearly contributes nearly a million tons, the largest portion of which is from the Furness district; the Park mines alone give more than a quarter, whilst the Askham, the Lindal, and the Dalton mines are large contributors. And though now there may be a temporary check to the production, in consequence of the cloud which overhangs the whole iron trades, yet there are—in knowledge of a brighter future for it—developments of the great industry and of the illimitable resources of Furness now in progress, the result of which must be largely to add to its output of iron, and therefore to increase the trade on which hitherto Barrow has chiefly built the foundations of its greatness.

Leeds Public Offices.—Designs sent in competition for proposed new Public Offices for Leeds are now before the Mayor and Corporation.

THE ABBEY CHURCH OF TEWKESBURY.

ON the occasion of the visit of the Bristol and Gloucestershire Archæological Association to Tewkesbury, elsewhere spoken of, the Rev. J. H. Blunt read a paper on the Abbey Church. We learn from a report in the *Worcester Herald* that Mr. Blunt sketched first the history of the church itself, and afterwards drew attention to its interesting association with the great families who were Lords of Tewkesbury and Earls of Gloucester. Mr. Blunt divides the history of the Abbey into four periods,—the first embracing its original design, which was only executed in part; the second, the completed Norman church; the third, some thirteenth-century alterations; and the fourth, the period of the vaulted roof and the chevet of chapels. These he traced in detail. Mr. Blunt says:—There is much reason to think that the original design for the Abbey included two western towers, with the noble recessed arch and an interior porch between. The west end as it stands is, indeed, a great puzzle to architects and antiquaries, for it is difficult to believe that the Norman master of the works made his fine arch for no particular purpose, and yet no purpose is discernible. The measurements of the walls are considered, however, by Sir Gilbert Scott, to support the theory of towers, and fragments of what appear to be the commencement of their eastern walls have been observed in the triforium. A distinguished archæologist and historian who examined the west end not long since gave it as his final opinion that the only chance of determining the question was by building up theories and then demolishing them, as children do with cardhouses; and he considered it possible that out of the ruins of many theories one stable and practical one might eventually be formed. I confess to holding a strong opinion myself that the western faces of the present aisles were originally constructed for the purpose of being carried up as towers, and that the small turrets are an afterthought. The grand arch of seven-recessed members would then have occupied a natural position, having a massive support on either side; whereas, at present, beautiful as it is in itself, it must be acknowledged that it looks rather inconsequential, and like a jewel too large for its setting. Subsequently tracing the history of the building from 1107 to 1123, Mr. Blunt says,—The substitution of turrets for towers at the west end took place, it is probable, as a consequence of the determination to raise the central tower two stages, and surmount it with a wooden spire. This addition to the tower has made it exceedingly beautiful, and those who are familiar with Durham will remember that there is a strong family likeness between it and the two western towers which overhang the rocks and the river there. When the abbey was completed under Earl Robert of Gloucester, it consisted, as originally designed, of a nave and its aisles, a spacious transept with apsidal chapels, and a choir with a similar semicircular wall. This nave was and is 165 ft. long and 33 ft. wide between the columns, the width from wall to wall of the aisles being 71 ft. The massive columns are each 6 ft. 3 in. in diameter and 30 ft. high, 6 in. less in diameter and 3 ft. more in height than those of Gloucester. These seven grand columns on either side, with the four piers and responds east and west of them, support sixteen plain semicircular arches, which carry walls nearly 6 ft. thick to bear the roof of the nave. In their original condition the walls were pierced with a pair of double arches about 4 ft. in height and width, which open into the triforium; and above there were small clearstory windows giving light to the roof. The clearstory windows have been enlarged into low and wide three-light windows for lighting up the vaulted ceiling; but all above the capitals of the columns is very unsatisfactory in the proportions which its several parts bear to the columns themselves. The church was probably similar to the nave as regards the pillars and arches which divided the presbytery from the procession-path or aisle, being the same width as the nave, 33 ft., and exactly twice that number of feet in length. The ceilings throughout the church were at this time of timber, panelled; similar to the Norman ceiling remaining at Peterborough; and they were no doubt decorated with colour and gold, as the columns and walls were. The floor of the high altar was not so much raised at that time as it is at present, but the columns were lower by two courses, and thus the proportion would not seem very different from what it does at present. Most likely the altar stood upon a plat-

form of steps, such as is used for the throne at coronations in Westminster Abbey, and above it there would probably be some kind of canopy giving point and dignity to the Holy Table in the general aspect of the choir. The tower-lantern was open for almost 20 ft. above the arches which support it, the walls of the interior being arcaded in two stages and having windows in a third stage above. Thus completed, the Abbey was consecrated on November 20, 1123, seven centuries and a half ago. After this time for about a century there appears to have been little or no change in the church itself, but in the first half of the thirteenth century some extensive additions were made to the north side of the church, and the choir underwent such alteration as must have amounted to a reconstruction of all above the piers. This was, in fact, an age in which a great deal of reconstruction was going on, those who loved their churches and had means for carrying out their wishes endeavouring to keep pace with the developments of pointed architecture. A glance at the pillars of the choir will show that they were at this time raised higher by two courses of masonry. This was done partly for the purpose of raising the floor of the high altar, and partly to bring the piers into better proportion with the pointed arches which took the place of the round ones, for which they had been built. It is scarcely probable that the apse was of any other form than a semicircle, as originally constructed, and no doubt it was altered to the present angular form, beautiful without and within, when the piers were heightened. In what manner the choir was roofed in at this time it is impossible to say, for the noble windows and vaulted ceiling belong to nearly the end of the following century, and if there was ever an Early-English vault it has entirely vanished. The altar had at this time been made so splendid that it became one of the most celebrated in England. A sad memorial of its glory remains, in the shape of its mensa or slab. This was a blue marble measuring 13 ft. 8 in. long, 3 ft. 6 in. broad, and 7 in. thick. At the Reformation it was put underground in the north ambulatory. It was discovered in 1607, and again appropriated to its ancient use. In 1739 the sum of 14s. 6d. is entered in the churchwardens' accounts for removing it again, in the night, to the aisle. Since that time it has been again taken up, sawn in two lengthwise, and turned into benches on either side of the porch. During the alterations that were made in the choir on October 25, 1241, the body of Fitz Hamon was removed from the chapter-house, where it had hitherto lain, and placed in the middle bay of the choir on the north side. With him was also reinterred, being brought from the same place, the body of Abbot Benedict, the third Abbot of Tewkesbury. On the top of the table-tomb you will see the matrix of a knight's wran, and in the floor there are tiles emblazoned with the arms of the Abbey, and Fitz Hamon backed by a pastoral staff. What association there was between Fitz Hamon and Abbot Benedict I am not able to say. It was about the same time when the choir was reconstructed that a cluster of chapels was erected on the east and north sides of the north transept. The first built would naturally be that next to the ambulatory, into which it opens by a beautiful arch recently opened out during the work of restoration. The building of this chapel necessitated the destruction of the apse on that side, and I should think that the Norman arch by which it had opened into the transept was still retained for the new chapel. Beyond this, northward, a second chapel was built, perhaps as a development of the original plan; and westward of this, communicating with it by three narrow Early-English arches, there was a third chapel with a vaulted Early-English ceiling of the same character as that of Westminster Abbey, and very rare in Gloucestershire. This western chapel has entirely disappeared, but its extent is shown by the traces of its vaulting on the wall of the transept, and foundations have been traced which were no doubt those of its walls. There is an old theory, backed by the authority of the respected vicar, Canon Davies, that this cluster of chapels, or the northern and western portion of it, was the ancient lady-chapel. I venture to think that the documentary evidence shows that there were three chapels here, dedicated to St. James, St. Nicholas, and St. Eustachius. The only chapel of St. Mary that I remember to have seen mentioned in any document is described as being near the vestry. The chapels of St. Nicholas and St. James I believe to have been built by Prior Sipton about A.D. 1237, and that of St. Eustachius by Prior Henry de Banbury, about 1246. Coming to the last of the four periods which mark the successive developments of the original structure, Mr. Blunt said the fourteenth century saw (1) the reconstruction of the upper part of the choir; (2) the building of the beautiful chapels of the chevet; (3) the building of the now effaced lady-chapel; and (4) the substitution of the present vaulted ceilings for timber, or whatever existed before, throughout the building. These he severally described, and said that to the great works of the fourteenth century must be added the vaulted ceilings throughout the church, the date of which is proved to be after 1321, by the appearance of the Despenser arms. The nave ceiling was put up probably about 1375. The bosses at the intersections of the ribs are sculptured with Scriptural subjects in regular order, beginning with the great figures of Adam and Eve, which support the westernmost ribs of the groining. Mr. Blunt next gave a history of the families who owned the secular lands of Tewkesbury, who were the great builders and benefactors of the Abbey, and whose names were widely known among the bravest and most honourable of England's great men during the Middle Ages,—the Earls of Gloucester. He then remarked upon the noble monuments in the church, and concluded his paper with some remarks on the restorations. In referring to what still remains to be done, he remarked that there are twenty-five good-sized windows in the chapels alone for lovers of stained glass to exercise their liberality upon.

CUMBERLAND AND WESTMORELAND ARCHÆOLOGICAL SOCIETY.

THE second two-days' excursion of this Society for the present season took place on the 30th and 31st ult. Aspatria was selected as the starting-point on the 30th, and conveyances being taken at the station, the party proceeded at once to

Plumbland Church, where a short time was spent in the examination of an old Runic stone, in two pieces, which, in the thirteenth century, was built into the wall of the church as a corbel. After entering the church, an interesting paper concerning it—prepared by the Rev. C. W. Watson, curate of Plumbland—was read by the Rev. E. E. Curwen. The paper stated that the original church of Plumbland, of which there were no traces, stood on the site of the present one, and consisted probably of an oblong nave, the north and south walls of which stood where the pillars of the present church stand, and of a chancel about the same length as the present one. The church was rebuilt by subscription from a design by Messrs. Cory & Ferguson, of Carlisle, at a cost of 2,155*l*. At the close of Mr. Watson's paper, Mr. Jackson read a short paper on the "Orfeurs" of High Close, as it is commonly called, or Plumbland Hall, the commencement of whose connexion with the parish of Plumbland appears to have been during the reign of one of the Edwards.

The party then drove through Plumbland and past Threapland Hall to Bethel, where a halt was made for the purpose of inspecting the large boulder-stone, lying in a field near the village, known as "Sampson." This stone, which is about 25 ft. long between point and point, between 9 ft. and 10 ft. high, and about 8 ft. wide, was, in the opinion of Professor Harkness, removed from Dumfriesshire to its present situation by the action of the ice. The examination of the boulder completed, the party proceeded to Cockbridge Inn for luncheon, pressing offers of hospitality made by Mr. George Moore, of Whitehall, and Sir Wilfrid Lawson, of Brayton, having been declined by the Society on the ground that "they liked, and that it was their rule during these excursions, to pay their own way."

After luncheon, Mr. Jackson read a paper on Threapland Hall, and the visitors then proceeded to

Torpenhow Church, where a paper was read by the Rev. C. H. Gem, who at the outset referred to the theories relative to the origin of the name of the village. The first is that the Britons called the rising hill "Pen"; they were succeeded by the Saxons, who taking "Pen" for the name of the place, added the syllable "Tor"; and then the Danes added "How," meaning "Head." The same process is observed now-a-days,—the people speak of "Torpenhow Brow." The second theory is that it is a Danish name entirely,—"Torpen's How." Another theory is that "Thorpe" is a village, and that "Thorpen-how" means the "hill town, or town hill." The registers of the parish begin in 1551, and in reading them one cannot but be struck with the fact of the changes in the names of the landowners of the place. The frequent occurrence of the name of Tickell, in the year 1680, leads to the conclusion that this parish had the honour of giving birth to Tickell, the friend of Addison, and part translator of Pope's "Homer." The account-books of the parish extend from the year 1671 to the present time, and show that the affairs of the parish were at one period managed by sixteen persons,—elected from the four quarters into which the parish is divided, and the vicar and churchwardens. Among the various items of church expenses in 1759, an allowance was made of "5s. to Richard Railton for whipping dogs out of the church," and he was also allowed "3d. for a whip," and "2d. for a thong." In 1789 the proceedings of the council of sixteen were not marked by their usual sense, for they altered the pitch of the roof of the church, and sold the lead for 39*l*. 13s. 10d. The church of Torpenhow is dedicated to St. Michael, and dates from the time of William II. or Henry I. There was probably a church there before the Norman Conquest, but no part of that church remains. About the time of Henry III. the north transept was built. The present east window was inserted about the fifteenth century; the west window was inserted early in the sixteenth century. The chancel ceiling was the work of Mr. Thexton, Mr. Gem's predecessor. At the close of the paper, Mr. Cory said the church was very singular in one respect. He was convinced that the arches on the south side were of a very late date, whereas on the other side they were very early.

Conveyances were next taken to, and the visitors were driven through Ireby to

Bolton Church, which was described in a paper by Mr. C. J. Ferguson, who said it was one of the most remarkable churches, if not the most remarkable, in the county. It had succeeded a Norman one of former times, and had evidently been re-built on the old foundations. Tradition says the church was built in one night by imps at the command of Michael Scott, the Wizard of the *Lay of the Last Minstrel*, who is reported to have been a monk either of Holme Cultram or Melrose. Mr. Cory suggested that the original builder was Ralph Neville, first Earl of Westmoreland, and eighth Baron of Raby, who lived in the time of Richard II., and was Governor of the Western Marches. The church, doubtless, was built for defence and shelter, as well as for worship. In the inside of the stone roof are a series of massive corbels; and the masonry of the building is not only excellent, but of extraordinary size, some of the walling stones being 21 in. in depth. In the course of the conversation which followed the reading of the paper, Dr. Simpson said he thought it was only fair to say that William, the last Earl of Lonsdale but one, took a great interest in the restoration of the church, but he refused to subscribe anything towards it unless the roof was not interfered with.

The visit to Bolton Church finished the first day's programme, and on leaving the place the excursionists proceeded to Brayton Hall, where they were very kindly received by Sir Wilfrid Lawson, M.P.

On the second day the visitors assembled at Wigton, where the annual meeting was held, the Rev. Dr. Simpson in the chair. The first business was to elect officers for the ensuing year, which was done. The business of the meeting concluded,

Professor Harkness exhibited a small fragment of a stone celt, which he said was found in August last, by his friend Mr. Williams, of Penrith, near the entrance of Maybrough. The stone was rather rude in its aspect, and, he thought, indicated that at one time there was a population at Maybrough which probably occupied stone huts, or huts built of twigs; that this population prepared its own weapons and ornaments; and that the celt produced was a rejected fragment, broken in polishing, belonging to that ancient population.

Mr. Jackson then proceeded to read an exhaustive and able paper on "Agricola's Line of March from Chester to the Solway."

Mr. R. S. Ferguson, at the close of the paper, said in reference to the route taken by Agricola Mr. Jackson and himself were quite in accord. He referred to the existence of a Roman camp between Mowbray and Allonby, and another at

Silloth, which had been destroyed by the sea, and stated they would find Old Carlisle the centre of a complete system of military roadways. He could not help thinking that the military power of the Romans was centred at one time in Old Carlisle, and that afterwards they found the present Carlisle a more suitable place, and removed their seat of power to Stanwix. Old Carlisle appeared to be a centre of great importance in a strategic point of view, because from every point of it, like the spokes of a wheel, roads branched out, and at the end of every one of them was a camp.

Mr. Jackson next read a paper, written by himself, on the "Roman Camp at Muncaster," and another,—the joint production of the Rev. Canon Knowles and himself,—on "Walls Castle," which, the paper stated, stands a few yards to the north-east of the Roman Camp at Muncaster, and is about 52 ft. by 43 ft., but is clearly only the fragment of a larger building.

After the papers were finished, a few of those present proceeded in conveyances to visit Old Carlisle, and with this visit the excursion terminated.

MOVEMENT IN INDIA.

THE state of the Madras harbour works is beginning to attract the serious notice of the Local Government. The papers received by last mail state that the Hon. Mr. Ellis was returning from Coonoor, to meet Mr. Thoroughgood, the new engineer, on his arrival from England, and in his company to make an inspection of the groyne, the railway rolling stock, and the quarries. It was expected that the Duke of Buckingham would himself inspect the works later in the month, and it was also rumoured that Sir Andrew Clark, the Public Works Minister, would visit Madras in the cold season, and thoroughly investigate the state of the undertaking on behalf of the Government of India.

A proposal to establish an Institution of Civil Engineers for India was discussed at a meeting recently held in Calcutta, when a resolution was passed to the effect that the meeting being of opinion that the establishment of an institution was desirable, it should be open to all engineers of reputation, whether in the Public Works Department or not, to consider and report how effect could be best given to this intention.

The sanitary improvement of Simla, for which the Home Government lately sanctioned an expenditure of ten lakhs of rupees, is said to be still as far off as ever. The scheme now awaits the authorisation of the Viceroy, which rumour represents him as unwilling to give. A local journal says if the financial difficulties of the Government were not so great the Viceroy would start the sanitation works, if merely for the sake of the permanent population of Simla without prejudice to the question whether the Government should go elsewhere. And if he felt sure that no other hill station would answer as a seat of Government, he would probably start the works in spite of his financial embarrassments. As it is, however, the two motives for hesitation tend in the same direction, and nothing is done.

The Duke of Buckingham, governor of Madras, has purchased a house at Ootacamund for a gubernatorial residence; and strong parties of sappers and surveyors are employed making out the grounds, tracing roads, and rendering the edifice and its surroundings suitable for their future destiny. The business dwellers in the cities of the plains do not regard such doings as these and those at Simla with much favour, and grumble loudly at the preference their highly-paid viceroys and governors nowadays display for their Indian Capuas.

Sir Dinkur Rao is said to intend signalising himself by a great engineering work,—a sort of Indian Menai Bridge project,—the building of a bridge across the Paumben Channel to the island of that name. The South of India Railway would be carried across this bridge, and perhaps extended to the island of Ceylon itself. It is believed that the numberless pilgrims who annually flock to the shrine of Ramisweram would more than pay the cost in a very few years.

A paper factory designed to be worked by steam is being erected at Surat, and will, it is expected, be in full operation before the end of the year.

Falkirk.—New burgh buildings are to be erected at Falkirk, from plans by Mr. Alexander Black. The cost will be about 2,600*l*.

PROFESSOR DONALDSON.

ON the 2nd inst. died Matilda Georgiana, the beloved wife of Professor T. L. Donaldson, after many years of painful suffering most patiently borne. There is no member of the profession so widely regarded with affection as Professor Donaldson is, and many of our readers who knew nothing of Mrs. Donaldson will grieve because of the sorrow that has overtaken him. With that smaller number who, like ourselves for long years, have enjoyed the friendship of the admirable and estimable lady who has passed away, the sorrow will have additional poignancy.

IRON WELL-COVERING.

BRUCK, ON THE RIVER MUR.

BRUCK, on the Mur, is one of the oldest and most interesting places in Upper Styria. It appears to have existed since 861, when, as it is related, King Louis, the German, sent a proclamation to the city of Salzburg "from Bruck on the Mur."

Rudolph of Hapsburg raised Bruck to the dignity of a town in 1277. Many of the historical details concerning Bruck have been lost, from the ill-fate of the town, which has been so often destroyed that its chronicles have perished also. In the course of years this city has survived twenty wars and ten fires. Its position is extremely beautiful, being situated on the confines of the two rivers Mur and Mürz. Independently of its natural beauties, it possesses many interesting objects worthy of notice. Amongst the latter is the great iron well, the age of which is given in an inscription on it, which may be thus Englished:—

"In the year 1620
By my good town
Was I formed."

On the south side of the well can be read in German,—

"I, Hans Frasser,
Drink rather wine than water,
Did I drink water so gladly as wine;
So should I a richer Frasser be."

And then in another place,—

"Therefore have I been dug,
That all a big draught can have,
And may drink freely of me."

Looking beyond the Iron Well is seen on the horizon the historical "Rennfeld." From Rennfeld we have a surpassingly lovely view of the river Mürz and the peaks of the Upper Styrian range of mountains.

History relates that the Knights of Stubenberg and Kneuring, with their followers, went up to the Rennfeld, 4,800 ft. high, in order to throw themselves down between the highest points of the mount to break their necks, out of desperation, through unrequited love for Agnes of Bernegg, beloved by both of them.

Near the well stands the old palace of the Archduke, now a private dwelling-house. It was built in the year 1390. Archduke Ernest, styled the Iron Duke, was its builder. Inside the palace are shown the remains of a small chapel of the same period. A large hall, in which the state councils used to be held, still remains. Added to the well and the Duke's palace, a third object worth noticing is the iron door of the sacristy of the town church. This must be as old as the well. At the Exhibition of Vienna, in 1873, this held a prominent place in the "Pavilion of Amateurs," and excited great attention and admiration.

THE YARMOUTH AQUARIUM.

ANOTHER aquarium has been added to the present list. On Tuesday last the Yarmouth Aquarium was, not ceremoniously, but publicly opened by Lord Suffield, who, at the beginning of October last, laid the corner-stone. The committee, or directors, boast of the wonderfully quick time in which the building has been erected. Had they given a little more time, thought, and taste, this last aquarium building might have been more remarkable for architectural character. Given a square space, a certain number of bricks, &c., and a certain amount of labour, and much may be done under the term of "mushroom growth." The present structure is a rectangular hall about 190 ft. by 90 ft., divided down the centre by ten iron columns, having from the top of each to the piers of the side walls iron girders, with intermediate girders from which flat arches spring, forming the ceiling of the hall and the roof. An effect somewhat of oppressiveness is given by the ceiling being so low (at a guess, about 13 ft. from the floor). Between the piers of the side walls are the tanks,—eleven openings on each side: over each is a semicircular arch from pier to pier. At each end of the hall is a tank (rather small) for crocodiles, and one for seals, with rockwork, by Mr. Wills, of South Kensington.

The principles adopted in the construction and management of the Aquarium are stated to be those enunciated by Mr. Savile Kent, formerly of the Brighton and Manchester Aquariums.

A corridor reached by a few steps at the north end divides the hall from the *restaurant* and the reading and assembly rooms. A small and too narrow (less than 3 ft. wide) stone staircase leads to the rink, which forms the roof of the whole building, making a large open space surrounded by a stone balustrade, plenty of sea-view, and, without doubt, at times, a great deal too much wind for the comfort and safety of the rinkers.

The exterior of the building is brick and stone, divided into piers and semi-arches, similar to the interior, and surmounted with a stone cornice and balustrade. For particulars and further description of the tanks, water-supply, heating, lighting, &c., we refer our readers to the architect's own words at page 560 of our present volume. The interior being in an unfinished (and very wet) state on the opening day, it would be hard to say what appearance the hall will have when decorated, as it is intended to be. We missed observing where the lavatories and retiring-rooms were placed. A handsome luncheon was given to the visitors, and some speeches were made.

Messrs. Norton & Masey, of Old Bond-street, London, are the architects; Messrs. Aldin & Son, of Kensington, the builders; and Messrs. Leete & Co., London, have constructed the machinery and fittings. The heating apparatus is by Messrs. Bacon & Co. Mr. Kingham, Notting-hill, has charge of the restaurant. The total cost thus far is said to be about 35,000*l*.

The Aquarium, if properly managed, as we have no reason to doubt will be the case, can scarcely fail to prove a valuable institution for Yarmouth.

CONDITION OF LYME REGIS, DORSET.

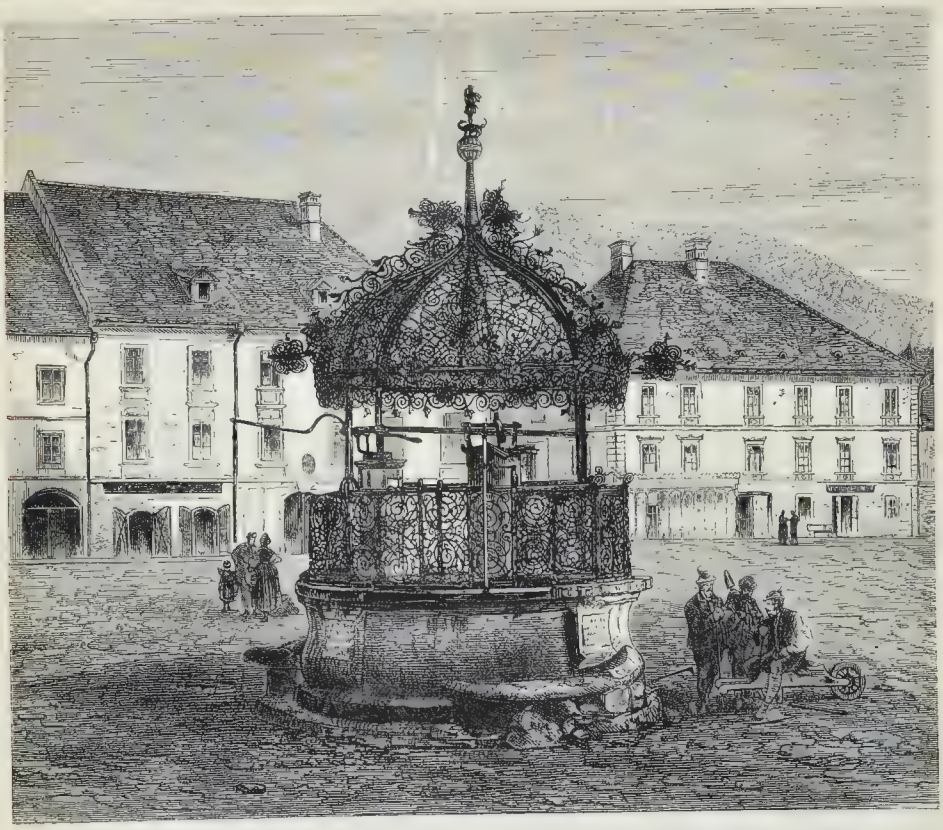
SIR,—Your correspondent "Solo" has modestly described this town as being "one of the prettiest watering-places on the South Coast." My father prefers it to Naples in summer for its English beauty and oceanic freshness.

"Solo," however, errs in attributing the "fearful state" of Lyme Regis to the want of draining, and to overcrowding. That "fearful state" has been induced by the gases generated in the ruination of the eastern foreshore to feed the kiln on the other side of the harbour. The shales left to the sea action, decomposing it, enshroud the lower town in the mephitic airs, the sulphuretted smoke of the cement works westward as surely asphyxiating the villas above them.

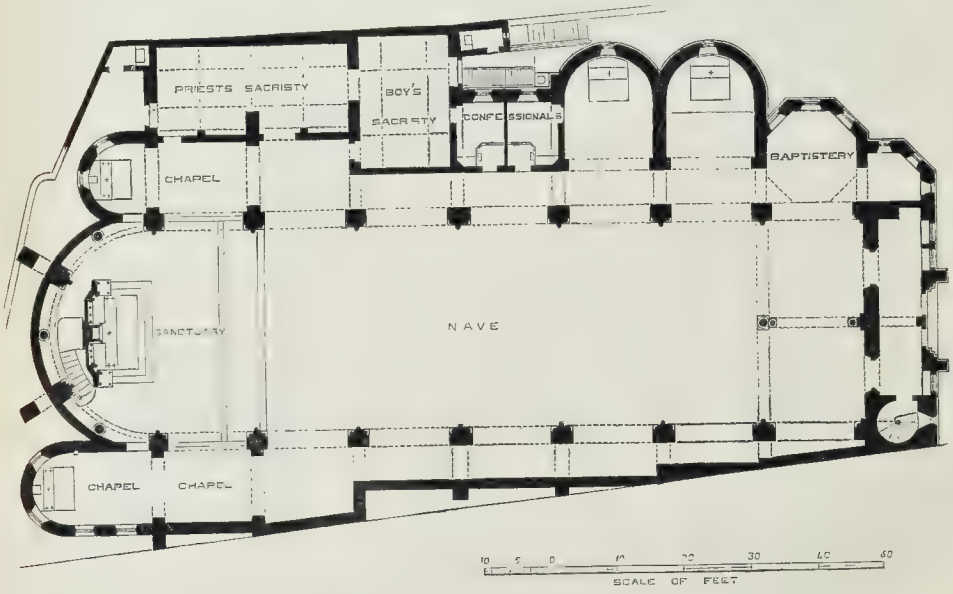
Of course, my father has denounced the nuisance; and all the more indignantly since, in addition to the annual holocaust of really poisoned victims, many labourers have been killed under the cliffs, so that homicide lies charged to those whom the corporate negligence excused in employing them. I will only add that, in the event of what has been hitherto called an "accident," we shall consider it as murder, and hold the principals liable to all the consequences.

F. S. B. HAWKINS.

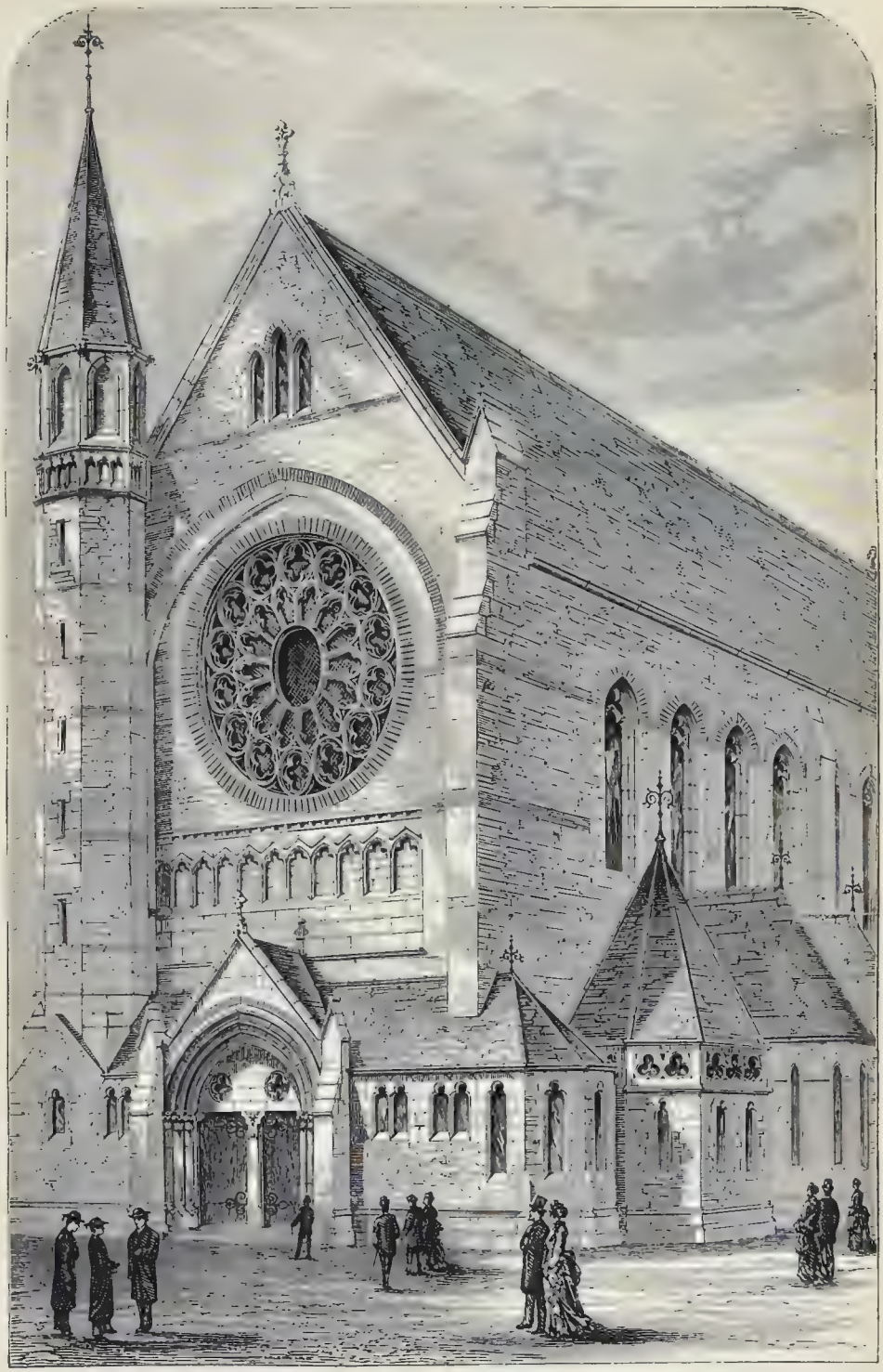
Distress amongst American Workmen.—A New York correspondent, writing on August 19th, says:—"As to trade in and around this city, a pretty good knowledge may be obtained from the state of affairs in Newark, N.J., which is the centre of important industrial interests. One of the leading journals of that town stated this week that never in the history of this city has such wide-spread poverty and distress been known to exist among the families of working men as during the present summer. A competent judge estimates that in Newark, Belleville, Bloomfield, and the Oranges, fully 4,000 skilled mechanics are out of employment, or work but two days in the week." A special despatch to the *New York Times* from Philadelphia, dated August 18th, says that 20,000 persons are out of employment, and large firms are discharging operatives every week.



IRON WELL-COVERING, BRUCK, ON THE RIVER MUR, STYRIA.—Date, 1620.



CHURCH OF ST. ALOYSIUS, OXFORD.—*Plan.*



THE JESUIT CHURCH OF ST. ALOYSIUS, OXFORD.—MESSRS. HANSOM, ARCHITECTS.

THE JESUIT CHURCH OF ST. ALOYSIUS, OXFORD.

AT the end of last year a new Roman Catholic church, which has been erected in St. Giles's, a few yards to the south of the Radcliffe Infirmary, was opened with great ceremony. Of this we now give a view of the exterior and the plan. The church was erected by the Jesuit order, and is dedicated in honour of Saint Aloysius. It is a lofty and imposing building, plain and simple in its plan and main outline, and of the Early English style, with a few semi-Norman details. It is 122 ft. long, 45 ft. broad, and 57 ft. across the transepts, and 57 ft. to the ceiling ridge of the panelled wagon-headed roof, and is lighted by a series of large windows in the clearstory, rising above the arches of the nave. There are two side chapels, each of which have an altar of its own, one being dedicated to "Our Lady and St. Joseph," and the other to "The Sacred Heart." In the side aisles are an outer and an inner vestry for the clergy, choir, &c., and also two or three confessionals. The High Altar, which has been made abroad, is the gift of the Marquis of Bute. The church stands west and east, not east and west, owing to the exigencies of the site, and it will ultimately have attached to it a presbytery, as a residence for the officiating clergy, who at present will live in a house close by, facing the street. The mission itself, like that hitherto existing in St. Clement's, is in the hands of the Jesuit body. The cost of the building was upwards of 7,000*l*. The architects were Messrs. Hansom, of London; and the builder was Mr. C. Claridge, of Banbury.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THIS Society, which was inaugurated in April last at Bristol, held its first annual meeting at Gloucester a fortnight ago. The proceedings commenced on Wednesday, the 23rd ult., when the Mayor of Gloucester received the members (who mustered in strong force) at the Shire Hall.

The report of the Council, read by Mr. P. Hallett (general secretary) stated that at present the number of members of the Society was 466. The balance-sheet was satisfactory, the receipts, including composition payments for life members, being 672*l*. 10*s*. 6*d*., leaving, after payment of inaugural expenses, a balance of 572*l*. 14*s*. 9*d*.

Mr. C. J. Monk, M.P., moved that the report of the Council and the rules as amended be adopted.

Mr. S. S. Marling, M.P., seconded the resolution, which was unanimously agreed to.

Mr. W. K. Wait, M.P., then submitted that the Society's scheme as revised be adopted. He said that he thought in such a county as Gloucester they would have ample work for the Society for many years to come.

Mr. A. J. Stanton, M.P., seconded the resolution, and it was carried.

The President (Sir William Guise) then delivered his inaugural address, in the course of which he said:—The present is not the first attempt which has been made to form an archæological society for this county. About thirty years ago such a society was set on foot, of which I had the honour to be chosen president. Our number was not great, but amongst us were several accomplished antiquaries, of whom I may name the late Mr. Thomas Phillipps, Rev. Samuel Lysons, Mr. Niblett, Mr. Gomonde, of Cheltenham, and Captain Bell, of the same place; but we met with little support or encouragement, and after an existence of a few years, we dissolved by mutual consent, when the antiquarian element became absorbed in the Cotswold Naturalists' Field Club, in whose printed "Transactions" will be found many valuable memoirs in connexion with the antiquities of this county. The newly-constituted society, the first meeting of which we are here assembled to celebrate, had its origin at Bristol, after the visit to that city of the British Archæological Association in 1874, when a proposal was made to form an association for the investigation of the antiquities of our county on the model of those already established, and doing such good work, in the adjoining counties of Somerset and Wilts. A provisional committee was named, having at its head the Earl Ducie, lord-lieutenant of the county, which speedily drew together such a number of adherents as to justify the calling a public meeting in connexion therewith. The meeting took place in April last, and was attended by a large and influential body of supporters. The Society was then duly constituted, laws were voted, a governing council appointed, and I was honoured by being called to the chair as your first president. This our county of Gloucester offers special attractions to inquirers in the field of archæology. It has from the earliest times of which we have any record been a battlefield for contending races,—Briton, Roman, Saxon, Dane, and Norman have in turn striven for the mastery over our hills and valleys, and have left behind them those traces, more or less enduring, which it is the delight of the antiquary to follow up, and concerning which it is the special aim of associations such as ours to collect and register, while yet we may, those remaining facts and evidences which time and cultivation and the hand of man are year by year obliterating. It is only within the last forty years or so that archæology,—the scientific study of antiquities,—has been pursued in a systematic manner by large bodies of inquirers associated for a common purpose. Before that time we had noble examples of individuals who devoted their lives and their means to that end, and have left behind them invaluable records of their labours,—invaluable because since they wrote wholesale destruction has been going on amongst the objects which they loved; some of the sites described and figured have been entirely obliterated, while others, if not wholly destroyed, have been so mutilated that scarcely a fragment of the original structure remains. It is to the labours of such men as Stukeley, Dugdale, Lysons, and others, that we are indebted that so much of the past is preserved to aid the researches of those who have come after them. At the present day it is far otherwise. Increase of wealth and leisure has given a vast impetus to scientific inquiry, and numbers now combine all that means and mind can effect to place within the reach of all, by publications, that knowledge which previously could only be attained after much laborious inquiry by the few. What stores of literary wealth have been opened up by the two great London archæological societies, and by others such as our own, which are widely disseminated through the provinces! But of all the sources of historic knowledge which learning and liberality have combined to set free, there is none that can compare in value to the historian with the magnificent series of volumes published at the national cost by the Record Office. Of these I would especially direct attention to the splendid folio entitled "Monumenta Historica Britannica, or Materials for the History of Britain," which constitutes in itself a complete library of all that has been written concerning our island from its first invasion by Julius Cæsar to the period of the Norman Conquest. It is edited by Thomas Duffus Hardy, the keeper of the records, to whose learning and research it does infinite credit. In respect of county histories Gloucestershire is very deficient. Sir Robert Atkyns is still, on the whole, the best authority. His first edition was published in 1712, in folio; Rudder, a printer of Cirencester, published another folio about 1740. Fosbroke published two vols. in 4to., which, though meagre, supply some deficiencies in the two former; and lastly, Archdeacon Rudge published 2 vols. 8vo. in 1806. Bigland's collection in folio was never completed, though some parts of a continuation were printed by the late Sir Thomas Phillipps. A new county history is greatly needed. . . . . Prior to the arrival of the Romans, the earliest races which have had a footing in our county have left behind them traces of their occupation in tumuli, grave-mounds, and earthworks, scattered abundantly over the Cotswold hills. The earliest form of burial appears to have been that of a body doubled up under a mound of earth; the next a round tumulus, with a cist in the centre; and, lastly, the long heart-shaped barrow constructed with dry walling, and containing chambers variously arranged. Of the first and rudest kind, examples have been recorded as occurring at Cowley, in this county, and at the entrance of Lord Bathurst's park, near Cirencester. In this class of sepulture there is no trace of cremation. The next race appears to have been a long-headed race, standing 6 ft. high and upward, with skulls unusually large and thick; these likewise were usually buried in a sitting posture in a cist formed by flat stones and dry walling. Such a tumulus was found in a field near Brockhampton. The long heart-shaped barrows are the most common. That at Uley Bury is large and in good preservation. Tumuli abound on the hills around Stroud. At Rodmarton a very perfect example was opened a few years since by the Rev. S. Lysons, one of the chambers of which was found to be filled with human bones; there were no marks of cremation. But perhaps the most remarkable of the long barrows of the Cotswolds is that of Belas Knap, near Winchcomb. The skulls removed from this barrow are in the museum of Cheltenham College. A paper descriptive of this tumulus was contributed to the Society of Antiquaries by its discoverer, Mr. L. Winterbotham, of Cheltenham. . . . A volume might be written on the Romans in Gloucestershire. It must suffice at present to glance at some of the more prominent features connected with their occupation. Glevum (Gloucester) and Corinium (Cirencester), called likewise "Durocornovium," were the chief military centres of the Romans in this country, of which Corinium was the principal,—three of the great roads meeting at that point, whereas only one, the Ermin-street, connected Glevum with Corinium. In connexion with these were numerous vicinal ways communicating with a stong chain of camps and posts, which, established on prominent points of the Cotswolds to the number of eighty-four (as lately enumerated and described by Mr. G. F. Playne in the Transactions of the Cotswold Field Club), served to keep in subjection not merely the dwellers on the hither side of the Severn, but by a system of posts and signals to overawe the restless tribes on the other side of the river. Remains of the country residences of the luxurious people have been found in many localities throughout the county, of which the most extensive and best preserved were found at Whitcomb, at Woodchester (described by Lysons at Cirencester), and one of the best preserved of all was discovered a few years since on the property of Lord Eldon, near Chedworth, on the line of the Foss-way. Records of these monuments are to be found scattered through the pages of the "Archæologia"; the "Transactions" of the Archæological Institute and Association, and in those of the Cotswold Field Club; in the fine volumes of Lysons; and in a beautiful volume on Corinium, published some years ago by Professor Buckman and Mr. C. Newmarch. Passing to later times, the old monkish historians and the "Saxon Chronicle" give us a confused history of invasion and retreat, battle and bloodshed, which seems to have lasted with longer or shorter intervals of rest down to the time when William the Norman came in and crushed all under the iron heel of his great feudatories, whose castles and strongholds soon covered the land. Relics of this Norman period are to be found everywhere throughout the county, especially in ecclesiastical buildings; and it is not a little noteworthy, as indicative of the populous condition of the Cotswolds in the eleventh century, that there is scarcely a church in the most sequestered village of that district that does not exhibit some traces, sometimes very considerable, of Norman work in its construction. . . . . It is in the power of every man of education, in his own way and amid his own surroundings, to aid in lifting the veil of obscurity from the past, and to gather such new facts as may serve to elucidate history, and to preserve from perishing those ancient customs, traditions, and forms of speech which yet linger amongst us. And here let me add a word upon a purpose not the less useful which such a society as ours may subserve; and that is in respect of its office and power of protecting and preserving those ancient monuments which still remain to us. I have always seen reason to regret that the sensitiveness of landed proprietors in whose guardianship these invaluable relics lie, availed to throw out the moderate and well-considered measure introduced by Sir John Lubbock into the legislature for the protection of such monuments. May we not hope that even in this direction societies such as ours may help to prepare the territorial mind to accept at no distant date a measure so much needed, and one which will prove welcome to all who value historical relics at once so precious and so perishable? An important aim, which we should keep in view, should be the formation of an archæological museum for the county, one in which every object of antiquarian importance discovered in the county should find its proper place.

The Bishop of the Diocese proposed a vote of thanks to the president, "for the first proof of his ability in occupying the chair."

Professor Rolleston seconded the resolution.

The resolution having been cordially adopted,

the president briefly acknowledged the compliment paid to him, and expressed his thanks to the Mayor of Gloucester for the use of the Shire Hall and his presence among them.

The members, leaving the Shire Hall, under the guidance of Mr. John Bellows, proceeded to trace the old Roman wall of Gloucester, past the Cathedral Gardens, across Northgate-street, up St. Aldate-street and King-street to Eastgate House, where some portions of the wall can be inspected; thence along Constitution-walk, where the members branched off from the Roman wall and inspected the Roman pavement in the bonded vaults by the Greyfriars. They also visited the Greyfriars, the Crypt Church, and Blackfriars, thence following the Roman wall again through Commercial-road, Barbican-road, to the Westgate in front of the Shire Hall. Afterwards they proceeded to the Cathedral and examined the building, under the guidance of Mr. J. D. T. Niblett and Mr. F. W. Waller, and on their return towards the Bell Hotel, passed up Westgate-street, and visited Mr. Johnstone's house, the Cellar at the Fleece Inn, Mr. Wyncoll's house, the New Inn near the Cross in Northgate-street, and Mr. Clark's house near the Bell Hotel, in Southgate-street.

In the evening there was a dinner, well attended, at the Bell Hotel, the chair being taken by Sir William Guise.

On Thursday, the 24th ult., the members, to the number of about seventy, proceeded in breaks and other vehicles to visit the ancient church of Deerhurst, the site of the battle of Tewkesbury, and the Abbey Church. Deerhurst Church is often spoken of as an Anglo-Saxon structure. It was restored fourteen years ago. In the eighth century, according to the historians, one Almeric had a palace at Deerhurst, and dying, his brother Dodo, a great Mercian nobleman, built and founded a monastery and church here. The monastery appears to have been a pleasant place. The church was destroyed by Canute the Dane, and a little island, which formerly existed in the river at this place, was the supposed scene of the combat between Canute and Edmund Ironsides for the possession of the kingdom. The church was rebuilt by Edward the Confessor in the Norman style, and then consisted of an apse, transepts, and one aisle. At some later period side aisles were added, and the Puritans altered the original shape still further by destroying the apse. The piers and arches have also been changed into Early English, the former having detached shafts. The tower had at one time a spire, but this fell in 1666. When the church was restored, all the features of it, ancient and modern, were preserved. Many of the peculiar features of the edifice were noted with interest by the visitors, who, however, did not, as might be supposed, find inscriptions

> "Such as, when legible, were never read,
> But being cankered now, and half worn out,
> Craze antiquarian brains with endless doubt."

The Rev. Mr. Butterworth, the vicar, read an interesting paper descriptive of the structure, which, he said, was in all probability the oldest ecclesiastical building in the county. He traced the history of Deerhurst, and said that in the beginning of the eighth century a priory was founded there by two brothers, named Oddo and Doddo. Edmund Ironsides and Canute signed a treaty of peace at Deerhurst, and the priory was destroyed by the Danes. Absolute proof that the church was rebuilt in 1056 they had not, but they had good *primâ facie* evidence that it was, and Mr. Parker said he believed it to be one of the earliest-dated of English churches. The most ancient portion of the church was the tower up to a certain height, the side walls, and the present chancel; and traces of its Saxon origin were to be found in a unique treble-light triangular window in the east wall of the tower, looking into the church; in the rude carved capitals of the chancel archway, now blocked up; and in some massive doorways, also blocked up, in the north and south walls of the chancel.

Sir W. Guise expressed the thanks of those present to Mr. Butterworth for his admirable paper. He described the peculiar architecture of the edifice as Romanesque, and not as Saxon and Norman, for, as Mr. Freeman would contend if he were there, there had been no break in the continuity, the imitation of the Roman being carried on to Saxon times, and by the Normans still further. He pointed to the peculiar character of the chancel arch, which bore unmistakeable traces of great antiquity, resembling the arch seen portrayed in some Saxon illuminations; but it was impossible to fix the exact date. Again entering their carriages, the company were conveyed to Tewkesbury Park, the seat of Mr. Sargeaunt, where, on the site of the battle of Tewkesbury, the Rev. W. S. Symonds read a paper on "Records of Tewkesbury and its Battle Field."

On reaching Tewkesbury the company were entertained at luncheon by the Mayor of Tewkesbury, Mr. A. Healing, in his grounds adjoining the Abbey.

Tewkesbury Abbey was then visited. The building is now in process of restoration, a wooden partition dividing the untouched part from that which is in the hands of the workmen,—the eastern portion of the church, which it has been decided to restore first. In this restoration the first thing to be done was to clear away from the choir and transept the whole of the galleries, pews, &c. Next followed the cleaning of the walls of the choir and triforium from the whitewash which had long overlaid them and obliterated marble columns and delicate carved work. The same has been done with the first two bays of the nave. The vaulting of the chapels and ambulatory has also been cleared of whitewash and repaired. The ceilings of the north and south transepts have been almost entirely renewed, and the ancient decorations in red and gold reproduced. Some interesting discoveries were made in opening what has been called the Chapter House, on the north of the north transept, and which had been blocked up by a wall, made up of fragments of plain and ornamental masonry. When the present contract is completed the work of restoration of the remaining portion of the edifice will be proceeded with as funds will permit. The Rev. J. H. Blunt read a paper descriptive of the building (see p. 876, *ante*), and of the tombs and monuments it contains.

At the evening meeting, Mr. F. W. Waller, in the absence through indisposition of his father (the cathedral architect) read a paper on the Crypt of Gloucester Cathedral, premising that this was the portion of the building on which perhaps less had been written than on any other, and no correct drawings had hitherto been made of it. The writer continued,—"Many and various have been the opinions put forth as to the date of the crypt; amongst others it is no uncommon thing to hear it spoken of as being Saxon, again as being Norman of a much earlier character than the superstructure, and, indeed, as being part of a former church. My object in writing this paper is to endeavour to disprove these theories, and to establish for the crypt a history coeval with the Norman work which rests upon it, all of which I believe to have been built at one and the same period. As regards the 'Saxon' theory, there may be stones in this building which at one time may have formed part of a Saxon edifice, but if such do exist they are carefully concealed. I can see no vestige of Saxon work whatever in any part of the Cathedral, below or above ground." After stating clearly the grounds of his opinion, the writer said,—"After a careful examination and study of the whole subject, I am led to believe that the crypt is of the same date as the two stages of Norman work above it."

Mr. Waller afterwards called attention to the wholesale destruction wrought in many of our churches under the name of "restoration," and as he believed the effect of the new society might be to a great extent to check the pulling down of old buildings unnecessarily, he suggested that a consulting committee of the Society be appointed, who shall form a sort of court of appeal, and whose duty it shall be to advise upon all work submitted to them and proposed to be taken in hand, such committee to be formed of men of acknowledged taste and experience, whose opinions may be safely taken, and who from the interest they have in the matter would probably visit any building about to be interfered with. He believed that such a step would be of immense service in preventing destruction. The fear of publication would act strongly on evil-doers, as he had himself prevented many an enormity by the following remark:—"If the archæologists hear of it your name will be in every newspaper in the county."

The chairman said he entirely sympathised with Mr. Waller's suggestions as to "the horrible system of church restoration." When the original Gloucestershire Archæological Society existed he (Sir William Guise), Sir T. Phillips, and others visited Elmstone Church, which was being restored. The men were scratching away at the walls, and they came upon a figure. Sir Thomas expressed a hope that this would not be destroyed, whereupon a middle-aged female in the church asked, "Pray who are you who are laying down the law in such a manner?" They told her they belonged to the Archæological Society, and inquired who she was? She replied, "I am the clergyman's wife, and I am not going to have any of your Popish ways here; I'll have you out of this before the week's over!" Sir William said he was horrified at the way some churches were furbished up, and all their traces of antiquity completely destroyed.

Mr. G. F. Playne was to have read a short paper on "The Recent Destruction of a Gloucestershire Menhir." In his absence Sir W. Guise read it. This was followed by a paper entitled "Annals of Ashdown in the Twelfth Century," by the Rev. Dr. Smithe (read, in the absence of the writer, by the Rev. Hugh Fowler). Mr. Phillimore read papers "On Public Opinion at Gloucester at the Time of Threatened Invasion in 1715"; and "Short Note about Merchant Marks of Clothiers at Uley and Cam." The concluding paper was by the Rev. E. A. Fuller, "On the Sums raised in the various Parishes of Gloucestershire, of the Devotion of the People for Aid and Defence against the Turks, A.D. 1544."

The closing meeting was held on Friday, the 25th ult., in the Shire Hall, when the president congratulated the members present on the success of the meeting.

The members afterwards proceeded to Berkeley, to make an inspection of the castle. Under the guidance of Mr. J. H. Cooke, they spent two hours pleasantly in the castle and church. This closed the meeting.

"WHEN AND BY WHOM WERE STONEHENGE AND ABURY ERECTED?"

THIS was the question asked by Sir John Lubbock in his address at the opening of the Wiltshire Archæological Society's Congress at Salisbury on the 23rd ult., and thus he answered it as regards Abury:—History is entirely silent. Stonehenge, with the exception possibly of allusion in Hecatæus, is unmentioned by any Greek or Roman writer; nor is there any reference to it in Gildas, Nennius, Bede, or in the Saxon Chronicle. Henry of Huntingdon, in the twelfth century, alludes to it with admiration, but expresses no opinion as to its date or origin. In the same century, Geoffrey of Monmouth, who in the words of Dr. Guest, "is everywhere found darkening the pure light of our early history," gave to the world that which some call an historical account of Stonehenge, namely, that it was erected in the fifth century, to commemorate the treacherous murder of the British by Hengist. The stones are said to have come from Africa, whence they were transported by giants to the plains of Kildare; and thence by the enchantments of Merlin, carried to Salisbury Plain. The question has been well discussed by one of our members, Mr. Long, in his recent work on "Stonehenge and its Barrows," in which he has usefully brought together our present information on the subject, and I will therefore only add that, for my own part, I look upon the account given by Geoffrey as altogether mythical. It is remarkable that the source of the small inner stones, which, as Stukeley first pointed out, are of a different material from the others, is still uncertain, but the large ones are certainly "Sarcen" stones, such as are still shown in many places on the Plain. The best evidence as to the age of Stonehenge seems to me derivable from the contents of the tumuli surrounding it. Within a radius of three miles round Stonehenge there are no less than 300 tumuli; which is, I need not say, a much larger number than are found anywhere else within an equal area. We can hardly doubt, I think, that these tumuli cluster round the great monument, or, at least, that the same circumstances which led to the erection of Stonehenge on its present site, either directly or indirectly, led to the remarkable assemblage of tumuli round it. Now, 250 of these tumuli were opened by our great antiquary, Sir Richard Colt Hoare, and are described in his "Ancient Wiltshire." If these belonged to the post-Roman period we should naturally expect to find iron weapons, and especially knives, coins, well-burnt pottery, and other relics characteristic of the period. Is this so? Not at all. The primary interment was not in any case accompanied by objects of iron, while in no less than thirty-nine cases bronze was present. We have then, I think, strong grounds for referring these monuments to the Bronze Age; and if this be true,

of Stonehenge, it probably is the case with Abury also, which seems decidedly more archaic, the stones, for instance, being rough, while those of Stonehenge are hewn. Now when was the Bronze Age? And what do archæologists mean by the Bronze Age? I ask this question because, though it has been repeatedly answered, there is still a great misapprehension even in the minds of some who have written on the subject. By the Bronze Age, then, we mean a period when weapons were made almost entirely, and ornaments principally, of bronze; that is to say, of copper and tin; gold being rare, iron and silver still more so, or even unknown, as was also the case with coins and glass. Some archæologists, indeed, have considered that the bronze swords and daggers which characterise the Bronze Age are really Roman. This question has been much discussed, and I will not now enlarge on it, but will only say that in my judgment these arms are not found with Roman remains, and that the Roman weapons were made of iron, the word "ferrum" being synonymous with a sword. On this point, I have taken some pains to ascertain the opinions of Italian archæologists. Bronze swords, daggers, &c., occur south of the Alps, the very patterns being in some places identical with those of Northern Europe. But I believe it may be asserted that no object characteristic of the Bronze Age has been found in a Roman tomb; none have been met with at Pompeii, and those Italian archæologists whom I have been able to consult all agree that they are undeniably Pre-Roman. If, indeed, the bronze swords and daggers were of Roman origin, they ought to be more numerous in Italy than in the north. Now, what are the facts? The Museum of the Royal Irish Academy contains no less than 300 swords and daggers of bronze. As regards other countries, M. Chantre, who has been collecting statistics on the subject, has been good enough to inform me that the French museums contain 409, those of Sweden (including poignards) 480, and of Denmark 600, while in Italy he knows of 60 only. These numbers seem to me to militate very strongly against the views of those who would ascribe these weapons to the Romans. When, then, was the Bronze Age? We know that iron was known in the time of Homer, which seems to have been, as regards the South of Europe, the period of transition from the age of iron to that of bronze. In the Pentateuch, excluding Deuteronomy (which probably belongs to a much later date) brass, that is to say bronze, is frequently mentioned, while iron is only alluded to four times. Coins were first struck about 900 B.C., as it is generally said, by the Æginetans under Pheidon, king of Argos, though Herodotus ascribes them to the Lydians. It is true that the use of iron may have been known in Southern Europe long before it was introduced in the north. On the whole, however, I am disposed to think that when iron was once discovered, its use would spread somewhat rapidly; and the similarity of form, of pattern, and of ornaments existing between the bronze arms and implements throughout Europe, seems to negative the idea that bronze was in use for such purposes in the north for any great length of time after it had been replaced by iron in the south. It is, however, more probable that many of our smaller Wiltshire tumuli belong to a still earlier period, namely, to the Neolithic, or later Stone Age, though it is not easy to say which of them do so. This is probably also the case with the large chambered tumuli in which as yet no metal has been discovered. As regards the Stone Age, the same word of caution is necessary as in that of Bronze. There are still some who deny the very existence of such a period, alleging generally as their reason against this proposed classification that implements and weapons of stone were used in conjunction with those of metal. This, however, no one denies. The characteristic of the Stone Age is not the presence of stone, but the absence of metal; and if the name were to be a definition, the period would be more correctly designated as non-metallic. That there was, indeed, a time when stone axes, knives, and javelin-heads were used in Europe, and when metal was unknown, cannot, I think, be for a moment doubted or denied by any one who has carefully looked into the evidence. These objects of stone, so well described by Mr. Evans in his excellent work on the ancient stone implements of Great Britain, are of the most varied character; mere flakes used as knives, scrapers for preparing skins, axes, adzes, hammers, gouges, chisels, arrow-heads, javelin-heads, swords, picks, awls, sling-stones, and many other forms; these, too, found not singly or in small numbers, but by hundreds and thousands, I might say tens of thousands, attest the important part which has been played by stone in the early stages of the development of the human race. . . . . It must be admitted, indeed, that our knowledge of the Stone Age is still scanty, fragmentary, and unsatisfactory; on the other hand, the stone weapons and implements found in Europe so very closely resemble those in use amongst various races of existing savages that they give us a vivid, and I think to a great extent accurate, idea of the mode of life which prevailed at that distant period; distant, indeed, it was according to the ideas of chronology which almost universally prevailed until within the last quarter of a century, for we can scarcely doubt that even the latter Stone Age goes back to a period more remote than the 6,000 years which were traditionally supposed to be the limit of man's existence on earth. No doubt, indeed, the difficulties of the received chronology had long been felt. Well-marked varieties of the human race are shown by the Egyptian monuments to have existed as early, at any rate, as the fifteenth century before Christ. The antiquity of man is also indicated by the differences of language and by the existence of powerful and flourishing monarchs at a very early period, for the pyramids themselves are considered by M. Mariette and other high authorities to have been constructed about 4,000 years B.C., and even at that early period it would appear that the Sphinx was suffering from age, for we possess a decree by which Cheops provides for its repair. Quitting now the Neolithic, or second Stone Age, we come to the Palæolithic, or first Stone Age. At this period man appears to have been ignorant not only of metals, but of pottery. The stone implements are much ruder, and are simply chipped into form, being never ground or polished. We have no evidence of the existence of any domestic animals, and man probably lived mainly on the produce of the chase, contending for the possession of Europe with animals which now exist only in distant regions, or have become entirely extinct. So unexpected were these facts, so improbable did they appear, that geologists accepted them only after reiterated and incontrovertible proofs.

THE RAILWAY LEGISLATION OF 1876.

DURING the session which has just closed, out of 136 railway Bills which came before the committees, 98 received Parliamentary sanction, whilst 38 were rejected. Of those Bills in respect of which Acts have been obtained, 13 were promoted by newly-incorporated companies for the construction of entirely new lines of railway, the aggregate length of which is 132 miles, and the capital required, 1,996,000*l.* The most costly of the new lines sanctioned, in proportion to their length, are the Caterham and Godstone Valley, and the Westerham Valley, the former being a little more than two miles in length, at an estimated cost of 160,000*l.*, and the latter, three miles, and the estimated cost, 133,000*l.* Both these lines are in connexion with the lines of the South-Eastern Company, the one being from the South-Eastern station at Caterham to Godstone, and the other from the Sevenoaks and Tunbridge line of the South-Eastern Railway to Westerham and Oxted. Twenty of the Bills sanctioned were promoted by existing companies, for powers to construct additional lines and other new works, these several companies being authorised to expend in such works an aggregate sum amounting to upwards of 15,000,000*l.* Of this amount the Midland Company have received powers to expend no less than 3,900,000*l.* in new works of a varied character; the London and North-Western, 2,066,000*l.*; the Lancashire and Yorkshire, 2,000,000*l.*; the North-Eastern, 1,332,000*l.*; the Manchester, Sheffield, and Lincolnshire, 1,000,000*l.*; the Great Eastern, 640,000*l.*, which includes, amongst other works, the conversion of the Bishopsgate high-level station into a goods station, and the construction of wharfs and quays at West Ham; the Great Western, 600,000*l.*; the London, Chatham, and Dover, 500,000*l.*; the South-Eastern, 600,000*l.*; and the South-Western, 320,000*l.* Perhaps the most important of the new projects for which Acts have been obtained is the London, Tilbury, Dartford, and Kent Coast Junction Railway, for connecting the South-Eastern line, near Greenhithe, with the London, Tilbury, and Southend Railway, by means of a tunnel under the Thames. This proposed line, which is a little more than twelve miles in length, is estimated to cost 680,000*l.*

Of the projects which Parliament refused to sanction, eight were for the construction of new lines, and one giving powers to the Metropolitan Company to extend their railway at the east end from Aldgate High-street, and at the west end at Hammersmith. The aggregate length of these several proposed new lines was ninety-seven miles, and their estimated cost 6,400,000*l.*, the cost of the proposed Metropolitan extensions being 1,292,333*l.* They included amongst others, a project for making a line from the Tottenham and Hampstead Railway to the Crystal Palace, three miles in length, at a cost of 310,000*l.*; also a railway from the London, Tilbury, and Southend line at Grays Thurrock, passing under the Thames at Gravesend, to the London, Chatham, and Dover Railway. The intended line was a little more than seven miles in length, and its estimated cost 553,000*l.* Another of the unsuccessful projects was the West Riding and Lancashire Railways Bill, for making new lines between Manchester and various parts of Yorkshire. The length of this proposed line was thirty-seven miles, and its estimated cost 2,622,000*l.* The project underwent a protracted investigation before the Parliamentary committees, during which it was strongly opposed by the London and North-Western, the Lancashire and Yorkshire, the Midland, and other leading companies.

COMPETITIONS.

Bromley, Kent.—The Local Burial Board having invited five architects to compete for their proposed cemetery chapels, lodge, and mortuary, decided, on the 30th ult., to adopt the designs by Mr. George Truefitt, and they will at once be carried out. A premium of 15*l.* was awarded to Mr. J. Salman, 10*l.* to Mr. George Raynes, 5*l.* to Mr. Mallett, and 5*l.* to Mr. Stenning.

Builth.—The Builth Public Hall and Market House Company recently advertised for designs for their proposed new buildings, and in reply received numerous drawings from architects resident in various parts of the country. After consideration, two designs were retained for final decision, and these were submitted to Mr. Williams, of Brecon, the county surveyor, who was called in to report upon their merits. The result is the selection of a design submitted by Messrs. Haddon, Brothers, architects, who are engaged to carry out the works forthwith.

SURVEYORSHIP ITEMS.

Wigan.—The death of Mr. J. L. Humber, C.E., borough engineer and surveyor of Wigan, is announced. Since his appointment in 1850 a complete system of sewerage has been carried out under his superintendence, and the Wigan waterworks were completed.

Upper Sedgley.—Mr. J. Bradley has been appointed surveyor to the Upper Sedgley Local Board and Urban Sanitary Authority, *vice* Hughes, resigned.

Woolwich.—At a meeting of the Woolwich District Board of Works on the 28th ult., Capt. Bebenna suggested that a village cart and a pony should be purchased with a view of enabling the surveyor to ride round and look after the roads. There were thirteen miles of ground to look after, and they ought to be gone over twice a week. He moved that the matter should be referred to the Highway Committee. Mr. Hughes suggested that the surveyor should be supplied with a bicycle. Mr. Topley seconded the motion, as he thought a horse and cart might obviate the necessity of the surveyor procuring an assistant. Mr. W. C. Taylor referred to the motion as ridiculous and absurd, adding that the surveyor had a similar conveyance forty years ago, when it was the laughing-stock of the whole neighbourhood. Capt. Bebenna withdrew his resolution.

An Engineer's Claim for Preparing Drainage Plans.—Mr. Baldwin Latham having taken legal proceedings against the Newmarket Board of Health to enforce the payment of his bill for surveying and preparing plans for the drainage of the town, amounting to upwards of 600*l.*, an extraordinary meeting of the Board was held on the 28th ult., when it was unanimously resolved to settle the account forthwith.

SANITARY WORK IN RIPLEY.

The sanction of the Local Government Board has just been obtained by the Local Board of the district of Ripley, in the county of Derby, for the borrowing of a sum of money for the construction of waterworks, and a system of sewerage in their district, according to plans prepared for the purpose by Mr. R. Argile, jun., engineer, of Ripley. That portion of the township of Ripley which is under the authority of the Local Board contains a population of about 6,000, consisting mainly of miners and iron-workers, and has been hitherto destitute of any efficient system of either drainage or water supply. Already a well has been sunk, near the western side of the town, to a depth of nearly 60 yards, and a boring carried to a further depth of about 5 yards, yielding a constant supply of 100,000 gallons of water per day, equal to over 16 gallons per head, which is considered to be in excess of present requirements, inasmuch as a number of the inhabitants are already tolerably well supplied from other sources, and there are scarcely any manufactures carried on in the place. A combined bucket and plunger pump, 10 in. diameter, made by Mr. John Borwell, of the Britannia Foundry, Burton-on-Trent, has been fixed in the well; and working drawings, &c., are now in course of preparation for reservoir and valve wells, engines, boiler, engine and boiler house, water-tower, cast-iron tank, and service-mains. The main reservoir will be constructed near to the well, and will be capable of holding 270,000 gallons, from which the greater portion of the district will be supplied by gravitation. For the supply of the upper portions a water-tower will be constructed, with a cast-iron tank upon the top, to contain 60,000 gallons.

As there is very little doubt that the yield of the well could be doubled by sinking to a greater depth, provision is made in the plans for doubling the pumping plant, and constructing a second reservoir alongside the first at any future time, should the increase of population render it necessary.

The town being situated upon the top of a hill is naturally divided, for drainage purposes, into two main divisions, north and south, the great bulk of the population being upon the northern side. It is proposed to dispose of the sewage by irrigation, for which purpose the Board have arranged to purchase about 31 acres of land on the northern side, and about 7½ acres on the southern, both sites being about a mile away from the centre of the town. An all but entirely new system of sewers will be required, which will convey the sewage by gravitation to the respective outfalls. It is probable that a portion of the sewage farms will be devoted to the growth of market-garden produce, for which there is a great demand in the immediate neighbourhood.

The total estimated cost of the water supply, including purchase of land, is 9,500*l.*; and of the sewerage, including purchase and laying out of sewage farms, 13,200*l.*

COWAN'S COMPENSATING STEAM-GENERATING APPARATUS.

We have often asked why the heat evolved in the production of lime should be wasted. The apparatus we have named above shows one way in which it may be applied.

This apparatus consists in the combination of a steam boiler with a miniature lime-kiln, or with a furnace so constructed that lime is manufactured in it, whilst at the same time steam is generated in the boiler by the products of combustion arising from the stone and coal used in producing the lime, which is suitable for building or other purposes, and the quantity sufficient in many cases to cover the cost of the limestone and coal used, including that of producing the steam.

The apparatus promises to be valuable in cases where economy of working is the great desideratum, such as for pumping, driving stone-crushing machinery, and mortar-mills, or for contractors' use in the construction of railways, docks, and other works where large quantities of lime are required.

An Inventive Stonemason.—A working stonemason in Clevedon, Somerset, claims to have invented an instrument to "take the distance and height of remote objects without the previous labour of measuring a base line." The inventor is Mr. S. Reynolds, East Clevedon.

A RHYMING VIEW OF A RECENT CONGRESS.

Those who imagine that the pursuit of an archæologist is a dry one, may be led to think differently by perusing the poetic musings of an investigator who accompanied the visit of the "Institute" to the Eastern Counties in the early part of last month:—

A thirsty archæologist, from London's sultry streets,
I started Tuesday morning for Essex's cool retreats;
Where rippling Colne meanders thro' meadows green and wide,
And Colchester's old towers look down upon its tide.

I sing not now of Colchester, that ancient town and fair,
Nor of the glorious welcome we all encounter'd there;
Nor of the sumptuous luncheon our generous hosts had spread,
Nor how we spoke, and ate, and drank, before we went to bed.

To other archæologists I leave the stirring lay;
By other bards may be rehearsed the triumphs of that day;
My Muse restrains her pinions, nor dares the dizzy heights,
For next day's doings well she knows will tax her strongest flight.

The sun was shining brightly on the auspicious morn
When past trim villages, and woods, and fields of ripening corn,
We blithesome archæologists were borne upon our way,
To talk and think, and eat and drink, and spend a happy day.

The first place we were bound for was Sudbury's pleasant town,
And when our engine halted we joyfully got down,
For 'twas said the mayor had pitied our long and weary ride,
And had kindly undertaken some refreshment to provide.

We went to see the churches three, and eke the ancient wall,
Then gladly march'd to our repast, served in the Public Hall.
Oh! fine that mouldering masonry, and fine those churches very;
But perhaps the *finest* thing was his worship's golden sherry.

But time (too quickly flying) now warns us to depart,
And so, in fly and omnibus, for Hedingham we start;
Sure, such a weight of wisdom, and such a bulk of brains,
Had ne'er before been carted o'er the fertile Essex plains.

And now the Keep of Hedingham is seen above the trees,
And on the Keep the crimson flag is fluttering in the breeze;
To questions why it flouts the sky, some clever sage insists
That crimson sheet is spread to greet us archæologists.

We wander'd round the castle ground, and up the winding stair,
And from the crumbled battlements survey'd the landscape fair;
But 'twas sadly hot and droughty work, and quickly we were fain
Our thirst to quench, with copious drench, of the good Squire's champagne.

I can't describe the luncheon: my Muse's feeble powers
Would ne'er suffice, e'en for the ice, and fruits, and ferns, and flowers;
But we ate, and drank, and toasted, within the castle grey,
Till half-past three announced that we must tear ourselves away.

Not long at Little Maplestead, our rolling wheels were stay'd,
Not long the tiny Templar Church our hurrying feet delay'd;
Earl's Colne was still before us, six weary miles or more,
And we felt we needed sustenance, and wish'd our journey o'er.

But soon or late all ills must end,—in an exhausted state,
At length, the travellers pull'd up at the good Colonel's gate;
A good Samaritan indeed! though, with perception fine,
He judged he might omit the oil, and only pour the wine.

But close at hand the Priory was nestling in the shade,
And there the "Alabaster Earls" in effigy are laid:
We rambled down, but as we found our time was nearly up,
We went at once into the tent and had some claret cup.

And now it seem'd our happy day was drawing to its close,
And we felt that, after all our toils, we needed some repose.
Ere we got back to Colchester twelve fleeting hours had sped,
So there we had a social glass, then gaily went to bed.

O Essex, queen of Eastern shires! thou hast my warmest heart,
As from thy kind and gallant squires reluctant I depart!
When next the Archæologists explore thy classic ground
May I, the thirsty one, among their ranks be found.

SANITARY MATTERS IN THE BRUSSELS INTERNATIONAL EXHIBITION.

Among the "exhibits" in the Sanitary Section of this Exhibition may be noticed several large wall maps and an extensive series of plans in albums and portfolios, which show the great amount of attention which is at length being given to sanitation in Germany. They are exhibited by Mr. Jos. Gordon, Mem. Inst. C.E., who, as a consulting engineer resident for the past ten years and a half in Frankfort-on-the-Maine, has been called upon to design and execute several important sanitary works, of a portion of which he exhibits the principal plans. They include a general plan, measuring 18 ft. by 9 ft., and drawn to a scale of 1 : 1250, of the sewerage works now being executed in Stuttgart, a town of 110,000 inhabitants. A descriptive pamphlet in German, which accompanies Mr. Gordon's exhibits, states that before the execution of the scheme as devised by him was definitely decided upon, his report was handed over by the authorities of the town, in February, 1875, to a commission, consisting of eleven members of the Württemberg Engineering Society, who subjected the whole to a detailed examination, extending up till May of the present year, when they presented a report recommending the adoption of the scheme. The Medical Society being also called upon in the same manner to report upon the scheme, declared that its execution would be of immense benefit to the sanitary condition of the town.

It would perhaps be interesting to have the opinions of English authorities upon this system of handing over the reports of eminent engineers to various societies for an expression of their opinion upon the merits or demerits of the proposals.

Plans of the proposed sewerage works of Hanau, Heilbronn, and other towns are also exhibited, and a very interesting portion of the plans refers to house-drainage, as carried out on model principles in Frankfort. Plans, sections, and details of the drainage of over thirty different establishments are shown, embracing almost every class of building, from a new Frankfort hotel, containing 280 bedrooms, to the various types of private dwelling-houses. There is also a portfolio containing eight sheets of drawings referring solely to the drainage of a Government powder-mill, and the dwelling-houses of the numerous officials. In all these plans the question of efficient ventilation and flushing receives full attention. All soil-pipes, as well as the down-pipes from kitchen-sinks, are carried through the roof, and in some instances, where unusually long lengths of private drains are needed, or where the available fall is less than 1 in 60, special means for flushing are also provided. The plans exhibited show the beneficial result of the system adopted in Frankfort since 1868 in the formation of a special house-drainage department in connexion with the Sewerage Works Office. All plans are examined by this department, and only passed after having been found in accordance with the very stringent regulations as to trapping, ventilation, gradients, use of iron pipes in special cases, &c.

This collection of plans forms a very complete series, and some regret may be felt that they are necessarily not in the British section.

NAIRN FREESTONE AND GRANITE QUARRIES.

A correspondent of the *Inverness Advertiser* writes:—"Nairn is well known in most parts of the United Kingdom of Great Britain for its genial temperature and bathing facilities; but, as a stone-producing district, it has been hitherto comparatively kept in the background; its neighbouring towns of Burghead and Elgin, not to speak of Aberdeen and Peterhead, have attained more notoriety in this respect. But for many years Nairn has liberally supplied itself, as well as Inverness and other eastern and western districts, with a freestone of a pure white colour, and, if I mistake not, your own Caledonian Bank Buildings have been entirely built from its freestone. Remarking so to some of my holiday ramblers, who happened for the nonce to be residents in the Brighton of the North, which at the time I did not know, I was informed to my surprise that Nairnshire now-a-days produced much superior stone in the near neighbourhood of the Royal burgh. On further inquiry, I was told that this was a red granite, and to my further surprise they stated that a rich vein of it ran south of the valley of the Nairn, almost parallel with the freestone. I determined to make sure of this statement and gratify my own curiosity, and on arriving at the dilapidated village of Auldearn, on the road indicated, was surprised to find that all the stone dykes in the district testified to the truthfulness of my informants. It was soon to be seen that the hardy granite was in abundance in the locality. One of the natives of the village, of whom I asked whether there was a stone quarry in the vicinity, replied, 'Ou, ay, there's a grand quarry oot at Kinsteary, and folk frae this toon work at it. It belangs to chiels at Inverness they ca' Davidsons; and if you want to see the warks gaeing on, ye'll be in good time, and they'll gie ye a' information.' Our informant directed us into the 'road we should walk,' and we soon

found the Kinsteary granite quarry; in fact, as geologists say, 'we stumbled on the parent rock.' On asking, of a well-informed sunburnt man who was hard at work in the bottom of the 'gully,' for the lessees, we were told none of them were there, 'but onything we wanted to ken, he wad dee.' In answer to queries, our intelligent workman told us that the Messrs. Davidson were the original lessees, and that the works were only commenced a few years ago. The specimens of the stones shown us were all that could be desired. The quarry is situated about three miles south-east of Nairn, and a new road has been constructed by the Messrs. Davidson from the village already referred to, in the direction of Cawdor. We saw during our short stay huge blocks blasted, some, we may state in passing, upwards of 30 tons in weight, and the process after blasting of cutting up the same into smaller fragments by 'plug and feather,' in sizes suitable for monumental and architectural uses at home and abroad. The colour of the stone is a beautiful bright red, and the mixture everything that could be desired in red granite."

PRIMITIVE DWELLINGS AND "BEEHIVE HOUSES" IN SCOTLAND.

DR. ARTHUR MITCHELL, in the third of his course of "Rhind Lectures on Archæology," delivered a short time ago in Edinburgh, noticed some rude forms of dwellings still to be seen in Scotland. He first described a type of houses in which many thousands of people were born, lived, and died in Lewis and Harris, and of which others were to be found in many other parts of Scotland. He did not dwell on the wretchedness of these dwellings, the absence of privacy and of the separation of the sexes, the presence of the cattle and human beings together, and the entire want of comforts. He desired only to fix attention on certain features of the buildings in relation to the present inquiry. First, the thickness of the wall, often 6 ft. or 7 ft.; second, the way in which it was built, two faces of dry stone with turf between; third, the very low door, often not 4 ft. high; fourth, the absence of any light-hole or window; fifth, the want of overlapping of the wall by the roof, so that such rain that did not simply wet the roof or fell through it, ran down the body of the wall. To this last point, more than even to any other, he would direct attention. If it were to be accepted as indicative of the intellectual state of the people, that state would be the very lowest. To show the ignorance of the principle of the arch would be nothing in comparison with this, and to suppose the arrangement as the outcome of ignorance and stupidity was to show a degree of ignorance scarcely found among any people on the earth, either now or at any past time. In point of fact, this plan of roofing houses was not the expression of want of mind and want of knowledge. The people knew very well the advantages of the roof throwing the rain over the wall; why they did not act up to their knowledge might be a puzzle. The Lewis people were well-conconditioned,—physically, mentally, and morally; there was much more intelligence, happiness, and gratitude in those black hovels than in the comparatively well and skilfully built houses which went to make the closes in the Canongate and Cowgate. The people of the slums of our great cities, the dregs of the population, were inferior to the people whose typical dwellings he had just been describing, and who were the whole community, embracing some members with potential although undeveloped greatness. These were a people forming part of a nation which had been for a couple of thousand years in its Iron Age. Comparing these with the Lacodones, a tribe of the Pacific Indians, occupying an inaccessible position in the Yucatan peninsula, who, found by the Spaniards in 1695, knew nothing of any metal, their instruments being all made of stone, Dr. Mitchell proceeded to remark that they had there a picture of what he might call a sort of Stone-age civilisation. In what he said of the Lewis and Harris people, on the other hand, they had a picture of what he might as properly call a sort of Iron-age barbarity. It followed, therefore, that there could be existing a sort of civilisation with the Stone Age and a sort of barbarity with the Iron Age. If that conclusion was correct, it was clearly an important one. He next referred to what are known as the beehive structures, which were just passing into complete disuse, and of which there were only from twenty to thirty now in occupation in Scotland. These houses were of different dimensions. He referred to smaller specimens at Larach-Tigh-Dhubhstapl, Harris, ten miles from Loch Roag, and in other districts, and noticed one of larger dimensions at Meall na Uamh, in South Uist, which, he remarked, might have been the palace or reception-hall of an ancient king. The dome and pillars marked it out as fit for such a purpose. Whoever used it, the designer was a man of no mean mental power, and was beyond all question a man of ingenuity, large ideas, and good taste. Could any one, he asked, even assert that he must have been potentially inferior to the builder and designer of the extremely beautiful circular church at Nocera Dei Pagani, on the road from Rome to Naples? The more the facts were studied the more it would be felt, with such a question as he had put properly raised, that there was more than the possibility of its being justified by the answer if they could get it.

NEW CLUB-HOUSES IN THE PROVINCES.

Ilkley.—Arrangements are in progress for the erection of a large building at Ilkley (to be called "The Yorkshire Residential Club") as a residence for single gentlemen, containing within it features which will render it an attractive resort for others besides those resident in the house. It is thought (according to the *Bradford Observer*) that the proposed building, with its accompanying arrangements, will meet the requirements of a large number of young men at present living in lodgings in such towns as Leeds and Bradford, and already several have expressed their intention of taking rooms. A site of eight acres has been secured near Rosemount Nursery, Ilkley, which, being upon a commanding plateau, insures to the building uninterrupted views of the valley of the Wharfe. Several influential gentlemen have associated themselves for the purpose of forming the club and erecting the building, designs for which have been prepared by Mr. George Smith, architect, Bradford. The building will contain about 200 bedrooms, a number of sitting-rooms, dining, drawing, reading, billiard, smoke, ball, and concert rooms; while complete culinary arrangements and apartments for working staff are provided. The building will have a frontage of 232 ft., having two projecting wings 110 ft. in depth. In the centre will be an elaborate entrance-porch, with entrance-hall 24 ft. in width. The principal corridor, 12 ft. wide, dividing the building into two halves, will also render the ground-floor more than usually light and cheerful, owing to it and the cross corridors terminating with large windows. The dining-room will be on the ground-floor, and will be 70 ft. by 40 ft. Over it will be placed the ball-room, of similar dimensions, and above that the billiard-room will be situated. All these rooms will be 16 ft. in height. The drawing-rooms, situated in one of the wings, will be 40 ft. by 28 ft.; and a reading-room, 24 ft. by 20 ft., will be placed over the principal entrance. The building will be four stories in height, surmounted over the principal entrance by a Mansard tower, and at intervals by smaller spirelet turrets. The cost is estimated at about 40,000*l.*

Brighton.—The "Brighton New Club" has been completed. The building stands at the corner of Preston-street, with its main frontage upon the King's-road. The building is four stories high. A noticeable feature of the interior is the loftiness of the apartments, their lightness and spaciousness, in the front rooms especially. For instance, the morning-room, the dining-room, and the card-room, each occupying respectively the fore part of the ground, first, and second floors, fill the whole breadth of the building, with a proportionate depth. In convenient proximity to the main rooms are two large billiard-rooms, both on the ground-floor, to be fitted with tables by the firm of Burroughes & Watts; also a convenient entrance-hall, fromwhich a massive, square, stone staircase reaches to the second floor. There are also, in this division of the club, a library, a private dining-room, &c., and the usual subsidiary apartments, such as manager's office, &c. The bedrooms are twenty in number, arranged in quadrangular form on the third and fourth floors. The kitchen has been furnished with every modern convenience for culinary operations. The club was erected by Mr. Barnes, builder, Upper North-street; and Mr. Thos. Lainson was the architect.

WAGES QUESTION.

AT the Woolwich Police Court, before Mr. Balguy, Robert Lonergan, builder, Plumstead, was summoned by Charles Young, bricklayer, for three days' wages, at 8½d. per hour.

Mr. Lonergan offered 7d. an hour, saying that the plaintiff was worth no more. He admitted that since the late strike in the building trades the standard wages for a good bricklayer were 8½d., but there was an understanding that masters were at liberty to pay inferior men at lower rates. His son reported to him on the first day of Young's engagement that he was not a "full-rate" man, and on the third day witness took a trowel and went to work beside him, in order to try his value. The complainant made some sarcastic observation about the master taking the trowel, and witness finding out by observation that the man was not worth full wages, told him so. The complainant then threw down the trowel, and told him to do the work himself.

Complainant said it was the first time he had ever been told that he was not worth full wages. He worked all through the strike at 8½d. an hour, and was getting the same pay from an old employer at the present time.

Mr. Balguy said that Mr. Lonergan was wrong in allowing three days to pass without fixing the complainant's wages, and that consequently he must for those three days come to the complainant's own terms. On board ship it was customary to enter a seaman as A B, and if he was afterwards found inferior the captain gave him notice, and disrated him. When Mr. Lonergan engaged a new man he should pay him at the full rate for the first day, see what he was worth, and then say what wages he was prepared to give, and not go on for three days or a week, and then offer a reduced rate. This was common sense, and he thought it was law and justice also.

Mr. Lonergan expressed himself satisfied, and paid the money demanded, saying that he should act on the magistrate's advice in future.

NEW MARKETS.

Liverpool.—An extension to the wholesale vegetable and hay market in Fox-street, Liverpool, has been opened. This market is now one of the largest of the kind in the country, covering (without the extension) 14,000 square yards. The new portion of the market extends from the west wall of the old market along Great Nelson-street to Bell-street, and has an area of 2,530 square yards, the whole of which is covered. The entrance is in Bell-street, but there is a door communicating with the present market. The floor is of asphalte, and will be divided into four avenues. The walls are stoutly built of red brick, and light is admitted by a series of large windows on three sides. The extension was built by Messrs. Burroughs & Sons. The cost, exclusive of the land, was about 5,600*l.*

Coleraine.—A number of houses occupying the site of contemplated market premises between Blind-gate-street and New-row, Coleraine, have been demolished. In addition to the necessary offices for clerks, &c., the inclosures will consist chiefly of shops, with living apartments above, the lane traversing the proposed market from east to west being widened.

London.—The works for the completion of the Metropolitan Poultry Market (previously noticed in the *Builder*) are being rapidly proceeded with by Messrs. Holland & Hannen, the contractors. The houses on the side of King-street next to the Poultry Market will have been taken down in a few days, and the ground will then be clear for the completion of that building, so as to make it in a line with the Meat Market. The street from Charterhouse-street to King-street will be brought clear out by the corner of the market, where it is at present partly hoarded up. Part of this street will have to be carried on iron girders over the railway. The concrete wall which forms the present boundary of the railway in the King-street side is to be pulled down and replaced by a brick wall, as it is not certain whether it would safely bear the weight which will rest upon it. The contractors are also engaged in the preliminary excavations for the Vegetable and Flower Market. There is here an immense quantity of earth to be removed before the whole site will be reduced to the level of the railway. It is in contemplation to set apart a portion of the site adjacent to the line for sidings, for the delivery of produce; while another portion will be devoted to stabling for the horses conveying carted market stuff. The site, which can now be well surveyed from any of the streets around, occupies the whole area bounded by the London, Chatham, and Dover Railway, Snow-hill, Farringdon-street, Charterhouse-street, and the new street on the west of the Poultry Market. This site is to be intersected by a new street, which will run from the point where Snow-hill joins Farringdon-street to a point in King-street, nearly opposite Hosier-lane. This street will be carried on iron girders over the basement of the Vegetable Market and over the railway. It will

be a most important improvement, as it will open up direct communication between the line of thoroughfare from Chiswell-street to Long-lane and Farringdon-street. The contract has only been taken for the excavations, basement flooring in concrete, and the girder-work for the streets; the amount being 13,968*l.* It is estimated that about 20,000 cubic yards of earthwork altogether have to be removed. The works are under the superintendence of Mr. Ville.

Rotherham.—Major Tulloch, R.E., has held an inquiry at Rotherham in reference to an application of the Town Council to the Local Government Board for sanction to borrow 16,000*l.* for the purpose of providing markets, and 2,500*l.* for providing slaughter-houses.

Hull.—The North-Eastern Railway Company having acquired powers to take possession of the Hull Cattle Market for railway purposes, negotiations are in progress for the purchase by the Corporation of about fifty acres of land adjoining Walton-street, the property of the company, who offer to sell the land, subject to certain conditions, for 70,000*l.*

Mexborough.—Lieut.-Col. Ponsonby Cox, R.E., has held an inquiry at the office of the Mexborough Local Board, relative to an application by that body to the Local Government Board for sanction to borrow 4,000*l.* for the erection of a market-hall. The Local Board some time ago advertised for plans, offering 25*l.* for the best and most suitable, which premium was secured by Messrs. Tacon & Rawson, architects, Rotherham. The market will be partly covered and partly open, and will comprise Local Board offices, magistrates' room, public hall, shops, cellars, &c.

MASTERS AND MEN.

Warrington.—The strike of the flint-glass cutters in the employ of Mr. Edward Bolton, of Orford-lane Glass Works, was brought to a close on the 28th ult., and the men, after a month's absence, have resumed work. The piece-work system, which was at first objected to, has been accepted, and the price-list somewhat modified.

Glasgow.—A meeting of Glasgow operative joiners connected with the union was held in Albion Hall, on the 30th ult. It was stated that the strike was virtually at an end. There were no names on the strike-roll, and with one or two exceptions all the masters had signed the bye-laws. The principal object of the meeting was to pass a resolution with reference to what are termed in the trade "knobs." A motion was adopted at the meeting to the effect that no "knobs" be allowed to work alongside of trade unionists—in other words, that they be not allowed to work at all,—and that, before being admitted members of the society, should they resolve on that course, a fine of 1*l.* each must be paid.

Willenhall.—On the 23rd ult., a meeting of workmen in the rim and mortise lock and key trade was held at Willenhall, in order to induce all engaged in the trade to become members of the Willenhall Lock and Key Smiths' Association, and to consider the desirability of amalgamating the society with the Wednesbury Trades Council. Mr. J. Carter, president of the Willenhall Lock and Key Smiths' Society, occupied the chair. Mr. R. Juggins, general secretary of the National Amalgamated Association of Nut and Bolt Makers, referred to the change that had occurred in the circumstances of the men on account of the late strike, by means of which they had gained an advance of 7½ per cent. upon their wages. He said that many might think because of that advance they had gained all they could possibly require, and that there was nothing further to be done. But he warned them that if they rested content with that they would be in the same, or even in a worse, position than they were some time ago. Only let them let go their hold on the employers and the latter would seize their opportunity and bring them lower than they had been, and the workmen would sincerely repent the apathy they had exhibited. The following resolutions were adopted:—(1) "That in the opinion of this meeting it is the duty and privilege of every workman in the trade to become a member of the Lock and Key Smiths' Association, and thereby contribute an equal share to that fund, which is established in order to enable them, on all occasions, to obtain and maintain a fair and equitable rate of wages." (2) "That this meeting, perceiving the advantages to be gained by the representatives of the various trade societies meeting together in council, does hereby instruct the committee to make the necessary arrangements for the society to be represented at the Wednesbury Trades Council."——On Monday evening last a meeting of brass padlock-makers now on strike was held, Mr. Edward Ellard in the chair, when it was resolved:—"That this meeting of brass padlock-makers and keysmiths still refuse to return to work until the employers concede the advance of their wages, for which they have given reasonable and proper notice, and which they know full well they are entitled to; at the same time a deputation of the men is open to meet the employers, so that, if possible, a better understanding may be come to."

Macclesfield. — The "Macclesfield House Painters' Committee" have issued a manifesto replying in detail to a statement in the *Macclesfield Courier* that the strike was "virtually at an end." Such, they say, is "unfortunately not the case, nor is it likely to be with some of the employers, who are constantly boasting that they shall never give what is now known as the town's wages, namely 7d. per hour, but that they will employ anybody, or, as one of them remarked a few days ago, any 'muff' that came along first. But with those employers who are giving the wages, it is a different thing; they at once gave the men 7d., and, as a matter of course, their men never stopped work at all."

Greenock.—The *Glasgow Herald* says that the 200 masons who, as already stated, lately sailed from New York for Glasgow, have come to Scotland on the engagement of Messrs. Coghill & Son, builders, Greenock. The Messrs. Coghill are the contractors for the mason-work of the extensive buildings presently being erected by the Greenock Parochial Board at Smithston; and although between two and three hundred masons can be employed on this job, very few men can be obtained, and at present there are not many more than a dozen masons working there. The reason of this appears to be, that the men find no difficulty in obtaining work within the town, which they naturally prefer to the work at Smithston, a considerable distance off. Messrs. Coghill & Son have made a special contract with the State Line Company for the transport of the men.

Southampton.—About three hundred joiners employed by the shipbuilders and steam packet companies of Southampton went out on strike on Tuesday last, the 5th inst., for an advance of 10 per cent., making their wages equal to those of other joiners in the town, viz., 32s. a week.

Nairn.—The carpenters in Nairn came out on strike on the 1st inst. for an advance of wages and for nine hours a day. Their present wage is 5d. per hour, and they ask 6d. The masons have been working only nine hours since the beginning of the year.

PRECAUTIONS AGAINST FIRE AT THE PUBLIC RECORD OFFICE.

SINCE the 1st of January last the Office of Works and Public Buildings has undertaken the entire control of the water supply and the police arrangements at the Public Record Office, which is situated on the old garden belonging to the Rolls House, Chancery-lane, and contains the muniments of the nation; and the Deputy-Keeper of the Public Records has taken the opportunity of giving an account of the means adopted for the security of the record repository from fire. The building is of fireproof construction throughout. The walls are built of brick, and the several fronts faced with Kentish rag and Portland stones. Besides the central tower of two tiers, there are four stories. Each room in which records are kept is fitted up with cast-iron presses, having slate shelves. No wood-work of any description, except a fall table fixed in the wall, is in these rooms. The division walls between the rooms are of brick. The ceilings are arched in brickwork with iron girders; the staircases are cast iron, and the floors are formed with cast iron or wrought and cast iron girders, and brick arches, with hollow fire-clay tile paving on concrete filling; but on the basement floor the paving is of Portland stone. The corridors and hall are paved either with Portland stone or tiles on brick arching. The casements and skylights are cast iron, and the room-doors are of wrought iron. The building is entirely detached, except that a wooden bridge, covered with corrugated iron, and provided with an iron door, connects a staircase with the Rolls House. The roof generally is constructed with cast-iron girders, wood principals, struts, purlins, and boarding, and covered with slate. The furnaces, boilers, &c., for the hot-water apparatus, are in the basement, and they, together with the gas supply, are considered by the Office of Works quite secure. The gas-burners, except in the offices, are protected by wire guards. The supply of water is considered sufficient by the Office of Works. There are on each floor fire-cocks affixed to pipes charged from tanks in the central tower; the depth of water in them is indicated on a dial in the hall. There is a resident turncock, and the police are on duty in the building day and night. There is to be fire-hose practice once a week. The use of lighted candles is forbidden, except by special authority in cases of necessity. Every day at the closing of the office all fires in the stoves are to be left in such a state that no danger may arise from them. No fuel is to be put on the fires after three o'clock, and the fire-guards are to be put on before the rooms are left; "nor are fires to be raked out." As soon as the office is closed, a policeman is to pass through all the rooms containing fire-places which have been used during the day; he is also to examine whether every part of the premises is secure. No person is to be admitted into the office on any pretence after it is closed. Every part of the building is to be visited by the deputy-keeper at least twice a year to ascertain whether any further precautions are required.

HOP-PICKERS' LODGINGS.

DURING the past week or ten days the South-Eastern and London, Chatham, and Dover Railway Companies have conveyed upwards of 20,000 hop-pickers—men, women, and children—to Maidstone and the immediate neighbourhood. It is therefore satisfactory to know, on the authority of the *Maidstone and Kentish Journal*, that this large "floating population" is likely to be housed in a manner more conducive both to its physical and moral well-being than has been the case in past years. The improved condition of things is largely owing to the exertions of the Kent Society for the Employment and Improved Lodging of Hop-pickers. The sanitary authorities of Bromley, Cranbrook, and Tenterden have adopted the powers afforded to them under the amended Sanitary Act, and have issued a code of bye-laws which secure, at little cost to the growers, all that can fairly be required in the provision of suitable lodgings and accommodation to the hop-pickers. The main features of the bye-laws, which are thus being enforced for the first time this year in many of the hop districts in Kent may be briefly stated. All habitations in which persons employed in hop-picking are designed to be lodged must be weather-proof and dry; clean when required for habitation; ventilated so far as may be required; and, where practicable, lighted. During sleeping hours, 16 square feet at the least of available floor space must be allowed to each adult, two children under ten years of age counting as one adult. Screens or partitions of sufficient height and length to secure privacy must separate the beds. Available places for cooking and the drying of clothes must be provided in the proportion of one to fifteen pickers, and there must be a sufficient supply of good water. The other regulations relate to the changing or cleansing of the straw used for beds, the limewashing of each habitation previously to the periodical occupation, and the removal of accumulations. The penalty for an offence against any of the bye-laws is a fine not exceeding 10*l.*, with a further penalty not exceeding 10*s.* for every day during which the offence shall continue.

HUNSTANTON CONVALESCENT HOME.

SIR,—Seeing in your last week's paper an advertisement inviting architects to send in designs, &c., for the above building, I feel you will allow me to make a few remarks upon this matter; for, at a meeting of subscribers held at the Town-hall, in Lynn, a short time ago, several gentlemen expressed it as their opinion that they were morally bound to employ Messrs. Drury & Lovejoy, the architects to the Hunstanton Estate, as they had already taken the trouble to prepare some designs, and were also subscribers to the building fund. I am of their opinion too, but as the committee have advertised for plans, in justice to those about to compete, and to remove every suspicion, they ought to undertake to employ a professional man, quite unbiassed, to make a report on the plans submitted, or otherwise they will get very few designs from competent men, except, perhaps, from those unacquainted with what took place at the meeting before mentioned; for architects have been "sold" too often lately in competitions, and do not care to waste valuable time, not to say anything about money, to gain a paltry second premium. All the competitors cannot be first; but, at least, let the unsuccessful ones know that they were beaten solely by merit.

AN OLD BIRD.

ANOTHER MORTISING MACHINE.

MESSRS. F. W. REYNOLDS & Co., the engineers of Southwark-street, have brought out another new patent mortising-machine, the novelty of which consists in the method of connecting the hand-lever to the part which carries the spindle of the chisel. In place of the usual rack and cog-wheel, it has an articulated elbow, or toggle movement, the action of which not only produces the requisite vertical motion of the chisel, but gives it an increased power as it penetrates deeper and deeper into the material being worked. The regularity of the depth of mortises not required to pass through the wood is secured by making the part adjustable which carries the chisel-spindle of the fulcrum of the lever. The lever is always brought down to the lowest point, but the desired uniformity in depth of the mortise is obtained by this method, the patentee claims, with great certainty, and with less trouble than is required by other machines that are made for this purpose. It will be called the "Eclipse."

MELBOURNE SEWERAGE.

At a meeting of the Parochial Committee for Melbourne, Derbyshire, held on the 30th of August last, the following tenders were opened for sewerage works at Melbourne, when the Committee unanimously recommended the tender of Mr. W. Smart, contractor, Nottingham, to be accepted subject to the approval of the Shardlow Sanitary Authority: this recommendation the Rural Sanitary Authority have decided to adopt. Mr. Geo. Thomson, of Derby, is the engineer:—

Knight	£4,350	5	0
Barton	2,998	0	0
Knighton	2,913	0	0
Vale	2,846	16	0
Cowderey & Sons	2,844	0	0
W. & H. Earl	2,814	10	0
Maclean	2,795	0	0
Shaw	2,600	0	0
Smart	2,560	0	0
Lea & Fryer	2,410	0	0*
J. & F. Tomlinson	Schedule of prices.		
Harpur	"		"
Tyson & Son	"		"

* And 4s. per yard extra for rock cutting.

OBITUARY.

Mr. F. W. Maynard.—Mr. Frederick Waite Maynard, secretary of the Arundel Society, and for many years secretary of the Artists' General Benevolent Institution and the Artists' Orphan Fund, died on the 27th ult., while in Switzerland, at Bex, Canton de Vaud, at the age of 44.

Mr. George Smith.—A telegram, received at the British Museum on Monday last from Constantinople, states that Mr. George Smith, the Assyriologist, died at Aleppo on the 19th ult.

"OPEN SPACES."

STABLES IN A COURT!

SIR,—Here in Southwark we are filling up very small open spaces! If any of your readers are sceptical as to this, let them pay a visit to Red Cross-court, in the High-street, in the Borough, and they will find what I state to be correct,—that there have been just erected stables in the centre of a court. It is almost incredible, but there they are nevertheless. A City Company (the Vintners) are not ashamed to try to increase their revenues by such an act of Vandalism!

ONLY A TAILOR.

P.S.—I find it is called a square. It is approached from the High-street by a passage that the "Claimant" could scarcely pass through.

RIGHTS OF RIPARIAN OWNERS.

LYON *v.* THE FISHMONGERS' COMPANY.

AN important judgment was lately delivered by the House of Lords in the case of Lyon *v.* The Fishmongers' Company and the Conservators of the Thames." The suit was instituted by the owner of Lyon's Wharf, near Upper Thames-street, for the purpose of restraining the Fishmongers' Company from making, and the Conservators from granting a licence to make, an embankment which would cut off all access of barges to the west front of Lyon's Wharf. Vice-Chancellor Malins, on the principle that if a man's house has two doorways opening on the highway he has an equal right to the uninterrupted use of both, decided that the right claimed by Mr. Lyon was a private right expressly reserved to him by the 179th section of the Thames Conservancy Act, and that the Conservators had gone beyond their powers in granting to the Fishmongers' Company the licence to construct the proposed embankment, and granted the injunction asked for by the plaintiff. The Court of Appeal declined to hold that the rights of a riparian owner on the banks of a stream above the flow of the tide necessarily extended to a riparian owner where the tide flows and reflows, and held that the only right the latter proprietor had in reference to the river was a right of navigation, and, consequently, that the only ground he would have for restraining an obstruction interfering with his right of navigation was, that the obstruction would be a public nuisance, from which he individually would suffer damage. The court held, moreover, that the rights reserved by the Thames Conservancy Act were the private rights of the owners and occupiers of wharfs, and not their interest in the public navigation of the river. From this decision Mr. Lyon appealed to the House of Lords. The Lord Chancellor, Lord Chelmsford, and Lord Selborne now delivered judgment. The Lord Chancellor was of opinion that the view taken by the Lords Justices of the rights of a riparian owner on the banks of a navigable river was wrong. The ordinary rights of a riparian owner of a non-navigable river were well known. Those rights, in his lordship's opinion, were retained by the owner of land on the banks of a tidal and navigable river, though no doubt they underlay, and were controlled (not extinguished) by the public right of navigation. The questions were (1), what were the rights of Mr. Lyon; and (2) were those rights reserved by the 179th section of the Thames Conservancy Act. In his (the Lord Chancellor's) opinion both questions had been rightly decided by the Vice-Chancellor, and the judgment of the Lords Justices ought to be reversed. Lords Chelmsford and Selborne concurred.

NEW MUNICIPAL BUILDINGS.

Newbury.—On the 30th ult. the Mayor of Newbury (Mr. W. G. Adey) laid the foundation-stone of new municipal buildings for the town. The new buildings, which will cost upwards of 4,000*l.*, will comprise a commodious council-chamber, a court for administration of justice by the county and borough magistrates, municipal offices, &c. The architect is Mr. James H. Money, of Speenhamland, whose plan was selected in competition, and the contractor is Mr. Crook, of Southampton. The "foundation" stone is the corner stone of the principal tower, and weighs nearly four tons.

Wantage.—The *Reading Mercury* states that negotiations have been successfully completed for obtaining a site for the erection of new municipal buildings at Wantage, the committee having purchased the Falcon Inn and some adjoining premises.

Leicester.—On the 17th ult. the Mayor of Leicester (Mr. W. Barfoot) opened the new municipal buildings at Leicester, erected at a cost of about 50,000*l.* The buildings are in the "Queen Anne" style, from competitive designs by Mr. F. Hames, London, and comprise assize and borough police-courts, police and fire brigade stations, council-chamber, school board, and other public offices.

ACCIDENTS.

DR. HARDWICKE, the coroner for Central Middlesex, lately held an inquiry at University College Hospital as to the death of Charles Bonnick, aged fifteen. The deceased was in the employ of Mr. Cowland, heraldic painter, Woburn-place, and was engaged in painting the steps of the staircase leading from the hall to the drawing-room floor of his employer's house, when he fell over the baluster on to the hall floor, fracturing his skull. It appeared from the evidence that the deceased was leaning over the baluster in order to paint the nosings of the steps. The jury having viewed the staircase, one of the jurors said that the steps were dangerous, there being from the ground-floor to the drawing-room floor no less than ten winding steps and fourteen straight ones; and the baluster-rails were rather lower than the average. The nosing could not have been done easily by reaching through the baluster-rails. The coroner said that the lesson to be derived from this case was, that practical men only should be employed to do dangerous work. Employers who put inexperienced persons to dangerous work were responsible, under Lord Campbell's Act. It was like a gentleman asking his coachman to clean windows, although not used to it. The jury returned a verdict of "accidental death."

Dr. Hardwicke has also held an inquest at the Middlesex Hospital, as to the death of Alfred John Bull, aged thirteen, a youth employed in the cabinet factory of Messrs. Howard & Son, Cleveland-street, Fitzroy-square. Deceased was employed in the turners' shop, under Mr. William Reeves, a contractor with Messrs. Howard & Son for turnery work. It appeared that Reeves left his lathe on the day in question in motion, in order to go and sharpen some tools, and during his absence deceased, on passing the lathe, fell against it, and was struck on the head with a piece of wood thrown from the lathe by the machinery, his skull being fractured. Joseph Langdon, a sawyer at the works, who saw the accident, attributed it to the flooring near the lathe being worn uneven and slippery. The jury decided that this was a case of accidental death; but they were of opinion that had the floor in front of the lathes been in a proper condition, the accident could not have happened.

An inquest was held at Gravesend on the 29th ult. by Mr. E. A. Hilder, the borough coroner, relative to the death of William Smith, aged nineteen years, lately employed as a labourer at the cement works of Messrs. Knight, Bevan, & Sturge, Northfleet, who was scalded while engaged in cleaning a boiler. Verdict: "accidental death."

A serious accident, by which one man lost his life and two others were injured, occurred on the 31st ult. at Manchester. It appears that a number of men were engaged upon some buildings which are in course of erection in Fennell-street, by Mr. Isaac Storey, for the purposes of shops and offices, the builder being Mr. R. Thomas, Long Millgate, and the contractor for the brickwork, Mr. S. Adshead, Hoyle-street, Fairfield-street. At the time of the accident, Philip Connolly, aged fifty-nine, a labourer; William H. Johnstone, bricklayer; and another man named Charles Hartsborn, also a bricklayer, were "pointing" an arch in the basement. The arch was 6 ft. 10 in. across, with a rise of 10½ in., and about 6 yards in length, and was three rings of bricks in thickness. The "centres" of the arch were drawn three days previously, but a tie-rod had been placed to prevent the arch from bulging. Another man, also named Connolly, had been assisting in the work, but had gone to the front of the building when he heard the men shouting, and the noise of falling bricks and masonry. He ran to the spot, and found that the arch had fallen, and that the men were buried beneath a large mass of earth and bricks. It was said that the accident was due to the heavy rains of the previous few days, which, penetrating between the bricks composing the arch, had prevented the mortar from setting.

On Saturday morning last Mr. William Carter, the coroner for East Surrey, held an inquiry at St. Thomas's Hospital respecting the death of Mr. J. J. Cockle, of Vine-place, Bond-street, South Lambeth. From the evidence of J. Lines and G. Williams, it appeared the deceased was superintending the works now in progress at St. Ann's Church, Lambeth. At the time of the accident the workmen were hoisting a large beam, weighing a ton and a half, for a "principal," by the aid of a derrick, which was in the second scaffold. The crab was set in motion, and immediately after the rope collar, 4½ in. in circumference, snapped asunder, and the deceased was caught on the head by the broken collar, and knocked off the scaffold, falling in his descent on his head, a distance of over 40 ft. He was picked up in a pool of blood and conveyed to St. Thomas's, where he expired shortly after admission. The jury returned a verdict of "accidental death."

CHURCH-BUILDING NEWS.

Panteg.—Panteg Church, near Pontypool, has lately been re-opened, after restoration from plans by Mr. Woodyer, architect, Graffham, under the superintendence of Mr. W. U. Coupmaker, by a foreman mason, Charles Randall, and a carpenter, Thomas Jenkins, of Caerleon.

Croxton.—An effort is being made to raise a fund for the restoration of the parish church of Croxton, Lincolnshire. Mr. Fowler, architect, reports the edifice to be "in a very dangerous state." The church appears to have been built in the twelfth century, and had originally north and south aisles to the nave, which have long

since disappeared, but the foundation of the north aisle remains, and the arcade,—for it is at present in the walls, built up, the pillars being very handsome ones, in fair condition. It is proposed to rebuild the north aisle, a porch, and vestry, and to restore the tower, walls, roof, and windows, and reseat and refit the whole, the cost being estimated at about 1,100*l*.

Holywell.—The foundation-stone of a new vestry and organ chamber at Holywell Church was laid on the 3rd ult. Mr. H. J. Tollit is the architect of the new building, and Messrs. Knowles & Son, builders, of Holywell, are the contractors, and it is expected that the work will be completed in about three months.

Dudley.—A new church, dedicated to St. Luke, was recently opened at Dudley by the Bishop of Worcester. The style of the church is Early Pointed, and the architects are Messrs. Davies & Middleton. The foundation-stone was laid in May, last year, and the whole of the work has been executed in a very substantial manner. The windows, which are of cathedral tinted glass, are the work of Mr. John Davies, of Worcester.

Navenby.—The parish church of St. Peter, Navenby, has been re-opened, after restoration. The building, which dates from the Perpendicular period, was very dilapidated when taken in hand by the architect. The walls have been stripped, scraped, and pointed; the old pews have been replaced by open oak benches, with carved and moulded side ends; the blocked-up organ-chamber has been opened out. The old roofs have given place to new ones; the flooring-stones have been refaced and relaid; the chancel floored with Minton's tesselated pavement, laid in geometrical patterns; the great east window restored to its former style; and a new porch and vestry built. Mr. Chas. Kirke is the architect, and the work has been carried out by Messrs. Rudd & Son, Grantham. The cost will be 3,500*l*.

Corscombe. — The old church of this parish has, with the exception of the porch and tower, been razed to the ground, and the foundation-stone of a new edifice as its successor has been laid by Miss Troyte Bullock, of Sedgehill House. Mr. Charles Trask, of Norton, is the contractor for the work, which has to be completed by next May.

Gainsborough.—It has been decided to continue and complete the decoration of the nave of the parish church of Gainsborough in harmony with that of the apse, which was carried out last winter. The work has been entrusted to the same artist, Mr. J. Knowles, of York, and it is estimated to cost 300*l*. The work will be commenced shortly, and finished (it is hoped) by the end of October, the church being closed during the interim.

Little Leigh (*Cheshire*).—The foundation-stone has been laid of a new church, which is to supersede the present dilapidated edifice. The new church of St. Michael is to be constructed in the Gothic style of the Early English period, from the plans of Mr. Edmund Kirby, and the building is intended to seat about 200 persons. The builder is Mr. Richard Beckett, of Hartford. The foundation-stone was "well and truly laid" by Lady Leigh, who fulfilled her duties in a workmanlike manner with a silver trowel from Messrs. Hunt & Roskell's. The trowel was presented to Lady Leigh by two young lady parishioners on behalf of the ladies of the parish, who have taken a great interest in this Church movement.

STAINED GLASS.

Frankley.—The inhabitants of Frankley have decided to place a new east window in the chancel of the parish church, as a memorial to the late Lord Lieutenant. The subject of the window will be Abraham's Offering, the Good Samaritan, and the Good Shepherd, and the work has been entrusted to Mr. Bourne, Birmingham.

Morecambe. — A memorial window has been placed in the east end of Morecambe Church, to perpetuate the memory of the late rector, the Rev. E. F. Manby, who died in January last. The window consists of three lights, the subject illustrated being the Crucifixion. The centre light contains the figure of our Lord upon the cross, with an angel above weeping, and the Magdalene embracing his feet, and beneath this another angel bearing a scroll, with the inscription, "It is finished." The right-hand light contains the figure of the Blessed Virgin Mary, with her emblems,—the rose above and the lily beneath. The left-hand light contains the figure of St. John with his emblems,—the apostolic chalice and dragon above, the evangelical eagle beneath. Throughout the two side lights there is a groundwork of passion-flower ornament painted *en grisaille*. The window has been executed by Messrs. Shrigley & Hunt, Lancaster.

Burslem. — A stained glass window to the memory of the late Joseph Shirley, of Longport, has just been placed in the south aisle of Dalehall Church, at the expense of the workpeople of Messrs. Davenport & Co., over whom Mr. Shirley for many years acted as manager. The design of the window consists mainly of floral wreaths running over a ground of circles and quatrefoils. Beneath the window is a brass tablet bearing an inscription.

Denham. — The east window of Denham Church, which consists of two lights, has been filled with stained glass by Messrs. Dixon, Frampton, & Hean. The subjects represented are the Crucifixion and the Ascension, and the quatrefoil in the heading is occupied by the Agnus Dei.

Henstridge. — A stained glass window, by Messrs. Hardman, has just been given to the parish church of Henstridge, as a memorial of the late Mrs. Macdonald. The window represents our Lord's Epiphany to the Gentiles, the visit of the Wise Men. This occupies the centre light. The tracery of the window head is also filled with coloured glass.

Thirsk.—Another stained glass window, by Messrs. Lavers & Barraud, has just been erected at the west end of Topcliffe Church, to the memory of Charles William Hawkins, eldest son of the vicar, who died suddenly at Bombay, August 3, 1875.

Bottisham.—An Early English triplet window, designed by Mr. A. W. Blomfield, has just been placed in Bottisham Church, and filled with stained glass by Messrs. Clayton & Bell, as a memorial to the late Col. Soame Gambier Jenyns, C.B.

Books Received.

Latham's Edition of Johnson's Dictionary of the English Language. Abridged by the Editor. Longmans, Green, & Co. 1876.

DR. LATHAM'S edition of Dr. Johnson's well-known dictionary is admittedly an excellent and very superior work. This forms four quarto volumes, and is too large and costly for many who yet need a good dictionary. Dr. Latham has done good service, therefore, in reducing the original work to one of moderate dimensions in octavo, the substance of the greater work having been carefully preserved. The reduction of matter has been effected chiefly in the extracts given in the way of authority and illustration. In the larger edition these extracts were both numerous and long: many are retained in the new work.

In a very interesting "Historical Sketch of the English Language," prefixed to the volume, the editor has traced the history of the three languages or dialects which make up the present spoken language. He shows that "the principle which has determined the present arrangement is the fact that, whether we use the word *language* or *dialect*, each of the three is represented by a definite and important literature. (1) The *West-Saxon* culminates as the literature of the times before the Norman Conquest, and the fact of its *not* having been the direct and lineal ancestor of the present standard English has long been understood. (2) The *Northumbrian* is represented by the lowland Scotch, which up to the union of the two Crowns was as much a different language from the English of South Britain as the Portuguese is a different language from the Spanish, or the Danish from the Swedish. (3) The present classical, standard, typical, or literary, English is *Midland* or *Mercian*; and this is the one with which the present Dictionary is most specially connected." The head-lines are printed in a strong and obvious type, so as to make reference easy and agreeable. The book is sure to have a large sale.

"*La Semaine des Constructeurs*," 51, Rue des Écoles, Paris.

THIS is the title of a weekly illustrated journal of public and private works, which has been started under the general direction of the energetic M. César Daly, M. P. Planat being the sub-director. It is published every Saturday, price half a franc, and has already reached eight numbers. It has something of the character of the *Builder*, and will doubtless reach a body of readers who would be little likely to subscribe to the *Revue Générale de l'Architecture*, and other similar higher-priced and severer periodicals. We cordially wish M. Daly complete success in his new undertaking.

Miscellanea.

Why should not Hydraulic Lime be made at Reading?—Mr. James J. Wheble, of Bulmershe, Reading, in a letter to the *Reading Mercury*, says:—"There is plenty of clay and chalk in the neighbourhood, and the question may be fairly asked, why we cannot make hydraulic lime, such as is used at Silchester and Reading Abbey? Was that lime made here from clay and chalk, or did it come from the limestone formations, and commonly called blue lias? The Silicate and other companies state that they can teach the art of making lime; and if such a company was formed, we might utilise our gravels for concrete houses and walls. Bridgewater hydraulic blue lias lime is 30*s*. per ton, and will make about 7,000 bricks of about 9 lb. weight. The concrete walls at Silchester and Reading were most likely made thus: a layer of large or small stones was made a certain height, and then the lime, well wetted, was mixed with broken bricks and stones, and found its own level when put into this trough. Hydraulic lime is burned and ground, and, when wetted, gives out no heat, but hardens at once, even under water. I have heard it said, frequently, that the Romans ran their mortar in hot. It should have been in a liquid state. Concrete houses and walls have been built in Reading, and bricks are now being made; but the blue lias or Portland cements are not equal to that used at the Reading Abbey and elsewhere. I have a brick kiln with plenty of clay, and I am about to dig a well into the sand bed near the deep cutting on the Great Western Railway at Sonning to drain at all times the gravel beds above them, so as to utilise the gravel for concrete works. I have made many inquiries about making hydraulic lime, to no purpose, and should be glad to receive any information on that subject. I have made concrete bricks, and built walls which have stood fairly, but the lime is uncertain, and sometimes flies."

A New Flying Machine.—Mr. J. Simmons, C.E., made some experimental trials of a new description of flying machine at Chatham Lines on the 24th ult. The machine is intended for use by an army in the field, so as to enable a person to be raised by means of the wind to whatever elevation required to reconnoitre the movements of a hostile force, and to ascertain the whereabouts of an enemy's position. Mr. Simmons displays for this purpose a number of parakites, which are in reality huge square-shaped kites, the material of which they are composed being French cambric covered with a coating of birdlime and indiarubber. Each parakite is balanced by a long tail composed of goosequills. The first parakite raised was a few feet square, and on the required height being obtained it was fastened to another of the same description, somewhat larger; a third and fourth were subsequently raised, and a height of about 1,200 ft. attained by the smallest of the parakites, the lifting power being such that with about a dozen men holding on to the ropes a drummer-boy was raised from the ground by the pulling force of the parakites. At this moment, and just as a fifth parakite was about to be raised, one of the rods used for stretching the machine gave way, rendering it useless. The largest of the five parakites, which is 25 ft. square, was then raised, when it was found to have a lifting power sufficient to raise a man. Almost immediately afterwards the rope gave way from the immense strain of the four parakites, and the whole came to the ground.

Memorial Church to Dr. Hook at Leeds.—On Saturday the foundation-stone was laid in Leeds by Lord Hatherley of a memorial church to the late Dr. Hook, formerly vicar of Leeds. The stone bore the following inscription:—"This foundation-stone is laid to the glory of God and the memory of Walter Farquhar Hook, D.D., vicar of this town 1837–1859, by his life-long friend, William Page, Baron Hatherley, late Lord High Chancellor of Great Britain, Sept. 2, 1876." The cost of the church will be about 20,000*l*. The architect is Sir Gilbert Scott.

Art Gallery of New South Wales.—An art-gallery was opened at Sydney on June 1, and will henceforth, says the *Sydney Morning Herald*, be accessible to the public, without charge, every Friday and Saturday afternoon. The Council of the Academy of Arts, to whom the public are indebted for the foundation of this institution, are (says the journal mentioned) worthy of all praise, and the success of their labours must be satisfactory to the lovers of art. Their difficulties have been considerable, but by persevering energy they have been surmounted, and the art-gallery being once established, it will grow in favour until the colonists feel proud of their national collection of pictures. To the unwearied efforts of Messrs. E. L. Montefiore and E. Du Faur, the present results are mainly to be attributed. Parliamentary grants in aid of the purchase of pictures have been voted for the past two or three years, and the appropriation of the money has been placed in the hands of Sir Alfred Stephen, and Messrs. E. L. Montefiore, J. R. Fairfax, and E. Du Faur as trustees for the formation of this national institution. The original grant was 500*l.*; subsequently 500*l.* were voted for the same object, and on the motion of Mr. Watson, M.L.A., 1,000*l.* were voted to the Academy of Arts, a portion of which the council agreed to expend in the purchase of pictures for the National Gallery. Out of the first 500*l.* available, six paintings were procured, being by T. W. Richardson, Paul Naftel, O. W. Brierley, J. W. Whymper, J. H. Mole, and H. Brittan Willis.

French Ouvriers and American Workmen.—The delegates sent by the artisans of Paris to the Philadelphia Exhibition have had a dinner given to them, which 600 persons attended. M. Desmoulins, secretary of the delegates, gave a summary of what they had observed, and declared that unless France developed technical education she would lose her industrial superiority. M. Daniel, delegate of the shoemakers, followed him in a speech showing that he had found the United States less of a working-man's paradise than he had imagined it. He remarked: — "There are, strictly speaking, no American artisans. All the artisans of America are the expatriated of other countries, who have carried their industry thither. In that great American Republic, so much vaunted by our politicians, we found what is seen everywhere at home, the same economical position for the workman, capital being there as much the master as in France. In America workmen have every possible liberty, and there are more schools than with us; but if negro slavery has been abolished, that does not prevent white slavery from existing in all its rigour. In spite of all the methods of teaching, schools, libraries, and universities, to be found in America, the workman is ignorant. He has every liberty, but he does not make use of it. The reason is that he is forced to work fifteen hours a day in order to live miserably."

Fall of a Tunnel.—The new line of extension of the Metropolitan Railway system from Bishopsgate to Aldgate was the scene of a shocking accident on Wednesday last, resulting in the death of two, if not three, men, and serious injury to others. The carrying out of the extension has been intrusted to Messrs. Lucas & Aird, and a great part of the tunnel has been finished. The line runs from the Bishopsgate station in Liverpool-street across Bishopsgate-street to the eastern side of Houndsditch, and the work of tilting the rubble, on the top of the brick tunnel, has been going on at that point of the line running beneath Cavendish-court, Houndsditch. About three o'clock in the afternoon a horse and cart were upon the top of the tunnel at the last-mentioned point, when the brickwork suddenly gave way and about 20 yards of the tunnel fell in, carrying with it the horse, cart, and the driver. Neither of the three was injured, but unfortunately some ten or twelve men were at work immediately under the part that fell. In an instant the whole of the poor fellows were struck down by the mass of brick and rubble. Two men were found to be dead, and six so frightfully hurt that no hopes were given of their ultimate recovery. The sufferers are all bricklayers.

Holland and her Colonies.—The Dutch Colonial Department have determined on improving the harbour of Batavia, Isle of Java. A Dutch firm, a French firm, and an English firm sent in tenders. We understand the Dutch Government have selected that of the English firm, Le Fevre & Co.

The Birmingham Improvement Scheme and Artisans' Dwellings.—By the provisions of the Artisans' Dwellings Improvement Act, it is enacted that the local authority, on proceeding to carry out improvements, shall provide for the accommodation of at least as many persons of the working classes as may from time to time be displaced within the condemned area, such accommodation to be provided within the area itself or in its vicinity, unless there are special reasons to the contrary. The provisional order for the Birmingham Improvement Scheme also stipulates that only so much of the areas shall be cleared of buildings at one time as will suffice to provide accommodation for at least 500 of the persons to be displaced, no further clearances to be made until these are provided for. The *Birmingham Gazette* states that these matters have recently engaged the special attention of the Improvement Committee, who have been fortunate enough to secure a plot of ground three acres in extent, at present unbuilt upon, within an easy distance of any part of the condemned area, and upon which building could at once take place, and proceed *pari passu* with the work of demolition. Miss Ryland, who has already done much for Birmingham, has indicated her wish to materially assist in the erection of houses for the working classes.

The New Street from Shoreditch to Oxford-street.—On Monday last another section of the new main thoroughfare from New Oxford-street to Shoreditch, now in course of construction by the Metropolitan Board of Works, was opened to the public. The portion of this new street is situate between High-street, Shoreditch (opposite Commercial-street) and Tabernacle square, Old-street, and is about 2,000 ft. in length and 60 ft. wide, the carriage-way being formed of granite and the footways of York stone. A portion only of the street is at present available for carriage traffic. It forms a part of the new thoroughfare from Shoreditch to New Oxford-street, now in progress at a cost of nearly a million. Old-street will be widened on the North side, and Wilderness-row was widened and opened in May, 1875; a new road will be formed from St. John-street, Clerkenwell, to Farringdon-road, near the Clerkenwell Sessions House, and another new road to Liquorpond-street, which will be widened, as well as Christopher-street, King's-road, and Theobald's-road. A communication has been opened from Gloucester-street and Kingsgate-street to Vernon-place and New Oxford-street. A wrought-iron girder bridge to carry the new street over the Metropolitan Railway at Farringdon-road has been completed, at a cost of 18,250*l.*

A Suggested Street Improvement in the City.—"A Minorite," in a letter to the *Daily News*, says:—"Will you allow me to call the attention of the Board of Works and the Corporation of the City of London to a scheme which appears to me to have all the constituents to cause it to be favourably received, not only by the above Boards, but by the general body of business men? Before making the connexion between the District and the Metropolitan Railways, would it not be well to consider the advisability of making a good wide street from the eastern end of Cannon-street, through Eastcheap, Tower-street, over Tower-hill, to the south end of the Minories? I would suggest that the new street should not stop there, but continue its course to meet the Commercial-road at the end of Alie-street: this would give a good broadway from Blackwall to Westminster; the two railways mentioned could join by using the new street, as they have done under the Embankment. Such a street would much relieve the already overburdened streets in this neighbourhood, and open a good broad passage from East to West. The proposal to erect a bridge at Tower-hill should carry some weight in the consideration of these suggestions. If we are fortunate enough to get the bridge, unless we have some good wide approaches to it we may suffer from the blockings such as affect the passage over London Bridge."

The Gibbon Wakefield Bust, sculptured by Mr. Joseph Durham, A.R.A., has just been placed in the corridor of the Colonial Office on a bracket, bearing the following inscription:—"Edward Gibbon Wakefield, author of the "Art of Colonisation," born in London 20th March, 1796, died at Wellington (N.Z.) 16th May, 1862. To commemorate his statesmanlike qualities and disinterested efforts for the improvement of the Empire, his friends and admirers have presented this bust to the Colonial Office."

The Ascent of Steep Railway Gradients by Locomotives. — With reference to the experiments carried out on the High Peak Railway, of the London and North-Western Company, in Derbyshire, mentioned in the *Builder* last week, we learn from the *Derby Reporter* that the distinguishing feature of Mr. Handysides' system is to fix the locomotive to the rails; and, for the ascent of the incline, to convert it into a stationary engine. At the back of the locomotive a horizontal drum is fixed, round which a steel wire rope is coiled. The drum is rotated by separate cylinders. On each side of the engine-framing is suspended a self-acting gripping strut. These, when pressed by levers, clasp the sides of the rail firmly, and so fix the engine in its position, and render it stationary. The engine is of light construction, which involves a saving in the weight to be moved, and in the weight of rail and general construction of the permanent way; but the essential novelty is the use of an effective brake to give great power in arresting speed in the descent, and particularly in fixing the engine in the ascent, then turning the steam into the cylinders which produce the revolution of the drum, and drawing up the load by the steel wire rope.

Cleansing Old Iron Water Pipes at Elgin.—A short time ago the commissioners of Elgin resolved to cleanse the old iron water-pipes, and relay them in those parts of the town where they would be of use. The first portion of the pipes (which had been in the ground for more than twenty years, and were much incrusted) has now been cleaned. The process was gone through at New Elgin, where a rough furnace was erected to meet the object in view. The pipes, two at a time, were laid into the furnace, and subjected to an intense heat for about half an hour. The action of the heat loosened the incrustation of the pipes, and when the pipes were lifted out of the furnace the greater portion of it at once fell off. The most troublesome portion of the work, however, remained to be done. The pipes had to be cleaned with a spring scraper, made to exactly fit the size of the pipe. After undergoing this work, the pipe was allowed to cool till it was in a fit condition to be dipped into a "well" some 12 ft. deep, containing Smith's patent solution, where it remained for nearly a minute; after which it was taken out, and presented all the appearances of a new pipe. By the adoption of this process the town will, it is said, be 300*l.* richer than if the old pipes had been sold as mere metal, and new pipes bought to replace them.

Proposed Railway for Cranbrook.—A numerously attended meeting of inhabitants of Cranbrook and neighbouring parishes was held at the vestry-hall last week, in response to a notice inviting the presence of all who were favourable to the project of making a light railway from Paddock-wood to Cranbrook. Mr. J. S. Hardy, M.P., presided, and in the course of his address said,—One respect in which this scheme differed from the old one was, that it would have a station brought into the town of Cranbrook, instead of stopping at Hartley. They must judge for themselves whether a railway would be an advantage to them, and, if so, the main point then would be whether they were prepared to find a portion of the cost which would be incurred in its construction. The cost would be probably 100,000*l.*, or rather less. Mr. Butler, engineer, said it was proposed to commence the line at Paddock Wood Station, passing thence through the villages of Brenchley and Horsmonden, between Lamberhurst and Goudhurst, and terminating near the brewery in Cranbrook. Its length would be thirteen miles. A resolution pledging the meeting to cordially support the project was carried unanimously.

Building Operations at Portobello.—It is stated that a second skating-rink is about to be erected in Portobello, near Edinburgh. The site is at the foot of Bath-street, and the building will front the promenade, Bath-street, and Bath-place. The rink will be on the first floor, access to it being obtained by a staircase at the angle of the building; it will be about 100 ft. in length by 70 ft. wide; lighted from the ends, sides, and roof. The plans are being prepared by Messrs. Sutherland & Walker, architects. The ground attached to the mansion-house known as Ramsay Lodge is, it is stated, shortly to be opened up for feuing purposes. It is proposed to lay out several streets having access from Bath-street and Ramsay-lane. The feuing plans are in course of preparation by the above-named architects.

Tenders for Painting at Southampton. At a meeting of the Southampton Town Council, on the 30th ult., the Cemetery Committee reported that Mr. Lemon (the borough surveyor) had named 65*l.* as his protecting estimate for certain painting at the cemetery. The following tenders were received:—

Browning	£65 0 0 !
Comport	55 10 0
Penny	52 12 6
Sims	45 18 0
Doggrel	40 0 0
Pardey	27 0 0 !

The committee recommended that Mr. Pardey's tender be accepted, the work to be done according to the specification prepared. Some discussion ensued on the propriety of accepting Pardey's tender, it being urged, on the one hand, that he must have made a mistake, and that the work would be "scamped," and, on the other, that the surveyor would be responsible for the due performance of the contract, and that, the tender being submitted, the council had no right to assume that the man did not know what he was about, and would not do the work properly. The proposition was carried.

A Relic of Old London.—An interesting relic of old London (the *Athenæum* says), missing, according to Maitland's testimony, during more than 150 years, has just been discovered, during the demolition, previously to rebuilding, of the premises, No. 23, formerly 25, Pudding-lane, near the Monument. This is an inscribed stone, found face downwards, in a pavement, formerly of a back yard of the house in question, which, at a comparatively recent period, has been floored over. The stone seems not to have been exposed to the weather, and was probably removed from its original place very shortly after it was set up. The inscription is as follows:—"Here by ye Permission of (H)eaven, Hell broke loose upon this Protestant City from the Malicious hearts of barbarous Papists, by ye hand of their Agent Hubert, who confessed, and on ye Ruines of this Place declare(d) the Fact, for which he was hanged, (vizt) th(a)t here began that dredfull Fire, which is de(s)cribed and perpetuated on and by the (n)eighbouring Pillar. Erected Anno 168( ) (i)n the Maioritie of Sr Patie(nc)e Ward Kt."

A Chapel for Sale.—On Thursday in last week Mr. Jenkinson put up for sale by auction, at the Mart, the old proprietary chapel, situated in Montpelier-street, Knightsbridge. The auctioneer, in stating the nature of the property, said the building was estimated to seat 1,000 persons, with an excellent organ, and an appropriate chancel. The chapel was a proprietary one, and occupied the large area of 6,500 square feet. If any of the clergy he saw present were inclined to purchase he would remind them that this might prove a much more eligible investment than an advowson, for with the latter it might be a long time before possession could be obtained, and then the income was fixed; but in the case of Brompton Chapel immediate possession would be given, and a popular clergyman might secure a continually increasing income. The first bid was 4,000*l.*, which rose to 6,000*l.*, upon which a clergyman who was present made an advance of 100*l.* The auctioneer said the 6,100*l.* was below the sum fixed by the Court of Chancery, and the property was open to sale by private contract.

Overcrowding at Malton.—At the monthly meeting of the Malton Local Board of Health, on the 30th ult., the nuisance inspector under the Sanitary Authority reported the existence of typhoid fever in a cottage owned by Earl Fitzwilliam. His report stated that the cottage was very much overcrowded, there being only two bedrooms, and in one of these four daughters, of the respective ages of 18, 11, 7, and 5, and two sons, 17 and 12 years of age, were nightly sleeping. The house, he said, was very clean, but much too small for the inmates, eight in number; and he added that it had been stated the boy who had the fever had contracted it by bathing in the Derwent, as he had several times gone in near where two drains emptied themselves into the river. Dr. Young, the medical officer of health, also reported two more cases of overcrowding at Norton, where he said there were two families of seven persons each occupying only two rooms. The Board gave instructions for the abatement of the evil.

The Indian Public Works Department. The *Bombay Gazette* states that Sir Andrew Clarke is said to have prepared a scheme for the reorganisation of the Public Works Department, which is to come into force about next December.

Rust Cement for Water and Steam Pipes.—The *Engineer* says the following is a rust cement for water and steam pipes:—Make a stiff paste with two parts sal-ammoniac, thirty-five parts iron borings, one part sulphur, and water, and drive it into the joint with a chisel; or, to two parts sal-ammoniac and one part flowers of sulphur, add sixty parts of iron chips, and mix the whole with water to which one-sixth part vinegar or a little sulphuric acid is added. Another cement is made by mixing 100 parts of bright iron filings or fine chips or borings with one part powdered sal-ammoniac, and moistening with urine; when thus prepared, force it into the joint. It will prove serviceable under the action of fire. All the above parts are by weight.

Excavation of a Tumulus in Scotland.—An ancient tumulus, known as the "Gask Hill," situated immediately to the south of the village of the Collessie, was opened a few days ago by workmen under the direction of Mr. Anderson, curator of the Antiquarian Museum, Edinburgh. The tumulus, which is of an irregularly ovoid shape, measures about 120 ft. in its longer diameter, from north to south, and nearly 100 ft. from east to west, and its centre rises fully 12 ft. above the level of the ground. Openings were made at the south and north extremities, and carried inwards towards the centre, but owing to the great mass of material to be removed, only about a fourth of the work was accomplished.

Exhibition of Engravings in Brussels. On the 1st inst. the King and Queen of the Belgians opened the Exhibition of Etchings at the Brussels Artistic and Literary Club. Their Majesties were received by M. Vervoost, president, and the committee of the club, and by the committee of the International Society of Aquafortists. Sir Savile Lumley, English Minister, and president of the society, himself an amateur in the art, and an exhibitor, addressed their Majesties in a brief speech. Several French artists have exhibited, as well as those from Holland and Germany, and it is said that our countryman, Mr. Seymour Haden, is the lion of the Exhibition. The engravings are more than 500 in number.

Mitford Church.—On Sunday, the 27th of August, a large Munich window was unveiled to a crowded congregation in the above fine old church. The window is a double lancet, containing in one light the subject of the "Holy Women at the Tomb"; and in the other that of our Lord's "Ascension." The window (the gift of Mrs. Wm. Mitford) is in memory of her husband, Captain Wm. Mitford, late of H.M.'s 73rd Regiment, and of Colonel W. Vernon Mitford. Amongst the group of the Apostles in the "Ascension" has been introduced the portrait of Captain Wm. Mitford. Those most interested in the work think it reflects great credit on Messrs. Mayer, to whom the design and execution were entrusted.

The New York Court-house that Kills.—At the recent meeting of the members of the New York Bar in the Superior Court, to take action on the death of the late Chief Justice Monell, the Hon. Noah Davis, of the Supreme Court, who presided, said he thought that Chief Justice Monell owed his death to "discharging his duties (under circumstances which no judge should be called upon to endure) in this building,—in an air unfit for human beings, and certain, in a longer or shorter time, to produce fatal results. We call this the providence of God, but it is the improvidence of man; and many have experienced the evil effects of the malaria which lurks in the walls of the building."

A Tribute to the Home Secretary.—On the 31st ult. the Town Council of Glasgow resolved to confer the freedom of the city on Mr. Cross, the Home Secretary, in recognition of his labours in dealing with important and delicate questions affecting the rights, duties, and obligations of labour, the sanitary conditions of towns, and the re-organisation of various departments of public administration, with the view of securing greater economy and efficiency.

Trade Unions and Friendly Societies.—By the recent Act on trade unions (39 and 40 Vic., c. 22) trade unions, whether registered or not, which insure or pay money on the death of a child under ten years of age, are brought within the provisions of section 28 of the Friendly Societies' Act, 1875.

Halifax Congress of the Yorkshire Archæological Association.—The excellent programme prepared for this Congress by the hon. secs., to which we have already alluded, contained a full schedule of the masons' marks to be found on Halifax Church. Arabic numerals on an accompanying plan of the church show where the various marks occur. We shall be glad to find this example followed. We shall give a report of the proceedings next week.

The Wrexham Exhibition and the Working Classes.—It is satisfactory (says a Liverpool paper) to learn that the efforts of the promoters of this exhibition are being heartily seconded by the public. Nearly 20,000 persons passed through the turnstiles last week, and there is a steady increase of visitors daily. The railway companies have consented to lower their fares to visitors to the exhibition. Many large employers of labour are taking advantage of this to send their workmen.

Great Fire in Canada.—A telegram from Montreal states that a great fire broke out on Sunday last at St. Hyacinthe. Commencing in the west end, it spread through and completely destroyed the main and three parallel streets of the town. The post-office, the market, the court-house, three banks, several factories, and eighty stores, together with 500 other buildings, are entirely burned down. A hundred families are rendered homeless by the catastrophe. The loss is roughly estimated at $2,000,000.

The Viaduct, Carlisle.—Rapid progress is being made in the construction of this viaduct. The retaining-walls of the incline to James-street are now up; those of the main structure are far advanced; and the pulling down of the long-debated property of Messrs. Mounsey, on Bush Brow, has prepared the way for active operations on the east side of the railway. Messrs. Ward & Co., the contractors, are simultaneously pushing on vigorously with the construction of the new Nelson Bridge.

Sheerness.—The foundation-stone of the first elementary school to be built by the Minster-in-Sheppey School Board was laid on the 23rd ult. in the village of Minster, by the Hon. Mrs. Foley. This school is the smallest of three that are about to be erected from the designs and under the superintendence of the Board's architect, Mr. E. H. Lingen Barker, to accommodate 1,000 children, the other two being situated in Sheerness.

Who is Responsible?—The *Athenæum* tells a striking story, which, if true, shows that the Houses of Parliament at Westminster are in irresponsible hands. It relates how that an eminent artist, from whom the Houses of Parliament have already received considerable benefits, was just in time, the other day, to procure the suspension, if not total stoppage, of operations likely to terminate in painting the whole exterior of the edifice!

Poplar Wood alleged to be Fireproof.—The *Garden* says:—Many despise poplar as a timber, but it has one golden property—it will not burn. Some years ago a factory at Nottingham took fire on the second floor, and burned to the top furiously, but not downward; although the floors lay a yard thick with hot clinkers and melted machinery, yet it did not get downwards, because the floors were of poplar.

Pin Factories in the United States.—The old, though perhaps bootless, question,—"Where do all the pins go to?" is recalled by the statement in an American paper that there are now eight pin factories in the United States, which make 47,000,000 pins daily. In addition to these, the importation of pins reaches 25,000,000 daily. As these are sold, it is safe to say that 72,000,000 pins are lost daily, or 50,000 every minute!

Free Public Library for Plymouth.—On the 30th ult. the Earl of Morley presided at the inauguration of a free public library, said to be the first opened in the district. A commodious suite of rooms, which formerly constituted the Guildhall of the town, has been devoted to the purpose, and a nucleus of 5,000 volumes collected.

Steam Locomotion for Tramways.—The works belonging to the Tramcar Construction Company at Greenwich have recently been purchased by Messrs. Merryweather & Sons, the fire-engine makers, as a branch establishment for the production of their patent steam tramway locomotives, which, we are informed, they are turning out at the rate of three per week.

The Builder.

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The Demand of India for Public Works and the Practical Answer.

RE railways the best mode of communication for poor and undeveloped countries? No question has a more direct interest for England at the present time than this. It concerns the workman, the engineer, the capitalist directly; it concerns the consumer hardly less directly. The satisfactory solution of the question will involve the decision of a subject which must, before long, force itself into prominence,—viz., the economic value of the mineral traffic of railways in countries like our own. But the region where the real pinch is to be found is our Indian Empire. The want of communications in India, despite of what has been done in the way of railways, is a crying and monstrous evil. Wheat is at the present moment, if we may rely on the statement of Sir Arthur Cotton, selling at sixpence a bushel in Central India. This statement has been contradicted, but the *Friend of India* states that in May last wheat was selling at 6s. per quarter 180 miles from Calcutta. To bring that wheat to the coast costs three times as much as it would do to carry it from the ports to England. For that reason, we leave the cereals of our own territory to find neither market nor encouragement for their production, while we are paying some 20 millions per annum to America for grain to supply the place of that which we thus waste. We may well inquire whether this state of things is to be allowed to continue until we can afford to lay out 16,000*l.* a mile on railways long and numerous enough to make an outlet for this rich agricultural produce.

The compiler of the official statement of the moral and material progress of India during the years 1873-74 (the last published) has not taken the trouble to give any exact statement as to the railway works executed during that year, the whole subject of "communications" occupying less than a single page of the return. In the statement of the preceding year the lines open are returned at 5,872 miles of railway, having cost about 97,000,000*l.*, giving an average expenditure of 16,536*l.* a mile. On this outlay the gross receipts were 6,742,000*l.*, and the expenses, 3,557,000*l.*; giving a net income of 3,185,000*l.*, or a profit of 3·28 per cent. To make up the guaranteed rate of interest the Government had to advance the sum of 1,428,442*l.* in the year in question. The working expenditure amounted to 53 per cent. of the gross receipts, which compares favourably with the nearest subject of comparison at home. The Irish railways in 1874 earned a gross revenue of 1,186*l.* per mile, 57 per cent. of which was spent in working. The gross returns of the Indian lines averaged 1,149*l.* per mile, with a working rate of 53 per cent. But as we find that the traffic receipts of the Oude and Rohilkund Railway, 523 miles of which are open, for 1872-73, were only 55,502*l.*, mainly made up from carriage of third-class passengers, and of food, grain, seeds, timber, salt, and artillery stores, the prospect of a speedy return for outlay on the communications needed to give an outlet for agricultural produce is not brilliant.

Such being on the one hand the want of communication, and on the other hand the small return for that costly convenience of populous countries,—the ordinary railway,—it is matter of surprise that the Government of India have not directed more systematic attention to the development of the cheap and ready service of water communication. It is not possible to extract the existing facts as to the actual water system of India from the Blue Book. They are not given. The question of irrigation is much mixed up with that of navigation; and although the two requisites may be, in many instances, combined, it is necessary in the first place to ascertain the cost and the returns of each of the two services apart. The whole outlay on the Bengal canals during 1873 was 20,828*l.*, and the income 38,145*l.*, showing, the report adds, the existence of a great and increasing traffic. When we add that there are two steam navigation companies running steamers on the Irawadi, which make sixty trips in the year, and that there are also 19,400 boats employed in the Irawadi travelling trade, we have pretty well exhausted all the positive information as to this highly-important subject which is communicated in the report. The statement for 1873-74 is silent as to water traffic. Most of the new roads have been undertaken with the view of forming feeders to the railways. But when we glance at the map of India, and observe the enormous areas which are only fringed by railways, either open or in course of construction, we find but little ground for encouragement. From the Great Indian Peninsula Railway, a line drawn to the eastward, at right angles to the direction of the course of the route, measures the breadth of an area of more than 350,000 square miles of country unpierced by railways, and for which the affluents and channels of the Mahanadi, the Godaveri, the Krishna, and smaller rivers alone can be expected to open practicable commercial routes for more decades of years than we can count. In Rajputana, Central India, Mysore, the south of Madras, and the long extent of British Burmah, the broad bands of inaccessible space are but little inferior in extent to the central provinces. Although for political and military purposes, and to some extent commercially, the great Indian lines are of the utmost importance by way of holding the country; at the same time as a means of developing its resources, and finding outlet for its productions, they are contemptibly and ridiculously disproportionate. The area of England and Wales is 58,320 square English miles. This area was served, at the end of 1874, by 11,622 miles of railway,—a length which allows a mile of railway to nearly every five square miles of country. But, in addition to this, we had 4,138 miles of inland navigation; 20,636 miles of turnpike-roads; and 106,573 miles of highways; making in all 141,969 miles of communication by land and water; while our coast-line is estimated by Sir Arthur Cotton at 3,000 miles of additional waterway. The twelve provinces of British India contain a total area of 943,406 square miles, with a mean density of population of 204 souls per mile against 254 in the United Kingdom. The railway accommodation provided we have seen to be 16,449 miles, or one mile for every 160 square miles; that is to say, a thirty-second part of the English provision. Neither the statement of moral and material progress, nor Mr. Thornton's volume on Indian Public Works, enables us to form any conception, however vague, of the length of the internal roads and waterways of India. But when we regard the density of the population, which rises in Oudh to 469 souls per square mile, and the fertility of which the soil is capable, when duly irrigated, we seem to ourselves to resemble the helpless savages who scratch a few handfuls of coal-dust from an outcrop, as compared to the bold and experienced miners who plunge into the bowels of the earth, and extract the wealth of a 50-ft. seam.

Sir Arthur Cotton, of whom it is justly remarked by Mr. Thornton, "few Englishmen are better entitled to be regarded as benefactors to India," does not speak without the great authority due to successful experience. It is now more than forty years since he was appointed to the post of civil engineer in Tanjore. The soil of this district, naturally a poor light sand, has been fertilised by the alluvial deposits of the water of the Cauvery; the distribution of which in a maze of ramifying streamlets was commenced, it is said, by the Hindoo Rajah Veranum, in the second or third century of our era. Neglect had allowed the steady operation of natural causes to choke up and destroy much of the artificial system which had turned the arid district into an Indian Lombardy. The River Cauvery, which drains a watershed of some 20,000 square miles, divided into two branches, before entering Tanjore. Of these, the northern takes the name of the Coleroon. This branch, having a more direct course and rapid fall, received a larger share of water in the first instance, and by constant erosion of its bed, so gained upon the sister stream that the latter, the Cauvery proper, was all but silted up. Sir Arthur restored the proper division of the stream; damming up the Coleroon, and constructing a regulating dam to prevent the Cauvery, in its

turn, from robbing the Coleroon. The success of this and the subsidiary works was complete. During the next sixteen years at least 50,000 acres of previously waste ground were brought under tillage, and the average produce of the cultivated land was increased by one-eighth. The cost of the works, which thus added a value of at least five millions sterling to the wealth of the province, is stated not to have exceeded 80,000*l.* The increase in the land revenue of the Government arose to nearly an equal amount per annum; that is to say, that the outlay of 80,000*l.* produced 70,000*l.* per annum to the Government, and probably ten times that amount to the province. This is the manner of laying out money in which Sir Arthur Cotton now seeks to interest the engineers, the workmen, and the capitalists of the United Kingdom. These statements are taken from the work of Mr. Thornton.

After thus restoring and enhancing the fertility of Tanjore, Sir Arthur Cotton turned his attention to the deltas of the Godavery and the Krishna. The former river has a water-shed of 112,000 square miles, and a course of 898 miles. It rises in the western ghauts, within fifty miles of the sea, and flows in a south-easterly direction across the whole remaining breadth of the Deccan, entering the Bay of Bengal by several mouths in the neighbourhood of Corindan and Coranada. The last hundred miles of its course lies through the district of Rajahmundy, a province which, thirty years ago, presented an aspect of desolation. It was thinly inhabited, and cultivated only in patches, the river being rather a scourge than a blessing, rising in destructive floods, or leaving the soil to be baked by the sun. Sir Arthur Cotton raised an enormous anniout, or dam, at Dowlaish-weram, between forty and fifty miles from the sea, two miles and a half long, 130 ft. wide at the base, and 12 ft. high. Over this the flood water, which rises to the height of 25 ft., freely escapes, while the ordinary stream is kept at a level suitable for irrigation, and distributed by a system of canals, many of which are navigable. The area thus watered is already 800,000 acres, and will be raised to a million of acres when the work is complete. 256,000 acres have been brought under wet cultivation, and the average produce per acre has nearly doubled. Rajahmundy is now described as a luxuriant garden; and the Government revenue has doubled. The outlay has been 620,000*l.*, a sum which has been repaid to Government more than twice over; while as much as 25 per cent. annual profit is permanently added to the revenue in consequence of the works. The Cauvery canals are now reckoned to pay 23½ per cent. on their cost; the Godavery works are credited with 45 per cent., and the Kistna works with 16 per cent. These may be regarded as exceptional dates. But they are enough to show that it is in the power of the engineer to develop to an enormous extent the fertility of India. The figures are those either of the Blue Book or of Mr. Thornton.

It cannot be denied that the utmost care and experience are necessary for the successful designing of works of this magnitude; and that it may often be the case that the Indian rulers of past times have indicated the nature of those irrigation systems which can now be restored with the best results. It is not, however, so with the completion of water communication. This is a matter as to which we are perhaps better able to form a correct opinion in this country than as to the more lucrative, if less certain, work of irrigation. The blending of India under one rule gives an opportunity, and a reason, for perfecting the missing links of internal navigation such as did not exist under the sway of the native princes. On 300 miles of the Godavery canals as many as 50,000 boats and rafts are now employed in conducting an annual traffic of 870,000 tons; but returns of the general movement by water are entirely wanting.

The first desideratum in this matter is to bring before the public of this country such definite and authentic information as shall allow of a serious consideration of any proposed works from a purely business point of view. Mr. Thornton enumerates eleven groups of canals, on which 17½ millions sterling have been expended, which he states to be now earning an annual profit of 10 per cent. on the average. Of these the least favorable investment is the Ganges Canal, yielding a profit of 4½ per cent. on three millions of capital; and the most lucrative is that of the Godavery Canals, giving a profit of 40 per cent. on 750,000*l.* Investments of this nature, if no *per contra* is forthcoming, render quite unnecessary any appeal to Government to find the money. All that is required is public confidence. Let us be once assured that money can be laid out, with ordinary prudence, so as to bring back an annual steady profit of 10 per cent., and any requisite amount will be forthcoming. It is to this object, then, that the attention of those who desire to endow India with internal communications should be mainly directed. Careful and well-digested statements, capable of official proof, should alone be brought forward. Thus we have cited the price of wheat in Central India, on the authority of Sir A. Cotton, at sixpence a bushel. But Mr. C. J. Shaw writes to say that from 1862 to 1870 the price of wheat over a district of 200 miles extent in Central India was 16 seers, of 2 lb. each, for the rupee; or over 4s. a bushel. Another writer gives a price of 1s. 6d. Unexplained variations of this nature tend to the discouragement of any serious efforts. Chapter and verse must be cited, and no statements made without proof.

Sir Arthur Cotton states that the effect, at the present time of the Ganges, Agra, Lower Ganges, and Sone Canals upon the opening up of the wheat trade between the north-west and England is nothing; but that if these four systems of waterway were connected, the result would be to pour a million tons of wheat per annum into England. To the Ganges Canal reference has just been made, as paying 4½ per cent. only on its capital. The length of the main canal and its branches is 614 miles, giving a cost of a little under 5,000*l.* per mile; a not extravagant outlay to provide for the double requirements of irrigation and navigation. The navigation returns, in 1872–3, were only about 1-20th of the water rents. The Agra Canal was opened on March 1, 1874. The commencement of irrigation was deferred for a six months' trial, and we have no further information as yet on the subject, nor any statement of either cost or length. The area to be irrigated by it is 350,000 acres. The lower Ganges Canal is reported to be in rapid progress. It was commenced in 1872–73, on an estimate of 1,825,000*l.* Its works include a weir across the Ganges at Rajghat. The estimated cost of the Sone Canal is 3,775,000*l.*; and it is intended to irrinate two millions of acres in the districts of Patna, Gaya, and Shâhabad. Heavy works are now in progress on this canal. The average water-rate per acre irrigated in the north-western provinces has been 2½ rupees per acre; and in 1872–3, 940,586 acres were irrigated by the canals, which yielded a gross revenue of 230,000*l.* on a capital of rather less than three millions. The working expenses, however, are more than 56 per cent., which indicates a transition state of affairs, as it is considerably more than double the ordinary rate of canal expense in proportion to income. But under these circumstances an erroneous opinion might be formed from Sir Arthur Cotton's statement that the works undertaken by the Government "form only isolated patches of cheap internal transit." In point of fact, great activity is developed over the whole line indicated as likely to "make the most wonderful revolution in the valley of the Ganges that probably any country underwent in material prosperity." For at least 1,450 miles to the west and north-west of Patna a great system of water communication is in course of completion; and the Blue Book certainly leaves no room for the supposition that the Government is not fully aware of the importance of bringing these several enormous systems of canalisation into complete unity of operation.

We have already intimated that it is probable that the case of the Godavery canals, stated to yield an annual profit of 40 per cent. on 750,000*l.* (corrected to 39·7 per cent on 683,705*l.*) may be altogether exceptional. On the other hand, it must be borne in mind that this is the very system of which we have the longest experience;—so that it is highly satisfactory in this respect, and also as intimating that the profits of other works may be expected to increase, year by year, with the extension and improvement of cultivation. But if we take a more modest return, such as that of the works of the Kistna Delta, paying only 13½ per cent. on 5 0,000*l.*, it may be conceived that that is not the only spot in India where such a result is now certainly attainable. If such is the case, it is something like crying to Hercules to ask the Government of India to undertake such a work. Not only would it be self-supporting, but remunerative to an extent that would infallibly attract capital, provided that public confidence were established. What new sanction might be needed from Government as to the imposition of canal-dues and water-rates must, of course, be obtained. A full, accurate, and business-like account of similar works (such as those already briefly described) should be published. The exact particulars of the selected case should be ascertained, and also published in such a form as not only to make the matter perfectly intelligible, but to present such quantities to the public as to prevent any mistake as to the *bonâfides* of the enterprise. It would be naturally expected that a portion of the required capital should be raised in India. Under these conditions we apprehend that there can be no doubt that a comparatively small, well-selected, well-paying scheme might be successfully carried out. The success of one such scheme, perfected under such conditions as are familiar to the public of the country, would do far more toward the endowment of India with public works than anything which it would be in the power of any Government directly to effect. Sir Arthur Cotton says that at least twenty millions sterling ought to be annually spent on public works in India. From the point of view of the engineer or of the philanthropist he, no doubt, understates the amount that can be not only wisely but most productively laid out. But the total revenue of India, for the year ending March, 1872, was 50,110,215*l.* There was an excess of income over expenditure of 1,495,703*l.*; and even if this had been at once made to fructify by investment in reproductive works, it is but a fraction of the twenty millions required. In the same year a total sum of 4,592,166*l.* was paid by the Government as guaranteed interest on the capital of railway and other companies. The net traffic receipts, which go in diminution of this sum, amount to 2,868,948*l.* Thus in 1872 the Indian Government not only gave its guarantee for interest on a sum which, at 5 per cent., does not fall short of 90,000,000*l.* sterling, but actually was out of pocket by nearly a million and three-quarters for so doing. It may very fairly be urged that such an effort is by no means disproportionate to the revenue drawn. It is perfectly true that the apparent discrepancy between the fact that Government undergoes this loss, and the statement that further outlay will be remunerative, may receive a full explanation. The depreciation of silver at the present moment is such as to diminish the value of the Indian revenue by 23 per cent. It was, perhaps, more important for the Government to make its costly communications perfect, than to aid its subjects to water their soil, or even to send their harvests to market. But then the matter must be fairly looked at. The contention of the advocates of public works is, that they will be enormously productive. If so, why ask Government to do more than facilitate their introduction? If a canal will pay 15 per cent.,—all told,—what childish want of self-reliance would be evinced by asking the Government to guarantee 5 per cent.! If a canal requires the outlay of a million, a sure return of 15 per cent. is ample to raise that million. Confidence alone is needed. We do not enter into those details which are more particularly known in India than in this country as to the special facilities which the Indian Government may give. We look at it as matter of finance. We say to Sir Arthur Cotton and his friends, "Prove to those who have the capital in England that by the outlay of so many millions, on such-and-such land, in so many months, they may insure a permanent revenue of 12, 15, or 18 per cent., and the money will be promptly forthcoming. Have but a little patience. Bring all your knowledge of the case to bear to select a good case for trial. Let your first million of capital enter on the steady enjoyment of its 15 per cent.,—not anticipated earning, but audited and vouched profit,—and there will only be too much anxiety evinced in this country to ascertain in what other quarters a like result may be attained."

One word remains to be said. It is not the first time that an attempt has been made to reap Indian wealth by a sickle forged in London. There have been schemes in Madras, Orissa, Bengal, and elsewhere, which are commonly thought not to have proved successful. To establish confidence, which is the great desideratum, it will be necessary openly to admit all cases of former miscalculation, to show where the evil lay, and to make it perfectly clear how misadventure will be prevented in future. It is here that the real knot of the question lies, and those advocates of public works in India will best advance their object who can best deal with this difficulty.

THE NEW CATHEDRAL AT CHESTER.

No one who was familiar with the outlines of old Chester Cathedral would think, on first catching sight of its restored form on entering the town, that the above heading to our remarks was unsuitable or incorrect. The old heavy square mass, time-worn and blackened, which at once stamped the character of the ancient city as we used to sight it from the railway, is no more; and in place of it the traveller sees a gay-looking new tower, with tall turrets and spikey pinnacles, and the couple of rather overgrown and top-heavy conical finials which now flank the east gable of the choir. A closer inspection certainly does not diminish this first impression. Certain portions of the exterior, of which more anon, are untouched; but on what may be called the show side, the south side and east end adjoining the more public portion of the Cathedral enclosure, what we now see is, in fact, a modern Gothic church, a reproduction of a Mediæval building by modern workmen. In saying this, we are by no means hinting a word against the archæological good faith and thorough knowledge and insight with which this imitative work has been carried out. We are quite prepared to believe that there is not a detail in the new work for which at least strong presumptive, if not incontrovertible evidence, had not been picked out from among the mass of nearly shapeless sandstone boulders to which the exterior had in process of time been mostly reduced. We may recognise (though perhaps with a smile) the rather ostentatious fidelity with which a single piece of old stone, not quite so much worn as the rest, is left in the middle of nearly a whole face of new and elaborate work. It would be absurd to say, either, that the new exterior is not, from a purely architectural point of view, superior to the old; seeing that in the old building there was, in fact, very little that could be called architectural design left at all: it had all vanished or become almost unintelligible. It is only when we come to consider the process in relation to the past as well as to the present,—when we are told in effect that the Cathedral is now as good as new, and that in place of destroying the old building the restoration has in fact enabled us to see it in its reality, we feel that there may be room for question, and that on more grounds than one.

Waiving that point for a moment, we will just indicate what are now the characteristics of this part of the exterior of the building, as thus resuscitated, renovated, restored, or by whatever other past participle the reader likes to characterise it. The west front was either less gone than the rest of the building, or else has been to some extent repaired at an earlier date; but a considerable part of the wall surface, and most of the large west window, are untouched. The front is flanked by large octagonal turrets, of which that on the north side is new. We come, at the west end, on what is almost a characteristic of Chester, the predominance of quatrefoil panelling as an ornament. A double row of quatrefoil lights crosses the centre of the window, and has a very rich effect from the interior; and in a similar style is the fine band of ornamental panelling and mouldings, forming an elaborate string-course across the front, rather below the centre of the window. We are here in the Perpendicular period, to which the west window and doorway and the large south porch belong, though the body of the ground story of the nave is of Late Decorated work. The west window is a particularly fine specimen of the tracery design of the period. Coming round to the south side, we find ourselves opposite an aisle of Late Decorated windows, with rather low-pitched canopies over them, and a simple panel design in the spandrels; the buttresses are of bold proportion, with large crocketed finials. The clearstory, of later date, and verging on the Perpendicular period, is very bald in effect, with battlemented parapet, thin, mean-looking pinnacles, a great deal of bare wall, and windows with Perpendicular tracery un-cusped; which latter peculiarity is one of the specialities or eccentricities which add to the archæological interest of this Cathedral. The front of the south porch, which is evidently subsequent to the clearstory work, is very richly ornamented with panelling and pinnacles, but presents the usual hard and wiry aspect of Late Perpendicular work, the character of which is faithfully enough preserved in this part of the restoration. The large south transept carries on, with little modification, the design of the south side of the nave, with which it is evidently contemporary, or very nearly so. This transept, it may be remembered, is of unusual size and extent in proportion to the other transept and the building generally, and has been long shut off from the cathedral internally, and separately used for worship as the Church of St. Oswald, one of the two saints to whom the cathedral is dedicated. The southern extremity of this transept,—the centre portion at least,—was restored in a very hard and poor style some time since, and was in too good a state, practically, to justify its removal, on economical grounds, though it is certainly an eyesore in connexion with the rest, either of the old or the renewed work. Adjoining this we find the one piece of old work of any extent left intact on this side of the cathedral, the extremity of the western aisle of this transept, which serves to show the condition to which the old masonry had been reduced, and, at the same time, to preserve, in its mouldering but still not quite obliterated details, some record of the authority and precedent on which the rest of the work has been restored. The contrast between the appearance of this and the new work is remarkable, and will be looked upon with varying sensations, as our archæological or architectural feeling happens to be uppermost. On the east side of the transept the Late Decorated character of the window-tracery has been retained in the ground story, and the execution of this portion, with the details of the very beautifully-designed buttresses, is certainly an excellent specimen of modern Gothic workmanship as such; and it is almost sad to reflect that, being carried out necessarily in the same quality of stone as the original, it is, of course, doomed to similar obliteration in due course of time. Behind the transept rises the tower, also a perfectly new structure externally, very well carried out in detail, so far as close inspection shows it, but less satisfactory at a distance, from the over-height of the angle turrets and the ragged outline given to them by the too large and projecting grotesque spout-heads with which they are adorned. There has been strong wish on the part of the restoring architect (whether seconded by the clerical authorities we know not) to cap the tower with a timber spire; an addition which, besides interfering with the monumental and masonic character of the building, would have obliterated the last possible faint reminiscence of the proportion and appearance of the old building, and would effectually, in conjunction with the town-hall, have brought the centre of Chester to the condition of a modern Mediæval town. This useless project, we hope, is now abandoned. Coming to the choir, we find an Early English south aisle terminated eastward by an octagonal apse, with an extraordinary pyramid of masonry surmounting it, looking like a hip termination to a very acute, high-pitched roof, which, of course, does not exist. The history of this feature has been before referred to; it was first modelled and then built on the basis of a few indications found in taking down the eastern portion of the south aisle, and by a very clever process of putting two and two together. The apse itself, as well as the pyramid over it, is purely a restoration of what had completely disappeared, except in regard to a few traces and relics of its former existence. The termination of the choir aisles of the Early English building was by an apse, but a square end had been added and the apse removed in the Late Gothic period; and while this later addition has been retained in the north aisle, it was determined to restore to the south aisle its earlier form. This, however, is the second apse of the building, for beneath the third bay of the aisle, counting from the crossing, is found the foundation of the circular apse of the Norman church, and part of the stonework of the present plinth is left out near the ground line at this point, to enable the remains of the Norman apse to be seen. The clearstory of the choir is Late Decorated work; like the nave clearstory it is rather bare in effect. Parapets are the order of the day at Chester; that of the aisle here is an arcade of small trefoiled arches, that of the upper roof an open work of the prevalent quatrefoil form. Both these, if we remember right, had entirely perished; but sufficient fragments existed for their restoration. The octagon turrets at the east angles of the chancel, which formerly were truncated and finished with a lead roofing something like a pepper-box top, are now crowned with the very large extinguishers which show from a distance, and which, whatever authority there may be for them, we cannot admire. The eastern bay of the aisle shows another of the peculiarities of window-tracery which strike one so oddly at Chester. In a three-light Early Geometrical window, the middle light of the lower portion has an extra order of moulding, or rather an extra large section of mullion, having no relation to the rest of the tracery, so that the fillet of this portion projects considerably in advance of the plane of the tracery. What could be the possible motive for such a vagary it is difficult to imagine, or what could be the use of making it over again in this way, for this appears to be entirely new stone, not a repairing of old tracery. The east end of the lady chapel had been, like the end of the south transept, restored to some extent previously, and its renovation has now been completed.

How far this external work, on which so many thousands have been expended, is a satisfactory achievement, it is not quite easy to decide. Restoration may either be archæological, or simply architectural; that is to say, it may aim at gathering up and putting together the evidence as to peculiarities of a structure which have disappeared, and thus reconstructing them historically, or it may aim merely at repairing and bringing into a better condition an architectural design which exists in a complete, though more or less dilapidated, state. The former process is of the highest usefulness, on paper, as contributing to a knowledge of architectural history, but to carry it out in a building is often a very questionable proceeding, since a feature that is really valuable and interesting as an original, may be utterly worthless as a copy. We cannot see much use, for instance, in removing the Late Gothic termination of the choir aisle, and replacing the Early English apse, unless on the plea that the latter is architecturally a beautiful feature; in any other respect it is really falsifying the history of the building. The reconstruction of the pyramidal feature over the apse is an entire mistake. It is an ugly excrescence, which would have been historically interesting had the original existed, but which is merely constructed on conjecture from traces found (for it is impossible to prove that this was the precise proportion and aspect of the original feature), and which as a copy, even assuming it to be an exact one, has not the slightest value of any kind. With regard to the general treatment of the building, the case is different, as this may be said to be a renovation rather on architectural than on merely archæological grounds. There is no question that all that could be called architectural detail had pretty nearly disappeared from the walls, and that even some of the ordinary beauty of decay was absent, since this red sandstone assumes in age a grim, dirty, blackened look, very different from the beautiful and varied tints often found in old and ruined masonry. The question, therefore, was between a reality which presented little beauty save that of association, and an imitation which gave something like the original architectural design of the building. We say advisedly, "something like," for it is idle to tell objectors to the restoration, as they have been told, that the custodians of the Cathedral were enabling them to see the building in its reality. Take it as you may, indeed, an imitation is not the reality; but, more than this, the new work is not, and cannot be, like the old, because, study and copy old detail as we will, there is a spirit, *a je ne sais quoi*, in old workmanship, which is distinct from that of the present day, and which modern restorers cannot really reproduce, charm they never so wisely. Let any one who doubts this compare the rebuilt north side of the cloister at Chester with the corresponding work which formed its model on the west side, and see (after making all allowance for the difference between fresh and old masonry) how tame and weak the new work looks beside the old, in regard to the buttresses especially; and consider that the same kind of difference almost certainly exists between the rest of the new work and the original which it is supposed to revive. The building is now an admirable modern Gothic exterior, deserving all credit as such; but let us not be told that it is the old cathedral over again, for that is impossible.

We have had our say on this point before speaking of the interior, because in regard to this the case is very different, and (with one exception to be noted) there is little room for anything but congratulation on the result. Here the question is not one of cutting away and replacing, but simply of cleaning the ancient work from dirt and whitewash, repairing where necessary (which has been very little), removing unsightly interpolations in the edifice, and

generally refurnishing and redecorating it; and there can be no question that the result has been to bring out wonderfully the interest and beauty of the architecture, which had been almost lost before, and to make a fine, cheerful, and impressive interior of what was previously a very dingy and shabby-looking place. We will take a brief look round the interior, and notice some points of the original design and the present re-arrangement. Entering at the large south porch of the nave, we are opposite what should be the second bay of the arcade; but the western bay has been at some time built up on each side, leaving a mass of solid wall where the arches should be, shutting off at the south angle the Consistory Court, and at the north angle the ground story of the original north-west tower, a good piece of Transitional Norman work, which has long been a dark and unused corner of the building, but which it is now intended to throw open and use as a baptistery. The closing up of the two first arches gives a gloomy and unsatisfactory effect to the west extremity of the nave, not relieved by the very weak-looking Perpendicular wall-arcade which fills up the space below the large window. But turning the other way we look along a Decorated arcade of very fine work indeed, remarkably bold and effective in the sections of the piers and arch-mouldings, and now seen in all the freshness of new stone work, after the scraping off of the whitewash with which it had been completely covered. The south aisle shows a range of stained glass windows put in at different times, and which, without possessing extraordinary merit in any one instance, make a very good and harmonious combination of colour as a whole. In the north aisle the windows were kept high up, on account of the adjoining cloister, and this wall, which is of Norman date and plastered over, is left with the plaster undisturbed, as it was in a very rough state and would not bear meddling with. The nave has the peculiarity of wanting a triforium arcade, though there is a triforium gallery, and the clearstory windows are lofty but weak in design. The rather small and delicate moulding of the vaulting shafts contrasts curiously with the large character of the arcade mouldings. These shafts lead the eye up to the one serious defect which we have already hinted at as existing in the interior restoration, the wooden vault. We object entirely to the employment of wood in this form; it is as complete a sham as anything could be, and the fact of its having been used in some Mediæval buildings makes it no better. To complete the pretence, the external flying buttresses have been built; they never existed before, the Mediæval builders having (quite rightly) deferred building them as long as the stone vault which they were to support was not built. The effect of the wooden vault, left its natural colour, in contrast with the stone springers, is very bad, the more so from the way in which the vault is truncated at the east end from the interposition of the crossing arch, which is a segmental arch with the haunches too high to allow of the vaulting ribs at this point descending to the same springing level as the others. The whole thing looks like a piece of patchwork, a great timber cradling pretending to be a vault. Some improvement would be effected if the lines of the ribs were strongly emphasised by colour or gilding carried down to the cap of the vaulting shaft, so as to lessen a little the harshness of the junction of the wood ribs with the stone springers. But it would surely have been far better to have left the springers as the evidence of the original intention of a stone vault and to have roofed the nave with a genuine timber roof in proper form, instead of making a compromise which is neither one thing nor another, and is totally opposed to all true architectural principle. It might have been possible even to have designed the springing of the roof principals, in such a case, so as to have seated them satisfactorily upon the springing stones, without falsifying either the one or the other.

Looking down the nave to the east end, we now find the crossing intercepted only by the light open canopy work of the return stalls, and the new brass gates of the choir in the centre. Beyond this is the almost uninterrupted view of the choir, fresh and bright in its cleaned state, and terminated above by the Decorated east window above the lady-chapel roof. The effect of the vista is very pleasing, and though by no means prepared to support unreservedly the movement for taking away cathedral organs from the central position, we may admit that an effect is gained in this case. We cannot but remark, however, as one argument often used is that the apparent length of a cathedral is interfered with by the interposition of the organ in the old position, that the effect of the removal of the organ in this case is most unquestionably, to our eyes, to diminish the apparent length of the building, though the change is effective in other respects. Advancing along the nave, we find a new and noble internal effect secured by the throwing open of the great south transept, long shut off as St. Oswald's church. This is still in a state of whitewash as to the walls, but the pews and galleries have been removed, and the area furnished with suitable plain open seats; and when the whitewash is scraped off and the great south window filled with stained glass, the effect on entering the crossing from the nave will be very fine, and the apparent spaciousness of the interior is, of course, greatly increased. The throwing back of the choir-screen to the eastern side of the crossing was a *sine quâ non* in carrying out this arrangement, whereby the crossing space becomes, as it should be, the central space from which everything else opens, instead of being cut off entirely as it formerly was. The crossing arches at Chester offer the peculiarity of being in pairs of entirely different design; the east and west arches being segmental, and springing at an angle with the pier, and with a flat soffit decorated with panelling, while the north and south arches have a moulded section and spring from caps at the impost level in the usual manner. Passing round behind the organ, which now stands under the north arch (as shown in our view given in a recent number*), we come to one of the most historically-interesting corners of the building, in the north transept. Here has been uncovered, in the east wall, the outer ring of the round arch which, in the Norman church, gave access to the apsidal chapel eastward of the transept. A wall-arcade above this is the best and most characteristic bit of Early Norman work preserved in the cathedral. To the right of the position of the arch is to be seen one-half of a well-preserved trefoil-headed piscina recess of Transitional date, which has been cut right through the centre by the respond pier of Decorated date at the angle of the transept and the choir aisle. Against this pier, again, stands one mullion, or upright, or whatever one may call it, of a stone screen of coarse Late Perpendicular work, which probably at one time extended across the north transept. This strange jumble of work of different dates at one angle of the building was entirely embedded in plaster, and is now brought out to the light to tell its tale. We enter the choir aisles through some very fine iron gates of Italian design and workmanship presented by the Duke of Westminster, but the precise history of which we have not obtained. They are, of course, quite out of keeping with the building; but their fine and artistic style and workmanship forms a significant contrast to some of the modern Gothic metal-work which has been put in during the restoration,—the altar-rails, for instance, which are brass-work washed over with gilding, and very feeble and tawdry in style and execution. Passing these gates, we see immediately on the right a cleared space in the floor where are visible the bases of two of the circular piers of the Norman church, the bays of which were much narrower than those of the present church, and which must, indeed, have been a most impressive building in the mass and solidity of its proportions. On the left a door gives access to the site of the Norman apsidal chapel before referred to, which, however, lost its apse form in the Early English period, when it received a square end and a lancet triplet, probably at the same date as the building of the beautiful chapter-house. Close to the door of the apartment a small piece of stone plinth still shows the commencement of the curve of the apse. The choir aisles are laid mostly with the marble pavement formerly in the centre of the choir, and at a certain point a semicircle formed in the tiling in each aisle shows the termination of the aisles of the Norman church. This is a very good way of leaving a memorandum, but the building up of a piece of a buttress in the Early English style, in the Perpendicular chapel north of the lady chapel, just to show that an external buttress was there originally, is a clumsy and unnecessary proceeding, and looks exceedingly awkward. Besides, when these ultra-conscientious pieces of restoration have become old and worn and have lost their distinctive character as new work, how are the archæologists of the future to know what is real and what is not? It is highly probable that all this kind of proceeding will eventually defeat what must be presumed to be its object, and confuse the history of a building instead of illustrating it.

The arcade and triforium of the choir form the finest portion of the architecture of Chester Cathedral; the triforium especially, with its heavily-moulded trefoiled arches, is a beautiful bit of Early English work of the best style. The arch-mouldings of the south arcade present one of the peculiarities of the building, being quite different from any moulding usually found in work of this date, consisting of shallow quarter hollows divided into groups by rectangular sinkings; they form a curious contrast to the deeply-cut pure Early English mouldings of the north arcade. If we step for a moment through the door from the north aisle into the precentor's garden (if he will excuse the liberty) we can see in the exterior of the aisle windows other peculiarities almost unique in English cathedral work; two of the windows having the outer order of mouldings returned downwards and meeting in a point or pendant, leaving a small open spandril below the crown of the arch; the same members in another window interpenetrate at the top in German fashion. In regard to the decorative treatment of the choir, the tiled floor is very good in general effect and tone; the inlaid figures of St. Augustine and others of the fathers are, of course, in that starved-monkey style which is supposed to be necessary for figures that are to be *propria quæ ecclesiis*. Of the bishop's throne and pulpit, which are new, we shall give illustrations; the latter is perhaps the better design of the two; the throne wants a little more filling-in in the canopy, but the work is excellently done, as is the new woodwork in the choir generally. The stalls and canopy work have been cleared of four coats of paint, and at present the wood looks a little raw after the operation, but that will tone down in time. The vault is a wooden one, in place of a plaster one, which was formerly there; as it is decorated in colour, it has a better effect than that of the nave: gilding predominates in the decoration, which partly from this cause seems a little too yellow in tone, but it has the merit of not being too heavy in effect. A view of the new reredos we give in our present number (p. 904). The restoration of the sedilia on the south of the chancel is a point to be noted; the elaborate stone canopy work is, we believe, conjectural only; it is worth remark that one of the arch-heads over the seats, which was missing, was discovered by the present clerk of works, Mr. Osborne, amid the architectural relics in and about St. John's Church, whence it has been conjectured the sedilia (of late date) were brought. The lady chapel does not come under the head of the present restoration work, as it was restored and decorated previously.

A word as to the organ, before we quit the interior of the building. The design (for which see our former illustration) we like very much, and are not ill-pleased to see the quiet gilt pipes for once, instead of the prevalent fashion of prismatic hues all over them; only we think the woodwork looks dingy, and wants some colour, which is perhaps intended. As to the position, there is no doubt that if the organ was to come away from the centre screen, the present is the best place is could have. The practical result is, however, that it does not support the voices so directly or efficiently, and, of course, is not so effectively heard in the nave and choir; it speaks, in fact, straight into the south transept. Some of the lighter stops of the choir organ are, however, to be placed in a small subsidiary organ case, which already stands in the centre of the choir screen, in the position once occupied by the whole instrument, and looking like the "survival of a type." This is the old German arrangement of the separate choir organ (called the *ruck-positiv*, or "back-organ," because it was placed behind the player), in a slightly different form: it will probably have a good bright effect, and combine well with the voices, though it may interfere with the player hearing the singers a little. The large wood pipes of the 32-ft. pedal stop, again, are placed against the wall at the end of the north transept, quite separate from the rest of the organ; as these are pipes of a soft, deep, and travelling tone, there will probably be no disadvantage in such an arrangement in this case; had it been a powerful stop of the reed species, such an isolation from the main instrument (which has sometimes been attempted) would have been in the

* See pp. 760, 761, *ante*.

highest degree objectionable. It is nonsense, however, to suppose that a cathedral organ will ever sound as well in such a side position as in the old central position; and if restoring architects think it will, they know nothing about it. The only reasonable ground for the change is that a cathedral is not a music-room, and that the architectural effect has the first claim to consideration, which is, no doubt, a point open to discussion. The Chester organ is at present partially *hors de combat*, owing to the failure of a "gas-engine," which was to supply the blowing power, to do its work,—a fact which it may be useful to mention in the interest of others who may be intending to try similar means of raising the wind.

Returning to the nave, and passing out by the north door into the cloister, we are gratified to find the old work here perfectly untouched, and to see that there is still a bit of the old and time-hallowed association of the place left, and that the sun can still shine through gleaming foliage on time-worn and broken mullions that are undisturbed by any modern tool. We understand the cloister is not to be touched, and sincerely hope the information is correct. On the other hand, the rebuilding of the south walk of the cloister is a perfectly satisfactory proceeding, the completion or (in the most correct sense) the restoration of an architectural feature which had been destroyed, but for which all the data for restoration are present in the most unimpeachable form. The new south cloister continues the design of that portion of the west side which formed the "reading cloister," where the outer wall and the windows are projected forward so as to widen the cloister walk by about 3 ft., and the springing of the vault is taken by a series of piers continuing the line of the main wall of the other portion. This row of free piers within the wall line is continued along the south side, and the grouping at the angle of the west and south walks is as picturesque a bit of effect on a small scale as one could wish to see. The cathedral wall on the south side of the new walk is the old Norman wall, with its niches which marked the tombs of the abbots, the work in connexion with which has been treated with every care and respect; small portions of the arch-mouldings, &c., being restored, and the rest left; one jamb of the Norman door by which we entered the east cloister is also restored, and the other side left *in statu quo*. This part of the work has no doubt stood better than most of the building, through being partially under cover; but it is remarkable that the north side of the Cathedral generally seems to have suffered far less from weather and decay than the south side; and the chapter-house has on this side been left untouched externally.* In the east cloister, by the door, are piled the bosses from the roof of the Perpendicular chapel at the end of the south choir aisle, which, as we observed, was removed to allow of the restoration of the Early English apse termination. The buildings in connexion with the cloisters should not be overlooked by any visitor. Parallel with the west cloister there is the Transitional vaulted chamber in two aisles, on short round columns of admirable work, referred to in our last article, and which will, no doubt, be presently cleared from its present state of lumber and darkness. Towards the south-east angle, on the same side, a Norman doorway (across the centre of which a pier to carry the cloister vault has been built with perfect nonchalance by the Perpendicular architects) leads to a Norman vaulted passage running north and south, formerly giving access probably to the abbot's house. Over this is the former "Bishop's Chapel," in which a late Gothic vault, just previous to the period when the vault developed into the fan form, springs from Transitional capitals, carried by coupled shafts. At the east end of this, over the cloister, a small chancel has been formed, or at least decorated, in the Renaissance period, with an elaborately-panelled plaster ceiling. This interesting chamber is also in a state of rubbish and whitewash at present, but is otherwise in good preservation. The ancient refectory adjoining the north aisle, with its well-known pulpit, which has long been used as the "King's School," is now to be made into a library in connexion with the cathedral establishment. The chapter-house does not come into the work of the present restoration, save that a new entry to its vestibule is being made from the passage leading out of the east cloister. The said vestibule, with its peculiar arrangement of the vaulting shafts continued direct out of the mouldings of the piers without any impost, was restored some time previously, its entry from the east cloister forming the only new portion of work in this part of the cloister. On the other side of the passage mentioned is the room referred to in a former article as now utilised for a choir-vestry and practising-room. This is the old "guest-house" of the convent, a very beautiful Early English apartment, vaulted in two aisles on slender piers in the centre, and with a group of lancet windows at the north end; it was completely disused and blocked up. The centre piers have an odd kind of rudimentary impost, little more than a roll moulding; if we remember right, a similar feature occurs in some of the work in connexion with St. John's Priory Church at Chester. Indeed, Chester Cathedral is a place full of odd incidents, architecturally speaking; perhaps in part derived from Wales, where Gothic architectural detail assumed so many unusual and abnormal forms. A peculiarity at the north end of the east cloister is to be found in the large circular window, with quatrefoil tracery, which lighted the dormitory stairs, and which (Early English in date), is very unlike anything we are used to in Gothic. The springing of the Perpendicular vaulting-ribs at this point has been hung in front of this window, corbel fashion, with most delightful unconcern. The trace of a similar window, subsequently walled up, is seen higher up, following the slope of the stairs, the door to which, in the north-east angle of the cloister, has also peculiarities of its own.

We observed that the King's School is to be turned out of the old refectory. Its new habitation is being provided at the north-west angle of the Cathedral, on what is believed to be the site of the former bishop's palace. A portion of the building next to the west front of the Cathedral, and up to the first-floor string, has been built from Sir G. Scott's design, and is a remarkably effective bit of work, with its deeply-recessed traceried windows between boldly-projecting buttresses. The main portion of the building is being carried out by Mr. Blomfield, and is not as yet forward enough to speak particularly of. It ought to make a pleasing adjunct to the Cathedral. Some mean third-rate patent brick houses or shops just opposite disfigure this angle of the cathedral close greatly; but on the south side we observed with pleasure the picturesque character and excellent workmanship of the new shops and houses which adjoin the site here, and which are a credit to whoever designed and built them. The whole site, taken in connexion with the restored Cathedral, has a very "modern-antique" appearance, it is true; and the old Mediæval names which distinguish some of the neighbouring streets and alleys suggest associations with which the old Cathedral certainly harmonised better than the new one. Yet, balancing the difficulties with the drawbacks, we must look impartially at what has been accomplished, and admit the energy and ability displayed in carrying out the work, and the good intentions of those who first initiated it.

* There is a probability, it is true, that the north clearstory of the nave has been repaired at a later date, and is not in its original state; but the chapter-house exterior is the original Lancet work, and it is remarkable in how much better preservation it is than was the much later work on even the most sheltered parts of the south side. The earlier builders must have selected the stone more carefully.

TRACERIED WINDOWS.

AMONG the various propositions that have been made towards promoting a new or original style, has been the suggestion that Government should put a tax on every traceried window, by way of depriving the practitioners of modern Gothic of their chief source of effect, and driving them to invent some compensating feature for themselves. Whatever may have been thought of such a proposal, it would be superfluous now. To drop tracery and adopt perfectly plain windows is almost *de rigueur* in Gothic design now, even in the case of churches. In this respect we have progressed exactly in the opposite direction, in revived Gothic, from that of genuine Gothic. We commenced by a great admiration for and imitation of Late Decorated and Perpendicular window-tracery, which was even imitated in cast-iron when its production in stone was considered too costly or troublesome. The elaboration of a large window of flowing tracery was the pride of the earlier revival architects and the masons they employed; and the correct and neat drawing out of such a design was a test of the skill and application of young draughtsmen and pupils in the office, and their proficiency in the use of their instruments; and no bad test either. Then it was seen by more thoughtful votaries of tracery that the geometrical style had the advantage of giving regular and symmetrical lights as well as a regular design for the bars, and perhaps the gradual perception that the earlier forms of Gothic generally were more dignified and more true in architectural feeling than the later, helped the change of taste. We kept at first, however, to the true tracery, with its mitres and intersecting fillets, and carried it out in large and elaborate designs. Gradually, however, even this began to be looked on as over-ornamental and meretricious, and we went back a stage and imitated the immature forms of "plate-tracery"; a complete mistake, as this is really neither one thing nor another, but only an experimental stage in the development of this feature in Mediæval design. This immature and often awkward form of window design was, however, adopted a great deal, and for a time almost exclusively, by some of the ablest modern Gothic architects, and gave, in conjunction with other peculiarities, a certain character of its own to one phase of Victorian Gothic. As far as we have observed, however, even those who were most in love with this style of window are now abandoning it, and with good reason, for its employment almost always gives an air of heaviness and want of finish to the decorative treatment of the building in which it is employed. It is, in fact, good in effect only from the interior, and for the use of stained glass especially, in apartments not over-much lighted and where the eye is consequently directed almost entirely to the shape of the lights, and not to that of the divisions. A large number of Gothic designers have now taken the final step, and gone back to plain pointed windows without any tracery. Where tracery is used at all in recent church designs, it is usually now in very simple forms, based on either geometric or late Gothic models, but rarely on the more flowing forms and in the more exuberant taste of the Late Decorated style, which, in fact, would be out of keeping with the manner of Gothic, in regard to other details, which is now most in favour. The little tracery that is now used is generally true tracery as far as it goes, and the hole-punching style called plate-tracery is rarely employed now by architects with any pretension to a refined taste in regard to detail; but it is very common to find this characteristic feature of Gothic architecture omitted altogether by the designers who claim to have most affinity with the true Gothic spirit, and the stern simplicity of plain lights taking its place.

If this change of taste is the result of a desire to avoid all mere copying, and of a conviction that tracery is opposed also to the utilitarian objects of a window as an opening for admitting light, there is little or nothing to be said against it on principle. But it rather arises, we imagine, from the lately developed tendency to extreme purism in church architecture, and the preference shown for early forms of the Gothic style which have not yet been so completely worked out by copying as the later forms, and, therefore, seem to have a comparative freshness and novelty about them. It would, however, be a very incorrect criticism which would assert that the Gothic style was really in its best and finest phase in this unadorned stage of its existence, and that the development of such a decorative feature as window tracery was a mark of decadence. It is, in fact, one of the most beautiful and one of the most naturally and logically developed features of the style, though eventually over-worked and misused, as most inventions in architectural design are in the end; and a fitter use for the modern architect to make of it would be, not to neglect it altogether (under the plea of avoiding copyism), but to consider what new or modern application of the same idea is possible, what there is that has been left undone, though suggested, by the Mediæval builders.

It is curious that window tracery, as an important source of architectural effect, has been developed in the most southern and in the most northern of the important styles of the world, and neglected in those which occupy the intermediate latitude. When we say, "most southern," we should rather say, "most tropical," which is the real point as regards the influence of climate on the form of the window. Saracenic architecture has its elaborate window traceries, which are evidently in part a natural suggestion for tempering the glare of a hot sun; an ornamental screen, in fact. The only other school of tracery

in an elaborate form is found in the northern styles of Europe. Southern Europe, in its most important styles, misses this element of architectural effect altogether, though under a sky far more suggestive of contrivances for tempering light than that under which the northern Mediæval style was developed, and far more fitted to give brilliant effect to any elaboration of the window-decoration, as seen from the interior especially. But the Italian architect was content to accommodate his building to a bright light by the simple and prosaic method of making very small windows, in his churches especially, and occasionally of recessing them behind a loggia in the case of domestic buildings. In the northern styles, the development of tracery, which practically is a device hardly suited to, at any rate not suggested by, a cloudy atmosphere, sprang in the first instance from a purely architectural motive, and owed its further elaboration probably in great measure to the taste for stained glass, and the desire for as full a field as possible for its exhibition in an effective framework. But Gothic tracery has always retained, in English work particularly, the recollection of its constructive origin. It is never a mere toy; the lines of its construction are always emphasised; in its latest form, which gave the name to the "Perpendicular" style, this constructive character is more marked even than in some of its earlier forms. In this respect it is essentially different from Saracenic tracery, which is almost always more like an ornamental window-frame or a permanent curtain, fitted into the window-opening, than like an integral part of the constructive design of the window.

These two perfectly distinct phases of window-tracery have each their suggestions, however, for further extension and application by the modern architect. The Saracenic traceried screen, certainly, is more the feature for a tropical climate than for a northern one; yet there seems no reason why such a method of permanently filling up a window-opening, in an apartment intended especially for summer use, should not have its appropriate application in our dwellings. During this summer, indeed, we have had valid excuses for the adoption of almost any device in building supposed to be specially suitable for tropical climates. The Saracenic window is quite out of keeping, it is true, with our look-out-of-window habits of life; it is a device telling of an interior jealously concealed from the neighbours, of a home of luxury rather selfish than social. In ordinary situations, even plate-glass would be preferred, in an English house, to those mysterious-looking infinitesimally divided stained-glass windows, the jewelled effect of which makes so much of the charm of colour in the interior scenes of Gerôme and Lewis. Yet there are plenty of opportunities, where windows are required which are to admit of light but not sight—borrowed lights or lights looking out on ugly contiguous brick walls, as is so often the case in towns, where something after the manner of the Eastern traceried screen would be a grateful substitute for "best polished plate-glass ground on one side," or even for some of the more ornate, but hardly more tasteful forms of obscured glass, of which one sees so much. Our interest, however, is more with the masonic form of Gothic tracery, as more strictly architectural as well as indigenous to the country. And in the application of this to domestic architecture in particular there seems to be room for novelty and originality; for something to be done more than has yet been attempted. The northern form of tracery, which confines this decoration to the head of the window only, and leaves the lower part open, is not unsuited either to this climate, or to the requirements of lighting in dwelling-houses. In regard to the latter point, one has only to notice how constantly, in the rooms in which people daily live, the blinds will be found drawn only part way up, and the upper portion of the window left, by preference, in semi-obscurity. An apartment for effect is lighted from above; an apartment for use, in the majority of cases, is more comfortable and agreeable to the eye when lighted low. Tracery, considered practically, would be only the permanent blind softening the glare from the upper part of the window, and at the same time giving opportunity for decorative effect, both internally and externally, and for extending the window, and thus assisting the filling up of the architectural scheme or design, without either over-lighting the interior or rendering the exterior bald and blank by the presence of large and staring expanses of glass. But what is further worth considering is that an attempt to work out the feature of tracery more freely in domestic architecture would probably show that the possible forms of this class of design are by no means exhausted. In applying tracery to modern churches, the architects of the present day have mostly been content to use up old forms. In applying it, or something like it, to domestic architecture, there has been a general tendency to confine it to the mere mullion-and-transom device, as if anything else were unsuitable for a dwelling-house and for the square-headed window which is usually the most convenient and suitable form in domestic architecture. A combination of this square form of the leading lines, with some of the more ornate and flowing detail suggested by the geometric and "curvilinear" tracery styles would in itself lead to a good deal of novel treatment, without taking into account the variety of geometric and other forms and combinations which are still almost untried. At all events, the recurrence in modern Ecclesiastical Gothic to the plain window looks as if a source of purely architectural decoration were to be abandoned which has not by any means been worked out, and which is capable, in Ecclesiastical architecture to some extent, but in domestic architecture to a much greater extent, of a more varied application and development than it has yet received.

THE WORKS AT COLOGNE CATHEDRAL.

WE have received the following letter:—

SIR,—The amusing self-sufficiency, not to say the raw ignorance, in the attempted criticism of Cologne Cathedral,* the greatest and most perfect masterpiece of pure Church Gothic extant, is too apparent to deserve more than a passing feeling of contempt mingled with pity. Such clumsy hypercriticism one could hardly afford to notice were it not for the publication of it in your widely-circulated journal amongst so many of the *uninitiated in art*, and thus to protect them from erroneous impression and prejudice. FRED. SANG.

If Mr. Sang had restrained his pity for our "raw ignorance," and carefully read our "Notes from Germany," he would at once have seen that our criticisms upon Cologne Cathedral had reference solely to certain *modern* works executed in connexion with this magnificent church, namely, the terrace, the fountain at the east end, and the modern portions of the west front. Now, if Mr. Sang chooses to consider either the new terrace or the wretched little fountain "a masterpiece of pure Church Gothic," we must beg to differ from him; and if Mr. Sang thinks the modern portion of the west front anything like what the Mediæval architects would have done, we cannot agree with him. It is precisely because we so much admire the *ancient* portions of this cathedral that we regret the want of true Gothic spirit shown in some of the *modern* additions.

We have, of course, been told that the new west front follows the ancient design, and to a certain extent it does carry out a drawing discovered some years ago, and preserved in the cathedral; but, in the first place, very little is known about this drawing: it may even be doubted whether it is a Mediæval drawing at all, and, even supposing it to be so, there is nothing to prove that it was more than a suggestion for completing the cathedral. That it was, at any rate, a design which had been abandoned or modified is proved by the fact that the small portion of the north-west tower which had been erected did not agree with this drawing. And even supposing this "design" to be all that the Cologne people would have us believe, surely Mr. Sang can understand that a design may be ruined by the poverty and want of true artistic feeling shown in carrying out the details. Whatever the defect may be, or from whatever cause it arises, we must still retain our opinion that this west front is a most unsatisfactory production, and totally wanting in that artistic feeling shown in all the ancient works of the kind. If our angry correspondent will compare the treatment of this front and its details with the same portion of the cathedral at Ratisbon, he will understand why we say that this portion of Cologne Cathedral is entirely wanting in Gothic spirit and true artistic effect.

We repeat some of our criticisms upon this portion of Cologne Cathedral, and we defy Mr. Sang or any one else to contradict them. We said that the design was monotonous. Now, who can deny this when the six great buttresses are all exactly alike, and one tower is the exact counterpart of the other, when all the windows are so exactly alike that they might have been cast in one mould,—when not even a moulding or a capital is varied? How different are all the ancient fronts to this. Look, for instance, at Ratisbon. The general effect is uniform, but when one comes to examine the detail, what charming variety we find: not two buttresses quite alike, and all the detail varied in a most artistic manner. We said that "this front was wanting in that grand effect of light and shadow to be seen in the great French churches, and we missed those deep portals with their solemn gloom." Well, this is no mere matter of opinion: it is a matter of fact, which even Mr. Sang cannot deny. We said that this front has not the quiet look of dignity to be seen in some of our English cathedrals, and we repeat this self-evident observation. We said that the west front of Cologne is a "correctly insipid" work, by which we meant to convey the idea that it is a mechanical and not an artistic rendering of the design. And, unfortunately, this is the great defect of nearly all the new work at Cologne Cathedral, where mere mechanical reproduction sufficed for the carrying out of the ancient design. The work has been well done, but where a little artistic treatment was required we look for it in vain. To give a few examples of what we mean, let our readers next time they are in Cologne look at the cast-iron flèche over the crossing. Is it possible to conceive anything more ugly or ill-designed? And the worst of the matter is, it is so badly treated as to scale that it makes this immense church look about half its size, and disfigures the building from every point of view. Again, the huge cabbages with which the modern builders have terminated the transept ends, and the Brummagem Gothic altar under the crossing, show an entire want of artistic feeling. To accuse us of raw ignorance and presumption for criticising these defects in the modern portions of Cologne Cathedral is simply ridiculous. The "raw ignorance" is rather on the side of those who cannot draw a distinction between the ancient work at Cologne, with its artistically executed details, and the modern portion of the same church, with its vapid, mechanically-executed detail. In conclusion, we beg to assure Mr. Sang that we have every respect for the works of the ancient architects and workmen of Cologne Cathedral, but we decline to extend that feeling to the works of some of their modern successors.

* See p. 874, *ante*.

MOVEMENT IN INDIA.

FROM a minute published by Sir John Strachey, governor of the North-west Provinces, on the preservation of works of art and antiquity in those provinces from 1872 to 1875 inclusive, it appears that an expenditure of 16,758*l.* on the Palace buildings, Agra fort, and on the Taj Mehal was sanctioned, of which sum 7 958*l.* were spent on the Taj Mehal alone. Besides these two interesting works a sum of rs. 1,968 has been spent on Futehpur Sigri, and on the temple of Govind Deva at Brindaban Muttra rs. 19,533 have been laid out, and still the work of improvement is not completed. Further estimates have been prepared to the extent of 69,123*l.* to be expended on the above works, including the magnificent buildings at Jaunpeor.

The *Madras Mail* understands that Mr. Melville, C.S.I., agent to the Governor-General at Baroda, has, at the request of Sir T. Madhava Rao, applied to the Madras Government for the services of Mr. Chisholm, the Government architect, who was shortly expected to arrive at Madras, *viâ* Bombay, from England. Sir T. Mudhava Rao intends erecting a high school at Baroda, and wanted Mr. Chisholm to devise a plan, offering a handsome honorarium and expenses, but the Government, which has the first claim to his services, has declined to allow him to go on account of the quantity of work which has accumulated during his absence.

Some remarkable archæological discoveries have been made in carrying out excavations on the banks of the Kishengunga, near Mozufferabad. Several large slabs have been recovered, one of them being so heavy as to need the united strength of a dozen men to lift it. It is sculptured with delineations either of Hindoo mythology, or the still more ancient figures and symbols of Buddhism; but which of the two the learned in such matters have not yet had an opportunity of deciding.

It is rumoured that Sir Andrew Clarke's scheme for the re-organisation of the Public Works Department will be ready shortly, and submitted to the Government of India, so that the changes and reductions therein contemplated may be introduced and effected before December next.

A carved stone pulpit has just been put up in the station church at Simla to the memory of the late Bishop of Calcutta. It is of native workmanship, but is said to be exceedingly well executed, and is the first memorial which has been erected in honour of the deceased prelate in India.

PHOTOGRAPHICAL RECORD OF HISTORICAL BUILDINGS.

THE Society for the Preservation of the Ancient Monuments of Alsace has adopted a resolution at a recent meeting which will meet with universal approval. It has been resolved to take photographs of all the ancient and peculiar houses for which Strasbourg is celebrated, but which are in danger of destruction. Two houses especially, of considerable archæological interest, have been condemned, and must soon be pulled down to make room for modern improvements. The architectural and historical merits of the buildings will not, however, be entirely lost to future generations. According to the resolution just adopted, the Society will take the most elaborate photographs of these constructions before they are submitted to the desecrating touch of the pickaxe. In these days of reconstruction and of sanitary improvements the Alsatian society gives us a good example; and we venture to submit this fact to the local and municipal authorities of this country. Where no private bodies are willing to undertake such a "work of love," perhaps even ratepayers would not object to the very trivial outlay necessary to secure photographs of remarkable houses before they are swept away for ever. Local museums might be enriched, at a very small cost, by these mementoes of the past; which would, indeed, be of great historical, artistic, and technical value. It would be interesting, for instance, to know whether photographs were taken of the many artistic beauties for which the interior of Northumberland House was celebrated. The authorities by whose decision London was deprived of this ancient mansion might have insisted on preserving, with the assistance of the photographer, the memory of its former glories. Doubtless a suitable place for such a collection of photographs might be found at South Kensington, or at some other museum equally accessible.

But in Paris, more than in London, the adoption of some measure of this description is particularly needed at the present moment. Besides the vast schemes which are now under discussion, several public works have been already commenced, and notably the completion of the Boulevard Saint-Germain. Stretching from the Halle-aux-Vins over the Pantheon and Luxembourg quarters, this boulevard cuts right through several blocks of old houses situated between the site of the ancient Abbaye and the modern École de Médecine. The dark, confused, incongruous buildings, divided by the narrowest of streets and little courts, which the new boulevard is destined to destroy, stood on historical ground held sacred by the true Parisian. This group of old houses, inhabited by many generations of Quartier Latin students, has often been designated as the cradle of the great Revolution. Here the Cordeliers congregated, and the courts and alleys now pierced by the new boulevards have again and again echoed to the thunder of Danton's oratory, of Desmoulin's eloquence, and Marat's denunciations.

Legendre, Fréron, d'Eglantine, Brune, Jourdeuil, Chaumette, Vincent, Mornoro, harangued the angry inhabitants of these little streets, in the midst of which they lived, and fanned the flames of revolution that spread from this quarter over the whole of France, indirectly affecting the legislatures of even the most conservative countries in Europe. Already, at the entrance of the Passage du Commerce, the walls that sheltered one side of Danton's house have been brought down, thus exposing his favourite room to the gaze of all who pass along the street. The house in which Marat lived and was assassinated is, we believe, still standing, though doomed to destruction. At the extremity of the Rue de l'École de Médecine and the ancient Rue des Boucheries, there remained the room where the civic committee of the Section des Quatre-Nations were in the habit of meeting. In the Cour du Commerce, Duplain, the printer, had his abode; while, close at hand, in the Rue du Paon, was Chaumette's modest home, which he did not forsake when appointed Procurator of the Commune in 1793. Many other equally interesting details might be mentioned concerning this quarter, and we trust that such historical *souvenirs* will not be swept away without first securing illustrations of the abodes of these celebrated men. This historical evidence is more than curious, for it may vindicate many a reputation from the libels that spring from party animosities. Thus, for instance, it is sufficient to examine the house and furniture of Danton to understand how little he deserved the title of the "leader of the corrupt party." When he is accused so often of loading himself with gold pillaged in Belgium, and living a life of degrading vice and luxury, there is some use in keeping illustrations of his home,—a home, indeed, so simple and modest in its every detail as to set at nought the reckless assertions of ignorant or unscrupulous adversaries. The removal of stone and mortar pregnant with so much useful information, and which served as a chronicle of the most stirring episodes of modern history, must deeply concern all who have some respect for the lessons taught by the past.

SUSSEX ARCHÆOLOGICAL SOCIETY.

THE annual meeting of the Sussex Archæological Society was held at Arundel on the 31st ult., when, notwithstanding the unfavourable state of the weather, there was a goodly muster of the members and their friends.

The party arrived soon after eleven o'clock at Ford Junction, where carriages were in waiting.

Climping Church was the first halting-place. Climping is a small parish lying between Ford and the sea, including all that remains of the ancient parish of Cudlawe, or Cudlow, only about 100 acres of which have escaped erosion by old Neptune. Mr. Gordon M. Hills, the architect under whose supervision this interesting edifice was restored a few years since, acted as *cicerone*. In the course of his remarks he said Climping Church was one of the most perfect and interesting of the ancient churches of Sussex. There had been a church here at a very early period, and mention was made of one in Doomsday Book. That there had been one of very early date was apparent from the fact that traces,—though they were but shadows of traces,—of it still existed; yet the height and dimensions of it could be seen by the church as it now stood. It was cruciform in shape, and was evidently built at two periods, owing its completion to the nuns who resided at Leominster, in connexion with the Abbey of Seez, in Normandy. The oldest part of it is the chancel, the tower being built in the time of Henry II.; not long after which the nuns built the complete body as it now stood,—one of the most perfect specimens of church architecture of the thirteenth century. It had undergone no changes. The door in the tower, on the west side, was the only ancient door; but a window had been converted into a door in the reign of Charles II., which was really the only alteration that had been made. It had been restored, and, in doing that, they had been guided by what was found on the spot. The pillars were all the old ones, having merely been cleansed; and in reseating the church they had been guided by a number of ancient seats which were found in it, and which were now ranged down the passage. The pulpit is the original one. In early times the population of the parish was very small, and the pulpit was near the south door; but when the building was reseated, the pulpit was put into its present and more convenient position; and he hoped that, in doing that, nothing had been done to offend archæologists. Referring to the ancient boundaries of the parish, Mr. Hills said it formerly belonged to that of Cudlawe, but was now annexed to that of Arundel; and, alluding to an adjoining parish, he concluded by saying that he had attended the church at Middleton, which had been since washed away by the sea. The visitors then inspected the various points of interest about the church, including a curious oaken chest, thought to be coeval with the church.

Ford Church was next visited, Mr. Gordon Hills describing the building, which is exceedingly small. It is a very curious specimen of ecclesiastical architecture, having only a very ancient chancel and nave, the former being the larger of the two; the latter seating about fifty persons. The walls are Norman. Mr. Hills said there were the remains of an aisle outside which seemed to have been built about the year 1200; but, judging from its appearance, it was not long in existence. It seemed to have been erected in anticipation of a rising parish, but, as the population remained stationary, it was removed in the next century. The columns were evidently about 4 ft. 6 in. high; but they would be better comprehended by a visit to Tortington Church, where they were discovered and restored. The only interesting thing in the church is the font, which is a square block of Pulborough stone, its sides being as unfinished as when rough-hewn from the quarry.

Tortington Church, which, like that at Ford, is very small, was then visited. It was restored twelve years ago by a local builder, the outlay being borne by Mr. Leeves. The principal points of interest are the semi-circular arch in the south door, and the arch dividing the chancel from the nave. They are of rich workmanship; the latter having a grotesque moulding, ornamented with the heads of birds and beasts. During the restoration, in 1864, a stone was found exactly fitting an opening which had been built up 200 years before, when a doorway was removed from one to another part of the church.

Arundel Castle.—By permission of the Duke of Norfolk, the members and their friends were allowed to inspect the interior of Arundel Castle. His Grace, besides throwing open the interior of the castle to the society, showed his hospitality by entertaining his visitors with light refreshments in the Barons' Hall. Having partaken of this, they roamed at will through the several rooms. The original castle, which was of a very remote antiquity, dating from the Saxon era, was destroyed in the Parliamentary wars, having stood a siege of seventeen days in the winter of 1643-4; but the present castle was re-built on the original lines in 1791 by the then Duke Charles. The ground plan—the walls being from 5 ft. to 12 ft. thick—very nearly resembles that of Windsor Castle, and the building is not dissimilar in elevation. Having visited the keep, the party proceeded to the tombs in the Fitz Alan Chapel—or Collegiate Chapel and Chapel of Our Lady,—the gilded roofs and fine carvings of which have been allowed to decay year by year since the Reformation. The interior of these once beautiful chapels—the Collegiate chapel forming the chancel of St. Nicholas parish church of Arundel—is rendered more desolate by the present duke having filled the chancel arch with plain red bricks to cut it off entirely from the church.

Luncheon was partaken of in a marquee in the Park at Arundel. The Rev. W. Powell, in responding to the toast of "Success to the Sussex Archæological Society," said that since their last meeting they had lost two old and valued contributors to the archæological literature of Sussex in the persons of Mr. Durrant Cooper and Mr. Mark Antony Lower; and he should not be discharging his duty to the association did he not take this opportunity of recording their deep regret at the death of these two well-known members. Each in his respective province was unsurpassed, Mr. Cooper having especial knowledge and experience in Mediæval Latin, and being most indefatigable in his researches. To him they owed many corrections in their papers, in which accuracy was most desirable, and where its absence would have been most detrimental. Mr. Lower was a self-made man, with a remarkable talent and genius for heraldry and genealogy, as well as for archæology and biographical research. No one could read his papers published in the collections of the society without learning something.

Next year's meeting of the society will, probably, be held at Mayfield.

Thames Valley Drainage Act.—The Commissioners are re-constructing the bridge over the river Ray, at Islip, Oxon. The bridge is the property of the Ecclesiastical Commissioners, and it was considered unsafe for public traffic, and had been indicted. The Ray is one of the rivers that will probably be improved under the powers of the Thames Valley Drainage Commissioners. The two Commissions therefore united in contributing to the cost of re-erecting it. The works are in rapid progress under Mr. Grantham's superintendence; Mr. Maxwell, of Plaistow, Essex, being the contractor.

THE GREENWICH NEW PUBLIC OFFICES.

THE new offices which have some time been in course of erection for the Greenwich District Board of Works are fast approaching completion. They are situated in the Greenwich-road, not far from the railway station. The building has a main frontage of 61 ft. in length, and the general elevation is 36 ft. in height from the street level. In the central portion of the elevation there is a clock tower carried to a height of 13 ft. above the main body of the building, terminating with a dome and lantern-light, 7 ft. high, the entire height of the tower and dome from the ground-line being about 56 ft. The building has a handsome circular portico entrance, projecting 6 ft. beyond the main body of the elevation, and surmounted by a balustrade. There are also similar balustrades on each side of the clock tower. The structure, which is two stories in height, is built of yellow brick, with a free introduction of Portland stone for dressings and ornamentation. On each side of the entrance double stone pilasters are carried up to the top of the building, and a deep stone cornice runs across the elevation immediately above the ground-floor. There are ranges of three-light windows on each side of the elevation, with a central lofty window, and two smaller ones on either side, in the central portion, above the entrance portico. The elevation is surmounted by a stone cornice and parapet. The entrance leads into a vestibule, 11 ft. square, from which the offices on the ground-floor are reached along corridors on either side of the main central staircase, the corridors being 5 ft. 3 in. in width. The ground-floor contains all the general offices, including the clerk's private office and those of his assistants, together with the offices of the surveyor, the engineer, and the accountant, strong-room, store-room, lavatories, and other conveniences. The stone staircase leading to the upper floor is 5 ft. 6 in. in width. This floor contains the Board-room, a spacious apartment, 57 ft. 6 in. by 40 ft., and very lofty, being 22 ft. in height. It has a coved panelled ceiling, and is intended to be elaborately fitted and decorated. This floor also contains several committee and waiting rooms. In addition to the ground and upper floors, the building has also a large and convenient basement, in which are the caretaker's apartments, and a number of store-rooms. It should be added that the ground-floor is considerably above the street level, and is reached by a flight of five steps under the portico. The building is seen to much advantage, having an area in front 20 ft. beyond the street line.

The architect is Mr. Wallen, of College-street, City; and the builder is Mr. W. Tongue, of Plumstead.

NOXIOUS TRADES IN THE METROPOLIS.

NEW SANITARY REGULATIONS.

WITH the view of abating the nuisance caused by certain trades carried on in different parts of the metropolis, and improving the sanitary condition of those localities, the Metropolitan Board of Works are about to enforce the adoption of new and more rigid regulations, which have just been decided upon. The particular trades and manufactures to which the new regulations are to apply are specially set out, and they embrace catgut manufacturers, manure manufacturers, blood and bone boilers, soap boilers, and tripe boilers. The carrying on of the whole of these several trades is more or less offensive, and injurious to the health of the inhabitants in the districts where the manufactories are located, and the object of the Metropolitan Board appears to be to reduce the nuisance to a minimum. With respect to the establishments where the manufacture of catgut is carried on, and which is exceptionally offensive, the mechanical and other arrangements to be in future observed are particularly stringent. In the first place, the material used in the manufacture is not to be allowed to come upon the premises except in iron vessels firmly closed, and from which no foul odour can possibly be emitted. Chambers for the carrying on of the manufacture are to be constructed according to designs prepared by the Board, and the vessels containing the materials are not to be opened, nor the preparing of the catgut carried on, in any place but these chambers, the object being to prevent the emission of offensive smells, such as are now experienced at these manufactories by the residents in the districts around them. A further regulation stipulates for the air in these chambers, during the time the process is going on, being conveyed through a shaft into a furnace. The regulations likewise provide for similar precautions being observed in every apartment in the manufactory where the process of manufacture is attended with the foul odours above referred to. Provisions are also laid down as regards the structural character of the buildings, one of which is that all the window-sashes are to be so constructed as to be perfectly air-tight, and the glass in the windows themselves is not to be under a quarter of an inch in thickness. As regards the boiling trades and manufactures, the regulations direct that all boilers emitting offensive and noxious vapours are to be so constructed as to secure the vapour passing through the furnace fire. The thorough cleansing at intervals of the buildings internally is also insisted upon, the regulations stating that the walls are to be limewashed every three months. No garbage or offal of any kind whatsoever is to be exposed, but to be kept in iron vessels closely secured, from which no smell can escape.

EXTENSIONS AND IMPROVEMENTS IN NORTHAMPTON.

THE *Northampton Mercury* gives an account of the past year's building operations in the town, which have been somewhat active, notwithstanding the general depression of trade.

The new Masonic hall and buildings are fast approaching completion. They stand on the site of the old Temperance Hotel, and have a frontage in Abington-street of about 47 ft. This frontage, with the exception of the central gateway on the ground floor, is occupied by two houses and shops, the Masonic hall and offices being at the rear. The houses have equal areas, and, including the basement, are five stories in height. A common corridor runs from front to back of the buildings, by means of which access is gained to the Masonic hall, as also to the private entrances to the houses. The Masonic buildings at the back consist of a large hall on the ground-floor, with the requisite offices, intended to be let for the use of Oddfellows and other kindred benefit societies; and a large room on the first floor, with ante-room, &c., for the exclusive use of the craft. The buildings are in the late French Gothic style, and are of red bricks, with Bath-stone and terra-cotta "dressings." Moulded bricks from the Vigo Brick Company's Works are used to the jambs and heads of windows. The carving is quite a feature of the Abington-street elevation, and has been executed by Mr. T. Bromfield, of London. The whole of the works are being carried out by Mr. John Watkin, of St. George's-street, from the designs and under the superintendence of Messrs. E. F. Law & Sons, architects.

In the Leicester-road there are signs of activity in connexion with another craft. The decision of the War Office authorities to constitute Northampton a depôt of the Northern Military District, of which it is understood that Warwick will be the centre, has necessitated a considerable enlargement and many important alterations of the barracks. Occupying a large area of ground as the premises must have done to meet the requirements of a cavalry barracks, the work was able to be proceeded with without purchasing additional property. The old buildings are built of white stone, and range along the head of the ground. On the left of the gateway leading from the Leicester-road is the guard-house, and on the right the various shops, &c. Opposite the entrance is the block constituting the officers' quarters, flanked on either side with two larger blocks, which form on the ground-floor the stable, and on the upper floor soldiers' quarters. At the rear is a large open space serving as a parade-ground, and on the south-west is the hospital. Some considerable time has elapsed since any artillery or cavalry were located here, the barracks having been occupied by detachments of the 48th and 58th Regiments of Foot. It has been decided that only infantry is to be stationed in the town in future, therefore the old stables, &c., have been, or rather are in process of being rendered serviceable for their future occupants. In addition to this, it has been found expedient to erect new buildings and provide accommodation for supplementary detachments, consisting of 120 men, four non-commissioned officers, thirty-one married soldiers, with an infant school, sergeants' mess, with reading and recreation-rooms, stabling for five horses belonging to officers, washing establishment, latrines, drill-shed, &c. These buildings are all arranged around the parade-ground, which, although considerably diminished, will be of sufficient extent for the purposes of the troops. The married soldiers' quarters form two blocks to the south-west. Each man will be provided with a living-room, bedroom, and scullery, measuring 13 ft. by 14 ft., 9 ft. 6 in. by 14 ft., and 6 ft. 6 in. by 14 ft. respectively. The school-room is embraced by the right-side block, and is 19 ft. by 14 ft. (fitted up with a gallery, desks, and the usual scholastic appurtenances), and a class-room measuring 14 ft. by 9 ft. The soldiers' barracks are on the south of the grounds, and are divided into four large rooms, each 79 ft. by 22 ft., bedding and the ordinary requirements being provided for thirty men in each room. On the north are the sergeants' mess-room, reading-room, recreation-room, &c., the two former being 24 ft. by 18 ft., and the latter 28 ft. by 20 ft. The drill-shed, which is near to the sergeants' mess, is 60 ft. by 30 ft. in extent, with an asphalted floor, and an iron roof. The whole of the work is being carried out by Mr. J. Loveday, of Kibworth, the contractor, from plans supervised by the engineers. The buildings are of red bricks, with blue bands at the window heads and sills, and are roofed with blue slate, the copings being of stone. The work of laying the concrete foundations was commenced in the first week of September, 1875, and it is thought the whole will be completed within two months, at a cost of 15,000*l*.

In Bridge-street several improvements have been made. Mr. Henry Mulliner, who intends to transform his present carriage-room into a skating-rink, has entrusted the erection of new premises to Mr. Bonham, of Edith-street, from the plans of Mr. Ingman, architect. Some old cottages which adjoined the manufactory were pulled down, and upon the site a carriage-room, 114 ft. in length, and having a frontage of 40 ft., has been built. The flooring will be of asphalte, and above is a room of similar dimensions, which is intended for a show-room.

PROGRESS OF THE GREAT TAY BRIDGE.

THE stupendous bridge across the Tay which has been in course of construction for more than two years past under the auspices of the North British Railway Company, is making rapid progress, and notwithstanding the exceptional magnitude of the undertaking, and the enormous amount of engineering skill and labour involved, the contractors, Messrs. Hopkins, Gilkes, & Co., of Middlesbrough, express their confident hope that in twelve months from the present time they will be able to run an engine over it. The work has so far proceeded that from the south side to the fifteenth pier the bridge is complete. This fifteenth pier is the first in which the superstructure of iron columns has been substituted for solid brick piers above high water. From the north side the whole bridge is completed as far as the 162 ft. span, which comes between the 145 ft. and the 245 ft. span, the only exception being that the girders of one span, which have been used throughout as a travelling crane, to lift the other girders, are not yet dropped into place, and two of the girders are not yet to the full height. Of the fourteen piers for the thirteen spans of 245 ft., ten are now in the water. Of the ten piers, the majority are complete to the stone coping above high-water level, and two of the piers, with the girders spanning them, are to the full height. Next the largest span, to the south, are five spans of the medium width, all complete and with girders in place. Between these and pier No. 15 is a gap of five spans, the work for which is more or less in a state of forwardness. Of the eighty-five spans in the bridge, seventy-seven piers are in place, there being only eight piers to put down, four of these being of the largest size. Of these seventy-seven spans, above fifty are actually finished, and the majority of the others are well advanced towards completion.

An interesting sight was witnessed at the works the other day. The contractors had invited the Cleveland Institution of Engineers to inspect the bridge, and amongst other things which they saw they were eye-witnesses to the floating of one of the iron caissons or piers for the thirteen spans of 245 ft., which are built on shore on pontoons, and then floated out to their places. These iron caissons are above two hundred tons weight each, and are thus described. They are 31 ft. in diameter and 40 ft. in height,

when floated, though of this height about one half is temporary, and is removed after the permanent portion has been placed. As floated the latter portion has a brick lining of 15 in. The weight is swung on a series of girders, which are borne upon the two pontoons, the catch being by means of four powerful steel pins passed through projecting "links" on the superficies of the caisson. On being sunk upon the river-bed the caisson is made to force its way into the solid bed, by the action of powerful sand-pumps; upon the solid bed formed by this caisson, when filled with cement, the pointed blocks of brickwork are then placed and built up to the necessary level above high water, and on them the cast-iron columns of the superstructure are based.

It may be added that the 245 ft. spans of the bridge are about 90 ft. above water level. Just think what these figures mean!

ASSERTED BAD BUILDING IN HACKNEY.

WE learn from a published correspondence that the editor of the *Hackney Express* is threatened with a prosecution by the builder of some houses in that neighbourhood, in consequence of remarks in reference to them which he allowed a correspondent to make. The writer of the remarks now says,—

"After a repeated examination of these houses, plan, arrangement, workmanship, and materials, I unhesitatingly assert that they are what are known as 'run up' buildings, and are of the 'Jerry' class, and I boldly affirm that no respectable professional architect, of the least standing in his profession, would plan such houses, or pass them as fit and proper ones. I have examined them in carcase and skeleton state, and also in process of completion. Room by room, from ground-floor to roof-tree, I have gone over several of them, and have taken copious notes of the workmanship and material, and I am in possession of sufficient information to qualify me to speak of the exact character of these houses. . . . The design and construction of the houses are utterly bad, and so is a large amount of the materials and workmanship. An examination of the brickwork, mortar, plastering, floor joists, flooring, ceiling joists, rafters, and other timbers, will show their character. The timbers generally are poor and of insufficient strength, and exhibit make-shift construction."

After further description the writer adds in conclusion:—

"If the builders are not satisfied with my description I will return to the subject again, and particularise things, bad, good, and indifferent, more minutely. Before concluding, I would also remark that I found on examination a length of the roadway and footway in front of some of these houses made up of common rubbish and refuse matter. The stuff is what is generally known as 'shoot' material, and,—will it be credited?—I found the kerb-stones along a portion of the footways bedded in with no other than this loose, shifting ash and unsold stuff. A public journalist is threatened with legal proceedings for telling the above facts and warning the public against living in houses of bad foundations, materials, and ill-construction. I have spoken for the safety of the living on this and on former occasions and perhaps it will not be regretted by the general public if this threatened suit is prosecuted, as a test case may be afforded in which even the Metropolitan Board of Works might take future action. The time has surely come for the smiting down with public indignation and the strong arm of the law the nefarious practices of the tribes of 'jerry' builders 'scamping' builders, and 'speculative' builders, and their aiders and abettors, who have for so many years infested the London metropolis, preying like ghouls upon the vitals of our unsuspecting people."

If the account given be true (we ourselves know nothing of its correctness or incorrectness) it ought to be no crime in a journalist to point the work out for reprobation. It is high time that such a mode of building should be put an end to, and this will best be brought about by the expression of public opinion.

THE PORTSMOUTH DOCKYARD CONNECTING RAILWAY.

THE short line of railway which is to connect the South-Western and Brighton lines, at Portsmouth, with the wateside and the dockyard, is intended to be opened on the 1st of October. The line has been in course of construction for nearly two years, having been commenced at the latter part of 1874. For nearly its whole length it passes over embankments and bridges, and at the wateside it is supported upon iron girders resting upon screw piles. A few days ago the line was inspected by Colonel Hutchinson, of the Board of Trade, previously to the granting of a certificate by the Board for the opening of the line. In order thoroughly to test the iron girders and screw piles, two of the heaviest engines from each company were run along the line, and the deflection of the girders was so slight that the inspection was considered quite satisfactory. Messrs. Saxby & Farmer's block-and-lock signal apparatus, by which the line will be worked, is now in course of erection. It is considered that the new line will be a great convenience to tourists, as it will enable them to embark in Isle of Wight steamers without the intervention of trams and piers. It will also be used by all troops embarking and disembarking. The line has been constructed by Messrs. Aird & Sons, of Lambeth, under the superintendence of Mr. Jacomb, the engineer of the South-Western Company.

PROPOSED FRENCH SOUTH KENSINGTON MUSEUM.

THE Directors of *L'Art* have opened a national subscription "for the foundation and organisation of a South-Kensington Museum,—a Museum of the Decorative Arts," in connexion with *L'Union Centrale des Beaux Arts appliqué à l'Industrie*, and have published some reasons why it should be done, and why the people should do it for themselves. The writers call upon their countrymen to give letters of naturalisation to the English motto, "Self-Help, Self-Respect," and to make the Museum of Decorative Arts the first result of the act. With the fullest recognition of the value of such a movement for France, we are disposed to think that the provision of a museum and establishment of the kind desired is too great a work to be looked for from the infancy of Self-Help, and that the Government should be moved to assist it. The advertised amount subscribed up to the present time is 180*l*.

THE PARIS INTERNATIONAL EXHIBITION OF 1878.

WE publish this week a reduced copy of the official plan of the Universal Exhibition of 1878, so far as the Champ de Mars is concerned. We have already, more or less, described the arrangements which occupy the enormous space of 240,000 square mètres, one half of which will be devoted to France and her dependencies, and the other to the foreign countries.

Although the English journals appear to have said very little on the subject, the authorities here, relying upon England and Germany being the largest contributors to the foreign section, have allotted to them the two façades respectively facing the Seine and the École Polytechnique, that facing the Seine being devoted to England.

The *Journal Officiel* has just published the decree of the Marshal President, instituting the Universal Exhibition of 1878, together with the general regulations and classification, comprising an immense mass of clauses and details, the most important of which we will here publish, or have already done so. We are told that an official notice will shortly be given in England regarding this Exhibition, by which the attention of all intending exhibitors will be called to the subject.

Manufacturers exhibiting abroad, having so often suffered from the inconvenience connected with the Custom House, will be glad to hear that the rate of duties will be accommodated on the easiest possible terms; no object being liable to duty on entering the Exhibition, and alone subject to a small tax in the event of the object being purchased and remaining in France. Much of the usual officialism (it is said) is to be relaxed, and every consideration will be given to the convenience of the exhibitors.

The system of general classification, to which we have referred above, comprises nine groups divided into ninety classes:—

The first group,—*Works of Art*,—includes five classes:—

Oil paintings; different paintings and drawings; sculpture and medal engraving; designs and architectural models; engravings and lithography.

The second group,—*Education and Instruction*,—includes eleven classes:—

Education of the infant—primary instruction; organisation and materials for secondary instruction; organisation, methods, and materials for superior instruction; printing and stationery; book-binding, materials for painting and drawing; ordinary application of the arts of drawing and plastic art; photographic proofs and apparatus; musical instruments; medicine, hygiene, and public assistance; mathematical instruments; maps and apparatus of geography and cosmography.

Third group,—*Furniture and its Accessories*:—

Decorative and cheap furniture; upholsterers' and decorators' work; crystal, glass-work, and stained windows; pottery; carpets, hangings, and other furnishing textures; wall-papers; cutlery, goldsmiths' work, bronzes, metal casts, and works *repoussé*; watch and clock making; apparatus and processes of heating and lighting; perfumery.

Fourth group,—*Tissues, Clothing, and their Accessories*:—

Thread and cotton tissues; thread and tissues of hemp and flax, &c.; thread and tissues of combed wool; thread and tissues of carded wool; silk, and tissues of silk; shawls; lace, tulle, embroidery, and fringes; bonnets and linen objects accessories to the clothing; clothing of both sexes; jewelry; portative arms, for the chase, &c.; travelling and camping objects; toys.

Fifth group,—*Raw and worked-up Products of the Extractive Industries*,—seven classes:—

Mining and products of metallurgy; products of the forester's industry; products of the chase, engines, &c., instruments for fishing and harvesting; agricultural products not alimentary; chemical and pharmaceutical products; chemical processes of bleaching, dyeing, printing, and preparing; skins and leather.

Sixth group,—*Tools and Processes of Mechanical Industries*,—nineteen classes:—

Materials and processes of mining and metallurgy; materials and processes of rural and foresters' industries; materials and processes of agricultural manufactories, and their elementary industries; materials and processes of tanning; machines generally; tools; materials and processes of spinning and rope-making; materials and processes of weaving; materials and processes of cutting and making of clothes; materials and processes of the manufacture of objects of furniture and the household; materials and processes of paper-making, dyeing, and printing; machines, instruments, and processes, used in different branches of trade; carriage and cart building; saddlery and harness-making; railway stock; materials and processes of telegraphy, materials and processes of civil engineering, public works, and architecture; materials of navigation and life-saving; materials and processes of military art.

Seventh group,—*Alimentary Products*,—seven classes:—

Cereals, farinaceous products with their derivatives; products of baking; fat alimentary bodies; meats and fish; vegetables and fruit; condiments and stimulants sugars and their products; fermented drinks.

Eighth group,—*Agriculture*,—nine classes:—

Specimens of rural industries and agricultural manufactures; horses, asses, mules, &c.; oxen, buffaloes, &c.; sheep, goats, pigs, rabbits, &c.; poultry; dogs; useful insects; fish, crustacea and molluscs.

Ninth group,—*Horticulture*,—six classes:—

Hothouses and horticultural materials; flowers and ornamental plants; kitchen-garden plants; fruits and fruit-trees; grains and plants of wild origin; hothouse plants.

The actual progress in the work on the Champ de Mars consists of a low trelliswork, marking the limits of the future Exhibition, and the labour of a few workmen who have been, for some few days, searching for the drains of the Exhibition of 1867.

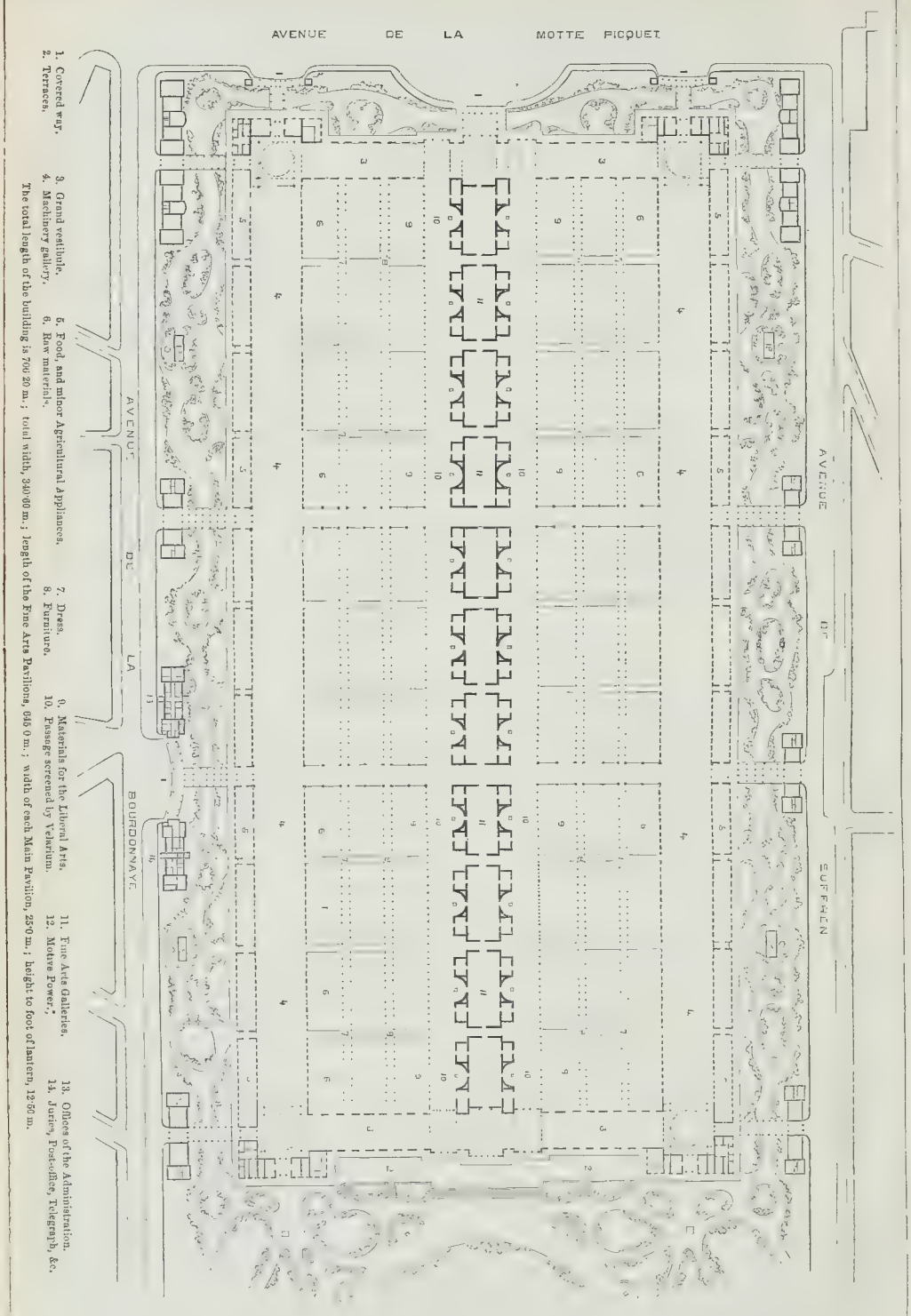
The facts that have led to the controversy that has lately arisen on the relative merits of English and American manufactures must have been a surprise in many an English "Sleepy Hollow"; and if the indifference to exhibit the products of our factories at Philadelphia should be repeated when the time comes for exhibiting in Paris, the friends and admirers of American skill are likely to have great additional reasons for jubilation; and if there is any probability of the same apathy on the part of the English manufacturing capitalists within the next eighteen months, the repeated blow in 1878 is likely to be no slight one.

If it be the case, and doubtless it is, that America's rapidly-increasing capital and energy, of which we hear so much, succeed in alluring from other countries skilled workmen and accomplished artists to aid her in her competitive aspirations, England will be put even at a greater disadvantage, as our own skilled workmen are not so numerous, and our accomplished artists so easily obtained, as to make our manufacturers altogether independent of foreign aid.

The high standard of intelligence that the education of America affords to the class of men who are occupied in mechanical or other manufacturing pursuits allows them to regard utterly without prejudice, and to avail themselves without question, of the accumulated intelligence and skill of any part of the world where what the Americans require is to be found, and they readily give up their own deficient hand where they find another obedient to the mind which is so often superior to the power of production.

There must be few branches of profitable manufacture that in course of time America will not excel in. We hear a good deal of their silks and woollens being equal to our own. They will of course depend on French artists for all that they do. It is said that French workmen in whatever branch lose their acute artistic perception in England after a very few months' practice in our climate; they perhaps may find America, its ways, its people, and its rewards, more agreeable to their tastes.

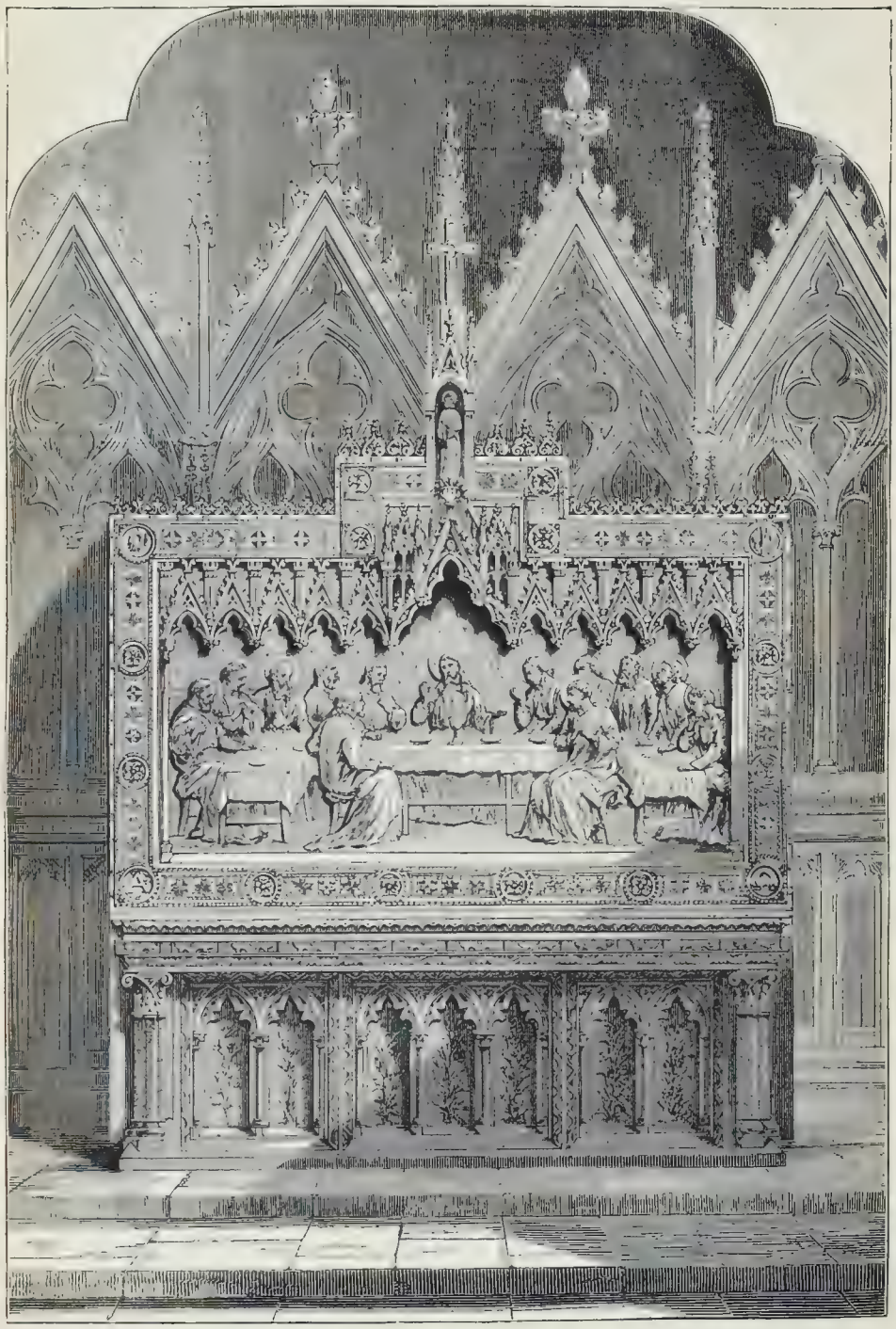
The Americans at least intend to make a great effort for the Paris Exhibition of 1878, and they will come before the world with the advantage proverbially attached to an agreeable surprise.



1. Covered way.
2. Terraces.
3. Grand vestibule.
4. Machinery gallery.
5. Food, and minor Agricultural appliances.
6. Raw materials.
7. Dress.
8. Furniture.
9. Materials for the Liberal Arts.
10. Passage screened by Velarium.
11. Fine Arts Galleries.
12. Motive Power.
13. Offices of the Administration.
14. Juries, Post-office, Telegraph, &c.

The total length of the building is 700·20 m.; total width, 340·60 m.; length of the Fine Arts Pavilions, 945·0 m.; width of each Main Pavilion, 250 m.; height to foot of lantern, 12·50 m.

PLAN OF THE PARIS UNIVERSAL EXHIBITION FOR 1878. THE CHAMP-DE-MARS PORTION.
ARCHITECT, M. HARDY; ENGINEER-IN-CHIEF, M. DUVAL.



THE NEW REREDOS, CHESTER CATHEDRAL.

[See p. 896, *ante*.



THE "CANTERBURY," WESTMINSTER BRIDGE ROAD.—THE LATE MR. ALBERT BRIDGMAN, ARCHITECT.

THE "CANTERBURY."

WE give in our present number a view of the principal entrance to the "Canterbury," rebuilt for Mr. R. E. Villiers, from the designs of the late Mr. Albert Bridgman, architect, whose lamented death at the early age of thirty-five years, and at the most eventful period of his brief professional career, we announced at the beginning of the present year.

All those who remember the Canterbury Hall of former years, and they are probably many, will doubtless be surprised at the transformation since their last visit. The new building will be opened to the public on the date of our present issue. The "Canterbury," which covers an area of 27,000 superficial feet, or about two-thirds of an acre, will be an attractive place of entertainment.

The principal entrance is from the Westminster Bridge-road, in close proximity to the South-Western Railway, and opposite the Lambeth Baths, two houses next Carlisle-street having been purchased and removed for this purpose. The façade is of stone, of 35 ft. frontage, and four stories in height, profusely sculptured, and surmounted by a lofty curb roof decorated with metal work. The top story comprises one large circular window, designed for the purpose of displaying revolving scenes, and the announcements of the "Canterbury."

The floor of the arcaded entrance is paved with tiles, and leads, past the pay-offices, first into an aquarium, which is a spacious and handsome compartment, surrounded with fish-tanks, already supplied with interesting specimens. The tanks are well lighted, and have a constant air and water supply.

Passing from the aquarium through a loggia,—from which are approached, by means of a spacious flight of stone steps, the billiard-rooms, arranged on the first floor of this part of the building, together with the various management offices,—we enter the fernery, this portion of the building being covered with a glass roof. Here a picturesque sight greets the eye,—drooping ferns in nooks of rockwork and rippling streams line the footway on either side, whilst the walls, for a height of some 10 ft., consist of silvered glass, reflecting a scene yet unreached,— the cave fernery, with varied plants. The pendent rocks and stalactites above, and the cooling streams beneath; the staircase, balcony, and promenade in the distance; together with the chief entrance to the great hall—all combine to form a striking scene of its kind. A turn to the left on passing through the cave reveals an arcaded vista of considerable distance, with water, rock, and fern. Leaving the staircase, we approach the entrance to the fauteuils, a distance of 200 ft. from the Westminster Bridge-road. We are now within the hall. This is 100 ft. in length from the orchestra to the back wall, and is 70 ft. wide. The balcony, supported on iron columns, is 13 ft. from the floor, having a double curve at the springing of the horse-shoe. 12 ft. above this is the gallery-floor, with a curved front similar to the balcony below, but set back 2 ft. Springing from the top of the second tier of columns, which are 15 ft. apart, is a series of vaulted arches encircling the building, and curved towards its centre to a height of 12 ft., leaving a complete oval. From this height springs a second hollow curve to a further height of 9 ft., leaving an oval opening to the sky of 40 ft. by 20 ft., to cover which is provided a semicircular iron and glass dome, at a height of 60 ft. from the floor, capable of being opened or closed in twenty seconds. This dome is of considerable weight, and rolls by means of simple machinery on two iron girders placed longitudinally, which in turn rest upon two lattice girders, 4 ft. 6 in. deep, the whole width of the building and clear above the roof: the arrangement is patented. The upper cove of the roof is painted to imitate sky, with a bottom border of trellis-work interweaved with flowers and ferns. The spandrels of the vaults and arches beneath are decorated in colour and gold. From the springing of the vaults are groups of palms and ferns, spreading and filling the spandrels. The upper half of the columns throughout are decorated to form palm-trees, the caps being of spreading and drooping leaves; from which spring five pendants for gas to each column. The balcony and gallery fronts are of bold ogee shape, with large hollow mould at bottom, and are ornamented in carton-pierre of different patterns, with a basket of flowers and ferns every 10 ft. apart. The decorations of the proscenium front are of the same character,—palm-trees and leaves, profuse in colour and embellished with gold. The oval central light contains a ring of gas-jets, 9 in. apart, to each of which is fixed a thirteen-star light, each 4 in. in diameter.

The stage is 70 ft. by 30 ft., and the proscenium 40 ft. by 40 ft. Communicating with the hall is the lounge and picture-gallery, 70 ft. by 24 ft., fitted for refreshment accommodation. The counter fronts are of polished ebony, and the tops of the counters and tables of Mexican onyx. This apartment is also decorated and is lighted with three sunlights and three wrought brass standards on the counters.

The balcony is approached by the main stairs through the fernery. The gallery entrances, however, are in Upper Marsh (the original main entrance to the "Old Canterbury"); the approaches are by means of double staircases, of fireproof materials, to prevent crush, and have separate means of exit. There is also a distinct "pass" stair, in stone, from the gallery to the balcony floors. The professionals engaged also enter from Upper Marsh, there being commodious dressing and retiring rooms for them on the first, second, and third floors, having direct communication with the stage.

The ground-floor rises from the orchestra backwards at the rate of 1 ft. in 4 ft., which, whilst it gives a good view of the stage, admits of spacious cellarage underneath over the whole area, which communicates with that under the lounge, and has convenient access from Upper Marsh.

The contractors for the hall were Messrs. Bracher & Son, the Westminster Bridge-road building and aquarium being previously built. Mr. W. Bradwell has executed the carton-pierre work and other decorations; Mr. Somerville constructed the sliding roof-light; Mr. Cannon, the gasfittings; and Mr. Radclyffe, of Holborn, the rockwork and gardening. Mr. H. Taylor has been the general foreman of the works; the whole of which, when completed, will have cost nearly 40,000*l.*

Mr. H. H. Bridgman succeeded his brother as architect, and under his superintendence, in conjunction with Mr. Chas. Dunch, the works have been carried out, with the aid at all times of the enterprising proprietor.

YORKSHIRE ARCHÆOLOGICAL ASSOCIATION.

HALIFAX PARISH CHURCH.

THE tenth annual excursion of the Yorkshire Archæological and Topographical Association took place, as already mentioned, on the 30th ult., Halifax being the *locale*. After morning service at the parish church, the members were welcomed by the vicar, the Rev. F. Pigou, who said that it was his earnest hope that the time was not far off when they would—not only in Halifax, but in Yorkshire—rejoice in seeing that parish church, of such noble proportions and splendid capabilities, "re-arranged" as some, "restored" as others, would say—preserving all the original design, which it would be sheer wantonness to efface—by entrusting the work to one whose accurate and scientific knowledge would at once enable him to discern between what really belonged to the past, and was, therefore, worth preserving, and what was of modern innovation, and not worth preserving. He desired to see the time when by opening the whole church, pulling down the galleries, and placing the pulpit in a better position, the church would be better fitted for its purpose. He yielded to no one in a real love of antiquity, but he would rejoice if the visit of the Association should lend a stimulus to the restoration of that church. He had already had a generous offer from an individual towards that object.

Col. Akroyd, acknowledging the welcome, said he believed it was his distinction to be the first to commence, along with his wife, the work of the restoration of that church by the insertion of the east window; but he must give his opinion that the baring of the rubble walls was an exhibition of bad taste, inasmuch as the more correct taste would be displayed by plastering them up again. Some years ago, when Sir Gilbert Scott spoke to the late Archdeacon Musgrave about the restoration of the church, the reply was, "Let it be; it will last my time."

Mr. Fairless Barber then read an elaborate paper descriptive of the church, in the course of which he said, —Externally the distinct character of these additions is very clearly seen, and is specially marked in the buttresses of the parapet, which, commencing on the newer work, has been continued over the earlier chancel. The moulding under the parapet will be found decorated with little shields and other devices. Taking the architecture alone, we shall at once conclude that the whole is work well within the fifteenth century; that none of it is earlier than 1400, or later than 1500; and but for the points I have mentioned, it would have been difficult to say from the architecture alone in what order of date the different parts of the church can have been built. The following extract from an original MS. is referred to by both Wright and Watson in their histories, as the best information that can be obtained as to the precise date we require.

"In the time of John Waterhouse, of Halifax, deceased, who died about Candlemas 25 years since (*i.e.*, 1540), at his death being neer 100 years of age, I trowe three years under, and when he was a child about six or seven years of age, was the church of Halifax began to be builded, and he and many more children stood upon the first stone of the steeple. It was twenty years in building. By this it appeareth that John Waterhouse, of Halifax, was born in 1443, and in 1857, it is 207 years since the foundation of Halifax Church was laid."

This would give 1450 as the date when this centenarian played as an infant on the foundation of the tower, and if the change from the church in its second state to what we now see was at that time taking place, he might well think the whole fabric was being built afresh. The tower indeed may have been commenced before the additions at the east end, which are attributed on the strength of an inscription upon his arms in the roof, to the vicariate of Thos. Wilkinson (1439–1481), who is said to have built the great east window, finished in 1480. The recent stripping of the walls and arches had revealed another class of evidence bearing on the question, viz., the masons' marks, a schedule of which had been carefully prepared by Mr. E. Walker, in a form which would enable any one to verify the results for himself. The occurrence of the same marks in the church in its second state and not elsewhere confirmed the view that it was a separate work, and the like occurrence of different marks in the three eastern bays only, supported the same conclusion as to that part. The testamentary records of the period supply another source of information; these have been carefully examined by Mr. Walker, from 1398 to 1550. Within this period he has met with about 150 testamentary burials, but the allusions to the fabric are but scanty. In 1454, W. Halifax, of Nottingham, bequeaths vestments. 1459, John Savile, of Copley, gives 1*l.* to the tower, and 6*s.* 8*d.* for the bells. 1457, William Lyttster, of Halifax, draper (whose daughter married a Savile), bequeaths fabrice campanilis ejusdem ecclesiæ vjs. viijd. quolibet anno solvendo post decessum meum quousque fabrica dicti campanilis ædificetur et finiatur. According to Wright's History the 7th bell, recast in 1639, had previously been cast by Thomas Fourness, in 1472, thus confirming John Waterhouse's testimony that in 1450 he played on the foundation of the steeple, and that it was twenty years in building. In 1502, John Deyn gives 20*s.* for organs. From this we may gather that there was some church requiring vestments in 1454, probably the church in its second state then completed; that a tower was then building, and subsequently in 1472 completed; and that some time before 1481, when Thomas Wilkinson died, the rest of the completed fabric was built.

Of the Rokeby chapel, it was built in pursuance of the will of Wm. Rokeby, who was archbishop of Dublin and vicar of Halifax. This will, extracts from which are given by Watson, directs that his body is to be disembowelled, his bowels and heart buried in the quire at Halifax, his body in the new chapel at Sandal. That a chapel be made with all convenient haste, on the north side, and a tomb with his image, and thereupon written, "Hic jacet Willelmus Rokebey nuper Dublinensis Archiepiscopus et Vicarius perpetuus istius Ecclesiæ."

Of the Holdsworth chapel, the date 1554, inscribed on the authority of a statement on the monument in the chapel, still remaining, must be corrected. The date also of his vicariate has been more nearly ascertained, for he is described as vicar in the will of James Lister, in 1524, of which will he was executor. And one William Palden, of Halifax, clerk, in 1535, by his will, directed that his body should be buried in the chapel recently erected by Vicar Holdsworth. It is larger than the Rokeby Chapel, and in order to give it a roof continuous with the south aisle, the three arches, by which it is separated from the nave, are somewhat higher, and the general arrangement has rendered

necessary the raising of that roof to its present position. The additional lights on the line of the roof and west of the porch have at this time been added.

Mr. Barker then briefly alluded to the historical evidences of the dates of the church; to the grant of Halifax church by Wm. Earl Warren, which Dugdale attributed to the first, Watson to the second, and Hunter showed to be the grant of the third Earl Warren; to the unworthy character of the early rectors appointed by the Priory of Lewes, as stated by the Archbishop of York, who procured the formation of the vicariate of Halifax in 1273; to the coincident evidence that, when this state of things was amended, a church was erected of which a portion still existed in the north wall; and to the fact that the existing church, both as to the second and the completed church, were coincident with the vicariate of natives of Halifax, a coincidence on which, he said, Halifax had reason to be proud; and then passed from the fabric to its furniture and contents. The font, with its magnificent cover, first claims attention. This is evidently of the period of the completed church. The cover, which is 13 ft. high, is as rich an example of carving as can well be found anywhere of the Perpendicular period. It has not been preserved without some vicissitudes, for we learn from Mr. Brearcliffe's MS., exhibited in the Halifax museum, that,—

"1645, 3 Ap., 1,000 Scots came out of Cheshire to Halifax, and stayed to 23rd April."

And this further:—

"Ye Scots caused ye font to be taken downe in Halifax Church, which stood at ye lower end, which stood near the bellhouse, just in the middle of the upper walk side of ye east side of our church." "Ye font head is in Chr. Hartley's parlour, and was taken out of ye church by Will. Schofield, churchwarden, in 1650."

The accounts for 1648 contain the item, "A basin to hold water to baptiz childre, 2s. 10d.," this was the substitute at that period for the font which had been removed. A subsequent register has the entry, "In the year 1660—was our ould font re-erected."

In 1693 the churchwardens paid "for takeing downe the ffont, beautifying and mending it, and setting it up againe, 6l. 5s." The churchwardens' accounts for 1728 tell of expenses in taking down and mending the font and the chain, and also

"To Jo Aked, for gilding the font, 2 dials, cleaning Moses and Aaron, the Creed and Lord's Prayer, as per note, 3l. 5s."

That there was a rood-screen in the church in its second state is probable, but all trace of its existence would be lost in the alterations made in the piers of the chancel arch. In the completed fabric the rood-screen occupied the site of the present chancel-screen, within which considerable portions of its framework are concealed. At the north side, mortises, with the ends of the supports of the platform or staging of the loft still pegged in, can be seen. The beams have been richly carved, and the mere remnants, out of which the present screens have been made up, indicate a work little, if at all, inferior to the font in execution. Above it was a crucifix, before which, in the middle alley, Thomas Northend, in 1533, directed his body to be buried. There was a rood service and a perpetual stipend or service at the rood-altar, to which he would presently allude, but of this altar no trace remains.

Shorn, as we have seen, of its loft, this screen was destined to receive in succession the king's arms, the State's arms, and the royal arms again. This we find proved by the accounts of James Hodgson and Abraham Wood, churchwardens A.D. 1652 (John Brearcliffe being overseer, and writing the entries):—

Item to Thos. Wray, joyner, to make a frame for ye State Arms, and new Crest making for quire	00 10 8
It. for p-inting State arms at York 21s. 6d., for carridg. of ye fram from York to and fro, 6s.	01 07 6
It. for 2 crooked legd irons & staple for ye Arms to stand upon	00 06 2
It. for mortices for State Arms to stand on 4d., ale 6d., a ladr removeng 1d.	00 00 11
I: to go to Coley and Lightcliff to new how ye State Arms was painted there, spent	00 00 6
I: to bring King's Arms from W Scolfield to Library	00 00 4

The king's arms had probably been set up in 1606, when, according to the churchwardens' accounts, 1l. 18s. 4d. was paid for the frame over the quire; and in 1636, when, as we shall see, great alterations were made in the church, there was a payment for boards for the king's arms. These, no doubt, would be again set up on the restoration, and in 1663 4l. were paid for gilding and beautifying them. These, then, remained until the very beautiful royal arms of Queen Anne, carved to face both ways, and now fixed under the tower arch, were put up to replace them;* they in turn being removed to their present place on the erection of the present painted east window a few years ago. The existing somewhat pretentious and most unpleasing chancel screen is quite modern.

Mr. Barber, next referring to the full copy of the chantry returns which he had received from the office in London (but to which there was not time to make more than general allusion), explained that separate chantries did not involve separate altars.

The earliest chantry in the church is Wilby's. The Wilby family were of Priestley, in Hipperholme, and the founder was John Willebye, and the date of his foundation 1494. Brigg's chantry was founded (says the chantry return) Oct. 10th, 16th Henry VIII, A.D. 1524, though the Harleian MS. says 24th Henry VIII., A.D. 1532.

There was also a lady altar. John Milner in 1526 gave 5s. "to byeing a masse boke to our ladie altar in Halifax churche." The same year Ric. Ambler gave 20s. from land at Farsley "to the maynteynying of the service of Almyghtie God in the parish churche of Halifax before our ladie, sancte George, and to the morne preist to be divided amoog these by equall porcon." This seems to connect the three with one altar. Two chantries are named by the commissioners, which are not assigned to any particular altar,—Hunter's chantry and the Firth chantry.

Connected closely with the screen are the chancel stalls; these you will find in their present form to be mere patchwork, in which three sets of three each, of stalls of earlier work (the misericordes in which remain and are described in the programme), have been extended by very inferior work, which contrasts strongly with the beautiful carving of the earlier work. The details of this better work correspond with the work in the roof of the north aisle, and it seems safe to attribute them to the church in its second state. You will find the pelican, the wild man, and the mermaid well preserved, and admirable specimens of fifteenth-century carving.

The first mention of a pulpit is in 1596, when 2l. 5s. 2d. were paid for making a pulpit. An old pulpit, probably an older one which the 1596 pulpit had replaced, was sold in 1621 to Gregory Patchett, churchwarden of Coley, for 6s. 8d. On this, Oliver Heywood notes:—

"While Mr. Denton was curate of Coley, that chapel was enlarged and pewed, and the pulpit brought from Halifax, being an old pulpit opposite to that which now stands in the church; for as this stands on the south side, so that removed stood north, facing the south at the other great pillar."

Mr. Barber then spoke of the seating, which is a very interesting feature of this church. The stalls or seats, for the term is used interchangeably, present an arrangement which it is clear must have existed during the early part of the sixteenth century, and which may have originated at the completion of the church, in 1481. For we find a "rowme in the 26th stall in the south of the midst alley," bequeathed by William Holmes, of Halifax, to Richard Brighouse, of Hipperholme, in 1538. Edward Waterhouse, also of Skircoat, in 1543, bequeathed to his son "one seitt in the saide parish church." And in 1542 and in later years we meet with several instances of testators desiring specially to be buried near their seat or forme in the church.

The following licence to erect a pew in 1606 (from Mr. Lister's collections), shows how faculties were then dispensed with:—

"Whereas there ys a vacant place in the lower p't of the north quear of Halyfax Church, and that Wyllm Holdsworth of Southowram ys destitute of a convenient place for hering ye dyvyne seruice and —— of God in the said church we churchwardens here subscribed do lycence the Wyllm to make a Sest or forme in the said vacant place for the intent aforesaid, hopinge Mr. Doctor wyle agree and consent thereu to. In wytnesse whereof we have subscribed our names the day and years aforesaid.

Jo. Favour.
James Murgatroyd.
George Banister.
John Brooksbanke.
Michaell Slater.
Richard Brodley."

Samcel Mitchell.
John Clough.
Henry Best.
Richard Gibson.

Considerable sums were spent in the church early in the seventeenth century, which may have had reference to the seats. Thus, in 1606 the wardens paid

"for 17 trees to Sir George Savile besyde 2 wh hee gave	10 00 10
for p-sting slitting and saweinge	8 3 4
for sawing and hewewnge 4 roods of bords and 74 jobbyes	3 15 6
for f-lling 19 trees	0 9 6"

* These were the work of John Aked, who appears to have been connected with much of the later work at the commencement of the eighteenth century.

About this time also we find references to lofts. John Waterhouse, of Cross Hill, Halifax, yeoman, by his will, dated 1606, proved 1610, left 20s. for and towards the making of a scaffold or loft within the said parish church of Halifax. In 1621 also there is an entry for making a loft for the churchwardens. This must have been at the west end, for amongst other work done that year was the making of two pairs of stone staire into the loft, and "paid a joiner for post and two rails for stairs behind the great church door." These scattered entries bring us to the time 1633-5, when the church was seated in the characteristic and unique manner still preserved. The entries in the accounts are supplemented by a statement in John Brearcliffe's own handwriting, which bears both on this and on the earlier seating.

"This year, 1634, the present church wardens took all ye old church stalls downe and erected them new and tooke or gained so much space of ground (viz.) made ye former 6 seates from ye pulpit towards ye quire into 7 formes or seates. So yt now ye stall or seat adjoyning next unto ye pulpit is employed and made use of for ye clarke to sit in and so continued to this day."

[Mr. E. J. Walker here added the additional information that, in 1802, the churchwardens purchased this clerk's seat for 6l. 6s. to add the still existing stairs leading to the pulpit.]

"And likewise they tooke and gained more space of ground on the north side in the middle p't of ye church wch lyeth opposite to the little pillar next to ye great pillar over against ye pulpit towards ye bell house being ye stall or seat counting downwards from the stall joyning to ye great pillar."

Adverting to the roof, which is a special peculiarity of the church, with its arms of the vicars in the nave, and of laymen in the chancel, the following particulars are given in the various churchwardens' accounts. The great use of gilding and of gold stars in the church, seem to forbid the idea that the arms were then painted; and the accounts of painting the panels [? repainting] accounted for nearly the whole of the panels in the nave:—

1636. Ite for makeing a scaffould for the paynter	00 02 06
Ite for 2s bookes of leafe gould	04 07 00
Ite payd to William Slater for his works done in the chancell	08 10 00
Ite for fower hundered & odd Stars for the Chancell	01 02 04
Ite to Christo Robinson for seeleing and for the frames for the tenn commandments and for borders for the Kings armes	04 12 02
1663. To John Wilson for guilding & beautyfying the Kings arms	4 0 0
1696. Pd John Shepard for 4 pannells over the ffont and mending the ffont	00 19 08
To James Hulle for painting Eight Pannells over ye ffront & for waiscoat painting	03 10 00
1699. pd for four Pannells to put over the ffont	01 16 00
pd for painting the Pannells and a new door	01 06 0
1730. pd for 4 Pannelles and putting them up in the Church	03 01 11
1701. pd for 15 men cleaning ye Church when ye Old Pannells was pulled down	0 9 9
Augus: pd John Aked for painting ye 4 pannells	— 16 —
1702. To John Aked for 4 Pannells and putting them up	03 0 0
1703. pd for 4 Pannells to John Aked	03 5 0
pd for stays of wood to secure the rest and fastening them	00 13 0
1706. pd Fran: Benti-y for 45 books of gold 2/6	05 12 0
pd to John Aykill [Halifax for John Aked]	07 19 6
1716. Pd Tho: Dikinson for pointing the Thatch over the Coats of Arms 20s, for sand 1s	01 01 0

The altar-rails, which were curious in structure, were accounted for at these periods:—

1671. Paid for new banisters in the quier	1 10 0
1693. Paid for twisting the banisters, &c.	3 2 8
" for paving within the said banisters	4 2 0
Paid for chimney erecting	6 10 0
Paid for carrying and re-carrying the Commandments	0 1 6
1702. Paid John Aked, for banisters in quire	7 0 0

In 1716, there was an entry for taking the tapestry down, and nailing it up. In 1748, Sowerby objected to a proposal to substitute wainscot for tapestry. In 1767, there were paid "expences of the altar-piece, 20l."

The registers are probably the most perfect and the best-preserved in any parish church. They commence in 1538 (the very year of the injunction by Thomas, Lord Cromwell Earl of Essex), and it is noticeable that the first volume is on paper, and was not copied upon parchment, as was ordered in 1603. It existed in three separate books until 1652, when John Brearcliffe, a local antiquary, came into office, when he had it bound in one volume as it now is.

Mr. Barber, in conclusion, expressed his hope that the fine wood carvings which he had shown existed in part of the present galleries would be preserved, and that the whole church would be

carefully restored, and thrown open from end to end. He said it was not correct to say that no trace of the Norman church, given by Earl Warren, existed, for there was an incised stone built above the chancel arch, and some other stones bearing chevron marks in a window in the north wall; but these were of a very fragmentary character. Referring to the pewing and galleries, he observed that no doubt the early date of this extensive pewing of the church was the result of the Halifax Exercises, which Oliver Heywood says were "famous, and were maintained for thirty years together or upwards at Halifax, whereat not only neighbour ministers preached in their turns, but strangers far and near were sent for to preach; two sermons a day, being the last Wednesday in the month. Multitudes of hearers."

Mr. F. A. Leyland inquired on what authority Mr. Barber stated that the church given to the Priory of Lewes was a Norman church?

Mr. Barber.—It was given in the Norman period.

Mr. Leyland said he had had the honour of reading a paper on the fabric of that church, which was published in the Journal of the British Archæological Association, and he must mention also that in connexion with them he had prepared a ground-plan like the one in the programme of that day. So well did he know the architectural history of that church that he felt bound, whilst acknowledging the general excellence of the paper, to say that it contained many inaccuracies. The length and breadth of the church of 1250 were well known; but he should like to ask Mr. Barber what the age of the north wall was?

Mr. Barber said he was sure it would be satisfactory to the members of the society that a separate investigation, wholly independent of Mr. Leyland, should have arrived at the same results in regard to the plan; but as to the north wall, he must say with some confidence that it was of the same date as the windows, viz., late thirteenth-century work.

The Vicar here suggested that such a discussion ought to take place elsewhere than in God's house.

This put an end to the discussion, and the company proceeded in wagonnettes, to Shibden Hall, where they were received by Mr. John Lister, who kindly permitted a thorough examination of the ancient edifice, and of the old timber-built house, removed by him from Cripplegate, and re-erected near the lake, in his park.

Mr. Lister, after a short account and description of Shibden Hall, read a paper on "The Owners of Shibden Hall."

Returning to Halifax, luncheon was provided at the Assembly-rooms.

After a visit to the Museum of the Halifax Literary and Philosophical Society, where there was a special exhibition of drawings and views of old Halifax, including a series of the arms of Halifax families, sent by Mr. F. Sowerby; water-colour drawings of old houses in the parish by Mr. Sykes, lent by Mr. J. W. Davis; all the histories of Halifax, Nathaniel Waterhouse's original will, Brearcliffe's MSS.; Watson's "collections for Halifax," lent by Col. Akroyd; some old unpublished conveyances of property in Halifax, from A.D. 1255 to 1401, sent by Mr. E. J. Walker; a die used by Halifax coiners, lent by Mr. Walsh; photographs of old Halifax posts by Mr. E. Gledhill, &c., the excursionists proceeded by train to inspect

The Church of St. Mary at Elland.—The Rev. F. Musson, rector of Elland, welcomed the visitors, remarking that if in the restoration of the window they did wrong, they sinned with the very best intention of doing right.

Colonel Akroyd briefly acknowledged the welcome, and Mr. Barber gave a few particulars of the church.

Mr. J. Fowler, F.S.A., read an interesting paper on the east window of the church. In the course of the paper, Mr. Fowler said:—"Whilst admiring beyond measure the generous enthusiasm which has, in the popular sense of the words, 'beautifully restored' the east window of this church, I feel found in truth and sincerity to say that that process—which has rendered it more trim and sightly in the eyes of the majority of persons—has rendered it comparatively useless to the student of history, of art, or of our national antiquities. It is as though you had had an autograph letter of Shakspeare, for many a year laid by or throwing about, without any one to take any care or notice of it, with great pieces torn out of it, defaced, with many words and even sentences or paragraphs altogether missing, and with the ink faded and paper yellowed by age, and crumpled, and dog-eared. At last, in the midst of the great 'Shakspeare revival,' when every one's thoughts are directed to the subject, the handwriting is recognised; the letter is thought 'really worth restoring'; and you send it to some manufacturing stationer, who sets one of his workmen to write over again for you, in a beautiful copperplate hand, the parts where the ink has faded, and supply, at his dictation, what he fancies may possibly have been the missing sentences. Meanwhile another is set to work to clean and straighten the paper for you; whilst the master himself cuts the letter to pieces with a pair of scissors, separates the sentences and paragraphs, and—without any reference to sense or meaning,—transposes them so as to make the old and new writing mix up nicely and not too violently contrast with one another. The letter is then sent home, and vast numbers come to see it and are delighted with it; but the scholar turns from what you have done with horror—regarding it as little less than sacrilege. In his eye you have spoilt the letter, and it is with pain and grief that he mournfully deciphers here and there a word of the original, and laboriously makes out the sense. What would he not give to have back again the letter in its un—'restored' state,—so cruelly torn and spoiled, and yet as far as it went—the genuine, untampered with, true and original letter—paper and ink—SHAKSPEARE! In a like predicament, with such difficulty as may be, I will endeavour to discover the original plan of this window, and point out what is old and to be trusted, and what new. The date of the glass is late fifteenth century. The window consists of five lights without tracery; the second and fourth—which contain each four panels and a canopy-head, being higher than the first and fifth—which contain each four panels only, and the third or central, the highest—containing five panels;—twenty-one panels or pictures therefore in all. The subject of the window, in its perfect state, was the life of the Blessed Virgin Mary, as related in Holy Scripture, the at that time scarcely less venerated 'Gospel of the Nativity of St. Mary,' the *Legenda Aurea*, the *Speculum Historiale* of Vincent of Beauvais, and other less known writings. . . . I must repeat, in conclusion, my extreme regret that a work of such grandeur of conception should ever have been 'restored.' The panels, however broken and imperfect, but still untampered with, would have told us far more than we can ever now learn from the new work, supplied, as has been obvious as we have proceeded, without either knowledge of or sympathy with what the window in its original state was intended to represent. The present order in which even what is left has been arranged by the 'restorer' is, moreover, entirely meaningless, and quite puzzling and tiresome,—even to an experienced eye. Nor can I allow that the result could have been satisfactory even if the work had been done at the present day, and by more competent hands than those to which it was then entrusted. It is impossible, in the nature of things, for an artist of one frame of mind to finish the work of an artist of an entirely different frame of mind,—separated from him by the gulph of 400 years; or to 'restore' anything whatever once gone (he can at best but *imitate* it more or less successfully)—as impossible as to 'restore' faded natural beauty; and what is really wanted is, the courage to let it alone, as the Cathedral Chapter of Gloucester did *their* east window some years ago, when it was proposed by an eminent firm of glass painters to 'fill in a heaven' in the vacant part of it. How far more interesting, again, the fourteenth-century fragments of glass now in the west windows of the aisles would have been if allowed to remain in the fourteenth-century windows from which they were taken, and to which they belonged, and the fifteenth-century fragments in the fifteenth-century windows from which *they* were taken, and to which *they* belonged, instead of being all, as now, huddled together in meaningless confusion! It cannot be too often repeated, or too clearly understood, that the *removal* of fragments, however small, and 'restoration' of fragments, whether large or small, are alike 'untrue in art, unjustifiable in taste, destructive in practice, and fatal to all those archæological interests and pursuits which it is the duty of this society to protect.'"

The proceedings then concluded.

THE PROPOSED NEW ASSIZE COURTS IN NEWCASTLE.

THE following report as to the proposed new Assize Courts for Newcastle and Northumberland has been presented by the committee having charge of that subject to the Council:—

Sir G. Gilbert Scott, R.A., of London, during a visit to St. Nicholas's Church restoration, having incidentally heard it was in contemplation to erect new Assize Courts, expressed a strong wish that he might be allowed to submit a design for the same, as he had devoted considerable attention to the construction of such courts. This was duly communicated to your committee, and resulted in a correspondence between their chairman and Sir Gilbert, as per copies appended to this report, which fully explain subsequent proceedings. Sir Gilbert has paid three visits to Newcastle, accompanied on the last occasion by his chief draughtsman. He has made a careful survey of the Moot Hall, the Guildhall, and the proposed site for the contemplated new Assize Courts. He has also inspected the Assize Courts at Durham and at Manchester, and had conferences with Mr. Lamb and Mr. Charlton (the county surveyor), both of whom have kindly furnished him with every information as to the assize requirements for the town and county. The result of his labours is the very elegant design and admirable internal arrangements, as shown in the accompanying drawings, which have met with the entire approbation of your committee, and are now respectfully submitted to the Council for consideration.

The report then goes on to describe the designs, and concludes with asking "the Council's approval of Sir G. Gilbert Scott's plans; that they will sanction their being submitted to the magistrates of the county, with a view to further negotiation, and, if approved of by the County, that it will authorise the committee to take such other steps as may be necessary to enable them to bring the subject before the Council in a more definite form."

The conditions under which Sir Gilbert Scott offers his services are set forth in the following letter, which is in reply to a communication from Mr. Young, who had informed Sir Gilbert that "the committee have no power to expend money without the previous sanction of the Council":—

"31, late 20, Spring-gardens, London, S.W.
April 15th, 1876.

My dear Sir,—In reply to your letter, I beg to say that in offering to submit a design for the Assize Courts, it is not my intention to cause any expense unless my design eventually be adopted, or I appointed the architect to the work, in which case I only make the usual charge on the work. At the same time, I suppose that, if my offer be accepted it will be with a bonâ fide desire on both sides that it may lead to my appointment. My meaning is simply this:—I greatly desire to execute this work, but decline to compete for it. Wishing, however, that the Council shall not be in a worse position for my preparing a design, in case I do not succeed in meeting their views, I offer to do so on the understanding I have named, viz., that if I fail to satisfy them I withdraw without making a charge. In making this offer, however, I do so in full confidence that they will deal with me as is usual with an architect expressly called in; that is to say, that I shall be enabled to procure all information as to practical experiments, and that if (as is hardly probable that it should) the scheme I first strike out may not be in all points to their minds, I shall receive in full confidence such criticisms as will enable me to revise and correct it. I assume, also, that the Council will not, after I have submitted a design, lightly, and without due reason, go to any one else or to competition, but will use their best endeavours to enable me to meet their views, dealing with me encouraging no one else while I am negotiating with them.

I remain, my dear sir, very faithfully yours,
GEO. GILBERT SCOTT.

Charles Henry Young, Esq.

P.S.—I will mention that I am convinced that this method is far more likely to ensure a good design than competition."

THE TUNNEL ACCIDENT IN THE CITY.

MR. W. H. Payne carried on an inquiry on Saturday last into the cause of the deaths of Edward Austin, 45; Edward Candler, 40; George Harris, 19; and John Coyle, 18, who lost their lives by the giving way of a newly-constructed vault on the extension of the Metropolitan Railway from Liverpool-street to Aldgate, as already mentioned. Messrs. Lucas & Aird are the contractors. The accident occurred nearly opposite Bishopsgate Church. The fissure is 38 ft. in depth and 36 ft. long.

Joseph Downs, a mason, said:—To make the tunnel, they dug out the solid earth, and supported the sides with timber, close boarded. The sides were afterwards bricked, and the height of the arch to the spring was then 13 ft. or 14 ft. It was 2 ft. 4 in. thick in its narrowest part, and 3 ft. 9 in. in the widest part, which was at the bottom on the concrete. The sides remain perfect. They were made of proper material, and in his judgment the work was properly done, and was solid and substantial. They did not test the work to see if they settled, but when they were solid the centres were put in made of wood, and in them the arch was built with bricks. They completed the arch with five rings, which made it 1 ft. 11 in. in thickness all over. The arch rested upon the walls and the centres combined, and when the centres were away the brickwork area rested on the sides, and everything had been done properly and in the customary way. The workmen employed by the contractors were all good and competent. He examined the work portion by portion six times during its progress, and everything was all right. It was "keyed" in on the 28th, and

everything considered perfect, the centres and battens being there. They were removed on the 4th of September, and everything appeared all sound. The sides did not bulge in in any way. Above the five rings concrete was put each side in the spandrels sloped up to the crown. The concrete was allowed to set firm, and then coats of asphalte were placed on the top of it before the earth was put in. He could not form any notion of the weight that was put on the arch, and it was not entirely filled in when it fell. A sewer was being built under the arch, and the four men now lying dead were working in that sewer, which did not interfere with the foundations of the arch. He considered the arch had fallen through an error over which he had no control,—of filling in the earth unevenly on the top of the arch, and throwing an uneven strain upon it. The arch was very much exposed to the weather, and rain had been falling heavily for three days. The weight put on one side would turn the arch round; if it had been put on evenly the arch would not slip.

Mr. Ellis, manager to the contractors, stated that he had control of the works in question from their commencement. There had been no shifting of the walls. Five days were enough to allow the centres to remain for the arches to be safe. Rain had fallen, and he thought even the best of constructions might come to such a termination under such conditions. He confirmed the evidence of the former witness, who stated that an unequal pressure of earth thrown on one side would be sufficient cause for the accident.

The jury returned a verdict of "accidental death."

A GREAT BLAST AT LOCH FYNE.

In connexion with the recent meeting in Glasgow of the British Association for the Advancement of Science,* Mr. Duncan, of Benmore, commissioned a steamer to take 300 members of the British Association to see Loch Fyne. A great exhibition had been promised, the explosion of six tons of gunpowder in one of the granite quarries on the Duke of Argyll's estate. The blast, in honour of the visit of the Association, was sent off in the village of Furnace. The village, as well as the quarry, takes its name from the circumstance that early in the present century works were established here by the Argyll Furnace Company for the purpose of making pig-iron from a particular description of ore which they imported from Lancashire, and smelted with charcoal made from the timber produced in the district. The product was afterwards returned to England to be converted and sold as charcoal iron, a superior class, which still commands a greatly higher price than the ordinary qualities. The company continued their operations at Furnace till timber got too scarce for their purposes. Furnace Quarry was at that period quite unknown. It was commenced by Mr. Wm. Sim in 1841, who previously had been engaged in supplying the Board of Police, Glasgow, with square dressed causeway stones, prepared from basaltic trap rock, commonly known in Scotland under the name of whinstone, and of which there is an abundant supply in the neighbourhood of Glasgow. The Furnace Quarry rock, though popularly termed granite, is said to be a porphyry. During the first ten years of Mr. Sim's occupation of the quarry, the boring, blasting, and quarrying operations were conducted in the usual way—slow, uncertain, and by no means free from danger. At the great International Exhibition of 1851 Mr. Sim obtained the opportunity of inspecting the quarries and the system of blasting by means of mines and large charges of gunpowder, as then in practice to procure rock to form the breakwater at Holyhead, and profiting by the experience gained there, decided upon adopting the same principle at Furnace Quarry. The first large blast fired there in 1852 proved itself so eminently successful as to induce a continuance of the system. Horizontal mines going inwards from the quarry face are preferred to vertical shafts sunk from the top surface. It is also found to be advantageous to have the full charge of gunpowder concentrated in one chamber. The present charge of six tons had been supplied from the Loch Fyne Gunpowder Works, in the vicinity of the quarry; and the *Morning Advertiser* describes so well what took place that we shall not seek for fresh words to do it in. The face of Furnace Quarry is about 200 yards inwards from Loch Fyne side, and it is 250 ft. in width from one side of the quarry to the other, and 245 ft. in length above the level of the quarry floor. A black patch indicated the vicinity of the chamber. The work has progressed inwards from this point in a straight line for a distance of 65 ft., and then branched off at a slight angle towards the side of the quarry for a further distance of 25 ft. The gunpowder chamber was then completed to a required capacity to contain the six tons of gunpowder. This being accomplished and made all as thoroughly free from the effects of damp as possible, the gunpowder was carried in bags and carefully stored in the chamber and the fuses inserted into the centre of the mass of powder. The next process was to build up a wall of turf, so as to cut off the connexion between the mine and the gunpowder. As all this work had to be done in the dark, it necessarily required much careful attention. A large portion of the mine was then built up with rubble, stone, and cement, and the remainder dammed up with clay, stones, and sand, the wooden casement containing the fuse being placed as the building and damming proceeds. The length of fuse used in this instance was 85 ft. It took nearly half an hour to ignite. The steamer took up its position opposite the quarry, the face of which had been cleaned, so that the effect of so great an explosion might be seen. Presently the hills reverberated in a deep rumble, which continued for some three seconds; the quarry was hidden in smoke, but there was hardly a ripple on the water, and the houses at the very base of the rock seemed scarcely to shake, the wreathy smoke from the cottage chimneys ascending as undisturbed as if some child had exploded a pop-gun. We had expected that so tremendous a blast would have thrown down the whole face of the rock, but it was not so. Even the flags which hung over the very brink of the precipice were unmoved, though one of the masts had been displaced along its whole length, and looked after the explosion very much as if it had divided the rock, just as a needle divides ice. There was a tremendous fall of stone into the depths below, but the stone in front of the powder chamber still held in position, and save that a quantity of rubble had evidently been disturbed, the only effect of the blast was a deep gullet in the rock. In fact, the granite hills of Scotland seemed to defy an explosion which would have shaken London to its centre, and which did actually lay a whole district waste some little time ago.

* The general proceedings have been so fully and so widely reported that we do not think it necessary or desirable to repeat the story.

THE NEW CONCERT HALL AND ADDITIONAL GROUNDS AT BUXTON.

The Buxton Improvements Company was formed about six years since "in order to add to the attractions and increase the popularity of Buxton by the provision of enclosed gardens in which covered promenades and a concert-hall might be erected for the amusement and recreation of the public in all weathers, for the engagement and maintenance of the band, for the laying out and culture of the grounds and walks, and all such acts as may be served by the possession and use of ornamental and well-kept gardens and pleasure-grounds." For these purposes the Duke of Devonshire gave to the company about fourteen acres of admirably situated pleasure-grounds, on both banks of the river Wye, and well wooded. These grounds, known as the Hall Gardens, were re-laid with much taste and skill by Mr. Milner, of Norwood. One of the features of the scheme was a large concert-room, which was required owing to the fact that the present pavilion was incapable of holding the numbers that crowded to it at the concerts. The additional buildings have been designed to harmonise with the present buildings as far as practicable. The west corridor has been extended about 50 ft. in length, and is 5 ft. wider than the old one. The music-hall is octagonal in plan, and is over 100 ft. in diameter. It is surmounted by an octagonal dome 50 ft. in diameter. To the eaves of the aisles the music-hall is 29 ft. high, to the springing of the dome it is 38 ft. high, and to the apex of the dome from the floor the height is 68 ft. The constructive materials used are principally cast and wrought iron. The external columns of the aisles are of cast-iron, with foliated capitals, upon which is placed a continuous wrought-iron girder, forming the octagon; the inner columns supporting the dome are coupled, having ornamental bases and capitals, and partly fluted; upon these are placed wrought-iron lattice girders, making another continuous octagon, and forming a base to the dome. The hall and dome are roofed with slates, and the ceilings are of pitch pine, varnished and stencilled. There are eight triple-light windows to the bottom of the dome to light up the centre of the large area, and to assist in ventilating the room. All the iron work has been painted in colours and decorated in a chaste style. The lighting is by a sunlight in the dome, with the addition of brackets round the hall. There is also a sunlight of equal power to fifty lights over the orchestra. There are a band-room, a board-room, and a smoking-room. The whole building is warmed with hot-water pipes. The terrace has been extended about 400 ft. in length, and is 60 ft. in width. The total cost to the company has been about 30,000*l.*

THE EMPLOYMENT OF YOUNG GIRLS IN BRICKYARDS.

DIFFICULTY IN ENFORCING THE LAW.

The Factory Inspectors' reports for the past half-year contain some curious incidents illustrative of the difficulty of enforcing the Brickfield Act of 1871. Mr. Blenkinsopp, sub-inspector for the Wolverhampton district, gives the following graphic account of his experiences:—

On the first visit to any works, or on any change in the law, I see the master, carefully explain the Act, and endeavour to show how he may overcome anticipated difficulties. This I did in 1870–71 in case of the brickworks; all promised strict attention, to which some half-dozen adhered. The rest only deceived me with apparent success. At my approach little girls were concealed. Report has it that I once stepped on a girl hidden under some matting without discovering her. One day I saw two girls run, and after much trouble they were produced from a hole under the engine. When prosecuted the master was fined 6*d.*! This opened my eyes, and I inspected more carefully, but for some time with indifferent success. Every possible device was resorted to by the brickmakers. Oldbury, one of the chief brickmaking places, has a population of about 16,000, and the hand of almost every man, woman, and child was been against me. The moment I get out of the train news is sent to every brickyard, a watch kept, and the girls concealed on my approach. I had to try various methods, the most successful one being to go to a station at a distance, and drive in a closed carriage by a circuitous route. Even thus I can, as a rule, only get to one brickyard unknown for word is at once sent to the others. It is the interest of all concerned to employ little girls. The masters get cheap labour; wages are good, a woman moulder can earn from 22*s.* to 30*s.* a week, a girl of thirteen can earn 10*s.*, a girl of sixteen can earn 14*s.* or 15*s.* If a master saves 4*l.* or 5*l.* a week, what does he care if he is fined 3*l.* once a year? What does a parent of a girl who makes 12*s.* a week care for a fine of 5*s.* once a year? The master of large brickworks has been seen helping with his own hands little girls into a canal boat, so as to conceal them from me. One day a girl locked herself in an out-house where the brick moulds are kept, and I had to break the shutters open with a brick before I could get her name, for every one denied she was there. In about ten minutes there was a mob of 250 or 300 people in the brickyard. For perhaps two or three years I had a sort of running fight with the brick people, which was rather amusing, but at last things came to a climax. One day last May I found two little girls concealed under some hay in the loft of a stable in a brickyard, so I searched the rest of the place. There are three fired sheds, one through the other. At the top of the innermost one, in a dark corner, there were some bricks neatly arranged, about 6 ft. high, as though placed to dry, but which eventually proved to form a sort of box for concealing children. The occupier was with me, and as I approached the place he said, "You need not look there, Mr. Blenkinsopp; they are only bricks placed to dry." Then I knew the scent was warm. I looked over the top of the bricks, but could see nothing. Fortunately, I had a box of matches with me, and lighted one and put it over. Immediately seven children stood up, and began to cry furiously. I tried to pacify them, telling them I would not hurt them, and asked for their names. They only cried the more, for both masters and parents frighten the children by telling them that the inspector would take them to prison or eat them. In the midst of the noise the occupier vanished; news was sent to the parents, some of whom, together with the brick-moulders, rushed upon me. Before I was aware, they seized me from behind, pulled down the bricks, and rescued the children. Though I was somewhat ignominiously hustled about, I stopped two of these children till I obtained name and address, making four caught in the week. The rest, of course, escaped, and I could only recognise one of the persons who obstructed me; this one I prosecuted. The fines and costs of the occupier amounted to about 16*l.*, and on the parents to about 17*s.* each.

Mr. Blenkinsopp goes on to say that a better state of things appears to be in progress.

Mr. Bowling's report on the brickyards of Tamworth is much more satisfactory. He says:—

"I have completed a round of the brickyards in the Tamworth district, and I think it very satisfactory to be able to report that I not only found no women at all employed, but also a unanimous opinion expressed that there was no necessity for female labour in brickyards, such labour being regarded as in the highest degree mischievous in all its bearings. I found several half-time children over ten years of age employed, but only in one instance irregularly, and that was at a small brickyard at Curdworth which had never been inspected before."

Destruction of Scarborough Spa by Fire.—On the night of the 8th inst., the buildings known as the Scarborough Spa were destroyed by fire. The block of buildings included a saloon or theatre, spacious refreshment-rooms, &c. In the hurry and excitement of the moment there was little time to save any of the valuable property. Portions of the goods were, however, removed, and among them the painting by Sir Noel Paton, "The Man of Sorrows." The building was designed by Sir Joseph Paxton.

YARMOUTH AQUARIUM.

SIR,—Having read your description of the above—the last school for piscatorial instruction—and also the description accompanying the view in the *Illustrated London News* of Saturday last, there appears such an extraordinary difference that I beg to ask whether you can give any explanation that may lead me, and others also, to put faith in the literature of the day, the duty of which I always understood was to place facts before the public, and not to mislead, which in this case either you have done or your pictorial contemporary has. As I read your account there is the low aquarium hall only, the roof of which is the skating-rink. The other account gives a large assembly-room above the aquarium hall, and rooms for attendants as well, and all appears to be topped by a curved roof. At the four angles high towers, &c., are shown. Also a glass building like a large conservatory at the front or south end.

These accounts being irreconcilable with one another is my excuse for seeking for some explanation. As it stands, one asks who can believe things even when set before us in black and white? S.

*** Our esteemed contemporary, whose illustrations week by week of passing events are little short of a marvel, has been led into error; in representing such a building as is shown as ornamenting the strand at Yarmouth. We must say, as Macbeth did after a similar deceit proceeding from the heat-oppressed brain, "There's no such thing." The lofty hall, the towers, the great conservatory, are all creatures of the imagination; and if our correspondent proposes to visit Yarmouth he may make up his mind that he will find nothing more at present than the very modest building described in our pages.

"ART AND CIVILISATION."

SIR,—One may easily be drowned in the eddies of this question. It requires a careful and thoughtful navigator to steer a right course; but if the matter be not rightly grasped, art may suffer disparagement.

Civilisation is a question of degree. Civilisation of the highest kind has never yet been reached. The past was hollow, and the present is far from being solid and stable. This ideal civilisation is, in fact, a most difficult thing to attain to, and the past ages of the world have only furnished quotas in the progression.

The question of the relation of art and morality assumes clearness as soon as we place it in the following form. Is it impossible either for a moral people to have a grand national art, or for a moral man to be a great artist? If so, let art be abandoned; if not, all else is beside the question, and is only what comes within the facts of history and of individual experience, viz., that it is possible for both states and individuals to have the knowledge of the moral law, and to be conscious of the advantages of obeying it and yet be immoral. Again, we know that it is possible for a state to exhibit a public morality whilst privately vicious; that it is also possible for an artist to be moral in his art and vicious in his life; but this is not a relation peculiar to art, it may exist in all professions. The knowledge of the right and the observance of the right are not always linked together.

But this knowledge of in what rectitude consists is the basis of civilisation and progress, and though neither states nor individuals may as yet be able to fulfil its full conditions, yet that knowledge is the pole-star by which the world is forging ahead, and to which, as it ever and anon swerves, it again turns its eyes and endeavours to bear up in the right course.

Both vicious states and vicious individuals may exhibit public virtue. The vicious may have the knowledge of rectitude, and of the value of its practice, and render their homage to virtue in noble public acts, in lofty literature and high art. The highest art is that which is conformed by that moral consciousness, and is moral notwithstanding the imperfections of its author. The highest art must ever be moral in its form and qualities.

The highest art of all, perhaps, is not that which fashions paint and marble, but men. And they who know the laws of rectitude and of modifying and newly developing life, know that a people can only be fashioned into beauty by their observance of rectitude of life, and that in the measure in which they swerve from this observance do they lapse into ugliness and deformity. Beauty, then, that ideal of the artist, is the moral form of existence, and can only be realised, become a living reality, by rectitude of life, and be preserved by rectitude of life. Beauty, living beauty, can never be severed from the observance of the moral law but at the penalty of decadence.

Art belongs to the natural man only to a certain and very poor extent, no great art can come but of the knowledge of good and evil.

W. CAVE THOMAS.

ARCHITECTS AND CLERKS OF WORKS.

MR. WILLIAM CROZIER, architect to the county of Durham, &c., has raised a point of some interest in regard to the appointment of clerks of works.

It appears that the Durham Board of Guardians are erecting a new vagrant ward, at a cost of 3,000*l.*, of which Mr. Crozier is the architect. The guardians, unknown to their architect, resolved to appoint a clerk of the works for the new structure, and advertised for candidates. Upon this reaching the knowledge of Mr. Crozier, he wrote the following letter to the Board's clerk:—

"August 24, 1876.

Dear Sir,—I understand the clerk of the works elected by the Board is not coming, and I am bound to say on this subject that I consider it very strange that I was never in any way consulted in the matter.

Architects, generally, are consulted, if they do not actually appoint, which is more generally the case. Many of the names that I saw mentioned in the newspapers were no more fit to be clerk of works than to be Viceroy of India.

I do not say this as if I had some end in view, as at the present moment I have not the slightest idea where I could get a clerk; and, for my part, I think that with the contractor and foreman we have got, the plainness of the work, and the architect being in the town, the appointment of a clerk of works is quite unnecessary.—Yours truly, WILLIAM CROZIER."

This communication being read at the last Board meeting, brought on a lively discussion.

One guardian considered it was a matter in which Mr. Crozier had no right to interfere, as he was merely employed as an architect, and they ought to have an independent person to look after the building.

Eventually the Board decided to appoint a clerk of works of their own selection, without further advertising.

EXHIBITION OF SANITARY, DOMESTIC, AND EDUCATIONAL APPLIANCES.

NOTWITHSTANDING the fears entertained to the contrary, an Exhibition of this kind will be held in connexion with the Social Science Congress, in Liverpool, and will continue from the 11th to the 21st of October. The Drill Hall of the First Lancashire Rifle Volunteers, St. Anne-street, Liverpool, has been obtained for the purpose.

The object of the Exhibition, as heretofore, is to bring under the notice of the public generally, and particularly those who are interested in social, sanitary, educational, and economical questions, the latest scientific appliances for improving the public health, promoting education, and advancing social economy. The classes are arranged to admit all sorts of utensils and appliances appertaining to the advancement of social science. As the time is short application should at once be made.

The mangement of the Exhibition, as heretofore, will be under the superintendence of a committee.

THE NORTH AND SOUTH WOOLWICH TUNNEL UNDER THE THAMES.

PROPOSED CARRIAGE-WAY.

AT the last meeting of the Woolwich District Board of Works the new subway about to be constructed under the Thames between North and South Woolwich formed the subject of discussion by the Board. Mr. Topley, one of the members, drew attention to the fact that the thoroughfare was only to be for foot-passengers, but he thought that if the directors could be prevailed upon to extend the scheme to the extent of a carriage-way, it would be one of the best things that could happen for Woolwich, as he believed trade would flow in from all directions. Captain Behenna, another member, expressed a similar opinion, observing that he believed a subway for foot-passengers only would not be of much use. He doubted whether it would be a financial success inasmuch as it would have a strong opponent in the steam ferry, and the chairman said he was of the same opinion. Mr. Farnfield, the solicitor, said that the footway would cost 70,000*l.*, and a carriage-way 350,000*l.* He suggested that if a public meeting were called, and half the 350,000*l.* subscribed, the directors would probably be willing to reconsider the matter. It was further suggested that the difficulty might be overcome if the Metropolitan Board would assist the Subway Company. Ultimately the matter was referred to the Highway Committee for consideration.

THE FALL OF AN ARCH AT MANCHESTER.

ON the 7th inst. the Manchester City Coroner, Mr. Herford, held an adjourned inquest on the body of Philip Connelly, a bricklayer's labourer, who was killed by the falling of an arch in a building in course of erection in Fennel-street, as recorded in last week's *Builder* (p. 889). The accident took place on the 31st ult., and the coroner's inquiry had been adjourned, in order that the premises in question be inspected by an architect. This had been done by Mr. Richard Hartley Goldsmith, who said that the plans of the building, which had been prepared by Mr. Richard Thomas, jun., seemed to have been generally carried out. Witness examined the remains of the fallen arch, and he found that the immediate cause of its destruction was the removal of the centres. There had been an evident want of skill and care in designing and carrying out the work. Witness considered that the arch had been built by the bricklayer in a slovenly and careless manner. The mortar-joints varied from half an inch to an inch in thickness. There was a tie-rod to secure the work, but it had no effect in restraining the thrust of the arch, in consequence of the imperfect way in which it was riveted to a slight piece of iron, in no way fit for the purpose for which it had been made. If the rod had been carefully attached, he was of opinion that the accident would not have happened. There had been a want of skill and judgment in designing an arch in a position like the one in question, without iron springers and a sufficient number of ties so arranged as to avoid the flues, and having plates properly secured to the rods.

Mr. R. Thomas, jun., said that the plate to which the tie-rod was fastened appeared to him to be good, because he had sounded it on the blacksmith's anvil. Witness told the smith to rivet the rod to the plate. Witness did not see him do it. He thought that the weight of the brickwork was sufficient, and that the joists coming in at right angles would assist to prevent the fall. It was never intended that any heavy weight should go over the arch. Witness could not say that the teagle shown in the plans was not intended for the unloading of light spring carts. He should think that 1 ton or 1½ ton would be the utmost.

The coroner summed up, and the jury, in returning a verdict of "accidental death," expressed the opinion that there had been a want of experience on the part of the architect; that the work in the construction of the arch had been imperfectly done; and there had also been a want of supervision.

WOOD-CARVING CLASS, SHEFFIELD SCHOOL OF ART.

THE prize of 10*l.* 10*s.*, offered by Mr. Godwin for the best wood-carving executed in the school, has been awarded to Mr. Henry Archer.

The Carriage of Explosives.—Owing to the shutting up of many of the harbours, and the stringent regulations which are being enacted for others in regard to explosives, coupled with the refusal of nearly all the railway companies to carry dynamite, much expense and inconvenience is being caused to the manufacturers and users of dynamite and other blasting agents, and obstacles thrown in the way of a variety of useful public undertakings, and of the mining industries of the country. The absence of properly regulated transit facilities leads to surreptitious conveyance, and serious danger not only to the travelling public, but to the property and plant of the railway company as well. The greatest precaution should, of course, be observed, but the necessity for the transmission of such materials at reasonable cost must nevertheless be recognised.

THE STAFFORDSHIRE INSTITUTION FOR NURSES.

The foundation stone of a new building for the Staffordshire Institution for Nurses was laid on the 2nd inst. The site is a short distance from the entrance to the Mount at Penkhull, and was presented by the Rev. Sir L. T. Stamer, bart. The home will be specially constructed inside with disinfecting apparatus and non-absorbent cement walls which can be constantly washed with disinfectants, which is necessary to enable the nurses to be sent from house to house without danger of carrying infections with them. The building will comprise on the ground-floor outer porch, entrance-hall with staircase, corridor, from which are entered two sitting-rooms and dining-room, side lobby, with entrance from back, communicating with kitchen, scullery, store, pantry, cellars, and yard. On the first floor, five nurses' double bedrooms, matron's bedroom, bathroom, disinfecting-room, &c. On the second floor, two double bedrooms and box-room. The style is Domestic Gothic, of an inexpensive character, and it is built of white bricks, effect being sought in the proportion and disposition of the building, and by the introduction of coloured bricks and stone dressings. The cost of the building will be about 2,000*l.*, a considerable portion of which yet remains to be raised. The architects are Messrs. Scrivener & Son, Hanley; and the builders, Messrs. Inskip, Longton.

PROPOSED DRAINAGE OF DUKINFIELD.

Major Tulloch, R.E., of the Local Government Board, held a preliminary inquiry at Dukinfield, on August 31st, arising out of complaints that had been made by the owner of the estate as to a nuisance caused by the sewage from certain portions of the district being allowed to flow into the natural brook courses.

Mr. Marshall, solicitor to the Board, observed that the statements which had been set forth in this respect had been greatly exaggerated, and that with respect to the blame, it rather rested with the complainant than with the Board; for before the commencement of the Board, the owner of the estate opened out new streets, and allowed houses to be built thereon, without providing proper outfall sewers. No doubt, by recent Acts of Parliament the Board would be held responsible for any nuisance that might arise from this condition of things; but the Board did not and had not shirked their responsibility in this respect; for, since their establishment in 1836, they had expended no less a sum than 60,000*l.* in works of sewerage, street improvements and water-supply, and at the present time surveyors to the Board was under instructions to prepare a scheme of sewerage by which the sewage of the district might be conveyed to one point.

Mr. Cartwright, Assoc. Inst. C.E., surveyor to the Board, produced a plan showing an outline scheme of what is proposed to be carried out, the estimated cost of which, exclusive of land, would not be less than 25,000*l.* Major Tulloch expressed himself as pleased with the plan, and urged the Board to at once carry out the same, as if carried out to completion the rateable value of the district would rapidly increase. It was understood that as soon as the plans, &c., were completed an application would be made to the Local Government Board to sanction a loan of money to carry out the works.

THE PUBLIC BUILDINGS, PHILADELPHIA.

Sir,—In your issue of July 22, I find an excellent illustration of the new Municipal Hall at Philadelphia, Pa., of which I am the architect.

Accompanying the drawing is a short description, in which mention is made of Mr. Frank H. Loenholdt, crediting him with a position, as regards this building, to which he is not in any way entitled, and which, in justice to those assistants who have been with me since the commencement of the work, requires proper explanation and correction.

From its inception until the present time I have held the position of architect, and at no period has there been associated with me in my department any gentleman other than assistant, whose duty is to produce, under my directions, such drawings as are required to elucidate my design in detail for the use of workmen and others engaged in the construction of the building. In such a capacity, at the beginning of April, 1875, Mr. Loenholdt was engaged to draw a perspective elevation of the new hall, and on October 1st of the same year, he having completed the drawing, his connexion with my office ceased, and at no time previous to, during, or since this period, has he held any other relation to the building than that just stated.

I trust that my request for a correction of the error named in your article may meet with prompt and favourable consideration. John McArthur, Architect.

New Public Buildings, Philadelphia, Pa.

BOILER EXPLOSIONS.

Sir,—Boiler explosions are again to the fore. My remedy is,—The top plate nearest the safety-valve to be concaved steel. In the event of valves sticking, and steam generating too fast, the plate would bulge up to stays and crutch, and lift any valve off its throttle.

This could be tested when the boiler underwent the hydraulic pressure test. R. T.

MASTERS AND MEN.

Sheffield.—Messrs. Mannel & Son, of the Devonshire Cabinetmaking Works, Sheffield, gave notice to their cabinetmakers that on the expiry of a fortnight they would cease to employ union men. These notices expired on the 2nd inst., when about half of the workmen took their chests, and went out on strike. The others remained with the masters, who are fighting the battle for the other employers in various parts of the kingdom.

Whitehaven.—A notice intimating a reduction of wages was posted at the Whitehaven Shipbuilding Yard, to the extent of 1d. per hour on the carpenters, and 10 per cent. on all other classes, to come into force on September 7. The company have in their employ about 800 hands. Meetings have been held by the workmen, who consider the proposed reduction in excess of trade requirements, and representations to that effect have been made to the manager. Ship carpenters work 54 hours per week, at the rate of 7½d. per hour, and the proposed reduction would effect them to the extent of 4s. 6d. per week. On the 2nd inst. the company informed the men that they meant to adhere to the notice, and the workmen seem determined not to submit to a reduction.

CHURCH-BUILDING NEWS.

Laxton.—On the 7th ult. a new church was consecrated at Laxton, near Howden. The new church replaces one erected two centuries ago, but is on the opposite side of the road, the site having been given by Mr. P. Saltmarshe, of Saltmarshe Hall, who has also contributed nearly 800*l.* to the building fund. The estimated cost is 3,300*l.*

Medbourne. — The chancel of Medbourne Church, near Market Harborough, was lately opened by the Bishop of Peterborough, after rebuilding. The cost (575*l.*) has been borne by the rector (the Rev. C. F. Eastburne), who entrusted the work to Mr. Edwin Dolby, of Abingdon. The architect has carried out the work upon the old lines, using, where it was possible to do so, the old stones in the tracery of the windows, drip-stones and corbels, and buttresses. There are two windows in the south wall and three in the north, and in the east is a stained three-light window, which has been presented by Mr. H. J. Grieveson and the late Mrs. Ord. The subject is the Ascension.

Tonbridge.—The new church known as St. Saviour's Chapel of Ease has been consecrated by the Archbishop of Canterbury. The building has been erected by Messrs. Punnett, from plans by Mr. Ewan Christian, of London. It is calculated to seat 500, and has been built at the sole expense of Mr. Deacon, the patron of the parish of Tonbridge.

Eldersfield.—About twenty-five years ago the parish church of Eldersfield, in the county of Worcester, was partially restored at an expense of 820*l.*; since then, during a severe thunderstorm, the spire was struck by lightning, and had to be thoroughly repaired at a further cost of 200*l.*, which was collected by Church-rate. It was stated at the time that a new roof and south wall to the nave were necessary, but could not then be taken in hand for want of funds. The completion of the work is now being carried out under the direction of Messrs. Waller & Son, architects, of Gloucester, by Mr. James Griffiths, builder, of Eldersfield. On taking down the old roof, it was found that the timbers were completely rotten, and the wall crumbling away. A new roof and south wall to the nave, with a buttress, are now being rebuilt.

Bourn.—The parish church of St. Mary at Bourn, Cambridgeshire, was re-opened on the 9th ult., after restoration. The nave roof has been entirely renewed, but the form of the old one has been preserved. The old timbers were so completely rotted away that it was found impossible to attempt to retain them. The aisle roof retains the old wood, which was fairly sound. The main alteration in the fabric is in the chancel arch, which was small, and of very poor and meagre character. It has been taken down, and considerably enlarged, and the screen enlarged to fill the new arch. The whole of the floor has been re-laid, and the seats re-fitted. The bench-ends were of very good character, and every portion has been scrupulously preserved. The pulpit is formed into tracery of similar character to the seat-ends. The chancel has been restored by the Master and Fellows of Christ College, who hold the Rectoral Tithes. The walls have been made sound, pointed on the exterior and plastered internally. The roof retains a considerable amount of the old timber. All the main beams of the old roof remain, but the smaller rafters, &c., being much decayed, are replaced, and the angles at the head of the hammer-beams have also been replaced. The windows and the eastern portion of the chancel (excepting the east window) were restored by the college some years ago. The seating has been re-modelled in its original form as nearly as can be ascertained, and the old bench-ends with the curious finials have been carefully refixed. The Earl of De-la-Warr has been at the expense of the restoration of the south transept, which has formally been a mortuary chapel for the family. Much remains still to be done, and it is hoped the poor crippled spire will not long be left as it is. This tower with its spire quite ranks as a county monument. The architect is Mr. W. M. Fawcett, M.A., Cambridge, and the contractor, Mr. Taylor, of Cambridge. The cost of the present work is 2,200*l.*

Morecambe.—On the 9th ult, the Bishop of Manchester laid the foundation-stone of a new church at Morecambe. The new church will be free and open, and capable of seating about 700; to be at first a chapel-of-ease to the parish church, and eventually a district church with separate parish. The church will be built on a central site of 1,015 square yards, in New-street, which, with an adjoining plot of 495 square yards, has been secured at a cost of 780*l.* The estimated cost of the church, with tower and spire, is 8,000*l.* Messrs. Paley & Austin, of Lancaster, are the architects.

East Garston. — All Saints' Church, East Garston, has been re-opened after the re-building of the chancel and the restoration of the Seymour Chapel. The cost of re-building the chancel has been defrayed by the Dean and Canons of Christ Church, Oxford; and Sir Robert Burdett; while the expense of restoring the Seymour Chapel has been borne by the Vicar and his friends, past and present. The architect engaged was Mr. Hugall, of Oxford; and the contractors, Messrs. Hook & Ward, of Stroud.

Ladbroke.—The little parish church of All Saints, Ladbroke, was lately re-opened, after restoration, at a cost of nearly 2,000*l.* The floor of the church has been lowered some 18 in., and the roof has been raised some 2 ft. or 3 ft. In doing this, great care was taken in using the old roof, which had been in existence since the sixteenth century. The whole of the church has been re-seated throughout, the sittings being of stained oak, the carving of which is of the most elaborate description. The pulpit and stalls are also of stained oak. In carrying out the alterations in the chancel, evidences were discovered that three sedilia used to exist on the right-hand side of the communion-table, and these have been restored, Sir Gilbert Scott, the architect, having furnished designs for canopies, with finials to as nearly as possible correspond with the restored sedilia. An Easter sepulchre, and ambry on the left side of the holy table, have also been restored, and a small leper window on the north side of the church, near the chancel, which had been blocked up, was accidentally discovered and restored. The organ has been erected on the north side of the chancel, Messrs. Farmer & Brindley doing the carving. Mr. George Hannaford had the supervision of the alterations, which were carried out in a workmanlike manner by Mr. William Watson, builder, Napton.

Speke.—A new church has lately been opened for the district of Speke, hitherto united to Garston and Hale, but now created a separate parish. The new church has been built at the entire cost of Mr. Sprot, and is in the Early English style. It is built of stone, rough faced, having a spire of 105 ft. from the ground, with a chime of bells. The simplicity of the exterior is in a manner followed out in the interior. The fittings are plain, but substantial. The organ is placed in a chamber in the north side of the church, and has been built by Messrs. Gray & Davison. The church is capable of seating 250, and all the seats are free. The architect was Mr. Pearson, of London.

Lighthorne.—The parish church of Lighthorne was re-opened on the 10th ult., after rebuilding. With the exception of the tower, the whole of the old church has been pulled down. The newly-erected portions consist of nave, with aisle, chancel, and mortuary chapel, the latter covering the vault in which deceased members of the Willoughby family are interred. The north aisle is divided from the nave by circular columns,

composed of Burton stone. The interior of the church is cased with dressings of that stone, and the wall-stone is white lias. The chocolate colour of the Burton stone blends very agreeably with the creamy lias. The reredos is of Corsham Down stone, with mosaic panels, and was executed by Mr. John Smith, of Birmingham. The whole of the work has been carried out by Mr. Wilkins, builder, Lighthorne, Mr. William Lait, Compton Verney, efficiently acting as clerk of the works. Mr. John Gibson is the architect.

Newmarket.—A meeting was held in the vestry of St. Mary's Church, Newmarket, on the 4th inst., for the purpose of considering the present state of the porch of the church, when it was resolved,—"That Messrs. Clark & Holland's plan and approximate estimate for the restoration of the porch and the repairs to the belfry windows of St. Mary's Church be adopted, and the work executed by Mr. R. Arber, under their supervision."

Darlington.—On the 30th ult. the new Church of St. James, Darlington, was consecrated by the Bishop of Durham. The building comprises nave, 68 ft. by 32 ft.; chancel, 36 ft. by 21 ft.; north and south transepts, each 20 ft. by 14 ft.; organ-chamber and sacristy, the latter occupying the lower portion of the tower, which is placed at the junction of the south transept with the chancel, and, together with the spire, rises to a height of about 148 ft. The east end of the chancel is apsidal in form. The style adopted is fourteenth-century Gothic, with characteristic window tracery, and the transepts and chancel are separated from the nave by massive moulded arches in ashlar, springing from carved corbels, with red Mansfield shafts. The chancel is provided with sedilia and reredos, and further enriched with arcading and diaper work below the window-sills, while the seats are open benches of pitch pine, with sloping backs and moulded ends. Accommodation is provided for about 500 people, and the church is so planned as to admit readily of future enlargement. Of this design the chancel and organ-chamber, together with the tower and spire, yet remain to be completed. For the present a small temporary chancel is provided. Up to the present there have been about 4,500*l.* expended on the building. The architects are Messrs. Ross & Lamb, Darlington; and the contractors,—for masonry, Messrs. Simpson & Cowling; joiners' work, Mr. R. T. Snaith; slating, Messrs. Pattison & Son; plastering, Mr. J. H. Hope; plumbing and glazing, Mr. R. Smith; and painting, Mr. S. Harrow; clerk of works, Mr. Bryans,—all of Darlington.

Skendleby.—The parish church of Skendleby, Lincolnshire, which is at present in a sad state of decay and dilapidation, is about to be restored, under the direction of Mr. G. G. Scott, jun., the contract having been taken by Messrs. White & Wood, of Alford. Mr. Scott, in his report of the condition of the building, writes,—"The church has many good points. Such as it is, it carries us back to the reign of Henry III., if not earlier, and it forms a *resumé* of English history from that period downwards; but the state of the fabric is exceedingly bad, and probably it will be found still worse upon a more detailed examination. Rebuilding will be not only the cheapest, but the only course open. In rebuilding, I should endeavour to retain as much as possible of the character of the old building. I should follow generally the original plan, and should reuse all the old windows and other architectural features which it is possible to retain." The estimated cost of the restoration is 2,350*l.*; the actual amount of tender is 2,484*l.*; incidental expenses, such as architect's commission, will increase this sum to at least 2,650*l.* This does not include a vestry and new porch, which are much needed.

Newdigate.—The ancient parish church of Newdigate, Surrey, is reported to be in a sadly dilapidated state, and an effort is being made to restore it. Plans have been prepared by Mr. T. E. C. Streatfield, architect, London, and approved of by the Bishop of Winchester. To effect the restoration, the sum of 1,700*l.* will be required.

Hartshead.—The Rev. T. King, vicar of Hartshead, has received from Kirklees Hall, the residence of Sir George Armytage, bart., plans and an estimate, prepared by Sir Gilbert Scott, for the restoration of Hartshead Church. The cost is computed at about 3,000*l.*, and it is said that a lady will furnish the necessary funds. Both the old church and its surroundings are thoroughly old English in character, and the *Halifax Guardian* hopes that the proposed restoration will not rob the quaint old edifice of its picturesque appearance.

Bramley.—Bramley Church, Surrey, has been re-opened, after restoration and enlargement by the addition of a south aisle. The church formerly consisted solely of a nave and chancel, but in 1850 a north aisle was added at the cost of Mr. Sutherland. The exterior of the new south aisle is of Bargate stone, with dressings of the same material. The inside walls are stuccoed, and the arches and windows of chalk, with string-courses of Farleigh Down stone, and the large west window is also of stone. The roof is of yellow deal, and open-timbered. The addition will furnish seating for about 150 more persons. Other improvements are the erection, by subscription, of a new vestry and organ-chamber on the north side of the chancel. The nave has been restored, the roof being thrown open and plastered. The gallery has been removed, and the nave lengthened by the addition of an arch. The chancel has been restored throughout by the lay rector, Mr. G. A. Godwin Austen. The entire seating of the church is new. The church is heated by hot-water apparatus, provided by Mr. Jackson, of Bramley. The whole of the restoration and additions have been executed from the designs of Mr. Woodyer, architect, Graffham, by Messrs. Wheeler, Bros., of Reading, Mr. Brown being foreman.

ROMAN CATHOLIC CHURCH BUILDING NEWS.

Liverpool.—On the 15th ult. the foundation-stone of the new Roman Catholic Church of St. Joseph, Grosvenor-street, was laid by the Right Rev. Dr. O'Reilly. The cost of the building will be 10,000*l.* It replaces an older building, in which, in 1870, fifteen people were killed by a "crush."——The laying and blessing of the foundation-stone of a new Roman Catholic Church in Toxteth Park took place on the 16th ult., on a piece of ground facing High Park-street and to the rear of the Mount Carmel Schools. The cost is estimated at 4,000*l.* The church will be erected in the Early Decorated style of architecture, will be about 110 ft. long by 60 ft., will run from west to east, and will be built of stone and pressed brick. It will accommodate 800 people. No decision has been arrived at respecting the internal decorations and fittings; but, in accordance with the new decrees, the choir will be at the sanctuary end over the sacristy. Mr. J. O'Byrne, Southport, is the architect.

Walton.—On the 9th ult. the Right Rev. Dr. O'Reilly, the Roman Catholic Bishop of Liverpool, laid the foundation-stone of the new Catholic Church of the Blessed Sacrament, Rice-lane, Walton. The site is on the east side of Rice-lane, and there is sufficient land for presbytery and schools. The style will be Early Decorated, and the edifice will be simple and spacious, affording accommodation for between 600 and 700 worshippers. The altar or chancel end will be to the east. On each side of the chancel will be side chapels, and there will be a nave and north and south aisles. The length of the building will be 104 ft., and the width 53 ft. The principal entrance to the sacred edifice will be at the west end, opposite Rice-lane, and a short street running eastwards from Rice-lane will give access to a porch at the north-west angle of the church. When the state of the funds will permit, it is intended to erect a belfry and spire at the north-west angle. The cost will be about 4,500*l.* Mr. Edward Kirby is the architect, and the contract has been entrusted to Mr. James Leslie, of Bootle.

Exeter.—An addition to the Roman Catholic Church at Exeter, in the shape of a sculptured statue of St. Patrick, was unveiled on the 6th ult. The figure has been wrought from a finely-grained block of Caen stone, by Mr. Harry Hems, who has other commissions to execute for the same church.

Gateshead.—Plans for a new presbytery, in connexion with St. Joseph's Roman Catholic Church, Gateshead, have been prepared by Messrs. Dunn & Hanson, Newcastle. The building will be of stone, and in keeping with the style of the church. The cost will be about 2,000*l.*

Ditton.—On the 22nd ult., the (R.C.) Bishop of Liverpool (Dr. O'Reilly) laid the foundation-stone of a new Catholic church, to be dedicated to St. Michael, on the estate of the Marchioness Stapleton-Bretherton, close to Ditton Hall. The new church is to cost between 18,000*l.* and 20,000*l.*, and it is entirely the gift of the proprietress of the estate. The building will be a large and substantial one, the material used in its erection being chiefly Rainhill stone. The design is Gothic, with early French details. At the west end will be a tower, 120 ft. high. The nave roof will be 60 ft. high. The nave is 56 ft. wide and 83 ft. across the transepts, and the total length is 152 ft. There will be sitting accommodation for 800 persons. The architect is Mr. Clutton, of London.

South Shields.—The new Roman Catholic Church of St. Bede, Westoe-lane, South Shields, was opened on the 22nd ult. by the Rev. Dr. Chadwick, Bishop of Hexham and Newcastle. The building stands at the corner of Westoe-lane and Percy-street. It is built of freestone, in the style of Gothic architecture which prevailed towards the end of the twelfth century. The erection consists of a nave, with aisles, the chancel, two lateral chapels, placed at the extreme end of the aisles, a large sacristy, and a tower. The total interior length is 118 ft., and the width 58 ft. 6 in. The nave is 60 ft. in height to the apex of the roof, and is lighted by a clearstory. It is 26 ft. wide, and divided from the aisles by an arcade of five arches on each side, springing from octagonal columns, with moulded caps and bases. The sittings accommodate over 700 persons, but the entire building, with the vacant space at the end of the nave and aisles, will afford accommodation for 1,000. The chancel is spacious, being 30 ft. long and 22 ft. wide, divided from the nave by an arch 40 ft. in height. The cost will be 9,000*l.* The church has been built from designs by Mr. Gibson Leadbitter, but the work has been carried out under the immediate superintendence of Mr. T. C. Nicholson, of Newcastle, architect. The contractor is Mr. Joseph Fishburn.

"HOW I GOT ON."

MR. FREDERICK SAGE, the glass case manufacturer, is a prosperous tradesman, and on the 9th inst. he gave a dinner to the villagers at Freston, the place of his birth (the clergy and gentry assisting), and at the close of it told them something of his early life. It was a curious and instructive story, and this is the pith of what he said. He is the son of a carpenter belonging to Freston, named Joseph Sage, and for a time worked under his parent's eye. This, however, was not sufficient for an energetic lad who longed to start in the world on his own account. He pondered the subject, and at last, when about eight years old, decided to set up business on the enormous capital of 6d. He thought that if he could make some knife-trays he might reap a small profit; but then he remembered that he had only 6d. to invest, and that that would not go far at a timber merchant's. But he was not to be deterred, and went to Ipswich, where he purchased an empty tea-chest at a grocer's, which he determined to convert into his knife-trays, besides which he also made some candle tinder-boxes and stay-busks. With these wares at his back he trudged to Woolverstone and Chelmondiston, and met with a fair amount of luck, returning in the evening with his pockets heavily laden with coppers. Thus did he commence his career in life. This success opened his father's eyes as to his worth, and he was set to hurdle-making. But this was not enterprising enough, and Frederick turned his thoughts towards Ipswich, where he thought he might obtain work as a joiner. He looked at his clothes, which he considered hardly good enough for such a high calling, and thereupon very liberally helped himself to his brother's belongings, and rigged himself out in a carpenter's jacket and white apron. Adorned thus, he went to Ipswich, and applied to the foreman of some works at the corner of Museum-street, who told him he was too young a man, as one was wanted who could make a mahogany door or build a pig-sty, evidently thinking the young aspirant more fit for the latter than the former class of work. The poor lad went to several other places, but failing to secure work turned his footsteps homewards. As he was passing over Stoke Bridge, he saw a steamer with a notice stating that she conveyed passengers to London. Just the thing, thought Frederick, and he went home full of his project, determined to invest his then capital of 10*s.* in a trip to the great city. He at once carried out his purpose, and was landed at Blackwall. There, of course, he was altogether out of his latitude, but was too proud to let the crowd around know

that he was a stranger, and, hearing many asking for tickets for Fenchurch-street, he did likewise, and eventually found himself on London Bridge, and afterwards at the Elephant and Castle. Here, to use his own words, he was "wholly stammed" at the immense amount of traffic, but still he kept his wits about him, and, fearing to lose himself, retraced his steps, till, becoming tired, he went into a coffee-house and engaged a bed for 1s. He slept at the top of the house, and found that he had plenty of company during the night. He was astir early in the morning, but would not venture to remain in London any longer, as he feared bankruptcy, on account of his 10s. running low. He then worked in Ipswich for some long time, but his services were not appreciated, and, through the aid of a friend, he secured work in London as a carpenter. By this time he had entered into the bonds of matrimony, and of course had to look out for himself. As he passed through the streets of London in pursuit of his calling, it struck him that if some of the tall warehouses he saw were fitted up with speaking tubes a good deal of time, and consequently money might be saved. At this time he had a fund of 20s. and determined to set up in business, and had some circulars prepared setting forth his plan of the speaking-tubes. This was on a Monday morning, and by dinner time he had distributed several of the circulars but had not obtained any orders, and Tuesday passed in the same way. On Wednesday morning he again sallied forth, and this time was asked to make out an estimate for fitting up a large warehouse with the tubes, which he did at once. Encouraged by this he asked the merchant whether he did not want some counters, &c., fitted. The merchant replied that he did, but that was not his (Frederick's) work. "Oh yes," he replied, "that is my business, and I only do the tubes when I am slack." Upon this he was instructed to draw up an estimate for the work. He went home, made his plans, and the next day gave in an estimate for 130*l.*, and accepted a contract to do the work in ten days, or forfeit 1*l.* for every day over. He went home and told his wife what he had done, and she, being a prudent woman, thought he must have gone mad. He, however, assured her of the contrary, and told her to go to four of her friends and borrow 5*l.* from each, to enable him to buy the material for the counter, whilst he hunted up a workshop and employed hands. Both were successful in their search, and on Friday morning the men were at work on timber. On the Saturday night, of course, he could not pay his men, but they worked early and late all the next week, and a good deal of the stuff was got into the warehouse. When Saturday came round again Frederick Sage knew that he must pay his men, and he accordingly went to the merchant for whom he was working and demanded 50*l.* on account. This was paid him, and he was able to settle with his men. Monday was the last day for the contract, and every nerve was strained to complete the work, but alas! the paint was obstinate and would not dry, which resulted in the loss of one day. When he came to settle the merchant informed him that he must be deducted for that day. Frederick protested, and pointed to the manner in which the work had been pushed on. But the merchant was immovable, and then told him that his contract was the highest, but was accepted as he thought him to be a man in a large way of business, and therefore able to do the job within the time. Consequently Frederick had to content himself for the loss of the 1*l.* with the knowledge that he must have acted in a business-like way to impart such an impression, and learn wisdom for the future. This was his first contract. Since that time he has had an uphill fight, but has now firmly established himself, and is carrying on a large business as a maker of air-tight windows and cases for shops. This is the short history of a humble carpenter's son of Freston.

Serious Accident at the Leeds Amphitheatre.—The scaffolding on which a party of London decorators were at work on the 8th inst. in the Amphitheatre at Leeds gave way, and the poor men fell from near the ceiling to the pit, a distance of 60 ft. A number of joiners who were flooring the pit were much hurt by the fall of the *débris* upon them; one of them, a joiner, in the employ of Mr. Hobson, the proprietor of the theatre, was very seriously injured. He and several others were removed to the Leeds Infirmary.

COMMON LODGING-HOUSES IN THE METROPOLIS.

COLONEL HENDERSON, the chief commissioner of the Metropolitan Police, in his report for 1875, just issued, says that the common lodging-houses in that part of the Metropolitan Police district comprised within the limits of the Metropolis Local Management Act of 1855, and which are under police supervision, may be said to be in a very fair sanitary condition, the number of cases of infectious and contagious diseases that have occurred in them being comparatively few. The area under inspection is twenty-two square miles, containing 1,241 registered common lodging-houses, and accommodating about 27,000 persons, exceeding in number the population of some of our cities. During the past year 69 deaths have occurred in the common lodging-houses. Of these fifty-six cases were sudden deaths. Eighteen cases of infectious diseases have arisen. Owing to the representation of the medical officer of health of the Whitechapel district that many of the rooms in his district were over-crowded,—"that is to say, every room where there is not 300 cubic feet of space allowed for each lodger,"—these rooms have been remeasured, and, where considered necessary, the number of lodgers reduced. Another medical officer of health, however, in referring to his district, makes the following statement:—"I am of opinion that, with the abundance of ventilation that is provided in nearly all the dormitories at common lodging-houses, 250 cubic feet of space is quite sufficient for the maintenance of health." To meet, as far as possible, the conflicting opinions of medical gentlemen, the following scale has been adopted for the measurement of common lodging-houses, by which it will be seen that nearly 300 cubic feet of space is given to each adult lodger:—

Height of Room.	Sup. Feet.	Cub. Contents.
6 ft. and under	50	300
6 ft. 6 in. and under	45	292
7 ft. 6 in. and under	40	300
8 ft. 6 in. and under	35	297
Above 8 ft. 6 in.	30	—

These rooms being only occupied by night, and as at a stated time in the morning (ten o'clock) all the windows and doors are opened so as to obtain thorough purification, and remain so during the day, it is considered that the present scale of measurement affords ample space for all purposes of health, and that should a greater number of cubical feet of space be enforced—that is, more than 300—the effect, owing to the reduction of lodgers, high rents, taxes, firing, &c., must be that the houses would become unremunerative and given up, the lodgers being dispersed to find homes in unlicensed houses situated in courts and alleys, already densely populated; great detriment to the public health would, in all probability, ensue, and the poorer classes themselves, would, from the want of those comforts which are now afforded them in registered houses, be made great sufferers. Accounts as to the unhealthy state of some of the common lodging-houses in the metropolis having appeared in several of the daily newspapers, certificates in refutation of these statements were obtained from the medical officers of health of the districts in which the houses complained of were situated.

During the past year, 432 keepers have been served with notices to register their houses, or the parts of houses occupied and used at the time as common lodging-houses; 275 of these houses have been surveyed and measured to accommodate (if registered), including the keepers and their families, 3,142 persons. A very large majority of these houses might, with comparatively small outlay, be rendered fit for registration. 189 houses have been permanently registered and re-opened, and are used wholly or in part as common lodging-houses. In the houses thus registered, good accommodation was provided at the time of registration for 2,747 persons. 127 houses have, from change of tenants, death of keepers, and other causes, been closed and taken off the register (many of these, however, after being improved, and in some cases considerably enlarged, have been re-opened); most of the others will, no doubt, be registered. 3,787 houses casually used as common lodging-houses are under strict supervision, and periodical visits are made by the police inspecting-officers to prevent sub-letting within the meaning of the Act. 180 common lodging-houses are now under observation, requiring more or less alterations and improvements previously to their being registered. Twenty summonses have been applied for against the keepers of common lodging-houses for various offences against the provisions of the Act. In concluding his report, Colonel Henderson says that the Common Lodging-houses Acts are working well, and taking into consideration the small staff, the large extent of ground over which they have to travel, the number of houses to be visited, and the continuous nature of these visits, very satisfactory results have been obtained. There can be no doubt that without strict supervision the common lodging-houses would quickly become active foci of moral as well as physical pestilence.

TENDERS FOR THE SEWERAGE OF LINCOLN.

AN adjourned meeting of the Lincoln Town Council was held on Monday afternoon, for the purpose of deciding upon whose tender should be accepted for the performance of the deep sewerage of the city. The tenders sent in were as follow:—

Ritson & Co.	£97,804 7 0
Greenwood & Co.	96,763 17 8
Waddingham	90,560 17 8
Clarke	82,934 15 1
Wheildon	75,767 1 6
Smith, Finlayson, & Co.	74,818 6 8
Neave & Sons	67,077 6 6
Acock	63,605 19 2

The Mayor went on to say that the contract of Mr. G. T. Acock, of Oxford (63,605*l.* 19*s.* 2*d.*), had been read and considered, and the clerk had fully explained to the Council the reason for the contractor being relieved from providing sureties for the execution of the works. The Mayor afterwards informed Mr. Acock, who was present, that his contract had been accepted and signed on behalf of the Corporation. The engineer, Mr. Mansergh, reported to the Council on each tender.

THE STICKING OF SAFETY-VALVES.

SIR,—In reading your able article "Public Safety: Three recent Calamities," I notice that you attribute the sticking of the safety-valve on board the *Thunderer* to the adhesion of the valve to its seating, owing to the extreme accuracy of fit obtainable in the lathes of the present day.

As this part of your article has been copied into some of the daily papers, I should like to point out what I conceive to be a misunderstanding on the part of the writer of it. In the first place, the fitting of a safety-valve to its seating is one of the simplest operations performed in the turning-lathe, and could have been done as accurately twenty years ago as at the present time.

Then as to the adhesion of the surfaces.

The whole area of the valve-seating would probably not exceed 6 square inches, while the area exposed to the full boiler pressure would be at least twice that amount. Supposing there was only 65 lb. pressure per square inch in the boiler when it exploded, the total excess of pressure on the exposed surface of the valve, over and above what it was loaded to blow off at, would be about 360 lb. This would be the force the adhesion would have to counteract. Divide this by the area of the seating and it gives an adhesive force of 60 lb. per square inch, a result never obtained with the most perfect plane surfaces ever made.

Again, I would ask, how can a valve be anything but a good fit in its seating when it will stand full steam pressure without leaking, and how can there ever be a film of air between the metal surfaces?

The writer of your article has evidently misunderstood the evidence of Mr. Bramwell. The sticking of the valve was caused (as I understand it) through the expansion by heat of the cylindrical fitting which forms a guide below the valve-seating, to keep it central as it rises and falls in it.

Any one who has seen the difference of fit produced in a pair of Whitworth cylindrical gauges merely by the warmth of the hand, can readily understand the effect produced by the heat of steam on the part of a valve when fitted too closely, as this appears to have been.

H. BAMFORD.

New Public Park at Jarrow.—A park or recreation-ground, value 12,000*l.*, was, on the 6th inst., given to the Mayor and Corporation of Jarrow-on-Tyne, for the use of the public, by Sir Walter and Lady James.

Books Received.

Public Health. By the late E. A. PARKES, M.D. Revised by W. AITKEN, M.D. London: Churchill. 1876.

HERE, in the space of 66 pages, we have a clear and incisive *resumé* of the requirements necessary for preserving and improving Public Health. Old readers of the *Builder* will not find anything new in it. It is a summary of deductions, so to speak, from what has been continuously set forth in our pages and is gradually obtaining general acceptance.

The views of Dr. Parkes in respect of sanitary measures were much less advanced early in his career than they afterwards became. We can remember a passage of arms with him some years ago, when he refused to attach importance to the removal of conditions the evils of which he fully recognises in the little treatise before us,—a work we can warmly recommend.

VARIORUM.

Blackwood's Magazine, treating of "Picture Dealing and its Knaveries," says:—He had come into possession of,—not one of the great State pictures that belong to history and geography, and change places only through wars and revolutions,—but still a great prize in the private collector's community, say a Madonna by Sassoferrato. At the gallery of the London dealer whence it had been obtained appears soon afterwards the Royal æsthetic agent, come expressly for that picture; but, behold, it had gone to a Manchester manufacturer! All particulars are asked and noted by the cunning æsthetic, and he is especially minute in his inquiries as to any marks on the back, and of these there are several. His coming is known as that of a great connoisseur in art; and rumours are afloat about the princely prices he has been known to pay for such works as attracted his fancy. He strays from one collection to another, carefully avoiding that where the object of his furtive design hangs. Thither he is at last driven by a special and urgent invitation of the owner, who is proud to attend on so eminent a pursuer of his own pursuit. At length they stand before the picture, and the critical moment has come. The stranger recognises an old friend. He knows it as a very remarkable production. In fact, it was created in a manner under his own very eyes; and he always maintained it to be the most perfect copy of a great picture ever made. Its owner remonstrates. It was warranted genuine, and paid for accordingly. "Now, my good fellow," says the agent, "to satisfy you how familiar I am with that piece of canvas, I shall describe to you every mark on the back of it;" and so he does. The indignant owner demands explanation from the dealer, who, after a long wrangling, offers to abjure the bargain and take back the picture.——Mr. Scott Russell, in a paper in *Good Words* on "The Service of Steam," explains the means used to attain sixty miles an hour. "To go sixty miles an hour, it is convenient to take a pair of 7-ft. wheels. A wheel 7 ft. diameter measures 22 ft. round the rim; that is, if we roll it along a road, it will roll forward 22 ft. in turning once round. In giving it two turns forward it will travel 44 ft. forward. In three turns it will travel 66 ft.; and in four turns round it will go forward 88 ft. These numbers deserve to be remembered. The value of these numbers consists in the fact that each of them represents a railway speed. If a train travel forward 22 ft. in a second of time, it will go fifteen miles an hour. If a train travel forward 44 ft. in a second of time, it goes thirty miles an hour. If it travel 66 ft. a second, that gives forty-five miles an hour. If a train travel forward 88 ft. a second, that is our sought speed of sixty miles an hour. This brings us to the important practical result, that if we wish a locomotive engine with 7-ft. wheels to drive a train forward sixty miles an hour, we must so use our power as to compel these 7-ft. wheels to go round four times in every second of time, and to take the train forward four times 22 ft. a second, and so give a speed of 88 ft. per second to the wheels and the train."

The New Airedale Independent College. This building, erected in the Gothic style, from the designs of Messrs. Lockwood & Mawson, Bradford, will be ready for opening in a few weeks. The new college is in a pleasant location at Heaton.

Miscellanea.

The Toll on Chelsea Suspension Bridge. On the 8th inst. a meeting of the residents of Battersea, Wandsworth, and locality, was held at the Artisans' Hall, Wandsworth-road, to consider the best means to be taken for freeing from toll Chelsea Suspension Bridge and other bridges. Mr. T. A. Bishop presided, and expressed regret that the Bill promoted by the Metropolitan Free Bridges Association had not passed into law. That a Bill for freeing the bridges would eventually pass he had no doubt, but in the meantime the toll which pressed most heavily on the working classes had to be paid. Chelsea Suspension Bridge was somewhat differently situated to the other metropolitan toll bridges. It was built by the Government out of money borrowed from the Public Loan Commissioners, and he believed the receipts from tolls were just sufficient to keep it in repair, so that there was a large sum due to the Public Loan Commissioners, both for principal and interest. In the other bridges the interest of the private owners would have to be compensated. He suggested that the authorities should be asked to throw open Chelsea Bridge at once, leaving the terms of payment to be decided by a Bill, having for its object a general scheme for freeing all the metropolitan bridges. Mr. H. Payne said, at present, owing to the toll at this bridge, Battersea contained miles of empty and half-built houses, while on the other side of the river, owing to the overcrowding, rents were extremely high. It was resolved that a memorial should be presented to the authorities, asking for the opening of the bridge, as suggested by the chairman.

The Charlton Drinking Fountain, Gateshead.—The ceremony of unveiling the drinking-fountain erected in the Gateshead Park, by public subscription, in honour of Mr. George Charlton, J.P., took place on the 6th inst. The fountain, which stands in a commanding position in the park, consists of a central block of masonry, approached by two steps, and crowned with a lofty crocketed shaft, surmounted with a light ironwork finial. At each corner of the upper portion of the fountain is placed a smaller shaft. The lower part of the structure is ornamented on one side by a medallion portrait of Mr. Charlton, inserted in a circular marble panel, placed upon a triangular freestone setting. On the three other sides of the fountain are similar medallions,—two charged with the arms of Gateshead, and the third bearing an inscription. Red granite columns are placed at the four corners of the structure, and smaller columns of similar materials support the fountain-basins, of which there is one upon each side of the erection. These basins, into which the water flows from floriated panels, are of grey granite. The fountain was erected by Messrs. Montgomery & Co., of Newcastle.

Solihull Rural Sanitary Authority.—The fortnightly meeting of the Solihull Rural Sanitary Authority was held on Wednesday, at the Workhouse, Solihull, the Rev. J. Howe presiding. Six tenders were received for the erection of the infectious hospital at Bickenhill. That of Mr. John Bowen, builder, Edwardes-street, Balsall Heath, which was the lowest, was accepted, the amount being 2,045*l.* The clerk (Mr. E. O. Smith) reported that he had communicated with the Local Government Board with reference to the decision of the Solihull Sanitary Authority not to combine with the adjoining Sanitary Authorities in the further joint appointment of a medical officer of health, but to appoint separately an officer for their own district. The clerk said they would remember that they had declined to combine with Birmingham for the purpose of forming a united drainage district. He had received a letter from the Drainage Committee, enclosing a copy of the proposed drainage scheme, which he read. It was decided that Mr. Pritchard, C.E., should report to the Board as to the advisability of joining with Birmingham to carry out the scheme.

New South Wales Academy of Art.—Since the purchase of the works recorded in the *Builder* of last week for the National Gallery at Sydney, the Committee of Selection have purchased the fine picture of "Chaucer reading his Poems to John of Gaunt," by F. Madox Brown (this is some 10 ft. by 14 ft.), a Pyne, a Leitch, and a De Wint. It is evident, therefore, that this enterprising colony does not intend to neglect art.

Good Advice.—The *World*, speaking of the summer life of Ilfracombe, says,—"There is no reason why the existence of Ilfracombe should come abruptly to a pause when the winter sets in. It might be such a town on the north as Torquay is on the south. The town, probably, has a Board, or can boast of some influential individuals, who surely might do something to brush up the place,—make a good carriage-road from the station, for instance; purchase the Capstan Hill, and lay it out properly with ornamental walks; build on some of the splendid vacant sites really good houses; have some good schools for residents. This is the way in which watering-places are developed when there is a happy absence of the normal sluggishness of the local mind. Ilfracombe has an excellent and very cheap market, the absence of which is a loss to the residents of Torquay; the climate is of the same temperature, but with greater changes, and being more bracing is better adapted for hopeful cases of phthisis. It might have a prosperous future before it, but it is hardly likely that such a future will be developed."

Central London Throat and Ear Hospital.—This new hospital, which is situate in the Gray's-inn-road, is now partially completed. Externally the building is simple, but substantial. The upper portion is of plain brick, with Portland dressings. The lower portion is relieved by glazed tiles. All the passages, waiting, consulting, and operating rooms, have a dado of 4 ft. 6 in. high of blue and white glazed tiles of Dutch pattern. The walls above have been finished with a permanent coloured cement, under the direction of the architect, Mr. Ernest Turner. The doors and window-fittings are for the most part of oak. The ground-floor comprises office for issue of letters to out-patients, dispensary, committee and secretary's rooms, waiting-halls, consulting-room, examining, operating, inhaling, and electric rooms. The wards are not yet finished, but immediate provision will be made for from six to ten beds. The hospital relieves annually about 4,000 patients.

New Baths and Washhouses for St. Pancras.—Some time ago the Vestry of St. Pancras decided upon building additional baths and washhouses for the accommodation of the inhabitants of the southern part of the parish, and the site of the Old Fitzroy Market, Tottenham-court-road, was secured from the London School Board at a cost of 5,030*l.* A large number of designs for the new building to be erected on the site were sent in, which have been considered by the seven commissioners of baths and washhouses appointed by the Vestry, assisted by a committee of the Vestry, the result being that the designs sent in by Mr. Gundry, of the Adelphi, Strand, were selected. Mr. Gundry will be the architect of the new building, which he estimates will cost 21,000*l.*, in addition to the 5,030*l.* for the site, which has already been paid.

Value of Land in Sunderland.—The compensation case of Carter *v.* the North-Eastern Railway Company was concluded at Sunderland on the 6th inst. The claimant's witnesses, Messrs. Tillman, Middlemiss, Porteous, and Barnes, averaged 3,580*l.* as the value of the property, against which the Company's witnesses, Messrs. Wardropper, M. Reed, and Raine, averaged 2,004*l.* The jury gave a verdict for 3,300*l.* As showing the great increase of late years in the value of Sunderland property, Mr. Carter in 1867 paid 760*l.* for what he now gets 3,300*l.* The house, No. 40, Union-street, which forms part of the block, was the birthplace of Mr. Tom Taylor, the well-known dramatic author.

Huntingdon.—Cromwell House Estate, said to be the birthplace of Oliver Cromwell, has been purchased by private contract for 3,500*l.*, apparently (says a local paper) for speculation, as part of the estate is already announced for sale in building lots.——The work of restoration at St. Mary's Church is in full progress. The north-aisle roof has been taken down. There were the remains of two roofs. The old bells have been removed, and Mr. M. E. Maile, one of the churchwardens, has presented a new peal of eight bells. The dates on the old bells were 1510, 1679, and 1737. One, dated 1833, was the gift of Sir John Arundel.

Aquarium and Winter Gardens for Rhyl. The corner-stones of a new aquarium and winter gardens at Rhyl were laid on the 9th inst. with Masonic honours, by Sir Watkin Williams Wynn, Sir Pyers Mostyn, and Mr. Osborne Morgan, M.P.

New Railway Buildings at Derby.—Within the last year the Midland Railway Company has erected in Nelson-street, Derby, two huge blocks of buildings, to accommodate two working departments, the accountant's and the goods manager's. The buildings in question possess each four flats, with thirteen spacious offices upon each flat, and also a powerful hydraulic lift. Opposite to the structure set aside for the accountants was a row of dirty dwellings of railway *employés;* but these have been "improved off," and their site is now occupied by an extensive wing in connexion with the company's well-known Midland Hotel.

A Meteoric Body.—A thunderstorm, unaccompanied by rain, occurred at Windsor about half-past five o'clock on Thursday in last week, and it is asserted that a meteoric body, apparently the size of a small cannon-ball, came over St. George's Chapel, Windsor Castle, from the north, and descending towards the roof of the residence of Captain Gee, the military knights' quarters, between the Henry VIII.'s Gateway and Garter Tower, burst. It knocked off a portion of the stone parapet, tearing the creepers in front, and withering a great portion of them. There is reason to believe it was an ordinary discharge of electricity.

The Cathedrals of England and Wales.—Messrs. Beynon & Co., of Cheltenham, have published on one large sheet views of the Anglican Cathedrals of England and Wales; grouped around St. Paul's. These are twenty-eight in number, and give a good idea of the general effect of each of these well-known buildings. We cannot go so far as to say that architects will be satisfied with it; too little knowledge of detail is shown for that; but it makes an interesting picture, and will be well in place in any clergyman's library, from Curate to Primate. Mr. W. H. Beynon, jun., did the work.

Lyme Regis.—We have to acknowledge a letter from Dr. Skinner, in which he says,—"I am far from wishing to slur over the defects of Lyme, but am most anxious to see them removed; nor do I think my letter, if honestly read, would convey such an impression; in fact, I was anxious not to state anything which could lay me open to the charge of inconsiderate writing. I inclose you a cutting from a local paper of September 5th, from which you will find that all visitors to Lyme do not find the same fault with it as 'Solo.'"—[The observations inclosed, on the "Beauties of Lyme," do not touch the matters in question.]

The Wrexham Art Treasures Exhibition.—The art treasures collected under the roof of the extemporised building at Wrexham have had a worthy exponent in the person of Mr. Forbes Robertson (of the *Art Journal*), who, on Monday afternoon, lectured on the "Old Masters of the Continental School," with special reference to the magnificent specimens that adorn the gallery; also on Friday evening on "The Modern and British School of Art." The exhibition can now be seen at its best, the collections being better classified than at first, and many articles of interest and beauty have been added.

Photographic Exhibition.—The annual exhibition arranged by the Photographic Society of Great Britain is now open in the Water Colour Gallery, Pall-mall East, and consists of 350 specimens, mostly admirable. Photography made such rapid strides at first that its movements now seem slow. The chief advance shown in the present exhibition, as in some previously, is in the direction of enlargements. There are portraits, life-size, of Mr. Millais, Mr. Ruskin, Dr. W. H. Russell, and others, which are very noticeable.

Sir R. Peel's Statue for Westminster. The late Matthew Noble's statue of Sir R. Peel was successfully cast at Messrs. Cox & Son's Bronze Foundry at Thames Ditton a few days since, and it is anticipated that it will be completed and placed in position by the end of the year. The model for this statue is almost the last work on which Mr. Noble laboured, as he spent several days at Thames Ditton putting the finishing touches to it a very short time before his death.

Cost of American Architecture.—It is stated that the amount expended for United States custom-houses and post-offices, mints, and hospital buildings, from 1789 to 1860, was $28,640,170; while since 1860 $41,269,746 have been expended.

Rugby School.—A meeting of the governing body of this school was held on the 7th inst. The only business was the opening of the tenders for the new subordinate schools to be built, from which the present school is to recruit its ranks when the scholars attain a certain standard of knowledge. The tender of Mr. Claridge, of Banbury, was accepted, and the work was ordered to be commenced at once. Mr. Clarke is the architect.

"National Association of Operative Plasterers."—Mr. M. J. Fitschen sends us an ornamental certificate of membership designed by him for this body. We took occasion, some time ago, to point out the architectural errors he had committed in a similar production, and instead of being cross he was thankful, and says he has tried to do better in consequence. He has greatly improved upon his first attempt.

Fire at a Builders' Yard.—On the morning of the 7th inst. a fire broke out on the premises of Messrs. J. & F. Coleman, builders, Nelson-street, King-street, Borough, resulting in great damage to property. A number of men are thrown out of employment through the disaster, and to compensate them for the loss of their tools a subscription has been set on foot.

Accident at the Queen's Theatre, Long-acre.—William Merrick, aged 27, one of the property men engaged at the Queen's Theatre, has been killed in a remarkable manner. The poor fellow had descended into the cellar, and for some reason or other purposed rising by a trap, which he released himself, when in his ascent his head was caught, crushing his skull, and causing instant death.

St. Helen's Town Council.—At the last monthly meeting of this council the mayor (Mr. James Radley) presiding, the council proceeded to the election of a water engineer, at a salary of 300*l.* per year. There were sixty applications for the appointment, which the water committee went carefully through, and finally selected Mr. D. M. F. Gaskin, of Liverpool, whom they recommended to the council.

Masonic Archæology.—Two Newport (R.I.) antiquaries, who have been studying the old stone mill, give it as their opinion that it was built by Freemasons at an early date. One reason assigned is that the windows are in the east, south, and west, with none in the north side of the structure. They judge, says the *American Architect*, that it was a Masonic temple built by the Norsemen.

New Vicarage at Ashted.—The foundation-stone of a new vicarage, in connexion with St. James's Church, Ashted, was laid on the 5th inst. The new building will be a substantial red brick building in the Domestic Gothic style, costing about 3,000*l.* The architect is Mr. F. B. Osborn, and the builders Messrs. Jeffery & Pritchard, all of Birmingham.

New Sewage Works at Alfreton.—A meeting of the Alfreton Sanitary Committee was held on the 7th inst., when it was resolved "That the whole responsibility of carrying on the sewage works and contract rest with Mr. Shaw, of Derby, and that he be paid remuneration at the rate of 7½ cent. on the amount of the contract."

The War in the East.—Mr. Wyld has issued a very good map of Turkey in Europe, coloured, and referred to ethnologically. It serves to show, what many people appear to be ignorant of, the great extent of the nationalities involved, the largeness of the interests at stake, and the relative positions of the great fighting powers of the Continent.

Newcastle Antiquarian Society.—On the 6th inst. the members of the Newcastle Antiquarian Society held their monthly meeting in the Old Castle, when an interesting paper was read by Mr. Holmes, C.E., on the Roman Bridge at Chollerton. Mr. John Clayton, of the Chesters, occupied the chair.

The Norwich Skating-Rink is to be opened on Tuesday, the 19th inst.

TENDERS

For reinstating stable buildings in Sermon-lane, Islington. Mr. T. H. Watson, architect:—

Batchelder	£593 0 0
Ebbage	518 0 0
Marr	518 0 0
Lumm	510 0 0
Carr & Sons	510 0 0
Keyes & Head	510 0 0

For drainage of Highbridge. Mr. A. W. Estridge, engineer. Mr. W. L. Gaskell, clerk of works:—

Brock & Bruce	£4,100 0 0
Coker	3,910 0 0
Bugbird	3,450 0 0
Martell	3,212 0 0
Mitchell	3,197 0 0
Bisset	3,033 0 0
Frayne, Bros.	2,947 0 0
Crokam	2,706 0 0
Haynes	2,400 0 0
Lean	2,345 0 0
Hayter (accepted)	2,260 0 0

For schools for 160 children, with teachers' residence attached, for the Stanton School Board, Suffolk. Mr. John T. Woodard, architect:—

Adams & Cawley (accepted)	£1,133 0 0

Accepted for the erection of the Holy Croft Board Schools, caretaker's house, cookery instruction-room, covered playgrounds, outbuildings, and boundary-walls, Keighley. Mr. George Smith, architect. Quantities supplied:—

Crabtree, Bros., and Sugden (masons).
Demaine (joiner).
Harrison & Sons (plumbers).
Mitchell (plasterer).
Hill & Nelson (slaters).
Tillotson & Harrison (painters).

Total	£3,704 0 0

For rebuilding Nos. 47 and 48, Leadenhall-street, for Mr. W. Conolly. Mr. R. P. Notley, architect:—

Perry & Co.	£3,510 0 0
Little	3,434 0 0
Kirby	3,420 0 0
Radkin	3,328 0 0
Morter	3,323 0 0
Browne & Robinson	3,285 0 0
Bangs & Co.	3,260 0 0
Hart	3,248 0 0
Falkner	3,185 0 0

For new boys' schools, East-street, Greenwich, for Roan's Charity. Mr. Robert Walker, architect:—

Stamp & Bowtle	£5,738 0 0
Grieve & Littlejohn	5,436 0 0
Coles	5,188 0 0
Marsland	4,994 0 0
Smith	4,948 0 0
Sawyer	4,835 0 0
Bayes, Bros., & Allen	4,771 0 0
Hart	4,742 0 0
Jerrard	4,731 0 0
Tongue	4,711 0 0
Kilby	4,672 0 0

For the construction of main reservoir and valve wells, for the Water Supply of Ripley, Derbyshire. Mr. R. Argile, jun., engineer. Quantities supplied:—

Coupe & Clower	£649 0 0
Knighton	552 16 0
Wain (accepted)	330 10 0

For a block of shops and offices to be erected on the site of St. Antholin's, Queen Victoria-street, for Messrs. Standing & Marten. Mr. J. Ebenezer Saunders, architect. Quantities by Messrs. Osborn & Russell:—

Baker & Sons	£20,000 0 0
Trollope	18,983 0 0
Gammon	18,800 0 0
Colls & Sons	18,769 0 0
Tarrant	18,647 0 0
Merritt & Ashby	18,510 0 0
Conder	18,490 0 0
Ashby, Bros.	18,382 0 0
Newman & Mann	18,169 0 0
Perry & Co.	18,133 0 0
Bland	17,987 0 0
Jackson & Shaw	17,929 0 0
Brass (accepted)	17,478 0 0

For system of sewerage for workmen's cottages at Percy Main, for the Duke of Northumberland. Mr. J. P. Spencer, engineer:—

Contract No. 1 (*exclusive of Ironwork*).

Harvey	£1,494 5 0
Bell	1,425 10 0
Smith & Sons	1,395 0 0
Walker	1,335 0 0
Wood	1,212 0 0
Kennedy	1,128 15 0
Smith	1,127 0 0
Marshall	1,141 6 0
Craig (accepted)	1,133 0 0

For system of sewerage for workmen's cottages at Spital Dene, near Tynemouth, for the Duke of Northumberland. Mr. J. P. Spencer, engineer:—

Contract No. 1 (*exclusive of Ironwork*).

Quin	£635 0 0
Marshall	621 10 0
Welton	560 0 0
Craig	520 0 0
Bell	493 8 0
Wood	490 0 0
Walker	454 18 0
Moulton	448 0 0
Kennedy (accepted)	421 0 0

For new filter-beds at the Salt Water Works, North Shields, for the borough of Tynemouth Urban Sanitary Authority. Mr. J. P. Spencer, engineer:—

Simpson	£2,005 9 0
Atkinson	2,001 6 0
Hannah	2,000 0 0
Hunter	1,998 5 0
Bell	1,898 3 0
Donkin	1,850 0 0
Jackson	1,620 0 0
Smith	1,382 10 0
Hall (accepted)	1,337 5 0

For pair of semi-detached villa residences, Madeira-road, Ventnor, for Mr. A. Hill. Mr. Francis Newman, architect. Quantities by Mr. J. Newman:—

Moses & Wallder	£1,850 0 0
A. & A. Newnham	1,840 0 0
Coleman (accepted)	1,751 18 8

For the erection of a new house Over Hill-road, Dulwich, for Mr. Morley. Mr. C. Wilshire, architect:—

Buck (accepted)	£590 0 0

The Builder.

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House and Home in the Heart of Town.

IN many parts of India at the present time may be observed social phases which serve to illustrate the domestic life of Mediæval Britain, as it is now known to us from historical and antiquarian researches. Among the plantations of Lower Bengal an Englishman's house is often isolated for a radius of thirty or forty miles from neighbours of the same race. The master, lord sometimes of a domain extending over 20,000 acres, dwells among a crowd of retainers. Butcher, baker, gardener, tailor and milliner, mason, carpenter, and smith, villages of tenants, and troops of labourers, surround the flat white house, in which, if its owner be respected, many a local dispute is adjusted by the great sahib. He is the centre of a social system, and numerous families minister to his wants. The stranger of his own nation who passes over his land is entertained as a welcome and valued guest. The daily repasts are partaken of almost in public. The different rooms in the house open into each other, and the doorways are often only closed by hanging drapery. The kitchens and offices are in a separate building at a distance from the house; but in the latter, in corners and alcoves, servants lie at night, sleeping—yet alert at the call of their master. At festive gatherings, when such houses are usually full of visitors, the number or the accommodation of dependents is as little important as it probably was in the castle of a feudal baron.

When in this country the like possession of a shelter implied to the majority of people almost similar dependence, the houses of the religious communities were school, workshop, and home, not only to different sorts and conditions of men, but also to their wives and families. Within the abbeys and priories lived bands of workers in every useful art. When these men threw off direct ecclesiastical control and set up for themselves, the monastic discipline to which they had been accustomed was preserved in the form of trade corporations; and the artistic traditions acquired within the walls of the cloister were perpetuated outside their old masters' domains. Houses spread around the hill upon which stood a fortress; the valley where a monastery lay embosomed became dotted with gables. As a rule each house was arranged for the accommodation of a single family; but before the sixteenth century, and, indeed, for a long time after, a family was an agglomeration of persons not necessarily of the same blood. Soldiers took service under the banner of particular nobles, and formed part of their retinue. In families of rank the sons of gentlemen—pages or apprentices of fashion—were attached to my lord's service; and young damsels of birth assisted at the toilette of my lady. The merchant's apprentice lived in his master's house; he did all the work of the shop, both professional and menial, and this custom still prevailed during the early part of the present century. Less than 150 years ago country squires sometimes kept a chaplain. A tutor is a dependent of recent times, and governesses still form part of even middle-class households. It is needless for our purpose to particularise the details of social development and change. A significant relic of early manners may yet be seen in the parlour of many a house, where a single comfortable arm-chair, surrounded by subordinate ones, marks the master's seat—to use which neither wife, dependent, nor even guest aspires or is invited.

To-day, however, men and women with education enough to fit them for posts in an office, a warehouse, or a shop will not take any kind of service in even great households. People of humble belongings aspire to work out life by themselves or more correctly in the company of wife and children alone. The nation recognises the desire for independence evinced by its immediate servants of the army and navy. Soldiers after a short term of service lodge at home; the Greenwich pensioner is not now subjected to the discipline of a Government almshouse. Nor are householders, at least in London, indisposed to join in the attainment of a self-same object; their horses and carriages, their plate, linen, and other similar articles are often hired. Common material objects are so modified as to individualise social comfort. Extensive ramifications of rooms and domestic offices are no longer required. Instead of a few large houses many small ones are wanted, and they must be relatively as well built as the old ones they supersede. The modern problem is, How to lodge the greatest number in separate tenements most profitably to all concerned? In the crowded centre of a metropolis the land is too valuable for small houses; it must be covered with lofty buildings of many stories; and since it is an accepted fact that the lower ones must be devoted to commercial purposes, only the upper portions remain available for residents. How such buildings ought to be arranged has been shown during the course of this century in the principal cities of Europe, and few Continental architects would now think of discussing a problem which in the English capital still remains unsolved.

In the majority of instances a Londoner lives out of London. He may be found in what he is pleased to distinguish as "town" an hour or so before noon and an hour or so after. He returns to his residence "out of town" to dine and sleep. In this respect the example set by the merchant and the professional man is now followed by the shop-owner. In the City the last-named can lease simply a shop; and although in the metropolis he is often compelled to take a whole house, he uses only the ground-story, except in rare cases where he requires large warehouse-room. The heart of town is thus fast becoming a place of business only, and is already principally composed of houses let out in shops, business-offices, and extemporised dwellings. The most fashionable and expensive squares are hemmed in by streets entirely devoted to commercial purposes. Mayfair as a residential quarter is decreasing in area year by year. To the west of Baker-street there is still a large neighbourhood devoted to private residences; to the west of Portland-place another; near the Foundling Hospital there are a few squares lined with excellent family homes. But the great mass of houses in London proper is inhabited by the poorer middle-classes, and in such neighbourhoods as those of which Clare-market is one centre and the Seven-dials another the very poorest of the population find comparatively expensive dwellings. This would be no detriment to the heart of town were the great mass of houses fitted to receive the tenants who occupy them, but on the contrary they are totally and in every respect unfitted for the purpose to which they are now devoted. This great mass of houses is made up of streets once residential and once even fashionable resorts, but now irretrievably and for ever fallen,—because by the London system of house arrangement a residential neighbourhood once deteriorated cannot recover itself even by re-building. Nor in the very heart of town does the completion of a new street improve the social character of the neighbourhood, for it brings neither occupiers of houses nor residents in the English acceptation of the term. On the contrary it brings the class and description of tenement already existing around it—the house inhabited, two or three generations back, by one family and converted by the present generation to the uses, not the wants, of several families. This is not difficult to describe. While, at the West-end, houses originally the residences of noble and wealthy families have become clubs or public offices, most of the once stately houses of Great Ormond-street, Bedford-row, and Lincoln's-inn-fields are now occupied by business people, who hold floors or even single rooms, and the smaller houses in less important and adjacent streets are full of lodgers. Within a certain radius of Temple-bar the residential population is almost entirely composed of lodgers; that is, of persons (families or groups) who occupy a portion of a house, a floor, or even a single room. The householders, that is, those who occupy an entire house, have long retreated to Kensington, Bayswater, or Belgravia.

In residential neighbourhoods the fashionable street, at a certain period of its prosperity, is always a prey to a species of attack peculiarly English in origin and character; and this, the beginning of a course of disintegration to which it is always at some time or other subjected, is often singularly fatal. The thin end of the social wedge which ultimately destroys it is

perhaps a physician. He obtains quietly, and after much patience, a house situated at the corner of the subsidiary mews, which is an inevitable adjunct to a fashionable residential street, but he wisely makes no sign by either door-plate or special bell. In the course, perhaps, of years, and we write with caution, he is followed by another, less fastidious and circumspect, who takes an adjoining house; but who, using only the ground-floor rooms and a demonstrative street-door, secretly lets the "upper-part-of-the-house" to a noble bachelor or a South American legation. A general practitioner is sure to follow; and then—so rapid is descent upon the steeps of fashion—some house blooms into a parti-coloured threshold, an olive-green door, and into windows of "lead-lights," announcing the premature arrival of a thriving architect. The advent, at no distant date, of an æsthetic upholsterer—artist *pur et simple*—completes the doom of the street. Thus, one class invades another class, and assaults it in its most susceptible point—its home. An attempt at resistance is sometimes made, but it is slight and of no avail. The wounded householder—whose aspiration it is to live far away from any trace of the means of livelihood—flies to another street further from the heart of town, only, however, to incur, in course of time, the same rude shock, and to continue his flight to the suburbs.

"*La maison, c'est le vêtement de la famille*"; and the retreat of one family is followed by the arrival of another. But this is just what does not occur in central London. The discarded vestment is too rich or too plain to please the new comer; or more often it does not fit the sort of person who steps in to fill the void left by the fugitive. The coat is cut up,—divided like Joseph's garment among several people,—and once in pieces remains an effectual covering to none.* The house, perfect in itself, built for the special accommodation of one family or group, becomes tenanted by several groups, who, if they carried out co-operative housekeeping, might perhaps find an advantage in such a division of tenements. But this they neither attempt nor desire. The tenants try to make the different fragments of a house each a home in itself,—that is, each fragment independent of the other. This social deterioration does not, as a rule, imply depreciation in the value of houses as property. Wherever business is extensively carried on, a house of four stories, all told, which would obtain as a single private residence a rental, say, of 150*l.* per annum, brings in an income of almost double that sum if it be let by floors or rooms. It is, therefore, to a leaseholder's interest to get rid of the family occupying an entire house, because he can let it in fragments at an enormous commercial advantage. These fragments become, at the street level, shops; on the first and sometimes second floors, offices; and on the upper floor, lodgings. Near Charing-cross such residences of three rooms, bare and unfurnished (on the second and third floors), fetch from 50*l.* to 100*l.* per annum. Near Bond-street similar sets of rooms bring in from 80*l.* to 130*l.* per annum. An inquiry into the total amount realised by the numerous speculators who, in the vicinity of the great clubs, let single rooms to bachelors would probably show a profit upon their original outlay for rent and taxes of more than 100 per cent. As far back as 1855, two houses in Blackfriars, which were worth together 44*l.* per annum, returned under the careful direction of the middleman a yearly rental of 180*l.* Ten years ago it was estimated by a competent authority that the miserable tenements in St. Giles's cost the occupants—per 1,000 cubical feet—as much as the owner of the land on which they rested would pay for a luxurious mansion in the most fashionable London square. Since then, house-rent has risen higher; and until such houses fall, at the expiry of their leases, into the ground-landlord's possession, the majority of them will remain as they are, and as they have been, for more than the last quarter of a century. None of the speculators connected therewith would gain anything by attempting to improve or alter them; certainly not the landowner, whose land, while the lease endures, will not increase in value by any building addition or amendment; not the leaseholder, who will have to give up the land, and all that stands upon it, at the termination of his lease; not the nominal householder, who sublets at a large profit, and whose rent would probably be raised if the building were improved. Thus the Englishman's "castle" follows what may be called the natural law of native bricks and mortar. Some, perhaps, may think it a beneficent one; for, as grade after grade of the elevated community disappears, inferior classes come upon the scene, and in their own fashion fill the vacant houses, still at a profit to the owners. It is, however, anything but a beneficent, or even an economical system. It is attended with sanitary and social inconveniences of every description; and the profit already obtained by dividing one house into several extemporised dwellings might under another and more methodical system be double what it is, not only to the owner of the house, but also to the ground-landlord; while the lodgers, at present put to all sorts of shifts, would be enormously benefited.

The decay of a residential neighbourhood is always accompanied by the spread of what is known as a "slum"; and in this particular Central London offers an infinity of choice. In the small hours of the morning the member of Parliament, the club frequenter, the press-man,—from Westminster, Pall-mall, or Fleet-street,—often trudge to the circumference through labyrinths of small narrow houses, some of three stories, others of four, and a few even of two stories only. There seems to be no method in the mad speculation by which alone domestic London is built. In many parts ground is wantonly wasted; yet the lateral extension of the metropolis is so enormous that economists may well inquire if the most be made of the land it covers. That the most is not made of it even in the crowded localities, is certain. There is the example of Paris for comparison and illustration. From time almost immemorial the French capital has been enclosed with some description of wall, and it has, therefore, been partly compelled to increase vertically,—that is, extra stories have been added to the houses. As in Edinburgh, where the peculiarities of site rendered the same expedient necessary, people built over instead of alongside their neighbours. Of course, while the town remained of small circumference, it would have been better to have added new houses rather than to have raised old ones; but when such proportions as those of modern London are attained, it becomes a different thing. It may be argued that an area of twenty square miles covered with houses of three stories such as those in London, or of ten square miles occupied by houses of six stories, such as those in Paris, is nearly identical in the end, because the French houses are constructed upon the horizontal system of plan, and the English ones upon the vertical mode of arrangement; and that although the French or Continental system represents economy of space, it implies a greater chance of polluted air and of overcrowding than the English method. This, however, is not the case, because houses on the French plan must perforce be more strongly built, stand upon more open sites, and in broader streets, than ours. It should be remembered that, less than ten years ago, the rough average of inhabitants per house in London was eight to *thirty-five* in Paris. It is said now to be about six souls per house in the English capital; but statistics of this kind are, we grant, often entirely deceptive. The rate of progression at which the metropolis has increased of late years is, however, perfectly clear. We have but to refer to our own pages to show that in two years alone—1862 to 1864—164 miles of streets and squares were made in London, or, at least, in what a short time ago would have been called the outskirts of the town. Happily this did not continue, or London streets would have been lengthened some 82 miles every year. Not very long ago the average number of houses built annually was about 16,000, and in 1874 nearly 8,000 were built. "The total number of houses built from 1849 to 1874—that is to say, in a quarter of a century—is 270,327, giving an average of 10,813 per annum."* The economical distribution of buildings of all kinds in the heart of the town is, therefore, a point of the utmost importance to freeholder, leaseholder, householder, and to the public generally. Many families, who, years ago, retreated to what were then suburbs, have returned in desperation to the centre; for the green fields and villages, which existed at the period of their flight, are now irrevocably covered and absorbed.

London, neither metropolis nor capital in the ordinary meaning of either term, is become an ever-extending province of buildings; and, in its centre, it has been the invariable rule for many years—for half a century, at least—for the vast majority of the small, ill-built houses, each intended for the accommodation of one family, to be occupied each by two, three, or more groups of people. Yet, in the new houses, building speculators, almost without exception, continue to superpose two or three rooms over two or three rooms, with a kitchen below the ground level, and two servants' bedrooms in the roof. Like the old, the new building is almost invariably arranged for the home of a single family; and it is taken for granted that the several groups who must inevitably inhabit it will share not only the house but the home,—which never by any chance takes place. We are not referring here to those classes of the population in Central London for whose benefit a recent Act of Parliament was passed, and is now in operation. We urge the remodelling of the ordinary house,—of the "speculating builder" class, and of the type usually to be found on the London estates of noblemen,—with a view to accommodating those numerous families and groups who at the present moment are compelled to share indiscriminately a house originally built for the use of a single family; and who, perforce, inhabit "lodgings," which possess all the disadvantages, and none of the advantages, of those private and economical residences abounding in the heart of such capitals as Paris, Vienna, St. Petersburg, Brussels, and Berlin.

THE ARCHITECTURE OF THE THAMES BRIDGES.

A MONOGRAPH on the subject of the crossing of the Thames, whether by ferry, by bridge, or by tunnel, would be a very valuable addition to the library of the architect and of the civil engineer. Nor would the interest of such a work be exclusively professional. If the subject were adequately handled, it would have charms for the historical student, for the archæologist, and for the lover of general literature, no less than for the student of the constructive arts. The reader would be bidden to glance back to that period, so early in our own history, and yet so recent in the history of the world, when a ford across the Thames, defended, in some manner which it is now difficult altogether to understand, by stakes, was attacked and carried by Julius Cæsar, on his march towards the British capital at Verulam. It would describe the primitive vessel in which, in pre-Roman times, the Britons navigated their abundant streams,—namely, the coracle, which is to be found at the present day on the Towy and other Welsh rivers in the exact form in which it swam on the Thames in the days of Cæsar. It would tell of the listering of the salmon on the sandy reach of silvery water that washed the island afterwards chosen as the site of the Abbey Church of St. Peter—then Westminster. It would tell how, in that stirring time when Christendom had first awakened to the possibility that the world might last for another thousand years, men began to build bridges, as well as churches, convents, and castles. Domesday Book had just been compiled; Peter the Hermit was stirring Europe by his wild self-imposed mission; the Crusaders were on their way to the Holy Land; the red king was rearing the noble

* See p. 423, *ante*.

* Any one who takes the trouble to look, even carelessly, through our thirty-three volumes will stumble at short intervals upon letters from correspondents, couched often in similar language, referring to the subject of house accommodation in the centre of London. Fifteen years ago, Mr. E. B. Paxton wrote to us an admirable letter. He said:—"There are in London hundreds of streets consisting of houses which were apparently intended when built for the residence of one family or whatsoever station, that are now occupied by many. Houses planned for the accommodation of gentry or of wealthy tradespeople, when, in the course of time, fashions set out for new localities, become, like old clothes, the shabby gentility of gradually lowering grades, until they sink into back slums. . . . . These houses can hardly answer the purpose of any of those succeeding the first-class occupiers; and yet one would think, considering the well-known fact that a large amount of rent is collected from tenants, even of the poorest class, that they were all worthy of consideration, in a commercial, if not a social or humanitarian point of view. In the intermediate steps of their decadence, however, these structures sometimes fall to the lot of a respectable class of tradesmen of small means, or of mechanics, in which tenure they often remain. These holders frequently let out a portion, in some cases nearly all the rooms in pairs, or even singly, reserving to themselves, perhaps, the ground-floor. It would be useful to know how many houses in London entertain lodgers, probably were the figures at hand, they would create great surprise. Yet, with slight exception, there are no houses built to afford accommodation to lodgers. . . . . Many 'happy homes of England' are placed one above another, in a manner which almost belies our reputed love of domestic privacy, when we consider how easily they might be separated."—*Builder*, 1861, p 148.

Long before this, however, we had ourselves again and again traced the gradual decadence of parts of the town in this way; particularly while continuously examining its "slums" in a manner that up to that time had not been elsewhere attempted.

roof of Westminster Hall; a season of unusual scarcity was following one of great mortality in England;—when the first stone bridge was erected over the Thames to replace the wooden edifice that had supplanted the ancient ferry. A timid and ponderous structure was that ancient bridge. It is a marvel that the Roman masters of the country had impressed on its inhabitants so little of their own magnificent genius for public works. Down to the memory of those who are not yet very old men, the bridge that, with various changes of fortune, was finally replaced by Rennie's noble work nearly half a century ago, occupied nearly as much waterway by its piers and starlings as it kept open by its small and ill-constructed arches. London Bridge was a combination of street, defence, chapel, drawbridge, and waterworks, and formed at once one of the quaintest relics of the past, and one of the most inconvenient makeshifts of the time when the nineteenth century was young.

A monograph on the bridges of the Thames, if even it did not extend higher than Windsor, would contain descriptions of structures of the most various design, and of the utmost difference in cost. The statement of the actual cost of each bridge or tunnel would be a necessary and most valuable accompaniment of the description of the works in question. Thus Walton Bridge was acquired by the committee formed for promoting the free passage of the Thames, in 1870, for the modest sum of 7,000*l*. It is not, of course, to be assumed that this represents the prime cost of the bridge; but it is the price at which it was sold by the owners, including the right of toll. The Thames Tunnel, on the other hand, cost nearly 455,000*l*.,—a not extravagant outlay for that noble work, considering the great physical difficulties attendant on an attempt to cross the bed of the river at so small a depth below low-water mark. Mr. Barlow's little tunnel, wisely driven through the solid clay, was estimated at the small sum of 12,000*l*.; and there is no doubt that a full-sized tunnel might be carried through the same stratum for a very moderate cost. The difficulty, from a financial point of view, lies not so much in the work itself, as in the approaches. To provide adequate approach to either bridge or tunnel is a task quite as serious as the actual crossing of the river. Thus, out of the sum of 1,050,000*l*., which Waterloo Bridge cost, only 565,000*l*. were spent on the architectural structure. The balance was the cost of land and approaches. London Bridge cost about 22,000*l*. less than Waterloo Bridge. In these two noble works we have examples of approaches of the best practicable character. The idea of spanning Thames-street by a land arch has been one of the main causes of the architectural beauty which Sir John Rennie was able to secure, as well as of the unrivalled convenience afforded for traffic. Owing to the excellence of its approaches, London Bridge attracts and retains a large proportion of traffic which, as mere matter of distance and of plan, might be expected to cross either Southwark or Waterloo Bridge. The requirements of public traffic are illustrated in a remarkable degree, by the proportionate use made of these three bridges, as well as of those of Blackfriars and of Westminster. But of these five important structures, two are comparatively unused. The reason is not far to seek. Southwark Bridge, which, as a matter of position alone, is perhaps only second to London Bridge itself in importance, is comparatively inaccessible, owing to the steep pitch at which it rises from the Surrey side. The hindrance thus caused is so great, and so unavoidable in case of heavily-loaded vehicles, which, in their turn, check the speed of the lighter conveyances, that it proves more convenient to follow a better section, although at the cost of increased distance, and risk of delay from block. In the case of Waterloo Bridge, on the other hand, the half million spent on the approaches has been well laid out. The mechanical arrangement is admirable. But here the economic obstacle comes in, and the toll both on man and beast imposed at Waterloo Bridge has acted quite as prejudicially, as far as the utility of that structure to the public is concerned, as the steep approach to its iron neighbour. The result is most prejudicial to the neighbourhood. Waterloo Bridge, at present, is chiefly used as a kind of back door to the London and South-Western Railway. It is less irksome to passengers, driving from and to the Waterloo Station, to pay their 2d. to the warders of this noble level viaduct, than it is to drive round by Blackfriars or by Westminster. And the course of the goods traffic is to a great extent determined in the same way. For this reason, instead of that thriving, active trade which occupies every window along the great unimpeded thoroughfares, we see the sleepy, timid, questionable sort of business that betakes itself to a suburban home, for the sake of economy in rent, occupying the line of this great national artery. If the property, say, from the Strand to the South-Western Station were all syndicated together, under one intelligent management, we very much question whether it would not pay such a management to purchase the right of toll, and to throw the bridge freely open to the public, for the sake of the rise of rent, and increase of value, that would at once accrue to the house property along the line of route.

So much has already been spent on the metropolitan bridges, that it is inconceivable how the City and the public at large can be contented to rest until the best is made of the existing structures. At certain intervals of time the question of widening London Bridge is brought forward again and again, and discussed with as much acerbity and with as much disregard of common sense as if the leading features of the case had never been distinctly stated. The want of proper approaches to Southwark Bridge has thrown so much traffic on the line of London Bridge that matters would be very little (if at all) mended by doubling the width of the latter. The block would, in that case, take place all the same, though it might be transferred, to some extent, from the immediate vicinity of the bridge to the least convenient parts of the approaches.

Since the beginning of the present century the Corporation of London have spent 1,617,164*l*. out of their Bridge Estates for the maintenance of old London Bridge, the erection and maintenance of new London Bridge, the purchase and maintenance of Southwark Bridge, and the erection and maintenance of Blackfriars Bridge. To this sum must be added an outstanding debt of 615,000*l*. charged upon the Bridge Estates of the Corporation for the same purposes, making a total of 2,232,164*l*., or say two millions and a third sterling. The form of the return made by the Corporation does not allow us to distinguish exactly the cost of the two latter bridges, as one of the sums yet due is said to be in respect of rebuilding Blackfriars Bridge and the purchase of Southwark Bridge. The average annual expenditure in maintenance may be worked out as follows:—London Bridge, for seventy-five years (old and new), has cost 1,345*l*. per annum; the cost down to 1840 having been taken regularly at 1,000*l*. per annum. Blackfriars Bridge, from 1834 to 1868, cost an average of 5,060*l*. per annum in maintenance; the expense of supporting the old bridge having risen to 14,960*l*. in 1863, the year before the first expenditure on the new structure. Since 1866, up to which time Southwark Bridge was maintained by the Southwark Bridge Company, who charged a toll, the Corporation has spent 1,671*l*. per annum in the maintenance of this work. Deducting the cost of maintenance, which amounts to 318,744*l*. from the total outlay of the Corporation on these three bridges, we find that 2,031,420*l*. have been the cost of the erection and purchase of the three bridges, of which sum 1,027,863*l*. are set down to the erection of London Bridge alone.

The distance by water from London Bridge to Windsor is something over thirty-two miles. The number of bridges in this distance is also thirty-two, which is exclusive of the two tunnels below London Bridge. Between 1870 and 1876 the toll-bridges at Kingston, Walton, Staines, and Hampton Court have been purchased, at an aggregate sum of 90,773*l*., and thrown open to the public. The Bill unfortunately lost in this year's Session of Parliament provided for the purchase of nine bridges, and two foot-bridges, at the estimated cost of 1,500,000*l*. This would make a total of 3,604,193*l*. paid by the City of London and the Metropolitan Board of Works (that is to say, by the ratepayers) for the erection or purchase of sixteen bridges. The average cost is thus about 225,000*l*. per bridge; but neither this average nor the statement that the payments ranged from 7,000*l*. for Walton Bridge to nearly one hundred and fifty times as much for each of the great well-approached metropolitan bridges, is so satisfactory as would be that comparative statement of the design and cost of each of those structures, which we have indicated as a professional desideratum.

The railway bridges that cross the Thames in the district in question, and which we included in the numbers given, are eleven in number. They vary in design, in cost, and in architectural, if not in engineering merit, to almost as wide a range as do the roadway bridges. With regard to the important question of the gradient of the approach, and of the provision of approaches exactly consistent with the capabilities of the bridges themselves, the railway bridges are, of course, much nearer to theoretical perfection than are the roadway bridges. On the other hand, in the matter of engineering economy, or the outlay of so much money, and no more, as would meet the engineering requirements of the case, the railway bridges will probably be pronounced far inferior to the road bridges; not forgetting that with regard to one of the latter, in which iron is the main structural material, the *ne plus ultra* of repulsive ugliness has been attained. In some of the larger and more pretentious structures, on the contrary, there is something worse than the bald ugliness of naked inelegant structure. There is the attempt to give architectural decoration, without the presence of architectural taste. Proud as we may rightly feel of those massive structures, as permanent as any iron structures can be made, that allow the free passage of hundreds of laden trains to and fro over the surfaces of the Thames, as matters of engineering, we have but too much reason to be ashamed of them as matters of architecture. In fact, we want some other word to denote their elaborate hideousness. Every builder seems to have done that which was right in his own eyes, and rather to have chuckled to himself at the odious eyesore that he was about to inflict on his neighbours, than to have endeavoured to immortalise his own name as that of one who knew how to cast some seed of beauty in things useful. The opening of the Northumberland Avenue has given us a very costly lesson on this point. To any one who advances from Cockspur-street or from Pall-mall East towards the vacant site long occupied by Northumberland House, the prospect is something altogether humiliating. Absolute despair can only be avoided by the hope that some sort of buildings will hereafter be raised to such a height as to conceal that which is now the dominant feature of the landscape,—the huge, hideous wagon-headed roof of the Charing-cross station. But until, by some means or other, that unpictorial abomination is veiled from view, it is idle to talk of architectural effect. The view, at present, is simply detestable as a *coup d'œil*, and no amount of grace or beauty in minor details can in any way redeem it, so long as that vast boiler-like roof towers over all.

It is pretty clear that such a work as we now suggest will be more satisfactory as to its engineering than as to its architectural details. But it is a great mistake to endeavour to separate the two. In the hands of a true architect,—a master of the structural art,—plain structural lines may become so graceful as to gratify the eye when unadorned, and to lend themselves to the most charming decoration. All that is most beautiful in Gothic architecture has thus originated. The flying buttress and the towering pinnacle are cases in point,—the glorification, rather than the concealment, of the plain strut. In bridge architecture the most important advance which has been made is in the method of sinking foundations. In old bridges yet standing in many parts of the country, the builders merely cleared the ground to the lowest level that the water left uncovered when at its lowest ebb, and built their piers and abutments on that surface. Massive bulk, in comparison to the span of the arch, was thus necessary to the solidity of the pier; and this cumbrous proportion characterises most of the bridges to which we refer. With the advance made by Smeaton, Telford, Rennie, and the men of their school, the foundations were more accurately regarded. The invention of the cofferdam allowed the excavation of the bases of the piers down to an absolutely reliable foundation. It thus became safe to throw more weight on the superficial area of the piers; and the spans of the arches were widened in consequence. The waterway was opened for perhaps four-fifths of its entire width, instead of being restricted to little more than half the channel. Where rock foundation occurred, the builder was yet bolder; spanning the river in a single arch, as at Chester, or hanging a platform from chains stretched between lofty towers, as at the Menai Straits. During this period of scientific and practical advance, London Bridge, Southwark Bridge, and Waterloo Bridge were erected. The architectural difficulty with which the bridge-builder has now mainly to strive is the substitution of some perfectly satisfactory

feature for the old starlings. Piles were driven into the bed of the river to protect the natural foundations of the piers to which we formerly referred. As these were multiplied and tied together, from time to time, adapted in some instances for landing-stages, but always bearing that stamp of real utility of purpose which cannot fail to give a picturesque force to any architectural elevation, they became recognised as a permanent element of the river-bridge. When foundations were more scientifically laid, the starling was replaced by a stone projecting platform, advancing to some distance beyond the line of the parapets of the bridge, and pointed to cut the current of the river, or the flow of the ascending tide. In many instances these stone starlings are real and useful additions to the solidity of the pier. But the question of the pictorial beauty of the structure hinges for the most part on the treatment of the spandrel, or blank triangular space between the *extrados* of the arches, and above the level of the starlings. If this is left blank, it gives a heavy clumsiness to the elevation. And yet any attempt to veil or to decorate this space by projecting columns, or other non-structural devices, is usually so plainly useless, so evidently a cost which is not of the need of the bridge, but incurred for a pictorial effect which is rarely good, that bridges are, in nine cases out of ten, failures as attempts at graceful elevations.

A collection such as we have suggested of the various elevations of the Thames bridges would render to the architect the great service of enabling him to compare the mode in which this difficulty has been met by the builders of our bridges. Closely connected with this part of the subject is the question of rise of roadway. In a railway bridge a level platform is needed; and if the exigencies of construction raise the parapet over the waterway openings so as to form aërial arches, still the horizontal line can never cease to form a true structural feature. It is by the use of iron that this mode of construction, which resembles in some degree an inverted suspension bridge, can best be carried out. But in road bridges it is matter for consideration, according to the special details of each case, whether the level line should be adopted. There are good reasons against it in many cases. A greater height may be desirable in the centre of the waterway than near the shore. If the levels be such as to require an ascent from each side of the bridge, the cost of the approaches will be reduced by continuing the ascent until it meets the descending gradient, that is to say, by giving a moderate curve to the roadway over the bridge, in vertical section. The main engineering objection to this plan is the fact that it is desirable to make the transit over the actual platform of the bridge as easy as possible, so as to avoid any risk of stoppage on the structure itself tending to an arrest of the traffic in the most critical point. Between these two requirements the architect has to exercise his judgment, and the usual result has been the adoption of a cambered line of parapet. A comparison of the elevations of the various bridges will throw light on the pictorial results of the various modes adopted for dealing with the blank spaces between the arches, and for determining the level or curved line of roadway and parapet.

Again, the question of original cost, as compared with the cost of maintenance of a bridge, is one on which it is desirable to throw into accessible form the experience attained from the Thames Bridges. We have seen that the repairs and maintenance of old London Bridge were kept down to the rate of 1,000*l.* per annum, to the year 1834. Since that time the annual charge has increased to an average of one-third more; but this includes sums of 3,000*l.* and 4,000*l.* spent in alterations or renewals in 1842, 1851, 1859, 1865, and 1869. The enormous traffic over this bridge wears the roadway with irresistible force. Blackfriars Bridge steadily increased in cost of maintenance from 1834, when it cost 1,220*l.*, to 1863, when it cost 14,960*l.* The maintenance of Southwark Bridge, if the matter be under proper supervision, may be taken to show that an economy made in the first instance by introducing comparatively steep gradients, is counterbalanced by the wear and tear occasioned by the resistance offered by such gradients to the horses. For Southwark Bridge, with its comparatively small traffic, and with no expenditure likely to be incurred below the springing of the arches, and but little, except painting, below the roadway, to cost 1,671*l.* per annum, against the cost of 1,345*l.* per annum on London Bridge, is not what might have been anticipated. The comparison of the prime cost and annual maintenance of Westminster Bridge, in which lightness of structure has been carried, at all events, as far as can be thought in any way desirable, would shed additional light on this important practical question.

We may mention that when, in the year 1755, it was proposed to build a "new bridge over the Thames at Blackfriars," the cost was estimated at 110,000*l.*, which it was proposed to raise by way of tontine. In regarding the provision which will sooner or later become imperative for a crossing of the river below London Bridge, we must calculate on an expenditure of at least a million sterling. We have little doubt that by sinking to the solid clay a tunnel might be completed beneath the river for a considerably less cost than the 455,000*l.* of the original Thames Tunnel. But with every foot of rise or fall above the ordinary level of the shore the cost of approaches increases. It is open to doubt whether 545,000*l.*, being the balance out of a million, would be adequate to provide the best possible approaches to a tunnel at the low depth required by the engineer for safety, at least without enormous cost. On this important question, however, it is desirable to bring together all the information that exists. The land required for the approaches to London Bridge was of higher value than any property lower down would have been at the time of the purchase. But we are aware of the steady rise of prices in all directions. No engineer could now hope to build a new London Bridge for less than the sum expended by Rennie. He might save in the foundations, but the labour would be more costly, and the land far more costly. What is requisite is a compendium of actual experience on the subject, and we shall be happy if we have in any way advanced the prosecution of so valuable a study.

BELLINI AND CATANIA.

WE were invited to "assist" at a very interesting ceremony on the 16th inst., at Père la Chaise, in Paris,—the exhumation of Bellini's remains. Nothing was omitted in the arrangements which could do honour to his name or the countries represented. Arrived at the cemetery, we saw a sail-cloth on the ground, an open oak coffin in the centre, many members of different *corps diplomatiques*, soldiers, gardes, and Italian marines around; then came a procession of the noblemen of the Sicilian Commission following the coffin just disinterred. It was placed alongside the other, opened, identification made, and then lifted into the oak coffin, which was placed within one of crimson velvet with silver ornaments; wreaths of oak and laurel, tied with Italian and French colours, were placed on it by the Italian Minister's representative, and then the Marquis San Giuliano stepped forward, and made the following address, which was most impressive, as he has a clear voice, besides many other qualifications requisite in oratory, and is well known in Catania as highly educated and somewhat in advance of the age. All listened with attention flattering to him as well as his subject. He said:—

"I am not going to speak to you of Bellini; one does not praise *genius*,—above all, such a genius as Bellini was, who possessed in the highest degree the marvellous power of profoundly touching the souls of men. One need not show you that he was grand and sublime in his pure simplicity, because one only requires a heart to understand him, and to foresee that his works will not perish whilst gentle and refined feelings exist. I speak only to testify to Paris—to France—the lively gratitude of my compatriots. We shall never forget the enthusiastic reception Paris gave Bellini in 1835; we shall never forget that in the deafening and unanimous cheers which then resounded through the Salle des Italiens the name of his country was united with his own; we shall never forget that, when an untimely death snatched him away from art, from Italy, and, allow me to add, from France, the grief was as general and sincere here as in his native town, of which he was the idol and pride, and where he lived amidst his family and friends. We shall never forget the fresh mark of esteem which France gives at this moment to him and to his country by your presence here. My colleagues and I only represent here the town of Catania; but I can confidently assert that the feelings which I have just expressed are shared by all Italians, and that the echo of this ceremony will resound from one end of the country to the other, and will trengthen anew the bonds of sympathy and friendship which unite Italy and France."

This was followed by some orations in Italian by President Prince Grimaldi, the composer, Ardizzoni, and the dear friend of Bellini, Commandeur Florimo, of whom in his last delirium he spoke, unconscious of his presence, and thinking his mother watched him, "Call Florimo, I cannot die till I have seen him." To hear him speak, therefore, of the merits of the illustrious dead severely tried the emotions; broken words and sobs had their own eloquence, and called forth deep feeling in many. A funeral car, in black and silver, waited to convey the remains to the Lyons Railway Station. The wreaths were hung over the plumes of feathers at each corner, the Italian Minister sending one, which was placed over the door, of great size and beauty. Then the *cortége* moved slowly; the funeral car, eighteen mourning coaches (black and silver), containing the noblemen charged with the commission from Catania, some private carriages with their relations and friends, the calm, if curious, Parisian mob; and the ceremony was brought to a close after two hours by the deposition of the coffin at the station, whence it would be taken to the Straits of Messina, to be put on board a frigate and received in Catania with every possible honour.

PROPOSED MONSTER BALLOON FOR THE PARIS EXHIBITION.

AMONGST the propositions on which it is said the Commissioners have looked favourably, is that of M. Henry Giffard, an engineer of reputation, who has projected a huge captive balloon for 1878. It would be formed of silk and sheets of India-rubber, covered with varnish, and painted white to reflect the rays of the sun. The balloon would be about 110 ft. in diameter; the car itself would form a gallery nearly 50 ft. in circumference, and the balloon would be held to the earth by eight cables attached to iron rings secured in a wall of masonry, and it would take up forty or fifty persons each time. The cable by which it would be brought down is described as working round an iron axle more than 6 ft. in diameter, and 23 ft. long, worked by a steam-engine of 200-horse power. The length of the cable would be about 1,800 ft., and the balloon would ascend about 1,600 ft. from the earth. The quantity of iron filings and sulphuric acid needed to produce the gas required to fill the balloon is something enormous, and the process would have to be repeated about every forty-eight hours. To us, the game seems hardly worth the candle,—at any rate, such a very big candle. It is like Mr. Gamgee's very ingenious "Glaciarium," where two steam-engines are kept going to enable a dozen persons to do a little skating out of season!

THE EXHIBITION FOR SOUTH AFRICA.

THE South African International and Intercolonial Exhibition, to which we have already drawn attention, will be opened at Cape Town on February 15th, 1877. The building will be in the gardens of the Masonic Lodge of the Goede Hoop, adjoining the House of Assembly. The Exhibition is to tap, in addition to the Cape Colony, the neighbouring territories of Griqualand West, Natal, the Orange Free State, and of other promising communities. Goods intended for the Exhibition should be shipped from London not later than the first week of December, 1876. Mr. Edmund Johnson is the Commissaire Délégué of the Exhibition in Europe, and the central European offices are at 3, Castle-street, Holborn, London. The Exhibition is also to have its representatives at Paris, Berlin, Vienna, Turin, and Amsterdam. The building is being prepared in this country, of glass and iron, somewhat in the style of the 1851 Exhibition. With the materials will go out workmen to put them together. The demand for labour in the colony for railways and agriculture leaves few hands to spare either for manufacture or construction. The Exhibition will be open during the Cape summer, which begins in November and lasts until April.

University College.—The engineering and architectural classes will be opened on the 3rd of October. Professor Hayter Lewis having received leave of absence, the architectural classes will be conducted for the session by Mr. T. Roger Smith.

THE RUSSIAN BUILDING TRADES.

It is absolutely essential to the progress of national industries that their condition at all times, and especially contemporaneously, should be well known. In these civilised days people have learned to depend much more upon recognised authorities for their improvement and benefit than at any other period of the world's history, and a "paternal government" has been the arcanum of national prosperity that has been through all ages searched for in vain. Few people have been enabled to cry, "Eureka!" after their long and laborious search, and we are sure, from what we have seen of the Muscovite, that he cannot consider himself any more successful than the races by whom he is surrounded. His government is too much wrapped up in its ambitious foreign policy of extension. The bureaucratic leaders here seem to pride themselves exclusively upon the foreign secrets with which an expensive espionage has filled their pigeon-holes, and every military man we have met seems more delighted with his topographical knowledge of the smallest village in England, than with his little acquaintance with the condition of the wheat crops of the Crimea. So it is with every branch of Russian trade and industry. We will not vaguely say that there is an unfortunate lack of industrial knowledge in Russia, but we can more circumstantially state that the statistics, without a knowledge of which no one can even attempt to improve the *status quo* of native commerce, are seldom made public, or even collected. The blame for this falls entirely upon the Government, and, to some extent, it is inexplicable. It might be understood very well if Russia were still under the sway of the ambitious Nicholas, but when we consider that the present Emperor has attempted to follow that Augustus whom Napoleon III. took for his prototype, we are at a loss to account for his phlegmatic negligence as to the mainstay of his empire. A few books upon Russian industries have been published at long intervals, under the auspices of some such well-known names as Tegoborski and Schnitzler, but these, through other revolutions which are continually being effected, have long ceased to have any value apart from mere historical landmarks. Once only, in 1869, the Government made a groping effort in its lethargy, and issued a Year-book, but this fitful exertion was doomed never to be repeated. In describing the building trades, however, we have been fortunate enough to find amongst the mass of private publications with which we were favoured during the existence of the recent Moscow Exhibition enough facts and statistics to give a very fair idea of the present condition of these trades; but, besides this, the kindness of local merchants has enabled us to give domestic particulars down to a much more recent date. We shall include under this title stone-quarrying, lime-burning, cement manufacture, gypsum, tile and brick burning, stone-polishing, soulpture (as distinct from statuary), and the manufacture of mosaic pictures. Beyond the privately collected facts we have been enabled to accumulate, there are few data in existence which can be made use of. This little is comprehended in the following statistical excerpt, from the above-mentioned Year-book of the Ministry of Finance (1869). In 1866 Russia possessed eight alabaster manufactories, 146 lime-kilns, 3 cement manufactories, and 2,127 brick-kilns, the total value of their annual produce being a little under four million roubles.

The quarry-stone used for flagstones and ordinary paving is, as is very well known, found in large quantities in the Grand Duchy of Finland. St. Petersburg has to be thankful to these resources for all the handsome building materials which have, in recent years, so contributed to the beauty of the town, and especially the fine granite pillars which ornament the incomparable Neva quays. The most important Russian stone-quarries exist in the governments (*i.e.*, provinces) of Moscow, Wologda, and Tchernigov, the products being used principally for architectural work. In the extensive marble quarry of Mr. M. J. Filatjev, in the village of Pajanka, near the town of Podolsk (gov. Moscow), marble manufactures of yellow-grained marble are annually produced to the value of 30,000 roubles. These manufactures are of the character of table-tops, steps, &c. In order to give some complete idea of how this business is carried on, it may be necessary to mention that in Filatjev's quarry seventy-five skilled or regular workmen are employed, as well as an average of fifty day labourers. Mill-stones are principally made in the quarries of Messrs. P. & J. Gubonin, near the village of Kotelinki (gov. Moscow), and of Messrs. A. & M. Miklaschevski, of Gluchov (gov. Tchernigov), and stone suitable for cutting and polishing for ultimate ornamental uses is found in considerable quantities in the quarries rented by the firm of Messrs. M. & J. Latkin, of Ust-Ssysolsk (gov. Wologda). Here 57,000 roubles worth of these species of stone is annually produced. We have occasionally seen some very beautiful floor paving, and step stone, which comes from the neighbourhood of Reval. The quarries, however, do not at all seem to have been explored as energetically as they deserve. And this is all the more regrettable because the workers have not any of the excuses which hamper many other quarry proprietors. Especially may we mention that there is excellent canal service and many other means of communication between this district and St. Petersburg. As we have before mentioned, the Russian capital consumes large quantities of the very species of stone in which Reval appears to be particularly rich. These quarries are, we believe, at the present moment to be let. Marble quarries exist also in no despicable quantities in Poland, but they also are either not being worked, or are very lazily explored. A species of stone at the present moment very fashionable here for foundation stones, private pavements, and staircases, is the blueish limestone for which the banks of the Ishora are famous. Here, also, are the limestone pits in which most of the lime used for building purposes in the large towns is burnt. Although the lime is generally brought to St. Petersburg slaked, there are also a few lime manufacturers here. The most important of these is perhaps Messrs. W. & J. Strubinski, who produce annually about 1,000 cubic sashes of burnt and slaked lime, at about 33 rbs. per sashe. Another large factory belongs to a Mr. J. Pal. It is established in the village of Soboro, in Peterhof (gov. St. Petersburg). Being in connexion with a cement manufactory belonging to the same gentleman, it is of more than ordinary importance, the amount of its annual produce in burnt and unburnt lime being about 240,000 pouds, varying in price between 15 and 27 kops. per pond. In the same district, on the Krassnaja-Mysa estate, is the celebrated lime factory of Messrs. D. & P. Skvorzov, who employ 80 workmen to turn out annually 350,000 pouds of lime, worth approximately 75,000 rbs. The Peterhof district and the neighbourhood of Robscha are especially well endowed with limestone resources. There can be little doubt that the lime manufacture in Russia is at a lamentably low ebb. In the hands of energetic merchants, with, we will not say a large, but an easily available, capital, not only large fortunes could be made out of it, but great benefits could be rendered to the empire by its proper and systematic manipulation.

The small limestone which is useless for burning purposes is very profitably used in the manufacture of cement. This industy has in recent times made great progress here, and there are a large number of firms which, although recently established, are making money as quickly as they can wish. Large, however, as their produce is, it is not at all enough to cover the ever-increasing demand, and so, large quantities of German and English cement are always being imported. The only official record we could find anent this industry (the Year-book of the Ministry of Finance, 1869) mentions that in 1866 there were three cement manufacturers in Russia, employing collectively 260 workmen, who produced 121,200 rbs. worth of cement annually. In juxtaposition to these meagre statistics let us place those which were developed by the Exhibition at Moscow. There alone, nine cement manufacturers exhibited specimens of their goods. Altogether they were then producing 1,500,000 pouds of cement, worth about 381,000 rbs., annually, and for this they were employing 722 workmen. This, even if we do not take into consideration the manufacturers who did not exhibit, is no mean improvement for six years. The cements made in Riga are usually considered the best in the Russian market. Messrs. K. & K. Schmidt, of Podera—a very well-known Riga firm—sell the Roman and Portland cements, which they manufacture at 25 kops. per poud of the former and 35 kops., for the latter. This firm produces about 75,000 pouds per annum, and in addition to forty-seven workmen they employ machinery of 40-horse-power. Another species of cement very much in use here is the peculiar manufacture of a Mr. Rasché, of the gov. St. Petersburg. Of this cement, which is called after the name of the manufacturer, 75,000 barrels, worth 150,000 rbs., are annually manufactured with the aid of 200 workmen and 30-horse-power machinery. Altogether the Russian cement manufacture has been progressing very satisfactorily, and it has every prospect of becoming a very important, as it is at present a very profitable branch of native industry. It is a significant fact that the export of Russian cement is not entirely unknown, for in 1868, 187,754 pouds, worth 35 kops. per poud, passed the European frontiers into foreign countries. This, of course, becomes ridiculous when compared to the import, which in 1868 reached 1,217,271 pouds., but it is nevertheless very satisfactory to see that the beginning is made where so excellent a prospect is in view. The cement industry must become important, even if it confines itself to native supply.

A similar industry of no small consequence is the manufacture of gypsum, here called alabaster. There are several large factories in St. Petersburg, where it is burnt out of the natural gypseous stone. At Dünhof, on the Düna, near Riga, there are large deposits of this stone; and from the quarries of Messrs. C. F. Gerike & Co., of this locality, between 600,000 and 650,000 pouds of gypseous stone are annually turned out. In the neighbourhood of Peypussees the stone is also found, but only in very thin strata, and of by no means good quality. The principal manufacturers of gypsum are established in St. Petersburg. The most important is Messrs Gerike & Co., who, as we have before observed, possess their own quarries at Dünhof. The factory was established in 1847; it contains fourteen large kilns, especially constructed by the firm, and produces annually 250,000 pouds of gypsum, which is sold at prices varying between 15 and 27 kops per poud. Messrs. Gerike & Co. employ thirty workmen and a steam engine of thirty-five horse power. After theirs in importance we may quote the factory of Mr. Julius Balzer, in which 35,000 rbs. worth of gypsum is manufactured every year. Besides these there are many manufacturers, but of them we know nothing except that in everything they are subordinate to the two we have mentioned. There are also several in the interior of the empire, but of these little is known. The manufacturers of alabaster figures and ornaments burn and paint their gypsum themselves. The latter they generally do very artistically. By far the largest quautity of all the gypsum produced is used for stucco-work in buildings.

We now come to a building-trade which is unfortunately not so important in Russia as it ought to be, comparatively with the vastness of the empire: this is the brick and tile manufacture. The large wholesale brick-kilns are concentrated principally in the neighbourhood of all such large towns as St. Petersburg and Moscow, in which brick buildings preponderate, and are on the increase. In the country and the smaller towns wooden buildings are still in a large majority, notwithstanding their combustibility. It is not to be wondered at that they are preferred to buildings of brick or stone; for, since the emancipation, many a quondam serf has been obliged to build his own house, and to him money has been an object of great consideration. That the necessity should exist for the erection of wooden buildings is very much to be regretted, as, in consequence, probably more numerous and serious conflagrations occur in Russia than in any other country. Often a stray spark from the rude firing-means of the humble peasant will develop into a raging fire which will carry off whole villages, and efface every vestige of civilisation from an entire district. Tile manufactories exist in Russia in a comparatively small number, as in the towns the houses are usually roofed with iron, and in the country with wood, if not with humbler materials. Almost the only districts in which tiles are manufactured and used are some of the Baltic and Silesian provinces. In all the large towns of Russia—as if in irony of the ill-luck of the villages—a preponderance of fire-proof bricks is used. Of these there are numerous manufacturers, the best known of which are probably Messrs. K. A. Ljaschkov, of Schitomer, E. A. Jansen, of Petersburg, and Efimov & Ssoboljev, of Slavjanko, on the Neva. Ordinary wall-bricks are made in the largest quantities by Mr. S. Rosterjajev (gov. St. Petersburg), and Messrs. Plater, Starschinski & Schutschuk (gov. Warsaw). The former produces annually about 8 000,000 bricks, worth about 90,000 roubles, employing

or this manufacture twelve kilns, fifteen machines worked by horses, and 500 workmen. The latter manufacture bricks to the value of 80,000 roubles, but almost entirely by steam power. They use only one kiln; that is to say, the kiln of Hoffman's system. We make especial mention of this factory, because we do not believe there are many Russian firms in any branch of industry sufficiently enterprising to introduce new and economising—albeit expensive in cost—apparatus. Hoffmann's apparatus costs about 15,000 roubles; but, as an economiser of fuel, it would be invaluable in the south of Russia, where fuel (especially wood) is by no means plentiful. The most important manufacturers of clay piping, coupling-boxes, moulded bricks, &c., are Messrs. J. Schabaschjev, of Tver.

With respect to the more artistic departments of the building trades, their condition in Russia is somewhat more satisfactory than that of the departments already described. This is perfectly in keeping with the character of the urban Russian. Many superficial observers might imagine, from the habits and manners of the inhabitants of the old and new metropolis, that they were fair criterions of national taste, and *ergo*, they would judge Muscovite civilisation very favourably. Much as we are inclined to acquiesce in this conclusion, we must protest against the reliability of its premises. Civilisation need not necessarily be built on a foundation of faultless æsthetics, whilst it must at any rate have a strong basis of practical science. Russian taste is not the pure development of long ages of artistic teaching, but it really is nothing more than an exaggeration of that sentiment which makes the eyes of the naked blackamoor twinkle when he sees parti-coloured vestments and brightly painted beads. The *civilised* Russians of the present day look upon the artistic in ornament more as an adjunct of the luxury they love so well, than in any way as an embodiment of that absorbing ideal which is so much to the enthusiastic artist. And consequently, their realisations are as false as their perceptions are incorrect. Much as Russian taste is now being purified by the teachings of foreign masters, and the imbibing of foreign theories, there is still a great *penchant* for everything tawdry and overloaded with ornament, whilst the beauty of strict simplicity seems far from being properly appreciated. This may be seen everywhere in Russian public and domestic life,—from architecture and furniture down to the most minute chimney-piece ornament. With this predilection for ornament, it is not surprising that State aid should be given to the development of art studies, and that the industries we are about to discuss should be in a satisfactory condition. But this State aid is founded upon no purely artistic or economical ideas. It is fostered—we will not say to the detriment—but to the neglect of more necessary and practical sciences, in the same way as in Russian politics a great deal of domestic legislation is shelved for the benefit of foreign diplomacy.

The exhibits at Moscow of the results of stone-cutting and polishing were very fair examples of the stage which these arts have reached in Russia. They were almost all, speaking in a strictly industrial sense—of great beauty and elaborate workmanship. In fact, everywhere could be seen, in contradistinction to other industries, how influential the state factories at Ekaterinburg and the Imperial Kolivan factory in the gov. Tomsk were in promoting the welfare and extension of these artistic industries. Prices, as may be imagined, were, and still are, very high. A large oval dish, of wonderful beauty and faultless cut, made out of the rare orlet—a mineral which has recently been found in comparatively large quantities, but which seldom appears in large blocks—was marked 37,873 rbs. The exhibits of the Ekaterinburg Institute were all of faultless workmanship and magnificent material, the vases of agate, rhodonite, nephrite, jasper, and orlet, varying in price between 200 rbs. and 5,400 rbs. Not only these vases, but the smaller and cheaper goods, such as ash-trays, letter-weights, and desk furniture of the same materials, as well as of red porphyry and aventurine, were all finished with the same excellent care in detail. Their high prices, however, render them inaccessible except to the rich. The Ekaterinburg Stone Cutting and Polishing Works were established in 1765, and they now employ fifty workmen. The publications of the executive of this factory estimate the value of the annual production at 23,000 rbs., an amount which is out of all proportion to the prices we have just quoted, even if we assume that a year is required for the manufacture of each large vase. The same may be said of the Kolivan Factory. It was established in 1787; it now employs fifty workmen, and its annual turnover is estimated at 15,000 rbs. We cannot explain these statistics at all. It is probable that the work may take longer than we imagined, because we know that the profits charged are enormous, having no perceptible connexion whatever with the intrinsic value of material or workmanship. The exhibits of the Kolivan Institute at the Moscow Exhibition were very fine. A set of vases of greyish violet porphyry (794 rbs. each) were as much distinguished by the excellence of the material and the beauty of the workmanship as by the simplicity and symmetry of the designs. Another exhibit—a large chimney-piece of sea-green jasper (10,759 rbs.)—was really a wonderful *chef d'œuvre* of the art of stone-cutting. The impulse which State interference has given to the stone-cutting and polishing industries in Russia has resulted in a somewhat numerous and prosperous class of private manufacturers. This is especially the case in Ekaterinburg, and other districts of the Ural countries, and Siberia. In more recent times it has extended as far as St. Petersburg, and we have now here several malachite and lapis-lazuli polishing works of great importance. About the most important private provincial manufacturer is Stebakov, of Ekaterinburg. He has employed the stone-polishing processes for the production of small busts, and the four that he exhibited at Moscow,—of the Emperor, the Empress, the Monk Vladimir, and Jermak, the conqueror of Siberia,—were very successful specimens. The prices were between 400 and 1000 roubles. His letter-weights and fruits, cut out of the stones suitable in colour for their natural representation, and mounted on blocks of jasper and porphyry, are far superior to those of the Imperial factories; and his seals of smoky topaz, mountain crystal, orlet, and other minerals, are of exquisite material and finish. Stebakov's factory was established in 1845; it employs between twenty and twenty-five workmen, and its annual produce averages a value of 30,000 roubles. The manufacture of malachite and lapis-lazulite goods is carried on in a more wholesale manner in St. Petersburg. In fact, there are two firms established here, — Messrs. J. Spöhrbase & Co. & K. Hössreich & Co.,—which are well known all over the world. Before we proceed to describe the works of these two manufacturers, be it observed that only small malachite work, such as earrings, brooches, studs, &c., is cut out of the solid material. Even if, as is sometimes the case, malachite blocks of large size are found, they are never so solid throughout that vases can be wholly cut out of them. Besides this, it would never, under any circumstances, pay, for it would require a superhuman mineralogical knowledge and manual dexterity to evade the rich complications of flaws and cross-grains which characterise malachite *en bloc*. It is, therefore, almost invariably used in small pieces,—for small work in the solid, for large as a kind of veneer-mosaic. For the latter the malachite is cut into layers, of thicknesses varying according to the capacities of the blocks. These are placed upon the object they are intended to ornament, and then cemented with malachite powder or green-coloured mastich. The most difficult work consists in adapting the malachite veneer to bent ornaments. That department of work in which the most artistic care is exercised is the selection of suitable layers, so that when placed together they will have the appearance of one undivided block, with a richly-continuous and apparently natural grain. The process of fitting small pieces of malachite in this manner is not only one of great difficulty, but it requires extraordinary accuracy and experience. Spöhrhase, whose manufactures have a European reputation, only produces such large-sized goods as tables, vases, clocks, gaseliers, and chandeliers. Besides this he does a large trade in lapis-lazuli and also *articles de luxe* of small bulk. Amongst his exhibits at the Moscow Exhibition was a block of malachite weighing 47½ ponds, and which, notwithstanding its size, was worthless except for veneer and small work. Spöhrhase employs thirty-five workmen, and turns out annually 75,000 rbs. worth of goods, which are sent all over Europe and America. Hössreich has a similar business, but it partakes more of the character of a manufactory of ornaments than of necessaries for the building trades. The art of veneering any rounded substance is understood in Hössreich's establishment to an exquisite extent. His *personnel* consists of forty workmen, producing 40,000 rbs. worth of stone ornaments per annum. Besides these houses, there are many working jewellers in St. Petersburg who work up a great deal of malachite into *bijouterie*. In the manufacture of all large malachite goods the Russian industries are far superior to the foreign, but the latter excel in both the excellence and the lowness of price of their malachite small ware. The reason of this is that the Russian workman, although most versatile, does not excel in skill, and if he does turn out anything fine a price is asked for it out of all proportion to its intrinsic value. Considering that malachite workers all over Europe procure their raw material much oftener from Russia than Australia, it is presumable that with the spread of technical education the Russians will find it easy to keep the entire trade in their hands. Spöhrbase, as we have before observed, exports in large quantities, and that is principally because he has a reputation not at all controlled by prices. He uses, like all the better-class of stone cutters and polishers, Demidoff malachite, which here in St. Petersburg costs, warehoused, between 120 and 180 rbs. per pood. It is a pity that working in malachite is not more developed in England. It would do a great deal of good. In buying from Russia you have to pay preposterous prices, whilst you have artisans much cleverer than it has ever been our lot to observe here, and you can import malachite from Russia at reasonable prices. It is not likely that the malachite industries will ever become great sources of national prosperity; but, as we have said before, some discretion in price might so act that Russia would enjoy a monopoly of the trade for many years to come.

We cannot dismiss this subject altogether without saying something of sculpture. We are unfortunately unable to say anything on this subject except from what was seen at the Moscow Exhibition. The materials which are principally used are marble and granite, the former, in a great measure, for chimney-pieces, washhand-stands, pedestals, and gravestones; and the latter for gravestones, steps, and balusters. At the Exhibition the principal style of sculpture was in the shape of chimney-pieces. Some were very beautiful. One, in particular, in black Belgian marble, after a design of the architect Schreiber, was exhibited by Messrs. Botta, Bros., of St. Petersburg. A rich choice of goods was found amongst the exhibits of Messrs. Maderin & Rudgis, of St. Petersburg. Two chimney-pieces in white, and one in black, marble, ornamented in the style of Louis XVI., attracted much attention. Their prices varied between 350 and 1,400 roubles. The workshops of this firm, established in 1810, employ sixty workmen, and produce 50,000 rbs. worth of goods annually. Grave monuments are sculptured principally in the workshops of Ehrenberg, of St. Petersburg. He employs sixty workmen, but only turns over 25,000 rbs. every year. Russian sculpture is rapidly becoming an important industry; but it is to be hoped that however industrial it may become, it will largely use the aids of artistic studies. Another branch of the building trades which has the advantage of State aid is the manufacture of mosaic pictures. This industry is in Russia more important than in any other country of Europe, because mosaic work is still very much used for the ornamentation of Russian churches, and especially for altar pictures; whilst in other countries the use of mosaics for churches is a thing of the past. The Imperial Academy of Arts at St. Petersburg owns a small factory itself, which is occupied in the production of all those differently shaped and coloured stones and glasses of which mosaic pictures are formed. The productions of this institution, which was established in 1851, are very fine. Altogether, the Russian building trade is in its infancy, and, like everything else of an immature age, it is liable to drawbacks, weaknesses, and errors. It will not be long before the Russian systems will be altogether revolutionised; and then, when Government and people walk hand in hand, with no ulterior object in view than the practical good of the country, all those industries which are founded upon its natural resources will rise and flourish.

St. Petersburg.

Salisbury Cathedral.—It has been decided to re-open the choir of this cathedral on Wednesday, the 1st of November (All Saints' Day), the work of restoration and refitting being in course of completion.

HOW THE MOSQUE GREW.

Now that "Eastern,"—to use that most comprehensive word,—matters are so much and painfully, in more senses than one, in the world's eye, it may be opportune to glance at one or two things which the Oriental man has done and is yet doing *well*. So much has been said in all sorts of ways about the East, from the earliest of recorded times, down to the modern "Tancred," that there would hardly seem to be anything more left to say. But, truth to tell, there is very much to be said and to be yet thought over before the subject is rightly understood, to say nothing of exhausted. Indeed, the difficulty is not to know when to stop, but where best to begin, so really *new* is the subject, if there be anything true at all in the most recent utterances of those best qualified to judge of it, after years of personal looking at and experience. We know of but few things indeed stranger to very many than these Eastern matters. No one can hope to thoroughly understand that Eastern volume, the Bible, says an accomplished lady, till he or she "has lived for some years in an Eastern country and among Easterns" and their surroundings. Indeed, it may be affirmed with truth that the more we really know about it, the more there is yet to be known, and the circle expands as we go on. We must needs confine our hasty thoughts here to matters artistic and architectural, with but a note here and there to further illustrate these.

It is really surprising to note how little we know in detail, and mode of special construction, of Eastern architecture. Here, with us, all to a certain extent is plain; and we know how a building is "designed," and how it is brought into existence and completed; and can refer, if need be, to the "precedent" it is commonly drawn from. But in a far-away Oriental town, all these conditions so necessary here, are absent, and a something else must needs take the place of them. What is a common living-house in Delhi, or Morocco, or Jerusalem, or Damascus? What sort of building is an Oriental inn? What is a mosque, and what its surroundings and uses, special and particular? Things of note these, and well worth the looking at, and into, for they tell of matters and ways as old as the historic world itself. We are, it must be confessed, a good deal at a loss for evidence in detail of the very things which would throw light on these problems. They are things which but few travellers, even with art proclivities, care much to go into. Bishop Heber, a kindly and observing man, complains a good deal of the narrowness and inconvenience to him of the streets and ways up and down which he was compelled to go in his Indian mission journeys. But it was in these very narrow ways that he found so much to interest and instruct him; so much so that he could hardly bring himself to wish they were otherwise! In some narrow way wherein the houses or huts on either side of it could be touched by the outstretched hands at the same time, he not unfrequently came across the entrance, ruined though it might be, of some small temple or other building, of such marked beauty and refinement of detail, that he could but pause to look at and make note of it, the meanness of the materials, (common brickwork and plaster), notwithstanding,—the beauty of the "handwork" and the delicacy of the design quite captivating him, in spite of all inconveniences, and even "horrors," all about it. One or two he specially notes in Delhi and Benares. He more than admired the way in which very small buildings made up for their want of large dimensions by the elaborate beauty of their details, and by the advantage, so cleverly taken, of position. There is, there can be no doubt, a whole world of art and architectural thought to be met with in these Eastern cities hitherto unnoticed, and we might well look to it while there is yet time, and before it altogether disappears. The India Office might do much at but little cost. We could well point to many things in detail if occasion called for it. It is not here and there only, but all over the Eastern world that such are to to be met with, and not only in public and well-known buildings,—world-famous not a few of them; but in smaller and more out-of-the-way localities: in buildings hidden away almost in the narrower ways and in the darkened courts of the Oriental cities and lesser towns. We may note here that if the Eastern man, as an artist-workman, be remarkable for his skill in stone and marble cutting, not less so is he in his manipulation of common *plaster*,—commonness of material does not stay his hand. Among those many buildings, of which we know really so little, which go to make up an Oriental town, there is none more remarkable and exceptional in character than a mosque. What is a mosque? It would seem a little strange, considering its importance in Eastern life, and the place it holds in it, how little there is in the "illustrative" and architectural way to be met with about it. It may be of interest to give a general idea of one of these buildings. The leading idea or plan being pretty much the same all the Eastern world over, mosques differing only in size, and in elaborateness, more or less, of detail and costliness. It is very simple on plan,—a simple square or parallelogram,—and in size from a few feet across, as small, at times, as 12 ft., to 300 ft. to 400 ft. square. Most commonly, though not always, a mosque of any size,—the larger ones especially,—consists of an open court, with a fountain in the centre of it; and round this court the mosque proper is built, consisting simply of a covered-in building, or "porticoes," supported by columns, indeed, not a little like an old-fashioned inn-yard, the covered buildings, or porticoes, being open to the inner court-yard, or central space, round which they are built. One of these,—that in the direction of Mecca, to which the worshipper turns,—is usually deeper than the other three, and contains the "furniture" of the sacred structure. Indeed, the idea of a building of this kind is simplicity itself, for a common room may become a mosque with a little adaptation; and, indeed, it does not differ in plan from an ordinary Eastern house. Supposing, therefore, to take a general idea, three of the covered-in sides to be supported by a single range of columns and outer wall, the fourth side, being deeper, would have a double or triple row; and these, with a tower or "minaret" in one corner, would make up the building. This arrangement admits of any amount of extension and degree of costliness. Some of the larger mosques have from 300 to 400 columns, as reported by Dr. Bartle. One side or end,—as we have said, that pointing to Mecca, more correctly written "Mekker",—contains, first, in its end wall, the "Mehrab," or niche, which marks always the direction of Mecca, and to this the congregation turn during prayer, or while the Koran is being read, or rather chanted, in a quite peculiar manner. This Mehrab is most elaborately ornamented at times.

To the right of this niche is the Nimbar, or pulpit, with some peculiarities of construction, but used for the purpose indicated by the name. So far the "furniture" is simple enough, but opposite to the Mehrab, or niche, and in the centre, or forepart of the end portico, there is, at least in all the larger mosques, a platform supported by slender columns and railed in by a low parapet, and from which a portion of the mosque service is repeated, as by a choir. It may be somewhat difficult to get at the precise origin of this chanting-desk, which might lead to much else that is a little obscure, but it has a prototype in the "reading-desk" of the synagogue. By the side of this platform, or in front of it, are one, and sometimes two, seats or chairs, with low desks in front of them, from which a chapter is read from the Koran to the assembled congregation. The walls of a mosque are usually quite plain and unornamented, but in some of them a long frieze, or panel, runs round the end wall of the building, filled with texts from the Koran, written in long and bold letters, always admirably executed, and which have a striking effect, and not a little appropriate, and to the purpose. This writing on the wall might, perhaps, be imitated elsewhere with some advantage. The pavement of stone or marble is covered with matting, and at times with costly carpets. No distinction whatever is made; wealth and poverty would seem here, at least, to be on a level. Nothing, as we have said, can possibly be simpler in idea than a mosque; and certainly the main purpose of it, whatever its shortcomings, is not less so. The domes, which form so conspicuous a feature in the view of an Oriental city — as much so, perhaps, as the minarets themselves — are striking parts of mosque architecture. The angles where the porticoes meet, and the space before the niche, and sometimes, indeed, the whole length of an arcade or aisle, is roofed over by a succession of small domes. Many mosques are wholly covered in, the smaller ones especially; and it must not be supposed that all the interest, even architecturally, is to be found in the larger and more imposing structures, for many of the most rude in construction—as in out-of-the-way Africa—are full of strange conceits, and simple and primitive dignity. Carried back even farther than we have done above, the origin of the mosque will be found in a short piece of walling to mark the direction of Mecca.

We might now go into almost any amount of detail, and take note of things from which some novel modes of work might be hinted at, but must needs forbear. But we must not forget the "minaret," an essential item in mosque architecture. The minaret, or, more nearly to the Arabic "Mad'neh," is to a mosque what a tower and spire are to a church. The church-bell calls to church; the mueddin, or crier, from the mosque minaret calls to prayer in a yet more striking and instructive way. At sunset, at nightfall, a little after midnight, an hour before daybreak, at daybreak, at noon, and afternoon, are these "calls" made. The "adan," or call to prayer, is surely one of the most striking and poetic of acts done under the sun in these somewhat prosy days. It was the happiest thought of the founder of El Islam. It built the characteristic minaret, and made of all Eastern cities a stone, or brick, or even plaster dream, and what is lacking, if anything, in the material beauty and picturesqueness of the structure, is made up, and more, by the use it subserves. As the sun sets and rises, and in the darkness and stillness of night, there always comes at stated times from those minarets the "call to prayer." None who can hear can mistake it. The "criers" are chosen for the strength and clearness and sonorousness of their voices, and "Alla hu akbar," "God is most Great"; "There is no deity but God"; and the invitation, "Come to Prayer, Come to Security," and specially in the stillness of night,—"Prayer is better than sleep,"—tell the simple and yet living faith of those who build for utility as well as for beauty!

EARL SPENCER'S PICTURES AT SOUTH KENSINGTON.

THE rooms left vacant by the transference to Trafalgar-square of that portion of the National Collection which was at the South Kensington Museum are for the present occupied by the interesting collection of pictures, chiefly portraits, lent by Earl Spencer. Some of them are generally known through their having been seen at different temporary loan exhibitions of late years, but their interest is the greater for the opportunity of comparison afforded by seeing them together here. A special point in the collection consists in the juxtaposition of a good many portraits of eminent painters executed by their own hands. Of these, perhaps, the most remarkable is that of Murillo, who is represented looking from an oval frame or border, painted to resemble stonework, and on the margin of which one hand rests. The painter's broad square countenance, rendered more massive in appearance by the thickish loose hair which stands out on either side of it, rather recalls the physiognomy of a certain great pianist, who was one of the lions of the recent season; the force and character displayed in it are of a nature different from what one would associate with the artist's works. Beneath the painted frame we read on a label the inscription, "*Bart. Murillo, seipsum depingens pro filiorum votis ac precibus explendis*" ("painting himself in fulfilment of the prayers and entreaties of his children"). There is no pretence or littleness about the work, though it has not the rugged power displayed by Velasquez in portraiture. Cuyp's likeness of himself, on the other hand, which hangs near, is that of a rather fine-gentleman painter, in an "attitude," with his hand on his heart, and a tall hat on his head. Sofonisba Anguisciola, whose portrait hangs next to his, should have been a woman of considerable power and independence of mind, if her countenance is any indication of her character; she plays on a spinet, turning, however, from it toward the spectator: one wonders if it were as a foil to her own countenance that she put in that of the ugly shrivelled woman who stands in the background. Bordone and his mistress, that type of the full-blown Italian woman whom Browning is fond of describing, and who appears so frequently in this artist's pictures, form a portrait group which is interesting rather from the good looks of the pair than from any individuality of character. The reverse precisely is the case with Rembrandt's portrait of himself when young. He represents himself, with perfect frankness, as a very ugly, sulky-looking young fellow, with a face full of

character, thin, with projecting lips; a red turban and a dirty-green robe: altogether he is no attractive person outwardly, save in virtue of his marked individuality. One would not expect to find Rembrandt painting a "finicking" picture of himself; and it is odd to find Richard Wilson doing so, and representing himself as a more genteel and "proper" man than he probably was at all wont to appear in reality. His portrait is well executed, though rather weak in style. Next to him is that charlatan, Verrio, who looks a kind of Shylock, with his low wizened countenance and great round spectacles. Lely's own portrait, on a small scale, is of course in a very grandiose style, full of flowing cloak and everything of that kind; and over him is a still smaller and much damaged portrait of Watteau, who represents himself turning the handle of a mechanical lute or "hurdy-gurdy," and leering like Yorick in the Sentimental Journey. One would have liked to see a pleasanter representation of so pleasant a painter.

Tintoretto's portrait of Luigi Cornaro is one of the most masterly works of the collection, especially in regard to the richness and fulness of texture of the old man's crimson robe. A curious contrast to this is Titian's broadly painted, matter-of-fact portrait of Loyola, of the ungainly face and figure, a portrait which one would fancy Titian would paint with little sympathy, and which looks indeed as if almost defiantly treated. A notable picture in a way is the triptych, by Schoorels, in the same room, reminding one in feeling and manner of Quintin Matsys; the connexion (if any is intended) between the three leaves of the painting is not very obvious. Vandyck's "Dædalus and Icarus" is a beautiful specimen of the painter, in a rather unusual style and subject; the conception of Icarus, a young and almost feminine-looking figure, with thick masses of light hair, is very fine; in a certain feeling of design which pervades it the figure reminds one a little of Etty, though with a difference. Gainsborough's and Reynolds's two paintings of the "Duchess of Devonshire," if less solid in execution than the Italian portraits (and they certainly are so in a very marked degree), yield to nothing in the collection in grace and freedom of style: the Gainsborough carries off the palm, however, to our thinking; a nobler figure, and in a finer attitude of unstudied ease, combined with dignity, it would be difficult to imagine. And, after all, this style of our English painters is perhaps a truer portrait style than that in which the costume is so elaborately wrought out in all its minutest details. A specimen of the extreme of this mode is seen in Antonio More's "Philip II.," which might really be described as a rich costume with a head at the top. With Reynolds and Gainsborough, at all events, the person is the chief interest rather than the dress.

A curiosity among the English pictures is Hogarth's View of the Green Park, from Piccadilly, with a formal square pond in the foreground, around which rather stiff figures are walking. Spencer House and some of the adjoining houses flanking the park are seen on the left, old Buckingham Palace on the right, and in the distance appears St. James's Park water; the painting is of more value as a representation of things that have passed away than from its intrinsic qualities as a work of art.

THE ARTISTIC AND INDUSTRIAL EXHIBITION AT COLOGNE.

THIS Exhibition has not belied the promise of its promoters. It is a rich picture of German genius, vivid with the historical German thought. There is no region of the world, probably, if Italy be excepted, which is, in itself, so magnificent a studio; but even Italy must be put apart if we would appreciate the full purport of the display now offered on the banks of the Rhine. The official report is addressed, as a matter of course, to the German Emperor, and deals, in chief, with works of art, "up to the end of the eighteenth century." The space at disposal was not in any way ample, yet it has been admirably utilised. Four rooms of the Casino are filled with tapestries, arms, ceramic specimens, examples of metal-work, and wood and ivory carving. The administration of the Exhibition announced, among other points of interest, the celebrated treasures of art, so long cloistered in the Cathedral of Cologne, the seven-branched bronze candlestick reputed to have been among the possessions of a sister of the Emperor Otho III., and other magnificent antiquities of a like character. With them, we find a splendid assemblage of tissues, some Persian, and dating from the sixth century. It is grievous to note, however, that Cologne, like Dusseldorf, has been remorselessly despoiled, in the course of wars and tumults, and scarcely possesses a gallery, in either painting or sculpture, of its own. At the same time, the remark is naturally made that Germany considers art as a province peculiarly, if not exclusively, her own, which is a narrow view, and one she would not seriously sustain if challenged. In fact, at Cologne, two schools are conspicuously illustrated, which in no sense can be called Germanic. These are the Flemish and the Dutch, though the Italians, Spaniards, and English occupy a considerable space. We pass some of them as too popularly known,—the copy from Poussin, in the Doria gallery; the trio made up by Murillo, Velasquez, and Ribeira; and it may even be permitted to merely glance at the world-famous works of Rubens and Rembrandt. There are, on these walls, pictures that are, so to speak, obscurities to the common knowledge, and yet which are essential to the historical understanding of art. Thus, the canvasses of Madrazo. He was the Reynolds of his country and his day, but he painted the portraits of only queens and princesses, and is not vulgarly known. Yet neither Murillo nor Velasquez could draw with a more true and tender grace. It is in getting rid of these traditions that art-exhibitions have their educational value. We do not need to pull down Velasquez or Murillo; but to do justice to the neglected and misjudged Madrazo. It was not his fault that the Duchess of Alva was ugly, any more than that her husband was a monster; but we turn now to another illustration at Cologne. Was M. Ribeira, in his portraits, or dramatic groups, the equal of his master, Paul Delaroche? No; but he excelled him in sentiment. It is doubtful, however, whether the signatures on the canvasses at Cologne are universally genuine. Two of the reputed Murillos most certainly are not, and, indeed, may be traced to the Palais-Royal pencils of a nineteenth-century date. They may be faithful as imitations; but they are spurious, nevertheless. In Germany, however, and in all countries fringing upon the Flemish borders, criticism is more acute with reference to Dutch and low country art generally than with respect to that which is foreign. At Cologne, a "Last Judgment," an "Adoration of the Magi," a "Medusa," or an "Assumption" might pass current, although a forgery; but not a false Gallait, Wouvermans, Verboeckhœven, Robbe, or Kievs. No; Kievs, of Amsterdam, could have no copyist, except his teacher, Rembrandt, or his rival, "single-candled Schendel," the "artist of oil and wick," who said, "If I cannot paint the sun, I will study the lamp." Inevitably, there are many Rhenish landscapes; many sketches from Switzerland, as the source and birthplace of the Rhine; and many bits of character and colour due to the primitive genius of Ruysdaël. We must not look, at Cologne, for any illustration of the English school. It is not admired,—perhaps it is not necessary to say that it is unappreciated,—on the Continent. France denies us the gift of painting; Germany refuses us credit for music. Still, the critics of Cologne have discussed our merits, during the last few days, with an approach, at all events, to impartiality. Yet it is a sign of eccentricity, if not of ignorance, to institute an elaborate comparison between the works of Cornelius and those of Landseer. They had no qualities in common, and we will venture to assert that there is not an original Landseer in the galleries at Cologne. We might as well, speaking from a far-off distance, compare Raffaelle with Rembrandt, or Rubens with Da Vinci. Let each school be studied and understood by itself, and then the study of contrasting art may be made profitable. Van Loo and Watteau, and Boucher, are, in their way, sharers in the glory which belongs to Michelangelo and Titian; yet the German habit of analysis which compares them is altogether pedantic. The Cologne critics, again, fancy themselves to have made a discovery in pronouncing that Wilkie was not Hogarth; but they might have waited until anything like such a parallel had been drawn. The English have not been bold competitors at Cologne, and it seems to be forgotten that the design of the Exhibition was not identical with that of a Piccadilly first-floor in the flush of the season. It was not intended to be a cluster of annexes, a strife over prize medals, a Court of Artistic Honour wherein awards were to be given. Invitations, in fact, were not sent broadcast through the length and breadth of Europe. To begin with, after Germany itself, Switzerland, Belgium, Holland, and Bavaria were the only States expected to take an active interest in the affair; and of these four, Bavaria alone has displayed any enthusiasm, unless, perhaps, we except the States of Northern Europe, which rarely fail to struggle for a place among the winners. They have grand traditions to sustain, and they are not, in 1876, unworthy of them. The countrymen of Thorwaldsen especially are jealous of the fame bequeathed to them. So, in their degree, are the descendants of the Swiss, Gleyve and Muyden, and of the Dutch Bischoff, the fellow-student of Alma-Tadema, and teacher of the Polish artists, who, in colour, in concentration, and in energy, are marvellous. Their pictures, "While we Live, Poland is not Dead," "Super Flumina," and "The Curse of the Dead," while rough and wild in execution, are extraordinary in force, and historical in character. It is in the German school, however, as represented at Cologne, that the mind is principally interested. It is not illustrated in its best form. As at Paris, as at Munich, so at Cologne: it is more ambitious than eclectic. We find the mural decorations of Berlin resplendent upon walls that should have been alive and bright with subjects which fill up spaces less vast than those that are demanded for cartoons. Here is Kreutzer, eloquent, at once, upon the Bible, the Niebelungen, and Faust. There is Kaulbach, who flames with all the horrors of the Spanish Terra, in the Low Countries; and the son of Kaulbach, who celebrates, on canvas, Arndt's much-puffed air, "The Watch on the Rhine," which may be forgiven him on account of his splendid frescoes in the Museum of Berlin. It is curious, again, to note some nationalities, or rather provincialisms of German art. We have, for example, M. Knaus, of Wiesbaden, whose tints are all blue, in various shades, with a generally ghastly effect, whether in landscape or composition of groups. His fields are almost of the same colour as his skies; just as the foregrounds of M. Liezenmayer are all of a shadowless white. Still, both these masters possess a charm, and the outlines and hues of their canvasses, whether consonant with nature or not, are attractive. Those grand reminiscences of the great Frederick must evoke strong symyathies in German minds; they are national and historical to intensity. Then from Baden comes a scene in the Forest of Fontainebleau, perfect in its woodland aspects, and thence, the transition is dramatic in its effect, to a wall hung with the interiors of German cathedrals, great Gothic monuments, perspectives of edifices half Pagan and half Christian, portraits of warriors, queens, and ecclesiastics;—Queen Elizabeth by the side of Gustavus Adolphus; John Huss; Arnold, of Brescia; Abelard; Savonarola, and Luther "as he appeared" when burning the Roman bull. The Portrait Gallery is endless,—Zwingle and Calvin, Coligny and Maurice of Saxony, William of Orange, and Barneveldt, with our own Essex and Burleigh, Drake and Thomas Moore, and Cranmer. It is a vast historial allegory, so to speak, illustrated by a magnificent Pilgrim's Progress of heroes and martyrs through many generations of human life. More than this, however, it is a brilliant illumination, the light of which is cast upon modern German art especially, at a time when this art is, amid the glow and fever of military triumphs, awaiting, perhaps, another *renaissance*. We have confined our present notice to the artistic display at Cologne; but in many other respects, it is interesting, and, although limited in scale, it is choice in selection, and does honour to that German spirit which, however exclusive, and always over-patriotic, is loyal to the Arts.

Pipe-Founding Contract. — The undertaking of introducing into the city of Rio de Janeiro an abundant supply of water has been taken in hand by the Government of Brazil, the chief contractor being Signor Gabrielli. It is understood that the execution of the entire contract, which has been entrusted to him, will cost something like 1,700,000*l.*, and that the money will be raised exclusively by Brazil out of her ordinary resources. According to *Iron*, the pipe contract under notice is chiefly for mains of large size, 31¼ in. in diameter, the smaller sizes forming only about 10 per cent. of the whole. It consists of 80,000 tons of cast-iron pipes, and has been taken by three Glasgow firms.

A FRENCH SOUTH KENSINGTON MUSEUM.

ALTHOUGH the proposal of a national subscription "for the foundation and organisation of a South Kensington Museum,—a Museum of the Decorative Arts" in connexion with the *Union Centrale des Beaux Arts appliqués à l'Industrie*,—appears at first an inadequate means of establishing so important an institution, the commencement of the *Union Centrale* has been so well considered, and the earliest efforts so completely carried out, that many believe in the ultimate success of the project.

We not long since visited the library of the *Union Centrale*, which is situated on a first floor in a delightful old house in the Place des Vosges (the old Place Royale), the front windows of which look on to the quiet old quadrangle, and the windows of the rudimentary museum at the back on a fine courtyard with a terraced flight of steps of the time of Louis XIV.,—the visit reminding one slightly of a visit to the old British Museum in the days when Sir Henry Ellis and Montagu House existed.

So highly is the directory of this museum esteemed in Paris, and so much have they done, within the last ten years (the limit of its existence), to supply precisely the kind of information that all workmen, in whatever field of labour, seek for, or ought to seek for, that Marshal MacMahon, doubtless at the suggestion of M. Senator Krantz, has requested M. André, the director of the *Union Centrale des Beaux Arts*, to take part in the superior commission of the Universal Exhibition of 1878.

Such a request, indeed, seems obvious, when we recal the all but exhaustive work that the *Union Centrale* has done for Paris. The splendid show of Japanese art, the first Oriental Congress visited four years since; the interesting history of costume two years back; and now at this exhibition at the Palais de l'Industrie, the history of tapestry is shown by a magnificent suite of nearly three-hundred pieces of tapestry, dating from the fourteenth century to the work of the present day, when you may see workmen at the loom, producing designs feebly adapted for the purpose, but perfect in mechanism, both in the *haute lisse* and the *basse lisse*.

The French have a faculty apparently for arranging exhibitions.

Twenty years ago,—twenty-two in reality,—the town of Bagnols, in the Department of Gard, near Nîmes, possessed a *bibliothèque musée*, or a library and museum, founded by M. Léon Alègre. Seconded by some chosen friends, and encouraged by intelligent administrations and ministries, M. Alègre has succeeded in giving his natal town an establishment which we dare to say is almost model.

The end which the founder proposed was to attract the curious and the visitors, and to instruct them through their eyes, and to moralise them through the study of the books and different collections put at their disposition. It is in the *Hôtel de Ville* that this museum and library are situated. Five rooms are given up to the collections, which are as varied as they are important.

The first room contains, besides a plan in relief of the Department, all the specimens of mineralogy, geology, and palæontology peculiar to the locality; natural history is represented, not only by pictures, but by types methodically classified; conchology, ornithology, botany, ethnography, &c. A glass case contains the objects connected with the study and products of agriculture.

Another series of cases is devoted to the industries of the locality and its environs, pottery, glass-making, iron, silk, paper, hats, obar-coal, &c., from the raw material to the worked-up and finished object.

The second room contains the library, properly so called; the books, to the number of 4,000, are disposed in such a way as to form two groups, of which one is specially reserved to the popular library; splendid illustrated publications, all the military and other geographical maps, and plans and maps in relief.

The third room is given to the *histoire de travail*, commencing with an interesting prehistoric collection, the age of stone, the ages of bronze and iron, antique medals, Gallo-Roman objects found in the country; Middle Age and Renaissance types; products of Egyptian and Oriental art, brought back by intelligent travellers or by friends, enrich other cases.

Further on in a gallery uniting the two buildings are casts of all the inscriptions of the Canton, Gallic epigraphy, Greek, Roman, and Middle Age, even in *langue d'oc*.

Then opens out a vast room consecrated to the fine arts. By the side of some beautiful paintings, given or lent by the State, the founder, who has brought together the works of Flandrin, Yvon, Roqueplan, Roybet, De Segues, Laurent, &c., has classed all the different kinds of drawing, crayon, tinting, water-colour, body-colour, engravings since the earliest periods till 1876 (changed from time to time in their frames), lithographs, oil-paintings, wax-paintings, enamel, lava, glass, wood, &c., and all this to show the types of the varieties of the interpretation of art. Casts of some beautiful statues, vases, bas-reliefs, give in the museum of Bagnols a high idea of antique art.

In this same room are also the portraits of all the illustrious or distinguished Bagnolais:—Rivarol, Gentil (viceroy of Hindustan), General Teste, Admiral Bompard, Gensoul, De Roussel, Madier de Lamartine, &c.; Father Bridaine, Archbishop Menjaud, &c., painted and presented by the founder. There is also a modest monument erected to the memory of the young soldiers who were killed during the war (1870-71); fifty-two soldiers, natives of the canton of Bagnols, died for their country during that fatal war.

In the fifth room are collected the products of industrial art. A series of casts teaches the novice how to distinguish Greek and Roman art, that of the Middle Ages and the Renaissance; a vast picture painted by M. Alègre, a *resumé* of the great works on polychromatic design of Racinet, Lièvre, and Owen Jones presents the history of decorative art from the time of the Egyptians to Louis XVI.

The local products, models for locksmiths, timber-work, carpentry, modelling, sculpture, galvanoplastic, church windows, art of weaving silk, carpets, wall-papers, a series of apparatus for experiments in physics and chemistry, &c. All this offers a whole of the most interesting nature, and captivates the attention of the *savant* and the erudite, as much as it pricks the curiosity of the man whose knowledge is but little developed.

Let us avow that few towns or even large cities in England have an establishment of instruction and curiosity as complete and as extended as this museum and library of Bagnols.

The founder, M. Alègre, who is at the same time the curator, has placed in the most conspicuous parts of the rooms a number of significant inscriptions, of which here are some of the principal:—

"Let us aid each other and love each other",—motto of the Société d'Encouragement au Bien, of which the curator is a laureate. "Reading is one of the duties of an honest man" (Christine de Suède). "To see, to understand, and recollect, is to know" (Rubens). "There are three kinds of ignorance,—To know nothing; to know badly that which one knows; to know something else but what one ought to know." Under the bust of Lafontaine,—"Work is a treasure." Lastly, under that of Franklin,—"Those who pretend that one can arrive at something without work and without trouble are poisoners."

M. Alègre has rendered his natal town a signal service in putting within the reach of all his countrymen practical instruction and good counsels. We add, with great pleasure, that he is rewarded for his devotion by the gratitude of all; and what touches him more still, by the numerous visits made to his bibliothèque-musée.

WEST HARTLEPOOL.

OF all the new towns in the North-Eastern district, which has been this century prolific, there is none which has a more wonderful growth than West Hartlepool. Middlesbrough, with twenty years more life, has attained to greater dimensions, but its growth has been practically unchecked. Jarrow has revived an Old-World name, but it is yet a comparatively small town, though incorporated. Others have made wonderful strides in a generation; but in none, from so small a nucleus, has there been so great a growth by bounds and starts, with pauses between, as at West Hartlepool. Not thirty years ago its site was fields, its docks and harbour were pastures and sandy shores, its rolling-mill grounds were then rabbit warrens, and only a farm-house, a mill, and half a dozen seaside cottages occupied the site. The township of Stranton, within which it is almost wholly situated, had a population of about 380, and one of the best Gazetteers of that day described it as "inconsiderable both in its population and trade." The excellence of its place for purposes of export and import trades was appreciated; docks were constructed, the ancient Clarence Railway was extended to it, trades gradually centred themselves there, and thus a town of 30,000 people has arisen on what were erewhile sandy shores and agricultural lands.

The first trade planted in West Hartlepool was that of coal export. In 1847, the first dock opened, and in that month the shipments of coal amounted to 2,500 tons, and for the year they amounted to 54,202 tons. For some years there was a tolerably regular increase in the amount of coals shipped, and in 1861 close upon a million tons were shipped, but from that time for some years the increasing home demand caused the shipments to fall off until they sank down to scarcely half a million tons for 1873. With the depression in the iron trade the export of coal has again increased, and now the shipments are at the rate of about three-quarters of a million tons yearly, those for the latest month tabulated being fully 98,000 tons; whilst the vessels entering the port (numbering in the first year of its existence 460), were in that month 537, and yearly amount to close upon 4,000. Five years after the opening of the first dock a second was opened, and from that period the import trades—on which West Hartlepool largely depends—date their commencement. First, however, it may be said in a sentence that the export of goods other than coal and coke began with a value for 1853 of 23,846*l*., and rose till it reached its maximum in 1861—the amount then being close upon six millions sterling, falling, however, until the low value of one million and a half was reached in 1869, to recover until now the amount is between two and three millions. The imported goods inciude grain, cattle, timber, and general goods. Beginning in 1852 with 16,000 quarters, the grain trade has assumed large proportions, 300,000 quarters being now yearly imported, and the amount being now largely increased, until in the month alone to which reference has been made about 58,000 quarters were imported. The extent of the general goods imported in the first year was about 5,000 tons,—a quantity now multiplied tenfold. The live-stock trade is not so extensive, but the thousand heads imported two dozen years ago are now multiplied thirty-fold. The timber trade has known a vast increase from the 500 tons with which it began, the quantity imported last year being about 350,000 loads, whilst a vast increase is this year being known to an extent indicated by the fact that one month's imports were 68,956 loads. To meet the needs of these trades, the docks have had to be enlarged in number, and now a deep-water dock of large capacity is in course of construction. With this the dock area will be about 50 acres, the timber-ponds cover nearly 100 acres, and the yards for the storage of timber occupy above 100 acres; and yet merchants ask, like Oliver Twist, for more.

Manufactures were begun, so far as shipbuilding is concerned, twenty-two years ago. Now, in normal times, a tonnage of ten to fifteen thousand tons is launched yearly. The iron manufacture has been commenced, and there are three blast furnaces, and about 150 puddling furnaces at the works, whilst the dulness of these now is, alas! the general fate of others in the district. The nut and bolt trade flourishes to a certain extent; the creosoting of timber is largely carried on; and the saw, planing, and joinery trades are to an extent greater than in most other towns in the North; whilst for years briskness has characterised the building trades. As the result of these, the population of some 380 rose by 1851 to nearly 5,000; by 1861, it was 13,600; by 1871, there was a further large increase,—to 22,121; and now its population may be taken as about 30,000.

At present, although the stagnation in the iron trade is a serious drawback to its prosperity, yet the unparalleled activity in the timber trade largely counterbalances this. Extension is in various directions going on. The school accommodation was sadly deficient, and the School Board has now in course of erection and in contemplation schools for 2,000 children; several ornate additions to its chapels have recently been brought into use; its docks and quay accommodation is being enlarged, and its graving docks are to be numerically increased. A new branch line of railway is now approaching completion; and another, in the future, will bring it

nearer to the vast deposits of ironstone in Cleveland, so that its prospects brighten beyond the present. It depended, in early days, on forced trade; and when, fourteen years ago, its parental company got into difficulties, it experienced the results of the sudden stoppage of the forcing process, and again under somewhat similar circumstances, four years later, its growth was arrested. It is now no longer dependent on one company's forcing, as at first, nor upon one industry, as in the second stage of its growth; but, drawing its life from varying trades, it finds the advantage in times like the present when one is depressed so greatly. It has latterly had no patron, such as Barrow, its west coast imitator, has, nor has it, like its prototype, Middlesbrough, had the advantage of good local government and oversight. Its inherent merits, its position, its facilities for shipment and for extension, and the fact that immense mineral deposits back it up to the west, are the causes of its growth, coupled with its facility for commanding the trades of the Scandinavian and North German countries. And as further trade facilities are given to it, its future will be more assured, and its growth more rapid, and its progress will be as great and less fluctuating in the future than in the past.

DEMOLITION OF THE CHURCH OF ST. MICHAEL, QUEENHITHE.

THE building materials of the old Church of St. Michael, Queenhithe, have been sold by Messrs. Fuller, Horsey, & Co., and this church will now very shortly be swept away. The remains of a large number of persons buried in vaults within the church have been removed, and several claimed by the relatives or representatives of the deceased re-interred in other places, whilst the remaining portion have been buried in a large new vault, constructed in the yard attached to the church. In disposing of the fabric and the fittings within the church, several memorials have been retained. Amongst these is the memorial-stone of the structure, at the corner of Little Trinity-lane, on which is the following inscription:—"This chvrch was bvrned in ye dreadevl fire in ye yeare 1666, and was began to bee rebuilt in ye yeare 1676. Will. Woodrof, Thos. Lyme, chvrch wardens." The stone, with its inscription, is to be placed in some public building in the City, probably in Guildhall. Amongst the interior portions of the structure to be preserved is the old white marble font, which was in the previous church. It was found amongst the ruins after the fire, and with the exception of cracks from the heat of the flames, was uninjured. After being repaired it was placed in the edifice now about to be taken down, where it has since remained. Within the last few weeks it has been re-erected in St Paul's Cathedral, as well as several of the old monuments and tablets. The old carved oak pulpit and canopy have likewise been retained, and now stand in the church of St. James, Garlick Hythe, whilst the stained-glass windows have also been preserved, and are to be transferred to a new church now in course of erection in the parish of St. Pancras. Schools and a rectory-house will be erected on the site.

THE PROPOSED STREET IMPROVEMENTS IN CAMBERWELL.

IN the Improvement Bill which the Metropolitan Board of Works intend to promote during the next Parliamentary session, about two hundred houses will be scheduled, and either partially or wholly taken by compulsory purchase, for the contemplated widening of the main thoroughfare between the Camberwell-road near the Green, and Queen's-road, in Peckham, extending to within a short distance of the bridge which carries the London and Brighton Railway over the last-named thoroughfare. Several of the houses proposed to be removed are amongst the oldest in the district, having been built more than two centuries ago, and more than one have interesting historical associations. The estimated cost of the improvements, if ultimately carried out in their integrity, is upwards of 250,000*l*. For the widening of that part of Camberwell-road, near Camberwell-green, from 35 ft. to 50 ft., amongst other property to be taken is the Old Father Red Cap public-house at the corner of Camberwell-green. It is stated to be one of the most ancient establishments of its kind in the district, and noted as being one of those old inns where, in days gone by, the old stage-coaches running to and from London drew up to bait, when bad roads made short stages the rule. Another section of the proposed improvements is the widening of that part of Church-street, Camberwell, from its commencement at the south-east side of the green to a point opposite to St. Giles's parish church. Both sides of the road, and nearly every house and shop between the points named, will be affected by the improvement, and amongst the property which it will be necessary entirely to demolish is the old public house on the right hand side, at the corner of Grove-lane, known by the name of the Hermit's Cave. On the left-hand side of the road a portion of the grounds of the vicarage, opposite the church, will be absorbed by the widening of the road. The most expensive portion of the improvement will be that commencing in High-street, Peckham, and extending to the Queen's-road. Certain portions of High-street are at present only 19 ft. wide, and as the intention is to make the entire thoroughfare, from end to end 50 ft. wide (including the footpaths), it will be seen that extensive portions of the frontages of the property on each side of the road will necessarily have to be taken, and in carrying out this part of the improvement alone upwards of 120 houses, shops, and other places of business will either be entirely or partially taken down, and in those instances in which portions of the sites of existing premises are not required, new frontages will have to be erected. This part of the improvement will take in a house in Queen's-road, which is said to have been built nearly three hundred years ago. The interior of the premises reveals their ancient character, the walls and other portions of the internal workmanship being elaborately carved and panelled in oak.

THE JOHANNESKIRCHE, STUTTGART.

THE principal Protestant churches of Stuttgart, as they still stand at the present day, were erected in the fifteenth century, at a time when the town numbered only 4,000 inhabitants. When the Reformation came, with its more simple rites, the three churches were sufficient for the religious requirements of the population; but when the latter increased to nearly a hundred thousand, more accommodation was wanted. It is a testimony to the reawakening of religious life in Stuttgart that, besides the Church of St. John (the subject of our illustration), five more churches are either near completion, in course of erection, or projected. But it is also from an architectural point of view that Stuttgart may be congratulated. If formerly one of the hills surrounding the city was ascended, a panorama causing a peculiar impression spread itself around; the handsome frame of hills did not agree with the picture which it inclosed. It seemed as if a beauty wished to supplement a deficiency of charms by sylendour of frame. Only the Stiftskirche, the principal church of Stuttgart, in connexion with the old ducal castle, as seen from the east, formed an architectural picture of exceptional merit. This was the only point which, towering above sea of black roofs, succeeded in attracting the eye.

All this will be changed in future. The sepulchral chapel on the elevated Campo Santo has become a dominating point. Soon the new Roman Catholic Church, with two towers of equal height, will follow; and at the same time, or perhaps somewhat earlier, will rise the Garrison Church, with two towers at the entrance, and with a boldly-constructed dome, flanked by four towers. At Heslach, a suburb of Stuttgart, the erection of a new church has long been resolved upon, and the erection of the sixth of the new churches, the Friedenskirche, which is to supply the spiritual wants of the part of the Würtemberg capital lying between the city proper and the suburb of Berg, is only a question of time. If we now take also into account the new railway terminus, the site of which on the Hasenberg Terrace is 300 ft. above the level of the Feuersee, the Stuttgarters are perfectly right in assuming that the monotonous features of their city will be considerably changed and animated within the next five or six years.

The Johanneskirche affords a first indication of what the aspect of the Swabian capital will be in future. The church is situate on a tongue of land extending into the Feuersee, which was regulated ten years ago, and it is surrounded for two-thirds of its length by the lake. Our illustration is a choir view of the church, and shows in the background St. John's School. All the principal parts of the church are shown. In making a regular inspection of the church, we turn first to the western tower front.

The tower forms an independent part of the structure at the point where it reaches the eaves of the roof; here is the first gallery, of which there are altogether three. Over the belfry rises the spire of the tower, in which openwork and closed panels alternate. The former impart to the tower, even when seen from a distance, a great charm. But of especial interest is its constructive design; the outlines of the spire are not straight, but they show a swelling of about 7 in. at the highest point. This entasis prevents the pyramid from appearing too slender. The tower has a height of 227 ft., measured from the pavement to the top of the stone structure.

The western front has three entrances. We find first an ante-chapel, with stairs at the sides leading to the galleries; and from here, after passing the doors of the tambour, the interior of the church. Similar arrangements are met with in the entrances to the aisles; from these porches also the galleries may be ascended, which are thus reached without disturbing the assembled congregation. The ground-plan shows a design of nave and two aisles. The nave is crossed by a transept, and is separated from the aisles by pointed arches; the transept has flat arches. The whole building differs in its style only very slightly from a Roman Catholic church, with the exception, however, of the choir. The spacious choir required for Catholic rites can, in truth, be dispensed with in the simple forms of Protestant worship. The choir here consists of the five sides of a regular octagon, and is not very deep. The church receives its light from three rows of windows, placed above each other; the first row is in the walls of the aisles; over this the second and most pleasing; the upper row being placed in the centre nave. The whole church is so profusely painted as has hitherto been hardly considered compatible with a Protestant place of worship. The ground tone is the yellow-greenish-grey sandstone of which the whole church is constructed. Only the moulding, the pillars, capitals, panelling, &c., have the natural colour. All the vaulting is painted, but especially the keystones of the arches. An increase of colour, as in the decorations of the walls, is perceptible in the stained-glass windows. In the windows of the transepts three bright colours are placed together to produce effect; while, with the exception of the half-length figures of the twelve Apostles and four Prophets in the lower row of windows, all the windows of the nave are decorated only by geometrical patterns; the choir windows show figurative representations. The choir itself has golden stars upon a dark-blue ground, with vine-branches and ears of corn. We find here, also, the painted emblems of the four Evangelists, and in the centre panel the Lamb, resting upon the Book closed with seven seals. Below the pulpit, surrounded by pillars of red and green marble, stands the statue of the Reformer Luther; his right hand rests confirmatively upon the Bible, supported by the left arm. An eagle with extended wings serves as lectern. The body of the pulpit consists of a balustrade, between the uprights of which variegated tapestry appears. The sounding-board is a piece of elaborate Gothic carving. The organ is a good piece of work. The seats as well as the doors are of heavy oak. The church offers sitting-room for 1,600 people, and there is room altogether for 2,000.

The name of the architect has not reached us.

THE PROPOSED SHAKSPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON.

OUR readers have been informed on several occasions of the projected erection in Stratford of a Theatre, Library, and Picture Gallery, as a memorial of Shakspeare, and of the steps which were taken to obtain plans. The accompanying engraving is a view of the design submitted by Messrs. Dodgshun & Co., which has been selected as the most suitable. The building on the left hand is that intended for the Library and Reading-room, with Picture Gallery above.

If there should be any serious intention to carry out this design it should receive careful revision. According to the plan which has been published, not half the people sitting in the dress-circle would be able to see half the stage.



PROPOSED MEMORIAL THEATRE, STRATFORD-ON-AVON.—Selected Design.



THE JOHANNESKIRCHE, STUTTGART.

RESTORATION OF THE ERECHTHEUM AT ATHENS.

WITH reference to Mr. Fergusson's paper, on the "Erechtheum at Athens," read at the ordinary general meeting of the Royal Institute of British Architects, on February 14th last,* the following communication from Dr. Forchhammer, of Kiel, has been received by the Institute:—

Mr. Fergusson, D.C.L., F.R.S., F.R.I.B.A., has lately published a very interesting paper on the most interesting building of Athens,—the Erechtheum, a copy of which the author has been kind enough to send to me. Mr. Fergusson considers the edifice chiefly from an architectural point of view. The less he regards the religious character of it the bolder he appears in arranging the single parts of the building. He reads the riddle, but by putting outside what should be inside he creates another enigma. I do not intend to criticise the ingenious construction of the temple propounded by the successful author of the brilliant restoration of the Mausoleum at Halicarnassus. I prefer to give my own explanation in concordance with what I lately have published in a book entitled "Daduchos, Einleitung in das Verständniss der Hellenischen Mythen, Mythensprache und mythischen Bauten. Kiel, 1875."

Before entering into the question and explaining the building and its parts we must recall to the memory of the reader the following thesis:—

a. The whole building was a religious one.

b. With it were connected a number of religious fables, belonging to the earliest times of Athens.

c. In these there are at least some very clear indications of the primitive physical character of the Athenian and Greek religion. An olive-tree was growing within the temple, the testimony of Athenê's benefit to the land. That tree could not exist without water and air. Then there was water or a lake, created by Poseidon, and bearing the name of Erechtheus, who at the same time was called Poseidon, and worshipped as Poseidon-Erechtheus. Further there, was a sanctuary of Pandrosos, the goddess of dew. In that sanctuary grew the olive-tree.

d. Besides the temple of Athene Polias and Pandrosos, there was a sanctuary of Erechtheus, a subterraneous chamber of Erechtheus, and a subterraneous chamber of Cecrops, the father of Pandrosos and her sisters Aglauros and Herse. Further, there was a portico of the "Korae" or Caryatides. The body of Cecrops was said to end (instead of in legs) in a serpent; and also Erechtheus was in his lower part a serpent. Pausanias, 1, 24, 7, says, the serpent near to the spear of Athene, in the Parthenon is Erichthonios, or Erechtheus.

Now, I think in any restoration of the building all these peculiarities must be accounted for. It certainly is not sufficient to place the rooms mentioned architectonically, which can be done in many different ways, as is shown by numerous restorations, and now by Mr. Fergusson placing the Cecropion, the Pandroseion, and the olive-tree outside the temple.

It will be desirable, first, to look at the fables, and to try to understand their meaning. Cecrops was married to Agraulos, and father of Pandrosos, Aglauros and Herse. It is quite clear that the father of the three genii of dew, as their name indicates, must be a genius of humidity in some form or other; the more so, as he was married to the genius of the Attik land, Agraulos. It appears, therefore, very probable that Cecrops originaly was a genius of rain. Thus we understand that after death he was elevated to the sky, where he became Aquarius of the Zodiac, whilst on earth he was supposed, with regard to the inferior part of his body, to be like a serpent (*τὰ πρὸς πόδῶν δρακοντίδης*, Aristophanes Wasps. v. 438), which means, that the rain finishes in serpentine rivers and rivulets (on the symbolic meaning of *δράκων* and *ὄφις*. See my book, "Daduchos," pp. 35–42).

That Cecrops really was a genius of rain I had already proved (1837) in my book entitled "Hellenica," page 67. I had therefore ventured to prophesy, that by excavations there would be found a cistern, being the "Hypogeon of Cecrops," under the place in the Pandroseion next to the portico of the Caryatides, as assigned to it by the inscription (Boeckh. Corp. Inscr. 160). Well, that cistern, with a beautiful double-roofed vault, was found two years later, 1839, and may be seen in Mr. Tetas's drawing, attached to Mr. Fergusson's lecture, figs. 1 and 4. It was merely a proof of *amour propre*, that Professor Thiersch, M. Raoul Rochette, and the Athenian Commission declared the cistern to be modern, though it is cut in the rock, 1·30 mètre deep, and though some parts of the marble wall of the temple rest on the wall of the cistern. We can now easily understand why Cecrops enigmatically was called *διφύης*,—born of heaven; or, if you like, double-natured, or *αἰγυπτιος*= *αἰγ-ὑπτιος*, the hero of the returning waves. Hesych. *αἶγες κύματα*.

This settled, we have to inquire about the wonders in the history of Erechtheus, which is related in the same enigmatical way. The cloud-collecting god of heavens had devoured the vapour-rising daughter of the ocean. In order to get delivered of his pains and dulness, he called the god who makes lightning and thunder to help him. Hephaistos left the clouds, and Pallas, with thunder and storm, rose from the head of Zeus. In consequence of hail and rain, symbolically called the sperm of Hephaistos, falling on the earth, the goddess Gea procreated Erechtheus, the hero of the source or pond Erechtheïs in the Erechtheum. We shall see afterwards how the pond Erechtheïs served to moisten the soil wherein the olive-tree grew.

As for Poseidon, we know that he was not only a god of the sea, but that, being particularly worshipped in Arcadia and in other places which had no connexion with the sea, he is in general the god of moistening the earth, and therefore was called Poseidon, *Ποσειδάων*, *Ποτειδάων*, from *πόσις πότις* and *δα*=*γῆ*. Now, if the Erechtheum pond was destined to moisten the soil of the olive-tree (as will be proved by the existing ruins), it appears to be very natural that the god and the hero were worshiped under the common name of Erechtheus-Poseidon. After the rain falling on the temple and its temenos, and after the increase of water in the pond, it discharged necessarily into a rivulet, which was the reason why the Athenians said that Erechtheus finished in a serpent, and that Pausanias declares the serpent near the spear of Athene to signify Erechtheus. All these heroes and gods on the Acropolis were at the same time representatives of the nature of Attica throughout. Erechtheus of the rivers, Cecrops of the rain, Pandrosos of the dew, and Poseidon of the general watering power, and all these divinities were the promoters of the growth and fertility of the olive-tree, the proof and witness of Attica belonging to Athene, the goddess of the air, which receives and adopts every child,—every produce of the earth. I am quite aware that the whole of my exposition of these Athenian fables must be proved by the construction of the building, which I know by autopsy, and which I now am going to describe in a more detailed way than hitherto has been done, admitting some peculiarities recently discovered as antique, following a route of Pausanias, differing from my predecessors, and not altering the evident meaning of the inscriptions.

Pausanias, after having turned from the southern enclosure wall of the Acropolis to the north, commences his narrative of the Erechtheum, viz.:—The great stoa (*οἴκημα Ἐρεχθειον*) at the *west* end of the temple. He first mentions before the entrance to the *οἴκημα*, the altar of Zeus hypatos, which was erected by Cecrops, whose hypogeon was under the sanctuary inside of the wall with windows. Pausanias does not speak of the doorway under the second pillar of that wall, which evidently leads into the Cecropion. Leaving the altar of Zeus hypatos, Pausanias enters the Erechtheum, apparently by the little doorway in its southern wall. This was probably the common, and perhaps the only, entrance to it. The intercolumniations between the six columns probably were enclosed by metal grating, and the great doorway in the wall between the Erechtheum and the main temple was filled in with large regular blocks of blue marble, which I have seen myself. These were afterwards taken away, probably by some unhappy superintendent, who naturally could not imagine that a doorway with so fine a cornice and frames should be closed up, being the forever-closed door (*θύρωμα*) to the hypogeon of Erechtheus. On the Stoa side that filling of the closed doorway was covered by a double door of four large slabs (panels) of black marble inserted into the (white?) frames (*ξυγά*). I think the slabs were of black marble, because they represented the door to the tomb of Erechtheus. The inscription, § 12, denotes this:—IIII. *θύραι λιθιναι μῆκος ὀκτῶ ποδῶν καὶ παλαστῆς, πλάτος πέντε ἡμιποδίων. πούτων τά μὲν ἄλλα ἐξεποίητο, ἐς τὰ ξυγὰ δὲ ἔδει τοὺς λίθους μέλανας ἐνθεῖναι.*

Pausanias does not say a word on his further passage to the temple of Athene Polias. No doubt he returned through the little doorway, by which he entered into the Erechtheum, or he passed through a gate in the gratings of the intercolumniations; he ascended then the steps on the north side of the temple, and came in that way to the eastern entrance of the temple, of Athene Polias. Within the temple he mentions the statue of Athene, which was said to have fallen from heaven, and some other curiosities. Then speaking of the olive-tree, which he probably could see from the sanctuary of the goddess, he justly observes that the Pandroseum was (*συνεχὴς*) contiguous with the former. The olive-tree was in the Pandroseum, which apparently occupied the whole lower part of the building. (Apollod. 1, 14, 1.) Besides, there was in this sanctuary an altar of Zeus Herceious, which stood under the olive-tree according to Hellanicus: *Κύων εἰς τὸν τῆς Πολιάδος νεὼν εἰσελθοῦσα καὶ δύσα εἰς τὸ Παυδρόσιον ἐπὶ τὸν βωμὸν ἀναβᾶσα τοῦ ἑρκείου Διος τὸν ὑπὸ τῇ ἐλαίᾳ κατέκειτο.*

After having placed the three chief parts of the building in their proper sites, viz., the temple of Athene in the eastern, the sanctuary of Pandrosos in the lower part to the west, and the Erectheum in the Stoa to the north, we must return to the latter in regard to some most extraordinary peculiarities.

Pausanias describes the interior of the Erechtheum. There was an altar of Poseidon, upon which they also sacrificed to Erechtheus; and an altar of Hephaistos, the father of Erechtheus; then an altar of Butes (the first priest of Erechtheus-Poseidon), and on the wall the painted genealogy of the Butades. All these things easily can be accounted for. But we have to join to them, from the inscription, the altar of the *θυήκοος*, as is clearly written three times, not *θυήκοος*. ΘΥΗΧΟΟΣ means a priest who brings sacrifices, which are fluid, not burning or smoking. How this was we learn by the following passage of Pausanias:—"The *οἴκημα* being double (viz., one above and one underneath, like the *οἰκήματα* in the labyrinth, Herod 2, 148, or like the *διπλοῦν οἰκίδιον* in Lysias de caede Erecth p. 12), there is" water from the sea "in a wel and in the rock are the signs of the trident, which were said to have appeared as proofs of Poseidon's contest about the possession of the land." These signs are indeed found at the bottom of a well cut in the rock. The well itself is still lined with stucco, and over it stood the hollow altar of the Thyechoos, through which the Butade, or priest of Erechtheus in the dry season, poured water in order to moisten the olive-tree in the inner part of the Pandroseum. For that purpose there is still a subterraneous channel passing from the well under the wall into the soil of the olive-tree in the Pandroseum. Outside of the Stoa is a cistern communicating with the well, and also by a second channel with the Pandroseum. This second channel appears now to be obstructed by masonry.

The olive-tree, no doubt, was named *πάγκυφος* because it stooped under the roof of the Pandroseum and turned its branches towards the windows, which were clearly intended to admit air and dew (*δροσος*) into the room where the olive-tree was growing. There was no reason why there should not be an altar of Zeus herceios over the cistern as in other buildings. The whole Pandroseum, being destined for the olive-tree, it is difficult to justify the supposition that the large and beautifully ornamented door (*τὸ θύρωμα*) in the Erechtheum should be an open entrance into the Pandroseum. If it had been, why did not Pausanias pass through it? All Architectonic difficulties in regard to it vanish, when it was, as I have shown, closed and concealed from the inside of the Pandroseum by large blocks of marble, and outside ornamented with black marble slabs, which are the ones, as I presume, mentioned in the inscription.

The water in the well of the Erechtheum was called mysteriously and enigmatically *θαλάσσιον ὕδωρ*, having its origin from the sea, and afterwards was simply called *θάλασσα*,—as Strabo says: "*διὰ τὴν κρύψιν τὴν μυσικὴν τῶν ἱερῶν, ἢ σεμνοποίει τὸ θεῖον*. The religion of the Greeks is full of that *κρύψις μυστική*. The well chiefly being filled by rain, and the rain coming with the south wind, the priests told Pausanias that the well of the Erechtheum presented the sound of moving water at the time when the south winds blew *τὸ φρέαρ παρέχεται κυμάτων ἦχον ἐπι νότῳ πνεύσαντι*.

There can be no doubt that also the portico of the six virgins, the Korae of the inscription,

* See p. 158, *ante*, for brief notice of it and report of the discussion which followed.

strictly belongs to all the other sacred parts of the whole building. I think they cannot but represent the six daughters of Erechtheus, who, at a time of war, offered themselves for their country, and were said to have been elevated to heaven as Hyades, goddesses of the rain. The flat roof they bear upon their heads is hollowed so as to prevent the rain from flowing off. Perhaps there was somewhere an arrangement to lead the rain into the interior of the portico and thence by a still existing doorway into the cistern of the Cekropion, or to the roots of the olive-tree. DR. FORCHHAMMER.

Kiel, April, 1876.

Remarks on Dr. Forchhammer's Communication.

By Mr. Fergusson.

Dr. Forchhammer's paper is one that I would not have thought it necessary to notice had it appeared independently in any of the ordinary channels of publication, inasmuch as it is not an answer to my article on the subject of the Erechtheum, and, indeed, except a complimentary allusion to my restoration of the Mausoleum, he takes no notice of me or of my restoration, directly or indirectly, during the whole of his observations. In fact, he only uses my paper as affording him an opportunity of restating certain views regarding the Erechtheum, which he put forward last year in a work called "Daduchos." That work I had in my possession before I wrote my paper, but the views therein enunciated appeared to me so strangely at variance with the facts of the case as known to me, that I thought the kindest thing I could do was to say nothing about them. As, however, the committee of papers of the Institute think Professor Forchhammer's paper worthy of being placed on record in the same category as mine, it becomes incumbent on me to state why I dissent from his views, though it is not pleasant to be obliged to speak disrespectfully, as I must at least appear to do, of the theories of one who has attained to such eminence among the Greek scholars of the day.

I may, I hope, however, be excused from noticing the mythological views with which the Professor introduces his paper. I said nothing about mythology, and do not profess to understand anything so transcendental as his views on the subject. My observations were confined strictly to the architecture of the building, of which I fancy I am capable of forming an opinion, and hope to be allowed to adhere to this restriction now, as that only seems to be what really concerns us on the present occasion.

The Professor commences his description of the building at the top of the third page, with what purports to be a quotation from Pausanias. How far it deserves to be considered as such any one can see at a glance who will either turn to the original Greek, or be content with the translation, of which I printed every word bearing on the subject (pp. 142–143). The principal discrepancies are, that Pausanias does not use the word "west" which the Professor puts into italics; had he used any such definite indication the controversy would never have arisen. He does mention the altar of "Zeus hypatos," but does not say that it was erected by Cecrops, and he does not mention the "hypogeon of Cecrops," as existing either where the Professor puts it, or indeed anywhere else. He is absolutely silent regarding this tomb. The assumption, therefore, that the "little doorway under the second pillar" led into the "Cecropion," is the Professor's own, and whether right or wrong is not justified by anything in Pausanias.

Leaving these "quotations" for the present. The route which Professor Forchhammer assumed Pausanias to have followed has at least the merit of originality. All other writers, so far as I know, understand him to have left the Parthenon by its eastern door, visited the objects at the eastern end of the Akropolis, and entered the Erechtheum by the eastern door. He, on the contrary, makes him come from the south; he either jumps down the terrace wall that extends 80 ft. or 90 ft. westward from the temple, or turns it, and then passing by the temple itself, he is made to enter what is usually assumed to be the northern portico, by the little doorway at its south-western angle. This portico thus becomes, according to Dr. Forchhammer, the Erechtheum, but in order to fit it for this purpose metal gratings are assumed to have existed between all its columns, so as to inclose it like a gigantic birdcage or wild beast's den. It need not be said that there is not a shadow of written authority for this, and I hold it to be impossible that such grilles or gratings could ever have been so fixed and sustained without mortises or traces of their fastenings being now found either on the floors or the columns; it need not be added that none such have yet been detected either by the Professor or by any one else.*

The most startling part, however, of Dr. Forchhammer's theory of restoration is that the great doorway under this portico,—the *θύρωμα* of the inscription, as he admits,—was not a doorway at all, but a false doorway or sham, and he asserts that he himself has seen the regular blocks of blue marble with which it was originally built up. It may be so, but it is quite certain that no one else has observed these. It is true that Stuart was denied access to this part, as it was then used as a Turkish arsenal, but Lord Elgin and his artists had access to every part of the building. So had Inwood, for he drew this doorway in its minutest detail (his work was published in 1827), and so have hundreds since, yet no one either before or since has seen what Dr. Forchhammer saw, or made any remarks that could justify such an hypothesis.† We may, therefore, I fancy, fairly assume that when the doorway was built up by the Turks, or whoever did it, they selected some of the larger and more regular blocks that lie scattered about the Akropolis in thousands, and did it with more care than other similar blockings up they have indulged in.

The attempt to connect the *θύρωμα* of the inscription with the *θύραι λιθιναι* is no doubt ingenious, but so far as I can judge it will not bear serious examination. The first term is used in the seventy-eighth line of the inscription, without any qualifying epithet which would lead to the assumption that it was anything but a large doorway, capable at least of opening, which is the only meaning attached to the word in any lexicon I have access to. The expression, "for ever closed," is wholly of Dr. Forchhammer's invention, and is not found in Pausanias nor anywhere else. The *θύραι λίναι* occurs in the 180th line of the inscription, but as that is perfectly consecutive, had there been any connexion between them they would certainly have been mentioned together. Besides this they will not fit; according to the inscription, the slabs were 8 ft. 3 in. high. The doorway is only 15 ft. in the clear, and they are 1 ft. 6 in. too high. They were 2 ft. 6 in. wide, or 5 ft. together, while the doorway measures 6 ft. 6 in., so that in that direction they were 1 ft. 6 in. too narrow.

It would be easy to go on multiplying these verbal and technical objections to Professor Forchhammer's theory to any extent, for there is hardly a line in his description that does not appear to me to contain a misapprehension of some sort, but to my mind the great argument lies in the question, is it conceivable that the Greeks in the age of Pericles could have perpetrated such a sham? In so far as I am capable of realising the arrangement of this building, there is nothing so exquisite either in Greek or in any other art as the proportion of the two pillared porticos of this building to each other, and to the relative importance of the apartments to which they led. Nothing more beautiful, either in design, proportion, or utility, than the great doorway to the position in which it is placed, and nothing more clever in design than the size and position of the smaller doorway relatively to the functions I conceive it was designed to fulfil. To be told now that all this is a sham, which would not be tolerated at Kensal-green, is strange and rather startling, for there is really no analogy between a frontispiece of a tomb engraved on a rock and such a temple building as this. The Professor in his second letter talks of "many examples of these cut by the Greeks." I know some early barbarous ones in Asia, and equally barbarous late examples of the Roman age, but not one in Greece of the great Greek age; but here, as in many other instances, I must bow to his superior knowledge, and if he will produce his examples it will be time enough to discuss their relevancy. Assuming, for the nonce, however, that these examples do exist, though I am ignorant of the fact, the absurdity, in so far as I can judge, lies in the assumption that the Greeks set up a sham doorway in front of what every one in Athens—if the Professor is right—knew to be the tomb of Cecrops, in order that it might simulate the tomb of Erechtheus. In his second letter he admits, in contradiction to the theory of his first, that the sepulchre of Erechtheus was within the Temple; and there I believe he is right, and I have pointed out what I believe to be indubitably the remains of that tomb, but he prefers to contradict himself rather than notice anything I may have pointed out.

There are other difficulties in the Professor's theory as great as these, which it would be easy, though tedious, to dwell upon. Meanwhile I am prepared to take my stand on the broad ground that such contrivances and such shams as he insists upon are in direct opposition, not only to every principle of Greek, but of any true, art, in any part of the world. If he is right, not only I, but every one who has hitherto written on Greek art, is hopelessly wrong; we must all go to school again to learn the first elements of the art.

The truth of the matter appears to be that Professor Forchhammer has been led away by a discovery he fancied he made on the spot, and to which all his ideas of the building have been made to bow. Just inside the western wall of the Temple is a long, low vault, extending the whole width across. It is about 12 ft. wide, and 6 ft. 6 in. high in the centre of the arch, which is constructed of rubble masonry, the stones composing it being not much larger than ordinary bricks. In some parts the arch is single, the stones being a foot or so long. In others it is in two rims, but nowhere is it more than 1 ft. 6 in. in thickness, the stones of which it is composed being only very partially dressed. It is divided into three compartments by two strengthening arches, and no access is obtained to it except by a man-hole in the roof of the centre compartment.

Professor Forchhammer admits, in his present paper, that Thiersch, Raoul Rochette, the members of the Athenian Commission—he might have added Tetaz, Beulé, and, in fact, every one else who has mentioned it—assume it to be a modern Turkish construction. Nine people, in fact, out of ten, who have written on the subject do not mention it at all, it appears to them so manifestly modern; and all those who do mention it, except Forchhammer, distinctly state that it is a Turkish cistern, or granary, or storehouse of some sort. In his "Daduchos" (p, 131), Professor Forchhammer instances the Cloaca Maxima at Rome, as a vault similar to this, but that is composed of three rims of cleanly-dressed and perfectly-fitted stones, aggregating 5 ft. in thickness, and consequently infinitely superior to a rubbishy rubble vault like this, only 1 ft. to 1 ft. 6 in. in thickness; and, consequently, till something more analogous is brought forward, I for one decline to believe that this vault was an integral part of one of the most highly-finished temples of the best age of Greek art. Besides this, as the Professor admits, its extrados rises 1 ft. or more above the floor-line of the temple, as marked by the steps of the north and west doorways, and by the narrow course marking the floor-line all round the interior. When covered by the pavement, which I presume it will be admitted it once was, this discrepancy of the levels would have been even more marked, and, so far as I can judge, in Greek art impossible.

If what has been said above is sufficient to justify me in rejecting Professor Forchhammer's views on the two cardinal points—of the sham doorway, symbolising the tomb of Erechtheus; and the Turkish vault, being the tomb of Cecrops—it is no use attempting to follow the argument further. If he is right in these, all the assumptions interspersed throughout his essay may be right; but if he is wrong on these two points, his whole theory falls to the ground like a house of cards, and it is no use arguing about what, in that latter case, becomes manifestly untenable.

It may, for instance, be left to botanists to decide whether the olive-tree would grow in a chamber with a solid roof, lighted only by three small windows looking to the west. I fancy it would not; but, at all events, I feel sure that his plan of moistening its roots with salt water would not improve its vigour or health. In like manner it is needless to inquire whether the bitch, who figures so largely in all restorations of the temple, was likely to leap down a clear

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* A grille of some sort seems to have existed between the inner pillars of the Posticum of the Parthenon. At least, the mortise-holes by which such a thing could easily be sustained are perfectly distinct at the present day.—See Böttticher Untersuchungen auf der Akropolis, figs. 20 to 26.

† In a second letter to Professor Donaldson he somewhat modifies the expression used in his first statement, but he adheres to the assertion that the masonry he saw was the original filling up of the doorway, and erected when the temple was first built; which is all we are at present concerned with.

drop of 10 ft., which is the only means of communication the Professor provides between the upper and lower temples. I feel sure, at all events, that neither the priests nor votaries were likely to follow her example; and if they did, it is difficult to see how they would ever get back again. But these are details it is hardly worth alluding to, and only to be understood by examining the plates in his "Daduchos."

As Professor Forchhammer nowhere in his paper alludes to my restoration, nor to the arguments by which I sought to sustain it, no defence or re-statement of them is called for, or necessary, at present. My views remain exactly where they where before the Professor's paper was written, with this only difference: the Institute have now before them two separate and independent restorations of the temples of the Erechtheum, and can choose whichever most accords with their interpretation of the authorities, or their views of the principles of Greek art. For myself, I have, I believe, said enough above to justify me in declining to accept the Professor's views as a substitute, or even an improvement in any way on my own; and this seems to be all that is at present required.

In conclusion, I can only say it is now more than thirty years since I first became personally acquainted with the buildings in the Akropolis, at Athens, and during the interval they have seldom been long out of mind; and I have thought much and written a good deal about Greek architectural art. The result has been, that I have arrived at views so diametrically opposed to those of Professor Forchhammer, not only as to the first principles of Greek art, but also as to the mode in which authorities should be interpreted and restoration attempted, that agreement between us seems impossible. I may, of course, be mistaken, and my views be as completely beneath attention as Professor Forchhammer considers them to be; but I decline to admit that this is the case, till at least something more pertinent to the subject is brought forward than anything contained in the paper now under examination.*

TIMBER NOMENCLATURE.

A MERE glance at the vocabulary pertaining to timber shows that it abounds in monosyllables, and that words of a compound character are the exceptions. This fact points with unerring truth to the rude and simple language of our Saxon ancestors as the source from which it is drawn.

Balk, or "baulk," as applied to a log of wood, is from the Saxon *balc*, the German *balken*, and the Dutch *balk*. In the former dialect it had a more extended meaning than it bears at present, as we find it implied a beam, a roof, a covering, or a balcony.

Batten is from the Saxon "bat," a boat or ship, and implies a piece of wood suitable for making or building such vessels. The club or bat of the cricketers, as applied to a piece of wood, is allied to this word.

Beam, from the German "baum," a tree. In the sense of a tree the word still lingers with us in horn-beam, horn-tree. Its primitive meaning was a rough-hewn tree used for constructive purposes.

Board is the Anglo-Saxon "bord," and German "brade," a thin plank. This word has been highly wrought upon, from being made of boards. We find it applied to the deck of a ship, also to a table, and hence those that assemble round it, and even the food placed upon it.

Chestnut, sometimes called Spanish—from the fact of the best fruit coming from that country—is from the Anglo-Saxon "cyst-beam," literally the fruitful tree; being a tree requiring a warmer climate to ripen its fruit than that prevailing in this country, it is naturally inferred that it was a tree little known to our rude ancestors. Be this as it may, the fact remains that they were present at its christening. The horse-chestnut was so called upon its introduction from Asia in 1629, the term being a mere translation of its classic name, *hippocastanum*.

Deal is the Anglo-Saxon "dael," and the German "diele," a part or portion, hence a piece of wood. In early times it most probably referred to a riven piece, as a riving axe was called a "deal axe"; we still retain the word in a "deal of cards," meaning a division or portion of the whole. So far as the timber trade is concerned, the term "deal" appears to have been applied alike to the fir and the spruce, the "mast-tree" and "deal-tree" being common terms long before it was known what trees they were the products of.

Fir, as a term, embraces all the best known coniferous trees, such as the Scotch fir, the spruce fir, and the silver fir; it applies to trees of a resinous character, easily ignitible, and consequently suitable for fuel, for torches, and firebrands. Gerard says, "the fir-tree" was originally the "fire-tree," an inference that all investigations confirm, and there can be no doubt upon comparing the Anglo-Saxon "fyr," fire, with the Scandinavian "fyrre," fir, that the terms "fire-wood" and "fir-wood" are synonymous.

Log is an old Dutch term for "heavy," hence a heavy piece of timber is so called. The equivalent in the German tongue is "klog." In America, where the mother tongue is subject to great mutations, the act of rafting timber has got corrupted to logging.

Lumber, dry, household rubbish, has taken the place of the term "wood" on the American continent. With the early settlers, whose all lay in the cultivation of cereals, timber was an incumbrance to the land; and although it has long since raised itself into a marketable commodity, it has failed to free itself from this term of ridicule.

Oak, the Anglo-Saxon "a'c," "aec," and "aac," and German "Eich." The first form is preserved to us in the fruit "a'corn," the corn of the oak. In ancient times it was a tree prized for its fruit, being used for fattening swine, and, in time of dearth, as human food.

Spruce occurs as spruce fir and Norway spruce. The former is the older or original term, and if rightly read is simply descriptive. Spruce fir is the old Prusse, or Prussian-fir. It occurs in the manuscript of *Liber Albus* (*circa* 1250), as "pruz-fir." It would appear that there was little or no distinction in these early times between Prussia and Russia, as the Russian leather of our day was the spruce leather of the Dutch merchants, who, during the Hanseatic League, had their seat of trade at Wisby, in the Baltic. It was through their instrumentality that the produce of the Baltic shores reached England *vid* Amsterdam, and from this cause may be traced the numerous lowland terms that abound in our nomenclature of timber. It will be seen that as the timber trade moved to Norway, the term spruce accompanied it, and hence "Norway spruce fir" has long been held as the equivalent of "white deal." The same remark applies to America, where "spruce" stands for the "white fir" of that continent. In unearthing the meaning of these ancient terms, the first form in which they were used contrasts strangely with their present use. In the case in point, we should scarcely be credited with the exercise of sound reason were we to write "American Prussian fir" for "American spruce fir," although such term would be orthographically correct.*

* Some other communications on the subject appear in the Transactions of the Institute.

THE NEW WINTER GARDEN AND AQUARIUM AT RHYL.

THE watering-places in the north are fast vieing with those on the south, and on the west and east coasts, in becoming specially attractive from the number of inducements to visitors and novelties which they are constantly presenting. Southport, from an unpretending village, not very many years ago, has been transformed into a noble and beautiful marine town, and is now designated the Montpelier of England, whilst its neighbour, Blackpool, on the north-west coast, is not inaptly called the Brighton of Lancashire. Those who, like the writer, may remember Rhyl little beyond a decade, with its then almost solitary street frontage facing the Welsh coast, could scarcely have imagined that it would now be distinguished as the Queen of North Wales watering-places, but so it is that within the last few years Rhyl has made rapid strides, both in regard to its expansion and the number of its public buildings, and other places of resort, and the particulars of the opening of a new skating-rink, and laying the memorial-stones of an aquarium and winter-garden, which took place on Saturday last, are deserving of special record.

Manchester and Liverpool have largely contributed to the success of some of the northern watering-places of which we are speaking,—notably so in the case of Southport, and it is to a Manchester company of capitalists that Rhyl is indebted for the aquarium and winter gardens which it will shortly possess, and for the skating-rink which was inaugurated on Saturday last. It is little more than twelve months since the company was established, and immediately afterwards they purchased about 35 acres of freehold land, one third of which is being devoted to the purpose of winter gardens, with aquarium, concert-rooms, skating-rink, &c., whilst the remainder of the ground is intended to be sold for the erection of residences and hotels. This land has already been in great demand, in proof of which it may be stated that up to the present time the company has realised a profit of 2,500*l.* for portions of it. The main erections of the structure, the memorial stones of which were laid on Saturday, will be the aquarium, winter gardens, and concert-hall. The aquarium will contain a show space of 675 lineal feet, the largest sea-water tank being 90 ft. long, and the largest fresh-water tank 50 ft. The seal-pond will be supplied with the water of every tide. The winter garden will be 150 ft. long by 75 ft. wide, and the concert-room will be about the same dimensions, which, with the galleries, will afford space for a very large audience. There will be also a refreshment-room and dining-hall, each capable of accommodating a thousand people; likewise a sculpture gallery, 150 ft. by 40 ft. Between these erections and the sea a large stretch of ground will be laid out as bowling-greens, Italian gardens, and playing fountains, whilst the land dividing the aquarium from the skating-rink will contain ferneries, terraces, a lake, a waterfall nearly 30 ft. in height, broken in three places by ledges of rock; and a cave 70 ft. long, 30 ft. wide, and 18 ft. high; together with rustic bridges and grottoes. The four memorial stones were laid respectively by Mr. J. E. Middlehurst, of Manchester, chairman of the company; Mr. Ellis Eyton, M.P., one of the directors; Sir Piers Mostyn, and Mr. Osborne Morgan, M.P. The skating-rink, which was inaugurated on the same day, is a very large one, being 180 ft. long, and 66 ft. wide, with superficial skating area of 1,113 square yards. It is covered in with a semicircular open-timbered roof, rising to a height of 40 ft. from the floor.

It is noteworthy that the whole of the bricks with which mainly the several buildings are being constructed are manufactured by the company on land purchased by them adjoining the railway. This ground yields excellent clay, and the machinery and plant brought into use enable the directors to turn out from 70,000 to 90,000 bricks per week, at a saving of from 10*s.* to 14*s.* per 1,000.

The estimated cost of the several buildings is 35,000*l.* Mr. Owen Edwards, of Manchester, is the architect; and Mr. Herd, of Manchester, and Mr. Abel Jones, of Rhyl, are the contractors.*

* Condensed from the *Timber Trades Journal*.

THE RADIOMETER.

IN a recent discussion by the Paris Academy of Sciences on the cause of the movements in Prof. Crooke's radiometer, M. Govi rejected the idea of an impulsive force of light and of thermal currents of gas in the receiver; the cause he assigned was the dilatation by heat, or condensation by cold, of gaseous layers which all bodies retain at their surface, even in an absolute vacuum. It should be possible to obtain insensible radiometers, by heating the vanes during the action of the mercury pump. M. Fizeau said that the constant motion for as long as an hour of a radiometer placed in the centre of a circle of candles was against this hypothesis.

The future of the radiometer is being talked of, though its *rationale* is certainly as yet unsettled. The inventor says,—Having found that the force developed would carry round a comparatively heavy weight, another useful application suggested itself. If I can carry round heavy mirrors or plates of copper, I can carry round a magnet. Here, then, is an instrument carrying a magnet, and outside is a smaller magnet, delicately balanced in a vertical position, having the south pole at the top, and the north pole at the bottom. As the inside magnet comes round, the outside magnet, being delicately suspended on its centre, bows backward and forwards, and, making contact at the bottom, carries an electric current from a battery to a Morse instrument. A ribbon of paper is drawn through the "Morse" by clockwork, and at each contact—at each revolution of the radiometer—

* In a previous volume (xxxii., p. 1,072) a view of the Town-hall, recently erected in Rhyl, will be found.

a record is printed on the strip of paper by dots; close together if the radiometer revolves quickly, farther apart if it goes slower.

THE ACADEMY OF MUSIC, MELBOURNE.

AMONGST the most important works just now in progress in Melbourne are the new Arcade and the Academy of Music. Commenced only twelve weeks since, it has risen by perceptible stages daily, and as it is to be formally opened on the 1st of November next, it will, when finished, stand as a monument of the architects' genius. Over one million and a half of bricks have been already used in the edifice, which is rapidly approaching completion. The Bourke-street or grand façade will be one of the most striking frontages in the city, the addition of several statues being quite an original feature in Melbourne. The arcade will consist of thirty-four shops. The front premises have been constructed to serve the purpose of an hotel and *café* on a large scale. A jeweller's shop will occupy part of the frontage on the opposite side of Mr. Hosie's establishment, the remaining portion being taken up by the grand staircase which leads to the dress circle of the Academy of Music. The academy occupies one of the block, and the back of the stage runs up to Little Collins-street. After ascending the stone staircase, visitors will find themselves in the grand saloon, a lofty apartment, 130 ft. in length, which runs over one side of the arcade. Twelve bronze statues, 5 ft. high, on 4 ft. pedestals, support rich lamps, while the intervening space round the walls is filled up by mirrors over 11 ft. high. Between these glittering accessories will be placed specimens of the highest photographic art to be obtained. Ranged around the walls of this saloon will be crimson satin folding chairs, statuesque vases, and groups of rare exotic flowers. At either extremity of the saloon two mirrors, 12 ft. high and 7 ft. wide, will reflect back the figures of the promenaders from one end to the other. One of the most striking features of the whole design, however, will be an immense stained-glass screen, forming the end view from the arcade. This screen, divided into nine panels, has for the centre a colossal figure of her Majesty the Queen, 11 ft. high, by Messrs. Ferguson & Urie, of this city. Eight smaller panels—four on each side, will show allegorical pictures of music and the drama, while eight large circles will be filled in with life-size busts of the most eminent musical and dramatic composers and authors—all done in stained glass. Instead of the disagreeable cramped-up boxes that usually do duty for ladies' cloak-rooms in this city, Mr. Aarons has launched into a heavy expense to secure full accommodation. A cloak-room, 40 ft. long by 16 ft. wide, is provided for the ladies, besides lavatories, dressing-rooms, &c., all well fitted up, and supplied with fire-places and stoves. The gentlemen are similarly provided for, and as Mr. Hosie intends making some novel arrangements, very pleasant parties may make the Academy their rendezvous, where they can have dinner, dress for the theatre, and attend it without having to leave the building once. The theatre itself will be on a scale of magnificence hitherto undreamt of in this part of the world. There will be no pit, the only space below the level of the stage being occupied by the stalls. This part of the house has been constructed with the view of holding 250 chairs, the frames of which are of cast iron, light and pretty in pattern, and coloured grey and gold, with turn-up seats of maroon Utrecht velvet, and backs and arms to match. The dress circle, which rises level with the stage, will hold 300,—that is to say, it will comfortably accommodate that number. Special attention is to be bestowed on the vice-regal box in order to make it worthy of the general surroundings. The family circle occupies the place usually allotted to the dress circle, being only 10 ft. above the level of the stage. This part of the house will accommodate 500, while the gallery above will seat 800 more. This latter part of the house will be open to the public at the prices charged at other theatres for the pit. The whole of the decorations will be on the same liberal scale.

In order to guard against the danger of a conflagration, Mr. Aarons has adopted an ingenious, and, so far as this colony is concerned, novel invention for extinguishing fires without human aid, or rather of making a fire extinguish itself. It is on the same principle as an invention by Mr. Stewart Harrison, which consists of placing a 4-in. pipe of wrought iron throughout the building, extending from the bottom to the top, and carrying 2-in. pipes of similar material from this pipe along the ceiling of each room or part of the edifice, at distances of about 6 ft. apart, or more if desired. At the same distances along the pipes, dividing the whole area of the room into squares of 6 ft., or 36 ft. superficial, are placed valves connected with the pipe, and fastened by fusible metal solder, which keep the water shut off until the metal is melted. The pipes being charged and the valves shut, all remains so until a fire breaks out, when the flame or products of combustion rising to the ceiling, as all hot or heated air will do, heats one or other of the valves exposed to the greatest heat, and the small brass ring at the bottom of the boxwood stem of the valve having attained a temperature of 212 deg. or thereabouts, which is that of boiling water, the heat of the flame causes the wedge of fusible metal, which keeps the inner or smaller plug sustaining the valve against the pressure of the water in place, to melt, and the small plug instantly drops, being forced out by the water. The valve being thus opened, the water pours directly on the burning material beneath, and keeps on doing so until it is shut off by those in charge, extinguishing, it is expected, any active or incipient fire in its immediate neighbourhood, and rendering its extension impossible. The rose-like form of the valve distributes the water just as the rose of a garden-engine or a watering-pot, in a stronger or lighter shower, according to the size of the perforations, cooling down all that is heated or beginning to fire, and quickly putting out that already ignited. Mr. Aarons has entered into the design along with Messrs. Reed & Barnes, the architects, *con amore*. The contractors are Messrs. Freeman & Lockington.

A PATENT ROADWAY IN SHEFFIELD.

SOME experiments have been tried on a patent roadway laid on the premises of the Saville-street Foundry Engineering Co. by Messrs. Davison, Walker, & Hainge. The experiments were made in a small space inside the works, where about 100 square yards of the patent roadway had been laid. The "iron-roughed asphalte paving," as it is called, is laid on a bed of rough concrete in cement about 9 in. thick, above which is placed a layer of fine concrete or asphalte about 1 in. thick, and then come a series of iron plates or frames, having projecting iron studs at intervals, the spaces between the studs being filled in with asphalte, so as to produce a paving of asphalte, with slightly projecting bearing surfaces, adapted to sustain heavy traffic, and to give foothold to horses. That the pavement, by reason of the slightly projecting iron studs, is capable of giving very sure foothold to horses, was apparent. One of the workmen appeared on horseback, and took the animal over the new pavement at the trot, pulling it up very sharply at intervals, yet the horse never slipped, being able to keep firmly on its feet throughout the whole of the experiment. A horse and gig were now taken over the roadway, with equally successful results, and then a huge dray, bearing a weight of nearly three tons, and drawn by three horses, was taken across the pavement. The horses, even in backing, retained a firm foothold; but in some parts of the roadway the weight caused the asphalte to spring a little. The iron plates upon which the asphalte is filled can be lifted in sections of four to the square yard, and thus any alterations to the thoroughfare can be carried on with despatch, and without any obstruction to the traffic.

NEW BUILDINGS AT THE NEWINGTON WORKHOUSE.

EXTENSIVE additional buildings are in course of erection at the Newington Workhouse, Walworth. They consist of new infirmary wards, board-room, medical officer's house, receiving-wards, a mortuary, porter's lodge, and other additions so as to give increased accommodation to the establishment generally. The foundation-stone of the new buildings was recently laid by the chairman of the St. Saviour's Union, in the presence of the guardians and others interested. The intended buildings embrace new wings to the main central building for the purpose of enlarging the infirmary accommodation. They will be uniform in architectural design and appearance with the present structure, the materials being white brick, with stone dressings. They will be four stories in height, the upper floors containing the wards, which will be 120 ft. long, and 44 ft. wide. On either side of the entrance there will be stone staircases, about 6 ft. in width, leading to the several floors, whilst near the centre of the entrance there will be a lift for conveying bed-ridden patients into the wards above. On each story, at one end of the several wards, there will be spacious day-rooms, together with attendants' rooms, whilst each floor will have a bath-room attached. The lower portion of the building will be set apart for stores.

The additions to the central portion of the present building consist, amongst other structures, of new and more spacious wards for the inmates, four large day-rooms being about to be erected on the ground-floor. A new master's and clerk's office, medical superintendent's office, and strong room, will likewise be erected near the central entrance, whilst on the site of some cottages which formerly stood in front of the building, and recently demolished, will be the board-room, connected with which are both large and small waiting-rooms. On a portion of this site, immediately adjoining the board-room are the medical superintendent's house, and also receiving-wards. The board-room will have its principal frontage to Westmoreland-road, whilst the medical superintendent's house will overlook the ornamental grounds in front of the main building. The two receiving-wards will be fitted with bath-rooms, lavatories, and store-rooms.

In erecting the new mortuary with *post-mortem* room, its entire isolation from the rest of the buildings has been secured. It stands at some distance from them, and the walls of both the mortuary and *post-mortem* room are lined with white glazed tiles, and the floors are laid with asphalte.

Messrs. Henry Jarvis & Son, of Trinity-square, Southwark, are the architects for the several buildings, and Mr. W. Downs, of Walworth, is the contractor. The estimated cost of the buildings is 18,769*l*.

KIRKCALDY FINE ART ASSOCIATION.

THE fifth annual Exhibition of this Association was opened a few days ago, and promises to be what its predecessors have never been, viz., a great commercial success. The Association was established in 1872, and although the amount of sales, &c., has always been on the increase, yet the expense in connexion with the Exhibitions has always been in excess of the earnings. This year, however, the committee were fortunate enough to secure a much better Exhibition Gallery than they have hitherto been able to get. The new room is about 100 ft. long, is lighted from the roof, and has many of the requirements of a picture-gallery, which were totally wanting in the Town-hall. The collection this year consists of about 460 works in oil and water-colours, besides a few pieces of sculpture. Among these (besides a few fine pictures kindly lent, chief of which is a splendid Raeburn) are many capital specimens of such well-known artists as Waller H. Paton, Wm. Fettes Douglas, J. B. McDonald, Erskine Nicol, J. C. Wintour, Wm. Beattie Brown, Wm. F. Vallance, G. P. Chalmers, John Smart, Gourlay Steel, W. E. Lockhart, A. Perigal, Clark Stanton, C. Lees, James Cassie, and a host of others, which, altogether, make up a most creditable exhibition for such a place as this plucky little town. Local artists too, are well represented, and show that they have not been idle since last year. Should the Association receive the encouragement they certainly deserve, there should be little difficulty in the way of building a suitable gallery for themselves. The gallery will remain open for a few weeks, and during that time there will be occasional performances of music by friends of the Association, which, it is hoped, will make the Exhibition more popular among the working classes, and tend to the advancement of the Association in the way of increased membership. The number of members on the list last year was about 200, but this has been increased to about 300 already this season.

CHURCH ARCHITECTURE.

CAN any of your readers inform me what was the use of eight square holes, constructed at the time an "Early English" church was built, intentionally? They are in the walls of the chancel, some concealed by the pewing; they go quite through the wall: two in the east wall, three on each of the other walls, at regular intervals, and carefully tooled out; size, 5 in. or 6 in.

MOONRAKER.

BELLS FOR ST. PAUL'S.

AT the last meeting of the Court of Common Council it was resolved, on the motion of Mr. J. T. Bedford, to subscribe the sum of 530*l.*, the estimated cost of the principal, or tenor bell, of the peal it is proposed to set up in the bell-tower of St. Paul's Cathedral. Some opposition was offered, but the motion was ultimately carried by a large majority.

A memorial from the committee of the fund stated that two bells had been given by the Drapers' Company, and one each, at large cost, by the Grocers', Clothworkers', Fishmongers', Merchant Taylors', and Salters' Companies; and besides the tenor bell, only four smaller ones, costing less than 400*l.*, remain to be contributed. The expense of the whole peal would be about 3,800*l.*, exclusive of hanging, machinery, and ringing, which would cost nearly 500*l.* more.

THE HULL HYDRAULIC POWER COMPANY.

THE works for supplying hydraulic power to Hull, now completed, are attracting attention from their being the first of the kind carried out under Act of Parliament.

In the year 1872 an Act of Parliament was obtained for the purpose of establishing at Kingston-upon-Hull what was termed in the preamble of the Act, "a system for applying motive power by hydraulic pressure to water-side and land cranes, used for the purpose of raising and landing goods, and for working dock gates and other machinery." It also authorised the abstraction from the Old Harbour of the river Hull, an amount of water not exceeding a million gallons a-day for distribution within the company's district, for which a payment was to be made to the Corporation of 12*l.* 10*s.* per annum for each quarter of a million gallons, the water to be used for no other purpose than as a motive power, except with the consent of the Corporation. A 6-in. pressure main has been laid from the northern boundary of the defined area, near the Cottingham drain; in a southerly direction along Wincolmlee, Trippett, Dock Office-row, under the Old Dock Basin (which forms the eastern, or River Hull entrance to the Queen's Dock), and crossing this entrance it is laid along the whole length of High-street, terminating close to the western approach of the South Bridge across the River Hull. The length of pressure main laid, exclusive of the dock crossing, is altogether 1,485 yards, that on the north side of the dock entrance being 673 yards in length, and that on the south side 812 yards. In laying this main many obstructions were met with, in the shape of old sewers, gas and water pipes, gullies, &c., all of which had to be avoided. This involved much careful arrangement of bends and irregular pipes, and the difficulties were increased, as the streets through which the works were carried out had a heavy goods traffic over them, and in many parts, especially in High-street, were very narrow. An engine-house has been built to receive, eventually, four 60-horse power engines. As the ground beneath this site was silty and treacherous, the foundations had to be carried down 24 ft. before a good bottom was reached on hard clay. The footings of the walls are built on a series of arches carried on concrete piers, which made sound and economical work. The engine-house is covered by a cast-iron tank. Two pairs of 60-horse power, high pressure, horizontal pumping-engines have been erected, capable of pumping about 300 gallons per minute at 700 lb. pressure per square inch, with steam at 100 lb. pressure, supplied by two Lancashire boilers, fitted with the most approved appliances. The water-supply from the river Hull is filtered. One accumulator is erected at the pumping-station in Machell-street. It has a diameter of 18 in., and a stroke of 20 ft. The case is loaded with 65 tons of slag and sand, which gives a pressure of 600 lb. per inch in the main. The accumulator case and cylinder rest on concrete piers carried down to the solid clay, and are enclosed in a brick tower. The supply of water is obtained from the river Hull, and is pumped through a 10-in. suction-pipe into the tank over the engine-house. The distance from the river to the pumping site is 125 yds., and the total height of the lift from low-tide level to top of tank is 35 ft. A centrifugal pump (in duplicate), fixed in the engine-house, raises the water from the river to the tank. The water-power supplied by the company will be paid for by the consumer at rates dependent on the amount of water used. The following tariff has been issued by the company:—One crane in one warehouse, 52*l.* per annum; two cranes in one warehouse, 94*l.* per annum; three cranes in one warehouse, 132*l.* per annum; and four cranes in one warehouse, 166*l.* per annum. Each crane will have a counter attached to it to register the amount of work done. One hundred tons may be lifted 40 ft., or 200 tons 20 ft., and so on, each day by each crane, for the above charge, which is under one halfpenny per ton for a lift of 40 ft. If more work than this is done, the extra work will be charged at the rate of 4*s.* for every additional 100 tons lifted 40 ft. Special rates will be made for working presses, hydraulic engines, capstans, small cranes, &c., as occasion arises.

The works have been carried out by Mr. Henry Robinson, C.E., the company's engineer, assisted by Mr. Frederick W. Thornton, the resident engineer. The machinery was supplied by the Hydraulic Engineering Company, of Chester. Already the Dock Company have made arrangements for taking a 4-in. pipe from the Hydraulic Company's main for the purpose of working cranes and appliances at the Queen's Dock, and several parties in High-street are preparing to take the power. This is the first work of the kind which has been carried out on the co-operative principle in the country.

THE THEATRE ROYAL, BIRMINGHAM.

THE Theatre Royal Birmingham was reopened on the 7th inst., after alterations and redecoration. We learn from *Aris's Gazette* that the theatre was originally opened to the public in January, 1775, under the management of Mr. Yates, the then manager of Covent Garden Theatre, London. Seventeen years afterwards, in 1792, the building was burnt out, only the outer walls being left standing. In 1795 the theatre was reopened, Mr. Macready assuming the management. On January 6th, 1820, the theatre was again destroyed by fire. The work of reconstruction was at once begun, and on August 14th of the same year the "Royal" was opened, under the management of Mr. Alfred Bunn. From that time to the present the theatre has had an uninterrupted career of success and good luck. During this lengthened period it has undergone but few alterations. The rapid increase of the town of late years has made it necessary that more accommodation should be provided, and this has been done. The pit has been lowered to the depth of 4 ft., and carried under the lower circle. By this means additional accommodation will be provided for between 500 and 600 persons in that part of the house. The stage has been lowered in a corresponding degree, in order to suit the gradual slope of the pit. The work of sinking the stage, considering the large quantity of apparatus contained below and resting upon it, was a work of some magnitude; but, by means of a large number of screw-jacks, the whole was removed bodily. The stage-front has been thrown back about 2 ft. The footlights have been let into the boards. The lower circle rests upon stout iron pillars and girders, supplied by Messrs. Bennett & Co., of the Spon-lane Ironworks, West Bromwich. The front of the lower circle has been brought forward about 18 in., enabling the spaces between the rows of seats to be increased. The entrances to the pit have been considerably enlarged and improved. By the lowering of the floor the necessity for ascending steps has been done away with. On occasions when the house was crowded, which of late has not been very seldom, persons standing near the steps at the back or the sides were in imminent danger of an uncomfortable precipitation. That danger is now obviated by the entrance. The old refreshment-room of the lower circle has been transformed into a ladies' cloak-room, and a few yards further on a spacious refreshment-room has been erected, leading out of which is a lavatory. A similar improvement has been effected in the upper circle. The ventilation and heating of the theatre have not been overlooked. Air is brought under the floor of the pit in passages, draughts being prevented by the carrying of it above the heads of the audience. The architect is Mr. Naden, of Temple-street; and the builder, Mr. Moffatt, of Camp-hill.

The theatre has been re-furnished, re-painted, and to a certain extent re-decorated, this portion of the work having been entrusted to Messrs. Smith & Co., of London. Messrs. White & Co., of Great Marylebone-street, London, have supplied a new design in *papier mâché* for the front of the lower circle, which has been painted and gilded. The proscenium has been partially re-painted, and the decorated parts of the house affected by the alterations have been cleaned and "touched up." The lower circle is entirely re-furnished. Mr. John Gault, the scenic artist of the theatre, has painted a new act-drop, containing a view of Stratford-on-Avon Church.

NEW BANKING PREMISES.

Elgin.—The Royal Bank of Scotland are about to erect new banking premises on the site recently acquired by them at Dufftown. The plans have been prepared by Messrs. Peddie & Kinnear, architects, Edinburgh. The architectural design is of the Anglo-Italian order; and the front will measure about 54 ft.; breadth of the main building,—exclusive of a wing to be erected at the back in connexion with the agent's residence,—about 48 ft.; and the height, from the pavement to the top of the roof, which is at present intended to be truncated, having no gables, will also be about 48 ft. In the centre will be the entrance to the bank, on the left or west side of which will be the telling-room, 28 ft. by 19 ft., and 14 ft. 6 in. high. On the right of the entrance will be the agent's room, 19 ft. by about 12 ft. 6 in. At the eastern extremity of the building is the entrance lobby to the agent's private dwelling. Messrs. Forsyth & Stewart, solicitors, who, along with ex-Provost Russell, are joint-agents of the bank, propose to erect offices for their law business immediately to the east of the new building. The architects for the law offices are Messrs. Reid & Melvin.

Ironbridge.—Messrs. Lloyd & Co. have opened their new premises at Ironbridge. The buildings, which are situate in the Market-square, were adapted to their present use from designs prepared by Mr. J. A. Chatwin, architect, Birmingham, and include the bank and a residence for the manager. The premises are four stories high, with an ornamented front of moulded cement with rusticated quoins. The ground-floor consists of the banking-room, 16 ft. high; consulting-room, lavatory, and fireproof strong-room, fitted with Messrs. Chubb's patent iron door. The residence is approached from the Market-square. The contract was entrusted to Messrs. Nevett Brothers, and carried out in their usual style of workmanship.

Brighouse.—The new building erected by the Halifax Commercial Bank to serve the purposes of a branch has been completed. The Classic style has been adopted. In the three stories are combined the necessary offices for a bank, and a manager's residence.

"MAY DIFFERENCE OF OPINION NEVER ALTER FRIENDSHIP."

A CASE of arbitration, in which many of the architects and builders of the North of England have been examined for and against, has recently been decided.

The plaintiff is Mr. Crawford Marley, an extensive coal agent of Darlington; and the defendant, Mr. Thomas Watson, is a respectable builder of the same town.

The action was first commenced at the Leeds Summer Assizes; but Mr. Justice Lush, being scared at the formidable array of architects and professional gentlemen who were to be examined, shelved the trial by referring the cause to Mr. John Edge, barrister, as arbitrator, and on and off has the trial proceeded up to last week.

The whole case can, however, be more summarily disposed of in print by stating that the plaintiff sought to recover 300*l.* damages for injuries alleged to have been done to his house through the building operations of the defendant whilst erecting another house adjoining to the plaintiff's. The damage alleged to have been done consisted of several cracks and flaws occasioned in the west gable and south front wall of the house, as well as fractures internally.

In support of the allegation the following witnesses were called:—Messrs. Oliver (Newcastle), W. Bell, R. B. Dixon, architects; M. Mackenzie and John Robinson, builders; T. Watson, auctioneer, and W. Mosson, painter. One of these witnesses went to the extent of saying the depreciation in the value of the house was from 500*l.* to 600*l.*

The answer to the case was, that no injury had arisen from the defendant's building operations, and that the cracks and other injuries complained of were in existence four years ago, whilst defendant only commenced his building operations at the commencement of this year.

In support of defendant's view, the following witnesses gave evidence:—Messrs. George Wood, chief assistant to Sir Gilbert Scott; R. Lamb and G. G. Hoskins, architects; G. Dickenson, civil engineer; R. Robson and G. Duck, builders.

The Arbitrator found for the defendant on every point, that no injury had been done by the defendant to plaintiff's house, and ordered the plaintiff to bear not only his own costs but those of the defendant, and the entire cost of the arbitrator and his award.

WHITE LEAD AND ZINC WHITE.

REFERRING to Mr. Redgrave's report on the manufacture of white lead, Professor Barff says he wishes, as having been long engaged on the investigation of paints, to call attention to the fact that the evil which he complains of extends far beyond the manufacture of this substance. House-painters suffer very much from lead poisoning, in its various degrees of intensity; and it is almost impossible to make them see the need of cleanliness and of taking other very necessary precautions. Sooner or later white lead must be given up as a pigment; from its power of saponifying with oil, involving the loss of carbonic acid, it loses its opacity and turns yellowish. It is valued for what is termed its "body," and from the ease with which it is laid on. In his lectures for several years past at the Royal Academy of Arts, he has pointed out its defects with, he is glad to say, some success, and many artists are now using zinc white, which retains its opacity and does not blacken on exposure to foul air. For artistic purposes zinc white can be prepared nearly equal in body to white lead. He feels convinced, from the result of his experiments, that sulphide of zinc, properly prepared, can be made to have as good covering properties as white lead, and that the addition of magnesia in the manufacture renders it as agreeable to work. He wishes, therefore, to call the attention of those interested in this question to the fact that they can obtain a better paint in all respects than white lead, and one which has no injurious effects on the health of those who prepare or use it.

AMERICAN AND ENGLISH MACHINE SHOPS.*

IN every grade of workshop in England, and especially in the engineers' shops (as the machine shops are there denominated), as well as in the offices of the civil engineers, student apprentices or articled pupils are employed. With regard to the former of these, there are many reasons why a similar practice has not been and will not be followed in America. The first of these reasons is the comparative absence in England of that destructive rivalry in mechanical business which exists in America. The rates for labour, and the estimated value of the mineral in that country, have been so low, and the application of machinery so much in advance (at least until recent years of the century) that England has led the world for a market. The established product of an English workshop has at all times possessed what might be called a good will. Few of them will purposely rival, in the same way, another in the production of what is the regular manufacture of the one, and but the exceptional demand upon the other; and purchasers are yet more chary in the acceptance of work from inexperienced makers. A man can be generous who has an abundance; he can be just, where he is sure of just dealing in return. Perhaps the condition of abundance has more relevance to the subject under discussion than that of justice. Not many American manufacturers would accept educated, clear-headed, intelligent young men as student apprentices, to learn from their workmen, their machines, and their processes, the art and mystery of their business. Besides this, the condition of the student apprentices amongst the workmen in one of our shops may be regarded as too anomalous to the habits of the average American workman or foreman, to be supposable in actuality. The second method for obtaining practical experience, — that of the articled pupil,—suffices in the office of the engineer, but is far from satisfactory as the method to learn the value of the workshop manipulations to the pupil. In this country, at this time, there are no articled pupils, and even students in engineers' offices are rarely to be found.

Neither a return to the system of apprentices and masters, nor the adoption of the method of pupilage in an office, presents the least prospect of affording the education of the business engineer in the future.

SLATES.

SIR,—I should be glad if any of your correspondents would furnish particulars of the slates said to be obtained from America and sent to Lewestoft. In the present scarcity and dearness of our own supply, I have no doubt it would interest a great many besides R. W.

* From a paper in the *Journal of the Franklin Institute*.

LYME REGIS, DORSET.

SIR,—Your correspondents do not seem to agree as to the cause of the "fearful state" of Lyme. I am glad to find, from Mr. Hawkins's letter, that want of drainage and overcrowding have nothing to do with it.

I do not quite gather from his letter what noxious gases are generated on the foreshore; nor do I exactly understand what is decomposed,—whether it is the shales or the sea.

That "annual holocaust of really poisoned victims" seems calculated to harrow up the souls of your readers even more than the Bulgarian atrocities. During the twelve years that I have resided here no labourers have been killed, or seriously injured, under the cliffs; nor have I ever seen a case of illness that was attributable to the noxious gases generated on the foreshore.

D. S. SKINNER.

WHAT REGULATES THE PRICE OF BRICKS?

SIR,—The builders tell me that bricks have recently gone up 2s. a thousand, and that stocks are now 40s. delivered, and this after the wonderful brick season we have had, and full warning brickmakers must have had of the demand for bricks.

I dare say you want no suggestions of subjects of inquiry for the *Builder*; but if you do, it would be an interesting inquiry, how far School Boards have affected the value of bricks; whether a reduction in price would follow a larger introduction of machinery in their manufacture, and what difficulties there are in the way of this introduction; and what the future price of bricks is likely to be.

It is curious how closely a community hangs together, and how impossible it is to make changes affecting one part of it, without those changes being felt all through in many ways beyond the simple payment of rates.

HORACE FIELD.

*** We shall be glad to hear what some of our correspondents have to say on this serious subject.

THE WARMING AND VENTILATING OF CHURCHES.

THIS is, in one respect, undoubtedly the most trying season of the year,—not for weakly people alone, but for ordinary and even robust mortals, who are not proof against "catching cold" and the divers afflictions which in natural sequence frequently follow,—in so far as by present structural arrangements it is impossible to regulate the temperature of churches, &c., where large numbers of people are assembled; and chiefly and naturally this difficulty is increased in the now chilly evenings. While the internal atmosphere is rising in temperature, the external is falling; hence the inflow of the cooling and denser air into the midst of the heating and rarifying atmosphere of necessity causes a strong and dangerous current of cold air to descend, in some particular parts of the building, on heated, and so, susceptible, persons. Is it *quite* beyond the grasp of our architects to master this difficulty? In one of the churches of Torquay, being placed for some time near the cold limestone wall at the west end, which reaches up to the lofty roof, the downpour of cold air was so great that I moved my place, while others left the church, the strength of the current increasing as the service proceeded, and the atmosphere of the crowded church becoming continually more heated, forced the air into more rapid motion, naturally driving the expanded and lightened—because heated—air up to the roof, where, finding no escape, and becoming cooled by contact with the cool roof, it necessarily descended by the cold walls,—the circulation thus set up being precisely that which takes place in boiling water in a vessel where the heat is applied beneath the centre only, as when a spirit-lamp is used, the water as it becomes heated ascending in the centre of the vessel and descending against the cooler sides. Is it impossible to contrive means to arrest these air currents? In a second church in the town, columns of cold air are let down from the clear-story windows on the devoted head of some unfortunate who is seated immediately beneath them, and to my cost I have found that through a heated, and therefore rarified, air, a column of cold, and therefore condensed, air will fall, with considerable force and weight. Last evening I had the misfortune to be placed within the arc which was formed by the horizontal projection of a stream of cold and heavy air from the window of a side aisle, on its passage to the floor.

These churches are the work of some of our leading architects, and yet, by these defects, are rendered not only unsuited to the purpose for which they were erected, but absolutely unsafe. And I cannot but think that a little study of the laws which govern these currents of air would lead to a remedy. Surely the present state of our churches and places of public assembly in this respect is a blot on the practice of scientific architecture.

Mr. George Hudson, of the potteries at Poole, has succeeded in the erection of his own house in securing ventilation, while avoiding rapid currents of air in any one apartment to a very remarkable extent; but I am not architect sufficient to see how his system, which he recently was so good as to explain to me, could well be adapted in the cases I have cited.

J. D. P.

CHURCH-BUILDING NEWS.

Kirkwall.—The new Episcopal Church of St. Olaf, Kirkwall, was opened on the 5th ult. It is the only Episcopal Church in the county of Orkney, and has cost about 1,200*l*. It is 71 ft. 6 in. long, and 27 ft. 6 in. broad, and is seated for about 160 persons. It is intended to build a tower 60 ft. high over the main entrance. The materials used in building were random rubble, all the faces being of freestone. The roof is an open one, of Swedish pine, the main beams taking the form of arches. The choir is raised three steps from the nave, the sanctuary three steps more, besides the footpace on which the altar stands. Four stained-glass windows have been already put in. One of these represents St. Olaf, king of Norway, to whom the church is dedicated. He, it is said, was the first who introduced Christianity into the Orkney Isles, and founded the Bishop's See. To the church are annexed a vestry and organ-chamber. In the sanctuary is placed the ancient credence from the old pre-Reformation church of St. Olaf, formerly standing near the shore of Kirkwall. In the vestry is the aumbry from the same church. The bowl of the font is said to be of great antiquity, and was presented by Col. Burroughs, of Rousay and Veira.

Willington.—The new church of St. Mary, at Willington, on the Tyne, has been consecrated. The building has been erected from the designs of Messrs. Johnston & Austin, architects, Newcastle, by Messrs. Robson, North Shields, and consists of a nave and chancel, porch, vestry, and organ-chamber. Sittings are provided for about 300 persons. The cost was about 2,700*l*.

Eckington. — Plans for the restoration of Eckington Parish Church, Derbyshire, have been prepared by Messrs. Flockton & Abbot.

Wickford.—The parish church of Wickford, Essex, is now in course of restoration amounting almost to complete rebuilding. The church consists of a nave and chancel, with an opening from the latter, which is for a vestry or organ chamber. Altogether, seats will be afforded for 170 persons. An interesting feature of the restoration is the retention of the old Tudor roof of the chancel. In rebuilding the church, the old material is being re-used. The architect is Mr. Henry Stone, of London, and the builder is Mr. Saunders, of Maldon, the amount of the contract being 1,687*l*.

New Malden.—The family of the late Mr. J. C. Sim having decided to rebuild the chancel of Christ Church, New Malden, as a memorial to their father, and as it has long been felt that the accommodation in the church is quite inadequate to the requirements of the rapidly-increasing population, it has been decided to embrace the present opportunity of enlarging and improving the church. Plans and estimates have been submitted by Mr. Ewan Christian, which include the raising of the present roof, extending the church to the east, rebuilding the chancel, erection of a new vestry and organ-chamber, completion of organ, and the building of the south aisle. It is not intended, however, to carry all these improvements out at the present time. The eastward extension, vestry, organ-chamber, and completion of the organ will, it is estimated, cost about 1,500*l*. The rebuilding of the chancel will cost about 850*l*. The church will then provide accommodation for 469 persons, or about 160 more than at present.

West Dulwich.—The foundation stone of a

new church at West Dulwich, dedicated to St. Emanuel, has been laid by Mr. Frederick Peek. The cost is estimated at 9,000*l.*

Gatten.—St. Paul's Church, Gatten, near Shanklin, Isle of Wight, has been consecrated. The style is Early English, and at present there are sittings for 370 persons; but when the church is finished there will be accommodation for 750. The church has an apsidal east end, and the aisles are carried round the east end, forming vestry, organ-chamber, and porch. Immediately above the communion-table are indented spaces, which will be fittingly filled; these are surmounted by an open arcade; and there is a clearstory of lancet windows. The nave is 26 ft. 6 in. wide, the aisles are 10 ft. in width, and the total height of the church is 56 ft. to the ridge. The roof is wagon-headed inside. The present building, from the communion-steps, is 56 ft. long, but when completed the church will be three more bays in length. The benches are open, and of pitch-pine. The floor, which is at present of Portland cement, is intended to be paved with tiles. According to the design, the west end will be elaborate, with lofty pinnacles. The architect is Mr. C. L. Luck, of London; the clerk of the works is Mr. W. H. Coussmaker, of Shanklin; and the builder, Mr. Robert Allen, of Sea View.

CHESTER CATHEDRAL.

SIR,—Having read the graphic and able account of the restoration of Chester Cathedral in the *Builder* of September 16th, entitled "The New Cathedral at Chester," I feel desirous of making a few remarks on one or two points therein which clash with my own views, though I cordially agree with it in the main. I had no wish of adding to what I have already advanced on the subject; but I cannot let the opportunity slip, which your article affords, of rendering my published views more complete and explicit, especially to my old friends, professional or non-professional, among the readers of the *Builder*, supposing I may so far obtrude upon your space.

In the first place, we differ as to the former state of the building, and consequently as to its need of restoration. I believe the writer has truly recorded his impressions or recollections of it; and I cannot dispute his word when he speaks of the "mass of nearly shapeless boulders to which the exterior had been mostly reduced." But, from some cause or other, we must have looked at the building with different eyes. After living some years in Chester before the commencement of the works, and seeing it nearly every day, I can conscientiously say that it never appeared to me but in a state in which I thought it highly desirable, in the interest of art and beauty, it should be preserved, and the portions of carving which have been left on the west front will show the quality of what still remained. I never was conscious of anything in the cathedral but a touching, almost pathetic, expression of age and endurance, bearing striking analogy to what interests and moves us in a feeling and venerable human face. These remarks apply emphatically to the tower, a feature of the cathedral and of the city which must dwell vividly in many memories, as nobody could fail to be impressed by its air of extreme antiquity and abandonment. Though its turrets had become truncated, there was a unique grandeur about it which the new one does not attempt to realise.

In the second place, while acknowledging the beautiful condition of our cathedrals generally by the weird markings of nature, the writer, I think, underrates its quality and æsthetic importance as a subject of gratification and study, and deems it more a thing for the artist to take note of than the architect, speaking of the preference of the latter for details. These are seldom so much wanting as they were at Chester, which the friability of the stone rendered an exceptional example. But with all due respect for mouldings, I think that any deficiency of these is generally amply compensated by the additional spirit and grace, and the infinite varieties of minute beauty, in texture and colour, which natural influences communicate. Now, though artist-painters, from greater intercourse with nature, are most appreciative of this beauty, yet, if architecture is the art of building beautifully, the architect, who is an artist, has good reason to take cognisance of it. Nay, being a beauty which inevitably attaches to buildings of a certain age in our climate, it should have for him a peculiar interest. Nature has given a finish to his work, and in it a lesson for his future guidance,—a lesson in ornamentation which no works of the Moors or any human design could yield.

The feeling or sentiment that appreciates this beauty, let me say, is that on which all poetry, art, and whatever administers to the higher needs of our nature is based, and is not a questionable thing at all,—not a myth, but a real element in human nature. Sentiment, as Rogers the poet once remarked to Shelley, may be the logic of a higher sphere.

I have not seen the interior of the Cathedral, or I should have been happy to bear testimony to its having been so tenderly treated as it seems to have been; and to the improvement which must have been effected by the restoration to it of the long-severed south transept. All the alterations and additions named must be deemed improvements, except the removal of the organ; the writer's remarks on which are very valuable, and will have their effect on future re-arrangements of cathedral interiors and planning of churches. He says the organ would best speak and combine with the voices in the centre. If so, in the centre it should have been placed. Though the Cathedral is not a music-hall, yet the organ, being for use, had the first claim to consideration. As the matter stands, a sacrifice has been made of utility to architectural effect,—a capital error, which will also appear if we view the question thus: The two sisters, Architecture and Music, are both there as handmaids to Religion. Which is the most directly aiding in the worship? Music unquestionably; and if so, the organ should have been placed where it would sound best,—the centre.

But I believe the central position of the organ needed not to interfere with the apparent length of the building; which would have been best felt or appreciated by an arched opening in the screen under the organ, or through the organ, if placed on the ground, giving a mere glimpse only of what was beyond.

His exception to the wooden vault may be just, but a wooden vault is not necessarily a sham or falsehood—as timber will serve a real practical purpose, employed on the same constructive principle as stone, to which it is only inferior in being combustible and less durable. If the roof is constructed on the vault principle, then the restoration of the flying buttresses was necessary, while it renders the exterior more complete, and does away with the unfinished appearance.

I am glad to hear of the intention to spare the cloister, the more as it is the realisation of a hope I expressed in print at or near the outset of the operations. The cloister, which seems as if it held the Middle Ages embalmed, is the most precious feature of the cathedral and of the city. It is a romance in stone, and one of the most graceful relics of antiquity in existence. It seems as if the very genius and spirit of picturesque beauty inform and shine through its aspect. Its escape from restoration is the redeeming feature of the transaction.

If I could feel sufficient interest in the present exterior of the cathedral, I should sympathise in the writer's hope that the project of capping the tower with a wooden spire was abandoned; and also in his dislike to the octagonal apse, with its surmounting pyramid, terminating the south aisle of the choir, and the conical finials, which flank the east gable of the chancel.

SAMUEL HUGGINS.

ANCIENT AND MODERN STANDARDS OF WEIGHTS AND MEASURES.

THE concluding lecture of the series given at South Kensington Museum in connexion with the loan collection of scientific instruments was delivered on the 28th ult. by Mr. Chisholm, the Warden of the Standards. For much of the following report we are indebted to the *Morning Post*.

Mr. Scott Russell occupied the chair. In introducing the lecturer, he said that perhaps many would wonder why it was so important to have the yard measure so exactly correct. He would therefore say that there was nothing but a yard stick wherewith to measure oceans and continents, and if the yard were but the one-thousandth of its length wrong that might lead to our ships in some parts of the world finding themselves twenty-four miles out from where, by calculation, they thought they were. There was nothing but the yard stick as a unit wherewith to measure the stars' distances, and it was almost impossible to calculate the errors that might be introduced by an almost microscopic mistake in the yard's length. The French had originated a new standard of length, namely, the ten-millionth part of a quarter of the girth of the earth, but they had made a mistake in their calculation, and their mètre was not therefore reliable. The yard measure was not invented by us, but had come down to us by tradition. No one was more competent than the lecturer to tell us how our present standards of measure came to be what they are.

Mr. Chisholm began by saying that the subject of the lecture was not weights and measures generally, but only standards of weights and measures. The subject even then was a large one, but he hoped to compress what he had to say into the time allotted. He proposed first to refer to the earliest standards of weights and measures; and to those systems of ancient countries from which there can be no doubt that all other systems have been derived, with the single exception of the decimal metric system, which is of an original character. The use of weights and measures must have been one of the earliest necessities of civilised life. Josephus mentions the Jewish tradition that Caio, after his wanderings, built a city in the land of Nod, and was the inventor of weights and measures. The extreme antiquity of the use of weights and measures is also shown by the fact that the ancient heathens attributed the origin of weights and measures to the gods; the Egyptians to their god, Theath or Theth; and the Greeks to Mercury. As regards the original standards of weights and measures, we learn from the most ancient records that the practice was to derive all other measures, as well as weights, from a recognised standard unit measure of length, and that the cube of this unit, or of a determinate aliquot part or multiple, formed the unit measure of capacity, and the weight of water or other liquid contained in the standard measure of capacity formed the unit of weight. We learn, too, not only from ancient records, but also from the very names of the measures of length, that the proportions of the human body were taken to form the scale of measures of length, and that the cubit, or average length from the point of a man's elbow to the extremity of his middle finger, was practically adopted as the most convenient standard unit of length. The following scale of these natural proportions of the human body was most generally recognised, the digit, or breadth of the middle part of the first joint of the fore-finger, being the lowest unit of the scale. The digit, 1 part; palm or handbreadth, 4 parts; span, 12 parts; foot, 16 parts; cubit, 24 parts; arm's length, or step, or single pace, 40 parts; double pace, or stride, 80 parts; fathom, or greatest length of extended arms to the tips of the fingers, equal to the height of a man, 96 parts. The cubit is the only measure mentioned in the book of Genesis as in use before the Flood. The earliest system of weights and measures of which we now have any knowledge were the analogous systems established in Chaldæa, Egypt, and Phœnicia. All these systems were based upon the cubit as the standard unit measure of length, and it is to these systems that the derivation of the weights and measures used in almost all civilised countries can be traced. Of these early systems, the Egyptian has probably had the greatest influence upon those of other countries. It is generally admitted that the Egyptian weights and measures passed into Asia and Judæa, as well as into Greece, and, with some modifications, extended to Italy, where they were adopted by the Romans, and subsequently by all European nations.

Mr. Chisholm gave at some length an account of the standards of Egypt, but time prevented more than a rapid glance at the measures of Greece and Rome. The old French foot, or *pied du roi*, is said traditionally to have been the length of Charlemagne's foot, as the English yard has been said to have been the length Henry I.'s arm. Six of these old French feet made the toise, which was made the standard unit of length in France early in the last century, and was used for measuring an arc of the meridian in Peru. The iron standard toise actually used became the legal standard measure of length in France until the mètre was substituted for it, being known as the *toise de Pérou*. It was the standard unit of length for all measurement of arcs of the meridian made in Europe. (The standard toise of the Ordnance Survey Department was exhibited here.) The English yard is very nearly the same length as double the

original cubit. It is very probable that the yard was derived from this early standard measure by the Anglo-Saxons, or at least from its being the length of double the natural cubit. There is not equally satisfactory evidence with regard to ancient standard weight. Our English standard units of measures of length and capacity and of weight, the yard, bushel, and pound, have come down to us from the Saxons, though some modification of the two last-mentioned units have since been made. The earliest recorded standard of length in this country was the yard, or gird, of the Saxon kings, kept at Winchester. King Edgar is recorded to have decreed, with the consent of his wites or council, that "the measure of Winchester shall be the standard." No change was made by the Normans in the Saxon system of weights and measures established in England; and by a statute of William the Conqueror, it was ordained that "the measures and weights shall be true and stamped in all parts of the country, as had before been established by law." The only change that appears to have been made at the Conquest was in the custody of the standards, which were transferred from Winchester to the Exchequer at Westminster, where they were placed under the custody of the King's chamberlains. The Exchequer itself was a Norman institution, and even up to the present time there may be seen at Rouen the ancient building of the Norman Exchequer, with the inscription upon it "Le père de l'exchequer de Londres." The English standards of weight and measure were deposited by the king's orders in a consecrated building, just as the standards of old times in ancient countries were placed in their temples. Together with the royal treasures, they were placed in the Crypt, Chapel of Edward the Confessor in the cloisters of Westminster Abbey, since known as the Pyx Chapel. This portion of the old Abbey of Westminster then became vested in the Sovereign, and has ever since been held by the officer who has had charge of the standards. Some of the old standards, which were not required for actual use, remained in the Pyx Chapel, up to the time of Mr. Chisholm's appointment. The office of the King's chamberlains, which was a part of the old Exchequer Office, was not abolished till 1826, when the custody of the standards was transferred to the auditor of the Exchequer. It was again transferred to the Controller General of the Exchequer in 1834, when the old establishment of the Exchequer was remodelled. In 1866 the Exchequer ceased to be a separate office for the Government, and was amalgamated with the Audit-office. The new office of the Warden of the Standards was created, in pursuance of recommendations of the Standard Commission, and to this office Mr. Chisholm was appointed, in consequence of his long experience as an Exchequer officer, which began before the chamberlains' office was abolished. The Exchequer standards became the Board of Trade standards, the new office being placed under the Board of Trade. These standards include also those of coinage, the standard trial plates for testing the gold and silver moneys coined at the Mint having been entrusted, together with the standards of weights and measures, to the same officer of the king. Certainly from the time of Edward III., and probably from the time of the Conquest, the standard trial plates were always kept in the Pyx Chapel, the custody and keys of which were also transferred to Mr. Chisholm. But he preferred to keep the standard trial plates, with the imperial standards of weights and measures, in the fire-proof strong-room at his office, which has been specially fitted up for their reception. They are kept there in fire-proof iron chests. There is every reason to believe that the standard yard of Henry VII. represents accurately the length of the old Anglo-Saxon yard. It does not differ from our present standard more than one foot-rule differs from another,—that is, it is about 0·01 in. shorter. The yard and the ell were originally the same measure in this country. From the period of the Conquest down to the reign of Richard II. the statutes of official documents were generally in Latin and sometimes in Norman-French, and the yard and ell (*virga* and *verge*, *ulna* and *aulne*) are used indiscriminately as the same unit of length. In the clause of Magna-Charta relating to weights and measures, the term *ulna* is used as the unit of length of cloth, whilst in Domesday Book, land measured by the yard or yard-land, is called *terra virgata*. The old English yard was extended to our later English cloth ell, first by making it only 1 in. longer. By the statute of Henry VIII., the measure of the cloth yard was declared to be a yard and an inch, or thumb's breadth. Having thus got this little addition to the yard, the next process was probably to make a cloth yard of 37 in. and add a hand's breadth, and by repeating this process to get a cloth ell of 45 in. in Queen Elizabeth's time. There was shown Queen Elizabeth's standard yard of 36 in. and ell of 45 in., both marked on the same bronze bar. The earliest standard of monetary weight in England was the old pound of the Saxon moneyers in use at the Mint before the Conquest. The only legal standard of this pound, of which any account has come down to us, was the Mint pound of the Tower of London, known as the Tower pound. It was of the same weight as the old apothecaries' or medicinal pound of Germany, and was equal to 5,400 of our later Troy or imperial grains. In 1842 an ancient weight of brass was discovered in the Pyx Chapel that weighed 5,409 Troy grains, and was evidently an old monetary pound, somewhat increased in weight from oxidation. This moneyers' pound was the ancient pound sterling of silver, divided into 20 shillings, each into 12d. or penny weights. We find that up to the end of the reign of Edward III. the weight of all gold and silver articles in the King's Treasury was expressed in our old Exchequer records in pounds, shillings, and pence, *poise de la Towre* or *pois d'orfèvres*. The penny weight contained 32 grains, and thus the Tower pound contained 7,680 monetary grains, or grains of wheat. The pennyweight was equal to 22½ Troy grains, which is the average weight of the Saxon and Norman coined silver pennies. The mark was two-thirds of the Tower pound, and was used for denoting both the weight and value of silver under the Norman Sovereign. It was equal to 3,600 Troy grains, and they did not sensibly differ from the ancient unit of money weight in Germany, known as the Cologne mark. The Tower pound ceased to be the legal mint weight in 1527 by an Ordnance of 18 Henry VIII., enacting that "The Pound Towre" shall be no more used and occupied, but "al maner of golde and sylver shall be wayed by the Pounde Troye, which maketh xii. oz. Troye, which excedith the Pounde Towre in weight iii. quarters of the oz." From this time to the present our system of coinage and of weighing gold and silver has been based on the pound Troy. Troy weight had, however, been introduced into England long before the reign of Henry VIII., and was certainly in general use there in the early part of Henry V., being mentioned in the Act 2 Henry V., cap. 4. In the Exchequer records the earliest mention of Troy weight is in 1 Henry IV. It is probable that it was brought into England from France during the wars and the English occupation under the Black Prince. Its name has been considered to have been derived from the French town of Troyes, where a celebrated fair was held. There was certainly a known *livre de Troyes* and *marc de Troyes*, and the recorded weight of the *marc de Troyes* was very nearly two-thirds of our Troy pound. The use of the systems of weights based on the Tower and the Troy pound was confined to the precious metals and drugs. The earliest standard of commercial weight in England was the merchant's pound—*libra mercatoria*. It is mentioned in a statute of 5½ Henry III., as a pound of 25s. used for all other commodities than the precious metals and medicines. It consequently was equal to one-fourth more than the Tower pound, or to 6,750 Troy grains. There was also a merchant's pound weighing about 7,200 Troy grains, and was one-third more than the Tower pound, which was used in England, and still more in Scotland. The merchant's pound, whether of 6,750 or 7,200 Troy grains, was superseded in England by the avoirdupois pound of 7,000 Troy grains, which appears to have been in use here as early as the year 1303, as it is recited in a weights and measures statute of that year—31 Edward III. It was probably introduced from France about the same time as the Troy pound. The pound avoirdupois was evidently taken from the old French commercial pound of 16 ounces, used at that time in many parts of France. Our existing imperial standard pound can be clearly proved to be of the same standard avoirdupois pound of Edward III., and there are good grounds for believing that no substantial difference has occurred in its standard weight, or in that of the Troy pound, since these standards were originally established in this country. The avordupois system of weight was legalised in this country by a statute of Henry VIII., which is a curiosity in its way. It was thus:—"Beef, pork, mutton, and veal shall be sold by weight called *haver du pois*. No person shall take for a pound of beef or pork above one halfpenny, nor for a pound of mutton or veal above three farthings, and less in those countries where they are sold for less." It is upon evidence of this kind that the theory is founded of the value or purchasing-power of money having diminished about fifteen-fold in this country since the Conquest. As to our early English standard measures of capacity, it is stated in Magna Charta, "There shall be throughout our realm one measure of wine, one measure of ale, and one measure of corn." This would seem to imply that there were then three distinct standard measures of capacity. But the only one of which we now have any cognisance is the Winchester corn bushel, of a capacity of about 2,150⅖ cubic inches, together with the Winchester corn gallon of 272¼ cubic inches, the later standard of which, constructed by Henry VII., still remains in the Standards Office. A standard ale-gallon of 282 cubic inches was added by Queen Elizabeth, and a standard wine-gallon of 231 cubic inches by Queen Anne. But all these standard measures of capacity were abolished in 1824, and the new imperial standard gallon, containing 10 lb. weight of water, and equal to about 272½ cubic inches, was made the standard of capacity for liquid measures, and the imperial standard bushel of eight gallons was made the standard for measuring dry commodities. A reference to Scotch and Irish standards concluded the lecture.

The Chairman, in offering the thanks of the audience, referred to the fact that this was the last of twenty-nine lectures given by gentlemen who had generously placed their gratuitous services at the disposal of the committee of management. With regard to the collection of scientific instruments, he hoped a permanent museum would be formed.

Some one from the body of the room, who, instead of giving his name, said he was No. 5 in the roll of those who had years ago joined the Mechanics' Institute, said he wished to bear testimony to the great value the lectures had been to working men.

HEALTH AND SEWAGE OF TOWNS.

SIR,—In the general interest of public health, the council of the Society of Arts appeal to the inhabitants of the metropolitan districts, and to the public generally, to send to the Society evidence of cases showing the various evils which have occurred from the present imperfect system of the drainage of houses. At the Conference on the Health and Sewage of Towns, lately held at the Society, and attended by numerous representatives from various towns and localities in the kingdom, the importance of greater attention to the house drainage, as distinct from the sewerage, was especially brought to the notice of the Society.

It was pointed out that, however good the general sewerage might be, unless the drainage proper of the house and its connexion with the sewers were carefully planned, executed under due supervision, and maintained in proper order, there was imminent danger of typhoid and other diseases from the imperfect exclusion of sewer gas.

The council are well aware of the extensive powers which are given by Act of Parliament to vestries in the metropolitan district to deal with this matter. As regards buildings erected and in course of erection since 1855, the date of the Metropolis Local Management Acts, no doubt a large amount of supervision is exercised; plans of the house drainage are frequently deposited, and are open for inspection to the ratepayers. But the powers of the local authorities are rather remedial than preventive of disease, and are more or less imperfectly exercised. The evidence already collected shows that, in most of the metropolitan parishes, a small proportion of the total number of the houses in them has been properly dealt with, and consequently the plans of house-drainage are, on the whole, comparatively few even in parishes on the outskirts, where a considerable extension of building has taken place in the last few years. Neither owner nor lessee, nor intending purchaser, as regards houses built previous to 1855, unless in some few exceptional and accidental cases, has any means of ascertaining whether the house is or is not well drained, or properly connected with the sewers, and, if defective, how or in what direction amendment is to be sought. It is with a view to remedy this admitted evil, which reduces the usefulness of the main sewers on which millions have been spent, that the Council of the Society of Arts, in the interests of improved public health, have taken up this question. They have already memorialised the Metropolitan Board of Works on the subject, and they propose to address the President of the Local Government Board in reference both to the metropolis and to localities in other parts of the kingdom. The Council have sought for information and suggestions from the various metropolitan authorities having such matters in charge. They appreciate the valuable labours of these bodies, but they desire to draw public attention to what it appears to the Council needs further action on their parts, and they suggest that Parliament should be moved, if need be, to confer additional powers and responsibility on local authorities.

Under these circumstances, the Council invite communications both as to cases of evil arising under the present state of things in the metropolis and in the country generally, as well as any suggestions for remedy, and they will be glad to receive any such communications before the 20th of October next.

P. LE NEVE FOSTER, Secretary.

Miscellanea.

Insurance of Workmen's Furniture.—Mr. Baker, one of Her Majesty's Inspectors of Factories, in his last report to the Home Secretary, draws attention to a scheme of collective fire assurance for working men now in operation at the works of M. Engel Dollfus, at Mulhouse. It appears that M. Dollfus has for the past twelve years pursued a practice which has made insurance by working men so easy and satisfactory that at the present moment 283 of his hands, possessing about 417,000 francs in furniture are insured. "I obtained," says M. Dollfus, "from the Caisse Générale of Agricultural Assurance that it would construct a policy to include all those of our workmen who would insure their furniture; that it should receive the premiums in a mass; and that the insured should be covered wherever he might reside, on condition that he signified his change of abode, and inscribed the same on a special register." Only 106 of the *employés* of the firm at first took advantage of this collective scheme; but now, it is stated, 283 workmen have their furniture insured. During the twelve years in which the system has been at work in Mulhouse the loss by fire amounted to only 2,805 francs.

An Economical Ice-house.—Mr. W. W. Newman, writing in the *New York Tribune*, says:—An ice-house made of rails on the top of the ground in the open sun will preserve ice all summer if rain is kept from it, and a foot of sawdust is kept between it and the earth. The ice must be closely packed to prevent a continuous contact with air at every point. My ice-house stands in the sun on a dry knoll, is made of rough boards about 12 ft. by 16 ft., half-board length, 8 ft. high; it has a steep board roof, a north window, never shut in summer, with 8-in. or 12-in. upright studding inside; inside horizontal boarding, and filled between these two boardings with sawdust pounded down. The floor is made of pieces of rails, boards, &c., laid on the ground and cross-laid, and covered with a foot of sawdust. On this a layer of ice-cakes is placed, leaving a foot or more on the outside for sawdust, and sawdust is placed between the cakes that do not fit closely, and the last layer is well covered with the same non-conductor. In summer the sawdust is occasionally packed down, and large ice-blocks when wanted sawed into smaller pieces and repacked.

The Trade Unions Congress.—The annual session of the National Trades Congress was opened on Monday in the Mechanics' Institute, Newcastle-on-Tyne, under the presidency of Mr. J. C. Laird, president of the Newcastle and Gateshead Trades Council. The subjects for discussion included the following:—A Bill to amend the law of compensation for accidents, so that workmen might obtain damages; a Workshop Regulation Bill for women and children; the extension of the Factory Acts to bleaching and dyeing works; a reform of the magistracy, with special regard to the summary jurisdiction of magistrates; the reform of the Jury Laws, so as to admit workmen as jurymen; the extension of the Employers and Workmen Act to seamen; reform of the Patent Law; reconstruction of the Small Penalties Act; restriction of imprisonment; and an Act to prevent truck by making compulsory weekly payment to workmen in the current coin of the realm. The Committee, in reviewing the depressed condition of trade, express a hope that whenever any attempt is made to increase the working hours the men will resolutely oppose it by every legitimate means at their command. There are 119 delegates on the list, most of whom were present.

A Tight Hand.—The *Cornish Telegraph* says that the Redruth surveyor is not at all likely to pay workmen a fraction more than they ought to receive. He knows, so to speak, the exact amount of pressure to the square inch in each labourer, and he pays according to strength, industry, and skill. Hence we find some of the workmen receiving 3s. per day; others, 2s. 10d.; others, 2s. 6d.; while one or two get only 2s. The parishioners may well believe these men fully earn what they receive. Were they disposed to skulk occasionally it would be almost impossible to do so, for Mr. Hicks, rising even before the lark, closely pursues the hands during the whole of the live-long day. No overseer of a diamond field ever watched his underlings more keenly and constantly than our ubiquitous local surveyor. And in this way alone he has effected a considerable saving of money.

New Slaughter-house at Turriff.—A large slaughter-house, to be used in common by the butchers of the town, is in course of erection at Turriff, Banffshire. The building is situated in the Horse Market stance, beside the Market Hill, and stands high. The extreme length of the building is 80 ft., with a front elevation of 50 ft., and the extreme width 20 ft. This is divided into five killing-rooms or compartments, four of which are of equal size, 13 ft. long by 16 ft. 4 in. in width. The fifth is much larger than the others, being 25 ft. long by 16 ft. 4 in. in width, with ample accommodation, and hanging-room for a number of beasts. All the compartments are provided with ventilators on the roof, and each has a distinct conveyance-pipe to the cesspool. At the back of the building are sites laid off for byres. Mr. Duncan was the architect, and the contractors were:—For mason work, Messrs. Fordyce & Son; carpenter work, Mr. Clark, Newmill, Auchterless; and slater work, Mr. Gillespie, Turriff. The cost will be about 400*l*.

Ancient Wall Paintings at Cropredy.—An interesting discovery has been made in the fine old church at Cropredy, which is at present undergoing restoration. In clearing the plaster of the chancel and north aisle it was found that underneath the successive coats of whitewash there still remained considerable traces of the fresco painting with which the church was originally adorned. On the chancel, so far, only portions of leaves and interlacing patterns have been found, but over and near the north door of the church representations of figures have been laid bare with half-obliterated texts in black letter. Some of these are enclosed in a kind of medallion formed by interwoven patterns, and appear to represent on one side the seven deadly sins, viz., pride, anger, avarice, lust, gluttony and drunkenness, envy, sloth. In each an attendant demon is waiting on the sinner. Parallel with these are apparently the seven works of mercy, with angels instead of devils.

The Preservation of Clapham Common.—The Enclosure Commissioners for England and Wales, under the Metropolitan Commons Act, 1866, and Metropolitan Commons Amendment Act, 1869, have duly certified a scheme for placing Clapham Common under the control of the local board. Briefly summarised, it is as follows:—The common, which is 220 acres in extent, has been purchased for a sum of 18,000*l*., and is to be dedicated to the use and recreation of the public for ever. The Board may drain, plant, and ornament the common as necessary; but no houses shall ever be built thereon, except lodges necessary for its maintenance. Arrangements shall be made for the accommodation of equestrians, and certain parts of the common are to be set aside for cricket, football, &c., and the intolerable nuisance caused by carpet-beaters, who flock to the common from all quarters of the southern portion of the metropolis, will be done away with.

Pier Extension at Woolwich Arsenal.—In order to ship the 81-ton gun for conveyance to Shoeburyness for further trials, it has been necessary to extend the pier at the Arsenal. The pier extension consists of a separate approach designed to carry guns of 120 tons weight, and it is built on cast-iron screw piles filled with concrete. These piles are from 3 ft. to 5 ft. in diameter, and are screwed about 4 ft. into the gravel bed of the river. The traffic is along a line of rails carried over the pile-heads on girders, and at the extremity, where the crane is fixed, there are twelve of these piles arranged in a circle round a larger one to bear the burden. Every pile has been tested with a dead load of 135 tons. The extension of the pier was designed by Col. Inglis, R.E., director of iron constructions at the War Office, in consultation with Col. Scratchley, R.E., inspector of works at the Arsenal, who supervised the work.

Thunderstorms.—At Quarrington, Durham, an alarming thunderstorm broke over the village about noon on Sunday. The lightning, striking the cottage occupied by Thomas Knox, a pitman, who, with wife and family, was indoors, the chimney crashed through the roof, carrying away the joists and destroying nearly everything upstairs and down, but, marvellous to relate, all the six inmates escaped with only a severe fright. Ralph Tarpin, who was standing at a neighbouring door, was hurled 10 yards into an adjacent cottage with comparatively slight injury. —— At King's Lynn the lofty central lantern-tower, all that remains of the church of the Grey Friars, built in 1264, was slightly struck by lightning on Sunday night.

Westminster Embankment.—The surveyor of the Metropolitan Board of Works has inspected the line of the proposed new street from Abingdon-street, Westminster, to Millbank Penitentiary, with the object of preparing plans for the embankment of the river between those points, it being the intention of the Metropolitan Board of Works to apply to Parliament to construct the works at a cost of 333,000*l*. The proposed embankment will join the embankment recently constructed by the Government adjacent to the Houses of Parliament, and will be continued on to Millbank. When completed, this would give a continuous available embankment of the river for nearly four miles from Blackfriars Bridge to Chelsea, were it not cut off by Westminster Bridge and the Houses of Parliament.

The Locksmiths' Strike at Willenhall. A meeting of the brass padlock-makers, who are now on strike for an advance of 10 per cent. in their wages, was held on the 11th inst. The announcement was made that two leading firms in Willenhall were giving the 10 per cent. rise, and the following resolution was adopted:—"That because two respectable employers in our trade can afford, and have consented to pay, the 10 per cent. advance to their workmen, this meeting has come to the conclusion not to return to work until the same advance is conceded to us." It was afterwards resolved:—"That this meeting is quite willing to have this wages dispute in our trade settled by arbitration should the employers feel so disposed, and that our secretary be requested to convey this resolution to the masters' secretary."

Ecclesiastical Dilapidations.—On the 15th inst. a meeting of archdeacons and rural deans was held in Wells, under the presidency of the Bishop of Bath and Wells. The meeting was called for the purpose of electing surveyors of ecclesiastical dilapidations for the diocese. The three gentlemen at present filling the office of surveyors were originally appointed for five years, and they were now re-elected, but only for two years, the general opinion being that a change in the law would be made before very long. A committee, including the Archdeacons of Wells, Taunton, and Bath, and six rural deans, was appointed to consider the Report of the Select Committee of the House of Commons on Ecclesiastical Dilapidations, and report thereon to the bishop.

Rodmersham Vicarage.—A new vicarage has been built at Rodmersham. There are nine rooms on the ground-floor, comprising reception-room (16 ft. by 15 ft.), with bay-window, drawing-room (18 ft. 6 in. by 15 ft.), dining-room, study, kitchen, scullery, vestibule, and hall. There are seven bedrooms on the first floor, besides dressing-room and bath-room. The architect is Mr. W. Barber, of London, and the builder and contractor, Mr. John Seager, of Cryall's Lodge, Borden.

New Synagogue at Canonbury.—On the 17th inst, a new temporary iron building, in Mildmay-road, Canonbury, was dedicated as a synagogue. The permanent synagogue, which it is intended shortly to erect on the site of the temporary building, will cost nearly 4,000*l*. The temporary building has been erected by Mr. Kent, of Euston-road, under the superintendence of the architect, Mr. J. Spielman, the fittings being supplied by Mr. Knight, of Praed-street, Paddington.

Belgian Iron Girders.—We are informed that Mr. Thos. Scott, iron merchant, Edinburgh, has secured the contract for the supply of 400 tons of iron girders to be used in the construction of St. Enoch Station, Glasgow. Notwithstanding the depressed state of the iron trade here, it is stated these girders will be made in Belgium, and brought over here and delivered in Glasgow at a considerably lower price than they could be produced at home.

Monument to King Robert the Bruce.—The monument to King Robert the Bruce has been entrusted for execution to Mr. Andrew Currie, the sculptor of the monument in Ettrick Forest to Mungo Park and the poet Hogg. The monument will mainly consist of a colossal statue of the king, sheathing his sword in the moment of victory. It was designed by Mr. George Cruikshank.

South Kensington Museum.—The number of visitors at present appears to be far above the average. The number given for the week ending September 16 is 29,988:—the average of corresponding week in former years being stated at 16,634.

A Terrible Fall occurred at a new building in Holborn on Saturday, a little east of Chancery-lane. A man named Martin, a foreman carpenter, was on the roof of the structure in question, giving directions to some men under his charge. Turning suddenly round he lost his balance and pitched headlong down through the building, a distance of about 70 ft., falling upon the stones in the basement. He was conveyed to St. Bartholomew's hospital, but he died on the way.

Arbitration Case at Bradford.—The award in an arbitration case between the Midland Railway Company and the owners of property required for station purposes at Bradford has been made. There were 8,000 yards of land, for which the owners claimed 139,000*l*. The company estimated the value at 82,000*l*., and the umpire, Mr. Pownall, awarded 88,472*l*.

Howard Association.—The report of this Association for September, 1876, shows the various directions in which it has moved during the past year. The Association maintains its belief that Congregate Labour of Convicts can be pursued with advantage only in the case of carefully selected and classified prisoners.

The Newcastle Assize Courts.—We have received several letters commenting strongly on the action taken by Sir Gilbert Scott in this matter. We think it likely, however, that the circumstances which led to the correspondence may not be before the public, and decline, therefore, to publish our correspondents' observations.

An Example.—The Prussian Government has instituted an inquiry into the condition of the theatres in Prussia, and the advisability of establishing an academy of the dramatic arts, endowed by Government. Something of this kind for England we have long asked for.

Weston-super-Mare.—Mr. Henry Pethick, of Clifton, is about to erect a residence on a portion of the Montpelier Estate, adjoining the upper Bristol-road, the contract being entrusted to Mr. John Hando, of Bristol. The architects are Messrs. Wills & Voisey, of Park-street, Bristol.

TENDERS

For new baths, laundry, &c., for the Imperial Hotel Company, Great Malvern. Ironfounder's, smith's, and plumber's work not included. Messrs. Haddon Bros., architects:—

Broad	£2,312 10 0
Porter	2,100 0 0
Everal	1,870 0 0
Smart	1,800 0 0
Mills	1,663 2 1
Inwood	1,625 0 0
Garbutt	1,535 12 9

For new house at the Wyche Point, Malvern, for Mr. J. S. Canning. Messrs. Haddon Bros., architects:—

Collins & Cullis	£3,650 0 0
Porter	3,633 0 0
Jones	3,550 0 0
Garbutt	3,527 0 0
Everal	3,500 0 0
Osborn (accepted)	3,250 0 0

For the Langley Schools, for 500 children, for the Dawley (Salop) School Board. Teachers' residences not included. Messrs. Haddon Bros., architects:—

	School Buildings.	Boundaries.
Morgan	£3,056 8 0	... £224 0 0
Nevett Brothers	2,698 0 0	... 481 0 0
Rushton	2,843 5 1	... 333 0 0
Bowers	2,662 5 2	248 14 0
W. & J. Wellington	2,575 0 0	... 320 0 0
Welsh	2,500 0 0	... 230 0 0
Patterson & Son*	2,398 0 0	... 190 0 0

* Accepted.

For new buildings for the Herefordshire and District Working Boys' Home. Messrs. Haddon Bros., architects:—

Welsh	£2,245 0 0
Griffiths	1,975 0 0
Bowers	1,900 0 0
Ford	1,760 0 0
Lewis (accepted)	1,750 0 0

For new school buildings and teachers' residence, at Genfron, for the Nantmel School Board. Messrs. Haddon Bros., architects:—

Stephens & Briston	£1,379 7 6
Hurst	1,189 0 0
Morgan	1,029 19 6
Evans (accepted)	1,027 10 1

For erection of house and stables, Wood Lee Estate, Egham, Surrey, for Mr. John King, Farlow. Mr. Robert P. Notley, architect. Quantities by Messrs. Lindsell & Giffard:—

	House.	Stables.
Haward Bros.	£5,341	£1,007
Falkner	4,778	878
Bangs & Co.	4,523	1,115
Pither	4,676	889
Browne & Robinson	4,343	1,068
Cades	4,294	999
Messom	4,415	822

For new school buildings, with teacher's residence, for the Avenbury (near Bromyard) School Board. Messrs. Haddon Bros., architects:—

Rouse	£950 0 0
Dixon	926 0 0
Kings	889 11 11
Turbull (accepted)	794 10 0

For new story, at No. 116, High-street, Shoreditch. Mr. Horace T. Bonner, architect:—

Steed	£343 0 0
Shurmur	240 0 0
Whales	219 17 0
Allen	205 0 0
Shingfield	190 0 0
Manning & Dowdney (accepted)	165 0 0

For rebuilding Nos. 28, 29, 30, and 31, Camomile-street. Quantities supplied by Mr. R. W. Griffiths. Mr. Wm. C. Banks, architect:—

Staines & Son	£5,282 0 0
Bangs & Co.	5,251 0 0
Hart & Son	5,234 0 0
Oliver	5,100 0 0
Rider & Son	5,053 0 0
Nightingale	4,975 0 0
Sharpington & Cole	4,838 0 0
W. & F. Croaker	4,562 0 0

For fittings at Nos. 65 and 66, Houndsditch, for Mr. Hyman A. Abrahams. Mr. Wm. C. Banks, architect:—

Drew	£1,195 10 0
Colls	1,130 0 0
Somerville & Smith	947 1 6
Nightingale (accepted)	897 0 0
Salter	893 0 0

For alteration to tower of Patshull Church. Quantities by Mr. R. W. Griffiths. Mr. Wm. C. Banks, architect:—

B. Graham & Son	£1,599 0 0

For external painting, repairs, &c., at St. Catherine's, Beckenham. Mr. Wm. C. Banks, architect:—

T. Graham	£237 17 0

For new dining-room, &c., Oakdene, Beckenham:—

Cooper	£388 0 0

For the erection of a residence on the Dudley-road, Tipton, for Mr. Daniel Dudley, jun. Messrs. Round & Beddoe, architects. Bricks and doors found by the proprietor.

Tranter	£347 0 0
Round & Bagnall	315 0 0
Cox	313 14 0
Kendrick	297 10 0
Adams (accepted)	249 0 0

For alterations and additions to the Cock tavern, Camberwell-green. Mr. R. C. James, architect:—

Jackson & Todd	£1,150 0 0
Cook	1,110 0 0
Simpson	1,075 0 0
G. & S. Fisher	1,069 0 0
Cole	1,015 0 0
Cox	988 0 0

For alterations and additions to house, Bromley, Kent, for Mr. G. Weeks. Mr. A. G. Hennell, architect:—

Hooker	£2,420 0 0
Arnaud	2,338 0 0
Payne & Balding (accepted)	2,300 0 0

For alterations, stable buildings, greenhouse, &c., at Dulwich, for Mr. R. Peck. Mr. A. G. Hennell, architect.—

Amer	£888 0 0
Payne & Balding (accepted)	871 0 0

For cottages and farm buildings, at Farnborough, Kent, for Messrs. John Fox & Sons. Mr. G. St. Pierre Harris, architect:—

Payne & Balding (accepted)	£1,220 0 0

For alterations and additions to house, Elmstead-lane, Chislehurst, Kent:—

Payne & Balding (accepted)	£795 0 0

For alterations and new stables, at the Laurels, Bromley, Kent:—

Payne & Balding (accepted)	£328 0 0

For rebuilding the Independent Chapel, Wattisfield. Mr. Alfred Conder, architect:—

Day (accepted)	£940 0 0

For the erection of stables, cottage, lodge, and fences at Croydon. Mr. Gwyther, architect. Quantities supplied by Mr. C. Kirkby:—

Colls & Son	£2,653 0 0
Patrick & Sons	2,620 0 0
Gregory	2,585 0 0
Mason & Bristy	2,331 0 0
Smith	2,189 0 0

For alterations and additions to 202, Sloane-street:—

Simpson & Sons	£1,170 0 0
Turrall	1,120 0 0
Braid & Co.	1,100 0 0

For alterations and additions at Whitechapel Workhouse, Baker's-row. Mr. Longmore, architect:—

Andrews	£3,524 0 0
Crockett	3,200 0 0
Wood & Son	2,763 0 0
Stephenson	2,719 0 0
Braid & Co.	2,498 0 0
Judd & Hawkings	2,440 0 0
Scrivener & White	2,438 0 0
Hunt (accepted)	2,322 0 0

For new farm buildings, Heathrow (near Hounslow) Mr. C. J. Shoppee, architect:—

Briant	£1,115 0 0
Tayler	1,043 0 0
Larrett	984 15 0
Kearley	825 0 0
Hardy	789 0 0

For additions to the Green Man, Kingsbury, Hendon. Mr. C. J. Shoppee, architect:—

Willett	£1,097 0 0
Donne	1,031 10 0

For additions to the Surrey Arms, Hendon. Mr. C. J. Shoppee, architect:—

Willett	£341 0 0
Donne	329 10 0

For alterations, &c., at Grazeley Court, Reading. Mr. C. J. Shoppee, architect:—

Searle	£255 14 0

For rebuilding No. 28, Budge-row, Cannon-street, for Mr. O. H. Davis. Messrs. H. & J. D. Mathews, architects. Quantities supplied:—

Downs	£5,386 0 0
Dove Bros.	5,185 0 0
Moreland & Nixon	5,184 0 0
Brass	5,029 0 0
Gammon	5,000 0 0
Adamson	4,979 0 0
Morter	4,939 0 0
Hearle	4,895 0 0
Ashby & Horner	4,840 0 0
Conder	4,831 0 0
Sewell	4,768 0 0
Newman & Mann (accepted)	4,690 0 0

Iron Girders, Columns, and Fireproof Floors.

Moreland	£1,058 0 0
Homan & Rodgers (accepted)	884 0 0

For alterations and additions to Harley-street Chapel, Bow. Mr. T. L. Banks, architect. Quantities supplied by Messrs. Sargeant & Billings:—

Morter	£2,371 0 0
Bangs	2,323 0 0
Coleman	2,153 0 0
Toms	1,990 0 0

For alterations and additions to Wotton House, Dorking, for Mr. W. J. Evelyn. Mr. G. R. Redgrave, architect. Quantities supplied:—

Prebbie & Co.	£2,280 0 0
Martin	2,250 0 0
Colls & Sons	2,159 0 0
Newton & Triggs	2,148 0 0
Putney	2,055 17 0
Grieve & Littlejohn	2,020 0 0
Hide & Co.	1,970 0 0
Beale	1,965 0 0
Stephenson	1,950 0 0
R. & E. Smith	1,940 0 0
Watson	1,893 0 0
Aden	1,879 0 0
Braid & Co.	1,750 0 0
Vincent	1,647 0 0
Warr	1,567 0 0
Tunewell (accepted)	1,547 0 0

For the erection of dwellings, Peel-street, Notting-hill, for the National Dwellings Society (Limited). Mr. E. Evans Cronk, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Macey	£30,250 0 0
Downs & Co.	29,995 0 0
Rider & Sons	29,985 0 0
Allen & Sons	29,820 0 0
Bywaters	29,346 0 0
Hill, Higgs, & Hill	28,840 0 0
Shepherd	28,575 0 0
Patrick & Son	26,700 0 0
Perry & Co.	25,153 0 0

For the erection of a villa residence, at Brockley Park, Kent, for Mr. J. Frank. Mr. Henry Prior, architect:—

Stark	£1,048 0 0
Amer	1,020 0 0
Shapley (accepted)	893 0 0

For alterations and additions at Reindeer tavern, Eyelane, Peckham, for Mr. W. Wilson. Mr. Aldous, architect:—

Croaker	£494 0 0
Shapley	435 0 0

TO CORRESPONDENTS.

R. P. M.—S. H.—J. B.—L. M. M.—F. P.—H. T. B.—A. C.—P. & B.—J. & H.—B. & Co.—G. & S. F.—Messrs. H.

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The Builder.

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The New Town Hall and other Works in Manchester.

THE great building which forms the architectural centre of Manchester is now nearly approaching completion. Since our last detailed notice of the progress of work at the town-hall (see *Builder* for October 9, 1875), part of the business portion of the building has been fitted for occupation and taken possession of by the officials of certain departments; the great tower is completed externally (except the filling in of the large lights, which, of course, are to receive louvres or some substitute for them); and the greater part of the work remaining to be done consists only in interior fittings and decorations.*

Of these latter the most important portion is the decoration of the roof of the great hall, which is now nearly complete, though the effect as a whole can hardly be judged of while the scaffolds are still up, as they were at the time of our visit. The roof, which we have previously described in its general features, has heavy oak principals with curved braces, carrying a panelled wooden ceiling in four cants, meeting in a ridge at the apex. The decoration of the principals is very simple, its object being to emphasise and strengthen their principal lines, by a double line of gilding on the lower mouldings on the soffit of the braces; a heavy roll moulding, which forms the outer member of the ribs on either side, being picked out with a spiral of gilding on a dark ground, dotted with a rosette on the interspaces. The decoration of the panelled ceiling has been carried out on a scheme drawn out, under the approval of the architect, by Messrs. Heaton, Butler, & Bayne, who are executing the work. The panels, which (speaking roughly) are some 8 ft. or so square, have an inner circular border painted on them, formed of two bands of colour intersecting or crossing each other something like the strands of a rope; the spandrel spaces left in the angles of the panel being filled with a powdering of gold bees on a blue ground. The symbolism of the bee, of course, is obvious; whether the twisted strands of the circular border have an indirect reference to cotton-spinning, or are designed merely for effect, we do not undertake to say. Within the circle each panel has a device representing the arms of some country or city, in combination with other details, animal or vegetable forms, or artificial implements, symbolising the arts or products with which each is most generally associated. The cities and countries represented are as follow, beginning at the upper end of the room, and naming each set of four which cross the ceiling from right to left of the entrance (as that is evidently the connexion in which they have been grouped):—Great Britain, Manchester, Salford, Duchy of Lancaster; London, Edinburgh, Dublin, Liverpool; Leeds, Glasgow, Bristol, Bradford; France, Russia, Austria, Prussia; Norway and Sweden, Denmark, Holland, Belgium; Egypt, America, China, Japan; India, West Indies, Australia, Canada. The details of some of the panels may be mentioned, as giving an idea of the general scheme. The red rose of the Lancastrian faction forms the historically appropriate decoration of the Manchester and Salford panels; the London arms are accompanied by ships, seaweed, and coins, the two latter items may be taken to indicate perhaps the past and the present; Liverpool in a somewhat similar manner; Glasgow by ships and sugar-cane; Bristol, ships and tobacco; Prussia, military accoutrements, only too appropriate for a nation which holds a "Sedan-fest," and lime-boughs, the connexion of which comes home to us more if we call them *Linden*,—it is the same thing, of course; Egypt, ibis and papyrus; Russia, bears, wheat and hemp plants; India, tiger, elephant, and bananas; and so on. We do not mean to imply that bears and wheat, or tigers and bananas, are twined together into a homogeneous design. The general system is that the foliage introduced forms a kind of ornamental background and border to the coat of arms, and the animals and other larger objects stand outside: they are only, in fact, very conventional animals, more symbols than representations. The symbolism employed for Holland strikes one rather oddly in such a position,—tulips and a Dutch cheese! the latter with a good cut taken out of it, and showing a gilded surface in the interior. At this rate, why not have been still more direct, and shown case-bottles of "hollands"?

However, one must not look at work of this kind from the scaffold; it is meant to be seen from below, and the object, of course, is to produce a generally good decorative effect, while providing something like a motive and meaning for the decoration. The general effect will be good; possibly slightly heavy, at least if we consider it in relation to the lower portion of the apartment. In a previous notice we suggested that the large windows at the side would form an excellent opportunity for the display of high-class stained glass design. This has not been done so far; the windows are filled with nearly plain glass in ornamental leadings, and with a little conventional foliage design in coloured glass introduced here and there. It is very tastefully done, and the effect is very good, so far as the windows themselves are concerned (they are the work of Messrs. Odell, who have done all the ornamental glazing throughout the building); but then there are these nearly white windows, in conjunction with the light-toned undecorated stonework of the walls and piers, giving a very light effect to the lower portion of the hall, while the roof is decorated in strong and pronounced colouring and gilding. With a most decided sympathy for the pure and truly architectural effect of the moulded and uncoloured stonework, we cannot help thinking that to put all the strong colour in an apartment on the ceiling, and none below to support it, is almost as great a mistake in regard to general effect as the reverse proceeding; and that a more satisfactory and complete effect would be produced if there had been some colour either on the walls or in the windows. A difference will be observed, no doubt, when the hall is used on state occasions, and a good deal of colour supplied by dresses; but even in that case the colour in the roof will, so to speak, stand upon nothing. Looking at the roof-decoration in itself, it appears to us to be very well and completely carried out from the point of view of its designers; the only thing that at all strikes us as incomplete in the scheme is, that there should have been some distinction of grouping or treatment between the arms and symbols of mere cities and those of countries: the associations with the two classes of topography are so completely different in scale, and even in their nature, that it seems scarcely suitable to mix them together on exactly the same footing in a design. Such a scheme, for instance, as making the lower row of panels emblematic of countries and the upper one of cities, might have been quite possible, and would have made the meaning of the whole more complete and obvious. Looking at the subject from a more general point of view, we cannot help raising the question, whether the system and type of decoration followed here and in other similar cases is one worthy of the occasion and of modern intelligence and education, and whether it is not in some degree a misapplication of rather an old-fashioned and commonplace motive, or one which has now become commonplace? We cannot find fault with those who have carried out this particular piece of work for adopting a system which has come very much into favour, and which apparently met with the approval of their architect. But if the desire is entertained of giving to such a piece of decoration an intellectual interest, something more than this is required; if a decorative effect only is sought, something less would often be better and more manageable. As it is, the decorative effect, the production of a decorative design rich in general effect and beautiful and graceful in all its details, is rather hampered and interfered with by such a scheme of coats of arms and appropriate symbols; and do these add anything really to the interest of the design? As a rule, scarcely any one notices them or takes the trouble to make them out; what strikes the eye is the general decorative effect; and if after looking a little at the ceiling

* We give a general view of the exterior in our present Number. See p. 952.

it does occur to the spectator that these are the arms and symbols of different countries, or if visitors going over the building get it pointed out to them by the official showman,—"These hall represents the harms and the produc's of different countries; to your right the harms of Hindia,—hobserve the helephant and the banannies," &c.; what, after all, is the good of it? We have a respect for coa's of arms; they form a picturesque method of distinguishing families and corporations, and have the association derived from historical precedent; they form, therefore, very good centre points for decorative treatment; but the system of working in the products of the different countries into the design seems often to lead to the introduction of details that are anything but ornamental, and as a method of giving meaning to a design rather reminds us of the story-books for children in which pictures of the principal objects referred to in the tale are inserted in the text, instead of the words which define them, to lead the young idea to connect words with objects. This is very well for children, and useful to them; but it becomes rather absurd when grown-up people are expected to take an interest in seeing a dragon put for China, and a cheese for Holland; things which are certainly not beautiful in themselves, and which are not worth painting in such a position for the sake of their meaning.

The remainder of the decoration in the Town-hall, as far as at present decided upon, consists principally of the ceilings of the council-chamber, reception-room, and committee-rooms, the corridors and the outer hall or vestibule on the first floor, leading to the great hall. The decoration of this vestibule was not commenced when our notes were made. The ceiling of the council-chamber has a design in relief, consisting of small panels on the soffits of the beams and larger ones in the interspaces, the former filled with conventional foliage, and the latter with a tracery of intersecting circles; and the colour decoration here is confined to picking out this design in gold, and lining out the cornice in colour; but there is to be a rather deep frieze formed on the wall, in which the arms of neighbouring towns will be represented amid a foliage design of oak-leaves. The heads of the painted windows cut through this frieze. The most elaborately-decorated ceiling in the range of rooms on this side of the building is that of the large reception-room, in which there is a geometrical design in raised tracery forming panels, which are filled with conventional foliage in rather low tints, introducing the Tudor rose, the tracery ribs relieved with colour and gilding, and the centres of the circular panels from which the chandeliers hang decorated with gold stars or radiations. The soffits of the beams in this room are to receive a design in which the arms of families of the county or neighbourhood will be incorporated. These decorations are by Messrs. Best & Lea, of Manchester, who are also decorating the stone-vaulted roof of the room under the tower (forming the centre of the council-chamber and reception-suite), in a rather severe style, more recalling Roman than Gothic feeling in its lines and colouring, so far as the small portion executed can be taken as a sample: the effect is good, however. The same firm are also decorating the vaults over the main staircases. The committee-room ceilings are being executed by Messrs. Pollitt & Coleman, also of Manchester; gilding on the tracery lines and gilded bosses at the centres form the principal source of effect. The windows are all filled with the same ornamentally-leaded style of glazing, with a very little colour at certain points, which has been adhered to throughout the building, and which, for business rooms, very happily combines plenty of light with a good decorative effect. The decoration of the ceilings of the ground-floor corridors has been done by Messrs. Pollitt & Coleman, and those of the first floor by Messrs. Best & Lea; this consists chiefly of a very light bluish grey ornament on the nearly white ground; in the upper corridors the design takes the shape of a kind of zig-zag key pattern, which, simple as it is, has an excellent effect, and in which we think we can trace the direct suggestion of the architect of the building. The whole of the public portion of the interior, the halls, staircases, and corridors, exhibits a refinement of taste and a total absence of overdoing anything which produces a most agreeable and satisfactory impression.

Externally there is nothing new to notice, except that the large tower is now complete, and realises the impression of combined solidity and picturesque character conveyed in the perspective sketch for its completion which we had seen on a previous occasion. The short spire which terminates it is, as we mentioned before, a heavy and solid stone one, an agreeable change, to our thinking, from the pyramid of slate and ornamental ironwork which has become the most approved and accepted method of terminating a town-hall tower.

The most important building we noticed in progress after the town-hall is a very large hotel filling up the triangular space formed by the junction of Deansgate and Victoria-street just above the cathedral. This is being carried out, according to a painted notice-board, by the "Corporation Building Society" (that, if we remember rightly, is the "style and title"): Mr. W. Dawes is the architect. The site is not yet entirely filled up, as the lower corner, which will form the acute angle of the triangle towards the north, is still occupied by some of the old houses, about which we suppose some difficulties of negotiation have occurred. Over the remainder of the site the building is up to the first-floor level; the ground-story all round is to be let for shops, and takes the required character of wide square-headed openings and narrow piers accordingly. The site is one which almost suggests its employment for a large and impressive building, and the change from the mean houses which formerly stood here will be a great improvement in the approach to the Exchange and Market-street from the Victoria Station; nor could any large hotel have a more central site, both in regard to appearance and convenience of access to the chief business centres of the city. Whether architecturally the result will be so satisfactory we cannot say as yet. The building is apparently to be Gothic; in the two principal fronts the line of shops is interrupted by two large entrances, which we suppose will furnish access to the interior economy of the structure, and which are covered by pointed arches filled with tracery, which appears very "Manchester Gothic" in style. The heads of the wide shop windows are formed of what are intended to look like stone lintels, but which are really flat arches in three stones, with raking joints, upon which the shafts of the first-floor windows stand. Some of the joints, which are not as well fitted as others, convey the impression that the stone lintel has already cracked, as it infallibly would if it were a lintel, and really carried the superstructure. Of course it is to be presumed that there are iron beams in the rear. That, however, is not building "in the Gothic manner." In Cross-street a new Gothic Insurance Office (the "Imperial") shoulders a new Italian one (the "General)." There is a good solid look about the former, but it exhibits the want of refinement in detail, which is the constant failing of indigenous Manchester architecture, and the stone terminal brackets put up to stop the first-floor string mouldings look as if they were copied from the boxings which form the regular "stop" of an ordinary wooden shop cornice. That again is not "the Gothic manner." The details of the other building are better in their style, though it is not, we admit, the style for Manchester. A better building than either is that erected in Deansgate, a good deal farther from the Exchange, by the Queen's Building Society, whose offices form part of the new building. The architects are Messrs. Pennington & Bridgen, who seem a little in search of a style, for the large doorway or the return-front, with its battlemented decorations, is quite distinct in style from the window adjacent to it. Still, there is picturesque treatment in this building, which is one of the best new erections we noticed. There are other new office or warehouse buildings dotted about, but nothing that we came upon of any particular importance. It is surprising that all the new building seems still to keep clear of Market-street, which, as in one sense the principal street of the town, looks dingy and uninteresting in comparison with many comparatively back streets where much new building has been done. The new hotel and the new Exchange may, however, give an impulse presently to rebuilding in this locality.

We must say a word in regard to the picture exhibition at the Royal Institution this year, one of the best and most interesting provincial exhibitions we have seen for a long time. Of course some part of its excellence arises from what has been seen already at the Academy; but it says something for the interest taken in art in Manchester that so many of our ablest artists send their pictures, and apparently paint works on purpose for this exhibition, or at least exhibit them here for the first time. It is agreeable also to meet pictures one has admired in a new light. Mr. Aumonier's beautiful work, "Toilers of the Field," receives the justice here which it did not receive at the Academy, and, in conjunction with his "Water-lilies," more than confirms the opinion we had already formed as to this artist's rare ability and poetic feeling. Mr. Mark Fisher's very fine landscape, "A Scotch Hillside," which was at the Academy, is here supplemented by a companion picture, "On the Cam," which is new to us, and is equally excellent. Mr. Holloway's "In Chancery" is a picture of much feeling, a representation of the ruin and decay of an old neglected house, with the boat half sunk in the stagnant moat before the gate. Mr. Brewtnall exhibits a large and in some respects very excellent (though rather mannered) picture from Tennyson's poem of the Sleeping Beauty, at the moment when the fairy prince breaks into the bower; the face of the sleeping princess is very sweet in its dream-like repose. Other pictures which are known to us, by Henry, Armstrong, and others, are included in the collection; and there is Mr. Poynter's small study for the Atalanta picture, which will be looked upon with interest. It is also a pleasure to come upon excellent works by artists who a "local habitation," but whose merits entitle them to more than local repute. Among these we specially noticed two large and powerful watercolours, "Dunbeg Bar" and "On the Bollin," by Mr. G. Sheffield, of Wilmslow, whose name is new to us. The smaller works by Mr. Wade, of Preston, "Old Houses at Bassenthwaite," and others, are very good; and there are two admirable landscapes in oil by Mr. Anderson Hague (of Stockport), who has a style and feeling a good deal his own, and which suggests a study and thought beyond the ordinary practice of English landscape painting. The collection of water-colours generally is of a very high average; we missed, however, the name of Mr. Sam Bough, who used to be great at some of these exhibitions. But the exhibition is worth a visit by any one going into the neighbourhood.

ENGINEERING WORKS REQUIRED IN INDIA.

THE public attention has been so loudly called, since we penned our recent remarks on Public Works in India, to that important subject, that our readers may be glad to have some further definite information on a matter which remains in great obscurity in this country. On the appearance of Mr. Thornton's book on the Public Works of India we took occasion to express regret that the volume did not contain more positive information of such a nature as should be satisfactory to the engineer. Nor is the deficiency to be supplied from any sources as yet published in this country. We took the pains some little time back, to draw up for the columns of the *Builder* an abstract of the information as to public works contained in the report on the moral and material condition of India; but the pressure of original matter left no room for the insertion of intelligence which was in any way accessible in England, although it involved no small amount of pains to grasp it in a compendious form. Since that time we have been able to provide ourselves with more definite information, which as yet has not been published in England, and we hope that such a contribution to the literature of an engineering subject of primary importance will be welcome to many of our readers.

In approaching a subject of such enormous magnitude as the public works of India it is requisite to lay down with some precision the limits of discussion proposed. We do not, for instance, propose at the present moment to touch the question of Indian railways. Nor do we approach the no less important topic of harbours, coast navigation, and coast lighting. Nor, again, have we anything to say at present on the improvement of the highways; a matter, it need not be said, of vital importance, in which very much progress has been made within the last twenty years. That these three branches of public works are of supreme national importance there can be no question whatever. That they form a part of the indispensable machinery for turning swamp and desert into fertile cultivable soil is equally true. Nor do we doubt the self-supporting character of such works, if regarded as a whole, and if the returns are calculated for a sufficient number of years. At the same time, in most of these works large present outlay is demanded, the full commercial return

for which will be either deferred, as in the case of railways, or is only indirectly to be calculated, as in the case of highways. No one could propose, for instance, so to toll the vast inland traffic of India as to derive from that source a direct interest on the money laid out in roads. The fact is that over an enormous area of country so much work of the most beneficial character only requires heads to plan, hands to execute, and capital to set it in operation, that the task of the engineer is rather that of selection than of invention. Nay, even more than that; in very many instances it is from the restoration and repair of the magnificent works which were planned and carried out by the native sovereigns of India many centuries ago that the most lucrative and immediate returns have hitherto been derived. The engineer who contents himself with the humble task of reconstructing the colossal bunds and annicuts of Veranum or other great rajahs, as old, may be, as the Christian era, may not earn for himself the fame of a great designer or an original genius. But the great gift and need of India will track his footsteps,—water will flow by his instrumentality in ancient, though artificial, channels; and it will not be too much to say that his course will be more beneficial to India than if his horse had been literally shod with silver.

It is, therefore, to the irrigation and canalisation works of India that we wish now to call attention. In so doing it is convenient to point out the three main groups of the primary works in course of execution, or desirable, for these ends. These are, the regulation of river deltas and basins, the storing of rainfall, and the construction of canals, whether lateral or lines of new water communication. These are works that require large sums of money for their construction, and the commencement of which would be improvident without due and certain provision of the adequate capital. From these great master works, which, although connected with each other as systems of water treatment, occupy three different zones of country, the derivation of the smaller canals and water-courses, which may be called the directly earning members of the system, is matter, not perhaps of less importance, but of less difficulty. From year to year and from month to month these smaller works can be extended as labour is available for the purpose. A little more or a little less vigour in the prosecution only involves the receipt of more or less water-rents. No great mischief will follow from their interruption; or rather the mischief which so follows will be purely negative, involving the deferring of agricultural prosperity and increased revenue; not positive, like the flooding of half a province by the failure of a mountain reservoir.

Of these three great classes of works, those which have been longest in operation, and also most lucrative in their financial results, have been those intended for the irrigation and regulation of river deltas. The deltas of the Cauvery, the Kistna, and the Godavery have each been attacked on the same principle. At a convenient spot a weir, or annicut, has been built across the stream, so as to allow of the discharge of the excess of flood water, and to maintain an average head, from which main and subsidiary canals of irrigation can be fed during the season when water is required for the growth of the various crops. Thus, in the case of the Godavery, the average rainfall over its basin is estimated by Sir Arthur Cotton at 40 inches. If half of this quantity is discharged by the river, the amount of water equals 200,000,000,000 (say 200 milliards) of cubic yards. But when the river is full (which may perhaps only happen once in four or five years), it brings down nearly 180 millions of cubic yards per hour, or more than 4,000 millions of cubic yards in a day. This is sixfold the daily discharge of the Nile in its average October flood, as measured at Cairo. The loss of the latter river by evaporation on its long course of nearly 1,350 nautical miles, without receiving a single affluent, from the mouth of the Tacazze to the delta, as Humboldt estimates the distance, is enormous. The Godavery, however, drains nearly a tenth of the area of India. The cost of the works up to December 1874, has been 600,000*l*. Interest and repairs are taken at 7 per cent., giving 42,000*l*. per annum. The distribution of water made by the works is estimated as 7,000 million cubic yards, a quantity equal to more than a third of the total average flood-flow of the Nile for the month of October. The actual cost of the water, on these data, is 1*l*. sterling for 170,000 cubic yards. Not half the supply, however, is as yet utilised, as the distribution works are not complete, and as the capacity of the canals is of course considerably in excess of the calculated demand. At present, about 600,000 acres receive each 5,000 cubic yards of water, giving an annual total of 3,000 millions of cubic yards, or three-sevenths of the capacity of the works. The cost to the Government of the water actually taken for irrigation thus comes to 1*l*. for 70,000 cubic yards, or 0·00031 of 1d. per yard. For the cultivation of rice, as much as 6,000 cubic yards of water per acre is required; for that of dry grains, not more than 1,600; for sugar-cane, which requires water for ten months out of the year, as much as 20,000 cubic yards per acre. The average water-rate paid in the Godavery district is 4 rupees, or 8s., per acre. This is equivalent to a sale price of 1*l*. for every 12,500 cubic yards of water, or 0·019 pence per cubic yard. The profit made by the Government is thus 57·5 out of 70·0, or between five-fold and six-fold the annual cost. If we double the latter, so as to provide not only for all costs and contingencies, but also for the repayment of the capital within a very limited number of years, there still remains a direct annual return of a nature more lucrative than it is easy to find offered by any other means of employing money,—and that directly secured upon land.

A rent of 4 rupees per acre on 600,000 acres is equal (leaving the silver difficulty out of the question) to an annual revenue of 240,000*l*. Such is the actual return on the expenditure of 600,000*l*. But it requires only a small increase on that expenditure to enable the Government to supply a million of acres with water; that is to say, to earn a water revenue of half a million sterling per annum from the Godavery delta. It is to be wished that the actual expenses of repairs and maintenance of the canal, and of water distribution and supervision, were published. In the lecture by Sir A. Cotton at the School of Military Engineering at Chatham, from which we have abstracted the above particulars, cost and interest are taken together. It has to be borne in mind that the cost of collecting the water-rate is *nil*; as it is received at the same time and by the same machinery as the land-tax. In fact, in some districts, as in Tinnevelly, the income from land-tax is not distinguished from that from water-rate, the average Government income being set down at 14 rupees per acre, which is allowing 12 rupees for water, or sufficient to raise two crops in the year. Look at it, therefore, how we like, we find something close upon a gross income of 40 per cent. per annum on the original outlay secured to the Government on the completion of the subsidiary works of this district (to be raised to 50 per cent. when the cost is swelled to a million), and that a return of so extraordinary a nature is received at the present moment.

For the guidance of the capitalist, it is only necessary to verify the above statements by independent testimony, and then to ascertain whether similar conditions exist in other parts of India. If so, the only question remaining will be,—how far any independent company could obtain the requisite powers for executing any similar work, and how far, if such powers can be obtained, it would be possible to secure the aid, or, at all events, to avoid the ruinous hostility, of the two great Indian services; to the unfortunate jealousy between which most of the hindrances to the prosecution of public works in India are attributed by many of those who are familiar with the subject. Assure, not the anticipated return of the Godavery works, but one-third of that return. Assure the hearty goodwill of the Government of India, of the engineers in charge of the public works, and of the collectors and their subordinates, and it will only be a question of a few hours to raise capital by millions or by tens of millions.

But while the above statement of the definite profit to be made by the simple process of the collection and distribution of water is enough for the satisfaction of the capitalist, the interest of the Government of India, and that of the British public, is far more wide. As having made the works, that is to say in the capacity of capitalists, Government is now in receipt of this magnificent result of a gross return of 40 per cent. per annum on a moderate outlay. But there is another source of direct revenue which, in all parts of India when it is not debarred by the improvident measure of a permanent settlement of taxation, follows close on the benefits of irrigation. The taxation of the district has increased to a large extent, independently of the water-rate. Thus, while a water-rate of 180,000*l*. per annum has been collected in the Godavery district, the increase of annual revenue has been 300,000*l*. per annum, showing a Government income from the increased productiveness of the land and wealth of the people equal to two-thirds of the new water-tax. The Government, then, while first admirably paid in its capacity of capitalist, is a second time remunerated for its outlay in its sovereign capacity. There is yet a third aspect under which the case has to be regarded.

A rice crop, irrigated with 6,000 cubic yards of water per acre, will produce (allowing for much waste) half a ton of grain, besides straw for fodder. At the low price of two-thirds of a penny per pound, this quantity of grain is worth 3*l*. per acre. The value of a non-irrigated crop may be taken at 1*l*. per acre. At the cost, therefore, of four or five rupees, the cultivator has secured an increase of treble his unwatered crop. In money value his net gain will be 30s.; making his return 50s. per acre instead of 20s. From this only the same deduction for labour in the first instance as that required for the smaller earning has to be made. Not confining the investigation to rice, but considering all kinds of produce that are cultivated under irrigation, the income of the cultivator throughout the district is nearly, or quite, doubled. The average income of a family in India is reckoned at about 5*l*. per annum. We say nothing of the fifty million families of India, because we are speaking of special districts alone, or the figures would be colossal. But if we look at a duplication or triplication of the products of a single district alone, as in the case of the million acres of the Godavery, we see that where half a million is added to the revenue of the State, four times that amount is added to the income of the industrial population.

It would exceed any rational limit, as far as our columns are concerned, to carry out a similar investigation with regard to other works undertaken for the purpose of agricultural irrigation. In Tanjore 1,200,000 acres are now irrigated, a considerable portion of it for two crops a year, and the produce is worth fully five millions per annum. But, independently of the golden results of a system of canalisation designed for the feeding of the crops, we have to regard the value of such works in providing a cheap and effective method of internal communication. The facts on this subject are no less remarkable than are those which we have already cited. In the case of the Godavery works there are now between 400 and 500 miles of canal completed, which serve not only for irrigation, but also for navigation. On these canals 48,999 boats were plying in 1873–4, and 53,432 boats in 1874–5, showing an increase of nearly 9 per cent. in the year. The ton mileage amounted to 31,091,461 in the former year, and to 31,971,314 in the latter; and the navigation receipts were respectively 3,060*l*. and 3,284*l*. These receipts are equivalent to a charge of 6 pice (or ¾d.) per ton carried an average distance of thirty miles, or one-sixth of a pie per ton per mile. But some of the boats carry passengers only. A charge of 1 pie per ton per mile would be excessive, according to the administrative reports of the Madras Government; and it is anticipated by the same reporter that when the rates are properly adjusted the revenue receipts under this head will reach a lakh or even a lakh and a half of rupees annually. The total actual cost of transport on these canals is stated by the *Friend of India* to be but 1 pie per ton per mile. Cargoes to the value of seven and eight millions sterling are now being carried on these canals, at a cost not exceeding ¼d. per ton per mile. The whole cost of the carriage of goods on this canal during the last year is stated by the same authority at a little over 20,000*l*.; while by ordinary land-carriage it would have amounted to 815,000*l*. The land revenue of the whole Godavery district is 420,000*l*., so that the saving to the country by the canals, as affording the means of transport, is double the whole amount of its taxation. It may, of course, be remarked that so large a sum would not in all probability have been expended in transport; but the reply is, that the creation of a new system of transport yields a wealth which is only very imperfectly estimated by comparing the amount of the old rate, for a limited traffic, with that of the new rate, for a large and rapidly increasing traffic. Thus it may be noted that twenty-five years ago the whole export and import trade of the district was not 120,000*l*. a year. It is now 1,200,000*l*. a year.

Statements such as the above, made on official authority, leave no doubt as to the enormous advantages which are offered to India by canals

used as means of communication. The lowest estimate that has recently been published of the cost of locomotive power on railways gives a price of from one-third to four-tenths of a penny as the minimum expense, per ton mile, of working the trains, irrespective of any allowance for interest and wear and tear, which would amount to as much again. Here, on the contrary, in the canals, we have a cost to the producer of one-eighth of a penny per ton mile for transport, which yields an income that, whether it be less or more, is nearly all pure gain to the Government; as the cost of maintenance and repairs has already been charged to the debit of irrigation, and cannot be appreciably increased by the additional service of navigation.

It is not in India alone that the true value of canal communication is becoming daily more fully appreciated. In the United States there are three great lines of inland water communication, by which the produce of the land is conveyed to the coast. On the St. Lawrence, the Erie Canal, and the Mississippi, ten millions of tons of produce are annually conveyed. The cost of conveying this tonnage for 1,200 miles, at a penny per ton per mile by railway would be fifty millions sterling. By water, at one-eighth the price, the cost is reduced to 6·25 millions, giving a saving to the producer of 43¾ millions sterling in carriage. The Sirhind, the Ganges, and the Sone Canals form a line of 1,000 miles, in which there are as yet two breaks, one of 100 miles, and one of 50 miles. On the completion of these links, wheat can be brought from the North-Western Provinces to Calcutta for 8s. 4d. a ton, or about 3d. a bushel. The revolution which such a facilitation would cause in the corn trade is of the utmost magnitude.

We have not space on the present occasion for either the brief account of the lines of canal through the Ganges valley, or of any of those magnificent works for the storage of rainfall, of which we hope hereafter to offer some account to our readers. We wish to point our remarks as to two primary elements of consideration. One is the great return shown to be derived, in a given case, from a great work of canalisation. The other is the consideration that different features exist in every part of India, and that it would be rash to argue from facts, however striking, collected in one district, as to the result of expenditure on another. The conditions of the Godavery district have been such as to make the prime cost of water supplied by the Government as low as 1*l.* for 70,000 cubic yards, with the prospect that by extension of the area irrigated the cost will be reduced to 1*l.* per 100,000 cubic yards. The selling price, or water-rate received by the Government, we have seen to be 4 rupees per acre receiving 5,000 cube yards, or 1*l.* for 12,500 cube yards. But as the increase of revenue, mainly due to irrigation, has been equal to two-fifths of the water-rate, we find the actual value to the Government of the water is 1*l.* for 7,000 cube yards, or a net profit of 900 per cent. The cultivator, again, who takes 6,000 cubic yards of water, if he pays the proportionate rate of 4 rupees 12 annas 9 pice, earns 2*l.* more per acre than would have been the case without the water. That is to say, 3,000 yards of water have an earning value of 1*l.*, or more than twentyfold that of the cost. This is, no doubt, an extraordinary case. It is desirable to inquire into the conditions which would produce profitable returns, however inferior to those above taken from official sources, in other districts of India.

SOME DRAWINGS AT BETHNAL-GREEN.

THE Museum at Bethnal-green at present holds, as our readers will have seen from our advertisement columns, the Dulwich collection of pictures, lent for a short period to the East-end establishment, which by means of this and other such loans, past and (we hope) future, is becoming a most valuable means for introducing some knowledge of and familiarity with works of art in a part of London hitherto entirely without such advantages. We only allude to the fact, however, as a gratifying one; the temporary transference of the well-known collection to another site gives no occasion for any fresh comments upon it. But among subsidiary attractions of an artistic kind at present in the same building, is a collection of sketches by eminent artists, the larger part lent by Miss S. A. James, which has more novelty of interest. A large proportion of these consist of sketches and studies by Watteau, an artist whom it is rather interesting to study behind the scenes, and at the preparation of the materials for his graceful, but, in one sense, highly artificial art.

The sketches referred to are arranged on screens, and on the end wall, in one of the galleries. Those on the end wall are entirely sketches and studies by Watteau: they are mostly in red chalk or in a mixture of black and red. They are by no means confined to the study of those dressed-up figures of belles and beaux familiar to us in the artist's finished pictures; on the contrary, a majority are studies of figures in simple costumes, and in some cases persons of the lower orders; two fishermen with creels on their backs, for instance; and the impression they convey is that the sympathies of the painter extended a good deal beyond the circle of fashionable subjects to which his paintings, in deference no doubt to the demands of his patrons and the state of the picture-market, are mostly confined. A good many of the studies seem to have for their special object the realisation of movement in the figure, in regard to which the success of some of the slighter sketches is remarkable, and may be compared a little with that of Leech in some of his rough sketches, though of course in a very different manner. Watteau is fond of studies of the back of the figure, and of figures retreating, the application of which latter studies we can recal as forming the happiest points in some of his best works. Among the studies of stationary figures is a sketch larger and more finished than most of the collection, of the half-length of a girl with her back to the spectator, talking to another who faces her; the attitude and expression of the first-named figure, drawing back rather from her interlocutor and with a most graceful and expressive turn of the head, is charming: the costume in this case is very simple, and the whole sketch perfectly inartificial. An amusing contrast to this bit of true nature is the full-length sketch of a beau in all the agony of a profoundly polite salutation, hit off to perfection at its critical moment.

On the first of the row of screens are two fine and highly-finished studies of trees in crayon by Constable,—far more finished indeed in detail than his painted trees ever were; a fact which is suggestive as to the amount of real hard work which is at the bottom of such apparently free and rapid painting as that of Constable. Those who know little of the preliminary stages of "making a picture" are apt to suppose that this broad style of handling, in which details are all subordinate to general effect, is comparatively simple and easy; whereas, in its genuine form, it infers all the preliminary study bestowed on a highly-finished realistic representation, with the additional mental labour of the problem of translating the careful study into the apparently bold and free painting. This same screen contains a small sketch by Wilkie, in colour, for the "Penny Wedding," and a powerful little water-colour study by W. Hunt of an ill-looking old man with his arms crossed. The next screen includes a very fine De Wint drawing, and a sketch by Lawrence of a girl seated with her hands clasped round her knees; a sketch which again shows, as in the case of Watteau, how natural a very artificial painter can sometimes be in cases where he is not posing for a particular class of admirers. On the third screen we come to Watteau again, one of the first sketches that strikes us being a roughly-executed figure in pencil of a girl swinging, with her back to the spectator; the motion of the swing capitally given. A study of an old woman leaning on a stick is something quite out of our usual association with Watteau; so is, on the next screen, a drawing of a very sanctimonious-looking priest, showing considerable satiric humour. A half-length of a girl sewing, on this screen, is admirable for its natural attitude and the look of earnest attention in the face. Another sketch, which is rather curious, is that of a man sitting up, yawning and stretching his arms; a repetition of the figure in a horizontal position is made on the same piece of paper, squares being drawn over the paper, apparently to assist the eye in transferring the figure. This looks as if the painter intended to draw a man in the recumbent position, and commenced by drawing him upright, in order the better to get the proportions of the figure. On this screen are some architectural sketches by Guardi, slight; and some larger ones by Canaletti, which are certainly not artistic in style or execution, as sketches; the effect is very weakly put in, and the buildings and foreground are covered with little scratchy, wriggling touches put in with a pen, with no obvious meaning. There are some pretty studies of trees by Ruysdael; and a small but very careful drawing by Van Eyck of a head something after the type of that of Luther, and which has a higher interest than anything else near to it. There is, however, a capital sketch of an alehouse group by Jan Steen, as well as other sketches by the same hand: these are mostly drawn roughly in strong black lines, apparently with a thick pen, and the shadows washed in with Indian ink. On the other side of the same screen two water-colour drawings by W. Hunt, of the interior of a church, and the stable-yard of an inn, are interesting, as coming from the hand of an artist who did not usually paint such subjects: they are admirable specimens of the treatment of architectural subjects, perfectly clear without being hard, and very delicate and truthful in local colour.

On the next screen we find some sketches by Ostade, one of them apparently the first idea for a well-known picture; these are exceedingly similar in appearance and manner of execution to those of Jan Steen, but somewhat rougher and bolder. A single frame contains the exceedingly odd assortment of a sketch of himself by big vulgar Frank Hals, a delicately-drawn study of an old woman by Mieris, and, between these, two pen-drawings, by Parmigiano, of heads of a Mater Dolorosa cast (the same head, apparently, turned opposite ways). A seated figure of a card-player, attributed to Cuyp, reminds one much more of Teniers. There is a study of dead snipe, by Weenix, in water-colour, and a vigorous small coloured study of three horses, by Wouvermans, two of them with riders, but without trappings of any kind, and showing that massive, broad, square build which distinguishes Wouvermans's horses everywhere. At the back of this screen are some small Flaxman sketches, in mere pencil outline, and a tolerably large drawing of "Aurora and the Pleiades"; all, large and small, pervaded by that exquisite grace and truth which make Flaxman's drawings, wherever met with, seem like bits of Greek art that have got astray among the moderns. It is curious to contrast with these the sketches of Stothard, which hang by them, and which go to increase the sense of puzzlement which his drawings often induce as to the possible ground for the position he held, and, with some people, still seems to hold in English art. The drawing of these, such as the illustrations to Rokeby, is something perfectly astounding in its badness, and almost equally so in regard to the utter puerility of the conception. There is a small sketch of "Venus at her Toilet," in which the Venus, a nude figure, has the appearance and proportions of a child, though evidently meant for an adult figure. On the next screen, however, is a larger and very dark painting of "Diana and Actæon," which has a good deal of richness and power: the treatment of the subject is unusual; the goddess is slumbering, half-covered with a mantle, after her bathe, under the shade of a thick tree, from behind which Actæon does a sort of "Peeping Tom" business: this is in contradiction to the legend, which always represents the luckless huntsman's intrusion as unintentional and accidental; but there is in this small painting, and in another of "Venus and Cupid" huddled up together on a couch asleep, a degree of richness of tone and feeling, and a quality of drawing and conception, which render the other specimens of the artist the more extraordinary in their platitude. There is a sketch of Othello and Desdemona close to these, in which the Othello is literally laughable. This sixth and last screen contains some Ostade sketches, which are coloured in a very barbarous kind of manner, not suggesting anything like the harmonious tone of his paintings; they are, perhaps, the realistic studies of the Boor life, as it actually appeared before passing through the artistic crucible. Some little very delicate pen-sketches in brown ink, by Adrian Van de Velde, slightly tinted for the shadows, are beautiful; likewise some in a somewhat similar manner on this and the last screen, by Both, in which it is curious to notice how much of his peculiar glowing effect the artist manages to indicate with this monochrome tinting. Three little drawings of marine subjects, and some autograph writing, by Backhuizen, are framed together, and near these is a study of lions by Rubens, evidently one of the studies for the large picture of "Daniel among the Lions," one or two of the animals represented in the picture being quite recognisable here in attitude and grouping. Altogether there is a good deal that is interesting among this collection of artists' studies.

THE REMONSTRANCE OF M. SCRIBLERUS THE YOUNGER WITH THE LORD CHAMBERLAIN.

IT hath pleased you (my dear Lord), from time to time, and in the exercise of judicial duties, to recommend to the present managers of our THEATRE methods of reform, which, I make no doubt, are instalments of a wise and, as yet, concealed Project for the Advancement of the Stage. But as a judge passes sentence to small purpose if the judgment remain unexecuted, so the anathema of a Pope, which injures no one, is not a greater absurdity than the dictum of a Censor, which is not accepted. Your Lordship's hands are, without doubt, tied by bad precedents, and the conflicting circumstances of the present; and as I would not have posterity record an only triumph in the epigram, that, Shocked with bare shoulders which delight the eye of your own world, you covered knees which had offended that of ours, so I will here deliver to you (perhaps with more freedom than prudence) my opinion of the greater extent of your duties. And I will venture to declare that the gradual decay of delicacy and refinement, among some of the men and women of our nation, is in part due to that scrupulous care with which, in the majority of our theatres, the eye of the public is protected from unlawful sights, while its mind is neither preserved from evil, nor its body from danger therein.

In an age, when it is thought sacrilegious to deface an ancient inscription, or clean a mutilated grotesque, I hold it inconsistent, and a reproach to our good sense, that the literature of genuine Comedy should be impudently perverted, in order to gratify the taste of the moderns; and that the interpolations of buffoonery should be palmed off, as the work of men of Wit and Humour, upon audiences unable to distinguish between that which is original and that which has been "restored." I pass over the judgment which hath permitted a ploughman of the last century to carry a short pipe, and a milkmaid (his sister) to talk about her photograph; but in presence of the many new readings and additions, now introduced by clown and pantaloon, into the chief works of a past age, I do protest against the modesty of editors who have a clear right to a share in the honours of applause with the original authors. A play thus embellished should be described in the bills as the joint production of Messrs. Geo. *Colman* and Co.; or of Mr. *Sheridan* and others; or of Sir *John Vanbrugh* (Limited). And I do farther protest against the practice of English adapters, who transform the courtesan of another nation into the merry wife and frolicksome widow of ours. Neither hath it yet appeared to me rational for Englishmen, who have outlived the Second Empire, to fight duels at Scarborough. Nor is it seemly for counterfeit men to squeak with women's voices, in scenes, where actors and actresses are boisterous, when they should be only lively; giggle, when they should smile; and, in mimick drawing-rooms, bandy conversation, which might be thought "smart" at College or on the Race-course, but to which the polite world, being wholly ignorant thereof, hath given no name. Although I own that the temptation to sin in this manner is great in the presence of an audience, which, silent under the stroke of Irony and deaf to Satire, is uproarious in its appreciation of a pun, if it be easy to understand; or of a social paradox, provided it be gross; or of a political allusion, if it have a vulgar turn. Indeed, the intellectual character of our dramatic audiences is finely gauged by the Parisian actor. As the Athenian architect, summoned to erect a palace or a villa for his Roman patron, emphasised material effect and grossified ornament, so the French artist before an English crowd, exaggerates gesture, and points delicate indecency with a prurient glance: for in no other way can he secure the attention of a people whose THEATRE subsists by the antics of Burlesque. There are still, however, Frenchmen—as of old there were Athenians who had never seen Rome—rich enough to decline humouring the taste of the British publick; and it is to the honour of "French Comedians" that they lately preferred the provincial appreciation of Brussels to the dulness of insular enthusiasm in our capital.

Although I do not accuse you (my dear Lord) of encouraging abuses which arise from the publick incapacity to admire or understand, I do charge you with permitting the ministers of a form of religion, foreign to our thought and recent history, to be grotesquely represented upon our Stage. The solemn operations of such men are subjects of contemplation, not of ridicule, in the eyes of wise and true reformers. Although an English Marquis, of whom your Lordship hath heard, and whom God hath taken, once perpetrated a witticism of the kind in his Chasteau of Bagatelle (where, in a private Oratory, in which an honest and royal woman had knelt, the figure of the Virgin was exchanged for a profane statue), there was no malice in the act, nor did the publick suffer from it. But that a Spanish priest—at least equal to a Bulgarian Christian—should be even now caricatured at the well-managed *Gaiety*; and that, not long ago, in a certain drunken scene at the *Royalty* in Soho, the priestly garb should have been brought into contempt, is a greater scandal to Protestants than ever it was to the more licentious subjects of the Most Christian King. For indeed, even while Ireland supported the wealth of a State Episcopacy, I have never witnessed an attempt to caricature upon the French Stage the Bishop of *Bullocksmithy*; nor is any priest either of the National Church or of any other Persuasion ever represented upon it—the wholesome example of *Tartuffe* being an exception which proves the rule.

For if our playwrights are permitted to import the follies of the French Stage, they should be bound to imitate what wisdom it may possess and the refinement which is inherent to it. The British publick, once brought to comprehend the good sense of others, will arrive in time to think rightly of itself, and, by the exercise of discrimination and sparing applause, may yet lead the most prolific living adapter of successful and sometimes amusing farce, to produce a comedy, or at least the words of a comic opera, which shall be witty, humourous, and original, without outraging good manners, or, even, the English tongue.

As I have thought fit to plead for the publick mind, so now on behalf of its body, I beg leave to call your Lordship's serious attention to the state of some of the buildings in which our THEATRE occupies a divided and uncertain home. And I do solemnly affirm that many, if not all, of them are, in one or other particular, so full of defects and abuses, as to call for the inspection of our Sanitary police. The stalled journalist, who too often praises with effusion, where he should damn with force, knows nothing of those parts of a theatre, which, in London, are devoted to the uses of the common people; and a person of your quality (my dear Lord), is always ushered with becoming deference into a private box. But I am of that little world, which in its "petit coin" of the *pit*, humbled M. *Lekain* with its silence, when the vociferations of the multitude had otherwise gratified his ear; and, the friend of actors and actresses, I have long admired the foresight of that Church, which strikes with Excommunication those, to witness whose triumphs, the people risk health, and court death, in the heighths of a poisoned *gallery*, or the depths of a pestiferous *pit*.

The design of our theatres is like a labyrinth, in and out of which nobody can get but by long practice, a good memory, and an exhausting patience. Their architecture is one of vaults and cellars with a covering of bandboxes, rather than one of domes and pyramids; and their architects are as exceeding careful in the choice of narrow passages, and entrance-chasms, as their managers in the sober and orderly way of ranging people within them. It hath ever seemed to me that the waiting in a crowd without their doors is, in a man, a proof of folly, and, in a woman, the negation of modesty. The vast improvement of public entertainments, such as the roasting-alive of families in a burning house, or of an Indignation-speech; and of private ones, such as a Hanging at Newgate, ariseth from their being supervised by policemen, among whom the duty of direction is divided. But in our theatres, the guardian of the streets remains within, while the people press outside; and the curse of the tripe-merchant, at the *pit*-door no more reacheth his ear than doth the scream of the oyster-woman at the *gallery*-gate. Nothing in the entrances of a French theatre can be compared with those of a London one; nor have I ever seen anything here to equal the dire confusion of persons who force their way into the latter,—except once, when, at the Palace, I witnessed the ladies and gentlemen of the Court struggling, under the guidance of one of your lordship's predecessors, to pay their respects to the Queen; but, with this difference, that *St. James* only looked the unutterable things which *St. Giles*, in an honester fashion, saith.

Too true it is, that while the moderns have discovered the way to make life agreeable, when in small numbers at home, no plan hath yet been proposed to render it bearable, when in large congregations, under a closed and common roof. Your Lordship's recent edict concerning the freedom of gangways, hath removed a row of benches here, and stray chairs there, but it hath not prevented individuals from interposing their upright bodies in the way of the sole retreat from fire or panic; and for this they have sometimes excuse. It is the custom, in the Theatre Royal ——— and other Houses, for the money-takers at the *pit* and *gallery* entrances, to reply affirmatively that there is still room, when all the seats are occupied. There is, then, no alternative except to stand in a gangway, lose a ticket, the value of which, though obtained under mistaken pretences, is never returned; or pay more money. Many of these pits, both in old and new theatres, are below the level of the street; and that place, where the gods breathe fumes fitted for another and opposing class of immortals, is attained only after much climbing. It hath pleased God to refrain of late years from visiting our theatres with fire; but, if a panic seized the minds of people assembled in some of them (and especially in those hemmed in by private houses) I do believe that the death of many spectators, and the injury of all, would result therefrom.

And if, in our theatres, there be little means to save life in case of sudden tumult, the means to preserve health, in a calm, are insufficient, useless, or illusory. Will your Lordship inquire whence the occupants at. . . . . [*hiatus in MS.*] obtain the air they breathe? In the three last-named theatres the atmosphere of the *pit* is foul; and that of the third is the foulest of the three. There in one corner of a cellar, a door is left ajar, whence blasts of cold air chill the damp bodies of those nearest it; and while the noxious effluvium of a refreshment-bar is thereby blown towards the stage, the heavy gases which hang over the other parts are kept stagnant, for not even a hole-in-the-wall exists. In most of these underground regions dried throats and restless lungs are partially relieved by beer and spirits; and a woman, who, like "Jo," is always moving on, hath incited *Demos*, in my presence, to quench thirst, and at an exorbitant tariff. Indeed, I cannot but congratulate this age and country that, in our THEATRE, profit or gain, both in the gratification of the eye and of the stomach, is the principal aim of contractors; and to such as these it would be ingratitude not to own that other of our arts are often infinitely indebted.

The Greeks and Romans have not suffered from all the ills which, in a theatre, afflict the more ingenious moderns. I cannot doubt but that the antients excelled in the arts of theatrical construction; and though I hear and see in many parts of the town, theoretical and practical eulogies of the Gothick manner, which some say is the sole panacea of constructive genius, I am convinced, in the matter of theatres, that, since the days of *Vitruvius*, no art or science hath progressed less than Architecture. The antient theatres, whose ruins abound in Europe, possessed in common this unique quality: of never intercepting, with columns or obstructions, the view of the proscenium from any single spectator. And besides the fire-resisting nature of their materials they possessed another great advantage over the speculating manager's theatre of the moderns—consisting in the order, conduct, and regard for decency, which the different gradations of spectators enjoyed. Now, on the contrary, *Silenus* is often obliged to confine an unwieldy body and its swollen extremities, within an area of 18 in. by 22 in.; and partly enveloped by the robes of pretty maidens from the country, or wives from town, he sits jaded, but not ill-pleased! Indeed, it hath long seemed to me that, in the majority of our theatres, there is a scandalous wedging together of the sexes, of grown people and children, which is more conducive to publick immorality than the short skirts of a ballet-girl, or the false wit of double-entendre; and I commend some of our *pits* and *galleries* to your Lordship's private inspection and public conscience: whether they are places to which prudent men should take their daughters or their wives—quite irrespective of poisoned air which must affect the health of all; and of fire which may yet prove (and mark it well my dear Lord) the violent destruction of many helpless people.

The Excavations at Olympia.—The excavations conducted under the direction of the German Government at Olympia were resumed on the 18th inst., having been suspended during the summer heat.

ENGLISH DOMESTIC ARCHITECTURE, 1300.

THE opening chapters of this art in England are necessarily somewhat hazy. Every fact that can be brought from the writers of history bearing upon this subject, which they have touched so lightly, however trivial to the general reader, is of value to the architect, as it gives him fresh insight into the constructive details of buildings of the past, in which so much of beauty has been manifested, that schools and styles have been founded on their characteristics. The dwellings of England probably possessed some of the same features that distinguish the more substantial and enduring public buildings, but the mutations of stormy and turbulent times have left the early history of domestic architecture based only on conjecture. The earliest development of a predilection for building or constructing a dwelling-place is so much a matter of theory, that archæologists and antiquaries eminent for their research have but briefly indicated the nature of its rise, and passed on to the period when the writings of contemporary historians or the faithful pencil of the illuminator furnish them with solid ground on which to rebuild in imagination the cities of the past. To trace the art from its earliest commencement we should have to search far back indeed. The first attempt of the primitive Britons at architecture would naturally commence with dwellings. From seeking some retreat from the inclemency of the proverbially boisterous climate, exchanging the holes and caverns of the earth to which they are said to have retreated in winter for the leafy groves with which the island abounded, in summer; they passed to erecting small huts, composed of stakes driven into the earth, interwoven with wattles or pliant branches of trees, and covered with green boughs to protect them from the rain. The idea of a dwelling suggested, says Strutt, "their next step might be to plaster the walls over with clay to prevent the penetration of the wind, and to make the dwelling warmer"; and even in that unpolished time we find the Germans not a little proud of procuring such clay as was of a glossy nature, to make the walls withal, and by mixing a variety of colours together they produced a kind of picture on them. The Britons affected a plain white surface in their dwellings, whitewashing the walls with chalk. The next improvement in their habitations was to thatch them with reeds or straw, a better defence against the rain than the boughs could afford. Then they set about more substantial dwellings, making a frame of wood instead of the wattles. In this state were the domestic structures in Britain at the time of the Roman invasion, "all of them built in a circular form, the roof thatched up round like a cone, in the middle of which an aperture was left for the smoke to issue out." There is some mention of a better sort of house, said to have been of stone, and it is known that on the arrival of the Romans quarries were worked, and the houses of the Roman colonists were, though inferior in character and execution, similarly constructed to the villas of their own country. These buildings appear to have been substantially built and of the most solid materials, concrete and stone being employed. Some of our best stone quarries were worked in the fourth century, while in the zenith of the Saxon power buildings of the Roman days were yet standing in the chief towns in England, significantly distinguished in the Saxon dialect from constructions of a later date, as the quarter called the Aldwark at York and the suburb of Southwark in London. The rude attempts at a town made by clustering a few huts soon gave place to the formation of cities by the civilised conquerors. Thus in A.D. 61, the Roman colony of Camulodunum, destroyed by Boadicea, was a "large well-built town, with a temple, statues, a theatre, and other public buildings."* London and Verulam were also populous cities. Building was encouraged by the Romans, who were not slow to perceive that as the taste for the arts of peace developed in the British race, a love of luxury and effeminacy took the place of the fiery spirit of the ancient Briton. The new and extended social system required public buildings besides those devoted to religion; but as our inquiry is with Domestic architecture only, we must pass these by with bare mention, as also the wonderful Stonehenge of an earlier period, as erections of a monumental character. The quarries which had supplied the Britons and Romans with materials for rearing these structures ceased to be worked in Saxon times. The houses of the Romans were taken into possession by the invading Saxons, but neither addition nor alteration to these appears to have been made, nor any new building reared by them. The fierce and warlike spirit of that age was opposed to building. The Saxon had still the free and roving tastes which led him to seek materials in the woods and forests, rather than to delve and dig. The hall of wood, covered with a reed thatch, suited his inclination. Hudson Turner, in his well-known work on this subject, classes the dwelling-place of the Saxon "thegne" as "little more than a capacious apartment, which in the daytime was adapted to the patriarchal hospitality of the owner, and formed at night a sort of stable for his servants, to whose rude accommodation their master's was not much superior in an adjoining chamber. The buildings designed for the higher order of nobles were of a more ornamental design; rude carvings and paintings decorated the interior, but outside they presented no imposing appearance, being a collection of separate tenements, rather than a complete and symmetrical structure. That such was the aspect of the abbey, which from the arrangements made for the accommodation of numberless residents and guests we may refer to as a domestic institution, may be seen by reference to a plan of the Abbey of St. Gall."* This abbey, though situated south of the Rhine, was founded and sustained by Englishmen. Receiving, in A.D. 614, a grant from King Sigebert, it was restored or rebuilt by Gozpertus, to whom the Abbot Equinhardus, prefect of the royal buildings under Charlemagne, "well skilled in architecture," gave the precepts and the plan to which we refer. The entire establishment resembles a town composed of isolated houses, with streets running between them, and occupies a space of 430 ft. square. The church is in the centre, and is surrounded by houses and grounds devoted to various religious, educational, hospitable, and domestic purposes. The guest-house, abbot's house, the scholars' house, and doctor's house, with the physic garden hard by, are ranged nearest the centre; then the refectories and dormitories, the scriptorium of the monks with the precious library; outside these, the infirmary and domestic offices; while the stables, forge, workshops, and a complete set of farm offices occupy the outer boundary. Convents in England were similarly designed: clusters of small tenements, surrounded by pleasant gardens. The Saxon, with his "free and joyous" liberty, to which the old chronicles so often allude, seems to have needed the Norman spirit of enterprise and sociality to induce him to arrange his buildings collectively. It is to the Conqueror himself that we owe the foundation and prosperity of many of our cities. The gift of freedom to the fugitive bondsman and other privileges were conferred by him on condition of residence in his burghs for a year and a day, and though little improvement was manifested in the style of the dwelling-houses, it was at this period that the nucleus of many a now famous town was formed.

The first edifices erected in England by the Normans were doubtless their castles, some of which are still left to us, though their lofty towers and gloomy keeps are in ruins. The dwelling of the Norman baron partook in some degree, no doubt, of the character of these fortresses, although one of the earliest remaining examples, Oakham Castle, built by Wakelin de Ferrars, *circa* 1180, appears from its noble hall and convenient offices better adapted for a feast than a fray. The pure transitional style of the massive Norman merging into the Early English, has been pointed out by an eminent archæologist. Standing yet in almost its original state, it illustrates the size and decorations of the Anglo-Norman "hall," the usual appendage to the manor, differing in its architectural character as well as in its nature from the castle. The king's house at Southampton, part of which is still to be seen, is a specimen of a dwelling of the latter part of the twelfth century. This building was probably of a quadrangular shape, and contained a "hall," a chapel, several apartments, and a capacious cellar capable of containing 170 tuns of wine, but which does not appear to have been of sufficient size, as the butler or "sheriffe" was frequently obliged to rent additional cellars. These apartments and offices were inclosed and isolated from surrounding buildings. This house has a window of unusual design in a tolerably perfect state, with a segmental arch and dripstone over it, with the usual Norman abacus moulding at the imposts; this is continued as a string along the wall, though broken in places by later insertions. The window is ornamented interiorly with shafts on the jambs sunk in a square recess in the angle, having capitals sculptured with the foliage of a peculiar but late Norman character, the bases approaching to Early English. Two houses adjoining the walls of Southampton are of yet earlier date; one of these is nearly perfect, and is one of the oldest houses remaining in England. Of other examples, including the house at Christchurch, St. Mary's Guild, Moyses Hall (Bury St. Edmund's), Boothby Pagnel, Barnack, and others, the Jew's house at Lincoln is the best preserved and the best known of the remains of this period. The most remarkable feature in this last house is the doorway, enriched with ornaments closely corresponding to Bishop Alexander's work in Lincoln Cathedral; the head of the doorway also forms an arch, to carry the fireplace and chimney above. From contemporary writings and illuminations it would appear that the roof was invariably high-pitched, as in many of the old houses in Normandy. The doors are usually lofty, and with ornamented posts and an ornament on the apex of the gable. The lower windows are mostly square-headed, while the upper windows are circular-headed and lofty. The London Assize of 1189, which, with other legal documents illustrating the domestic architecture and appointments of their various times, is printed in its original Latin at the end of Mr. Turner's book, throws much light on the aspect of the London of those days. All the footways of the streets must have been muddy, and bad travelling for foot-passengers; open drains led the drainage by a natural fall from the higher and more level parts of the city to the river. This assize was held in consequence of the frequent fires, owing to so many of the houses being built of wood, and roofed with straw or reeds. To encourage the more general adoption of stone for dwelling-houses, privileges were conceded thus:—

"When two neighbours shall have agreed to build between themselves a stone wall, each shall give a foot and a half of his land, and so they shall construct, at their joint cost, a stone wall 3 ft. thick, and 16 ft. in height, and if they agree they shall make a gutter between them, at their common expense, to carry off the water from their houses; but if they should not agree, either of them may make a gutter to carry off the water dripping from his house on to his own land, except he can convey it into the high street. They may also, if they agree, raise the said wall as high as they please at their joint expense, and if it should happen that one should wish to raise the wall and the other not, it shall be lawful for him who is willing to raise his own part as much as he please, and build upon it at his own cost, and he shall receive the falling water as is aforesaid."

It would appear from this that additional stories were erected on the walls. The question of "ancient lights" is succinctly settled in the following clause:—"If any one shall have windows looking toward the land of a neighbour, and although he and his predecessors have been long possessed of the view of the aforesaid windows, nevertheless his neighbour may lawfully obstruct the view of these windows by building opposite to them on his own ground, as he shall consider most expedient, except he who hath the windows can show any writing whereby his neighbour may not obstruct the view of these windows. Also, if any one should make a pavement in the high street unjustly to the nuisance of the city and of his neighbour, that neighbour may lawfully hinder it by the bailiffs of the city." Though the majority of houses were of wood, some few of the more pretentious were of stone, as in the supplementary decrees of 1212 it is enacted that "all wooden houses which are nearest to the stone houses on Cheap whereby the stone houses may be in peril, shall be securely amended by view of the mayor and sheriffs and good men of the city, or without any exception to whom they may belong, they will be pulled down." The upper or first story, the "solar," was the principal room of the house, and is represented with large and ornamented windows. In some cases, though not generally, houses appear to be two or even three stories high, and ornamented exteriorly with various colours, as

* Tacit. Annal., lib. xiv., c. 10.

* This plan has been modernised, and presented in a popular form by the Rev. R. Willis, and published in the "Archæological Journal," vol. v., p. 83.

may be seen from the chequered walls of the houses represented in illuminations, and also in the Bayeux tapestry the roof and walls are always depicted in different colours, chiefly red and blue, while the prevailing pattern is two colours arranged in chequered parallelograms, giving the appearance of long narrow bricks.

HALF-YEARLY REVIEW OF THE RAILWAY COMPANIES.

LARGE AND COSTLY FURTHER EXTENSIONS.

THE summer half-yearly meetings of the railway companies have just been brought to a close, and a review of the proceedings shows that a very large expenditure is intended to be incurred by most of the leading companies during the current half-year, on still further extensions, in the construction of new lines, and the erection of additional station and other buildings, for the accommodation of a constantly increasing traffic, which it appears is rapidly going forward on all the several lines, without exception. The expansion of the railway system is proceeding at such a rate that it is difficult to say when and where it will stop, as evidenced by the statements made at the meeting of the London and North-Western Company more especially, from which it appears that for several years to come the shareholders must be prepared to expend a very large amount of capital annually in new works of a varied and extensive character. A striking feature in the reports of almost all the companies is an increase of the traffic receipts of the last half-year, as compared with the corresponding period of 1875, notwithstanding the depression in trade which has characterised the present year.

In the case of the London and North-Western Company, the receipts for the half-year were 4,357,191*l.*, as compared with 4,330,792*l.* in the first half-year of 1875, showing an increase of 26,399*l.* The shareholders granted 1,420,268*l.* for new lines and additional works, 869,143*l.* of which were, under the New Lines and Additional Powers Act, obtained during the present year. Amongst the other items in this intended expenditure, 95,000*l.* are for the new station at Preston; 117,000*l.* to complete the widening of the line from Willesden to Bletchley; 54,000*l.* for widening the Buxton and High Peak line; and 138,835*l.* for additional siding and other accommodation at several stations named. In reference to this intended expenditure, Mr. Herapath raised a discussion, which elicited from the chairman an important statement as to the expansion of the company, and the rapid increase in the population and trade of large towns. Mr. Herapath observed that for several half-years upwards of 1,000,000*l.* of capital had been expended each half-year, not in constructing new lines, but in improving the present system of the company. Last year fully 2,000,000*l.* had been so spent, and in the past half-year there had been between 900,000*l.* and 1,000,000*l.* expended, whilst for the current year over 1,000,000*l.* was estimated to be expended in the same way, which would make another 2,000,000*l.* this year. He asked whether it was necessary for all time to continue spending 2,000,000*l.* annually on capital account in improving the company's system? In reply, the chairman said that the directors were doing as little as they could,—only that which the necessities of the traffic and its growth absolutely required. They could not get a town like Liverpool to develop itself, and then not provide for the town, and the same remark applied to Manchester, Leeds, Birmingham, Wolverhampton, and other great centres of commerce. He was afraid Mr. Herapath had not been to all the company's stations, for if he had he would have seen that, with all they had done, they had not gone far enough. The only limit to their local traffic seemed to be the limit of accommodation they could give. If the country grew and then traffic grew, they would have to find more money than they were asked for to-day. Adverting to the heavy works which have for some time past been in progress at different points, both in this country and Ireland, the engineer in his report says that the retaining walls of the new tunnel at Primrose Hill are nearly complete, and that of the total length of 1,180 yards of the tunnel 724 yards are finished, being more than two-thirds. On the Festiniog Tunnel (on the Betts-y-Coed and Festiniog line), 3,872 yards long, two out of three of the shafts are sunk, and 160 yards of the tunnel complete. At Holyhead, the enlargement of the inner harbour has made rapid progress during the last few months.

The report of the Midland Company stated that the traffic of the half-year showed a gross increase of 117,195*l.*, as compared with the corresponding period of 1875; but that on the mineral traffic there had been a decrease of 72,262*l.*, caused by the strike which lasted for many weeks in the North Derbyshire and South Yorkshire colliery districts, the net increase being therefore only 44,933*l.* The chairman stated at the meeting that the outlay during the half-year on lines open and on works in course of construction, was 1,712,963*l.* During the half-year, 76,000*l.* had been spent on the new locomotive and carriage shops at Derby. Up to the present time the large sum of 281,000*l.* had been laid out on those works, and before they were completed no less than 170,000*l.* more would have to be spent, making altogether 450,000*l.* This was really a prodigious outlay, but it was absolutely necessary. Adverting to the St. Pancras Station and Hotel, he said that it was now entirely completed, and the outlay was at an end. The further outlay of capital during the current half-year was estimated at 1,500,000*l.*, and in the four half-years following, 4,650,000*l.*; making the large total of 6,150,000*l.* In answer to a shareholder, who said he looked with very considerable anxiety upon the large outlay of capital which was taking place, the chairman observed that he was almost astonished at times at the forbearance with which the shareholders of the company responded to the demands which were made upon them for increased capital. The directors were anxious to keep down such expenditure as much as possible, but the shareholders must bear in mind that for the large increasing traffic which they had had in the last few years they must provide accommodation. In reply to a shareholder who desired information as to the purchase by the directors of a large and extensive property in London for dock purposes, the chairman stated that eight acres of very valuable land fronting the River Thames at Poplar, had been purchased, on which a shipping basin and wharf were about to be constructed. The property was an exceedingly valuable one,—an old shipbuilding yard,—and had cost 110,000*l.* This year they had obtained power to make a short branch into it, which would require a further considerable outlay of capital.

The traffic receipts of the Great Northern Company amounted to 1,399,284*l.* for the last half-year as against 1,395,141*l.* last year. The capital expenditure during the half-year had been 958,188*l.*, a large portion of which was on the new lines in Derbyshire, Nottinghamshire, and Yorkshire. The doubling of the two tunnels at London—the Copenhagen tunnel, and that close to King's-cross—was proceeding satisfactorily. One half of the Copenhagen tunnel was completed, and that at King's-cross, nearer to the station, had been commenced, and several shafts put in. Nearly 40,000*l.* had been expended on those tunnels during the half-year. The accounts of the engineer's department showed a reduction in the expenditure of 7,659*l.*, chiefly attributable to the price of rails, chairs, and building materials having been less than in the corresponding period.

The accounts of the Great Western Company show a slight increase of traffic as compared with last year. The engineer reports that the tunnel of the Bewdley and Kidderminster, and Netherton and Halesowen Railways has been finished, with the exception of the face at the east end, and that all the piers and abutments of the viaduct crossing the river Stour have been brought up to springing level, and three of the arches turned. The engineer in charge of the Severn tunnel works reports that the heading has now been driven to a length of 2,540 ft. from the shaft, and is more than 60 ft. under the shoots. Inclusive of the cost of the plant, the expenditure to the present time amounts to 55,448*l.* At the meeting the shareholders passed a vote of 224,685*l.* for additional new works during the current half-year. Amongst the items of this intended expenditure are, carriage-repairing shops at Paddington, 4,870*l.*; new wagon-yard at Swindon, 6,000*l.*; doubling the line between West Drayton and Slough, 10,000*l.*; additional sidings at Exeter, 8,000*l.*; new goods stations at Bath, Bristol, and Cardiff, 27,800*l.*; new passenger stations at Cwmbran and Newport, 32,000*l.*; and new station at Neath, 20,000*l.*

The report of the South-Eastern Company stated that there was an increase in the earnings from all sources, of 19,694*l.* as compared with the corresponding period of last year. The directors nevertheless regretted that great depression of trade and the long winter had had an effect upon the traffic receipts of the company. The report further stated that the works of the Blackfriars Branch, and of the extension from Greenwich to Maize-hill, were all but complete, and would be opened for traffic very shortly. It added that purchases of property for the further enlargement of the Bricklayers' Arms Station, and in connexion with extension works at other points, were being made. The discussions before the Government Department in reference to the enlargement of the harbour of Boulogne were progressing favourably, and the directors were advised that in all probability a project would be submitted to the French Chambers in January next for definitively dealing with the question.

The depression of trade during the present year has had a serious effect on the merchandise and mineral traffic of the North-Eastern Railway Company, more especially on the last-named traffic, which has fallen off to the extent of 55,000*l.* At the half-yearly meeting the chairman stated that during the half-year they had spent, on existing lines, in works necessary for the public convenience and safety, 396,500*l.*, mainly made up by extension of stations and construction of new sidings. The expenditure on land alone amounted to 109,698*l.* As in the case of all other railway companies, the cost of land was becoming one of the most serious items. There was an item of a very serious character, which had reference to cottages and cabins. The expenditure on these during the half-year, together with block-signal cabins, amounted to 64,000*l.* On new jetties and sidings at the Tyne docks they had spent 12,885*l.* During the half-year some of the heaviest works they had to construct under their Acts of Parliament had been in progress. On the very heavy works crossing Sunderland they had expended 56,000*l.*; on the new station at York and the railways approaching it, all of which were being pushed forward and showed great progress, 84,644*l.*; on the railway and docks at West Hartlepool, 32,000*l.*; and on the line from Castle Eden to Stockton, 64,000*l.* In the course of his remarks the chairman alluded to the enormous amount which the company had recently expended on rolling stock. Last year they added to their stock 105 new engines, for which 265,000*l.* have been paid. During the past half-year they had spent 76,000*l.*, adding thirty-three new engines, which increased their stock to 1,364. In the course of last year they expended in new wagons as much as 480,000*l.*, and during the past half-year they had spent 134,187*l.* The total expenditure by the company on rolling-stock, up to the end of the half-year, had been close upon 9,000,000*l.*

The London, Chatham, and Dover Company have resolved to spend a large sum in station and other extensions at different points along the line. At the meeting of that company the directors reported that it will be necessary to incur, during the next two or three years, considerable additional expenditure in the provision of further accommodation and material for the growing traffic of the railway. There was no doubt that the income of the company was at present suffering from the want of such outlay. Extensions at several stations on the line had become indispensable, and to secure a punctual and efficient service a large quantity of additional sidings and siding-room at various points must be constructed. The shareholders have confirmed a recommendation of the directors to raise 500,000*l.* additional capital for carrying out a portion of the proposed new works.

The report of the London and Brighton Company stated that the general depression during the past half-year, while it had arrested the rapid progress of the revenue, had not prevented an increase resulting from the general development of traffic. The capital expenditure for the half-year had been 201,871*l.*

The traffic receipts of the Metropolitan for the half-year amount to 240,477*l.*, showing an increase of 17,490*l.* as compared with the corresponding period of last year. The extension from Bishopsgate to Aldgate is being rapidly proceeded with, and is expected to be completed and opened by the 1st of December. The works on the St. John's Wood line, from the Swiss Cottage to Willesden-green, are about to be commenced.

The report of the East London Company stated that the works of the goods junction with the main line of the Great Eastern Company will be at once commenced and completed, as a very large amount of revenue depends upon it.

The Great Eastern Company report that the conversion of their Shoreditch high-level passenger station into a goods station, together with the works in connexion, are about to be carried out.

It was stated at the meeting of the North London Company that the dock and other works at Poplar, now in progress, will cost 200,000*l.*

At the meeting of the Manchester and Sheffield Company it transpired that, during the half-year there had been a decrease in the traffic, as compared with the corresponding half-year of 1875 of 33,000*l.* Sir Edward Watkin, the chairman, attributed it in a great measure to the strike in the coal districts of South Yorkshire, which lasted ten weeks. He calculated that the company had lost 50,000*l.* by that "foolish, iniquitous, and unnecessary strike," whilst the workmen themselves lost 100,000*l.*, and the employers 200,000*l.*, the value of the 500,000 tons of coal which were not got during the strike.

SURVEYORSHIP ITEMS.

Sevenoaks.—Mr. George William Brumell, assistant surveyor for the central district of St. Pancras parish, has been appointed surveyor to the Sevenoaks Local Board of Health.

Stoke-on-Trent.—At a meeting of the Stoke-on-Trent Town Council, on the 21st inst., Mr. Bowen, of Liverpool, was appointed borough surveyor. There were sixty-three applicants, a number of whom had been selected to attend the meeting. The salary is 200*l.* a year.

COST OF RAILWAY MAINTENANCE.

SOME pains have been taken to enable us to lay before our readers a tabular statement showing the particulars of the expenditure, by sixteen of the principal railway companies, in maintaining and renewing their permanent way, stations, buildings, and other works in the engineer's department. The figures are for the half-year ended June, 1876, and have been obtained from the official half-yearly reports of the companies. A number of calculations are added which show the rate of expenditure per mile of line, the mileage being equated to single line; the percentage which the expenditure forms of the actual cost of constructing the lines; and also the proportion of the earnings which was absorbed. The mean averages obtained from the combined figures of these companies may be accepted as fair data for fixing the rate of outlay in this important department of railway working. These may be given as follows:—

Salaries, Office Expenses, and Superintendence.

Per mile of single line	£3 000
Percentage of cost of construction	·019
Percentage of earnings	·27

Permanent Way.

Per mile of single line	£88 009
Percentage of cost of construction	·482
Percentage of earnings	·695

Stations, Buildings, and Works.

Per mile of single line	£39 000
Percentage of cost of construction	·212
Percentage of earnings	3·07

Gross Total.

Per mile of single line	£130 000
Percentage of cost of construction	·713
Percentage of earnings	10 29

SOME OLD HOUSES AND THEIR STORIES.

THE HOUSE IN WHICH JOHN LOCKE DIED.

THE year sixteen hundred and thirty-four is memorable in English history as that in which the obnoxious ship-money tax was first imposed on a people already groaning beneath the weight of excesive and illegal taxation. The unpopularity of Charles I. was rapidly spreading, the indignation of Parliament was as rapidly deepening, and the earliest mutterings of that awful storm which swept the Stuarts from their throne pervaded the entire land.

John Locke was then two years old. He was born, as may be remembered, in a thatched house beside the ancient church of a small market town in Somersetshire, called Wrington; eleven miles from Bristol, and a shorter distance from Axbridge. His father, a lawyer and agent, was a man in fairly prosperous circumstances who shared the growing discontent of the country, and in that neat little one-street town at the foot of the Mendip-hills was an important and influential personage.

As little John Locke grew in years and began to wander about the town and through the tall ferns covering the vast heaths on the hill sides of the Mendips, with the elder companions of his childhood, his mind became deeply impressed by all he heard and saw as the great waves of pity, horror, indignation, and rage swept over the land; now from Ireland, now from Scotland, and most frequently from London. The dreadful whisperings of secret horrors instigated by the Queen in Whitehall—the cruel and abominable Star-chamber doings—wrongs done by servile magistrates basking in the light of royal favour and protection, the infliction of ruinous fines for the most trifling and even imaginary offences, the torture and imprisonment of patriotic gentlemen in and out of Parliament, arbitrary exactions of the most aggravating description, these and kindred things raised the swelling waves of public feeling and sent them rolling stormily onward. In Bristol, then, and long after, the second city of the kingdom, the people were terribly excited, and thence the emotion spread to Axbridge and Wrington. Hot controversies sprang up concerning the supposed Divine Right of kings with the consequent wickedness of rebellion, versus the people's right of resistance when sore need was in arms, and, if need be, even to the death. In these Mr. John Locke, we feel sure, took part. And when the time came he was not tardy in exchanging words for blows, the sword for the pen, and went forth to raise men, deserting law-books and ink-horn until happier times should be won, prepared for sternest work wherein life, land, and all men hold dearest were to be staked upon the hazard of a desperate struggle for the country's rightful freedom.

As the chief entrance into Wales, and a station giving its owners the entire command of Somerset, the strongly-fortified city of Bristol, with its wealth of manufactures, shipping, money, and population was a point of the highest possible importance to the king on the one hand, and the Parliament on the other. Harassed by the demands of arrogant, never-satisfied commissioners and pursuivants, driven to the verge of frantic desperation by steadily-increasing imposts, and the utter impossibility of obtaining redress or relief, the merchants of Bristol were determined to play no mean part in the coming struggle. Civil commotions soon began to assume formidable appearances; the soap-makers determined to abandon trade rather than pay a duty of 4*l.* per ton on soap; the brewers were resolved to cease brewing rather than take out the hitherto unheard-of licences at a cost of 40 marks each per annum. Richard Aldworth, as mayor of the city, his aldermen, and the city guilds, terribly perplexed, and with much dread and fear in their hearts, prepared to meet the coming troubles. Forts were erected, the ancient castle, and the double line of the city walls were repaired and strengthened; tall, strong towers arose on the hills of Brandon and St. Michael; cannon, and unusually large pieces of ordnance, were mounted and arranged for use against possible besiegers. The gaily-attired city train bands, with their floating feathers, gay doublets, gleaming pikes, and clumsy muskets, marched to and fro through the streets, each looking like a captain, so well was he armed and attired. Sightseers came in from the outlying towns and villages, full of wonder and excitement, and amongst them doubtless Mr. Locke, with his poor, delicate, pale-faced, intelligent lad, John, then ten years old,—for all these things were in 1642.

But the civic authorities were divided even amongst themselves, although by far the greater proportion of the citizens were hostile to the king. Rumours came in from time to time which increased their uncertainty. Now the Royal cause looked strongest, now that of the Houses of Parliament; the advantages leaned now this way, now that; it was hard for prudent men, with a just sense of their responsibilities, to decide in favour of one or the other. While they were thus wavering, a new element sprang up to bring about a final decision. A procession of strong-minded, warm-hearted, patriotic ladies, headed by the wife of the mayor, broke into the council-chamber and prayed them earnestly and fervently to proclaim against the king, and they prevailed. The Earl of Essex, who held a great military reputation, had been chosen to head the forces opposed to Charles, and when he marched from Gloucester to Bristol, thanks to these ladies, he found the gates opened for his admission, which were afterwards closed for his protection.

But Essex disgusted the sober citizens and traders. He and his officers plunged into the unwarlike delights of feasting, drinking, and dancing, disgracing the place with their broils and debauchery, and weakening the cause they were embarked in, just when it most needed strengthening and support. So it happened that, on the 16th of February, in 1643, the Parliament sent Colonel Nathaniel Fiennes to depose the Earl from his command, and hold him in close confinement until his conduct had been strictly investigated. But even Fiennes suffered the enemy to approach unperceived, and nearly lost the town through their treachery.

John Locke's father was then serving the Parliament as captain of a troop he had raised in Wrington, and was doubtless with his family in Bristol when Prince Rupert came by secret marches to plan a terrible surprise. He had received private messages from certain royalist citizens who had matured a plan for the massacre of their fellow-citizens by night, and the

Comparative Statement of the Particulars and Cost of maintaining the Permanent Way and Works of the principal Railway Companies.

Half-year ending 30th June, 1876.

Company.	Miles of Single Line maintained	Capital Cost of Lines Open.	Salaries and Superintendence. Amount.	Per mile single line.	Per cent. of cost.	Per cent. of earnings.	Permanent Way: Maintenance and Renewals. Wages.	Materials.	Totals.	Per mile single line.	Per cent. of cost.	Per cent. of earnings.	Stations, Buildings, Roads, Bridges, &c. Amount.	Per mile single line.	Per cent. of cost	Per cent. of earnings.	Gross Total. Amount	Per mile single line.	Per cent. of cost.	Per cent. of earnings.
		£	£	£			£	£	£	£			£	£			£	£		
Caledonian	1,1[illegible]	20,2[illegible],888	1,395,633	1,8[illegible]	2	·069	·13	18,3[illegible]	54,491	103,875	87	·514	7 45	28,107	23	139	2 C11	133,783	112	·662	9·58
Great Eastern	1[illegible]7	23,52[illegible],922	1,289,303	9[illegible]	1	·004	·07	47,287	62,161	109,518	84	468	8 50	24,711	19	205	1·92	135,212	104	·755	10 49
Great Northern	1,[illegible]62	18,[illegible]0 143	1,899,484	4,771	5	·026	·33	38,1[illegible]3	57,179	95,282	93	·518	6·81	41,460	41	225	2 97	141,[illegible]43	140	·769	10 11
Great Southern and Western	6[illegible]2	[illegible],84[illegible],892	353,810	564	2	·017	·28	16,888	31,489	51,127	81	·883	14·58	10,644	17	182	3·00	63,135	100	1·082	17 86
Great Western	2,679	44,[illegible]8,857	3,479,549	12,928	4	·030	·37	122,665	217,237	339,902	113	·780	9 77	89,881	30	209	2·58	442,[illegible]1[illegible]	148	1·[illegible]2	12·72
Lancashire and Yorkshire	848	23,[illegible]1,[illegible]16	1,744,272	3,073	4	·013	·18	35,219	25,000	[illegible],219	71	·248	3·49	48,870	58	210	2·83	112,162	133	·482	6·50
London and Brighton	590	16,3[illegible],[illegible]4	7[illegible],[illegible]06	1,421	2	·009	·18	23,095	20,[illegible]91	43,185	72	·265	5 46	15,508	26	095	·96	60,[illegible]1[illegible]	[illegible]	·369	7 09
London and North-Western	2,727	52,[illegible]0,450	4,[illegible]0,[illegible]92	15,[illegible]8[illegible]	6	·029	·34	133,516	98,[illegible]9	232,[illegible]5	85	441	5 28	170,233	62	324	3 86	417,851	153	·793	9 96
London and South-Western	1,[illegible]8	[illegible]6,[illegible]74,[illegible]0	1,060,[illegible]5	1,788	2	·011	·17	41,[illegible]5	[illegible],472	[illegible]2,[illegible]7	74	·[illegible]59	7 84	[illegible],[illegible]46	24	168	2 58	111,231	100	·688	10·59
Manchester, Sheffield, & Lin.	510	11,8[illegible],[illegible]95	[illegible]2 ,[illegible]91	1,[illegible]5	3	·015	·22	14,[illegible]3	21,267	[illegible]6,[illegible]3	69	·3[illegible]4	4·39	10,030	37	161	2 32	56,880	[illegible]9	·340	6 93
Midland	2,[illegible]47	44,[illegible]7,197	2,[illegible]0,[illegible]63	9,[illegible]8	4	·021	·31	172,[illegible]82	117,[illegible]60	290,[illegible]22	108	·[illegible]96	7 49	91,102	45	2[illegible]3	3 09	320,992	177	·714	10·89
Midland Great Western	330	3,[illegible]6,[illegible]34	224,858	1,[illegible]27	2	·030	·46	15,154	18,483	33,[illegible]37	[illegible]3	·679	14·96	[illegible],[illegible]75	11	162	3 52	[illegible]03	[illegible]	1·[illegible]75	17 94
North British	1,[illegible]39	19,[illegible]5,527	1,[illegible]4,[illegible]85	1,[illegible]94	1	·009	17	49,[illegible]82	48,[illegible]84	97,[illegible]76	78	·492	9·13	34,[illegible]80	27	17[illegible]	·15	132,[illegible]2[illegible]07		·671	12 45
North Eastern	2,824	42,[illegible]2,[illegible]12	3,142,245	8,[illegible]60	4	·020	·27	92,960	85,161	178,361	77	·[illegible]16	5 68	141,29[illegible]	61	[illegible]1	4 50	328,253	141	·768	10 45
North Staffordshire	340	[illegible],[illegible]2,[illegible]75	[illegible]0,[illegible]83	968	3	·019	·31	11,179	18,583	29,762	87	·[illegible]65	9·62	12,[illegible]7	36	236	3·01	42,[illegible]2[illegible]	[illegible]	·814	13 84
South-Eastern	[illegible]71	17,[illegible]6,[illegible]63	8[illegible],[illegible]38	1,[illegible]1	2	·009	·17	24,[illegible]78	[illegible]4,[illegible]99	45,[illegible]73	70	262	5 11	16,263	25	102	1 91	63,782	97	364	7·09
Totals and Averages	[illegible]3	[illegible],[illegible]58,740	25,[illegible]1,924	67,881	3	·019	·27	822,093	937,585	1,759,[illegible]78	[illegible]3	484	6·95	775,[illegible]6[illegible]	39	212	3 07	2,[illegible]6,167	1[illegible]0	·763	10·29

admission of the king's forces, which was discovered only at the very moment when the bells of three churches near the walls were to be suddenly tolled as the signal for its execution. So awful had been the (doubtless exaggerated) stories industriously spread abroad concerning the cruel outrages and tortures inflicted by the savage Irish and German troops in the pay of Prince Rupert on men, women, and children, that we can readily imagine how the wan face of poor little John Locke grew still more white when one morning, on the 8th of March, he heard his excited father describing the danger they, in the dead of night, had so unconsciously escaped, and heard his mother's grateful thanks given to a merciful God for the miracle of their safety.

Tracing the fierce, hot progress of the siege which ensued, we remember how the leaders of the detected conspirators suffered, and paid the last barbarous and horrible penalties of their crime in being hanged, and, whilst still alive, drawn and quartered, before the Nag's Head tavern in Wine-street. How, on the 23rd of July, Bristol was compelled, by foes without and traitors within the gates, to capitulate, but did so on the most favourable and honourable conditions, which Prince Rupert granted and most dishonourably violated. The soldiers of the Parliament, instead of marching out with shouldered pikes and muskets, their flags bravely flying, were driven forth stripped of arms, money, and even clothes,—amongst them, as we may fairly presume, being Captain Locke, with his frightened wife and children, who, in some way or other, through hardships, sufferings, and dangers, contrived to reach London.

The Roundheads were no longer jubilant and hopeful; so far all the advantages seemed to be won by the Royalists, who were victorious in the north and in the west, and now held Bristol. The king's army began to grow, that of the Parliament to diminish. Those who had remained doubtful decided for the more hopeful cause, and many who had decided for the other bitterly blamed their rashness. London was in a state of terror. Riots arose, plots were feared, dissension and discontent abounded, and in London there were hurried preparations to endure a siege.

About this time, or soon after, John became one of the scholars who had the privilege of being educated and prepared for the University in that famous "publique school for grammar, rethorick, poetrie, and for the Latin and Greek languages," now called Westminster School. It was at that time no easy task to secure admission thereto, and Captain Locke must have commanded considerable influence in securing the same. For the first year John was probationer or commoner. How the weakly boy fared in the rude sports and exercises of the sturdy Westminster scholars, and what triumphs the ambitious genius won in learning to compensate for defeat in athletic contests, we can fancy without much help from imagination. Whether he played in the old Greek dramas which Queen Elizabeth commanded that the boys should play every year at Christmas, or whether the Puritans suppressed these, as they did other plays, we have not ascertained. His laughter blended in the roar which arose at the tossing of the pancake, but there was little chance of his being the boy to catch it, but his pale face flushed with pride when the glorious day of a crowning triumph came, and he was borne three times round the precincts of the school amidst a shouting and din of congratulations which aroused half Westminster to share the excitement.

From Westminster John Locke went to Oxford, where in Christ Church College his superior abilities soon gave him prominence. In 1655 he obtained his degree of B.A., he being then twenty-three years of age, and three years after he appended to his name the honourable distinction of M.A. But Locke was greatly dissatisfied with the chaotic state learning was then in, and the unprofitable directions it was taking. It irritated him to see students growing bewildered amongst mere verbal subtleties, and he protested strongly against the Aristotelian philosophy as fanciful and practically useless, as tending to convert students into wrangling disputants rather than sound thinkers. Despite its wonderful comprehensiveness, and the vast reputation it had for so many centuries enjoyed, he showed how unfruitful this system of philosophy had been, and attacked it with all the weapons in his armoury; tracing to it many faults in the exercise and training of the mental faculties whereby men were kept in ignorance and error all their lives. It was a somewhat bold thing to do, for new doctrines in philosophy were regarded almost as suspiciously as were new doctrines in religion, and "the imputation of novelty was a terrible charge amongst those who judged men's heads as they did their perukes, by the fashion."

It was now time that Locke should select his future calling or profession. His father had determined that he should be a physician, and a physician he consequently became, commencing practice in Oxford.

The physician of that day was an odd mixture of science and quackery, learning and superstitious ignorance. His profession was, however, one whereby poor men rapidly grew rich, and Mr. Locke, senior, was wise in his generation when he selected it for his son's following. Dr. Baldwin Hammey tells us how in 1644 he knew Dr. Robert Wright, who, although he had been in London only three years, pocketed a thousand broad pieces in the course of the year, and he, moreover, tells how on one occasion he himself received thirty-six broad pieces in gold as a single fee from a sick Puritan, who would have given him a much larger sum if he had not declined to receive it. But it was a profession absurd in its customs, ridiculous in the extravagance of its pretensions, eccentric in dress, and its professors, conscious of much ignorance, concealed it under an assumption of something mysterious and unearthly in the profundity of their wisdom. The huge wig and the gold-headed cane were its chief outer signs, on the strength of which many an ignorant dunce went about torturing and slaying his poor helpless fellow-creatures with perfect impunity. Alchemy, magic, and astrology in the minds of the ignorant were still associated with the practice of medicine, and most of its professors adhered to superstitious and absurd delusions fully justifying such associations. They blundered tragically in their ignorance of drugs, for chemistry was then and, medicinally, for long after, in its infancy, and were as careless in administering them as if they were things of the most harmless and impotent character. To this the learned John Seldon referred when he wrote:—"If a man was rich, and the whole college of physicians were sent to him to administer to him severally, haply, so long as they observed the rules of art, he might recover. But if one of them had a great deal of scammony by him, he must put off that; therefore will he prescribe scammony; another had a great deal of rhubarb, and he must put off that; therefore he prescribes rhubarb; and they would certainly kill the man."

A profession at this feeble stage of its development could not be expected to hold fast a man like John Locke, a conscientious, earnest, great, and high-minded man, who would not condescend to support unreal pretensions or disguise ignorance beneath the assumption of mysterious knowledge. He very soon ceased to be a physician, and accepted the post of secretary to Sir William Swan, with whom, in 1664, he visited Germany. Troublous times were then once again threatening the peace of England, and envoys extraordinary were being despatched by King Charles II. in various directions. Of these Sir William Swan was one, and he was sent forth to visit the elector of Brandenburg and other princes of the German Empire on a secret mission. There are some amusing and interesting letters written by Locke on what he saw and heard in Germany at this time, which were published by Lord King.

In the following year Locke returned to Oxford, and was tempted by an offer of considerable preferment in the Irish Church to take orders. But on precisely that ground which must have influenced him in abandoning the practice of medicine, he ultimately declined this opportunity of rising to wealth and distinction. In reply to the friend who obtained the offer for him, he said, "I believe you think me too proud to undertake anything wherein I should acquit myself but unworthily. I am sure I cannot content myself with being undermost, possibly the middle-most of my profession, and you will allow, on consideration, care is to be taken not to engage in a calling wherein, if one chance to be a bungler, there is no retreat." About the same time, "through fate or fortune," as he said, he declined with hesitation an appointment in the suite of the English Ambassador to Spain.

Thrown back upon his old profession, Locke resumed fresh studies in connexion with it, and worked hard for its improvement, when a chance enabled him finally to abandon it. The learned and eloquent Lord Ashley Cooper being advised to drink the mineral waters at Acton for an abscess in his breast, wrote to a physician at Oxford to provide a quantity of that water for his use. Arriving in the city, he found Mr. John Locke acting for the physican he had written to during that physican's absence, and was so pleased with the urbanity of the substitute's manners, the superiority of his understanding, and the sincerity of his pretensions, that he soon regarded him with feelings of admiration and friendship, and finally invited him to abandon a distasteful profession and take up his abode with him.

Lord Ashley Cooper, in his younger days, had himself won a distinguished position in Exeter College, Oxford. He delighted in philosophical studies and abstruse speculations. The greatest geniuses of the age were his constant friends and companions. He had fought with Captain Locke on the side of the Parliament, although he had been one of those who were most active in bringing about the Restoration when that step seemed to him the best and most desperately necessary. Such a man could not but appreciate another whose tastes and powers were so near akin to his own, and the friendship thus commenced speedily ripened into one of the deepest sincerity and warmth. When he became Earl Shaftesbury and Lord High Chancellor of England, Locke shared his good fortune, and was made Secretary of the Presentations.

Lord Shaftesbury as an active political leader was in the thick of all the fierce, hot Parliamentary struggles of his day, seeking power, and delighting in its exercise; but he was by no means the unscrupulous and selfishly ambitious man his enemies have delighted in painting. At Oxford, surrounded and admired by an enlightened circle, Locke had ceased to take any active interest in political questions, and devoted himself exclusively to scientific and philosophical pursuits. The most eminent physicians of Oxford, the famous Mr. Boyle, who did so much for chemistry and mechanical science, with many other learned men, were his most intimate friends there, and it must have been with some regret that he followed his new patron to the luxurious leisure of Sunning-hill, Wells, and afterwards to Exeter House, in the Strand, wherein he formed the scheme of his now famous essay on "The Conduct of the Understanding." Wandering along the pleasant gardens and terraces overlooking the Thames, Locke may have thought of the lines in which Spenser, referring to the same mansion, wrote:—

> "Next whereunto there stands a stately place,
> Where oft I gayned gifts and goodly grace
> Of that great lord which therein wont to dwell."

The intimacy he enjoyed with the Earl brought with it a variety of occupations which prevented the carrying out of the plan he had carefully devised, the education of his patron's son largely occupying his time. Locke had never from his childhood enjoyed robust health, and at length a severe attack of asthma induced him to seek relief in the South of France. In 1675 he left England for Calais, and by short stages proceeded slowly thence to Montpelier, where he became acquainted with the Earl of Pembroke. He afterwards went to Paris, where he formed a friendship with the learned anatomist, Guenellon, of Amsterdam. In 1679 he received intelligence of the Earl of Shaftesbury's reinstatement at Court, and a letter from him urging his return, politics having assumed so difficult and dangerous an aspect that the advice of a wise and prudent friend assumed high importance.

The last years of the Merry Monarch's reign were closing in shame, infamy, and turbulent outbreaks of popular feeling, when the Duke of York, afterwards James II., at length obtained the dismissal of the Earl of Shaftesbury, the enemy who had persistently striven to prevent his succession. Some of the Duke's creatures falsely charged the Earl with perjury, and he was tried for that offence, but the gleeful hopes of his persecutors were vain; the daring jury acquitted him. Dryden was one of those who embittered the Earl's misfortunes by scathing mockery. His satire of "Absalom and Architophel" lashed the fallen minister with a severity which he felt deeply and resented indignantly. The Earl, however, as Governor of the Charter House, none the less readily gave Dryden's son the nomination to a scholarship, and Dryden, in the next edition of his satiric poem, speaking of the Earl as Lord Chancellor, penitently returned the compliment by adding the following lines:—

> "In Israel's court ne'er sat an Abethdin
> With more discerning eyes, or hands more clean,
> Unbribed, unsought, the wretched to redress,
> Swift of despatch, and easy of access."

When the great Earl was driven out of the country to seek refuge in Holland, John Locke, ever steadfast and faithful to his friend and patron, went with him, content to spend the rest of his days in complete retirement from friends, country, and relatives. In January, 1683, the Earl of Shaftesbury died in exile, and two years after, amidst "inexpressible luxury and profaneness, gaming, and all dissoluteness, and, as it were, total forgetfulness of God," died King Charles II.

James II. carried his hatred beyond the grave, and being unable to wreak it upon the dead earl, kept it in reserve for those who had been the deceased statesman's dearest friends. Mr. Penn wrote to Locke, offering to sue for him with the new monarch for forgiveness. Locke replied gratefully, but with dignity. He was guilty of no offence against the king; there was consequently nothing to be forgiven, and to accept pardon would imply a confession of guiltiness, which, in all honesty and truthfulness, he could never make. This increased the king's hatred of him, and when reports reached England that the English and Scotch exiles in Holland were plotting an invasion of the kingdom, with Argyll and Monmouth at their head, although there was no evidence to show that Locke had participated in their rebellious scheme, yet his name figured last on the list of those whose apprehension was demanded of the Louvestein faction then holding Amsterdam. The innocence of Locke was so well known in that city of commerce that the chief magistrate, had he dared, would have indignantly declined to give him up. All he could do for innocence he did. Locke was warned to hide himself, with the understanding that so long as his presence could be kept unknown no real attempt would be made for his discovery. The friend he had won in France, Guenellon, now proved his truthfulness. He gave him a safe refuge in his house, from which he never ventured until the blackness of night overspread the deserted streets. When the canals intersecting the town in every direction gleamed dimly, and the great docks and warehouses, and the crowd of clumsy coasters and Rhine vessels rested dark and still along the booms in front of the overhanging houses, then, all eye and ear, in his painful dread of spies, knowing that he took his life in his hand,—disguised and carefully shunning observation,—the great English philosopher stole watchfully forth, like a thief in the night, to take the air. In his secret retirement, however, he continued to write. In 1687 appeared an abridgment of his great unpublished work on the "Understanding," in French, and shortly after a Latin letter on "Toleration,"—of all subjects that which in this country was then least understood or cared for,—with "A New Method of making Commonplace Books." About the same time the evil government of the second James bore its evil fruit in another great, but happily bloodless, revolution, and Locke, joyously hearing the news, came boldly forth into the light of day, bade his generous friend a grateful adieu, and sailed back to his own dear land. His friends at the court of William of Orange appointed him Commissioner of Appeals, and would have made him envoy to the elector of Brandenburg, had he not preferred the smaller income of his former office, with more time for studious labour of love in the retirement of his home and the society of the dear friends from whom he had so long been separated. Amongst those friends were Sir Francis Masham and his blue-stocking lady, his second wife, the learned daughter of a learned father, Dr. Ralph Cudworth, author of "The Intellectual System."

At this period Waltham Forest, which had anciently enshrouded the entire county of Essex, and has now dwindled down to Epping Forest, retained much of its former grandeur and extent. There, in the midst of beautiful undulating woodland scenery, which belonged more or less intimately to that fine old forest, shut in by groups of trees vast in age and proportions, stood the old manor-house of Otes, Sir Francis Masham's seat. Partially embattled and ivy-grown, its walls enriched by the mellow hues wherewith time delights in painting sturdy brick and stone, with the additions and alterations of several generations conspicuously traceable, both within and without it, this snug, quaint, old roomy mansion had charms of a picturesque and interesting kind peculiarly its own. But its memory is preserved now, some thirty or more years after it has been taken down, exclusively by stories belonging to it as the home of John Locke during the last fourteen years of his life, and as the house wherein he died. In London, where he enjoyed the continued attention of the greatest and most learned men in the kingdom, and was constantly visited by the Earl of Pembroke and the Earl of Peterborough, with both of whom he lived on terms of the closest intimacy, Locke struggled against the disease which was slowly killing him with much difficulty and suffering. At Otes, where the air was purer and softer, his life was more peaceful and endurable. Therefore, two years after his return to England, he resolved, at the solicitation of Sir Francis and his lady, to make their pleasant manor-house his constant abode for the remainder of his days.



Otes, the Seat of Sir Francis Masham.—John Locke's last Retreat.

Notwithstanding this, the Government, to mark its sense of his national services to the cause of learning, and his valuable practical essays on commercial subjects, appointed him a member of the Council of Trade, with the customary stipend of 1,000*l.* per annum. He held the post two months, and then wrote to the Lord Keeper Somers pleading for dismissal, on the ground that the craziness of his body so ill seconded the inclination he had to serve his Majesty. He was urged in vain to retain the post, and with reluctance was allowed to abandon it. In his letter to Lord Somers he said:—

"I should not trouble you with an account of the prevailing decays of an old pair of lungs, were it not my duty to take care his Majesty should not be disappointed, and, therefore, that he lay not any expectation on that which, to my great misfortune, every way, I find, would certainly fail him, and I must beg your lordship, for the interest of the public, to prevail with his Majesty to think on somebody else, since I do not only fear, but am sure, my broken health will never permit me to accept the great honour his Majesty meant me. As it would be unpardonable to betray the King's business by undertaking what I should be unable to go through, so it would be great madness to put myself out of the reach of my friends during the small time I am to linger in this world, only to die a little more rich, or a little more advanced. He must have a heart strangely touched with wealth, or honours, who at my age, and labouring for breath, can find any great relish for either of them."

At Otes, however, he continued to work. In 1695 appeared his "Reasonableness of Christianity," and soon after his "Commentary on the Apostolic Epistles."

In the well-stocked library of the old mansion he loved to sit and converse quietly with his friends, while through the open windows came the glowing sunshine, the soft perfumed wind of summer, the rustle of leaves, and the songs of birds. By the blazing logs of the huge hearth when cold and frost came with stormy winds, in that same room, curtained and closed and warm, with that love of lingering amongst memories of early days which belong to age and the consciousness of rapidly approaching death, he would tell the stories we have been recalling and partially guessing at, of the great civil war in which his father fought, of the breezy hill-sides on which he wandered as a child, of his experience at Oxford, of his troubles and misfortunes in Holland. Lady Masham, with the most tender sisterly kindness, devoted all her time to his care, surrounding him with every comfort she could command, solicitously careful to preserve him from every influence which might injure his feeble health or lessen his tranquillity.

Once more spring came, with its clear blue sky and budding leaves, and as it warmed and blossomed into summer the dying philosopher knew it was the last he should ever see on earth. On the 1st of June, 1704, he wrote to Mr. King as follows:—

"This comfortable and usually restorative season of the year has no effect upon me for the better; on the contrary, my shortness of breath and uneasiness every day increase. My stomach, without any visible cause, sensibly decays, so that all appearances concur to warn me that the dissolution of this cottage is not far off."

As he grew weaker and weaker, it was still his delight to be carried into that dear old library to spend the hours in his favourite easy-chair, looking upon the summer scene outspread before him, listening to the voice of that loving, loveable, gentle, and true-hearted blue-stocking. And so the days shortened and the air grew chilly, and the windows and curtains once again were closed, and it was on the 27th day of October. Her ladyship, not discovering him as usual in his favourite seat in the library, went sadly to his bedside, where she found him patient and resigned, too weak to rise, waiting for the end. The day wore mournfully on until the time came for evening devotions. He particularly desired that in their prayers they would specially remember him, and, for his gratification, when the solemn twilight settled down, the family and servants gathered about his bed for the performance of their usual devotional duties. From that poor, pale, wasted face, the thoughtful eyes calmly looked through the gathering shadows upon familiar faces, seen for the last time, and for the last time John Locke heard the sounds of familiar voices, awe-subdued by the thought of his passing away. "My work is almost at an end," said he, "and I thank God for it."

We take another and a parting glance at John Locke. He had insisted upon being once more carried into the library, and placed in his favourite seat. The room was endeared to him in many ways, and he had desired that his eyes should rest upon it just before they closed for ever. Lady Masham sat near him reading the Psalms to herself. He faintly desires her to read aloud. She obeys tearfully, and presently he signs that she shall cease doing so. She again obeys. A few minutes elapse; then is heard a long, low, quivering sigh, and from the body of one of the very few truly great thinkers the world has ever known the last breath of life oozes quietly away. He died on the 28th of October, 1704, at about three o'clock in the afternoon.





THE TOWN-HALL, MANCHESTER—MR. ALFRED WATERHOUSE, ARCHITECT.

[See p. 941, *ante*.

THE CONTRACTORS AND THE PARIS EXHIBITION OF 1878.

PROVISION FOR WORKMEN.

THE Commissioners last week arranged their bargains with the contractors for the iron-work to be employed in the two great machine galleries of the Exhibition building, the Creusot factory undertaking the work on the side of the Avenue de Suffren, and the Fives-Lille factory for the side of the Avenue de la Bourdonnais. These two firms must furnish the material, and terminate its erection within twelve months from the day of the command, that is to say, Thursday, September 21st. The work of erection to commence in six months time. The total cost of each of these two bargains amounts to 1,800,000 francs (72,000*l.*). Here are the prices which the Commissioners have agreed to give for the material:—Castings for columns, pipes, &c., 30 centimes the kilogramme (about 2 lb.); iron and sheet-iron for the glass cases, 68 centimes; ordinary iron, 55 centimes. In case of delay in the execution of the works, these prices remain thus fixed:—Castings for columns, pipes, &c., 28 centimes; sheet-iron for the glass cases, 645 millièmes; ordinary iron, 52 centimes.

From the nature of the soil of the Champ de Mars, which, in the course of digging for the drains, was found to consist of ordinary broken rubbish, utterly deficient in vegetable soil, it was thought necessary, in view of the great feature that will be made of the surrounding gardens, that a quantity of earth should be brought to the spot. This, on account of its great expense, created at first some apprehension; but at the same meeting of the Commission at which the contracts for the iron were arranged, a treaty was made with Messrs. Alasseur & Lacourrière, contractors for the Avenue de l'Opéra, by the terms of which they engaged to bring 75,000 cubic mètres of soil to the spot, at a cost of 20 centimes per cubic mètre.

On Friday, the 22nd, the Commission sat again, and in the course of their proceedings adjudged to M. Rigollet a fourth part of the metallic constructions for the interior galleries. The price of the adjudication was 1,330,000 francs (53,200*l.*). The contractor, however, has consented to a reduction of 3 per cent. All the expense of octroi, placing, erection, and painting with three coats, remains at his charge.

M. Krantz has organised the medical service, which will consist of one head surgeon, two under ones, and two hospital assistants. All workmen injured on the works will receive gratuitous advice and assistance either at the hospital or at their own homes, as the head surgeon may advise, and when injuries received disable a man for life, he will receive half his salary during one year. When married workmen, or those having families to assist, are killed on the works or die from injuries received, or illness caused by the work, their wives or families can claim an indemnity of 600 francs. This can be increased by a special decision of the minister, according to the position and wants of the victims and their families. Workmen injured while in a state of drunkenness will only receive medical help. When from any cause the work cannot be proceeded with, the workmen engaged will receive half their salaries.

MOVEMENT IN INDIA.

THE "Prince of Wales Memorial Fund Committee" of Cawnpore have determined to appropriate the sums subscribed by the native gentry of that station to some charitable purpose. It has been resolved that of the amount already realised, 8,000 rupees shall be devoted to the erection of a hospital, in addition to the subscriptions from other sources for the same purpose, and that the remainder be set apart for the formation of a public library. Application has been made to the Government for the grant of a site for the hospital.

The Government of Madras have forwarded to the Government of India their scheme for separating the offices of Chief Engineer and Secretary to the Department of Public Works. General Walker retains the post of chief engineer. Mr. Thorogood, the new superintendent of the harbour works at Madras, has arrived out, and the local journals express a hope that he will soon make his presence felt. They say that the Madras Government and the Government of India seem to be almost powerless in the matter, the control of the works having been vested in the India Office, London. The latest development has been the setting up of a cement manufactory, which is expected to turn out about fifty tons a day.

The fund for raising a statue to Sir William Muir, at Benares, already amounts to 8,676 rupees. It was only started a fortnight before the mail left. Half of the amount was subscribed by the Maharajah of Benares and the Nawab of Rampoor, and a fourth of the remaining half by the Maharajah of Vizianagram.

The Sutlej Bridge, consisting of fifty-eight piers, has had three of them washed away. The smaller Beas Bridge has been entirely destroyed by the floods, and the towns of Jacobabad and Shikarpore are said to be threatened with total destruction by the rising waters of the Indus.

The district engineer of South Canara has reported the destruction of a couple of bridges by the roots of trees. He says:—"On this coast nothing short of the uprootal of all trees that possess lateral roots, growing within fifty yards of bridges, will save further destruction of this sort, for the made earth of embankments and bridge-backing proves genial to roots, and the usual masonry (laterite), from its clayey nature, offers almost as great attractions, and not very much more resistance to their growth."

Captain Newmarch, R.E., Executive Engineer, is under orders to proceed to Rangoon, where he will be employed in surveying the principal ports of the province of Burmah for the purpose of establishing an efficient system of harbour defences. The plan likely to be adopted is that recommended by Colonel Oliphant, late Chief Engineer of Burmah.

Messrs. Binny & Co. intend to start a spinning and weaving factory at Madras. Mr. Chisholm, the Government architect, has been asked to select a site, and draw out plans for the structure.

The Lucknow paper understands that the office of the collector and compiler of ancient Sanscrit manuscripts in Oudh has been abolished by the Chief Commissioner. This is the first step towards a general reduction in the several Government establishments throughout the Province, in conformity with the recent instructions received from the Government of India, calling upon the several local Governments to curtail expenditure as much as possible. The Public Works Department is, it is said, put down for a retrenchment of 7,000 rupees from their official budget for extraordinary works alone.

The *Punjab Courier* hears that it is probable that the Delhi Railway engineers will have to abandon the present Sutlej Bridge and build another on a different site.

Through Indian channels we learn that the members of her Majesty's Diplomatic and Consular Services in China have erected a monument in memory of the late Mr. Margary, in the portico of the cathedral at Shanghai. It is a shield, carved in marble, and bears a suitable inscription, concluding with the text,—"Quit ye like men."

NATIONAL MEDAL AWARDS.

THE report of the examiners on the National Competition of Works sent up from Schools of Art, in competition for prizes, 1876, is distinguished from its predecessors in former years by giving the reasons of the judges for their decisions, as well as short judicious criticisms on the merits and defects of the students' works. Speaking of the modelling, the examiners say that it "was so inferior that it was impossible to find any work deserving of the Gold Medal, and the silver medals were awarded rather as an encouragement than on account of the merit of the works. The want of that workmanlike power over the material which is so noticeable in all French productions of this class was most conspicuous. As long as this continues, a large proportion of the decorative figure or ornament design in relief made for the English market will be in the hands of foreign artists." This criticism seems sound; but what the examiners say of wall papers and the analysis of flowers should have been more carefully set forth. "The analysis of flowers," they say, "is evidently applied wrongly to the treatment of flat decoration. As a means of gaining knowledge of the structure of plants, and so aiding the student in his drawing, and to a limited extent" (Why limited? we ask) "as suggestive of decorative forms, the analysis is of great value; but it is clear that in many cases there is an idea that a flower dissected and arranged geometrically will of necessity produce a good design. The result plainly shows that when the analysis is used to supply the designer with ideas, and takes the place of natural artistic production and taste in combination of form and colour, it is more calculated to mislead than to be of use." A student might be led from this to regard the analysis of botanical forms as somewhat pooh-poohed by the examiners, and to be advised to return to the naturalistic and exploded treatment of forms in wall-papers of some half-century ago. The analysis of floral forms, which the late director of art introduced, has made an impression on all the best schools of art in Europe, and notably in France, where it is considered an estimable and striking marking of the *goût anglais* in wall-papers, which find a market even in Paris. There is no doubt that the artistic influence of the new director of art will be beneficial to the schools, but it may be hinted to him that it ought not to be assumed that whatever is "is wrong." In the actual awards made, *three* out of ten gold medals are given for the drawing of the figure, and *all* three to students of the Lambeth School, the superintendent of which, we believe, has become now the Head Master of the School at South Kensington. Without disputing the judgment, there can be no doubt that such awards are somewhat of a discouragement to the other 130 art-schools, and give an aspect of biassed judgment. It might easily have been avoided by awarding only *honorary* medals, beyond one, in schools where there is distinguished merit for the same class of drawings, and letting other schools have a chance of a gold medal.

GLASS FROM SLAG.

MR. RASHLEY BRITTEN, of Redhill, Surrey, read a paper before the Iron and Steel Institute at Leeds, on the 21st inst., "On the Utilisation of Blast Furnace Slag, with its Heat, for the Manufacture of Glass." He said,—

Few of the substances which occur as manufacturers' refuse or by-products have arrested more attention than the scoria or cinder formed in the smelting of iron ores. The vast quantity produced, and its liquid form, at once suggest the idea of extensive usefulness; and all that seems necessary at first sight is to collect it as it flows, and forthwith cast it into a thousand articles of utility. Experience, however, has shown that this is attended with difficulty arising from its behaviour as it cools. When allowed to solidify slowly, the particles of slag arrange themselves in a crystallised form, and the substance becomes tough, and presents the well-known grey stone appearance; but if chilled by contact with a mould, or any surface causing rapid congelation, it becomes vitreous and brittle, and of a black or dark brown colour, so that in the same piece two wholly dissimilar structures may often be seen. Unequal tensions are thus occasioned, causing the substance to crack and break unless prevented by such slow and careful annealing as involves considerable trouble and expense. The purposes to which at various times it has been proposed to apply this material are strangely various, and among others are those of casting it, in imitation of stone, directly into paving blocks, slabs, and pipes; of colouring it and making it into decorative tiles and columns to resemble marble; of shaping it into architectural ornaments of black obsidian; of converting it into bricks; blowing it into a white wool; pulverising it into cement; and also of reducing it in water to the state of sand, in which form it has been advertised as a valuable manure. Most of these schemes have failed and been abandoned; still the building and paving materials now made from slag at Middlesbrough seem of good quality, and it is to be hoped that their manufacture will prove remunerative; but the cost of carriage for such weighty and necessarily low-priced articles would appear to be only too likely to confine them to a comparatively narrow local demand. The only use as yet found for any considerable quantity of slag is to break it up for road-making, and to build rough walls and foundations where stone is scarce. By far the major part of what is produced is wholly valueless, and the iron smelter has not only to bear the cost of moving it out of his way, but frequently must purchase land on which it may be deposited. It will support no kind of vegetation, and must be well known by those who have seen the huge barren mounds which in all the iron districts disfigure the country for miles. In Yorkshire alone upwards of 4,000,000 tons of this ugly refuse have annually to be thrown away, while the total quantity made throughout the country probably

exceeds four times as much as this. Any method therefore of checking this accumulation, even to a small extent, may fairly engage attention. There is no novelty in the idea of employing slag as an ingredient of glass. It has long been so used in this country to some extent, but on a larger scale abroad. In the Forest of Dean persons are employed about the old charcoal iron cinder heaps to collect the more vitreous-looking pieces, which are supposed to be the only suitable portions, and these are put under stump heads and pulverised in water; the resulting sand is then dried and sent to the glass-makers of Bristol, who mix it with their other materials and melt them down together. The practice is, however, fast becoming obsolete, because it is found that the cost of preparation and transport, and the very intense heat required to forge slag which has once cooled, leaves no advantage from its employment instead of other materials. A few years ago the price paid for this slag sand delivered at Bristol was as much as 20s. per ton, and this in 1875 had diminished down to 12s. 6d., which was said to be scarcely remunerative. For perfectly white glass, such as crystal, it is obvious that slag can be of no value at all, in consequence of the amount of iron it contains, which cannot be eliminated, and would produce a green or amber colour. Still iron is present more or less in all glass. The analyses of specimens of the window glass of commerce exhibit as much as from one half to one and a half per cent., it being possible to neutralise its effect to a considerable extent by decolouring materials. For all glass in which a tinge of colour is either needed or is not detrimental—and this includes an extremely large proportion of all that is made—a little iron does no harm; it is, in fact, often purposely introduced as an important element, for it is capable of replacing other flux, and so lessening the amount of alkali which would otherwise be required. Some estimate of the probable intrinsic value of slag to the glass-maker may be seen from the following table, in which the ascertained composition of slag of an average description is placed side by side for comparison with that of common bottle glass:—

	Composition of Iron Slag (Welsh or South Staffordshire).	Composition of Bottle Glass (Quantities variable).
Silica.....	40 per cent.	45 to 60 per cent.
Lime	36 ,, ...	18 to 28 ,,
Alumina ...	18 ,, ...	6 to 12 ,,
Magnesia...	6 ,, ...	0 to 7 ,,
Alkali	1 to 2 per cent.	2 to 7 ,,
Oxide of Iron	½ to 2 ,, ...	2 to 6 ,,

A trace of sulphur is also found in slag associated with the lime, but this need not be regarded, as it is insignificant in quantity and readily passes away with heat. It will be observed that there is nothing in this waste of the blast-furnace which is not represented in glass. It is also clear that it really contains less iron than is often required by the glass-maker. Some striking facts, therefore, arise which may be pointed out. The glass-maker must buy all the above ingredients or their equivalents. They represent large quantities, and he has to pay for their conveyance to his premises, where they have to be carefully mixed and moved again, and finally put into his furnaces, there to be kept at a white heat for many hours till the highly refractory substances are dissolved and fused. The iron-master, with a different object, is always melting down precisely the same materials; he cannot produce his iron until he has first converted the gangue of his ore into glass; but this he calls "cinder," and gets rid of it as best he may. The cinder is not readily recognised as glass because it looks like stone, but all glass will look like stone if cooled slowly from its liquid state. The cause of slag being so completely devitrified is that it is too rich in lime and too poor in silica. The glass-maker, however, has to buy his lime at five or six times the price of his silica or sand, while all his ingredients together cost him comparatively little more than the very large quantity of fuel he must burn in order to bring them into the melted form in which the ironmaster throws all his glass away. The question, therefore, to be opened out is whether there may not, to a great extent at least, be a remedy for these practical anomalies. May not the manufacture of crude iron be so combined with that of glass that the latter may be produced so cheap as to render it available for many additional uses, possibly more extensive than those to which it is at present applied? Glass-making now fairly ranks among the largest industries of the country, and commands a wide export trade. It is a material of great beauty as well as strength, and, being nearly proof against all chemical reactions, is quite unrivalled for durability and cleanliness, and with those qualities it is capable of being manipulated or pressed and moulded into shape with greater facility than any other known substance. If then, as will be found probable, it can be produced in finished forms cheaper than any other material, not excluding even stone, slate, or common earthenware, it is difficult to foresee the extent of its application. At scarcely any extra expense it may be made of almost any colour, or absolutely black like jet, in which latter form it might, for many purposes, serve better than the finest marble. As one example of usefulness, its suitability for roofing may be mentioned. It may be either opaque or clear to admit light. If opaque it would be less transparent to heat than slate, and as it could without skilled labour be rolled into the desired forms, either plain or highly ornamental, it is likely that they might largely take the place of slates, by being sold at a lower price and yet at a handsome profit. The paper proceeded to discuss the necessary treatment. He added:—The constituents of slag are common to all kinds of green glass used either for bottles, or windows, or even mirror-plate; therefore, by diluting them with the usual pure materials to a greater or less extent, the compound may be brought up to any standard short of the purity from colour inconsistent with the iron or sometimes manganese residing in the slag. Perhaps it is scarcely to be expected that slag glass will ever be produced quite equal in colour to the ordinary best window glass; still it would be premature to anticipate what may be done should it ever become worth while to adopt special means for rendering the slag purer. In regard to all other essentials, such as clearness, brilliancy, strength, plasticity in working, power of resisting acids, and the capability of being cut with a diamond, it may be made equal to any other. The principal question has next to be considered of how far it is possible to combine the manufacture of glass and iron without in any way interfering with the necessary continuous operations of the blast furnace, for this, as a matter of course, is absolutely essential. Blast furnace works where pig iron only is made frequently stand in pairs, in isolated situations, with plenty of space around, on which glassworks may be erected on any scale; and in many instances they might be built close up to the sides of the furnaces, and extending laterally away from the pig bed. In that case the slag might be run directly into a glass furnace, on the well-known plan of Mr. Siemens, for continuous founding and working. When there is insufficient room for this the glassworks might be at some distance, and the slag could be collected and conveyed to them in a state of fusion in large covered iron ladles on wheels, similar to those used in some Bessemer steel works, where the molten iron is carried upwards of a mile to be poured into the converters. Various other plans will suggest themselves to suit the exigencies of the existing works. The foregoing observations are founded on the result of a long series of experiments extending over the greater part of the last three years, in which the author has endeavoured to test, in every way open to him, the soundness of his conclusions before submitting them to criticism. A few specimens of the glass produced from slag are on the table for inspection, and they are not to be regarded as perfect, but only as indications of what may be expected from developed means. They are, in fact, only experimental results in the making of a few hundredweights at a time. The glass can, of course, lay no claim to high quality in point of colour; still this is its only inferiority, and no doubt it may be improved in this respect. But it may be observed that it is as nearly as possible the same tint as that purposely made to suit the requirements of horticulture, as evidenced in the great conservatories at Kew. It is also but little, if any, darker than a great deal of what is now used in the form of rough plate for skylights. It is well known that a tinge of green is of great utility in checking the heat rays and softening the glare of white light. Although slag-glass cannot compete with that higher quality which is produced so largely in this neighbourhood, it certainly has the recommendation of great cheapness, for it is doubtful whether glass as good could be made for less than three or four times its cost when everything is taken into account. A very large proportion of it represents so much material and fuel which is now utterly wasted; and it only remains to point to the enormous quantity of coloured glass now employed for various useful and ornamental articles, and then to ask what further uses may be found for such material.

COOKING BY GAS.

WE have before now dwelt on certain obvious advantages attending the use of gas for cooking, the quickness with which it can be put on and off, its cleanliness, and so forth; but these have been counterbalanced by the asserted extra cost as compared with coal. If we may judge, however, from a bundle of statements in respect of Messrs. Leoni & Co.'s gas-cooking apparatus which have reached us, this objection has vanished. The chairman of the London Hospital says the waste in cooking is materially reduced, and that "as to the economy in comparison with the use of other fuel, we have reason to know that the average daily consumption of gas in the kitchen of the hospital (which has upwards of 600 in-door patients, and a corresponding staff of attendants) is something over 1,800 ft., representing a cost in money of about 7s. per day, the cooking being done on two days in every week partly by gas, and the other five days entirely." In an establishment at Westbourne-grove, where 1,200 people are cooked for daily, the proprietor asserts that the saving in the cost of meat will be 800*l. per annum*; while from the Westminster Aquarium comes the assertion that "for the requisite cooking for over 2,400 people during one week, the cost of gas was 1*l.* per day, and the saving in waste of meat more than sufficient to cover this outlay."

We have no particular desire to advertise Messrs. Leoni, but it seems to us desirable, in the interest of the public, that these results should be known, and that they and other manufacturers should continue to direct their attention to the subject, which is one of great importance.

RAISING THE RAVENNA BAPTISTERY.

MANY of our readers know this ancient and most interesting building, and its remarkable mosaics. With the exception of some trifling alterations and restorations, this structure, erected, it is said, by Bishop St. Ursus about the year A.D. 380, and ornamented with mosaics by Bishop Neon, A.D. 430, has, both in outward appearance and internal decoration, been left untouched since the day it was completed. Time, however, has wrought one great alteration in it. Partly owing to geological phenomenon, which causes a continual lowering of the ground between Venice and Ancona, and partly to the accumulation gathered above, the baptistery has sunk nearly 10 ft. in what below is marshy ground. To remedy this, and save the building and its mosaics from the dangers that menace it, Signor Lanciani has prepared plans for raising it bodily to the present level of the city, and these are to be carried out. The *Times* of September 25th contains a full and discriminating account of the mosaics which adorn it. We have a vivid recollection of the eight grand figures of prophets draped in white, and which there is reason to believe were executed at the time the baptistery was erected, viz., A.D. 380, rather than when the other mosaics were set up, A.D. 430. All must hope that the intended operation will be safely performed.

THE VALUATION OF RAILWAYS.

LORD SHAND has recently given judgment in the Scotch Court of Session, in two appeals by railway companies against the valuation of their property. In one case, that of Sutherland and Caithness line, the appellants stated that, in valuing their undertaking, instead of first ascertaining the net revenue, and thereafter deducting usual percentage on tenants' profits, the assessor took five per cent. on 27,800*l.*, the cost of stations, which gave 1,390*l.*, and added to that a sum of 1*l.* per mile of the appellants' line, which extends to 66 miles 27 chains, making altogether 1,456*l.*, which he fixed as the valuation of the appellants' undertaking. They maintained that if their undertaking were valued in the same way as other lines, its annual value would not exceed 631*l.* 17*s.* 7*d.* There was thus 825*l.* of over-valuation. The case having been discussed, the Lord Ordinary issued an interlocutor sustaining the appeal and remitting to

the assessor to amend the valuation-roll, giving effect to the principle contended for by the appellants. In a note his lordship says :—

"In the exceptional circumstances of this company the assessor has adopted the unusual course of entering in the valuation-roll the sum of 1,390*l.*, representing five per cent. on 27,800*l.*, the cost of the offices, stations, and buildings, adding a nominal sum per mile for the length of the railway. It is not disputed, however, that the amount thus entered in the roll as the basis for assessments is much in excess of the actual annual return of the property, and in excess of the return which might reasonably be expected for the property, one year with another, if it was let. I am of opinion that the mode of valuation usually applied to such undertakings, as the fair mode of fixing their annual value, namely, by taking their revenue, subject to the recognised deductions for working charges, &c., should be adopted there as in other cases. It is true the amount brought out is too small to admit of the assessor deducting five per cent. on the cost of stations, &c. In order to fix the valuation of the company's property in each county and parish, as the Valuation Statutes provide should be done, a specification in the statutes of five per cent. as the rate of deduction cannot, I think, be held to imply that the property must be valued above the sum which that rate represents when the true value is much less. The provision is one intended to fix, not the mode of reaching the gross valuation, but only the principle upon which that valuation, when reached, is to be divided amongst different counties and parishes through which the line runs; and if the actual value does not admit of so large a deduction the assessor must take a lower rate, or make the apportionment on the equitable principle, as nearly as possible in accordance with the statute as the facts admit. It would be injustice to the company to enter the property above what is admittedly its true value, and I think the provisions of the statute do not require that this should be done."

ASTON AND HANDSWORTH SEWERAGE WORKS.

ON the 21st inst. the first stone of the combined sewerage works for the districts of the manor of Aston and Handsworth was laid at Salford Bridge, Aston. Mr. D. Barr, the chairman of the Aston Local Board, opened the proceedings with the following address, explanatory of the proposed works :—

The area of the manor of Aston is about 913 acres, and in 1831 the population was 946, and in 1861 it was 16,337; and at the time the Local Board was formed, in 1869, contained about 30,000 inhabitants. The increase has been exceedingly rapid, the population having risen to 33,948 in 1871, and is at the present time about 42,500. The consequence was, that the sanitary arrangements did not keep pace with the growth of the district, the whole of the sewage being allowed either to soak into the soil or to run into the River Tame or the Hockley Brook. The members of the Local Board were fully aware of the evils attending this unsatisfactory state of affairs, and determined to use their best endeavours to rectify it. Accordingly, in February, 1874, Mr. William Humber, civil engineer, of Westminster, was called in to advise the Board, and on the recommendation of that gentleman it was decided to apply to the Local Government Board for permission to borrow a sum of 80,000*l.* for the purpose of constructing a thorough system of intercepting and main outfall sewers, and for completing the remainder of the arterial drains. Major Hector Tulloch, R.E., one of the Local Government Board inspectors, held a public inquiry at the offices of the Board, in September, 1874, and, on his making a favourable report, permission was granted to borrow the necessary funds. The first instalment of the loan, amounting to 30,000*l.*, has been borrowed from the Public Loan Commissioners, at a rate of interest of 3½ per cent. per annum, to be repaid in thirty years, the annual repayment of interest and sinking fund being 5*l.* 8*s.* 9*d.* per cent., and was intended for the purpose of constructing the intercepting and portion of main outfall sewers, these requiring the most urgent attention; and also for the purchase of lands, easements, wharfs, and other expenses. The surveys, plans, and working drawings were completed in July, 1875, the intention being to make a provisional outfall into the river Tame, near the Salford Bridge, this being necessary in order to avoid interfering with the construction of the continuation of the main outfall sewers, and the necessary works for the treatment of the sewage. Before the works could be commenced, the Urban Sanitary District of Handsworth made overtures to Aston to be allowed the joint use of the intercepting sewers. Handsworth joins Aston on the north-west, and forms, at a higher level, part of the same watershed; consequently its natural, and indeed only practicable, outfall lies through the manor. The area of the Handsworth district is about 3,720 acres, and the population 14,500. An agreement, as recommended by Mr. Humber and mutually advantageous to both parties, was drawn up, by which Handsworth was to use the intercepting sewers of Aston for their main outfall, the expense of construction to be proportionately borne between them. This arrangement materially reduced the cost of the sewers to Aston, while at the same time saving to Handsworth the considerable extra outlay of having to carry separate main outfall sewers through the manor. The alteration was sanctioned by the Local Government Board, and permission given to the Handsworth Board to borrow 15,000*l.*, their estimated share of the cost of the work. These matters, and the necessity of making fresh plans, &c., to suit the enlarged sizes of the sewers, and the alteration in other practical details, delayed the advertising for tenders until June last.

The lowest tender was by Messrs. H. Young & Co., Pimlico, to whom the Board have entrusted the works, and who have undertaken to complete the same within twelve months from their commencement for the sum of about 35,000*l.*

A NEW MISSION AND PUBLIC HALL IN WALWORTH.

IN connexion with St. Mark's Church, East-street, Walworth, a new mission hall, which is also intended to be used for general public purposes, is now in course of erection in York-street, about the centre of the Walworth district. The architectural character of the building is Gothic, and it will contain a room 70 ft. in length, 28 ft. in width, and 25 ft. in height. On Sundays the building will be used for mission purposes and children's services, and on week-days it will also be used as a night-school, and applied for lectures, in connexion with which there will be a reading-room and youth's institute, whilst it will likewise be let for public meetings, concerts, and other purposes of a miscellaneous character. The architects are Messrs. Henry Jarvis & Son, and the contractor is Mr. Marsland.

WELDING IRON.

AT the meeting of the Iron and Steel Institute, at Leeds, Mr. Richard Howson, engineer, Middlesbrough, read a paper on this subject, in which he contended that it was possible to obtain a more homogeneous quality of iron by means of piling than by the rolling out of a mass of puddled iron. The author observed that there was impending change in the manufacture of finished iron, as it was admitted on all hands that machinery would soon entirely supersede hand-labour in the puddling process. Along with this conviction there is a current impression that iron will have to be puddled in large masses, and not divided into small balls, as in the ordinary practice; that the system of piling must be abolished; that piling means welding, and that welding is a mistake, and that homogeneity is the thing to be aimed at. "Now," said Mr. Howson, "when the matter is fairly considered, it becomes evident that the iron rolled from a puddled ball is in no case homogeneous, and that the larger the ball the more herterogeneous it is likely to be. The term homogeneous can only be strictly applied to iron which has been melted, such as the mild steel which is made in Sheffield, containing a low percentage of carbon. When a specimen of material of this class is treated with acid, the surface being first polished, there is usually no appearance of grain, and the action of the acid is slow. On the other hand, a piece of ordinary rolled bar subjected to the same treatment shows a fibre which stands out like whipcord." After defining the term "welding," and pointing out the conditions necessary for properly effecting that process, Mr. Howson described the methods of rolling and welding as practised at some of the leading iron and steel works. He then recapitulated in brief the points he had elaborated in support of his views, and which may be expressed as follows :—First, when two surfaces of wrought iron in a half-melted or viscous state are pressed together, the intervening cinder is expelled, provided it is liquid enough, and has a chance of escape, and cohesion results. This constitutes a weld, and if the proper conditions have been fulfilled such a weld would be as sound as any other part of the bar. Secondly, the requisite conditions are seldom, if ever, absolutely fulfilled in practice. When the surfaces to be united have a large area it is impossible to avoid enclosing some small quantity of cinder. The endeavour should be to reduce it to a minimum, and then dilute it by after-working. Thirdly, shingling a puddled ball is essentially a process of welding, and the term homogeneous is altogether inapplicable to it. Fourthly, the conditions for perfect welding are in no case favourable in a puddled ball, and the difficulty increases with its size. Mr. Howson concluded by observing that he granted that machine puddling would before long entirely supersede hand-labour; but the question lay between working on a large scale and on a comparatively small one. The advantages claimed for the former were a saving in fuel, in labour, in waste from crop-ends, and in waste from re-heating. The extent of such saving, however, depended upon the class of manufacture, and in no case was it very large. "On the other hand," said Mr. Howson, "we have the sacrifice of existing machinery and the cost of erecting new of an expensive class, also an increased liability to loss from the folding up of raw iron and fettling in the puddled ball."

THE MASONIC HALL, EDINBURGH.

THE decoration of the various halls in connexion with the Masonic Institute in Exchange-street, has been completed, after designs by Mr. Lewis Soder, Edinburgh.

The general character of the style of decoration that has been adopted by the artist is that of the thirteenth century. The ceiling of the large hall is divided into three circles, the two smaller ones containing allegorical figures representing the seasons, these figures being connected by ribbons carrying fruits and flowers appropriate to the various seasons of the year. The central circle, which also is the largest, is divided into twelve compartments, containing the twelve signs of the zodiac. The formation of the centre portion of the ceiling is produced by a pink frieze outlined with gold, and the spaces between the circles are filled with the diaper pattern on a soft green ground. Round the whole runs a frieze which is broken up again by six medallions bearing Masonic emblems. Two smaller panels have also been introduced, containing conventionalised thistles. The thistle in its conventionalised form is also repeated in the cove of the ceiling, being produced with shades of dark green, buff, and purple on a soft green ground. The prevailing colour of the cornice is buff, some of the mouldings being brightened with gold, and sombre colours are introduced to harmonise it with the rest of the decorations.

The height and the general style of the orchestra gallery has given in a manner the key to the whole of the wall decorations. The idea of the artist has evidently been to continue the mouldings or the cornice below the gallery right round the room, and to divide the walls of the hall by these means into two parts. The top portion is filled with twelve arches, on each of the spandrels of which, on a blue ground, is a red shield with a square and compass in gold. Within the arches are represented, alternately, two different upright ornaments. Below the line of the gallery, and running right round the hall, is a coloured frieze, on which are introduced, so as to correspond with the arches and pillars above, medallions on a gold ground, containing the different masonic jewels. Below this, again, the wall is so treated by the introduction of a number of simple lines as to give the suggestion of a curtain, which is looped from the medallions and enriched at the bottom with a zig-zag ornament. Means of ventilation have been introduced between the cornice and the ceiling, and by the erection of two air-shafts (one on each side of the platform) in the form of Corinthian pillars.

The execution of the work has been contracted for by Messrs. George Dobie & Son, George-street, Edinburgh, by whom it is being carried out expeditiously.

Birmingham Art-Gallery.—The last published report of the Free Libraries Committee records an important gift from Alderman Chamberlain. He has placed at the disposal of the Corporation the sum of 1,000*l.* for the purchase of objects for the Art-Gallery, and has expressed his desire that this amount may be expended in the acquisition of a collection of specimens of industrial art. No opportunity has yet occurred of laying out the money in the manner desired, but the committee have the subject under consideration, and hope soon to expend the gift in a collection which may worthily contribute to the attractions, and promote the usefulness of the new Gallery of Art, about to be erected in Edmund-street.

THE "MARBLE" SKATING RINK.

In addition to the numerous skating-rinks which have recently been constructed and opened in the metropolis, one of an entirely novel character in the Clapham-road is intended to be inaugurated to-day. This new rink has appropriately been named the "Marble," the floor, which contains a skating area of 18,000 superficial feet, having been laid in Sicilian marble, polished. The rink has been constructed on an area of land forming the grounds in the rear of an old mansion on the east side of Clapham-road, called Thanet House. The entrance from Clapham-road is through the gateway and approach to the old mansion on the south side, along which an arcade has been erected, covered in with a glass roof. This leads to a corridor or promenade, upwards of 10 ft. in width, and more than 400 ft. in length, running parallel with the skating-rink area. The south side wall is divided into panels on a pale green ground, and casts on pedestals are placed along its entire length, whilst evergreens and ornamental trees are introduced in profusion. The north side of the corridor is of lattice-work, with wide openings at intervals, thus giving the spectators a view of the skaters on the rink. A little more than one-third of the rink, at the east end, is covered in by a large semicircular roof in one span, supported by light iron lattice girder ribs, and in the centre of this portion of the rink there is a chandelier suspended from the ceiling. In carrying out the works in the open portion of the skating area advantage has been taken of a number of full-grown trees, in the grounds, which have been preserved, and impart to the rink a rural appearance. The open portion is lighted by burners, enclosed in ground-glass globes. In addition to the corridor on the south side, there is also an open promenade on the west and north sides, with ornamental plantations and flower-beds adjoining. At the north-east corner there are refreshment and smoking rooms, together with an orchestra for a band, which will play at intervals daily.

The rink has been designed and carried out by Mr. Alfred Timewell, the owner.

"COALBROOK-DALE CASTINGS."

THE Coalbrook-Dale Company came prominently forward on the occasion of the Great Exhibition of 1851, and from that time to this have maintained their position, though the reputation of their castings has varied now and then during the period. The Catalogue of the Castings and Work in Metal made by the company is now before us, and is a remarkable work. It consists of two large stout volumes, and the articles illustrated, classified for easy reference, range from a flat-iron or a skid, worth a few pence each, to fountains and gates costing thousands of pounds. It appears to be intended for the use of the iron trade solely, and duplicate copies may be obtained by those to whom it is presented at 4*l.* 4*s.* per copy.

STREET-CLEANSING IN ST. PANCRAS.

"PAYMENT BY THE LOAD."

MR. CHARLES WORRELL, chief clerk of the Works Department, St. Pancras, has submitted to the Works, &c., Committee of the Vestry some comparative statistics, showing the result of the load-work system of payment for cartage of road-sweepings, from which it appears that the estimated number of loads that would have to be carted under the load-work payment system during the year ending the 25th of March last was 29,809 loads. It was anticipated that an increased number of loads would be recorded, because much of the cartage under the old system was done at night, after the vestry's workmen had finished sweeping, and also because the altered system would stimulate attention. The estimated cost of the above was 5,709*l.* The lowest tender for the same period, at per lump sum, amounted to 6,224*l.* The actual number of loads carted during the year ending the 25th of March last, was 30,797; the cost of carting, at per load, being 3*s.* 6*d.*, 3*s.* 9*d.*, 4*s.*, in one ward 3*s.* 11*d.*, and in another 4*s.* 5*d.* per load. The actual cost of cartage for the said year, of road-sweepings (by load-work payment) was 5,928*l.* 7*s.* These figures show that while only 25,643 loads were removed from the streets under the lump-sum system, the actual number of loads removed under the load-work system was 30,797, and this in a winter season exceptionally long and wet, and the streets better cleansed to the extent of the removal of 5,154 additional loads of sweepings. Also, that while the lowest tender for the same period, at per lump sum, was 6,224*l.*, the actual cost for the said year of the cartage of road-sweepings, by load-work payment was only 5,928*l.* 7*s.*, being a saving of 295*l.* 13*s.* per annum.

PIECE-WORK AND THE TRADE-UNIONS CONGRESS.

AT a meeting of the Congress last week,

Mr. Knight (Boilermakers, Liverpool) moved, —"That this Congress observes with regret that in a very large number of cases piece-work is a fruitful source of disputes, and most injurious to workmen; their employers, managers, and foremen making the same a cloak to reduce wages and introduce sub-contracting, with its attendant evils; the system also offers in many instances an inducement to workmen to lose time, and to remove the security which they enjoy under the day's work principle. We therefore pledge ourselves to use our utmost exertions to reduce its application, and resist its extension in all those places where these evils exist." Mr. Knight said this question was a very difficult one, for he thought that many delegates who represented large associations were continually on the piece-work system, and in many cases they found it operated very well, but he would point out a few of the evils arising from piece-work. One of the arguments of the employers in favour of it was that it enabled them to take contracts and give some correct estimate of the cost; but they found that when the workmen earned anything like a respectable wage at this piece-work the employers took steps at once to reduce the prices, and so the prices were time after time continually decreased. Foremen in a piece-work shop became sub-contractors, and the whole object which the sub-contractor had in view was to get as much money as he possibly could out of the men who were working under him. He became a perfect slave-driver. Another evil was that unskilled workmen were employed at a cheaper rate by these sub-contractors, and the result was that they got a large amount of imperfect work done through the system.

Mr. Duncan Kennedy (Glasgow) seconded the motion, and believed that piece-work was one of the greatest curses with which the country had to contend. In some works it was the introduction of the system of blood-money.

Mr. Townley (Dyers), who supported the motion, said that the Bishop of Manchester had christened the system of piece-work "scamp work," and he believed that it was scamp work.

Mr. Memmet (Sheffield) moved an amendment, "That in the opinion of the Congress it is unwise to interfere with the question of day or piece work." Every workman, he asserted, ought to be allowed to make the best use of his energies and his skill. He did not believe that it was right to tie the hands of a skilful, hard-working man behind him, simply to make him go the same pace as the man who was not so industrious. Again, piece-work enabled the employer to give an estimate of the cost of the work. They could go into the market knowing what a dozen knives had cost, and what they could sell them for.

Mr. Bailey (Preston) did not think that the question of piece-work or day-work was one that could be dealt with by the Congress. It was rather one to be considered by individual societies, which it affected one way or another.

After some more discussion the subject was got rid of by a resolution, which was carried, that the Congress go to the next business.

MEDIÆVAL AND MODERN WORK.

SIR,—Your interesting article on the restoration of Chester Cathedral contains the statement that there is a *je ne sais quoi* about the buildings of Mediæval architects which is unattainable in modern times. It is hard to see how this should be if the lines which the ancient architects confined themselves to were followed. In all parts of their buildings, but especially in detail, those lines appear to be chastity of conception, delicacy of proportion, and quaintness of expression; the whole being accompanied by a high finish. It is true that no modern buildings are in any way comparable to the ancient edifices; but I think it will be found that the closer these lines have been followed the greater is the approximation. J. CARTER.

BAD BUILDING AT WARRINGTON.

SOME time since we briefly noticed the arbitration case of Artingstall *v.* Pierpoint & Collin. Letters explanatory of the state of things found in pulling down Mr. Artingstall's house have been published. The writers are Mr. R. W. Hughes, architect; Mr. W. Heleby, clerk of works; and Mr. Lewis Hornblower, architect. These letters go to show that the materials and workmanship were as bad as bad could be. Mr. Hornblower, for instance, says:—

"A greater imposition could never have been attempted to be foisted upon any man as work constructed in 'the best and most workmanlike manner,' to quote the words of the specification. Concrete of the character of that used (which was not concrete, for that term, in an architectural as well as in any other sense, means a compact and homogeneous mass adhering together) is worse than useless; it was an element of weakness instead of strength, composed, as it chiefly was, of loose broken bricks, broken stone, scapplings, and lime chippings pitched into the foundation, with a thin scrape of common mortar thrown in at intervals. The bulk of the loose material being dry, was simply a drain leading all the water from the surrounding ground under the foundations, and thereby endangering the safety of the superincumbent walls; instead of acting, as it would have done had the concrete been in accordance with the specification, as a sound and solid foundation for the walls of your house, resisting perfectly the damp, and defying the power of the floods to injure it. The house was quite unfit for your habitation—you could never have been certain how and when the foundation might give way. The roofing over your head was miserably weak, and showed signs of giving, while every particle of the joiners' work was vile. . . . . I must say that if such work is to be tolerated, it will be useless for a man to employ an architect to protect his interests, and see justice done alike to proprietor and contractor. I repeat, it is perfectly useless to have professional aid if this is the way you are to be treated. You deserve the thanks of the architectural profession throughout England, in exposing such treatment."

Mr. Artingstall writes to say that the costs and expenses which he has had to pay are more than 1,500*l.* in excess of the amount received from Messrs. Pierpoint & Collin.

A MAN SUFFOCATED IN A SEWER AT BOOTLE.

ON the 18th inst. four men in the employ of the Bootle Corporation were engaged in examining and cleansing a sewer leading from Stanley-road to a new thoroughfare which forms a continuation commencing at Merton-road and running to Linacre. The object of their examination was to discover the length of the sewer, which was constructed by Lord Derby's agent some years ago, but had never been used for ordinary sewerage purposes. Two of the men, under the direction of the surveyor, entered the sewer, with instructions to return immediately if they detected the presence of any noxious gases. Another of the men, who was standing at the bottom of the manhole, complained of poisonous gases, and it began to be feared that the two men who had entered the sewer had been suffocated. The man in the manhole shouted for assistance, which was promptly volunteered by two chimney-sweeps, who entered the manhole, and, though they suffered considerably from the poison, succeeded in bringing out one of the men, who was in an apparently lifeless state; he afterwards recovered. The brave chimney-sweeps (whose names are James Johnstone, master, and William Pover, journeyman) again descended into the sewer, and, although nearly overcome by the impurity of the gases, they succeeded in finding the other man (Thomas Lee), and were dragging him out, when one of them fell down exhausted. The other with great difficulty carried his "mate" to the manhole, and tying him to the rope, had him hoisted to the surface. Meanwhile another manhole was opened, down which two other men descended, and shortly afterwards succeeded in bringing up Lee, who was conveyed to the Bootle Borough Hospital in an unconscious state. He was partially restored to consciousness, but died three hours after admission. An inquest was opened on the body of Lee on the 20th inst., when Mr. Pennington, Lord Derby's agent, was present, and evidence was given by Mr. George Biddle, the borough surveyor, who stated that the sewer had several times before been inspected up to the point where the accident occurred, but the men had never gone beyond that. It did not occur to him that there might be noxious if not inflammable gases in the sewer, because the men had been at work in it for several weeks. The coroner (Mr. C. E. Driffield) expressed it as his opinion that the surveyor had left too much to the discretion of the men, and the jury considered that the Corporation were more or less to blame for not having Lord Derby's plans of the sewer. In the end, however, a verdict of "Accidental death" was returned. All honour to the sweeps!

CHURCH-BUILDING NEWS.

Stretham.—The parish church, Stretham, in the Isle of Ely, has been reopened, after being closed for two years, for purposes of restoration. Great alterations have been made in the church. The old gallery has been removed, two transepts have been added, the north aisle widened, and a new arcade made on the north side, an organ-loft added, and new seats in every part. With the exception of the Norman buttresses, the whole church is in the Decorated style. The parts that have been destroyed were of the fifteenth century, and it is now, as one of the speakers after luncheon put it, "a new church with just a trace of the old."

Cheltenham.—Progress is being made towards the erection of the new parish church for Cheltenham. Plans and specifications have been obtained from Mr. Christian, architect, White-hall-place, London, and tenders have been invited from builders for the erection of the church.

Dunster. — The parish church of Dunster, Somersetshire, was reopened on the 13th inst., after restoration under the direction of Mr. G. E. Street, R.A. Nearly the whole of the walls have been pulled down and rebuilt with sand-stone, from the Lodge-rocks quarry. In the east wall a dilapidated late Perpendicular window, which had been partially blocked up, was taken out; and in taking down the walls, stones of a thirteenth-century window were found, some of which had been made out of stones which had been used in the Norman work. The window has been restored as in the thirteenth century. The roof is of oak, and the greater part is new. A number of tiles, representing the arms of various families, were found among rubbish under the floor, and their designs have been copied in making new ones, with which the whole of the chancel has been paved. There are no less than forty-five different varieties. The original high-altar slab was found in the north aisle of the parish church, where it was used as a monumental stone. It has been replaced on columns of Blue Anchor alabaster, and it also has an alabaster super-altar and reredos. The altar-steps are also of alabaster, and the effect of the whole of the work in this material is very striking. The fine monuments of the Luttrell and Everard families have been completely restored. On the north side, at the entrance of St. Lawrence's chapel, the ancient table monument of the Mohuns, with recumbent effigies, has been repaired. St. Lawrence's chapel has been entirely rebuilt, and the altar-slab, with its five crosses, and one on the centre of the broad face of the stone, has been fixed in its proper position. The wood and stone carving has been done by Mr. Harry Hems, of Exeter, and the contract has been carried out by Messrs. Hales & Sons, Salisbury. The cost has been 8,000*l.*

Binton.—The newly-rebuilt parish church at Binton was consecrated a few days ago by the Bishop of Worcester. The original church at Binton, judging from some few remains of Norman date which existed in the north walls of the nave and chancel and other parts of the fabric, must have been erected at least as early as that period, or it may have been rebuilt on Saxon foundations. No remains, however, of any stonework indicative of so early a date have been discovered. The chancel and south side of the nave had been by no means successfully restored in the seventeenth century. With the exception of these last restorations, however, which of course had to be taken down, the whole of the walls were in such a dilapidated condition that it had become a necessity to rebuild them entirely. The tower, an interesting specimen of twelfth-century work, was built also on very insecure foundations, and although of inconsiderable height, was much out of the perpendicular, and being only secured from falling by a church-warden buttress of huge dimensions, rebuilding became a matter of necessity. The church, as rebuilt, being of larger size in every respect than the old one, increase in height in the new tower became also imperative; the whole of the old features, however, in the latter have been, as far as practicable, retained in the new work. The church, as rebuilt, consists of a nave, 46 ft. long and 23 ft. wide, and chancel, 30 ft. long by 18 ft. wide. There are also north and south transepts, the south transept forming vestry and organ-chamber. The tower is placed, as formerly, at the south-west angle of the nave, and the lower part forms an entrance-porch, the upper portion consisting of ringing-chamber and belfry. The nave is divided from the chancel by a moulded stone arch springing from triple-shafted corbels, with carved capitals. The windows of the nave and the sides of the chancel have traceried heads of Early English geometric character. The general contractor was Mr. William Porter, of Malvern. The pulpit and carvings were executed by Messrs. Martyn & Emms, of Cheltenham. The architect was Mr. Frederick Preedy, of London. The total cost of the building has been 3,000*l.*, 2,000*l.* of which were contributed by the Marquis of Hertford.

Walsall.—After much renovation and repair in continuation of the work begun some eight years ago, this church was re-opened for Divine service on the 17th inst. The interior has undergone a complete restoration. The cast-iron windows have been removed and replaced with stained glass in various devices of lead fret glazing. The walls of the nave are now coloured partly a cream colour, with the dados of the floor and gallery painted in cinnamon, relieved in diaper work of pale-brown, with bands of pink and green, the window arches being relieved with a Gothic trefoil ornament. The ceiling is coloured a light azure blue, relieved with grey and pale yellow. The gallery fronts are coloured purple-grey, with the mouldings relieved with several neutral tints. The chancel walls are executed in diaper-work of different designs in various neutral tints, chiefly in pink and maize united with bands worked out in ribbon patterns. The hood-moulding to the window is relieved with blue and gold, and the triple arches are surmounted with a gold band with the text "Holy, holy, Lord God Almighty," executed in blue and vermilion. The reredos is executed with a purple groundwork enriched with corona ornaments and monograms in gold relieved with green and red. The side portions are executed on a light-red ground, relieved with crimson devices with green bands. The present work, which will cost about 800*l.*, has been entrusted to Mr. G. B. Nicholls, architect, Handsworth, the builder's work having been carried out by Mr. J. Adkins, of Walsall, the stained glass windows executed by Messrs. Camm, of Smethwick, and the decorative work by Mr. Gee, of Stafford.

DISSENTING CHURCH BUILDING NEWS.

Barnstaple.—A new chapel for the "Bible Christians" was opened at Barnstaple on the 6th inst. The building is situate in Bear-street, and has been built from the designs of Mr. W. C. Oliver, architect. The materials used in the construction are Marwood stone, with Bath stone dressings, and the style chosen is the Early Geometrical. The columns in the doorways are of polished red granite. Welsh slates cover the roofs, surmounted by red ridge tiles. The capitals, corbels, bosses, &c., have all been carved by Mr. Harry Hems, of Exeter, and his assistants. The whole of the work has been carried out by the various contractors,—Mr. John Pulsford, for the stonework; Mr. Vicary, for the carpentering; and Mr. Bevan, the walling,—all of Barnstaple, under the immediate supervision of the architect.

Endon.—The services in connexion with the opening of the new Wesleyan Chapel at Endon were commenced on the 14th inst. The total expenditure has been 1,700*l.* The architect of the building was Mr. William Sugden, of Leek.

Dalston.—The Congregational Church, Middleton-road, Dalston, was re-opened on the 21st inst., after alterations and improvements, which include the erection of an entire new frontage, built of Kentish rag stone, and containing four entrances, with lofty turrets on either side. The interior of the building has undergone considerable improvement. The organ has been removed to the ground-floor, and the gallery at the south end so altered as to be more in accordance and in unison with the interior generally. The walls have been re-decorated. Mr. J. Brown, of Finsbury, was the contractor; Mr. C. Pertwee, of Chelmsford, being the architect.

Northampton.—On the 18th inst. the foundation-stones of a new Wesleyan Chapel to be erected in Regent-square, Northampton, were laid with due ceremony. The building will replace the chapel fronting Grafton-street, and will be built in a plain Italian style, from the design of Mr. S. J. Newman, of Northampton. The front will be of red pressed brick, with Bath stone dressings enriched with ornamental brickwork of various patterns. There will be accommodation on the ground-floor for 419 adults, and in the galleries for 306 and 87 children, making a total of 812 seats. The whole of the seating, rostrum, and gallery front are to be of polished pitch pine. Beneath the chapel there will be an infants' schoolroom, in size about 35 ft. by 22 ft., containing a gallery to accommodate seventy children. There will also be five class-rooms in the basement, each 11 ft. high, together with storing-closets and chambers fitted up with heating apparatus. There are to be two vestries on the ground-floor at the back of the chapel, under the organ-gallery, to which there is a back staircase communicating with the minister's vestry. Mr. John Watkin, the builder, has contracted to complete the works by April next. The total cost will not be far short of 4,500*l.*

Sale.—A new Unitarian chapel was opened at Sale on the 21st inst. It consists of a nave, without aisles; transepts, apse, organ-chamber, vestry, and vestibule at the west end, with principal entrance from Atkinson-road, having a turret above the porch and a minor entrance on the north side. The chapel is built with ashlar dressings to the doors, windows, &c., and Yorkshire wall-stones, lined with brick inside, and plastered, the style being plain Geometric Decorated. There is accommodation for 250 persons. The seats and other joiners' work are of pitch-pine, stained and varnished. The pulpit is of oak, with Caen stone base, having seven marble shafts grouped round it, the lower part being presented by Mr. Hobbs, carver. The contract was taken by Mr. J. Birch, of Manchester, and the works have been carried out from the designs of Mr. J. G. Elgood, architect. The cost will be about 3,000*l.*

ACCIDENTS.

New Law Courts.—Last week Thomas Walker, of Wiltshire, expired in King's College Hospital, in great agony, from the effects of a fall from a scaffold at the New Law Courts in the Strand. The deceased, who was 26 years of age, ascended the scaffolding, and on reaching the upper portion, a height of over 50 ft., he suddenly stumbled, and fell head-foremost. In his descent he struck a portion of the scaffolding, and fell with a crash on his face. On his removal to the hospital, the surgical officials found that he had sustained shocking injuries, his face being battered in and his thigh-bone broken.

British Museum.—Chas. Rice, a messenger in the British Museum since November, 1837, was going up the back stairs of the building, when he was seized with giddiness, and fell over the hand-railing from the third landing to the hall floor beneath. He was picked up insensible, and sent to the hospital, where he died directly. The hand-rail was about 3 ft. high, which was the usual height. Mrs. Elizabeth Rice, the widow, said that the deceased was subject to fits of giddiness.

Holborn.—On the 20th inst. an inquest was held by Mr. W. J. Payne at St. Bartholomew's Hospital upon the body of James Hibberd, a carpenter, who died from injuries received through a fall whilst employed in rebuilding the premises of Mr. J. Morgan, hosier and shirt-maker, High Holborn. Walter Penfold, a carpenter, stated that he was in the employ of Mr. J. B. Axford, Henry-street, Gray's-inn-road, by whom the deceased was also employed. At half-past eleven on the previous Saturday, he and deceased were working at the premises, 323, High Holborn, on the top floor, inside the house. Deceased was standing on a stool about 4 in. in width. The stool went over, and deceased fell through a well-hole, and was precipitated from the top floor to the basement. The well-hole was 14 ft. by 4 ft., but a portion of it had been boarded up, leaving a space of about 4 ft. square. The deceased fell a distance of from 60 ft. to 70 ft. The jury returned a verdict of accidental death, and expressed their opinion that care ought to be taken in future to prevent a recurrence of similar accidents.

Freemasonry and Archæology. — The brethren of the Falcon Lodge of Freemasons, Thirsk, with an eye to architectural study, are at present endeavouring to form an archæological section. In the immediate neighbourhood there are no fewer than 100 churches, abbeys, castles, and historic sites worthy of examination, and it is thought by the brethren that these places of interest might in turn be visited, with the additional advantage of having their more remarkable details sketched and indicated by professional gentlemen who are or may become members of the lodge.

SCHOOL BOARD SCHOOLS.

Dumfries.—Two new public schools erected by the Dumfries Burgh School Board were opened on the 4th inst. The one situated in Loreburn-street was built from plans prepared by Mr. Kinnear, architect, Dumfries. It will accommodate 500 children, and cost, exclusive of the site, about 3,770*l.* There are two distinct departments for boys and girls, and the school-rooms are provided with appliances for heating and ventilating. The new street at present being formed from Loreburn-street to the Lovers' Walk will run past the school. The St. Michael-street school is erected on a feu of St. Michael's Glebe, and the plans were prepared by Messrs. A. Crombie & Son. It will accommodate 400 scholars, and cost, exclusive of the site, about 2,800*l.* A new street is also being formed from Craiga-road to the Almshouses on Broom's-road, and the principal frontage of the school is towards this new street.

Beeley.—The new Board schools at Beeley, which are being built by Messrs. Collins & Callis, of Tewkesbury, from the designs of Mr. John Cotton, Birmingham, architect to the Board, are progressing rapidly. The building was commenced in April last. The work is being carried out under the direction of Mr. Cotton, the architect.

Edgwick.— New Board schools at Edgwick have been taken possession of by the Foleshill School Board. The buildings are situated at the corner of the Edgwick-lane, and front the main road from Coventry to Bedworth. Facing the highway is the infant school, 40 ft. by 29 ft., with class-room 22 ft. by 23 ft. Adjoining the class-room is a porch, 16 ft. by 6 ft. At the rear are the girls' and boys' schools, the former being first. It is 39 ft. long, part of it being 33 ft. wide, and the remainder 20 ft. wide. The class-room is 16 ft. by 20 ft., and the porch attached, 15 ft. by 6 ft. The boys' school, class-room, &c., are of similar dimensions. In each porch there are lavatories. The buildings are of red brick, with blue brick bands and dressings. The roof is of bands of blue and brown tiles, with ornamental ridges and finials. There are two main entrances from Edgwick-lane, which will be fitted with iron gates and piers. The work has been done by Mr. G. Storer, from plans prepared by Mr. A. H. Byrd, the outlay being about 2,000*l.*

Burslem.—The Board have just opened their new schools, which are the first they have erected. The new buildings, of which Mr. G. B. Ford, of Burslem, is the architect, have been erected by Messrs. Matthews, of Hanley. They are situated in the North-road. The three departments have each a large school-room with two class-rooms, the combined area of the latter being equal to the former. The girls' and infants' school-rooms and class-room enclose three sides of a quadrangle. The quadrangle itself, being roofed, forms a covered playground, which will not only be found a very valuable adjunct, but can at any time be used as a school-room, capable of accommodating 200 additional children. The boys' schoolroom and class-rooms are comprised in a block apart from that of the girls and infants, being severed therefrom by a three-story building, in which provision is made for a care-taker and teachers' retiring-room, and in the basement of which is a vault for the warming apparatus. Externally the buildings are faced with red bricks, and the roofs are covered with tiles, ornamentally arranged. Internally the walls are faced with red bricks, the lower parts of which are arranged in patterns of various coloured bricks, terminating along the top with a band of tiles. Special attention has been paid to lighting, warming, and ventilation. The windows are placed high up. Flues, for the admission of fresh air, on the "vertical principle," without causing draughts, have been constructed within the walls, and the whole of the rooms and covered playgrounds are warmed by hot-water with pipes placed beneath the floors, so as not to form obstructions. The accommodation provided is for 160 boys, 160 girls, and 260 infants, being a total of 580. The builders' contract, which includes fencing, asphalting, galleries, water-fittings, and care-taker's house, is 3,914*l.*; warming, 156*l.*; making a total of 4,070*l.* In addition to the furniture and other requisites with which the schools are supplied, provision has been made for gymnastic exercises. These appliances have been designed and manufactured by Messrs. Charles Spencer & Co., of London, and they include the well-known giant's stride, parallel bars, a jumping-stand with weighted cord and indicator, contrived to obviate accidents, and a compact portable apparatus which, under the name of pangymnasticon, combines trapeze-bar, ladders, swarming rope and pole, stirrups, and swing, and ingeniously provides for a great variety of athletic exercises appropriate for children.

MASTERS AND MEN.

Dumbarton.—At a recent meeting of the master joiners of Dumbarton with a deputation of their workmen, it was agreed to grant an increase of ½d. per hour on the rate of wages.

Glasgow.—The latest phase of the Glasgow joiners' strike, which, although formally ended, is (according to the *Scotsman*) being still continued in secret, shows rather a curious development of trade unionism. It is said that on the men having resumed work, "a picket" of the leaders was told off to visit the shops of the city with the view of ascertaining whether those who laboured in them were unionists. In cases where men were found who did not belong to the organisation, they asked that they should at once consent to the enrolment of their names. During this shop-to-shop visitation, they alighted on several so-termed "renegades," and they not only demanded that these should return, but that they should each pay a heavy fine. When this was refused, the sum, which was at first fixed at 1*l.*, was gradually raised, and in the end they usually managed to obtain the money. The course adopted when unable to secure their terms by argument, was to advise the union men to cease work. In several instances the masters have received intimation from the men to that effect, but as yet the operatives have managed to gain their ends without resorting to the extreme measure of striking.

Belfast.—The workmen of Messrs. Harland & Wolff, iron shipbuilders, Queen's Island, Belfast, have been out on strike for the past month. On the 16th inst. there was a meeting of the reconciliation committee, and it appeared that all the trades on strike, except three, had passed resolutions giving unlimited power to the council to settle the dispute, but that the three others would not go further than their previous proposition, which was, to split the difference and allow 50 per cent. of the demand of the employers.

HOUSE AND HOME IN TOWN.

SIR,—Those of your readers who take an interest in the future—or indeed in the present—welfare of our great metropolis will be grateful to you for returning to the subject of house and home in the heart of town, and for having given so much attention to it for so long a time.

The evils attending house-building and house-occupation in great cities are caused mainly by the want of information, and by the wrong-headed prejudice of those who live in them; and there can be little doubt that the moment a demand for well-built and convenient houses arises the supply will follow it; and that if tenants show themselves desirous of living in houses on what you have termed the horizontal system, speculators will eagerly turn their attention to them.

I have under my supervision a district of London in which many poor persons live in badly-constructed old houses. These are being renewed from time to time; but I find that it is only public bodies which replace the present two and three storied tenements by lofty well-built houses in flats. The speculators all build small houses, again,—better ones, it is true, than the old ones, but all of them adapted only for single families, yet sure, almost without exception, to be occupied as lodgings by many families. I believe that this pays better, there being no kind of prejudice against the private houses, and a strong prejudice against dwellings of the Peabody and Waterlow type. Nobody is really deceived into believing that the whole house belongs to the poor fellow who has the first-floor front, or to the widow who has the back parlour, but it is a kind of amiable fiction that it might be supposed by their friends, if the poor souls have any, that this is the case. At any rate, a prosperous and successful artisan of their own class, if he did live in a house all to himself, would occupy one of these; and hence the feeling that being in a private house looks like prosperity. As we all know, a different feeling exists in Paris, and the lofty well-built houses of that capital are the outcome of it. If, either by the spread of better knowledge among the people, or in consequence of a good example set by the middle or upper classes, a popular prejudice in favour of some sort of residence built to be let out in flats and rooms can be made to take the place of the prejudice against such residences which undoubtedly exists, it will be a good day for London. Cannot the approaching Social Science Congress take up this question? It is one not limited to London, but more or less calling for attention in many of our cities and large towns; and a change in public opinion is what is wanted. A DISTRICT SURVEYOR.

THE STATE OF MY HOUSE.

SIR,—After considerable trouble in looking over some dozens of modern-built residences in what is considered a salubrious suburb of the metropolis, I found one that seemed rather better than the others, and well fitted as a home for my little family.

Before taking it, I informed the proprietor that a stipulation that the sanitary matters were in order, or would be made so, was desirable. Well, after entering into possession, several obnoxious features were gradually disclosed, upon which it is the purport of this communication to seek advice.

If it had been a mere personal affair, affecting the pocket alone, I would not have ventured to inflict a detail of grievances upon you, but it concerns the health and well-being of little ones precious to me; and, moreover, my house is, I may vouch for it, only a type of many others, notwithstanding our boasted sanitary advance; and the question really belongs to tens of thousands. To proceed: in a day or two horrid smells pervaded the house at uncertain times, apparently issuing from beneath the basement floors and the scullery sink. On setting in action the valve of one water-closet a gust of vile air meets the face, whilst another closet is endowed with the property of perpetually evolving stench. The pipes of sinks are covered, of course, with the well-known bells dipping into an eighth of an inch or so of water. My water supply is rendered foul by contact with the metropolitan sewer, through agency of the ubiquitous waste-pipe of the cistern.

As to proper ventilation of apartments and underground low-ceilinged rooms, I have not found it, neither expected, that London builders had reached such a stage of reformation. The practical point is this,—that my landlord does not admit sanitary defects, and consequently will not remedy them. Now, does there exist any public authority to which I can, with hope of success, appeal for redress? Also, is there any Act of Parliament, and if so, under which clause can action be taken for nuisances within a dwelling from which private individuals suffer, and not the outside public? And lastly, if remedy does exist, practically enforceable, how may I avoid the consequences that may be anticipated on endeavouring to compel a stubborn landlord to perform his duty?

A HOUSEHOLDER.

THE PRICE OF BRICKS.

SIR,—A little more than thirty years ago there was a duty on bricks of 6s. 6d. per 1,000. Immediately on the bricks being packed in clamp for firing, the Excise officer entered the brickfield, took dimensions of the clamp, and demanded the amount of duty, the manufacturer taking the risk of burning; and where the fire did not act the bricks were of an inferior character, and, being unfit for good work, were sold at a very reduced price. Under these circumstances men of slender means were unable to undertake such a business, consequently none but persons of capital could manufacture the article. Still, under these disadvantages, the price of bricks was little more than half their present price.

The duty at the time referred to being considered a burden on the community, and pressing heavily more especially on the working-classes, the Legislature, with the view of affording relief by reducing the cost of house-building, and consequently leading to a reduction in rent, determined upon taking off the duty: the consequence was that in the year 1854, when I was engaged in building some small houses at Millwall, Poplar, the stock bricks were charged, including water carriage, 25s. per 1,000; and place at 16s. I now find the same kind of article,—stocks, 45s.; place, 28s.

Now, how is this extraordinary advance in price to be accounted for? The manufacturer may plead the advance in wages, but that is not

a tithe of the amount pocketed by the manufacturer. The fact is, brick-making has become a monstrous monopoly, and it is high time something should be done to break it down; for, doubtless, it is the principal cause of much of the depression experienced in the building business at the present time. And were it not for the number of Board schools and public buildings now in hand we should have thousands of willing hands out of employment. When bricks were cheap capitalists found house property a good investment, but now find a better market for their money.

SURVEYOR.

ST. JOHN'S, STUTTGART.

THE architect of the St. Johanneskirche, Stuttgart (see *Builder*, p. 929), is Herr Oberbaurath von Leins, at present director of the excellent Technical School, the Polytechnicum. Among his works may be mentioned the Kœnigsbau at Stuttgart and the King's Villa at Berg. Herr von Leins, besides being one of the first architects in Germany, is well known for his ability, painstaking zeal, and kindliness, as professor in the Polytechnicum. Several of the rising architects of Würtemberg have been trained in his office.

L. BRISBANE BROUN.

STRIKE OF BRICKLAYERS AT MESSRS. DOULTON & CO.'S NEW BUILDINGS, LAMBETH.

AT the corner of High-street, Lambeth, Messrs. Doulton & Co. are erecting a building about 35 ft. square and 110 ft. high, to be used as show-rooms and studios in connexion with their art pottery. On the Albert Embankment, about 200 yards distant, they are also erecting two large buildings, each nearly 85 ft. square and 100 ft. high. These buildings are being faced with red brick, considerably ornamented, especially the former, with red and buff terra cotta and Doulton ware in combination. Owing to the generally elaborate character of the terra-cotta at the High-street building it was found necessary to employ two skilled workmen to set it. At the buildings on the Embankment bricklayers have hitherto set nearly the whole of the terra-cotta, but here also it may be necessary to employ skilled workmen for some parts of the work.

The two terra-cotta fixers engaged were originally plasterers, but for many years past they have been chiefly employed in making and fixing terra-cotta. They fixed the terra-cotta at the late Turkish Baths, Victoria-street, Westminster (about sixteen years ago); at the South Kensington Museum, where they worked nearly two years; at the Horticultural Society's Gardens, South Kensington; and at various other places. Hence there is nothing new in their being now employed in fixing terra-cotta at these buildings. In fact, their trade is now that of makers and fixers of terra-cotta, and from their long practice and experience in this particular work they have acquired a skill and aptitude in it which bricklayers and others new to it do not possess. It is well known that articles in clay warp and twist in drying and burning. For this reason artistic care and precision must be brought to bear in fixing them, in order to produce and maintain continuous horizontal and vertical lines, and even faces. Where such is not exercised, the resulting work is generally unsatisfactory. The hand and the eye, in fact, must be trained to this work, the same as in other art-work, in order to arrive at perfection in it.

On Monday morning last all the bricklayers employed on these buildings struck work, without notice, until the two "plasterers," as they call them, who were fixing terra cotta at the High-street building, were discharged. On the same day, Mr. Coulson, secretary to the "Operative Bricklayers' Society," called at the Office on the works, and handed in the following letter:—

"Operative Bricklayers' Society,
Executive Council, General Office,
No. 25, Hatfield-street, London, S.E.
25th Sept., 1876.

"MESSRS. DOULTON & CO.—We are informed by the bricklayers employed on your works that you have put plasterers to do the fixing of 'terra cotta' in brickwork, which, being contrary to the custom of the trade, and being bricklayers' work, we, therefore, hope you will allow the bricklayers to set the terra cotta with their ordinary work.—Yours respectfully, E. COULSON, Gen. Sec."

The generally ornamental character and difficult nature of some parts of the terra-cotta in all the buildings were pointed out to Mr. Coulson; and he was told that bricklayers, who had hitherto fixed nearly all the terra-cotta at the buildings on the Embankment, should continue to do so, but that for the particular and difficult portions of the work it might be necessary to employ skilled workmen such as those objected to. But neither reason nor argument in the matter appears to have had any influence with the "Operative Bricklayers' Society," who have decided that the bricklayers shall remain out on strike for the senseless object as stated above, and have picketed the works to prevent if possible other bricklayers being employed.

LYME REGIS, DORSET.

SIR,—The misplacement of a comma in my son's communication making it obscure to Mr. Skinner, the following letter will clear it up to himself and your readers. The death-rate for this town exceeding in numbers the total average for all England, warrants the assertion of an annual holocaust of victims; and can Mr. Skinner deny, in the teeth of my letter, that they are in effect, though not perhaps directly, poisoned?

THOMAS HAWKINS.

Copy.

"Lyme Regis, Sep. 4, 1876.

SIR,—In your last report of what ought to be called the insanitary state of Lyme Regis, you observe that 'the Inspector of Nuisances has not reported any nuisance during the year, but I cannot assert in consequence that there are none.'

It were amazing if you had, seeing that the town suffers from the decomposing shales on the foreshore east, and on the west from the asmephitic cement-works. I denounce them to you,

THOMAS HAWKINS.

Dr. D. S. Skinner,
Medical Officer of Health for Lyme Regis."

THE PNEUMATIC DESPATCH COMPANY'S STATION AT ST. MARTIN'S-LE-GRAND.

LAST week the building materials of the Pneumatic Despatch Company's Station, situated in the yard of the General Post-office, St. Martin's-le-Grand, were sold by auction by direction of her Majesty's Commissioners of Works. The building, which was only recently erected, is at the entrance to St. Martin's-le-Grand and Aldersgate-street, and immediately opposite Newgate-street. It is faced with Portland cement, and has two frontages, at the corner of Cheapside and Aldersgate-street respectively, extending into the yard of the General Post-office, to a depth of about 36 *ft.* The building has been sold, for removal in consequence of the enterprise having proved a failure. It may be remembered that the company constructed tunnels or tubes between their station at the General Post-office, and the Euston Station, Oxford-street, and Camden-town, for the pneumatic conveyance of parcels to and from each of those points, but the trucks containing the parcels continually stuck in the tubes, the result being that the company's operations came to grief, and the project was, some time ago, compulsorily abandoned. The whole of the interior fittings were included in the building which has just been sold, and it is stated that the original cost of the whole was about 1,000*l.* The biddings of the sale, however, showed that a mere nominal value was put upon the property. The whole was sold in one lot. The first offer made was 5*l.*, and the property was ultimately knocked down at 38*l.*!

THE WARMING AND VENTILATION OF CHURCHES.

HAVING read the letter in the *Builder* under the above heading, I agree with your correspondent that some more effectual method is needed.

There are only two systems generally adopted for heating large buildings,—those of hot air and hot water. In the former plan air is often passed over iron plates, or through the tubes of an apparatus heated by a furnace to a temperature of 590° or 660°, thence, by means of calliducts to gratings, whence it escapes into the building.

In the hot-water system, a pipe rises from the boiler, traverses the places to be warmed, and returns to terminate at the bottom of the boiler. Along this tube the heated water circulates, giving out its heat as it proceeds; if one part of the building is colder than another the heat can be increased by coils, or by increasing the number of pipes: thus, one 2-in. pipe, with a threeway-syphon, will feed three 4-in. pipes. The heat can be regulated in any particular range of pipes by means of valves.

In the hot-air system, the number of gratings at which the heated air escapes is very limited, the air is super-heated, so that immediately it enters the building it disturbs the equilibrium of the atmosphere, causing an endless amount of draughts. The hot-water system, when not properly applied, is subject to the same difficulties. At a church near Manchester the clergyman always complained of a draught at the reading-desk. This was owing to the chancel not being heated, the pipes in the body of the church causing the air to ascend. As a natural law, the cold air in the chancel set in to supply the place of warm ascending air. This continued until alterations were made in the apparatus. A coil of pipes was placed behind the communion-table, the heat from which equalised the ascending current, and entirely dispensed with the draught.

To have an equable temperature in a large building, warm air should rise on every side; and I contend that it is absurd to expect to heat a church or chapel, calculated to seat 600 or 700 people, with the heated air rising from a grating 3 ft. square. Of course, the efficiency of any form of hot-water apparatus greatly depends on the boiler, which should be so constructed as to expose the greatest amount of surface to the fire in the smallest space, to absorb the heat from the fuel so that as little as possible escape up the chimney; to allow a free circulation for the water throughout the entire extent, and not be liable to get out of order by constant use.

In the hot-air apparatus the furnace soon burns away, as would a teakettle without water in it. The sulphur gets through the cracks to the air-flues, and thence into the building; then comes the expense of new apparatus, &c.

WM. WOLSTENCROFT.

WARMING HOUSES.

THE best method consists of an apparatus placed on the basement floor, and it may be fixed either *within or without* the building or house, being provided with a flue, to carry away the smoke arising from the fuel consumed in it. Around it, a chamber or hollow space is then built, leaving a small channel open at the base, through which the atmospheric air enters, becomes warm and rarified, and is admitted at pleasure into the different apartments by valves, which regulate the supply. Nothing can be more simple, or less liable to be deranged by time or accident. The area occupied need never exceed a square yard, and it may be fixed in a few days. To obviate any apprehensions that might be entertained from air heated by a metallic body, the air may be heated by passing over a surface of pure porcelain or earthenware, and by a small addition may also be rendered available for the fumigation of apartments, and the air supplied be impregnated with the requisite degree of moisture or perfume. Any kind of fuel may be used, and from the rapidity of the draught the flue never requires cleansing. This plan is recommended for theatres, barracks, public halls, churches, gaols, &c., and for all-sized houses.

JAMES BRUCE.

THE CANTERBURY PALACE.

SIR,—Favour us with space in your next number to mention that the elevation shown in your artistic engraving of this building in your issue of the 16th inst. (p. 905) was carried out by Mr. William Schofield, now senior member in the firm of SCHOFIELD & Co.
Steam Stone Saw Mills.

*** We have received a letter from a correspondent, dating from Reading, claiming to have "done" (whatever that may mean), "under the late Mr. A. Bridgman, the Entrance of the Canterbury Palace; also the principal approaches, plans, and ideas, taken by me from Paris houses." We decline, as a rule to recognise such claims.

Paintings in Berlin.—With reference to our recent article on the Exhibition at Cologne, we are reminded that the fine mural paintings in the new Museum at Berlin are by the great Kaulbach himself,—Wilhelm Kaulbach, not his son. They are not frescoes, but paintings in the *wasserglass* (water-glass) process,—the process which was used by Maclise and Herbert in the Houses of Parliament.

PENMON PRIORY.

SIR,—Having had occasion recently to be in the neighbourhood of Penmon, in the county of Anglesey, I was informed that there was at that place a most interesting ruin,—that of an ancient priory; and that on the neighbouring island of Priestholme were the remains of a cell attached to the same.

I accordingly found time to visit the place, and found, as reported, some most interesting remains. The priory church is restored, and used now for divine service; and exhibits, particularly in the south transept and in the tower-arches, some fine Norman work. The other buildings, too, are most interesting,—one being a peculiar pigeon-cote of the time of Henry VIII. As my stay was very short, I could take no accurate dimensions, nor was there any one to supply information. I hope, therefore, that some one of your correspondents may be able to send some particulars of this most interesting ruin.

G. H.

TRADE CUSTOMS.

IN the case, Simpkin *v.* Ludlow & Whitley, at the Wednesbury Police-court, the defendants are nut and bolt makers, of Darlaston, and were summoned by the complainant (late in their employ) for not supplying him with work according to contract.

Messrs. Ludlow did not deny the refusal to give the work out, but contended that, being short of orders, they, according to custom, were not compelled to find their men work.

Mr. Spooner, the stipendiary, said such a custom, if it existed, would be unjust and cruel; but, without entering into the custom of the trade, he had no hesitation in saying the law was on the side of the men, and he found for the complainant, on the ground that the notice formed part of the contract.

Judgment for the complainant, with costs against the defendants.

THE ENDOWED GRAMMAR SCHOOL AT ODIHAM.

THIS school was re-opened on the 11th inst., in the new buildings raised by the governors under a scheme framed by the Endowed Schools Commissioners. The site is in that portion of the town situate east of the church, and running parallel to the south of the High-street, known as "The Bury." The style is that of the Domestic Tudor Gothic, the material being red brick pointed black, with Bath-stone quoins, gable copings, finials, and door and window dressings. The roof coverings are old tiles, and the spirelet of the turret is surmounted by a gilt vane. The principal school-room, about 55 ft. by 20 ft., with open ribs sustaining the roof, plastered between the principals and purlins, is lighted by large traceried windows in the north and south gables, and two smaller windows to the east. There is a large class-room and dining-room, and these three principal apartments are finished in red brick with a struck white joint on a deep dado faced in Portland cement. The gas-fittings in the school and dining-room are by Hart, Son, Peard, & Co., of London. There are three lofty, well-ventilated and lighted commodious dormitories, lavatories, and bath-room, besides the master's residence, which is fitted for a moderate family. The original contractors were Newman & Son, of Winchester, for the sum of 3,295*l.*, but out-buildings and fencing have largely increased the amount. On the failure of the contractors, their sureties (Mr. H. W. Frampton and Mr. T. H. Burton, of Winchester) were called on by the governors to finish the half-completed works. Mr. E. Woodthorpe, of London, was the architect.

Books Received.

Encyclopédie d'Architecture: Revue Mensuelle. Paris: Morel & Co.

THE September number of this periodical contains, in addition to several of its ordinary engravings, twenty-three pages of lithographs, illustrating more or less the twelve designs for the proposed Paris International Exhibition Building, to which premiums were awarded. The author of each design has appended some brief descriptive particulars.

Miscellanea.

Working Lads' Institutes.—On the 21st inst. a deputation, headed by Mr. J. E. Saunders, a member of the Corporation, waited upon the Lord Mayor at the Mansion-house, on the subject of working lads' institutes. They stated that the condition of the lads of London of thirteen years of age and upwards, engaged as apprentices, errand-boys, porters, and factory hands, deserved, as they thought, the earnest attention of philanthropists. Their day's work usually ended about seven in the evening, and they were not expected at their homes or lodgings until ten. In the interval where were they and what were they doing? Hundreds might be seen loitering about public-houses, while many more were in music-halls and theatres. The proposal of the deputation was to provide in different parts of the Metropolis "Working Lads' Institutes," which would form comfortable places of resort for the evening and supply pure and useful literature in the place of that which they found was now ruining so many. Each institute would be open all the evening, and associated with it would be a reading-room, library, class-room, a savings bank, and a clothing club. A register of "Situations wanted" would also be kept. The subscription would be nominal. It was proposed to start an experimental institute in Whitechapel, and it was estimated that the outlay in fitting it up and maintaining it the first year would be 800*l.* Towards this sum 200*l.* and upwards had already been subscribed. The Lord Mayor expressed the pleasure with which he listened to the proposals of the deputation, and agreed to grant them the use of the Long Parlour for a public meeting on Friday, the 27th of October.

The Asphalte Roadway in High Holborn.—High Holborn was closed against vehicular traffic on Monday last for the relaying of the asphalte by the Val de Travers Asphalte Company. The state of the roadway has lately been most dangerous to traffic, there being holes and "waves" almost throughout the entire length of the asphalte, which extends from near the end of Gray's-inn-road to a little beyond Chancery-lane, and the Holborn District Board of Works have had to serve notice on the company to put the roadway into proper repair, according to their contract with the Board, within fourteen days, which time expired about three weeks ago. The company have found that the only way to put the roadway into thorough repair is to take up the present asphalte and lay down new material on a different kind of bedding to that down. The thoroughfare will be closed for nearly three weeks. The present asphalte was laid down five years ago, at a cost of about 15,000*l.*, and the company contracted with the Board to keep it in proper repair for fifteen years for 100*l.* a year. It is believed that it has cost the company much more than this amount every year to put the material in repair, and yet it is continually getting into a bad state. The cost of laying the new asphalte will fall entirely on the company.

Mycenæ.—Dr. Henry Schliemann gives in the *Times* of September 27th interesting particulars of his latest excavations on the site of Mycenæ. After describing some of the things found, he says, in conclusion,—"In carefully examining these sculptures, I find in the representation of all the animals, but particularly in that of the horned one, so great a resemblance to the style of sculpture in the lions above the entrance-door, that I think they must belong to the same epoch, viz., about 1200 B.C. To the same time will probably belong all the Treasuries of Mycenæ, that part of the circuit walls at the Lion's Gate, and the gate itself. If, then, as we did at Tiryns, we fix the chronology of the idols with the birds' heads at 1400 B.C., this will probably also be the age of the circuit walls of carefully carved and fitted polygons, while that part of the walls which consists of huge boulders joined with small stones is probably contemporaneous with the walls of Tiryns, which we supposed to be of about 2000 B.C. Homer repeatedly calls Mycenæ πολύχρυσος (rich in gold), and the great wealth of the city is certainly confirmed by its numerous Treasuries and the costly style of their architecture. But the question naturally arises how the city obtained its gold at that remote period when there was no commerce as yet. It appears, indeed, that it cannot have obtained it in any other way than by powerful piratical expeditions to the Asiatic coast."

Antiquities at Amsterdam.—A correspondent of the *Morning Post* says that there is at the present moment an exhibition in Amsterdam which shows the popularity of antiquity hunting and collecting with the Dutch people. A well-known architect and antiquary of the town bethought himself of starting a loan collection of antiquities, and when the owners came to be applied to there was an *embarras de richesses*. The Museum Van der Hoop, where the loan collection is exhibited, is a large building, but all its suites of rooms are filled with objects of the utmost interest, and its walls are crowded with pictures of the Dutch school, foremost among which figure the works of Rembrandt. There is what purports to be a *fac-simile* of the printing of Coster, whom the Dutch claim as the inventor of typography, though it is held to be very doubtful whether he used movable types at all. There is, of course, much old china, and ceramic ware of various kinds. Perhaps, however, the most interesting part of the exhibition is the rooms which have been fitted up exactly in the style of the sixteenth and seventeenth centuries respectively, and, moreover, with the actual furniture and ornaments of those epochs—old plate, old pictures, old carved cupboards, old ironwork, and old crockery.

Exhausted Parish Lands.—One of the last Acts passed in the recent session was to make provision for the disposal of certain lands appropriated for the supply of materials for the repair of public or private roads. Before issuing their order for the sale of exhausted or other lands, the Local Government Board are to hear and decide upon every objection and claim made within three months from the passing of the resolution for the sale, and shall either refuse to sanction the sale or allow it. Disputed claims may be settled by proceedings in the High Court of Justice, or, when the value in dispute does not exceed 50*l.*, in a County Court. In dealing with the produce of the sale the Board is to appropriate the same as far as practicable to the repair of highways, or in some permanent improvement of the highways, or to direct the same to be invested; "and the said Board shall have the like power of dealing with the produce of the sale of lands under the Highway Acts, if applied to by the surveyor of highways, or any authority exercising the powers of such surveyor, where such produce cannot be conveniently appropriated in the manner provided by those Acts." The word "parish" has a large application as to highways in this statute.

A Chain for Melbourne.—In recognition of public services rendered by Councillor A. K. Smith, Mayor of Melbourne, a number of his private friends and fellow-citizens have subscribed the amount necessary for the purchase of a mayoral chain. A departure from the usual course has been made in this instance, and instead of waiting until Councillor Smith's year of office expires, the chain was presented in sufficient time to permit its being worn for at least one quarter of the term. The chain has been manufactured by Messrs. Joseph Brothers, from the design of Mr. J. B. Cohen, A.R.I.B.A. It consists of a chain of long band-like links, divided into two at the lower part, and supporting five lockets, graduated in size, of Gothic design, of the *vesica piscis* form, and bearing in open floriated letters the inscription "Mayor of Melbourne, 1875-1876." It has been manufactured entirely of 18-carat gold, and weighs 21 oz.

The Proposed New Hospital for Wakefield.—A day or two since, the committee of the Clayton Hospital and Wakefield General Dispensary met in the Board Room, at the present hospital, for the purpose of accepting tenders required for the various works in connexion with the proposed new hospital. Some time ago the committee purchased for 4,500*l.* about two acres of land near St. John's, belonging to Mr. R. B. Mackie, and upon this land is intended to be built a new hospital, from the designs of Mr. Bakewell, Leeds, at a cost of nearly 14,000*l.*, exclusive of the site. About 14,000*l.* have already been raised towards the new building. Tenders were accepted for the various works, which are to be proceeded with as soon as possible.

Industrial Exhibition at West Hartlepool.—On the 21st. inst. an exhibition of fine arts, industrial products, natural and artificial curiosities, models, paintings, &c., in connexion with the local lodges of Good Templars, was opened in the Athenæum, at West Hartlepool by Mr. I. L. Bell, M.P.

Overcrowding at Maidstone.—When the London, Chatham, and Dover Railway built their station at Maidstone, about fifty houses were pulled down, and the inhabitants were forced to seek shelter elsewhere. The overcrowding in small houses which resulted from this wholesale demolition was evil in every way, and now we learn that these evils will be intensified, inasmuch as the house property between the London and Chatham station and the Brigade Depôt Barracks will shortly be pulled down, without any provision being made for the tenants. It is (as the *South-Eastern Gazette* remarks) a pleasant thing to see "people dwell together in peace," but to get three families in a small house would be neither pleasant nor peaceful. Unless something, however, is done, human gregariousness in small houses will soon resemble the domestic economy of the rabbit family. The question is, however, what is to be done? Houses of the description required scarcely pay the speculative builder for his outlay. Our contemporary suggests that the local Cottage Improvement Society should enlarge its basis of operations, in order to meet the difficulty.

Noxious Vapours at Warrington and Widnes.—The Royal Commission to inquire into the noxious vapours caused by chemical and other works begins its operations in Warrington and Widnes the first week in October, under the presidency of Lord Aberdare. Dr. Richardson has been engaged during the last few days in collecting evidence for the commission, and in order to give the commission a most complete detail of the alleged injuries caused by the noxious vapours to the crops and land, the landed proprietors of this part of the county have subscribed over 1,500*l.* to be devoted to the collecting of evidence and other incidental expenses connected with the commission. The Warrington Town Council have resolved to obtain an injunction against the Bank Quay Spelter Works for creating an offensive effluvium detrimental to vegetable life in the locality, and the company have asked for an extension of time in which to obtain an apparatus to remove the nuisance complained of. The Council have granted them a period of six months, but upon the distinct understanding that during that time the offensive manufacture must be entirely stopped.

Hard Water.—At the meeting of the British Association at Glasgow, Professor Wanklyn read a paper "On the Effects of the Mineral Substances in Drinking Water on the Health of the Community." In the course of the discussion which followed, Dr. Carr observed, with respect to Kent water, which was very hard, that it contained a large percentage of lime, and was very wholesome for young persons. The children of Kent were singularly staight-legged, and it was well known that lime readily assimilated in the system and created sound bone. Professor Wanklyn said that Kent water was, as a rule, as pure organically as distilled water. Hard water was, it was true, good for children, as they required lime in various shapes, but it was very doubtful whether later in life hard water was so good for those who partook of it. In reply to Mr. Groom Napier, Professor Wanklyn said he had heard that hard water introduced goitre, but he could not say that was so without further inquiry.

Discovery of an Ancient Celtic Inscription in Shetland.—The *Scotsman* says that a remarkable antiquarian find has been made by the Rev. J. C. Roger, of Lerwick, while on a visit to the parish of Luinnasting. He observed in the possession of a cottar a stone with an inscription, which a closer inscription showed Mr. Roger to be distinctly Ogham. The man stated that he had recently come upon it 5 ft. below the surface in a peat moss, a considerable distance from any habitation. Mr. Roger obtained the stone, and has it now in his possession at Lerwick. Its length is 3 ft. 8½ in.; breadth, 1 ft. 1 in.; thickness, 1½ in. The inscription (which is in admirable preservation) is cut on one of the flat sides, and runs almost down the centre, arranged on either side of an incised line. There are thirty-eight separate characters, and from the appearance of the stone itself and the engraved marks, the inscription appears to be intact.

The Esplanade at Ryde, Isle of Wight. The Ryde Town Council has just passed a resolution for a joint application of the Council and the St. Helen's Board to borrow funds to extend the esplanade to Sea View, which, it is estimated, would cost nearly 23,000*l.*: of this about four-fifths would fall upon Ryde.

The New St. Vincent's Bridge, Cork.—The Cork Town Council, on the 15th inst., selected the design of Mr. Francis O'Connor, C.E., Ennis, Co. Clare (motto, "Resurgam"), for the new St. Vincent's footbridge to span the Lee from Grenville Quay to the North Mall. There were thirty-six competitors. Mr. O'Connor's design (to which a premium of 50*l.* was awarded) consists of a continuous lattice girder supported on two sets of cast-iron cylinders, screwed into the bed of the river, dividing the span into three bays, the centre opening being 80 ft., and the two side openings 29 ft. each, with four ornamental cast-iron pillars at the ends of girders, and over each of the centre piers. The roadway is formed by cross girders, having patent road plates fastened on them, the whole covered with cement concrete. Estimated cost complete, 1,120*l.* Messrs. Walker & Ring, civil engineers, acted as professional advisers in the selection of the design.

A Neglected Burial Ground.—Attention has been drawn to the disgraceful condition of the disused burial-ground of St. James's, Piccadilly, situate in the Hampstead-road. Dr. Eastes, the medical officer of health of St. Pancras, found on visiting the burial-ground in question that it was in a very neglected condition, being overgrown with rank weeds, whilst the tombstones and monuments which are erected in different parts of the ground are passing rapidly into a state of decay, without any attempt to save them being made. Close to the edge of the ground where it is bordered by houses, the inhabitants have evidently considered the "neglected spot" as a convenient dust-bin, and have consequently thrown refuse of all descriptions into it.

Playgrounds for Children.—It ought to be generally known, says the *Lancet*, that the playgrounds of all Board schools are open to the children of the poor in the summer months, after school-hours. It would also be well if the time were extended, and the police were instructed to make the parents of the little creatures who crowd the courts and alleys of great cities acquainted with the boon provided for them. Not only is life endangered, and too often sacrificed, by the habit of allowing children to play in the streets, but the risk induces many of the poor to keep their children in-doors, or turn them into dark and dismal back-yards, where the healthful conditions essential to growth and development are impossible.

Cremation in Germany.—A Berlin correspondent states that the municipality of Gotha have, by permission of the Ducal Government, allowed the introduction of cremation, and accepted a sum of 15,000 marks offered by the Cremation Society for the purpose of building in the new cemetery an oven on Siemens's principle. From the statute simultaneously drawn up we learn that cremation can either take place at the express wish of the deceased, or of his relatives, on the district doctor having attested that death has ensued by natural causes. The ashes will, after cremation, be collected in an urn and either handed over to the relatives or preserved by the authorities in a place appropriated for them in the churchyard.

Interesting Discoveries near Thirsk.—The *Darlington and Stockton Times* states that within the past few days some interesting relics have come to light during the progress of the restoration of All Saints Church at Pickhill, near Thirsk. During the progress of excavating in the chancel, a large figure of a knight in chain armour and cut in stone was found face downwards just below the pavement. The figure has its legs crossed. The arms are over the breast, together with a shield and a sword, and it is supposed to belong to the early part of the thirteenth century. An Anglo-Saxon Memorial Cross and stones of Anglo-Saxon date have also been discovered, as well as a representation of the Day of Judgment in colour on the walls.

The Royal Academy.—The *Athenæum* understands that a Committee of the Royal Academy is shortly to be formed to take into consideration the better lighting of the exhibition-rooms in Burlington-gardens, and with a view to the immediate improvement of one or more of the rooms in that respect, so that the work may be completed for the next exhibition. The rumours, which have been frequently spread of late, that there would be no more exhibitions of old masters' pictures by the Royal Academicians, are, so far as the coming winter is concerned, incorrect.

The Prince's Indian Collection.—The exhibition of his Royal Highness the Prince of Wales's loan collection at the India Museum, South Kensington, closes to-day (Saturday). In order to give the inhabitants of the East End an opportunity of seeing the Indian presents, his Royal Highness has directed that they should, on their removal from the India Museum, be exhibited for two or three months in the Bethnal-green Museum. His Royal Highness has further instructed Lord Lyons to communicate to the Duc Decazes his Royal Highness's intention to exhibit his Indian collection at the French Exhibition of 1878.

Kent Archæological Society.—The council of this society have resolved to hold their next annual meeting in Thanet. It is expected that the gathering will take place in July. The programme will include a visit to the Reculvers (the ancient Regulbium), Minster Church and Abbey, and, if possible, the spots connected with the supposed landing of Hengist and Horsa, together with that of St. Augustine, at Ebbs Fleet, and Cottington. Lord Granville has expressed his intention of erecting some appropriate monument on the site of the oak under which St. Augustine is traditionally supposed to have first met King Ethelbert, and which is included in a field recently acquired by his lordship.

A Good Templars' Hall at Brotton.—On the 18th inst. a Good Templars' hall was opened at Brotton. It is in the Italian style of architecture, and consists of a large hall for public meetings, a spacious lodge-room, reading-room, and committee-room. Adjoining is a dwelling-house for the hall-keeper. The entire cost is 1,600*l.* The architect was Mr. Hunter, of Middlesbrough; and the contractors Mr. John Dixon, Saltburn; Mr. James Peak, Brotton; Mr. Boddy, Loftus; and Mr. Dickenson, Middlesbrough.

Asphalte.—The tender of the Brunswick Rock Asphalte Paving Company was accepted for paving the floor of Messrs. Gilbey's new wine premises, Chalk Farm-road. The ground-floor of this warehouse contains 21,150 superficial feet, and is laid with 1 in. Brunswick Rock asphalte, and 6 in. concrete, especially for bottling wine. Mr. John Carden, of Acton, is the contractor, and Mr. S. Mead foreman of works. The floor is nearly completed.

Medals.—To Messrs. Chubb & Son, London, whose exhibit of fire-resisting safes and gunpowder magazines attracts considerable attention at the International Exhibition, Brussels, a medal and an honourable mention have been awarded. ——Mr. Joseph Hamblet, of West Bromwich, whose exhibit there of blue bricks we had occasion to mention, has also received a silver medal.——And so has Mr. Gordon, C.E., of whose plans, &c., we spoke.

Exhibition of Sanitary and Educational Appliances.—Such of our readers as propose to apply for space in the Exhibition about to be opened in Liverpool in connexion with the Social Science Congress (Oct. 11th), should do so immediately, as the applications are already numerous enough to fill the greater part of the available area. The Mayor of Liverpool will probably be invited formally to open the Exhibition.

By Railway to Central Asia.—The Russian Government is pushing on its new railway works, which are to connect Europe with Central Asia, with great vigour. It is announced that the construction of the new line from Samara to Orenburg is making such rapid progress as to make it probable that it will be fit for traffic as early as December. The line will then have been carried up to the boundary separating Europe from Asia.

A Japanese Appointment.—Mr. R. A. Biggleston, who has filled the position of practical engineer at the Royal Harbour, Chatham, under the Board of Trade, for the last ten years, has been successful in obtaining an appointment under the Imperial Japanese Government at Yokohama, Japan, as inspecting engineer of lighthouses, at a salary of 400*l.* a year.

Birkbeck Literary and Scientific Institution, Southampton Buildings, Chancery-lane.—The fifty-fourth session of this Institution will commence on Monday next. The Chancellor of the Exchequer has consented to preside at the fifty-third anniversary and distribution of prizes, which will be held at the beginning of November.

Church Extension in Leeds.—At a meeting of Churchmen, held in Leeds a few months ago, it was determined to raise a fund of 100,000*l.* towards church extension in the borough. Of this amount nearly 60,000*l.* have already been contributed, and the sites of several new churches to be built in various parts of the town have been procured.

Temple Bar.—The City Corporation has, by 69 votes to 45, resolved to remove Temple Bar, with the exception of the northern and southern walls, postponing for future consideration how the boundary of the City's jurisdiction at that spot shall be marked.

White Lead direct from the Ore.—Mr. J. C. Martin has invented a process for the manufacture of white lead direct from the ore. The *Mining Journal* says that the new product is completely amorphous, of good colour, and will doubtless find a ready market.

London University College.—We are asked to state that though the session begins on the 3rd prox., as named in our recent paragraph on the subject, the architectural lectures are not to commence till Thursday, the 17th prox.

Society of Engineers.—At the first ordinary meeting of the Society for the session, to be held on Monday, the 2nd of October next, a paper on "Stone Sawing Machinery," by Mr. Henry Conradi, will be read.

American Slates.—In reply to our correspondent, "R. W.," we believe Messrs. G. Guy & Co., of Lombard-street, are the chief importers of American slates in this country. Samples can always be seen at their office.

Chatham College of Military Engineering.—Mr. T. Roger Smith will, during the ensuing winter, give a short course of lectures on architecture to the students of the College of Military Engineering at Chatham.

TENDERS

For completion of house at Wallington, Surrey:—

Broadbridge	£650	0	0
Ridge & Kings'and	648	0	0
Owen	447	0	0

For grammar school at Mansfield, Notts. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Govell:—

Hodgson & Fecon	£10,547	15	6
Stephenson	10,157	0	0
Slight & Hind	10,007	0	0
Kirk & Parry	9,386	0	0
Fast	9,270	0	0
Bell & Son	9,168	0	0
Marriott & Co.	8,800	0	0
J. & W. Pattinson	8,255	0	0

For erection of vicarage-house, St. John the Evangelist's, Brownswood Park, Hornsey. Mr. Ewan Christian, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Colls & Son	£1,746	0	0
Brass	1,690	0	0
Ennor	1,620	0	0
Dove Brothers	1,575	0	0
Manley & Rogers	1,567	0	0
Adamson & Son	1,545	0	0
Williams & Son	1,540	0	0
Tyerman (accepted)	1,534	0	0

For main drainage (districts A and E), Southampton, Mr. James Lemon, engineer. Quantities by Mr. J. G. Poole:—

Bull & Sons	£2,564	0	0
Crook	2,544	0	0
Hayter	2,500	0	0
Nichols	2,472	0	0
Stevens (accepted)	2,256	0	0

For the erection of two houses, for Mr. Gruning, at Beulah-hill, Norwood. Mr. W. E. Browne, architect:—

Brealy	£2,573	10	0
Taylor & Son	2,537	0	0
Colliver	2,495	0	0
Beadle	2,211	0	0

For building St. Martin's Vicarage, Brighton, for the Rev. R. T. Salmon, M.A. Mr. Somers Clarke, jun., architect:—

Deacon	£3,980	0	0
Lockyer	3,925	0	0
Cheesman & Co.	3,690	0	0
Lynn & Sons	3,635	0	0
Patching & Webber	3,545	0	0

For a detached house at Sutton, Surrey, for Mr. Nye. Mr. H. R. Cotton, arch.tect:—

Keal	£1,260	0	0
Cuff	1,269	0	0
Tomkin	1,143	0	0
Potter (accepted)	1,045	0	0

For alterations at the Duke of Norfolk public-house, Westbourne-grove, for Mr. Austin. Mr. J. C. Dear, architect:—

Bryant	£600	0	0
Cohen	556	0	0
Lamble (accepted)	514	0	0

For repairs and decorations at the Yorkshire Stingo public house, for Mr. James Bennett. Mr. W. Nunn, architect:—

Hanley	£193	0	0
Lamble	153	0	0
Cole	134	0	0
Grimwood & Sons	134	0	0
Coney	107	0	0

For the erection of a detached house at Enfield, Middlesex, for Mr. Henry Cox. Mr. W. J. Worthington, architect:—

Cowland	£2,270	0	0
Lamble	2,163	0	0
Patman	2,060	0	0
Linzell & Son	1,800	0	0

For new schools, for the London School Board, on Queen's Park estate, Harrow-road. Mr. E. R. Robson, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Grover	£9,712	0	0
Pritchard	9,367	0	0
Kilby Brothers	9,291	0	0
Williams & Son	9,234	0	0
Crockett	9,035	0	0
Tongue	9,020	0	0
Wall Brothers	8,977	0	0
Boyce	8,949	0	0
Attchison & Walker	8,879	0	0
Hook & Oldrey	8,850	0	0

For alterations, additions, and repairs, to Batt's Hotel, Dover-street, Piccadilly, for Mr. B. Rawlings. Mr. Charles Sewell, architect. Quantities supplied:—

Howard	£2,293	0	0
Stimpson	2,235	0	0
Newman & Mann	2,170	0	0
Scott	2,157	0	0
Higgs	2,069	0	0
Curtis	1,970	0	0

For the erection of a villa residence at Chislehurst, Kent, for Mr. Owen Edwards. Mr. Joseph S. Moye, architect. Quantities supplied:—

Manley & Rogers	£4,760	0	0
Keyes & Head	4,589	0	0
Newman & Mann	4,589	0	0
Grover	4,283	0	0

For the erection of a Baptist Chapel at Lower Norwood, for the Building Committee. Messrs. Edmond Power & Wheeler, architects. Quantities supplied by Mr. Walter Barnett:—

Cook & Green	£9,031	0	0
Aitchison & Walker	8,534	0	0
Hill, Higgs, & Hill	8,511	0	0
Ward & Son	8,100	0	0
Bayes Brothers & Allen	7,863	0	0
Tarrant & Sons	7,612	0	0
Dove Brothers	7,386	0	0
Colls & Sons	7,095	0	0
Newman & Mann (accepted)	6,911	0	0
Bracher & Sons	6,358	0	0

For taking down and rebuilding No. 2, Royal Exchange-avenue, for Mr. Reuben Bibbard. Mr. John Whichcord, architect. Quantities supplied by Mr. W. Barnett:—

Scrivener & White	£7,541	0	0
Jackson & Shaw	7,468	0	0
Phelps & Bisiker	6,995	0	0
Clarke & Bracey	6,934	0	0
Ashby Brothers	6,761	0	0
Ashby & Horner	6,715	0	0
Macey	6,660	0	0
Newman & Mann	6,441	0	0

For the erection and completion of eight houses and shops fronting High-street and Kentish-town-road, Camden-town, exclusive of excavating site. Quantities supplied by Mr. F. Thomson. Mr. H. H. Bridgman, architect:—

Wall Brothers	£7,534	0	0
Manley & Rogers	7,313	0	0
Crockett	7,200	0	0
Scrivener & White	7,178	0	0
Niblett & Son	7,172	0	0
Kelly Brothers	7,037	0	0
Grover	6,983	0	0
Willson Brothers	6,964	0	0
Hunt (accepted)	6,600	0	0

For the erection and completion of two houses and shops, Kentish-town-road, at the corner of Union-terrace, Camden-town. Quantities by Mr. W. Barnett. Mr. H. H. Bridgman, architect:—

Hunt (accepted), schedule.

For the erection of a pair of semi-detached villas, Tooting-road. Mr. Alfred Wright, architect. Quantities supplied:—

Lost & Co.	£3,150	0	0
Sharpington & Cole	2,787	0	0
Bush	2,590	0	0
Phelps & Rice*	2,459	0	0

* Accepted for increased size of houses, 2,695*l.* 14*s.*

For building two shops in the Milkwood-road, Camberwell, for Mr. Havill. Messrs. Habershon & Pite, architects:—

Judd & Hawkings	£1,993	0	0
Holloway	1,995	0	0
Taylor	1,899	0	0
Jenkins	1,300	0	0

TO CORRESPONDENTS.

Manchester (a considerable extent of wood-pavement has been laid down in Piccadilly. It is so tight that travelling over it is like travelling on a drum. We do not give this, however, as one of its merits, as the "hum" is at times not agreeable. We cannot give addresses).—W. F.—H. C.—T. W.—W. G.—A. G.—E. G. C.—E. J. T. J. P.—Mr. H.—G. R.—R. S.—W. C. S.—E. C. D.—W. A.—R. E.—J. P.—R. W.—T. H. J. S. H.—Junior Clerk.—T. R. S.—L. B. B.—S. R. L.—J. W. S.—H. K.—H. & O.—B. & Son.—A slater.—H. R.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

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Street Architecture: Social Aspects.

THE Social Science Congress to be held next week in Liverpool, a new feature has, as our readers are aware, been introduced into the programme, by the formation of an Art Department, in which papers will be read relating especially to the influence of art upon society in its material and mental conditions. This idea of an art department may or may not be a permanent extension of the scope of the Social Science meetings. In the present year it is a local ordination, suggested apparently by the fact of the approaching completion of the Art-Gallery in Liverpool, and the stir which has recently been made about art in that centre of commercial enterprise. Among those who are responsible for the success and utility of these annual meetings there is, we believe, a fear lest discussions on art, if once admitted as a permanent part of the scheme, should drift into considerations quite foreign to the original objects of the Congress, and of very doubtful practical utility; nor can we say that such fears are groundless. But so far as architecture and what may be called domestic art are concerned, we cannot see but that these subjects have a proper *locus standi* at a Social Science meeting, considering that they are so much connected on the one hand with science (sanitary science especially), and on the other hand with social well-being in one at least of its aspects.

The heads under which art is to be considered at the Congress next week are four:—1. As to the best methods of securing the improvement of street architecture, especially as regards its connexion with public buildings; 2. As to the encouragement of mural decorations, especially frescoes; 3. The influence of academies on the art of a nation; 4. The influence upon society of decorative art and art-workmanship in all household details. The first-named subject is one which naturally connects the art section with the main objects of the Congress, and therefore very fittingly stands first. For the improvement of street architecture depends in a great measure upon considerations which are in the strictest sense scientific and social. Before anything can be done with the improvement in the picturesque of street architecture upon a satisfactory basis, it must first be seen that the method of building fulfils the conditions of health as nearly as can be arrived at. And the increased expenditure upon really sanitary building, over what is now expended upon average street architecture, would in a great many cases run away with all the funds which might be available for decorative building, consistently with a remunerative expenditure. For it is to this last economical question that the improvement of street architecture must in the end return. Even if the great work were accomplished of scotching the lower class of speculating builders, and getting house-building into more honourable and less greedy hands, there must still remain the fact that the great portion of street architecture in towns must consist of structures on which capital is expended in order to get a return for it in the shape of a respectable interest on the outlay. Every man cannot build his own house, for his own comfort and after his own taste; the building capitalist is a necessity, and his existence is dependent on his getting his percentage. What sort of result these conditions have led to we know very well: houses ill-built, ill-ventilated, ill-drained, the only object of which, in the mind of their builder, is that they should look well enough externally to tempt persons who are able to pay the required amount of purchase-money or rent. In some cases, perhaps, the builder gets a disproportionate profit, and he is then, at least, morally responsible (if he ought not to be considered so in all cases) for having deliberately fabricated dishonest and rickety buildings, to the injury of the public health. But, considering the influence of competition, we may perhaps assume that the speculative builder in most cases puts his rents as low as he can afford to do with any reasonable profit to himself. There is therefore to be deduced the uncomfortable corollary, that the amount of expenditure on average street dwellings at present is not sufficient to render them properly healthful and permanent structures; and that the additional funds will have to be found by the public, unless they can be met by any more economical and yet sound and satisfactory method of construction.

In regard to this latter alternative there is certainly not much to hope for. The question of concrete building, which seems the only important suggestion for a change on a large scale in the method and material of average house-building, has been thoroughly considered of late, and its discussion seems at least to have established the fact that any material gain in the way of economy by the constructive use of concrete is out of the question; that, in short, good concrete building, like good brick building, costs money; and the cost of the subsidiary drainage arrangements, &c., is the same in both cases. Nor can it be said that the use of concrete would help us at all in the direction of pleasing or picturesque effect in our streets, however it may be susceptible, in certain cases and with a good deal of care and trouble, of special decorative treatment. The one way of reconciling the two requisites of economy and solidity in ordinary house construction seems to us to lie in the direction of the kind of combination of tenements within one set of walls, the advantages of which for modern town building we have discussed pretty fully. Such a system presents a chance for making solid building and thorough sanitary arrangement remunerative, by realising a more economic distribution of material in proportion to the number of tenements, and at the same time dividing the increased expenditure more evenly between owner and tenants than would be possible on the separate-house system to which habit has wedded us; though with a proper construction* the separation of tenements can be almost as effectually maintained, if not quite, as when every house rises from the ground as a separate structure. It is, as has been before pointed out, little more than the difference between vertical and horizontal dividing-walls. The necessity for greater concentration of dwellings, in some way or other, in our large towns, is another argument in favour of this system. Some of the "diseases of modern life" have been traced to daily journeys to and from the place of business.

The same system which would, as we believe, enable sound construction to be carried out economically, would also on the same grounds open the door for a more decorative and architectural treatment of the dwellings suitable for those of moderate means who form so large a proportion of the inhabitants of town houses. In regard to the architectural treatment of the better class of street houses and of street architecture generally, this of course would come under the same influences as to style which are operating, or may operate, upon the architecture of the country at large. There are, however, one or two considerations which specially touch street architecture. Being composed almost entirely of buildings in which the utilitarian element is predominant, street architecture is necessarily bound up, or should be, with utilitarian and practical considerations. It is of no real service, for instance, to talk about "skyline," and to make numerous pointed gables to the street, to emulate the effect of Mediæval towns, if it can be shown statistically that such a method of roofing is neither economically nor practically the best for modern purposes or for safety; a hint which is further applicable to other points in modern street architecture. And, on the other hand, there can be no doubt that too much legislation on street architecture has often an unnecessarily injurious effect upon the aspect of modern streets, cramping and effacing individuality of taste or the application of special design to special ends. In the present condition of building morality, Building Acts are an absolute necessity; but they should be so framed as to leave as free a course as possible for variety of architectural treatment, concerning themselves rather with ensuring that what is built shall be well built or constructed, than with imposing limits on new or varied ideas in the arrangement and design of structures. How prejudicial the influence of Building Acts is to the picturesque aspect of a town there can be little doubt; indeed, if we were to take, say, one of Prout's views in a North German town, full of picturesque and piquant incidents of building, and were to copy it, omitting everything that a London or Liverpool Building Act would forbid,

* Sound construction and scientific arrangement are however, absolutely necessary to make anything satisfactory of a combination of tenements in one structure; and the hand of the architect rather than of the jerry-builder is required in the matter. When we speak of the speculating builder being a necessity in average house-building, of course we mean merely the capitalist who invests his money in this way, and who is very often also the builder in the more literal sense.

we should probably find that almost the whole quarter had vanished under the process.

In the discussion of this question the difficulty thrown in the way of solid and noble building by the prevalence of short leases must not be forgotten. In former times houses were built to last as long as was possible; they were to be "possessions for ever." In the present day, as Carlyle said (contrasting the brickwork of his own house in Cheyne-row with that of the modern builder's "desirable residence"), the bricks are evidently made to last out the leases, and no more. There is no doubt that the more rapid changes and shifting in the nature and value of modern town sites render it difficult to determine, sometimes, where a permanent building can be erected with security for its future; but it is much to be regretted that a system of tenure should prevail which actually suggests temporary and ephemeral rather than permanent and solidly-built structures.

The question of street architecture is, in the prospectus of the Social Science Congress, qualified by the words "especially as regards its connexion with public buildings"; a rather vague phrase, the import of which is not quite clear. If it refers, however (as grammatically it certainly does) to the relation between street arrangement and the placing of public buildings, that is an important subject in connexion with the realisation of architectural effect in towns, and one which with us is much neglected. Buildings constantly lose, in English towns, half the effect they might otherwise have, through the neglect to place them so as to be effective, or even to arrange street lines so as to provide for them the possibility of an effective site. As the Congress will meet at Liverpool, it is not inappropriate to instance the injury done to what, with all its mistakes, is no doubt the finest building there, St. George's Hall, by its having been built so as to front up hill instead of down hill. The effect formerly was to put the building in a complete hole, as seen on its principal (eastern) flank; and though this has since been altered by raising the platform on which the building stands to a level with the adjoining street, this has only been at the expense of the loss of the lower half of the great flight of steps which, according to the architect's idea, was to lead up to the portico, and form a kind of eminence for the building to stand upon. One difficulty in relation to the placing of public buildings is that it so frequently happens that a site is arranged, and a square or a group of streets laid out, before there is any decisive idea as to placing a great building on the ground; and it has afterwards to be placed, not as well as it might be, but as well as it can be under the circumstances. This is sometimes unavoidable, but not always; in some cases a certain amount of forethought is all that is necessary to ensure a fine effect which, once the opportunity let slip, can never be secured. Whenever changes in the lines of route in a town take place, or a new line of streets or a new square is planned, there should be some thought taken as to the possible use that may be made of the site for a large building, some effort to provide adequately and effectively for what is likely to be done. There is more thought given to this in London than there used to be; we have noticed no indication of a similar foresight in large provincial towns, however.

The question "how best to encourage mural decorations, especially frescoes," which forms the second section in the Art Department, is one of great interest. We have so long urged the desirability of bringing art into the council chamber and the market-place, that we are not likely to be misunderstood if we warn enthusiasts against expecting too much at first from such a proceeding. But it must not be forgotten that the deliberate effort to revive art by the revival of this or that process is a very different thing from the existence of art as a living reality, a natural growth of the time. In the Italy of the fifteenth century the demand for art of the type indicated was a part of the very life of the people; the artist's work was produced because he needs must produce that which was in him, and because the whole people looked to him for what was almost a necessity of life as then existing. Browning, who more than any other contemporary mind in this country has realised the spirit of the days of Italian art, has suggested in a few picturesque lines the kind of inevitable and spontaneous out-growth of art which characterised the Florentine life of that period, in the passage where Luria, the Moorish commander of the Florentine troops, complains that, once peace restored, his merely military genius will have no place or recognition any longer:—

> "Fl rences at peace, and the calm studious heads
> Come out again, the penetrating eyes;
> As if a spell broke, all resumed, each art
> Y a beast, more vivid that it slept a-while
> Against the clod heaven, o'er the white palace-front,
> The interrupted scaffold climbs anew;
> Inc wa s are peopled by the painter's brush;
> The statue to its niche ascends to dwell."

The real business of life (which painting, especially, was in those days) goes on spontaneously the moment the temporary pressure of war is removed. The artist desired then, as we desire for him now, opportunity to display his power on a great scale; but the demand was not then made on the plea that such opportunities would encourage and foster art and what is called "a taste" for art: it was made because the art was there in presence and in power, and demanded room for its exhibition, and would take no denial. The question of the suitability of fresco-painting for this climate is still in an inconclusive stage; but without considering that point, which does not affect the broad principle of the matter, it is well to recognise the truth that the re-development of mural decoration of this type, though it would assist in raising and stimulating public taste for pictorial design, and afford to some highly-gifted modern artists opportunities which they well deserve to have, cannot be expected, in the nature of things, of itself to revive the spirit of the great age of painting, because it is, in fact, the reverse process of that which produced the glories of Italian art; it is not the spontaneous expression in painting of the desire of the heart and of the eyes, it is the artificial grafting upon the modern mind of the external expressions of art, in the hope that thereby the modern mind will be attuned to and brought into harmony with them. This in itself would be much; but the process is one which is apt to include what is artificial and unreal, as indeed we already see in attempts that have been made to popularise art in this fashion. We have, for example, external pictorial decoration of buildings in tiles, or occasionally in mosaic, in which figures in the garb of another age are delineated, with the intention of illustrating the purpose of the building. This is very much the kind of thing which was done when painting was the universal exponent of the mind of the people; only *then* the costumes of the day would have been used, which were picturesque, as life itself was picturesque in a sense in which it no longer seems to be: *now*, the whole thing seems to most people an anachronism, and instead of exciting admiration and public interest, this kind of pictorial decoration seems to be merely regarded as an odd whim, and is usually the object of wonder or of a few facetious comments from passers-by, who stop to inquire what is the meaning of it. One practical or semi-practical obstacle to giving to such artistic work a real interest lies in the unpicturesque character of modern costume, which leaves the artist in the dilemma of either making his group merely archæological, or of dealing with shapes and hues the most unfitted for painting, and for decorative painting in particular. We hope suggestions will be made at the Congress which will bear on these difficulties in the way of resuscitating what was once an art of real and vivid public interest: we must wait to see.

Nothing seems to be specially suggested in the programme of the Congress as to the development of sculpture as an accessory to the art of cities; yet, in relation to public buildings especially, there can be no art more important in its bearing upon architectural effect on a great scale. The mischief has too often been that when sculpture has been made an important element in an architectural design, it has been used too profusely, and executed with too little regard either to the intellectual interest or the executive excellence of the work. Sculpture may no doubt be used in a merely decorative manner to produce an *ensemble*, without challenging too much attention to the expression and design of individual figures; but this is not using it in a very worthy manner, and the art under these circumstances is in fact very liable to degenerate into mere stone-cutting. The ideal of sculpture in association with architecture seems to be that it should be (unless almost unlimited funds are forthcoming) rather sparingly employed, but in its highest form, as the culminating interest at some important points of the building. To scatter a number of mediocre figures over a building to produce an effect is a very unsatisfactory expenditure of means and material and labour. There may be opportunities, however, though but rare in these days, for employing the higher forms of sculpture without stint upon the decoration of a great building. One such opportunity exists which there is a special suitability in calling attention to at this moment. Whilst the question of art in relation to public buildings is being debated next week at the Social Science Congress, it may perhaps hardly occur to most of those who are to be engaged in carrying on the discussion, that the building in which they will meet is one of those which most imperatively demands and offers opportunity for the application of the art of the sculptor. Although St. George's Hall at Liverpool has for a quarter of a century been considered by Liverpool people the great architectural boast of the town; though it is admitted by less partial critics to be the finest instance of the application of Greek architecture to a modern building, it has remained all this time incomplete, and that in a most important point. Its exterior is almost entirely deficient in the sculptured decoration intended by the architect as the source of life and expression and picturesque effect in the building. Most of those immediately interested in it seem to be unaware of this. They do not know that the dark spaces between the square columns at either end of the principal flank are intended as the background to throw out statues intended to be set on the blocking placed ready for them in the screen-wall between the columns. They are not aware that the large square slabs or projecting panels of rough-finished stone beneath these colonnades and in other parts of the building, are no permanent part of the design as contemplated by the architect; that these dumb stones are only waiting for the hand of the sculptor to waken them into life and interest as bas-reliefs. St. George's Hall has been called cold and bare in appearance; it may well be so, when it wants the very means by which this effect was to be counteracted and the highest touch of interest given to the building. A great deal has been said about art in Liverpool lately; an art-gallery has been given to the town, pictures are being presented for it (some say with more zeal than judgment), and so on.* Here, however, is lying ready to the hand of the art-patrons of Liverpool one of the finest opportunities possible of encouraging one of the noblest forms of art,—the use of sculpture as an accessory of architecture, simply by completing the building which has all these years remained unfinished and lacking its true and crowning graces. There is opportunity here for high-class figures, on an heroic scale, between the columns, and for emulating the art of Flaxman in the bas-reliefs for which the stone is waiting. By promoting the completion of St. George's Hall in this manner the Corporation would be doing good work for the advancement of art and the credit of their town. Upon some of the other subjects included in the programme, the influence of academies and the influence of decorative art upon society, we may have something to say when the proceedings are published. In the mean time we hope the Art Section will not separate without something being done or spoken in regard to the completion (better late than never) of the building in which they will assemble; and may point out that if any Liverpool Mæcenas desires to follow some of the liberal examples that have been set in the town, and to immortalise himself by giving 20,000*l.* or so to encourage art, he could find no better and more suitable object than the artistic completion of Elmes's great building.

THE TOWN-HOUSE AT HOME AND ABROAD.

One of the delights of Continental travel to Englishwomen, and to some Englishmen, is the pleasure experienced in reaching home again. The Insular wife and mother has enjoyed in Paris or Vienna, hotel-life, *café*-life, garden-life, and out-of-door life, of every description, but no home-life; and she draws the rapid inference that "home," both in name and fact, is exclusively English. Her self-congratulation,—her delight at getting back to "the Square"—though sometimes chastened by the conviction

* One or two of the most recent purchases, considered as works intended to occupy a permanent Gallery of Art, are really quite deplorable. It is not sufficient to spend money upon art: it must be spent on the right objects, otherwise it is better not spent at all.

that four of the servants must leave at the first opportunity—has something in it of Pharisaical scorn and pity for the social Publicans of neighbouring cities, and another tongue. To her, the whole course of life in Paris seems to resemble that probationary term of existence led by the British bachelor, from the time of leaving his maternal moorings to that of accepting another form of feminine bondage. She knows that her Bertie and Sydney, who, in the season, stand daily at the window of the Sarcophagus or the Megatherium, retire at night into two small bedrooms in Jermyn-street; but this is a temporary expedient to enable them to learn how their betters live—a short and dissgreeable prelude to social development, when Bertie shall have household gods and a goddess, and Sydney, in his "castle," be enabled to lower a portcullis against all intruders. To the out-of-door French life, however—and it is the Insular wife and mother, not the writer, who is thinking—there is no *après*; no portcullis, but a mere private door upon a common staircase! Therefore she is glad to return to that house which to an Englishman is his castle—a glorious adage which, in the French language, has no equivalent, except the proverb: "Le charbonnier est maître chez lui"; although, to those who know both sides of the question, the French saying is a much more expressive interpretation of domestic liberty and right, when the homes of all—not alone those of the few—are taken into serious consideration.

We grant, however, that even to the stronger, although not always sterner, sex there is something ludicrous in the manner in which *ce petit* Jules and M. de Chacabac will sometimes talk about their mode of housing,—much in advance, nevertheless, of that of many Englishmen of the same types, who live in dingy, expensive lodgings in London. Jules has a "*chez lui*" under a chimney-stack in the Quartier-Latin, and de Chacabac is "*dans ses meubles*," near the Madeleine; and when the time comes for these young gentlemen to "*ranger*" themselves, the latter's aspirations will probably mount to an "*appartement avec balcon*," on the third or fourth story of some new block of buildings, which, when duly garnished with furniture and a wife, he will call his "*intérieur*." All this seems very funny,—especially to call a home an interior,—but the fact remains that both Jules and de Chacabac will continue to be citizens of a great capital, enjoy its pleasures, live in the heart of town, and mix in the concentrated wit of their country to the end of their days. If ever de Chacabac gets rich enough to pay 600*l.* or 800*l.* per annum for a first-floor "flat" or *appartement*, he will probably choose one of the new houses in the Champs-Élysées; and his domestic servants will then be one cook, one scullion, one valet or butler, one lady's maid, and, unless under extraordinary and unpremeditated circumstances, one nurse. Monsieur and madame will breakfast, lunch, and dine at home, with almost scrupulous regularity; and be quite as particular about closing their portcullis as the most bigoted householder in this country. Although, for a change and the fun of the thing, they may at times be seen on chairs in the Champs-Élysées, or even outside a *café* on a summer's evening, it is no more the habitual custom for French ladies and gentlemen to do either, than it was for Louis Philippe to traverse Paris in omnibuses, in one of which the King was once detected, armed only with an umbrella; and English people, who imagine they see Parisian householders dining at "Durand's," or breakfasting at the Café Riche, are as much deceived as the foreigner, who, visiting a London theatre in September, thinks to encounter an audience of Londoners; or who, perceiving the inhabitants of a suburban semi-detached villa at dinner in the basement story, writes to the *Figaro* information that all Englishmen dine underground.

Nevertheless, if the Parisian rushed from one English city to another,—from one centre of commercial activity to another, as we English do abroad,—he would probably pick out, although in an equally confused and incomplete manner, some of the blots in the household arrangements of this country. He might wonder that, where, as in the heart of London, several families are housed under one roof, some method of separating them, better than that which exists, is not devised; and he might ask whether English architects have ever been inside a French *maison-à-loyer?* Why, also, when the English are successful in copying the exteriors of Continental houses, they do not extend their researches to the insides of them, and reproduce the economical, the comfortable, the easily-served *appartement* of Europe? He would be quite unable to understand the logic which plans a house, for the accommodation of several families, on exactly the same principle as a house destined to be inhabited by only one. He would be still more astonished to learn that, at the bottom of the palpable absurdity, rest defective laws and legalised abuses; and that the anachronism does not result from any absence of artistic talent, or even of scientific and technical learning on the part of British architects and engineers, or the apostles of Hygeia.

In few, if any, European cities are houses to be found similar to the town residences of London. Therein, a certain description of room is proper to a certain floor; and a feeling of incongruity is experienced in being ushered upstairs to dine, or, on being received at a formal visit, in any room on a level with the street. To proceed from one set of rooms to another, it is necessary to mount or descend a number of steps; and, in some even expensive neighbourhoods, a single staircase is the sole means of communication, for both master and servant, from one part of the house to another. When a family requires additional accommodation, an extra story is superposed. But the average town-house may be said to consist of four stories, enclosed by a stratum of domestic offices at the bottom, and another of servants' bed-rooms at the top. Insulation from damp below and cold above is preserved by the dependents, who live in the basement by day and in the roof by night; and upon them falls the real inconvenience of the London private house. To their employers, climbing from room to room is often healthy exercise; but the majority of the employed are women, with whom the enforced climbing of several stairs always aggravates, and sometimes produces, disease. Tenants, therefore, of tall, vertical houses are obliged so to arrange their homes, as to admit of posting certain servants, midway, between basement and roof. Thus, some female servants seldom descend to the kitchen, and, as an almost invariable rule, men-servants do not ascend higher than the drawing-room floor. These—butler, footman, page—sleep on a level with the cellars. Where there is a large family, and consequently a numerous staff of servants, the English town-house undeniably secures privacy; and it encloses the domestic circle more effectually than does the residence peculiar to the Continent.

But when, on the contrary, a family is not increased by a large number of young children, the Continental house offers many advantages, besides that of economy, over the English one. It is worth while glancing at one example of the manner in which a Londoner and a Parisian, of similar tastes and social position, and with an equally small income, obtain house-room in a crowded capital. They both wish to frequent the parks and fashionable thoroughfares, as well as the theatres, clubs, and learned societies. To both, books, newspapers, and conversation are necessities of life. Neither can esteem that place a home in which are obtained merely "bed and breakfast." Yet neither can afford to spend on rent and taxes more than 60*l.* or 70*l.* per annum. In Central London, at least in a tolerable neighbourhood, it is difficult to obtain a house for that sum; and it is therefore the custom to take a portion of one, the remainder of which may be occupied by a speculating "landlord," or by other lodgers. Sometimes this same landlord lives in the front kitchen by day, and in the back parlour by night. The back kitchen, and what is called the "upper part-of-the-house," are let together; the front parlour and the second-floor back bedroom are also let together; and a bachelor or so may have a bed-room on the top story. The different occupants are continually meeting each other on the narrow stairs; and they can neither shut themselves in, nor shut out their fellow lodgers. They have, however, the consolation of occupying a house which externally appears to be a private one—quite as much a castle as any other inhabited by a single family. If there exist just a suspicion that it is a lodging-house, outsiders are not able to tell if the "householder" be the parties on the upper floors or the parties on the lower ones. The Parisian is more logical and methodical, if not more fortunate. In the centre of Paris a complete house fit for a family, composed of husband, wife, two children, and two servants, can be obtained in a broad street and even on a boulevard. Each of these horizontal houses (*appartements*) consists often of a kitchen and its offices, with two vaulted cellars, and two servants' bedrooms; a drawing-room, a dining-room, two bedrooms, and a dressing room; and there is an entrance-hall or antechamber to each. The objection to them lies in the fact that in the fashionable quarters of Paris privacy and comfort at a low rental can only be had on the upper floors of a building. Yet even this objection, to use a French phrase, is more apparent than real; for the Parisian, who ascends twice or thrice a day to his horizontal house, has less climbing to do in the course of twenty-four hours than the Londoner, who, in his superposed vertical home, is perpetually running up or down stairs on trivial errands. That, however, is hardly a point worth discussion; the fact to be noted is that, in the heart of Paris, small families are provided with private residences specially contrived for their accommodation, the minimum rental of which may be put at 50*l.* per annum. In the heart of London, small entire houses, fit to reside in, cost annually, with taxes, double that amount. Moreover, Paris buildings, in which these small horizontal residences are to be found, possess often carved stone fronts; and always, in the new houses, iron and concrete floors, with oak joinery. But the London vertical "castle," of twice the rental, is built of plain brick walls, with perhaps a stucco front; always with rough wooden floors, naked and hollow; and with deal joinery.

No more convincing proof of the vast difference, in an artistic point of view, between housebuilding in England and France can be found, than in the fact that Parisian architects and others are enabled to publish whole bookfuls of plans and elevations of ordinary *maisons-à-loyer*, erected in Paris, and the chief departmental cities. These are not only instructive, as examples of distribution, but, also, as studies of ornament and other details. We ourselves are enabled, from time to time, to publish views and plans of private houses and shops erected in London, but the occasions for so doing are extremely rare; and no publisher would be suicidal enough to commit to print,—as is done in Paris with whole streets of new houses,—similar buildings in London. It is notorious that M. César Daly's "L'Architecture Privée" has become, or is fast becoming, a standard work of reference, from which the house-fronts of other Continental cities are deliberately copied; and upon which, we suspect, the future façades, at least, of Northumberland-avenue will largely depend for inspiration.

The advantage of the London town-house,—belonging to the vertical system of house accommodation,—which lies in the possibility of entering it immediately from the street, is counterbalanced in the horizontal system,—whereby several houses are superposed,—by the addition of a carriage entrance, under which the tenants can reach the grand staircase without risk of exposure to rain or inclement weather. In Paris, a block of four or five horizontal houses is always possessed of a *porte-cochère*; so that a lady, attired for ball or concert, can quit and re-enter her own house with the greatest impunity, even in a thunderstorm. Nor is the apparent disadvantage,—that which is most likely to strike an Englishman,—of having neighbours above and below greater than is experienced in semi-detached villas and suburban terraces in this country; for the Paris houses have party-floors as well as party-walls; and we leave it to those who have lived in both capitals to say whether the latter in London are a more effectual barrier against contiguous noise than are the former in Paris.

All the houses in Vienna, with the exception of the private mansions of the nobility and the wealthy classes, are erected upon the horizontal system,—that is, in more vulgar parlance, they are houses-in-flats. These town-dwellings vary from one or two rooms and a kitchen to ten, fifteen, and twenty rooms. The rents vary according to floor, size of rooms, elegance of finish, and neighbourhood. Away from the centre of the town, a bachelor correspondent, to whom we are indebted for some of this information,—occupies a dwelling—on the third floor—of two rooms and a kitchen, for which he pays 24*l.* per annum. The ground-story of each house is almost always devoted, as in Paris, to commerce; and in St. Stephen's-square, the best part of Vienna, a large and well-known *café* is rented at 4,400*l.* per annum. Some of the Viennese buildings have two horizontal houses on a floor, and they are consequently reached from one common landing; and lately, some of the large dwellings of fifteen and twenty rooms, being

found too extensive, have been sub-divided. Those, however, of from two to five rooms each, with the necessary domestic offices attached, are in constant request; and they steadily maintain a comparatively high rent. Those in localities not central, may be valued annually at about 13*l.* per room (exclusive of servants' rooms and offices). In central situations, and on a first floor, the average is about 36*l.* per room; and, at the street level, a shop is generally paid for according to number and size of windows,—in some parts, a window being worth 175*l.* annually.

In St. Petersburg, only the wealthier classes live in what, in England, are called private houses. The horizontal house prevails; and family dwellings vary in size and convenience from three rooms to thirty and even forty rooms, the annual rents of which may be estimated at from 300 Rbs. to as much as 15,000 Rbs. per annum.

In Switzerland, among a mixed race, numerically small, there seems to be a thorough appreciation of the mode of life and housing, necessary to those centres in which men congregate for business or even pleasure; and it may fairly be said that few nations are more domesticated than the Swiss. Generally their town-houses are arranged in stories, each containing a family dwelling having all its rooms on the same level. A middle-class horizontal house, in Geneva, is composed of a drawing and a dining room, two or three bedrooms, and a kitchen and its offices. Others of a larger description possess, in addition, a library and a small drawing-room, with often extra bedrooms; but the kitchen is always on the same level (though at the back) as the rest of the dwelling. There are also houses, which contain two dwellings of several rooms on each story; and also, in some larger houses, there is a servants' staircase, as in Paris, but this is rare. A great many well-to-do and even wealthy Swiss, who have country houses, content themselves with small town-dwellings, which, in summer, and at other times, they leave in charge of the house-porter.

The ordinary British notion of horizontal houses, erected upon the model of the Parisian *maison-à-loyer*, is generally connected with the old-fashioned form of "flat," to be seen in Edinburgh, Glasgow, and Aberdeen. But although, of late years, the Scotch dwellings have been vastly improved in internal distribution, they cannot yet be compared to the new houses of the Second Empire, and the numerous copies of them in different parts of Europe. The Scotch "flat" is still extremely defective in a sanitary point of view; and were it not that Edinburgh is happily situated on a spot where, at times, a piercing wind penetrates into the most confined courts and areas,—sweeping lofty and impossible ventilating shafts,—the result of unscientific planning might effectually exhibit itself in the Registrar-General's returns. In no other city, however, has the horizontal system of house accommodation been so fully developed, among all classes of people, and from a remote period, as in Edinburgh. As far back as the sixteenth and seventeenth centuries, houses in the Old Town were planned and built in "flats"; and on their fronts, at the level of particular stories, were carved shields of arms, indicating the position in society of some of the occupants. We believe it is now beyond dispute that, in parts of Edinburgh, at the end of the sixteenth century, there were immense blocks of building, some as much as thirteen stories high, each one containing a large horizontal house.

But in the largest and richest city in the world—in London,—although the vast majority of the houses, within a certain distance N., N.W., and S. of Temple Bar, are occupied in floors, and by several groups of people, none are built in "flats," or in blocks of self-contained dwellings,—except, of course, those almost-public buildings which have been raised by the exertions of commercial companies and private charity. In saying that the economical town-house of the Continent—of Paris, Vienna, St Petersburg, and Berlin, of the chief Italian cities, of Geneva and the French parts of Switzerland, of Brussels, and of some of the northern seaport towns, of Lyons, Marseilles, and Bordeaux,—is unknown in London, we are not Quixotically urging the alteration of houses such as now exist in Grosvenor-square or Grosvenor-place, in Bedford, Portman, and other squares, or in Portland-place; and we do not advise the noble and wealthy in this country to seek horizontal houses of twenty-five rooms, in preference to their present lofty, vertical residences. Our object is to point out that the Continental architect has solved the problem of housing numerous families and groups under one roof, in a popular and an economical fashion; and that although his work may be still blemished with many sanitary defects, it is infinitely better,—more scientific and artistic,—than anything of the kind to be found among those worn-out houses, which contain the extemporised homes of thousands of Londoners, many of whom, although scandalously lodged, are neither poor, ill-educated, nor ill-bred.

The Continental or horizontal system of house accommodation enables a larger number of persons to share in the advantages of a good site—in healthy separate tenements, complete and specially contrived,—than does the vertical system, whereby an old family dwelling-house is divided and subdivided into several lodgings; and the vertical system, although admirably adapted for small towns and the circumference of large ones, is,—and this is surely indisputable,—an extravagant method of covering valuable land in the centre of a colossal metropolis. At present, the ground-rent of a site in London costs no more for the erection of a six-story building than for one of two stories. By adopting the Continental principle of plan, two strong houses could be made to stand upon a plot of ground, where a single weak one stood before; or, at least, it may be considered certain that the land covered by three vertical houses, in each of which two families extemporise homes, would suffice to hold six "flat" residences or horizontal houses, distinct and self-contained; and these, with the profitable addition of shops or offices on the ground floor. Such a re-arrangement of tenements in Central London would provide homes for an immense number of families,—some of them, we repeat, comparatively well-to-do in the world,—who, at present, are obliged to rent only portions of houses.

Opportunities for improving the dwellings of Central London are now and then offered to speculators. The recent Act of Parliament is likely to afford many not only to workmen, but to higher grades of the community. The few new streets, which have been lately opened, are, if not broad, at least broader than those they supersede; and the building-land, through which they pass, is necessarily increased in value. In Paris, broad streets imply tall houses; for, there, the Legislature regulates the height of buildings, lining the highways, by the width of the street; and, here, by some unwritten law, houses erected in a new thoroughfare are tall and consequently composed of several floors. The improvements, as far as they have gone, in the centre of London, are simply a gain to commerce; but since a shop must be at the street level, and only two floors over it can be let for business purposes—since the lessees of both the shop and the offices will reside out of town—there remain, in these tall houses, upper floors in which small, well-to-do families might find residences. It is perfectly easy to arrange a building so that the portions devoted to commerce shall be distinct from those devoted to private dwellings; and the latter can be made equally distinct from each other. That people will not inhabit the tops of high houses, and that they will not climb up several flights of steps, are both mere assertions; for a great part of an Englishwoman's daily life is spent upon the stairs. All over Europe, and in parts of America, families do live comfortably at the tops of big buildings; and, since "elevators" have been successfully introduced, the upper floors are often preferred. In Paris the favourite story is the *seconde* and, after that, the *cinquième*. If the question were put practically, on a good site in Central London, to small families of education and position, a horizontal residence on an upper floor—and the ease of a lift—would be often preferred to a vertical one in a park of semi-detached villas at Clapham, or a terrace in Westbourne Park—and the confusion of an underground railway.

But a residence on a floor, however complete and private, is not regarded by a "thorough" Englishman, whose house is his "castle," in any other light than "lodgings,"—a temporary home, which he would quit at the earliest opportunity. The Insular conception of house and home implies a bit of one's own land, so to speak, beneath, and a bit of one's own sky above. A domestic fortress may have closely contiguous neighbours on three of its four sides; but immediately under it must be earth, and immediately over it air; for on no other condition can Englishmen believe that they are residing in a private house. Yet, unless some compromise be accepted by those who live in the heart of town and in private houses, the present difficulty of obtaining such accommodation must culminate in the impossibility of so doing. The constant diminution in the area of the exclusively residential portions of central London has been frequently pointed out and explained in our columns. Not the faintest sign points to a chance of Soho, or St. Giles, or similarly fallen neighbourhoods, regaining the positions they held, at no remote period, as quarters of the town eligible for residence. The squalor which now reigns in their streets of vertical houses,—once private residences,—is unknown among the blocks of horizontal houses in the heart of the French capital. Within a radius of two miles from the Madeleine, there is no vitiated thoroughfare comparable to Drury-lane or Bedfordbury; no tortuous passages such as permeate the vicinity of Holborn and the Strand. We do not deny that, in Paris, improvement has tended a little severely to make the poorer classes give place to their more prosperous brethren; but, in London, time, not improvement, gradually drives the rich to the outskirts, and leaves the poor in possession of the town.

Perhaps it is only logical that the most dangerous opponents, in England, to the application to Central London of the Continental system of house-building, should be found among the classes of people who receive the most benefit from it abroad. Of its worst antagonists, often the speaker at a public meeting, and the critics who favourably review his utterances, have never set foot in a Paris dwelling-house. Although the objections to a horizontal house are undoubtedly numerous, those which, in particular, seize the Insular mind are not more weighty than the arguments used to extol the vertical one. It is not the contiguity of neighbours,—for Londoners have sufficient experience of that through party-walls, to which imperfect clauses of a moribund Building Act have inured them,—but the fancied evils of a public staircase and the imaginary danger of a lift, which are the real obstacles to the popularisation, in this country, of the horizontal house. These, English human nature,—so different from all other human nature!—can never overcome; but, at least, some errors concerning both can be refuted, even if the prejudices against them remain irresistible. A public staircase is the rule, not the exception, on the Continent. In Paris, much less inconvenience is felt by tenants who use the same staircase than the "thorough" Englishman supposes. The open sea, as sailors know, is just where ships rarely meet; and either from the smallness of French families, or hazard, or diversity of habit, the score of dwellers, of all ages and both sexes, in a Paris building, rarely encounter each other on the staircase. The servants never jostle their masters upon it, for they have their own stairs; and often in each house their own corridor. It is forgotten by the Insular wife and mother, habituated to the vertical system, that, in a horizontal house, there is no need to go to different rooms either up or down stairs, which is the passage simply of ascent from, or descent to, the street pavement. All sorts of iniquities, it is said, might be perpetrated upon these stairs! At every turn of them the peer, who resides on a first-floor, rubs shoulders against the labourer, who has a room in the roof,—a strange fallacy which cannot be too positively contradicted. The inhabitants of a block of houses in Paris move in pretty nearly the same stratum of society, and, as in London, their social position is generally relative to the neighbourhood in which they reside. But stairs, leading to horizontal houses on the upper stories of big buildings in central London, would be rarely used, because the advantage of a lift, in two or even three compartments, would soon be appreciated. In America, travellers, at least, seldom use any other mode of ascent than the common elevator. Of the objections urged to it here,—and, indeed, to the horizontal house,—one is exactly similar to that which was made to the introduction of the "flying coach," regarded 200 years ago as a fatal innovation. Passengers, it was said, would be grievously annoyed by invalids and crying children. The horse was preferable as a means of transit, because on that quadruped's back a man was, so to speak, on his own ground, with his own sky above him. Nevertheless, potent as this argument was, the "stage" has long given place to the "rail"; and here and there, in Europe and America, the elevator, which carries one, has already superseded stairs, which one is obliged to climb.

"HISTORICAL AND ARCHITECTURAL STUDIES."

The usefulness and suggestiveness of this book,* which in some lights, and to certain classes of readers, ought to be considerable, are due mainly to the view which it presents of the connexion between architectural monuments and history. Its author is one of the very few men of wide scholarship and literary ability who have given some serious attention to architecture both in regard to its intrinsic interest and its connexion with and illustration of the history of cities and nations, and have studied to understand its principles correctly and describe it accurately. In some respects we are disposed to say that Mr. Freeman stands alone among scholars and historians of the day, in England at least, in his architectural appreciations. It is positively refreshing, for instance, to find a writer, neither an architect nor a professed art-critic, estimating so correctly and contemptuously as he does the rubbish which every visitor to Rome thinks himself bound to write and talk about St. Peter's and the perfection of its "proportions." "In the tourist mind," as he observes, "it is received as a kind of moral duty to look on the Vatican Basilica as the noblest church in the world. We saw a small book of travels the other day in which the writer, after going through several cities of Italy, is on the point of declaring St. Vitale, at Ravenna, to be the finest thing he had seen on his journey. But he checks himself, and puts in a proviso that, of course, he only means after St. Peter's. This is not a bad case of a man's natural sense revolting against the dogmas of his guide or his guidebook." The average tourist's notions on the subject are probably much what are indicated in the letter of the young lady in Clough's poem:—

> "Here we are, dearest Louise, with the seven-and-twenty boxes!
> Here we are all at Rome, and delighted, of course, with St. Peter's," &c.

We recommend to all the class of "tourists," before they go into their next raptures about St. Peter's, just to read Mr. Freeman's criticism on it and them (pp. 198 200), and they will, perhaps, be enlightened. The absurdity of the "proportions" idea about St. Peter's has been commented on frequently in our columns, and by one or two known professional writers on architecture; but this is really the first time we remember to have seen the point properly dealt with in a non-professional book; and for that, at least, we may thank the author.

If the "sketches" in general are not likely to be of much use to the average tourist, it is because they would make far too large demands on his historical knowledge and sympathies. To persons of good general education going over the same ground, who have not as yet given any particular thought to the significance of architectural monuments except as mere adjuncts to the picturesque, or as "fine buildings," this book contains much that would be very suggestive, and would open the minds of some of its readers to an interest in Italian cities beyond what they have previously experienced. And whilst such readers would learn from it more of the architectural interest of the places they pass through than they before knew, it may be said that Mr. Freeman's pages might, from an opposite point of view, be of some value to travelling architects in leading them to think more of the historical side of architecture, and of the historical interest and association and meaning of some famous buildings and cities. Of course there are those in the profession who require no assistance in estimating the value of this side of architectural study; but we must confess that in some records of architectural tours, written by architects of no little ability and eminence, this broad intellectual view of the subject is just what we seem to miss. There is nothing to be learned by the architect upon architecture, *pur et simple*, in Mr. Freeman's pages; indeed, in regard to architectural detail we are inclined to suspect that his knowledge is rather general than special, nor does he appear to be so familiar with the constructive basis of architecture as it is necessary for any one to be who is really intending to give definite instruction in regard to the art of building. But then this, as we have implied, is scarcely the object of the book. Mr. Freeman goes over the historic cities of Italy with the eyes at once of a student of history and a lover of architecture; and it is this combination which gives the specialty to his book. He has nearly always a broad generalisation to give as to the associations and connexions, political and architectural, of the cities he takes us to. He sees Ravenna as the city which, above all others, "keeps up the memory of the days which were alike Roman, Christian, and Imperial." Gelnhausen reminds him that "to the true student of universal history Rome is everywhere." At Pisa we are reminded of the change in her position by the receding of the coast-line, while it is suggested that as under new modes of communication new cities arise, so also old ones which have sunk may rise again, and Pisa may look to become, under the railway system, a great centre of communication by land, as she was formerly a great maritime town. The date of the Duomo at Pisa is discussed; but to a Northern inquirer the interest is not in the precise year of its foundation, "but in the fact that it is contemporary with Durham." The broad space in which the great group of the architectural monuments of Pisa stands is contrasted with the precincts of our English cathedrals. "Though there is at Pisa a distinct ecclesiastical quarter, its feeling is as unlike as possible to that of an English cathedral-close. In England the close is commonly something cut off from the city; in some cases the city itself is something which has grown up outside the close. At Pisa, though we are in an ecclesiastical quarter of the city, we still feel that we are within the city, that the great church and its satellites were the work and possession of its citizens, and not the separate domain of an ecclesiastical prince": and nothing could be more significant than such a distinction. In this kind of way the author constantly flashes for a moment a new light upon the relations of buildings to their builders and to each other, which makes his pages very suggestive. By way of a more connected specimen of his style, and also as illustrating the kind of view of his subject which has evidently suggested his studies, we may quote the following remarks on the advantages of renewed and comparative study of famous sites, from the chapter on "Aachen revisited":—

> "Sometimes, again, a visit to one place makes it almost a duty to make a second visit to another place. Two or more places are often so closely connected, that the history of the one is imperfect without the history of the other. The connexion may be of various kinds. The same great names may be common to both; the events which happened at one may have had a direct influence on the events which happened at another; the two places may actually stand to each other in the relation of sisters or of child to parent. Or, again, the connexion, though not so direct as this, may be none the less true and instructive. The two places may hold the same position in the history of their respective countries, or of the times when they were severally most famous; the comparison may be instructive, through the likeness or unlikeness of the two physical sites, or of the buildings which have been raised upon them. In all these ways, whether by likeness or unlikeness, by direct cause an effect, or by mere analogy, one place illustrates another, and the traveller is constantly led to form the fruitless wish that he could suddenly spirit himself from one spot to another far distant. The architectural inquirer would be well pleased if he could place the apses of Köln and Amiens side by side. He would be still better pleased if he could fly suddenly from the banks of the Wear to the banks of the Arno, and see the glories of Northern and Southern Romanesque, Durham and Pisa, in successive hours. And he would be well pleased, again, on such a Utopian ramble, if he could stop on the way by the banks of the Rhine, and compare the metropolitan church of Germany, the stately and varied forms of the great minster at Mainz, with the buildings on each side of it, which have so much in common with it, and yet so much that is unlike. Here the connexion is only one of analogy and contrast. But when we stand in St. Mark's, we feel that the analogy is imperfect, because we cannot see at the same glance its parent church at Constantinople, and its daughter church at Périgueux. In all these ways one spot illustrates another; and as, even in the days of electric telegraphs, the laws of time and space cannot be wholly got rid of, the best thing is to take every opportunity of seeing one of two places thus connected with a mind still full of the memories of the other."

This is the spirit in which to read architectural history, no doubt, and to make it seem a real and living part of the great course of human affairs. And the author carries his principle into practice, as indeed we have already indicated. Among some other suggestive comparisons we may mention that in which the likeness between the early towers of our own country and the Italian campaniles is touched upon (p. 16), and they are characterised as differing, "not as members of two different classes, but only as highly-finished examples of one class differ from ruder examples of the same"; and the closing paragraph of the very interesting chapter on "Greece in Italy," in which it is observed, speaking of the remains at Pæstum, that "the admiration and reverence which they awaken in the mind of the mere classical purist is cold beside that which they kindle in the mind which can give them their place in the history of art. The temples of Pæstum are great and noble from any point of view. But they become greater and nobler as we run over the successive steps in the long series by which their massive columns and entablatures grew into the tall clusters and soaring arches of Westminster and Amiens." A point touched upon in reference to the ancient theatre at Verona has a bearing on the questions of restoration, so much debated at present. The author remarks (p. 31) on the completeness of the internal ranges of seats, and the new look of some of them, as contrasting disagreeably with the ancient and dilapidated ranges of arches. "But when we find that the practice of keeping them in repair has gone on unbroken through all ages down to our own, the custom itself becomes a part of the history of the building, a part as well worth preserving as any other, and which helps in a forcible way to keep up the feeling of unbroken connexion with the past."

We are glad to give all recognition to the high standard of literary power, historical knowledge, and (to a great extent) of architectural criticism which Mr. Freeman's pages exhibit. A book of this stamp, if it becomes popular, cannot but advance the interest in and comprehension of architecture among general readers. We regret to have to point out the serious drawback to the book in the nature of the illustrations supplied. These are photographs from the author's own sketches, made in pen and ink on the spot (we presume). From a remark in his preface, that he fears "the result of the process has been to exaggerate the necessary defects of the rough sketches, and at the same time to take off something from their life and force," it appears that he is not without misgivings in regard to this part of the work. It is our duty to tell Mr. Freeman that the illustrations are a great deal worse than he seems to be aware of; so much so as to be a positive annoyance to any one with an eye for drawing, and likely to have a very bad effect (if any) on those who have not. We have no particular objection to mere roughness of sketches which are made on the spot, if it be roughness of the right sort; such sketches are often very piquant and vivid records of the impression made by the building upon the spectator. But the sketches given us by Mr. Freeman are not only destitute of anything like artistic feeling and style, but they display a grotesque indifference to perspective, which no man with a trained hand and eye, and accustomed (if we may use the expression) to think in perspective, could possibly fall into, even in the roughest and most hasty sketch. We have only to refer to the sketches facing pp. 29, 142, and 215, to justify us in saying that to publish these as architectural illustrations amounts to a want of respect on the part of the author towards all those of his readers who have any knowledge of drawing. Some are better, but the very best, such as those facing pp. 209 and 250, are merely passable; they have not gross faults, but they are destitute of that "touch" and style which an artistic sketcher will put into his roughest work. Mr. Freeman hopes to follow the present book by others of a similar kind, going over other ground. We shall heartily welcome such publications, on literary grounds; but we do earnestly counsel Mr. Freeman not again to be his own artist—unless he will take lessons in drawing first.

* Historical and Architectural Studies, chiefly Italian. By Edward A. Freeman, D.C.L., LL.D., &c. Macmillan & Co.

NEGLECTED ARCHITECTURAL BIOGRAPHY.

(NOTES AND MS. MATERIALS)

We recently picked up on a book-stall the two volumes of "Milizia's Lives of Celebrated Architects, Ancient and Modern," as translated from the Italian by Mrs. Edward Cresy, the wife of the architect and architectural writer of that name, who was one of the original members of the precursor society that pioneered the way for the establishment of the Royal Institute of British Architects. In these volumes we found between the leaves a number of MS. notes, on slips, containing data of a useful kind concerning British, Continental, and American architects, several of whose biographies are as yet unwritten, lists of some of their works, and the dates of their birth and death. In the volume in question there is also a number of marginal notes or corrections relating to the text, and in reference to blunders committed through ignorance or oversight. In the index to the second volume, containing the names of the architects (whose lives have been given) arranged alphabetically, the

author of the MS notes has inserted, or added, under each respective initial letter, the names of the architects of whom no notice was given in Milizia's work, and of several others living towards the end of the eighteenth, and in the first half of the present century. The intention of the writer of the notes would appear to have been the preparation of a new edition of the lives of the architects, carried down to the present day, and written on the basis of Milizia's work. The last English architect whose name was inserted in the lists made, is Augustus Welby Pugin, 1852, signifying the date of his death; and preceding this are the names of an Irish and a Continental architect, Sir Richard Morrison, 1849, and Bianchi, 1850, the years in which these architects died. Among the memorabilia there is a list of the London clubs and other public institutions, and a list of several noble mansions existing and destroyed; the architects of the two former, and the styles of architecture in which they are built. References are given in several instances to volumes in which some materials may be found, or the sources to which the compiler of the data is indebted for the names he has furnished of architects hitherto overlooked, or scantily noticed during their lifetime. Among these are some names, British, Irish, and foreign, of whom we have ourselves furnished some brief biographies in the *Builder*. Again, there are names of architects of eminence in their day, docketed for notice, and living many years into the present century, who have hitherto obtained but slight passing notice, though their architectural works are the admired of thousands. Of some of the latter class the present writer possesses MS. materials and docketed sources of information which will be made available some day for a comprehensive notice of these architects' lives and works, if health, time, and other circumstances favour the task.

In the MS. slips in Milizia's book we find among others the following brief interesting particulars of two English architects, whose buildings are well known, though their names are seldom mentioned,—Porden and Latrobe,—the latter, though English by birth, was an American architect by practice. "William Porden was architect of two buildings of note for their unusual character, and one of them also for its magnitude. The first is the riding-house at the Pavilion at Brighton, erected about 1800 in the Moorish style, with a circular court or rotunda covered in by a skylight dome. The other, Eaton Hall, in Cheshire, for the Earl of Grosvenor, afterwards first Marquis of Westminster, one of the most extensive private mansions in England, in the Gothic style of the time, but with more of the ecclesiastical than domestic character. A folio volume of views of its interior as well as exterior was published by Clarke in 1826. Porden died in Berners-street, September 14, 1822, aged about sixty-seven, was father of Eleanor Anne Porden, author of two poems, 'The Veils,' 1816, a production akin to Darwin's 'Botanic Garden,' and 'Richard Cœur de Lion,' 1822." The following memorandum in relation to the above is added: - "Putney Park (New Vit. Brit.), Villa for Beilby Thompson; capital plan, elevation in mesgre style (church at Brixton—Doric, with tower at altar end, by his nephew—Porden)." The above materials by the author of the MS. notes are partly compiled from other sources and partly original. Of Latrobe are the following memoranda, with a reference:—"Born 1763, son of an English Moravian preacher, was originally brought up as an architect. Went to America in 1795 (in consequence of being unsettled by his wife's death), where he had an uncle in Philadelphia; died of yellow fever, September 3, 1820." A list of the public buildings he designed in America is appended, and a memorandum, "his son's," indicating, we suppose, that they were worthy of notice.

As half a century has passed since Mrs. Cresy's translation of Milizia's work appeared, it may not be amiss here to say a few words concerning that work. The author, Francesco Milizia, was a somewhat voluminous writer, and the author of cognate works to the one under notice. He was born at Oria, a small city of Terra d'Otranto, in Naples, as far back as 1725, and he died in the city of Rome in 1798. Mrs. Cresy's translated volumes are dedicated to the well-known Sir John Soane, the architect, and past Professor of Architecture in the Royal Academy. He is buried in the old graveyard of St. Giles's, adjoining Old St. Pancras churchyard, and his costly monument, when we last visited that wretchedly-kept cemetery, was in a much injured condition. Mrs. Cresy's translation of Milizia's work contains a number of notes and notices of buildings erected in England during the Middle Ages. The additional matter also comprises a great part of the life of Sir Christopher Wren, and a number of short memoirs of English architects who flourished mostly in the last century. For the additional matter, the lady translator says in her preface, she is indebted to the memoranda of a professional architect. Her auxiliary most likely was her own beloved husband, Edward Cresy, who at that day hailed from the same address as herself, 6, Suffolk-street, Pall-mall. Edward Cresy and G. L. Taylor, architects, were conjointly authors of the well-known "Architectural Antiquities of Rome," "Revived Architecture of Italy," and "Architecture of the Middle Ages at Pisa," &c.

One of the singular blunders made in Milizia's work, and marked by the writer of the MS. notes in that work, is the including of Benjamin Jonson, "Rare Ben," the bricklayer, poet and dramatist, among the architects whose lives are given. Ben Jonson's life, however, in the work under notice, is compressed into a few lines, and, by way of finis, his celebrated epitaph in Westminster Abbey shines in capitals.

Whether the volumes which have suggested our remarks were "lost, stolen, or strayed," or came into the second-hand-book market in the legitimate way, after passing under the auctioneer's hammer, on decease of their owner, we know not.

THE PROGRESS OF MIDDLESBROUGH-ON-TEES.

Middlesbrough has more than once been described as the Chicago of the North; but its growth has been unlike that of the great American city, and the causes which have led to its present extent and importance are widely different from those moulding the destinies of its supposed prototype. It has not had so absolutely sudden a growth, nor one so wholly unchecked, and the cause of its foundation is only partly the cause of its present prosperity, which, in great measure, is due to the second of the two great causes of the upgrowth of the towns in the North. Middlesbrough, though coal-begot, has been nurtured till it has attained its present importance by iron; but the causes of its introduction to the latter were brought about by no accident, as has long been supposed. Indeed, no town in Britain had for so long the parental care of its founders, and few have derived greater advantages from the situation. But still the story of its growth is a wonderful one, and one which, as every year increases its extent, is yearly more worth the telling.

On the site of its first houses, there stood, in the ancient days, a priory dedicated to St. Hilda, and given by Robert de Brus, of Skelton Castle, to Whitby. The chapel fell into decay after the Reformation, but the attached graveyard continued in use down to a much later date. Fifty years ago, however, there was one farmhouse only on the present site of Middlesbrough, into whose walls the ruins of the priory, it is stated, had been built. It stood remote, melancholy, and alone, not far from the winding and uncertain stream of the Tees, and it was not till after the opening of the first public railway and the search for a place for coal shipment, that there seemed a possibility of the growth of even a village on the site. In search of such a place for the shipment of South Durham coal, the promoters fixed upon Middlesbrough, and in 1829 seven enterprising Quakers purchased some 500 acres of land, and so laid the foundation of the town of Middlesbrough, in what was then a "barren, naked spot." In the following year the primal and still the only public railway—the Stockton and Darlington—was extended to the little village, and, by the shipment of coals, the young community began its first stage of growth. The huts in which the coal-trimmers and builders lived began to be replaced by decent cottages, one of which, in what is now West-street, bears an inscription that it was erected in April, 1830, and was "the first house in the new town of Middlesbrough-upon-Tees." Its growth was slow but sure, and, steadily fostered by its parental owners and by the railway company, it gradually acquired the dimensions of a town. Early, gas lighted its streets; and in that same year—1834—it commenced manufactures by establishing and working a pottery, and also by commencing the iron trade on a miniature scale by the erection of a foundry. Still, when, forty years ago, the Duke of Sussex visited the town, the after-dinner orators who dilated on the young town dwelt almost solely upon the shipping trade, and appeared to look to it, and to the ship-building yards then begun, as the sheet-anchors of the future prosperity of the young town, which had scarcely church, chapel, or settled place of worship. It is fully thirty-five years ago since the addition of foundries and ironworks on a scale of some magnitude to the young town by a firm—that of Bolckow & Vaughan,—whose name is now historically associated with a new departure in the iron trade. Gradually these works, and others commenced near them three years later, grew, and for eight or nine years Middlesbrough's fortunes varied with a critical period of the iron trade. Eventually, the need and the demand for iron, and especially the exhaustion of ironfields, caused a search to be commenced for ironstone. In Cleveland, the firm we have named prosecuted it with vigour, and eventually, twenty-six years ago, what is known as the "commercial discovery of the Cleveland ironstone" became an accomplished fact, and the second epoch in the growth of the young town thereafter commenced. The iron trade of the North from thence took a leap forward, and it became the factor, determining the rate of growth of the town and also the prosperity of other and allied trades. Adjoining and around Middlesbrough lay the great seams of the Cleveland ironstone, and these have been yearly tapped with increasing energy until now there are drawn from thence above six million tons of ironstone yearly, from a district in which, up to 1850, a few hundred or at most a few thousand tons was the annual output. To smelt this, there was no blast furnace in the Cleveland district up to that discovery, and only some thirty-six in the whole of the North of England; but gradually, with the growth of iron-mining, there was an equal growth of furnaces, and now of these dark and costly indices to prosperity about 160 are erected in the north-eastern district, and naturally, of the prosperity these indicate, Middlesbrough became the centre and the emporium. These blast furnaces were erected first at Middlesbrough, then they crept to Eston, a little to the east, near which the ironstone had been discovered, then to the west, across the Tees, and now their blast flames may be seen along a large part of the boundary of Cleveland. Next puddling furnaces and rolling-mills in a fully corresponding ratio were erected, not only in Cleveland, but in the adjacent district, until the four hundred previously known in the north had been more than multiplied fivefold, and the whole district may be said to be permeated with the wealth and the influence created by this great industry.

That change became marked most in Middlesbrough. The discovery of ironstone was made at a time when the town was very small and comparatively insignificant. One dusky little church graced the corner of the market-place, with a Wesleyan chapel fronting it; one rowed boat did duty to ferry the passengers over the Tees; and two or three trains daily brought in the rest of the passenger traffic. The population had increased from 383 in 1831 to 5,709 in 1841, and again by 1851 to 7,893, then governed under an Improvement Act. Under the reign of the Iron King the town shot forward rapidly in population, increasing to 18,273 in 1861, again in another decade to 39,434, and now its population is estimated at 50,000. Institutions were founded, the town was incorporated and began to increase in every way in a ratio certainly unexcelled in the history of the growth of towns. Its shipments of coal and coke slightly decreased because of the additional enormous demand for fuel for ironworks; but the exports of other goods leapt by bounds upwards, rising, for instance, from 390,650*l.* in 1864, to above three millions sterling in ten years' time. The 600 acres comprised in its town bounds were added to till now they number 2,600 acres. The streets have grown till those dedicated to the public now number about 100, and extend in length above fourteen miles. Its debt has grown also, but as it may be said to be only about a fifth of its rateable value, it is as yet within bounds. The two places of worship in the pre-iron days are now succeeded by more than two dozen. A station at vast cost is being built to provide for the two-score trains that daily enter the town, and the passenger traffic is also catered for by steam-ferries, which daily convey to and fro nearly 1,000 persons: river-boats also largely swelling the ranks of the travelling public. Every year

the free library issues some 40,000 volumes, and about 6,000 persons enter weekly its two reading-rooms. Its public-houses now number with their subsidiary places of sale nearly seven-score; the police cases number above 2,000 yearly. Its shipyards turn out from twelve to sixteen steam-vessels annually; the blast furnaces within the bounds of the port have a monthly "make" of pig-iron, even in these depressed times, of above 100,000 tons, and one alone of its large rolling-mills can manufacture 1,000 tons of rails weekly.

It has lavishly rewarded with wealth the owners and the firms who assisted in its development. The firm which laid the foundation of the iron trade has been succeeded by a company which employs 10,000 men where a few score were employed; it works half a dozen iron-mines and works where two were once; and it is now, at a vast cost, building Bessemer works to introduce the steel manufacture into Cleveland. The company mines at a dozen collieries, consumes nearly half a million tons of coke, and produces at its various works a quarter of a million tons of pig iron, besides farming thousands of acres of land, owning steamers, iron-mines, and limestone quarries. Similar, if not equal, development has been known by other of the early firms, and they have shown that they have not been unforgetful of the source of their wealth. This industrial development, it may be remarked, has not ended in the bounds of the town, though it has known the greatest extent there. From Stockton to Saltburn, however, it may be generically said that it has either lined the banks of the River Tees with blast-furnaces and rolling-mills, or caused the hills a little to the south of that stream to be honeycombed in the search for ironstone, whilst the whole district of Cleveland has known such an influx of population within a generation as is almost unparalleled.

At present the town and the district are under a cloud. There had been in a period of prolonged intense demand for iron an eagerness to invest in ironworks, and thus, when that demand was passing away, there was a large addition to the productive capacity as well as to the manufacturing capacity. Prices in that period of intense demand were forced up for all kinds of iron goods, and they reached at last so great a height that the demand in part was diverted and in part abated. Hence last year and this came to the district and found it with lessened needs and greater powers of production, and the result of this is known in the crisis which came upon Cleveland with increasing intensity until some of the firms fell before it,—and of this strain Middlesbrough has felt the chief force. Naturally, works have been closed, mines have been laid in, but these are temporary measures the result of which is to lessen the supply to what is believed to be the temporarily-lessened demand. With the revival of the need for iron, with the commencement in other countries of another era of railroad making, and with the general recuperation of our own home trade, there will arise a renewed inquiry for iron goods,—if not on so intense or so large a scale as was known three years ago. No district in the world has greater facilities for the supply of that demand than that of which Middlesbrough is the centre, for nature has prodigally endowed it with all the materials for iron manufacture near to it. It possesses one of the largest fields of ironstone in the world; it has close to it the immense coal-fields of South Durham, which yield an annual output of coal greater than any other district; and it has also the limestone of South Durham to flux its ironstone with, so that its raw materials are abundant as well as admirable. Thus favourably circumstanced by nature for manufacture, possessing full facilities for sending off its manufactures, and having confidence in itself, its men, and its proved resources, there are no bounds that may yet be set to the extent of the future growth of Middlesbrough.

Fall of a Roof at Accrington.—Shortly before eight o'clock on Thursday, the 28th ult., the roof of the winding-room connected with Providence Mill, Church, near Accrington, suddenly fell, without any warning. Many persons were at work in the room at the time, and the roof broke through the floor into the weaving-shed. Four persons were seriously injured, and several slightly wounded by the falling slates and stones. The cause of the accident is thought to be the giving way of the outer wall of the winding-room.

MODERN TYRANTS.

We printed in our last number a simple statement of facts in regard to a "dispute" which has occurred between Messrs. Doulton & Co., the eminent pottery manufacturers, and the Operative Bricklayers' Society (see p. 961, *ante*), which has resulted for the present in the strike of the bricklayers in their employ, and in the enforcement of that state of things, on the part of the Society, by the modern phase of unjust (good authority seems to say, illegal), coercion which is euphoniously termed "picketing." This sort of incident is now unfortunately too familiar any more to raise in the minds of many persons the mingled astonishment and indignation which the earlier development of the system aroused among those who now seem to regard it as part of the nature of things; and persons who would call themselves philosophers, and whose names appear in the fore-front of important literary publications as the prophets of modern political and social advancement, will go out of their way to give such assistance as the possession of literary power places in their hands to this kind of proceeding, and uphold the right of the injured working-man "peacefully to picket" such buildings as are carried on by his employer in any way which does not approve itself to his limited sense of his own interests. We may not be philosophers, possibly; but retaining, as we believe we do, some certain commonplace perceptions in regard to what constitutes common sense and common justice, we cannot pass over without one more word in the cause of those old-fashioned qualities an incident which seems to bring the wrong side of trade-unionism into such undesirable and discreditable relief.

Now, let any impartial reader just consider what is the real bearing of the case we refer to. Messrs. Doulton & Co. are manufacturers who have achieved a great commercial success in their line of business, by, as far as we have any means of judging, perfectly legitimate methods; by the exercise of ability, forethought, and energy. Those who achieve such a success, in benefiting themselves almost necessarily benefit the community also, by giving a stimulus to the employment of operatives, and furnishing advantages to the buyer. But the particular firm in question have done more than this: they have not only succeeded commercially, by establishing a reputation for good workmanship and materials, but they have given an important stimulus to the revival of a very beautiful branch of art workmanship, and by their enterprise in finding out and employing talented persons, and establishing a school of art-pottery, they have succeeded in producing work which is admitted by the most exigeant of art-critics and connoisseurs to be equal to anything of its kind which is to be found among the productions of the best schools of art-pottery that have existed. This firm, in the process of extending their establishment, erect two new buildings, in the decoration of which they are naturally and properly desirous that the art which they have made a specialty should be represented in the best possible form, in the shape of well-executed terra-cotta work. The difficulties of this work, when used as architectural decoration, are known to all who have any experience on the subject. The twisting and alteration of bulk in the material, consequent on the process of firing, render it extremely difficult to ensure a true correspondence of lines and joints in the finished work, success being dependent upon great care in the adjustment of the modelling, so that the various pieces may form a correct fit, as we may say, when burnt, and upon their accurate placing and fitting subsequently. As it is useless to expect the requisite delicacy from ordinary bricklayers, two skilled workmen accustomed to this work, and who have made it their special study, are employed to do it. Hereupon arises the grievance of the worshipful Society of Bricklayers. Not the slightest possible injury has been done to them: it does not appear that the two skilled hands even displaced two ordinary bricklayers; they were an addition to the staff: and as to the main point, the proceedings of Messrs. Doulton were a direct benefit to the bricklayers, in giving them extensive employment on a large job. But the cause of offence was that men were employed who were superior in skill to the members of the Bricklayers' Society, and could do what they could not do: a thing not to be tolerated. Not that the case was openly stated in this way: that would have been far too straightforward a proceeding for the Society. In order to bring their complaint formally within the usual trade-union rules, a pretext was got up, which those who made it must have known to be practically a deliberate falsehood, that "plasterers" were being employed on what was by right bricklayers' work. The fact apparently was that the obnoxious men had formerly started in life as plasterers, but that they had long since given themselves to the special business of terra-cotta fixing, and had in that capacity been regularly employed on some of the best work of that kind that has been done in London. They had committed, however, the unpardonable sin of being superior workmen to the Society of Bricklayers, and the members of that enlightened body are accordingly forbidden to work any longer on Messrs. Doulton's building, unless the latter will be content with bad work instead of good.

Such is the plain English of as pretty a story of petty insolence, narrowness, and class prejudice as could well be made up. One is inclined to ask, in reading such an account, whether we really live in a civilised country and under the operation of impartial laws. The very temperately-worded letter in which Messrs. Doulton called attention to the case in the *Daily News* was headed, whether by the writers or the newspaper people we do not know, "A Trade Dispute." Dispute, indeed! How is that term to be applied to a case in which the whole of the common sense and justice of the matter are on the side which is comparatively powerless, and the whole force of ignorance, prejudice, and pigheadedness, *plus* the coercive force of numbers, on the other side? That is not a "trade dispute," it is "trade oppression." We have never been unjust to trade unions; have never questioned the desirability of combinations for mutual protection of common interests in the case of operatives, any more than in the case of professions. But the working classes seem utterly incapable of seeing, or are determined not to see, the line which separates legitimate defence of their own interests from infringement of the interests and the freedom of others. Their principle, or at all events their practice, is "Heads I win, tails you lose." The simple moral justice of the case is this: any man or body of men have no doubt a right to refuse to work upon any but their own terms. Men who refused to work with A and B, because A and B are superior workmen to themselves, and consequently command a special position and higher wages, would be no better than fools for their pains,—would probably in the end injure themselves by putting a heavy drag upon trade and investment, and would show a despicable spirit of selfishness and indifference to the real good of the community, which is concerned in getting all work done as well as it is possible to do it. They would, however, have a right to do this if they chose; but their right of action ceases with themselves. One man has no more right to forcibly prevent another from undertaking work which he himself does not choose to undertake, than he has a right to pick his pocket. This has of course been said over and over again; but the evil is unabated, and it is in the interests of the public at large, in the interests of art, in the interests of progress generally, that we ask once more,—How long is this sort of thing to be tolerated? The kind of principle on which such an action as that of the Bricklayers' Society referred to is based is literally that which has been satirically put into the mouth of an American expounder of the law of the land,—"You cannot take such and such a course, because this is a free country, and the majority won't allow it." We laugh at that as an absurd exaggeration of what the application of universal liberty might, under certain circumstances, result in; but it is no more than the literal statement of the principle upon which the progress of building is regulated by the enlightenment of trade unions. The temporary victimising of a highly respectable and able firm, in a manner the most grossly unjust, is in itself a serious matter; but it is a still more serious thing to reflect that, upon this principle, every improvement in the carrying out of the higher class of builders' work might be put a check to, or the most vexatious and undesirable restriction put upon it, solely to serve the selfish ends of the least educated portion of the community, or rather, to serve what they imagine to be their interests, which are, in fact, certain in the long run to be injured by such an illogical course of proceeding, though it is apparently useless to offer to argue the point with people who appear to have nothing but ignorance and obstinacy to oppose to reason and considerations of fair dealing.

It is therefore in the public interest, in the widest sense (including that of the offenders themselves), that we wish to give some prominence to a flagrant instance of the tyranny of the many; to point out that we are now in the position of having to regard as almost a necessary and inevitable matter, a style of proceeding on the part of certain trade societies which is subversive of the common interests of society at large, and which, if carried on by any body of professional men in the kingdom, would be denounced by the unanimous voice of public opinion as base, selfish, and tyrannical; and to ask how long it is to be tolerated that any body of men are, for their own purposes, to be permitted to carry out measures towards others which are contrary to common sense and common honesty, and which, whatever temporary standing-ground the present state of the law may afford them, are morally as completely at variance with the duty of one man to another, and to the State, as house-breaking or garotting.

THE STRIKE AT MESSRS. DOULTON'S.

Sir, Will you kindly grant me a little space in your valuable columns for a few comments on what I hold to be a piece of modern despotism, a perverted right, and an insult to the high tone of Bricklayers' Trade Unionism? The origin of this turn-out has been well published in almost every paper; that the facts there stated are true, I have no doubt, I being in a position to obtain proof of their accuracy, as secretary of a trade-union lodge at the time.

Now, sir, under what pretext did this strike originate, and what say the rules of the London Order on this subject?

It appears that two men, originally plasterers, were put to set terra cotta (it is said by the firm to be terra cotta that would require greater skill than the bricklayer could produce; I will say more on this by and by). The rules of the Order say that the committee of any branch shall have power to authorise any member or members to strike work, if the employer attempts to reduce the rate of wages, to increase the hours of labour, or to put persons to any trade who are not of the trade. Now, sir, if those in authority can class terra cotta as bricks, then they have a pretext for this strike, but, since it is not bricks, nor anything akin to bricks, those that authorised this strike lay themselves open to public censure. Why? Because a man has been placed in a position to examine the rules of any society that shall apply to him for registration before facing it on the Government Register; and any society so registered misapplying its rules, to the intimidation and injury of any person or persons, lays itself open to censure. But there must be reason for this strike, some will say; and some will ask—does the whole of this society acquiesce with the action taken by those in authority? I cannot answer for the whole society, but I know that the executive approve of it; and this is where I blame bricklayers, the majority of whom approve of everything done by the E. C., being too indolent to question their policy. Now for what I conceive to be the reason for this strike. Three years have passed away without any material agitation on the part of Building Operative Trade Societies. It is well known by the leaders of these societies that on occasions like the present, should they be successful in carrying out their object, they will obtain a greater amount of popularity, which will assist them materially to retain their present positions, but help them in the future should an opportunity present itself of further advancement, or in the question of a bonus.

Now, at the present time, the leaders of this strike can be confident of success. Why? Because there never was such a demand for bricklayers in the history of the oldest unionist as at the present, therefore not the members alone (and I would urge that they should) insist on the E. C. putting an end to this disgraceful bit of tyranny, it is plain that Messrs. Doulton must give in to the conditions of the strike.

Now, as to the assertion that bricklayers are not sufficiently skilled to fix terra cotta. This may apply to the men engaged at the time on the works; but I can venture to say that, if Messrs. Doulton wished for bricklayers to set it, there are are plenty to be found. If skilled labour is required in an especial degree, I can advise Messrs. Doulton, and their employers in want thereof, to apply to no better place than to the President of the Bricklayers' Technical Education Class, 29, Castle-street, St. Martin's-lane, where I am sure a genuine article will be supplied. And here, again, I would deplore the apathy displayed by the leading bricklayer unionists towards these classes. Had they come to the front when, at the beginning of the present year, I begged (through your columns) for their co-operation, they might have earned a name that would have been revered by posterity; they would have been helping forward a movement that would have raised the bricklayer in the eyes of architects and employers; and the bricklayer, in the confidence of his ability, would have repudiated the published statement that he was behind the last few trades. Let our leaders look more to those objects that have for their aim the advancement of the general interest of the trade, and these acts of despotic tyranny will become a thing of the past, trade unions will then be looked up to by respectable and aspiring young men, and they will be appreciated by all sensible people.

I hope, sir, that my few remarks may not be in vain; but conducive to the speedy termination of what all right-minded Englishmen will call a disgraceful affair.

J. P. Morris, Manchester Order of Bricklayers.

P.S.—I have this week resigned my position as secretary of the London lodge.

Artisans' Dwellings at Walsall.—The Walsall Town Council agreed, on the 4th inst., to apply the Artisans' Dwellings Act to a part of the town containing 119 dwellings and between 500 and 600 inhabitants.

THE THAMES STEAM FERRY.

The Society of Engineers recently visited the works of the Thames Steam Ferry Company, now in progress at Wapping and Rotherhithe, on which occasion Mr. Waller, the managing director, read a paper descriptive of the works. He said that the boats, of which the *Jessie May* is one, are built by Messrs. Edwards & Symes at their yard at Cubitt-town. The *Jessie May* is an iron-built vessel 82 ft. in length, 42 ft. in width on deck, and 8 ft. 9 in. in depth. With the exception of a slight curve in her sides, the vessel is nearly rectangular, and she can be propelled in either direction, being fitted with a rudder at each end. She has two separate sets of steering gear, each of which is worked from the top of each paddle-box, so as to give clear way on the deck, and to enable a good look-out to be kept. In order further to obviate deck obstruction, the funnels, of which there are two, are placed on each sponson near the paddle-boxes. The whole deck is thus left clear for three rows of wagons and carts, there being besides ample room for passengers and goods. Each vessel will accommodate twelve two-horse vans, and possess a carrying capacity of 50 tons. The engine-room, skylights, and hatches are placed between the cart tracks, and the whole of the machinery works clear of the deck beams. The vessel is fitted at each end with a hinged platform, which is raised and lowered by chains and winches, and which form, when hoisted up, the end bulwarks, and, when lowered, a connecting piece between the boat and the landing-stage over which the traffic will pass from boat to shore and *vice versâ*. The boats draw 2 ft. 6 in. of water, and consequently cannot approach within 170 ft. of the Wapping Wharf at low water spring. An intervening bridge or prow was necessary, but the Thames Conservancy would not allow of any which had not a clear height of 8 ft. above Trinity high water. The rise and fall of the Thames at ordinary spring tides is 20 ft. It was an engineering problem, therefore, to devise a safe and expeditious means of transferring a boatload of horses and vehicles as well as foot-passengers, weighing some 50 tons, through a vertical distance of 28 ft. from the boat's deck to the floor of a fixed jetty, and to lower a similar load from the jetty to the boat at least once every quarter of an hour. The well-known hydraulic lift apparatus, with a single ram, could only deal with the traffic in detail, taking up and down but one or two vehicles at a time, and except by providing some six or eight of such lifts, and a large floating stage on which the traffic to and from the boats might be received, there was no possibility of the work being done in the quarter of an hour interval. Messrs. Clark & Stanfield proposed to bring the boat between two rows of hydraulic rams, somewhat similar to their Victoris ship-lift, and by suitable attachments lift the boat's deck with its entire freight to and from the required levels, and this, but for the necessity of carrying out the piers 50 ft. further into the Thames, and so seriously interfering with the navigation of the river, would possibly have worked well. Another scheme was to have a large platform on which the traffic could draw from the boats, and a long winding drum on shore with eight or ten heavy chains passing from it over pulleys to as many attachments on the platform, the drum to be worked by a steam engine of about 120 horse power. The directors gave due consideration to these proposals, and one simultaneously submitted by Mr. F. E. Duckham, of the Millwall Docks. Mr. Duckham's lift was selected, and he was appointed the company's engineer for carrying out the works. In Mr. Duckham's scheme a jetty 100 ft. long, 19 ft. 6 in. wide for 60 ft., and fanning out to 33 ft. at the outer end, is formed by wrought-iron plate girders, supported on cast-iron screw columns. The proper floor of the jetty is to be set apart for vehicles, and for economy as to space and cost, as also for the comfort of the foot-passengers themselves, the foot-paths to and from the lift are placed on top of the side girders. A platform is provided of a sufficient area to accommodate both the outward and inward freight. Upon commencing its work the platform forms a continuation of the roadway and footpaths of the jetty. It is proposed that the outgoing vehicles occupy the two outside of the four ranks on the platform, and the outgoing passengers the top of the right-hand girder. As the boat approaches, the platform will be lowered to the deck level and the machine locked. The vehicles on the boat will then draw off to the two vacant centre ranks of the platform, the foot-passengers to the top of the left-hand girder. The outgoing traffic will move on to the boat, the boat will leave for the opposite shore, the platform be raised to its first position, its freight transferred to the roadway, and the process repeated. To accomplish this a hydraulic engine of 25-horse-power is employed, supplied with steam by vertical boilers, 4 ft. 6 in. diameter, by 12 ft. 6 in. high, and having an accumulator with a 1 ft. 8 in. ram of 20 ft. stroke, loaded to 750 lb. per square inch, whence the hydraulic pressure pipes are laid to the valve-house on the stage, where the power is split up between four hydraulic presses, 1 ft. ram and 15 ft. stroke. To ensure the horizontality of the platform the presses are fixed horizontally on the cast-iron columns at the side of the lift, and their rams on each side connected by stout connecting-rods, so that the one cannot move without the other; 1½ in. pitched chain passes over two sheaves on each ram, one on the cylinder end, then round a pulley on the platform, and the chain end is made fast to the fixed girders on which the presses are supported. The pulleys on the platform are pitched to fit the links of the chain, and are keyed on two strong shafts which pass under the platform from one side of the lift to the other, and which shafts rotate as the platform is raised or lowered. The two ends of each shaft must rotate simultaneously, and the two rams on each side can only move in unison. For convenience in event of repairs, &c., the platform is formed into a pontoon which would float even with 150 tons added to its own weight. The screw columns, jetties, &c., were contracted for by Mr. John Gibson, and were chiefly manufactured by Messrs. Hawks, Crawshay, & Co., of Gateshead. The hydraulic machinery was made by the East Ferry-road Engineering Company, of Millwall.

The wall foundations were built in sections; under the accumulator and engine-house a solid mass of concrete has been filled in 26 ft. thick, extending over the whole surface, to receive the heavy weight to be put upon it. The engine and accumulator-house, with chimney-shaft 75 ft. high from the ground line, were built first, the river wall coped with Cornish granite; the part under the jetty being at the height of 8 ft. above Trinity high-water mark, as required by the Thames Conservancy Board, the other portion being 6 ft. above high water, to comply with recent instructions from the Metropolitan and Local Boards of Works.

In consequence of the river wall being carried up so high, and the bad foundations extending over the whole site, the directors, after careful consideration, decided to build vaults under the roadway from Wapping High-street to the jetty, and this portion of the work is now completed; the foundations for the walls have been carried down to the depth of 19 ft. below street-line, or 21 ft. below Trinity high water, and over the whole surface the ground has been excavated and concrete filled in to a depth of 6 ft. 6 in., to render the vaults free from damp; and, with a view to further security, a layer of asphalte has been put in the middle of the concrete to prevent any water rising, and this, being weighted with 18 in. of concrete, will, it is thought, prevent the water ever blowing it up. Arches on piers and cast-iron girders have been turned at the requisite height in two half-brick rings in cement, and the crown and haunches of the arches filled in with Portland cement concrete. Penrhyn granite trams and curbs have been laid down, the space between the trams being filled in with wood paving, and the footways will be formed on each side, and rendered in Portland cement. The gradient of the roadway, 1 in 16, is somewhat steep, owing to the great height required by the Thames Conservancy for the jetty to be kept up; but from the care taken in forming the roadway, no difficulty is anticipated with the traffic. The work to this point is now completed. The whole of the ground-floor is given up to the roadways, the traffic on and off being kept distinct; various offices are provided at the entrance. The height of this floor will be 16 ft. from the floor of the jetty to the underside of the girder on the river front, and at the street front, 18 ft. to the underside of the crown of the arches. These large openings will be filled in with suitable revolving iron shutters. The floor over the roadway will consist of wrought-iron girders and bow-strings, filled in with concrete. The superstructure over the roadway and on the adjoining wharfs will, when completed, form a block of warehouses, six floors in height; at the level of the girder over

the roadway a moulded string of red Dumfries and Portland stone will be carried through, and above this the building will be in Kent stocks, with some red brick bands. The reveals to the door and window openings and arches will be in blue Staffordshire bricks, the whole finished with a moulded brick and stone cornice, with a centre gable. The warehouses will be fitted with hydraulic cranes.

The works on the Rotherhithe side have not been of so extensive a character. An accumulator-house and engine-shaft similar to those on the Wapping side, have been built, and the engine-house will shortly be completed. Improvements are being made in the approaches on this side, and negotiations are going on for the acquiring of more land for the purposes of a stand-by, and with a view to meet the projected improvements of the Metropolitan Board of Works in this neighbourhood. The whole of the building works have been done under the superintendence of the company's architect, Mr. Alexander R. Stenning, the general contractors being Messrs. Lee & Son, of Westminster, Messrs. Moreland & Son, of Old-street, supplying all the ironwork. Mr. W. W. Browne is clerk of works.

A NEW ROUTE TO INDIA.

The project of a sub-marine tunnel to unite Europe with Africa has been published at Madrid, and has called forth much criticism. The tunnel would, of course, pass under the Straits of Gibraltar, but the precise spot chosen is near Algesiras on the European side. From here the coast of Africa would be reached at a favourable landing-place, between Tangiers and Ceuta. It has been calculated that the part of the tunnel entirely submerged would be nine miles long, with a descent towards the centre of about one per cent. The other and slanting portions of the tunnel would measure six to seven miles in length on either side, so that altogether the tunnel will be about twenty-two miles long. The maximum depth of the sea in the Straits does not exceed 3,000 ft., and it is proposed to dig 300 ft. below this point. Thus the tunnel will be 3,300 ft. below the surface of the water. As for the somewhat complex question of cost, the promoters of the scheme maintain that this will not amount to more than 4,000,000*l*. By this means, they urge, when the tunnel between Calais and Dover is completed, it will be possible to travel the whole way from London to India by rail, and without changing carriages!

BUILDING PROJECTS AT ST. PETERSBURG.

Notwithstanding the clouds on the political horizon, the inhabitants of St. Petersburg still find time to discuss various projects for the improvement of their city. Local authorities pass numerous resolutions in favour of the construction of innumerable new streets, and rely on the immense receipts which will, it is supposed, reward this labour when new and magnificent houses have been built. Unfortunately, the practical result of past and present enterprise is not very encouraging. It is, it seems, more easy to build houses than to find tenants; for there are now some 5,000 apartments empty in St. Petersburg. Two-fifths of these are estimated in value at a yearly rental of 500 roubles and upwards, while the remaining three-fifths of the total number are more modest residences, and consequently to be let at a cheaper rate. To continue building under these circumstances is evidently to court ruin; and though the local authorities in their unreasoning enthusiasm may continue to vote the construction of new streets, the Minister of the Interior will in all probability put a check to such unwarrantable enterprise. There are other projects of greater utility, which when accomplished will render the enlargement of the town not only practicable, but necessary. The construction of a maritime canal and the creation of a large mercantile port at St. Petersburg would soon increase the population, and thus fill the empty houses. Then it will be time to build new residences. The project of a canal and port of this description is included among the numerous new maps, topographical reports, &c., which have been prepared during the years 1873, 1874, and 1875. These were recently examined and approved by the Czar in person. Unfortunately, in Russia as elsewhere the monetary difficulty is after all the greatest of obstacles, and it is more easy to obtain even the unanimous approval of a project than to find the means for carrying it out. It is calculated, for instance, that the draining and paving of the town will cost 20,000,000 roubles; and that if a loan is levied, as proposed, for this purpose it will augment the charges on the city budget to the extent of 1,200,000 roubles per annum, and the town is not in a position to support extra charges. There was already a deficit of 500,000 roubles in the last budget, and there are other schemes which demand public support. The present schemes for primary and compulsory education will cost at least 600,000 roubles, and the maintenance of the hospitals about 700,000 roubles. To meet these urgent demands it is probable that some insignificant but vexatious taxes will be abolished and compensated by a new and heavy tax on inhabited dwellings. It was also proposed to reduce the sum spent by the municipality for the salaries, &c., of the police and gendarmerie; and, as this item amounts to no less than 1,120,000 roubles per annum, it will bear reduction. In the meanwhile tradesmen and small proprietors are already indulging in loud complaints against the high rate of taxation, so that altogether, and when we add to these facts the prospect of political complications in the East, we may confidently urge that this is scarcely a favourable moment to choose for the *Haussmannization* of St. Petersburg.

ROYAL HORTICULTURAL SOCIETY.

The following scheme for reconstituting this Society has been made public. The plan, it is stated, now finds favour with many leading horticulturists, who long thought it, if not unadvisable, at least premature:—

"The Society is now doing important and useful work, which benefits all who value their gardens, or who care for fruit, vegetables, or flowers. The scientific committee is now the recognised authority on all subjects connected with plant life, disease, and plagues, and does much other valuable work. Its fruit and floral committees examine new fruits, vegetables, and flowers, work which can only be done by a great central society: their judgments, immediately published by means of the gardening press, are now received with respect, and acted upon all the ugh the country. In the Society's garden at Chiswick, flowers, fruit, and vegetables are grown side by side, are tested and judged by the highest authorities, and troublesome synonyms got rid of. The Society, being relieved from the heavy charge of South Kensington, will have only Chiswick garden to keep up, and to provide for shows and committee meetings, if possible at South Kensington, otherwise in the neighbourhood, the great country shows will be self-supporting. The guinea subscription will enable good horticulturists to come into the Society from every corner of the kingdom. It is hoped that some of the old supporters of the Society who have paid their five-guinea subscriptions will at least for a time continue to do so, and that some wealthy and enthusiastic horticulturists will join their number. The subscribers of not less than four guineas will be called patron fellows. As soon as the Council of the Royal Horticultural Society can arrange with her Majesty's Commissioners of 1851, in the interests of the debenture-holders, the lease of the South Kensington garden will be surrendered, and it may be expected that the subscriptions of those fellows who paid to get the exercise-ground for their children will be discontinued. It is therefore most desirable that new fellows should be in readiness to supply their place. It was lately suggested to form a large and influential committee, headed by the editors of the four leading London horticultural journals (to show unanimity of feeling at least in the leaders). This committee to bind itself in nothing, but to aid in bringing in guinea fellows when the society is freed from its present incumbrances. Three out of the four editors have given their names, the fourth, being secretary of the society, can hold no other position. Very influential gardening names have already been received and are constantly coming in. It was decided not to publish names till the list was a very long one. The privileges which can at the present be stated as accruing to the guinea fellowships are admittances to all the Society's shows in London and in the provinces, and to all minor exhibitions of fruit and flowers held at the fortnightly committee meetings, and daily admission to the Chiswick garden (Sunday excepted)."

THE NEW WATER-SUPPLY FOR WARWICK.

The borough of Warwick was, on the 27th ult., supplied for the first time with water from the new works at Haseley. The town of Warwick has had considerable difficulty in connexion with its water-supply. After spending 1,100*l*., and boring to a depth of 400 ft. near the workhouse, the local authorities obtained water from the Avon, which river at that time received the sewage of Rugby, Coventry, Kenilworth, Leamington, and other places. From the year 1857 until the present time the borough has had an intermittent supply from the Avon, the works costing 14,627*l*. 18s. 7d., and the annual expenditure during the past three years being 644*l*. 12s. 11d. The Avon supply having been repeatedly and authoritatively condemned, the Town Council commissioned Mr. E. Pritchard, C.E., to seek another source of supply. He propounded the Haseley scheme, which was approved by Messrs. Cawley & Newton, engineers, and in 1872 the Corporation obtained the Warwick Waterworks Act, empowering them to take lands, and construct the required works for getting water from Haseley. No pumping is necessary, the water flowing into the town by gravitation. Haseley Mill, the site of the abstraction of the water from the brook, is four miles from Warwick, on the Birmingham side. The level of the brook is 100 ft. above the highest level of the borough. About twelve acres of land have been acquired, and the area of the available water-shed is 1,500 acres. After filtration the water passes through a brick conduit, of oval form, 3 ft. 6 in. by 2 ft. 6 in. 1,661 yards, long. From the end conduit the water is conveyed through a 12-in. cast-iron main, 736 yards in length along the Beansale, Birmingham, and Warwick roads, and from thence to the water-tower, 4,284 yards, through a 10-in. cast-iron main.

Mr. Pritchard's estimated cost of the work was:—Cast-iron main, valves, &c., 2,886*l*.; reservoirs, filter-beds, conduit, fencing, laying of mains, &c., 10,113*l*. 13s. 6d.; compensation, purchase of land, &c., 4,500*l*. These items make up the sum of 17,500*l*.; but the actual outlay will not be far below 25,000*l*. The difficulty experienced in the deep cutting, where the main is placed at a maximum depth of 48 ft. below the surface, led, as already stated, to the abandonment of the work by Mr. C. Hart, of Leamington, who has commenced proceedings against the Warwick Corporation. This work and the making of adits, reservoirs, &c., have been performed by Mr. G. F. Smith, of Milverton. The iron pipes were supplied by Messrs. J. & T. Roberts, West Bromwich, and the earthenware pipes by Doulton & Co., of Lambeth. To prevent sand passing through the perforated pipes of the adits there is provided a filter medium of washed gravel and sand, of a thickness of 4 ft. 6 in. and 3 ft. in width. The sand and gravel are placed in layers round the pipes in the following order:—Washed gravel, of the size of hens' eggs, for a thickness of 2 ft. 3 in.; washed gravel, of the size of walnuts, for a thickness of 9 in.; washed gravel, the size of horse-beans, for 6 in.; and washed sand 1 ft.; total thickness, 4 ft. 6 in. Great difficulties were encountered in controlling the sand, and the contractor had to supply a plant of the value of 2,500*l*. for the execution of the work. The ceremony of turning on the water was performed by the Mayor.

PROPOSED NEW SEWERAGE WORKS AT WALSALL.

At a special meeting of the Walsall Town Council lately, the Mayor said the first business was of great importance, and had been forced upon the Council by the provisions of "The Rivers Pollution Prevention Act, 1876," by which every person (including a Corporation) who, after the 15th of August, 1877, causes to fall or flow or to be carried into any stream any solid or liquid sewage matter, unless he proves to the Court having cognisance of the case that he is using the best practicable and available means to render harmless the said sewage matter, will be liable to be restrained from so doing by a summary order of Court, and in default of compliance with such order will be subject to a penalty of 50*l*. a day for every day during which he is in default. For a long time now the course which they had been pursuing in reference to getting rid of their sewage matter by means of the River Tame had been contrary to the decisions of the courts of law, and they now found that an Act of Parliament had made it compulsory to alter that state of things. They had not much time given them to put their house in order, and as it was necessary that the subject should be taken in hand at once, he moved the following:—

"That the time having arrived when it has become absolutely imperative by the legislation of the last session of Parliament, embodied in the 'Rivers Pollution Prevention Act, 1876,' that effectual measures shall be adopted for preventing any solid or liquid sewage from flowing from the sewers of the borough into the stream or brook, and the Borough Surveyor having had under his consideration the question of the disposal of the sewage of the borough so as to avoid the pollution of the neighbouring streams; and having had also under his consideration the necessary extension of the main outlet sewer, near Bridley's, to land in or near the Tame Valley, the Sanitary Committee is hereby authorised and requested to make a careful inquiry into the whole question, with power to engage such professional assistance as they may deem necessary, and to report to the Council as early as practicable their opinion as to the best mode of dealing with the sewage of the borough."

The resolution was adopted, and the town clerk read a report from Mr. W. J. Boys, the borough surveyor, which stated that the works contemplated were a deep intercepting sewer, commencing at the present outlets, near Bodley's, and following the valley of the Tame to land situate near Delves Green, the total length being 3,960 yards, and the gradient 1 in 2,000. This sewer would enable the council to thoroughly drain the lowest parts of the borough, and would enable them to deal effectually with the sewage without pumping, the outlet being 10 ft. above the bed of the Tame. The point of outlet was also the nearest to sufficient land for the necessary works, and was at such a distance from the town and any highway that no complaint of nuisance could arise, and where the land, which would be a considerable quantity, could be acquired on advantageous terms.

TECHNICAL EDUCATION IN THE IRON TRADES.

At the meeting of the Iron and Steel Institute, recently held in Leeds, Mr. John Jones, the secretary, read a paper on "Technical Education in connexion with the Iron Trades." Providing facilities for imparting technical knowledge had of late by no means been lost sight of or neglected, but we had not yet got so far as several other countries had done. There was one way in which he thought substantial aid might be rendered in extending existing arrangements for imparting technical knowledge. The Commissioners for the International Exhibition for 1851 had a surplus of 180,000*l.*, out of which they proposed to expend 100,000*l.* in providing a scientific library at South Kensington, and in creating scholarships in connexion with the Science and Art Department. The paper on this subject remarked that it did not seem just to concentrate the contemplated expenditure in London. Mr. Jones maintained that the commissioners would be carrying out the spirit in which such a fund should be administered if they were to render assistance, within certain limits, to the science colleges and institutions in the principal manufacturing and industrial districts, and to encourage the opening of new colleges in other localities. The proposed scholarships would be best localised and made tenable at the provincial colleges and institutions. As to the form in which aid should be given to local science colleges, it would evidently be injudicious to make a grant in money towards buildings. The assistance should rather be in the form of a loan, so that the property could revert to the commissioners in case any particular institution ceased to exist.

The President (Mr. Menelaus) said that as the House of Commons would have finally to decide this matter, it was a happy circumstance that they had several members of Parliament present, and he hoped they would favour them with their sentiments on this subject.

Mr. Barran, M.P., spoke upon the efficiency of the Yorkshire College of Science, although it had but recently been opened, and said he hoped all the funds in question would not be devoted to establishing a technical institution in London. He believed the greatness of the nation depended as much upon the education of the sons of employers and capitalists in scientific matters as upon making the working men skilful and thoroughly educated. In the Yorkshire College they had nearly 300 students, and he claimed for it that it was second to none, considering the short time it had been open.

Mr. Samuelson, M.P., thought Mr. Jones's proposal was essentially a just one. He did not think that hitherto the administration of the fund had been altogether what the country had a right to expect, and he was very much afraid, unless some strong measures were taken to bring about a change in that administration, they must not expect justice or anything else. The fund would have been seven times larger than it was if the ordinary rules of prudence had been observed in the management of it. The Albert Hall was one of its results, and it was nothing but a source of difficulty and anxiety to all connected with it. Funds had been spent in buildings which had not answered the purpose for which they were intended. It would be useless, however, to make grants of the kind contemplated by Mr. Jones until the elementary education of the working classes had been more improved and extended. Colleges of science like that in Leeds, or like that in Newcastle, or such as Owens College in Manchester, were all exceedingly useful, but until the general education of working men was better cared for and got to a higher point, it would be in vain almost to attempt to impart to them technical education.

Mr. Brogden, M.P., did not think it would be so difficult to get grants from this fund for local institutions. He knew some of the commissioners were desirous of using the funds in the way which would best promote scientific training, and he believed it only required an outside expression of opinion to get from them an application of the funds to provincial purposes.

Mr. Lowthian Bell, M.P., thought that as regards the deficiency of primary education, thanks to a gentleman living in the neighbourhood of Leeds, the evil was about to be remedied, not in what he considered the very best way, but it was a step in the right direction. With respect to the iron trade of this country he spoke most hopefully, and predicted that England would for all practical purposes continue in the future, as she had done in the past, to take the lead in the manufacture of iron and steel.

Mr. Tennant, M.P., said he should be happy to co-operate in getting a share for Leeds or any other provincial centre of the fund it was intended to devote to technical education.

THE OFEN ROYAL PALACE OF THE FUTURE.

Some time since the official Hungarian journal made known the Royal decision that the Ofen fortress should be divested of its character as a fortification, the fetters cast off which for so long had prevented the enlargement of the Hungarian capital on account of its encircling stone walls. This capital will become a great city worthy of the residence of a monarch. In order to make Buda Pesth a fine city, the Hungarian Parliament contracted a loan of twenty-four millions of florins, and has been making the greatest exertions for the improvement of the city. The great road which, going from the Danube, divides the city into two parts, and then again turns back towards the strand of the river, will be converted into a boulevard after the Parisian model. The thickly-populated portion of the city, called the "Theresa Town," will be intersected the length of the third of a German mile, and from the little wood without the town a stream of healthier air will be let into the arteries of this crowded nest of houses. A "Ringstrasse" like that of Vienna will encircle the whole town as a girdle, new railway stations, several miles of tramway for local convenience, two new bridges on each side of the chain bridge over the river,—all these are to be undertaken; in fact, since the coronation of the king, in 1867, it has been the constant aim of the people to accomplish these improvements.

The fortifications of the Ofen fortress prevented the city on the right side of the Danube, till now, taking the interest in the improvement of that half of the city which the left side created. On the Ofen side nothing has been undertaken but great quays half a mile in length; but the perpendicular high walls of the fortress, with their ugly bastions and grim battlements, were so protected by the military *noli me tangere* decrees against any changes which the wish of the city for its amelioration or adornment could suggest, that nothing could be attempted. The Royal Palace on the south side of the Fortress-hill will be the first fruit of the decision, and the first building undertaken.

In a semicircle of vine-clad hills stands this fortress,—the dearly-bought prize of many a deadly struggle. Thence will be seen the restored King's Palace, the rapid Danube, and on its opposite shore palace on palace; tributary town on town; from each end of the palace also vast towering chimneys; from amidst the church towers daily, rising to the blue heavens, the incense of the growing effects of civilisation; the sound of the blow of the anvil; the roaring of machinery,—the peaceful Cyclopean work of modern times. These represent the organ music of the worship of progress.

The view from the Palace, also, is very grand; but on the fortress side it is spoiled by the ugly Danube quays, as yet showing little else but the loading and unloading of wagons to and from the steam-barges. But there is in progress a charming park-like terrace on the sloping side of the palace, and a project of widening the palace itself is on the *tapis*. Already one wing is built out, elegantly decorated with white and gold, where the Royal family stay when they visit the Hungarian capital. The carrying out of all these projects, which has the hearty consent of the Emperor, will be forwarded as soon as the funds can be raised.

THE VOLKSGARTEN ARCADE, VIENNA.

No European capital has in so few years carried out so many changes and improvements as Vienna. After the demolishing of the old walls it became the aim of the Viennese to set to work to replace them by handsome streets and squares.

In speaking of New Vienna, uppermost arises in the mind the "Ringstrasse." Of course, many of the vast undertakings commenced have not been as yet fully accomplished, but in the gaps that intervene, pearl on pearl is being strung in order to collect the entire row. The finest part of the Ringstrasse will unquestionably be that part in which the Town-hall, the Parliament-house, and the University form three sides of a square.

When the discussion as to the position of the Royal Opera-house was being carried on, and the proposition to place it within the Volksgarten made, Baron Hasenauer, one of the first of the many able architects of Vienna, and the builder of the Exhibition, stepped forward to protest against the plan, and suggested that the incomparable square of the town-hall should have its fourth side filled with the new theatre.

To realise this idea, great difficulties would have to be overcome, parts of streets to be demolished, and so on. But Baron Hasenauer, undaunted, urged his opinion on all, declaring it certain that the Royal Theatre could stand in no better place, and also that the quarter in its vicinity must necessarily be rebuilt, and in harmony with the splendid new building. This, of course, met with the consent and approval of all intelligent men, and soon, it is to be hoped, the whole of the project, including that of which we give a sketch, may be carried out.

In order to make room for all these buildings, the last remains of the walls of Vienna,—the renowned Lion Bastion, must disappear,—a spot on which, in the war with the Turks, the most bloody and determined struggles took place. Later must be removed the Palace of Prince Lichtenstein, in which the first Supreme Court of Judicature was held; the Palace where resides the English Ambassador; the fine Admiralty Office, in which one of Austria's best sons, Admiral Tegenhoff, breathed his last; and, finally, the Royal Palm-house.

According to Hasenauer's plan, the street which runs at the back of the Opera-house is to be widened to 60 yards, the little narrow Löwengasse to 40 yards. Down towards the once well-known Bellaria, from the theatre, a magnificent frontage can be acquired. Hasenauer desired more especially that his project should be carried out, seeing that Vienna, unlike Paris and most of the large cities of Italy, was devoid of an open promenade, where, at the same time, shelter from the rain could be gained; in short, it had no covered public walk.

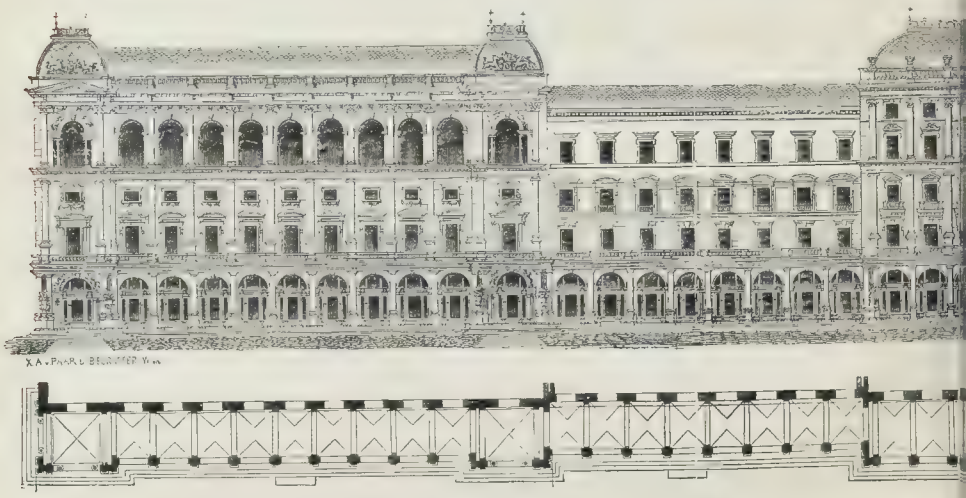
The group of houses he projected to erect on this ground are to have arcades having immediate correspondence with the Volksgarten, in a way leading to it, the buildings at one end being only divided from it by a narrow street, on one side of which is a railing through which it may be seen. The terrace of the arcade is to be adorned with flowers and shrubs. Under the arcades are handsome shops and refreshment-rooms. The whole range of houses will be divided into five parcels; two fine buildings projecting somewhat from the rest, at each end; in the centre a building dominating over those at each end, while the two intervening rows of buildings that connect them stand back. The style is that of the Italian Renaissance.

Through the centre a handsome passage will end in the Kreuzgasse, and lead to the Minoritenplatz.

The Sewage of Kingston-on-Thames.—The Thames Conservancy applied on the 28th ult. to the Kingston County Bench for a summons against the Corporation of Kingston-on-Thames, for having neglected, within the statutory periods, to withdraw the sewage of the town from the river Thames. It was stated that the penalties claimed were 50*l.* a day for something like 2,000 days. The summons was granted, and made returnable a week hence.



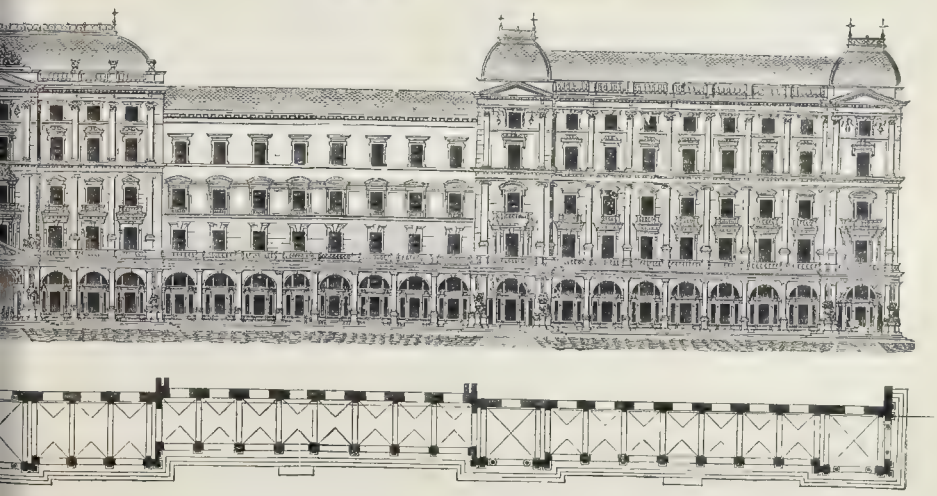
THE OFEN PALACE C



THE VOLKSGARTEN ARCADE,



FUTURE, HUNGARY.



A.—Baron Hasenauer, Architect.

IMAGINARY CONVERSATIONS.

MR. SERJT. PARRY AND A "JERRY BUILDER."

"For among my people are found wicked men: they y wait, as he that setteth snares; they set a trap, they atch men. As a cage is full of birds, so are their houses ll of deceit; therefore they are become great, and axen rich."—Jer. v. 26, 27.

You are a master builder, are you not, and the uilder of those houses which are characterised s run-up, and of the "Jerry" class?

Now, Mr. Master Builder, what constitutes ood building?

Is mortar composed of three parts of clay or oam, with a little sprinkling of lime, a good edding mortar for brickwork?

Is wall plaster, made up of road scrapings, creened ashes, vegetable mould, or ordinary shoot" material, a proper floating or rendering tuff for the coating of walls?

These houses that are being built by you have ot been planned by any architect?

No; but they are built, you say, according to a lan now very much followed over the metropolis? n the present instance, according to your statenents, you have improved upon the usual stereoyped plan by economising materials, and adding o the available space?

You say they are good of their kind,—that is, hey are good enough for "Jerry" houses,—good enough for the class of people they are intended to accommodate; but, let me ask you, is any class of builders privileged to build houses ill-planned and in violation of the Building Acts and sanitary regulations, and to put up staircases that endanger life and limb?

No answer. Well, then, I will not press you further on that head; but you are prepared, I suppose, to answer a few questions as to the thickness of your doors, sashes, and the timber scantlings used generally in the carpentry and joinery work of your houses? . . . .

Turning to another point, let me ask you, what constitutes ordinary brickwork for front walls?

In the building of several of your houses in certain places, particularly in partition work, I believe you preferred the brick laid on the edge, as it tended to the economy of space and the quickness of workmanship, as well as the saving of materials?

Yes, yes, I quite understand. Motives of humanity and philanthropy may have induced you to give your future humble tenants as much room as possible, and houses at very low rents; but were there no personal interests influencing you—you built, did you, solely for the public good?

A very benevolent motive, in sooth; but unfortunately, as we have seen, your philanthropic motives are misconstrued by callous and suspecting newspaper critics, by medical officers of health; and those unsympathising fellows called district surveyors pounced down upon you, and your benevolent motives underwent a change?

Not having the fear of the Building Act before your eyes, you treated it as a dead letter by running your head against its provisions?

No doubt. A man can build as cheaply as he likes, and in whatever way he likes, if he build solely for his own pleasure, but not for others' occupation. He may build to sell, but not to kill; for the buyer can punish the seller who attempts to obtain money under false pretences. I'm here, however, not to argue with you, but to interrogate you.

Now, as to the foundation of your houses. Is it true, or is it not, that you have dug down to between 6 ft. to 8ft., and more in some places, removed the sand, and sold it and the shingle, and, though you had plenty of sand on the site, you used little or none of it in the plastering of your walls?

In fact, you filled up the excavated pits or spaces between your walls with the refuse of dust-bins and other rubbish and scavenge matter, and you also utilised a large portion of this stuff and road-scrapings for your wall-plaster?

In using this material you say you only acted as others have done and are doing, and that it is considered not bad material?

Please tell the jury what constitutes good mortar,—that is, mortar with cementing and hardening qualities.

Is it not necessary that mortar should be composed of clean sharp sand and lime in certain well-defined proportions; and, in the absence of river sand, should not pit sand, if used, be washed, so that no particles of clay or loam should remain? Come now, Mr. Builder, tell us is this mortar used in the brickwork of your houses much better than road mud?

Do you know what hydrate of lime is, or what is carbonate of lime? Well, do you know what is slaked lime, and what it is converted into after it is mixed with sand and acted on by the atmosphere?

I suppose, then, there is no use in asking you what is carbonic acid gas, and if carbolic acid would be equally good in effecting the hardening of mortar as the former?

You say you're not a "'pothecary,"—chemist you mean. I am pretty well aware that you are not; but you are a Master "Jerry," according to your own admissions, who believes common clay, loam, or road mud mixed with a little lime, makes a mortar with wonderful cementing qualities?

Of course, you treat your plaster in a similar manner as you treat your mortar. Coal-ashes and road-scrapings warmed up with a little lime, floated on your walls expeditiously, makes, in your opinion, an admirable "sticking plaster?"

Do you know how to cure a smoky chimney? Oh, no. You are not a chimney-curer; you are only a constructor of chimneys that act with a draught downwards instead of upwards.

May I ask you what is the exact size of the principal rooms of your houses? Leaving out the recesses formed by the "genteel" bay-window to the front parlours of your houses, are these rooms much more than 6 ft. by 8 ft., or do they even amount to those dimensions?

Your rooms, then, if not very commodious, are very compact. Pretty self-contained little parlours, fitted up with ducky little cupboards, and when a medium-sized table is placed in the centre of the room and the tenants sit down to a meal they may lean their backs against the wall. There is, of course, no danger of suffocation in your parlours; though they are small they are neat, and the rooms are well ventilated by "cracks," settlements, shaky doors and sashes?

You have heard, I suppose, before now, the celebrated song of "The Spider and the Fly?"

You may have heard it, you say, but you forget. Well, I'll refresh your memory,—

"Come into my parlour, said the spider to the fly,
'Tis the prettiest litt'e parlour that ever you did spy.
If you only put your head just inside of the door,
You'll see so many curious things you never saw before."

Now, Mr. Builder, is not that a faithful description of your ducky little parlours, constructed *pro bono publico*, and each a *multum in parvo*?

What is the scantling or the dimensions of the timbers that form your joists, partitions, rafters, ceiling joists, and the stiles and rails of your doors and sashes, and can you deny that the timbers are green and unseasoned?

Without going through them all *seriatim*, can you deny that your hall-doors are under 1¾ in., and that a large number of your inside four-panelled room-doors are not more than 1¼ in., and in several instances only full 1 in. in thickness? Can you deny that your window-sashes are under 1¼ in., or, to speak more plainly, a something between 1 in. and 1¼ in. in thickness?

Are not your flooring-boards between ½ in. and ¾ in.—⅞ in. at most? Now I will let you tell the jury yourself the dimensions of the timber forming the joists, partitions, roof, ceilings, &c., and when you have done I'll compare notes with you.

What fall, may I ask you, have your house-drains, and are they connected with the street sewer; and are all the joints water-tight, and with what materials are the joints made?

The ordinary fall, you say?

The parish surveyor, you have heard, holds a different opinion. From what he says they appear to be on a zigzag level, and, taking the whole length, they indicate the fall rather in the reverse direction.

How do you account for that? Has there been a landslip, a settlement in the natural or rather the unnatural soil, as well as a settlement in the work of some of your houses?

'Tis the fault of the parish authorities. Oh, is that it? We are, then, to believe they made a mistake in the level of the street sewer, which is likely to drain into your house-drains instead of your house-drains into that?

I suppose you know what gravitation means? You evidently do not believe in its laws, or you have made a wonderful discovery. In fact, Mr. Builder, if your plan of draining houses succeeds, you will eclipse Pythagoras, Archimedes, and the rest. Water heretofore found its own level, but you will make it gravitate upward, *minus* what leaks out at the joints?

I will not detain you much longer. Answer honestly this question. Is not there a large amount of the work of your houses known as "scamped" work, and such as would not be performed by any respectable London building firm?

It may not be your fault, but it is your misfortune (perhaps I might have said your fortune, in many instances) to have engaged in "Jerry" building. In view of this and of the perils and profits belonging, you run the gauntlet of sanitary laws and Building Acts.

ROCK-CONCRETE SEWER TUBES.

An article that promises to be of great use in the construction of main sewers has lately been introduced by Messrs. Hy. Sharp & Jones, of Poole, Dorset, proprietors of the old-established Bourne-valley Stoneware Pipe Works, near that town. The firm, not content with producing a stoneware pipe up to 18 in. diameter, are now also making large sewer tubes of almost any size, the material being a certain mixture of Portland cement and other material, to which they have given the name of "Rock-concrete." The joint is formed in the thickness of the tube itself without any projecting flange, and the spigot and socket are so fitted as to allow space for a thin packing of cement in the joint, which once made becomes homogeneous with the tubes themselves, forming, it is maintained, a perfectly water-tight sewer, smoother and sounder than any cement-lined brick sewer. In the process of manufacture the tubes take a very smooth face, which, from the nature of the material, hardens, it is believed, still further in use. Junctions—so often useless in main drains through having been originally wrongly placed or with a wrong-sized connecting socket—are with these tubes unnecessary, as the latter may safely be cut in any place, the branch stoneware pipe inserted, and the joint made good with a little cement. There being no outside projections, the tubes are easy to bed, truly taking a bearing throughout their whole length, and Messrs. Sharp have made the 24-in. size with a flat base, which shape has its advantages.

There is a prospect of these tubes being utilised in some places for water-supply, and they have, besides a great difference in cost, the further advantage over iron pipes that they neither spoil nor are spoilt by the water that passes through them. The makers are themselves now using the tubes under a 12-ft. head of water, and are confident of being able shortly to recommend them for greater pressures.

NORFOLK AND NORWICH ARCHÆOLOGICAL SOCIETY.

The annual meeting of the members of the Norfolk and Norwich Archæological Society was held at the Guildhall, Norwich, on the 22nd ult., the chair being filled, in the absence of the president, the Very Rev. the Dean of Norwich, by the Rev. J. Lee Warner.

The Rev. C. R. Manning read the annual report, which referred with satisfaction to the progress of archæological studies in the county, and announced the publication of the third part of the eighth volume of the "Original Papers" of the Society.

Mr. Fitch read the balance-sheet, which showed that the year commenced with a balance at Messrs. Gurney's, the bankers, of 212*l.* 6*s.* 4*d.* on the general account, and 63*l.* 3*s.* 4*d.* on the deposit account; the subscriptions amounted to 80*l.* 12*s.* 6*d.*, and the sale of publications produced 17*l.* 2*s.* 3*d.* With 3*l.* 4*s.* 5*d.* added for interest, the total receipts amounted to 386*l.* 8*s.* 10*d.* At the end of the year there remained at Messrs. Gurney's a balance of 224*l.* 9*s.* 10*d.* on the general account, and of 64*l.* 4*s.* 10*d.* on the deposit account.

The report and balance-sheet having been adopted, the Very Rev. the Dean of Norwich was re-elected president for the ensuing year; and Mr. Fitch and the Rev. C. R. Manning were also re-elected treasurer and secretary.

There was no other business to be transacted, and the members adjourned to the Norfolk Hotel, where conveyances were in readiness to take them upon an excursion to Trowse and Whitlingham, Framingham, and Arminghall.

Trowse Church was the first place visited, the party being received there by the Rev. A. Pownall. Some information as to the antiquity

of the church was furnished by the Rev. C. R. Manning, who stated that the chancel of the church was rebuilt by William de Kirkby, Prior of Norwich from 1272–80, and the east window, which is of that date, has some Early Geometrical tracery. There is nothing remarkable about the church, which was altered in Perpendicular times.

The churches of Kirby Bedon, two miles distant, were next visited, and some notes were read on them by the Rector, the Rev. R. Kinder. In these it was stated that, according to Blomefield, Kirby signifies dwelling at the Kirken or churches; and Bedon, or rather Bidon, the name of the ancient lords of the manor, was added to distinguish it from another Kirby in the county. There were two churches here before the time of Edward the Confessor. Helenald de Bidun was lord of the manor about 1150, and John de Bidon, the last of the name, died without issue about 1250, when the barony and estate were divided among his five sisters. It appeared, however, to have been re-united under John de Saham about 1300, and from him obtained the name of Saham's manor, which it now retains. In 1604 the manor belonged to Owen Shepherd. There is a mural monument in the chancel of St. Andrew's Church to Robert Shepherd and Anne his wife, dated 1600, bearing the carved figures of a man and woman kneeling at a faldstool. Robert Shepherd sold the manor-house known as Kirby Hall, and demesnes, to a Mr. Cock, of Norwich, who disposed of them to Captain Nicholas Rookwood. The Rookwoods are interred on the north side of the chancel, and in the east window are two of the Rookwood coats of arms. They sold the estate to the Berneys, whose burial-place adjoins that of the Rookwoods, and was formerly enclosed by a building entered by a door from the north side of the chancel. This building, called in Blomefield a dormitory, becoming dilapidated, was pulled down by the representatives of Sir Hanson Berney, during the incumbency of the Rev. E. Day, and the space enclosed with iron railings.

Mr. Gunn was of opinion that the ruined church, which is dedicated to St. Mary, is of Saxon date, from the fact that the quoining was in some places done with rude lumps of flint, and not with freestone.

Mr. Phipson thought that the date of the church was not earlier than the thirteenth century, and he attributed the use of flint to the scarcity of freestone.

The rector invited the party, before leaving, to partake of his hospitality.

Proceeding to Framingham Pigot, the party first visited the church which Mr. G. H. Christie erected a few years ago at a cost of 4,500*l.*, and then accepted an invitation to the hall, where they found much to interest them, and had a most hospitable reception accorded them by Mr. Christie.

On the church of Framingham Earl, which the company next visited, a paper was read by the Rev. C. R. Manning. In the churchyard are interred the remains of Edward Rigby, M.D., of Norwich, who planted the landscape around Framingham, which fact supplies the meaning of his epitaph:—

> "A monument for Rigby do you seek,
> On every side the whispering woodlands speak."

Arminghall church, which is now undergoing repair, and Arminghall Old Hall, which is divided into two dwellings occupied by workmen, and is an interesting piece of Domestic architecture, were the final places visited. With respect to the latter, Mr. Fitch read the following notice:—"It is an Elizabethan house of timber and moulded brick, with sunk panels, pillars, &c., of that period. The materials of an older building are worked up with these, and Cotman mentions a tradition that some of the materials were brought from Carrow Abbey. The entrance doorway to the south porch is good and rich, decorated with two figures in niches on each side, having ogee canopies, pinnacles, crockets, and finials. Another doorway at the back has very bold and good foliage of the vine sculptured in the jambs. The lintel is of wood, carved in imitation of the stonework. There is a similar foliage in the large doorway. The doorway under the porch is good Perpendicular, with the original oak door having the date carved upon it. Over the doorway is a sunk panel filled with sculpture of a man pulled off his horse by a lion."

The excursionists on their return to Norwich dined in the evening at the Norfolk Hotel.

CLOCKS AND BELLS.

Long-lane, Derbyshire.—A large quarter-clock, with two dials, has just been placed in the parish church here. Three new bells have also been put up in connexion with the clock. These are chimed in a novel manner, on account of the cramped situation. Mr. Smith, of the Midland Clock Works, Derby, executed the whole of the work.

Oldham.—A new clock, chimes, and carillons have just been fitted up in the tower of St. Mark's Church, Glodwick, Oldham, by Messrs. Gillett & Bland, of Croydon. The clock strikes the hours upon a bell of about 8 cwt., and chimes the celebrated St. Mary's, of Cambridge, chimes every quarter of an hour on four other bells, and shows the time upon four 4 ft. 8 in. skeleton iron dials, glazed with opal glass for illumination. The carillon or chiming machine is placed in the chamber below the clock, to which it is connected by a wire for the purpose of letting off the tunes at the proper intervals. It plays fourteen tunes on eight bells,—a fresh tune every day for fourteen days. Each tune is played three times over every three hours, at six, nine, three, and twelve o'clock day and night, the change of tune taking place at midnight, by a self-acting arrangement. The machine also has a barrel pricked with changes similar to ringing a peal, which is used automatically for the services of the church on Sundays, rendering the employment of ringers unnecessary.

Bray.—The bell-ringers of Bray Church, between Maidenhead and Windsor, lately struck during the temporary absence of the vicar from the parish. The churchwardens were, however, equal to the emergency, and caused a set of chiming hammers to be fixed, and these are now used with the bells, while the occupation of the ringers has gone.

Alnwick.—The Town-hall clock of Alnwick has lately been repaired and renewed by the chamberlain and common council of that borough. Entirely new works have been placed in the clock-tower. The new clock-work has been supplied and fixed by Mr. F. Evans, of Handsworth. The entire works have been carried out under the superintendence of Messrs. T. Robertson & Sons, of Alnwick; and, besides Mr. Evans, the other contractors employed have been, Messrs. Armstrong, Brothers (mason-work), Messrs. Rennison (painting and glazing), and Messrs. Thompson & Wright (plastering, &c.).

Cologne.—The bell of the Imperial clock of Cologne, called the "Silent," made from French cannon, has always, it is said, stopped at the sixth stroke, notwithstanding the efforts made to remedy the defect. The authorities of the city have, therefore, resolved that it shall be melted for another purpose, and replaced by a bell in bronze.

Edlingham.—The church-bells at Ellingham, near Bungay, have recently undergone extensive repairs at the hands of Messrs. G. Day & Son, of Eye. The bells have been entirely rehung, the three large bells turned, and a new treble-bell, cast by John Warner & Son, has been added.

Uttoxeter.—The parish church here has just received an addition, in the form of a new set of chiming-machinery, which plays seven tunes (one tune for each day of the week). The work has been carried out by Mr. Smith, Midland Clock Works, Derby.

Tibenham.—The church-bells at Tibenham, said to be the finest peal of six in the county of Norfolk, have recently been rehung by Mr. Day, of Eye.

Pontefract.—A new machine for chiming church-bells has just been fitted up in the tower of Pontefract Old Church. It is the invention of Mr. Shaw, of Bradford, and is stated to be so constructed that "rising" can be effectually imitated, as well as "round-ringing" and "chiming-in." The machine occupies a space about 2 ft. square, and is formed entirely of iron and brass. It can be made to suit any number of bells.

Working Men's College, Blackfriars-road.—The night schools and evening classes were re-opened on the 25th ult. The new elementary French and German classes will be taught by Dr. Maller, of the Stationers' School. The Civil Service class meet three times weekly, under Mr. Gibbings, of the Civil Service. Besides these, there will be new classes for drawing, Latin, literature, mathematics, grammar, history, &c.

THE CHURCH AND SOCIAL SCIENCE.

At a conference of the members of the Rural Deanery of Liverpool South, held on the 28th ult., the Rev. W. Lefroy read a paper on "The Church and Social Science." In the course of his observations, he remarked that it was just because the work of the church was exclusively with the souls of men that he claimed their sympathy on behalf of science. The work of the clergy was injured by social ignorance, and every pastor found his work hampered by ignorance, extravagance, and intemperance, and to reduce their dimensions was the whole work of social science. In that, science was the handmaid of religion, and therefore it would ill become the clergy to stand coldly by in the matter. He counselled the inculcation of habits of frugality, which, in his opinion, must begin with the young; and he referred, as one means of securing the object in view, to the establishment of penny banks. In that respect Liverpool was far behind Glasgow. Again, the personal habits and amusements of the people might concern the Church of England more, without any danger to herself, and she should also take more interest in sanitary affairs, temperance, and the popular recreations of the people; but she must have thrift as a basis, and the school as its early scene. The extension of opportunities for popular amusements should be in the same ratio as the diminution of opportunities for popular drinking. To deprive the masses of their chief means of animal gratification while they seemed still incapable of any other would be, in his opinion, a perilous experiment in a free country. He advocated the establishment of zoological gardens, gymnasia, and swimming-baths, especially a swimming-bath on the Mersey.

Dr. J. Stopford Taylor (deputy medical officer of health) also read a paper on the same subject. The first obstacle in the improvement of the masses he conceived to be the manner in which the lower classes were housed; and said that unless the habits of the people were changed little or no benefit could be hoped for. That change might, he thought, be brought about by the Church, for could it not be brought home to the people? He did not mean that this should be done by clergymen alone, but by every member of the Church. He suggested that each incumbent should surround himself with a body of energetic workers, who would enlist the sympathies of the people, and explain to them that improper food and drink should be avoided, and that the life of every man was, in a measure, in his own hands.

The Rev. J. Shaw, referring to amusements for the people, expressed the opinion that no attractions were so great as what were called working men's clubs. He considered that those clubs worked exceedingly well, and he was of opinion that if the Diocesan Society undertook the building of mission-rooms in the lower parts of the town, much good might be done.

Mr. L. R. Baily said that as long as people lived in squalid, miserable homes they would naturally be driven to public-houses and other places where they could get light, comfort, and amusement. He, therefore, thought that one of the first things to be done was to improve the dwellings, and to give the people the impression that they were doing it for themselves.

Mr. B. H. Grindley said that what they wanted was a more paternal Church in the poorer districts of Liverpool. By that they would take in hand social science, and would do very great good for the people. He believed that the Church had in the past done a great deal of social science work, but it was evident that she could do a great deal more. There was urgent need of floating and swimming baths for the people, but what should be aimed at for the future were free baths.

A vote of thanks was accorded to the readers of the papers.

The Rev. W. Lefroy moved the following resolution:—"That a great want exists for larger and cheaper facilities for bathing; and that it is respectfully suggested to the Town Council that not only baths might be constructed on the river, but that the use of the pieces of water in the public parks might be granted up to eight o'clock in the morning."

The Rev. T. B. Banner seconded the resolution.

Dr. Taylor remarked that the Corporation were losing very considerably every year by the baths they had established in the town. There were baths in Cornwallis-street, Steble-street,

and Margaret-street. One was about to be erected in Upper Parliament-street; another was being erected in Kirkdale; and the baths in Paul-street were about to be replaced by better ones. The baths at the Pierhead had cost a great deal of money to keep in repair, and the Corporation were considering whether they should not dispose of the land. The difficulty was to decide where the Salt-water Baths were to be placed when the George's Baths were removed. Some wished that a large bath should be placed in the centre of the town; others desired that one should be placed on the Landing-stage; and others were in favour of one on the Cheshire side. The feeling of the Corporation was in favour of the bath system, and they were exceedingly anxious that the inhabitants should have sea-bathing and fresh-water bathing. He did not, however, think that bathing in the parks would be of very much advantage.

The resolution was withdrawn, in consequence of Dr. Taylor's explanation.

THE DARIEN CANAL.

"A DEFINITE step is about to be taken towards the construction of the Darien Canal. It has been estimated that the cost of the work will be about 20,000,000*l.*, that the length of it will be 180 miles, and the time taken to construct it at least five years. Most persons will say that if the work is achieved in twice five years it will have been quickly done. The Government of the United States is now going to enter into negotiations with that of Nicaragua, through whose territory the canal will pass. How long the negotiations will take remains to be seen.'

Sir,—In reference to the above excerpt from a local newspaper (the *Western Morning News*), you may perhaps concur with me, as I believe you did in either the latter part of 1848 or beginning of 1849 (from October to June) in reprobating a scheme that seems to me to be the project of little short of insanity. I cannot now remember the number of the *Builder* in which I (as "Capt. Nelson, R.E.") invited public attention to this matter, when stationed at Pembroke between the times above mentioned.

A canal, à cheval of the *Grand Volcanic Main* of the Western World,—"bristling with volcanoes" (as expressed either by Stevens or Humboldt, I forget which),—is a hobby which few would have any fancy to ride, if they did but recollect his "personal character," as collected from the following:—

1. Caracoas.—Convulsed from 1811 to 1813; especially during *the* Caracoas earthquake of the 25th of March, 1812.

2. The Chiloe or Conception earthquake, on the 20th of February, 1835; felt south, north, west, and east between the Island of Chiloe, Copiapo, Juan Fernandez, and Mendoza respectively. Almost all the towns and villages between 35° and 38° south latitude destroyed; and all the lower members of the "Volcanic Society" near Chiloe vehemently disquieted.

3. The eruption of Coseguina, on the 20th of January, 1835, and synchronous earthquake of New Granada, which affected the *whole Isthmus of Panama*,—hundreds of miles south of it, and *many* miles northward. "The whole of New Granada was violently convulsed, and the subterranean thunder was heard simultaneously in Popayan, Bogota, Sta. Martha, Caraccas, Haiti, Jamaica, Curaçoa, and at *Lake Nicaragua*."

4. To complete this *very modern* list of sixty-four years' duration (1811—1875), we may add the recent earthquake in Guatemala, by which, *in less than one minute*, the city of San José de Cucuta was utterly destroyed on the 18th of May, 1875; "and the majority of the 2,000 or 3,000 survivors prepared to leave a site and a city under whose ruins lay buried from 8,000 to 10,000 dead bodies, which were already infecting the air with their putrid emanations."

How well the above-mentioned "personal character" was understood by Byron!—

> "Where the slumb'ring earthquake
> Lies pillow'd on fire;
> And the lakes of bitumen
> Rise boilingly higher;
> Where the roots of the Andes
> Strike deep in the earth
> As their summits to heaven
> Shoot soaringly forth."

It is quite probable that there are no insurmountable difficulties as regards the Engineer's work in this project. Let it be granted that *complete* success attends its execution;—one slight quiver or shiver from the giant "pillowed on fire" below, and every lock, gate-post, gate, and piece of masonry will be started; let alone the damage done to the canal itself at different points from time to time.

The liability to expenses, and hindrances to traffic, resulting from repairs, or even ruin, will be best studied by the light of the Volcano, in the southern bight of Lake Nicaragua, placed there expressly (we will suppose) as a friendly beacon and warning to speculators respecting the projected canal in its very near neighbourhood.

R. J. NELSON,
Major-General (late) Royal Engineers.

WORCESTER DIOCESAN ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE excursions of this society were interrupted last year by the lamented death of Mr. Severn Walker, but the committee having determined to continue the objects and investigations entertained for so many years, Mr. J. Hooper and the Rev. T. W. Wood were induced to become honorary secretaries, and commenced active work by organizing an excursion to examine several churches, and this came off on the 20th ult., when a large party accordingly met at the Shrub Hill Station, and proceeded by train to Pershore, where carriages conveyed them *en route* to the places put down on the programme.

Besford, which lies in a rural district, was first visited, and its timber-framed church, with its rood-loft, and remarkable tomb and painted triptych in honour of Edmund Harewell, the young heir of his family who died, aged 15, in 1576, was examined with much curiosity. Next, the new church of Birlingham was examined, and the Rev. R. Duke, the rector, explained its characteristics and ornamentation. Thence the party were conveyed to the pleasant village of Eckington, and here the church was inspected under the direction of the Rev. H. J. Vernon, the vicar. Here are some remarkable memorials of the Hanford family, of Woollas Hall. The broad square tower forms a prominent object. Mr. Vernon hospitably entertained the members of the Society to dinner, after which the party drove on to inspect the little church of Wyre Piddle, which, unpretending as it is, contains a Saxon arch and font, and has a bell-cot, believed by Mr. Bloxam to be also Saxon. These Saxon remains are quite unique in Worcestershire. Another church had yet to be visited, and crossing the sedge-fringed brook from which the hamlet of Wyre has its second adjunct, the party were carried rapidly to Fladbury. This was formerly an important place, there being a monastery and market here in Saxon times, and King Ethelred gave the town to the then Bishop of Worcester. The living is still in the Bishop's gift, and one of the best in the diocese. The church is mainly of fifteenth-century work, except the base of the square pinnacled tower. It consists of nave divided from the side aisles by pointed arches, and chancel, in which is an ornate alabaster reredos with figures of angels, and an east window of five lights filled with stained glass. The last renovation of the structure was in 1871, when the nave was restored, the tower opened to the church, the high pews taken away, and open seats substituted. Here, under the tower, then removed from the nave, is a massive altar-tomb, with brasses on it, depicting Sir John Throckmorton and his wife, the date 1445. The tall marble monument of Bishop Lloyd has been divided, his bust remaining on the wall of the north side of the altar, while the long Latin inscription is placed for those who like to read it in the vestry. Mr. Noake was the expounder at this and other churches.

HYDRAULIC FORGING.

AT a meeting of the Iron and Steel Institute, at Leeds, on the 21st ult., Major J. O. Butler, of Kirstall Forge, read a paper on "The Hydraulic Forging and Stamping of Malleable Iron on the 'Système Haswell' of Vienna." He said,—The forging and shaping of malleable iron has been practised from the earliest period. Long before the Christian era, it is recorded that there were "cunning workers in iron," rude in shape at first, no doubt, and with appliances of the simplest character. As time rolled on, however, and civilisation advanced, and men's wants multiplied, refinements in the mode of working produced superior "handicrafters"; and approaching our own times, we have sufficient evidence of this in our armouries, museums, and arsenals, where are found in all parts of the world magnificent specimens of workings in iron, chiefly, however, for warlike purposes. Coming nearer to our own times, and we may say to the commencement of the present century, or even so recently as forty years ago, the manipulation of malleable iron, when in an incandescent state, into shapes of almost endless variety has been greatly stimulated by the ever-varying requirements of the practical engineer. The introduction of steam into our mercantile marine and into our navy, as well as the locomotive engine, which was the natural offspring of our railways, has called forth the inventive genius of our workers in iron in a most remarkable manner, and perhaps no machine has brought out the talents of our working smiths more than the locomotive engine. The writer well remembers the time when smith-work even of a comparatively simple kind was difficult to be executed, and it was often the case that the designer and the draughtsman had first to chalk out the piece of work he wished to be done in a particular fashion on the foreplate of the smith's hearth, and ask his workman, "Can it be done like this"? When he would often reply, "No, maister, it cannot be done." We must not, however, omit here to mention that the rapid strides made in the operations to which allusion has been made are due almost entirely to the steam-hammer, that wonderful production of the brain of a Nasmyth, which, about thirty-five years ago, revolutionised the operations in our forges and smiths' shops. In the present day masses of iron of immense magnitude are being manipulated with ease that once was thought impossible: witness our "Woolwich Infants," and other kindred pieces, such as armour-plates and the like, which have first to go under the steam-hammer. The pressing of iron into a mould, or matrix, to give shape to various articles by the aid of the screw press, has also been practised for many years; the steam hammer has likewise been brought into requisition for the same purpose, but to a limited extent only. Reciprocating blows from a steam hammer, it is found, do not produce or accomplish satisfactorily the kind of pressure necessary for forcing the atoms or molecules of iron, in an incandescent state, into all the interstices of a mould, where intricacy and accuracy are desired. This, however, can be done effectually by the inexorable thrust of a hydraulic or hydrostatic "squeeze." And this leads us to the subject of the paper now before you. We believe that Mr. Haswell, of Vienna, was the first to bring into practical and useful operation the "squeezing" of malleable iron at a welding heat into shapes and uses, as they are technically called, previously to their being manipulated by the smith and fitter. Some years before Mr. Haswell's patent of the machine or tool now under consideration was designed, hydraulic power had been made use of for forging or pressing malleable iron, both with and without the aid of an accumulator; but it is to Mr. Haswell that we are indebted for the improvements which make the hydraulic press a tool of general use. The drawings or photographs against the wall illustrate the machine or tool that he has produced for that purpose. It will be perceived that it is simply the adaptation of the hydraulic press, on the principle of Bramah, with an arrangement peculiar to Haswell, whereby a "squeeze" can be given, either reciprocating or in one continuous thrust, until the piece operated upon acquires the desired shape. The pieces on the table are samples of what are produced. No. 1 is a sector of a 12-spoked wrought-iron locomotive wheel, showing three spokes with their portion of rim and boss pressed out of the solid slab. No. 2, locomotive cross head ditto. No. 3, ditto (double) ditto. No. 4, outside crank with its pin, ditto. No. 5, piston rod socket, ditto. No. 6, locomotive axle-box, ditto. Then followed a description of the machine.

Sir Joseph Whitworth, bart., who was next called upon, said the great novelty in his application of hydraulic power was in giving intense pressure to the fluid metal. On applying this great pressure to a column of metal its length was diminished one-eighth in less than five minutes. This would indicate to them the amount of work done, and the effect with which the air cells were expelled. It had been a somewhat dangerous and difficult process to carry out, but it was now quite successful, and his firm were preparing to carry it out on a much larger scale. It might be of interest to mention that they had lately completed for her Majesty's ship *Inflexible* two twin screw-shafts, 283 ft. in length, weighing 63 tons. The weight of iron would have been 97 tons, so that by using this compressed steel they saved 34 on the driving round of two shafts during the whole life of the engine. These shafts were now lying at the yard of Messrs. John Elder & Co., Glasgow. The strength of the shafts was 40 tons to the square inch, and their ductility or power of extension was

30 per cent. of their length. The shafts were 17 in. in diameter, and they had a 9-in. hole through them cast hollow. It was found desirable to get the pressure applied as soon as possible—when, in fact, the metal was still in a white heat. The firm had not applied the process for forging iron, what they had done having been done entirely with fluid-compressed steel. The value of the hydraulic pressure in forging, so far as his experience went, was in proportion to the size of the mass. The larger it was, the better the hydraulic pressure. In reply to a question, Sir Joseph added that the value of the compression was in proportion to the ductility of the metal. If they wanted to produce a steel that would have 30 per cent. of ductility, they could not produce it at all without pressure; otherwise it would be full of air cells. The fact that gas was squeezed out of the cells was proved by the fact that there was a considerable flame burning from them during the process, owing to the escape of the gas.

Mr. Snelus said he had over and over again made steel which bore exactly the same tensile strain, and gave the same ductility, without pressure. This was accomplished by the use of ferro-manganese.

Sir J. Whitworth.—If you can do it without the use of compression, so much the better.

Major Butler, replying to the remarks of some of the previous speakers, said there was no fear of the hydraulic system, excellent as it was, superseding the steam-hammer. In the case, however, of heavy work, it dispensed with the need of such enormous foundations as an 80-ton hammer, for instance, would require. He had seen armour-plates 14 in. thick and 10 ft. wide quite easily bent by Haswell's process.

After some discussion,

The President (Mr. W. Menelaus) remarked that he thought the Institute would agree with him that Mr. Butler had not proved his assertion that ten years ago large steel cylinders could not be cast in England. But even if the assertion had been correct, they could now produce anything that could be done elsewhere. Mr. Butler, however, deserved a hearty vote of thanks for his paper.

A "CHRISTIAN WORKERS' MISSION HALL" AT CAMBERWELL.

The ceremony of laying the memorial stone of a new building bearing the above title was performed on Tuesday afternoon by Mr. Robert Alexander Gray, J.P. The building, which may be de-cribed as one of a rather exceptional character, is situated in George-street, near Camberwell-green, and is intended for the services of "Ned Wright," who has for several years past been distinguished for preaching to thieves, he himself having once been a convict. The site for the building has been granted by Edmonds's Trustees, who are the freeholders, and who have granted a lease for the term of sixty years, at a ground-rent of 60*l.* a year to Messrs. Ned Wright, Eneas Dawson, and M. H. Hodder, the lessees undertaking that within twelve months a brick building shall be erected of the value of 1,000*l.* The site occupies an area of about 14,000 superficial feet. The structure is to be 140 ft. in length and 62 ft. in width, and, when completed, will hold 1,500 persons. It will be a plain brick building, covered in by a roof of 80 ft. span, with iron principals and girders. The walls internally will be plastered, and the only fittings will consist of a platform at one end, and plain benches and chairs in the body for the congregation. The design has been gratuitously furnished by a friendly architect, who will superintend the erection of the building, whilst Ned Wright himself (who is connected with the building trade), assisted by several artisans, also friendly to the undertaking, will carry out the work. The plans have been submitted to the Metropolitan Board of Works, and approved by them.

Metropolitan Improvements.—The officials of the Metropolitan Board of Works are occupied inspecting and preparing plans for the proposed improvements and means of communication between Tottenham-court-road and Charing-cross, and also the widening of Gray's-inn-road from Holborn to Liquorpond-street, and the widening of Little Gray's-inn-lane, from Gray's-inn-road to Mount Pleasant. The plans and estimates will be submitted to a meeting of a full Board, who will decide whether they shall promote a Bill in Parliament next session.

WORKMEN'S MODEL DWELLINGS.

We recently commented on the doings of the Model Lodging Houses Association in reference to this question, and our parochial contemporary, the *Metropolitan*, has the following:

"Dwellings for the Working Classes.—A correspondent suggests, with reference to the notice in our issue of the 9th inst., of a new undertaking 'for the benefit of the working classes,' that the Metropolitan Board of Works and local authorities generally will do well, in the interests of the ratepayers and the poor, if in the exercise of the important powers vested in them by recent legislation, they make some inquiries into the *bonâ fides* of some of the companies, which, taking advantage of public sympathy, have sprung into existence concurrently with the Artisans' Dwellings Act. A perusal of the articles of association of these companies will show that in one or two instances—happily in one or two only—the undertakings have been promoted more for the benefit of a few interested individuals, than either for the benefit of the working classes, for effecting sanitary and other improvements, or for assistance to local authorities."

PROPOSED NEW TOWN-HALL, GREAT YARMOUTH.

At the last meeting of the Yarmouth town council, the committee appointed to consider the question of the erection of a new town-hall presented the following report, which was moved by the Mayor, and seconded by Mr. F. Palmer:—

"The committee viewed the site of the Tollhouse-hall and gaol, and found that from its position it was not suitable for the erection of a Sessions Court-house and public offices; and the committee subsequently considered various other sites suggested, but found that not one of them was adapted to the proposed new buildings. The committee, after considerable discussion, found that the only suitable position for a sessions court and corporate offices was on the site of the present town-hall, and on viewing the building, which it was found would, from its age, have to undergo heavy repairs in the course of a few years, and also considering the unsuitableness of the present magistrates' court and justices' retiring-room, the committee resolved to recommend the council to pull down the present town-hall buildings, and to erect upon the site (extended as shown in the plan submitted to the council) a public assembly room, sufficiently large to meet the present and future requirements of the borough, a sessions court, council-chamber, magistrates' court, and the necessary corporate offices. The committee further recommend that a police-station, cells, and residence for the superintendent be erected upon the vacant site belonging to the Corporation at the north end of Middlegate-street. The committee have considered the cost of town-halls recently erected by other towns, and are of opinion that the buildings proposed to be erected upon the site of the present town-hall can be built for a sum of from 17,000*l.* to 20,000*l.* And they recommend that the Council authorise them to advertise for plans, with premiums of 100*l.*, 50*l.*, and 20*l.*, for the three best designs, the plans sent in to be submitted to a future meeting of the Council. The style of the building to be 'Classic,' and the principal fronts to be to the north and west. The site of the town-hall contains 8,960 superficial feet, and the site extended on the north, east, and south sides, as shown on the plan submitted, will contain 13,000 superficial feet, which the committee consider is amply large enough for the erection of a new town-hall, adapted to the increasing size of the town. The cost of the building could be met by a loan, the repayment of which would be extended over a term of years.

A letter was read from Mr. Augustus Frere, of London, architect, offering to furnish the Corporation with plans for a town-hall, on the understanding that he would receive no remuneration if they were not accepted, but binding the Corporation not to be in treaty with any architect while they were considering his plans. The Corporation, however, said they could not accept the offer of Mr. Frere, who must put in his plans for competition in the same way as others."

The report was adopted with but two dissentients.

LIVERPOOL AND SOCIAL SCIENCE.

With reference to the approaching Congress, the *Liverpool Weekly Albion* is publishing some essays headed "How Liverpool was Made," "The Spirit of Liverpool Commerce," "The Blots of Liverpool Life," and so on. We take a passage from the last named. After describing the hosts of Irish to be found in Liverpool, untaught in any handicraft, and devoid of the faintest glimpse of education; and the even more dangerous element, "the Americanised Irish rowdy, who on the other side of the Atlantic has lost even that one redeeming feature of pure Hibernian brutality—its utter stupidity; and who brings back with him a respectable overcoat, a revolver, and a faculty for deliberate planning of outrage which could hardly be overdrawn"; the writer thus concludes:—

"This is the dark side of Liverpool life, and so dark is it that it might well strike any but the most hopeful mind with dread as to the ultimate results to which such a state of things must lead. And here, while casting about for means to counteract these dangerous growths, the question must naturally arise,—what amount of power or will to fight against them is to be found with those who wield the municipal authority? The power need not be much discussed, because it is much to be feared that the will is deficient. Here it is that the weak and dangerous side of the character of Liverpool society makes itself felt. We do not, in dealing with individuals, expect to find the jovial, hearty, dinner-giving man the best person with whom to discuss grave problems of morality; and equally delusive would it be to expect from the Corporation, which finds its best satisfaction in brilliant public occasions, that amount of careful consideration of their duties towards their town which might well be displayed by a less open-handed but more conscientious body. It might not untruly be said that, if recklessness is the distinguishing feature of the lower life of Liverpool, the distinguishing feature of its higher life, as evidenced through its municipal proceedings, is a want of due sense of responsibility. It is not that the Corporation does not treat the town liberally; on the contrary, it is liberal almost to a fault, not only in its corporate capacity, but also in respect to the private action of its individual members. The spacious parks that have been laid out; the public buildings that have been erected and presented to the town at the sole cost of single individuals—these are things which amply bear witness to the fact that the influence of the Council Chamber does not tend to niggardliness; and though it may be even more than suspected that the expenditure of public money looks for a return in the shape of support given to the political party that spends it, or that private munificence has an eye to a possible baronetcy, the advantage to the town is none the less on that account. Want of liberality, then, is the last complaint which the inhabitants of Liverpool could bring against their governing body. It is rather when note is taken of the high death-rate existing in a place so naturally healthy by situation, and so capable of a thorough system of drainage; and, further, of the manner in which jerry-building speculators (Welsh for the most part, and possessing a large and unctuous interest in brick chapels) have been allowed to take possession of whole districts,—it is when such facts as these, and others no less significant, are noticed, that a glimpse is obtained of what ought to have been done while by no means necessarily leaving other things undone; nor can it be said that the manner of the recent appointment of a deputy medical officer (against the appointment itself we say not a word at the present moment) was calculated to inspire confidence in this most important direction."

THE ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD.

The fifth annual report of the Local Government Board has just been issued. The statements and observations of the Board relate, first, to the Administration of the Laws for the Relief of the Poor; and, secondly, to the Administration of the Laws affecting Local Government and the Public Health. Under the first head we find that the total expenditure for the relief of the poor during the parochial year 1874-5 was 7,488,481*l.*, against 7,664,975*l.* in the preceding year. The absolute decrease was therefore 176,476*l.*, or 2·3 per cent. In the extra Metropolitan district of Middlesex the decrease was 2·8 per cent, and in the Metropolis 2·7 per cent. The total number of paupers of all classes in receipt of relief on the 1st of January, 1875, was 817,822*l*, a decrease of 1·7 per cent. on 1874, and in July, 1875, the decrease was as much as 4·8 per cent. as compared with the corresponding period of the year before. The population at the last Census was 22,706,031, so that the ratio per cent. of paupers relieved in the population was 3·5 in 1874, and 3·4 in 1875. The report then deals with infirmary accommodation, the school districts, the asylums and dispensaries, vagrancy, lunatics, emigration, and a variety of other matters, furnishing statistics of great interest and importance to all interested in poor-law matters. We find from one table that there were 54,571 lunatics chargeable to the poor-rates in 1875, an increase of 1,690 over the previous year, so that the advance in numbers, remarked upon in previous reports, still continues. The emigration at the cost of the poor-rate in 1875 was on a very small scale, 108

persons only having been sent abroad, at a cost of 378*l.*

The sum of 562,556*l.* was expended during the twelve months in building expenditure on workhouses, the Metropolitan District Asylums, and District Schools.

Under the second head the report furnishes copious information respecting the different sanitary measures that have been in operation, and shows what has been done throughout the country for the protection of the public health. There are now 807 medical officers of health, and 808 inspectors of nuisances throughout the country, towards whose salaries the Government contributed, up to September last, the sum of 59,119*l.* The amounts sanctioned during the last two years as loans to sanitary authorities in respect of urban districts were considerably in excess of the total amounts sanctioned in respect of the same districts during the ten years which followed the passing of the Public Health Act, 1848; and the continuous increase of expenditure on the part of sanitary authorities is regarded as affording a most convincing proof of the amount of interest taken throughout the country in sanitary matters. With respect to local taxation, the total of 1873-4 is given as 37,418,810*l.*, and the total expenditure as 36,371,099*l.* The non-remunerative local taxation in the same period was 12,580,607*l.*, or 116,243*l.* in excess of the amount raised during the preceding year.

MONUMENTAL.

The Late Lord Marjoribanks.—A Gothic mural tablet to the memory of the late Lord Marjoribanks, of Ladykirk, Berwickshire, N.B., has just been executed by Mr. Currie, sculptor, Oxford-street. It is 7 ft. high, by 4 ft. wide. An arch, springing from capitals carved with ivy, supported by triple columns on clustered bases, the whole resting upon a moulded plinth with foliated brackets, forms the memorial.

Dunfermline.—The monuments to the memory of Thomas Gillespie and Ralph Erskine have now been erected at Dunfermline. The Gillespie monument consists of a tablet of polished Sicilian marble, which has been let in behind the columns of the arcade in the north aisle of the nave of the Abbey Church. It measures 8 ft. by 2 ft. 3 in. The monument placed over the grave of Erskine is in the form of a sarcophagus, and measures 6 ft. 6 in. in height, and 8 ft. by 3 ft. 6 in. at the base. The work is purely Classic. The pedestal rises from a moulded basement, and is enriched with carved rustic coins, from which are projected inscription panels. The sarcophagus rests upon a square block, consisting of moulded base, cornice, and die—the cornice and base having carved mouldings. On the four sides of the die moulded panels have been introduced, and each of these bears bas reliefs, indicating the character and work of Erskine, and of the late Rev. John Smith, Rev. James Husband, D.D., and Rev. Robert Brown, who were leading ministers of the Secession Church in Dunfermline. Both monuments have been executed by Messrs. Stewart, M'Glashan, & Son, sculptors, Edinburgh.

Colonsay.—A short time ago Lady Emma M'Mill inaugurated a monument on the Island of Colonsay, erected by subscription to the memory of the late Lord Colonsay, former proprietor of the island, and of the adjacent island of Oronsay. The design was prepared by Mr. Thomson, architect, Edinburgh, and the erection of the work was entrusted to Mr. W. Vass, of the Sound of Iona Granite Quarries, Mull. The monument is an obelisk of red Mull granite, finely dressed, resting on a moulded quadrangular pedestal of the same material. It is fully 30 ft. high.

Newcastle-upon-Tyne.—Mr. Joseph Mayer, of Liverpool, recently commissioned Signor Fontana, a London sculptor, to execute a memorial tablet to the memory of his parents, which is to be erected in a church at Newcastle-upon-Tyne. The tablet has just been finished. The size of the memorial is 4 ft. 6 in. by 8 ft. 6 in. It consists of a simple frame in the Greek style. The portraits of Mr. Joseph Mayer and his mother, each three-quarter face, are in bas relief in the upper portion of the tablet, the medallion being set in drapery to correspond with the lower portion of the work. Below is a pedestal, having on each side a female figure. These are Integrity and History. One holds a wreath of lilies—denoting purity—below the medallion; and the other has a stylus in her hand, as though about to record the deeds of the departed.

Winchester.—A monument has just been placed near Gardiner's Chantry, Winchester Cathedral, in memory of the late Bishop Sumner. The work is from the studio of Mr. Weekes, R.A. The form of the memorial is that known as an "altar tomb." Upon a Gothic base of Caen stone rests the effigy of the prelate. The effigy is in Carrara marble, life sized, the Bishop being represented sleeping in his episcopal robes, which are partially covered with the mantle of the Order of the Garter, of which *ex-officio* he was the prelate.

Dumfries.—A tablet has just been erected in St. Andrew's Roman Catholic Church, Dumfries, by Lord Herries, in memory of his late brother, the Hon. Marmaduke Constable Maxwell, of Terregles. The tablet is 9 ft. 6 in. in length by 5 ft. at its greatest breadth. It is wrought out of Caen stone, and has on either side pillars of polished red granite, and is supported by two modelled figures representing Piety and Benevolence. The pediment above is florid with carving in high relief. The monument was designed and executed by Mr. Wm. Flint, Dumfries.

SCHOOL BOARD SCHOOLS.

Michelmersh.—The foundation stone of a new Board School, at Michelmersh, was laid on the 13th ult. The work undertaken by the Board comprises three schools, situate respectively at Braishfield, Michelmersh, and Awbridge, each containing accommodation for eighty scholars, with large playgrounds for both sexes, and the central school at Michelmersh having in addition thereto a teacher's residence attached to the school. The contracts for the two first-named have been taken by Mr. John Crook, and for the latter by Mr. J. W. Rowland; the architect being Mr. W. H. Mitchell, of Southampton.

Bermondsey.—On the 25th ult., Sir Charles Reed, chairman of the School Board for London, opened new schools in the Manor-road, Bermondsey. The buildings, which will accommodate upwards of 800 children, are close to the South Bermondsey Station of the South London Railway, and are approached from the station by Rotherhithe New-road and Manor-road. They consist of one large block of buildings, three stories in height, the front, towards Manor-road, being enriched with carving in red brick by M'Culloch, the style of architecture being, as usual, "Queen Anne." The infants are placed on the ground-floor, having a large schoolroom and babies' room; the girls on the first and the boys on the second floor, each having a double schoolroom and two class-rooms, with the usual means of access; cloak-room, and lavatories. There are also rooms for the care-taker and the teachers, together with ample covered and uncovered playgrounds. The accommodation will suffice for 274 boys, 270 girls, and 293 infants,—837 in all; and the total cost per head is 12*l.* 11*s.* 9*d.*, the purchase of the site amounting to 1,676*l.* 16*s.* 10*d.*, and the building to 8,862*l.* 6*s.* 4*d.*, making a total of 10,539*l.* 3*s.* 2*d.* The buildings were erected from the designs of the Board's architect, Mr. E. R. Robson, the contractors being Messrs. Hill, Higgs, & Hill, and the clerk of the works, Mr. Ashford.

Rotherhithe.—New schools in the Dartmouth-road, Rotherhithe, built by the School Board for London, were opened on the 26th ult. by Sir Charles Reed. The schools are situated near to, and overlook, the Southwark Park, and consist of one block of building three stories in height. On the ground-floor are a spacious school and a babies' room for the infants; on the first-floor a double school-room, and two class-rooms for the girls; and on the second-floor like accommodation for the boys, with separate entrances, cloak-rooms, lavatories, &c. There are also rooms for the caretaker and teachers, together with spacious playgrounds. The school will contain 274 boys, 273 girls, and 294 infants; total, 841; the total cost per head being 9*l.* 17*s.* 3*d.* The cost of the building is 6,995*l.* 15*s.* 2*d.*, and that of the site, 1,298*l.* 18*s.* 10*d.*, making a total of 8,294*l.* 14*s.* The design is that of the Board architect, Mr. E. R. Robson, the builder being Mr. Thompson, and the clerk of works Mr. Ashford.

Brighton.—The alterations and extensions of the Board schools in Middle-street, Brighton, which were commenced a year ago, are fast approaching completion. A plot of ground on the south side of the schools, facing Boyce's-street, has been secured, and made the site of an infants' school. It was at the same time arranged that a playground for girls and infants should be attached to the new building, and that from Boyce's-street a corridor and staircase should lead to the existing girls' department in the Middle-street block. By these means extra and better accommodation will be provided for girls and infants, and the one entrance and the common playground got rid of. The new infants' school is erected in the Queen Anne style—the style of the building in Middle-street. The front is of red Suffolk brick, and the pediments are surmounted by a finial of Doulting stone. Facing Boyce's-street are five windows, and an oriel under the centre pediment, with brickwork scrolls on each side. On the left is a wide doorway, with side-lights, surmounted by a pediment, while the tympanum is filled with scroll brickwork, with "1876" carved in the centre. The extra accommodation provided consists of two rooms—one, 42 ft. by 27 ft.; and the other, a class-room, 27 ft. by 18 ft. The general fittings of the new building are similar to those of the other Board schools. Mr. T. Simpson is the architect; Mr. G. Lockyer, the builder; Mr. T. Ransome, the clerk of the works; and Mr. G. Avis, the foreman.

Alfrick.—The United School Board of Suckley, Alfrick, and Lulsley opened their new school at Clay-green, Alfrick, a few days ago. The building has been erected by Mr. Garbutt, of Malvern Link, from designs of Mr. Ernest A. Day, of Worcester. A residence for the master and mistress adjoins the schoolrooms.

SUBSIDENCE OF BUILDINGS NEAR GLASGOW.

Considerable alarm was experienced on the morning of the 25th ult. by the inhabitants of a four-story tenement, at the corner of Douglas-street and Castlebank-street, Partick, near Glasgow, owing to a sudden shock and vibration similar to that preceding the fall of a building. The tenement in question is comparatively a new one, and was purchased by Mr. Wallace, of Cambuslang, for about 4,000*l.* It is occupied by the families of workmen, and is divided into rooms and kitchens, and single apartments. The bed of the river Kelvin is about 200 yards to the east of the building, Messrs. Wilson's bleachworks, a row of two-story houses, and a street intervening. The bleachworks, on the margin of the stream, escaped uninjured, but the old two-story houses are cracked outside and inside, and the plaster of the exteriors and roofs removed by the vibration. In the new tenement, however, is a rent reaching from the first to the top story, and extending in width from 1 in. to 8 in. Within the several houses and on the connecting stairs there is an ugly webwork of fissures, and a further subsidence was threatened two days after the first. The authorities warned the occupants to quit, but of the forty families, consisting of a total of 120 persons, only one or two obeyed the warning, though many of them, apparently indifferent to their personal safety, removed their furniture. Steps are also being taken to have the walls and foundations of the property rendered secure. In order to account for the subsidence, it is stated that the houses were built on ground which, some seventy or eighty years ago, had been undermined for coal, that the pit had become overcharged with water from the river, thus saturating the foundations of the houses. Another theory is that the tenements had been built upon a sandy soil, and subsided through their own weight. It is impossible, however, to account for the misfortune with anything like accuracy. It is not thought necessary at present to raze the buildings, provided they can be rendered more secure.

BONÂ-FIDE.

Mr. Editor,—The following appears in the arrival-book at Lynton, near Ilfracombe. I have just now stumbled over it. As a piece of unpaid-for advertising it will doubtless please one who often uses your columns.

A New-made Benedict.

"From Lynton's Castle Inn to Lynmouth low,
The visitor, with facile steps, may go;
But in returning to the upper air
Some rather stiffish exercise is there.
'Tis true that contemplation lifts the mind,
But leaves our unpoetic parts behind.
Would it not, therefore, be a useful gift,
If 'Bunnett' would provide us with a lift,
That while our minds are charm'd with lofty scenery,
Our legs might have the benefit of machinery?"

A SURVEYOR'S ACTION.

At the Westminster County Court on the 30th ultimo, the case of Foster v. Hayter was heard before Mr. Judge Bayley, in which the plaintiff, a surveyor, of Great Marlborough-street, sued the defendant, a contractor, of Portsmouth, to recover the sum of 5*l.* 15*s.* 6*d.* under the following circumstances. Mr. Owen Low appeared as solicitor for the plaintiff; and Mr. H. T. Roberts for the defendant.

From Mr. Low's opening it appeared that his client was employed by the defendant to make a survey of some extras and variations which the defendant had in his account, as contractor for the erection of the new Lunatic Asylum at Portsea, charged against the Town Council of Portsmouth. The plaintiff's claim was originally for eleven guineas, but it was ultimately agreed that one-half of this sum should be paid by Mr. Rake, the architect of the building, residing at Portsmouth, and the other half by the defendant; but as the defendant refused to pay his portion of the claim the present proceedings were instituted.

At this stage of the case Mr. Roberts said he should (*in limine*) object to the jurisdiction of the Court, as the transaction took place in Portsmouth and not in London.

Mr. Low considered that the objection could not stand, as it was true that although the information had been obtained in Portsmouth, the real work was actually executed at the plaintiff's chambers in London; upon which the learned Judge over-ruled the objection, and the case proceeded.

Mr. Rake being called, said he was an architect at Portsmouth, and was employed on the erection of the new Lunatic Asylum at Portsea, and that the defendant had the contract, but, owing to some extras and variations, the Town Council would not pass the defendant's accounts, when it was suggested that the plaintiff should go through them and report upon them; and this suggestion being adopted, the plaintiff was employed, and witness agreed to pay half of his charges. In answer to the learned judge, the witness said that the charges were fair and reasonable, and in accordance with professional usance.

This was the plaintiff's case; when, the defendant being called, said he never authorised the plaintiff being employed, as there was no necessity for doing so, as the architect's clerk could have done so without incurring further expense.

Mr. Rake here said his clerk was a very young man, and as the Town Council would not have been satisfied, it was agreed to employ the plaintiff.

The defendant continued, and said the plaintiff's report was incorrect, and had been the means of the Town Council of Portsmouth not paying him 70*l.* remaining due to him.

A surveyor from Portsmouth was called, who considered there were some trifling inaccuracies in the plaintiff's report.

The learned judge considered it was evident that the plaintiff had been employed by the defendant, and therefore he should rule in favour of the plaintiff, with costs of solicitor and travelling expenses of Mr. Rake from Portsmouth.

THE HIPPODROME AT BRIGHTON.

For some years Brighton has needed an edifice dedicated to equine entertainments, and though the late Mr. Batty constructed a permanent building at the east end of this thriving borough, and a similar structure was made for Mr. James Newsome, these places, from various causes fell into disuse, and improvements have swept them away. The first circus recorded in the annals of the "Queen of Watering-places" was that on the Grand Parade, constructed by Messrs. Kendall & Co. in 1808, and opened in the August of that year by Mr. Saunders, the "father of the ring"; the fabric was 100 ft. in depth, and 37 yards wide: through paucity of support it was closed in 1812, and, excepting Hengler's Arena in a portion of the Pavilion stables, and the occasional visits of travelling *troupes* during the tenting "season," the good folks of Brighton have been unsupplied with feats of horsemanship and regular athletic displays. Mr. Fred. Guinett has, however, made several abortive attempts to secure a site suitable for the purpose of building a hippodrome, and it was not till the month of June, 1876, that he succeeded in procuring the spot on which, over a quarter of a century since, stood the Maze, in the south-east part of the late James Ireland's famous pleasure-gardens, in the rear of St. Martin's Memorial Church, on the Lewes-road. The main entrances of the circus are in Park-crescent-place. The building is formed of brickwork, with a roof of wood and iron; it is 50 ft. from the base to the vane; 80 ft. wide, and 120 ft. in length; the ride has a circuit of 150 ft., and the promenade exceeds 200 ft. The boxes and stalls will accommodate 300 visitors, the pit 1,350, and the like number can also be disposed of in the gallery.

The interior is after the style of the Grand Cirques in Paris and Madrid, and lighted by one thousand jets of gas. At the back there are extensive stabling for the stud, and dressing-rooms with every convenience for the use of the performers. Bright crimson and gold predominate in the decorations.

The cost of the building is 4,000*l.*, and the sum paid for the ground, 1,000*l.* The contractors, Messrs. W. A. & J. Stenning, of Lewes-road, have nearly finished their task, though the claims of their workmen threatened at one time to hinder the construction going on.

The opening will take place on All Hallows' Eve.

LOWERING THE DEATH RATE.

The King of Belgium has announced to the President of the Health Congress his offer of 5,000*f.* as a prize to that city, local authority, or private association which shall by improvement in the dwellings of the working classes effect the greatest reduction of the death-rate at the lowest cost. This prize is to be awarded at the next International Hygienic Congress.

SURVEYORSHIP ITEMS.

Mr. Robert H. Inch, of Croydon, has been appointed surveyor to the Lowestoft Improvement Commissioners and Urban Sanitary Authority, *vice* Marks, appointed clerk, surveyor, and engineer to the Llandudno Improvement Commissioners and Urban Sanitary Authority.

Whitechapel District Board of Works.—At a meeting of the Whitechapel District Board of Works on the 2nd inst., the salary of the surveyor (Mr. W. S. Iron) was increased from 350*l.* to 400*l.* per annum.

STONE-CUTTING MACHINERY.

SOCIETY OF ENGINEERS.

The first meeting of the members for the session was held on Monday evening, in the Society's Hall, 6, Westminster-chambers. Mr. V. Pendred, president, in the chair. A paper on "Stone-cutting Machinery," by Mr. Henry Conradi, was read. The author first noticed the ordinary stone-sawing machines as worked by hand. He then described the improved machinery for cutting and dressing stone as in use at the new Law Courts, by Messrs. Bull & Sons, the contractors. It consists of a timber stand, carrying a cast-iron saw-frame suspended by the corners to the upper part of the frame. The saw-frame is raised or lowered by means of winches and chains. The author also described some saw-frames for stone, with both horizontal and vertical revolving disc-cutters, by which the stone is cut. The author then proceeded, by the aid of diagrams, to describe some stone-sawing machines designed by himself, and which have been made and used in France. In this machine the author reversed the principle adopted in ordinary stone-sawing frames, making the fixed stand a movable one, carrying the saw-frame with it in its forward and backward motion, the frame receiving its vertical motion from a suspension arrangement. This sawing-frame is usually driven by means of a semi-portable engine of special construction, which was described by the author.

PNEUMATIC DESPATCH COMPANY.

Sir,—Observing in the *Builder*, a notice of the sale of the station of the Pneumatic Despatch Company at St. Martin's-le-Grand, in which it is stated that "the trucks containing the parcels continually stuck in the tubes," permit me to say that the reason why the operations of the Pneumatic Despatch Company were discontinued had nothing whatever to do with the mechanical working of the pneumatic system, which was in every respect satisfactory.

T. W. Rammell,
Engineer to the Pneumatic System.

*** We shall perhaps hear what the Post-office officials have to say on the subject.

CHURCH WARMING.

Sir,—In reply to your correspondent, the English in Russia find no difficulty in warming their chapels. There no cough nor sneeze disturbs the quiet of the service, and you might hear a pin fall! At St. Petersburg, I believe, they use the Gurney stove. The difficulties here in England arise from the passive resistance of prejudice and indifference. The question is quite settled elsewhere, if not to the satisfaction of the scientific, to the feeling of comfort, at least, of the congregations.

L. W. B.

"PENMON PRIORY."

Sir,—If your correspondent, "G. H.," will turn to the "Archæological Journal," No. 2, June, 1845, p. 118, he will find a very interesting paper, entitled "Remarks on some of the Churches of Anglesey," which will give him all the information he requires.

John L. Clemence.

SUPPLY OF WATER.

Sir,—Will one of your readers kindly inform me what kind of pipe would be best to use as a main for the supply of pure water for a town of about 2,500 inhabitants; length of main about half a mile, with a fall of 230 ft. from the reservoir. Three stopcocks would be required in the length.

Peto.

MASTERS AND MEN.

North Warwickshire.—The strike in North Warwickshire, between the joiners and carpenters and their masters has now, after a protracted struggle, been settled. The men struck for an increase of from 7d. to 8d. per hour, but have accepted 7½d.

Glasgow. — Though the joiners' strike in Glasgow is virtually at an end, a considerable number of the employers have, it is stated, refused to sign the by-laws. The resolution passed by the society men as to refusing to work along with "nobs" is being rigidly adhered to, and work is so far behind that several employers have no alternative but to ask the non-society men either to join the union or leave off work. Since the commencement of the strike a considerable number of men have left the town, and there are now fewer joiners in Glasgow than is usually the case. A pretty large contingent emigrated to New Zealand, and others are in London. The expense of the strike to the society was over 4,000*l.*—the largest sum ever disbursed by them for a like object—and of that amount only about 65*l.* was received from the provinces. Towards the end of 1837 and the beginning of 1838 (says the *Scotsman*) the Glasgow joiners came out on strike with the object of raising their wages from 18*s.* to 1*l.* per week, and the records of this dispute bear curious testimony as to the changes the last forty years have wrought. The struggle lasted till about the month of March, and, according to the minutes relating to the strike, the operatives had to submit to the employers' terms, "because a thaw set in, and the ice breaking upon the canal a body of men came from Edinburgh to work for 18*s.* a week." All through, these minutes bear evidence of the heart-felt wish of the Glasgow joiners that the frost would continue, so as to render the canal impassable.

CHURCH-BUILDING NEWS.

Marlow.—On the 14th ult. the parish church of Marlow, Bucks, was re-opened, after the completion of the new chancel, of which the foundation-stone was laid a year ago. The work has been carried out under the direction of Mr. John O. Scott, architect, by Mr. Thomas Corby, builder, of Marlow, whose contract amounted to 1,924*l.* The materials of the chancel are rubble stone walling, faced with flints and Bath-stone dressing. It is 24 ft. in length inside, and is lighted with three-light windows on each side and a fine five-light window at the east end. The east window has been filled with stained glass, in memory of the late Bishop Milman, of Calcutta, formerly vicar of the parish.

Soham.—It has been determined to restore the parish church of Soham, Cambridgeshire, from plans prepared by Mr. J. P. St. Aubyn, architect.

Dinsdale.—The parish church of Dinsdale was re-opened on the 19th ult., after restoration. The church dates from the year 1196, and is dedicated to St. John, and the adjoining, or Surtees Chapel, to St. Mary. In the restoration all the old features have been retained. The east window of the chancel, which had been recently placed there, has been taken out and replaced by a window of the Early Decorated style. Two new windows of the fourteenth-century period have been added, corresponding to the one previously existing. The west window, built in 1841, has been converted into an Early Decorated one, from the Perpendicular style. The other windows are also Early English and Early Decorated. An organ-chamber and vestry are additions to the edifice, as is also a tower, in the Early Decorated style. The seats are all open benches. There are already four memorial windows of stained glass. That in the chapel is from the Rev. Scott F. Surtees, to the memory of his parents, and is by Messrs. O'Connor & Co. Two windows in the chancel are from the Rev. J. W. Smith, in memory of two daughters; and the third is by Dr. Eastwood, in remembrance of two young children. These are all by Messrs. Clayton & Bell. The building was until lately surmounted by a low-pitched roof with flat ceiling; these have been removed, and the pitch of the new roof made higher, with open woodwork of pitch pine. The walls are faced with red sandstone from the estate, relieved by Osmotherley white stone.

Bridlington.—On the 29th ult. a meeting of the committee for the restoration of Bridlington Priory Church was held at the Town Hall, at which Sir Gilbert Scott, the architect, presented

a satisfactory report of the work already done by the contractor (Mr. Thompson, of Peterborough). Sir Gilbert said he had examined the north porch, and he was glad to learn that the committee contemplated including it in the restoration scheme.

Hartfordbridge.—On the 6th ult. the wooden church which has for some time been in course of erection at Hartfordbridge, in the parish of Elvetham, near Odiham, was opened by the Bishop of Winchester. Mr. George Birch, of Chancery-lane, London, is the architect.

Gloucester.—During the last few weeks St. Luke's Church, Gloucester, has been in the hands of the decorators. The chancel has been decorated in the Grecian style. The windows have been traced in patterns, and keystones formed. The work, which it is estimated will cost about 200*l.*, has been carried out by Mr. W. Pimm, from the designs of Messrs. Waller & Son, architects.

Southwick.—On the 12th ult. a meeting was held at Southwick, near Brighton, to hear a report from Mr. Brock, of the firm of Messrs. E. Habershon & Brock, architects, London, relating to the condition of the tower and spire of the above church. The report stated that the tower was originally built about eleven hundred years since, and that the foundations were giving way, and required strengthening. The spire also required some repairs. The cost of the necessary works was estimated at 300*l.* A committee was appointed to carry out the recommendations of the architect.

Sheffield.—St. James's Church, Sheffield, was reopened on the 28th ult., after alteration and renovation, at a cost of 1,500*l.* The works have been carried out under the direction of Messrs. Flockton & Abbott, architects. The new pulpit and reading-desk have been executed from their designs by Mr. Hayball, wood-carver.

Heaton Moor.—St. Paul's Church, Heaton Moor, was opened on the 29th ult. The church was erected from designs by Messrs. Bird & Whittenbury, of Manchester, and is in the Early Geometric style. The building consists of a nave of four bays, 67 ft. long and 24 ft. wide, with north and south aisles. The chancel is 30 ft. long and 22 ft. wide. On the north side of the chancel is the organ-chamber, with vestries adjoining, and on the south side a tower has been erected, under which is the principal entrance to the church. There is also a porch on the south side. The roof is a barrel-vault in timber, with moulded ribs, resting on stone shafts with moulded caps and bases, and is 44 ft. from the floor to the ridge. The chancel roof is of similar construction, but rather richer in detail. It is 36 ft. from the floor to the ridge. Sitting accommodation has been provided for 425 persons. The exterior of the building is faced with parpoint, and Yorkshire stone dressings have been applied to the buttresses and windows with nice effect. The roofs are covered with Welsh slates. The tower is at present only carried up to the belfry stage. The building will be warmed by apparatus supplied by Mr. Whittaker, of Bolton. The total cost will be about 5,500*l.* The contract for the erection of the church was taken by Mr. James Terras, of Stockport-road. Mr. J. Cordingly was the sub-contractor for the masonry, Mr. Griffiths for the plumbing, Mr. A. Brierley for the plastering and painting, Mr. Barrow for the gas-fittings, Mr. T. Ashworth for the ironwork, Messrs. Edmundson for the glass, and Mr. W. Dale for the tiling.

Culworth.—Funds are being raised for the restoration of the parish church of Culworth. The building is of Early English date, and is dedicated to the Blessed Virgin. It consists of a chancel with vestry attached, nave and side aisles, and tower. The present chancel was built when the exterior of the church was restored about forty years ago; but the interior was not interfered with, the old oak pewing dating back as far as 1450, while the font bears the date of 1662. It is more on account of the old-fashioned mode of seating being highly inconvenient, and the desire to be in harmony with other restored churches, that the restoration of the interior was decided upon. The proposition is to reseat the whole of the church, except the north aisle, with open seats in the place of the high-backed ones, to remove the organ from the western arch into an organ-chamber in the chancel, and to have the choir also in the chancel, The expense is estimated at about 700*l.*

Hunton.—The parish church of St. Mary, Hunton, was re-opened on the 28th ult., after internal restoration by Mr. W. Vaughan, of Maidstone, builder. Care has been taken to adhere as strictly as possible to the ancient style of the building. The gallery at the west end has been removed, and the belfry thrown open. The floor has been re-tiled, open sittings have been provided throughout, and a new pulpit and reading-desk have replaced those which previously existed. The walls have been re-plastered. In course of the work the opening to a vault belonging to the Fane family, supposed to belong to the fourteenth century, was discovered. Mr. Ewan Christian was the architect, under whose direction the restoration was effected.

Wolviston.—The new church lately erected at Wolviston, near Stockton-on-Tees, was consecrated a few days since by the Bishop of Durham. The new church is erected on a site the gift of the Dean and Chapter of Durham. It is dedicated to St. Peter, and consists of nave and chancel, organ chapel, and vestry, with arch opening to the chancel. The roof is open to the ridge. The building is intended to accommodate 200 worshippers. The total cost was 2,315*l.* The architects were Messrs. Austen, Johnson, & Hicks, of Newcastle-on-Tyne, and the builder was Mr. Robert Barrowdale, of Darlington.

Rousdon.—Rousdon, near Lyme Regis, has had a church for hundreds of years, but when Sir Henry Peek bought the property it was in a woefully dilapidated condition. With its thatched roof out of repair, and crumbling walls, the building looked more like a barn than a place of worship. Indeed, it had not been used for any sacred purpose for many a long year; and it is even said that a pack of hounds had actually kennelled in it. Sir Henry resolved to pull down and rebuild the church, and this was one of the first pieces of work done on the estate. The new church, which is a Gothic structure, was opened four years ago. Though the population of the parish of Rousden was then and is still very small, the church has been so well attended that Sir Henry was induced to enlarge it, and that has just been done by the addition of a chancel and south transept. On the 28th ult. the Bishop of the Diocese went to Rousdon for the purpose of consecrating the new work. The builder was Mr. Moase, of Exeter, and Messrs. Ernest George & Peto were the architects.

DISSENTING CHURCH BUILDING NEWS.

Gilwern.—The foundation stone of a new Baptist chapel was laid at Gilwern on the 7th ult. The contractor is Mr. Burgoine, of Blaenafon, and the cost will be 500*l.*

Wolverhampton. — On the 25th ult. four memorial stones of a new Primitive Methodist Chapel, at Wolverhampton, were laid with due ceremony. The total cost of the new building will be upwards of 1 000*l.* The contract for the shell is 715*l.* It will be a brick building, with Gothic front, with stone dressings over the doors, windows, and gables. A vestry and class-room will be provided at the rear. The accommodation provided will be for nearly 500 persons. The builder is Mr. A. Groves, and the architect Mr. Shepperd, both of Wolverhampton.

Goole.—On the 27th ult. the new Congregational Church, to be known as Christ Church, Goole, was opened for divine worship. The new church has been built from the designs of Mr. T. Porter, of London, at a cost exceeding 5,000*l.*

Malvern.—A new Congregational Church was opened at Malvern on the 28th ult. The style is Decorated. The building is arranged to seat 400 persons on the ground floor, with provision for a future end gallery, which would give 100 additional sittings. It is divided into nave and side aisles, by arcades carried on columns of Forest of Dean stone, with moulded caps and bases. Over the western arcade is a series of mullioned and traceried windows. The north wall is lighted by a large five-light traceried window, underneath which is a glazed screen of panelled and traceried woodwork, enclosing an entrance corridor. The south wall of the church is occupied by three traceried windows filled with stained glass, the wall underneath which is panelled and traceried with detached stone shafts, having carved caps and moulded bases, the arches and panels being designed for decoration in colours. On either side of the panelling is a moulded doorway leading to the vestries. The space in front of the south wall forms the Communion platform, which is enclosed with a moulded rail on wrought-metal foliated standards. Spacious vestries are provided at the south end of the church. Externally the walling is of Cradley stone, rock-faced, in level courses, with dressings of Bath stone. The roofs are covered with Broseley tiles. The rapid slope of the hill-side on which the church stands gives a much greater height to the east than to the west side of the church, and the difference in levels has been turned to account by forming under the east end a commodious lecture-room, lighted by a series of deeply-recessed arched windows. At the northern angle of the east front are a tower and spire, 135 ft. high. The contractor is Mr. Meredith, of Gloucester. The heating apparatus is by Messrs. Truswell & Holden, of Sheffield. The works have been executed from the designs and under the superintendence of the architect, Mr. Tait, of Leicester. The carving is by Mr. Forsyth, of Worcester. The total cost, including 1,100*l.* for the site, has been about 5,200*l.*

Newark.—A new Baptist Chapel was opened at Newark on the 26th ult. The building occupies the site of the old structure, near the General Hospital, in Albert-street, and is Gothic in style. The nave is 54 ft. long by 26 ft. wide, the aisles being each 10 ft. in width. The roof is open-timbered, with a queen-post roof, ornamented by iron panelling. The seats throughout the chapel are of red deal, stained and varnished, and are of a very comfortable kind. At the end is a platform, and behind it is a singers' gallery. The heating of the chapel will be effected by the use of superheated hot-water pipes, manufactured by Messrs. Longbottom, of Leeds. Accommodation is provided on the ground-floor for 300 persons, but provision has been made for future extension. A separate building has been erected for school purposes. The architects are Messrs. Drury & Mortimer, Lincoln, and the builder is Mr. Dake, of Newark. The cost in money, in addition to the value of old material, will be about 1,700*l.*

Bradford. — Old Dolphin Chapel, Clayton Heights, Bradford, was re-opened on the 24th ult. after alteration and redecoration. The works have been carried out by Mr. John Hodgson, of Queensbury.

Bunbury.—A new Primitive Methodist chapel was opened at Bunbury, Cheshire, on the 23rd ult. The chapel is built at the top of what is known as the College-lane, and will seat about 130. There are pews on about one-half of the floor, and the rest of the space will be occupied by forms. Mr. Parker, of Beeston, has been the builder.

SCHOOL-BUILDING NEWS.

Willenhall.—On the 4th ult. the memorial-stones of new Sunday schools in connexion with the Primitive Methodist denomination were laid at Willenhall. The buildings now commenced will supersede those in Cannon-street. The cost will be 1,200*l.*, the contract having been taken by Mr. J. H. Hunter, of Willenhall, the plans being prepared by Mr. Homeyard, architect, Birmingham. The buildings, which face Russell-street, will be of brick, with stone dressings, and with class and large rooms, will afford accommodation for 400 children.

Ingatestone.—On the 27th ult. the memorial stone of the new Congregational Sunday School at Ingatestone was laid. Concurrently with the erection of the school the chapel itself is to be thoroughly renovated and rebenched, the estimated cost of the whole being about 1,000*l.* The plans prepared by Mr. C. Pertwee, the architect, have been entrusted to Messrs. Choat & Son, builders, of Caelmsford, to execute. The school will be a neat structure in red brick relieved by white bands, and it will accommodate some 200 scholars, the schoolroom, 50 ft. by 19 ft., being supplemented by four class-rooms.

Rousdon.—New National schools, which have been erected on the main road between Seaton and Lyme Regis, close by the northern entrance of the mansion in course of erection at Rousdon for Sir Henry Peek, were opened on the 28th ult. The schools have been built at Sir Henry's cost. They occupy a considerable piece of land, and have open and covered playgrounds. The schools are situated on the confines of three parishes, and although the district is only thinly populated, it is anticipated that nearly 100 children will be brought together. Sir Henry Peek has provided for the little ones being supplied with a hot dinner every day, at a nominal cost, and a dining-room has been incorporated with the schools, communicating with the master's kitchen. There is the usual mixed schoolroom, infants'-room, and class-room; and, besides these, committee and visitors' rooms are provided. The materials used in the erection of the buildings are of excellent quality. English oak is used wherever wood is required, and

internally the rooms are skirted with dados of that material. The floors and joinery generally are also of oak. The external walls are of Chert stone, raised in a neighbouring quarry. The mullions and dressings generally are of Doulting stone, whilst internally the walls are of red brick. The roofs are of Bridgwater tiles of a warm tint, and the chimney stacks are of Fareham brick. The architects are Messrs. Ernest George & Peto. The whole cost has been about 6,000*l.*, and the contract has been carried out by Mr. Hutchings, of Colyford. The sgraffito work and the wood carving have been executed by Mr. Harry Hems. Mr. William Prosser was the clerk of works, and Mr. Berry the builder's foreman.

STAINED GLASS.

Dunster.—A new memorial three-light window has been placed in the east end of Dunster Church by Messrs. Clayton & Bell. The subject represented is the Crucifixion of our Lord, with scenes before and after that event, such as the Last Supper, His appearance to Mary Magdalene, &c. The window in the south aisle contains six lights, in which are representations, on painted glass, of the entombment of Our Saviour, His resurrection, His appearance to Mary Magdalene, and the Ascension. Five heraldic windows in the north and south aisles have been supplied by Mr. Drake, of Exeter.

Cerrig-y-Drudion. — A stained window in memory of the late Mr. William Jones, of Catharine-street, Liverpool, has been erected in Cerrig-y-Drudion Church. The subject illustrated is the Good Samaritan.

Richmond.—A painted glass window has been placed in St. Matthias's Church, Richmond, Surrey, to the memory of the late George Henrd Ashbee, C.E. The window is of two lights, any the subjects represented are the "Nativity" and the "Adoration of the Magi." In the quatrefoil is the symbolical Lamb, and the panels below contain geometrical designs. The entire cost of the memorial, which is the work of Messrs. Hardman, of Birmingham, has been defrayed by the professional friends of the deceased gentleman.

Colkirk.—The parish church in this village, which very recently was restored and enlarged, has just been enriched by the introduction of three stained-glass windows, designed and executed by Hughes, of London. That in the chancel, the gift of the rector, the Rev. W. M. Hoare, represents "The Adoration of the Shepherds" and "The Baptism of Christ." The other two windows are in the south side of the church, the one being given by Mr. Thomas Chambers, in memory of the late Mrs. Feltom; of Dunton; and the other by Miss M. Case, in memory of the late Miss S. O. Chambers, of Gately. The former portrays the "Raising of Jairus's Daughter" and "The good Samaritan." The latter represents "Mary and Martha," in the company of Jesus, and Christ as "The Good Shepherd."

THE PARIS EXHIBITION BUILDING.

MM. Roussel, Moisant, & Baudet have been entrusted with the construction of the remaining three-fourths of the metallic galleries in the interior of the Exhibition. The masonry work, &c., will be adjudged at the end of this week. The work of the great cascade has already commenced, workmen being now employed in removing the stone steps on the Trocadero. One of the "great attractions" of the Exhibition will, it is stated, be a monster aquarium, capable of containing 400,000 gallons of water, in which four millions of pounds of fish can sport! The cost is estimated at one million of francs.

Another New Pavement.—At the meeting of the City Commissioners of Sewers, on the 26th ult., an application was made on behalf of Messrs. Poletti & Dimple, the inventors of a new description of pavement, for permission to lay down a portion of their pavement as an experiment in some part of the City, and the applicants requested permission to make the experiment in some part of the City where the traffic was of the heaviest character. The proposed new pavement was described as being more durable than either asphalte, granite, or wood, and to make no dust or mud, and to be also noiseless. The application was referred to the Streets Committee.

VARIORUM.

The new number of "Picturesque Europe" illustrates Linlithgow Castle,—"This palace, the most stately and magnificent of the old Scottish royal residences, under the roof of which King James left his weeping queen when he departed for Flodden, and in the western wing of which his hapless grand-daughter was born, stands near the ancient burgh of the same name, on a high green knoll that is nearly insulated by a beautiful sheet of water, whereon the royal swans have floated from time immemorial. Even from a distance, it is evident to the eye that this great and massive edifice is divided into two distinct epochs of architecture. The lofty tower that frowns on the west, bare and utterly devoid of ornament, belongs to the thirteenth century, and has seen much of war and bloodshed; the rest of the quadrangle, which recalls the ruins of Heidelberg, with its floridity of detail, its cusped and mullioned windows, belongs to the days of James IV. and James V. The latter monarch erected the beautiful gateway, above which are carved in four panels his orders of knighthood, viz., St. Andrew, St. George, St. Michael, and the Golden Fleece. The highest summit of the palace is the bower of Queen Margaret, a groined and octagonal tower, accessible from the battlements only; and from thence a spacious view can be had of fertile West Lothian, and the high eminence beyond the loch, Cath-ail-righ." The same number contains a capital view of St. Michael's Mount, Cornwall, engraved by J. Saddler, after a drawing by Birket Foster.——From "Old and New London" we take a brief account of the commencement of University College:—"On the east side of Gower-street is University College, which was founded in the year 1826, for the purpose of affording 'literary and scientific education at a moderate expense', divinity being excluded. The credit of the idea of a university for London, in which the ancient languages should be taught, free from those artificial restrictions which bound Oxford and Cambridge so tightly, has generally been given to Lord Brougham and the other Whig politicians of his time. Cyrus Redding, however, in his 'Recollections,' claims the praise for Tom Campbell, the poet, who certainly took an active part in its foundation, and even journeyed,—indolent as he was by nature,—to Berlin in order to observe with his own eyes the professional system of Prussia, and to mature a plan for the government of the university. Testimony to the same effect was eventually borne by Lord Brougham himself. The foundation-stone of the college was laid on Monday, the 30th of April 1827, by H.R.H. the Duke of Sussex, who had long been associated with the leaders of the Whig party. The architect was Mr. William Wilkins, R.A., the designer of the National Gallery. The Duke of Sussex, on laying the stone, said, 'May God bless this undertaking which we have so happily commenced, and make it prosper for honour, happiness, and glory, not only of the metropolis but of the whole country.' He also expressed a hope that the undertaking would excite the old universities to fresh exertions, and force them to reform abuses. An 'oration,' or prayer, was then offered up by the Rev. Dr. Maltby, afterwards Bishop of Durham. The ceremony was followed by a dinner at Freemasons' Hall, nearly all the chief Whigs of the day being among the guests."——*Little Folks* tells the children "Where India-rubber comes from." Some grown-up children may like to know also:—"The tree from which it is taken is one of the giants of the forest, growing to a height of 80 ft. or 100 ft., and sometimes measuring 70 ft. round the trunk. From the extreme top the branches spread, clothed with dark glossy leaves. It is said that tracts of the country may be found where, for hundreds of miles together, these mighty trees are growing side by side. The natives come to them with little earthen cups, and, making cuttings in the bark, they leave a cup to fill under each hole. During the course of the day a small quantity (about a tumblerful) of a thick yellowish cream oozes out, and flows down into each cup. When full, they are all collected, and their contents poured into large earthen vessels. This is the caoutchouc, or india-rubber, in its natural state, and, by being poured into moulds, and dried, it can now be formed into any shape. Many of the natives are employed in making india-rubber shoes. They take wooden lasts, and cover them with clay to prevent them from sticking to the shoe. Then they pour the thick caoutchouc all over these moulds, hold them for a while over a fire, and then, fastening each on top of a stick planted in the ground, they leave them to dry in the sun. Then the caoutchouc is poured on again, and in this way coating after coating is formed, and after each layer is put on the shoe is held in the smoke of the wood fire, and so it gets its dark colour, and dries more quickly. The caoutchouc is also dried and smoked when it is being made into the large thick slabs,—the general form in which it is shipped from Brazil to all parts of the world."

Miscellanea.

Nomenclature of London Streets.—In the last twenty years the Metropolitan Board of Works has revised the names of 1,916 streets, and abolished 6,740 names of subsidiary portions of streets rendered unnecessary on renumbering the whole street. The Board has given new numbers to 143,409 houses. A general index of the names of existing streets has been compiled, and an index of abolished names, and plans of all the revised streets, showing the old and new numbers against the block plan of each house; these plans are bound up in atlas-form for reference and the identification of properties. The superintending architect of the Board reports the practice followed in numbering houses:—"St. Paul's Cathedral is recognised as a central point, and the numbering of houses, when altered, and also in new streets, begins at the entrance or end of the street nearest to that building; but where both entrances to a street are about equally distant from St. Paul's the numbering begins at the entrance abutting on the most important thoroughfare. Taking, then, the sides of the streets as left and right (assuming that the back is towards St. Paul's), the odd numbers will be assigned to the left-hand side, and the even numbers to the right-hand side. No name is to be used for a street without the approval of the Board; and it must be a name consisting, if possible, of one word (with the addition of "street") not already in use in the metropolis in street nomenclature. Names for terraces or other blocks of houses and sections of streets, usually known as subsidiary names, will not be recognised; nor such names as are already in use for provincial towns and postal places." The superintending architect mentions in his report in 1875 that on the suggestion of the vestry of Chelsea the new approach from Queen's-road West to the river adjoining Chelsea Hospital is named "Tite-street" (in compliment to the late Sir William Tite, who was for many years a member of the Board), and the short street connecting the latter with Swan-walk, "Dilke-street," and under the regulations adopted by the Board, Chelsea has a species of copyright in these as London street names.

A Man Washed Away in a Sewer.—On the 28th ult., a sad accident, if it can fairly be so designated, occurred at Hampstead. It appears that William Evans, a bricklayer, aged about 60, and William Hipwell, a labourer, a younger man, went down into the main sewer on Haverstock-hill, about eight o'clock in the morning, to connect some house-drains therewith. The main sewer forms part of the metropolitan system, and both men were in the employ of the Hampstead Vestry. Between nine o'clock and half-past there was a heavy storm of rain at Hampstead, and the water rushed through the sewers with great force. The men's lights were extinguished, and they themselves were swept onward by the force of the water. Hipwell managed to seize hold of the side of the sewer after being washed some distance, and called out for help. After occupying his perilous position for some time he was rescued. The body of the unfortunate man Evans was found by Thomas Anthony, inspector of flushers, about a quarter-past two on Saturday morning, about 20 yards south of Stratford-road. An inquest was held on the 2nd inst., when Mr. Lowe, the surveyor of Hampstead, produced plans, and said when washed away the deceased must have passed through the parish sewer into the Fleet Ditch, and then into the main-drainage system, and right on to West Ham, a distance of seven miles. The sewer deceased was at work in was a brick one, 3 ft. 9 in. by 2 ft. 6 in. The jury returned a verdict of "accidental death." We have frequently insisted on the necessity of adopting means to give warning of the approach of storm-water to sewer-flushers and others engaged in the sewers.

London Wall.—Five houses have recently been taken down for rebuilding,—Nos. 28 to 32, Camomile-street, close to the junction of the latter with Bishopsgate-street,—and the work of excavation has revealed a length of about 36 ft. of the ancient wall and bastion. The wall was fully 9 ft. thick; the bastion projected on the northern side, and was rather more than a semi-circle, and was solid; it measured about 16 ft. across; the heights varied from 2 ft. to about 4 ft. 6 in., and the whole mass was met with about 10 ft. below the present level of Camomile-street. The wall had had faces of roughly-wrought stone, with a double band of the usual bright red tiles on the City side, but on the outer side much dark iron-tone was used, and no tiles were observable. Much of the walling is of Kentish ironstone, and large blocks of greenstone are also conspicuous. The presence of materials, therefore, from Northamptonshire, Surrey, and Kent is thought to point to a period for the erection of the wall when the Romans had practical knowledge of the country and ability to transport their building materials from considerable distances. The core of the wall was formed of hard rubble, solidly bedded in still harder mortar formed of bright coarse gravel, as is frequently the case in London, with but little of the pounded brick so often considered as evidence of Roman workmanship. Mr. E. P. L. Brock, F.S.A., suggests that the bastion met with was probably the first along the course of the wall eastward from Bishop's Gate,—a gate probably of later foundation than Roman times. The soil on the City side was hard clay, and the contrast to the dark-coloured earth on the outlet or Houndsditch side was very apparent.

The Introduction of Printing. — Mr. Hodson, the secretary of the Printers' Pension Corporation, has issued a circular letter, suggesting that the 400th anniversary of the introduction into this country of the art of printing should be celebrated. Adopting 1477 as the date of the introduction of printing into England, Mr. Hodson says:—"Whether as a matter of history, or as marking, perhaps, the most important epoch in the progress of civilisation, I respectfully submit that it is eminently desirable to signalise this 400th anniversary of English printing by some suitable public manifestion. The Printers' Pension, Almshouse, and Orphan Asylum Corporation was made the depository of the fund collected in 1847, when an effort was made, at the instigation of the late Very Rev. Dr. Henry Hart Milman, to 'erect a monument to commemorate the introduction of printing into England, and in honour of William Caxton;' and the 'Caxton Pensioner' thus became a living memorial of the founder of English printing. From this circumstance the Printers' Corporation would appear to be the most fitting body to undertake this quarcentenary celebration, and as the corporation is about completing its fiftieth year of existence, the time would appear opportune also, as its Jubilee Festival could be commemorated at the same time. I venture, therefore, to make the following suggestion:—To hold an Exhibition of Antiquities and Curiosities connected with the art at some suitable public building (the Stationers' Company might be solicited to offer their hall), such exhibition to be open for not less than a week, and to be held in June next; and to hold the Jubilee Festival of the Corporation during the same week."

The Church Congress at Plymouth.—This Congress was opened on the 3rd inst. at the new Guildhall, Plymouth. The law courts and the suites of rooms connected therewith are all laid under requisition. In the Eastern Court Messrs. Fouracre & Watson, Stonehouse, exhibit examples of their stained glass, including windows for Tavistock and St. Budeaux; and Mr. Harry Heme, of Exeter, illustrates, by a series of one hundred photographs, his sculptural work. He also sends two sculptured panels in alabaster. These latter represent respectively:—Paul preaching at Athens, and John the Baptist teaching in the Wilderness. They will eventually occupy places in a new pulpit he is making for the Church of St. George, at Georgeham, Devon.

Modern Painting.—Mr. Albert Pell, M.P., attended a *conversazione* on the 28th ult. on the occasion of the opening of a new building in connexion with the Leicester Town Museum and School of Art. He delivered an address on the subject of modern painting, maintaining that whatever might be said of our portrait-painters, no nation surpassed English landscape artists.

Trade Unions in Scotland.—Last year, according to a Parliamentary paper just issued, six Trade Unions were registered in Scotland, and three received certificates of alterations. Thirty Trade Unions have been registered in Scotland, and from an abstract received for 1875 it appears one paid in the year 505*l.* for strikes and another 309*l.* The registrar, in his report, states that he is "desirous that the attention of members of Trade Unions should be called to the clauses made by the Trade Union Amendment Act of this Session (39 and 40 Vic., cap. 22). These are principally the change in the definition of the term 'Trade Union,' by the removal of the test founded on the illegality of combination in restraint of trade (section 16); the legalising of assurances by members on the lives of their wives and children by the extension to Trade Unions of the exemption from the operation of the Life Assurance Companies Act, 1870,—a privilege hitherto accorded only to Friendly Societies (section 7); the restriction imposed on assurances on the lives of children by the application to Trade Unions of section 28 of the Friendly Societies Act, 1875 (section 2); provisions as to membership of minors (section 9); and payment of sums on death to nominees of members (section 10), with other provisions derived from the Friendly Societies Act above mentioned."

A Monster Hotel.—St. Louis (says an American paper) does not intend to be behind Chicago in the matter of hotels. A new one is going up on the corner of Grand and Page avenues, and if the plan is carried out it will have no superiors for size in the country. The building, with an inclosed court 200 ft. square, will cover over four acres of ground, and be built of Missouri granite and sandstone. It will be ten stories high, be lighted by 2,100 windows, and contain over 2,000 rooms. It will accommodate 3,500 persons. The front on Page-avenue will be the principal façade, and have a length of 387 ft. 6½ in. The interior court will be covered with blinded glass at a height of 42 ft. above the ground. It will be a conservatory blooming with tropical plants, and a fountain will scatter its cooling spray over the shaded walks. The sides of the building facing the court will contain 600 windows. The structure will be in full height 140 ft. from the curbstone to the open line of the cornice. The base will be of Missouri granite, and all above will be white sandstone. There will be eight elevators in the building, each with a capacity to carry fifteen persons, and there will be four stairways ascending from the basement to the top story. The upper story on the grand avenue side will have a billiard-room with thirty tables.

Steam on Tramways.—On the 20th ult. another experimental trial of the steam traction engine constructed by Messrs. H. Hughes & Co., Loughborough, was made between Edinburgh and Portobello. An ordinary tramway carriage was attached to the new engine, the leading feature of which is that the exhaust steam is thoroughly condensed. This is done by carrying a supply of cold water in a tank above the engine, which is supplied automatically to an apparatus beneath, so that at whatever speed the engine is running, or however much steam is being used, the proper supply of cold water is provided. It is not a condensing engine in the ordinary sense of stationary engines, but the steam is simply cooled to a temperature of 180°. The supply of cold water does not increase the weight of it to more than that required for the necessary adhesion to the rails. For the last few days trials have been made on the same lines between 5 and 8.30 a.m., and it has been found by these experiments that with a coke fire no firing need take place in the double journey between Edinburgh and Portobello, and that the amount of water required for condensing is about forty gallons per mile. The average pressure of steam per square inch is 30 lb.

Sheffield Manufactures in America.—The *Sheffield Telegraph* states that Sanderson Brothers & Co., the oldest steel manufacturing concern in Sheffield, have determined to transfer their American business to America, where they will convey Sheffield workmen and Sheffield trade secrets for steel-making. For this purpose works have been bought at Syracuse, State of New York, and a new company formed, with a capital of $450,000, largely held in Sheffield. The works are already in operation, and the steel is guaranteed fully equal to that of Sheffield make: the heavy protective duties will be wholly evaded.

The Bolebridge, Tamworth.—At a meeting of the Tamworth town council on the 22nd ult., it was resolved,—"That the Bolebridge within this borough be altered, widened, rebuilt, and improved, in accordance with the plans and specifications of Mr. C. H. Cope, and that the tender of Messrs. Goddard & Massey for the ironwork, of 1,641*l.*, and of Mr. Henry Mottram for the other work specified, of 1,480*l.*, be accepted; and that the two contracts be entered into by the town council, and the corporate seal affixed thereto by the mayor, security being given by both contractors for the due performance of the work." Further work to the estimated value of 500*l.* will be required to complete the bridge. The proposed new bridge will be a box-iron girder structure, resting on blue-brick piers with stone facings. The carriage-way is to be 20 ft. in width, with a gallery footpath on the east side 4 ft. wide. The bridge will have a clear span for waterway of 100 ft., and will be built slightly on the skew.

Font-cover at St. Sidwell's, Exeter.—St. Sidwell's Church, Exeter, has just received an addition in the shape of an elaborately carved font-cover, designed by Mr. Edward Ashworth, architect, in the Perpendicular style. Octagonal at the base, it takes a spiral form towards the top. Ribs, enriched by carved crockets, spring from buttresses, and clustering together at the top, terminate by a rich finial of foilage. The lower panels are pierced by tracery, surmounted by embattlements, whilst at the junction of the ribs and buttresses lofty pinnacles jut up. The cover has been wrought out of an ancient beam of oak, by Mr. Harry Hems, under the immediate supervision of the architect. It is supported by a wrought-iron bracket, designed by Mr. Ashworth, and made by Mr. Rice, of St Sidwell's.

Public Works in New Zealand. — The Public Works statement was made by the Hon. Mr. Richardson on the 25th of July. He stated that the mileage of railways was,—1,030 authorised, 459 open for traffic, and 382 in progress. The amount spent on railways during the past year was 1,639,014*l.*, making a total expenditure on railways of 5,215,018*l.*, with liabilities, extending to 1878, of 983,253*l.* If the estimate prove correct, it is calculated that the railways open for traffic ought to give next year about 3 per cent. on their capitalised cost. The Brunton Gorge iron railway bridge, which was to be opened soon, fell (in July) with an awful crash into the river. The anchor-plates were not strong enough to bear the strain upon them, and snapped. No lives were lost.

Pulpit at New Shoreham Church.—A correspondent of a Brighton paper says:—"It has been already reported in your columns that the old church of St. Mary, New Shoreham, is being partially restored. A stone pulpit of ancient date has been obtained from the cathedral of Durham, and has been erected upon novel and purely scientific principles. This pulpit has already become an object of attraction to the local archæologists, on account not alone of its history and intrinsic value, but also of its present position, for it is no less strange than true that it has been so placed as to render it a physical impossibility for any one but an acrobat to enter it, and on Sunday last the worthy vicar addressed his congregations from the communion-table."

Proposed Town Improvements at Denbigh.—The Denbigh Town Council has been discussing the desirability of borrowing a large sum of money from the Treasury for the purpose of carrying out various important improvements in the town. It was decided to prepare a scheme of necessary improvements, which should be submitted to a special Council meeting, to which the ratepayers should be invited and be given an opportunity of stating their opinions. The list prepared included the thorough drainage of the town where not completed, at an estimated cost of about 2,000*l.*; the erection of a cattle-market, the drainage of Henllan, part of the borough; the lighting of the castle district with gas; the thorough paving of several streets; and numerous similar improvements.

Provision for the Future.—In the province of Biscay every landowner must plant two saplings for every timber tree he cuts down. In Java the birth of every child is celebrated by planting a fruit-tree, which is carefully tended as a record of the age of the child whose birth it registers. This wise regard for the future deserves imitation.

Demolition of Houses by Limelight.—For the completion of the improvements in the Poultry there were two lofty buildings, numbered 36 and 37, situate between the Old Jewry and Grocers' Hall-court, awaiting demolition. The materials were sold on the 26th ult. by Messrs. Horne, Eversfield, & Co., and being found to be in an unsafe condition, Mr. Haywood, chief engineer to the Corporation, issued imperative orders for their removal on the night of the 28th ult., it being considered unsafe to allow the work to be performed in the daytime. It was entrusted to Mr. Iron, the auctioneers' manager, under whom Mr. Barlow directed the workmen. The carriage traffic was stopped at eight o'clock, and at midnight large numbers of persons were watching the work of demolition. The limelight was worked by Mr. Wood, of Cheapside.

New Organ at Holy Trinity Church, Hull.—The new organ in Holy Trinity Church, Hull, was "inaugurated" on the 26th ult. The instrument has been built by Messrs. Forster & Andrews, and stands in the south transept, with its front projecting a short distance beyond the line of the centre aisle of the nave under the tower, and the sides so arranged as to interfere as little as possible with the view from nave to chancel. The pneumatic movement is applied to great, swell, and pedal keys, and all couplers in connexion therewith. The pedal-board is of the latest improved construction, and wind is supplied at various pressures suitable for the different qualities of tone. The dimensions of the organ are 36 ft. high, 16 ft. 6 in. wide, and 22 ft. deep.

India-rubber.—Consul Green, reporting on the trade of the Brazilian provinces of Para and Amazonas, states that the crop of india-rubber, which was little over 2,000 tons in 1861, has been steadily increasing ever since, and reached 6,763 tons in the year 1875. He is able to add that there are vast rubber-yielding districts which have never yet been touched, and that if the rumours that the old districts are becoming exhausted should be correct, there is no reason why the yearly collection should not, in ordinary seasons, continue the steady increase it has shown for some years past, so long as there is an outlet for the produce in the European markets.

Value of Land in London.—The piece of land on the eastern side of Northumberland-avenue between the new thoroughfare and Northumberland-street, we are told, has just been let by the Metropolitan Board of Works. It consists of about a statute acre, and has a frontage to Charing-cross, a frontage to Northumberland-avenue, and a third frontage to Northumberland-street. The rent agreed upon is 58,000*l.* per annum for ninety years, and, though there is one year at a peppercorn, this peppercorn really amounts to 4,350*l.*, this being the interest on the first year's rent, which is to be paid within six months, or eighteen months before it becomes due.

To Soften and Purify Water.—Will you be good enough to allow me to make known, in your columns, the extremely simple discovery that I have made, that hard waters are rendered very soft and pure, rivalling distilled water, by merely boiling a two-ounce phial, say, in a kettleful of water? The carbonate of lime and any impurities will be found adhering to the phial. The water boils very much quicker at the same time. The knowledge of this fact will prove a boon to housewives and laundresses, as well as to brewers, as it is affirmed that good porter cannot be brewed out of London.

JAMES BRUCE.

Proposed Testimonial to Sir John Steell, R.S.A.—An influential committee has been formed in Edinburgh for the purpose of making some tangible acknowledgment of the labours of Sir John Steell, the sculptor of the Edinburgh Albert Memorial, on the part of his fellow-townsmen. It is intended that the testimonial shall assume a national character.

TENDERS

For schools, at Pillowell, near Lydney, for the Forest of Dean U. D. School Board. Messrs Haddon, Brothers, architects:—

	Schools.	Residences.
Coleman, Brothers	£3,626 0 0	£1,411 0 0
Jones & Co.	3,570 0 0	1,308 0 0
West & Jones	3,265 3 11½	1,181 11 2
Welsh	3,419 0 0	1,230 0 0
James	3,081 1 1	1,263 17 2
Bowers (accepted)	2,886 15 9	1,686 6 0

For new gymnasium (carcass only), on the College ground, for the Malvern College. Messrs. Haddon, Brothers, architects:—

Porter (accepted)	£1,933 0 0

For schools, residences, and boundaries, at Bilson, Cinderford, for the Forest of Dean U. D. School Board. Messrs. Haddon, Brothers, architects:—

Coleman, Brothers	£5,966 0 0
Welsh	5,681 0 0
Jones & Co.	5,651 0 0
Marfell	4,992 0 0
Bowers	4,883 16 8
West & Jones	4,864 3 8
Ratcliffe & Co.	3,797 0 0

For enlarging the Lyttelton Grammar School buildings, at Great Malvern. Messrs. Haddon, Brothers, architects:—

Everal	£500 0 0
Inwood	475 0 0
Porter (accepted)	450 0 0

For the erection of a villa residence, at Ealing, for Mr. W. Francis. Mr. W. J. Green, architect. Quantities supplied:—

Richards	£2,334 0 0
Nye	2,189 0 0
Whiteley	2,148 0 0
Adams & Son	2,025 0 0
Bayes, Brothers, & Co.	2,017 0 0

For the erection of a pair of nine-roomed villas, at Coleraine Park, Tottenham, for Mr. F. Parker. Mr. S. Hayward, architect:—

Co-operative Building Society	£1,700 0 0
Cohen	1,510 0 0
Wreth	1,497 0 0
Burbridge & Son	1,441 0 0

For rebuilding the Boys' Home, including new story to workshop, Stepney-causeway, for Dr. Barnardo. Mr. E. Gregg, architect:—

J. & F. Coleman	£11,747 0 0
Baker & Son	11,600 0 0
Ashby, Brothers	11,523 0 0
Hill, Higgs, & Hill	11,248 0 0
Rider & Son	10,795 0 0
Dove, Brothers	10,775 0 0
Kilby	10,745 0 0
Farr	10,610 0 0
Jacobs (accepted)	10,170 0 0

For the erection of warehouses, in Plough-yard, Bishopsgate, for Mr. Bianchi. Mr. W. Mundy, architect.

Croaker	£688 0 0
Ennor	668 0 0
Wood	649 0 0
Hearle & Son	623 0 0
Stamp & Bowtle	593 0 0
Thomerson	562 10 0

For alterations to No. 87, Cannon-street-road, for Mr. Owen Edwards. Mr. W. Mundy, architect:—

Johnson	£313 0 0
Hearle & Son	250 0 0
Wood	241 0 0
Stamp & Bowtle	230 0 0
Thomerson	204 10 0

For the erection of offices, in Baker-street, Enfield. Mr. T. J. Hill, architect.—

Pratt & Wiseman	£311 0 0
Fairhead	279 0 0
L. & W. D. Patman	263 0 0

For the erection of a board-room, &c., in Marloes-road Kensington, for the guardians of St. Mary Abbotts, Kensington. Messrs. E. Power & Wheeler, architects. Quantities by Mr. W. Barnett:—

	Board room.	Strong-room
Brass	£1,615	£345
Newman & Mann	1,500	300
Macey	1,477	302
Colls	1,429	259
Sewell	1,406	243
Aitchison & Walker	1,355	249
Bayes, Brothers, & Allen	1,322	230
Mills	1,315	182
Hook & Odrey	1,310	2 9
Smale	1,353	180
Browne & Robinson	987	226

For proposed new offices, with residence adjoining, for the Windsor Gas Company. Mr. W. Finn, architect. Quantities supplied by Mr. Herring:—

Gray	£3,735 0 0
Hollis	3,664 0 0

Accepted for New Community House, Ditchingham. Part of first contract. Mr. Frere, architect:—

J. B. & F. Bennett	£2,250 0 0

Accepted for vicarage, Moss, Doncaster. Mr. Frere, architect:—

Shillitoe & Morgan	£1,800 0 0

Accepted for mortuary chapel, Ditchingham. Mr. Frere, architect:—

Morris	£120 0 0

For the erection of business premises and residence, at Radstock, Bath. Mr. E. T. Boston, architect. Quantities by the architect:—

Vallis (accepted)	£2,450 0 0

For the erection of a new warehouse, on the site of 113, Golden-lane, St. Luke's, for Mr. B. Newsome. Messrs. Elkington & Son, architects. Quantities supplied:—

Ashby	£1,715 0 0
Lawrence	1,696 0 0
Colls & Sons	1,590 0 0
Conder	1,576 0 0
Newman & Mann	1,550 0 0
Rider & Son	1,529 0 0

TO CORRESPONDENTS.

S. H. C. Z.—J. G.—J. H.—Rev. H. S.—F. J. K.—L. W. B.—H. St. J.—G. H. J.—T. W. R.—J. L. W.—R. O. R.—C. E. F.—M.—J. S.—A. S.—G. W. T.—Mr. F.—C. C.—S. H.—G. F. S.—A. F.—A Junior (ships joiners are of course preferred).

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VOL. XXXIV. No. 1758. SATURDAY, OCTOBER 14, 1876.

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Old Streets in Paris.

The New Avenue de l'Opéra.

OR a long time past the project of this important opening has been before the Paris public, and in view of the approaching demolition, the proprietors of houses on the line of operations have for some time had notice to quit, and we are assured that the work of demolition will commence at once, opening up direct communication between the Louvre and the Boulevard des Capucines.

In the intention, therefore, of obtaining the necessary funds to carry out their plans (Imperial plans,—for it will be remembered that the new thoroughfare was to have been named the Avenue de Napoléon), early in May of this year a council was held by the municipality, at which it was determined that a loan of 120 millions of francs should be issued, repayable in seventy-three annuities, from the year 1877. This large sum (4,800,000*l.*) was to be employed as follows:—

	Francs.
For the Avenue de l'Opéra, what would be got back by re-selling the land deducted	45,000,000
For the Boulevard St. Germain	25,000,000
For the *entrepôt* of Bercy,—that great *abreuvoir* of the capital	40,000,000
For heightening the quay of Javel, in order to stop any future chance of inundation	2,000,000
For the construction of schools	5,000,000
For the general expenses	3,000,000
Making a total of	120,000,000

On the 27th of June the President promulgated the law authorising the city of Paris to issue the necessary loan, and by this time operations have commenced. Measures have been taken by the Prefecture of the Seine, in order that the Avenue should be opened for the Universal Exhibition of 1878. With this view the works of demolition will be continued all through the winter, and we see that the "*cahier des charges*" imposes on all purchasers of ground on the line the obligation of having their houses finished by the 1st of April, 1878. Between the 1st of April, 1877, when the demolition will be completed, and that date, when the time will expire for the construction, remains only a year; but builders in Paris are by no means slow, and they will, doubtless, know how to employ the time profitably, and the programme will be carried out.

That the new street will be a straight one there can be no question; but there is really no reason why all the houses in it should be alike, and like also so many other houses in other similar Parisian thoroughfares. Judging by the ends which are already finished, the new avenue is likely to be little more than another Rue du 4 Septembre; but, surely, there are streets enough of that description; there are certainly others the beauty of which is deserving of imitation.

The Boulevard Centrale at Brussels, the production of French art and labour it is true, has the merit, at least, of more variety of outline; and this variety is due to the happy thought of the municipality, who offered at the outset of the enterprise a large premium to the owner of the handsomest house in the boulevard, and in several instances the architects have not failed in appreciating and successfully imitating the grandiose and picturesque charms of Flemish domestic architecture.

At present we have only to deal with the Avenue de l'Opéra, for the construction of which, as above stated, the work of demolition will be immediately begun.

As might be expected, the piercing of such a broad, lengthy, and important way of communication, must cause a number of old streets to give way, and it is the history and associations connected with some of these same old streets that we propose now to talk about.

Every visitor to Paris knows well M. Garnier's new Opera-house, that enormous block of architecture and sculpture in the Boulevard des Italiens, which has taken fifteen years to build, and which has cost the nation no less than 35,000,000 francs.

But it is not everybody, in looking down the already-commenced and evenly built-up opening of the Avenue de l'Opéra (this part dates from 1873), who knows that in the straight line that leads from where he stands to the Place du Théâtre Français, just near the Palais Royal, are a number of narrow, dark, and crowded up streets, which, however, retain many remains of better days. There are but few strangers who look further down this opening than at the interesting show Goupil & Company have artfully made at their corner shop, and perhaps the Americans in Paris, who have all discovered the well-arranged office of the *New York Herald* on the right-hand side of the street.

We intend, however, to go further than this, and take the reader over the at-present unbroken ground, and show him what there is of interest in the streets that are about to come down.

Having approached the end of that part of the opening which is finished, exactly in the middle of the way we find a block of houses in the Rue Louis le Grand which will be demolished. This street is not a very ancient one, having been made, as its name implies, in the reign of the *Grand Monarque*; in fact, it was made just at the height of Louis's fame, when forty years of victory had entitled him to the epithet, which he has ever since borne (1701). Mdme. de Montespan lived for many years, and died, in this street (1709).

We now cross the Rue Neuve St. Augustin. This street derives its name, so Jaillot tells us, from the fact that it ran along the wall of the cloister of the Augustin Friars. Here, in the old days, there stood several important mansions which have long since disappeared, the Hôtel de Grammont (razed in 1766) and the Hôtel de la Vallière stand no more. At No. 55, on the left-hand side, as you look to the Rue de la Paix, lived and died (1824) Girodet-Trioson, the pupil of David, the painter.

Still advancing, we have now to make a long *détour*, as a block of buildings prevents us from, following the line of the future avenue. We however, turn to the right up the Rue d'Antin, about which we must say a few words. The street derives its name from the Hôtel d'Antin, which was situated where now meet the Rue d'Antin and the Rue du Port Mahon. It was built in 1707, but some difficulties arising after it was finished, the king (Louis XIV.) took it from the proprietor, and gave it in 1712 to M. le Comte de Toulouse, who sold it next year to M. le Duc d'Antin, *Directeur des Bâtiments*. Some forty years afterwards, 1757, it took the name of the Hôtel de Richelieu, from the Marshal of that name, celebrated for his abandoned character, and his notwithstanding successful career. The Marshal was the grand-nephew of the cardinal of the same name.

When we get to the corner where the Rue d'Antin runs into the Rue Neuve des Petits Champs, we must stop; here is the place where, more than two hundred years ago (1652), took place a famous duel.

The whole of this neighbourhood was then unformed, for it is not an old one, most, if not all the streets, dating from the middle of the seventeenth century. In 1667 four private individuals purchased of the Abbé St. Victor, the ground in this neighbourhood, which belonged to him: and soon after, having obtained the permission of the king, proceeded to lay out and build a number of streets, many of which were on the place of already-existing paths and roads; as, for instance, the modern Rue d'Argenteuil, which is built on an old road originally leading to that village, connected with the painful history of the famous Abelard and Héloïse, for here was the convent where the latter retired to avoid the resentment of her uncle.

By 1677 the whole neighbourhood was studded over with houses, and the *quartier* took the name of Gaillon, from an hôtel of that name, on a part of which in later years was built the church of St. Roch. At this point existed at that time an old gate called the Porte Gaillon, and the street which ran from the hôtel of that name to this gate, which has preserved the name, as we shall see later on.

The Butte des Moulins, as it was then called

from the mills which were established on it, had, however, to be levelled, for it was quite a little mountain.

Covered as the *quartier* was with trees, the houses very sparsely scattered about, it presented a curiously different aspect to what it does now, situated between two such busy thoroughfares as the Boulevards and the Rue St. Honoré. It had been one of Richelieu's plans, which his death (1642) alone prevented from being carried out, to build on this untidy and dirty neighbourhood (called, in consequence, the Champ Pourri), a magnificent square to be called the Place Ducale, a counterpoise on the east to the Place Royale on the west.

It was then, here, before the Butts had been levelled and the streets pierced, when the trees were still thickly about, that took place the duel which caused much talk at the time, between the Duc de Beaufort (the son of Cæsar Vendôme, the bastard of Henry IV., and the beautiful Gabrielle d'Estrées) and his brother-in-law, the Duc de Nemours. For a long time there had been an enmity between them, till at last a challenge was sent and accepted, and the opponents met (July 30th, 1652) at seven in the evening, at the spot now marked by the corner of the Rue d'Antin, each accompanied by four seconds. It was the Duc de Nemours who, as the offended, fired the first shot, but, having missed, wished to rush with his drawn sword on his adversary, who, however, killed him on the spot with three balls in the breast. Of the seconds two were killed and several others severely wounded.

We have now to turn to the left, down the Rue Neuve des Petits Champs, to again get into the line of the new Avenue. In that part which is coming down there is nothing worthy of particular mention, though the street is interesting, for it contained, and does now contain, many curious features. Here stood formerly the Hôtel Mazarin, an enormous block of buildings which were subsequently parcelled out into different houses, each sufficiently large in themselves for any ordinary purposes, as will be understood when we state that the Bibliothèque Nationale now stands on a part of the site of this dwelling; that the modern Bourse occupies another part, and other portions have been built upon by private individuals. Part of the building was given up in 1719 to the *Compagnie des Indes*, who had here a magnificent hôtel.

Having now crossed the Rue Neuve des Petits Champs, and looked down the Rue de Gaillon, a part of which is about to give way, we have two courses to choose from. We may either continue along the Rue St. Roch and go down the Rue des Moineaux, or go farther along the Rue Neuve des Petits Champs, and, turning to the right, follow the Rue Ventadour and Rue Thérèse, and so along the Rue des Moulins. But here we must stop. We have mentioned a number of streets, all of which have a history. First let us take the Rue Gaillon, which recalls the old days of the foundation of the church of St. Roch.

In the Hôtel Gaillon, which we have mentioned above, were two chapels, or rather oratories, one dedicated to Ste. Suzanne, and the other to the *Cinq Plaies de Notre Sauveur*; this latter dates from the year 1521. At that time one Jacques Moyon, a Spaniard, obtained permission to build a hospital in the neighbourhood, for the use of the poor who might be afflicted with that most horrible of diseases, scrofula. However, the *quartier* increasing in size and population as it became more covered with houses, the two oratories before alluded to gave way to a church, which was built. But a very few years elapsed before this, even, was found to be inadequate to the wants of the neighbourhood, and in 1653 (March 28th) Louis XIV. and Anne of Austria laid the first stone of the present church of St. Roch, which took its name, without doubt, from the hospital above mentioned, which was for the use of the plague-stricken, whose patron saint is St. Roch. Probably our readers will recall, at the mention of the name, Rubens's *chef d'œuvre*, now at Alost, in Belgium, representing that saint.

Let us now follow the Rue Neuve des Petits Champs, which will lead us into the Rue des Moulins, about which we have something to say. If we follow the Rue St. Roch and the Rue des Moineaux, we shall have nothing of interest to mention. Let us, then, go the other way, down the Rue Neuve des Petits Champs, passing on the right the Rue Ventadour, until we come to the corner of the Rue des Moulins. Here stood originally the house that Lulli (1633—1687) constructed, and which brought him in an income of 1,600 livres or francs yearly. The clever Italian, an artist like many of his countrymen, was yet a man of business, and knew how profitably to lay out the sums he gained by his talent. Probably our readers remember the history of the poor Italian boy, how he rose from being a mere kitchen drudge to be the head of the king's musicians, and became the founder of the modern opera.

We now turn up to the right, the Rue des Moulins, which, on the face of it, takes its name from the mills that existed here before the *butte* was levelled. It existed as a street, so Jaillot tells us, as early as 1624. We do not go far along it before we pass on the right the Rue Thérèse, with its old houses, cracked with age, blackened with smoke, and standing in solemn silence. It derives its name from Maria Thérèse, the wife of Louis XIV.; but, it appears, it was not till 1692 that the street was thus called; in fact, it was the Rue St. Thérèse, but, at the revolution in '89, it, with many other streets, was decanonised, and it has remained so till this day.

In continuing down the Rue des Moulins, we next come, on the left, at No. 14, to a very interesting house, that in which was born and lived the celebrated Abbé de l'Épée, whose successful efforts to help the poor deaf and dumb out of the miserable neglect and ignorance into which at that time they had been allowed to fall, merit the everlasting praise of humanity.

Up to the time of this disinterested man, little or no progress had been made in the instruction of these poor unfortunates, who were treated much as mad people were then, and alas! till quite lately, —in the most improper and inhuman manner. The Abbé, who in his youth adhered to Jansenist doctrines, soon found himself without employment, and it is to this fact that we owe the present advanced state of the treatment of the deaf and dumb. Chance threw into his way two sisters, twins, both deaf and dumb, who had been under the care of one Vanin, a priest of the *Doctrine Chrétienne*, but, dying, he left the two unfortunates scarcely any further advanced than ever. It was now that the Abbé de l'Épée came to their rescue, and soon devised a code of signals that put him and his pupils in complete communication with each other. His method differed essentially from any used up to that period. Till then all the efforts had been made to endeavour to make the pupil *speak*, but De l'Épée seeing the futility of this, devised a code of signals, and this means of communication has since been entirely adopted. But, like many good and virtuous men, his merits were not recognised till after his death, and it was not till 1791 that the *Assemblée Constituante* founded the *Institution nationale des Sourds-muets*, and acknowledged at last that the Abbé was deserving of his country's gratitude. Unfortunately, his compatriots were the last to recognise his talent, as the Emperor Joseph had held much communication with him, and indeed quite early in his career, an Austrian priest had been sent from Vienna, who carried back all that the Abbé had then in his power to impart.

It has been asserted by some that the Abbé was not the first to interest himself deeply in the fate of the deaf and dumb; it is true, for many years before De l'Épée, attempts to educate the deaf and dumb had been made by different men in different parts of the world, but all these had ended in nothing, and it remained to the humble inhabitant of the Rue des Moulins to gift the world with a language which has enabled many an intelligent mind to speak through the supple means of the fingers.

Between these early but earnest beginnings of De l'Épée, and the modern progress we have made, as exemplified by Dr. Howe's perfectly successful education of Laura Bridgman, who possesses but one sense, that of touch,* and the institutions for the education of the deaf and dumb, established in every civilised country, what a difference! and how would the old Abbé look with interest and pride on a work, in the perfection of which he played so important a part?

Having thus remarked the house where this devoted man was born, let us hasten on, along the Rue des Moulins, till we get to the Rue l'Évêque, which derives its name probably from its having been built on the property of the Bishop of Paris; the street, however, existed as a road before the levelling of the *butte*, in 1667, when most of the other streets were laid out, for we find it mentioned in several documents in the archives of the Archbishopric, at the commencement of the reign of Louis XIII. (1610-1643).

Continuing down this street, we get into the Rue de l'Échelle, and now see before us the Rue St. Honoré; on the left, in the Place du Théâtre Français, and here again this end of the Avenue de l'Opéra is finished, showing the line it will take when the houses are all down. If we go a little along the Rue de l'Échelle, which by-the-bye takes its name from the fact that in the days of the bishop's rule over this part, there was here a gibbet (*échelle patibulaire*), we shall soon come to a spot weich recalls to us a portion of history not so very remote from the present day. We all recollect the accounts of the flight of Louis XVI. on the night of June 20th, 1792, which ended in the fatal capture at Varennes. Well, at the corner of this same Rue de l'Échelle, when, as it then did, it led into the Place du Petit Carrousel, waited the carriage that was to convey the unfortunate fugitives from Paris. The first to arrive at the appointed spot were the two children, Louis (the unhappy Louis XVII.), and his sister (afterwards the Duchess of Angoulême) with their governess, Mdme. de Tourzelles; then came Mdme. Elizabeth, and her equerry M. de St. Pardoux, followed by the king and a body guard. For more than an hour they awaited the queen, who, accompanied by M. de Tersen, had missed her way, and short though the distance was from the palace (the Tuileries) to the appointed spot, they had crossed by mistake the Pont Royal, and had gone some way along the Rue du Bac, before the error was discovered. The rest of this ill-fated flight the world knows.

We have, however, in thus going down to the corner of the Rue de l'Échelle left behind us some interesting streets.

The Rue St. Anne, which existed some while before the levelling of the *butte*, was named in honour of Anne of Austria, the wife of Louis XIII., and we find that as early as 1622 it was closed for three years in order that by the deposit of gravel and other matters it might be made of the same height as the other parts of the *butte*, the ancient level of which, by-the-bye, the present garden of the Palais Royal still preserves. It was at the entrance to this Rue St. Anne that from the year 1528 there was a pig-market, which Jaillot tells us, writing in 1782, still existed in 1609. This was afterwards turned into a horse-market, which stood on the spot now occupied by the Théâtre Italien.

In going down this street it is not long before we come on the right-hand side to the Rue du Clos-Georgean, which derived its name, as appears from the archives of the Archbishopric, from the fact that it was built on the ground belonging to a private individual of this name. Let us go down this street, for it leads us to a famous spot,—the Rue Molière, otherwise named Rue de la Fontaine Molière, from the fact that at its junction with the Rue Richelieu stands the well-known fountain that bears the name of the great playwright. Just opposite, stands the house, No. 34, where he died, easily recognised by the black marble tablet, informing the reader that here in 1673 died the celebrated dramatist.

But we have not to deal with this street, it is out of the line of the Avenue de l'Opéra; so let us return to the Rue Molière. The street carries the reader back far beyond the time of the "Grand Monarque," to the period, in fact, when Joan of Arc lived and suffered.

After Charles VII.'s triumphant coronation at Rheims, in the presence of La Pucelle, his army advanced on Paris, then in the hands of the English, who held it, it will be remembered, no less than sixteen years (1420–1436). On the approach of the French, the English army had carefully protected the capital; but, however, assault was made, in which Joan was wounded and thrown from her horse, and, had it not been for the valour of the Comte d'Alençon, La Pucelle would have died in the *fosse*, which the old Rue Traversière (successively called Rue Traversine, Bâton Royal), and now the Rue Molière, marks. Many visitors to Paris may have observed the clever statue of the heroine, by M. Fremiet, recently erected in the Place des Pyramides, opposite the Tuileries, in the Rue de Rivoli, which, far though it is from the spot where she is reported to have fallen, is yet intended as a memorial of her association with the neighbourhood. We must recollect that, since those days, Paris, though in a less degree than other great cities, has considerably increased in size, and

* We refer those readers who desire to go further into this interesting case of Laura Bridgman to the pages of Dickens's "American Notes," where a lengthy and exhaustive account will be found of the method employed in her instruction.

though the spot we have spoken of is two miles and more from the present fortifications, it was then on the line of the ramparts. The repulse that the French thus received was the first revenge the English had had for the defeat at Orleans, and Charles was obliged to retire with his army, and not long after, as we all know, poor Joan fell into the hands of her enemies.

But, gentle reader, we have not yet come to the end of our journey together. In leading you thus to the end of our route, we have left on one side probably,—nay, certainly,—the most interesting part of the whole. We will now retrace our steps for a minute or so up that queer little street on our right-hand side, with its ramshackle and dirty old houses, showing, evidently, remains of a day long gone by. Approach the spot with reverence, for when you turn the corner, you stand before the house where lived and died the immortal Pierre Corneille (1606—1684). Yes, here in the Rue d'Argenteuil, at that number 18, lived that master spirit. Before you enter, look up at the façade, and on it you will read an inscription,—"The great Corneille died in this house, the 1st of October, 1684. Erected in 1826." But if you look in through the quaint old *porte cochère*, you will observe opposite you in the old court, a niche, and in the niche a bust, that of the immortal writer. Above, are simply the words, "The Cid. 1636." Below, those doubtful words of his, "Je ne dois qu'à moi-même toute ma renommé."

In this house, then, lived Corneille, and here he wrote many of his finest works. Here, in the midst of the life of Paris, he moved in a circle of admiring friends, till at last death came, and, strange though it may seem, unfortunately, like many another man of genius, found him poor. A countryman of his, who relates the anecdote of him, tells us that but a few days before his death he was obliged to stop before the cobbler in his street to have his only pair of shoes mended. Poor in pocket thus, but rich in name, this great spirit passed away, and the works he left behind him have since served to enrich many a publisher and tragedian, though in their day they had put so little into the pocket of their great author. His remains lie in the neighbouring church of St. Roch, which contains, in addition to these cherished reliques, the ashes of De l'Épée, and of the celebrated Lenôtre, whose skill made Versailles what it is, and who has left his stamp on so many parts of France and England. Nor must we forget that here also lie the remains of Pierre Maupertuis, the well-known astronomer (1698—1759), together with those of the court painter Mignard (1608—1668), whose portraits we all know so well. Many of our readers will probably recollect that anecdote told of him, when, after having taken Louis XIV.'s portrait no less than nine times, his Majesty presented himself for the tenth, "Mignard," said he, "you find me considerably older, do you not?" "Sire," replied the courtier, "I see but some few more victories on your head." The reply at such a period was worth rewarding, and one and the same day saw Mignard enter the Academy as member, professor, rector, director, and chancellor.

Let us not forget, however, to mention also the elegant De la Garde Dechoulières, whose beauty, wit, and *esprit*, were celebrated in her time. In fact, she was the tenth muse of the period. But though so admired during her lifetime for the elegance with which all she attempted was done, her poems are unknown by us now. Her ashes repose near those of her friend, the immortal Corneille.

THE PARIS UNIVERSAL EXHIBITION OF 1878.

CHANGE OF THE PLAN.

The Parisians seem determined to carry out, in 1878, the observation of the old antiquary, Sauval, who, writing in 1724, remarked that Paris being the most magnificent city in the world, ought to distinguish itself accordingly.

The happy arrangement of the interior garden, which so beautified the Paris Exhibition of 1867, is to be introduced into that of 1878, an important modification which changes the three departments of the centre, and diminishes the space devoted to the fine arts by about three acres of garden, which will be doubtless made a model of that taste which the Parisian horticulturists are now carrying to such remarkable perfection. Notwithstanding this diminution of the interior space, 10,000 mètres (or 3,000 mètres more than in 1867) will be devoted to the fine arts, while the breadth of the galleries will be more by 10 mètres than in that year.

The gates of the large trellis-work enclosure marked out for the Exhibition in the Champ de Mars were shut at mid-day on the 26th ult., and now one can see, in addition to the bands of workmen dotted about its surface, that the long flight of broad steps leading from the Trocadero down to the Quai de Passy are being rapidly demolished by a gang of about two hundred navvies, who are rapidly removing the heavy stones. At the bottom of these steps, on the level of the quay, considerable works of excavation are being made, with a view to carrying off the mass of water from the great cascade that is going to be constructed here with the rocks which served in the Exhibition of 1867, brought in that year from the forest of Fontainebleau. The roads which meet at the Pont d'Jéna are being considerably widened, and the difficulties of the levelling are being rapidly arranged. With a view to widening the bridge, the project of which will be discussed at a forthcoming meeting of the council of bridges and causeways, divers are daily to be seen actively at work sounding the bed of the river. These alterations already attract a large number of sight-seers, all of whom express their astonishment at the *grande affaire* they see progressing. It is just here that has to be arranged the principal terminus and point of departure of the cabs, omnibuses, and other vehicles which will bring and take away the thousands of visitors to the great show.

We have several times had occasion to mention the important works that are now in progress in Paris, all of which are undertaken to be finished for 1878, and the talk of preparations for that year is increasing daily. Already, several foreign Governments have laid before their respective Parliaments, projects for their worthy representation in Paris, and we are constantly hearing of some new wonder then to appear.

To-day, for instance, we see that a series of interesting experiments are now being made by the Government, with a telegraphic instrument due to M. Lenoir, the inventor of compressed air motive power. This apparatus, which will be one of the principal attractions of the section devoted to electricity in the Exhibition of 1878, reproduces instantaneously the *writing* of the person sending the telegram, who can thus, even at a distance, give his signature. This apparatus reproduces in addition, with great clearness we are assured, the most complicated drawings!

Since the organisation of the commission for the construction of the exhibition buildings, M. Krantz has received several hundred applications for spaces to erect drinking-canteens for the workmen; but he has wisely and humanely prohibited from being put up within his jurisdiction any such provocations to danger and crime, and he threatens the instant dismissal of any workman connected with the undertaking who is seen intoxicated on the works. Several hundred applications, as we have said, have been made for leave to supply wine, &c., and all have been refused. Even in France, with all their well-worn economical ways and provident habits, drink, drink, is the one undisguised, indecent, naked sin, and if M. Krantz, in addition to prohibiting drinking-booths on the works of the Exhibition buildings, succeeds in organising suitable places of refreshment and recreation for the workmen during the lengthy period that they are likely to be occupied, his efforts would perhaps supply the greatest practical service that international exhibitions have yet obtained for us.

LIVERPOOL CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

The Exhibition of Sanitary Appliances was opened on Tuesday morning: we will hereafter refer to the proceedings. On Wednesday evening the president, the Marquis of Huntly, delivered his address in the Philharmonic Hall. We give some passages of it:—

The Social Science Congress may be said to have at once an ideal significance and a practical use. As regards the first, it is, as it were, the symbol of one of the most honourable and distinctive characteristics of our day, a better, more helpful, and hopeful state of feeling between all the orders and degrees of society. It indicates the desire of the upper to lift the lower classes to a purer atmosphere and happier condition of life, and of the educated and prosperous to distribute throughout the community the mental and material wealth that only accumulates the more it is diffused. The time was when the state of feeling was very different. The Norman Castle rose to overawe a sullen and discontented peasantry, and the lord of the manor was not always scrupulous as to the persons from whom he levied black mail. The scholar, contemptuous of the unlettered herd, left it to its ignorance, and selfishly courted the Muses in his still retreat. But the enthusiasm of humanity is a more universal and potent spirit now than it was in those days. It has penetrated every section of the community, made each feel that the good or ill of the others is in a measure its own, and has raised a noble army of philanthropists, anxious to do battle with the evils that threaten to impede, if not arrest, and even turn back, our progress; and to create the good that will secure the continued prosperity, and ultimately the highest well-being, of our nation and people. In this Congress I see a section of this noble army met, not simply for drill, but for the creation of the enthusiasm, the spirit, and the loyalty to its cause which are ever among the most essential conditions of victory. Our meetings thus at once express and foster one of the noblest feelings that can animate the heart of man, the feeling that he ought to contribute his share towards promoting the welfare of his fellows, and that his doing so will help, in however small a degree, to increase the prosperity and happiness of mankind.

Of the practical utility of these congresses there can be no question. For one thing they bring the worker in the cause of social reform, and the student of social science, face to face, and each can aid, instruct, and inspire the other. The worker can here supply the thinker with facts suggestive of new, or corrective of old, schemes of social reform and improvement, while the thinker may give a fresh impulse, or a new application and meaning, to the methods and measures of the worker. The practical man without the theorist tends to become too limited in his aims and endeavours; the theorist without the practical man tends to become visionary, to build castles in the air, to dream dreams that can never be realised. For the questions affecting society cannot be wisely discussed and settled by the abstract methods proper to the pure theorist, while they are too vital and wide-reaching to be left to the too often isolated and off-hand schemes of the practical worker. But here in our Congress the two can meet, qualify, and encourage each other, and, like twin stars, so mingle their distinct yet harmonious lights as to make the progress of society, if no less toilsome, more bright and sure. For another thing these congresses are useful in asserting the importance of social questions, in securing their discussion by well-informed and deeply-interested men, and in keeping before the country the constant need of social reform and progress. Politicians may be left to look after politics, but the questions here discussed are the peculiar property of no class or party, but the common concern of all. Society never stands still. Change is busy everywhere, and never allows to-morrow to be an echo of to-day. As Mr. Herbert Spencer says,—"Societies acquire increased complexity along with increasing size; show traces of structures and functions not before possible; and give origin to new institutions, new activities, new ideas, sentiments, and habits." These new things are not of necessity good: accident can hardly be trusted to shape either them or their issues. The social unit and the social organism are most intimately related. No good or evil can happen to the one without affecting the other. And so the great endeavour ought to be to have in every part the minimum of evil, that there may be in the whole the maximum of good. Our social machinery needs thus to be always examined and repaired, adjusted to the new conditions under which it must work; improved so as to fulfil every beneficent end with greater sweetness and less expenditure of energy. The increasing wealth of the country, for example, is an increasing danger. Political economists can as eloquently depict the evils as they can easily analyse the causes of poverty, but they do not always see and cannot always protect us against the evils of too suddenly

acquired wealth. To increase the wealth of a class without increasing its ability to use it, may be to inflict great evils, not only on the class itself, but on society as a whole.

You will not, of course, understand me to lament the growing wealth of the artisan and labouring classes. I rejoice at it, and hope that it may become ever greater. But what I do lament is that their wealth should increase without any corresponding increase in their ability and will to use it wisely. Were the working classes to use their better wages to secure better homes, better education for their children, higher and more refining amusements for themselves, then their better wages would be an unmixed good. But so long as more money means more drink, more self-indulgence, more selfish concern for the workman and cynical indifference to the culture of his mind and the interests of his offspring, then I am forced to regard it as an evil rather than a good. The day has, perhaps, passed when civilisation can be overthrown by barbarians. Neither Asia nor Africa can ever send forth hordes to conquer and waste Europe as the barbarians overthrew the Roman Empire. The order is now reversed; the savage fades away before the civilised people. But a civilisation may die of self-generated diseases. Within the social body disintegrative forces may slowly gather and actively work, and the social scientist ought to study how these may be neutralised and dissipated. He watches social phenomena as the meteorologist watches the weather guide, pointing its finger from a lofty tower, that he may know the quarter whence the dangerous storm threatens to come. And a storm foreseen may be a storm averted. "*Luctantes ventos tempestatesque sonoras Imperio premit.*"

The subjects that occupy the Congress are of the most practically important sort, for they concern the prosperity and well-being of the people. We all feel with Burke that "the happiness or misery of multitudes can never be a thing indifferent." The conditions of happiness are of two kinds—moral and material: those that regard man as an intellectual and moral, and those that regard him as an industrial and physical, being; and these are the very matters which we have met to consider. The two sections devoted to law and education are concerned with the moral and mental problems suggested by society as it now exists in contrast with society as it ought to be. The two sections devoted to health and trade are occupied with questions that concern our physical and industrial well-being. Without due attention to the subjects that fall under these general divisions we can never secure the sound mind in the sound body, which is the condition for the individual of a happy life, for the state of a contented and progressive existence. A great people ought to be able to create all the conditions of happiness, moral and material,—must do so that it may not only maintain but increase its greatness. Our social questions are in an eminent degree imperial questions. That is a good Government which regards and secures the good of the governed. We remember who said, "*Boni pastoris est tondere pecus non deglubere.*" But it is not enough that a shepherd shear his flock; he needs to lead it to fresh pastures, and supply it with the conditions necessary to vigorous life. Now the very reason of our existence as an Association is to help society and the State to see what are the conditions necessary to a vigorous and happy life, and how they can be realised. And the history of the past nineteen years proves that these congresses have not been held in vain. The legislation, and still more, the sentiment and opinion of the country, have on all questions we discuss greatly progressed and improved. Law, national and international, civil and criminal, has been modified, reformed, and amended. Honest and earnest attempts have been made to deal with the primary education both of England and Scotland. There have been many noble efforts to improve the sanitary state of our great cities, and both the local and imperial powers are becoming alive to the supreme importance of everything affecting the public health. Trade and economy have become better understood both by the Legislature and the people; and the questions which are only confused and obscured in the vision of the master or the workman can here be discussed in circumstances which make a rational solution possible.

The several sections, with their respective subjects, are without doubt closely related to each other. The section which deals with jurisprudence and the amendment of the law is occupied with questions most intimately connected with our moral well-being. Law ever requires reform and improvement. The mind of society is always changing, progressively we hope, and the law needs to be brought into harmony with it. Burke, in one of his grandest speeches, said, "I would have the laws timed in unison with the manners of the times,—very dissonant are a gentle country and cruel laws; very dissonant that your reason is furious but your passions moderate, and that you are always equitable except in your courts of justice." The public mind is coming now to think the prevention a greater matter than the punishment of crime, to seek the reform of the offender as well as the punishment of the offence. And our criminal law ought to strive to become preventive and reformative as well as punitive. Our civil laws, too, are in many ways capable of amelioration and reform. In feudal times, for example, the relations of the owner and occupier to each other and the soil were very different from what they are now. The owner was a feudal superior, receiving his rent not only in money or kind, but in service. His tenants were feudatories, men who held of him on condition of rendering such services as would enable him to serve his country and his king. But now the owner is becoming, more and more, simply a capitalist, with his capital invested in land, and he lets it on the principle of securing, if not the largest, the best and safest return for his money. The occupier is now a tenant who leases the land as a means of earning a livelihood, and, if possible, of making a fortune. The idea of feudal service has either completely died out, or only reappears in a very exhausted and depraved form at election times, when the farmer is expected to follow his landlord or his landlord's friend to the poll. The great interest of the owner now is to improve his land, enhance its value, and so make it a better and more desirable property. The great interest of the occupier is to increase the productivity of his land, to make it so produce as to repay as handsomely as possible both his expenditure and his labour. But these changed relations of owner and occupier to each other and the soil imply many other changes. The application of capital to the soil by both landlord and tenant, so as to increase its productive powers and consequent commercial value, is the great necessity of these times, and requires many changes in usage and laws that had a feudal origin. In ancient times, the great ambition of the baron was to maintain his power by maintaining his connexion with the land; and so the laws he made were intended to secure its continued and unbroken destination to his descendants. But as his land now represents so much capital (by wise expenditure and adequate care capable of indefinite increase) the old laws have lost their *raison d'être* and become in many ways either useless or mischievous. They so tie up the landlord's hands as to prevent an adequate outlay on his part, and so deny security to the tenant as to hinder a sufficient expenditure of means and labour on his; and thus prevent the growth of our real and agricultural wealth. Hence it is becoming more and more needful that the laws which check the application of capital to the land, and so retard its improvement, be gradually modified and eventually repealed. It is, however, gratifying to feel that under these altered circumstances there is not of any necessity any change in the personal feeling and relationship between the two classes most interested. The very reverse is, and should be, the case. The more the owner of the soil devotes attention to the practical improvement of the laws and customs under which the occupier is encouraged to pursue his work, the deeper will be the kindly feeling and earnest respect engendered on the one hand, and sympathetic relations on the other, which are the best evidences of the attachment still existing between them.

But the questions connected with education seem to me even more important in their bearings on our social well-being than those connected with jurisprudence and the amendment of law.

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It is very important that instruction should be given to girls in domestic economy. Home is woman's natural sphere, and on her depends what the nature of the home is to be. And as I would seek to have boys fitted for the positions they are to fill, or the occupations in which they are to engage, so also I would have the girls trained in the knowledge of house-work and house-management,—cooking, sewing, darning, mending,—everything, in short, which can fit them for making good wives and happy homes. To teach lessons of thrift, economy, and wise saving in household affairs, is one of the most salutary and useful things we can impart to those who are to be the future wives and mothers of the men of our country. And it is gratifying to find that some of our School Boards are directing their attention to this important subject. The evening schools which have been instituted in many towns are of the highest utility. There are many whose education has been neglected in youth, who had not the opportunities which are now so fully provided, or who failed to use what they had, who are desirous to repair and supply the deficiencies which they feel and lament. Everything should be done to establish and extend such schools. The more we can diffuse instruction, the fuller means of education we provide, the happier and the better we make men. Some people even in these days seem to think that education makes men dissatisfied and discontented. A little knowledge may be a dangerous thing, and a smattering of information may make some conceited. But the more and better furnished a man's mind is the larger sources of enjoyment lie open to him, the more will he be diverted from low pursuits, and the more will low tastes be crushed out, and low habits cease to hold power over him. A man is restless and discontented when he is ignorant, he yields to low cravings because higher faculties and powers have not been stirred within him, and higher aims set before him. Education will help him to rise to a better position in society, or even if he should not do that, it will fit him to perform better the duties of his state, it will make him a greater man with greater powers, and greater and nobler pleasures, and it will tend to fit him all the more for a loftier and more exalted state hereafter, for which all life and all work here are only the school and preparation.

It appeared to me that this subject of education was one very appropriate for the president of this Congress to touch upon at Liverpool. In a city of such magnitude, in the centre of a vast population, the truths of social science, and the many questions affecting our social life, can hardly be brought home to our thoughts and ideas without entering upon it. I believe that this city has a right to be proud of the arrangements made by its School Board for the education of the vast number of children within it; and when one considers the great position held by Liverpool among the towns of Great Britain, it is an agreeable duty for the president of this Congress to congratulate her and her people upon the success that has hitherto attended the efforts of her citizens, and the great progress that has been made, since last this Congress visited Liverpool, in carrying out improvements for the benefit of all classes of her inhabitants; and it is with our united hearty goodwill that we wish for continued prosperity to the Queen of the Mersey. The duties devolving on the citizens of a town so large, wealthy, and increasing, are many, various, and important. Fully to discharge these duties requires great self-denial, which, with Mr. Ruskin, I believe to be "one of the noblest duties for the sake of posterity." The desire for the improvement of the social condition of all classes, the development of social science, should rank "among the publicly recognised motives of exertion." "Yet these are not the less our duties, nor is our part fitly sustained upon the earth, unless the range of our intended and deliberate usefulness includes not only the companions but the successors of our pilgrimage. God has lent us the earth for our life; it is a great entail. It belongs as much to those who come after us, and whose names are already written in the book of creation, as to us, and we have no right, by anything we do or neglect, to involve them in unnecessary penalties, or deprive them of benefits which it was in our power to bequeath." It is this grand sentiment of Mr. Ruskin's which breathes the spirit and intention of this Congress, and fitly depicts the great scheme which we have in view. Assembled as we are in this city, herself a gigantic specimen of the march of improvement and the progress of social science, the position she has attained testifies to the truth of our principles, and stands forth a guarantee for the fulfilment of our ideas.

The sections got fully to work on Thursday morning. We print two of the papers read in the Art Department, and will in our next report the proceedings more systematically.

WHAT ARE THE BEST METHODS OF SECURING THE IMPROVEMENT OF STREET ARCHITECTURE, ESPECIALLY AS REGARDS ITS CONNEXION WITH PUBLIC BUILDINGS?

BY MR. WILLIAM H. WHITE *

ANY attempt to suggest methods for improving street architecture must be preceded by a reference to some of its actual defects and the impediments to their removal. It is, therefore, necessary to seek the experience of some large city; and I propose to take London as an illustration, since it is the biggest yet to be found in the world. Its original position was perhaps no less the result of chance than its early distribution; and, as we are told that the capital of the ancient world was once a village of huts, which each man had built, after his own skill and fancy, upon ground chosen according to his strength or pleasure, so the commercial centre of the modern one may have begun existence in a similar fashion. Substantial edifices like a castle, a cathedral, and a palace, were connected by groups of wooden houses, planted at sometimes wide distances from each other. The spaces between them were eventually filled with other houses; and rough highways, in front and behind them, developed into streets of irregular alignement and tortuous course. The area of a city was limited by its external wall; and all over the country, communities lived within the boundaries of a fortress or the seclusion of the cloister. Outside such precincts there was plenty of waste land; and in the course of centuries, what with religious reform in one and political reform in another, a good deal of good property doubtless went-a-begging. Beyond Temple-bar, on the way to Westminster, the Strand was once bordered with the houses and gardens of the nobility; and to the north and north-west, at no remote period, was open country studded with parks and villages. Thereon now stand the churches and public buildings, the houses and shops, which make up our actual metropolis. In London proper, north and north-west of the City boundary, the greater part of the soil belongs to nine members of the Upper House; that is to say, to three dukes, four marquises, and two earls. The traffic in this soil, from generation to generation, is a business of the most extensive and profitable character. Most of the houses now standing upon it have been built, not for the comfort or the wants of the tenants, but for the protection of these nine noblemen and their heirs. All round the circumference of the capital, owners of farms, waste lands, and petty estates have followed superior example,—have consecrated them to building purposes; and along hundreds of miles of roadway, thousands of houses constitute just sufficient security for the land which speculating freeholders have lent on lease. For the patrician owners of our London soil decline to sell; and, of course, they may do what they choose with their own. Moreover, they will often only lend on condition that you build according to their liking. The system has been described over and over again: The owner of the soil lends you, for a certain term of years, a slice or several slices of land, for which you undertake to pay him an annual rent; but the interest you possess in the house or houses, which you are compelled to build thereon, is only temporary, since at the end of the term you must surrender to the freeholder, not only the land you borrowed, but all that you have built upon it. Your policy, therefore, is to make as much as you can out of the property before you lose it; and your ground landlord is too much a man of business to care about the character of property which will not revert to him or his heir until—if you are commonly shrewd—it will be worn out.

This is the blot upon the soil of London, and, to a variable degree, upon that of other native cities. It is an effectual bar to improving street architecture. But there is worse behind; for the law of leasehold, born of speculation, supports speculators of all kinds; breeds usury; and a long series of practices, often nefarious and always immoral.†

The many ills, however, directly and indirectly afflicting leasehold tenure, are not encountered in the case of public buildings, which are necessarily built upon freehold sites; but opinions are everywhere divided concerning the manner in which they should be planted in a great city. The Classical spirit advocates open squares and rectangular approaches; entrance porticoes immediately opposite broad avenues; and long vistas, from which distant points of view may be obtained. While the ancient precedents of Athens and Rome never enjoin absolute regularity, or exact architectural counterparts, the Gothic spirit is strongly in favour of surprises. It would lead the puzzled spectator, through a labyrinth of houses, up to the very base of a great building, which, it is often maintained, should be seen, not as a whole, but in parts; and while the history of Mediæval cathedrals proves that, even at an early period, they were diversified and altered without reference to original plan or intentions, the remains of the Athenian Propylæa, and what is surmised of the Forum at Rome, serve to show that Greek and Roman cities were singularly varied, in their grouping and minor effects, without any strong oppositions of form or material. But the moderns, however divided in their appreciation of Antiquity and the Middle Ages, agree that, as the ruins of public buildings have been, in the past, often the sole records of remote and half-understood forms of civilisation, so, in the present, something of Imperial importance ought to be attached to them. They are tokens of what the Romans called "public magnificence"; and to build one used to be, even in England, and at no distant date, the coveted reward of learning and perseverance. But, of late years, or at least from the days of the Empress Catherine II. of Russia, it has been the fashion to offer them, in a manner more or less limited, to public tender, or, to refine the phrase, to public competition; and although, by some accident often accompanied with acknowledged injustice, successful buildings have resulted therefrom, those who have ventured into the highways and byeways of the system probably agree with that Royal Academician who refuses to compete, because he thinks "competition one of the worst modes of obtaining good designs . . . . bad for the employers, bad for the architects, and bad for art generally."* Even when the conduct of an architectural competition has been honourable to all concerned, it is only a pictorial triumph, the outcome of which is more often archæology than architecture. Judges, even the most accomplished, see upon paper, in a happy arrangement of roofs and chimneys, of turrets and spires, something resembling those excellent buildings of Western Europe, each of which frequently marks the whole course of Mediæval story. They admire, and are convinced,—often unable to perceive, as a critic has well said, that it is one thing to admire the natural growth of the picturesque, but quite another thing to set to work deliberately to be picturesque, of "malice aforethought." The consequence is, that our cities are now adorned with public buildings—many of them extremely beautiful—which are clever representations of the amended work of centuries, scientifically reproduced in the space of a few years, or even a few months.

Nevertheless, it is often said that our public buildings are failures, on account of a want of knowledge in the British architect, and a want of taste in the British people. But taste is only culture,—the product of example and slow inheritance; and while, in this time of School Boards and social movement of all kinds, there is great hope for what ancient writers called the common people, their actual influence upon the arts is imperceptible either for good or ill. That the educated classes are devoid of taste is much less likely than that they are perplexed with the artistic confusion,—embarrassed with the riches, native and foreign, which are absolutely flung at them. For the modern architect has the whole past at his fingers' ends, and many of his patrons are as learned in archæology as he himself. Indeed, if my Lord Salisbury,—in his zeal for the propagation of brotherly love between Hindú, Musalmán, and Christian,—were to order the erection of a hundred domes upon the top of the India Office, and the conversion of all its chimneys into minarets, there are scores of honest and patriotic Englishmen, not only able, but willing to gratify him; and this facility prevents the natural development of our recovered building traditions.

Another impediment to the improvement of London street architecture arises from the general reluctance to acknowledge a radical change, which, during the course of this century, has taken place in the life and condition of the capital. A city, or at least the centre of it, is now merely a place where "men toil and accumulate; they go elsewhere to enjoy and expend." To continue, in Macaulay's words, "The chiefs of the mercantile interest are no longer citizens; they avoid, they almost contemn municipal honours." The heart of the metropolis, with rare and fast-decreasing exceptions, has become to the householder a place of business only, to be avoided at every possible opportunity. Neither common interests nor kindred associations exist among the different masses of men who hasten every morning to the centre to win bread; and, at night, take it away to share with wife and children at the circumference, or in suburban retreats. All that the majority of business men now require, in town itself, is a warehouse, a shop, or a suite of chambers. The houses, which were formerly occupied on the ground-floor as business premises, and as a family home above, remain; but, although the nature of the occupation is totally changed, no radical alteration has been made in the houses. The ground-floor is still a shop or a warehouse; the first-floor is let out in offices; the second and third floors are rented by small families and bachelors. The rickety wooden staircase, which, a generation ago, was the means of ascent from shop to sitting-room, from sitting-room to bedroom, has become a public one; and the street-door, originally private, is now a public entrance. The Legislature takes no cognisance of the fact—long recognised in other European capitals—that buildings in the heart of a metropolis are occupied in single floors—even in single rooms—and not in whole houses. Originally, when some of the large estates were laid out in squares and streets, the building plots were cut up into slices—some as narrow as 16 ft., but generally from 20 ft. to 25 ft. in width of street frontage,—and, at this moment, there are ground landlords, who, although you take on lease 50 ft. or 100 ft. frontage of their land, compel you to divide it with party-walls at a distance of 25 ft., more or less, from each other. But if you increase that distance to 50 ft., and spend the money thus saved in party-floors of brick or concrete, the house will be stronger and better, both internally and externally. Thereby, instead of two shops, there may be three; instead of four rooms on each floor, you can get six, almost as large; instead of two narrow private entrances, you will have a single comparatively broad one; and instead of two suicidal deal staircases, you may have a fire-resisting one of brick or concrete. By such an arrangement, the front wall need not seem to be miraculously supported upon a plate of glass, for the divisions between each shop will provide visible means of support; and the distribution of several window-openings, at each floor of the superstructure, will afford scope for artistic treatment.

But I doubt whether the time has arrived when we can safely talk about improvement in a purely artistic, or, perhaps, an æsthetic sense, more particularly while building remains in three-fourths of Central London in its present state. What that state is has been told, for the space of more than a generation, in the *Builder* newspaper. In spite of new streets, new railways, new public buildings, London is permeated with fallen neighbourhoods, slowly descending into what are called "slums." Although the evils, due to overcrowding, have slightly diminished; although sanitary precautions are now taken, and parochial authority exercises some control, the vast majority of the houses have not been improved; and I doubt whether the recent Act of Parliament relating to artisans' dwellings will affect polluted thoroughfares upon patrician estates. I know a slum, a property of much and increasing value, situated upon ducal soil. It is a long, irregular, and narrow lane, out of which an archæologist could extract a host of amusing reminiscences, and a painter many picturesque bits of form and colour. Not long ago, its sky-line was improved by the introduction of a small church with a gabled tower, containing a deep-sounding bell, which,

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* Read at Social Science Congress, Liverpool.

† The *Quarterly Review* for April, 1872, described in just and indignant language the state of our London houses. It said:—"This leasehold tenure, with its gambling speculation, extensive and often fraudulent building agreements; its heavy law-costs, complicated mortgages, releases, re-mortgages, and second charges; its doubtful titles and dreary waste of title-deeds; the risks of forfeiture, and the shortening term, forbids prudent men of business to erect substantial, well-built houses." . . . "It is a remarkable instance of the Chinese endurance of Englishmen that the people of London have not unanimously struck against the system. They have so small an interest in the houses that they might with proper indulgence and moderation urge the cessation by legislative means, if necessary, of a custom which is in every way so injurious to all." . . . "Those who know the working classes, in their homes, can testify that their chronic ill-condition is very greatly due to the pernicious customs, the injudicious greed, and the bad or defective legislation of their superiors."

* Mr. Edward Barry, R.A.

at orthodox intervals, summons the neighbourhood to prayer. Meanwhile, the numerous men, women, and children, who are huddled indiscriminately together in houses—each originally constructed for the special accommodation of a single family—scream, swear, fight; and, as the medley of strains reaches my ear, I often presume to think that had Charity, instead of giving sixty families a place in which to congregate on a Sunday, provided six of them with rooms in which to live decently every day in the week, there would be more satisfaction in Heaven. For the improvement of such neighbourhoods is a question of charity. You cannot pull down inhabited houses, especially in a slum, without incurring a dead loss; and, on the great estates and others, you must wait until the houses fall, at the expiration of their leases, into the ground-landlord's possession,—when, sometimes, he will cause the line of street-frontage to be set back; lend his land again at an increased rental; and frequently enjoin the re-erection of a similar description of house.

When the model upon which house architecture in London proper is still based, was new and almost original, many of the well-to-do inhabitants were accustomed to be carried in covered chairs, from one part of the town to another; and the convenience, in wet weather, of such a mode of transport is easy to understand. But, at the present hour, society has neither chairs nor chairmen in the obsolete sense of either term. To enter carriage or cab, it must traverse often an uncovered door-step and always the street pavement, even under heavy rain. The Parisian ladies are fortunate, for almost every house in the new quarters of Paris possesses an entrance lofty and wide enough to admit carriages to the foot of the staircase. In Paris, Turin, and other Continental cities, ladies can "shop," even in the worst weathers, under numerous public colonnades, passages, and arcades. In Milan, there has lately been erected a broad and extended "gallery," lined on either side with shops, and covered with a glass roof. Such places in England, from some exuberance of the national temperament, bear an ill reputation. In London, an arcade or a colonnade has been condemned by experienced moralists as a fashionable resort, whither, at certain hours, the more foolish of one sex go to stare at the more vicious of the other. Nevertheless, in a metropolis, where it rains, on an average, 157 days in the year, long and broad avenues, covered with glass, scientifically ventilated, and guarded by policemen—not by beadles—would render a wet day far less expensive than it is at present to a large number of Londoners.

Innovations, however, are not hastily accepted in England, especially if they come franked with a foreign recommendation. The Parisians, on the contrary, catch at novelties; and sometimes crown the edifice of even a constitution before the foundations are set. The recent rebuilding of Paris was successful, according to a well-known French architect and journalist, because it was sudden and grand; and it would not have been accomplished had it been timidly pursued. But our English characteristic is to be slow and sure,—inevitably slow and possibly sure; and we are not at all likely to imperil political or financial success for the sake of artistic triumphs. Yet, although there is much to avoid in the example of Paris, there is also a little to follow. The French capital, with all its faults, is still more perfect than many of the chief cities of more successful neighbours. If you inquire, you will find that it has long had an organised "Service of architecture," which has worked, and still works, very well. Although this Service has undergone some modification since the war and consequent revolution, there is still attached to each of the twenty arrondissements a qualified architect, under whose orders are surveyors, clerks-of-the-work, foremen, &c. Over all are now two inspectors-general, experienced professional men, who have to give opinions upon designs and estimates, and to visit national and municipal works in course of execution. They have also to prepare the programme, and sometimes preliminary sketches, of a suggested public building before any one is commissioned to design and carry it out. If you turn to Paris, you will find that the palaces, schools, monumental arches and statues, are kept in repair and cleanliness by a professional staff, regularly appointed to look after them; and, often, a new public building, even when entirely finished and occupied, remains under the fostering care of some of those who assisted in its design and construction. Such a work as the Great Hall of the celebrated Palace of Justice has risen slowly under the personal supervision of M. Duc and his assistants, who have devoted themselves almost exclusively to it. The superintendence of that and similar buildings represents a hierarchy of talent,—even the clerk-of-the-works sometimes succeeding, at his master's death, to the post of architect, with whom in France, where there are no general contractors, rests the sole and entire responsibility of the whole work. There, his authority, especially in the case of a public building, is greater than in England, for his responsibility is greater and more defined. Like the builders of ancient Rome, the French architect, during the space of ten years after the completion of any building with the erection of which he has been entrusted, may be mulcted, in goods and person, for any defects of its construction or accidents arising therefrom.

The Parisians also practise two of the precepts of Hygeia. In that metropolis of Cloudland, which Dr. Richardson so vividly described last year, "There is not permitted to be one living-room underground"; nor is any house, he said, higher than 60 ft.; but he did not mention the width of the street. In Paris, the public buildings and private houses rest upon vaulted cellars, containing wood, coal, and wine; and although servants are lodged often, unhappily, in a roof, none are consigned, either by day or night, to below the level of the street. Nor can any house be built in Paris, as high as 60 ft. from pavement to cornice, unless it be situated in a street or a boulevard, 66 ft. wide or upwards. In a London alley, you may erect a tower of Babel by simply buying the right to do so, not from your neighbours, but from the leaseholders and rackrenters of the opposite or adjoining houses. The Law lays down certain rules regarding party-walls and projections; but it leaves you to fight out, as best you may, caprices of light and air, the height of your walls, and the slope of your roofs. In Paris, such things are legally determined according to position and the width of a street; but in existing London thoroughfares, however narrow, the question is a marketable one, ignored by the Law and settled by lawyers. Although Parliament has given the town a Metropolitan Buildings Act and a Local Management Act, the present state of London seems to show, either that they are wrongly interpreted, or that some of their clauses are both illogical and unfair. For instance, you may construct a shop-front in wood, and project from the face of a brick wall absurd mouldings and so-called ornaments in wood, but you may not put any constructional feature in that material upon, or against, or even with, the brick or stone face of the first-floor window. You may erect over the entrance of a theatre, a music-hall, or a billiard-saloon, every variety of illuminated or pictorial box; you may have any number of cornices, which, in fine weather, will collect dust, and, when it rains, precipitate diluted mud upon the heads of passing pedestrians; you may have lions and unicorns, if you know how to obtain them, peering over your shop-cornice or from an upper window; you may completely envelop the front of your house in a wooden or a canvas covering, which you can let for a term of years to that enterprising contractor who "doth give us bold advertisement"; and although I have never perceived that the habitual drinker is fastidious in his choice of native liquors, it is a national custom for the names of eminent brewers to be displayed at public-houses upon huge boards, which often hang, from uncertain fastenings, over the street pavement. But you may not build a projecting window, however constructionally perfect, nor may you erect even a stone balcony upon a stone support—such as those which adorn the houses of new Paris—in even a broad new thoroughfare of London.

Some of the inconsistencies and blunders which militate against metropolitan improvement may yet be remedied by strong social pressure. The noble and other owners of our London soil are enlightened enough not to depreciate the force of public opinion. Their omnipotence may be exercised for good as well as ill. Although to hamper the lease of land with clauses,* relating to the quality of work to be erected upon it, constitutes a restriction for which intending lessees would perhaps demand compensation in reduced ground-rent, land in Central London is so scarce that an owner may virtually dictate terms with those who desire to build upon it. When, therefore, he knows, from precedent and surrounding example, that a new house will be inhabited in separate stories, and by several groups of people, let him insist that it be constructed with party-floors and a fire-resisting staircase. Let him stipulate for the spread of a concrete covering over the whole surface of the site; for the employment of proper materials; for a scientific system of drainage; and, above all things, secure the right to see that all is executed according to stipulation. In such matters, the real inhabitants of a house have no voice; they take what they can find, and at a price which must allow sufficient profit, not only to defray the expenses of land and building, but too often also the exigencies of a rackrenter, a nominal householder, two or perhaps more leaseholders, and sometimes a few mortgagees. But although public opinion may induce great freeholders, through their own middlemen, to enforce good building upon their estates, no outside pressure, no exposure of fraud and long-standing abuses, will reform the law of leasehold. Only a Royal Commission could get evidence of the evils which attend it, and only an Act of Parliament remove them.

The question, therefore, must remain for the present, one of possible improvement, because Parliament will not be in a hurry to cleanse the Englishman's "castle" of its legalised impurities; and, as yet, it is more a social question than an artistic one. For many years to come it will depend very little upon the *extrados* of any form of arch, the *entasis* of a column, or the "clear-obscure" properties of a cornice. It is not a taste for art that England lacks, but a real and serious desire for order and harmony which is wanting. Perhaps the many powers, dominations, and parliaments, which govern London by piecemeal, may yet receive Imperial attention. Any scheme which would serve to control, in an artistic point of view, the Metropolitan Vestries and Boards, while it left them the exercise of their actual functions, would certainly be beneficial. When it is remembered that some ground landlords compel you to erect a certain form of house, and that others impose a particular description of façade in accordance with drawings prepared by their own surveyors, there surely ought to be some power to which an intending lessee could appeal—if he deemed it necessary—against the artistic decision of the lessor or ground landlord. Parochial judgment is perhaps not sufficiently developed for such a position; and, indeed, it is expecting too much of human nature to suppose that a nobleman, who owns the land of an entire parish, would hold in awe a Vestry and a staff of officers, composed of his own tenants and their dependents. Some central artistic authority is required, disinterested and powerful enough to say to speculators of every social grade:—You shall not make day and night hideous with gigantic advertisements and notice-boards; you shall not traverse streets, courts, and gardens, with murderous telegraphic wires; you shall not carry a railway viaduct between the Palace of Westminster and the Abbey; you shall not build one public office in an Assyrian style of architecture, and another in absolute imitation of an Egyptian temple, or a Druidical monument. Such knotty questions, and the proper answers to them, should form the regular business of a technical tribunal, to whose decisions Parliament might listen with respect, or perhaps interpose its many-headed wisdom only on extraordinary occasions. True, in the Act under which Northumberland-avenue has been made, there is already a clause stipulating that the designs of the house-fronts are to be submitted to the Council of the Royal Institute of British Architects; but there is nothing in it to compel the Metropolitan Board to do more than *submit* the designs,—nothing to compel them to accept any judgment thereon.

Nor is the artistic improvement of London entirely dependent upon improved judgment in architecture, for I hold it a satire upon human intelligence to plant rich and beautiful edifices amid the filth of London. When, this summer, the sun shone, as it rarely shines in England, it was ludicrous to see the cornices of St. Paul's, the arches of Somerset House, the grotesque projections of more modern buildings, trying to cast a shadow! There is a social parallel to such a home of perpetual dirt, as the British capital, under artistic manipulation. Take a sweep: although in his working garb he is physically unclean, he may be upright, muscular,

* Clauses of such a nature are of course always introduced, but that they are neither scrupulously executed nor seriously enforced upon some of the great estates, need not be told to any one who has the smallest acquaintance with the sort of shops and houses which are even now rising in Central London.

honest, in fact, manlike; but put him into purple and fine linen, and he becomes a caricature of that form which is said to be moulded in the image of its Maker. Yet, under equally unpropitious circumstances, has London been dressed in an Antique and a Mediæval costume; and as fresh materials for gables and windows are now being sought for in Holland, perhaps the hose and the scrubbing-brush, with which the Dutch keep their house-fronts clean, may also be imported into this country. There are, however, responsible people who argue that the filth, which festers day by day upon the whole surface of London and its buildings — which floats in the air, within, above, and around them —cannot be removed; that the normal condition of a large English city is to be dirty; and that, if London were washed in the morning, it would be dirty again at night. The inhabitants of the French province of Auvergne have been similarly libelled; but if that plea of the Vestry and District Board be worth anything at all, how comes it that the well-to-do, well-bred Londoner, who resides in London, is the cleanest and best-dressed man in Europe? It seems almost an insult to common-sense to urge that the external faces of buildings in a great city should be composed of materials that will wash.* We possess all kinds of granite more abundant, and machines for polishing it better, than are to be found in any other country, and we have the strongest tiles and majolica-ware in the world. Yet brick, which must irretrievably soil, and stone, which after the dirt has been scraped from it, must decay, are the principal, if not the only, facing materials of even our national monuments. At the same time, walls of polished granite would be marred, in their purpose and effect, unless the surrounding streets and houses were kept in proper order. London employs an army to make the town morally secure; another is required to keep it physically clean. Upon the frank admission of local neglect and individual abuse, more than upon flights of archæology, hangs the immediate improvement of our streets. And if rich people or prosperous communities will only be satisfied with mere *building*,†—and refuse everything, except good, plain, honest *building*, during the few remaining years of this century,—it will then be possible, in the beginning of the next, for another generation to refine it, with equal patience, into true architecture.

SOME ACCOUNT OF THE ART-UNION OF LONDON: AN ART POPULARISER.

BY GEORGE GODWIN, F.R.S ‡

The history of the Art-Union of London is a very remarkable one; and the effects of the operations of this association have not yet been taken properly into consideration by writers on art. A brief account of the more salient points of that history will not be thought out of place in this Department, which has been established to discuss questions of art bearing upon educational and industrial development, and the best methods of cultivating taste in all ranks of the nation.

In 1837 it occurred to a few lovers of art in this country that something might be done to render a knowledge and appreciation of it more general than was then the case, and to raise the standard of taste; and it was thought that an Association, founded on the principle of the German Kunstvereine, might be successfully established,—money being subscribed in small amounts, to be afterwards distributed amongst the subscribers in larger sums for the provision and purchase of works of art. As a curious matter of fact, such an association in a small way, under the title of Virtuosi of St. Luke, was formed in London by Vandyck, revived by Sir Peter Lely, and continued in operation intermittently till 1743.

When the Art-Union of London was organised, a society with a similar aim had been started in Scotland, but the mode adopted in London differed from that of the Scotch association and the German undertakings in one important particular, inasmuch that, while in those schemes the selection of works to be given as prizes was made by the governing body, it was determined to confide the selection of prizes to the prize-gainers themselves, as being a plan better calculated to attract subscribers, and as likely to assist in cultivating the power of observing and appreciating the qualities on which the comparative value of works of art depends. Not merely does the act of selection thrown upon an individual lead in his particular case to inquiry and comparison, which often prove a good first lesson, but every member who goes to an exhibition feels the possibility of being some day a prize-holder, and so examines works, and tries to understand why this or that may be better or worse than others, with the view of having to choose for himself hereafter the best picture obtainable.

Going back to the organisation of the Society,—a committee of seventeen was formed, of whom three are still members of the Council, and in the first year they raised with difficulty 489*l.*, with which the prizeholders purchased thirteen works varying in price from 10*l.* to 100*l.* The amount of subscriptions went on doubling for several years until an income of about 12,000*l.* *per annum* was attained; and at this, more or less, it remained for some time. In 1875, however, it reached 18,926*l.*, and the last yearly subscription was no less than 20,932*l.*

In its second year, the Society adopted the principle of setting apart a certain sum for the purpose of engraving a picture, so that each member might receive an impression of the plate, and thus have a direct and certain return for his outlay; knowing that by combination a work could be produced, of the market value, at least, of the subscription, and having a confident belief that, in thus bringing a systematic artistic influence to bear upon a vast number of persons, at regularly recurring periods, they were preparing the way for the advancement of art, even in its highest departments. For, if the history of the fine arts in past ages teaches plainly any one lesson, it surely is that those arts only will flourish truly and permanently where they are of home-growth, and have set themselves to illustrate the characteristic sentiments and feelings of the nation, thereby ceasing to minister merely to the luxuries of the favoured few, and becoming rather the perennial and increasing sources of enjoyment to the public at large. A comparatively small sum only could be spared on the first occasion for the engraving, and the committee commissioned Mr. William Giller to engrave a plate from the picture, "A Camaldolese Monk," painted by Mr. Simson, which had been selected as a prize in the preceding distribution. This was the beginning of that issue of annual plates which has been continued ever since, and which may be truly termed remarkable, including reproductions by the first British engravers, such as Doo, Stocks, Sharpe, Finden, Heath, Willmore, Joubert, Jeens, and others, of the works of the first British painters, notably Mulready, Webster, Turner, Maclise, Landseer, Callcott, Frith, Cooke, Stanfield, Armitage, Goodall, and others, the whole culminating in the two large plates by Stocks and Sharpe respectively of Maclise's magnificent wall-paintings in Westminster Palace, of "Wellington and Blucher meeting after Waterloo" and the "Death of Nelson."

These remarkable works each occupied five years in engraving,—and of each about 20,000 impressions have been distributed,—at a cost, including copyright, paper, and printing, of 7,800*l.* and 7,200*l.* respectively. Produced commercially, two guineas at least must have been charged for each print, but under the arrangements of the Art-Union each subscriber of a guinea received an impression, and a large sum in the aggregate still remained to be distributed in the shape of prizes. It is to be noted in reference to these and other plates lately produced for the Society, that in every case the last impression taken from the plate is, in all respects, equal to the first printed. This result could not have been attained but for Mr. Joubert's valuable discovery of the process of steel-facing, by which the copper-plate is coated with an infinitesimally thin layer of steel, which thoroughly protects from wear the surface of the copper, and is renewed from time to time before any perceptible decline occurs in the quality of the impressions.

Besides plates engraved in pure line (of which branch of art, it may be noted, in passing, the Art-Union is now the sole support, publishers all adopting the more rapid, but inferior, styles of mezzotint or the dotted style, technically termed chalk engraving), the Society has produced some fine examples of chromolithography, such as "Choosing the Wedding-Gown," after Mulready, and "Bellagio," and "Wild Roses," after Birket Foster, besides volumes of the highest class of wood-engraving, by Jackson, the Dalziels, Linton, and others.

In the year 1841 the committee determined to endeavour to turn the attention of British artists to the production of compositions in pure outline, after the manner of Riepenhausen, and some later Germans, of which manner Flaxman was, up to that time, the sole representative in England, their object being to show the importance of that purity and correctness of drawing, and severe beauty of form, which, apart from colour, and all the effects of light and shade, exist in the compositions on the fictile vases of the ancients, and in the outlines of the artists above-named.

As the result of an offer of a premium of 60*l.* for a series of designs in furtherance of the object proposed, thirty sets of drawings, of various degrees of merit, were received, and the premium was adjudged to one illustrative of Bunyan's "Pilgrim's Progress," which was found to be by Mr. H. C. Selous. The engraving of these outlines was very satisactorily executed by Mr. Henry Moses, and copies were distributed to all the subscribers of the year 1844. Four other sets of engravings, in a similar style, have since been produced by the Art-Union. Amongst those who have received premiums for such works may be named Mr. F. R. Pickersgill, Mr. John Tenniel, and Sir Noel Paton. Of large and small prints, or sets of prints, of various kinds, the Society has distributed upwards of 500,000. Through the agencies, which have been established in all parts of the world wherever English-speaking people are to be found, from Jutland to the Cape of Good Hope, from San Francisco to Japan, there are to be seen, as cherished ornaments on the walls, the productions of the Art-Union, furnishing constant sources of enjoyment, telling some story of England's valour or loyalty, or clothing in lasting and impressive forms the poetical imagery of some English author; or, what is perhaps most of all appreciated in those distant lands, shadowing forth some scene of English rustic life, thus always and everywhere keeping up that memory and love of home which prevail nowhere more ardently than in the hearts of our countrymen scattered over distant parts of the world.

Besides the annual prints, the Art Union has distributed, as prizes, between 6,000 and 7,000 works in oil or water colour, a large number of which has been sent to Australia and other colonies. There are artists now high in the ranks who willingly admit the important assistance afforded them early in their career by the purchase of their works by members of the Society. In respect of sculpture, premiums have been offered at various times for important works, and which were obtained by Mr. Calder Marshall, R.A., Mr. Birch, and others. An endeavour has been made, too, and with some success, to encourage the art of cameo-cutting.

Up to the year 1841 it was a most rare thing to see in this country statuettes in bronze, such being found only in the collections of wealthy connoisseurs, and comprising real, or supposed, antique examples, and copies of fine works produced in France or Germany. Of English specimens of this work it is believed that none existed. The Art-Union determined to endeavour to bring about the production of artistic statuettes in bronze, but so little was known of the art of bronze-casting in general, that Mr. Edward Wyon, to whom was entrusted the reduction and casting of the Society's first work, the well-known "Michael and Satan" of Flaxman, had the greatest difficulty in finding men able to undertake the task. However, by dint of perseverance, a very satisfactory copy in bronze of the above group was produced, and this was the inauguration of a series of twenty bronzes, from works by Foley, Westmacott, Chantrey, Thorneycroft, Stephens, Armstead, and others, to which the Art-Union may point with satisfaction, as not yielding in excellence to the works produced by any foreign foundry.

In ceramic ware, again, at the period above alluded to, very rare examples were to be found in England, generally consisting of a few specimens of old Chelsea or Wedgwood ware or works in biscuit of foreign origin.

In the year 1845 the Art-Union entered into negotiations with Messrs. Copeland and Garrett with a view to the production of statuettes in

* Some years ago Sir G. G. Scott, R.A., said he wanted "vitrified bricks without a glazed surface." He was sure that if proper attention were directed to the subject, good and permanent vitrified bricks could be produced at a reasonable price.

† Those people who are sincerely desirous of seeing the introduction of style (not *a* style) into new buildings, and propose to spend money upon pilasters and buttresses, should read carefully the "Introduction" (of forty-one pages) to the "History of Modern Architecture," by Mr. James Fergusson, D.C.L., F.R.S., and published by Mr. Murray.

‡ Read at the Liverpool Congress.

porcelain, and, as the result of a conversation between the writer and the late Mr. Gibson, a reduction of that eminent sculptor's beautiful statuette of "Narcissus" was placed in the hands of the above firm, and, after many failures, due to want of experience in that particular branch of manufacture, a very satisfactory result was obtained, and this was the beginning of that series of fourteen statuettes and busts which are among the most popular of the Society's productions. It may be mentioned incidentally that of the reduction in parian of the beautiful antique bust of "Clytie," more than 2,500 copies have been distributed. The Art-Union of London may thus claim the largest share of the credit of fostering a branch of industry to which thousands of households are now indebted for reproductions of beautiful works.

So, too, in respect of the art of medal die engraving, an art but little cultivated in England, the action of the Art-Union in producing the medallic series of British artists is similarly noticeable. The Art-Union, with a view to encouraging the practice of this art, proposed to produce a pair of dies for one medal, each year, having on the obverse the head of some distinguished painter, sculptor, or architect, and on the reverse a subject from one of his works. The first medal thus produced was one of Chantrey, the sculptor, having, on the reverse, his fine sitting figure of Watt, the engineer. The execution of this medal, thus commemorating, at once, two of England's most gifted men, was intrusted to the late William Wyon, R.A., and it was the first of twenty-six medals, to this time completed, which, as a whole, form one of the most interesting records ever produced, of men most distinguished in the field of art in England.

During the period of its forty years' existence, the Art-Union has had some difficulties to encounter; and two of the most serious of these arose from the action of the Government. In the year 1844, when everything was prepared for holding the usual meeting for the distribution of prizes, the committee were startled by the receipt of a letter from the Treasury, to the effect that the proceedings of the Art-Union were illegal, and that the continuance of the same would render all parties concerned liable to prosecution. The committee thereon suspended all proceedings; and, although they had the opinion of leading counsel, that their operations were not in any way in contravention of the Act against lotteries, they thought it better not to contest the point.

A memorial was addressed to Sir Robert Peel, setting forth the amount of benefit already conferred on the artists of the country by the Art-Union, and the great loss and disappointment which would arise from stopping the distribution of the large amount then actually in hand. The committee, were, however, unable to obtain any guarantee permitting them to make the distribution. At this conjuncture, through the introduction of the late Marquis of Northampton, one of the vice-presidents of the Society, the committee had a conference with the late Lord Monteagle, and pointed out to him the difficulties of their position. Suffice it to say, that a temporary Act of Parliament was passed, to enable the distribution of prizes to take place, and this was carried out.

In the meantime, a large meeting of artists was held, numerous petitions were presented to the House of Commons, and, on the motion of Mr. Wyse, a committee of the House was appointed "to consider the whole question of Art-Unions, and what are the most expedient and practicable means to place them on a safe and permanent basis, and to render them most subservient to the improvement and diffusion of art through the different classes of the community." The report of the committee was a complete investigation of all the points which could be urged for and against Art-Unions, some of the leading painters, engravers, and print-sellers of the day having been examined, and the conclusions were thorough and unanswerable in favour of the principles of the Art-Union of London.

A Bill, founded on the report of the committee, legalising art-unions, under certain conditions, was carried through Parliament, and on August 13th, 1846, received the Royal assent. On December 1st of the same year the Art-Union of London was incorporated by Royal charter. Under the provisions of this charter and of the bye-laws which, in accordance with its terms, the council drew up, the proceedings of the Society have ever since been conducted.

In the year 1866 it was felt by many persons taking an interest in the advancement of art, and by none more strongly than by the council of the Art-Union, that in the Act above named the conditions on which such associations might be permitted to be formed were too lax, and that sufficient power was not vested in the Board of Trade, or in some department of the State, to prevent the fraudulent proceedings which were known to be carried on under the assumed title of art-unions. Lord Robert Montague procured the appointment of a committee of the House of Commons to investigate the matter. Ten witnesses were examined, and a report was laid before the House, recommending that the administration and enforcement of the Art-Union Laws should be placed under the charge of the Science and Art Department of the Privy Council, and proposing a code of regulations, which were in nearly all respects identical with the regulations of the Art-Union of London. Unfortunately, in consequence of the pressure of business in the House of Commons, the matter went no further than the presentation of the report, and an Act based on its recommendations is still a desideratum.

In the year 1848 the Privy Council sought to interfere with the constitution of the Society in three several particulars, viz, that the works of art to be given as prizes should be selected by a committee instead of the prizeholders themselves; that the annual issue of a print from some picture by an English artist should be discontinued; and that 10 per cent. of the amounts subscribed each year should be reserved for the purchase of works, not for distribution, but for public exhibition.

A consideration of the principles which guided the founders of the Art-Union in laying down the rules for its conduct, as described in the opening of this paper, will make it evident that the council could not fail in offering a strenuous opposition to the proposed alterations; being convinced that a measure which would have the effect of depriving the members of the certainty of receiving in return for the subscription, a work of at least adequate value, and, in the event of gaining a prize, would take from them the valued privilege of choosing a work of art for themselves, would, without any doubt, imperil the very existence of the Association. The proposal to mulct the annual receipts in a tenth part of their amount would be certainly unpopular, and would considerably trench on the sum disposable for a specific purpose, without bringing any compensating advantage.

A long correspondence with the Board of Trade ensued; a deputation waited on Mr. Labouchere, the president; a unanimous vote was passed at the annual meeting, requesting the Council "to persevere in their opposition to the proposal of Government"; a meeting of artists was called, and a memorial to the Board of Trade drawn up and presented, deprecating the proposed interference; and after more correspondence and further interviews, the Board of Trade forebore to urge their views "against the strongly expressed sentiments of the Council." Great as were the trouble and annoyance arising from these proceedings, they were not wholly without advantage, since they served to elicit from various quarters expressions of goodwill and appreciation very acceptable to those who had at heart the welfare of the Association.

The Art-Union has always been happy in the choice of its president. On its incorporation the office was accepted by the late Duke of Cambridge, and H.R. Highness, who always showed a warm interest in its proceedings, generally took the chair at the annual meeting, and was on one occasion a prizeholder.

The late Lord Monteagle, to whom the Society was indebted for most valuable aid at a critical moment, was then elected, and at his decease, Lord Houghton, who had been, as Mr. Monckton Milnes, a member of the Council, was elected president, and so continues.

Such is a brief sketch of the progress of the Art-Union. It has had its varied fortunes, but has steadily pursued its path of duty under circumstances at times very critical and difficult to meet. Its present position proves that it has triumphed over all.

To sum up in a few words, it has collected and distributed, with a view to the advancement of art and the spread of its enjoyments, half a million of money, not one sixpence of which would otherwise have been so applied: it has scattered fine works far and wide, and banded together English men and women throughout the world with one common object, and that a good one. I hope you will consider me entitled to say that much has been accomplished towards the attainment of the objects proposed in the original programme of the Society,—the promotion of the knowledge and love of the fine arts, the general advancement of art in the British Empire, and the encouragement of its professors by creating an increased demand for their works and an improved taste on the part of the public.

WOOD WORKING AND STONE DRESSING MACHINES.

A few years ago we went over Messrs. A. Ransome & Co.'s factory (the Stanley Works, in the King's-road, Chelsea), and described what we saw, prophesying that the use of wood-working machines would extend, and that these works would grow. All this has come; and we went again the other day to

Stanley Works.—The factory, which was rebuilt on a greatly extended scale in 1873-4, is now capable of accommodating from 300 to 400 workmen, and is devoted exclusively to the manufacture of wood-working machinery of the highest class. The workshops, which are very light and lofty, are fitted with the most modern engineers' tools, and with every appliance for economising labour. A special feature in most of the machines made by Messrs. A. Ransome & Co. is that they are constructed to work at much greater speed than others of their respective kinds in the market, the result being that they not only do more work, but the increased velocity of the cutting-tools causes them to produce a finer surface than can be obtained with machines in which the cutters are driven at the ordinary speeds. To adapt the machines to work at such high speeds without undue wear it has been found necessary, in many instances, to make the cutter spindles of the best quality of steel instead of wrought iron, and to employ phosphor bronze, instead of gun-metal bearings, which naturally increases the cost of manufacture; but the slight extra outlay in first cost which this entails is more than covered by the extra earnings of the machine in the first few months' working.

The success of this system was strikingly shown at the Vienna International Exhibition in 1873 (the last occasion on which all the principal makers of wood-working machinery exhibited in competition), when Messrs. Ransome & Co. were awarded two first-class Medals for Progress, and Mr. Ransome, at the close of the Exhibition, received the Decoration of the Order of Franz Josef, while the highest honour awarded to any of their English competitors was a single Medal for Merit. As a further instance of the success which has attended the introduction of these high-speed machines, we are told that the business of this firm has more than doubled within the last four years, and notwithstanding the general depression of trade which now prevails, they are employing nearly twice as many workmen as in the busy period of 1871-72.

The most interesting department at these works (to builders) is the trial shop, or show-room for machinery in motion, a building about 100 ft. long by 50 ft. wide, which serves the double purpose of a testing-room, in which all newly-invented machines are worked and perfected before being sent out, and a kind of permanent exhibition of joiners' machines, where the most novel labour-saving tools of this description may always be seen in operation. Intending purchasers are thus enabled to judge of the practical value of the various machines by seeing them actually at work. As an illustration of the value of this practical test we may mention that there are at present in the market about a dozen different machines of the class known as general or universal joiners, all of which are advertised by their various makers as capable of doing almost every operation connected with joiners' work, but as the prices of these machines range from 17*l.* up to 250*l.*, it is clear that they must differ widely both in construction as well as in quality and quantity of work which they are capable of turning out, and therefore the only way to form a correct judgment of their comparative values is to see them in operation.

Besides a number of representative machines of the more familiar kind, such as circular and band saws, planing and moulding machines, saw-sharpening machines, &c., which are at present to be seen at work at the show-room, we noticed some of a more novel description, and as they possess certain features which have not hitherto appeared in any corresponding machines, we will briefly describe them.

A patent single deal frame, capable of sawing battens, deals, planks, or flitches, up to 12 in. wide and 4 in. thick, was doing excellent work when cutting a plank of 11 in. by 3 in. into seven boards, with a feed of 3 ft. a minute; and we afterwards saw the same machine working with three saws, with a feed of 4 ft. a minute. One of the improvements in this machine consists in the working parts being very light, the crank-shaft and swing frame being of steel, which enables it to be driven at 320 strokes a minute, without any perceptible vibration. It requires very little excavation or foundation, as it stands on a bed-plate which is fixed on a level with the floor; the only foundation being two blocks of concrete, with a space between them for sawdust.

Another important feature in this frame consists in the introduction of two feed rollers, to act one on each side of the deal, and as they are both driven, very strong feeding-power is obtained, and although the rollers are perfectly smooth, they feed the deal through without the slighest slip, even when the frame is working with its full complement of twelve saws. The frame is said to be capable of sawing 150 12-ft. deals, with an average of three cuts in each, in ten hours, which is a better result than is obtained by most double deal frames to be met with in ordinary saw-mills.

We next inspected a Ransome's "Patent Complete Joiner," and saw it perform the various operations of which the makers advertise it as capable. The fact that the operations of sawing and planing or moulding can be carried on entirely distinct from one another, is a good feature in this machine, as where sawing and planing are done with the same spindle, a great loss of time must necessarily result from both men being obliged to stop whenever either of them requires to adjust or change a cutter. One of the great points of superiority in this machine over others of the kind which we have seen consists in the planing and moulding arrangement being provided with four revolving cutter blocks, so that all sides of a moulding are worked at one operation. We watched the machine turning out excellent match boarding, planed on both sides, and grooved and tongued on the edges, at the rate of 12 ft. a minute, whereas with other machines of the General Joiner type, which are fitted with only one planing cutter, the same result could only have been obtained by passing the wood four times through the machine.

The tenoning arrangement attached to this joiner is very complete, as with it several pieces can be tenoned simultaneously, and double tenons can be formed and the shoulders scribed at one operation if desired. By a simple adjustment, almost instantaneously effected, the cutters are made to form tenons on the skew, or with shoulders of unequal length. The arrangement for cutting circular mouldings which is carried on at the sawing side of the machine is also very good, the work being quickly performed and the surface produced being very smooth. The machine works equally readily every description of wood, the work in every case being finished ready to put together.

The machine at present in the trial shop will saw up to 9 in. deep, and plane anything up to 9 in. by 3 in.; but the firm are making a larger size, which will saw anything up to 11 in. deep, and plane up to 11 in. wide.

The "Richards's Patent Mortising-machine," which we next inspected, works with marvellous rapidity, and forms four perfect joiners' mortises in a minute. The chisel, which makes 600 strokes a minute, is so constructed as to draw the chips as they are made, thus avoiding the necessity for driving them out after they leave the mortising-machine, an operation which, with ordinary machines, often takes as long as cutting the mortise. To show the perfect action of this machine, two ½-in. mortises were cut through a piece of 4-in. yellow deal while we looked on, with a partition left between them of barely $\frac{1}{32}$ in. thick, this frail division being left quite unbroken and of a perfectly uniform thickness throughout. By a simple arrangement the chisel is instantaneously reversed, and the machine is so constructed that although driven at the extraordinarily high speed above mentioned, it works without any apparent vibration. A boring apparatus is attached at the side in such a position that the auger is exactly in line with the mortising chisel; but this is only required for hard wood, at starting, or for mortises of over ¾ in. wide.

A new tenoning-machine, specially constructed to work with the mortising-machine last described, is fixed alongside it, and produces single or double tenons, with or without scribed shoulders, with great precision. Although a small machine, it is of ample strength, as was proved by its cutting for us a large tenon in oak.

A trying-up machine, with sundry improvements, "trued up" in a very short time some rough pieces of deal on all four sides, with such accuracy that when any two sides of the two pieces were laid together they formed a perfectly true joint, through which no daylight could be seen. The machine has two rates of feed,—one for soft wood equal to 25 ft. a minute and the other for hard wood of 15 ft. a minute.

This machine is capable of trueing up the whole of the stuff for fifty doors in nine hours, and when one considers the great amount of time and labour which is expended in any joiners'shop in trueing up, framing, and reducing it to the required dimensions with the hand-plane, the vast economy this machine effects will readily be seen.

A large-sized panel-board planing-machine surfaced and thicknessed panels of pine, yellow deal, spruce wainscot, and mahogany of the full width (20 in.) which the machine will take in. These panels were fed through the machine at the rate of 12 ft. a minute, and the cutters, which are driven at a very high speed, gave them all a perfectly planed and smooth surface.

A "Shute's Patent Mitreing-machine," screwed to a bench, was exhibited; but this machine is already so well known as to need no description. It may, however, be interesting to our readers to know that this little tool was invented by a working joiner some four or five years ago, and its value has now become so recognised in the trade that Messrs. Ransome & Co. put in hand as many as 200 of them at a time.*

A fret-saw, of new design, and a small machine which is capable of making almost every part of a carriage or wagon wheel, were also exhibited in action.

Brunton's "Patent Grindstone Dresser," a novel and efficient arrangement, was shown at work, trueing up a very hard Yorkshire gritstone.

It consists of a steel disc bevelled to a cutting edge on one side, and keyed to a pin which revolves freely in a socket attached to a cast-iron plate. This plate is made to slide upon the bed plate by turning a hand-wheel attached to a screw, and thus the cutting-tool is caused to traverse across the face of the stone. The cutting-disc is fixed at an angle to the stone, and being pressed against it, is caused to revolve with a speed on the cutting-edge exactly equal to that of the circumference of the stone. The cutting-edge of the disc thus rolling on the stone cuts it with incredible ease, and as it will take a cut of half an inch thick, and will traverse quite across an 8-in. stone in two minutes, the great saving which it effects will be readily understood. The wear on the cutter-disc is hardly perceptible, and it rarely requires sharpening.

The whole of the machinery in the trial shop is driven by one of Messrs. Ransome's new special economic saw-mill engines, the chief feature of which consists in the application of an improved governor, which directly controls the action of the expansion-slide, and by this means maintains the engine at a very regular speed, no matter how much its load may vary. The cylinder is steam-jacketed, and the outer casing is covered with felt, and lagged with strips of mahogany, to prevent radiation of heat. All the bearing parts of this engine are very large, and the diagrams which have been taken of it show that it is exceedingly economical with fuel. We were also shown several samples of casks of different kinds and sizes, which had been made by three sets of special machinery for this purpose, which the firm have lately been working in their trial shop, and which not only effect a great economy over hand-labour, but produce a very superior article to any hand-made casks of their respective kinds. After witnessing the trials of the machines above noticed, we visited

The Battersea Foundry, which is situated on the Thames, about five minutes' walk from the Stanley Works. These premises, which were erected about ten years since by Messrs. Robinson & Cottam, comprise, besides very fine iron and brass foundries, engineers', smiths', and pattern-makers' shops, and, including a wharf on the east of the foundry, occupy over three acres of ground. Messrs. Ransome & Co. purchased these works about a year since, and by their acquisition they are now enabled to manufacture every part of their machines from the raw material, and thus make sure that none but the best material is used in their construction.

* We are asked here to mention that Messrs. Ransome, having no travellers of their own, have made arrangements with Messrs. F. W. Reynolds & Co., wholesale ironmongers, of Southwark-street, London, to push the sale of Shute's Mitre-cutters.

At these works we witnessed an interesting trial of the Pulsometer pump,—a great novelty, and the newest pumping apparatus in which the direct action of the steam upon the liquid is used for its elevation. It is of an extremely simple and distinctive type, the salient features being the absence of any engine, and even of plungers and stuffing-boxes, the moving and wearing parts of the apparatus being only four or five in number, and these of the simplest character, thus reducing the chances of disarrangement to a minimum. The automatic action of the steam ball which controls the action of the pulsometer is a problem which demands a thorough and searching investigation before the theory of its action can be definitely explained. Many opinions have been hazarded as to the principles which govern its motion, but none have been accepted as conclusive. But whatever may be the theory, the practical working of the pulsometer, its simplicity, durability, and reliability, will commend it to the favourable notice of those who want a steam pump which can be slung anywhere on a chain or rope without levelling or foundation, which wants nothing but a steam pipe besides the ordinary suction and delivery pipes. It will pump sandy or gritty water without damage to its working parts, and may be left at work for days at a time without attention, to take care of itself. The pulsometer, originally an American invention, has recently undergone many improvements at the hands of the manufacturers, Messrs. Hodgkin, Nenhaus, & Co., principally in the direction of a reduction in the consumption of steam accomplished by the entire isolation of the two steam chambers and water-chamber, and in the renewability of the few wearing parts, which can now at a small cost be rapidly replaced.

Stone-dressing Machine.

We also inspected at the Battersea Foundry a novel stone-dressing machine, designed and patented by Mr. John Dickenson Brunton, C.E., and as the results arrived at were very striking, the following description of the trials we witnessed will interest our readers:—A slab of Pennant stone, from Monmouthshire, close-grained, and so hard that every stroke of a mason's chisel elicits a flame, was fixed on a travelling bed. Above this stone is a vertical spindle, having, at its lower extremity, a circular iron box, like a cheese. Below this box are circular cutters, not visible, however, when working, or hardly visible, by reason of the rapid rotation imparted to the spindle, box, and cutters alike.

As the stone travels onwards, an evenly-dressed surface appears of 8 in. broad, produced by the revolving cutters. The depth of the cut or chip taken off varies from ½ in. to ¾ in., for the original surface of the stone is rough, as it came from the quarry. The stone is of considerable size, but four journeys of the bed, two one way and two the other, complete the dressing of the entire surface. Very remarkable, certainly, it will be said; but how fares it with the tools that have accomplished this remarkable work on so hard a stone? Hot and edgeless, surely. No, quite cool, and of the edge, only very little taken off. The tools evidently good for more work yet.

There are other points which the practical man will inquire into. What quality of surface is produced, and is the arris preserved? To this it may be replied,—the surface is very good, entirely unstunned, and of course perfectly true. The arris is sharp and unbroken.

To those inquiring minds who, not content with seeing or knowing that an extraordinary thing is done, wish to know *how* it is done, the following, by way of explanation, may be offered:—The revolving cutters have imparted to them a *positive* rotation, so regulated that their edges do not drag on the stone, but *roll* simply. It may be illustrated thus:—A locomotive, as is well known, compels the circular motion of its driving-wheels, and it is by virtue of the bite or hold of these wheels on the rails that the engine progresses, and draws the train after it. The wheels of the carriages, on the contrary, get their motion by virtue of their contact with the rails. Now, conceive that to the wheels of a carriage were given a compelled rotation, exactly such as they otherwise would get from the rails We have then an arrangement precisely analogous to that adopted in this stone-dressing machine. If the cutters were allowed to derive their needful rotation from their contact with the stone, there would be a certain amount of drag, and consequent wear; and if the speed were great, this drag and wear would be so considerable as

to quickly destroy the edge of the tools. With a compulsory absolute motion this does not occur, and there follows this further advantage,—that any practicable speed may be employed; and, indeed, it is evident that the greater the speed, not only is the quantity of work done in a given time greater, but the tools suffer still less, and the stress on the machine is less also.

A piece of Greenmoor stone from Yorkshire was then operated on. It is close-grained, and one of the hardest of the Yorkshire stones, but not by many degrees so hard as the Welsh Pennant. It was dressed in a few minutes from the rough quarry face. The surface produced was good enough for most building purposes. Going over it a second time, taking a smaller cut, a very good surface was produced; anything better could hardly be desired. Messrs. Ransome & Co. are now making for the patentees a machine on which will be mounted nine spindles. It will be capable of dressing three paving-stones side by side, or landings 9 ft. wide. The rate of travel of the stone under the machine will be 5 ft. per minute.

It will be seen that we found much to interest us in our visit to these factories.

COSTUMES AT THE CRYSTAL PALACE.

What is called a "grand costume contest" has been the attraction of this week at the Sydenham Palace; in other words, prizes have been offered (by the "Costume Contest and Exhibition Association") for the best designs for ladies' and children's dresses, and the specimens offered in competition have been exhibited on stands ranged down the centre of the nave. Looking at the collection from an artistic point of view, there is a good deal that is pleasing. There is less of mere "fuzbuz" decoration than we have seen in some similar exhibitions; and there seems a decided taste just now for defining a costume by strongly-marked lines, generally light on a darker ground, which gives definite form, and is much more satisfactory than mere formless bunches of ribbons and frippery. Costume design may be effective in three principal ways,—by its lines, by its combination and contrast of colour, or by mere beauty of material. The latter, of course, is a much more common-place source of effect than the other two; but it has its value, and a great deal of the material to be noted in this collection, in which diaper patterns in two tints, or two shades of the same tint, are predominant, is so positively pleasing in texture and effect that it would be difficult thoroughly to spoil it. The ruby velvet and brocaded silk of the dress called "Recherché" (97 in catalogue), form a most sumptuous combination, intensified by the broad band of lighter material which crosses the skirt obliquely. The tendency to oblique lines and one-sided design is tolerably marked in many of the costumes in which the lines are emphasised, and is to be commended as giving an easy sweep and sway, far more pleasing than a dull and symmetrical uniformity. This is well illustrated in the Duchess costume (72), next to the last-named, where a very pretty diaper forms the main ground of the skirt and a strongly-defined border in parallel lines of silver braid, sweeps round the left side of the skirt to lose itself in the train. This kind of "movement" effect in a dress may be overdone, no doubt; it is so, perhaps, in such a dress as the "Princess Victoria" ball costume (122), which has a completely spiral effect, and seems as if suggested by the lines which the present style of skirt naturally makes when its fair owner is whirling round in a waltz; the rotatory impression is so strong that one almost expects to see the dress spin round on its frame. It is piquant, but a room full of costumes in this style would sadly want repose.

The specimens are very numerous; we may mention a few which show a decidedly artistic effect. On Platform 1, the "Psyche" visiting-dress, described as "black gros grain and Persian damask," gives a very rich effect of colour; and the "Enid" and "Elaine" costumes are effective while quiet and unpretentious; these are "robes de chambre." On Platform 2, the "Brunnhilde" visiting-dress, a rich dark brown, trimmed with gold braid so placed as to bring out both the lines of the figure, and what may be called the construction of the dress, is a very artistic effort; and the "Siren" rinking costume (too suggestive title!), a dark serge with broad scarlet braid, produces much effect with very simple means. On Platform 5, a morning dress (13) of dark French cashmere, with edgings and tassels of oxidised braid, has its merits, as also a brown cashmere called "Robe de Triomphe"; but a fancy character dress of a Bulgarian lady is the centre point, and cuts out everything else in the place for brilliancy of effect in a slightly barbaric style: a close-fitting dark velvet body with gold embroidery, a skirt very light both in tone and texture, with a small check on it, and a bright red scarf fastened at the right side of the waist and drooping obliquely over the skirt and looped together by a string of pearls on the left side, form the points of this striking costume. Platform 6 contains some of the most really artistic dresses, of a slightly exotic taste. The "Ganges" visiting-dress has a body and upper skirt of rather dark cashmere, with a skirt of rich though subdued orange; the crimson bows as trimmings on the skirt we do not feel sure about, as a matter of colour, but the effect is exceedingly powerful and unusual. The "Geneviève" and "Madras" on the same platform are very good, the latter, a handsome silk and cashmere, has the old effect of "slashed" sleeves, with the richer material showing through. A simpler costume, called the "Bangalore," pleases us more than most things in the place; it is a particularly effective though by no means costly material (Matelasse cloth), in stripes marked by dots of colour, and with plain dark sleeves and collar: this is a kind of dress such a painter as Antonio More would have delighted in, and is one of the most really artistic in feeling that we noticed. A similar sort of merit belongs to the promenade dress, called poetically the "Zephyr," on Platform 7,—a simple dress of a grey material striped in two tones, and with a crimson neckerchief: this is one of the cheap class of dresses, but it shows real taste, and would tell capitally in a portrait. This platform contains the only bride's dress in the collection, which shows nothing new, only the ordinary type of white dress, with plenty of lace and flowers. Brides' dresses are very seldom really artistic; they seem to run in the same line of art as bridecake decorations; but a bridesmaid's dress near it (130) shows very pleasing and delicate combination of tints; and a dinner-dress, "The Marion," of maize silk, a very delicate warm buff (or one might say a "high" cream-colour), with crimson trimmings, is a good bit of colour. A pale-blue dress, with trimmings of a rich cashmere type, called "The Morn," shows a decided and not unpleasing novelty. On Platform 8 is a kind of novelty, too, in the Madame Baron dinner-dress, a combination of pale emerald green and very delicate pink silk; it has rather a washed-out effect. The "Muriel" evening dress, a nearly white (cream-tinted) grenadine, with a touch or two of black about it, is a costume the effect of which must depend a good deal on the wearer, but for a young and decidedly pretty girl nothing could be in more perfect taste. On Platform 9 the dark silk promenade costume, with a rich fringe (81), is very effective, and the fringe a capital bit of rich ornamental work, but we should say more suitable to a dinner-dress than a promenade dress. On Platform 13 the "Autumn Novelty" promenade dress owes its effect to the inherent beauty of the material rather than to anything in the design. A good dress is the "Osborne," a dark material, with fringe of oxidised braid six lines deep: a sort of treatment that always tells. Platform 14, occupied by a firm that has Australian connexions, shows some effective costumes, as the "Sydney" and "Adelaide," with a certain character of their own. Boys' dresses are in abundance, but none that seem to us particularly admirable; indeed, boys' dress at present has run into very ungainly fashions, and these are nearly all on the fashionable type.

The prizes appear to have been adjudged, as we have noticed before in similar exhibitions, from a costumier's point of view only. Scarcely any of those which attracted us as particularly artistic, and which show real taste and fancy in combination and effect, have been premiated, and some of the prize medals are awarded to what an artist would certainly consider among the poorest and least interesting costumes in the collection. Little real good will be done by these exhibitions in the promotion of artistic taste in dress as long as this is the case; as, of course, the prizes merely go to the dresses which conform most to the standard of fashion of the moment. Persons of artistic culture, unconnected with the trade, should have a voice in the awards: and we would especially point out that the object should be to encourage and promote artistic treatment and combination of materials of average cost, and such as are within the reach of the majority of wearers. This seems to have been kept in view to some extent in limiting the cost of certain classes of dress to moderate sums; nor are the dresses generally at all extravagantly costly; but there seems a decided tendency to give the prizes to the most rich and expensive specimens, though, as we have already implied, these are not by any means in all cases the most effective or tasteful. The true success in dress is attained when a costume is original, characteristic, and harmonious in colour, without being obtrusive or looking like a milliner's advertisement; when it is, in short, at the same time effective and lady-like: a combination not very easy to realise.

PROPOSED NEW EDUCATIONAL BUILDINGS, NOTTINGHAM.

The proposed outlay has been raised to 40,000*l.*, exclusive of furnishing and fittings, &c. Twenty-seven sets of competition designs have been sent in, and they are now being hung for adjudication. The committee, on the recommendation of the Borough Engineer, Mr. M. O. Tarbotton, have appointed Professor Clifton, F.R.S., of the Physical Laboratory, Oxford; Mr. Alfred Waterhouse, London; and Mr. W. M. Fawcett, M.A., architect, Cambridge, to report on the three best designs entitled to the three premiums. They will meet in a fortnight, and after the decision of the committee the drawings will be open to the inspection of the public.

THE NEW "KÜNSTLERHAUS" AT BUDA-PEST.

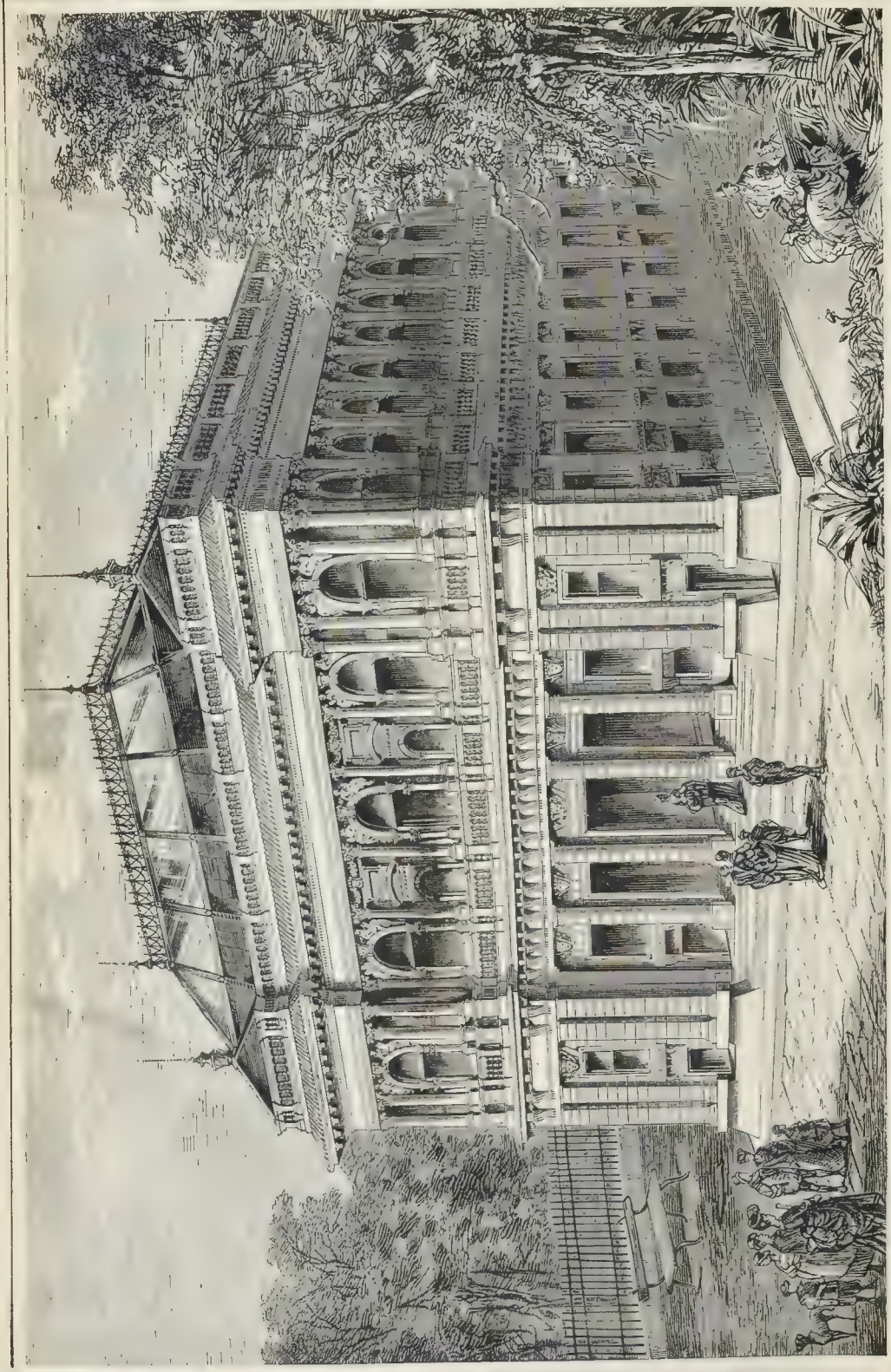
The handsome "Künstlerhaus" (artists' hall or house), at Pest, the subject of illustration in this number, will, it is hoped, be opened in the course of this year. It was begun hardly a year ago, and, thanks to the liberality prompted by the national spirit, to which an appeal is never made in vain in Hungary, the new home of Magyar art will soon open its portals to the products of native artists.

The history of this building forms a worthy episode in the national movement which has already left to posterity such magnificent monuments as the National Theatre, the new National Academy, the Museum, and others. As before mentioned, the new building is to serve as a lasting home for the creations of native talent. Hungarian art, in accordance with the reawakening of national life, has received such an impulse within recent years that it has attracted attention and found encouragement far beyond the boundaries of its cradle. It is partly from want of a worthy home where it might be fostered that the most distinguished artists have had to seek purchasers of their works abroad. Markó, the landscape-painter, has found a second home in Italy; Michael Zichy, in Russia; Wagner and Benczúr are domiciled at Munich; Munkácsy at Paris; Paál, Mészöly, Böhm, and others, reside also abroad.

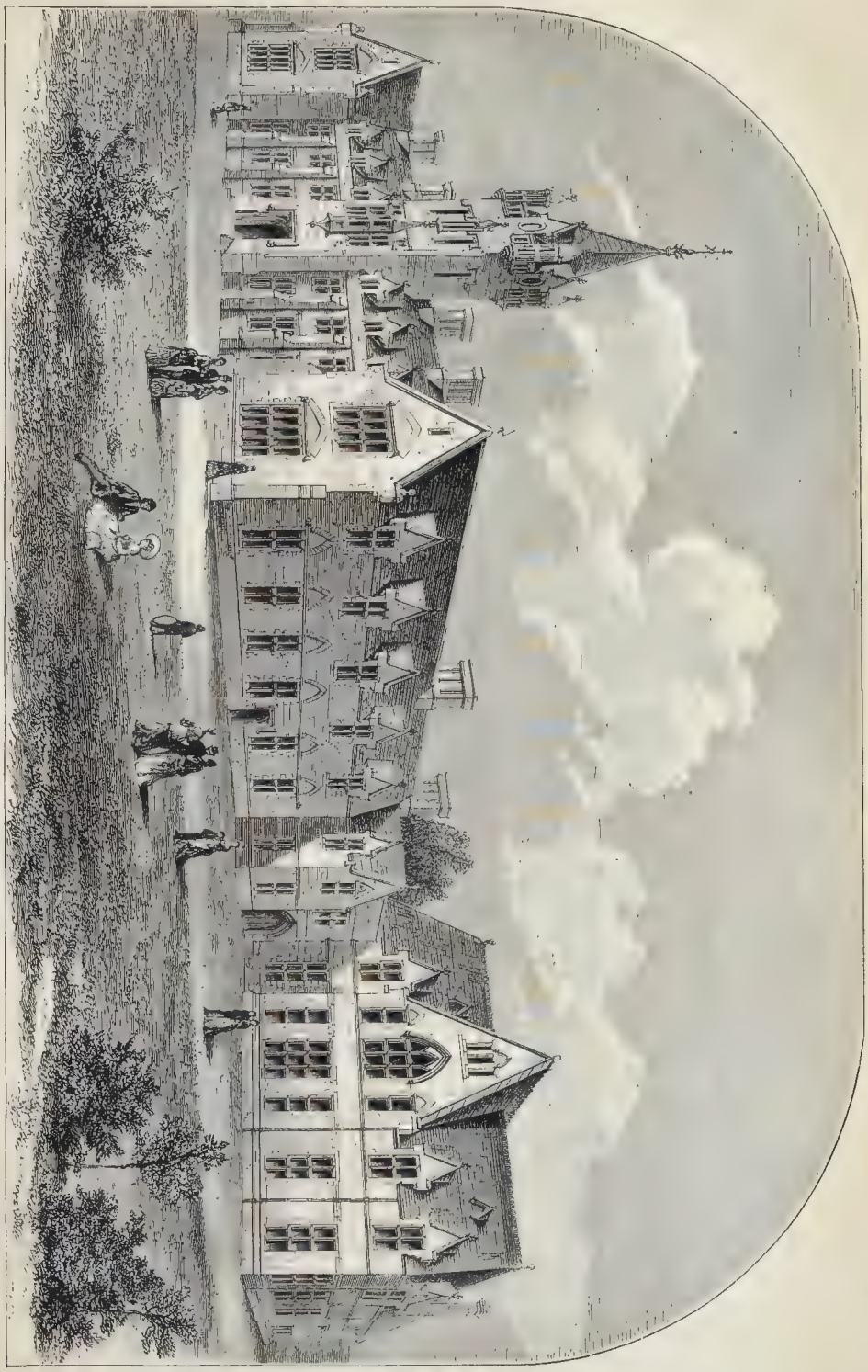
To put an end to such a state of things, the Hungarian Society of Arts fitly resolved to undertake the erection of a centre of native art. A piece of ground was speedily secured in the new Radialstrasse, under very favourable conditions; the means for the building were partly contributed by private munificence, partly raised by a lottery of works of art gratuitously supplied by the public spirit of Hungarian artists. On competition being invited for plans, designs were sent in from all parts of Europe. Among the forty-four plans submitted, that of Adolf Lang, of Pest, was selected; the design of A. Halmay, of Arad, receiving the second premium, and that of E. v. Förster, of Vienna, the third.

The building is in the Italian Renaissance. The ground-floor and mezzanine story are to serve as a museum of industrial art, while room for storing the objects of art, and a lift for moving them, without injury, up and down, as well as the necessary offices for the housekeeper, have been provided in the basement story. On the first floor are the exhibition and lecture-rooms.

Indian Civil Engineers.—The *Morning Post* understands that the grievances of the civil engineers in India, which refer to status and pay in the service, are now under consideration at the India office, and are likely soon to be redressed.



THE ARTISTS' HALL, BUDA-PEST.—Herr Adolf Lang, Architect.



THE ROYAL MASONIC INSTITUTION FOR GIRLS, WANDSWORTH COMMON.—Showing Additions now in Progress.



1. Hall. 2. Inner hall.
3. Corridor.
4. Passage to offices.
5. Proposed covered way.
6. Outer quadrangle.
7. School-room.
8. Dais.
9. Class-room.
10. Music-room.
11. Extension of music-room.
11a. Connecting lobby.
12. Large hall.
13. Committee-room.
14. Head governess's dining-room.
15. Day lavatory.
16. Lobby.
17. Committee's lavatory.
18. Iron safe.
19. Assembly-hall.
20. Dining-hall.
21. House dining-room.
22. Matron's sitting-room.
23. Matron's pantry.
24. Matron's stores.
25. Store-room and business-room.
26. Kitchen.
27. Scullery.
28. Pantry.
29. Boot-room.
30. Gas.
31. Box-room.
32. Tradesmen's entrance.
33. Wash-houses.
34. Drying-room.
35. Mangling-room.
36. Coals.
37. Coke.
38. Servants.
39. Outer lobby.
40. Inner lobby of children's w.-cs.
41. Porch.
42. Vestibule.
43. Convalescent-room.
44. Doctor's room.
45. Porter's sitting-room.
46. Porter's bed-room.
47. Nurse's bed-room.
48. Lavatory.
49. Lift.
50. Ironing-room.
51. Verandah.
52. Infirmary-garden.
53. Tool-house.
54. Earth-closet.
55. Earth.
56. Dust.

THE ROYAL MASONIC INSTITUTION FOR GIRLS.—*Plan.*

THE ROYAL MASONIC INSTITUTION FOR GIRLS.

The Royal Masonic Institution for Girls, near Clapham Junction, on Wandsworth-common, was erected about twenty-five years ago, from the designs of Mr. Hardwick, to accommodate seventy children.

Of late years very extensive alterations and additions have been made, and the present buildings now contain 155 children. A new wing is being erected on the north-east side, under the superintendence of Brother Massa, the surveyor to the Institution, to receive seventy more children. The chief corner-stone of this building, of which we give an illustration, was laid, on the 7th of September, by Lieut.-Colonel Creaton, one of the trustees, in the presence of the committees and officers of this Institution and the other Masonic charities.

The new wing contains on the ground-floor a large room, 90 ft. long, 31 ft. wide, and 21 ft. high, at the rear of which are class-rooms and a staircase leading to a mezzanine floor and gallery. Over the large hall are three dormitories, and over the class-rooms are bedrooms and lavatories.

The new building is connected with the old by an annex in connexion with the music-room and north-east dormitory.

AS TO THE INFLUENCE UPON SOCIETY OF DECORATIVE ART AND ART-WORKMANSHIP.

In view of what may be said on this subject at the Liverpool Congress, I shall be glad if you will allow me to make a few observations. It is a very curious fact—a most remarkable fact—that the English people have somehow or other got their art-problems inverted in their minds. They have by some means got possessed with the hazy notion that art makes civilisation, whereas it is the very reverse,—it is civilisation which produces art; art is the result of culture; art is the flower of which education is the very root and stalk. Art has very little power to teach, but is a faithful index of what has been taught. In Grecian art, in Italian art, and in Louis XIV. art, we shall find faithfully reflected what the Greeks, the Italians, and the French were taught. We have only to cite facts to show how little influence art—the highest art—has upon a people. For instance, Italy possessed intact, for nearly three centuries, those art-treasures which it took her about two centuries to produce, without their having the slightest power, either to arrest her own decadence, or the decadence of art. Italy is, in the fine arts, at this very day, behind other European nations. The same truths may be gathered from Grecian and Roman history, and from the history of art in Europe for the last century and a half. For has not Europe had the art-legacies of Greece and Italy during that period at her command, present to her, thrust upon her eyes in every direction; and yet, what is her art compared with that of the two great epochs? It is, therefore, evident that art is powerless to save civilisation, is powerless even to save art, and I will add that it is, in itself and by its own example, powerless to create a sound taste. If, then, the highest art exercises so little influence upon mankind, what are we to expect from ornamental art and art workmanship? If art made civilisation we should reasonably expect to find that the early ages of Greece and Italy were nurtured upon the finest works of art. Was that the case? Most assuredly not. On the contrary, we find that the early days of each great art-epoch were accompanied by rude art endeavour, and that art arrived at perfection only by persistent and earnest work through the centuries. Clearly, then, art was not the cause, but the effect of those two famous national developments. If art exercised a softening influence upon all conditions of men, we should, doubtless, have possessed ten times the legacy of antiquities we now have. But art was powerless to browbeat and to subdue Goth and Vandal; these heard not the tender appeals for mercy which the cultured of these days are too apt to imagine art makes upon all. It was often ruthlessly destroyed. It was even powerless to arrest the destroying hand of the more educated Vandals of a later date. All have doubtless heard of and smiled at the French Princess who expressed surprise that the poor could by any possibility starve to death whilst there was an abundance of penny buns. And yet you often express a surprise, of a somewhat allied kind, that, "after all the benevolent efforts of art enthusiasts, and all that wonderful supply of 'sweet things' at a moderate price," the poor public, in respect to taste, is still starving. But such is the state of things,—a state of things which will continue to be as long as we persist in a course diametrically opposed to that of Greece and Italy; as long as we persist in reversing the true order of things, and placing the cart before the horse. Refine the people by general education, and taste will, as a matter of course, fructify in due time. It is the refining power of education which produces that greater sensibility of organisation of which good taste is the result.

It is to the improvement of general education, to which we must at first address all our power, or at least our main power: we may then rest assured that art will be in a fair way of being taken care of. Then we shall have an art-loving people.

But let us for a moment suppose that the wildest dream of the enthusiast is at this very moment realised in Great Britain, and that no one in these realms, from this day forth, will have less than 400*l.* a year, payable quarterly, together with a house fitted up in the most approved style, from ceiling and chandelier, down to the fire-irons and the coal-skuttle. What influence do you suppose these tasteful homes would have in this suddenly-realised Art Millennium upon the great masses of the people? My own opinion is, that within a month of that time two-thirds of these tasteful homes, in as far as their decorations and their art manufactures were concerned, would be total wrecks.

And let me ask you whether, all things considered, and as the poorest inhabitant of these realms has not 400*l.* a year, payable quarterly,—whether it is not better, under existing conditions, that they have not refined tastes? What keener pang is there to a man of culture, in reduced circumstances, than to feel that he is surrounded by those ungainly prospects which poverty almost invariably presents? There are thousands and tens of thousands in this kingdom whose lives would be a burden to them if they were unfortunate enough to possess refined tastes. We see, then, that there are several aspects of this question.

From the foregoing arguments, therefore, it is clear that something more than mere art examples and art schools are required to create a fine taste and fine art. It is through our blindness to this great truth that we are continually wasting our resources upon institutions which are inadequate to their purpose,—nay, worse than inadequate, because if the funds thus misapplied had been rightly utilised, they would have been productive of grand results. Again, I say it, we rely too much upon museums, art schools, galleries, &c. If we desire to develop good taste, let us educate. If we desire to have a grand national school of art, employ artists on great national works. These are the only two direct means for furthering the art-objects we have in view. This was the policy pursued in the two great eras of art. Music, though the youngest, is the most advanced of the arts of the present age, for this simple reason that it had to be created from the elements, and had not to labour under the shadow of ancient example. If you desire that a certain manufacture should be perfected, there must be a steady stimulus given to production, there must be a steady and constant demand. This law equally holds good in respect to art as it does to cotton yarns.

But there is yet another aspect of this question. The schoolmaster is abroad. Can any good be gained by bringing the youth of the country, during their school training, into the presence of the splendid remains of ancient art, with those splendid results of the highest culture? This is a question deserving thoughtful consideration. Would the presence of fine works of art in schools tend to facilitate the development of that refined sensibility at which true education aims? Out of this springs another question,—Would the youth so educated and perfected in taste be able in the aggregate to gratify that taste? Because, if not, you would run the risk of making them discontented with their lot, or, at all events, you would have to provide art-entertainment on a grand national scale.

The notion of furnishing schools with copies of the noblest productions of art is not a mere untried suggestion: it has been put to experiment in the United States, and I will give you the words of its promoter:—

"A few years since I suggested and 'put through' (as we say) a little experiment in art-culture, which may interest you. 'We had adopted a system of free-hand drawing in our public schools. It seemed to me, however, that we needed something more, *i.e.* taste. How shall we develop that? It seemed to me that if our children were accustomed to see *the very best forms* and the very best colours in their school-rooms, their rapidly-growing brains would insensibly be affected by them in the course of time. The city of Boston were building a schoolhouse at the time,—a high school for 600 or 700 girls. We induced them to allow us to put the grand hall into what we considered an æsthetic condition. The room is some 70 ft. square by 15 ft. high. The Doric style was adopted; Doric pilasters support an entablature into which we placed the frieze of the Parthenon. Between the windows stand casts of the caryatides of the British Museum, the Demosthenes, the Ludovigi Juno, the Diana of the Gabii, &c. The Minerva presides over the stage. The walls were carefully tinted. The casts for drawing are kept in another room; the whole effect of this room *was to be indirect*."

Such, then, is the account of the experiment made in the United States, as given to me by its promoter. There is, however, one important point of view from which the prudence of this experiment may be questioned. It is a question whether the constant presence of art is either favourable to taste or the advancement of art. Should not the contemplation of art rather be a holiday festival for the eyes, than a splendour ever present and blinding? I fancy this occasional art festival, this out-door presence of art, must have been very much the state of things with the masses, both in Greece and Italy. Have not the most of us felt that we become perfectly insensible to the presence of the pictures, prints, &c., with which we surround ourselves in our homes? Are we not often surprised into finding that we possess them? Do we not, therefore, hazard the bringing about of a state of indifference, a result the very opposite of what is desired, by the constant presentment of fine works of art to the eyes of children, or even of grown persons? My own leaning is towards a public art-magnificence, and a private and homely Spartan simplicity. I believe these conditions to be those most conducive to the love of art, and the encouragement of art. A Spartan and proportioned simplicity in the home is possible to the greatest number of the people, whereas decoration and art-manufactures can only be compassed by the few. Moreover, this proportioned plainness and love of simple order are the very first indications of the dawn of good taste, as an ostentatious display of decoration, heaps of art-workmanship, and an overcrowding of furniture, are too frequently the symptoms of the reverse. This symplicity, and plain, undecorated order, are what we might reasonably encourage the poorest to aim at, whereas we cannot, with any consistency and good taste, advise all classes to go in for decoration and art-manufactures.

The United States as well as the European nations are intent upon solving the same important art problems as we. And whichever of them first successfully accomplishes it, will take the lead in art and in art-manufactures. I hope, therefore, I shall be forgiven for being outspoken, though that may be against the general views, and those of the powers.

W. Cave Thomas.

"MODERN ENGLISH ARCHITECTURE."*

The real mistake at the root of modern architecture is the sentimental archæology which seems to have absolutely taken possession of it. Even the engineers (who in some ways stand, more nearly than any other body of men, in the same position in regard to the present day as the Mediæval masons did to their own time) are bitten by this; and when they wish to make a structure "ornamental," they have no idea but to dress it in some borrowed plumes of Classic or Mediæval architecture. The influence of sentiment has been exhibited in a still more curious manner in a recent great building, the Albert Hall. This, which is the design of engineers, is a rather remarkable building, and exhibits some of the characteristics of a work constructed on genuine architectural principles. The details are coarse and commonplace, for it seems impossible to beat into the head of an engineer that some training and education of the eye and the judgment is necessary for the production of suitable and refined ornamental detail; but plan, construction, and design form a united and interdependent whole, arising as they do in a strictly logical manner one out of the other. The unfortunate point is, that the plan is utterly wrong, to begin with, for the purpose of the building; and it is so entirely from the sentimental worship of precedent, which led the designer, instead of considering what was the best plan for the purpose, to start with the idea of reproducing the Roman amphitheatre, although a moment's consideration ought to have rendered it evident, as a mere matter of ordinary common sense, that the plan of a building for seating people round a circumference to witness a spectacle in the centre, could by no possibility furnish the proper model for one in which they were to listen to music performed at one end of the building. But it is to such incongruities that people are led through forgetting that architecture is not (except in very rare instances) a pure art, governed by æsthetic or sentimental considerations; that it is the artistic or effective expression of practical requirements which must govern and form the basis of the whole. It is in further emphasising this condition of architecture that the possibility

* From a paper so entitled, in the October number of the *Fortnightly Review*, by Mr. H. H. Statham.

of making it a genuine intellectual pursuit, and not a mere toy, really consists.

After what has been said above about receipts, it will not be supposed that there is any intention here of offering another new and infallible one; but it is possible to point to modern examples in which this treatment of architectural effect on a practical basis has been so far realised as to indicate at least a direction in which the art may receive a new development. There is a large building at present in progress—the new town-hall in Manchester—the internal plan and arrangement of which affords an admirable instance of novel and picturesque effect, obtained simply as the natural result of the masterly and complete manner in which the very intricate internal economy of a great hive of multifarious departments is reduced to simplicity and order. The exterior of Mr. Waterhouse's building, it must be admitted, belongs to the sentimental school of architecture; it has no very close or necessary connexion with the internal plan; it is thought picturesque at present, and may or may not be thought so under future changes of taste; but the treatment of the interior will command admiration always, because its excellence is of a kind which is practical as well as picturesque, and is independent of mere changes in architectural fashion. The same sort of excellence, on a grander scale, is exemplified in the Houses of Parliament, which the designers of the Albert Hall will probably be surprised to be told is, in its main scheme, a much more practical, as well as more beautiful, piece of architecture than their building. It is so unquestionably; its plan is a most effective and yet perfectly simple and practical expression of the objects of the various parts of the building and their relation to one another, and all the principal features of the exterior design arise out of, and emphasize, the leading points of the plan. The "style" of the Houses of Parliament is an utter mistake; it was the deliberate selection for imitation of a bad and weak phase of late Mediæval architecture. But for this its architect was not responsible; and when a building fulfils the conditions of practical, and at the same time effective, grouping and construction, the details are of secondary consequence. The question of plan is more especially the basis of modern architecture on a large scale, because most large modern buildings are far more intricate in their purposes and requirements than was the case with ancient buildings, of which the larger ones were, as already observed, mostly temples, consisting principally of one great apartment, and presenting accordingly a far more simple and straightforward, and also a more purely æsthetic, problem than modern structures of the same dimensions.

But if architecture always has required and must require edifices on a great scale, and rising more or less beyond utilitarian objects, for her greatest effects, is there not also something to be done on a less ambitious scale—something, nevertheless, equally important, and which, having scarcely as yet received any adequate attention, presents a good deal of the suggestiveness always accompanying a new problem? It is only within the last century or so that we have had what may be called an architecture of the people—a style of the many, a vernacular of building, the results of which we see in those miles upon miles of dull brick walls with oblong holes in them which form the lining of the streets of London and of most of our large towns. This style was developed first when English architecture, after the decease of the Gothic spirit, had sunk through various grades of pseudo-Classicism to the primness of the square brick architecture and round knobs of the Queen Anne period, which only required to have its few decorative features shorn off to make a serviceable general builder's style for flanking the streets of towns, while separate slices of it were stuck about the land as country houses. The weight which these dreary acres of brick lay upon our daily lives is perhaps hardly felt or recognised, because we have come to accept it as the normal state of things. There are signs, however, of a growing dissatisfaction with the present state of town architecture, and a possibility of that demand for something better arising which must necessarily precede the supply; and any amelioration of street architecture must also follow the law of modern architectural design, and commence first from the basis of practical considerations. The sanitary conditions of life in large towns, as affecting the arrangement and construction of dwellings, form, or should form, a very important element in influencing the town architecture of the future. The increasing value of building-sites, and the simultaneous increase of population, suggest new expedients in the method of building town houses, such as the introduction of the Paris system of houses "in flats," which has been a good deal talked about and even tried in London, but not as yet in an adequate manner. Such a system, if adopted at all extensively, would, however, exercise a very important influence on street architecture by rendering almost necessary, and at the same time facilitating, in an economical point of view, the employment of a far more solid and sounder construction, and affording opportunity for realising a higher architectural character than has ever hitherto been attained in this department of building in England. Something like this system has also been a good deal employed in carrying out the excellent work of providing healthy homes for the poorer inhabitants of towns at rents commensurate with their means. It must, however, be matter for regret to observe how little the possibility of rendering these model homes attractive in appearance, as well as sanitary in arrangement, is considered. Nothing could well be more unhomelike, nothing more repellent to the eye, or devoid of every gracious and pleasing association, than the aspect of some of these stacks of building in various towns in which families are to make their homes. Surely some effort may be made to give them a more attractive and picturesque, a less mill-like, appearance—to give some characteristic variety also to the various tenements, instead of their "damnable iteration" of the same arrangement of doors and windows in so many rows. This is considered, I am well aware, to be simply a question of remunerative return; but ought it to be entirely so? Or is there not, even on public grounds, some sort of return to be considered and thought of besides that of so much per cent.?

Architecture, however, is an art, though an art involved with, and mostly arising out of, practical and scientific problems; and if we come to consider what sort of form the hoped-for development of our town architecture, either in great buildings or in streets, should take, it is here that the study of our Mediæval architecture comes in as an inspiration. There are two species of architectural art: that which ornaments the exterior of a building with a kind of screen or scenic design of features arbitrarily selected for their supposed elegance, but having no direct connexion with the plan and construction of the building; and that in which the constructive design is itself the foundation of the architectural effect and expression, and is merely decorated so far, and in such a way, as to give relief and emphasis to this constructive expression; any decoration which does not conduce to this being, in fact, beside the mark and an excrescence. Of the first-named species the most familiar type is that which is called Italian, having been evolved by the Italian architects of the Renaissance, and consisting of an application of some of the principal features of Greek and Roman architecture (pilasters, columns, small pediments, &c.) to the exterior of a building by way of ornament. This style arose under the influence of that Classic revival of literature which led to the exclusive worship of "the antique" as the only source of true culture; and it is remarkable how this *prestige* has clung to the style, insomuch that, until very recently, when any question of architectural style in connexion with some public building came before the Legislature, it was almost invariably the case that the Liberal party were in favour of a Classic style, supposing it to be essentially connected with progress and culture, and the Conservatives hoisted the Gothic colours, as champions of the past and of Mediævalism. Both sides were about equally in the wrong. Without denying that very pleasing and very elegant buildings—compositions they may be called—have been created on the Renaissance principle; without saying that there may not be occasions and circumstances under which it may be fitly employed in a purely decorative architecture (though it would be difficult perhaps to name them), it is evident that architectural design, as thus employed, is little more than a toy, with no more real relation to the practical basis of building than is to be found in the imitative Mediæval churches before referred to.

For the principle of all real and true architecture is the same—a decorative treatment based upon and emphasising the plan and construction of the building; and in this point of view the Greek and the Gothic are the two truest and most perfect styles of the world, the only essential distinction being that the Greek works out with perfect completeness and unity of expression a trabeated construction, and the Goth works out with equal completeness an arcuated construction. In all that constitutes the essence of architectural style, Salisbury Cathedral and the Sainte Chapelle have far more affinity with the Parthenon than have the artificial constructions of Palladio and Vignola. And Greek architecture, in its refined and reticent beauty, is full of suggestion for the modern architect; supplying, it may perhaps be said, the element demanded by modern culture and civilisation, while the study of Gothic supplies the element of strength and reality which has been so long absent from our architecture, and which is to be acquired not by copying and imitating Mediæval forms, but by cultivating a sympathy with the method and feeling of that grand and masculine school of architecture, and thereby acquiring the power of giving to the new practical forms of modern building their appropriate and picturesque expression, arising from the truthful treatment of materials and construction rather than from applied or misapplied ornament. Reticence in this last respect is one of the lessons we need most, in regard to London architecture especially. There is often more so-called "ornament" on one railway hotel than would be found on half a dozen cathedrals of the greatest age of Mediæval art; and the principle has yet to be learned by most of our architects, that every ornamental detail which does not assist the expression of a building injures it.

It is remarkable how very little has really been made, amid all the bustle of architectural revival in recent years, of the higher class of dwelling-houses as opportunities for something of what may be called the poetry of architecture. "Handsome" houses, and more lately "picturesque" houses, have no doubt been built by scores; but they seem to go very much on prevailing patterns, which succeed one another, like the fashions in dress, for no particular reason. The old notion of the typical English gentleman used to be that it was vulgar to have a house which differed materially or in any striking way from that of your neighbours. Surely it is that idea itself which rather deserves the epithet vulgar, even in the literal sense of the word. A great deal that is charming, a great deal of what constitutes the picturesque of life, might be realised in the interiors, especially, of the higher class of dwellings, if they were made the opportunity for the exercise of original thought and individual taste and feeling in the arrangement and decoration, instead of being so mechanically contrived on habitual and accepted schemes.

There has no doubt been a great advance in good taste as to house furniture and fittings of late years; and the monstrosities which used to crowd the windows of cabinet-makers would be scouted now. But a good deal of this, it must be confessed, is nothing more than another revival. A recent turn of popular thought has led to a kind of resuscitation of the art of what Tennyson rather happily calls the "tea-cup times." So far as architecture is concerned, this revival of the Queen Anne style seems the most rubbishy contemptible of all, since there is not even the excuse of an inherent grandeur in the style; it is the last lingering debasement of Renaissance architecture, the corruption of a corruption. The style of decorative art which belongs to it has a certain fitness and suitability to recommend it for interiors, though it is anything but intellectual, and is followed more as a matter of fashion than of deliberate opinion; indeed, it is impossible to avoid a disagreeable conviction of the imposture pervading the present mania for æsthetic fittings, Japanese jars and old china, and Queen Anne furniture and costumes; a mania which is carried so far that, as those who know anything of the ways of these disciples of the æsthetic must be aware, the joke in *Punch* about the gentleman who preferred the shorter of two sisters for a wife to the taller, because "she would go better with my style of furniture—buhl and marqueterie, you know"—is scarcely an exaggeration of literal fact. There is something contemptible in this exaltation of the mere decoration of life (a sham decoration, too) above the reality; and something quite apart from real artistic feeling, than which, in its true sense, nothing can harmonise better with that "plain living and high thinking," the decay of which was so feelingly deplored by Wordsworth, and from which we seem so very, very far at present.

BERKS ARCHÆOLOGICAL SOCIETY.

The members of this society recently had a day's excursion to Stanford, Pusey, Cherbury, Charney, Denchworth, and Wantage.

At *Stanford Church* the visitors were received by the Rev. E. Penwarne-Wellings, who explained the various objects of interest. The principal feature of the edifice is a curious little erection, of the character of a turret, in the north aisle, facing the Holy Table, which is believed to be peculiar to this church. There are steps up to it from the aisle, at the back; there is no vestige whatever of any steps on the other side. This was probably erected subsequently to the roof, the entrance-door being late fifteenth century. The vicar said it had been thought that this part of the church stood before the aisle was opened out, but the theory was clearly untenable from the character of the doorway. Some interesting and old glass in the east window represents St. Catherine.

The party then drove to *Pusey House*, where they were received by Mr. S. E. Bouverie Pusey, Mrs. Pusey, and the Rev. T. Vincent (vicar). The hall contains a bas-relief, over the fireplace, representing King Canute giving the celebrated Pusey horn to the first Pusey on the beach at Southampton. The legend is, that when the king rebuked his sycophantic courtiers by showing them his inability to command the sea, the seat on which he sat to give them the lesson was placed for his Majesty by the ancestor of the ancient house of Pusey, who received in return the horn which is now the chief object of interest in this district. The bas-relief, which surmounts a large sculptured horn, is of the same date as the present house, viz., 1750. The Rev. C. H. Tomlinson showed and explained this most singular relic of bygone times. It bears the following legend upon a silver-gilt band of the fifteenth century, elegantly wrought:—"I, Kyng Knowde [Canute] geue Wyllyam Pecote thys horne to holde by thy lond." The Rev. C. H. Tomlinson said it was not known by the family whether the horn was really and truly the original horn given to their ancestor by King Canute. Camden said:—"The family of Pusey held the village of Pusey, in Berkshire, in fee, by a horn which was first given to William Pecote by King Canute. Dr. Hickes, in 1681, states that in his time both the horn and manor were possessed by Charles Pusey, who had recovered the manor in the Court of Chancery, before Lord Chancellor Jefferies; the horn itself being produced in Court, and with universal admiration received, admitted, and proved to be the identical horn by which, as by a charter, Canute had conveyed the manor of Pusey 700 years before. The horn is that of an ox of middling size, mounted in silver-gilt, in workmanship of the latter part of the fifteenth century. The colour of the horn is dark brown, which proves it to be a real ox-horn, and not, as was sometimes the case, made of ivory. It is 2 ft. 6 in. long, and 9½ in. high from its feet; the circumference at the largest end is 1 ft.; in the middle, 9¼ in.; and at the small end, 2¼ in. The dog's head at the orifice was formerly moveable, turning upon a joint, so as to make it either a hunting or a drinking horn." The earliest historical mention of the family was in 1155, when Henry de Pesie held the manor. They could not go back historically earlier than that, but if they could accept Lord Chancellor Jefferies's view they would see that it was placed beyond doubt that the horn was really given by Canute to the first Pusey, Pesie, or Pecote—as it was variously spelt.

Pusey Church was then visited, and its history and monuments were explained in a paper by the Rev. T. Vincent, M.A., rector, who said,—The earliest monument of our parochial past is a white marble incised sepulchral slab, now in the north transept. Two figures thereon, in devotional form, may well, from their decided lineaments, be accounted likenesses of Sir Henry Dogett and his lady, who in their earlier years had probably thrilled with horror at the tidings of the capture and burning of Joan of Arc, and may even have heard the shouts of joy which welcomed the news of the victory of Agincourt. The inscription round the stone runs thus:—"Hic jacent corpora Henrici Dogett, Armigeri, et Amye, uxoris ejus, qui quide[m] Henricus obiit XII. die mensis Augusti. A. Domi. MCCCCLXXX., et dicta Amya obiit die mensis—A. Domi. MCCCCLXXX, qui aiabs misiet (propitietur Deus)." Now, seeing that the present church was built in 1745, this stone must evidently have been removed from an older church. Of this older church not a vestige now remains to show its date, nor even a tradition as to its site. . . . . We pass now to age marks outside the church, and the first question which naturally presents itself is this,—Does the present church stand upon the site of, at least, its immediate predecessor? There are no records to answer this question, not even a drawing of the older church, although defunct only 131 years ago. On careful consideration, I am inclined to say that the present stands on the site of the building which immediately preceded it. Outside the south transept there stands a stone monument, evidently of some age, with a brass inserted on its side, to the memory of "Rd. Pusey, *alias* Pesey Pecote," who "died comfortably," August 2nd, 1695, ninety years before the present church was built. True, this monument might easily have been brought thither from an older churchyard elsewhere, but it does not bear any marks of removal. This, however, is not the only witness. In a row to the south-west of this monument are four headstones, bearing dates, two of them 1720; one, 1738; and another, the southernmost, 1748. None of these show the least signs of removal.

A pleasant cross-country drive brought the party to the ancient British camp of *Cherbury*, a trebly-ditched earthwork, in excellent preservation. The Rev. C. H. Tomlinson gave an interesting address on the subject of the camp. He did not at all know why it was described in the programmes for that day as "Romano-British"; he must disclaim the name himself, as he considered it was a purely British camp. He had no doubt the name of Cherbury, whatever it might mean, was exactly the same as the French word Cherbourg. Like most British camps, it had no particular history, but it had been a universal tradition that King Canute had a palace or abode in this camp, which was of very large extent. What they did know from history was that Canute's father, Sweyn, on his progress from Wallingford to Bath, destroyed and burned all the villages between the two places in the Vale of White Horse. Supposing it to have been Canute's Palace, they had it between the two villages of Pusey and Denchworth. Looking at that camp of Cherbury, as he thought they ought, as a British rather than a Danish camp (as some had considered it), the question occurred in what relation it stood to other camps, and to the district generally. They were probably all aware that Mr. Jas. Parker, of Oxford, had a theory that almost every British camp had near it a Roman camp, which the invaders threw up when they came into the country in order to take Britain bit by bit, swallowing up the country by conquering one British camp after another. The British camps were almost always nearly or quite round, while those of the Romans were of a square or oblong square shape. Mr. Parker's theory, which he had no doubt was in the main correct, was that Aulus Plautius, who was sent into this country some decades after Christ, threw up all those square camps. Mr. Tomlinson referred at length to various illustrations of this theory in the camps at Letcombe and Limborough, Uffington and Hardwell, Sinodun and Dorchester, Leafield and Loughborough, Lyneham and Knowlbury, &c., in all of which the first was a British camp, and the second, contiguous to it, a Roman; there were no square camps, however, near the British camps at Lydington and Badbury. After he had heard Mr. Parker's theory on the subject, he tried to find a square camp near Cherbury.

At *Charney* a good specimen of the ancient market cross was noticed *en route* to the Manor House, the residence of Mr. James Beesley. Here Mr. E. Dolby, Abingdon, gave a brief account of the building and its history. In 1554 the Manor, which had belonged to the Abbey of Abingdon, was granted to Sir William Gorffyn; in 1806 it belonged to Mr. G. Keck, M.P. The party inspected the ancient "solar," or drawing-room, and the small oratory attached, which contains a piscina and aumbry. The rear of the structure, which contains the solar and oratory, is of thirteenth-century work, the front being modern. Charney Church was then visited, and found to contain a very good segmental Late Norman arch, and traces of a "squint," or hagioscope. The features of the church, which is Norman, are a very singular and well-preserved tympanum (probably Early Norman work) and the very remarkable ornamentation of the south porch, which is composed of rude heads, with beards, conventionally treated.

At *Denchworth*, where a small plain market-cross is still standing, the Rev. C. H. Tomlinson read a paper on the history of the parish and its church. The parish was first mentioned in 811, in the Abingdon Chronicle, when King Kenwulf (the Mercians then possessing this part of England) gave it to the Abbey; in 947, after it had again become part of Wessex, certain land in the parish was given to a man named Wulfric, who gave it to Abingdon. The name Denchworth had been said by some people to come from "Dunce's town;" but in his opinion it was called Denchworth, because it was the settlement on the extreme confines of the great mother parish of Worth or Longworth, of a family called Dench or Dunch. In 1265 a certain Henry de Tubbeney gave lands in the parish of Denchworth to found a chantry in the church for the erection of an altar to the Virgin. The chantry was now called the north transept. In 1299 the advowson of the living belonged to William de Bosco, and the lower part of the tower must have been built about that time. Its style was Early English, the superstructure being Perpendicular. Opposite the Norman doorway (the oldest part of the building) was built a north doorway, which was blocked in the Early English times; it was made that people, in accordance with the ancient superstition that the way to Heaven was literally "through the Church," might walk and carry their dead straight in at one door and out at the other. The chancel was erected in the Decorated period, and the south transept a little later,—at the time when the manor-house in the village was built. The Perpendicular font, which Mr. Parker considered a very fine specimen, came later in that period. In 1557 died Wm. Hyde the elder, who was represented on a very curious brass as kneeling at a desk, twelve sons coming behind him; from his mouth proceeded a scroll bearing the words, "Miserere mei Deus sedum magna misericordia tuam." His wife Margery, who died five years later, knelt at a desk on the other side of the brass, and eight daughters came behind her (the family having numbered twenty); a scroll from her mouth had the words, "Heale my soule, O Lord, for I haue synned agaynst the." That brass was the great wonder and curiosity of Denchworth. On the one side beneath the figures above described there was the inscription,—

"Quisquis transieris pro nostris ora siabus,
Et juctos tumulo tu prece junge Deo.

The whiche Wyl m Hyde Esquyer decessyd the second day of Maye in the yere of oure Lorde God mcccclvii., and thy sayde Margery his wyfe decessyd the xxvii. day of June in the yere of our Lorde God mcccclxii."

It was a rescript brass, and had been put into its present position with thumb-screws, that both sides might be examined. The brass, which had probably been bought in Reading, by William Hyde, sen., as old metal, and was the oldest dated brass extant, bore the following inscription on the reverse side:—

"Edward Roy danglete qe fist le siege deuant la cite de Berewyk et coquyst la bataille illeqs et la dite cite la veille seinte Margarete lan de gae mcccxxxiii mist ceste pere a la requeste Sire William de Montegu foundour de ceste mesoun."

William Hyde, sen., having got possession of the brass dated 1333, had his own inscription put on the other side, and it was embedded in a stone on his tomb in the church. In 1852, said Mr. Tomlinson (we quote from the *Reading Mercury*), a certain young man living at Oxford came over to the district; his name was Street. He was, most unfortunately, allowed to try his 'prentice hand on Denchworth Church. Amongst other things, he destroyed a good piscina and sedilia in the south chancel, window, and made the splay now existing. He took away an ancient rood-loft, in which used to be a crucifix with a taper before it; and blocked up in the unsightly way they saw, at the corner of the south transept, the rood-loft stairs, or else destroyed them; and as to the brasses, in order to put down coloured tiles, he took them all out of the stones in which they were embedded, used the stones to make a pathway in the churchyard, and knocked the brasses into the plaster of the wall with brass-headed nails. The consequence was, that the brasses were being eaten away when he (Mr. Tomlinson) came there by the galvanic current set up by the brass and iron in the damp wall. With the kind help of the Hyde family he got the brasses properly set in slabs of stone and put in the wall as they now saw them. He had been also able, by the liberality of various persons, to put in a very good east window, two south windows, and a small baptistery window, and to get a decent altar-cloth. Proceeding to the outside of the church the remains of the doorway leading up to the rood-loft were noticed, and the church-porch. The vicar explained that, in 1683, the then incumbent, Ralph Kedden, who on account of having thirteen children, probably

found it very difficult to study in the vicarage, went to the churchwarden, Mr. Geering, at the Manor-house, with the request that he would make him a study, and a room was made over the church porch by that worthy, in conjunction with his friend, David Brewster, a stationer of London, in it being chained about 150 old books. When Mr. Street "restored" the church, he pulled down this interesting old room, and erected in its place a porch with a simple lean-to roof, like a dust-bin. He (the speaker) had managed to alter that into the present gable-roof.

From Denchworth a pleasant drive brought the excursionists to *Wantage*, which they reached at 5 p.m. It had been intended to visit the church and other objects of interest, including King Alfred's Bath, the Priory (the birthplace of the famous Bishop Butler), and the Grammar School, but time only permitted a cursory inspection of the fine church. The proceedings of the day concluded with a dinner at the "Bear."

BOARD SCHOOL BUILDING IN LONDON.

STATISTICS.

At the first meeting of the London School Board, after the recess, Sir Charles Reed made a statement of considerable interest as to the number of new Board schools which have been erected in the metropolis since the formation of the Board. He said that the first Board built or secured sites for eighty-six schools, with accommodation for 79,625 children; and that now, at the end of another three years, 134 new schools had been opened, accommodating 115,942 children; in addition, forty other new schools were in course of building or contracted for, and twelve of these would be opened by November, the whole forty accommodating 31,199 children. Beyond these the schools on sites purchased or selected numbered forty-seven, accommodating 35,070, thus giving a total of 221 schools, with 182,211 places for children.

The cost of sites, in the case of completed schools, has been 5*l.* 0*s.* 10*d.* per child, which, the chairman observes, is not excessive considering the enormous price of land in London, and the necessity under which the Board lay of planting the schools, not where land happened to be cheapest, but where the children requiring provision lived. According to a Parliamentary return, the cost of buildings in the case of completed schools was but 9*l.* 8*s.* 4*d.* per head, being 18*s.* 6*d.* less than the Board's estimate, and more than 2*l.* below the cost in several provincial towns where labour is cheaper. In addition to their new schools, the Board has, at the request of the managers in each instance, taken over fifty-three schools, with places for 17,938 children, while it is further providing for 11,824 children in forty-four temporary buildings. The chairman adds that the best evidence that the Board has not overbuilt is found in the fact that the schools have filled as fast as they have been opened, and this while, as a rule, the efficient voluntary schools not only have not suffered, but have received large accessions of children. The number of children on the roll of all efficient voluntary schools in the metropolis in the year 1871 was 222,518, whereas last Christmas the voluntary schools had on their rolls 263,704 children, and the Board 125,398, showing on the whole an increase of 164,505.

A YEAR'S BUILDING OPERATIONS IN GLASGOW.

At the Glasgow Dean of Guild court a few days since, the Lord Dean of Guild King, in making his retiring speech, gave an epitome of the figures relating to the building operations of the past year, comprising the estimated cost of the buildings, exclusive of the sites. The number of houses for which linings have been passed by the Dean of Guild court from 1st September, 1875, till the 31st of August, 1876, are:—Houses of one apartment, 965; of two apartments, 2,803; of three apartments, 1,248; of four apartments, 440; of five apartments, 161; and of six apartments and upwards, 129. During the same period, 563 single and 336 double shops have been passed. These represent the aggregate sum of 1,268,500*l.* Churches, halls, and schools represent 113,700*l.*; warehouses, shops, and workshops, 445,174*l.*; alterations and additions, 297,875*l.* The new streets which have been passed during the year amount to fifteen in number, their length altogether being 2,585 lineal yards; the total of the various linings passed during the year amounting to 2,125,249*l.* Comparing these results with those of 1875, it would be found that while the linings granted in the preceding included 841 shops and 5,582 houses, those for the present year represented 899 shops and 5,746 houses. The extra number this year had been accompanied by a decided tendency towards larger houses. It was very remarkable that 11,228 new houses should have passed within two years, because the average increase in the population of the city within the Parliamentary boundaries since 1872 is estimated only at about 9,500 persons, representing 1,900 houses, and the actual average increase in the uninhabited houses during the last fifteen years amounts only to 1,400*l.* per annum. Making all allowances, the erection of houses must be proceeding in a ratio in excess of the wants of the population. The total money represented by linings granted in 1875 was 1,826,150*l.*; in 1874, 1,345,800*l.*; and in 1873, 1,210,514*l.* The last two years exhibit an increase of about 55 per cent. over the two preceding—a result which no one would have expected to find concurrently with a general and protracted depression in almost every branch of industry. In the opinion of the Dean of Guild, the following additional powers were required by the Court, and could be obtained only by legislative enactment:—1. Provision for wide and sufficient openings through three-sided or four-sided solid blocks of houses. 2. The alteration of the clause by which, under certain circumstances, the air space between a front and a back tenement may be made to serve for both, thus reducing the ventilating area of each to one-half of the ordinary statutory extent. 3. The control of the internal re-arrangement of houses, when even without external change larger houses are converted into houses of one or two apartments. 4. Provision for forming all private sewers and for laying all drainage pipes under the immediate supervision of the master of works, just as in the case of public sewers.

EXTENSIVE TOWN IMPROVEMENTS AT WALSALL.

ADOPTION OF THE ARTISANS' DWELLINGS ACT.

Improvements of a very important character are about being carried out at Walsall, under which about 120 houses in one of the worst districts of the town will be swept away, and the site, covering an area of about 2 acres, entirely relaid out. It appears that the district in which the houses are situated has for many years past been in a most unhealthy state. At a special meeting of the Town Council, held recently, the Mayor, in describing the district, said that its entire soil seemed to have been saturated with disease and death for generations past, and its population given over to drunkenness and idleness. Amongst the 120 houses which it contained, twenty-four were of notoriously bad character, whilst seven public-houses were adjuncts to establishments of ill fame. Such was the low and degraded sanitary state of the locality that it would be impossible to work any effectual remedy by the application of the Public Health Act, and the land in the centre of the town, closely adjoining, was too much wanted for business purposes and other new buildings of a respectable character for the present dens to be allowed any longer to exist. As a further proof of the unhealthy character of the district the mayor stated that the dwellings there had not inaptly been described, by a sanitary commissioner of the *Birmingham Daily Post*, as "houses of call for fever and cholera," and nothing short of an entire clearing away of the whole of the property could remedy the sanitary evils existing there. The council would be culpable if they did not avail themselves of the powers given by recent legislation, and cut this cancer out of the midst of the community. He proposed a resolution, founded on a report of the medical officer of health, declaring that the district was an unhealthy area, and that the provisions of the Artisans' Dwellings Act be adopted with reference to it. He said that the total value of the property proposed to be included in the scheme for clearing the site was estimated at 17,000*l.* It was also estimated that by the demolition of the houses about 500 persons would be turned out, and he explained that it was proposed to provide for these persons. There was land in the immediate vicinity of the town under the control of the Corporation, which could be adapted for artisans' dwellings, and these might be built before the carrying out of the scheme was commenced, or whilst it was in progress. It was the most important scheme that had ever been brought before the council, both as regarded the health and morality of the community. Mr. Alderman Williams, in seconding the motion for the adoption of the Act in reference to this property, said he could not have believed that such places as he had seen existed in Walsall, if he had not visited them. In the course of a discussion which took place on the subject, it transpired that the remodelling of about half of the older portion of the town was desirable in addition to the proposed improvement, but the expense would be so great that they felt they dared not deal with it at present. The resolution was passed all but unanimously, with an addition that in carrying out the scheme new buildings for the displaced inhabitants be provided simultaneously.

"COLCHESTER CASTLE A ROMAN BUILDING."

Sir,—You did me the honour to refer to my book "Colchester Castle a Roman Building," in the *Builder* of Aug. 19: permit me to make the following observations. The book shows—First, that the architecture of the castle is Roman; second, that the writings of archæologists do not prove it to be Norman. It was spoken of uncourteously by Mr. John Henry Parker, C.B., at the meeting of the Royal Archæological Institute: *vide* the following extracts from a "Full Report of the Proceedings of the Institute," reprinted from the *Essex Standard*. (Colchester, 1876.)

Page 50. Aug. 3.—"Mr. Parker said it was a Norman castle, and to say it was Roman would be absolute nonsense. The archway was a very good specimen of the commencement of the twelfth century, with all the ornamentation of the end of that period."

Page 106. Aug. 7.—"Arrived in the quadrangle, or great courtyard of the castle, Mr. Parker gave a description of the building. It was, he said, most distinctly a Norman castle, built at the end of the eleventh century. He held in his hand a book, by a modern and living architect (George Buckler), who was so insane as to suppose that the castle was a Roman erection; but he saw above him, in the walls, fireplaces,—and whoever heard of fireplaces in the Roman period? The building, he repeated, was unquestionably Norman; but, as was usual at the period, of a very plain, though substantial style. The ornamentation, however, which they observed, was added fifty years later, at which time also the grand Norman gateway must have been built, as it was of the twelfth-century style. There was not a vestige of Roman work about the place, except the materials of which it is composed, and which were utilised in consequence of their being to hand, and were doubtless the ruins of the Roman wall."

Page 107. Aug. 7.—"Some said that the bricks were not Roman at all, but were in imitation of the Roman; but one brick he pointed out was evidently of the fourth century, and undoubtedly Roman. There were some subterranean passages beneath the castle, and these, he said, were Norman cellars, from which a large quantity of the earth had never been removed, simply because it was not convenient to carry it away. Poor Mr. Jenkins, who lived twenty years ago, and whose ideas were forty years behind, then, might be excused for supposing the castle was Roman; but for a modern architect, like Mr. Buckler, to say it was Roman, was childish nonsense. The castle was not, as was supposed, a 'keep,' but a large Norman castle intended to assist a small garrison in keeping a large and discontented town in subjection; and was after the same style as that of Rochester, which was of fifty years later date."

Ibid.—"On the north wall Mr. Parker pointed out a buttress, which, he said, placed beyond doubt the Norman build."

Mr. Parker's declamation did not throw so much light upon the architecture of the castle as the brilliant lamps provided by Messrs. Joslin on the 3rd of August, and from Oxford he wrote to the *Essex Standard*, stating that he "frequently spoke rather too fast."

Probably Mr. Parker spoke too fast when he said that the large castle was intended to assist a small garrison, that the building showed work of two centuries, and ornamentation of two periods, that there was one brick of the fourth century, and a buttress of Norman build. And when Mr. Parker vehemently exclaimed, "Who ever heard of fireplaces in the Roman period?" had he forgotten that he accompanied Dr. Bromet to Wheatley in 1846, and found a fireplace, about 3 ft. high, built of brick, in a Roman villa? (Arch. Jour., ii., 352). Mr. Lysons found one 3 ft. 4 in. wide, and arched, in a Roman villa, at Witcombe, in 1818 (Archæologia, xix., 181; Arch. Jour., xiii., 92). In fact, the coldness of this climate compelled the Romans to add to the hypocaust system, in order to insure sufficient warmth in their living-rooms during the long winters of Britain (Jour. Brit. Arch. Assoc., iv., 371). Roman fire-dogs of handsome make (Ibid., xxix., 126), an open hearth with appliances for suspending cooking-vessels (Ibid., xviii., 394), and a stone curb, burnt on the inside (Arch. Jour., xiii., 329), are so many evidences of Roman fireplaces having existed in Britain. Not only the climate, but other circumstances (say archæologists) demanded a general modifi-

cation of the architectural arrangements and details of Roman buildings in Britain (Jour. B. A. Assoc., iv., 371), and yet some living archæologists are unable to appreciate the differences between Roman buildings in Rome, and Roman buildings in Britain; or, to distinguish between the work and materials in Roman buildings, and those in reputed Norman buildings (Arch. Jour., iii., 290).

The author has examined professionally nearly all the buildings mentioned by him, and compared them with the writings of archæologists.

"Why truly," said the king (to Dr. Johnson) "when once it comes to calling names, argument is pretty well at an end."—(*Vide* "Boswell's Johnson.")

GEO. BUCKLER.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION IN CORNWALL.

THE *Cornish Telegraph*, in an article on the recent visit of the British Archæological Association to Cornwall, says that from a commercial point of view the importance of the Congress may not have been great. "Indirectly, indeed, it may draw visitors into these parts and advertise Cornwall (especially Penzance) thoroughly in all the leading London papers. However, until the Great Western Railway improves its railway accommodation we cannot hope for a great influx of visitors. They may wish to come and see our many curiosities, but the journey, so much more tedious than the run to Scotland or to a Continental capital, deters them.

But, if we look at matters from a higher basis than £. s. d., we cannot but say that the visit of the British Archæological Association may be regarded as an event in our literary history. The relations of the archæologists to our local inquirers may be divided under two heads:—In relation to,—(1). Our Pre-historic Remains; (2). Our Mediæval Antiquities. As to the first, it seemed that the archæologists came to us rather as learners; with regard to the second, decidedly as teachers. The reason is manifest. Cornwall is the favoured region of Celtic remains, and consequently our Cornish antiquaries have had great advantage over the observers of other counties, in living in the midst of a region so rich in curiosities of this kind. On the other hand, when Mediæval remains are in question,—old churches, baronial castles, or venerable manor-houses,—the professed antiquaries and architects were able, from their long and varied experience and observation, to throw a flood of light on questions affecting our Mediæval local remains. It was here that the county gained by the Congress; in the other matter, the Congress, perhaps, was indebted to the county. Experienced eyes detected traces of old masonry, and relics of alterations and additions, of which, perhaps, few before dreamt. Especially was this true of Madron Church, where Mr. Brock detected, in the east wall, traces of three successive churches. At St. Michael's Mount, the date of the chapel was fixed shortly before William of Worcester's visit. Many minor local problems were settled,—or at least approximately so,—the general tendency of the inquiry being to trace the remains of earlier edifices in the walls of our existing churches, and thereby throw a light on periods till now almost a blank.

On the whole, then, we are inclined to regard the visit of the Congress as of considerable value to Cornwall, and an event long to be remembered."

BURSTING OF A RESERVOIR: NARROW ESCAPE.

THE inhabitants of several mining towns and villages have had a narrow escape from disaster, by the bursting of a reservoir a few days ago. These stores of water are sometimes dangerous neighbours.

The present case is the large reservoir of the Shildon and Weardale Water Company at Towlaw, Durham, which was constructed of malleable iron and cast-iron plates, cylindrical in shape, and holding about 1,000,000 gallons. The bottom of the reservoir was made of puddled clay, resting upon a very insecure foundation, as the coal, which is only a few feet below the surface, has recently been worked out. The iron plates which form the cylinders are 10 ft. in height, and above the surface, and to strengthen them an embankment has been raised around the outside.

A leakage being reported, the engineers hurried up, and found a number of children on the spot, and the water gushing up from between the plates and the outside embankment. The water soon tore away with irresistible force the cast-iron plates, made a large breach, and rushed down the reservoir-field, into the cutting of the Stockton and Darlington Railway, along which it flowed like a river. The embankment on both sides of the line confined the outburst until its arrival at the crossing leading to the Towlaw Ironworks. It then took several channels, going through houses, and fortunately found a stoppage in a large empty pond.

CLERKS OF WORKS AND THEIR DUTIES.

CURIOUS CHARGE OF WILFUL DAMAGE.

AT the Newbury Borough Police-court, on the 2nd inst., Mr. Henry Duval Brown, clerk of the works at the Newbury Municipal Buildings, was summoned that he did unlawfully and maliciously commit damage, injury, and spoil to and upon two lengths of certain stonework, termed "moulded string," on a certain building now in course of erection there, the property of John Crook, the contractor for the erection of the buildings, thereby doing injury to the said property to the amount of 1*l*.

Mr. Beckhuson appeared for Mr. Crook, and Mr. W. W. King for the defendant.

Mr. Money, the architect of the buildings, was one of the witnesses called on behalf of Mr. Crook. Mr. Money deposed that the clerk of works was engaged by him in pursuance of instructions of the Building Committee.

Mr. Money, in reply to questions, said:—The duty of the clerk of works is to condemn improper materials on finding that they were going to be used. I have no bias in the case. The duty of the clerk of works would be to complain to the foreman, who, by a clause in the contract, represented the contractor. My duty is to condemn the work, and I should expect the builder to alter it.

Mr. Beckhuson.—If the builder does not remove the work condemned, are you justified in touching it until you have given fourteen days' notice?

Mr. Money.—If the builder or contractor did not alter the work condemned by me or the clerk of the works then it is in my power to give a written notice and employ another builder. Mr. Crook did not object to alter it.

Mr. Beckhuson.—In case of a dispute between the builder and the architect, who was to settle it?

Mr. Money.—Two members of the Institute of Architects.

Mr. Beckhuson.—There was a dispute?

Mr. Money.—No one would ever think of sending for two architects over a trumpery stone like this; indeed, they would not undertake such a thing. It would be a perfect farce.

Mr. Beckhuson.—On what ground was this stone condemned?

Mr. Money.—It was objected to because of its bonding; it was crippled, not properly worked, and not according to specification.

Defendant.—In the first place, it was short.

Mr. King.—The duty of the clerk of the works would be to report any materials that were bad?

Mr. Money.—Quite so.

Mr. King.—Do you recollect whether Brown had it condemned before it was used?

Mr. Money.—I cannot answer that. Mr. Crook saw it when it was condemned and made no objection. Received a complaint indirectly that the condemned marks were rubbed out. The breaking of the stone was not a course I should have adopted. I believe it is frequently done. Brown called at my office to tell me, but I was away from home. The stone was marked in my presence and Mr. Crook did not complain. It was a mere trivial matter. The worth of the stone was not more than 10s. or 15s.

Mr. Beckhuson said the stone was marked on the 15th September, and the next morning before breakfast it was broken.

Mr. Crook was not called as a witness.

For the defence, it was contended that the stone was condemned before it was placed in the building; that when it was placed in position it was marked by the clerk of the works to be taken out, but that the work was proceeded with and the mark obliterated; and that it was after it had been marked a second time, and Mr. Crook had been again told of its defectiveness, that the stone was broken.

The magistrates, after deliberation, came to the conclusion that, under the circumstances, the clerk of the works was justified in breaking the stone, and that there was no malicious damage in the case.

The case was, therefore, dismissed.

From a long report in the *Newbury Weekly News*, the magisterial proceedings appear to have been conducted with some acrimony and want of dignity.

Newcastle Society of Antiquaries.—The usual monthly meeting of the Newcastle Society of Antiquaries was held on the 4th inst., in the Old Castle, when a paper was read by Mr. R. Carr-Ellison, on "Inscriptions on the Roman Altar recently found near Benwell."

OBSTRUCTING THE PATHWAY.

MR. DANIEL LOGAN, surveyor, living at Herne-hill, appeared before Mr. Ellison, at Lambeth police-court, to a summons charging him with assaulting Mr. Lewellyn Archer Jones, a barrister.

The complainant stated that on the morning of the 18th ult. he was walking with his wife along Poplar-walk, a public footpath leading from Herne-hill to Loughborough. Some little distance down he saw a string drawn across the path about 2 ft. from the ground. It was fastened to some brickwork each side of the path. Seeing the defendant there, he asked him to remove the string so that his wife might pass. The defendant, instead of doing so, immediately commenced abusing him, told him to be off, and declared if he did not he would put him on his back. The complainant was about to unfasten the cord, when defendant took him by the wrist and shook his fist in his face.

Police-constable 100 W said he heard the defendant swear at complainant and call him a barber's clerk.

Mr Fullgar (for defendant) said the complainant might easily have stepped over the cord, which was placed there in order to carry out the line with regard to some buildings the defendant was superintending.

Mr. Ellison said the defendant had no right to place the cord across a public footpath, and if the complainant had cut it he would have been perfectly justified. He ordered the defendant to enter into his own recognisances in 30*l*. to keep the peace, and to pay 1*l*. 3s. costs.

A WORKMAN'S CLAIM FOR WAGES.

HOLTGEN *v.* HOLLAND AND HANNEN.

IN this case (heard at the Westminster County Court on the 6th inst.) the plaintiff, in the employ of the defendants, sought to recover 7s. 2d., being the amount of one day's pay.

Plaintiff said that on the Friday previous to last Bank Holiday he instructed a shopmate to ask the foreman and cashier whether he was to resume work on the following Monday; and, in the event of that being the instructions, he requested that the cashier should notify the same on a little slip of paper, to be enclosed in his "pay-bag."

According to the statement of plaintiff's messenger, it appeared that the cashier declined the trouble of writing the required slip, and plaintiff went to work as usual.

Witnesses were called for the defence to show that none of the defendant's men were at work on the Bank Holiday, and that those who were at work were in the employ of a sub-contractor, to whom a portion of the work was let. Also it was stated by a witness that plaintiff had only been seen on the works for an hour or two after ten o'clock in the morning, whilst a member of defendant's firm stated that notices were conspicuously pasted up both inside and outside the gates of the works, to the effect that no workmen would be required to work on the Bank Holiday.

Plaintiff denied that he had seen any such notices, and insisted that he had been at work from seven o'clock in the morning until two o'clock in the afternoon.

His Honour said it was perfectly clear the plaintiff had no right to recover, because, in the first place, he had received no express instructions to resume his work on a general holiday; and, secondly, he had not waited for the reply of his messenger. Under those circumstances judgment would be for the defendants, with costs, as it was understood that the present proceedings were not taken at the plaintiff's risk, but at the instigation of the society to which he belonged.

LANDLORD AND TENANT.

PONTING *v.* ROBERTS.

IN this case, heard at the City of London Court, before Mr Brandon, Deputy-Judge, the plaintiff was the landlord of certain premises in Gutter-lane, City, where he carried on business and let offices.

One of his tenants (Gale) gave him verbal notice in December last that he was about to give up his offices. Before the expiration of the quarter the plaintiff went into the office, and found the defendant in occupation, who told him he had exchanged offices with Gale, upon which the plaintiff said he should require 25*l*. a year rent, in lieu of 20*l*., which had hitherto been paid by Gale, and if he were not prepared to pay that amount he had better leave. The defendant did not dissent, but when applied to for the following quarter's rent he refused to pay more than 5*l*., which he now paid into Court.

The Judge ruled that that was all the plaintiff was entitled to, and told him he had no right to have entered the office in the way he did, the letting having taken place with Gale, and not with the defendant.

Infringement of Building Bye-laws at Darlington.—At the Darlington Borough Police-court, on the 3rd inst., Robert Borrodaile, a builder, was charged with having within "the district of the Local Board of Health and the Urban Sanitary Authority for the borough of Darlington, unlawfully built the external walls of the second story of a certain dwelling-house, being three stories in height, and situate in certain streets there called High Northgate and Hope Town-lane, of a less thickness than 15 in., to wit, 10 in." Defendant pleaded guilty, and was fined 5*l*. and costs; in default, one month's imprisonment. On a second charge, for insufficiency of yard space, he was fined 2*l*. 10s.; in default, one month. On a third charge, for occupying the premises before they had been certified, he was fined 5*l*. and costs; in default, one month.

THE TURNERS' COMPANY.

The Worshipful Company of Turners have offered this year, as usual, prizes for the best work submitted in competition by workmen in the trade. The prizes were delivered by the Lord Mayor on the 12th, and the objects submitted in competition were, by his permission, exhibited at the Mansion-house on the 10th and 11th ult. The prizes were offered this year for turning in wood, in pottery, and in diamonds, the principal qualities taken into consideration being beauty and symmetry of shape, exact copying, so that two objects of the same design should be precisely similar in every way, and fitness of the work for the proposed purpose. The specimens exhibited could scarcely be taken to illustrate the latter quality very well, as a large proportion of them seemed to be purely ornamental in character, and merely intended to show shapes in which the material might be turned. The pottery articles showed remarkably sharp and clean work, and the two jars or vases for which the silver medal and freedom of the city of London were adjudged to Mr. Higginbottom, seemed to realise the condition of exact resemblance most completely. The bronze medal in the same department was adjudged to Mr. Seabridge, for two vases of the same description. Among the articles turned in wood was a set of chessmen, showing very neat execution, though not so remarkable in the way of design. Some small articles turned out of fragments of the wood of the *Goliath* training-ship, which was burnt some little time ago, excited some interest. In general, the woodwork seemed to us to illustrate neatness of workmanship rather than artistic design. A considerable number of operatives visited the Exhibition to inspect the work.

SURVEYORSHIP ITEMS.

Derby.—At a special meeting of the Derby Town Council, held on the 11th inst., for the purpose of appointing a surveyor to the borough, the Selection Committee submitted the names of four gentlemen (out of eighty-four applicants) to the council for the appointment, and upon being put to the ballot, Mr. Clement Dunscombe, M.A., engineer to the Corporation of Kingston-upon-Thames, was duly elected by a large majority, at a salary of 580*l.* per annum. Mr. Bretland, Assistant Borough Surveyor, Belfast, obtained the next highest number of votes.

Lavenham.—A meeting of the Lavenham Highway Board was held last week to consider the applications for the appointment of surveyor to the Board. There were thirty-six applications. The following candidates were ultimately selected:—Mr. S. Hills, a member of the Board, and waywarden of the parish of Edwardstone, who said he was a farmer, and thirty-eight years of age; Mr. Alves, assistant engineer on the Great Eastern Railway, forty-two years of age, and now residing at Stratford; Mr. Pettit, forty-four years of age, builder, Hadleigh; Mr. Payne, sixty, who has resided at Mildenhall for many years, and had had the management of several miles in that district. A show of hands was then taken with the following result:—Alves, 36; Payne, 18; Hills, 9; and Pettit, 17. The two lowest were then struck off, and a show of hands was again taken for Alves and Payne. The former then got 37 votes and the latter 15. Mr. Alves was therefore declared elected.

Wigan.—Forty-two applications for the appointment of borough engineer and surveyor at Wigan were sent in, and these were reduced to six by a special committee appointed for the purpose. The selected candidates were,—Mr. James Hart, Pendleton; Mr. Martin, Liverpool; Mr. Inch, Croydon; Mr. Brunton, Durham; Mr. Wike, Leicester; Mr. Dawson, Stockport. These were desired to attend before the committee at the council chamber, on the 21st ult., when Mr. Hart, of Pendleton, was selected by seven votes to four for Mr. Martin. We are informed that Mr. Hart was requested to make arrangements for leaving the Salford corporation at the end of October, so as to enter upon the duties at Wigan, and also to inspect the works at Wigan during the interval. With both of these requests he complied. At the council meeting held for the confirmation of the committee's minutes, on the 5th inst., Mr. Eckersley moved they be passed, with the exception of those referring to the appointment of the borough engineer, and moved as an amendment that Mr. Bolton (the assistant) be appointed at a salary of 200*l.* This, after a fierce discussion, was carried by one vote,—*i.e.*, by eighteen to seventeen,—although it is stated the committee were unanimous in agreeing not to include Mr. Bolton amongst the six candidates for the final selection. Mr. Hart thinks he has good reason to feel aggrieved.

NEGLECTED ARCHITECTURAL BIOGRAPHY.

In reference to the annotated copy of Milizia's "Lives of Architects," referred to on page 969, I think it very probable that the copy belonged to the late Mr. George Bailey, curator of Sir John Soane's Museum. The last name you have given as written in it is that of Pugin, who died in 1852, and Mr. Bailey was for some time unwell before his death in 1860. He very kindly assisted me in the early biographical articles for the "Dictionary of Architecture"; and having afforded him many notes for his amendments of "Milizia," I endeavoured to obtain his copy from his friends, after his decease, but was too late.

Milizia's "Lives" is a work that requires to be re-written, not only for the correction of the matter, but in too many places for the true rendering of the passages in the original Italian. The architectural biography of architects of all nations is in no work so complete as in the "Dictionary of Architecture," so far as it is published, and I am glad to say that a part comprising the letters M, N, and O will shortly be issued to the subscribers. I have this year rewritten and added to the "Brief Synoptical List of the Principal Architects, Ancient and Modern, with their Chief Works," comprised in my new edition of Gwilt's "Encyclopædia of Architecture," being nearly 400 in number, which is, perhaps, the next best list and account of them, as far as it goes. I have ready the manuscript of a work on "English Mediæval Architects and Masons"; but whether it will ever reach the printer's hands remains to be seen.

Wyatt Papworth.

THE STRIKE AT MESSRS. DOULTON'S.

Sir,—A night or two ago I was conversing with a thoughtful and intelligent mechanic on the subject of technical education, the value of which in itself, of course, be fully admitted. "But," he added, "the masters, too, often give us very little encouragement to improve ourselves. For instance, look at that affair at Doulton's the other day, when they put two men experienced in terra-cotta work over the heads of all the bricklayers on the works, without ever giving them a chance of showing that there were any among them capable of doing the work equally well. Now, what encouragement is it to men to fit themselves for the higher branches of their trade if this is the conduct pursued towards them?" I suggested that perhaps there were no men among the bricklayers able to do the work which Messrs. Doulton required. "Well," he replied, "I should hardly think they would be such muffs as to strike against the other two workmen if there were not." Soon after I was in conversation with the teachers and secretary of the bricklayers' technical class, held at the Artisans' Institute, and referred to what had just passed, when one of the teachers, who was formerly a journeyman bricklayer, but is now a clerk of works, said that there were many men in the bricklaying trade quite as competent to do the terra-cotta work at the Albert Embankment as the two men employed by Messrs. Doulton; and that the whole of the terra-cotta work at the Natural History Museum was at this very time being done by bricklayers. Now, the gist of all the reasonable objections (for no doubt there are some unreasonable complaints) made by the bricklayers to the employment of plasterers for executing what they certainly seemed justified in regarding as a higher branch of their own trade, is that it takes from them a stimulus to improve themselves in their trade, and furnishes a powerful argument to those evil advisers who laugh at any of their mates for caring about technical education, and recommend "another pot of beer" instead. But if it be asked,—What right have the bricklayers to regard terra-cotta work as a part of *their* business rather than that of plasterers? they answer at once that terra cotta is a hard-burnt substance, made into blocks like bricks, and built into walls with mortar, in precisely the same manner as brickwork; whereas the material in which plasterers work, of course, is of a soft plastic kind, laid upon a hard substance.

Henry Solly.

BATH STONE.

Will some one give me a receipt for mending Bath stone? Brown shellac will not do. The white shellac I have tried, dissolved with rectified naphtha, but it does not answer.

M.

Geodesical Congress.—The Permanent Commission of the International Geodesical Association met on the 5th inst. in the Salle des Académies, Brussels. The Comte d'Aspremont-Lynden welcomed the Congress, after which General Baeyer, delegate from Prussia, bore testimony to the important share contributed by Belgium to the work of the commission. Various reports were then read.

Books Received.

Examples of Ancient and Modern Furniture, Metal Work, Tapestries, Decorations, &c. By B. J. Talbert. London: B. T. Bateford, High Holborn.

This very tastefully got-up thin folio volume contains twenty plates of designs photo-lithographed from the author's drawings, in which original designs for furniture are interspersed with delineations of specimens of old work of special excellence or character; the original designs, however, predominating. The author is well known as one of our finest draughtsmen and ablest designers in this branch of decorative art. Prefixed to the book is a reprint of the introduction to Mr. Talbert's former publication on "Gothic Forms applied to Furniture Decoration," in which the author shows most sound critical discrimination on the subject of the application of ancient forms and feeling to modern requirements, though the literary form of his observations is somewhat defective, and the punctuation, &c., should have been more carefully corrected. Among other points remarked upon is the difficulty of applying anything like a Gothic type of furniture to the modern drawing-room, where everything is required to be graceful, refined, and elegant, while the prevailing character of Gothic furniture is mass and solidity, and a certain degree of stiffness and architectural character. The fact, of course, is, that when the original types of Gothic furniture were evolved, the drawing-room, in its present sense, was not in existence; the modern taste which calls for elegance and finish in furniture and fittings had not been developed. The tacit perception of this discrepancy was probably one reason which led to the change of taste in furniture, of which Mr. Talbert's present publication is one of the indications or records. Not that the author is here offering designs of Queen Anne or Georgian furniture. On the contrary, while declining any direct expression as to the merits of this or that style of architecture, he expresses his opinion that woodwork designs should be something more than merely imitative; that "it is still possible for those who believe in such work as Chippendale's, to buy the originals; but the reproduction of this work would be of most questionable utility. Chippendale was essentially a carver with a most redundant fancy; and to attain the feeling he liked,—to reach the roocco expression,—he ignored every other principle of true work. Those acquainted with carving know how easily this class of design lends itself to carvers' tools, until the gouge seems to have got a perfect mastery. But the result is only so much labour, ending in the monstrosities which are now so cheap and so plentiful." The author's object in his criticisms and designs is rather "to help to a conclusion as to woodwork designs." Among other mistakes to be found in the more costly modern productions in artistic furniture is the effort after too pretentious and monumental a character, unsuitable for any furniture which is really for daily use, and not designed for mere show or for a memorial purpose. On this point we are quite agreed with him, as a matter of opinion; but we can hardly see that the criticism is so specially called for at the present moment as he seems to imply. Except in rare and exceptional instances, it appears to us (and we have before called attention to the fact) that what is called artistic furniture at present, or all that portion of it which is more or less based on Mediæval models, is under the influence of a reaction towards what we should call a somewhat "homely" taste and style. A kind of cottage feeling pervades a great deal of it, so far, at least, as outline and general proportion and form are concerned. The mode of decoration and finish, it is true, counteracts a good deal of this; and modern black and gold, as Mr. Talbert remarks, whether it be called "Gothic" or "Old English," has in reality no resemblance to either.

In the designs which form the bulk of the volume, the change of taste to which the author alludes is exemplified chiefly in the prevalence of forms which have a closer affinity with Renaissance than with Gothic work, although evidently intended, in most cases, to elude too close identification with the details of any special style. The first illustration, the sideboard now in the South Kensington Museum, and on which we bestowed some words of appreciation on first seeing it at one of the International Exhibitions,

is an example of this; it is certainly Gothic in general feeling, yet there is hardly a detail in it that is Mediæval. This piece of furniture has that somewhat homely stamp which we have spoken of; it is very solid and satisfactory-looking, and yet we can hardly accept it as the most fitting type of furniture for modern civilised life in its more graceful aspects. The "cabinet in the style of James II.," which follows it, is a far more suitable style of furniture design for a modern gentleman's house. The design succeeding this is the completely Classic Jacobean, which is at variance with Mr. Talbert's principles as to the avoidance in furniture of forms which are directly derived from architecture. At the same time, it may be admitted that the forms used here are in reality much better suited to cabinet-making than to building, though they first originated in building. This is one of the drawings which goes to indicate the change in the direction of taste since the author's former work. The drawing-room interior, No. 35 (the designs are numbered consecutively with the previous volume on Gothic Forms) is more distinctly Gothic in character; the author has evidently given some trouble to refining Gothic forms to the drawing-room standard, yet we cannot say that the *coup d'œil* strikes us as by any means what we should desire for a drawing-room; it hits the taste of the present moment, but is not really a refined style of drawing-room decoration; there is too little interest and beauty of form and line, too much prevalent spottiness of decoration; for in the present reign of taste not a particle of surface on wall, ceiling, floor, or fittings can be let alone; everything must be crossed and recrossed, and diapered, and powdered with some device: the general result is rich, but (may we be pardoned for saying it?) a trifle barbaric; with the drawing-room of the country vicarage, of the larger class, one may connect it; never with the *salon*. The "dining-room" scheme (44) is more in keeping, because this style lends itself better to dining-room design. This last-named drawing is the first of a series of eight drawings, which conclude the book, and which were prepared in the first instance for exhibition at the Royal Academy, where we believe we have noticed and commented upon all of them. The "Entrance to Hall" (47) is admirable in its way, though we here also complain of an over-richness of elaboration, which almost confuses the eye; a criticism less applicable to the "Entresol" (49), which is in a broader and larger manner; it does not look as well here as in the coloured drawing which we remember to have seen at the Academy. The last plate in the book is a successful reproduction of the perspective view of a "design for a staircase in the Jacobean style," which was in this year's Academy Exhibition, and was one of the most effective pen drawings we have ever seen in the architectural room there.

The designs for silks and tapestries are very good in style, combining breadth and conventionality of treatment with a sufficient flow of line; and there is a design for a wall-paper with frieze and dado, which is admirable in its detail, though the dado is, to our eyes, rather too light and flowing in style for the upper portion, with which it seems scarcely in keeping. The drawings of old work, though not numerous, show judgment in their selection. We object, by the way, to the use of the phrase, "*antique* metal work," as the title of plate 41; the word "antique" is connected by all association now with Classic work, Greek especially, and not with Gothic; "ancient" would have done as well, and is, in fact, the expression most commonly used by those for whom "old" is too simple a word. A short chronological table of the dates of some of the principal domestic edifices in England, and the reigns with which the different styles of furniture-art are connected, is a useful addition to the book, which, besides its other recommendations, may be emphatically described as "good to crib from."

Historic Warwickshire: its Legendary Lore, Traditionary Stories, and Romantic Episodes. By J. Tom Burgess. London: Simpkin, Marshall, & Co.

The history of Warwickshire is rich in legends and romantic episodes, and Mr. Tom Burgess has made good use of them, and has so produced a very interesting little book. The author is well known as a local antiquary, earnest and painstaking, and readers may feel pretty sure that, while being amused, they are, at the same time, instructed. The volume has a number of illustrative engravings, and is dedicated to the Marquis of Hertford.

VARIORUM.

Sir Chas. Dilke, in a valuable paper on "English Influence in Japan" in the current number of *The Fortnightly*, gives us some reassurance as to the condition of modern art in that country. He says,—"English influence, of course, draws certain evils in its train. Birmingham metal-work, cut-glass decanters, gingham umbrellas, and hideous boots and felt hats, are spreading in the towns, and it has been my unfortunate fate to see an ex-Daimio dressed in a ready-made coat, driving a gig, and to behold the detestable suburban villa, near Tokio, in which another lives. At the same time, Japanese art has not yet been killed by English "taste." The show-rooms of the former palace of the Mikado at Kioto, even the tiger room in which the Mikado used to sleep, are surpassed by the marvellously lovely wall pictures of the rooms in the priest's house, at the temple on the Tokaido, near where the Enoshima path turns off, at Fujisawa. These are, I believe, but a few years old, and they certainly show no falling off from the work of the best period. There is one room of birds in a snow-storm, one of processions on a gold ground, one of egrets, and one, this last being the most beautiful,—of flights of kittiwake gulls settling on or rising off the sea,—while hundreds light and run along the sands. Many of the new screens in black, brown, and white,—with no colour introduced except in the plumage of birds, much of the work in mixed metals applied to belts and other articles manufactured for the European market, the application of enamel to objects also produced for Europe, and such books as the new Nautical Almanac (in which even tables of logarithms are made artistic by the exquisite copper-plate engraving of the Japanese characters), on delicate mulberry-leaf paper, compare favourably with the productions of the best days of Japanese art."——A writer in the *Leisure Hour* says, as to Palestine Exploration,—"People seem scarcely to have realised the fact that Captain Warren and his men have actually found King Solomon's wall, still standing as his builders left it, mostly buried, it is true, under thousands of tons of ruin and rubbish, but there still, towering above its foundation on the living rock,—140 ft. in some places, above 170 ft. in others! Who is there that has really taken in this astonishing fact? Not many, I think. The grand barrier by which the wise and mighty king separated the site of the temple which he was about to build for the dwelling-place of God, still exists! It has been examined and measured by Captain Warren, whose indomitable energy and courage enabled him to overcome all the obstacles and all the dangers involved in mining operations which have no parallel in the history of the world. And there the wall stands, preserved for us by the ruins heaped around it—ruins of the Holy House itself, and of the city of Jerusalem. This wall is not merely founded on the rock; it is sunk into the rock, into which sockets have been cut to receive the lower course of stones, and make them immovable foundations for so mighty a structure. Along the second course,—that above the foundations,—the stones are found to be marked with Phœnician masons' marks (such as exist to this day in the ruins of Tyre and Sidon), and thus enable us to identify this as the work of King Hiram's builders. The splendour of the stones astonished Captain Warren. He speaks of their vast size, and of the most beautiful masonry:—'The stones are fitted together in the most marvellous manner, the joints being hardly discernible.'"

Birmingham Arts Guild.—A meeting to inaugurate the session of the Birmingham Arts Guild was held on the 4th inst. in the Examination-room of Queen's College, when a lecture was delivered by Dr. Sebastian Evans, on "Art Training," in the course of which he remarked that we in England were somewhat wanting in art training; in point of fact, in the true sense of the term, there had been no art training since the Reformation. We had lost a vast amount of time in not learning those common processes of painting which an old hand could teach in the course of a few months, but which, in England, the student had to hammer out in the best way he could, and with very little assistance.

Miscellanea.

New Fragments of the Frieze of the Mausoleum.—Mr. C. T. Newton says in the *Academy*:—"Some years ago I was shown, in the courtyard of a Turkish house at Rhodes, two small fragments of reliefs, which I at once recognised as belonging to the principal frieze of the Mausoleum. After long delay I have at length obtained these two fragments, and on comparing them with the remains of the Mausoleum found at Budrum I had the satisfaction of uniting each of the Rhodian fragments with one of the many stray pieces of the frieze which are preserved in the British Museum. This new combination gives us the greater part of a wounded Amazon who is in the act of falling, and the upper part of a Greek warrior armed with a shield, who is moving to the right. These two figures do not appear to be connected with each other. During this recent re-examination of the Museum fragments, I made another curious discovery. There is in the Imperial Museum at Constantinople part of an Amazon in relief, which I long ago recognised as a figure from the frieze of the Mausoleum, and of which a photograph is given in my 'Travels and Discoveries in the Levant.' Of this Amazon the British Museum possesses a plaster cast, to the fractured surface of which a fragment of a left thigh and leg found by me on the site of the Mausoleum has just been adjusted. We have, therefore, now absolute proof that the two Rhodian fragments and the Constantinople fragment came from the Mausoleum."

Dwellings for the Rural Poor.—At a meeting of the members of the Birmingham and Midland Association of Medical Officers of Health, on the 5th inst., Dr. Swete read a paper "On the Construction of Cottages for the Labouring Classes in Rural Districts, so as to comply with Sanitary Requirements." The present condition of the cottages of the labouring poor was, he said, for the most part deplorable, coming under the personal knowledge of every medical officer of health for a rural sanitary district. They in their official rounds saw the poor literally "huddled and hustled together each day like swine." He cited cases in his own district—the Droitwich Combination Sanitary district—and then detailed at length the principle on which proper cottages should be constructed. The only plan he could see of preventing the evil was that of obtaining for rural districts the urban power of making bye-laws. He had gone into the question of expense in erecting really good cottages for the poor. With the high prices caused by strikes he found that a landlord might obtain 3½ per cent., and yet have good and wholesome houses for his poorer tenants.

Hints and Helps for Working Boys.—In the *Labour News* for the 7th inst., Mr. Alsager Hay Hill, the editor, commences a new feature in the shape of "Dick Whittington's Column; or, Hints and Helps for Working Boys." Mr. Hill, in an explanatory note, says:—"It is not our belief that even the most industrious boy is bound to become Lord Mayor, and we are not certain that if he could do so he would always confer the greatest good on himself and his kind by his ambition. Nevertheless, the old chime that rang out to the apprentice's ears in the old story, be it true or not, "Turn again, Whittington, thrice Lord Mayor of London Town," may find a useful echo even in the busy clash of the nineteenth-century bells now ringing from every quarter of the working world. It is not many that have a carpet laid down for them in their journey through life, and perhaps it is well that it is so. We shall therefore assume that a boy has to make his own way. It will be our duty simply to show him, as far as in us lies, the straightest and truest lines for him to take, and to show him also some of the dangers and difficulties which are certain to beset him."

The Proposed New Town-hall at Yarmouth.—Touching the proposal (noticed in last week's *Builder*) for erecting a new town-hall in Yarmouth, "F.S.A." writes to a local paper as follows:—"The Town Council propose to confine the competition to the 'Classic' style. It is quite right to limit the *cost*, but surely it would be far better to allow the competition to be unfettered as to *style*? Why not let the town have a chance of rivalling those glorious structures which are to be found in some of the towns in Belgium and Flanders, testifying, after the lapse of centuries, to the former commercial importance of those places?"

The Floating Bath at Charing-cross Bridge.—At the meeting of the Metropolitan Board of Works on the 6th inst., the Works Committee brought up a report recommending that the application of the Floating Swimming-baths Company, for the sanction of the Board to an adaptation of their bath as a Glaciarium for skating on real ice during the winter months, be granted for the ensuing winter. Mr. Selway opposed the motion, and said that permission was originally given to place a floating swimming-bath near the Charing-cross pier on sanitary grounds, but the bath having proved a failure, the proprietors now wanted to make a profit by converting it into a skating-rink. He hoped the Board would not allow the bath to become a permanent structure in front of the embankment, and to form an undesirable termination to Northumberland-avenue. Mr. Edwards described the floating swimming-bath as one of the greatest eyesores on the Embankment. The recommendation of the committee was agreed to.

The London Guildhall.—"Ironsides," in the *City Press*, concludes an article on "Incomplete Improvements," by noting a few instances of incomplete improvements which present themselves in a short walk from Guildhall. But first he asks,—"What shall we say about Guildhall itself? We have become so used to its one-eyed front and ragged back that it does not strike us, as it must every stranger who beholds it, as really disgraceful to the first municipal assembly in the world. With such places as Chester, Plymouth, and Leicester opening magnificent suites of municipal buildings, ought the City to be left for another year in its present condition? Let it be definitely decided what is to be done with the space now generally designated as Guildhall-buildings, and let it be done without further delay."

Coatham Convalescent Home.—The foundation stone of a new wing to the Coatham Convalescent Home has been laid. It having been found that mothers with young children who were admitted were sometimes a source of annoyance to the other patients, it was resolved to add another wing in which would be provided accommodation for ten mothers with children. Plans were drawn by Mr. Norman Shaw, architect, of London, which included also an hospital for fifty children. The latter portion of the plan, which is estimated to cost 1,000*l.*, will not be carried out at present owing to a scarcity of funds. That part of the wing which is being proceeded with will cost 2,600*l.* The building will be erected under the supervision of Mr. Moor, architect, of Redcar, the contractor being Mr. T. H. Barton, of the same place.

Illuminated Manuscripts.—The loan collection of illuminated MSS. now being exhibited at the rooms of the Liverpool Art Club comprises nearly 200 specimens of Abyssinian, Anglo-Saxon, Chinese, Egyptian, English, French, Japanese, Mexican, and other productions. Professor Westwood has contributed copies of some very curious MSS. and illuminations, which he examined in various Continental museums and monasteries. The Earl of Derby has contributed some valuable specimens, and Mr. James L. Bowes a set of Japanese books illuminated with various miniatures. The Library and Museum Committee of the Corporation have contributed largely to the exhibition.

Paignton.—According to a Plymouth paper, buildings are springing up in all directions at Paignton, and the space between the railway and the sea is fast being built on. Messrs. Evans Bros. have in hand a terrace of fifteen large houses facing the sea, the whole of which will be ready for occupation by next season, and Mr. M. Bridgeman has in hand fifteen more in the Station-road, that are approaching completion. The parish church will, it is hoped, soon be out of the hands of the stonemasons and glaziers, and this, with the New Congregational Church, nearly finished, and the Iron Mission Church, will meet the want hitherto felt of public worship accommodation.

M. Van de Weyer.—On the 1st inst. the King of the Belgians unveiled at Louvain a colossal bronze statue of M. Sylvan Van de Weyer (formerly Belgian Minister in London), which, on its pedestal of blue Belgian granite, rises 11 mètres high. The figure itself is 4 mètres in height. It is by Charles Geefs, of Brussels, and is said to be a good likeness. The statue has been erected by public subscription at a cost of 10,000f.

Public Improvements at Balsall Heath.—The Balsall Heath Local Board, having applied to the Local Government for sanction to borrow 11,000*l.* for works of sewerage and sewage disposal, and for providing offices for the transaction of the business of the Local Board, Major Hector Tulloch, R.E., last week held an inquiry into the subject at the offices, Lime-grove, Moseley-road. In the course of the inquiry it was stated that the Board have already acquired, on favourable terms, the premises in Lime-grove, which have been fitted up as offices for the surveyor, &c.

Byron Memorial.—We hear by accident that, by permission of the Lords of the Council, a general competition for the execution of the Byron statue will be held in the month of November, at the South Kensington Museum. Models are daily arriving from all parts of Europe; and as upwards of 100 sculptors (including some of the most famous in the country) have intimated their intention of competing, a keen interest will be felt, not only in England, but in most of the capitals of Europe. The Exhibition will be opened on Friday, the 3rd of November next.

The Proposed Public Park for Brighton. Mr. Alderman Brigden's motion, to instruct the General Purposes Committee "to continue its inquiries as to the terms and conditions upon which the land at Preston can be acquired of Mr. Benett-Stanford, M.P., for a public park, the uses to which it might be applied, and the cost of maintaining it," was, on the 4th inst., negatived by the Town Council by twenty-four votes to sixteen. The result will not (says a Brighton paper) raise the Town Council in the estimation of the town.

Lyme Regis.—On Sunday morning, October 1st, a fatal accident happened to a man named Thomas Wood. He was walking on the beach, about a quarter of a mile to the westward of the Cobb, probably looking for fossils, when a stone fell from the cliffs and struck him on the side. He was assisted home by two men, and Dr. Wollaston, who was immediately sent for, rendered every assistance, but the poor fellow died about two hours afterwards from internal injuries and the severe shock to the system.

End of the Locksmiths' Strike at Willenhall.—A meeting of the masters and men was held at Willenhall on the 9th inst., with the expectation of coming to a settlement of the matters in dispute. It was resolved,—"That this meeting will agree to resume work at the 7½ per cent. advance on the present price lists, with the understanding that the remaining 2½ be paid on the 1st of January, 1877." The meeting then ended. The men resumed work on Tuesday last.

Proposed New Town-hall, Old Meldrum. A movement is on foot in Old Meldrum for the provision of a new Town-hall. The existing hall on the Square is of insufficient accommodation. The feuars are anxious for a new hall, and they have appointed a committee of their number to consider as to the provision of a new hall, but no company has yet been formed. The committee have instructed Mr. Duncan, architect, Turriff, to prepare plans for a new building.

Reward of Bravery.—The *Journal Franklin* of Liége says that, at the recent distribution of rewards for acts of devotion and bravery, the workman Carie, of Anthisnes,—who, as our readers will remember, allowed himself to be burnt to the bone by molten lead, to save the life of one of his comrades,—received a public ovation. He was decreed a cross of the second class. A correspondent in the same paper asks, pertinently, what amount of devotion is necessary to merit the first class?

Health and Sewage of Towns.—A meeting of the Executive Committee of the Society of Arts in connexion with this subject has been summoned for the 24th inst.; and an invitation has been addressed to the surveyors and medical officers of health of the vestries and district boards of works of the metropolis, asking them to attend, to meet the committee, and confer with them on the house drainage of the metropolis.

Southport Chapel Competition. — The trustees of the United Methodist Free Church, Lord-street, Southport, having received seven competitive designs for proposed new chapel and school to be built in Duke-street, have accepted the plans submitted by Messrs. Maxwell & Tuke, Architects, 10, London-street, Southport. The amount proposed to be expended on the new building is 6,000*l.*

Toll Bridges.—It is stated that Mr. Wynne E. Baxter (Under Sheriff) has given notice of a motion for the next Court of Common Council, asking that it be referred to a committee to consider the advisability of giving Parliamentary notice of a Bill to effect the freedom of the toll-paying bridges over the Thames, with power for such committee to confer with the Metropolitan Board of Works.

Architectural Association.—The Architectural Association will commence its meetings for Session 1876-77 with a *conversazione* on the 27th inst.

TENDERS

For counting-house and foreman's residence, Whitecross-street, for Messrs. J. B. Gapp & Co. Mr. F. Harger, architect:—

Stone & Humphries	£785	0	0
Pyke	695	0	0
Bruce	650	0	0
Beguley	616	0	0

For warehouse, Charterhouse-square. Mr. Coutts Stone, architect:—

Elkington	£3,400	0	0
Moreland & Nixon	3,311	0	0
Killby	3,058	0	0
Lawrence	2,998	0	0
Mark	2,990	0	0
Ennor	2,835	0	0
Crabb	2,730	0	0
Scrivener & White	2,406	0	0

For an additional wing to the warehouse of Messrs. Heymann, Stoney-street, Nottingham. Mr. S. Dutton Walker, architect:—

Stevenson	£7,800	0	0
Measam	7,437	0	0
Underwood	7,430	0	0
Fish	7,370	0	0
Vickers	7,300	0	0
Hodson & Facon	7,282	10	0
Ward	7,250	0	0
Hind	7,187	0	0
Bromhead	7,103	0	0
Wood & Son	7,058	18	0
Bell & Son (accepted)	7,045	0	0

For the water-supply of the Urban Sanitary District of Ripley, Derby. Mr. R. Argill, jun., engineer:—

Contract, No. 7.

For erection of engine-man's house, boundary-wall, &c. Quantities supplied:—

Fletcher	£570	0	0
Slater	530	10	0
Warren	525	0	0
Fowkes	500	0	0
Clower (accepted)	482	0	0

Contract No. 8.

For the erection of engine-house, boiler-house, chimney, and water-tower. Quantities supplied:—

Fowkes	£2,352	0	0
Clower	1,957	10	0
Fletcher (accepted)	1,890	0	0
Slater	1,850	0	0

Contract No. 9.

For the supply and erection of engines, boiler, cast-iron tank, &c.:—

Kirkland	£1,900	0	0!
Bland & Son	1,595	0	0
Powis & Co.	1,550	0	0
Butterley Co.	1,450	0	0
Law & Son	1,450	0	0
Westray, Copeland, & Co.	1,339	0	0
Haslam Foundry Co.	1,280	0	0
Mason	1,239	0	0
Whieldon	1,210	0	0
Smedley, Bros.	1,125	0	0
Borwell	1,097	0	0
Tangye, Bros.	1,096	0	0
Thornewill & Warham (accepted)	1,085	0	0
Cowen & Co.	1,068	0	0
Newton & Co.	1,028	0	0
Buxton & Thornley	995	0	0
Bells & Co.	990	0	0
Lees & Co.	899	10	0
Swift & Co.	885	0	0!

Contract No. 10.

For the supply of pipes, valves, &c., for service-mains. Quantities supplied:—

Powis & Co.	£2,559	0	0
Westray & Co.	2,361	12	9
Bland & Son	1,958	11	2½
Laidlaw & Son	1,715	8	9
Butterley Co. (accepted)	1,697	15	2

For the erection of four warehouses, St. Thomas Apostle and Queen-street, Cheapside, for Mr. E. Hart and Mr. W. Courtney. Messrs. H. L. Hammack & T. J. Lambert, architects. Quantities supplied:—

Robinson	£9,774	0	0
Dove, Brothers	9,554	0	0
Newman & Mann	9,469	0	0
Ashby, Brothers	9,362	0	0
Browne & Robinson	9,186	0	0
Bangs & Co.	9,168	0	0

For new warehouses, Bute Docks, Cardiff. Quantities by the architect, Mr. Wm. Gaskell:—

Thomas, Watkins, & Jenkins	£7,480	0	0
Jackson & Co.	7,146	0	0
Shepton	7,143	6	0
Whalley & Pearse	6,757	17	9½
Jones & Co.	6,645	0	0
Howard	6,386	13	0
W. & J. Webb	6,240	0	0
D. J. & D. Davies	6,151	8	0
Biggs (accepted)	6,098	0	0

For alterations and additions to mansion at Palace Gate, Kensington, for Mr. H. P. Sharp. Mr. T. E. Knightley, architect. Quantities supplied by Messrs. Batterbury & Huxley:—

Manley & Rogers	£13,287	0	0
Downs & Co.	12,981	0	0
Ashby, Brothers	12,476	0	0
Newman & Mann	12,356	0	0
M'Lachlan	11,990	0	0

For erecting Board Schools at Ashwell, Herts. Mr. H. G. Luff, architect:—

Bates	£1,845	0	0
Thorne	1,800	0	0
Redhouse	1,790	0	0
Bailey (accepted)	1,680	0	0
Wilmott	1,330	0	0

For alteration to Oxford and Cambridge Chambers, Lord street, Liverpool, for Mr. J. Henstock. Messrs. Troughton & Prescott, architects. Quantities supplied:—

Parkinson	£623	0	0
Lamb	570	0	0
Beecham	522	0	0
Smith	505	0	0
Nicholson & Ayre	491	0	0
Thompson	483	0	0
Greenwood	479	0	0
Clarke (accepted)	460	0	0

For the erection of four houses at Upland-road, Peckham Rye, for Messrs. Charles Ross & Co. Mr. W. Paice, architect:—

Stowell	£1,400	0	0

For the erection of a block of buildings in Queen-street, Maidenhead, for Mr. J. H. Clark. Mr. E. J. Shrewsbury, architect. Quantities supplied:—

Cox	£2,637	0	0
Silver & Son	2,345	0	0
Simonds	2,291	0	0
Woodbridge	2,222	0	0

For the erection of a villa in the Dudley-road, Clive Vale estate, Hastings, for Mr. Charles Allerton. Mr. F. J. Shrewsbury, architect. Quantities supplied:

Womersley	£1,882	10	0
Vidler	1,871	10	0
Harman	1,630	0	0
Ditch	1,450	0	0

For reinstating two warehouses, Motley-street and Motley-avenue, Curtain-road, Shoreditch. Mr. John Hebb, architect:—

Abraham	£1,797	0	0
Rider & Son	1,778	0	0
Lathey, Brothers	1,770	0	0
Pritchard	1,731	0	0
Browne & Robinson	1,725	0	0
Macey	1,674	0	0

For roofs over new warehouses at Bankside, Southwark, for Mr. Moss Isaacs. Mr. C. Sewell, architect:—

Jopling & Co.	£700	0	0
Riches	645	0	0
Parker & Evans	595	0	0
Stone	575	0	0
Colliver	525	0	0
Winship	520	0	0
Blackmore	495	0	0
Vincent	457	0	0
Hutchinson & Co.	450	0	0

For additions to Holly House, Dorking, for Mr. B. Hicklin. Messrs. Bargman & Benison, architects:—

Hamblin, Brothers	£550	0	0
Heselgrave	498	0	0
Putney	477	0	0
Lynn & Dudley	449	0	0

For the erection of house and shop, High-street, Hampstead. Mr. Edward Monson, jun., architect:—

Cohen	£960	0	0
Parker & Evans	890	0	0
Warne	875	0	0
Vincent	865	0	0
Hunt, jun.	673	0	0
Beach, Brothers (accepted)	645	0	0

For new dining-room at the Horns Hotel, Shoreditch, for Mr. C. Higginson:—

Eaton	£157	0	0
Stamp & Bowtle (accepted)	143	0	0

For alterations at the Cat and Mutton, London-fields. Mr. E. Brown, architect:—
Stamp & Bowtle, accepted.

For stabling and offices at Woodberry-grove, Stoke Newington, for Mr. H. Burridge:—
Stamp & Bowtle, accepted.

Erratum.—In the list of tenders for St. Martin's Vicarage, Brighton, published in our issue on the 30th ult., the amount of Mr. Deacon's tender was stated as being 3,980*l*. It should have been 3,900*l*.

TO CORRESPONDENTS.

M. & T.—J. C.—C. M.—E. B. F.—R. A. jun.—L.—S. C.—G. T.—C. E. C. (we have much more of such matter than we can use)—H. G. W. (Mr. Archer was the architect of St. John's, Westminster. The lines quoted were written of Vanbrugh, to whom the design of this church has been wrongly attributed)—P. G. (in such case the only way is to bake it by means of brass jars).—S. H.—Rev. J. J. N.—W. N. W.—D. R. & F.—L. L.—C. B. W.—G. M. R.—C. H. B.—C. C.—C. C. H.—T. M. B.—P. L. N. F.—J. S. G.—Mrs. B. N.—G. C.—T. S. & W.—S. Bros.—G. M.

We are compelled to decline pointing out books and giving addresses.

All statements of facts lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication

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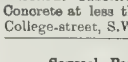
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The Builder.

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Railway Work in Canada.



THE Intercolonial, a History, is the title given to a book of no little interest* in regard both to the constructional and to what may be termed the political aspects of railway-making. It contains the history, from the first preliminary agitation of the scheme down to its final completion, of the line of railway called the "Intercolonial," which by a very circuitous route connects Quebec with Halifax and St. John. The book, as we learn from the prefatory letter addressed to the Hon. Alexander Mackenzie, Minister of Public Works and Premier of Canada, arose out of the fact that it became the duty of the chief engineer, on the completion of the line, to draw up a full report of it for the Government. Regarding the Intercolonial Railway as "national in its objects and character," the engineer thought that something beyond a mere professional and technical report would be of interest, and therefore, with the concurrence of his Government, has expanded the report into a general history of the line, giving all necessary technical information, but put into such a form as may make it of interest also to general readers. The idea has been exceedingly well carried out. There is no fine writing in Mr. Fleming's history; there is not, in fact, a superfluous sentence in the book; the technical description of the operations is fully illustrated by careful diagrams as well as by views of the principal structures on the line, while the interest of the non-professional reader is kept up as well by the clear and lucid account of the various difficulties in the route, and the means by which they were overcome, as by the broad view which the writer always keeps before him of the social and political relations of the subject, which impart to it, as he says, a national character, and have in one or two points also a direct practical interest for dwellers on this side of the Atlantic.

A great part of the introductory portion of the account is, in fact, intimately associated with the political history of Canada and New Brunswick. We can only just touch on the salient points in the long negotiation phase, as we may term it, of the scheme. The first suggestion of the advantage of a line connecting Quebec directly with the Atlantic coast was made from England in 1832, by Mr. Henry Fairbairn, whose letter on the subject, in the *United Service Journal*, is quoted at length, and a special tribute paid by the author to the foresight which Mr. Fairbairn exhibited in suggesting at that early date the main features of a scheme which has only just been completely realised. The idea then was that St. Andrew's should be the maritime terminus of the line, which was to cut directly across country in as straight a line as possible to Quebec. In 1836, in response to an appeal for help from St. Andrew's for a project the importance of which had by that time become fully realised, the English Government voted 10,000*l.*, to be expended in the difficult and costly process of making the necessary preliminary survey of a country then almost entirely uncleared, and the character of which had only been vaguely guessed at from the reports of a few hunters who had traversed it. Subsequently to this survey intervened the political difficulties in connexion with the Maine boundary question; and when, in 1842, the boundary between New Brunswick and the State of Maine was definitely settled, the result was to leave within the boundaries of the latter nearly the whole of the district over which the costly survey of 1836-7 had extended; a trifling *contretemps* which knocked that scheme on the head pretty effectually, and leaves at least the lesson not to survey a country till you know whether it is your own or not. The idea of the Intercolonial Railway revived, however, in the railway mania year of 1845; and in 1863, after repeated negotiations between Canada and the mother country, the English Government undertook to grant a loan of 3,000,000*l.* to assist the enterprise, so soon as a survey of the proposed route had been made and approved by Parliament. It was at this phase of the history that the author of the present volume was appointed to carry out the survey on behalf of the Canadian Government, and to co operate with two other professional representatives of the Imperial Government and the Lower Provinces respectively. On the 5th of March, 1864, Mr. Fleming left Quebec for Rivière du Loup, the terminus of the already constructed "Grand Trunk Railway," to arrange about forwarding supplies and commence a reconnaissance, which had to be carried on in a country destitute of roads, upon snow-shoes and dog-sleds. The report was made in 1865, and fifteen lines, or combinations of lines, were compared. The doubt and difficulty about the route almost entirely resulted from the destruction of the possibility of a direct route between St. Andrew's and Quebec by the interposition of the limb of the State of Maine. For the details of the controversy which issued, upon the relative advantages of different routes, and which was not finally terminated till September, 1868, we must refer the reader to Mr. Fleming's book: the account has considerable interest in regard to what may be termed the political economy of railway-making. The main contest was between the principle of keeping as near the original short route as possible, skirting the Maine State frontier (and which was called the "Frontier Scheme"), and taking a longer and more circuitous coast route, touching the head of Chaleur Bay and then skirting the shores of the St. Lawrence and joining the Grand Trunk Railway at Rivière du Loup. The effect of this is to take the line over a large arc of a circle instead of over the chord of the arc as originally suggested; the extra distance being compensated for by the increased importance of the coast route for traffic and for military purposes, and the increased facility for sending supplies and materials for a line which touched the coast at several points, as compared with an inland route through uncleared districts. Eventually, and after struggling against much opposition, the engineer-in-chief, who had always believed in the coast route, succeeded in obtaining precisely that modification of it which he had recommended; and which, starting from Halifax, crosses the head of the Bay of Fundy to Moncton, whence it sends off a south-western branch about ninety miles in length to St. John's, continuing its course northward to Chaleur Bay, and westward to the junction with the Grand Trunk Railway on the right bank of the St. Lawrence: making a total length of more than 700 miles of railway. The selection of the Chaleur Bay route is not without interest for Europeans, as one idea in selecting it was, that a port for ocean steamers at Chaleur Bay would shorten the whole distance between Montreal and Liverpool fully four hundred miles, and that even between Liverpool and New York one hundred and sixty miles would be saved by commencing the Ocean passage at Chaleur Bay. In furtherance of this view Mr. Fleming mentions that a survey has already been made for a branch line of about forty miles in length eastward from the intercolonial main line at Bathurst to Shippigan, at the entrance of Chaleur Bay, with the view of providing "a short mail route between England and America"; and that the survey shows that only wharfs and piers, a short distance from the land, are necessary to make the harbour available for the largest steamers.

The line was carried on under Commissioners till 1874, when Parliament passed an Act vesting all the powers and duties of the Commissioners in the Minister of Public Works, to whom the present history is addressed. At the first meeting of the chief engineer and his assistants with the Commissioners on December 30th, 1868, a dispute arose, which was not settled for some time, in regard to the recommendation of the engineer that all bridges should be of iron, and the wish of the Commissioners to build them of timber. This is a point in the history which touches on the subject of some recent remarks of our own on the picturesque aspect of railways. Considering that the railway was made through a timber country, it would seem that, even on the obvious principle of the utilisation of natura resources, the Commissioners had reason on their side. The chief engineer, however, entertained a more decidedly opposite view, fought the matter perseveringly, and succeeded eventually (as he appears generally indeed to have done) in getting his own way. His main reason appears

* The Intercolonial: an Historical Sketch of the Inception, Location, Construction, and Completion of the Line of Railway uniting the Inland and Atlantic Provinces of the Dominion; with Maps and numerous Illustrations. By Sandford Fleming, C.E., Engineer-in-Chief of the Newfoundland, Intercolonial, and Canadian Pacific Railways. Dawson, Bros., Montreal; Sampson Low, Marston, & Co., London. 1876.

to have been that iron was more permanent, could be delivered by sea at certain points without extravagant cost, and was free from danger from fire; and two of the timber bridges on the Grand Trunk Railway had recently been burned. This latter is a serious consideration, but might have been provided against by iron lining to the roadway, as it must be presumed the fire originated in those cases from cinders dropped by the engine. As to the question of permanence, is that fairly settled? While we applaud Mr. Fleming for his persistency in fighting for what he considered the best construction, we cannot but reflect, on looking at the numerous views of the bridges in his book, how in every case it is the ironwork which is the drawback to what would otherwise be a style of structure perfectly in keeping with the country, and cannot but wish that the experiment might have been fairly made of using the natural material of the country, and showing what could be done with timber, which the modern engineer so completely neglects for his favourite iron. But in his general views Mr. Fleming is remarkably in accordance with those recently expressed in our columns in regard to the treatment of railway structures, so far as appearances are concerned. He says (p. 113),—

"A railway of a high standard is, in fact, a simple problem. It does not exact magnificence of design, or works which astonish by their display or cost. Architectural monuments have no place on public works like the one in question, and many well-known structures can be regarded only as memorials of useless expenditure.

As a theory, the perfect railway consists of two parallel lines of continuous rails, uniformly sustained by a firm and slightly elastic support. Bridges and culverts are incidents naturally to be looked for, but never to be introduced except where absolutely exacted. It is the duty of the engineer to design and establish them as cheaply as he can, having regard to permanency, and not to convert them into opportunities for display. Taste may even be consulted without any expenditure beyond that required to secure solidity, and the skill of the designers should aim at the attainment of effect with the least extent of adorned material, and strive after the grace of outline to be found in extreme simplicity.

In the Intercolonial Railway it was held better to aim at the realisation of this principle, than to advocate the introduction of structures remarkable for their magnitude and ornament, however gratifying to the personal pride of the designer."

We are glad to find an able engineer like Mr. Fleming so completely endorsing, not only the spirit but almost the very wording, of some of our own remarks on railway structures (p. 816, *ante*). How he puts his ideas into practice we see from such illustrations as the views of the large piers of the Metapedia and Restigouche Bridges (plates 13, 15), and the general view of the Nipisiguit Bridge (plate 22). The great mass and strength of the Restigouche Pier, in comparison with the light superstructure, is no matter for surprise when the habits of the river are considered. In addition to the chance of "ice-jams" when the winter ice breaks up, the Restigouche is subject to spring freshets, in which the water rises 18 ft. or so above the average level, and as a great deal of timber is cut on the banks of the river, the contingency of rafts and rift logs striking the piers and endangering the superstructure had to be provided against by the greatly prolonged cutwater, to act as a guard. The author mentions that he has seen a bridge bodily carried away in Canada by drift timber on a rising stream, and that when proper precautions are not taken the occurrence is not uncommon. "During a 'timber drive' at flood water, the logs form a jam against the piers, and as the water rises are raised beneath the superstructure, lift it from its seat, and finally carry it away." In order to give greater strength to the cut-water, it was faced with granite, which had to be brought nearly ninety miles, seventy of which only were by open navigation. The blocks, weighing from three to nine tons in their finished sizes, were prepared in the quarry. "The face stones of the cut-water, the coping, bridge seats, and the two upper courses of ashlar, together with the skew quoins on the down-stream end of the piers, are of granite. A striking contrast is accordingly obtained to the dark slate colour of the body of the masonry, which adds to the appearance of the structure. . . . . The whole is built in Portland cement, and the exposed parts of the piers were secured by strong iron clamps, so contrived that it would be impossible for floating logs or ice to disturb a single stone without moving the whole mass to which it is attached." There are four mid-stream piers, and the work occupied five years and a half. The Nipissiguit Bridge was a much simpler affair, as the river is a comparatively shallow and well-behaved one. These illustrations, however, serve to show (as well as a good many others in the book) how very nearly modern engineering works, when treated unpretentiously and frankly in reference directly to the constructive necessities of the case, may approach to the characteristics of Mediæval building. There is something in the ponderous Restigouche pier, with its sloping lines and granite face, which irresistibly reminds us of the effect of a massive piece of early Gothic building, before the style had frittered into ornamental detail; and the outline of the Nipissiguit piers is as effective and picturesque as if this had been a main object. One can imagine how completely the effect and character would be taken out of these structures if the piers were ornamentally (?) panelled in the way many English engineers employ to give what they consider an architectural character to their constructions. The Tête-à-gauche Bridge, on the same section of line, which crosses a ravine with only a small stream, and where the piers stand mostly on dry ground, is a still more simple construction, the piers consisting merely of cubes of masonry carried straight up to the required height; the general effect at once recalls, on a larger scale, the style of bridge found over brooks in some wild parts of Wales, consisting simply of plain square dry-stone piers with a plank and rail across the top, and which, as we all know, artists are never tired of sketching and introducing into their landscapes. These and other illustrations at least indicate how entirely free from vulgarity railway structures may be, when there is no attempt made to dress them in an incongruous and ill-fitting decorative masquerade.

We need hardly say that the illustrations to Mr. Fleming's book are not confined to picturesque views; that full constructional plans and sections of the principal bridges are given, showing the details of the problems presented in bridging these (mostly) wide and rapid rivers. One or two points in the description of the process of constructing the bridges over the double stream of the Miramichi may be mentioned. This was one of the most difficult and important constructions of the route; and the section of the river was very deceitful. The preliminary boring operations, made with such boring implements as could be extemporised in the neighbourhood by a country blacksmith, to test the bed of the river, revealed a hard bed of some kind, under 25 ft. of water, and about the same of soft mud; and as the operator saw sandstone rock cropping up at the margin of the river, he excusably flattered himself that he had arrived at the rock. But subsequent tests with more perfect implements dispelled this pleasing allusion. What the first boring-tool had struck was a stratum of hard gravel, abont 8 ft. thick, below which came about 70 ft. (in the centre of the river) of silt, then about 15 ft. of clay, and below that the rock*. By various borings it was ascertained that this false bed of gravel was a nearly horizontal stratum; and the question was, could this comparatively thin gravel deposit, floated upon a bed of silt, be trusted to carry the piers, and thus save the immense cost and labour of penetrating to the rock? We may cite the author's description of the operations, partly complicated by the fact that the Miramichi, at the point where it is crossed, is a tidal river:—

"The boring was performed in the usual manner, 7 in. tubing being used. Some arrangement was, however, necessary to meet the difficulty which the rise and fall of the tide presented when operating from the ice" (from which the borings were performed in winter), "in order that the tube should be maintained vertical and steady, and free from all liability to derangement, as the ice rose and fall. A wooden tube or box, 9 in. square inside, and of sufficient length to extend beyond the range of tides, was sunk through the ice, and had arms which rested upon and were made fast to the surface. This box protected the upper part of the iron tubing from the ice, while itself rose and fell with the tide. When operating from a scow" (in summer) "a well through the floor of the scow served the same purpose. On reaching a suitable depth a smaller tube, 5 in. diameter, was introduced, telescopic fashion, care being taken that the upper end of the smaller tube did not fall below the bottom of the larger one. The point of the tubing was in all cases made to precede the point of the valve auger or other boring-tool in use, and thus the exact depth and character of the various strata were ascertained.

As the boring proceeded for the north-west bridge, experiments were made to ascertain by direct pressure the load which the strata would carry. On the tubes reaching the point to be tested, and the material within having been removed, iron rods, smaller than the tubing, were passed down. The rods terminated in a blunt end with an area of three square inches. They were kept clear from friction, and were loaded above the surface of the water with different weights, which were allowed to remain for definite lengths of time. In this manner the supporting power of the different strata in the bed of the river was distinctly ascertained."

A table of the result of these tests is referred to as given in the appendix, but appears to have been omitted through some oversight. The information, however, satisfied the engineer that the gravel stratum could be trusted to, with a wider base to the pier than was at first intended; which, after a little inevitable grumbling on the part of the contractors, was agreed to. For the detailed account of the building of the piers, which is very interesting, we must refer the reader to Mr. Fleming's pages. The piers now stand on 19 ft. thick of concrete (the upper surface within 5 ft. of low-water mark), which rests on a bed of crushed stone of the same thickness, supported by the gravel stratum: and the whole of this was surrounded by a mass of "rip-rap," or loose stones piled together, as a further defence from the disturbing action of the current. The piers were heavily loaded and left for some time, as a further test of the security of the gravel stratum, which proved perfectly satisfactory; what little settling there was in the process of building being traced to the compression of the stone filling under the concrete as the load of the pier came upon it. The whole account is worth the attention of all who are interested in engineering works.

Among special points in the construction of the Intercolonial railway may be mentioned the form of abutment adopted by the engineer where the bridges rest on the embankment. He discards wing-walls altogether, and simply builds up a strong hollow tower of masonry with vertical sides the width necessary to support the shore end of the bridge, and round which the slope of the embankment is finished, so as to surround the masonry tower. It is needless to say that this method, the appearance of which may be judged of from the views of the Metis Bridge and New Mills Bridge (plates 8 and 20), does not make so neat a finish to the termination of an embankment as the wing-wall system, and it appears to us that there may be situations and soils where the wing-wall would be almost a necessity; but the practical objection to wing-walls in the Canada climate, as stated by Mr. Fleming, is, that if the embankment is composed of anything that will hold moisture, the winter frosts give it an expansive force which, in the end, will fracture or displace masonry of any strength; whereas it is impossible for the hollow towers placed in the heart of the embankment, on his system, to be injured either by the thrust of the earth or by frost. The description of the difficulties with the clay-cuttings near Trois Pistoles is a phase of the story to be noted. Another point we may mention is the method devised by an enterprising sub-contractor for excavating by water-action. At one place on the Metapedia River, "a steep bank, about 120 ft. high, and composed chiefly of gravel, projected for a distance of about 1,000 ft. along the edge of the river, leaving no site for the railway. It was designed to construct an embankment along the river side, protected by extensive crib-wharfing. The sub-contractor introduced a method of washing away the gravel by means of water-jets. Streams from the high side-hills were dammed up at a point about half a mile from the work; the water was conveyed by a wooden trough to the place required, and directed against the face of the bank in a continuous stream. Its force undermined and loosened the material so effectually that masses, often by thousands of yards, would slide into the river in a brief space of time. Immense quantities of material were thus removed, with very little manual labour, and at a cost, probably, less than one-sixth of ordinary excavation. The result was, that the railway was made on solid ground, requiring little or no protection. This system of excavating material by an available flow of water was so successful, that it was adopted on other portions of the line where streams with sufficient fall could be obtained."

With this new "wrinkle" (as we believe it is) for the engineer in dealing with matter that is in the wrong place, we must conclude our remarks on a very interesting history of the triumph of engineering skill and perseverance over natural obstacles in the formation of a line of road the ultimate importance of which can only be partially estimated at present. It is desirable that the attention of general readers should be directed to a book which will give them a better idea than most of the public at present have of the process of forming the rail-

* The complete section of the river given in Mr. Fleming's diagram suggests very vividly the immense lapse of time since these rivers commenced their present course. What is now sandstone rock is evidently the original "scoop," at that time probably much softer: then upon this comes the deposit of clay and the much thicker deposit of silt, and on that the new deposit of gravel which has had time to consolidate to almost the hardness of rock, and become the real bed of the stream, and receive 25 ft. of more modern deposit of mud.

ways over which they travel. As the author remarks in his concluding chapter, "the traveller who is borne onwards, moving in an hour a distance which would have taken weeks to traverse through the tangled forests, scarcely casts a thought on the thousands of the sons of labour who toiled so many days and years in making smooth his path." With a chivalrous feeling of giving due credit and honour to all who have aided him in the work, the chief engineer appends a list of the whole engineering staff who have been employed on the line each year from the exploratory survey in 1864 to the completion of the line, marking in italics the names of those since deceased, to whom this last tribute becomes therefore more especially a duty. We congratulate Mr. Fleming on the successful completion of a great enterprise, and on his able and clear compilation of a history which ought to interest equally the professional and the non-professional reader, whether in regard to the constructive difficulties that have been overcome, or the social and political importance of the route that has been completed in spite of them.

THE MAINTENANCE OF ROADS AND FOOTWAYS, AND PAVING CHARGES.

Sir Gilbert Scott, in a letter to the *Times*, has drawn attention to the neglect of the vestry of the parish in which he resides to maintain and repair a certain "new" street, the houses in which have been completed for nearly two years; and he attributes the delay of the authorities in undertaking this duty to the fact that several houses are unoccupied, and "that there is no one to pay the rates."

The complaint of the eminent architect, and the admission that he seeks a remedy in the publicity afforded by a "letter to the *Times*," for want of knowing any other available means, are an apt illustration of the general uncertainty of the law on the subject, of the varying practices of different vestries, and—worse still—of the slight regard too often paid by the parish authorities to the individual interests involved, and the consequently harsh manner in which their powers are made to press upon owners, occupiers, and the ratepayers in general.

A short *résumé* of the legal enactments on the subject may be useful, therefore, in many ways.

The General Highway Act, 1835 (5 & 6 William IV., c. 50) is the principal statute upon which the general practice of parishes throughout the country is based; but for the metropolis this is supplemented by the Metropolis Local Management Act, 1855 (18 & 19 Vict., c. 120), and the amending Acts of 1856, 1858, and 1862 (the Act 19 & 20 Vict., c. 112; the Act 21 & 22 Vict., c. 104; and the Act 25 & 26 Vict., c. 102). There are other Acts incorporated with these statutes, or having special reference to the powers and duties of vestries in the metropolis, but it is not necessary for our purpose to refer here to more than one of these.

We must, however, make mention of the Act 57 Geo. III., c. 29, called the "Metropolitan General Paving Act," but generally known as "Michael Angelo Taylor's Act," which, passed in 1817, was incorporated, or so much of it as remained in force, by sec. 73 of 25 & 26 Vict. c. 102, in the Metropolis Local Management Acts. The operation of that Act was originally limited to the streets and public places then paved, or which might thereafter be paved, within the cities of London and Westminster and the borough of Southwark, and other parts included within the weekly bills of mortality, and within the parishes of St. Pancras and St. Marylebone, with certain specified exceptions; but these exceptions were abrogated, and the Act made to apply to unpaved streets, by the last-mentioned statute. "Many of the parishes comprised in the present metropolitan limits were neither within the bills of mortality, nor included among the parishes specially mentioned in that Act, but the 25 & 26 Vict., c. 102, sec. 73, has now extended many of its provisions to the whole of the Metropolitan districts." (Woolrych, "Metropolis Local Management Act," 1863, p. xxxv.)

Sections 6, 7, 8, and 9 of this Act are the only ones to which we need refer. Briefly, these sections make provision for the repair by surveyors of dangerous or defective pavements, on the requisition of the occupier or occupiers of houses rated to the relief of the poor at the sum of 50*l.* per annum.

But these sections refer only to streets already actually paved. The question which is exciting so much public feeling in different localities is the action of the vestries in dealing with roads and streets either already taken over by the parish, but not paved, or "new streets" not yet formally taken under their charge.

Under the General Highway Act (5 & 6 Will. IV., c. 50, sec. 23) it is enacted that no road made, or hereafter to be made, at the expense of any individual, "shall be deemed or taken to be a highway, which the inhabitants of any parish shall be compellable or liable to repair," *i.e.*, which shall be repaired at the expense of the rates, unless the "person . . . . . proposing to dedicate such highway to the use of the public shall have made, or shall make the same in a substantial manner, to the satisfaction of the surveyor, and of any two justices of the peace; after which, certain formalities in the way of certificates have to be gone through; and after such highway has been used by the public and kept in repair by the person dedicating it, for the space of twelve calendar months, "such highway shall for ever thereafter be kept in repair by the parish in which it is situate."

The Metropolis Local Management Act, 1855, prescribes other modes by which "new streets" may be taken by vestries or district boards. It is necessary, however, to understand the exact meaning which the Legislature assigns to the terms which will be used in the consideration of this subject. The word "street" is defined to mean "any highway (except the carriage-way of any turnpike-road), and any road, bridge (not being a county bridge), lane, footway, square, court, alley, passage," &c. (sec. 250, Act of 1855). The term "new street" is (by sec. 112 of the Act of 1862) defined to "apply to and include all streets hereafter to be formed or laid out, and a part of any such street, and also all streets, the maintenance of the paving and roadway whereof had not, previously to the passing of this Act, been taken into charge and assumed by the commissioners, trustees, surveyors, or other authorities having control of the pavements or highways in the parish or place in which such streets are situate, and a part of any such street, and also all streets partly formed or laid out."

By the same section the word "pave" is made to "apply to and include the formation of the roadway or footway of any street."

The above are the only terms used, to the meaning of which any exact limits are assigned in the Acts.

Sec. 98 of 18 & 19 Vict., c. 120, gives power to every vestry and district board from time to time to cause all or any of the streets within their parish or district to be paved or repaired in such form and manner, and with such materials as they shall think fit; the work to be performed at the expense of the rates, except in cases where the freehold of any court, passage, or public place, not being a thoroughfare, is vested in the owner of any adjoining houses, when (by sec. 99) such owner is to do the work if necessary.

By sec. 105, it is enacted that "in case the owners of the houses forming the greater part of any new street laid out or made, or hereafter to be laid out or made, which is not paved to the satisfaction of the vestry or district board, be desirous of having the same paved," or if the vestry or board think it necessary to do so, the vestry shall well and sufficiently pave the same, and levy the expense on the owners of the houses forming such street, such amount to be determined by the surveyor.

This section was afterwards amended by Sec. 77 of the 25 & 26 Vict., c. 102, by which the vestry, having paved, or being about to pave, any new street, are enabled to call upon the owners of land abutting on or bounding such street to contribute towards the expenses of the paving, as well as the owners of houses therein, provided that the owners of land may be charged a less proportion of the cost than the owners of house property, if the vestry deem it just and expedient to do so.

Under these sections, it will be seen, the duties and powers of the authorities are amply enumerated. Highways the vestry of a parish is bound to keep in repair. All streets it is also bound to maintain, pave, and repair at the expense of the general rates, with certain exceptions where the cost may be levied on the occupiers. New streets, however, a vestry may cause to be "paved" at the expense of the owners of land and houses therein. The levying of the cost of this work on the owners is recognised as a just and fair act, as the owners are more interested in the proper condition of a road than any other person, until, at any rate, it becomes a public thoroughfare,—a highway,—when the public, as enjoying the use of it, are fairly called upon to maintain it, and the parish generally made to contribute towards the expense. A landlord cannot expect his house in a new street to let well if its approaches at all resemble the description given by Sir Gilbert Scott of the condition of the road which has roused his indignation. He says, "During the winter it became so alarming and terrible a quagmire that the very horses were in the habit of taking fright at it, and refusing to plunge into its depths; but not a hand was stretched out to amend it, excepting a short length, which was repaired by private persons, and excepting also, that at one time during the winter a quantity of the less liquid mud was scraped up and laid in piles by the roadside. Spring came on, and the only amendment was that brought by nature in the reduced amount of water. As summer drew on, the pools of mud were converted into deep beds of dust, reconverted into quagmires by each alternation of rain; while the heaps of mud laid up by the sides of the road during the winter became hardened, and threatened overthrow to any luckless vehicle whose wheel during the night might chance to pass over them. Now, again, autumn and the rainy season have come on. The holes, long filled with dust, are again filled with slush, and we are threatened with the same terrors which accompanied the last winter, aggravated by the greater depths to which the abysses have been worn."

In such a case as this, it is not the "occupiers," but the owners who are liable to pay the expense of paving the road; and intending occupiers should take warning by the example, and insist on the duty being performed before they take possession of houses in a new road. In any case, the vestry have the power to see the work carried out, and they ought certainly to do so.

The longer such a work is left undone, the greater is the hardship upon future owners. If houses change hands while a street is left unpaved for a long period, the future owners have a fair cause for complaint in being called upon to pay up the quota of the expense which should have fallen upon the original owners.

There are great complaints, in fact, in various parishes that all the roads are not treated in the same way; the owners, in some instances, being called upon to contribute the whole of the expense; while, in others, the work is done at the cost of the parish.

A further sense of unfair treatment is excited by the fact that certain streets are paved with York flagging, the most expensive material; while others, similarly situated, are paved with asphalte, which is less costly; and in others, again, tar-paving, a still cheaper material, is employed. When the circumstances of different streets vary, this exercise of discretion is to be applauded, and it is quite reasonable that the most serviceable material should be used in streets subject to heavy and continuous traffic, while pathways liable to little wear and tear should be paved with the less durable, and cheaper, but equally suitable, material. But where streets subject to exactly the same conditions are treated differently, and the owners are called upon to pay, in the one case, the heavy charge of York flagging, while asphalte or tar-paving would be all that was necessary, and those materials are used in adjoining streets, the complaints are manifestly well founded.

But there is one further section in the Act, 25 & 26 Vict., c. 102, viz., sec. 78, which acts with the greatest hardship, and against the exercise of which a very strong feeling exists. In South London especially this is the case, and the Lambeth vestry have brought themselves into great odium by their action in reference to particular roads under this section.

This section enacts that in case any footway laid out at the passing of the Act of 18 & 19 Vict., cap. 120, shall have been repaired by the vestry or any other body, but shall not have been flagged, and the vestry or district board shall have deemed it necessary or expedient, or shall deem it necessary or expedient that the same shall be flagged, and such vestry or board shall have flagged or shall flag the same . . . . . it shall be lawful for such vestry or board to levy the costs and expenses by a rate or rates upon the occupiers of the houses in the road, street, or part abutting on or next to the footway which shall have been so flagged."

In this section two terms are used, of which

no definition is given in the Acts, viz., "flagged," and "laid out." The street must have been "laid out" before August 14th, 1855, or the vestry cannot proceed under the section.

St. John's-road, Angell Town, Brixton, is one of the roads to which the vestry of Lambeth have been endeavouring to apply the provisions of this clause. In 1855 St. John's-road contained five houses. It now contains twenty-five houses, and is 200 yards in length. About six months ago, the vestry ordered the footways of the road to be "flagged," *i.e.*, paved with York stone paving, and they have since called upon the occupiers to pay the costs. Up to that time the vestry had treated the road as a parish road, as it was a highway under the General Highway Act, 1835, having been dedicated under the provisions of the 23rd section of that Act quoted above; but the paths and roadway were allowed to get into a state of disrepair, and a public meeting of the inhabitants was called, in May, 1875, to urge upon the vestry the necessity of placing the street in a proper condition. Without in any way consulting the memorialists the vestry caused the flagging to be laid, and demanded the expenses from the occupiers.

The legal aspect of the question turns upon the construction to be placed upon the term "laid out." The occupiers maintain that the footpath was not laid out according to the intention of the Legislature, as there were only five houses built at the prescribed time. They contend that if "laid out" means "planned" on paper, or staked or marked out on the ground, there are many other roads in the parish which were equally "planned" many years antecedent to 1855, but which were not actually formed till very recently, and which the vestry have treated as "new streets," or have taken over and paved with flagging or otherwise at their own expense. The adjoining roads on the same estate (the "Angell Estate"), viz., the Wiltshire-road, Angell-road, and Angell Park Gardens, all of which were planned for building purposes at the same time as the St. John's-road, and which were actually completed at about the same period, have been flagged by the vestry, and the costs charged to the owners under the 105th section of 18 & 19 Vict., cap. 120, and the 77th section of the Act 25 & 26 Vict., cap. 102.

As a contribution towards ascertaining the real meaning of the words "laid out," we may point out that they are used in sec. 105 of 18 & 19 Vict., cap. 120, where "the owner or owners of the houses forming the greater part of any new street *laid out* or made," may call upon the vestry to pave the same, or the vestry may do so when they deem it necessary, and make the owners pay the costs. Now, no owner would incur this expense sooner than he could help; and he would not ask the vestry to pave a street which had only five houses built out of a possible thirty; for, under that section, before it was amended by sec. 77 of 25 & 26 Vict., cap. 102, the owner of say the five houses built would have had to pay the whole cost of paving the total length of street available for, perhaps, thirty or three hundred houses. The Legislature, therefore, could not have intended that the words should refer to the existence of the road on paper, but to its existence with houses along its whole length, or, at least, for practical purposes, for its whole length. Otherwise, where five houses were built out of a possible thirty, and the vestry chose to think the road should be paved, then they could have paved its entire length, and charged the expense to the unlucky owner of the five houses!

Had any other material besides "flagging" been used, the vestry must have performed the work at its own cost; and in many similar roads and streets in the neighbourhood, whose history is precisely identical with that of St. John's-road, tar-paving has been laid, and the costs charged to the general rates. The use of stone paving is said to be as unnecessary in the case of the St. John's-road, as in that of the other streets, and it is considered a hardship that so expensive a material should have been used when tar-paving would have sufficed.

When the above (78th) section was passed, asphalte and tar paving had not come into use, and "flagging" was recognised as the only permanent method of paving a path. It was, in fact, a choice between gravel paths and York pavement. At the present time, however, asphalte is superseding York paving, both on account of its relative cheapness and its perfect suitability and durability under the hardest foot-traffic. Tar-paving is now used as a substitute in paths where the traffic is less heavy. It is a question, therefore, whether the literal expression in the Act has not become obsolete, as the intention of the Legislature evidently was to secure the most lasting mode of pavement,—which would now be equally secured by the use of asphalte. If the literal reading of the Act is to be enforced, the vestry here are legally right in their claim, provided they are right in their reading of the words "laid out." But, if they are right, it would be equally lawful for them to have paved St. John's-road with asphalte, at the parish expense, and years afterwards to tear up the asphalte, and lay down "flagging," and *then* to claim the costs from the occupiers, because the road was "laid out" (otherwise planned) in 1855, and because it had not been "flagged" (otherwise paved with an arbitrary mode of paving which was no better than the asphalte).

Such a proceeding would not be tolerated, and no vestry would attempt to carry it out. It would, however, be perfectly lawful, though not equitable. Under present circumstances, the vestry should temper legality with equity, and not insist on their claim.

Permanent public improvements of this sort are in all cases effected either at the public expense or at the expense of the owners of the property affected; and there is no other instance in which the costs of such works can be levied on the occupiers unless they have the power to recover from the owners. In the present case, many of the houses have changed hands, and the purchasers have no doubt given full value for the property, without taking into consideration the chance of such an expense hanging over them in the future. Occupiers have given full rents for their houses, without counting that such a charge was impending. Rents, therefore, have been maintained at their fullest figures, and the rates paid have consequently been heavy. Had there been any general idea that the present charge would be made, occupiers would have stipulated for reduced rents, and the rates would therefore have been less. To receive the full rates, part of which is applied to "paving purposes," and then to make a special charge for the special paving operation, is therefore an unjust act on the part of the vestry. The present rateable value of the houses in St. John's-road is 1,499*l.* In the year 1876 they will contribute about 122*l.* towards the General Purposes Rate, and in past years they have contributed in proportion. In other words, the vestry have been receiving heavy rates towards paving charges, which they would not have received if the present charge had been anticipated.

We have gone fully into particulars, and have found it best to argue upon a specific grievance, rather than to take the abstract question, as illustrating more forcibly the point to which we referred at the commencement of this article, viz., the hardship which is inflicted by the varying provisions of the law, and the conflicting action of different vestries, or of the same vestry in different cases. Not that St. John's-road is the only case to which we could refer; there are other similar cases, though this is in every sense a typical one.

We would here point out that the provisions of the law are, as will be seen from the above recapitulation, chiefly permissive, and not absolute. The only instance in which the directions of the Act are imperative is under section 105 of 18 & 19 Vict., cap. 120 (amended by section 77 of 25 & 26 Vict., cap. 102). Here the enactments *shall* be carried out. In all other cases the powers are permissive merely: "It shall be lawful" are the words used. This fact points to the probability of cases occurring where an absolute enactment would be harsh in its application; and in such instances the Legislature has wisely left it to the discretion of the authorities to carry out the law in the most equitable manner, trusting to their judgment not to abuse the confidence placed in them.

The Metropolis Valuation.—On Saturday a Parliamentary paper, extending to twenty-two folio pages, was issued as to the valuation lists of the Poor Law Unions in England and Wales. With regard to the area comprised in the metropolis, the estimated rental, as settled in the valuation list in force at Lady-day, 1874, was 25,148,033*l.*, and last year 25,574,366*l.* The rateable value settled in 1874 was 20,672,765*l.*, and in 1875, 21,019,507*l.* The difference in the two years was, increase 356,212*l.*, and decrease 9,470*l.*

PROGRESS AT THE PARIS INTERNATIONAL EXHIBITION BUILDING.

The embanking and masonry work on the Champ de Mars, estimated by the administration at 3,100,000 francs, has been adjudged to M. Delauny, who accepted the above price, with a reduction of 10·50 per cent., and providing the required security of 100,000 francs. The construction of administrative offices and medical posts on the Champ de Mars and the Trocadero has been entrusted to M. Borgeot, at a total cost of 22,100 francs.

M. Krantz has been busily occupied in definitely selecting the members of the Exhibition committee for the department of the Seine. The duties of these gentlemen will be more arduous and delicate than those of the committees of the other departments, since Paris furnishes the greater number of French exhibitors, and the rejection or acceptance of inventions being at their discretion, considerable care will be required in selecting men known for their competency, sound judgment, and impartiality.

Two Italian delegates, Cammandant Ellena and Professor Basile, accompanied by M. George Berger, director of the foreign sections, had an interview with M. Krantz on Saturday last, to solicit more space, since Italy desires to take a large share in the Exhibition; they also approved of an international façade to take up the whole length of the grand avenue in the interior, which separates the foreign sections from the fine-art buildings.

The architecture which will be chosen for that portion opposite the Italian department will be selected from the purest specimens of the work of sixteenth century. In Austria, 370 manufacturers have already inscribed their names to take part in the Exhibition.

A THOUGHT OR TWO ABOUT CONSTANTINOPLE.

Now that "Eastern" matters, to use that very comprehensive and expressive term, are so much before the world, it may, perchance, be of some interest to make note of a few things which mark the Oriental man's ways of work, as distinguished from those whose lot in life has been cast in less heated and less sunlit paths. It is really wonderful to think of how slender the information is as to Eastern matters and manners and ways of life, considering the amount of talk there is every now and then about them. Man, we are sometimes told, is the same everywhere, and so, indeed, he may be, but his actions and ways of life must needs differ, as he finds himself under diverse conditions, and under another sun, and under the dire necessity of providing for such different conditions. Many may, perchance, think that this subject is trite, and the matter of it all but exhausted, but it is not so,—very far from it; it can hardly be said to be fairly commenced, if we go at all to the heart of the matter. Humanity, in a broad sense, is of course pretty much the same all the wide world over, but diverse conditions and climate create such differences in detail that the broad principle all but disappears, and races of men are seen to differ in their modes of work, in arts, in the art of living, and in daily existence, as distinct animals differ from each other,—a subject of no small import just now, when the tendency of the dominant world is to level all things, and to induce uniformity everywhere.

In the first place,—and it will evidence how much is wanting, in spite of the multitude of books on matters connected with the "East," to use that general term,—it is not a little strange to find how little it is that we really know of so remarkable and world-famous a city as Constantinople! The world of to-day is just now a good deal interested in that famous city, and in the actions of those who now possess it. How long they will hold it, who shall say? It is thoroughly typical of an Eastern city, or perhaps we should rather phrase it, as more nearly descriptive, a Southern city. We have had some special means of getting a little insight into the specialities and peculiarities of this famous city, or congeries of narrow lanes and ways. They are all typical of the past, and most surely the present is fast doing away with them, and the day will come when the city of the Sultan, as it was, or even now is, will disappear totally, and the future city will differ but little in street arrangement and laying out, and house planning and building, from that of any other newly-built and modern collection of buildings. The

charm and poetry of the city, even as it now is, and has been, lies in the main, it must needs be admitted, in its very inconvenience, and in the confusion of its arrangement, if the term may be allowed. Nothing can be more irregular and tortuous than its lines of ways and streets, without plan, and accidental as are the paths through a primeval forest. The narrow water-course which runs through the centre of it is quite straight and regular, compared with the direction and course of its wayward streets. A good and correct plan of Constantinople, as it is, would be a good and useful thing to have, and would be of infinite value in the future as well as now.

Constantinople is about thirteen miles round, and is enclosed by walls on the western, or land side. The "Harbour," or Golden Horn, on the north, divides it from Galata, and the Bosphorus divides it from Scutari. These are properly but suburbs, but make up together the city of Constantinople. It would be quite impossible to imagine a site better fitted for the building of an imperial city on. Nothing would seem to be wanting; and it is no wonder that the eye of the world is every now and then fixed on it. It may be as well to mention in passing that the population of this imperial city is about half a million, and is made up of a somewhat motley group—of Greeks, Armenians, Jews, Arabs, "Europeans," and Turks; the Turks making up, as it would seem, about one-half of the population. It must be needless to say that the city stands on the site of antique Byzantium, founded 656 B.C. But long before Byzantium, even, there must needs have been a colony of some sort in such a spot of earth as this, and the first building on it of human habitations may have been of the "stone age," and by rude men who have left no record. But we have here to deal with the immediate present, and to find out, if possible, what there is artistically of worth, and how far it is to be regretted, if it should by any cause disappear without due record being first made of it. Many an antique city has thus disappeared, and how much has the world lost thereby?

It would be difficult within a short notice to give an adequate idea of a place so different from all things about us. The total absence of churches, bells, and clocks, to begin with. The Moslem divides his day and night into twenty-four hours, it is true; but *his* day *begins* with the *sunset*. An hour after sunset it is one o'clock, a somewhat awkward but certainly very natural way of noting time, the sun-setting being sufficiently remarkable everywhere. It is at sunset, therefore, that the "call to prayer" is made from the galleries of the mosque minarets, and not at any one stated or set hour, and is thus made not a little significant. The absence of churches and clocks, therefore, must make the city strange if nothing else did so. Then there is,—what, indeed, was to be expected,—the narrowness and tortuous character of the streets and ways, where anything in the way of plan or arrangement never could have crossed the minds of those who built the houses or dwellings which line them. They can only be compared to the irregular way across an uneven field, with cottages built close to the edge of it, as the traffic across got year by year to be thicker and thicker. Each street of the city is a perfect zigzag, and a straight line is not to be found. Indeed, there is a total absence of "planning" in any sense. From east to west the city is about three miles and a half, while from north to south it is about three miles. The Golden Horn divides this main part of the city from Galata on the north; while the Bosphorus divides it, as we said, from Scutari. It is necessary to note this, as the Bosphorus is half a mile wide in parts, and the Bosphorus is more than a mile wide, so that there are, in fact, *three* towns, all of them making up the city. A finer site for an imperial city there could not be, nor a happier combination and grouping of natural surroundings. It is walled on the west or land side. We are here interesting ourselves more especially in this city as an Oriental city, and do not touch on the "improvements" going on, which will no doubt in time do away with its special character. It is in the narrow streets, in the strange-looking bazaars, in the inns or "khans," and in the mosques, and in all that which improvement will do away with, that the real and individual and Oriental interest of the place lies; and if not worth the keeping it is at least worth keeping the remembrance of, and thus to remind the world that very much of it yet exists.

As to the *streets* of Constantinople, as we have already hinted, they will but just bear the name,—they are rather long and crooked lanes, with low, timber-built houses; and, contrasted with like streets here, with straight and uniformly-built lines of brick-built small houses, would look but poorly. Much is sacrificed, doubtless, to the picturesque in the streets or ways of Constantinople. An Oriental "bazaar" is but little else than a covered-in street, with the goods exposed on either side of it, and it needs sunshine,—and powerful sunshine, too,—when a ray here and there does the work of the broad and evenly-distributed daylight elsewhere. Thus the elements of the "picturesque" always are here combined in full force, and it is no wonder that such a city, however strange and outlandish it may appear to many, makes the impression that it always does. It makes a powerful appeal to the artistic eye, and blinds it to all defects.

We must not forget the "fountains," those wells and springs of living waters for which nothing can make up in a sunlit spot. Here in Constantinople they are especially appropriate and grateful, and it is to be hoped that "improvement,"—the at times too eager spirit of improvement,—will pass them by. The great aqueduct here, built by Adrian, which supplied the cisterns, was repaired and added to by Solyman the Magnificent. It may here be noted how the ways of men change as the world progresses. In the rough old days of it, all that possibly could be seen was left visible, as in these aqueducts and flowing water-ways. Now the effort always is to hide such utilities as far as may be, and if not that, to disguise them in some way or other. A raised cistern of water here, and now-a-days, as at a railway-station, is simply a square unsightly iron box, put as much as possible out of sight. In the old days of the world, in Classic times, and under Oriental management, these *utilities* were and are beautified, and made to show themselves, not as a something else, but just what they are. "Improved" Constantinople will, and must needs be, full of such improvements, but such improvements will do away with all that which once filled their place, and helped to give the city its special character. The *old* "Serai," it may here be noted, must yet contain a mine of *precedent*, and may be, as the new Serai at the mouth of the Bosphorus supersedes it, a fair example of an Oriental and royal abode, and in parts, at least, in its original state. Parts of it in neglected places may be as well worth the looking at and study as the Spanish Alhambra itself.

It would seem a pity, therefore, that some vigorous effort is not made, before it is too late to do anything, to get systematically at the many curious and out-of-the-way antiquarianisms of this really remarkable and exceptional city at its present,—its past remains, and antiquities, whatever they may be. It would well reward any well-to-do society to effect this, even partially. A correct plan or map of the city would be not a little interesting, showing the places of its public buildings, and the ways and turnings of its many and nameless streets and lanes. We need but hint at the interest to be found in its nobler buildings, whether originally Pagan, or Christian, or purely Mahometan, all things in Constantinople being, as we are assured on all hands, in a state of half ruin and neglect: we must needs find, in consequence of this very neglect, the *bonâ fide* work itself, ruinous and neglected and uncared for may be, but in no other way altered or changed. Indeed, it is in such a place that there may be seen the handwork and the "writing" of the original artists and workmen, rude and in condition of ruin, but true and genuine. The city of the Sultan must needs, like all earthly things, pass away in time, and give place to the new, but a true record and remembrance of it may be useful, even to those who may have to rebuild it in another style of art, and under such different conditions, and in so widely different a phase of the world's history from that in which this Oriental city has until these days existed, and was founded.

Suggestion for Paris.—Those who are commencing the construction of the International Exhibition building in Paris should recollect that a good many cases of typhoid malarial fever, at the Exhibition in Philadelphia, caused by the confessedly bad drainage of the grounds, have occurred among those who are employed about the grounds and buildings day and night, particularly among the Centennial guards. Even exhibitors who are in the building during the day only have not escaped.

ART AT THE LIVERPOOL CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

At the first day's meeting of the Art Department (the 12th), Mr. E. M. Ward, R.A., in the chair, the special question for discussion was, "What are the best Methods of securing the Improvement of Street Architecture, especially as regards its Connexion with Public Buildings?"

Mr. J. J. Stevenson, who read the first paper on the question, said he was unable to fulfil the object proposed of discussing the influence of architecture, or of any other art, on the civilisation, education, or industrial development of the people; for art of any kind was best cultivated for its own sake, without *arrière pensée* of moral or utilitarian results, and was worth cultivating, even though it should not further develop our industry or create an increased demand for our manufactured goods. He should, therefore, take for granted in the discussion that art, like virtue, was its own reward. Mr. Stevenson having expressed his intention to confine himself to the subject of street architecture, without regard to public buildings, proceeded to describe our modern street architecture, tracing its different phases, and especially pointing out how the architectural appearance of our streets has been influenced by the requirements of ground landlords, by Building Acts, and by municipal regulations. Mr. Stevenson spoke with emphasis of the feeling of depression which the monotonous architecture of modern streets produces. Everywhere we found the same dull monotony of sad colour, the same weary repetition for miles of one design for door and windows, the same interminable straight line of street without break of skyline, or the slightest turn to give light or shadow. But in an old town, if it had not been improved and modernised, every new turn made a new picture: every house had its own identity, marked by some pretty feature of carved door or projecting window, or fantastic gable, looking as if each man had built his own and had taken pleasure in it. The present monotony in street architecture became common in the last century, when the prevailing style was that of Wimpole-street, "the long unlovely street," as Tennyson calls it. In this century, this style having been felt to be too dull, ground landlords insisted on bright colour and more ornament, and the "palatial expedient" was adopted, but failed. Mr. Stevenson condemned the modern practice of using stucco and cement for columns, windows, and cornices, and declared that the general result was the most dismal which the art of architecture had yet attained in the whole course of human history. But the reign of cement and stucco seemed over. The latest phase of street regulations was to allow red bricks only for the fronts; but several houses had lately been built in London in which people had freely followed their own taste in design, with the result of producing some excellent specimens, which gave interest and beauty to our streets. The advantages of freedom would, of course, depend much on how it was used. It might give opportunity for exhibiting ignorance and vulgarity; but be preferred freedom, with its risks of going wrong, to the safety of despotism. To build streets irregularly, with gentle curves and angles, was, of any single proposal, that which would most improve our street architecture. As to colour and materials, it was a pretty safe rule that they should not be such as would get to look dirty, for our new streets were mostly built in smoky, thriving neighbourhoods. Happily, good colour was not dependent on grand and expensive materials, but on a right use of the simplest.

Mr. W. H. White read an able paper on the same subject, and which we printed in our last issue.

Mr. Geo. Godwin (responding to the chairman) said that both speakers naturally enough had, as part of their reply to the special question, said, "Call in an architect." He would occupy the few minutes allowed to a speaker by commenting on some recent observations made by a distinguished scientific man, which bore forcibly on the question. He had recently received the report of an address delivered by Professor Huxley on the occasion of founding the John Hopkins University in Baltimore, wherein he had read, he must confess with some indignation, the following remarks:—

"If I may venture" (said Professor Huxley) "to give advice in a region which goes out of my proper competency, I would say that whenever you do begin to build, get an *honest bricklayer*, and make him build you just such rooms as you really want. And a century hence, when you have built all your laboratories, endowed all your

professors, and have the finest library that can be imagined, then if you have a few hundred thousand dollars you don't know what to do with, send for an architect, and tell him to put up a façade."

Now this, the speaker maintained, showed great want of judgment. Did Professor Huxley really think all the varied arrangements necessary for university buildings could best be made by a bricklayer? Was a century hence time enough to make such buildings fitting, decent, and delightful? Look at the mischief such an observation did. If a great university was not to send for the man of culture and taste, was not to think of beauty, still less need an individual do so. This sneer had been sent far and wide through the States, and would work evil. It was an example of the insolence (he did not use the word in an offensive sense: he had the highest respect for Professor Huxley) with which pure science was too ready to treat pure art. Putting aside the questionable emphasis on "*honest* bricklayer," he was ready to maintain that beauty was of the highest kind of utility. Moreover, he believed, as quaintly said by Spencer, that by the study of the beautiful, some might—

> —'Lift themselves up hver,
> And learn to love, with zealous humble duty,
> The eternal fountain of that heavenly Beauty."

Mr. Charles Lamport, in continuing the discussion, contended that, as regards architecture, utility is the only beauty. In the finest Greek buildings there was no single feature contributed for the purposes of what is called pure beauty, and the character of the architecture was rectilinear. He quoted, with approval, the saying of wise old Fuller—that houses should be built to be lived in, not to be looked at.

Sir Walter Stirling controverted the opinions of the last speaker, and remarked that the chief aim of the architect should be to exercise his skill in combining beauty with utility.

Miss Becker said that, as coming from Manchester, she might, perhaps, be allowed to say a word or two in reference to what had struck her as an interesting and valuable suggestion, viz., that public buildings in great towns should be made of some material that would wash. It was, in manufacturing towns, a great pity to see beautiful work and beautiful material placed in a situation where they must necessarily become blackened and spoiled in the course of a very few years. At a corner of one of the streets in Manchester was a statue of John Dalton, which was originally of pure white marble, but now had the reputation of being a bronze statue. The corporation of Manchester had lately erected a magnificent town-hall, and had put upon the façade four elaborately-carved stone statues. Now, there existed an Act for preventing the nuisance arising from the black smoke of the manufactories. This Act had been allowed to become a dead letter in Manchester, but, happily, the Corporation, in order to prevent their new town-hall being spoiled, had resolved to put it in force.

A few remarks having been made by Mr. Douglas Galton, there was a short adjournment for luncheon. On the reassembling of the section, the discussion was resumed by

Mr. Traice, of Manchester, who defended Professor Huxley from Mr. Godwin's criticisms, and expressed his opinion that the Professor did not intend that his remarks on the occasion in question should be taken literally, but *cum grano salis*. Those who knew Professor Huxley knew how a sly twinkle of the eye qualified remarks which, if taken seriously, would be open to animadversion.

Mr. Storr, of London, referred to the cases of Liverpool, which had built St. George's Hall, and Manchester, which was building its new town-hall, where the local government of a very large area, and having command of very large resources, were making the best use they possibly could of the existing architectural skill of the present day. They had operating upon that local authority the moral and social pressure that had been spoken of. These two illustrations furnished, in his opinion, the only practical clue to anything like a radical reformation in regard to street architecture, and particularly in regard to public buildings. What they wanted in London was a form of local self-government which should have the confidence of the people, and then they would have that moral and social pressure by educated people and producing the results they were all aiming at.

Mr. Stevenson, replying to the discussion, took occasion to speak of St. George's Hall as one of the noblest and greatest buildings that had been produced in modern times. It seemed somewhat singular that a building like that had not had more influence on the architecture around it, and especially that its noble and grand simplicity had not been imported into buildings recently erected in its neighbourhood.

The Chairman said it had given him the greatest satisfaction to preside on that occasion, although in the character of a *locum tenens*. It was the first time that an Art Department had been organised in connexion with the Social Science Congress, and he felt that anybody especially connected with art ought to give his sanction to or endeavour to be present upon so important an occasion. It had been unfortunately the custom of this country to consider art as a very secondary matter. He had attended a great number of public dinners, and he had always found that the toast of "The Fine Arts" was placed at the bottom of the list. He was satisfied that the formation of that section was a very desirable thing in the interests of art. With regard to what had been said as to Professor Huxley's remarks, he quite agreed with Mr. Godwin that those remarks were very unwise, especially when addressed to a people even less informed as to art matters than those of our own country.

Mural Decoration.

On the 13th, Mr. Poynter, R.A., presided. The special subject for discussion was—"How best can the Encouragement of Mural Decorations, especially Frescoes, be secured?"

The opening paper was read by Mr. W. B. Richmond. In answering the question, Mr. Richmond showed that in all great artistic, poetic, and philosophic nations this section of the fine arts had been looked on as of prime importance, and had received encouragement both from public bodies and from private individuals. He then endeavoured to point out what would be the best training for students in our local art schools. They should be prepared, in the first place, to assist masters in the art of mural painting in all its branches; and, in the second, the education should be of such a thorough nature as would enable these assistants ultimately to become masters. He also described methods of painting which he contended were adapted to mural decoration of the highest class, and in which every confidence as to durability might be placed. Mr. Richmond said that what was wanted, first and most of all, was that the mental level of the art student should be considerably raised. It should be impressed upon him that his pursuit is a very serious one, and that to excel in it requires just as much mental culture, self-command, and self-control, as in any other of the learned professions. With few exceptions, the greatest paintings of the world were mural, and the greatest minds in art had generally adopted either the method of tempera or fresco on walls on account of its rapid process, luminous quality of colour, and durability. One advantage of this style of art was that it obliged the architect and builder to design and construct in a dignified, solid, and thorough manner, and stimulated the designer and executer to produce a work which should be perfect in all its qualities. Until mural decoration on a large scale was encouraged in England, we should have no real, living, national art, nor, indeed, any school of painting of the highest order. He urged the establishment of an elaborate system of teaching and study, and in conclusion he compared the various styles of mural decoration throughout the world. In England, he believed, frescoes had failed owing to the fact that they were not for the most part really and truly frescoes, and that certain colours were used which would not compose with lime.

Mr. Cave Thomas then read a paper on the the same subject, to which we shall return.

Mr. J. C. Horsley, R.A., in speaking on the question of the State patronage of art, said that that great friend of art, the late Prince Consort, had often remarked to him that it was to the corporate bodies of England that he looked for the encouragement of modern art. He (Mr. Horsley) agreed in the main with what had been said by the previous speakers; but he could not forget that four of England's greatest painters, Hogarth, Reynolds, Gainsborough, and Turner, rose to eminence without the benefit of that severe scholastic training which those two gentlemen had so warmly advocated. He, however, admitted that if mural painting was ever to take root in this country, it must be by means of such a course of training on the part of art students. He was sorry to say that he believed climatic influences, and the smoke and fog of towns like Liverpool, were entirely destructive of fresco painting. Mr. Horsley referred, in support of this opinion, to the decay of the frescoes in the Houses of Parliament, and said that some frescoes he had executed in exactly the same manner, and with the same materials, in a house in Norfolk, were now in as perfect a condition as on the day they were painted. He could not forget the deep indebtedness of English art and artists to Lancashire during the last forty years. If Liverpool was going to take a still wider view of art, and to encourage mural painting, he heartily wished them God speed, and he could assure them they would have the support of every artist in the United Kingdom.

Mr. Leighton, R.A., said that as long as the English public gave themselves up to the seductive charms of realistic art there was very little hope that the severe style of the great heroic works of antiquity would receive encouragement.

Mr. Ward, R.A., said he should not despair of oil being used for the purposes of decoration.

The Promotion of Art an Economic Necessity for England.

Mr. P. H. Rathbone next read a paper on this subject. He began by remarking that the spread of machinery, supplanting the labour of unskilled workmen, was yearly increasing the demand for skilled and educated handicraftsmen, whilst in a few years England could not hope to retain the comparative monopoly of cheap manufactures which her coal-mines now give her. If we were to retain our trade it must be by paying more attention to the quality than to the quantity of our goods. In this strait art alone could help us, so that few would be inclined to deny the services it might render to commerce. As an example of what might thus be done, he then cited Paris, which, with neither coal nor water-power within reach, yet supports an enormous population as a manufacturing town. That Paris is the capital of France did not sufficiently explain this, for Washington is the capital of America, and history shows that France has done little for Paris compared to what Paris has done for France. The great power of the Parisian workman is that he is artistically educated beyond the work he is actually doing; he has, therefore, an ideal of perfection towards which he is always striving. He has a pride in the work he is doing, which prevents its becoming mechanical, and gives it a pecuniary value not otherwise attainable. He did not think the French were naturally an artistic nation, except in the great centres, where a love of art had been created and fostered by Government institutions. An art education gave to the workman and manufacturer the power of adapting their productions so as to provide for that thirst for novelty which was, in truth, the necessity of an inquiring age and a progressive civilisation. The economic advantages of taking the lead in this way might be even more strikingly illustrated by Lyons. The colours, shades, and even the fashions for the coming year were said to be designed by a council of bald-headed old manufacturers, whilst all others were a season behind, because, owing to the want of art education in themselves and their workmen, they were only fit to follow; not to lead. Rome, in a somewhat different way, was an instance of the same truth, for with the additional disadvantage of unhealthiness, it yet supported a large population by art manufactures. Turning to our own country, it would be found that, in spite of many advantages we had over Lyons, the silk trade of Spitalfields had declined through want of art-education in those connected with it. The decay of the straw-plaiting industry of Dunstable might also be attributed to the same cause. A more cheering view was the rise and progress of ceramic manufacture in England, much of which might be traced to the greatest of all potters, Josiah Wedgwood, and to the Great Exhibition of 1851, aided by the establishment of South Kensington Museum. The rise of the artistic glass manufactories of London, whether as regarded stained glass or table glass, was distinctly traceable to the same causes. The improvement in art-furniture, for which Mr. Morris had done so much, was most gratifying. It now only remained to discuss what had still to be done. For two reasons it was most desirable,—first, that all our handicraftsmen should have an artistic education, as the rapid spread of machinery made daily work less and less of an education; and, secondly, that it was more than ever necessary that our workmen should attain that flexibility of mind which only an artistic education could give, and which would prepare them for that change of

employment which the changed circumstances of the country might make necessary. Carving in wood, as practised by Norwegians and Swiss, modelling in clay or wax, would all be within the compass of mechanics who, with considerable leisure, were yet too fatigued with their day's work to be capable of much brain-work, even if the early age at which their education terminated did not make reading too great an effort to be a relaxation. This, if it did nothing else, would create a sound public opinion on art-matters which would keep our sculptors in order. If a taste for mural decoration was once widely spread in England, many men who now paint namby-pamby green lawns in water-colour might devote their time to making the houses of wealthy citizens so beautiful that they would be loth to leave them, and so give an element of fixity to the richer population of our great commercial centres which is much required, and which would give a living interest to the owners of houses who saw a work of art growing under their eyes which would not otherwise be aroused.

Mr. Traice said one point seemed to have escaped notice, and that was the training of the public mind to appreciate the things referred to. There was no doubt that if the public love of art was to be developed in this country as in Italy, it must spring from the people and from their institutions which fostered a taste for it. Until the people had such an appreciation of art and general good taste and judgment, they could not expect to attain the position in art they desired. He advocated the training of art workmen, and said this was one of the most important problems which the Congress had to consider. In conclusion, he said the schools of design had not done the work for which they were intended.

The discussion was continued by Mr. Stevenson, Mr. Lindsay (Belfast), Mr. Audsley, and the President, after which the section adjourned.

THE INFLUENCE OF ART ON A NATION.

In the Art Department of the Social Science Congress at Liverpool, on Saturday, Mr. E. J. Poynter, R.A., president, delivered an address.

Mr. Poynter began by saying that he found himself under the necessity of attempting, if not the solution of the question as to the effect of art upon our social system, and whether the influence of a general spirit of art were really for good, as he believed it to be, at least of bringing to their consideration the conditions under which alone art might be expected to produce that influence. It was true that on the special questions of decoration Mr. Charles Eastlake, who had made a special study of the subject, would read a paper; but although a matter full of interest, and in the highest degree worthy of attention, it could but touch only in a slight degree on such a general question as he (Mr. Poynter) had proposed, and which, put more fully, inquired in the first place, "Would the universal extension of a spirit and love of art—such a public spirit as should exact of our artists, manufacturers, and workmen that all their productions should be of the highest character for workmanship, skill, and taste—contribute to the general welfare and progress of the nation?" And in the second place—"To what extent can the cultivation and practice of art be made to take such a hold on our national life, and so permeate all classes of society, that such an end may be brought about, and that the national sentiment shall not permit of the making or exhibition of anything false in principle or offensive to taste?" And thirdly, "How can such a state of things be created?" for it certainly did not exist at present. From those who held with him that the very essence of good art was to be found in honest and good workmanship above all things, the answer to the first of these questions would doubtless be that a general diffusion of a sound artistic spirit would be an unmixed good, but they knew that opinions were sharply and strongly divided on that point, since the ideas of material progress so much in vogue were in direct opposition to the very existence of an art founded on principles apparently so obvious. To calculate, therefore, on any general artistic sentiment becoming a part of our national life would seem more hopeless now than ever, and before it could happen our national characteristics must be changed, and our beliefs in the efficacy of much that was thought essential to the progress and enlightenment and happiness of mankind must be eradicated. He would not philosophise on the question, however, but took for granted, what most persons present would concede, that the influence of a genuine art must necessarily be an influence for good. They still had before them the difficult question as to how such an influence was best to be diffused so as to take a hold of the nation at large. And first it would be necessary to inquire how far it was possible to diffuse such an influence. Was there any possibility of a genuine love of art taking such hold on people generally that it should seriously affect their habits of life? Was it possible, for instance, ever to recover amongst us the feeling which is now extinct, but of which a faint tradition lingered perhaps as late as the Great Exhibition of 1851, that it was not worth while to make furniture that would come to pieces, or to build a house which would not need repair for at least a reasonable time? In former times bad work was the exception; now it was the rule; and a piece of well-made furniture or a well-built house was an article of luxury, and must be made or built by specially trained hands. If the question was asked—Was the return to the time when every workman was also an artist possible? he would reply that it was not, under existing social conditions. That feeling of love of good work for its own sake, and of pleasure in bringing it to perfection,—which was, perhaps, the most certain evidence of genuine artistic spirit,—was not, in former times, the property of a few individuals distinguished by superior gifts and education; it was the common property of all handicraftsmen, whether possessed of original talent or not. He did not for a moment pretend that such a spirit as this had ever risen in this country to the dignity of national sentiment. At no time did he imagine that a cheap or easy mechanical substitute for labour would ever have been refused on artistic grounds. That such a state of national sentiment had existed in the world was indubitable. We had the evidence of everything that had come down to us from the best times of Greek art, that nothing short of perfection was tolerated among them; nay, more, that they were possessed of a critical faculty which would seem to have surpassed our own, so that their trained and cultivated perceptions were satisfied with nothing less than a subtlety of form and proportion, the advantages of which to our coarser senses seemed inappreciable. The Greek idea of art was not merely in adornment: it was, above everything, in completeness and consistency. It was melancholy to turn from such a state of things to our own times and surroundings, and it was only too clear that we must be content with aiming at something very far short of the Greek ideal of art in our own social life. Even then we must be satisfied if we got a tithe of what we desired. This was not the occason to inquire into the causes of the high standard of the glorious epoch of Greek art, but it was necessary to point out, however, that they can never be repeated in the world's history. The very perfection to which mechanical methods of production had been brought, and which raised works of mechanical skill almost to the level of works of art in their wonderful precision and finish, had given the death-blow to true artistic workmanship, the charm of which lay as much in the individual character given through the skill of the workman as in the invention displayed. What was now required of the skilled mechanic was not so much that he should understand how to make any particular object, as that he should know how to manage the machine by which it was made. It was useless, however, to deplore and rail against the invasion of mechanism; it would be far more worth while to see how far it can be made subservient to the principles of sound art. There could be no doubt that the worst of the eye-sores which the progress of civilisation had inflicted on our unhappy cities are the products of the art or science of engineering. That whole districts should be given up to desecration in the large towns through the invasion of railways and their appurtenances was probably unavoidable, but that a few spots favoured by picturesqueness of grouping or real architectural beauty should have their charms destroyed at one blow by some railway bridge or station, showed an amount of heartlessness on the part of the engineers who constructed them, and the public who permitted them, which would surprise us, did we not know that a large section of the community admired in their hearts what was supposed to be a fine practical preference for utility. After remarking that perhaps the most glaring results of this feeling were to be found in London, Mr. Poynter went on to say that it seemed to him neither necessary that iron railway bridges and stations should be as ugly as they were, nor that the only alternative should be, as was the generally-accepted idea among those who made them, an imitation of unsuitable architecture, or that they should be adorned with inappropriate ornaments by way of beautifying them. A notable instance of this misconception was afforded by the bridge that was built over Ludgate-hill. It was probable that the offensive form of construction that was placed there was the cheapest form of bridge that could be made. Of that he was no judge; but he was sure that an engineer who had but a little ingenuity beyond what was required for the calculation of strain and cost might have invented something which, in its original form, should have been less offensive to the eye. The view of St. Paul's up Ludgate-hill, with the small spire in the mid-distance, making a composition of the kind that delights an artist, and at the same time giving dignity by its slender proportions to the imposing mass behind, was heightened in effect by the framing of a busy and picturesque street, and seemed to unite every point that is characteristic and interesting in a great city; and the public in this case resented the offence to taste, so the company were obliged to spend a large sum of money in covering the bridge with ornament, which it was impossible could be otherwise than both unsuitable and useless. A very moderate quota of the national sentiment which he had alluded to as the property of the Greek nation would have prevented the possibility of the erection of this bridge in such a spot. He had said the use of iron was a necessity of modern engineering works, but he had no hesitation in adding that when they were obliged to intrude themselves on places already made beautiful by fine architectural features, the public and the authorities responsible to it ought to insist on the work being in harmony with the surroundings. In such a case as this an iron structure should not have been permitted at all. But there were situations where the use of iron structures was not only a necessity, but need be in no way objectionable. They had there in Liverpool a construction of which they were justly proud. The landing-stage, in the ingenuity of its structure, its admirable fitness for its purpose, and the excellence of its workmanship, combined with the picturesque accompaniments of river life, might be rightly considered in the light of a work of art; but its effect was marred, to his mind, by the ugliness of the iron bridges which connected it with the mainland. It was not too much to say that there was not the least need for their ugliness: a little more ingenuity spent in their construction might have made them not only inoffensive to the eye, but agreeable to look at. There were here no architectural features in the immediate neighbourhood; the surroundings were the wharfs and docks and warehouses, which were the glory of a great commercial city, and which had a character of their own. Any attempt to have made these bridges architecturally beautiful would not only have been out of place, but would have been wasted in such a spot; but he could quite imagine a method of constructing such works which should combine strength and lightness and elegance, without going outside the conditions and necessities of iron structure. But it gave, of course, less trouble to an engineer to make a square iron box which should be strong enough to bear the traffic, than to go out of his way to design something less objectionable. If anything of an ornamental nature appeared necessary, he was saved any further consideration by handing it over to an architect or artist to plaster with ornament. He (Mr. Poynter) would draw this conclusion, that engineering being distinctly an art of the present and the future, made up of different materials on different principles and under different conditions to any that have hitherto existed, if it was ever to have any beauty of its own, or, to put it more hopefully, if its results were ever to be less objectionable than now, it must be by seeking for such results within the necessary conditions of its existence, and not by the addition or superposition of an utterly unsuitable style of ornament drawn from past ages and a different order of things. In short, the exercise of ingenuity in work of pure utility might be made to occupy the place filled by decorative and ornamental design. Regarding works of art, properly so called, however, and those

works of manufacture in which decorative art played a more or less important part, the conditions were different. Here part of the beauty and charm would be derived from the beauty of the workmanship and the individuality given by the mind and touch of the workman—a phase of beauty to which mechanical production was death. What was it that we admired in Japanese art? No doubt the marvellous and inexhaustible fertility of invention, and the perfect rendering of natural forms; but if possible, still more, that exquisite workmanship which surpassed anything that European hands were capable of. Or, to confine ourselves to European art, wherein lay the beauty of the old Venetian glass goblet, which had the elegance and fragility of a harebell in its stem, and almost its fancy-like lightness? Doubtless, in the first place, with the beauty of its design and the delicacy of its material; but did it not owe an equal charm to the taste of the handicraftsman whose skill had triumphed over the extreme difficulty of producing a perfectly beautiful form in a material requiring such rapid and dexterous treatment as molten glass? How much of that skill of hand and eye was required by the modern glass-maker or potter? His business was not to use his discretion or his natural taste in giving elegance to the form of the glass or pot he was making, but to manage the mould out of which thousands of exactly similar objects were produced; and that the manufacturer believed that a mould was a much better way of producing forms than making them by hand was certain. To an uncultivated eye the effect might be equally good, and to save labour and produce in quantities might be equally good; but the original charm had disappeared. The delicate fabric had become a mechanical production without life, made probably at a tenth of the cost, and with a tenth of the labour, but which, as far as the artistic value of its "diamond moulding" went, it was unnecessary to make at all. He was not so foolish as to suppose that mechanical reproduction could be done away with; it was part of the necessity of the times; it was certainly a result of our material progress, which we could not go back from; but, as he had already said, the conditions under which everything that was made before the introduction of machinery was, in one sense, a work of art, could not be repeated. All he should wish to be understood was, that they must not delude themselves into the belief that they could produce works of art by the substitution of machinery for hand-labour, or that the decoration of objects of common utility, by a mechanical process, could ever have any artistic value, and they would have made an immense step in advance if the public could be persuaded that it was better to have no decorations at all than such as were purely mechanical. A strong feeling for the higher forms of art had never existed in this country; or, he should say, rather, the artistic faculty had never in our race, of its own accord, leaned towards the higher forms of art. Except in architecture, we had never produced any works of higher art, we had never had of indigenous growth anything in the shape of those schools of painting and sculpture, and metal work, which sprang out of the native soil in Flanders, to say nothing of Italy. All the higher forms of art had been imported into England either by foreign artists coming to work for our native princes, or by men of taste and culture. Until within the last hundred years there was no such thing as a school of painting in England at all. But there did exist in England until lately what, indeed, was common to all the world,—the sentiment and tradition of excellence in such more homely forms of art as were applied to household furniture and fittings; and such a feeling took, of course, an English development, which gave its own character to the work produced. Except in a few solitary cases, to which he would refer, it might be said that an object of industrial art was never now produced which was satisfactory to the cultivated eye from every point of view; and what he desired to point out was, that it was only through the determination and energy, and a certain amount of self-sacrifice, on the part of those who were capable of directing the public taste,—that was to say, of artists and men of culture,—that an improvement could be considered possible. There had been great efforts in this direction made of late years by the firm of which Mr. Morris was the head, and if he referred to the work Mr. Morris had done, it was not with the object of bringing his name forward, but because he had a firm conviction that it was only by such life-long devotion on the part of artists themselves that the degrading tendency of mechanism and all its accompaniments could be counteracted. There were other ways in which such a devotion might be shown amongst them—by the voluntary education and training of students, and in other ways. The French set us a noble example in this respect, for many French artists had an *atelier* where students worked, and to whom the artists devoted regularly two mornings a week without receiving any payment. The custom showed a love of art for its own sake, to which we could hardly find a parallel here. Speaking of the art-education of children, Mr. Poynter said it was not to be expected that the teaching of the rudiments of geometry and perspective and elementary freehand drawing to many thousands of children would turn them at once into artists, or even give them any artistic instinct; but it would act as other elementary education acted—it would give a chance to natures which might otherwise remain undeveloped. But in itself the learning of geometry and freehand drawing could no more be called studying art than learning the alphabet could be said to be studying literature. Both were the necessary preliminary stages for a higher culture. Speaking of the means for promoting art education, he alluded to the art schools, and added that a constant effort was being made so to arrange the Government payments to the masters that there should be the necessary inducement to lead their pupils from one stage to another, a matter which would be easy enough if the supplies were unlimited, but which was difficult when they had to be kept within bounds. It was in this way, however, that he hoped the influence of the vast machinery of the Art Department might be felt—through the chances given to children to turn their attention to art if their inclinations were in that direction; through the inducements to study offered by art classes and schools; and through the final inducements to enter into training at South Kensington as art masters, that in examinations they might diffuse their knowledge through the city. The system had its disadvantages, no doubt. According to the direction which the instruction took, its influence would be equally strong for good or for evil, and herein lay an immense responsibility. But there was another great piece of machinery which had no such risks, and by which the truest principles of taste might be diffused among all classes—through the institution and formation of museums. Here again, however, they must not deceive themselves as to the influence which they would exercise. Without previous culture, no one was likely to appreciate a work of high art; the richness and splendour of workmanship and material in a cup by Cellini would please an uneducated eye, but it needed a long apprenticeship in general and special study for the appreciation of the exquisite taste and fancy which had guided the artist. Mr. John Morley, in a speech on education lately delivered, had asked why the collection of Castellani jewels at the British Museum should not be sent to Birmingham to improve the taste of the jewellers. If it were in the least possible that the goldsmiths and jewellers would take to heart the lesson which those wonderful specimens of Greek art taught them—a lesson which he (Mr. Poynter) had tried to indicate in this paper,—namely, that exquisite workmanship was the essence of fine-art manufacture, and in jewelry, above all things, then no risk, perhaps, would be too great to run in the cause; but it was far too probable that the only result would a "cribbing" of a few of the forms to produce a novelty, and the executing them in a coarse and barbarous manner. But museums had another important function—the preservation of relics of antiquity, which, if lost, neither money nor labour could restore. The collection and preservation of objects of art could not but have a refining and educating effect on those whose tastes were sufficiently raised by cultivation to appreciate them; and to supply local museums and art schools with the best specimens available was one of the most important duties of the South Kensington Museum. He could see three ways in which the influence of art might be brought to bear on our social system,—through the return, if only partial, to the bygone excellence of workmanship; through the spread of education; and by affording art students, throughout the kingdom, the opportunity of seeing fine works of different periods and styles. We should not deceive ourselves, however, as to the extent to which public taste might be influenced through these means, for there was an immense mass of the people of all classes who were wholly indifferent as to whether their surroundings were ugly or beautiful, and who thought only of their personal comfort or luxury. Those who were really interested in art formed but a very small portion of the whole mass of the nation, who were for the most part animated by other interests, indifferent to, and in many cases opposed to and irreconcileable with the interests of art. It was encouraging to remember, however, that at no part of the world's history, except during the cultivation of Greek art, had a nation been wholly artistic. In Italy, even at the best time, the mass of the people were probably indifferent, and the love of art was confined to artists, artificers, and the cultivated class. Although he did not see the possibility, under existing conditions, of so complete a diffusion of taste for art among us as would make us an artistic race, yet there was no reason why it should not be the property of the cultivated class, and of all art workmen, as it was in Italy; and it was to be remembered that the spirit of art would of itself assist in the increase of this cultivated class, and in the spread of the cultivation by which it lived. "I have not," said Mr. Poynter, in conclusion, "entered into the question of painting, which is, as far as the imaginative powers are concerned, of course the highest and most important branch of the art; in the first place, because I have so often lectured on the subject, and in the second, because there is a fear, through the high marketable value of pictures, that all the best artistic talent of the country is rushing in that direction, and I was anxious to give prominence to the social and economic side of the subject. There is, however, no reason why this great art should not take here as high a place as in any country,—I might almost say as in any time. The English, if they have not the marvellous technical facility of the French, are far superior in poetic feeling and imagination; and the independence of thought which has in some respects barred the way to the formation of a definite school in England is combined in our national character with much readiness to learn from other countries. If we can only acquire sufficient love for art to enable us to resist the enervating influence of an indiscriminating public and a too ready market, the art of painting may receive amongst us its highest development."

HEALTH QUESTIONS AT THE SOCIAL SCIENCE CONGRESS, LIVERPOOL.

Noxious Vapours and Smoke.

The special question was,—"What Amendments are required in the Legislation necessary to prevent the Evils arising from Noxious Vapours and Smoke." The section met under the presidency of Mr. Thomas Hawksley, C.E.

Dr. Angus Smith (Manchester) read a paper on the subject. He said that the progress of chymical manufactures, and the alkali manufacture pre-eminently, were intimately connected with the progress, civilisation, and refinement of the country. It was said that these manufactures destroyed crops, trees, and vegetation generally, and the charge was not without foundation. In 1863 the capital of the alkali trade in the kingdom was equal to about 2,000,000*l.*, the total amount of salt used being annually 254,000 tons; now nearly that amount was used in the crowded collection of works at Widnes, whilst that was only 39 per cent. of the total used by the whole trade. It was needful to consider the actual nature of the damage done to the land. They must remember that that was not a money loss, except perhaps in a few cases. He had never heard of any piece of land selling at a diminishing rate because of chymical works in Lancashire, but he had heard of a great deal selling at a much increased rate. So far as could be made out, under the new Act crops had suffered very little, and in places where they used to suffer there were no complaints this year. Landowners might still, however, say, "We know you do us good by increasing the value of land, but why do us evil to counteract it? Send all the chymical works to some corner by themselves and let them rage together." Such a proposal might once have been reasonable, but it was now out of all question. It was completely made out that the sulphur acids from chymical works now far exceeded the muriatic acid. The sulphur from common coal was a very large quantity, and when chimneys were numerous and near, the amount given out was very destructive, so that, for example, near the centre of a town, such as

Manchester, trees would not grow at all. They burned about one hundred million tons of coal annually, and if it contained one per cent. of volatilised sulphur they had three million tons of the strongest vitriol poured into the air, most of it coming down on themselves and the land. The combustion of smoke, that was, of the black portion, was very desirable. It was known to be very easy in most cases, and the introduction of mechanical stokers was a duty in very many cases, probably for the majority of furnaces. It was very much wanted for the benefit also of the stokers, who, especially in sea vessels, were exposed to labour such as ought not to be given by a nation that rejoiced in putting down slavery. Condensation in alkali works was advancing so rapidly that it might even now be considered advisable that it should be completed in all new works from this time, and certainly so if the newer furnaces acted as they promised. The difficulties as to copper works were greatly removed, and it would be no hardship to insist that every copper worker should condense at least as well as Messrs. Vivian or Messrs. Newton & Co. did. They might then think of the gases of glassworks. At present he believed they were quite able to deal with those of potteries and cement works. The actual effect of any of these gases on the health of the population was not well known. They did not prevent to any known extent the existence of zymotic diseases, as some persons very naturally expected. The gases were not strong enough to prevent infection, and the total effect in a chymical town was not clearly known. In St. Helen's the mortality last year was 23·9. Still the evidence seemed to be against the gases, and very clearly in the case of the workmen. Gases, from putrefaction, were better known to be hurtful to health, but people did not avoid them so much, because they did not affect the senses so readily. It was better to prevent the formation of gases near them than to remove them when found. After giving a description of furnaces and various processes, Dr. Smith said all works giving out offensive gases ought to be put under inspection for a time, when complained of, and all those giving out the acids mentioned should be included under constant inspection. Certain facilities should be given in the case of actions for damages so as to include a number of persons as doing an injury, and persons should pay in proportion to the injury so far as could be ascertained.

Dr. Macadam (Glasgow) said that the only objection he had to Dr. Smith's paper was that it dwelt more upon persuasion than compulsion with reference to the consumption of smoke, and he thought a little compulsion along with the persuasion would be more effective in purifying the atmosphere.

Dr. Fergus (Glasgow) remarked that sewer gases found their way into all our houses in spite of any trap which had been invented; and these gases were sufficiently potent to destroy the lead soil-pipes between the trap and the house. He found that the trap of the closet was a small laboratory for the manufacture of a gas that destroyed the lead, and stated that none of the gases were kept out of the houses by what were called water-traps.

Dr. Andrews argued that sewer gases were often very injurious when no bad smell could be detected.

Sanitary Education of the People.

Dr. Hairland, on behalf of Mr. E. B. Ellice, Clark, read a paper "On the Education of the People with reference to Sanitation." The author remarked that, unless something was done by way of educating the masses in sanitary matters, all scientific research and practical teachings would be valueless. Sanitarians might labour for ever, with small results for good unless they had the assistance of the people. Individual responsibility should be taught and early insisted on, as little could be effected with the adult population. Through the School Boards there was an opportunity of inculcating knowledge at an age when it was rarely forgotten; and Mr. Clark suggested the necessity of School Boards having teachers who could instruct the young in such matters.

Health Lessons to the Poor.

Mr. W. Clode read a paper by Miss Lankester "On the Advantage of Health Lessons to the Poor." The authoress wrote on the necessity of popular lectures and lessons being given to the people, and especially to the lower and more ignorant classes, on the laws of health. She dwelt on the success which attended the delivery of lectures to poor women in London on such subjects as "How to Manage a Baby," "What to do till the Doctor comes," "Drink and Water," "How to keep the Doctor out of the House," &c. Many of the diseases of infants were preventible, but very few women knew intelligently how to bring up their babies.

The Rev. Canon Warr said that from close perusal of most of the tracts published by the Ladies' Sanitary Association, he could say that they were far superior to, and more likely to attract attention, than many of the story-books that circulated in our streets.

Mr. Cooke Taylor made some remarks commendatory of the society of which Miss Lankester is secretary.

Miss Becker remarked, with regard to the ventilation of the dwellings of the poor, that they must not, in their anxiety for fresh air, overlook the deadly effects from cold.

Co-operative Housekeeping.

Mr. Collins read a paper by Miss C. C. Morfitt, "On Co-operative Housekeeping." The authoress recommended the system of co-operation among industrious persons of limited means, on the grounds of economy, comfort, and healthfulness. Plans, illustrating the way in which she would have the co-operative residences constructed, were circulated amongst the members of the section. In addition to the ordinary domestic offices and rooms, the plans included a billiard-room, four servants' rooms, skating-rink, laundry, dining-room, engine-room, bakery and pastry, starching and ironing rooms, &c. Such an establishment could be erected at the cost of 10,000*l.*, and would let to six tenants at a gross rental of 700*l.* per annum, and would thus yield a per centage of 7 per cent. for the capital expended. There should be nine servants, with wages amounting to 190*l.* a year.

Rational and Beneficial Amusements.

Mr. Francis Fuller read a voluntary paper on "The increasing importance of enabling and inducing the people to seek rational and beneficial amusements in preference to intemperance and vicious indulgence." He remarked that the last year had brought but too-convincing evidence that whatever may have been the progress made by the School Board, however great the efforts to bring children to school, and whatever good effect these efforts may have in the future, depravity among our juvenile population was widely spread, and the fringe of the evil had scarcely been touched. No provision was made for the amusement and recreation of the young, which, he maintained, was not less urgent than the arrangements now agitating legislators and divines as to the safest mode of communicating useful information to the children of all classes. As to the working man himself, he found his amusement in the public-house, with poison for the staple of his pleasure, and ribaldry, blasphemy, quarrelling, and discord, its accessories. He urged that it should be the duty of the State to provide places of healthful, cheerful, and improving amusement and relaxation, as the policy of leaving such things to private enterprise had been carried too far. The time had come for the surrender of a portion of our national prejudice against governmental interference. As to the terrible incubus, drink, he confessed himself a radical revolutionist, but in the most peaceful and loyal sense. He did not object so much to the national revenue derived from beer; he would not oppose even an increase of the malt-tax, if considered necessary, provided that the habitual licensing system were given up and the trade properly compensated and made free; but the murderous system of licensed houses, where poison was frequently swallowed with the sanction and for the profit of the State, should be entirely abolished.

Mr. Robert Rawlinson, C.B., said the picture Mr. Fuller had drawn was a very deplorable one. He remembered several periods of prosperity in the history of the country, and he was sorry to say that the greater the prosperity the greater the demoralisation. Whether Government could do anything in the way of providing greater facilities for working men's savings he was not prepared to say, but as to collecting an income-tax through an employer, that he considered to be an impossibility.

Mr. J. F. Boys urged that working men's clubs should be kept entirely as clubs or places for the purpose of refreshment and amusement, and their libraries should have as much light literature as possible. Something should also be done towards providing amusement for the working women, for whom little or nothing had been done. Such a work was an admirable one for a number of ladies to engage in.

After some remarks from Sir W. Stirling in support of innocent recreation for the people,

The Rev. R. H. Lundie observed that one of the difficulties mentioned in Mr. Fuller's paper had been to a great extent met in Liverpool by the establishment of cocoa-rooms for the working classes, no fewer than fourteen of these rooms having been opened within the last twelve months.

EXHIBITION OF SANITARY AND DOMESTIC APPLIANCES, LIVERPOOL.

During the past week large numbers of people have visited the exhibition in the Drill-hall, St. Anne-street, which was opened on Wednesday in last week, in connexion with the Social Science Congress, and on Saturday evening the place was so crowded that locomotion from stand to stand was a matter of no little difficulty. The size of the building was far from sufficient for the number and varied character of the exhibits, and it is much to be regretted that the endeavour to obtain Victoria Hall, which was specially erected for the religious services of Messrs. Moody & Sankey, proved ineffectual, as that commodious building would not only have proved to be most admirably adapted for the purpose, so far as accommodation was concerned, but it would also have been much more central for visitors and a greater advantage to the exhibitors. As it is, many of the exhibits could not be properly inspected on account of being too much crowded, and several exhibitors were obliged to keep back many articles for want of room on their stalls to show them. Mr. R. T. Chaplin, of London, had the management of the exhibition; but it was mainly due, as before, to the exertions of Mr. James Robinson. The ceremony of opening the exhibition took place at eleven o'clock, and was very simple.

Mr. Godwin, being called to the chair, said the exhibition was not exactly a portion of the Social Science Association's programme, but it was an offshoot, and he was sure that all who had attended previous exhibitions strongly desired that it should be made part of the actual business of the Association. Whatever might be said of wild theories mooted elsewhere, at that exhibition they had only hard facts to deal with, which could be well examined and at once disposed of. After stating that the number of exhibitors was upwards of 100, he proceeded to mention some of the most important sanitary appliances to be found in the exhibition. Mr. Hogg's models for ventilation well deserved examination. Mr. Cole's apparatus for lowering and raising windows would be found very useful where the sashes were heavy or difficult of access. Messrs. John Powell & Co. had sent some capital samples of building materials and painted tiling; and Messrs. Doulton a charming collection of the artistic ware they were producing. William Green's Climax Coal Saver had obtained approval from a public committee. Mr. Henry Stott's plans for the ventilation of ships appeared to be excellent; but the application of his system to the ventilation of sewers seemed not to be without objections. Messrs. Leoni & Co. showed that cooking could be done by gas with even a saving of money. Mr. Goodall's exhibit of concrete flooring, and Mr. Northcroft's Fire-resisting Compound Arched Floors and Roofs, were described and commented on. Alluding to the importance of having dry houses, he referred to the exhibits of the Silicate Paint Company, Seel-street, Liverpool, and said when they recollected the enormous amount of injury that lead-paint did every year, and the number of persons who were damaged most seriously by it, and the difficulty of keeping damp out of houses, and when they found that this company claimed to meet these two points, their preparations were of importance. Another useful appliance was Harrison & Wood's domestic flushing plug, which was a very small article, but from which, if largely used throughout Liverpool, considerable advantage would result. The Ladies' Sanitary Association had a stall, and their work ought to come under the notice of the ladies of Liverpool. They were quietly doing a good deal of work, and might do more if they were aided by committees established in such large towns as Liverpool and Manchester. After mentioning other of the inven-

tions exhibited, he concluded by impressing the importance of giving increased attention to sanitary matters generally. Thousands of people had died in Liverpool simply because of the want of good sanitary arrangements. Liverpool possessed able sanitary officers and many good arrangements, still people died to an alarming extent who ought to live, and would live, under better sanitary arrangements.

Dr. Yeats next spoke, and said, the object which the committee had in view had been to make the exhibition as representative as possible of each class, and as far as could be to show to what point England had arrived in affording to every one, rich and poor, the best means of meeting his domestic and his social requirements.

Mr. Baldwin Latham said he had attended the whole of the exhibitions which had been held in connexion with the Social Science Congress, and he could bear testimony to the good from a sanitary point of view which such exhibitions had had upon those who had frequented them. New appliances of a sanitary character had often been brought out at exhibitions of this kind, to which the public needed to have their attention drawn, in order that they might be adopted for the benefit of the public health. The present exhibition formed no exception to the rule, for there were in it numerous appliances of immense importance in a sanitary point of view. After dwelling at some length, and very usefully, upon the importance of having pure air and pure water, he remarked that it could not be said with regard to Liverpool that its water-supply was of the most desirable quality when they took into consideration the fact that a large per-centage of the supply was procured from wells sunk in the red sandstone, and that the sewers which carried away fœcal matter were hewn out of the solid rock, and constructed with the addition of an arch only. He hoped those who visited the exhibition would pay particular attention to all the appliances, because in each one of them they would find something worthy of note, and perhaps something which might be of importance to their own health and that of their families.

The exhibition was then declared open, and the chairman said he had only to commend it to the special attention of the inhabitants of Liverpool, and to express an earnest hope that it would be productive of good.

THE LIVERPOOL ART CLUB.

Social Science, which, in different parts of England, for the last twenty years, has culled flowers of many and divers species,—otherwise destined perhaps to blush unseen,—has just brought into unusual notice the existence of a society of gentlemen whose artistic doings, from what we have read and experienced, must be added to the catalogue of those good deeds which may yet brighten the naughty aspect of a materialistic world. The objects of this club are to found and perpetuate in Liverpool one general centre of communication and reunion, whither local art-collectors and art-lovers may be attracted under one common hospitable roof; while they, moreover, may in like manner be brought into closer and more direct connexion, not only with local, but also with metropolitan artists. This club also aids in the promotion of loan collections and in the delivery of lectures upon art. The Liverpool Art-Club, in its first by-law, describes itself as formed for the purpose of bringing together those interested in artistic subjects, and the furtherance of anything that may promote the interests or diffuse a knowledge of art; and we learn that an attempt is even now being made to found a similar club in another large city in the north.

The presence in Liverpool of a few Royal Academicians, with a sprinkling of other Londoners of artistic and antiquarian tastes or notoriety, has afforded the Art-Club another occasion for exercising its hospitality to strangers; and, last Saturday evening, it proved, in the most practical manner, that not the meanest of the qualities developed at a Social Science Congress is the science of sociality. The dinner, which was a complete success, was held at the Club-house in the room at present devoted to a loan exhibition of illuminated manuscripts. Covers were laid for seventy-nine, of whom thirty were guests; and among the latter, besides the Mayor, were the Marquis of Huntly, Sir Robert Collier, and four presidents of sections. Of these last, one, Mr. Herschell, Q.C., M.P., had denounced, in his opening address, Coroners' Courts, and the uncodified state of English law; and another, Mr. Poynter, R.A., had, on that same morning, inveighed against an age of iron and engineers in general, and the landing-stages and bridges of Liverpool in particular. It was, therefore, with no small amusement that hosts and guests heard, in the course of the evening, the good-humoured rap on the knuckles received by both these gentlemen from the wit of one practised debater, and an awfully practical question put by another speaker. Mr. Herschell was pointedly told by Sir Robert Collier that "by no laws which you can enact, by no institutions which you can make, can you turn the savage into a civilised being. You require," added Sir Robert, "civilisation before good laws or good institutions are possible;" and the result of a wicked whisper induced Mr. Gaskell, the president, to say that he had taken the liberty to ask Mr. Poynter in what way horrible-looking works of utility could be made consistent with artistic rules; to which the Royal Academician had replied that it was scarcely his province to do more than point out the excessive ugliness of these things, and that it was for the engineers to devise some means by which utility and beauty would be combined. Nor did the Marquis of Huntly, who unintentionally delivered a little stab at the pugnacious character of art criticism, fail to raise a laugh by a story well told. He, it appears, is a *bric-à-brac* hunter; and once, killing time at a town in Northamptonshire, he found himself in the shop of "a silversmith with three balls over the door." Having asked the price of everything in the shop-window, and finding nothing of interest, he inquired if there were any great collectors in the town. The silversmith's wife said there was Mr. Sadler. "Pray," continued the Marquis, "what does Mr. Sadler collect?" "Oh!" replied the woman, "poor-rates, sir!"

Mr. Philip Rathbone, to whose earnestness the addition of an art-section to this year's Congress is due, spoke like a man of the world, as well as an art-lover. Referring to the repeated slur cast upon Social Science Congresses by the press, he said, very happily, that if such congresses did not advance science very much, they *spread* science; and concluded, with a touch of amiable satire, in describing Sir Robert Collier as "one who had shown that the love of art could flourish more strongly among politicians than among any other class of amateurs, except perhaps medical men." Nor did he fail to strike home with a hard hit—even in spite of the presence of the mayor—regarding the baneful influence upon the art of the country and the taste of the people exercised by some of our national and municipal institutions.

But the best speech of the evening was that delivered by Mr. Leighton, R.A., and we cannot but think that the evident facility with which he expresses himself,—with equal force and refinement,—will contribute, when the time comes, to lead to his elevation to a post which many of the public, and some of his colleagues, consider him destined to fill. Mr. Leighton's words (forming only a portion of his speech), if we remember rightly, were almost as follows:—"There can be no doubt that a place of meeting, where men, smitten with that absorbing thing—a love for art—may come together and discuss, in a friendly manner, their favourite topic, compare their treasured possessions, increase their knowledge, exchange their ideas, and by contact of intelligence perhaps evolve some new spark of thought—such an institution cannot fail to be useful as well as delightful, anywhere and everywhere. At the same time, I venture to think that the uses of an art-club are more especially obvious in great towns such as Liverpool and Manchester, which are huge centres of manufacturing and commercial activity, remote from the metropolis, where the current of daily life sets itself strongly and effectually in a direction entirely opposed and inimical to art. Although Englishmen have shown in political life that they cannot bear centralisation, in their artistic aims we see a different spectacle. We see heaped up, in profuse abundance, treasures of art in the metropolis; and, with the exception of the university towns of Oxford and Cambridge, and the capital towns of Edinburgh and Dublin, we see an almost entire baldness with regard to these things all over the country. How great is this contrast! See what immense resources are open to the lover of art in London. In the British Museum alone the student sees before him an art-epitome in all its lovely forms, which the world cannot rival. The precious spoils of the Parthenon, the light and pomp of scientific life in the great Periclean age, are arrayed before his eyes in the Panathenaic frieze; and, there, in the serene presence of gods and heroes, he may almost for a moment forget the din and squalor all around him. In the National Gallery we can follow the growth and development of the art of painting from its birth, in the city of Florence, to its culmination in Rome and Venice, and its later triumphs—its Indian summer—in Holland, Spain, and Flanders. . . . . On the other hand, when we turn, say to Liverpool, we find these resources, not wholly wanting, but, at the same time, in an embryonic condition. A great deal, however, has already been done . . . . . but a great deal remains to be done, in order to propagate the knowledge of art, to raise its tone, and to spread its refining influences among the great commercial populations." Here it is that the uses of such a club as that at Liverpool come into view; and we agree with Mr. Leighton that the worthy and noble objects which the Art-Club proposes to itself, beyond mere social and convivial enjoyment, will spread a beneficial and lasting influence upon the community at large in the wealthy and yet pauper-ridden town of Liverpool.

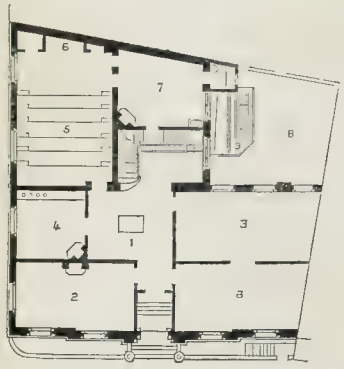
BRIGHTON SCHOOL OF ART AND SCIENCE.

On a convenient site in the Grand Parade, at the foot of Carlton-hill, a school of art and science is being erected for Brighton. We give a view of the façade and plans of the principal stories of the building. The first stone was laid by Sir Henry Cole in June last. Of the designs sent in the competition was an open one—that of Mr. J. G. Gibbins, of Brighton, was selected by the committee. Before being finally passed, however, the plans and elevations were carefully gone through by the committee and Mr. Fisher, and they were subsequently submitted to the Science and Art Department, South Kensington, for approval. The building in style will be a modern adaptation of the Romanesque, and it will cover an area of 68 ft. by 71 ft. 6 in. The façade will be handsome with stone-work and figures in terra-cotta, suggestive of the character of the institution. On each side of the main entrance on the Grand Parade will be columns of red polished granite, while the window columns will be of red Mansfield stone, and the jambs of yellow Malm brick. The front wall of each wing will have a sculptured medallion, with emblematical figures let into it, and in the centre of the façade will be a clock with a statuette on either side. The cornices, balustrading, and coping, will be of Bath stone. The accommodation for the art classes will consist of an elementary-room, 38 ft. by 32 ft. 6 in., lighted from the top, accommodating a class of about eighty students; painting and antique rooms, together about 50 ft. by 22 ft., lighted from the north; a modelling-room, library, master's room, &c. For Science there will be two large class-rooms, professor's room, and chemical liboratory; and, for both, a lecture-room, occasional class-rooms, secretary's office, cloak-rooms and lavatories, and residence for attendant.

Mr. G. R. Lockyer, of King-street, North-street, Brighton, is the builder; and the immediate superintendent of the operations is Mr. Parker Anscombe, his manager.

Interesting Discovery in Rome.—An interesting discovery has just been made at Rome, in the Church of St. Peter ad Vincula. Workmen have been engaged for some time in the construction of a "confession," near the high altar. In the course of the excavations, in a line between the altar and the apse, they came upon a marble sarcophagus more than two mètres in length. On the sides are sculptured five groups in the style, apparently, of the fourth or fifth century. The first represents the Redeemer raising Lazarus, with the sister of the latter on her knees at the tomb; the second, the multiplication of the loaves and fishes; the third, Jesus and the Samaritan woman at the well; the fourth, our Lord foretelling to Peter his triple denial; and the fifth, Christ giving the keys to Peter. The interior is divided into seven compartments, and this circumstance has given rise to the belief that the sarcophagus found contains the bodies of the seven Maccabees, which, according to Church history and tradition, rest in this church, built by Eudoxia.





GROUND PLAN



FIRST FLOOR PLAN

1. Entrance-hall.
2. Secretary's and Board room, 28 ft. by 16 ft.
3. Science class-rooms, 33 ft. by 16 ft. each.
4. Men's lavatory and paste-room.
5. Lecture-room, 31 ft. by 22 ft.
6. Black board.
7. Professor's room, 20 ft. by 16 ft.
8. Yard.
9. Roof of men's offices.
10. Elementary art room, 38 ft. by 32 ft. 6 in.
11. Closet.
12. Library, 16 ft. by 14 ft.
13. Master's room, 16 ft. by 14 ft.
14. Painting-room, 22 ft. by 16 ft.
15. Antique-room, 33 ft. by 22 ft.
16. Modelling-room, 20 ft. by 16 ft.
17. Lobby.
18. Landing.
19. Stairs to laboratory.

The ladies' room forms a mezzanine room above professor's room.
The basement floor contains caretakers' rooms, occasional class-rooms, stores, coals, &c.
The laboratory is over the modelling-room and grand staircase.

BRIGHTON SCHOOL OF ART AND SCIENCE.—Mr. J. G. Gibbins, Architect.



"BAYNARD CASTLE," QUEEN VICTORIA STREET, LONDON.—Designed by Major Wieland.

"BAYNARD CASTLE," QUEEN VICTORIA STREET.

This building, of which we give an illustration in our present number, is composed mainly of red brick, the highly ornate decorations being moulded in red terra cotta. The premises, which are situate in Queen Victoria-street, at the corner of St. Andrew's-hill, have been designed and built by Major J. F. Wieland, who owns several other buildings in the same street, notably Albert-buildings, Imperial-buildings, Poultry-chambers, Bridge-chambers, and, lastly, the Oriental Restaurant over Blackfriars Station. In the present instance of the Baynard Castle, he has chosen a variety of the Tudor style of architecture, because the present building covers a portion of the site of the historic Baynard Castle, which was for some time the residence of King Richard III. while Duke of Gloucester, and afterwards while king. It was from his residence, Baynard Castle, that Richard Duke of Gloucester proceeded to Westminster to demand the throne of England, and thence also did he proceed on the following day to St. Paul's Cathedral, where he was received by the Archbishop and clergy as the King of England. Baynard Castle is rich in history, for it was here that Edward was named king, and where Richard usurped the title; where Henry VII. frequently resided, and on one occasion received and lodged his storm-tossed guest, Philip of Austria. In Baynard Castle, too, in still earlier times, lived Maud the Fair, who was killed with a poisoned egg because she refused the hand of King John. Nice times those!

In the excavations for the present building, traces were found, it is stated, of a secret passage, supposed to be that which ran from Baynard Castle to Henry II.'s Fair Rosamond bower on Paul's-hill Wharf. One of the latest historic facts connected with Baynard Castle is the occasion of Queen Elizabeth supping there with the Earl of Pembroke. In the days we speak of, the river washed the walls of the castle, but now the City Flour-mills stand some hundreds of feet in front of it into the bed of the Thames. We are glad, however, that the name of the old castle (which is also the name of the City ward in which it is situated) should be perpetuated, albeit that the name now only attaches to a tavern.

The terra-cotta decorations are chiefly heraldic, giving in their various details the arms of England, and the crests and supporters of various sovereigns who lived at Baynard Castle, together with the City arms and the arms of the ward. There is also a representation in terra cotta in bas-relief on the south front of the building of the original Baynard Castle, introduced since our engraving was completed.

The design has been carefully carried out by clever artists under the personal direction of Major Wieland.

AS TO THE INFLUENCE OF ACADEMIES UPON THE ART OF A NATION.

This question, discussed at the Liverpool Congress, is a very useful one. But, as it stands, it tacitly implies that academies, art-academies, as they are now constituted, were always a part of the art organisations of the world. This, however, was by no means the case. Academies of art are of comparately recent origin. Whatever associations of artists may have existed in the two great art epochs, the Grecian and the Italian, the art of those epochs did not in the least degree owe its encouragement and progress to these guilds, but to much more potent influences outside and independent of them, viz., to the leading of the people, the culture of the people, and the will of the people.

The modern academy has risen upon the ruins of ancient art developments, more immediately upon that which was fostered by the Papal power. With the modern academy came in the institution of national galleries of pictures and museums of antiquities; in short, that complex system of institutions for art-teaching by which this present age vainly expects to place art on the same elevated pedestal as that of Greece and Italy; to effect, in fact, by an inverse process, by the force of example, what was patiently earned step by step through the centuries by hard thinking and patient labour. When the Church of Rome ceased to be the great patron of painters, and the walls of the churches, the palaces, and other public edifices were gradually closed against the genius of the painter, the time for picture exhibitions and academies came. The era of cabinet pictures set in.

The Academy of the Fine Arts was the product of these changed times. The world had commenced to educate itself and to think for itself. And whilst it was intent upon solving some very knotty questions, the feeling for art almost expired. Academies came to the rescue, and prevented its utter extinction.

It was under similar conditions to these,—in a country where the masses were uncultivated,—in a State where the taste of the people had no leading, in art, from the educated class, that the Royal Academy of London was founded, and faithfully it fed the lamp, and kept it burning till better times. For this devoted service we are deeply indebted to it. The Royal Academy deserves our gratitude. For had it not been for those associated English painters, sculptors, and architects, we should, in all probability, have had no art-sustaining power whatever,—no schools, no art-teaching through the greater part of a century. But the influence of such an institution upon the arts of a country, either for good or ill, is, under such adverse external conditions, too apt to be exaggerated. But now that there is somewhat more light diffused, on art matters, outside the Academy, the public is somewhat dazed by this access of effulgence, and has somehow or other got possessed with the notion that the Academy ought to be answerable for what it never can be answerable for, viz., the taste of the people. An academy in a free country, like all other institutions amongst a free people, will be what the people will to make it. The public in its intellectual progress has begun to rail at the Royal Academy without having itself as yet sufficiently advanced in its art-knowledge to understand that it is all the while railing at and condemning itself. For, in effect if not in words, it reproaches the Academy for not being something very different to what it has itself made it. If the Royal Academy had been endowed by the State specially to paint grand historical works, we might then have consistently blamed it for departing from the strict terms of its charter. But how can the public, with the least show of justice, complain if the academicians do not, with one accord, pursue the highest aims in painting, when the public itself is all the while demanding of them a very different kind of art? You are the great purchasers, you the great picture-buying public by whom the artists thrive. Artists paint their pictures to your orders, to your tastes. It is really you, and not the Royal Academy, who exercise the greatest influence over the arts of the country. It is really you who determine, though you may perhaps not be aware of it, the path which the rising art-talent shall pursue, but who yet have the effrontery to turn upon and blame the Academy and the art-schools of the country for only too well complying with the strict letter of your demands. An academy would possess a superhuman obstinacy if, in a country like this, it could for any length of time run counter to, and defy, public opinion and taste. When there happens to be anything wrong about a house, it is no uncommon thing for the master to turn upon and blame his servants. He seldom entertains the suspicion that he himself may be to blame. Can that public which has modified the several estates of the realm of this great country seriously turn upon a special institution like the Royal Academy, and accuse it of being the cause of all the national art-short-comings, and of defying its sovereign will and pleasure? To me, the proceeding appears to be utterly childish, and unworthy of a great people.

And what did the nation do when the cry was first raised against that institution,—against that institution but for which we should have had no art at all? Why, instead of rewarding it for its devotion, and increasing its powers, you established a new art-department to take the art-teaching of the country out of its hands.

How was it, I would inquire, that the nation was able to effect the great political reforms of the last half-century? Was it not by that educational progression which gave the people a clearer perception of their rights, and which enabled them to discern where error and corruption lurked, and to ask distinctly for the necessary reforms? A similar movement, arising from a similar cause, if I rightly interpret the addition of the art-section to the present Congress, is beginning to stir the country with respect to its art policy, and I feel convinced that it will be followed by equally important and beneficial reforms in regard to art as that which preceded it was in favour of better representation and good government.

Let us turn for a moment to survey the conditions on which a grand national art development depends. 1. It depends upon the leading of the people. 2. It depends upon the education, the culture of the people. 3. It depends upon the unity of thought and purpose of a people. 4. It depends upon the stability of a State.

1. Art depends upon the leading of a people, because the time must be yet far distant when the great mass of the population of this kingdom can possibly attain to that highest culture which is reached by but few. Meanwhile, the leading of the masses in art, as in other matters, devolves upon that educated few. It is the leaders of the people who should direct the taste of the many, who should open up great opportunities for the exercise of artistic talent, and demonstrate to the people that art in its highest exercise becomes monumental, by embodying, in more or less durable materials, the thoughts and aspirations of a people,—who should convince the people that unless this monumental art be encouraged, we shall, as a nation, have no lasting record of our intellectual status.

2. Art depends upon the education of a people, because it is the more finely organised sensibility which is developed by culture which makes men susceptible to the refinements of art. Without this educational preparation it will be in vain to expect any improvement in taste.

3. Art depends upon the unity of thought and purpose of a nation, because this alone leads to unity of style in architecture, painting, and sculpture, and impresses the arts of a country with a distinctive character.

4. And art depends upon the stability of a State, because political and social stability enables the fine arts to be persistent in their labours, and thus to perfect both their theoretical and practical knowledge.

But what would be the condition of the artist, and of art, in a State wherein all these necessary conditions for the successful prosecution of artistic studies were wanting, as they were in England, if we except that of national stability, till very recent times? For what leading had the people in art, half a century since, from the educated class? What field has the artist had in this country for the exercise of his talents on a "grand scale", on monumental painting, compared with the painters of Greece and Italy? Where was the unity of thought and purpose which would have made our cities rise, not as they have done, a chaotic patchwork of styles, but bearing upon them a common impress, exhibiting an architectural and national magnificence? Yet this, I say, was the very confusion of things which existed in England at the time the Royal Academy was founded. The Academy was quite powerless to change these conditions, but the walls of the Academy nevertheless served as a fortress in which the few English artists fought bravely through the adverse time, and the Royal Academy will, I will venture to say, send you recruits when you have found new fields for artistic conquest, and wider campaigning ground than that of the walls of the Academy itself.

I myself very much doubt whether an Academy of Fine Arts, constituted as modern academies are, could at any time show the slightest signs of vitality without being in some degree representative institutions. They may wear the appearance of being exclusive and absolute, when the art darkness of a people is profound, and they represent the taste but of a small class. The Royal Academy is now the representative of a much wider constituency than of old time, and none, I feel persuaded, know better than the Academicians themselves that the Academy's occupation would be gone if it ceased, as a body, to modify its views, and to respond to the taste of the people. I have myself noticed how faithfully the walls of the Academy have reflected any popular bias to this or that temporary art fashion.

I have, therefore, come to the conclusion that an academy is principally useful as serving as a stronghold in adverse art times, but that it has little or no power to mould the taste of a people,—it is itself influenced and moulded by public opinion, public taste.

Academies, as I have already stated, are modern institutions. In the two great art epochs, in those two epochs which produced the finest examples of art, academies, under the form in which we now know them, had no existence. Our modern art policy is altogether different from that which was so pre-eminently successful. There was no necessity for Academy

exhibitions when the walls of every important building were in themselves a grand exhibition. There was less need for the painting of cabinet pictures when the public took a lively interest in the grand themes of religion and history. There was very little occasion for schools of art when the system of scholarship prevailed, and every newly-erected edifice was a school of the very best kind,—a school in which the student was not left at the very threshold of art to shift for himself, but which conducted him far beyond, and furnished him with that experience which made him either a painter, a sculptor, or an ornamentist.

Depend upon it, if this country is to make a great mark in the fine arts, we must change our art policy. If we do that in the direction in which Greece and Italy point, and keep our minds steadily fixed on the great ends to be achieved, we may save the breath of clamour against academies, against any established art institution whatever. Liverpool has the inauguration of this new art-policy in her own hands, and to her fostering care I commend it.

But whatever changes may take place in the art-policy of this country, there is one function which an Academy of the Fine Arts, like that of the Royal Academy of London, ought to be the best able to perform. I mean that of dispensing honours, and of honours I trust it will remain the fountain-head as long as artists retain the amiable weakness of desiring them for their good work. W. Cave Thomas.

THE INTERIOR OF CHESTER CATHEDRAL.

Sir,—Having, since writing my former remarks thereon, had the pleasure of seeing the above-named place, I am impressed by one or two features in its treatment which, I think, in the interest of church arrangement and decoration generally, might be profitably brought under the notice of the profession.

The opening of the south transept into the church, and the clearing of the central space, from which all the vistas radiate, is a great improvement, and fully discloses the beauty and interest of a very impressive interior, and increases or restores the unity of the cathedral,—a quality very desirable in all such structures, and one in which our cathedrals are somewhat inferior to the French, which generally exhibit one vast apartment that strikes with an effect of noble simplicity and majesty, though ours have the greatest apparent length in proportion to their actual dimensions. One vista, I would just remark, the one upwards, has not been improved by the great chandelier hung up in the tower.

On the north side of this central space, two couples of polished Classic marble shafts, brought, I was told, from Corinth, which enter into the composition of the unique organ-screen, make a pleasing variation; and would have been still more pleasing and harmonious had their capitals, and the superincumbent features in the screen, been of the same precious material.

On entering the choir, though fully consoious of a due solemnity arising from grandeur and purity of form, which must owe much to the removal of whitewashes and excrescences, I could not help feeling a want of keeping between the bare sandstone of the piers and arches, and the richness everywhere else displayed,—in floor, storied pulpit, carved throne and stalls, and above all in the altar and reredos, in the construction of which has been wisely acknowledged, by the use of inlayings to which sacred associations attach, a principle which is violated in restorations generally. Nothing can be finer in form than those piers and arches, and the Early English triforium above them. But equally apparent with their beauty of form is their need of colour.

The newly-scraped stonework has, I am well aware, been left in this state in conformity with the general usage. But I am quite sure it is a violation of true principle and a grievous mistake so to leave it; and I should say the same were I assured it was the invariable practice of the Mediæval artists to do so. Without painting and embellishment, such an interior cannot have half the effect it is capable of, or look truly finished.

The only worthy interior finish, I conceive, of a great monumental structure, is the polished surface of a marble lining, which being once applied, finishes it for ever. As this is inapplicable here, painting and gilding, which could not be more worthily employed, should be brought to the rescue, and save the house of God, at least the most sacred division of it—the choir and its aisles,—from presenting a meanness of surface which we could not tolerate in our sitting-rooms, and which prompts the feeling expressed by David when he said, "Lo, I dwell in a house of cedar, but the ark of the covenant of the Lord remaineth under curtains." Fancy the improvement that would be produced in the place if piers, arches, walls, and triforium arcade were suddenly changed by wand of magician from dark-red coarse-grained sandstone, to dark-red polished granite. How greatly more palatial and monumental would be its air and character! But some three or four coats of oil-paint, highly varnished, would, without imitating any superior material, realise an almost equal effect, and, at the same time, be preservative of the stone from injury by damp. Gilding might be added so as to emphasise the forms if needful, while horizontal gilded and decorated bands might be so disposed as to increase the apparent height of the piers, and of the interior.

The noble and meritorious composition of St. Paul's Cathedral has inspired the universal wish to supply the great desideratum therein of good detail and decoration, and render its finish worthy of the general design. But the buildings in question are quite as worthy of receiving all possible internal adornment as the great work of Wren. In them the highest efforts of art-skill have been successfully put forth to produce excellence, — excellence which, whenever duly appreciated, must inspire the wish to carry out the general design to its utmost limits in regard to detail. Nothing, we may be assured, judiciously applied in the way of embellishment can be lost in those interiors. The distribution of light in them, more particularly by the great east and west windows, is so admirably adapted to enhance the result of majestic proportions by broad and powerful effects of *chiaroscuro*, such as delight us in pictures, and give the utmost beauty to any detail, moulding, or element of decoration, that it seems high treason against the republic of art not to give them the highest finish of which they are susceptible.

Some of the loftiest elements of adornment employed at St. Peter's Church at Rome, and the most sumptuous churches, Classic or Gothic, of the South of Europe, are equally applicable to these,—the finest and most venerable monuments we possess; and are, indeed, necessary to render them worthy of their exteriors, on which, in almost every instance, the beautifying finger of nature has been busy, till every stone has become literally a picture, and the whole glows with the interest and beauty of a landscape painting. But I return to the particular example under consideration, the omission of painting in which is, I humbly think, a mistake. I should not here point it out, were it not one which could still be corrected.

Colour and decoration on the arcades would render the extremely minute and rich mosaic floor more in keeping with its surroundings. For elaborate floors, for which there seems a passion among us, at present, we have no high precedent, or authority in reason. The tesselated, or rich mosaic pavements of the Classic ancients, we may be well assured, were never used but in connexion with walls and ceilings decorated in the highest style of art; or in accordance with the principle that, of the planes which bound an apartment, the plane of the floor, which is to be trampled on, is the most inferior in its claims to ornamentation. There are some inlaid figures in this floor, which I need scarcely say, are too sacred to be walked upon, even were the Oriental custom in vogue of taking off the shoes on entering our holy places.

The old carvings of the stalls have, very properly, been thoroughly cleaned. But in the operation of cleaning, which was by boiling, they have lost something of their look of age, which had been better retained, the more so as all looks new elsewhere. A general look of newness in the interior was of course inevitable. But, in so old an edifice, the eye instinctively looks for some sign of age; and these old carvings would have satisfied it.

Samuel Huggins.

Trade Marks.—Negotiations are in progress between the Governments of Germany and Brazil for the conclusion of a convention for the mutual protection of trade marks.

A WORD FOR THE BUILDERS' BENEVOLENT INSTITUTION.

The annual dinner in aid of the funds of this Institution will be held on the 2nd of November, Mr. Charles B. Waller in the chair. The invested property now amounts to something over 19,000*l.*, and the committee hope, with the assistance and through the liberality of the builders of the metropolis and their friends, to raise this fund to 20,000*l.* before the close of the year. When this end is attained, as surely it may easily be, they will feel themselves justified in distributing the whole of the annual income in pensions, without further adding to the invested property. We trust some of our readers will join in the present effort to increase the sphere of usefulness of the association.

From want of funds many deserving cases cannot be entertained. There are always more candidates than there are pensions available, and it frequently occurs that individuals have to stand five or six elections before they are successful, which, to persons of the usually advanced age of the applicants, often means total failure. The annual subscriptions are far below what might be expected of such a great industry as the building trade of this great city, and the committee are begging those who are not subscribers to become so, and those who already subscribe and can afford to enlarge their subscriptions to do so.

The pensions, viz., 24*l.* for men and 20*l.* for women, were fixed when the necessaries of life were far less costly than they now are: consequently the allowances no longer represent the same relief that they did formerly, and the committee are therefore very desirous to increase the amounts to such an extent as will give to their unfortunate brethren a somewhat larger share of the comforts so essential to declining years. This they cannot possibly do until they have a larger annual income at their disposal, and for this we now join them in asking.

THE EDUCATION OF ENGINEERS.

SUGGESTED DIPLOMA.

At the first ordinary meeting of the winter session of the Manchester Scientific and Mechanical Society, held on the 13th inst.,

The President (Professor O. Reynolds), in his inaugural address on "Engineers as a Profession," referred at length to the paucity, which he said had existed in the means of education for engineers; and alluding to the cause of preliminary technical education having been held of such little account, said the classical education of our public schools, or the mathematical education given at Cambridge, however much it might develope the power of mind of its possessor, were hardly the one more than the other calculated to forward the study which was his immediate object. By the establishment of special schools, and the extension of those existing, all the more useful branches of science were now, however, within the reach of the student of engineering, and in the form most suitable for him, so that as a step towards understanding the theory of machines, it was not now necessary for him to begin with the theory of astronomy or the doctrine of chances. There were now some fifteen colleges and universities in the country, where not only could a knowledge of all the useful sciences be obtained, but where the application of science and mathematics to the work of the engineer was made a special branch of study; and such was the hold which the study of natural science had taken in all classes, and such were the facilities for those in the lower ranks to rise, that it seemed quite certain that if those who had the best opportunity of qualifying themselves as engineers neglected to do so in the highest manner they would find their places filled by those who, while rising from below, had made better use of their opportunities. To the body of engineers as a whole belonged the duty of prescribing the course of study which should entitle any one to rank as one of them. It was not, however, too much to say that at present nothing of the kind was attempted in England, and although various ways in which it might be done had been under discussion, apparently no conclusions had yet been arrived at. It was done in other countries, and the fact that it was done by other professions was a sufficient proof that it might be done by engineers. Why could not the representative bodies of engineers constitute themselves into examining bodies like the College of Surgeons

or the College of Physicians, and only admit such members to the various grades within their ranks as should satisfy them as to the sufficiency of their education? Such a plan, if effectually carried out, would be a great advantage both to the outside public and to engineers themselves. It might be said that there were already institutions which required some qualification for membership, but the test for mechanical and civil engineers was entirely one of position, instead of one of capacity. The only approach to a real examination test was that for the degrees and certificates in engineering science conferred by the various colleges and universities, but these, however much they might be sought for the intrinsic value of the education they implied, were not as yet generally recognised by engineers. That they soon would be, seemed, however, probable, for one important step towards this had just been commenced by some of the engineers round Manchester, who had agreed to recognise the value of the complete certificates of Owens' College, by taking the holders of them into their work. In conclusion, the president said he hoped the time was not far off when the engineering profession would be able to hold its own, not only in the importance of its work and the capacity of its individual members, but as a coporate body, discharging all functions necessary for handing down its importance to posterity.

"GREAT EASTERN-STREET."

Such is to be the name of the new street from Shoreditch High-street to Old-street, which was formally opened on the 12th inst. by Mr. C. M. Roche, acting for the chairman of the Metropolitan Board of Works (who was absent through the death of a relative). The street forms a portion of the comprehensive scheme of street improvements initiated by the Board in the session of 1872, and confirmed by an Act passed in that year, the particular improvements of which this is part extending from Wapping High-street to New Oxford-street. The expenses incurred or to be incurred under the Act will probably amount in the whole to 2,500,000*l.*, of which sum the portion from Shoreditch to Old-street will have cost about 435,000*l.* Of these sums a large portion will be recouped by the letting and sale of building plots. The length of street from Old-street to Shoreditch is 2,000 ft., and the width is 60 ft., of which 36 ft. are devoted to carriage-ways and 12 ft. to each footway. The roadway is of granite, and the footways of York paving, and the cost of forming the road and of works in connexion will probably amount to something over 34,000*l.* The contractors were Messrs. Nowell & Robson. As 1,600 ft. of the road were opened for traffic some few weeks ago, 400 ft. only remained to be formally opened. The total length of new thoroughfare between Vernon-place, Bloomsbury-square, and Bethnal-green will be, when the improvements are completed, about two miles and a half, forming an uninterrupted communication between the eastern portion of the metropolis and New Oxford-street.

The members of the Metropolitan Board were afterwards entertained at luncheon by the vestry of St. Leonard's, Shoreditch.

NEW ENDOWED SCHOOL BUILDINGS IN CAMBERWELL.

The accumulated proceeds of a legacy left in trust, many years ago, by Mary Datchelor, for repairing her vault and monument in the church of St. Andrew Undershaft, educating children within the parish of St. Andrew, and apprenticing boys to trade, are about to be laid out in the erection and maintenance of spacious new school buildings in Camberwell for the education of girls. The new establishment is to be a middle-class school, capable of accommodating 400 girls. It appears that, in consequence of the continued removal of residents from the City, there have, for some time past, been very few children to educate within the parish of St. Andrew, and the funds of the charity in this respect have been practically useless. This has led to the trustees of the charity inducing the Charity Commissioners to draw up a new scheme for the administration of the funds under the legacy, which now amount to about 30,000*l.*, and which are invested in 3*l.* per cent. Annuities. In the first instance the Charity Commissioners drew up a scheme under which the trustees were empowered to purchase a site, near and convenient to the parish of St. Andrew Undershaft, upon which to erect new school buildings for the education of girls of the middle class. Girls resident in, or connected with, the parish of St. Andrew Undershaft were to have priority of admission, and next to them other girls of the middle class not so connected. In accordance with this scheme, the trustees proposed to erect a school on a site at Hoxton; but the Charity Commissioners did not approve of the neighbourhood of Hoxton, and, after considerable delay, a second scheme has been issued by the Commissioners under which new school-buildings are to erected in Camberwell, on a site which, it is stated, the trustees have secured in the neighbourhood of Camberwell-grove, near Church-street. The fees for each girl are to be 9*l.* a-year, and in connexion there are to be exhibition competitions. The scheme provides for the repairing of the founder's vault and monument in the church of St. Andrew Undershaft, and also for other payments stipulated in the bequest, including small annual sums to the rector, clerk, and sexton, and for the payment of pensions to aged decayed tradesmen and others, and their widows, connected with St. Andrew Undershaft.

THE FALCON LODGE OF FREEMASONS (THIRSK), AND ARCHÆOLOGY.

On the 7th October the members visited Leake, accompanied by the vicar, the Rev. A. T. Atwood, M.A., Rural Dean, and Messrs. Lewis & Brodrick, architects, of York and Ripon. Here many centuries ago stood a large village, which was probably destroyed under the successive attacks by the Danes, the Normans, and the Scots; its existence and extent being partially traceable in the ridges and buried foundations found in the neighbouring fields. Leake Hall, the only remaining house in the village, is an ancient building, containing many of the features of the manorial houses of the sixteenth century, a wide staircase of massive oak, and having its rooms wainscoted in panels.

The most important part of the church, in an antiquarian view, is the tower, which is of Anglo-Norman character, if not earlier. The belfry windows consist of two semicircular-headed lights, divided by a baluster shaft. The tower contains three bells, one of which is reported to have been brought from Rievaulx Abbey, and is inscribed, "O pater Aelred Grendale Miseri Misera." It is supposed to have been the gift of Aelred, the third abbot of Rievaulx, who died 1166, and the form of the letters denotes a period subsequent to the Norman Conquest. The other bells have inscriptions with the date 1618.

There are two curious specimens of ancient carving in oak, bearing figures of nondescript animals, symbols with brief legends, and the date of the work 1519. When the church was restored, in 1854, these were removed from the south aisle, where it is supposed a chantry chapel formerly was, and have been converted into choir-stall ends, and placed in the present chancel.

The nave arcade is Norman, with caps and arches. There is a piscina remaining in the south aisle, and an aumbrey in the north wall of the chancel. A brass plate on a large black stone in the nave, with old English capitals, is inscribed:—

"Of yor charitie p'y for ye soules of John Watson su'tyme Auditor to ye Lord Scroope of Upsall and Alice his wife and their child whose soules Jesu p'don."

The roof is of oak, and corbels remain in the walls, at the same level, showing that formerly it has been much higher, which can be accounted for by the recorded fact that in the incursions of the Danes, during the ninth and tenth centuries, almost all the monasteries and churches were set on fire and destroyed.

Withdrawal of Tender.—At a meeting of the Kensington Board of Guardians, on the 12th inst., a letter was read from Messrs. Browne & Robinson, whose tender for erecting a new board-room and strong-room for 1,253*l.* was accepted on the 28th ult., saying that, in consequence of an error in their estimate of 496*l.*, they must withdraw their tender. The chairman (the Rev. C. Darby Reade) said these contractors had done the same thing once before at another Board of which he was a member. After some conversation the next lowest tender was accepted,—that of Mr. Smale, for 1,533*l.*

A WILBERFORCE NEW CHURCH AT CAMBERWELL.

LAYING THE MEMORIAL STONE.

The memorial stone of one of the five new churches intended to be erected in South London in memory of the late Dr. Wilberforce, Bishop of Winchester, has been laid this week by the Bishop of Guildford. The site of the new church, which is dedicated to St. Luke, is in Rosemary-road, Commercial-road, Camberwell, in the midst of a neighbourhood which has recently been laid out for building purposes, and on which upwards of 200 houses have already been erected, whilst building is going forward at a rapid rate, and what little more than a year or two ago was mainly a large market garden, will shortly be a thickly populated locality. The new church will have a capacity for seating about 1,000 persons. The style of architecture adopted is a mixed Gothic, the materials being moulded red bricks, and Bath stone dressings and windows. The aisles will have lean-to roofs, and the nave will have a lofty clearstory, with an open-timber ceiling. The lower portion of the interior walls, to the height of about 6 ft. from the floor-level, will be wainscoted and painted, whilst the main part will be faced with red brick, uniform with the external elevations of the edifice. The nave will be divided from the aisles by arcades, the arches of which spring from Bath stone columns. The interior dimensions will be upwards of 120 ft. in length, and about 60 ft. in width, including a spacious chancel, with clergy and choir vestries, and organ-chamber. At the west end there will be a tower and spire. Mr. E. K. Cutts is the architect, and the builders are Messrs. Colls & Sons, of Moorgate-street and Camberwell, whose contract is 7,932*l.*, but we understand that this does not include the whole of the interior fittings and intended decorations.

MEMORIALS OF THE LATE BISHOP WILBERFORCE.

An episcopal throne, designed by Sir Gilbert Scott, has been erected in Christ Church Cathedral, Oxford, at a cost of 1,000*l.*, as a memorial to the late Bishop Wilberforce. The following figures are included in it:—On the top of the gables, front, our Saviour; east, the Virgin Mary; west, St. Frideswide; back, a finial; at the four corners, St. Matthew, St. Mark, St. Luke, and St. John. In the angles are the heads of the following bishops:—St. Birinius, St. Remigius, St. Hugh, and St. Grostete. Dr. Wilberforce is represented in a medallion at the back. A new chapel, lecture-room, and other buildings have also been added to Cuddesdon College as memorials of the late bishop, who founded the institution. These latter have cost 6,250*l.* It was determined to erect these memorials at a public meeting held in the Sheldonian Theatre on the 3rd of October, 1873, and they are now just brought to a successful completion.

We have engraved a view of the bishop's throne at Oxford, and will take an early opportunity to publish it.

THE AGE OF ROCKS.

At the first meeting of the session of the Liverpool Geological Society, on the 10th inst., the retiring president, Mr. T. Mellard Reade, C.E., delivered the annual address. The subject was an interesting one, being a calculation of the amount of solid matter removed annually from the surface of England and Wales in solution in rain or rather river water. The result of the calculations, which were of an elaborate nature, founded upon the analyses of water given by the Rivers Pollution Commission in their sixth report, and upon the rainfall chart prepared by Mr. Symons, showed that it would take 13,009 years to remove in this manner 1 ft. in depth of solid matter over the entire surface of England and Wales. This calculation was compared with others. As throwing light upon the age of sedimentary deposits, the calculations, taken together with the amount of matter annually brought down in river water in suspension in the form of mud, are extremely interesting, and Mr. Reade deduced from them that the minimum amount of time which must have elapsed since the first sedimentary rocks we know of were laid down, is in round numbers 500 millions of years, thus supporting the views of Lyell, Hutton, and other geologists as to the immense age of the world.

PUBLIC DRINKING-FOUNTAIN AND CLOCK-TURRET, KIDDERMINSTER.

A DRINKING-FOUNTAIN with clock-turret has been erected by Mr. John Brinton, J.P., of Moor Hall, Stourport, and will be presented by him to his native town—Kidderminster—on this Saturday, the 21st inst., when the ceremony of unveiling will be performed by Mrs. Philpott, the wife of the Bishop of Worcester, the structure being accepted by the Mayor of the borough and the Town Council on behalf of the burgesses. The building, which is in the Geometrical style, is octagonal on plan, measuring 12 ft. 6 in. across, and standing on a platform of York stone, 20 ft. across, the height to the vane being 32 ft. The three taps, placed over Sicilian marble basins are supplied with water from the town mains, and this flows from them to fill the York stone drinking-troughs for dogs.

The arcade surrounding the structure is composed of York stone arches, supported upon red Aberdeen granite shafts, with Cornish granite bases, the body of the structure being built of York stone and the spire erected in Bath stone with blue bands. At the rear is a space enclosed with a handsome iron railing, and planted with ornamental shrubs.

The turret has a clock with three illuminated dials, supplied by Messrs. Swindon & Sons, of Birmingham, also at Mr. Brinton's cost.

The fountain was erected from the design and under the superintendence of Mr. J. T. Meredith, architect, Kidderminster, and the works have been carried out by Mr. John Everal, of Malvern, the carving being executed by Mr. W. Forsyth, of Worcester.

MESSRS. DOULTON AND THEIR BRICKLAYERS.

THE following letter from the Secretary of the Operative Bricklayers' Society reached us immediately after the publication of our last number. It has since appeared in several newspapers, and Messrs. Doulton have contradicted it in parts; nevertheless, we now publish it, as it might otherwise be supposed we were unwilling to give both sides fair play. From the Artisans' Institute, Castle-street, where there is evidently a want of understanding amongst themselves, we print one more letter. For several other communications on both sides we have not room.

SIR,—As much misunderstanding exists in the public mind regarding this unfortunate dispute, I feel it my duty to explain the matter and to make such suggestions upon it as may be fair and just to employers and workmen.

It has been stated that we, the Bricklayers' Society, object to any workmen other than bricklayers fixing terra-cotta, which is not true, and is calculated to place us in a wrong light before the public. What we have hitherto contended for is the following:—Where the walls of a brick building are ornamented with terra-cotta, the bricklayer should have the fixing of the ornamental work, the same as they do in gauged arches, cornices, mullions, &c., which are composed of brick worked into various ornamental forms by the bricklayers, according to the specifications of the architect. We have also considered that where the walls of a building are composed of stone and the ornamentation is terra-cotta such work could be advantageously done by a mason. The same principle we have contended should apply to the plasterer; where the walls of buildings are to be cemented or stuccoed it would be quite consistent with his ordinary work that the plasterer should have the fixing of the terra-cotta. It has been asserted that the bricklayers know nothing of, and are incompetent to fix, terra-cotta; our answer to that is by giving the following places where terra-cotta has been set by bricklayers. The work must answer for itself. At 200 houses, villas, and mansions in Ferndale-road, Clapham, for Mr. Jennings, terra-cotta-maker and engineer; the Natural History Museum, South Kensington, where from thirty to forty bricklayers are now setting terra-cotta. Thomas Cook and W. Humphreys, both members of our Society, fixed all the terra-cotta in Mr. Doulton's house at Tooting-common. The case in dispute has arisen in consequence of the men on the works having taken the above view of the question. When the works commenced a number of bricklayers, consisting of Society and non-Society men, and as competent a lot of workmen as were to be found in London or elsewhere, went to work with the belief that they would have, as usual, the setting of the terra-cotta. When they had been working nearly two months, and had reached the second story of the buildings, they were surprised to find that two men, who had previously worked as plasterers, were brought on to the works and put to do the terra-cotta ornamentations. The men, believing that the usage of the trade was thus unfairly interfered with, had a consultation among themselves, and resolved on laying the case before our Council. After an investigation, the Council deemed it advisable to send one of their members, W. Ashdown, to the employer, with a view of effecting a satisfactory adjustment of the difficulty. The delegate proceeded at once to the works and saw the manager, Mr. Phillips, and upon the grounds above stated desired the removal of the two men. Mr. Phillips in a summary manner declined to entertain the question. This was reported to the Operative Bricklayers' Council, and the following resolution was the result:—"That in the event of the two plasterers not being removed from setting terra-cotta with the bricklayers the men be empowered to act in whatever way they may deem fit." The men continued working out the week, and on the following Monday they held a meeting, and decided upon consulting myself upon the whole matter. They came to me and wished me to see Messrs. Doulton on the subject. To this proposition I at once assented. I went to the works and saw Mr. Doulton and Mr. Phillips, who received me most courteously. During the conversation, which lasted upwards of an hour, I made the following proposition:—Would they agree for the bricklayers to fix the terra-cotta work on the two large buildings, and the plasterers to remain doing the terra-cotta work on the job in the High-street? This proposition which I thought was a fair compromise of the dispute, was refused by Mr. Doulton. I then proceeded to the public-house close by the works where the men were assembled, and reported the foregoing facts to them, when a resolution was immediately moved by the men, and unanimously carried, to the effect that the men would not return to work under existing circumstances; and a picket was appointed to inform bricklayers of the dispute and where they might obtain work. It will thus be seen that this dispute is one emanating from society and non-society men themselves, and not brought about by the action or wish of the Bricklayers' Society, and it is as much regretted by our Council as it ever could be by employers or any other portion of the community.

If the two plasterers had been on the work when it commenced I feel quite sure that no objection would have been taken to them by the men, but the fact of bringing them into the work after it had reached the second floor, and then for our men to be told they were not competent to do the work, was more than the self-respect of the bricklayers could bear. To prevent any further misunderstanding regarding the wishes or intentions of the Executive Council of the Operative Bricklayers' Society, I most respectfully make on behalf of the society the following proposition:—That if the grounds, as above stated, upon which bricklayers, masons, and plasterers were interpreted by us to fix terra-cotta are not approved of, we are most willing to have the whole question submitted to a board of conciliation and arbitration, to be composed in the following or any other satisfactory manner:—That Messrs. Doulton & Co. elect three gentlemen in whom they have confidence, that the Masons' Society elect three, that the Plasterers elect three, and the Bricklayers' Society elect three, the whole of these to form a board and choose a chairman from outside the board whose known character and position in society should place him beyond suspicion as to prejudice or partiality. I earnestly hope that the proposition I have made will meet the cordial approval of Messrs. Doulton & Co.,

E. COULSON, General Secretary,
Operative Bricklayers' Society.

SIR,—By the publication of the following, you may be able to remove any misapprehension that may have arisen in the minds of your readers from the perusal of the letters that have appeared in the last two numbers of your journal.

In the first, your correspondent, Mr. Morris,—to whose letter, as a whole, I would fain make no remark, only that he advises Messrs. Doulton & Co., and any other employers requiring specially skilled bricklayers to apply to the Bricklayers' Technical Class, and they would get what they want. To this I, as one of the two teachers of the above class, beg leave to say that these classes have been commenced but, say, four months, and although during even that short period great progress in technical knowledge has been made by the students, who number between forty and fifty, it would be a rash proceeding to recommend them as especially skilled workmen on the strength of that alone. The truth is, we have no means of ascertaining whether they have had this theoretical knowledge put to a practical test in actual execution; or, even if we had, it is not our mission to keep a supply of such like articles of merchandise, to serve out to those who choose to apply for them, nor have we any guarantee that the men would go where we chose to send them. Much less has Mr. Morris any authority to make such a statement.

In the next letter to which I would allude your correspondent, Mr. Solly, for whom I entertain the most profound respect, makes a statement upon the authority of one of the teachers of the bricklayers' class. To this I would beg leave to say that the authority for this statement did not originate with me, simply because I know nothing about the strike other than what I read in the papers, and I am only too sorry the men were not better advised; neither do I know anything about the terra cotta at the Natural History Museum, and I am careless who sets it either there or anywhere else, although I may say I have no doubt bricklayers can be found who are as able as any other class of skilled workmen to set terra cotta, feeling, as I do, pretty sure that the greatest skill required in dealing with terra cotta lies in the manufacture; but I must say just at this time when a bold and honourable struggle was being initiated to advance their status in the building trade, and remove the cause for the prejudice which it is well known does exist against them as a class, it is a pity some other means could not have been found to settle this unfortunate dispute about so trifling a matter.

J. WOODLEY,
The Originator of the Bricklayers' Technical Class.

"MODERN TYRANTS."

SIR,—Your remarks upon this subject in the *Builder* cannot but be regarded as just and equitable. An impartial observer unswayed by prejudice must view the late proceedings at Messrs. Doulton's works with indignation. Such outbursts of petty despotism on the part of trade unionists only tend to damage the institution. The working classes have "gone up like a rocket," and will, if they do not display greater discrimination and judgment, "come down like the stick." The institution of trade unions has probably, more than any other circumstances combined, tended to give an ever-increasing impetus to foreign competition. It is well known that in works of the nature of that at present in dispute, alien aid has had to be procured whenever extra care or delicacy was required in the manipulation. If the trade unions would guarantee that all their members are efficient workmen, the uses of such an institution would be considerably enhanced. An unskilled unionist may demand the same amount of wages as his skilled colleague, which proceeding is a palpable and gross injustice, that must ultimately have the effect of deteriorating the technical capabilities of the workmen. That praiseworthy emulation which prompts one workman to excel another is smothered for lack of appreciation and advancement which in other cases would be the legitimate reward of superiority.

What, will be asked, is the use of superior technical education to the unionist? Why should one man make himself superior to another if he is to derive no advantage? Technical education will be in a great measure nothing short of a dead letter if modern advancement is to be held in check by the trammels of unionist regulations, which are entirely opposed to the principles of free trade and legitimate competition.

The boasted privileges of Englishmen,—freedom of thought and action,—are entirely ignored, and the workman quietly permits himself to be ruled by those who cannot even rule themselves. Public opinion is a powerful moral persuasive, against which not even trade unions can hope to make a successful stand. There cannot be a doubt that if we are to be favoured by many more such instances of error on the part of the officials of the trade unionists as that recently displayed at Messrs. Doulton's, public opinion will ultimately assert its prerogative, and trade unions will become a thing of the past, and measures will be adopted in future by working men for their own protection that will be more compatible with the interests of art, improved technical education, and modern enlightenment.

AN ARCHITECT.

DENCHWORTH CHURCH.

SIR,—I see that in a report of the proceedings of an Archæological Society at Denchworth, Berks, you have printed a gross attack made on me by the clergyman of that parish. He charges me with having restored his church in (I think) 1854, and with having destroyed a whole series of interesting things in so doing. I think by this time my detestation of anything like destructive restoration is pretty well known. In the case of Denchworth Church I am perfectly certain that I never ordered the destruction of a piscina, or of a rood beam, or of old brasses, or indeed of any old furniture or features. The work I really did was so small that I cannot charge my memory with its exact nature. But the proceedings I am charged with would have been quite as revolting to me in 1854 as they are in 1876. I find in my account-books that on September 29th and December 17th, 1853, I visited Denchworth, and that my charges for these two journeys (and I made no others) and for my design for whatever I did design, amounted to the large total of 10*l.* 10*s.*, which must refer therefore to an expenditure at the outside of 150*l.*, obviously not enough for the various works which the clergyman of Denchworth, in his zeal for truth, charges me with being responsible for!

I do not suppose for an instant that a man who makes an attack in such ungentlemanly language as this clergyman thought fitting, will be able to acknowledge that he has made some mistake. Another time he may as well apply to the person concerned before he makes his charges.

GEORGE EDMUND STREET.

SUPPLY OF WATER.

SIR,—In reply to your correspondent "Peto," he should have put his question more fully. Not having stated the quantity of water the pipe is intended to convey, it is impossible to say the diameter of the same and its consequent thickness; but assuming that the supply will be distributed under the constant system, and that the daily consumption per head per day will be twenty gallons, and as this quantity, practically, would be required during eight hours of the earlier part of the day, the discharge per minute on this data would be 17 cubic feet; the pipes should be of cast iron, 3 in. diameter, and the metal ⅜ in. thick; length of pipes, exclusive of socket, 9 ft.; depth of socket, 3 in.; and the thickness of lead joint ¼ in.

L. L.

CHALK.

SIR,—Will any of your numerous readers give me some information respecting the proper treatment of chalk previously to its being used for building purposes, for both inside and outside work?

C. W.

INDUSTRIAL DWELLINGS IN THE MIDLAND COUNTIES.

The first general meeting of shareholders of the Midland Improved Industrial Dwellings Association (Limited) was held in Derby on the 10th inst.

The report presented by the directors stated that the object for which the association was formed was to endeavour to meet in some degree the great and pressing want which exists in some of the Midland towns for increased and improved house accommodation. That this could be done successfully, both in a sanitary and financial sense, had been satisfactorily proved by the operation of similar associations in other towns. During the last four months numerous facts had come to the knowledge of the directors, which showed beyond a doubt that no part of the kingdom stands more in need of the operation of such an association than the large Midland towns. Instances of great individual inconvenience are being frequently brought under their notice. As the main object contemplated was to deal with the more densely-populated parts of Derby and Nottingham, attention was first directed to these localities, and the directors had secured what were considered very suitable sites in both towns for the erection of blocks of improved dwellings. A portion of the buildings on the site in Brook-street, Derby, is already being converted into a model lodging-house for single men, with accommodation for sixty-eight beds. The beds will be enclosed by partitions 7 ft. high, giving to each the privacy of a separate room. The dining-room, kitchen, lavatory, and sanitary arrangements will be made as complete as possible. Tenders had been received for the erection of the first block of buildings on another portion of the site, which were under the consideration of the directors. Numerous applications had already been made to the manager for the shops and dwellings. The site chosen in Nottingham, at the corner of Heathcot-street, was considered a very advantageous one, and the directors would be prepared to deal with it as soon as a sufficient amount of capital has been subscribed. Important local support had been promised in Chesterfield, on condition that the first want supplied there should be a model lodging-house.

THE DEATH IN A SEWER AT BATTERSEA.

CONCLUSION OF THE INQUEST.

On the 12th inst. Mr. Carter, coroner for East Surrey, resumed, for the tenth time, the adjourned inquest on the body of John Thomas Lomas, a sewer-flusher in the employ of the Metropolitan Board of Works, who was poisoned in the New-road Sewer on the 9th August last, under circumstances already reported.

Mr. Frederick Alfred Manning, residing at Effingham Lodge, Upper Norwood, was called by Mr. Pettigall, and deposed that he was an analytical chemist, and had given much attention to sewage matters. He had made a thorough inspection of Mr. Wallace's premises. He considered that the cause of the suffocation of the deceased was the decomposit on of the sewage matter in the hot weather, and in a confined space. This fact would, in his opinion, be sufficient of itself to cause death. The sewer was not now large enough to drain the important district through which it passed. He did not attribute the death to anything connected with Mr. Wallace's works.

Mr. Thomas William Keats was next called by Mr. Straight. He deposed that he was consulting chemist to the Metropolitan Board. Fatal accidents of this kind were very rare, although no doubt the men became affected by the sewer gases. Out of forty accidents, going back to 1875, only five were due to sewer gases. He had heard the evidence of the sewer men. He was of opinion, in reference to the men working in the morning, that they must have been inhaling the same gases as after dinner. He thought death was caused by the presence of sulphuretted hydrogen.

At the conclusion of Mr. Keats's evidence the coroner announced that the jury had agreed upon their verdict, which the foreman then delivered as follows:—

"We find that John Lomas was killed by poisonous gases emanating from refuse chemical matter discharged into the New-road sewer from the works of Mr. Hugh Wallace, but by whom they were thrown in there is no evidence to show. The jury are of opinion that great censure is due to the Wandsworth Board of Works for permitting those chemical matters to be discharged into the New-road sewer, thereby perilling the lives of the men who were employed in the sewers, and endangering the health and comfort of the inhabitants of the neighbourhood. We wish to add, in conclusion, that we consider the greatest praise is due to the sewer-flusher Gates, who so bravely went into the sewer in a half-stupefied state, when almost dead himself, and so rescued the other men, Scott and Plester, who must have otherwise lost their lives as well as the deceased; and we sincerely regret that we have no institution in this country for awarding a medal to the men who save life in sewers as well as in rivers."

Mr. Thomas Buckham, C.E. (New Wandsworth), writes:—"Will you kindly allow me to state, in reply to Mr. F. A. Manning's opinion at the recent inquest, that death had resulted from decomposition of sewage-matter in a sewer not large enough to drain so important a district, that this sewer was designed by myself, submitted to the Metropolitan Board of Works, and approved of by their eminent engineer, Sir Joseph William Bazalgette, C.B.?"

At the meeting of the Metropolitan Board of Works on the 13th inst., the clerk read the result of the coroner's inquest as given above. Mr. Richardson, in moving that this matter should be referred to the Works and General Purposes Committee, with power to confer with her Majesty's Government, stated that it was desirable that the Board should have a controlling power over chemical works similar to that exercised by the Board in respect to slaughterhouses, and he could not imagine a stronger case in support of this than this case of death in a sewer at Battersea.

SEWERAGE MATTERS.

Ripley.—The Local Board of the district of Ripley, Derbyshire, having applied to the Local Government Board for permission to borrow 3,000*l.* for the purchase of about thirty acres of the Padley Hall Farm for the disposal, by means of irrigation, of the sewage from the northern side of their district, a public inquiry was held by Mr. Robert Morgan, C.E., in Ripley, on the 22nd ult. The Board was represented by the chairman and several other members, with the clerk to the Board; and the application was supported by Mr. R. Argile, jun., the engineer of the proposed works. There was no opposition, and it was understood that there would be no difficulty in obtaining the consent of the Local Government Board to the proposal.

Oxford.—Great progress has been made during the past year with the Oxford main drainage scheme. Most of the heavy works have been completed, including the outfall sewer from Christ Church Meadow to the pumping station at Littlemore; the western sewer, from the river Cherwell through Christ Church Meadow, St. Aldate's, St. Ebbe's, and St. Thomas, to Osney; the north-western sewer, from Titmouse-lane, through Worcester College Gardens, to Albert-street, Jericho; the short length of the north-eastern sewer across Merton Field, which links the drainage of the central and north-eastern part of the district with the outfall; the eastern sewer, through St. Clement's, collecting most of the drainage east of the Cherwell; and nearly the whole of the sewer across the valley to unite New Hincksey with the outfall; besides a large number of branch mains; in all,—three miles of brick culverts, varying in size from 4 ft. 6 in. by 3 ft. to 2 ft. by 1 ft. 4 in., and 11¼ miles of pipe sewers and surface drains, ranging from 18 in. down to 6 in. in diameter. On these works it has been necessary to carry out several difficult tunnelling operations, viz.:—Underneath the Castle Tower and other County Gaol premises adjoining, close to the Mill, and at a lower level than the bed of the river; under the Great Western Railway near the station; the malt-houses in Titmouse-lane; the house against the Canal Wharf, and other places. Cast-iron tubes, encased in concrete, have been laid underneath the two branches of the river at Pacey's Bridge, and the Canal has been crossed at the Goods Wharf. The sewers have also been carried twice under Trill Mill Stream, and a third crossing is now in hand. A dam has been put in for laying an inverted syphon under the river at Osney, and a similar syphon crossing the main river near Saunders' Bridge is partly done. These last-named works have, however, made but slow progress, owing to the obstacle presented by the hard conglomerate below, through which the piles have to be driven, and the consequent difficulty of making a watertight dam. A considerable number of house-connexions have been made, and about half the district is now in communication with the new system, the old outlets into the rivers and streams being temporarily used, and the engineer (Mr. W. H. White, C.E.) anticipates that the works within the city will be nearly or quite finished this year, except the remaining house-connexions. The Board has purchased about 350 acres of land for irrigation, and the works necessary for that purpose will be commenced shortly.

Dudley.—The Earl of Dudley has offered to take the whole of the sewage from the drainage of Dudley on to his farm free of expense, and to find an engineer to undertake the preparing of the sewerage scheme. The Town Council has decided to accept the offer of his lordship. This will, it is said, save the ratepayers 50,000*l.*

Dublin Waterworks.—The Dublin papers report a serious burst in the Vartry pipe, about half a mile from Enniskerry. The pipe passes under the river which flows between Enniskerry and Bray, and the burst has taken place right in the centre of the stream, a troublesome place to get at by reason of the swollen condition of the river. Large stones were driven aside, and the water issued from the pipe in great volumes, considerably adding to the size of the stream. If heavy floods come, there is reason to fear that Dublin will be short of water.

THE GROWTH OF LANCASHIRE.

A new valuation of Lancashire, ordered by the county magistrates, for county rate purposes, has just been completed, which shows the great expansion which has taken place in the buildings and population of the several Lancashire towns within a very recent period. Under the new valuation the rateable value of the county is now 15,638,162*l.*, as compared with 12,552,000*l.* in 1872, being an increase of 3,086,162*l.*, in four years, or about 20 per cent. over the whole county, but the increase in the towns shows a much larger percentage, the valuation in some cases being more than double that of 1872. The town of Barrow-in-Furness, of which we have spoken, stands at the head of the list, the new valuation of that town being 167,492*l.*, as compared with 75,652*l.* in 1872, being an increase of 91,840*l.*, or more than 120 per cent. in the four years. This increase indicates an enormous amount of building, in houses and manufacturing and other business establishments, which has been going forward here. The comparatively young town of Southport is next in order of increase, the new valuation being 168,172*l.*, as compared with 91,870*l.* in 1872, showing an increase of 76,302*l.*, or about 80 per cent. in the four years. The new valuation of all the large towns also shows a large percentage of increase, that of Manchester being 2,243,406*l.*, as compared with 1,766,268*l.* in 1872, an increase of 477,138*l.*, or nearly 25 per cent.; Liverpool, 3,027,380*l.*, as compared with 2,782,193*l.* in 1872, increase 245,184*l.*, or about 9 per cent.; Salford, 629,514*l.*, as compared with 460,498*l.* in 1872, increase, 169,116*l.*, or about 35 per cent.; and Bootle, 103,770*l.*, as compared with 68,660*l.* in 1872, increase 35,110*l.*, or about 50 per cent. The two last-named boroughs may be regarded as portions of Manchester and Liverpool respectively, as they immediately adjoin the two great Lancashire towns.

THE NEWCASTLE ASSIZE COURTS.*

Sir,—Provincial architects have fondly imagined hitherto that the practice of "touting" for commissions was confined to a "limited company" composed of the fag end of the profession. That pleasant delusion has been rudely dissipated by the statements in your paper of the 16th September as to the proposed new Assize Courts at Newcastle. From that statement, in the absence of all explanation from Sir G. G. Scott, the provincial architects aforesaid may conclude that the practice of their London brethren is different from theirs, in the matter of "touting"; seeing that one of the most eminent architects in London, who was lately President of the Institute, condescends to practise it. It may be an unfounded rumour, but it is hinted that the commission for the proposed Hook Memorial Church at Leeds was obtained by similar means.

Already the example set has been followed, as I note in your paper of the 7th that a Mr. Frere, of London, has written to the Corporation of Great Yarmouth, expressing a "strong desire" to make designs for their new Town-hall, almost in the same terms as Sir Gilbert used in the Newcastle case. Can it be that the depression of trade is arresting the flow of commissions to certain offices? However that may be, the matter is one that requires explanation if architects are still to be regarded as exercising a profession and not a trade. I inclose my card.

A Provincial Architect.

CERTIFICATED HOUSES.

In these days of sanitary questions, there is one which has lately been brought forward by the Society of Arts. This society proposes that an Act of Parliament should be passed requiring every house newly built to receive a certificate from an official that the sanitary arrangements are all that are required to render the house tenantable. I have observed numerous complaints from new tenants that when they have taken possession of their houses they are put to an extra expense to put their drains in order. A great deal of this annoyance might be saved if the District Board of Works would at once appoint an official surveyor, who was really competent to give an opinion from his special

* We continue to receive so many letters on this subject that we cannot do less than print one of them. A few words from Sir G. G. Scott would doubtless remove the impression which widely exists.

knowledge of house arrangements. This officer would not require a high salary, as his remuneration would be by his examination of houses of intending tenants. If the purchaser would, in his agreement, put in the words "subject to the district sanitary surveyor's certificate," it would give the purchaser some security that he is buying a healthy home for his family, and it would encourage speculative builders to be careful in laying their drains, knowing that if they did not attend to these matters their property would be tabooed. If such a competent surveyor were appointed, and the purchaser were content to buy a house without his certificate, he would have no one to blame but himself, and he might discover that he had been penny wise. This, it seems to me, would be a simple remedy pending an Act of Parliament, if it did not supersede the necessity of one. A. B.

ACCIDENTS.

On the 9th inst. Dr. Hardwicke, coroner for Central Middlesex, concluded an inquiry at Middlesex Hospital relative to the death of Robert Henry Tennant, a painter in the employ of Mr. John Crossley, of Newark, the sub-contractor for the painting of the interior of All Souls' Church, Langham-place. On the 19th ult. deceased was at work with another man in decorating the roof of the church, when a temporary platform which had been slung to the general scaffold to enable them to reach the corners better gave way, both being precipitated violently to the ground, deceased being so much injured that he died before he reached the hospital. The jury deliberated a considerable time, and ultimately returned a verdict of accidental death; but they desired to add that the foreman should exercise greater vigilance over the men and prevent the erection of unsafe scaffolds. They thought, too, that the contractors should do something in the way of compensation to the widow.

On the 10th inst., Mr. W. W. Robinson, deputy coroner, held an inquest at the Radcliffe Infirmary, Oxford, on the body of Robert Henry Williams, aged 15, clerk to Messrs. Parnell & Son, of Rugby, who are erecting some new works at Keble College. The deceased fell from a balcony at Keble College the previous day. It was stated in evidence that the deceased was engaged in measuring some new work the previous afternoon on a balcony which was only 6 ft. from the ground. While alone on the balcony, and with the measuring tape in his hand, he stepped backwards off the balcony and fell into a hole 6 ft. or 7 ft. deep, which was made for the drain. Some part of his body struck against the trench, which was shored up. He was picked up, but never spoke. Mr. H. S. Brantfoot, the house physician, said that the deceased lived about two hours and a half, although he was unconscious. There was a fracture of the right base of the skull. Verdict, "Accidental death."

On the 16th inst. an inquest was held by Mr. Humphreys at the German Hospital, Dalston, touching the death of George Johnson, aged 61. Deceased was carman in the employ of Mr. Izard, contractor, Lea Bridge. On the 11th inst. he was assisting his master in unloading a large block of stone at the Hoe-street Station of the Great Eastern Railway, when the jack slipped, and deceased, in endeavouring to save it, fell over the side of the truck on to the handle of the shunting points. He was conveyed to the hospital and died the same day. Verdict, "Accidental death."

MASTERS AND MEN.

Dumbarton.—On the 6th inst. the apprentice carpenters in the employment of Messrs. Denny, Bros., struck work on account of some dispute as to "allowance money." The Messrs. Denny have a number of apprentice carpenters employed on a new vessel in the Gareloch, which is getting ready for sea. They do not regard the "allowance money" received as sufficient, and therefore refused to continue working there. Those apprentices employed in the yard, fearing they might be sent to supply the places of those who left, have refused to work, and joined in the strike.

Greenock.—At a meeting of Greenock operative masons on the 10th inst., it was resolved to come out on strike on Monday, the 16th inst. The men recently asked an addition of ½d. to their present rate of wages—9½d. per hour—and this being refused, they offered to take ¼d. increase, but this demand also being resisted, a strike has been resolved upon.

DILAPIDATED HOUSES IN CAMBERWELL.

ORDER FOR DEMOLITION.

At the Lambeth police-court on the 12th inst., Mr. Napier, from the Solicitor's Office, Metropolitan Board of Works, appeared before the magistrate in reference to dilapidated houses in Havil-street, Camberwell. The houses were in a very bad state, and it was absolutely necessary for the public safety that measures should be at once taken for their demolition.

Mr. Jarvis, surveyor of Camberwell, said that Havil-street was in his district. He surveyed the premises on the 14th of July, and had then certified to their dangerous condition. They were in a very dilapidated state, the party-walls being separated from the front wall. The front wall was shored up. Notice had been given to the owners to pull them down.

The magistrate made an order that they should be demolished within fourteen days.

CURIOUS CLAIM FOR DAMAGES AGAINST A CONTRACTOR.

LEMAN *v.* WEBSTER.

In this case (heard in the City of London Court, before Mr. Besley, deputy judge), the plaintiff sued the defendant, Mr. Webster, contractor for the Holborn Viaduct Hotel, for 5*l.* damage done to his coat by dirty water splashing from the wall of the hotel.

The case had been adjourned, at the request of the defendant's counsel, for a tailor to give evidence as to the actual amount of the damage, as it was contended that the plaintiff's claim, even supposing he was entitled to recover, was excessive. The tailor who was called said that the coat did not cost anything like 5*l.* originally, and the damage was simply a little dirt, which could be completely removed by a clothes-brush.

Defendant's counsel submitted that plaintiff was, therefore, not entitled to anything. If a hansom cab splashed a man's clothes in the street, was he entitled to recover for cleansing them?

His Honour replied that any one would be entitled, and he would be very happy to make the hansom cab pay damages if it went splashing along. There was a great deal too much of people doing what they liked in the present day. What obligation was there on the plaintiff or on any tailor to brush the coat if it only cost sixpence to brush it?

Defendant still submitted that even then the plaintiff should only have sixpence for brushing the coat.

His Honour said the plaintiff ought not to be put to the expense of enforcing his legal rights against the defendant. It was the duty of contractors to protect passers-by from damage from the works they undertook.

Judgment for plaintiff—1*s.*, with costs for his attendance on each occasion.

DISINFECTING APPARATUS FOR BIRMINGHAM.

The Health Committee of the Corporation of Birmingham have recently caused to be erected a number of buildings, wherein the clothes, bedding, &c., of persons suffering from contagious diseases in the town may be thoroughly disinfected. The premises are situated in the Bacchus-road, and at some distance from the Borough Hospital. They consist (according to the *Birmingham Gazette*) of several detached buildings, within an enclosed yard, and are apart from any dwelling-houses, with the exception of a cottage which has been erected for the residence of the person in charge of the station. The principal building, that in which the work of disinfection will be carried on, stands in the centre of the yard. This building is square, and its interior is divided into two parts. Occupying an equal space in each compartment, and supporting that part of the wall built over it, is what at first sight appears to be a fire-proof safe, measuring 6 ft. 5 in. square. This is the apparatus, which is the invention of Dr. Ransome, of Nottingham. The infected clothing is conveyed from the residence of the patient in a van provided for the purpose by the Corporation, and in charge of a servant in the employ of that body. It is taken to the station, the conveyance being admitted at a gate on one side of the yard, and at some distance from any building. If dirty, the articles are washed, but the process of cleansing will be seldom resorted to. The clothing is then put into the large iron box by a separate door on one side, the wearing apparel being hung up, and the bedding placed upon a perforated floor. The door is then closed, and the compartment becomes air-tight. By means of jars in a stove beneath, the temperature in the chamber is raised to between 250 and 270 degrees, and after remaining there for four or five hours the clothes are completely disinfected by the heated air, and all germs of disease have disappeared. The articles are then taken out from another door on the other side of the disconnecting wall, and are conveyed to their owner's premises in a separate van, which is drawn by a separate horse, driven by another man, and leaves the station by a different gate. The principle of isolation and disconnexion is thoroughly carried out in every respect, the receiving-rooms being completely separated from the rooms through which the clothes pass after undergoing the process of disinfection. The officials on each side are isolated, and the horses and vans are kept in different parts of the station. The station has cost altogether about 1,000*l.*

MONUMENTAL.

Edinburgh.—Messrs. Stewart, M'Glashan, & Son, Edinburgh, have completed the erection of a granite monument over the last resting-place of the late Mr. Brownlow North, in the Dean Cemetery, Edinburgh. The monument is in the form of an obelisk, resting upon a basement, the entire height being 13 ft. 6 in. It is in unpolished grey granite, three polished panels being introduced at the base, upon the front one of which is an inscription.

Broughton.—A tablet, from the design of Sir Gilbert Scott, has been lately placed in Broughton Church, to record the career of the Hon. Edward Twisleton, youngest brother of Lord Saye and Sele.

SURVEYORSHIP ITEMS.

Stafford.—At a special meeting on the 12th inst., the Stafford town council proceeded to the election of a borough surveyor and superintendent of the sanitary department. There were originally sixty-two applicants, from whom the special committee selected five candidates to attend before the council, viz.,—Mr. J. H. Duckinfield, of Huddersfield; Mr. T. L. Johnson, of Cardiff; Mr. J. B. M'Callum, of Liverpool; Mr. J. Parker, of Bridgewater; and Mr. J. H. Taylor, of Facit, near Rochdale. The testimonials of each candidate were read, and the candidates were called into the room and interrogated in the order named. On examination it was found (according to the *Staffordshire Advertiser*) that there were some serious discrepancies between some of the original testimonials of the first-named candidate and the copies supplied by him to the council, and on being questioned concerning them, he volunteered to retire from the contest. His testimonials were forthwith handed to him, and his expenses were disallowed. One or two discrepancies were also discovered between the original and copy testimonials supplied by Mr. Johnson, and he attributed the errors to the printer. Mr. M'Callum was elected, and promised to commence his duties in a month.

Moreton-in-Marsh.—Mr. Edmund Jesty, of Fonthill Gifford, near Salisbury, has been elected by the Moreton highway board surveyor of the district, to succeed Mr. Alfred Stephens, resigned. There were twenty-four candidates.

Cheshire.—With reference to the vacancy for a county architect and surveyor for Cheshire, "Lincoln's-inn" writes to the *Chester Chronicle* as follows:—"I happened in passing through Chester to stay for a little at the Grosvenor, and there met a gentleman whom I well knew, and who is on the commission of the peace for Cheshire. He mentioned to me, among other items of news, that an officer of the army had been found to fill the above appointment, and the choice was to be confirmed on Monday. He belonged, he said, to an ancient and very influential family in the county—a circumstance he thought likely to be of advantage, as it would form a sort of connecting-link between the commonalty and the county families, which would be most beneficial to all parties concerned. I replied that the benefit to some of the parties concerned was obvious enough. Surely my informant is incorrect in his information?"—At the adjourned Quarter Sessions for the county of Chester, held on Monday, the 16th inst., at Knutsford, a surveyor was appointed for the county. There were over 100 applicants, among them a lieutenant-general, a lieutenant-colonel, and several other officers of the army. Six candidates were selected, viz.:—Mr. Adam T. Blandy, Mr. Stanhope Bull, Mr. W. Gordon Cotton, Mr. A. W. Maberly, Mr. James Morgan, Mr. C. W. Whitaker. These gentlemen attended the meeting; and Mr. Stanhope Bull was elected, Mr. Cotton coming in second, and Mr. Maberly third. The salary is 500*l.* per annum, with travelling expenses and a commission on works executed.

Cheadle.—Mr. E. Carnwell has been appointed surveyor and inspector of nuisances to the Cheadle Rural Sanitary Authority.

Great Crosby.—Mr. G. E. Thoms has been appointed surveyor and inspector of nuisances

to the Great Crosby Local Board and Urban Sanitary Authority.

Dover.—Mr. John Hanvey, the Dover town surveyor, was going to his residence on Castle-hill, on the 11th inst., when he was attacked by four soldiers, who knocked him down and robbed him of a gold watch and chain. The men have been committed for trial.

Wandsworth.—At a meeting of the Wandsworth District Board of Works, on the 10th inst., Mr. Stolz moved that the General Purposes Committee be instructed to inquire into certain charges made against the surveyor to the Board, and read a long statement reiterating the charges he had brought against the surveyor on previous occasions. Dr. Brown seconded the motion. Mr. Forster proposed an amendment, that the question be referred to a committee of the whole Board. The charges had been investigated by a committee of nine, and found to be unsubstantiated. Mr. Dulley seconded the amendment. After some further discussion the amendment was carried almost unanimously.

SOUND-PROOF FLOORS.

In the course of the interesting paper on "Improved Dwellings for the Rich," not long since read before the Society of Arts by Mr. T. Roger Smith and Mr. W. H. White (published in your columns), it was mentioned that the floors of "flats" might be made equivalent to horizontal party-walls (*i.e.*, fire and sound resisting), and composed of rolled iron entirely enveloped in concrete. I should much like to know how this sound-resisting quality is to be obtained. Having recently almost entirely remodified some offices, one story was subdivided into two by the interposition of a floor, the composition of which was as follows:—There were rolled iron joists 5 in. desp placed about 2 ft. apart. Between them the space was filled in with Portland cement concrete mixed with coke; the soffite floated with fine gauged stuff, and top rendered with Portland cement to form floor, which was further covered with linoleum. The space between the floors was therefore remarkably little, being altogether but 6 in. I have no hesitation in saying that this solid floor is a superior conductor of sound to an ordinary wooden one. The sound of a pencil dropped on the upper floor makes the by-no-means nervous occupants of the rooms under jump. The hard floor, instead of *deadening* such noises, seems to *sharpen* them. In the case alluded to, the assistants are on their guard, the principal's rooms being underneath, so there is no grievance. But what about a bevy of romping children careering about just over some crusty old bachelor's chambers in those "flats" which Messrs. Smith and White advocate? Surely an ordinary wood floor (though not so proof against fire), with lath-and-plaster ceiling well "packed," would transmit sound far less than concrete. I do not suppose a concrete floor 12 in. thick would be less sound-proof than one 9 in. or 6 in. thick. I may add, on the other hand, that a great recommendation to the concrete floor consists in its equality of temperature. I have found that in winter the rooms are warm; in summer deliciously cool, notwithstanding the sun shines on them from about eleven to three o'clock. I feel sure the presence of concrete must be at the bottom of this. Having carefully read through the whole of the paper and discussions on concrete lately published in the Institute Transactions, I did not find the points just named fully elucidated there, so I appeal to your columns.

I should like also to ask (while on the subject of acoustics) how it happens that a partition constructed according to the following description is not as sound-proof as an ordinary quartered lath-and-plastered partition: two thicknesses of inch boarding, one placed vertically, the other horizontally, with *very thick hair-felt* between them, the boards canvassed and papered on the outside edges.

INQUIRER.

Royal Archæological Institute.—The Town Clerk of Hereford has received a letter from Mr. Fortnum, one of the vice-presidents of the Archæological Institute (in the illness of the hon. secretary), stating that "the unanimous feeling of the council was, that Hereford be fixed upon as the city in which our Congress for the coming year, 1877, shall be held." Hereford has already been visited by the Cambrian Archæological Society and the British Archæological Society; by the last-named so lately as in 1870.

THE NEWBURY MUNICIPAL BUILDINGS.

THE LATE CASE OF CROOK *v.* BROWN.

SIR,—I am always unwilling to enter into a controversy publicly, but as you have reported this case, in which I was the complainant, you will, I trust, in justice to myself, permit me to give the building section of the public the real version of the affair.

In the first place, the contract provides that the old materials which were sound and fit for use were to be reused; and in the next place, it provided that if any unsound or improper materials were used, the contractor should have notice in writing to remove them, and if he failed to do this, then the architect should do so at his cost; but the magistrates refused, as I think very unfairly, to receive the contract or specification as evidence, simply because the clerk of works was not a party to it. Now, I wish to ask what is the duty of a clerk of works, if it is not to study the plans and *specification*, and see the work carried out accordingly? But here was one who had evidently done neither, and at this very time was under notice of dismissal, for reasons best known to himself and his employers. These were the real facts of the case:—A moulded string-course of Bath stone, 3 in. thick, was worked and fixed in the building, which he condemned, because it was in lengths of from 15 in. to 2 ft. If he had looked at the detail drawings he would have seen that it was strictly in accordance therewith. I, however, had the stone removed, and some other worked and fixed in its place, which he also objected to, not for the reason that it was short, but because it was not *new stone*. Now, sir, all practical men, especially masons, know full well that the longer Bath stone is exposed to the air the harder and better it is, as it thereby becomes seasoned, and will not be affected by frost, as new stone often is. Why, our stone merchants make it a point of recommending the stone that has been longest out of the quarry, and this very stone was thoroughly sound and much harder than the new stone; it has been seen by some of the best, oldest, and most practical masons in Newbury, and pronounced by them to be excellent. Well, sir, this clerk of works, without giving me notice, either verbally or in writing, to remove the stone, takes a heavy hammer, and, in a fit of ill temper, deliberately smashes it before it had been fixed two hours; and it was to raise the point and try the right of any clerk of works to violently take the law into his own hands and destroy a contractor's property that I brought the case before the justices. Perhaps it was not the right tribunal to have appealed to, for the reason that the gentlemen composing it were not, by their vocation and knowledge of building matters, competent to deal with it; but I should be perfectly content to submit to the judgment of any practical men, and abide thereby.

However, the matter is not of sufficient importance for me to take any further notice of it. Although I did not obtain a decision in my favour, I have to a certain extent accomplished my purpose in drawing the attention of others who like myself are engaged in the trade to the question, and I have no doubt that clerks of works will in future be careful not to exceed their duties as this one did, on the authority of Mr. Money, the architect, who honestly and honourably stated in his evidence that it was a course he could not justify, and should not himself have pursued, and further that he had no feeling in the matter, neither was there any unpleasantness between himself and the contractor, which I am very happy to confirm. Unfortunately he was from hom at the time this happened, or the stone would not have been broken; for if he had directed me to remove it I should have done so, though I am quite sure that had he seen the stone before it was broken he would not have objected to it, as better could not possibly be.

JOHN CROOK.

Books Received.

Plumbing: a Text-book to the Art or Craft of the Plumber. With Supplementary Chapters upon House Drainage. By WILLIAM PATON BUCHAN. London: Crosby Lockwood & Co.

THIS is intended as a text-book for the apprentice-plumber, the author of it, a member of the trade, having felt the want of such a treatise himself when an apprentice. The best use of the book in this way would be to give the apprentice an idea beforehand as to what he was to learn and look out for, and systematise the whole subject for him a little, which is of course a help to learning, and may enable the apprentice to look at the workshop operations with more understanding eyes than if he had to pick it all out as he went on, and find the reason for everything by inquiry. Otherwise, there is nothing in the book beyond what would be learned in the ordinary routine of the trade, nor could it be accepted at all as a complete treatise on plumbing; it is rather a series of chapters on the methods of various plumbing operations. The writer pays a good deal of attention to considerations of drainage, trapping, and ventilation, on which he evidently writes with some experience. The book is rather roughly put together, and written in what we should call "specification English," but it may be useful, and is of a convenient size for a book of reference, to be kept "handy." The writer alludes in his introduction to the importance of having the lead work, piping especially, which is now so extensive and intricate a portion of house-fitting, properly and carefully carried out; and nothing can be more true. But the question might perhaps be entertained whether the abolition of lead-piping, the possibility of substituting something that would be an improvement on it, is not an ultimate object to be looked to. Lead-piping is very expensive; it is not the best thing, in a sanitary point of view, to convey the water through; it is always getting out of repair, and under certain atmospheric conditions bursting, and is perhaps the cause of more disagreement between landlords and tenants than any other element in repairs to house property. Moreover, if we could get rid of the plumbers, there would be a considerable annual saving in fire insurances, and a better chance of preserving cathedrals, theatres, and other large buildings from those conflagrations which occur when "the plumbers are repairing the roof." However, in the absence of any immediate substitute, it is probable that plumbing may last our time; and so Mr. Buchan is to be commended for his efforts to improve it.

The Landscape Gardener: a Practical Guide to the Laying Out, Planting, and Arrangement of Villa Gardens, Town Squares, and Open Places, &c., &c. By JOSEPH NEWTON, F.R.H.S. London: Hardwicke & Bogue.

THIS is a rather large title in comparison with the scope of the work. It contains twenty-four plans, or drawings, which are something between plan and perspective, of different schemes for laying out gardens of moderate size, chiefly in relation to private houses. As, however, the author says that "the credit of the designs belongs to Dr. Siebek," and as the letterpress is merely an explanatory description of each design, it is not very easy to see why Dr. Siebek's name should not rather be on the title-page. The drawings are untinted, and merely show the direction of walks and the disposition of trees, whether singly or in what the French gardeners call *massifs*: the designs are all in one style, and, we confess, appear to our eyes to have a most remarkable and monotonous similarity of disposition. The variety may lie in the nature of the trees employed, which are catalogued with references to numbers on the plans; and, we must presume, are arranged with the view of producing pleasing combinations or contrasts of tints and foliage. In this way the book may be useful to those who wish to have some guide as to what trees they should procure for planting in various positions; but as the designs do not show in the least the varying character or colour of the vegetation, it is impossible to form any judgment as to what the result would be. The plans are all in what is called English taste, showing studiedly sinuous walks, arranged with a kind of unsymmetrical symmetry. Nothing could be less calculated to look well on paper; though in execution this method of laying out, when the various walks are sufficiently masked by raising the ground or by planting, has the effect of giving an impression of space and extent greater than the real area covered. We ourselves rather like a garden to be a garden,—to be openly and confessedly artificial, rather than to aim at a constructed irregularity, an imitation of nature. Tastes, however, differ in this respect. As a reference-book for the titles of trees fitted for ornamental planting, the volume will be useful; but it hardly makes the subject attractive.

Miscellanea.

Liddell's Improved Brick-making Machine.—Every good step in the direction of the object of this machine is noteworthy. The advantages claimed for this machine over others are numerous. For example, it is less liable to breakage, being more than a half heavier, consequently much stronger in all its different parts; also having only four bevel wheels, while other machines of a similar construction have no less than ten bevel wheels, which, with their attendant shafts and brackets, often become a total wreck, simply through a stone or any other hard substances getting into the gearing. The strain on the amount of gearing in these is very great, and either causes the shafts to jump out of their places or brings the machine to total ruin. In Mr. Liddell's machine the connecting-rods from cranks to slides are so fitted with safety springs that should any stone or piece of iron get into the slides the springs allow the connecting-rods to pass, and thus prevent injury, and when the impediment is removed this machine resumes its work with little or no trouble. It is so compact and simple and complete in its construction, that all the principal parts can easily be got at for repair.

Monuments in Westminster Abbey.—A correspondent writes:—"The appearance of the north transept has been completely metamorphosed; a new vista to the south-east having been thrown out, by taking down a brick wall which not only surmounted but completely invested an ancient stone screen; and the columns of the arcade on its western side having been disengaged from the monuments, by the removal from these latter of their needless and heavy backgrounds, thereby disclosing a fact which the cursory visitor might be forgiven for not knowing,—viz., that the transept is possessed of a western aisle, lighted by large handsome windows. The importance of the works carried out cannot possibly be overestimated; they are an earnest protest against the notion, which has been allowed of late years too much to possess the public mind, that the Abbey is but a museum; and also against the system of hacking and cutting about its walls to make room for what some call busts, but others figure-heads. Though generally understood that to Lord John Thynne, the venerable sub-dean, the public are indebted that this poor and tardy act of justice should at last be rendered to the Abbey, it is not too much to say that, had not the works been carried out under the watchful and sympathetic eye of the Rev. R. Duckworth, the canon in residence, the result might have been far less happy than what we now see. The Dean and Chapter have but commenced a great scheme in which they must not be allowed to stop short; the Abbey requires no more accessions of modern monumental works of art, falsely so called; but if a general clearing out of all that is hideous and incongruous be impossible, at least a reduction in size and a rearrangement of the material with which its interior has been lumbered during the last 300 years are proved perfectly practicable."

Surveyors' Charges on the City Sewers Commission.—At the meeting of the City Commissioners of Sewers, on the 10th instant, Mr. J. C. Davis called attention to the large sums to be paid to surveyors in respect to the property which had been taken by the Commissioners in the Poultry for the purpose of widening the thoroughfare. He thought that an effort should be made to keep these fees as low as possible, as improvements like these were entirely for the public benefit. The Chairman remarked that there could be no doubt this had been a most costly improvement, and, in negotiating for the purchase of the several properties they had enormous difficulties to contend with. The Commissioners invariably agreed with the claimants to pay all surveyors' fees, and, that being so, they had no alternative but to pay the amounts referred to. Mr. Davis also drew attention to the large sum, amounting to between 500*l.* and 600*l.*, to be paid to the engineer, Mr. Haywood, for assistance in his office for the quarter to Michaelmas. The Chairman said there were included in the last twelvemonths' statement certain amounts for improvements which had formerly been spread over four or five years. He added that these items had been considerably increased in consequence of proceedings which had been taken under the Artisans and Labourers' Dwellings Act.

A Benedictine Monastery in the Highlands.—The foundation-stone of a Benedictine Monastery at Fort Augustus, N.B., was laid on the 13th ult. The plans have been prepared by Mr. J. A. Hansom, of London, and by them provision is made for the conversion of Fort Augustus (a stronghold erected in 1729 to check rebellious Highland clans) into an imposing ecclesiastical pile in the Scottish Gothic style,—an edifice comprising, first, a monastery, which will be capable of accommodating 20 monks, each having his own commodious cell; next, a college intended for the education of 80 students; and, lastly, an hospitium, which will furnish means of entertaining about 30 guests, and which, it is expected, will, when complete, be much resorted to, not only by priests in their annual week of retirement, but also by other travellers. For the fitting up of the several portions of the building, Mr. Hansom has provided, and although the walls of the fort are intact, and will be fully taken advantage of, 4,000*l.* will be required to carry out the work. This is exclusive of the church cloisters, which will be erected as soon as the requisite funds are forthcoming, and which it is proposed to design in such a way as will correspond with the characteristics which the quadrangle will now assume.

Lead-stealing from a City Church.—At the Mansion House Police-court, on the 14th inst., two labouring men, named Charles Higgins and James Prendergast, were brought before Alderman Sir R. Carden, charged with stealing a large quantity of lead from the Church of St. Michael, Queenhithe. The church was recently doomed to destruction, the benefice being joined to another under the authority of the bishop and the Ecclesiastical Commissioners, and the building was purchased by contractors, who employed the prisoners and others in the work of demolition. On the 13th inst. the prisoners were seen by detectives during the dinner-hour in Union-street, in the Borough, and from their bulky appearance they were watched. The prisoners turned up the Southwark Bridge-road, and were going in the direction of the City when the officers stopped them, and found 33 lb. of lead on Higgins and 11 lb. on Prendergast. There was a large quantity of old lead in the church, and that found upon the prisoners had evidently formed a portion of it. When they were asked to account for the possession of the lead they at once admitted they had brought it from the church. The employer of the prisoners gave them most excellent characters, and said he looked upon them before this as two of the best men in his service. The prisoners both declared that this was the first time they had been guilty of any act of dishonesty, and said that before the officers spoke to them they felt that they had done wrong, and were on their way back to replace the lead they had stolen. Sir R. Carden said it was a sad thing to see working men with such characters as they had received placed in such a position, but under the circumstances he should deal with the case as one of unlawful possession, and fine them 10*s.* each, or fourteen days' imprisonment. The money was paid.

Temple Bar.—At the Court of Common Council on the 12th inst. Mr. G. C. Boore moved that before proceeding with the demolition of Temple Bar, it be referred to the law officer of the Corporation to report forthwith as to whether the Corporation have the power to erect a bar or archway on the site of the present structure. Mr. Phillips expressed his opinion that the motion was merely a subterfuge for the purpose of causing a delay. The Bar was an undoubted nuisance, and ought to be abolished at once. Mr. Lawley denied that any subterfuge was intended. After some further discussion, Deputy Lowman Taylor proposed as an amendment that it be an instruction to the City Lands Committee to take into consideration the rights of the Corporation over the site of Temple Bar, and report forthwith to the Court. The amendment was carried. Mr. R. Cox then moved that the Court proceed with the next business, which was carried. The amendment, therefore, was not put as an original motion, and the matter remains in the same position as before,—namely, that the Bar is to be removed as speedily as possible.

Presentation to Mr. Morris Charles Jones, F.S.A.—At the ninth annual meeting of the Powysland Club and Museum, Welshpool, held on the 5th inst., the Earl of Powis, president, in the chair, a testimonial was presented to Mr. Morris Charles Jones, F.S.A., in recognition of his services as the originator of the club and founder of the museum, and as the hon. secretary of the club. The testimonial consisted of a shield in *repoussé* iron and silver by M. Morel Ladeuil, one of the principal artists to Messrs. Elkington & Co., and being a *fac-simile* of the "Milton Shield," purchased by the Government for the South Kensington Museum. At Mr. Jones's request, the shield is to be placed in the museum at Welshpool. A supplementary presentation, in acknowledgment of Mr. Jones's services as editor of the "Montgomeryshire Collections," published by the Club, consisted of a bronze group representing the death of Tewdric Mawr, King of Gwent and Morganwg, 610 A.D. This group was designed, from suggestions by Lady Llanover, by the late John Evan Thomas, F.S.A., and modelled by his brother, W. Meredyth Thomas, medal student, R.A., London.

Value of Land in Manchester.—About 968 yards of ground in Piccadilly, Manchester, occupied by the White Bear Hotel and buildings at the back, recently fetched by auction nearly 61*l.* per square yard, which considered a large price. The purchaser had an offer of 3,000*l.* over the sum he had paid shortly after the fall of the hammer.

A Considerate Town Council.—At a meeting of the Barrow Town Council, on the 2cd inst., a long discussion took place on the Pennington Waterworks Contract. It appears that the engineer's estimate for the Pennington reservoir was 28,000*l.*, including land, and the tender of Mr. Poole, the contractor for the construction of the reservoir, was 26,650*l.*, being, it is stated, by far the lowest of the tenders sent in. The contract specified that the work was to be completed within twelve months, but the time had been extended to two years. In April, 1875, the contractor applied for an advance of 4,200*l.* on the contract sum, on the ground that the excavations for the tunnel connecting the reservoirs were far harder than was originally supposed. This was granted, but the contractor now applied for an additional sum of 4,500*l.* On the recommendation of the engineer, and to avoid the delay and uncertainty as to the issue of an arbitration, it was resolved, after a long debate, to make another and final grant to the contractors, subject to certain conditions.

Roman London.—Mr. E. P. Loftus Brock writes to say that several interesting sculptures have been met with in the Roman wall, Camomile-street, Bishopsgate, a portion of which was discovered early in September. The objects consist of fragments of moulded cornices of large size, a fluted pilaster, a portion of an engaged and carved shaft, and other architectural members. Above all these in interest is the figure of a lion, very boldly carved, standing above a recumbent lioness (?). This sculpture will occupy a high place among the relics of Roman London on account of the vigorous design and the capital execution of the group. It is in full relief. The lion and some of the other sculptures will be placed in the Guildhall Museum. They have been presented by the architect of the buildings in course of erection on the site, Mr. W. C. Banks.

The Royal Aquarium and Winter Garden, Westminster.—At an extraordinary general meeting of the shareholders of the Royal Aquarium and Summer and Winter Garden Society, Westminster, on the 12th inst., Mr. Stephen Coleman submitted a scheme for the future management of the concern. Mr. Coleman proposes to make several important alterations in the construction and management of the building, such as the removal of the orchestra and organ to the skating-rink end; the abolition of the rink; better arrangements for the convenience of fellows; the formation of a permanent choir; and the introduction of concerts similar to those held at the Floral Hall during the operatic season. The scheme was referred to a committee.

Serious Landslip in Manchester.—The heavy rains of Sunday, the 8th inst., caused the River Irwell to rise to 12 ft. above the low water mark, and caused a serious accident and great damage to property near St. Simon's Church, Salford. A large intercepting sewer has been in course of construction for some time in Salford, and the sewer had been carried to the Irwell, the mouth of it being, however, closed by a dam. During the night the water forced the dam down, and rushing into the sewer, burst it, and several extensive landslips occurred in consequence. Three or four cottages and a beerhouse were partially wrecked. Fears were entertained for the safety of St. Simon's Church, which is only a few yards away from the landslip.

The late Mr. Thomas Clark, A.R.S.A.—The *Scotsman* announces the death of Mr. Thomas Clark, A.R.S.A., which took place on the 7th inst., at Dundarach, Aberfoyle. The deceased artist was a son of the late Mr. William Clark, W.S., Sheriff-Substitute of Clackmannanshire, and was educated at Dollar. In the course of his schooldays he sustained an injury to the shoulder, the effects of which crippled him through life. Having early resolved to become a painter, he prosecuted in Edinburgh the necessary studies, and in his twentieth year began to exhibit. He was elected an Associate of the Royal Scottish Academy in November, 1865. He painted both in water-colour and oil.

Inverness Town-hall.—At a meeting of the Inverness Town Council, on the 4th inst., the New Town-hall Committee reported that they had instructed Messrs. Matthews & Lawrie to reduce their plan in terms of instructions, and to show first a sketch of what they proposed, the cost to be guaranteed not to exceed 9,500*l.*, and the hall not to be less than 60 ft.

The New Vestry Hall, Hampstead.—At a meeting of the Hampstead Vestry on the 13th inst., Messrs. Kendall & Mew, the architects, certified that Mr. Shepherd, the builder engaged on this work, was entitled to a payment 1,000*l*. The chairman informed the Vestry that Mr. Shepherd had not yet complied with that portion of the contract which required him to give sureties for 2,000*l*. for the proper execution of the work, though he had been allowed to commence the works. At the suggestion of the Vestry Clerk, and on the motion of Mr. Pearse, it was resolved that the cheque should be drawn at once, but held back until the previous resolution had been complied with.

Germany and the Paris Exhibition of '78.—The *National Zeitung* publishes a long article by Dr. Lessing, director of the Royal Industrial Museum, who advises Germany not to take part in the Paris Exhibition of 1878. He asks the following remarkable questions:—"Have we not, after all, to do with a malevolent intention? Has France not chosen just the present period to assert anew her supremacy?" People who share these opinions are (according to a Berlin correspondent) daily increasing in number, and it becomes more and more doubtful whether Germany will be officially represented at the Exhibition.

Heating Railway Carriages.—A correspondent, "J. B.," writes to ask "whether some method could not be devised for receiving all the waste steam from the locomotive engine into a pipe constructed for the purpose, and so conducting it through the flooring of all the carriages as it is in the feet that the cold is so severely felt?" We observe in the *London Gazette*, of October 6th, 1876, notice is given that provisional protection has been allowed to Mr. Alfred Mason, of Bradford, for the invention of "improvements in the method of and apparatus for warming railway-carriages with exhaust or waste steam from the engine."

The Midland Station at Bedford has just been completed. In the autumn of last year the directors ordered the down platform to be lengthened, and the whole of the station to be redecorated. The contractors selected were Messrs. T. & H. Skevington, of Derwent-street, Derby, and under the management of Mr. Stratford, of Gloucester, the clerk of the works, the covered portion of the station has been largely increased, and the whole building, including waiting-rooms, rendered more worthy of the increasingly-important town of Bedford.

Proposed Wood Pavement for the Strand. At a meeting of the ratepayers and inhabitants of the Strand on the 12th inst., a resolution declaring the expediency of laying down wood pavement in the Strand was carried unanimously, and a memorial to the vestry of St. Martin's-in-the-Fields was signed by every one present, praying that the work should be done, and offering on the part of the signitaries to defray the extra cost (over stone cubes) by a self-imposed local rate.

Messrs. Doulton and the Bricklayers.—Too late for insertion in its proper place, we received a letter from Mr. John Phillips, denying the correctness of some of Mr. Solly's statements in our last number. Mr. Phillips says,—"I may observe, in conclusion, that notwithstanding the intimidation practised by the Union and its pickets to prevent, if possible, Messrs. Doulton carrying on their works, we have now some eighteen bricklayers employed on the several buildings, and hope shortly to obtain the full number required."

No Music for Skating Rinks.—More than usual interest attached to the Middlesex Licensing Sessions on the 13th inst., in consequence of its being the first occasion upon which applications had been sent in for music licences for skating-rinks. Every application made was refused, Mr. J. F. Pownall remarking that there was no doubt such places would, in time, become music-halls, which the Court did not desire should be increased in number.

Unitarian Chapel Architecture.—At a Council meeting of the British and Foreign Unitarian Association, held on the 3rd inst., it was resolved:—"That it be an instruction to the Executive Committee to consider and adopt such means as may seem practicable, consistently with a due regard to the various circumstances and needs of different localities, with a view to the improvement of Unitarian ecclesiastical architecture."

Sawdust as Fuel.—For some time past a new steam-engine has been at work at Chatham Dockyard, and has been used for driving the machinery at the saw-mills, and for pumping the water consumed in the yard. Sawdust is used as fuel instead of coal, and it is said that the sawdust generates steam much more readily and with less trouble than coal. The sawdust is forced into the furnace by means of an air-shaft, a continuous supply being kept up.

The Sewage Question at St. Anne's-on-the-Sea.—Messrs. Maxwell & Tuke, architects, being directed by the Land and Building Company of this place to investigate the principles and practice of the pneumatic system of sewerage invented by Captain Liernur, and partially adopted at Dordrecht, Leiden, and Amsterdam, have advised that the system should be tried in the new town of St. Anne's.

The Late Mr. George Smith.—It is stated that the late Mr. G. Smith, the Assyriologist, has left a widow and a large family, who are now plunged in the greatest distress by his untimely death. A fund for their relief has been opened, towards which subscriptions will be thankfully received by Mr. J. W. Bosanquet, 73, Lombard-street, E.C., in the names of Sir Henry Rawlinson and Dr. Birch.

Indian Public Works.—It is said by the *Bombay Gazette* that Sir Andrew Clarke, the head of the Public Works Department, has steadily resisted the cry of certain economists, especially at home, to curtail productive works in India. Many public works may thus be saved this year, but the struggle will be to obtain the requisite sanction next year for public works of all sorts and description.

Proposed Historical Picture.—The *Morning Post* hears that Mr. Val Prinsep is commissioned to proceed to India to paint a great historical picture of the proclamation of the Empire at Delhi. It is said the artist is to receive 5,000*l*. for his work and 1,000*l*. for expenses.

Reduction in the Price of Gas.—At a meeting of the City Commissioners of Sewers, on the 10th inst., a letter was read from the Gas Light and Coke Company, stating that on the 1st of January next, the price of gas supplied to the City would be reduced to 3s. 9d. per 1,000 cubic feet.

Fox and Knot Mission Hall, Charterhouse-street.—A new mission-hall with the foregoing title has been built and opened in Charterhouse-street. Messrs. Habershon & Pite were the architects, and the work was carried out by Messrs. Matthew Allen & Son.

Knight's Terra-cotta Chimney Terminal. This is arranged to allow any smoke that may be blown down to pass out at the sides. There is nothing new in principle, but it seems an adaptation that may be useful.

Bailey's Turret Clock.—Messrs. Bailey & Co., of Salford, are manufacturing a turret clock which remedies some defects, and deserves notice. Several which have been put up are doing good service.

Clapham Marble Rink.—Mr. Rowley wishes we should add to the account we published of this place of recreation, that the whole of the ironwork, including roofing, &c., was designed, supplied, and erected by him.

TENDERS

For roads and sewers at Tulse hill. Messrs. Hanmack & Lambert, surveyors:—

Reddin	£4,600 0 0
Botterill	4,314 0 0
Tipping	4,160 10 0
Woodham, Bros.	4,100 0 0
Keebles	3,987 0 0
Stevenson	3,828 0 0
Jackson, E.	3,777 0 0
Jackson	3,720 0 0
Thompson & Son	3,447 0 0
Hutchinson & Co.	3,200 0 0
Wilson	2,998 0 0
Love	2,700 0 0
Mayo	2,700 0 0
Garrett	2,590 0 0

For Board-room, Kensington, for the Kensington Board of Guardians:—

	Board-room.	Strong-room.
Brass	£1,635 0	£336 0
Newman & Mann	1,506 0	300 0
Macey	1,477 0	302 0
Browne & Robinson	1,463 0	286 0
Colls	1,429 0	269 0
Mills	1,415 0	182 0
Sewell	1,406 0	243 0
Bayes, Bros.	1,372 0	239 0
Aitchison & Walker	1,355 0	249 0
Hook	1,319 15	239 17
Smale	1,363 0	180 0

For the Royal Opera-house, Leicester, exclusive of decorations, upholstery, seating, and special gaswork. Mr. C. J. Phipps, architect:—

Osborne, Bros.	£12,771 0 0
Bracher	12,400 0 0
Lindley	11,382 0 0
Allen	11,373 0 0
Bass & Hodgkin	11,362 0 0
Bland & Sons	10,839 0 0
Kellett*	10,825 0 0

* Accepted, and afterwards divided into separate contracts for each branch of trade.

For the erection of house for Mr. Wm. Ashley, Greetwell-road, Lincoln. Messrs. Goddard & Son, architects. Quantities supplied:—

Barnes & Wright	£2,730 0 0
Martin & Sims	2,639 0 0
Otter & Elsey (accepted)	2,389 0 0

For the erection of stables at New Ferry, Cheshire, for the Wirral Tramway Company. Mr. Charles H. Beloe, architect. Quantities supplied:—

Jones & Sons	£3,160 0 0
Urmson	2,985 0 0
Williams	2,800 0 0
Tomkinson & Sons	2,790 0 0
Hope	2,606 0 0
Forde	2,547 0 0
Fisher (accepted)	2,459 0 0
Aspinall	1,925 0 0

For alterations at Nos. 24 & 25, Paternoster-row, for Messrs. Wm. Hawtin & Son. Mr. Horace T. Bonnor, architect. Quantities not supplied:—

		Deductions.
Austin	£940	£242
Kirk	799	136
Linzell (accepted)	630	112

For the restoration of the parish church of St. Lawrence, Pembrokeshire. Mr. E. H. Lingen-Barker, architect:—

James & Thomas	£410 0 0
Jenkins & Jones	379 0 0
Lewis & Phillips	370 0 0
T. & J. Lloyd (accepted)	349 0 0

For the erection of new stable, boundary-wall, and entrance-gates, Folkestone, for Mr. Bridges. Mr. Burgess J. Reeve, architect:—

Robinson	£128 0 0
Brooks & Slade	127 5 0
Holdom	115 0 0
Dunk	108 10 0
Butler	102 0 0

For boundary-walls, entrance-gates, iron palisading, and sundry alterations at the Folkestone Gas and Coke Company's works. Mr. Burgess J. Reeve, architect:—

Butler	£458 0 0
Webster	350 0 0
Brooks & Slade	296 0 0
Dunk (accepted)	263 0 0

For alterations and additions to the Fire Brigade Station, Bow, for the Metropolitan Board of Works. Mr. G. Vulliamy, architect:—

Greenwood	£3,378 0 0
Ennor	3,172 0 0
Morter	3,142 0 0
Sims	3,082 0 0
F. & F. J. Wood (accepted)	2,983 0 0

For the sewerage of Harrow-road, Kensal New Town, for the Vestry of Chelsea. Mr. G. H. Stayton, engineer:—

Williams, Son, & Wallington	£1,395 0 0
Nowell & Robson	1,370 0 0
Killingback	1,350 0 0
Neave & Son	1,339 0 0
Mears (accepted)	1,056 0 0

For alterations to the Wellington Hotel, Sheerness, for Mr. Brisley:—

Sommerville & Smith (accepted)	£290 13 0

For alterations to the Robin Hood Tavern, Holborn, for Mr. J. Woods:—

Sommerville & Smith (accepted)	£230 0 0

For alterations to 41A, Clerkenwell-green, for Mr. J. Hunt:—

Sommerville & Smith (accepted)	£300 0 0

For villa on Crow-hill, Mansfield, Notts, for Mr Thomas Savage. Mr. John Jackson, architect:—

Slight	£3,240 0 0
S. & W. Pattinson	3,141 0 0
Bell & Son	2,756 0 0
Vallance & Sons	2,750 0 0
Hodgson & Facon	2,650 18 6
T. & J. Fisher	2,619 0 0
Vallance	2,480 0 0
Sills	2,448 14 0
Parsons (accepted)	2,420 0 0

For Portswood Main Drainage, Contract No. 5—engine and boiler house, cottage, &c. Mr. James Lemon, engineer. Quantities by Mr. J. G. Poole:—

Bostock	£1,699 4 0
Sanders	1,622 15 0
Nichols	1,592 0 0
Stevens	1,586 0 0
Crook (accepted)	1,419 0 0

For warehouse and alterations to candle factory, for Messrs. Wallis & Hack, Brighton. Messrs. Holford & Clayton, architects:—

Bruton	£1,580 0 0
Lockyer	1,565 0 0
Wills	1,463 0 0
Stenning	1,420 0 0
Barnes	1,385 0 0
Patching & Webber	1,345 0 0
Cheesman & Co. (accepted)	1,240 0 0

For alteration to the Hand and Flower, Union-street, Blackfriars, for Mr. W. Maklin. Mr. G. J. Needham, architect:—

Beale (accepted)	£475 0 0

For alteration to the Ship, Stepney-green, for Mr. H. Beames, Mr. J. G. Needham, architect :—

Mann	£1,095 0 0
Salt	983 0 0
Judd & Hawkings (accepted)	931 0 0
Beale (withdrawn)	783 0 0

For the completion of three pairs of villa residences in Caversham-place Park, Caversham, near Reading. Messrs. J. Omer Cooper & Son, architects. Quantities supplied :—

	Nos. 1 & 2.	Nos. 3 & 4.	Nos. 5 & 6.
Talbot	£375	£1,150	£2,050
Jopling & Co.	382	1,105	2,000
Jenkins	443	1,192	2,030
Watson	394	1,283	2,015
Kearley	350	1,140	—

For alterations to the Queen's Head, Great Ormond-street, for Mr. R. B. Troughton :—
Johnson & Co. (accepted).

For Board school, boundary wall, and offices, Holywell, North Wales, for 500 children. Mr. John Hill, architect :—

	School.	Wall and Offices.
Williams	£6,850	£400
Hughes & Son (accepted)	4,936	394

TO CORRESPONDENTS.

"Engineer" (it is quite impossible for us to search for and pick out of a bundle of pamphlets and newspaper reports the single fact or two that might interest the public. "Engineer" should have done it himself. People who want a thing done should do it).—S. H. (all right).—S. & S. (should send other names another time).—"Mechanic" (might possibly recover at law; but, encroachment being so small, had better take what he can get).—H. J. (the Bowes Museum, at Barnard Castle, was illustrated in our pages some time ago).—R. P. H. W.—T. T.—J. R.—F. S.—E. B. F.—J. B. McC.—J. C.—C. E.—W. T.—W. & Y.—W. J. B.—B. J. R.—J. B.—G. O. T.—T. J. W.—J. F.—W. S.—J. W.—C. M.—G. M. B.—E. B.—S. W. I.—C. J. P.—H. B. W.—A. W. M.—C. H. H.—J. P.—G. B.—T. R. & Co.—Messrs. D.—J. B. & Son.—C. W.—G. H. S.—F. H.—C. C. H.—J. H.—D & Co.—J. P.—J. T. M.—J. L.—J. O. C. & Son.—T. & R.—T. O. D.—J. G. N.—B. W. W.—A. J. U. T.—H. S. (too late).

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The Builder.

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The State of the English Stage.



WHEN the death of the Emperor Julian aroused in the bosom of his faithful followers conflicting aspirations regarding the manner and place—fitting alike to the philosopher and the soldier—in which his body should repose, ancient comedians caricatured upon the stage, and with the applause of a Christian audience, the faults and follies of a dead master, who had ever manifested contempt and aversion for the Theatre of his time. To use the language of Gibbon, "it was an ancient custom, in the funerals as well as in the triumphs of the Romans, that the voice of praise should be corrected by that of satire and ridicule; and that, in the midst of the splendid pageants, which displayed the glory of the living or of the dead, their imperfections should not be concealed from the eyes of the world." The recent triumph of British Comedy—the feast and flow of mutual compliment and reflected wit—affords, though not precisely in the manner of antiquity, an occasion, not for satire or ridicule, but for plain sober fact; and the last may suffice to counteract, in thoughtful minds, the baneful influence which sometimes springs from illiterate praise and mistaken exultation. Never were there more English actors than at the present time; never, in England, were there more theatres than at this hour; yet to count upon the fingers of one hand those in which a refined woman or a cultivated man can obtain intellectual recreation, without the reproach of either their taste or their conscience, leaves the majority unappropriated.

It is Mr. Gladstone's maxim of business,—and, mind, we are not attempting to depreciate it, for, with just a little care and superior encouragement and direction, it might be made a blessing instead of an evil,—"that, as a rule, the State, or individual, or company, thrives the best which dives deepest down into the mass of the community, and adapts its arrangements to the wants of the greatest number." The British Theatre does this: it therefore thrives and is feasted. The masses are pleased with the efforts of our Tragic and Comic Muse; and if there be a residuum, it is one of intellect; for it would seem that only men of wit and humour, and there are always very few of them, decline to believe that the national genius, as represented by its Drama, lies in gorgeous burlesque and licentious caricature.

Knowing as we do that in the arts it is generally the writer—the novelist or the independent critic—who gives the tone and sets the fashion, we are fain to inquire how and from what source has sprung the present debasement of the Stage? It would be incorrect to talk of the decline of Comedy in England; for, at the present hour, there is none. British Comedy, if we refer to Macaulay, was undermined by Congreve, and its ruin was precipitated by Sheridan. "Both," wrote he, in his Essay on Machiavelli, "were men of splendid wit and polished taste. Unhappily they made all their characters in their own likeness. . . . . It was not surely from want of wit that Shakspeare adopted so different a manner. . . . . He knew that such indiscriminate prodigality was, to use his own admirable language, 'from the purpose of playing, whose end, both at the first and now, was, and is, to hold, as it were, the mirror up to nature.'" Voltaire said of Congreve's plays that they portrayed "les actions de fripon" in the language of gentlemen. Fielding, in a delightful paragraph, speaks of those who were called "men of wit and pleasure about town," some of whom were "able to celebrate the beauty they admired, and all to judge of the merit of such compositions." But he questioned whether the same appellation could in justice be applied to the men of his own times; and, we take it, with even less justice to those of our own who pretend to a similar distinction. He would have had them called "men of wisdom and *vertu*"; and if the same title were applied now it would be difficult, as far as the English Stage goes, to affirm, that, in wisdom, men soared higher than to adopt the wit of Joe Miller, or, in *vertu*, felt compunction other than for the tolerably correct archæology of properties. Nor are we disposed to believe that the vulgar appreciation of the national uses of the Theatre was any better or loftier, when there were fewer actors and more exclusive audiences, than it is at present. Five years ago, an esteemed correspondent, who signed himself "Vetus," wrote in our pages a description of the management at Covent-garden, at the end of the last and the beginning of the present century. At that time, when barristers, literary men, and members of Parliament, occupied the first five rows of the pit (the stalls of to-day), "Othello" was played to houses containing 30*l.* worth of tickets, while "Bluebeard" filled the Treasury; and, in 1807 or thereabouts, "the elephants were an immense success." After nearly sixty years of culture we are still enabled to perceive the value of such theatrical accessories as supernumerary quadrupeds, and their superiority, in a speculative point of view, to men or women. But it should be remembered how, a generation earlier,

> "The tragic queen, to please a tasteless crowd,
> Had learn'd to bellow, rant, and roar so loud,
> That frighten'd nature, her best friend before,
> The blustering beldame's company foreswore."

To correct or perhaps chastise that "tasteless crowd," Sheridan wrote the first and greatest English burlesque—a work, by the way, which is unhappily known to the living public by the grotesque interpretation of living players. The British public thus obtained a taste of the tree of knowledge of good and evil in things dramatic; and, in devouring the apple presented to it, has preserved, for nearly the space of a century, a preference for evil rather than good, in its appreciation of theatrical entertainment.

In this downward course it has been unintentionally strengthened by the novels of a great Englishman. At the close of the former half of this century two writers, of acute and extended observation, brought themselves into notice. Thackeray pleased the few, Dickens the many; and with the latter lay the taste of the masses, as it always must do with writers who appeal to them in their own idioms. The first edition of "Pickwick," ill-spelt, ungrammatical, preposterous in plot—the violent outburst of commanding and uncontrollable genius—seized the public mind. Men who delighted in the repeated perusal of Cicero, Bacon, and Swift, of Gibbon and Macaulay, joined in the freshness of the general laugh. Later on, the absurdities of fictitious characters, themselves a caricature, were caricatured upon the Stage; and Robson there culled the laurel of Dickens. Extravaganza; opera-bouffe, vulgarised to suit English ear and eye; burlesque, of every kind, except that of the ancients, of Sheridan, of one living English author, or of the modern French; ridiculed the actions of gentlemen in the language of Bill Sykes, uttered with the twang of Sam Weller. The generation, which, in its youth, was moved with the bathos of "Vilikins and his Dinah," has lately sought in "Tommy, make room for your uncle" the distraction of its prime. Human nature is not strong enough to resist the licensed blandishments of inherited vulgarity. Many ladies, it must be admitted, did not participate in the excitement which the early works of Dickens caused to men and boys. Nor was Thackeray, as a rule, more fortunate with ladies. Allegory and satire never charm readers below a certain development of intellect, or a certain grade in society. If the "Pilgrim's Progress" and "Gulliver's Travels" have sometimes penetrated to inferior strata of population, it is probably because they have been taken for *bonâ fide* scenes of adventure. At the same time, men of intellect,—citizens of worth and education,—revelled, and still revel, in Thackeray's burlesque compositions, for, in his broadest caricatures he never even approached the confines of vulgarity; nor did Dickens ever aspire to describe a gentleman, in the worldly acceptation of the term. The satiric touch of the one showed that, even in scholarly work like that of the late Lord Lytton, it was wanted to correct the Comedy of his time; the genius of the other has induced, and its shade still hovers over, the unmannerly dialogue of our own illiterate farce.

"The Press," said a speaker, not very long ago, while we were discussing the actual power of the

fourth estate, "can damn a new play but nothing higher." We are disposed to believe that the Press cannot even do that, unless it strikes, in the public understanding, a sympathetic chord. All that writers can do is to point out conscientiously, and to the best of their ability, the blots and abuses which, unperceived, or condoned, by the average observer, are injurious to public morals and deprave the public taste. "By no laws which you can enact," said, recently, a well-known lawyer, "by no institutions which you can make, can you turn the savage into a civilised being." Now, one of the chief civilisers of the people, if properly directed, is the Stage; for, as Macaulay has said, "the real object of the Drama is the exhibition of human character;" and, as he continues, "to this fundamental law every other regulation is subordinate." It is, therefore, of the utmost importance that those who can, for a few pence or a few shillings, obtain amusing occupation during a whole evening,—and they form the mass of the community at large,—should not be nightly betrayed into dangerous admiration by a species of entertainment which the Parisian communist would openly reject with scorn, or avoid with silent contempt.

We have but to turn to a single London theatre to find out the character of representation which distinguishes all; and, though we are still desirous of excluding the admirable little Prince of Wales's from the scope of hostile criticism, it is impossible to forget that the comedy which is now being played there is a *réchauffé* of foreign wit, translated from a celebrated French one, and made "proper" for native sentiment. The theatre the best situated, within sight almost of the best clubs, and within half a mile of the best residential neighbourhoods, is the St. James's. It has lately opened with a new piece, in which two of the most accomplished English actors to be found anywhere play,—no,—join in the general buffoonery. "Three Millions of Money" is a *panaché*,—we use French words because we are writing about the English Stage,—of incidents in French farces, some of which have been played by a French company in London. In this, as in "The Great Divorce Case," and other similar pieces, the female characters generally have been made honest women of. The suspected wooden leg of one heroine has been converted,—*les Anglais sont si susceptibles!*—into a glass eye. The gentlemen, in haste to be convinced, no longer strike their opera-hats against the lady's hip, but they look curiously into her eyes. An American is made to behave in much the same way as an Englishman used to be made to behave on the French stage. Ladies and gentlemen catch one another round the waist, as people did at the fair,—so it is said,—when Greenwich was itself. Nevertheless, *on rit! on a beaucoup ri!! nous avons ri!!!*

At another theatre, Mr. Byron's best piece has been running for nearly 600 nights. It is always received—and deservedly so—with roars of laughter. But the able son of "Old Farren" must surely know that the baronet he is personating is frequently made to talk like a snob—to utter words and use impatient gestures, with which gentlemen, even those who mix in what is called "county" society, are unfamiliar; and both his daughter and his niece treat him with smart sentences of menace and reproach, such as young ladies who are taught to honour their parents seldom, if ever, use. With the butterman and the "servant-gal" Mr. Byron can deal honestly, and not a word can be said against his creations of that calibre. But his attempts to endow with speech society of a higher grade are as ludicrous to the ears of the original models as were the attempts, thirty years ago, of the tragic "super" to

> "Ape the swoln dialogue of kings and queens."

Not, let us say, because Mr. Byron knows no better, but because he knows his audience.

The remedy for this state of things lies in no radical alteration or reform. It is a mere question of money and management. We do not want better actors and actresses; but we do want a higher class of writers to interest themselves in the English Stage; and we want a few houses so managed as to attract a less indulgent, a more fastidious audience, than that which throngs the ordinary London theatre. When the great Comedians of France paid their visit to the English capital, an attempt was made to direct public attention to the necessity of founding a National Theatre,—in reality, not in name,—which should be the school of young actors and the home of old ones. The conductor of this journal then renewed a cry, which was taken up by men no less influential than Mr. Planché and Mr. Tom Taylor. If our readers will refer to our issue of July 15th, 1871, they will find an article entitled "A National Theatre and How to get it," written by Mr. George Godwin. Therein he said, and his words apply equally to the present time:—"The feeling is evidently widely spread, widely spreading, that our Theatre is not what it should be; that it might be rendered more worthy, and that the attempt should be made. Burlesque and opera-bouffe, when well done, are very amusing; but their universal reign is not desirable. Hundreds, thousands of persons, fond of the Drama keep away from theatres because they find no opportunity to see such plays represented as meet their taste and wants; no opportunity to see the noble dramatic works which belong to the country properly set forth. At any rate, they cry,—let us have one theatre where the classic glories of our Stage may be enjoyed; where a new poetical play or a high prose, thoughtful work may be fittingly presented; where actors of ability may be fostered and developed; and where our children may hear their own noble language properly spoken, and be aided in their appreciation of what is refined and elevating. And why not? The difficulties may be considerable, but surely they are not unconquerable. The manager of to-day says:—'I cannot help you. Shakespeare, Massinger, Beaumont and Fletcher, Ben Jonson, Otway, Webster, Congreve, Farquhar, Rowe, Vanbrugh, Goldsmith, Sheridan, Colman, Knowles, mean ruin!' . . . . Still the experiment ought to be tried fairly and loyally. Go further, and find it proved that the public will not fully maintain financially such a theatre; and still I would say that such a theatre should be established and supported. Well now comes the question,—How can the experiment best be tried? The mode that suggested itself to me was, broadly speaking, that which has given us Great Exhibitions, and, more recently, Society of Arts' Concerts in the Albert Hall,—a list of guarantors: a hundred gentlemen, say, giving their names for 100*l.* apiece; a small committee of the guarantors to supervise; and a proper and reasonable manager. An existing theatre to be taken; large pit, and moderate prices. No long runs; no short hirings of actors; a dramatic school attached; the advancement of the Drama: the healthful amusement and delight of the public to be considered the paramount object of the undertaking. I can imagine, under such circumstances, Mrs. Charles Kean leaving her retirement (this was written in 1871), and Mrs. Theodore Martin occasionally reading, in the Drama's cause, to promising aspirants of their sex; succeeded on other occasions by Mrs. Stirling, Mrs. Wigan, or Mrs. Keeley. . . . . Having no personal motive, I need have no hesitation in urging those who love the English Drama to consider how they may best aid this movement. . . . . We want a National Theatre not wholly controlled by the predominant taste of the public, and it seems to me there are no difficulties in the way that may not be easily overcome by those who will make up their mind to succeed."

The result of this appeal, and of the writings of others, was the formation of a committee to discuss the feasibility of a scheme which had been drafted for the institution of a National Theatre; but though all the members of it were in earnest, the movement shared the fate of other good things promoted with the best intentions. A principal actor, having put the MS. of the play in his pocket, forgot all about it; and thus the rest were left in even a worse condition than that traditional company which played "Hamlet" without the assistance of a Prince of Denmark.

Nevertheless, in reference to this same movement, at the well-remembered breakfast given to the "Comédie Française," Mr. Alfred Wigan had said, and in the French language:—"Great as is my admiration for the talents of our guests, it is mixed with a feeling of envy. I envy them the possession of that noble theatre, where they can devote themselves to the representation of the works of their best authors with that conscientious patience and talent, the brilliant results of which we so much admire; a theatre independent of all pecuniary speculation; and which can thus guide the public taste in the way of all that is pure and exalted in the Dramatic Art. Under our system of government, art cannot count on the aid of the State. I have, nevertheless, some hope that the visit of my colleagues of the Comédie Française will give vigour to a movement which is being made in vindication of the utility and necessity of such an aid. There is no doubt that some of the immense private fortunes in England are in the hands of persons who would be delighted to see a National Drama solidly established amongst us. If they would direct their attention to the principles of the constitution of the Théâtre Français, they would be able, perhaps, to raise a sufficient fund for the establishment of an analogous institution in the country of Shakspeare. If," continued Mr. Wigan, addressing the French Comedians, "such should be the effect of this visit, we should owe you a large debt of gratitude." And how potent is the influence of the Théâtre Français upon Paris, can only be thoroughly appreciated by those who know both. The Parisian public possesses the hereditary gift of "esprit," but unfortunately it is ignorant, from sheer want of practice, of any artificial means to control or guide it. It is the people, not the journalists, of Paris who damn a foolish play; and the chief fault of the former is that they often permit political and religious prejudice to warp their natural judgment. A bon-mot, a witty epigram, a scathing speech, has sufficed to raise a barricade. The Court of Louis XVI., and, above all, Marie Antoinette, innocently encouraged the performance of the "Mariage de Figaro"; and, in the private theatre at Versailles, smiled on Beaumarchais, whose caustic barber was sowing the seeds of revolution. But the British public has too much sense, or too little wit, or it has not the opportunity, to brood, even in a fool's paradise, over its own elevation and improvement. That, however, it carries away with it remembrance of what it has witnessed and heard is certain, for, too often, the joke of the day has originated in the rhyme of the last burlesque or the antics of the newest buffoon. Bloomsbury, with a grin, tells you that "still he is not happy"; the city clerk will "strike you with a feather"; and Drury Lane, having blackened his wife's eyes, poses with the just reflection,—"That's the sort of man I am."

A great change was made in "the bills" by the movement to which we have referred, as we may point out more particularly hereafter; but it was spasmodic and without principle. We want to be certain, at any rate, of one stage.

Montesquieu has divided mankind into two species: *ceux qui pensent et ceux qui amusent*. For neither is the ordinary London theatre intended—for neither is it fitted. What we want is a model—an example to the rest. We want, in the earnest language of Mr. Planché,—"The assured existence of a theatre, in which the masterpieces of our unrivalled dramatic authors shall be constantly and worthily represented, where—

> 'Thoughts that breathe and words that burn'

shall be uttered by actors, who can feel and express them to an audience, 'fit,' however 'few,' without the fear that their salaries will not be forthcoming on the following Saturday; and that the manager, disheartened by the appearance of empty benches, will change 'the bill,' discharge a company he has *jobbed* at a week's notice, and endeavour to outrival his competitors by pandering to the predominant taste of the public." One more quotation, descriptive of the English Stage a century ago, will suffice for our present purpose. "The actor and his work," in the words of Mr. Tom Taylor, "had then their place in the world of art. Productions of new pieces were events in that world. Great critics were not above sitting in judgment on plays and players. Great painters were proud to paint, great statesmen to know, them. The House of Commons paused once in debate to pay a formal compliment, by the eloquent lips of Burke, to Garrick, accidentally present in the Speaker's Gallery. We have only to read the critiques of the German Lichtenburg (written about 1775) on Garrick, Weston, Smith, and other actors of that time, to feel how immeasurably more intellectual an art acting then was; and in how incalculably more respectful and thoughtful a spirit it was viewed and judged then, than seems even conceivable nowadays."

The present constructive state of the majority of our London theatres also calls for immediate reform. Their imperfect, often even entire absence of, ventilation; their rude entrances; their dangerous staircases; their barbarous seats and other fittings; their noxious refreshment-bars; and, above all things, the risk of

health and life, which every playgoer braves in visiting them, have long formed the subject of our serious consideration; and, at no distant date, we may publish the result of our inquiries and experience.

PRIMITIVE ARCHITECTURE AND ITS POWER OF GROWTH.

It would be difficult to imagine, in these days of all but a universality of knowledge and *art practice*, a stranger phase of things than that now actually in existence in the heart of that still mysterious continent, Africa. We seem to know pretty much all that can be known as to the art and architecture of most of the rest of the world, not, it is true, of the origin of the various styles of art or architecture anywhere, but we have before us pretty fair and complete records of what has been done, and whole catalogues of most of all that remains of it. Of the origin, and first incipient beginnings of the Greek, for example, we know simply nothing, though we have before us, in books, and examples, and fragments, enough to show what the Greek architecture really was. Very much remains, it is true, to be done, and many difficult problems await solution, but with the given elements we may see the antique Greek at his glorious work, as an artist, as an architect, and as a workman. And so it is with Imperial Rome, and even with Assyria, and yet more out-of-the-way, and out-of-the-time, places. In Europe, Asia, and America, this may fairly be said to more or less apply.

But when we cross the narrow belt of sea which divides Europe from Africa, and travel to the interior of that vast continent, we come upon a totally new phase of things, and actually do look upon a "primeval" art and architecture, and that in a present, practical, and untaught way, which can really be found nowhere else, nor, indeed, is there any approximation to be found to it. The subject is certainly new, and may well interest a reader here and there.

In the first place, we owe not a little to those energetic and persevering and illustrious men who have accomplished the difficult pioneering work. Through trackless sand wastes, with the sun vertically overhead, through swamps and marshes, through forests so dense that but one can penetrate through the closely-set trees at a time, and across and up and down broad and rapid and all but endless rivers—these enthusiastic men have fought their way. Their names are many, and some of them have paid with their lives the price of their curiosity, for both man and beast fought against them. None of them, unfortunately,—so that that work has yet to be done,—went with any express purpose of discovering *artistic* or *architectural* curiosities and mysteries, and it is only here and there, therefore, by accident more than otherwise, that we come across a "note" throwing light on such matters. And even when so much is done, the notice is so slight, and details so few, that but a dim glance can be obtained. But a little is better than nothing, and putting one thing with another, we are able every now and then to come at a fair idea of what is done in places wherein every man must needs shift for himself, and wherein foreign trade, and information, and help can hardly be said to have existence. We can but hint at one or two matters out of so many, but they are very curious ones, and well worth the looking at.

House-building and town-building in the interior of Africa are not a little ingenious and unique. All that is done would seem to follow from the absolute necessities of the country and climate, and from the character of the materials provided by Nature herself on the spot. The ingenuity of the builders is certainly their own. The mere *plan* of an African house, within the clay walls of a town, is sufficiently ingenious, and would be an impossibility here, as would an ordinary house, as here constructed, be there. Dr. Barth, whose African labours have been second to none, lived for many months in the town of Timbuctoo, close to the mysterious Niger, in a house thoroughly characteristic of the place. It consisted of a lower story, with court-yard, and an upper story; and the roof, which was flat, was used as a terrace, without which these dwellings would be all but uninhabitable. Unfortunately, one has to guess a good deal at dimensions. No detailed sections are sketched, so that much is obscure, but yet the general idea of African house-building is pretty clearly seen. First there is an "ante-room" or entrance passage. These passages are commonly narrow, but long, and contain no furniture but a clay-seat on either side of the entrance doorway. Beyond this is a second ante-room, of irregular shape, with a staircase leading to the terrace at the top of the house. Beyond this is the first inner courtyard, and beyond this again a room in which is almost always that curious contrivance, — an African "bedstead." Other covered passages and small rooms are in the rear of this, and surround a second courtyard of the same size as the first. There are no windows to these rooms, the light and air coming in through the doorways; and there would seem to be an advantage in this absence of windows in so heated an atmosphere: the inner rooms, though dark, being thus closed, are cool. It is only at times, consequently, in the heat, that the terrace at the top of the house, and which is, of course, uncovered, is available. The walls of these houses are of pressed clay, as are the inner partitions as well, though these are at times of wood, and even of "matting." The floors are of pressed clay, and so, indeed, is the better part of the house furniture,—such as it is,—the seats, or settles, and benches being of clay. In the well-to-do houses, matting, rugs, and furs, cover these clay constructions. The walls occasionally are hung with fine matting, so that an African house is, after all, well adapted for Africa, and the heat of its climate is thus rendered endurable by this special mode of construction and planning. The doorways to these tropical apartments are commonly narrow and low, and closed when necessary by a matting or leather curtain,—a contrivance, by the way, which would seem to be of much older date than the hinged door. Fireplaces, as here understood, of course there are none,—an occasional hole in the ground serving all the purposes of one. These houses are, indeed, to the last degree interesting, and throw light on the obscure ways of the *old* world, for antiquity—to use a wide and generalising term—could never boast of such house-building as is seen now-a-days in modern towns and cities; but it must have been pretty much of the type indicated. The long-buried Italian cities show this, while Africa, to this hour, shows the work in actual progress. It is to observed that in the *towns* the houses are but here and there isolated, they standing side by side as elsewhere. The streets are very narrow and unpaved. There are no windows with outlook into the street,—nothing but the low doorways to give any idea of the clay-built buildings right and left being human habitations at all. It is to be noticed, too, that the only difference in the planning and construction of the houses of the richer class and the "poor" here consists in their size, the smaller ones being of but one story, with its terrace-roof, and in its having but one courtyard. All else would seem to be alike. Outside the town, and forming a sort of village, are many groups of straw-matting-built huts, each hut being separate. The mosques are the only public buildings, and need separate notice, both from the fact of their being buildings *per se*, and from the very striking uses which they subserve, all surrounded as they are with an all but boundless desert of sand and silence. The great mosque in Timbuctoo, indeed, stands on the very edge of the desert, on the outskirts of the town, and is a very striking object architecturally.

We have taken these exemplars of Old World house-building in the present from this special place, from the greater fulness of detail which we have been able to get of it. It is, however, but simply typical of the house-building and architecture of a vast extent of country, and takes us back to a remote time. It does not stand quite so still as many might suppose, and needs but to be caught sight of by those who can use it and develop it.

And it is this, indeed, which makes this African house-building, so remote as it is, so especially interesting; first, that it evidences what man does when uninstructed, and when in such a position that he cannot borrow; and, then again, it leads us further yet, for here it is that we may get a glimpse into the very origin and first beginnings of that great, and even to this hour unequalled, Egyptian architecture. No one can suppose that the colossal temples and gateways of old Egypt sprang into existence all at once, and as if by some sudden inspiration. They, without doubt, grew out of earlier and much simpler and rougher forms, and out of forms built up of humbler materials than limestone and all but impenetrable granite. Here we may really see, though dimly, how it was done. Some theorists have been puzzled at the generally sloping lines of Egyptian walling, and have noted how much was made of it, and how dignified the result, simple as the idea is. Here in the heart of Africa we find the origin of it in the bare necessities of construction, and in the nature of the material used. The gateway to the official residence of the chief, near to the house already noticed, struck Dr. Barth as especially "stately," with attempts, as he puts it, at "architectural decoration." This gateway, like to an Egyptian pylon before a temple portico, was of nothing but compressed clay, with the wall faces inclined for the sake of strength, and with, at intervals, wooden beams and cross-pieces, to afford additional strength. It has the simple square-headed doorway in the centre, with low walling on either side of it. Constructional necessity did the work, and its builder and contriver never, in all probability, thought for a moment of "architecture!" But,—and this is the noteworthy point,—the succeeding stone and granite builders who copied him, and who caught the idea without doubt from the clay building, did so, and the colossal gateways and "pylons" were the result of it. Indeed, this is as curious and instructive an example of architectural growth as could well be adduced, and shows how much can be made out of a simple "constructional" idea. We feel all but sure that the architecture of Egypt,—of the mighty Karnak itself,—might be built, in the mind's eye, out of the clay of Timbuctoo. We cannot but regret, again and again, that some of these African wanderers did not look at the strange places they saw with architectural interest, and so bring us back "details" and dimensions. It is only incidentally, as we have said, that they have done so,—more's the pity of it.

We have but glanced for a brief moment at this fruitful subject, on which so very much that is quite new might be said, and which is capable of throwing so much fresh, not to say strange, light on this difficult and obscure subject,—the origin of architectural style. It would be startling, indeed, if, amidst all the difficulties of the matter artistically looked at, out of old Egypt, so full of mysteries and puzzles on all hands, a clue should be found to the *origin* of an architectural "Style," or that we should be able to build up an architecture out of the mere necessities of materials and construction, and to be in a measure forced thereto by the very climate of the spot on which the architecture is built up. Nay, might we not even go further than this, and affirm that the simple dignity to be found at a glance in the inclined clay walling first roused into activity that feeling of the sublime which would seem to have ruled in the designing of Egyptian structures?

NEW MUNICIPAL BUILDINGS.

Dunfermline.—On the 12th inst. the memorial-stone of the new corporation buildings, Dunfermline, was laid with Masonic honours by Mr. Whyte-Melville, Provincial Grand Master, in presence of the Provost and members of the council, and a large company of people. The buildings have been erected from designs prepared by Mr. James C. Walker, architect, Edinburgh. The Bridge-street and Kirkgate fronts are built of fine dabbed coursers, the mouldings being polished, and the stones are from Polmaise Quarry, near Bannockburn. There are four floors to the back of the buildings, three at the bottom of Kirkgate, and two floors facing Bridge-street. On the ground-floor, looking into the Glen of Pittencrieff, there are the housekeeper's apartments, lamplighters' room, six public w.cs., urinal, &c. On the basement floor there is an office for the superintendent of police, a house for the police sergeant, a room for the policemen, and five police cells. There are also heating-rooms, coal-cellars, &c., on this basement. On the same floor, towards Bridge-street, there are three rooms for clerks employed in the bank above. On the street floor there are offices for the town clerk, master of works, and collector of public rates. On this floor there are apartments for a bank, consisting of sitting-room, manager's room, and a very spacious entrance-hall. Above all this is the council-chamber and committee-room, police court-room, &c. The building is in the Old Baronial style, having a square tower at the north-east corner, with four turrets corbelled out from the angles. The main entrance-door is in the tower facing High-street. The bank entrance will be from Bridge-street. The council-room is 39 ft. 3 in. by 25 ft. 3 in.; the police-court, 50 ft. 6 in. by 31 ft. 6 in. The steeple will in all be about

118 ft. in height. Messrs. Hutchinson are the masons; H. & J. Philip joiners; M. Williamson, plumber; J. Beveridge, slater; and the construction of the whole building is being superintended by Mr. John M'Laren, clerk of works.

Kidderminster.—At a meeting of the Kidderminster Town Council on the 11th inst. reference was made to the communication between the music-hall and the new municipal buildings, situated contiguous to each other, and the opening of which is fixed for the 31st inst. The buildings are situated at the bottom of Vicar-street, close to the new Midland Bank and the new offices of John Brinton & Co., and the whole are from the designs of Mr. Meredith, architect, with the exception of the music-hall, built in 1856, from designs by Messrs. Bidlake & Lovett, of Wolverhampton. The whole of the fittings in the police-court and council-chamber are of pitch-pine and oak, and have been carried out by Mr. Edwin Stringer, of Kidderminster. The buildings will cost over 8,500*l.*, and the contractor is Mr. Binnian, of Kidderminster.

THE DWELLINGS OF THE POOR.

OXFORD DIOCESAN CONFERENCE.

At the sitting of this Conference on the 10th inst., the Rev. Canon Ellison moved:—

"That the defective house accommodation, and other sanitary conditions, of the agricultural labourers in many of our villages are detrimental to the physical health of the people, to their moral and religious interests, and to their social progress; that from the report of 'The Commissioners on the Employment of Women and Children in Agriculture' (1867-9), as well as the more recent Reports of Sanitary Officers, it would appear that in order to remedy this evil additional legislative powers are needed; and that with a view to the obtaining of such powers, using those which already exist, and enlisting a wider circle of public opinion on the side of improvement, a Committee of this Conference be appointed to deliberate, and take such action as shall seem to them most expedient."

He was for twenty years a director of the Prince Consort's Windsor Society for improving the dwellings of the working classes; and during that time could not fail to see the manifold blessings which followed in the wake of improved homes. When he came to Haseley in January last, he was at once brought face to face with a directly opposite experience. The state of affairs he there discovered convinced him that if he were to do any good among the people he must begin with their homes. He was fortunate enough to fall in with the reports of Dr. Child (Medical Officer of Health for Oxfordshire), which led him to the perusal of the reports of the Commissioners on the Employment of Children, Young Persons, and Women in Agriculture. From these reports he read sundry extracts. Mr. Culley, the Commissioner for Berks, Bucks, and Oxon, spoke of "the insufficient amount of cottage accommodation in proportion to the wants of the land for the purpose of cultivation," and described the state of labourers' dwellings as being such as to "justify men in speaking of it as a national disgrace." Dr. Child said, "I have found the following defects to exist, some of them, of course, in combination. Houses are built in improper situations, improperly constructed, filthy, dilapidated, overcrowded." He added, "such cottages, though in number a minority, are still a considerable minority, as some are to be found in almost every village, and some villages contain great numbers of them." He alluded also to the water supply as continually polluted with sewage, and thus becoming the fruitful source of typhoid fever. He asked them to consider what it must be to the labourer to return to a home cheerless in itself and absolutely dangerous in its surroundings; to see wife or child sickening and dying; to know that with better house and better water not one of those things need have been; and to have the hopeless conviction that, bound to the soil by the necessities of his lot, he must remain where he is, impotent through want of knowledge to devise a remedy, or through want of means to carry it out. What was to be done, or rather remained to be done, to remedy the evil? Mr. Culley said they were calling upon the landowners of to-day to remedy the evil growth of many past generations, and nine-tenths of those who resided in the counties he had visited were already busy at the work as far as their means would allow. Dr. Child said, "a great deal is being done, chiefly by individual proprietors, towards remedying the shocking state of things which I have described. There are estates in every union in my district on which proprietors have done, and are doing, all that is possible for the improvement of their labourers' cottages." The powers of interference already given, which are at present chiefly permissive, would have to be made compulsory. The provisions of the "Artisans' and Labourers' Dwellings Act" of 1875 would have to be extended to rural districts. the local sentiment would have to be educated, and local action drawn out by the more general appointment of parochial sanitary committees, this action being quickened and sustained by the Local Government Board in London. With and amidst all that, a public opinion would have to be formed, which would in a few years make those miserable dwellings to be things of the past. In conclusion, he expressed his readiness to accept the amendment on the paper in the name of Mr. W. W. Wootten, "To strike out the words 'as shall seem to them most expedient,' and to insert the following: 'as, upon the bringing up of the report, the Conference shall deem most expedient.'"

The Rev. B. T. Ouvry advocated the passing of a General Building Act for the whole country, to prevent the building of any house except upon certain stated sanitary conditions.

The Rev. W. B. Duggan proposed as an amendment, that the words "of the labourers in many of our towns and villages," should be substituted for the words, "of agricultural labourers in many of our villages," which was seconded by the Rev. N. T. Garry.

Canon Ellison having accepted the proposal,

The motion as amended was carried unanimously.

NEW PUBLIC BATHS.

Liverpool.—Mr. Holbrook Gaskell, of Liverpool, has, at an estimated cost of between 3,000*l.* and 4,000*l.*, undertaken to erect public baths for the township of Widnes.

Maidenhead.—The new "Hamblettonian" Bath at Maidenhead has been opened. It measures 120 ft. long by 40 ft. wide, and from 3 ft. to 7 ft. deep, and contains 170,000 gallons. Mr. Hamblett is the proprietor. On one side of the bath are several dressing-boxes, and on the other a promenade, surrounded by flowers, trees, and shrubs. Near the same spot Mr. Hamblett is providing a large room to be used as a skating-rink. The whole of the work has been carried out under the direction of Mr. Henry Cooper, architect, of Maidenhead.

Croydon.—A new open-air swimming-bath has been constructed and opened for public use by the Croydon Local Board, in close proximity to the one long in operation. The desirability of greater accommodation has been demonstrated in a forcible manner this season, no fewer than 15,000 bathers having been admitted during July and August, a result far in advance of any previous year. The new bath, which in summer will prove very comfortable, is intended for use as a second-class or second bath, while the older one will be reserved for first-class visitors. The bath just opened was constructed by Mr. Smith, of Norwood. The paving is the workmanship of Minton, of Oxford-street. Thirty-two boxes have been placed for the accommodation of bathers, protected from wet by an overhanging roof; the bath itself being open to sun and rain. The pool, owing to the peculiar shape of the ground, is 76 ft. in length on one side, 56 ft. on the other, and 36 ft. in width.

THE LAST INVESTIGATION OF ROME.

Under the title of "Forum Romanum and Via Sacra," that indefatigable explorer, Mr. Parker, gives us another of those neatly-bound volumes* in which the results of his researches in the Eternal City are gradually getting themselves recorded. Those who have made acquaintance with the preceding volumes of the series will be prepared to encounter the idiosyncrasies of literary form, or rather, the sublime disregard of form, which distinguish the works of this persevering and painstaking archæologist. They will not be surprised to hear that the title-page is at the end of the volume and the preface in the middle,† and will be prepared to find that a process of comparison of various readings, and a very careful weighing and cogitation over the construction of paragraphs, are necessary to discover what is the precise information intended to be conveyed to them. The present volume seems somewhat less labyrinthine than its predecessor, as the grouping of the remains described under two heads, the "Forum Romanum" and the "Via Sacra," naturally suggests a division into two sections, to which the author has in the main mercifully adhered, and which makes it easier to give a general idea of the scope of this division of his Roman records than was the case with previous instalments of the work.

In the preface to the "Via Sacra" section, the author gives some account of the causes which led him to spend so much time over Roman archæology, and of the principles which have guided him in its investigation. A medical verdict, sentencing him to spend his winters in Rome, was the originating condition which led to his thoughts being turned in that direction. He knew that many books had been written on the history of the city of Rome, but that no one had applied the principles of the modern science of archæology to this subject. He had studied the best works in English, French, Italian, and German (the latter translated for him by friends), to ascertain the "true history of the city of Rome." None of these works satisfied him, "since the writers have in no instance studied architectural history on the principle of comparison with well-dated examples, or made that the basis of their work." Many of the most learned archæological authorities on the subject adhered to what were called "Roman traditions," which were "only the conjectures of learned men during the last three centuries." It seemed to him that though some were right on one point and some on others, the only safe plan was "to compare the exact words of the classical authors (*without note or comment**) with the existing remains, of which the dates are soon seen by comparison with other similar buildings by experienced eyes. This is the principle on which my work has been carried out; to obtain the best information I can get, either from books or from living authorities, and then form my own conclusions from them after consideration."

It is only bare justice to Mr. Parker to say that this is unquestionably the true principle to follow in researches of this kind, and that a man who has, both literally and figuratively, dug for himself to obtain the materials for his work may claim to have his conclusions received with attention, when those conclusions are at variance with other opinions based upon less careful and practical investigation. And in regard to this latter point, Mr. Parker draws attention to the facilities for more accurate knowledge afforded by recent excavations, and makes rather a point as against the "Roman tradition" school by publishing a photograph from a view of the Forum Romanum, taken in commemoration of the Jubilee in 1650, in which some well-known monuments (especially the three columns formerly called part of the Temple of Jupiter Tonans, but which Mr. Parker and others call the Temple of Saturn), now fully excavated, are either three parts buried, or entirely invisible. The thorough investigation of the truth of Mr. Parker's theories, so far as they conflict with existing ideas, could only be carried out by such a minute personal examination of the more newly excavated remains as he has himself made, and in regard to a good many of his ideas it may perhaps be said that they deal with what must always remain matters of controversy. But there can be little question that the system of investigation he has pursued is the best one for arriving at the truth, or the only one, provided the investigation is not biased, either consciously or unconsciously, by preconceived ideas or expectations, or the wish to oppose somebody else's view of the matter by which archæologists (being after all but mortal) are, we fear, not seldom influenced.

The object of Mr. Parker's work he describes to be to explain in a popular manner "the *true* history of the city of Rome." He makes no pretension, he assures us, to know more than other people, but has often been told that he possesses the art of explaining antiquities "in a very natural manner, easy to be understood and remembered." We fear Mr. Parker has been the object of a little good-natured flattery in regard to this point. After-dinner speeches at archæological societies are not always to be taken too literally. Our impression is just the reverse; that on this particular subject he does know more than most people, but that he has no faculty whatever of putting what he knows into logical form. His manner of explanation is "natural" in so far as there is an utter absence of art in it, and we should be inclined

* The Archæology of Rome. By John Henry Parker, C.B., &c. Vol. II.: The Forum Romanum and Via Sacra. James Parker & Co., Oxford; John Murray, London. 1876.

† The principal title-page and preface, that is to say; there are, of course, several.

* The italics are the author's.

to reverse the king's request to Polonius, and desire of him "less matter with more art." But in one respect Mr. Parker has done excellent service towards giving a clearer and more vivid idea of Roman remains and their character and antiquity to those whom he has addressed in speech and in print, by calling in the aid of photography in illustration. Those who, not having been to Rome, attended Mr. Parker's three lectures at Conduit-street not long ago (and it was much to be regretted that the audience was so small a one) must have felt, in spite of whatever puzzlement they may have experienced from the torrent of facts discharged upon their heads, that they had gained a new and fresh idea of the reality and meaning of the mural remains of Rome from hearing comments upon them with the actual structure in all its idiosyncrasies of detail brought bodily before their eyes by photography: and the like value and interest is imparted to the present volume by the photographic illustrations which are appended to it. Like all who have compared drawings of architectural remains with the remains themselves, Mr. Parker has found innumerable discrepancies between the drawings and the originals, even where the former were made by very able draughtsmen. Drawings, as he observes, are commonly made in the study from rough sketches taken on the spot, or are even made for engravers by an artist who has not seen the building. "For this reason photographs are indispensable for explaining the history of a building. No artist ever thinks of showing the thickness of the mortar between the joints of the stones, or the thickness of the bricks; yet on these two points the date of a building often hangs, at the most important turning-point in the history of architecture." The reason, of course, is that artists, having generally in view an object quite apart from archæological study, neglect details which are only of interest from that point of view.

The study of the history and topography of the Forum Romanum seems likely, in *Bottom's* phrase, to "grow to a point" now, after the long course of contradictions and conjectures through which it has passed. In regard to one or two important features of the topography, it has appeared that "third thoughts are best," and the more recent investigations have tended to a return to early theories which had been temporarily abandoned. It has been considered a fixed idea ever since 1500, that one angle of the Forum was near the arch of Severus, and another near the temple of Antoninus and Faustina, giving a line of about 100 paces in length, running nearly north.* But the question was, whether this line represented the length or the width of the Forum. Until the time of Nardini the universal opinion was that this was the long side, and that the width was about half the length,—a proportion apparently defined by the three columns of what is now known to be the Temple of Castor and Pollux, near the angle of the Palatine, and some little distance to westward of the Temple of Antoninus and Faustina. Nardini managed to upset this theory, and for some time was almost unanimously followed by antiquaries in the belief that the line referred to represented one end of the Forum, which would thus have its greatest length east and west. Bunsen returned to the original theory, which, it is scarcely necessary to say, is set at rest now by the excavation of the area, which shows the Forum as an irregular oblong space, nearly one-third wider at the north end, nearest the Capitol, than at the south end, and not extending quite so far southward as the Temple of Antoninus and Faustina, which, since the more complete excavation, can no longer be regarded as in the Forum, being on the other side of the Via Sacra, and a little away from the south-east angle of the Forum, though it is sufficiently near the angle to confirm the general correctness of the theory of the older antiquaries. This temple was buried to half its height, and houses built up against and between its columns, in the Middle Ages; the marks of the roofs of these houses, as Mr. Parker observes, are still visible on the columns. Palladio has the credit of having removed the houses and excavated the columns down to their bases.

The comparatively small area and irregular shape of the Forum are curiously at variance with the ideas we are accustomed to associate with a place so great in history. The Via Sacra, part of which skirts the east side of the Forum, terminating in the Clivus Capitolinus, and up which, as poets and poetic historians are fond of picturing, the triumphal processions of Rome wound their way to the Capitol, was little more than a crooked lane, after all! The architectural grandeur of Rome belongs for the most part to the time when her moral grandeur had deteriorated or nearly vanished. Very little indeed of the buildings whose remains are found round the Forum belongs to the date of the Roman Republic; only odd angles of basement here and there, left amid the masonry of later times, in that extraordinary jumble of remains characteristic of the Eternal City; and great part is of the time of the later Empire, many of the temples having been rebuilt on the old sites and with the old names. The most important conclusions derived, in Mr. Parker's pages, from the recent excavations in the Forum, relate to the three temples at the northern extremity, and their connexion with the Capitolium, which stood in their rear, and which was, in fact, what we should call the "town-hall" in a modern city. The Capitolium included, in its lowest story, and partly cut out of the rock, the Ærarium or treasury; over this the Tabularium or record-office, and over this the Municipium or public offices. This upper portion of the building was built as it now stands by Michelangelo, who blocked up the Tabularium arcade in order to get a sufficient wall to carry the new superstructure, the older buildings which it replaced having been of timber. The building of Michelangelo, which forms the large rather warehouse-looking mass conspicuous, with its tower, in all views of the Forum looking towards the north, became by degrees the chief visible record of the site of the Capitolium; the lower portion, containing the Tabularium and Ærarium, becoming more and more concealed and banked up by the gradual accumulation of earth and *débris*. The view of Rome at the time of the Jubilee, engraved by Mr. Parker, and which we before referred to, indicates how the ground had risen close to this site; and an engraving of the place in 1810, before the first of the modern excavations were commenced, gives evidence that it had been filled up still higher at that date. In this engraving we see the architrave and the tops of the columns of the Tabularium just appearing above the level of the made ground; the engraving (which is perhaps incorrect) shows them, however, in a more complete state than is the case at present; Mr. Parker's photograph (plate iii.) shows only two columns left, and the rest a blank wall. However, the removal of the ground at this place, down to the original level, reveals these lower stories of the ancient Capitolium, and also the basements of the three temples which stood between it and the north end of the Forum area. The proper nomenclature and identity of these remains has been, we need not remind the reader, the object of endless discussions, at least in regard to two of them. The eastern one, of which only the basement remains, has long been known to be the Temple of Concord. The remains next to it consist of the podium of another temple, situated directly in front of the Ærarium, and at the south-east angle of which stands that angle group of three columns which has successively borne the names of Jupiter Tonans, of Concord (Becker), of Saturn, and of Vespasian; while Mr. Parker, on grounds we will notice immediately, gives it again to Saturn. It fronts south, towards the Forum, and near it, and fronting eastward, stands, at the north-west angle of the Forum, the temple of which eight columns remain, and which has been successively labelled Concord, Fortune, Vespasian, and Saturn, and is given by Mr. Parker to Vespasian. Now, the main point of his remarks on the results of the excavations here is this, that he finds in them authority for a theory with regard to the Temples of Concord and Saturn, viz., that these were directly connected with the Senate-house and the Ærarium respectively. The connexion of the Temple of Saturn with the Ærarium had been previously urged by Bunsen, before the excavations were made; but with Mr. Parker the idea is first started with regard to the Temple of Concord, and seems to have arisen partly out of the existence of the commencement of a subterranean passage under the podium of the temple (laid bare in the recent excavations), and partly out of Mr. Parker's conviction that the Temple of Concord, which is constantly spoken of as the meeting-place of the senate, was not large enough for that purpose, and was in fact merely an ante-chamber or portico to the Senate-house. On Mr. Parker's own showing, the assumption appears a most gratuitous one. He admits that he cannot tell where to put the Senate-house in that case, and he quotes a passage from Cicero's second Philippic as supporting his view, which to ordinary readers will certainly appear to be in direct opposition to it. The only argument which really looks like a support to his view is an anecdote about the Emperor Pertinax coming to the Senate-house and finding it closed, and seating himself in the Temple of Concord till the doorkeeper was found; but the original Latin, quoted in a note on page 8, does not by any means seem to necessitate his interpretation. Mr. Parker takes it as proved, however, and goes on to the next temple, which he calls that of Saturn on the strength of the statements of Solinus and Plutarch that the treasury of Saturn was made into a temple, which remained in the time of the latter. "The real meaning of this," he says, "was the same as in the case of the Temple of Concord; there was a doorway in the wall of the Ærarium at the back under the podium of the temple." What Mr. Parker means by "under the podium" we do not quite understand; but he gives a photograph of the excavated podium of the temple as rebuilt by Severus, and part of the wall of the Ærarium (plate viii.) with an arched doorway in it built up, which evidently served formerly to communicate either with the exterior or with a building in front. The Temple of Saturn, of which the three columns remain, he regards as having been a mere portico without a *cella*, and the Ærarium behind might then, he thinks, naturally be looked on as the cella of the temple. We never heard of such a case before, nor does Mr. Parker give any reason for thinking the temple was only a portico, which seems quite improbable; there is plenty of room for a complete temple between the three columns and the wall of the Ærarium, and Bunsen's plan shows it as such, though his view supports Mr. Parker's in other ways. Within the built-up doorway mentioned, Canina discovered a steep flight of steps, which Mr. Parker says are of course the steep stairs to the Ærarium, which Cicero jocularly refers to in his oration *pro Fonteio*, though in mentioning this point a second time (Mr. Parker is never content with saying anything once) it is only said that Cicero is *believed* to have meant the steps of the Ærarium. Granting this to be the Temple of Saturn,* it will pretty well follow that the third temple is that of Vespasian; though Mr. Parker puts even this in his own original method of logical statement: "this must be the Temple of Vespasian, because there are no traces of any vaults for a Public Treasury in it." That can only be compared to the argument in the farce,—"Have you *no* strawberry mark on your arm? Then you are my long-lost brother!"

We hold no brief for either Vespasian or Saturn, and by no means intend to say that there is nothing in the theory which Mr. Parker adopts from Bunsen. On the contrary, the frequent mention in Latin literature of the Temple of Saturn in conjunction with the mention of the Treasury, certainly gives a colour to his conclusion, on a point in regard to which we may be permitted to doubt whether anything decisive can be proved at this distance of time. Bunsen's opinion in favour of this view was, perhaps, as purely conjectural as it has been found to be on other points; he placed the Basilica Julia, for instance, with its longer axis running east and west, while the subsequent excavations have shown it as running north and south. Canina, whose plan gives the Basilica its true position and extent, restores the name of Vespasian to the temple we have been speaking of; and there is the important evidence in his favour of the description by Statius of the equestrian statue of Domitian, which stood in the centre of the Forum, with a Basilica on either hand, and

* The side bounded by the Via Sacra runs nearly north and south, according to Mr. Parker's compass, though in the plans of Bunsen and Canina the same line is shown as nearly due north-west. They are probably right, and Mr. Parker has perhaps given magnetic north instead of true north; but as the end of the Forum next the Capitol has commonly been written of as the north end, it is convenient to retain this nomenclature.

* As we believe there is an impression that the three columns (*late* Jupiter Tonans) have been accepted as the Temple of Saturn since Bunsen started the idea in 1835, we may remind the reader that the architect Canina, to whom Bunsen's pamphlet was dedicated, declined to accept this view, and in a paper read by the Rev. E. Burgess at the Institute meeting of June 28, 1852, the reasons for considering this to be the Temple of Vespasian were fully placed before the meeting, and generally accepted; and Sir W. Tite, who had just returned from a survey of the then new excavations, expressed his opinion that "all question was at end" on the matter, and the Vespasian theory finally established.

which was looked upon by Vespasian from his temple in the rear. The pedestal of a colossal equestrian statue found in the centre of the Forum, in the precise spot indicated by the poet, and between the sites of the Basilica Emilia and the Basilica Julia, points almost exactly to the centre one of the three temples at the north end, so that, taking this to be the Temple of Vespasian, the whole description would be absolutely correct in relation to the statue; whereas the north-west temple, which Bunsen and Mr. Parker call Vespasian, does not look towards the pedestal at all.* We cannot say that, to our thinking, Mr. Parker's old doorway in the wall of the Ærarium (or what is called so) seems conclusive as against this important piece of literary evidence. Mr. Parker has one or two new facts to adduce, resulting from the recent excavations, but his manner of building up arguments is very curious. He adopts a far-fetched theory, very doubtfully supported, that the Temple of Concord stood to the Senate in the relation of a mere portico, and then uses this suggestion as a ground for arguing that the same idea was carried out in the connexion of the Temple of Saturn with the Treasury. To assume one step in the argument, and then treat it as a proved basis for the next step, is not a sort of reasoning to inspire much confidence.

The complete excavation of the site of the Basilica Julia on the western side of the Forum, showing that the length of the building was from north to south, Mr. Parker considers has also settled the name of the three celebrated columns which stand in a row at the south end of the Forum, and the capital of which used to be known and copied by every architectural pupil, in the good old days, as "the capital of Jupiter Stator." It has long been admitted, however, that the Temple of Jupiter Stator could not, consistently with various ancient references to it, have stood here; and the mention in the inscription of Augustus (known as the *Monumentum Ancyranum*) of the Basilica Julia as extending "from the Temple of Saturn to that of Castor and Pollux," along with other evidence, seems to settle the point, now that the actual length and direction of the Basilica Julia are known. But while Mr. Parker gives full weight to this evidence as fixing the position of Castor and Pollux at the south end of the Basilica, he evades its equal significance as fixing that of Saturn at the north end. Supposing the north-western temple, which Mr. Parker calls Vespasian, to be (as Canina and nearly every one since him are agreed) the Temple of Saturn, the two temples then exactly correspond with the description in the *Monumentum Ancyranum*; the front of the Temple of Castor and Pollux appears at one end of the flank of the Basilica, and that of Saturn at the other end: whereas Mr. Parker's Temple of Saturn (according to his own plan appended to this volume) leaves a distance of at least half the length of the Basilica between it and the latter, besides being in no sort of range with it, as the other temple is. We do not see how Mr. Parker is to get out of this dilemma.

The most daring of Mr. Parker's restorations in connexion with the Forum, however, is that of the supposed bridge of Caligula, who is said by Suetonius (and by him alone, we believe) to have connected the Capitoline Hill with his palace on the Palatine by a bridge. This is a puzzle, certainly, as it is difficult to understand how a bridge of the necessary length and height could be constructed, for so unusual a purpose, and be mentioned by no other writer, and leave no trace behind. We may refer to the remarks of the late Mr. Ashpitel on this point, in his paper read at the Institute in 1857, in which he suggested that as Suetonius says nothing of *building* a bridge, but talks of Caligula crossing over the Temple of Augustus by a bridge "thrown over" (*ponte transmisso*), and as one of Caligula's recorded habits was to scatter money to the people from the roof of the Basilica Julia, he may have had a light bridge made from the roof of one temple to another. Mr. Parker, however, believes he has found the evidence of the built bridge, and in a couple of geometrical drawings (plates 23, 24) shows us the commencement of a great bridge in three tiers of arcades one upon another, starting from certain well-known ruins under the Palatine Hill, and passing behind the Basilica Julia; and in his plan he dots the piers of this bridge* right across the valley to the Tarpeian Rock. And what is the authority for this tremendous construction? A couple of springers of arches from the remains of the arched brick building of the time of Caligula, which stands behind the Temple of Castor and Pollux; and which springers point, Mr. Parker says, in the direction of the Capitoline Temple which stood on the Tarpeian Rock. In addition to this, we have the assurance (in the notes on plate 23) that certain remains of the piers have been found under some houses near, and though much concealed, have been examined and measured by "an architectural draughtsman of much experience." Mr. Parker, however, does not venture to assume a single *positive* base of a pier in his dotted line of the course of the bridge on the general plan; the only thing he shows us is this impost of an arch, pointing in the required direction. If this is to be taken as evidence of a bridge a quarter of a mile long and 100 ft. high, in three stories of arcades, of which no other vestige is shown and no recognisable mention made by any one, this will be the most remarkable impost ever known, and the science of Roman archæology may be said to be a study highly stimulating to the imagination. If the "able architectural draughtsman" can find any further vestiges of the piers along the line traced on Mr. Parker's plan, the case would, of course, be quite altered; there must be some, if such a structure existed; but, until this evidence is forthcoming, we must, at least, remain sceptical.

Among the photographs appended, besides those already mentioned, are some which show very vividly the character of the ancient masonry, such as that of the Cloaca Maxima, and the view of the piers and arches at the north-west angle of the Basilica Julia; and one or two photographs from the bas-reliefs formerly in the Comitium: one piece of these (plate 15), showing the procession of the Bull, Ram, and Boar, for the sacrifice on the occasion of the *Lustrum*, or census, is interesting from the broad and conventional and yet vigorous style of the sculpture. The photographs appended to the remarks on the Via Sacra are of perhaps greater interest as delineations of the character of ancient masonry; but into this part of the book, which is an entirely separate section, we have not space to go on this occasion.

We observed at the commencement of our remarks that the present volume appeared somewhat less confused than its predecessor,—a rash conclusion, which we have had full space to repent of before coming to this point of our observations. As remarked before, we are convinced both of the value and the correctness of Mr. Parker's *facts*, and it is possible that their relations and the deductions therefrom may be clearer in his own head than the reader would conclude from his mode of putting them forth. But the utter literary clumsiness of his publications; his habit of continually dragging into a paragraph observations referring to another argument carried on at another part of the book, and having not the slightest perceptible relation to the context; the unmeaning and useless repetitions of the same thing (the story of the Emperor Pertinax and the Temple of Concord, for instance, is repeated no less than four times in different places), and the confusion and inaccuracy in which the letter-press is left, make the study of his results one of the most vexatious exercises possible. As a specimen of what Mr. Parker's readers have to put up with, we may mention that in the general chapter on the Forum, forming the bulk of this section of the work, fully three-fourths of the references (in the notes) to the numbered plates are wrong! Indeed, we were coming to the conclusion that they must refer to some other volume, but as about half a dozen are right, it is evident] that the other mistakes simply arise from utter carelessness or confusion in correcting the press. Readers might be pardoned for concluding that a writer who is so confused and unbusiness-like in his method (?) of book-making may be equally confused in his methods of thinking. If Mr. Parker, instead of shovelling out periodically a heap of facts arranged anyhow, would put his results from time to time into the hands of some friend able to put them for him into a connected and literary form, and to correct the proofs properly, we might have a connected record of modern Roman archæology no less interesting than valuable. As it is, only the conviction that his chaotic volumes do contain a great deal of information could induce any one to undertake the wearisome task of struggling through them.

* The statue does not come into Mr. Parker's argument, because he denies that the pedestal in the Forum has anything to do with the statue described by Statius, and says it is that of the statue of Constantine, which was in this *Regio*. But he makes no suggestion as to the whereabouts of the statue of Domitian described by Statius, in a manner completely fitting the position of the excavated pedestal.

* The dotted squares on the general plan are evidently meant for this, though there is nothing to tell us so; as, although Mr. Parker's plan is covered with reference numbers up to 10 or so, the explanatory notes appended only go up to No. 9; the meaning of the other numbers the reader may find out how he can.

WINTER EXHIBITION AT THE DUDLEY GALLERY.

The tenth winter exhibition of cabinet pictures in oil opened at this Gallery on Monday last. It can hardly be said that the collection is a very remarkable one; there is an averge of good workmanship of no particular originality or character, but very few things calculated to "give us pause" in going round the room. Among these may be named Mr. Hemy's "Baiting the Lines," an interior of a fisherman's cottage in which a somewhat hard and nonchalant young woman, evidently a study from life, is engaged as described, while a younger girl waits placidly with hands crossed, apparently the messenger to the beach when the operation is complete. The painting is in a broad, almost rough, manner, but every detail is in keeping, and both the total expression, which is not a little pathetic. Mr. Hemy also has a fine fresh out-door coast scene, "Out with the Tide," in which he seems to be breaking through a certain degree of mannerism in the tone and treatment of water which we were beginning to be conscious of in his works. Looking at the other works in which figures form the predominating interest, we may note M. Lhermitte's "Corner of the Market at Plondalmézeause" (96), a group of market-people drawn and painted in that easy spontaneous manner and full broad style of colouring which mark all this artist's works, but not a picture which will bear looking into like some of his; see, for instance, the right foot and ankle of the woman walking from the spectator, on the left. The seated figure in the foreground is, however, remarkable for a grace and dignity of attitude attained without sacrificing the rustic character. Mr. E. H. Fahey's "Nuts in the Fire" (153) occupies the angle position which others of his works have filled before: it represents a very vulgar and stiffly-drawn young woman trying her fortune with the nut which she holds to the fire as she kneels before it; the accessories are brilliantly painted. Mr. P. R. Morris sends the sketch for his picture of "Breezy June" in the last Academy, and a very clever slight picture of two girls walking along a lane in a "dust-cloud" (197); the effect of wind in the trees, and the action of the nearest figure half leaning back to the gust, are very well given: this is perhaps the most really original work in the collection. Mr. Watts's "Samson" we take to be a study of a figure with this title given to it subsequently, and a few dead Philistines put in to carry out the subject; the hero, nearly naked, is seated and resting after the affair of the jaw-bone, wearied and apparently very dejected; the figure is a fine one. Over it an elaborately-decorated interior, with a disagreeable-looking woman in the middle, shows Mr. Valentine Bromley's idea of "Sweet Home" (180), and below it Fantin's small work, "Baigneuse—Soleil levant" (185), the figure crouching beneath trees in the foreground, half seen in a grey misty light, has artistic power and feeling. Mr. Richmond's "Watchers" (298), an allegorical or supernatural subject representing naked angels, with considerable muscular development, seated by a corpse, contains fine drawing and colouring, but intellectually is too unreal to be of any interest. Mr. Heywood Hardy's "Country Circus" (309) fails in the opposite direction, and Mr. Macbeth's "Quiet Day at the Zoo" sounds the very base string of vulgarity. In "Twilight Tones" (353), a faintly-sketched shadowy group of rustics in an evening landscape, Mr. P. R. Morris recalls, whether purposely or not, a little of the feeling of Mason; slight as the thing is, it is a great relief after some we have noticed. Mdme. Kate Bisschop's "Treasure of the Family" (386), where a Bible is uncovered and shown to two children by their mother, has a power of handling, at least, which might have earned it a better place. Mrs. Jopling shows less finish, but more force and freedom than usual, in her pleasing study of a young lady engaged over "Geography and the Use of the Globes" (391), and her portrait head entitled "Looking Forward" (161) has fine qualities. Among smaller figure-subjects that are worth notice may be mentioned Mr. Yeames's "Moonlight" (88) in the courtyard of an old home-

stead, with a pair of lovers thrown in, which is very like moonlight; Mr. Cotman's "Little Bookworm" and "Expectation" (207, 225), both child studies; Mr. Canty's "Near Milking Time" (276), a study of an old bit of farm-building, with one figure; Mr. Macquoid's "Going Home" (281), a little child drawn along in a wagon by her sister, the group backed by a dark hedge; Mr. Hoveden's "Aline thinking of Yan" (396), a capital study of a strong fat strapping lass leaning back from her wheel to indulge in a sentimental reverie; and Mr. Marks's little study in which "A Book for the Beach" (265) is read by a young lady who sits on a balk of drift timber with her back to us, but with an attitude and manner full of character.

There are some good landscape studies in the collection. Madame Cazin's "On the Coast—a Sketch" (50), shows to the full her usual powerful style, in which realism of tone and effect are blended with poetic feeling. Mr. Legros has a rather large landscape, "Les Bords de la Suzon" (348), a dark evening scene, with qualities which should have given it a better place in the hanging. Mr. Joseph Knight's "Moorland" and "Showery Weather" (181-3) have certainly a very strong family likeness to other works, but are very good. Mr. H. Moore's "Gale Freshening" (59) needs no description of its character to those who are familiar with this painter's studies of sea; it is quite in his best manner. Mr. Ernest Waterlow, whose power in his art increases year by year, has two admirable works, "Salt Marshes" (57), and "Devonshire Lowlands" (318); the latter an evening scene of low meadowland with a river, and figures apparently gleaning, and a dark bank of trees making a silhouette against the evening sky: a work full of real feeling. The last words may apply equally to the small picture by Mr. Hetherington, called "Michaelmas Eve" (241), a foreground of dark grass field, with a group of cottages and their high garden-hedges behind; there is a great charm about this little work. Among other small paintings which possess the special interest arising out of originality of feeling or treatment are Mr. Lloyd's "Away in Devon" (40), a farmstead scene, painted a good deal in the French style of handling; "Oatfield, Overton" (97), a slight study, by Mr. Aumonier; "The Crabs at Dunwich" (121), a study of seaside barrenness, by Mr. Edwin Edwards; "Evening" (146) by Mr. A. Clay, very effective in the tones of the foliage; "Moorland" (290), by Mr. Frank Walton; two small landscapes by Mr. Marks (78, 80); "Clovelly, from the Head of the Street" (212), a view down the steep street, with the sea seen over and between the white houses stepped down the street, an effective study of buildings. Mr. Macquoid contributes an architectural subject,—a bit of "Bolton Priory" (122), concerning which we have our doubts. The running panel ornament cannot (if correctly drawn here) be of the same date as the intersecting arcade beneath it; but there is not the slightest distinction made in the texture or tint of the stone. We cannot help thinking that either drawing or colouring must be at fault, and that the painter has made a mistake through want of familiarity with architectural detail. Among subjects from the lower walks of "life," Mr. Coulbery has a cat painted *à merveille* (425), and Mr. John Emms a capital study of a foxhound puppy (452).

ASSERTED FAILURE OF SANITARY MEASURES.

This result, we fear, will be the inference drawn from the address delivered by Mr. Thomas Hawksley, C.E., at the Liverpool Social Science Congress, as president of the Health Department. It was an able address, as a matter of course, but so reactionary in parts that it may throw fresh obstacles in the way of those who are seeking to advance the public interest in this direction. We give a summary of the more striking portions of it, and will return to the subject.

Mr. Hawksley said,—The working men and their belongings constitute by very far the largest element of the vast population of the country. It is their interest in the important questions I propose to discuss in this address with which I shall chiefly concern myself; and with this object I shall confine my remarks, for the most part, to matters of a practical character bearing upon the topic of "Health," to which the attention of my section of the Association is more especially directed. For obvious reasons, I shall also confine my remarks to matters affecting the people of England and Wales, which for brevity's sake I shall hereafter designate by the word England only, and this the rather because each of the sister kingdoms of Scotland and Ireland has her own special sanitary legislation and her own special local government. The population of England now amounts to 24,000,000 persons, distributed over about 30,000,000 acres of cultivable land. There is, therefore, one person to one acre and a quarter, whereas in most (and averagely in all) of the other kingdoms of Europe there are about five acres of land to each person; and on the entire surface of the earth, exclusive of the arctic zones, about ten acres of land to each person; or, after a fair deduction for uninhabitable deserts and mountains, probably seven or eight acres of cultivable land to each person. Mr. Hawksley then alluded to the rapid increase of the population, and showed that in seven generations from the present time the people of English descent would more than outnumber the present entire population of the world, and in twenty generations they would have so increased as to require fifteen worlds as populous as our earth now is for their habitation. This he regarded as a most serious anxiety to the statesman, the legislator, the economist, and the sanitarian. In reference to the supply of food from abroad for the great bulk of the people, it did not appear to have struck any person that circumstances might arise in which there would be a deficiency. The Customs returns enable us to estimate that about 40 per cent. of the most important articles of the food of the people now comes from abroad, and this, too, for the daily sustentation of the existing population of 24,000,000,—a percentage which, year by year, will be sensibly added to as the population of our country continues to augment. We look at our Board of Trade and at our Customs returns; we rejoice because we find so many millions of exports and so many other millions of imports, and we exclaim with vast exultation, "*Eheu!* was there ever so great a nation as the English?" But we are utterly oblivious of the all-important fact that our exports consist of commodities we cannot eat; whilst our imports consist largely of commodities without which we should surely sicken and starve. Now, I ask you, as earnest sociologists, whether a nation can, in the proper sense of the word, truly say of itself, "I am great," so long as it is unable, if need be, to maintain itself? I look, indeed, with alarm to the signs of the times, the general restlessness of European nations, and the possibility of our being entangled in a war—perhaps a war of creeds, ultimately to extend itself to a war of aggrandisement and conquest; for, without in the least doubting the prowess of England, and her ultimate ability to come with glory from the fray, I cannot avoid expressing the apprehension that our supplies of food from abroad may be for a time very seriously interfered with, if not wholly interrupted. The practical sociologist must extend his views beyond the necessities of the hour. The number and consequent density of our population is year by year becoming greater, and year by year each individual of us, intentionally or unintentionally, becomes more earnestly engaged in the disagreeable endeavour to elbow his neighbour out of his way. We rejoice—fatuously, I would say—and sing pæans in praise of the increasing strength and prosperity of the nation—the strength of a noble structure firmly based upon a visible rock beneath which a mine has been cunningly laid, when to explode Heaven only knows. Would that our Government would exercise itself in that political prevision which looks rather to prevention than cure; for I am well assured that the now-existing waywardness of our working population, its spirit for menacing combinations and trade unionism, its misguided endeavours to compel the employment of three men to do two men's work, its ignorant belief that increased wages necessarily imply an increased purchasing power, its utter forgetfulness that, as working-men are customers one of another, they must eventually lose on the one hand as much as they gain on the other, besides placing themselves and their country in an unfavourable position with other nations trading or competing with us, and also its blind adherence to arbitrary rules and regulations as harassing to the immediate employer as they are annoying to the general public—all have their origin in the apprehension (unfounded though it may be) that we stand too closely upon the ground to make free and independent action perfectly safe each to each. In my opinion, then, our cry ought to be for "space—more space"; and, looking to the enormous extent of our colonial possessions, it appears to me that a most important opportunity now presents itself warranting our Government in affording facilities—I do not say inducements—to enable the surplus working-man to better his condition, if he so desires, in other suitable climes. Mr. Hawksley then traced the history of the struggle to raise high prices in this country, by which he thought they had damaged irretrievably the manufacture and commerce of this country, and had driven America, Belgium, France, Russia, and Prussia to create extensive mining and manufacturing establishments, which but for their imprudence would not have been wanted, and these were now actually supplying the English markets in considerable quantities with goods of which England had previously had the monopoly. We have, he said, at this moment an increasing population and a declining trade. I now pass to the consideration of another branch of this address. Are sanitary sociologists drawing correct and useful inferences from statistical facts? For my own part, I think they are not, and that in consequence much valuable time, and what might be useful effort, are utterly wasted and worse than thrown away. At your last year's congress a most remarkable and highly captivating address was delivered from the place I have the honour to occupy, in the course of which the learned president announced his ability to construct a city of health possessing sanitary advantages capable of extending the duration of the lives of its fortunate inhabitants to a mean period of 200 years; and consequently amongst whom a still more favoured few would, in obedience to known laws, continue in existence to the end of a fifth century. I have shown the evils of our present rate of increase with an average duration of life limited to 42 years, but what those evils would become if the span of life were protracted nearly fivefold it is quite beyond my powers even to conceive. The story of the city of health appears to have been as seriously as it was delightfully told, and, at all events, it finds its place and importance amongst your formal transactions. Now, what are the facts established by the statistics collected by the Registrar-General for public information? First, that the actual duration of human life in this country is under 42 years; secondly, that since the year 1838 (when the office of the Registrar-General was established) down to the year 1873, in all thirty-six years, there has not been an atom of movement towards the extension of that duration, notwithstanding that in the meantime there had been "heaps" of publications, official and otherwise, on the subject of health, unnumbered Acts of Parliament had been passed, and millions of money had been expended on making sewers, supplying water, building baths and washhouses, laying out sewage farms, and in the performance of other structural operations undertaken in the interests of health. Our municipal debts principally incurred on this head now amount to nearly one hundred millions of pounds sterling, and are fast increasing; and yet, without any effect having been produced in or towards the prolongation of life. An elaborate tabulated statement follows, to show that the mortality is 23·3 in 1,000 in the case of males, and of females 21·2 per thousand. But why, it will be asked, have our efforts for the prolongation of life been unavailing? In reply, because, as it appears to me, the wear and tear of the mechanism of the human frame is due mainly to natural organic changes and the repeated action of its parts, and particularly of those parts which are the subject of involuntary movement. These changes, and these actions, and the wear and tear they involve, are all evidently accomplished in given periods of time, differing very much in the individual, but obtaining a fixed ratio in the mass. Apart from the disturbing influence of epidemic diseases caused by atmospheric and cosmical action over which sanitary measures can exercise only a very limited control, we may, I think I may, with tolerable safety, pronounce that sanitary science, as at present applied, although in other ways of infinite benefit to the community, is not capable of materially extending those limits of life which nature has in her wisdom prescribed. At all events, the patriarchal ages assigned to the inhabitants of the city of Hygeia will never be reached if that city be built on any part of this sublunary sphere. I must not, however, be misunderstood whilst giving utterance to a doctrine so much at variance with accepted opinions. I

do not intend to convey the idea that by sanitary efforts we cannot diminish the undue waste of life we observe on all sides—but most amongst the labouring classes—a silent waste greater than that of a battlefield,—but I do desire to draw attention to the circumstance that we commonly omit from our regard the involuntary work of the human machine, which, exactly like the involuntary work of a watch, sooner or later (according to the particular constitution of the individual), ends in its failure and stoppage. The human heart cannot beat 100,000 times a day, nor the lungs expand and collapse 20,000 times a day, without suffering the usual effects of wear and tear—effects which manifest themselves in all of us, even when disease has no part in them, by producing a gradual change of appearance indicative of increasing age, the softer features of youth becoming the harder but still handsome features of middle life; these again yielding in turn to the wrinkling brow and the crow's foot near the eye, the uniform tint of the hair changing to grey and finally to white, the strongly-knit muscles gradually becoming more and more relaxed, and answering less and less easily to the behests of the will, till at length tottering humanity sinks into that grave which nature had destined for its reception from the moment of its birth. The span of life cannot be extended beyond the natural limit thus indicated, but it may in many ways be shortened. It is the business of the true sanitarian to be, above all things, practical, and with this view to point his efforts in the direction in which alone useful results can be obtained. Hitherto we have in some degree mistaken our way. We have relied too exclusively upon the consequential effects of improved water supplies, improved drainage, and improved pavements (each of great value in its particular way), but evidently not very potential in enabling the human machine to resist those far more destructive influences to which I shall, in the sequel, solicit your earnest attention. For thirty years I have devoted myself to the investigation of this important question, and have finally arrived at the conclusion,—a conclusion based on statistical research and personal observation,—that the natural turn of life of our urban populations is unnaturally shortened by preventible causes to the extent of one-fifth, and that these preventible causes are to be sought not in the water-pipes and sewers, but chiefly in the homes and habits of the industrial classes. I now pass to the subject of sanitary legislation. Numerous Acts of Parliament for effecting sanitary improvements have of late years been passed, but they are nearly all impaired and disfigured by the spirit of centralisation which pervades their enactments, and which operates most depressingly on the freedom of our municipal and other like public institutions, and on the development and exercise of the skill and ability in which this country is so redundant. Nothing can be done without the intervention and interference of a Government department, which has its own limited views and peculiar crotchets on all subjects,—medical, physical, constructional, and financial,—and to which every one concerned must either conform or succumb. You are aware that an Act has just been sanctioned to prevent the pollution of rivers, and you will probably one and all be of opinion with me that reckless and unnecessary pollution ought to be stopped. The law as it had previously stood was undoubtedly sufficiently powerful to effect this object, and consequently all that was really necessary was a cheaper and more facile procedure for bringing that law into operation. The new Act not only creates new laws and new procedures, but is also tainted with the vice of centralised action by the Government itself, who of all things ought not to have placed itself in a position of invidious relationship, sometimes between weak landowners and powerful manufacturers, and at other times between powerful landowners and weak manufacturers. A Government, to be respected and popular, must keep itself above the suspicion of favouritism, and should steer clear of all the entanglements into which unnecessary intervention in matters of private interest or cognisable by legal tribunals is certain to bring it. Mr. Hawksley then referred to the action which had taken place with regard to the sewerage of the country, to the process of disinfection, to the Artisans' Dwellings Act, and especially to the smallness of dwelling-houses, and the consequent want of cleanliness, and said,—It is my conviction, long entertained, that the sanitarian, the educationist, and the clergy will equally fail in their efforts to improve the health, the education, and the moral and religious improvement of the inhabitants of the class of dwellings to which I am now directing my observations until that class of dwellings shall have entirely disappeared. The chief difficulty lies in the possible costliness of the operation, but in some way this cost must be met before there will be any great outcome of our endeavours to elevate the lowest stratum of society. In fact, we need innumerable cities of Hygeia for the occupation of our working population, not exactly of the noble character of the gorgeous city painted in such glowing colours by my learned and warm-hearted predecessor, but planned almost entirely with a view to health and comfort, and constructible at a cost which shall not place the new dwellings beyond the reach of the people for whom they are intended. Omitting, for want of time, many important subjects I wished to include in this address, I must not forget that we are now present in the mighty city of Liverpool, a city which has received us with marked distinction and unbounded hospitality; a city which, be it remembered, took the lead in the promotion of sanitary measures; for in the year 1842, six years before the passing of the first Public Health Act, the Corporation of Liverpool sought and obtained an Act entitled, "An Act for the Promotion of the Health of the Inhabitants of the Borough of Liverpool, and the better Regulation of Buildings in the said Borough." This Act was, however, mainly a Building Act; and in consequence of being an unavoidable compromise between the builders,—a very influential body at that day,—and the Town Council, was in some respects defective and inefficient. Nevertheless, great good resulted from it, for houses subsequently erected were better planned and better built than had previously been the case. It was followed by other sanitary measures of greater importance. In the year 1845 the Town Council turned its attention to the subject of water and the inadequacy of the then supply, which was limited in the southern portion of the town to about 10 gallons per head per diem for all the purposes of domestic, trade, and manufacturing consumption; and in the northern part of the town to not more than 7 gallons. These supplies, amounting in the aggregate to about 4,000,000 gallons per day, were obtained from the new red sandstone rock, by means of wells, from which the water was, and to some extent still is, raised by steam power. After tracing the various measures which had been adopted for the supply of Liverpool with water, Mr. Hawksley continued, under the now existing conditions of the water supply of Liverpool—than which no city possesses a better, and few cities a cheaper, for the average charge does not exceed 7d. per 1,000 gallons—I think we may well congratulate the corporation on the complete success of this their greatest enterprise. Mr. Hawksley then alluded to the water-supply of Liverpool, and to the saving in waste water which had been effected through the agency of the borough engineer, and, in conclusion, said—It has been the habit of sanitary philosophers to regard the condition of the health of Liverpool as being exceptionally and preeminently "bad." The condition of the health of Liverpool is, however, I am glad to have the opportunity of stating, not exceptionally and preeminently bad. Comparing the state of Liverpool with the state of the other large cities most nearly approaching to her, namely, Manchester and Glasgow, what do we find? I will quote again from the Registrar-General's official returns; and, not to do an injustice to any one of these cities, I will append the mean of the deaths per thousand in each of them for the last seven successive years, which was—Liverpool, 30·1; Manchester, 30·1; Glasgow, 30·5. It is thus established that, in its sanitary status, Liverpool does not rank below Manchester and Glasgow, two cities on an equal footing with herself in respect to water supply, drainage, street formation, and municipal government, although somewhat dissimilar in the occupations of the people and in the structure of their dwellings. To what common causes, then, are we to attribute the equal excess of mortality to which the populations of all these great and important cities are subjected? I confess myself unable to answer with absolute certainty my own question; but I venture to suggest the pernicious effects of overcrowding and habitual inebriety. To the former I attribute the excessive waste of infant life, and to a combination of the two the correspondingly excessive waste of adult life. For the mitigation of these considerable evils so seriously affecting the health and happiness of the industrial classes, we must look to better dwellings, thorough ventilation, improved legislation in respect to the traffic in intoxicating drinks, and the general education of the rising generation in habits of order, sobriety, cleanliness, and prudence, rather than to measures of compulsion and restraint.

HEALTH QUESTIONS AT THE SOCIAL SCIENCE CONGRESS, LIVERPOOL.

Water Supply.

Mr. Baldwin Latham, C.E., amongst others, contributed a paper on the subject of Water-supply, in which he said that there were conditions which affected the quality of water which appeared to have been neglected. It had been generally concluded that water which had received the sewage of large populations must be unfit for domestic use. Careful investigation, however, showed that when such polluting matter had been poured into a river, and exposed to the influence of light, vegetation, &c., it became innocuous, as was shown by the good health enjoyed by the inhabitants of London, which city chiefly received its supply of water from the Thames and Lea, both of which rivers received a considerable amount of sewage pollution. The cholera epidemic at Newcastle-on-Tyne, in 1853, was supposed to be caused by the use of polluted Tyne water; but an investigation, conducted by Dr. Waller Lewis and Dr. Main, showed that disease was far more rife among persons using local well-water than among those who used the polluted water of the Tyne. The evidences, however, with regard to populations which received their supply from underground sources or from sources which had not been subjected to the influence of light, were very decided. Universal testimony of observed facts with reference to subterranean water-supply showed, beyond doubt, that fœcal contamination finding access to such sources, was invariably followed by serious consequences to the persons using those supplies. Mr. Latham, after pointing out that water which was exposed to the light and vegetation was subject to remarkable purifying powers, and that the quality of water in a great measure depended upon its aëration, observed that in the collection of water from distant and elevated sources there was great danger of pollution by means of the air which was held in the interstices of the water, which was a porous substance. River-water which was collected at the low levels of a district in which it was supplied, instead of absorbing air, parted with it upon being raised from a low to a high elevation. The disturbances of temperature to which water was subjected naturally affected its aëration and purity. Water stored in cisterns within the confines of a crowded town had its purity greatly injured by foul aëration, as was exemplified in the case of Glasgow, for the water in that city, when stored in covered cisterns, rapidly became fouler than the ordinary water-supply of the river as furnished by the Thames to London. Water brought to a town from distant sources was subject to greater changes and vicissitudes than was the case when the supply was procured from a local river. Pure water would contain more air than water containing salts, so that a water containing a moderate amount of saline matter was not so powerful in producing impure aëration as a more pure water. The author of the paper then gave some facts as to Liverpool, which had such a notoriously high death-rate, in spite of the magnificent and strenuous exertions of the governing body. It was pointed out that the sewers of Liverpool were, in some cases, simply hewn out of the solid rock on which the town stood; that from the same geological formation many million gallons of water were daily procured for the supply of water to the town; that the red sandstone formation from which this water was procured was very porous; that the influence of the drainage from pumping from local wells extended to considerable distances; and that in all probability the water now procured from the local sources of supply was derived from such polluted sources as the sewers and rivers.

Dr. Stevenson MacAdam, of Edinburgh, had a strong conviction that the hill water, or that obtained from high or upland districts, was more pure than that obtained from the valleys. There could be no doubt that wells were frequently contaminated even when the water did not present the slightest appearance of impurity. He

disputed the doctrine that rivers were better purifiers of water than wells. The rivers themselves became impure. He could not agree with Mr. Baldwin Latham's ideas as to aëration. He did not think that air was mechanically held in the interstices of water, and he believed that very often water from a high level was supersaturated with air.

Dr. Fergus, of Glasgow, spoke of the water supply to that city, where, he said, he had never known a case of lead poisoning. In Glasgow, they had a constant supply, and a constant supply was the right thing with regard to water. Having held that no river would oxidise the water, he humorously referred to a well in Glasgow or its neighbourhood, the water of which had been cut off some time ago. The well, however, was supplied with Loch Katrine water, and people, in taking their morning "constitutionals," drank it, thinking they were drinking the real water. Speaking of the necessity of testing well-water, he said that out of twenty-eight wells which he had examined at a favourite watering-place, he only found one in which the water was not impure. He urged that all well-water should be tested, and if ammonia was found in it, they should have nothing to do with it.

Professor Wanklyn, Mr. G. B. Galloway, and Sergeant-Major Black next addressed the section. The latter speaker, in the course of his remarks, spoke of the great purity of the water supplied to Aberdeen, and said that in 1866, when cholera prevailed in that city, not one case of the disease was traced to the water. The disease was brought to the city from the eastern coasts of the Baltic by seamen, and was thus communicated to the inhabitants.

Mr. W. J. Cooper pointed out the injuries caused to men and cattle from drinking water which contained quantities of sulphate of magnesia and soda. He mentioned the case of a stud of horses belonging to Mr. Tattersall which died one after another from this cause. In considering the water-supply of a town, he urged that the quality of the water should be carefully examined. Referring to impure ice, he said that he had examined a pond near London from which ice was taken, and he found the water contained a large quantity of organic matter, which was calculated to make people ill. Nineteen hundred years ago, he said, there was a great "row" in Jerusalem about the water-supply, which was not sufficient, and the Roman governor, who was anxious to get a proper supply to the city, proposed to bring it from a distance of fifty miles. The Jews refused the money for the purpose, when the governor, Pontius Pilate, seized upon the sacred treasury, and made an aqueduct through the solid rock, thus carrying water to Jerusalem, and this existed to the present day. He had an opportunity of constantly examining water from all parts of the country, and one could scarcely believe the filthy state of the water which people drank. Unless greater power was given to medical officers of health to shut up wells, he believed that disease would spread all the more rapidly.

Mr. Alderman Bennett observed that neither the readers of the papers nor those who had taken part in the discussion had in the slightest degree changed the opinions which he held on the subject when he entered the room. The water from the deep wells in the neighbourhood of Liverpool was proved to be purer the deeper they went down for it, and it was a very simple thing to keep out of the wells surface impurities. They could from the wells obtain any amount of pure unadulterated water to the end of time. He did not think the red sandstone objections of Mr. Symons were at all tenable. In making provision for the supply of water to a large town the first consideration was quality. He had no doubt that by a system of boring they in Liverpool could be put in the happy position of having an unlimited supply of the purest water. He thought that nine-tenths of the ratepayers of Liverpool were of opinion that no outside scheme should be entered upon by the Corporation until it was either proved or disproved that a good supply of pure water could be obtained in their own locality.

Mr. Owen Williams, after remarking upon the necessity for a plentiful supply of pure water, alluded to the deleterious effect of sewer-gases finding their way into traps and syphons, and said it was time the Government took the question of water-supply in hand. He showed that if the Government took it in hand, they could, by an expenditure of 50 or 100 millions—which would only involve a rate of a penny or twopence in the pound—procure a plentiful and pure supply of water.

Dr. Haviland remarked that he would advise the people of Liverpool, before they decided upon such a momentous question as that of a new water-supply, to discuss it well, and get every fact possible. He hoped great good would result from the operation of the Rivers Pollution Act, and pointed out the importance of keeping sewage out of their water-courses and protecting their wells. He moved a resolution to the effect that the three papers read be referred to the council of the Association for consideration.

Mr. J. Rayner (the town-clerk of Liverpool) seconded the resolution, and said he did not believe that any one could doubt the great value of the wells about Liverpool for water-supply. The great question, however, to be considered was whether the quantity of water required by Liverpool could be obtained by sinking additional wells. He did not think any one could be so sanguine as to suppose that in Liverpool they could attain such a degree of success in the sinking of additional wells as to get the 21,000,000 gallons a day more than they now got, and which they required. It had been demonstrated that the water in the wells was gradually going down and that one well affected another.

Mr. Deacon (borough engineer), alluding to an observation in one of the papers read as to the sewers of Liverpool, said that the new sewers in the town were built with brickwork in Portland cement, and many of them, both old and new, had their inverts lined with Portland cement, and were therefore almost as smooth and impervious as porcelain.

The resolution was carried unanimously.

Purification of Town Sewage.

On the following day, Mr. Hawksley, C.E., presiding,

Mr. James Banks (Liverpool) read a paper on "The Purification and Utilisation of Sewage," in which he stated that the system might be described as one of simple filtration and aëration. The constituents of the filters consisted of two or more feet in depth of well-burnt coal cinders, with a layer of soft bricks, and over that iron scraps. The sewage in its passage through the filter was thoroughly aërated by constant exposure to atmospheric oxygen, which by a simple contrivance was made to pass through it at the points where it fell in the form of a shower from one compartment to another throughout its entire length. Aëration was considered to be an all-efficient agent in bringing about the desired results, and could not be too largely employed. The disposal of the sludge connected with all sewage operations had ever been the point where failure had been most conspicuous, its constant accumulation and offensive character making it difficult to deal with. By the system in question, however, it was constantly used up, and before putrefaction could take place was mixed with the fouled cinders from the filters, and dried by the absorbent and deodorising qualities of the screenings from them. The adaptability of such a scheme for Liverpool was manifest as being a means of relieving the Corporation of the great quantity of cinders produced in the borough, which was a cause of constant anxiety to the Health Committee.

Professor Wanklyn remarked that the difficulty which existed in connexion with the question treated of was that it cost more to extract the valuable matter from sewage than that valuable matter was worth.

Dr. Glazebrook, alluding to the West Derby sewage farm, attributed its non-success to its costliness, due mainly to the extravagant price which the Board were obliged to pay for the land and the large amount of law expenses that were necessarily entailed.

Mr. Baldwin Latham said that great harm had been done to the utilisation of sewage by inventors and engineers depreciating each other's plans.

The Inspection of Brick and Tile Yards and Canal Boats.

Mr. George Smith, of Coalville, read a paper on this subject. He said that if there was anything that would undermine the foundations of any family, institutions, Church or State, and prevent our Factory and Workshops Act being properly respected, observed, and upheld, it was disorder, confusion, and laxity; and that was apparent, to a large extent, in the way the Brickfields Act of 1871 was being carried out. How could it be otherwise, when they took into consideration that the inspectors, by the passing of the Act, had, in addition to their other duties, of visiting 100,000 factories and workshops, to look after some 4,000 or 5,000 brick and tile yards, on which were employed nearly 20,000 men and women, and the same number of children and young persons? Many of those yards,—as mostly the case with brickyards,—were up to the knees in mud and clay, and miles away in the country, and far away from any railway station. Inspectors, like other men, had their likes and dislikes, and would naturally prefer visiting those works the cleanest and nearest their headquarters, so as to show the largest amount of work done in the least given time. He had visited brick and tile works and potteries in various parts of the country over and over again, and especially during the last few weeks, which had been in operation for years, and an inspector had not, at the time of his visit, set his foot upon the place, nor had any papers been sent to the employers informing them that they were under the Act. As a rule, he found it was the selfish employers, and not so much the men, that were opposed to the Act. Great objections had been raised as to the scarcity of children. If that were really the case, there would be more children upon half-time than there were. The Act did not lessen the number of children, it only sent them to school for a time. If the Act had been properly carried out at the commencement, the difficulty, if any, would long before this have been removed. It was pleasing to see the vast improvement among the men, women, and children, at brick and tile yards. The Brickfields Act, if wisely enforced, lessened the amount of drunkenness so prevalent among brickyard *employés*. Large works with which he was connected for fourteen years carried out, as nearly as possible, the Act as it now stood, and the result was that he had not seen one dozen cases of drunkenness among the men. Some of the inspectors had done their duties well as far as they were able; at the same time there were those among them who, if they understood their duties better, would have lessened the complaints about the Act. With regard to the inspection of canal boats, Mr. Smith, after alluding to the manner in which the majority of boatmen, their wives and children, lived, said that no inspection could be carried out so effectively and cheaply as the inspection of canal boats. With the assistance of the lock-tenters or boat gaugers two inspectors would be sufficient, and if they were stationed at proper places they would be able to see the 20,000 boats on our 4,800 miles of rivers and canals twice a year, much easier than a factory inspector would visit 1,000 factories and workshops. Inspectors should be appointed, overcrowding in boat cabins must be stopped. Sunday travelling, except in special cases, done away with, and the children educated; for nothing short of that would be satisfactory to the country.

ART QUESTIONS AT THE SOCIAL SCIENCE CONGRESS, LIVERPOOL.

On the special question "What is the Influence of Academies upon the Art of a Nation?" a paper by

Mr. Watkiss Lloyd was read. The writer said the conditions of the discussion made it necessary to limit the scope of the inquiry. National institutions for the promotion of literature, science, and even the useful arts, had been entitled academies, but in the present paper he proposed to consider only the question what institutions would truly further the development of the fine arts. Painting had numerous diversities of its own, from draughtsmanship simple to water colour, oil, tempera, fresco, and encaustic. Sculpture in the round seemed to liberate itself gradually from high relief; the varieties of engraving, pure and combined, were well known; and even photography was gradually making advances to an exercise of taste which might at last render it a fine art. Speaking of the musical drama, he said it had attained its Continental perfection by national aid, and it was due to the absence of this that England still lay under the disgrace, in contrast with Italy, Germany, and France, of never having produced an opera which had won the established admiration of the world. In the case of the drama, the fact that the world had still the glory and delight of the representations of Moliere and Corneille and Racine was due alone to the sustaining power of a national subsidy. Restricting attention to the graphic and plastic arts, the

writer asked—Is national legislative interference indispensable in these cases, or may they be safely left to individual enterprise and competition, to that vaunted agency of supply and demand, or shall they be consigned to the attention that can be spared to them by professions, guilds, or academical associations? This question had partly been settled by the establishment of a public department of science and art. National interference to some extent was demanded both by the dignity of the subject, in which national dignity is involved, and by the large scope and complicated circumstances that had to be dealt with, when the thorough diffusion of art through the nation, and nothing less, was in question. Prudence dictated that such interference should apply first and exclusively to what was indispensable, and should then go on to what was additionally desirable and practicable, as occasion prompted development. What might be set down as indispensable was that a certain amount of art teaching should be accessible to all as readily as the rudimentary teaching which was the general basis of education, and that opportunities should be afforded to pupils of peculiar aptitude of gaining more advanced instruction. The chief work ought to be to remove all the obstructions which were possible from the manifestation and exercise of genius, and this ought to be kept in view when it was considered by what organisation the highest instruction might be afforded to the most promising aspirants of the time, the most useful aids offered to men who reach the highest general standard of artistic aptitude; and, above all, to the necessarily few of entirely exceptional originality and genius. It was desirable that every distinct art should have its particular organisation, and the functions which would be required in connexion with a central academy of the associated arts would be,—(1) Provision of the highest form of instruction for the most gifted and promising students; (2), the assignment of distinctions in the way of prizes and medals to students; and (3) the assignment by election of special honours to positions conferring rights, privileges, or titles. If a society could be so constituted as to perform these functions with efficiency, they might count upon membership being so honourable as to elicit the corporate spirit and enthusiasm of the association sufficient to add spirit to its working throughout. Generally, the writer's answer to the proposed question was, that the art of nations might be most beneficially promoted by the influence of academies, but only under the condition that such institutions were laid out on the most just and well-considered basis, or speedily reduced to such if they have declined into mere fortresses of unfairness and incapacity.

Mr. Boyd said it was a mere sham to find, in connexion with the Royal Academy, that there were a number of professors who never delivered any lectures on art, thus adding to the lustre of their names and the institution with which they were connected. He concluded by advocating the opening of art galleries on Sundays as a means of educating the people.

Mr. Aitchison made a vigorous attack upon the paper. He said it might have been divided into three sections,—one the section of education, another the repression of crime, and the third might have been sent to that limbo to which was consigned all constitutions for the general amelioration of mankind. Those things which the writer proposed they found generally ended in nothing. As far as the effect of academies of art went, no one who knew the history of art could have the least doubt that academies generally came into existence when art either did not exist, or when it had almost died out. They were what they might call a sort of shoddy machine for making a very excellent colourable imitation out of waste. If they looked at the arts in the past, they would generally find that in their most brilliant epoch nothing of the kind proposed existed. We had no academies for novelists; but probably if we had not had a Thackeray, a Brontë, or a Dickens, we might have got an academy of knowledge by which a possibly readable novel might have been manufactured. The theories as to how academies were to work were not for this world; they might possibly be carried out in another; and the only way in which he could see improvement could be made in art was for the people of England generally to admire it, to desire it, and be a judge of it. If they would do that, they would not have imitations passed upon them, and he believed that when there was a demand there would be a certain supply.

Mr. Tracy said it rather startled him to be told that when Oxford and Cambridge came into distinction as schools of great learning they marked a period when learning had begun to fall away; nay, more, he was not prepared to admit, as the last speaker argued, that the establishment of the Royal Academy, under the auspices of Sir Joshua Reynolds and his friends, marked a period when art had reached its culminating point; and that from that time until now it had been on the decline. That was the only interpretation they could put on the remarks they had just listened to.

Mr. P. H. Rathbone thought that the Royal Academy might do a great deal of work out of London, as to some extent it had restricted its operations too much to the metropolis, and to those who had determined to devote the whole of their life to art as a profession. They had, however, done a great deal in the work of educating the people out of London to an appreciation of art by the way they had supported their Liverpool Exhibition. He might say that so far as that exhibition was concerned the committee had endeavoured that it should be as widely visited as possible, and especially by the young, and every school in Liverpool, whether elementary or secondary, had the offer of visiting it once free. In conclusion, Mr. Rathbone advocated the organisation in all towns of a series of popular lectures upon fine art, and said that he saw no difficulty in the way of making such lectures popular without being superficial. The discussion afterwards closed.

The other papers read included one by Mr. Joseph Bonomi, on the importance of determining a canon of proportions of the human figure; one by Mr. John Bell on the unity of the fine arts; and a paper on the best method of securing street or any architecture, by Mr. A. B. Martino.

On another day the special question for discussion was, "What is the Influence upon Society of decorative Art and Art-workmanship in all Household Details?" Mr. Poynter, R.A., presided.

Mr. C. L. Eastlake, secretary of the Royal Institute of British Architects, opened the discussion with an interesting paper. He said that within the last few years a marked improvement had been taking place in the decoration and appointments of English homes. After an interval of three generations people were beginning to feel that works of real art might sometimes be looked for beyond the limits of a picture-frame and below the pedestal of a statue. That this reform, which he believed to be a very healthy indication of natural taste, had at present made but a partial advance, might be inferred from the fact that we still found private collectors and dilletanti who lined their walls with pictures and filled their cabinets with bric-a-brac, but who furnished their houses as though they were ignorant of the first principles of design. In course of time, no doubt, furniture of a plain and homely description would partake of that improvement in form and material which now distinguished furniture of the best class; but until the manufacturer had been encouraged by people of taste and adequate means to improve the design of his goods, and until his workmen had thus been enabled by experience to get into the right groove of work and to revive the traditions of their craft, we could not expect that good taste which was stinted in the mansion would extend to humbler domiciles.

Mr. G. A. Audsley also read a paper on the same subject, in which he stated that to become an artistic nation they must surround their children and beset their path from their cradles with objects of beauty and utility, familiarise them with useful articles clad in artistic garb rather than with works of art which did not identify themselves with their daily wants and duties. Banish from our houses everything which partakes of the nature of a sham, so that our children may learn to respect the great principle of all art,—truth. The answer to the special question was, their influence for good was strictly in proportion to their artistic excellence and truthfulness. He should have great hopes for the artistic culture of the nation if he could see a widespread attention being paid to the art of decoration and furnishing of dwelling-houses. Looking at the state of household taste amongst us, more especially amongst the wealthy, his impression was that there was very little fine taste or love of art amongst those who most professed to be artistic. The widely-diffused idea that fine art was only to be found in framed and glazed pictures was doing more to destroy a popular knowledge and love for art than any other active element at work. Why should they thus worship one phase of art to the exclusion of almost every other? It might be applied to works in mosaics, frescoes, painting (as applied to decorative art), sculpture, works in glass, textile fabrics, metal, and domestic furniture. After giving a graphic and lively account of a sample of popular modern house furnishing, Mr. Audsley said they could not long close their eyes to the fact that it was imperative upon us as a nation to strive after improvement in domestic art or household taste, and he looked forward with some hope, now that art had been recognised as an important branch of social science, to the day, not very distant, perhaps, when it would be a disgrace to decorate and furnish dwelling-houses as they are now too frequently done. He referred to the excellent work done by schools of art and fine-art museums, especially that at South Kensington, gave certain ideas of household art and taste, concluding by stating that in these there should be truth, beauty, and harmony, not only in colour, but in every work of art which a house may contain.

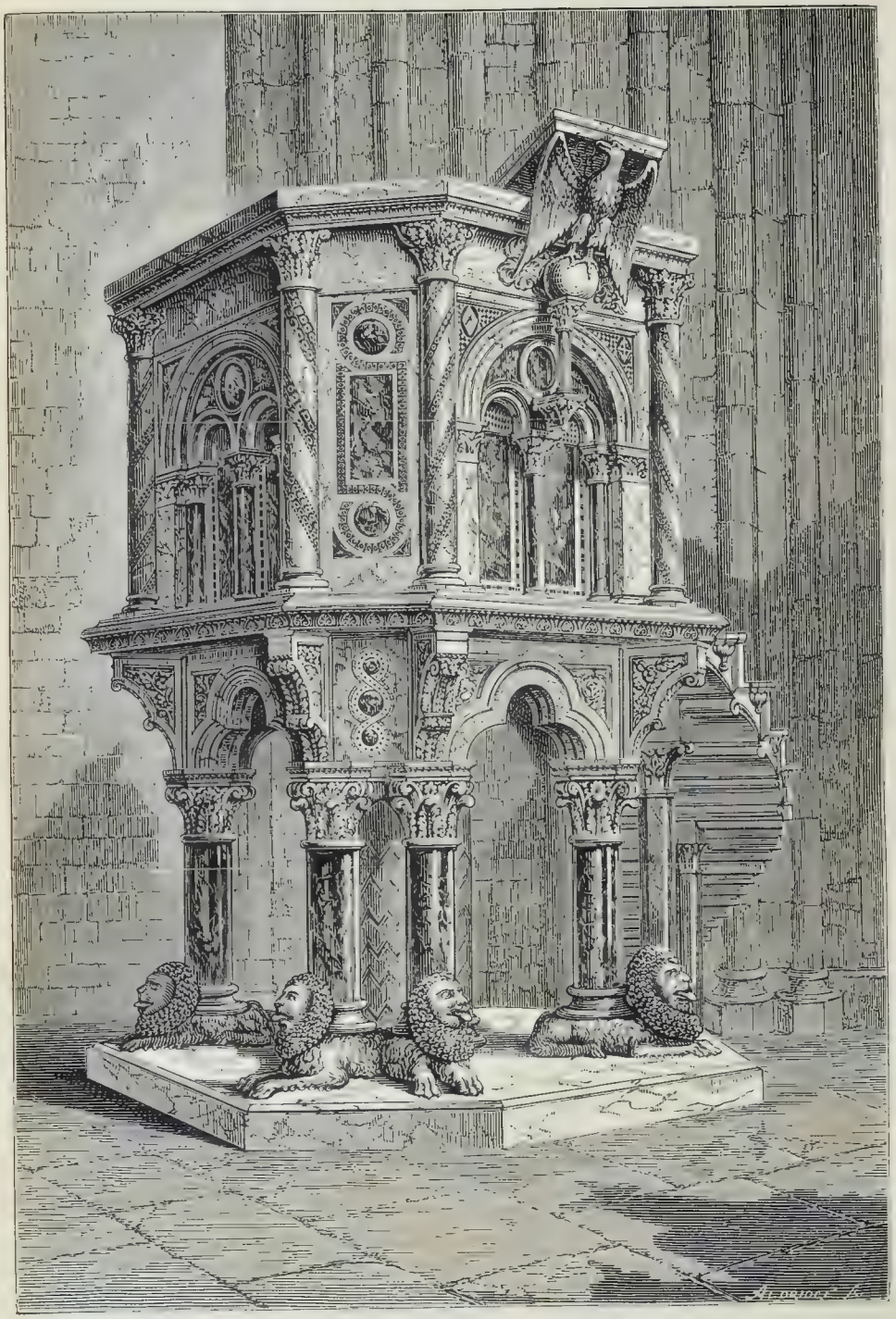
Miss Rhoda Garrett read a voluntary paper on the subject, "How to Improve the Interior of Modern Houses, with special reference to their Furniture and Decoration." The writer pointed out how the improvement of house decoration might be made the means of developing a wider interest in the higher branches of art. She drew a comparison between the houses of the seventeenth and eighteenth centuries and those built in the present day, and showed that a higher artistic taste might be profitably displayed in wall decoration, plaster work, and the construction of fixtures, furniture, and draperies. The question of women's sphere and women's right was one very much disputed, but no one could deny the right of women to decorate and beautify their own homes.

Mr. Buckman read a paper on "The Decorative Treatment of Modern Subjects, as applied to Domestic and Street Architecture." The purpose of the paper, he said, was to advance the idea that subjects for decorative purposes should be selected from actual and existing life; that statement of purpose was followed by descriptions of the decorative work of the great nations of ancient times, viz., the Assyrians, Egyptians, and, greatest of all, the Greeks, showing that in addition to decoration as a simple matter of embellishment, its vital purpose was that of transmitting historical representations of the life and occupations of the people by whom the various buildings were erected. The writer then proceeded to quote from the works of eminent writers on art, Ruskin and Owen Jones, passages *apropos* to the subject, and concluded by urging those who were building great houses to give the matter consideration. "Let the art be worthy and the truth absolute, and precisely as you observe those conditions you will encourage good art, and contribute to historical fact, and so leave a record as valuable in the future as the works of those great nations of the past, and the buildings you leave to your posterity shall tell to them and succeeding generations the manner of men you were in your day in the old time before them."

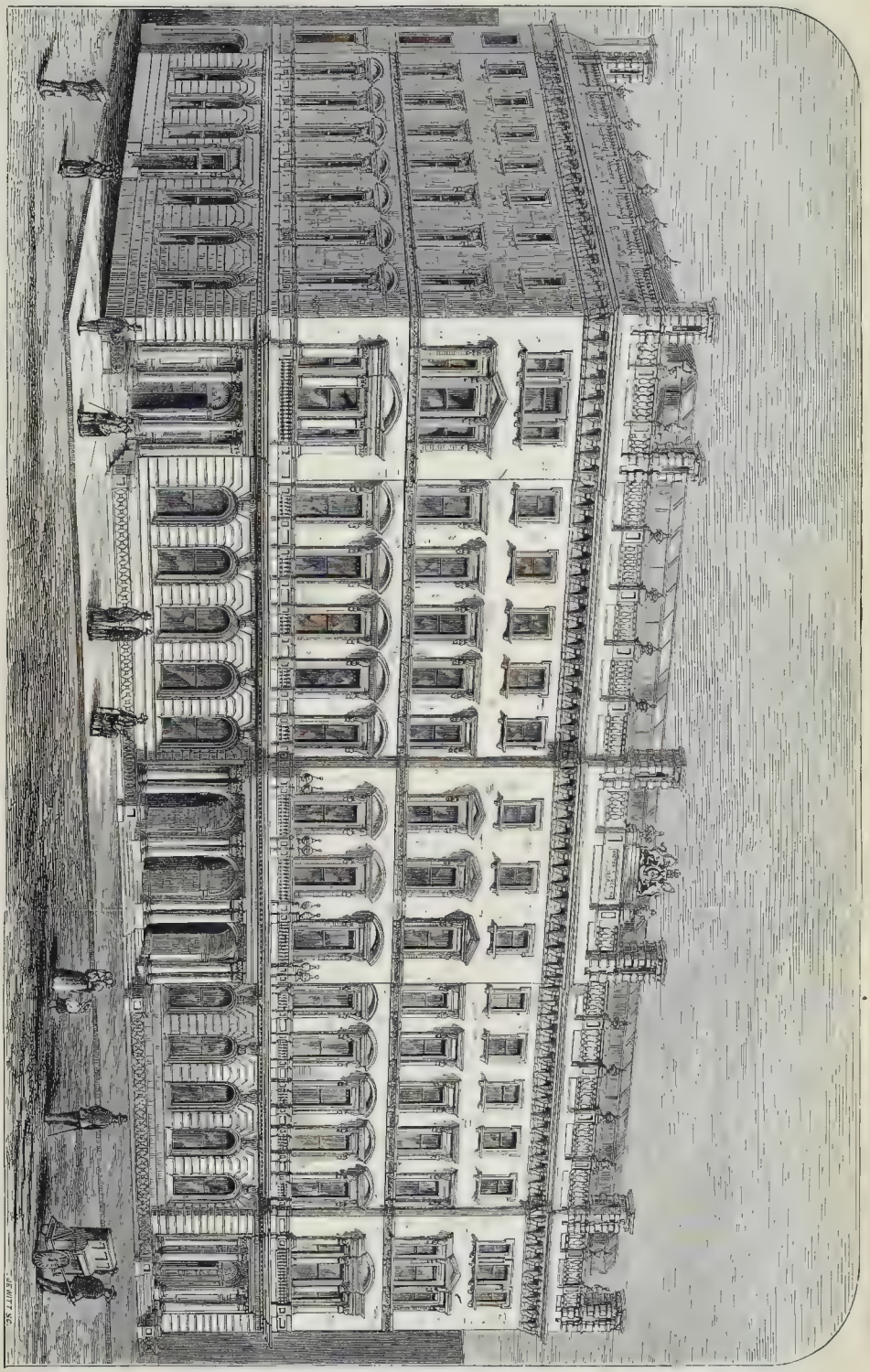
After a brief discussion, the President spoke of the advantages to be derived from the Art Section, and said that its success on the present occasion would no doubt lead to its being more largely attended by artists and lovers of art next year.

DURHAM CATHEDRAL PULPIT.

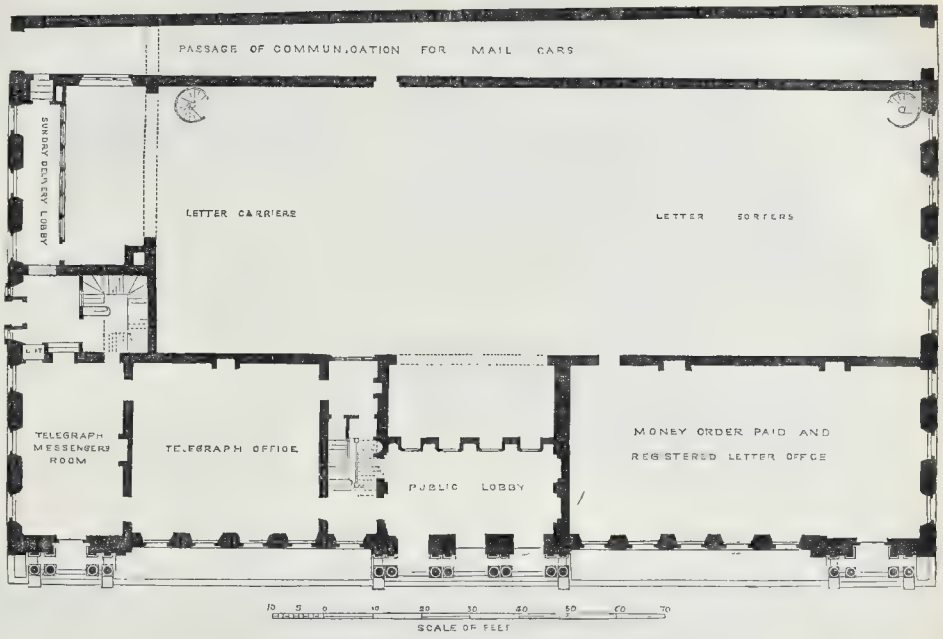
On the 18th inst. (the Feast of St. Luke) the Cathedral Church of Durham was reopened, after having been closed for some time for various works. The bishop, it may be remembered, refused to take part in the opening services owing to his belief that the money would have been better spent in relieving the spiritual destitution of poor parishes. The alterations of the interior have been going on more or less for five years, and have given rise during their progress to considerable and acrimonious discussion, both theological and architectural. If we exclude the Chapel of Nine Altars, which is of later erection, Durham may be called a Norman cathedral, and its vastness on entering strikes the worshipper as much as its height on the banks of the Wear (unequalled except in Lincoln) amazes him on first beholding the external fabric. Whether or not there should be a screen was one of the points chiefly mooted. Sir Gilbert Scott said that no cathedral suffered so much from the want of a screen as Durham, and one has been erected,



NEW PULPIT, DURHAM CATHEDRAL.—Sir G. G. Scott, R.A., Architect.



NEW POST-OFFICE, GLASGOW.—Mr. Matheson, Architect.



POST-OFFICE, GLASGOW.—*Plan of Ground Floor.*

which we shall illustrate before long. The base of the screen and pulpit, and the steps to the choir are of figured black and gold marble. Upon the base stand the arch piers of the screen, each of which is a cluster of dark marble shafts with moulded alabaster bases and bands and carved alabaster caps. Richly foliated, moulded and carved arches rise from these piers, and the whole is surmounted with a cross. The pulpit in the nave is composed of alabaster. In the upper part the shafts are grey marble, inlaid with mosaic; the panels are of dark red and green marble. In the lower part the shafts are of dark grey marble; the lions are of alabaster. Messrs. Farmer & Brindley were the carvers, and the cost is broadly spoken of as between 1,000*l.* and 2,000*l.* The pavement of the choir is of variegated marble; the choir stalls, of oak, which date from the latter part of the seventeenth century, have been advanced. The new organ, by Willis, built in halves, occupies the second arch on either side from the choir-screen. The altar-screen, of Caen stone, is of the latter part of the fourteenth century. Mr. C. Hodgson Fowler, the diocesan architect, has, we believe, assisted in the superintendence of the works.

NEW POST OFFICE, GLASGOW.

The scant accommodation at the Post Office of Glasgow has long been a cause of complaint to those whose daily business is affected by it, and a source of little satisfaction to a city which has otherwise so much to boast of in all that relates to business and the means of transacting it with expedition and success. The first good opportunity that offered for procuring ground for a new building was taken advantage of. Some property to the east of the present postal buildings was purchased, and plans were obtained from Mr. Matheson, the architect to Her Majesty's Board of Works in Scotland, for the edifice. This when completed, and occupying not only the space that has now been cleared at the south-east corner of George-square, but the site of the present office, will be seen to advantage in a square which is adorned by many fine structures. Some idea of the improvements which will thus be effected may be learned from the fact that while the present Post Office covers 950 superficial yards, the new one will extend to an area of 2,500 yards, or rather more than half an acre, being bounded on the north by George-square, on the west by Hanover-street, on the east by Frederick-street, and on the south by Old Assembly-lane. Towards George-square the frontage will be 190 ft., and the width down Frederick and Hanover streets will be 120 ft. To be in harmony with the principal buildings in the vicinity, the style of architecture adopted is Italian. The principal elevation is 75 ft. high, consisting of four floors above the level of the street, having centre and end compartments, in each of which are entrances. The entrance openings of the centre and sides are arched, having the piers between faced with coupled pilasters and relieved columns, all of polished Peterhead granite, forming a portico in front of each. Along the entire front and ends the cornice of the entablature will be carried, and will support a balustrade divided with panelled pedestals. The windows on the first floor are to have moulded architraves and trusses supporting pediments, arched and pointed alternately; those of the next floor are to be similarly finished, with the exception that they will only have cornices; while the upper windows will have moulded architraves resting on projecting sills, with carved blocks underneath. At the termination of the entire elevation there will be a massive cornice, the frieze being panelled and surmounted by a balustrade divided into compartments with panelled pedestals, on which a series of ornamental vases rest. In a conspicuous position, and elevated on a pedestal, the Royal Arms are to be placed. To give some variety in the design, the side compartments are to have windows of Venetian style.

Provision is made in the basement for the accommodation of the engine-house and pneumatic apparatus, as well as for the telegraphic batteries and store. Along the back there will be a covered passage, where the cars will receive and discharge the mails. On the street or entrance floor there will be a large public lobby for posting letters, &c. Turning to the right, the postal public office will be found, while on the opposite side will be the telegraph-office. Behind these, accommodation is provided for those engaged in sorting and delivering letters. Situated on the first floor will be the postmaster's room, the chief clerk's, accountants, and other principal offices, the rest of the offices being arranged for on the floor above. The entire area of the upper floor towards the front will be set apart as the telegraph-instrument room, which will be lighted and ventilated from the sides and roof. Some idea of the increased dimensions of the chief offices can be formed when it is stated that those of the telegraph and postal departments are to include 480 superficial yards, as compared with 220 at present, those of the letter-carriers and sorting will be almost twice as large, and the telegraph instrument room will measure 752 yards instead of 250 as at present. So as not to interfere in any way with the current business, the office will be erected in what may be termed halves. In the first instance, building operations will extend from the gable of the present edifice to Frederick-street, and then, when a transference of the whole of the departments is effected, the old office will be demolished and the new one completed. The foundation-stone was laid on Tuesday, the 17th inst., by the Prince of Wales.

WATER SUPPLY TO HOUSES.

Dr. Tripe, Medical Officer of Health for Hackney Parish, appeared at Worship-street to support a summons taken out by him against Messrs. Jordan & Paine, builders, of Hackney, for that they, having newly erected a house known as No. 2, Ridley-road, West Hackney, had not furnished it, as regards the domestic offices, with water supply and apparatus to ensure its proper working.

Mr. Charles C. Paine appeared to the summons, which, it was stated, was taken out under the Metropolis Local Management Act, section 81, and was, so far as was known, the first case wherein the section had been put into force.

Dr. Tripe said that the house had been inhabited a month, and during the time there had been no water-supply to the domestic offices, as the section required. Dr. Tripe argued that the builder was as liable to supply the proper apparatus and connexion as the landlord of an old house, who was frequently called on to effect a proper supply.

The defendant said that it was not usual until the tenant had contracted with the water company by paying the first quarter in advance.

Mr. Barstow said that the section was clear on the matter, and the Act had not been complied with. He ordered the defendant to pay a fine of 40*s.* and costs.

The money was paid.

PROFESSOR HUXLEY AND HIS "HONEST BRICKLAYER."

The following reaches us from an American architect:—Sir, I find in Professor Huxley's address to the trustees of the intended new University the following remarkable piece of advice, viz.:—"That whenever you begin to build, get an honest bricklayer, and make him build you just such rooms as you really want, and a century hence, if you have a few hundred thousand dollars you don't know what to do with, send for an architect and tell him to put up a façade," &c. Now, while I will look upon the utterances of even so great a scholar as Professor Huxley merely as a suggestion of his *theories*, without claiming for them any particular *accuracy*, yet there can be no perversion of their meaning that an honest bricklayer is in his view competent to devise and put up all the buildings adequate and necessary for a great university that is to be, and for its final and satisfactory finish an architect is to be called in to put a proper face to it. I know that Professor Huxley will not claim any particular accuracy for *that* suggestion of a new theory, for he evidently intended to imply that he, like everybody else, fully approved of the wisely-adopted policy of the trustees of the University not to put up expensive or elaborate buildings at present, at the conception and organisation of the institution, but only such necessary and simple accommodations as will be now (and for several years to come) absolutely necessary for the progressive advancement of the undertaking, which may gradually or eventually require proper, adequate, or even dignified accommodation for 500 or even 5,000 students. It appears singular and very astonishing that the Professor, who, in the very outset of his address, recommended that the University should, in respect to its true sense and universality, embrace *all* the sciences and arts—even schools for pictorial and plastic art, architecture and music, should eventually fall into the great misconception of recommending a bricklayer as the proper person to devise, arrange, and construct the numerous and important buildings for a great University, and propose the calling in of an architect *afterwards* to "put a façade to them." It is almost inconceivable how so learned a scholar and scientist as Professor Huxley, and one reared, brought up, and moving in and among the glories and time-honoured architectural piles in which the Old World, and particularly England, so much abounds, and a country where architecture has been fostered and nourished for centuries by the men of the highest position and talent, and has given such able men as Sir Christopher Wren, Jones, Gwilt, Chambers, Barry, and most of the leading men in the art, should show so little acquaintance with, or so much indifference to, the requirements and duties of an architect as to conceive that the latter's business is simply to put up a façade to the bare walls erected by a bricklayer! Architects, both in America and elsewhere, may not always be fully what the name implies, but our conception, as well as that of better informed men in all enlightened countries, has always been that the architect is what the Greek word *arkos* implies, "chief of the work." Again, *to build*, from the Anglo-Saxon, "*byldan*," to establish, to make firm and fast, but also in the æsthetic sense the designer, deviser, and embellisher of a structure which he fits not only in its interior for the purposes for which it is intended, but endows it with solidity, harmony, dignity, thought, and expression in all its parts; for, while economy, convenience, and proper solidity of construction are the fundamental principles in architecture, it is not the nature of this art to confine itself exclusively on utilitarian points, but the true artistic mind seeks instinctively to adorn what it produces, and we think with Professor Huxley, where he says in his address, "All knowledge is good. It is impossible to say that fragments of knowledge, however insignificant or remote, may not some day be turned to account"; and with Sir Henry Wotton's remark, that "architecture can want no commendation where there are noble men or noble minds." It matters not how simple or economically the contemplated and numerous buildings for a university, or any other purpose, may be constructed, whether of brick or wood, but to be well devised and studied to answer their proper purpose—to erect great lecture-rooms, laboratories, museums, examination and memorial halls, and their necessary appendices and service-rooms properly proportioned, arranged, lighted, warmed, and ventilated, even without any *façade*, requires surely the mind and skill of an architect, beyond the mere hands of a bricklayer, whether the latter be honest or not, and we were in hopes that, at least, England and her great scholars and scientists had gotten beyond our crude and original American idea of an architect, which used to be, at their first appearance, "that they were a little better sort of carpenter"; but now it seems we have advanced so far in the profession that even some of our English friends believe us to be "a little better kind of draughtsmen," who put up a façade to an honest bricklayer's bare walls, like a paper-hanger sticks up his wares by the yard on the bare whitewashed walls of a room "to decorate it." I do not wish to cavil or find fault with the individual opinion of Professor Huxley about architects and their art, but I am sorry to hear such crude and erroneous opinions so publicly expressed at the very opening address of one of our contemplated highest institutions of learning, where the very highest cultivation of all sciences and arts is otherwise so favourably dwelt upon by so high an authority as Professor Huxley; and we have even of late commenced to flatter ourselves somewhat with the idea that the productions of some of our architects compare favourably even with many of the better works in the old countries. But we shall nevertheless study, strive, and toil in the calling of our profession to reach at least up to an equality with the skill and eminence of an "honest bricklayer" in the art of building.

JOHN R. NIERNSEE.

Baltimore.

THE CARPENTERS AND JOINERS OF SCOTLAND.

The report of the Associated Carpenters and Joiners of Scotland for the month of September contains a good deal of information, which, coming so close on the recent strike in Glasgow, is of an interesting nature. More than a fourth of the whole report is devoted to the Glasgow strike, and the figures given of the cost of the struggle to the union bear out what has been stated in the *Scotsman* and in our own columns. Since the termination of the strike 643 new members have been enrolled in the Glasgow district alone, while over the whole of Scotland the new accessions to the ranks of unionism number about 150 more.

It may be remembered that a resolution was unanimously adopted previously to the settlement of the dispute that "nobs" should be charged 1*l.* of entrance-money before being admitted members of the union; and, further, that no society-man should work alongside any "nob" until he had joined the union. This left no alternative, and in several instances the men were compelled to pay the fine. To what extent this has been done is evident from the report. In the central district the fines amount to 10*l.* 13s. 9d.,—the 1*l.* probably being modified to a few shillings,—Cowcaddens, 4*l.*; Plantation, 17s. 6d.; South, 4*l.* 3s. 6d.; Townhead, 1*l.* 6s. 6d., to which is added "fine from an employer, 3*l.*;" West, 10s.; Govan, 2s.; and Partick, 2*l.* 7s. 6d.

Coming to the sum paid in the different districts for strike allowance, the central branch heads the list with 878*l.* 3s. 1½d., Townhead being next with 567*l.* 12s. 7½d. The total expenditure is given at 3,565*l.* 11s. 8d., but to this has to be added about 400*l.* expended otherwise than on members of the union. While on June 2nd the number of men on strike was 1,313, on July 7th it had decreased to 412, and on August 4th the number was 356, this being further reduced on September 1st to 168. The report concludes with two significant paragraphs, one from the Aberdeen branch with reference to compulsory membership, and the other a Glasgow "comment." The Aberdeen joiners say:—

"While we would be disposed to allow some latitude to our brethren in Glasgow in their present circumstances, yet from the statements in last month's report, and also in the public prints, we think they are adopting a course which has never received the sanction of the Association. We are as anxious as any to see all the members of the trade in Glasgow and elsewhere connected with the Association, provided they are persuaded it is their interest and their duty to become members; but a forced membership is not desirable, and it appears to us that our Glasgow brethren, in refusing to work along with non-members, are adopting a course which does not allow freedom of opinion, and is calculated to create and strengthen prejudices already strong enough against such combinations as ours, and it is a course which has certainly never been sanctioned by the Association."

Then follows the "comment":—

"We have had occasion repeatedly to request our members not to heed the statements in the newspapers relative to our trade movements or the business of the Association. The paragraphs are generally of a hostile character, and often twist and mangle facts in such a way that readers cannot miss being deceived. We deem it necessary to direct the attention of our Aberdeen friends to Rule XVII. sec. 1, and they will there find authority for all and more than they complain of. Were we inclined to open up or carry on a controversy as to whether we should compel those who are blind to their own and their trade interests to become members, we are confident that we would be able to show that our duty and interest both lie in that direction. We have had to pay sweetly for the freedom of opinion we allowed to non-members, and are now resolved that they shall pay at least some of what we have lost by our mistaken kindness to them. How often have we had to go begging for non-members? How often have they asked what the society is to do for them? How much money have they caused us to lose in the recent and previous strikes? Let our Aberdeen friends weigh the facts (they know them), and we are sure that their sympathy is at present extended to those who do not deserve it."

NEW HOSPITALS.

Lewes.—A new hospital for infectious diseases, which has just been built on the Offham-road, at Lewes, has been inspected by the Medical Officer of Health for East Sussex, Dr. Fussell. The hospital, which is commodious rather than showy, consists of three detached buildings, furnished with sanitary and ventilating appliances. It has been erected by Mr. H. Card under a contract with the sanitary authorities of Lewes and the Cliffe. The architect is Mr. Rutley, of London. The hospital is surrounded with grounds which are to be suitably laid out.

London.—The new building for the Central London Throat and Ear Hospital, Gray's-inn-road, has been completed. The foundation-stone of the building was laid, it will be remembered, by Madame Adelina Patti, about a year ago. Externally, the hospital is simple, but substantial. The upper portion is of plain brick, with Portland stone dressings. The lower portion is relieved by glazed tiles. All the passages, waiting, consulting, and operating rooms have a dado of 4 ft. 6 in. high, of blue and white glazed tiles, of Dutch pattern. These tiles were manufactured in the South of France, and are said to be about one-third the cost of the English make. They have been supplied by Messrs. Trollope. The walls above are finished with a permanent coloured cement, after a new process of the architect, Mr. Ernest Turner. The doors and window fittings are, for the most part, of oak.

Wakefield.—The Committee of the Clayton Hospital and Wakefield General Dispensary have accepted tenders for the various works required in connexion with the proposed new hospital. Some time ago the committee purchased for 4,500*l.* about two acres of land near St. John's, belonging to Mr. R. B. Mackie, and upon this land is intended to be built a new hospital, at a cost of nearly 14,000*l.*, exclusive of the site. The architect is Mr. Bakewell, of Leeds.

Warrington.—The new hospital and dispensary in Heath-lane, Warrington, overlooking Bank Park, is nearly completed. The architects are Messrs. John Pierpoint & Son, whose designs were selected in limited competition. The style is Gothic, and the material is pressed brick, with Cefn stone dressings. The most noticeable exterior feature is the clock tower, which will be visible from many parts of the town. The peculiar shape of the land has had much to do with the form of the building. By adopting what is known as the "pavilion" plan for the hospital, the other portions fell into their proper places better than they otherwise would have done. The axes of the wards run as nearly as possible north and south, so that the sun may shine in the rooms from rising to setting, on one side or the other. The walls of the wards are one brick and a half thick, with a 2-in. cavity, and the inside of the walls is plastered with Pariancement. The floors are laid with oak rebated boards, which are to be kept beeswaxed. The cubical space allowed for each patient in the wards, supposing all the beds to be occupied, will be about 1,339 ft. The windows in all the wards have been divided into three parts, the top portion being on a swivel, and the lower portions hung with the ordinary cords and weights. In addition to this, what is known as "Sheringham's ventilator" is used between the windows. The wards will be warmed by means of open fire-places. The dispensary is approached by a distinct entrance; and has suitable accommodation for the outdoor patients. There are also an accident ward and an operating ward, the latter lighted from the top. Adjoining the operating ward is the special ward for special cases; and a notable feature in this ward are the means adopted for clearing the room of all foul air or bad smells after a "dressing." A cold-air flue is brought from the outside to a valve under the centre of the beds, upon opening which, and the flaps to ventilators in the ceiling, the room will be immediately

cleared. In addition to these wards, there are the resident-surgeon's house, with library, &c., and apartments for the nurses and servants. There is a mortuary, the entrance to which is from the yard. The cost of the whole of the buildings, exclusive of furniture, will be about 7,000*l.*——A new infectious diseases hospital is also in course of erection at Warrington. For some time past it has been felt by the Corporation that there was a great want in the town of an hospital for diseases of an infectious character, and that if any epidemic were to break out in the town, the consequences, owing to this want of proper isolated accommodation, might be very serious indeed. The matter was taken up by the Sanitary Committee, and plans obtained from the borough surveyor, Mr. Vawser, for the erection of a suitable building, and one capable of meeting all the demands of a rapidly-growing town. The building is just outside the boundary-wall of the Union Workhouse, and will consist of six separate blocks one story high, communication being obtained between each two blocks by means of covered corridors. Each of these blocks will contain two wards, thus giving a total of twelve, each ward containing six beds. The room for the nurse is situate between the two wards, so that from windows on each side of her room she can constantly have the oversight of both wards. The wards are each 36 ft. by 24 ft., and each is fitted up with bath, closet, stoves, &c., in order to make each department thoroughly self-contained. The building will be of brick. Besides these blocks, there will be the lodge for the keeper, a mortuary, disinfecting house, laundry, coach-house, &c. It is not intended to complete the whole of the buildings at present, one of the blocks only being proceeded with, with the necessary porter's lodge, outbuildings, &c., and the total amount of the contracts for this work reaches 2,200*l.* The remaining blocks will be built from time to time as they are required, and it is estimated that the total cost of the whole when completed will be about 6,000*l.*

SCHOOLS OF ART.

Lewes. — The distribution of prizes at the Lewes School of Science and Art took place on the 10th inst., the Right Hon. the Speaker in the chair. The report, read by the secretary (the Rev. P. de Patron), recorded much useful work. The income for the year, including fees for the art school, day and evening classes, was 132*l.*; from science class, 5*l.* 15*s.*; grant for art department, 30*l.*; and grant for science department, 15*l.*; making a total of 182*l.* 15*s.*; against which were disbursements amounting to 204*l.* 10*s.* 1*d.* A deficit of 21*l.* 15*s.* 1*d.* was thus shown.

Henley-on-Thames. — In connexion with the distribution of prizes at the Henley-on-Thames School of Art, the other day, an art exhibition was held. Sir Robert Phillimore distributed the prizes. The report of the hon. secretary (Mr. W. Wing) stated that the total number of students attending the class has been :—Afternoon, 22; evening, 48. Average attendance :—Afternoon, 7·5; evening, 27·6. Mr. Havell having resigned his position as master of the school in May last, had been succeeded by Mr. Randall. The report of the Government Inspector and the list of students successful at the May examination are in every respect satisfactory. The local prizes were adjudged by Mr. W. Scott Champion, the competition being close.

Godalming. — The Godalming Art Classes have now been established three years, and are reported to be doing a very successful work. The number of students attending during the past year was, afternoon class, 32; evening, 64. The receipts were 138*l.* 12*s.*, which include subscriptions to the amount of 44*l.* 18*s.* 6*d.*, and Government grant, 24*l.* 11*s.*; and the expenditure, was 156*l.* 4*s.* 8*d.*; thus leaving a balance due of 17*l.* 12*s.* 8*d.* The teacher of the classes is Mr. W. T. Roberts, certificated teacher, South Kensington. The distribution of prizes and certificates to the successful students in the Government examination took place on the 9th inst., when Viscount Midleton presided.

Birkenhead.—The annual distribution of prizes at the Birkenhead School of Art took place last week in the new hall which has recently been opened. Mr. Laird presided, and congratulated the friends of the school on the completion of the new hall, for which they were indebted to the liberality of Mr. MacIver, who had placed 1,000*l.* in the hands of the committee for that purpose. Mr. Bentley, the master, read his report, from which it appeared that there were 202 students in the evening classes, and 64 in those held in the morning. In the late examinations 148 candidates had submitted 257 exercises, of which 31 were marked "excellent," and 112 "good." A total of 2,096 drawings, &c., had been forwarded to South Kensington, and from those twenty students had received prizes, being double the number of last year.

Walsall.—The report of the head-master of the Walsall School of Art, just published, shows that during the year the number of students increased from eighty-three to nine-seven, and the number of pupils from one class of nineteen to two of seventy and eighty respectively. The works of ten students in the elementary section and two in the advanced received special notice as satisfactory. Fourteen art certificates with two prizes, two third-grade prizes, and one national book prize, have been awarded by the Department. The grants for science and art amounted to 68*l.* 9*s.*, or about 20*l.* more than last year.

Leith.—The general meeting of the Leith Science and Art School was held on the 17th inst. The annual report showed that the numbers on the roll during the session were :—Machine construction, sixty-five ; mathematics, sixty-seven ; steam and the steam-engine, sixty-five. In the first department, twenty-five pupils had presented themselves for examination ; in the second, eight ; and in the third, twenty-six. The result had been that thirteen pupils had gained Queen's prizes ; thirteen, first-class certificates ; and seventeen, second-class certificates ; and a Government grant of 42*l.* secured. The financial condition of the school is satisfactory.

Selby.—The annual meeting of the Selby School of Art was held on the 19th inst., when Sir Henry Cole, K.C.B., presided, and distributed the prizes. Sir Henry, in opening the proceedings, observed that if the school at Selby had been simply content to stand upon the average, they would have got by the system of payment by results from the Government about 36*l.* for the last year. But the fact was he saw from the last report of the Department at South Kensington, that the school gained 58*l.* for the year. That may be taken as a satisfactory sign that the school was working well in comparison with others. These results had been obtained in spite of the very worst premises for a school of art that he had ever seen in his life.

Mansfield.—The annual distribution of prizes to the successful students of the Mansfield School of Art and Science took place on the 26th ult. Mr. J. S. Tyrer, head master of the school, read his annual report, from which it appeared that sixty-two students had been entered during the year, fourteen attending the morning and forty-eight in the evening class. This number of admissions, though six below those of last year, was still above the average for the last four years. Of the forty-eight students attending the evening class, thirty-six were above sixteen years of age. Only ten failed to make the necessary twenty attendances. At the Government April examinations twelve highest grade prizes were awarded to students of this school, against five, the highest number previously obtained. In addition to these, seven second grade prizes, one Queen's prize, fourteen certificates for free-hand and model drawing, and eight for machine drawing, were awarded at the Government examinations at South Kensington last April.

Hanley.—The annual meeting of the Hanley School of Art was held on the 18th inst., at the Town-hall. The report of the head master (Mr. A. A. Bradbury) stated that although there was a slight decrease in the number of students who attended the school in the year just ended, the works submitted for prizes and payments in April last numbered 1,576, being an increase on any previous year. An additional proof of the diligence of the students as a body last year is found in the increase in the number of those who executed sufficient satisfactory studies to be worthy of submitting for examination, for whilst in 1875 the works of 159 students were submitted, in the year just ended the works of 164 students were sent to South Kensington for examination. Since the last report the first of the prizes offered for design each year by the Worshipful Company of Plasterers, and open to competition to students in the entire kingdom, has been won by Mr. Joseph Ellis, lately of this school, for a design for a bracket. One of the students of the school has also obtained a National Scholarship at South Kensington of the value of 52*l.* per annum.

LIABILITY OF LOCAL BOARDS.

WIGRAM *v.* SOUTHEND LOCAL BOARD.

THIS was an action (heard in the Rochford County Court on the 10th inst., before Mr. J. T. Abdy, judge) by which the Rev. S. R. Wigram, vicar of Prittlewell, sought to recover from the Southend Board of Health 3*l.* 2*s.* 6*d.* for damage done to his carriage, and for cab hire during the time the repairs were going on, such damage being alleged to arise from the neglect of the defendants to keep the road and sewers in proper repair.

A previous action was brought at the June Court, but his Honour then nonsuited the plaintiff, on the ground that the Board as surveyors of the highway and as public servants were not amenable to action, but that the mode of procedure would be by indictment. At the August Court application was made on behalf of plaintiff for a new trial, and in support of this application citation was made of the action "White *v.* The Hindley Board of Health," in which it was laid down by Mr. Justice Blackburn that in their joint capacity as owners of sewers the Local Authority was liable to action for damage resulting from neglect in respect to the sewers, and on the strength of that case his Honour granted the new trial, and the case was now commenced *de novo*.

It appeared that on the 25th of November last year a traction engine passed along the High-street and broke through the sewer in several places. Shortly afterwards plaintiff's coachman was driving towards the station when the horse suddenly fell through a hole on the west side of the road, and it turned out that this hole on the surface was owing to the sewer being broken. It was alleged that when this sewer was constructed, instead of the earth being put back and properly rammed, a great portion of it was never put back, and that was the cause of the accident. In the case "White *v.* The Hindley Board of Guardians," Mr. Justice Blackburn held that the Board was liable for the damages sustained through a defective grid over a shaft leading down to the sewer. It was contended that the Board were guilty of gross negligence in not stopping the traffic along this road until the damage had been repaired.

Witnesses having been called on behalf of the plaintiff,

It was contended, for the defence, that the sewer was constructed five years prior to the accident by Mr. Marshall, who contracted to do the work. It was impossible to put in as much earth as was taken from the excavation, and from time to time as it subsided it was the practice to fill up the trench until it became quite solid, but in some cases, as in this, in dry weather the crust of the road was so hardened that while the work of subsidence went on underneath, the surface of the road remained perfect and formed an arch, but it was impossible to detect this until the surface was broken through. In this case the Board did properly in making a contract. Mr. Marshall was the contractor, had done the work, and had been gone from the district six years, and for five years before the accident the road had been used, and the winter before the road had been thoroughly repaired, and received a heavy coat of metal. It was further contended on behalf of the defendant that in the case of "Hammond *v.* The Vestry of St. Pancras" it was ruled that in the absence of negligence the vestry was not responsible for injury arising from the disrupture of the sewer, but in the case "Foreman *v.* The Mayor of Canterbury" there was negligence in putting the stones by the side of the road, and in the case of "White *v.* Hindley Local Board" the grid was known to have been broken six months.

Mr. W. Waterhouse, surveyor to the Southend Local Board, said that as soon as he heard of the breakage he went to the spot, set a man to keep anything from passing there, went to the police-station for a constable to keep people off, and as soon as possible procured ropes and stretched them across the road to prevent traffic, and he set men to work to repair the damage, which was done the same afternoon ; he did not hear of the accident to plaintiff's carriage until returning from the police-station, and not an hour elapsed from the time of his hearing of the breakage to his hearing of the accident ; he knew nothing of the cavity in the road before, and there was no means of knowing it.

His Honour here stopped the case, and said in his opinion there had been no negligence proved on the part of the Board, because as soon as the damage to the road was ascertained the surveyor did all he could to remedy it and to prevent accidents, and it had been proved he could not know the state of the road before the traction engine broke through and revealed it. He therefore gave judgment for the defendants with costs, but said he would give plaintiff a case for the court above if he desired it.

DAMAGES FOR DELAY.

ASHTON AND ANOTHER *v.* GIBBS.

THIS was an action in the City of London Court, before Mr. Commissioner Kerr, to recover the sum of 7*l.* 3*s.* for goods sold. The defendant pleaded a counter claim for 50*l.* damages against the plaintiff.

It appeared that the defendant, a civil engineer, of 2, Westminster-chambers, Victoria-street (who is engaged in large building operations at West Kensington), entered into a contract with the plaintiffs, Messrs. Ashton & Green, of 14 and 15, Bury-street, St. Mary-axe, slate and general merchants, to slate two villas situate on The Cedars Estate, Hammersmith-road. The plaintiffs' claim was for the balance of an account for work done ; but the defendant contended that in consequence of its not having been done in time, the rain and snow came through the roof, and so damaged the interior of the building, that he had lost in the maximum 81*l.*, although he now only claimed 50*l.*, for the purpose of giving the County Court jurisdiction.

The defendant's counsel said he would not contend against the plaintiffs' claim for the work done, but would rely upon the counter-claim, and upon that the defendant and several witnesses were called, and proved that the plaintiffs had contracted to do the work within a week, and had been paid 20*l.* in advance upon their estimate of 24*l.*, and that they had neglected the work, and did not complete it for upwards of a month after the contract time had expired, in consequence of which the rain and

snow came through the roof, and damaged the plaster, warped the floor boards, and put the defendant to considerable loss and inconvenience.

The plaintiffs called evidence to prove that the slating could not be gone on with in consequence of the work necessary to be done before the slating was commenced being imperfect, and that they had to wait for the zinc-worker. The defendant, however, rebutted that assertion by proving that everything was ready, and the zinc-worker in attendance to do his part of the work. The witnesses for the plaintiffs almost proved the defendant's case.

The Judge allowed the whole of the defendant's counter claim, and gave judgment in his favour for 42*l.* 17*s.*, being for the full amount of the counter claim less 7*l.* 3*s.*, the admitted balance due on the contract, and the plaintiffs were condemned in the costs of the action.

PAVING CHARGES.

In our article last week on the "Maintenance of Roads and Paving Charges," special reference was made to the case of St. John's-road, Angell-town, Brixton. At a late meeting of the Lambeth Vestry, the General Purposes Committee reported that a deputation of the occupiers of houses in that road had attended to urge upon the Vestry certain reasons as to the non-liability of the occupiers to pay the charges made upon them under section 78 of 25 and 26 Vict., cap. 102; and the committee submitted the following resolution to the Vestry:—

"After reviewing all the exceptional circumstances connected with this matter, the varied and conflicting interests involved, and your committee being of opinion that the question should be disposed of by an equitable and liberal spirit being exercised to all the ratepayers charged, it was resolved that the Vestry be recommended to accept two-fifths of the rate of any occupier in the road, who may pay the same within one month from the passing hereof."

The Vestry, however, decided to accept one-fourth of the sum claimed as full payment of the rate levied on the various tenants; and we believe this compromise has been accepted by the occupiers.

Since then a similar course has been adopted in the case of the Angell-road and the Crowhurst-road, which differ from the St. John's-road in that the claim has not yet been made upon the occupiers. The report of the General Purpcses Committee anticipates any opposition by recommending,—

"The Vestry to direct that the same course of procedure be adopted with the footways of the above-named roads, as adopted in respect to St. John's-road. That the surveyor be directed to make estimates of the cost and expenses of flagging such footways, apportioning the same, according to lineal measurement, on the frontage of each house. That the Vestry make the requisite rate, or rates, based on such estimates on the respective occupiers of the houses in the said roads; and that upon payment of one-fourth of the amounts charged within one month from the making of the said rate or rates, acquittances or discharges be given for the same, but in default thereof, that proceedings be taken at the expiration of such time for the recovery of the full amount charged in the first instance."

We are glad to see that the authorities have thought it best to defer to public opinion in this case.

MASTERS AND MEN.

Broughty Ferry.—A week or two ago the master masons of Broughton Ferry intimated to the operative masons in their employment that it was their intention to reduce the wages on the 14th inst. from 9½d. per hour to 8½d. per hour. On receipt of this intimation the men called a general meeting, when it was resolved to compromise the matter by offering to accept 9d. per hour. This decision was communicated to the masters. They, however, with two exceptions,—Messrs. T. Butchart & Son and Messrs. Bennett & Taylor, who expressed their willingness to give 9d. an hour,—adhere to their original intimation, 8½d. an hour. Thereupon, at a general meeting on the 14th inst. the men unanimously decided not to accept less than their present rate of pay, 9½d. an hour; and, accordingly all the operative masons in the Ferry, considerably upwards of 100, with scarcely an exception, struck work. The greater part of the workmen in the employment of Messrs. T. Butchart & Son, Messrs. Bennett & Taylor, and Messrs. Kay & Fleming, provisionally resumed work on the 16th inst. at the former rate of pay, 9½d. an hour.

Bloxwich.—At the Guildhall, Walsall, on the 16th inst., William Evans, a locksmith, appeared by adjournment, charged with having neglected the service of his employer, Mr. William Wilkes, of Bloxwich. When the case was first heard it was stated that the complainant had lost 13*l.* by the defendant absenting himself, and by having certain locks altered which the defendant had made improperly. The defendant then denied that the locks produced in court were made by him, and pleaded that he left the complainant's service because work was not found for him. The case was accordingly adjourned for the complainant to produce his wages-book. On this occasion he produced a journal containing a record of the work as it came in, and stated that he did not keep a wages-book. Objection was taken that the damages arose before the breach of contract, and consequently that the bench had no jurisdiction; but the bench over-ruled the objection, and ultimately made an order for 8*l.* damages against the defendant.

Greenock.—The Greenock operative masons have, by a large majority of their number, decided to rescind the resolution formerly agreed to, to demand a rise of ½d. per hour, and a strike will therefore be averted.——In the Greenock Sheriff Court, on the 18th inst., before Sheriff Smith, Messrs. John Coghill & Son, contractors, Smithston, craved his Lordship to compel Michael O'Dea, one of the recently-imported American masons, to return to his work, from which he had deserted, and to fine him a sum not exceeding 10*l.* O'Dea admitted deserting, but pleaded justification, on the ground that a large part of his wages had been kept back for passage-money from New York to Greenock, a thing he had never agreed to, inasmuch as in the Messrs. Coghill's advertisement, which appeared in the *New York Sun*, for masons, were the words, "passage paid." After evidence had been laid at great length, the sheriff dismissed the action, on the ground that the men were justified in concluding from the terms of the advertisement that their passage was to be free. A similar action against another American mason was also dismissed.

Portobello.—On the 14th inst. the labourers employed at the West Bank Brick Works received notice that their wages would from that date be reduced from 20*s.* to 19*s.* per week, for ten hours and a half daily work. The men, numbering nearly twenty, unanimously refused to accept these terms, and left the works.

Manchester.—An aggregate meeting of the carpenters and joiners of Manchester, Salford, and the surrounding district was held on the 17th inst., in the Corn Exchange, Manchester, for the purpose of considering the present working rules of the trade. There was a large attendance. Mr. W. F. Mee moved a resolution suggesting that between the 1st of February to the 30th of November the working time for both "inside" and "outside" men should be 49½ hours per week, and from the 1st of December to the 31st of January, 47 hours per week, wages both for summer and winter to be 10*d.* per hour. The resolution was adopted, with but one dissentient. Mr. Y. M. Day moved the next resolution, which suggested the following alterations in rules two, three, and four:—That no workman be allowed to work in the open air by means of artificial light; that "for the first three hours overtime should be counted time and a half, and after the first three hours, until starting time next morning, double time, overtime to commence on Saturday at twelve o'clock and to be charged double time until starting time on Monday morning; time worked on Christmas Day and Good Friday also to be charged as double time;" and that where men were working in unprotected buildings the employers be required to find work under cover for such men in wet weather. The motion was adopted. Mr. T. Phillips proposed the following alterations in succeeding rules:—That the shops should be the starting points for all men engaged on outside jobs; that all men should receive three hours' notice or three hours' pay, in case of being discharged; and that a new rule should be adopted declaring that no improver should be allowed to work as such after the age of twenty-one years. The resolution also proposed to approve of the rules in the existing code numbered ten, eleven, and twelve, the latter of which declares that all disputes which may arise shall be decided by a court of arbitration composed of six employers and six workmen, and an umpire, who must neither be a workman nor an employer. The discussion of these proposals was adjourned.

Completion of the Outer Pier, Weymouth. At a meeting of the Weymouth Town Council, on the 12th inst., the following tenders were received for completing the outer pier, viz.,—Mr. J. Jackson, Newcastle-on-Tyne, 2,848*l.* for concrete, or 3,523*l.* if with roach facing; Messrs. Marfield & Hill, Cinderford, at 4,287*l.*, or 4,642*l.* with roach facing; Messrs. Bull & Sons, Southampton, at 3,262*l.*, or 3,750*l.* with roach facing. Mr. Jackson's tender for concrete was accepted.

THE PUBLIC BUILDINGS, PHILADELPHIA.

We have received from America photographs of some of the sculptured decorations upon the New City Hall in Philadelphia, a view of which we published in a recent number.

The photographs referred to were taken from the original models of Mr. Alexander Calder, modeller to the Commission, under the direction of the architect, Mr. John McArthur.

The subjects include the nude figure, heads, such as those of Washington and Franklin, floral ornament, and symbols. We have to express our admiration, and we offer congratulations to both architect and sculptor.

THE ARTISANS' AND LABOURERS' DWELLINGS ACT, 1875.

THE HOLBORN AND WHITECHAPEL SCHEMES.—SUGGESTED AMENDMENT OF THE ACT.

The Artisans' and Labourers' Dwellings Act, and the powers which it confers on the Metropolitan Board of Works, were discussed at the last meeting of the Board. In the first place, the Works and General Purposes Committee brought up the following report as to the Gray's-inn-road or Holborn scheme:—

"Your committee have to report that they have considered the letter from the Holborn District Board referred to them on the 21st of July last, urging this Board to prepare and proceed, with as little delay as possible, with an improvement scheme for the Holborn District under the Artisans' and Labourers' Dwellings Act, 1875, in place of that which has not been confirmed. It will be remembered that in June of the present year a letter was received from Mr. G. Lushington, counsel to the Home Office, informing the Board that after a careful consideration of the scheme submitted by them for the improvement of the unhealthy area in the Holborn District, the Home Secretary found himself compelled, for the reasons stated, to decline to confirm the same, or any portion of it. A reply to this letter was sent by order of the Board on the 28th of July, and no reference has since been made by the Board to the committee on the subject of the Holborn scheme. Your committee recommend that the District Board be informed, in reply to their letter, that the question of the widening of Gray's inn-road is at present under the consideration of the committee to which it has been referred, and that the subject of their communication will receive careful attention in connexion with that question."

General Sir W. Codrington said formerly this improvement was urged on sanitary grounds, but now it appeared to be brought forward as a street improvement scheme.

Mr. Richardson said the improvement would necessitate the removal of a large number of properties proposed to be dealt with under the Artisans' Dwellings Act.

The report was adopted.

On the motion of Mr. Richardson, the Board also adopted a report of the same committee, recommending that the Holborn District Board be informed, in reply to their letter enclosing a copy of a letter from the agents of Lord Leigh, as to certain houses within the area which was proposed to be dealt with under the Holborn scheme, that this Board are of opinion that the property in question cannot at present be dealt with by them, but that any action which may be necessary in the matter should be taken by the District Board.

A report of the Works and General Purposes Committee was read, recommending that a communication be addressed to Messrs. F. R. & A. Vigers, in reply to their letter, on behalf of the Trustees of Mr. Peabody's Gift to the Poor of London, transmitting a plan showing a scheme for the improvement of certain lands within the metropolis, and asking this Board to take action with regard thereto, under clause 5 of the Artisans' and Labourers' Dwellings Improvement Act, 1875, informing them that any intervention by the Board must be founded upon official representations from the medical officers of St. Giles and St. Pancras, under the 3rd section of the Act, and that upon receiving such official representations and a sufficient guarantee of all the expenses to be incurred, the Board will be prepared to take their proposal into consideration.

The report was adopted.

The clerk laid before the Board a letter from the Home Secretary, returning plan approved of the area comprised in the Whitechapel and Limehouse improvement scheme, under the Artisans' &c., Dwellings Improvement Act, 1875, and stating that he is ready to receive the map and schedules required to be deposited in connexion with the scheme, and that he is desirous that no time should be lost in carrying out the scheme.

The communication was referred to the Works and General Purposes Committee.

Mr. J. Runtz proposed the following resolution :—

"That the Works and General Purposes Committee be authorised to confer with her Majesty's Government with the view of obtaining an amendment of the Artisans' and Labourers' Dwellings Improvement Act, 1875."

He said it was necessary in this matter for him to go into particulars. The committee had been diligently engaged in preparing schemes for presentation to Parliament next session. They had had no less than twenty-two schemes under consideration, but in considering these matters they had found that there were certain defects in the Act which they thought ought to be remedied.

The motion was carried.

"SOUND-PROOF" FLOORS.

Sir,—The writer of the letter under the above heading, which appeared in your last issue, refers to the papers, entitled "Model Dwellings for the Rich," read before the Society of Arts. He points out that the mode of rendering a concrete floor sound-resisting was not then stated, and asks for information as to how to make such a floor resist sound. It was the object of the authors to avoid a mass of technical details in that paper, written as it was for a general audience; and naturally, therefore, the matter in question was not gone into. Such a floor as your correspondent describes is undoubtedly a decided conductor of sound. To prevent the transmission of sound through it, there should be either a boarded floor, or a tile floor above it, and a separate plaster ceiling below. Each with its proper series of small floor-joists and small ceiling-joists; the transmission of sound being more checked by causing it to pass from one material to another three or four times than by any thickness of homogeneous and solid matter. The ordinary mode of treating such a floor in Paris provides a structure which offers an obstacle both to sound and fire, not absolutely insurmountable, but very difficult to be passed by either. In the double partition which your correspondent describes, probably spikes or screws pass from one series of boards to the other, and transmit the vibrations of the sound pretty nearly as well as though the felt had been left out. I should anticipate that if there were no screws, nails, or pegs, but the boards were only glued to each face of the felt, sound would be sensibly checked. T. Roger Smith.

If "Inquirer" will cover his cement floor with inch flooring on joists 2½ in. square he will have a sound-proof floor. I have built many offices in this manner, and have never had a failure. W. S. Horner.

COMPETITIONS.

Nottingham Church Cemetery.—The competitive plans for the proposed new mortuary chapel at the Nottingham Church Cemetery were exhibited at the Nottingham Art Museum last week. Nine sets were brought together for the selection of the directors, and for the inspection of the shareholders and the public. From the elaborate architectural details shown in some of the drawings, the *Nottinghamshire Guardian* is afraid that the original estimate could not possibly cover the cost of carrying out such designs. The following are the competing architects:—W. A. Heazell, Nottingham; A. Smith, Nottingham; E. P. Willins, London; "Experience," J. E. Truman, Nottingham; F. Jackson, Nottingham; W. Jackson, Nottingham; R. K. Freeman, Bolton-le-Moor; and R. Clarke & Son, Nottingham.

Inverness Townhall.—Mr. John Rhind, in a letter to the *Inverness Advertiser*, says that the will of the late Baght requires that the designs for the new town-hall must be selected from designs prepared by Inverness architects; but the Council, by a majority of one, now ignores this stipulation by proposing to accept the design of Mr. Matthews, an Aberdeen architect. Mr. Rhind observes,—"It is well known, at least by the profession, that Mr. Lawrie, who was long in the capacity of clerk of works for Mr. Matthews, Aberdeen, although now a partner, did not prepare or draw the designs 'Let Honour Follow.' They were prepared in Aberdeen, under Mr. Matthews's supervision. Mr. Matthews is an accomplished and educated Aberdeen architect; but I hold that in this competition he is quite out of court, and has no right to intrude where Inverness architects alone are invited. Mr. Lawrie, as one of the architects 'resident in the burgh,' who was invited and attended the conference with the Council, should have sent in a *bonâ fide* design of his own. Mr. Matthews's name was not mentioned in connexion with the matter until his designs are now brought under consideration, and Messrs. Matthews & Lawrie are, in consequence, proposed to be appointed architects for the work." Mr. Rhind, in some further remarks, criticises Messrs. Matthews & Lawrie's design, and says,—"As it is the general public opinion that all the architects have misled the Council, in submitting plans that cannot be erected within the stipulated outlay of 12,000*l.*, I beg to explain, after revising the matter with a surveyor, that I am prepared to carry out the plans sent in by me at 12,000*l.*, exclusive of the statuary in niches and heraldic carving."

WHITTLESEA SCHOOL COMPETITION.

Sir,—The following letter has been sent to the chairman of the Whittlesea School Board by Mr. C. Bell and myself, who, having been separately invited to compete, jointly submitted designs for the three schools.

We have a very high opinion of builders' foremen, but having been invited to compete against Messrs. Adams & Son, Mr. J. Ladds, Messrs. Mumford & Townshend, &c., we decidedly object to one of that body "turning architect" because he happens to have powerful local influence. Henry Lovegrove.

[Copy.]

Dear Sir,—We beg most respectfully to protest against the decision of the Whittlesea School Board in the recent competition.

We were invited to send designs in competition with nine other professional architects, as we believed, and now find that the plans selected are the work of a builder's foreman, formerly in the employ of Mr. Elworthy, of Upwell.

Judging from the report in the *Peterborough Advertiser*, the drawings received very little consideration. The chief point in the discussion upon their merits seemed to be that the plans for the larger school did not provide accommodation for 330 infants. It is difficult to see how they could, as the "Instructions to Architects" particularly stipulated that accommodation should be provided for 168 infants.

If the Board intended to employ a builder's foreman to do architect's work, why waste the time and money of ten gentlemen for the sake of obtaining their ideas on school planning?

The decision is unjust to the competitors and detrimental to the interests of the ratepayers of Whittlesea, who are entitled to have their money spent under the directions of experienced professional men, and not those who, perhaps very practical in building matters, cannot have that special knowledge of school arrangements which so important a subject demands.

(Signed) Charles Bell.
Henry Lovegrove.

SURVEYORSHIP ITEMS.

Sudbury.—The salary of Mr. Cross, borough surveyor of Sudbury, has been increased to 175*l.*

Breconshire.—At the Breconshire Michaelmas Quarter Sessions, on the 17th inst., the chairman said that the county surveyor (Mr. W. Williams) had by letter made application for an increase of salary, and the question would have to be brought forward at the next Court of Quarter Sessions. Mr. Williams, in his letter, stated that in consequence of the extensive area and the large number of bridges under his supervision, nearly one-half of his salary was expended in travelling and other expenses incurred in visiting and inspecting the bridges, leaving little more than 80*l.* available as remuneration for his professional services. He applied for an increase of 50*l.*, his salary at present being 150*l.* In reply to Sir Joseph Bailey, he said that he devoted the greater part of his time to his duties, and was obliged to get occasional assistance.

Newcastle-on-Tyne. — At a meeting of the Newcastle Town Council, on the 18th inst., the first business was the consideration of the proposed appointment of a chief engineer for the borough, at a salary of 1,000*l.* per year. The Council went into committee to consider the applications for the appointment, and the reporters withdrew. After being in committee for an hour and a half, the Council resumed, and the Mayor reported that in committee, upon the motion for the appointment of an engineer, an amendment was moved to defer the consideration of the matter for three months; and the amendment was adopted, there being 27 for it, and 23 against. On a show of hands the amendment was adopted by the Council.

York.—Mr. W. G. Penty has been appointed surveyor to the York Rural Sanitary Authority.

Swadlincote.—Mr. J. Salisbury has been appointed surveyor and inspector of nuisances to the Swadlincote Local Board and Urban Sanitary Authority.

Wallasey.—Mr. G. B. Mercer has been appointed assistant surveyor to the Wallasey Local Board and Urban Sanitary Authority, *vice* Ledder, deceased.

Halliwell.—Mr. G. Dickenson has been appointed surveyor and inspector of nuisances to the Halliwell Local Board and Urban Sanitary Authority.

Kingston.—At a meeting of the Kingston Town Council, on the 19th inst., it was resolved that the Council should, on the 9th of November next, proceed with the election of a successor to Mr. Dunscombe, resigned. It was suggested that the town clerk should, on behalf of the Council, write to Captain Macaulay to know whether he was inclined to accept the post, but Mr. Wilkinson said it would be more dignified to receive an application from him than to offer the appointment.

Rye.—At a meeting held at the town-hall, Rye, by the directors and shareholders of the Rye, East Sussex, and Kent Permanent Benefit Building and Investment Society, Mr. Thomas Marshall of Market-street, Rye, was unanimously elected surveyor to the society in the room of the late Mr. David Huggett, deceased.

A Hint to Parish Surveyors.—A correspondent of the *Times*, replying to a previous writer, who had experienced great inconvenience through the want of sign-posts and mile-stones, says:—"I have not the Highway Act before me, but I think 'W. B. L.' will find that every parish is compelled to have a sign-post erected at all cross-roads, the neglect of which incurs a penalty of 5*l.*, half of which goes to the informer."

VENTILATION AT THE INSTITUTE.

Sir,—In a week or two hence the Royal Institute of British Architects will have commenced another series of sessional meetings. May I ask if anything has been done during the recess to improve the ventilation of the Institute meeting-room? It may be said that the rooms in Conduit-street are no worse, in respect of want of ventilation, than those of other learned societies; but two blacks do not make a white, nor two wrongs a right. A session or two ago the theory of ventilation was much discussed by the members of the Institute, and it was remarked by more than one of the speakers that the practical application to the meeting-room of the Institute of a portion of the theoretical and practical knowledge possessed on the subject of ventilation by the members would be of great advantage. To see a body of scientific experts splitting hairs on theories of ventilation, while the air of the room they occupy is unbearably stuffy and gas-heated, reminds one of the homely proverb to the effect that the shoemaker's wife is always the worst-shod woman in the village. A committee is now engaged, I believe, in discussing the best means of promoting the continued well-being of the Institute, and I have heard it suggested that the committee should devise some means of securing a better attendance of members at the fortnightly meetings. The frequent paucity of members at the meetings is often put down to the dulness or uninteresting nature of the papers on the syllabus, but in my opinion the chief deterrent is the want of anything like adequate ventilation of the meeting-room. I should be glad to know that this subject has come under the cognisance of the committee mentioned, for I happen to be a fellow who is A Constant Attendant.

"TOUTING."

Sir,—Permit me in reply to "A Provincial Architect" to state my reasons for pursuing the course I adopted with reference to the Yarmouth Town-hall.

I have always consistently objected to public competitions, believing them to be useless to the public and ruinous to the profession, the expenses often exceeding the full value of the commission. National works may well be treated as exceptions. Architects can in such cases afford to spend time and money, perhaps in vain, because they derive real benefit from the stimulus which the desire to build such a work naturally excites. In all other cases there are many matters of detail which require intercourse between the architect and his client. Public competition forbids this.

It seems to me illogical for a professional man to let it be tacitly understood that he is at all times ready to furnish a design (competing against others) free of cost, and yet be ashamed to announce that he will do so in a particular instance if there be no competition.

We estimate our work too cheaply, and the public very naturally take advantage of the fact

according to their light. When competitions are limited, and all the competitors are paid for their designs, it will be right, no doubt, to call an offer to make a design free of expense "touting." Augustus Frere.

TENDERING AT RIPLEY (DERBY).

Sir,—In your issue of the 14th inst. you give a list of the tenders for the engine, boilers, &c. for this sanitary district waterworks; and although there are several good firms in the list lower than the accepted one, they are satisfied to give this accepted one 210*l.* more than the lowest, leaving the lowest six out in the cold. Is it not time that something was done by respectable firms for their protection from such parties, who clearly only put the clause of "the lowest tender not necessarily accepted" in their advertisement for other purposes than those for which respectable engineers use it, and who possibly let the work before the tenders come in?

One of the Lowest Six.

THE EMBANKMENT AND THE DROWNING.

Sir,—Mr. Charles Matthews, by his recent letter to the *Times*, adds to the number of suggestions which have from time to time been put forth in favour of festooning iron chains from the lions' heads on the masonry of the Thames Embankment,—this as a means of aid to drowning persons who may have fallen from its parapet. The frequent loss of life in such manner may well induce suggestions that preventive measures should be adopted. It requires, however, but little consideration to show that the device of suspending chains in the manner proposed would practically be of little or no avail in furthering the object in view, while the terrible disfigurement that would be inflicted on a noble work by the addition of long-drawn lengths of rusty chains hung in interminable loops would in appearance be offensive to the last degree.

Chains so depending in curves, from points 40 ft. or 50 ft. asunder, above or beneath the surface of a tidal water having many feet of rise and fall, could offer but widely separated points of holding available in the moment of peril to a person immersed. A swimmer could, of course, make for the spot where the chain entered the water, and might be grasped at his ease; but swimmers, under such circumstances, need hardly be pleaded for. A person unable to swim, and in instant danger of drowning, can be expected to use such means only of self-help as may be immediately at hand. To this important end, therefore, I beg to propose that the surface of the masonry within high and low water levels, should be channelled in horizontal lines some 2 in. deep, in a section devised to secure the best holding for the clutch, such as would be impulsively made by a drowning person. These channelled lines, which would be no eyesore, should be some 12 or 15 in. apart.

In such wise a person immersed would, at any point of the embankment, and at any level of the tide, find within a few inches of the surface of the water a means of safe holding till final help arrived.

The first consideration is the saving of human life; but we may well concern ourselves about saving the Embankment too. J. R. C.

THE PATHS NEAR BUCKINGHAM PALACE.

Sir,—It may be of some use to call attention to the continued objectionable condition of the park by Buckingham Palace. After many years of mud, the authorities have made a good asphalte path; but whom does it serve? and where does it lead to? Starting from the park gate, it makes a graceful curve a little out of the direct course to St. James's; but if you want to save time, you will find yourself making very little use of this highly-praised pavement, for it leads along by the palings, and you have a long way to cross through mud to the Palace. Still, passengers to St. James's are comparatively in comfort, but many others have to go from Buckingham-gate to Piccadilly, and it is positively a disgraceful journey: first some acres of bare earth in front of the Palace, so flat as to be always holding pools of water when raining; then a long stretch of wretched footpath, with the nasty soft bad sort of gravel, which is thought good enough for common people; and not a light all the way,—dirt and darkness, and danger after evening hours. Now, why should a Royal residence be so disgraced? Why should people suffer from such filthy slush? Some may say it is intended for a pleasure park only, and not for use in bad weather; but whatever it may have been formerly, this route now is a great thoroughfare, and ought to be therefore watched, lighted, and cleansed; whereas, in such weather as this it is abominably tantalising to see a well-kept path and gaslights near the great houses, where nobody walks, while the only path really much used is so muddy. What a pity to leave such a wide expanse before Buckingham Palace without a tree or shrub,—grass attempting to grow in the corners, but a perfect desert to look at, and giving an air of desolation and misery. When this area was planned and laid out, a large portion of green was done away with, and the whole appearance was brought to resemble a sort of parade yard, empty and dreary, possibly intended to be used for display on occasions, but the only use the military make of it is to march across it like other people, in mud or dust. H. C.

TRANSMISSION OF SOUND.

Sir,—We have had a partition fixed in a large room at our offices, for the purpose of forming a private room; but now find that a person speaking on one side of the partition can be heard by any one on the other side

The partition is formed of uprights 4 in. by 4 in., dovetailed into the head and cill (which are fitted tightly to ceiling and floor respectively), and covered with inch boarding, grooved and tongued; and this is covered with canvas and paper, varnished. The spaces between the boards are filled with sawdust, and the communication between the two rooms is closed by two doors; one an ordinary 1¼ in. four-panel door, and the other a 1¼ in. solid door, covered with green baize.

The walls are covered with paper varnished, and the private room has a large space of glass in the window openings, one being a large bay, reaching almost from floor to ceiling.

We should esteem it a favour if any of your readers would suggest anything to prevent the sound passing from one room to the other.

Thomas Robinson & Co.

ARCHITECTURAL ASSOCIATION.

PAPERS TO BE READ.

The following is the syllabus of papers, &c. to be read during the coming session, viz.:—

Nov. 10.—Address by the President, and Reports from the various Classes, &c.

Nov. 24.—"Binocular Perspective and Natural Drawing." By Mr. A. Frere.

Dec. 8.—"The Architectural Treatment of the Roof." By Mr. H. H. Statham.

Dec. 22. Discussion upon some proposed New Rules.

Jan. 12 (1877).—On "Architectural Illustrations." By Mr. Maurice B. Adams.

Jan. 26.—On "Modern Building in the City." By Mr. T. Chatfeild Clarke.

Feb. 9.—On "Half-timbered Houses and their Construction." By Mr. C. G. Maylard.

Feb. 23.—On "Early Churches in Asturias." By Mr. S. Flint Clarkson.

March 9.—On "The Causes which influenced the Arrangement of Mediæval Churches and Public Buildings." By Mr. H. W. Brewer.

March 23.—On "The Roman Baths." By Mr. R. Phené Spiers.

April 13.—Members' *Soirée*.

April 27.—On "Architecture as Contributing to Pictorial Art." By Mr. Thomas Wilhams.

May 11.—On "The Application of the Artisans' and Labourers' Dwellings Improvement Act, 1875, to some of the Courts and Alleys of the Metropolis." By Mr. Lewis H. Isaacs.

May 25.—"Notes upon Cornish Churches." By Mr. J. P. St. Aubyn.

June 8.—"The Study of Nature applied to Coloured Decoration." By Mr. J. D. Crace.

June 22.—On "Roman Amphitheatres." By Mr. W. Hilton Nash.

NEW PULPITS.

Derby.—A new pulpit, the gift of Mr. Abraham Woodiwiss and Mr. Benton, has been placed in All Saints' Church, Derby. The pulpit has been constructed by Messrs. J. & T. Hall, of St. Helen's, from a design by Mr. J. Young. The style is Classic, in harmony with that of the fabric. The pedestal is of Hopton stone, finely polished, and enriched by carving. The steps are of the same material, and the balustrades are of ornamental brass work. On the side of the steps there is a brass tablet bearing an inscription recording the names of the donors. The body of the pulpit is of oak, and of hexagonal shape with carving.

Dunmow.—A new pulpit has been placed in Dunmow Parish Church. It has been designed by Mr. Rogers, of Serle-street, London, and executed under the direction of Mr. Gibbons, of Dunmow. The pulpit, which is placed on the north side of the nave, at the foot of the chancel step, is of oak, and of octagonal form, standing on a base of Brunswick stone. It is open on two of its sides to a flight of four stone steps, by which it is entered from the south. Each of the six remaining sides is ornamented with a pointed arch, containing a cinquefoil of open work, the centre of which is formed alternately of a *fleur-de-lis* and a rose. At each corner stands an oaken buttress rising into a little spire of delicate carving. The desk and the two double candlesticks are of brass.

Fall of Houses.—Workmen were engaged on the 20th in shoring up some houses in Arundel-place, Coventry-street, part of which fell on the previous night, causing considerable excitement among the inhabitants of the neighbourhood.

ACCIDENTS.

On the 18th inst. the Shrewsbury Borough Coroner held an inquest on the body of William Dowley, a brickmaker, who was killed by the fall of some clay in a brickyard in Castle-foregate. It appeared that on the previous day deceased was getting some clay out of a hole. About noon the clay slipped, and deceased was buried alive. A verdict of accidental death was returned.

Dr. Thomas held an inquest on the 18th inst. at the Coroner's Court, South Wharf-road, Paddington, touching the death of Christopher Masters, aged 53, a house-painter, in the employ of Mr. Wm. Lethbridge, builder. It appeared that about five o'clock on the evening of the 16th inst., deceased had just completed a job of painting at 13, Blandford-square, and was going down the stone steps leading to the basement, when he pitched headforemost to the bottom. He was taken to St. Mary's Hospital, where he died in about six hours. The jury returned a verdict of accidental death.

On the 20th inst. the City Coroner held an inquiry at St. Bartholomew's Hospital into the cause of the death of James Morissey, aged 58, a mason, of George-street, Southwark. Whilst engaged with others at the top of No. 4, Middle-row, Goswell-road, on Wednesday, his foot slipped, and he fell into the street below, fracturing his skull. Death ensued a few minutes afterwards. A verdict of accidental death was returned.

A serious accident occurred on the 18th inst. at the works of the Corporation Viaduct, Bush Brow, Carlisle. Four men were digging the foundation for one of the abutments, the earth taken out of which is drawn up in tubs to the surface, and as one of these tubs was being drawn up by a crane, the "tackle" of the tub gave way, and the tub and its contents, about a ton in weight, fell with a crash to the bottom, striking one of the men, and injuring him so severely that little hopes were entertained of his recovery.

An unfortunate mishap has befallen the new church which is in course of erection at Bassenthwaite, Cumberland. The whole of the roofing timber had been put on between the western gable and the chancel arch, and during the heavy gale which prevailed on the night of the 18th inst. the whole of it was blown off and a portion of the ashlar work of the wall was also blown down. The damage done is estimated at about 200*l.*

On the 19th inst. a fall of earth occurred in the new tunnel in course of construction by Messrs. Firbank, the contractors, for the Great Northern Railway, at Copenhagen-fields, whereby William Shepherd, an excavator, was burried. He was speedily extricated and conveyed to the Royal Free Hospital, Gray's Inn-road, where he was found to be suffering from severe injuries.

Mr. Donaldson, Deputy-Coroner for Middlesex, held an inquiry at Bethnal Green, on the 19th inst., relative to the death of Mary Ann Foulson, aged 34, wife of a turner. It appeared from the evidence that the deceased had put her foot through a grating in passing by a baker's shop, and fallen in. The medical evidence showed that death arose from internal hæmorrhage, the result of the fall. A verdict of accidental death was returned, and the jury desired that the Vestry should be made acquainted with the state of the grating.

On the 20th inst. a serious accident occurred at some new buildings now in course of erection at the Tulse-hill Estate, Brixton. It seems that a number of workmen were engaged upon a high scaffolding, when one of them named Henry Clarke was seen to pitch headforemost from the scaffold, and in his descent his head struck against the lower supports. He was immediately removed to St Thomas's Hospital.

Proposed Supply of Sea-Water to Newcastle-on-Tyne.—Mr. J. Fulton, the borough engineer of Newcastle-on-Tyne, has reported to the sanitary committee of the Town Council in favour of the provision of a supply of sea-water to the town. He says:—"I feel quite satisfied that if we had pure sea-water instead of fresh-water for street-watering purposes, we could save at least half the labour and cartages, as well as the fresh-water at present used in such portions of the town as salt-water could be made available in." Mr. Fulton enters into details to show that the scheme is thoroughly feasible.

STYLE IN GLASGOW.

Sir, — You may perhaps be interested by a few items of architectural news from this northern Babylon. We have now as varied a medley of styles as your greater metropolis itself. We read much about the Queen Anne style, and its revival in London: at present the most popular here appears to be the Jacobean. I do not speak of the public buildings, which are in every possible style, from the Assyrian, as the new Music-hall, an enormous pile of masonry, to the German Gothic, as the new Stock Exchange; the Palladian, or Italian Composite, as the new Merchants' House; and the Scotch Renaissance, as the new Infirmary, another vast pile not yet completed. But the finest structures lately raised for the great commercial objects of buying and selling are in the same style in which most of the old palaces or noblemen's mansions, from the Savoy to Charing-cross, were built. You have now hardly any specimens of the Jacobean left in London, if it be true that Shaftesbury's house and the old episcopal residence in Aldersgate-street have been removed for railway clearances,—a shocking act of Vandalism if it has been perpetrated. Here we have had one or two very good examples, the best being a fine new range in Buchanan-street, of which the second floor will be occupied as a first-class shop or shops, and the upper part as stores and offices. It consists of four stories and an attic, with nine windows in each of the upper stories, surmounted by dormers and a central pavilion. The characteristics of the Jacobean, as I need not tell you, are pilasters prolonged up the whole elevation from the first or even the ground floor, with rich surface ornamentation. In the present case these appear as the anthropomorphic brackets which the Greeks called caryatides, for which name I believe the modern architectural vocabulary has no satisfactory substitute, the intercolumniate spaces above the windows in each story being carved in various patterns of diaper or foliation. The effect is rich and fantastic, without being so crude and pretentious as many of the modern antique frontages which are common in London. It reminds you at once of prints in which London streets, or houses of the seventeenth century, are represented. In spite of King James's Scotch birth, the style was never adopted in his native country, where the coeval buildings were in the style I have called Scotch Renaissance. It is that of Heriot's Hospital in Edinburgh, which is one of the finest collegiate buildings ever raised.

But what will there be left to do for the architects of the next generation? This is a puzzling question, but as I have no prophetical pretensions I shall not attempt to answer it.

Vitruvius Minor.

NEW CEMETERIES.

Mexborough —The Mexborough Burial Board have secured four acres of ground as a site for a new cemetery. The buildings in course of erection comprise an Episcopal Chapel and a Dissenters' Chapel, each 40 ft. by 20 ft., lodge-keeper's house, board-room, &c., all built of stone. The contract has been let to Mr. John Pressley, for 2,300*l*. The land has cost 400*l*. Messrs. Tacon & Rawson are the architects.

Portobello.—For some years past the necessity for the laying out of a new cemetery in the neighbourhood of Portobello has been very urgent, and the recent closing of part of the parish burying-ground at Duddingston rendered the step imperative. Numerous sites were reported upon, but the ground proved unsuitable for the purposes intended, and other objections were made by the proprietors of property. After several months' negotiations, the Town Council, as a cemetery board, have effected an arrangement with the Benhar Company, by which they will obtain a piece of ground, about four acres in extent, in a field in Easter Duddingston, a short distance from the Glen Nurseries, and facing the Musselburgh-road.

Stourbridge.—The members of the Stourbridge Burial Board have found themselves in the same position which the Kidderminster Burial Board were placed in some time ago. They accepted plans from the late Mr. Thomas Smith, of Stourbridge, to erect two chapels and one lodge, and to lay out the cemetery for a moderate sum; but when the tenders from the builders were received they were found to exceed in amount nearly 40 per cent. the sum estimated by the architect. At the last meeting of the Board, after considerable discussion, it was resolved to discard entirely the plans submitted by Mr. Thomas Smith, and asked Mr. Smalman Smith to prepare plans for the cemetery not to exceed 2,500*l*.

Kidderminster.—The new cemetery for the Kidderminster Burial Board is approaching completion. The architect is Mr. Meredith, and the contractor for the erection of the chapels, lodge, &c., is Mr. Smith, of Wolverley. Mr. John Mee, of Stourport, is the contractor for laying out the grounds, and Mr. G. Law is executing the drainage work. The total cost will be about 9,000*l*.

Weybridge.—The new cemetery at Weybridge is about three acres in extent, the site having cost 1,800*l*. The chapels are of equal size, 25 ft. by 16 ft., and in the Gothic style, the material being stock bricks, with Bath stone dressings, and red and black bands of brickwork. The work has been executed under the supervision of the architect, Mr. T. Wonnacott, of Farnham, by Mr. William Patrick, of Guildford, in conjunction with Mr. Woods, of Weybridge. The entire cost of the work being about 1,600*l*.

Compton Chamberlayne.—A new cemetery has been consecrated at Compton Chamberlayne, Wilts. The cemetery chapel has been built from the designs of Mr. James Soppitt, architect, Shaftesbury.

Reddish.—A company has been formed for the conversion of the Willow Grove Estate, Reddish, Cheshire, into a cemetery. The estate comprises over thirty-four acres, thirteen of which will at once be laid out as a burial-ground for all denominations.

THE PROPOSED ASSIZE COURTS, NEWCASTLE-ON-TYNE.

At the Northumberland Michaelmas Quarter Sessions, on the 18th inst., the Chairman (Mr. M. W. Ridley, M.P.) read the report of the Moot Hall Committee, as follows:—

"Your committee beg to report that, following on the acceptance by the Bench at the last Easter Sessions of the proposals made by the Town Council of Newcastle for the erection by them of the new Assize Courts and County Offices, towards the cost of which the county was, as its contribution, to convey to the town the Moot Hall, and to pay a sum of 15,000*l*., the committee of the Council obtained a series of plans by Sir Gilbert Scott, which, so far as your committee had an opportunity of examining them, seemed calculated to provide ample accommodation for the official transaction of the Assize business of both town and county, as well as to provide the requisite county offices; but that the Council, at a meeting held on the 4th of October instant, by a majority of 32 to 9, refused to accept the report of their committee in favour of the adoption of these plans. The Town Clerk of Newcastle has formally communicated to the Clerk of the Peace the fact of this refusal, and your committee therefore assume that the Town Council now wish their proposals to be regarded as withdrawn, leaving to your committee no option but simply to report the circumstances to the Bench."

The Chairman said they stood now exactly as they did before. He had received a letter from Mr. Young, the chairman of the Assize Committee of Newcastle, to their committee, but there was nothing in it which he felt he could lay before the Bench. He (Mr. Young) was very anxious that they should consider that matter as not closed, but he had only spoken in his private capacity. It seemed perfectly clear that the Council had, by a majority, refused to entertain the proposal of Sir Gilbert Scott. Having altogether refused to go on with the project, the committee had nothing more to do with it, and the question now was, whether the committee should have orders to proceed immediately with Mr. Crozier's plans for the Moot Hall. He could state, from letters received, that one of the most sanguine supporters of the scheme at Newcastle was of opinion that the only hope of securing those Assize Courts would be in their contribution being much larger. The county, however, would not entertain any proposal of the kind.

Mr. Bates said the Newcastle Council had not resolved not to build new courts, but had simply rejected the recommendation of the committee to carry out Sir Gilbert Scott's plans.

Earl Grey said, according to the plans that were proposed, the alteration to the Moot-hall would cost 10,000*l*. What the county had now offered to the Town Council was to contribute 15,000*l*. for the establishment of proper courts for the town and county. He quite agreed with Mr. Ridley that it was not necessary for the county to enter into a very large expense in the matter. It was a great many years since he had been at the Moot Hall, but he was quite persuaded, knowing the situation, that it would never make satisfactory courts. It never would be, after all the expenditure, a proper place to hold Assizes. Thus it seemed to him that before they expended so large a sum of money as 10,000*l*. on a plan which must be so imperfect, some further efforts should be made to come to an understanding with the town.

A short conversation having ensued, the following resolution was unanimously agreed to:—

"That it is further referred to the Moot Hall committee to ascertain whether the Town Council entirely withdraw from the proposals submitted by them to, and accepted by this Court, and to report on any alternative plan or arrangement which the committee may think calculated to improve the accommodation now available for the transaction of Assize business, with due regard to economy."

NEW MARKETS.

Leeds.—On the 4th inst. a new market, which has been erected by the Corporation on a site in Kirkgate, was opened at Leeds by Alderman Croft, the Mayor. Mr. Morant, the borough engineer, furnished the designs. The cost will be about 40 000*l*.

Monmouth.—A new cattle-market has been opened at Monmouth. It is situate near Monnow Bridge. After the Council had discussed the question for many years, it was agreed in 1874 to buy the site for 750*l*. In addition to this sum the works have cost 3,500*l*., making the whole about 4,250*l*. The architect was Mr. Curley, of Hereford, and the contractor was Mr. Jones, of Gloucester. The area of the market is about 1¼ acre; the cattle-shed is 220 ft. long, 13 ft. high, and 24 ft. wide, having accommodation for 64 beasts to be under cover. There are 148 large sheep-pens, and 29 pig-pens, eight of which are under cover. There are also three large open cattle spaces, a horse-ring, and an implement shed, 98 ft. long and 22 ft. wide.

Dundee.—At a meeting of the Dundee Police Commission, on the 12th inst., the markets committee brought up a report, submitting the following proposed inscription to be placed over the inside of the slaughterhouse-gateway:—"Public Markets and Slaughter-houses opened 1876. William Robertson, Provost; William Brownlee, Convener of Markets' Committee; William Mackison, architect." Mr. Ballingall thought no such inscription should be put on the gateway. Mr. Haggart was of Mr. Ballingall's opinion. If they were to put anything on the gateway it should be a pair of scales, with the motto,—"A false weight is an abomination." The provost moved that no names be put up, and that it be remitted back to the committee, with power to prepare a suitable inscription. This was agreed to.

BRICKLAYERS *versus* PLASTERERS.

Sir,—Being a member of a family well known in the terra-cotta line, and holding medals and honourable mention of the various exhibitions, will you kindly allow me to say a few words in its defence? Now, Sir, plasterers and modellers model the work; they piece, mould, and press, and after it comes out of the moulds they touch up and prepare it for the kiln. It is well known that the greatest defect is the warping or twisting in the burning. Now, who is better able to remedy this defect in the fixing than the *art workman?* As for Mr. Coulson's theory,—that, as it is built in the brickwork, the bricklayers ought to have the fixing of it,—on the same argument they might claim to fix the stone-dressings on a brick front, and thus usurp three trades. In conclusion, I beg to state that there are men in London who have been brought up in the country to the bricklaying and plastering, but when they come to London they honourably stick to one or the other.

William Pulham, Plasterer, &c.

Books Received.

Modern Domestic Building Construction: Illustrated by the Complete Drawings of a Villa Residence. By George Robson, architect. Batsford, 52, High Holborn. 1876.

By means of fifty-five sheets of drawings, large folio size, plans, sections, elevations, and working details, Mr. George Robson illustrates from top to bottom an ordinary villa residence in the vernacular style, thus giving the careful student a more perfect and comprehensive idea of the relations and bearings of the various matters entering into construction than he could obtain from studying any number of disconnected details. The object of the author has been to present, in a clear manner, some of the best methods followed by architects of the present day in the construction of ordinary domestic buildings. He says in his preface:—"The design adopted as the basis of the work was not chosen because of its merits as a design,—the experienced Architect could doubtless suggest modifications which would be improvements in this respect,—but as a means of

bringing together such a number of illustrative examples of building detail as would render the work interesting and, in some measure, of a representative character. Much of the matter is presented in a more elaborate and complete manner than has hitherto been attempted. There has been no striving after mere novelty for the sake of effect; on the contrary, the aim throughout has been the presentment only of what experience has proved to be the best and most practical in actual execution; and it is, therefore, confidently believed that the student will not rise from the study of domestic building construction, as here illustrated, without having acquired a clearer perception and a firmer grasp of the whole subject." A full specification of the works and materials to be employed is given in addition to the plates, and a supplement contains sensible advice as to drains, fire-proof floors, iron girders, and wood and iron roofs. The idea is a good one, and it has been very ably carried out; the drawings are very clear and accurate, and numerous varieties of doors, windows, and other fittings of the ordinary dwelling-house character are given so as to make the details as comprehensive as possible within the scope of the book. It will make a good prize for successful students at our art-schools in the class of Building Construction.

The Present State of Linguistic Science and *The Depreciation of Silver*. By J. A. Picton, F.S.A., &c.

Of these two pamphlets, the first is an address delivered at the opening meeting of the sixty-sixth session of the Liverpool Literary and Philosophical Society, and printed for private circulation only; the other is a paper prepared for reading at the recent Social Science Congress, but, owing to circumstances, omitted, and which its author has now published separately. (Walmsley, Liverpool.) The subjects of the pamphlets are not directly related to architecture, but the author, as most of our readers are aware, is an old and successful member of the architectural profession, who has now retired upon his laurels, but is not therefore allowing his brain to be idle. That an architect who has gained a success in life from very small beginnings, and by sheer energy and diligence in his calling, should have also made time to keep himself *au fait* at subjects like these, requiring in themselves no little thought and study even for an average appreciation of them, is a wholesome example of what may be done by untiring application. On the precise value of the two pamphlets in relation to the sciences they deal with it may be left to specialists in their respective subjects to pronounce; that an architect in busy practice should have gone so far into such alien subjects as these essays show him to have gone, evinces on the part of their author a breadth of interest and an activity of mind in regard to subjects beyond the area of the drawing-board, which is certainly not so common in the profession as we could wish it to be. We may observe that the general tendency of Mr. Picton's view in regard to the at present serious subject,—the depreciation of silver,—is that the difficulty is only temporary, and is merely to be considered as an ordinary operation of the laws of supply and demand, from which gold and silver cannot be regarded as exempt, and which it would be futile to attempt to remedy by any forced expedient of legislation.

Printing on Wood.—Mr. Maurice Young, of the Milford Nurseries, near Godalming, is endeavouring to carry out a process, patented by Mr. Whitburn, which might be made useful in decoration. We mentioned it long ago, but the operation may be thus described:—A given design is in the first instance drawn, and afterwards engraved on a wood block, from which an electrotype is taken, this is then inked with a printing-roller, and printed with an ordinary hand-press in the usual way, with the difference that the slab of wood to be printed on is laid on the platen first, and the electrotype block on the top, face downwards; this block, too, must be laid on the place required, by hand, for the purpose of procuring a correct register. The ink used somewhat differs from the ordinary printing-ink, which would fail to give that sharp, clear outline which the process secures. The result of the printing is as sharp as though it were printed on paper, and is for the most part executed in dark brown or black inks. Artistic results may thus be produced, under proper guidance, at a trifling cost.

Miscellanea.

Tempered Glass.—Tempered or toughened glass does not appear to be the success which its inventor and the public at large would desire. A singular instance of the behaviour of the material is given by Mrs. Nassau Senior, who writes to say that on the 11th of last month she furnished twelve gas-burners with tempered glass globes purchased in London, and having the veritable label of M. de la Bastie affixed to each. Two of these globes were fitted on burners in her bedroom, and on the night of the 6th inst., after the gas had been extinguished for exactly an hour, one of the globes burst with a report, and fell in pieces on the floor, leaving the bottom ring still on the burner. These pieces, which were, of course, found to be perfectly cold, were some two or three inches long, and an inch or so wide. Curiously enough, they continued for an hour or more splitting up and subdividing themselves into smaller and still smaller fragments, each split being accompanied by a slight report, until at length there was not a fragment larger than a hazel-nut, and the greater part of the glass was in pieces of about the size of a pea, and of a crystalline form. In the morning it was found that the rim had fallen from the burner to the floor in atoms. These facts would seem to indicate that the tempering process affects glass in a most peculiar manner. It would appear desirable that an exhaustive physical investigation should be made in respect of the material. "J. J." writes,—"My experience of tempered glass is much the same as Mrs. Nassau Senior's. I purchased six tumblers made by a London manufacturer. Five of them are perfect, and are as clear and as well made as any glasses can be; but the sixth crumbled to pieces like small diamonds. At the time it broke there was only cold water in it."

Mr. Ruskin and his Sheffield Museum.—Mr. Ruskin, in the October number of *Fors Clavigera*, writes:—I am sending, in gifts to the men at Sheffield, wealth of various kinds, in small instalments, but in secure forms. Five bits of opal; the market value of one, just paid to Mr. Wright, of Great Russell-street, 3*l.*; a beryl, of unusual shape, ditto, 2*l.*; a group of emeralds, from the mine of Holy Faith of Bogota, and two pieces of moss gold—market value, 2*l.* 10*s.*—just paid to Mr. Tennant. Also, the first volume of the Sheffield Library; an English Bible of the thirteenth century—market value 50*l.*—just paid to Mr. Ellis. I tell these prices only to secure the men's attention, because I am not sure what acceptant capacity they have for them. When once they recognise the things themselves to be wealth—when they can see the opals, know the wonderfulness of the beryl, enjoy the loveliness of the golden fibres, read the illuminations of the Bible page—they will not ask what the cost, nor consider what they can get for them. I do not believe they will think even of lending their Bible out on usury. I am a little ashamed of my accounts this time, having bought a missal worth 320*l.* for myself, and only given one worth 50*l.* to Sheffield. I might state several reasons, more or less excusing this selfishness; one being that the 50*l.* Bible is entirely perfect in every leaf, but mine wants the first leaf of Genesis, and is not, therefore, with all its beauty, fit for the first volume of the library. As to the price I ask for my books, and my continuing to take rent for my house property, and interest from the bank, I must request my readers still for a time to withhold their judgment.

Deconsecration of a City Church.—What is called a "deconsecration" service was held in Allhallows Church, Bread-street, last week, by order of the Bishop of London, preliminary to the removal of the edifice. This church is one of a large number in the City which were rebuilt, after the Fire of London, by Sir Christopher Wren, and its history is noteworthy from the fact that its rector, in 1555, the Rev. Lawrence Saunders, was burned at Coventry for preaching in defence of the doctrine of the Reformation, and that Milton was baptised here in December, 1608. Whilst the bishop was ascending the pulpit an elderly person in the aisle, near the door, called out in a loud tone, "I protest against this service in God's name," but had scarcely finished the sentence ere one of the guardians of the peace appeared on the scene, and promptly escorted him to the street. Gradually every evidence that London has a history will be removed: London and Chicago will be on a level.

Modern Grotesques at Chester Cathedral. The *North Wales Chronicle* says:—"Whoever visits Chester Cathedral should not fail to examine carefully the caricatures of the Earl of Beaconsfield, Mr. Gladstone, and Dr. Kenealy, carved in stone, outside the Cathedral, on the east side of the south transept, formerly the Church of St. Oswald. The heads are corbels to the vacant recesses. Mr. Gladstone holds a quill-pen between his lips, and has a crowbar put under the foundation of the church, the marks of cracking and of giving way being very visible; the Pope's crown is in the act of toppling down from the roof of the church and crushing a monk's hat, who is represented as in his devotions outside the church. It is scarcely necessary to add that Mr. Gladstone is here represented as the great antagonist of the Church of Rome, as evinced in his pamphlets on Vatican Decrees, &c. Dr. Kenealy is represented as endeavouring to take down the crown, which Earl Beaconsfield protects and holds up with a sword. In this curious piece of work we have a return to the Mediæval custom of caricature carvings on the outside of church fabrics, after a modern fashion. What can be the object of it we know not, except it be to mark the times in which the Cathedral was restored."

Wooden Buildings at Aldershott.—The Royal Aldershott Skating-Rink was totally destroyed by fire, within the space of a couple of hours, on the night of the 14th inst. The building was of wood. The asphalte floor, which (as stated in the *Builder* for March 4th last) was laid by the Brunswick Rock Asphalt Paving Company, is stated to have stood the test well, and although the surface was destroyed, the foundation remained. The rink was 170 ft. in length and 54 ft. in breadth. Only a few days before its destruction the proprietor attended a meeting of the Local Board in reference to the proceedings they were about taking to have it made permanent or pulled down. *Apropos* of this fire, a correspondent of *Sheldrake's Aldershott Gazette* says:—

"We have, at the present moment, several wooden buildings in course of erection, either of which, should it take fire, would endanger the whole of the High-street. . . . Some few years ago, 'The Royal' withdrew its insurances from the place on account of the extreme risk through wooden buildings. I have reason to believe that another withdrawal of insurances is contemplated, and should it come to the notice of one great London society, Aldershott will find itself without the means of obtaining compensation for any loss by fire at all. When Aldershott was young, wooden buildings were tolerated, and, indeed, within the law, but Aldershott is now twenty years old, and a Board of Health is established, whose province it is, or should be, to prevent the erection of buildings dangerous to health or public safety."

Leeds School of Art.—The drawings by students in the above-named institution have been on view during the present week, in the picture-gallery of the Leeds Mechanics' Institution. The original designs are numerous. The successes of the year include an art-mistress's certificate, gained by Miss S. Blackurn. B. P. Shires has been awarded a bronze medal from the national competition for a set of delineations of the Church of St. John the Baptist, Adel, Yorkshire. Shires also obtained the architectural Association of Ireland's prize for measured drawings, last November, for the same; and W. T. Kingston contributes a series of designs for wall-papers, natural forms, linoleum. He also shows two designs for fans. One of the fans has obtained a bronze medal. Walter Hobson exhibits a design for a school of art and science, for which he is awarded a National book prize in the same competition.

Religion and Hygiene.—An old adage already proclaims the near approximation of cleanliness to godliness; but, according to the *London Medical Record*, it is left to a French doctor, M. Dubert, to suggest the same union between hygiene and holiness. In a paper read by him at a recent scientific congress, "On the Mortality of Young Children," he attributes this deplorable result in great measure to the ignorance of the mothers, who feed their infants in an improper manner. To remedy this fatal ignorance, M. Dubert makes the suggestion that a short appendix containing elementary precepts on feeding and rearing infants should be printed at the end of prayer-books, missals, and religious books generally.

Presentation to Mr. Morris Jones.—With reference to a paragraph on this subject in our last, we have to mention that it is the bronze group (4 ft. 4 in. high on a pedestal 4 ft. high) which Mr. Jones has placed in the Welshpool Museum, not the shield.

St. James's, Westminster.—Dr. Edmunds, the medical officer to the parish of St. James, Westminster, in his annual report stated that the parish covered an area of 164 statute acres. The density of the population, taking as a basis the enumeration of 1871, was 205 persons per acre. The sub-districts varied very much in that respect, that of St. James's-square having only 123 persons per acre, and Berwick-street no less than 411. Since 1841 the population of St. James's has been continuously decreasing, and numbered about 4,000 less than it did thirty years ago. That exceptional condition followed from the fact that the parish had long since been built over, and for years had become the centre for clubs, hotels, and shops. The result had been an enormous rise in the value of houses, and a gradual extrusion of the less wealthy and important residents.

An Acquisition for South Kensington.—The *Staffordshire Advertiser* sarcastically observes that it is rumoured that Mr. George Wallis, of the South Kensington Museum, who visited the Potteries last week, has opened negotiations with the directors of the North Staffordshire Railway for the purchase of Etruria Railway Station. Should the purchase take place, the waiting-rooms and offices are to be removed to South Kensington and placed among the pre-historic antiquities. Our contemporary gives the rumour "under reserve," and hopes the directors will not allow themselves to be tempted by the handsome offer which the Government would be likely to make for specimens so unique, for the district would be inconsolable at the loss.

Rhyl Town-hall.—The town-hall which the Rhyl Commissioners have built in that town, in place of the wretched structure which did duty for many years, has been formally opened by the lord-lieutenant of the county of Flintshire. The foundation-stone of the building was laid in December, 1874. Mr. John Turner, of Barrow-in-Furness, is the architect; and the builder is Mr. J. Rhydwen Jones, of Rhyl. The building is in the Gothic style. Above the Wellington-road entrance is a tower, which when completed will, with the spire, be 160 ft. high. The estimated cost of the hall was 4,750*l.*, but owing to the introduction of improvements upon the original plan, the actual cost will be about 6,000*l.* A view and description of the building will be found in our volume for 1874, p. 1072.

The Thames Valley Drainage.—The summonses taken out by the Thames Conservancy against the Kingston Corporation and the Surbiton Improvement Commissioners came on for hearing on the 19th inst. before the county magistrates at Kingston. Substantial penalties were asked to be imposed on both bodies for having failed to comply with the notices requiring them to withdraw the sewage from the River Thames. It was urged that Kingston and Surbiton were making *bonâ fide* attempts to deal with the matter, and the summonses were adjourned for six months to give the corporation and the commissioners time to prepare schemes that would satisfy the bench.

The Late Mr. George Smith.—We are glad to learn that a letter has been addressed by the Prime Minister to Mrs. George Smith, announcing her Majesty's intention to bestow upon her a life pension of 150*l.* per annum. Assyriologists will hear with satisfaction (says a contemporary) that the most competent man to fill the late Mr. George Smith's place has been appointed to carry on those researches in the East with which Mr. Smith's name is now imperishably connected. M. Hormuzd Kassam is a native of Mosul, and, trained by Layard, has served a good apprenticeship in the very best school as a scientific traveller and explorer.

Presentations.—The painters and decorators of the well-known firm of Messrs. George Smith & Co. Pimlico, have presented to their late foreman, Mr. Robert Clarke, an artistic silver goblet, the design of Messrs. Hunt & Roskell.——On the 19th Mr. E. Moore, having left the service of Mr. J. T. Chappell to act as a clerk o. works at the new Law Courts, his late fellow-workmen gave him a testimonial of their esteem in the shape of a timepiece.

Sale of a Large Estate.—The Dinas Mawddwy estate, Merionethshire, the property of Sir Edmund Buckley, has been sold. The property consisted of 4,433 acres of land, 10,400 acres sheep-walks, with manorial rights over 32,000 acres. The net annual rental was 4,561*l.* The sum realised was 48,000*l.*

Rouen Cathedral.—The cast-iron spire of the cathedral at Rouen has just been completed. The *Semaine Religieuse* of that diocese publishes particulars relative to the comparative heights of the principal monuments of the globe, as contrasted with this new work, and claims that the spire of Rouen, with its 150 mètres, is the most elevated monument in the world. The old one, commenced in 1544, on the plans of Robert Becquet, destroyed by the fire of the 15th September, 1822, had a height of 132 mètres; it was, therefore, 18 mètres less than the present spire.

Graphic Society.—The annual meeting of the Graphic Society for the election of memb was held in the library of University College on the 11th inst., Professor Donaldson in the chair. Mr. Frederick Leighton, R.A., was unanimously elected to succeed Sir Digby Wyatt as president; Mr. Edwin Long, A.R.A., to fill vacancy as a painter; and Mr. J. Acton Adams, as a sculptor. There were three vacancies among the architects, and seven candidates, Messrs. Ernest George, E. I'Anson, and Aston Webb being elected.

Royal Naval Reserve Buildings, Wick.—A new battery and other buildings for the Royal Naval Reserve have just been erected at Wick. The works have been carried out under the direction of Mr. James Webster, of London, as clerk of works for the Government authorities, Mr. Daniel Miller, of Pulteneytown, having executed the masonry, and the works therewith connected generally completed by Mr. Jonathan Marshall, Admiralty contractor, of Plymouth.

Bradford School Board.—At a meeting of this Board on the 18th inst., it was referred to the Works Committee to consider and report as to the expediency of appointing an architect to the Board. The practice of the London, Birmingham, and Sheffield boards was cited to show that increased efficiency, coupled with greater economy, would result from the appointment of an architect who should give his sole attention to the work of the Board.

Wesleyan Chapel Building.—It is stated that the fund for the extension of Methodism in Great Britain has reached over 33,000*l.*, but the distribution of grants for new chapels will not commence until 40,000*l.* have been raised. The promoters of this fund hope to be soon erecting a thousand chapels at once; at least, they say so, though as a chapel can scarcely cost less on an average than 1,000*l.*, that means a fund of a million sterling, towards which as yet only about 3 per cent. have been raised.

New School Asylum for Imbecile Children.—Dr. Brewer, in presence of a numerous company, laid the foundation-stone of the new school for 500 children about to be erected at Darenth, near Dartford, in Kent, by the Metropolitan Asylums Board. The contractors are Messrs. Perry & Co., of Bow, at 69,000*l.* The architects are Messrs. A. & C. Harston, London.

The Strand to be Paved with Wood.—At a meeting of the Vestry of St. Martin's-in-the-Fields, on the 19th inst., it was resolved that the Strand be paved with wooden pavement on the terms suggested in the memorial of the inhabitants of the locality, they paying the cost over granite. A strong protest against the step has been circulated.

Dean of Guild Courts, Edinburgh and Glasgow.—At a meeting of the Council of the Edinburgh Guildry, a few days since, it was resolved to recommend the election of Mr. John Smith, builder, South Clerk-street, as Dean of Guild for the ensuing year.——Sir James Watson has been unanimously appointed the successor of Mr. James King, of Levernholm, in the office of Lord Dean of Guild of Glasgow.

Indian Public Works.—The *Morning Post* understands that the scheme drawn up by Sir Andrew Clarke, Minister of Public Works in India, for the re-organisation of the Public Works Department, has been submitted to the Government, so that the changes and reductions therein contemplated may be introduced and effected before December next.

New Rectory House, Cold Higham.—The new rectory-house at Cold Higham, now nearly completed, stands on an elevated position, just off the old Roman Watling-street, about three miles from Towcester. It is being built by Messrs. White & Robinson, of Denton, from the designs and under the superintendence of Mr. S. J. Newman, architect, Northampton.

Theatre Royal, Dundee.—This theatre has been re-opened on the completion of works which have included the re-arrangement and decoration of the whole of the interior. The auditorium will now hold 1,400 persons.

TENDERS

For the erection of Catholic schools, Upper St. James's-street, Brighton. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Goddard & Sons	£2,007	0	0
Cheesman & Co.	1,927	0	0
Bruton	1,926	0	0
Stamp & Bowtle	1,895	0	0
Colwell	1,835	0	0
Bayes, Brothers, & Allen	1,830	0	0
Longley	1,750	0	0
Wells (accepted)	1,641	0	0

For erection of villa residence at Bournemouth, for Mr. Harrison Spencer. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard.:—

Bayes, Brothers, & Allen	£3,345	0	0
Hammerton, Brothers, & Vine	3,135	0	0
Brett	3,065	0	0
Hoare, Brothers, & Warden	2,998	0	0
Dashwood (accepted)	2,977	0	0
Stroud	2,957	0	0
George	2,950	0	0

For additions and alterations to homestead and house, Warden, Beds, for Mr. Joseph Shuttleworth. Mr. John Usher, architect:—

Edey & Whidman	£1,995	0	0
Litchfield	1,740	0	0
Foster (accepted)	1,702	0	0

For waste weir on the River Ivel, Sandy, Beds, for the Commissioners. Mr. John Usher, surveyor:—

Haynes	£428	10	0
Corby & Son	380	4	0
Dickens (accepted)	369	0	0

For schools and teacher's residence, for the Skenfrith (U.D.) School Board, Garway, Herefordshire. Mr. E. H. Lingen-Barker, architect:—

Robbins & Sons	£2,003	0	0
Foster, Brothers	1,493	0	8
Welsh	1,388	0	0
Jones & Co.	1,252	0	0
Ford	1,239	11	0
Rosser	1,229	19	9

For schools and teacher's residence, for the Skenfrith (U.D.) School Board, Grosmont, Monmouthshire. Mr. E. H. Lingen-Barker, architect:—

Robbins & Sons	£1,993	0	0
Foster, Brothers	1,702	0	0
Welsh	1,450	0	0
Ford	1,283	0	0
Giles	1,280	0	0
Jones & Co.	1,267	0	0
Rosser	1,264	16	11

For schools and teacher's residence, for the Skenfrith (U.D.) School Board, New Inn, Monmouthshire. Mr. E. H. Lingen-Barker, architect:—

Robbins & Sons	£1,599	0	0
Foster, Brothers	1,461	0	0
Welsh	1,281	0	0
Jones & Co.	1,164	0	0
Powell	1,004	0	0
Price	1,000	0	0

For road-making at Anerley, for the British Land Company, Limited:—

Carter	£2,074	0	0
Keeble	1,614	0	0
Harris	1,250	0	0
Richardson	1,250	0	0
Jackson	1,222	0	0
Bloomfield	1,125	0	0
Pizzey	999	15	0
Love (accepted)	920	0	0

For alterations to the "Duke of York," Downham-road, Kingsland-road, for Mr. Thomas Wood. Mr. J. G. Needham, architect:—

Lancaster	£624	0	0
Judd & Hawkings	569	0	0
Salt	497	0	0
Marr (accepted)	475	0	0

For six cottages at Banstead, for Sir J. W. C. Hartopp, bart. Mr. William Smith, architect:—

Keal (accepted)	£1,380	0	0

For the erection of St. Lawrence's Church, Northampton. Mr. Alfred W. N. Burder, and Mr. Arthur Baker, architects. Quantities by Mr. J. S. Alder:—

Dove, Brothers	£7,700	0	0
Roberts	7,220	0	0
J. Ireson	7,105	0	0
Thompson	6,722	0	0
D. Ireson	6,474	10	0
Dunkley	6,412	0	0
Cosford	5,973	16	0
Watkin (accepted)	5,803	0	0

For house and stables on New Cadogan Estate, Hans-place, Sloane-street, for Major Arbuthnot. Mr. D. Campbell, architect:—

Browne & Robinson	£15,031	0	0
Ward	15,030	0	0
Ashby	14,851	0	0
Turrell	14,813	0	0
Crowder	14,668	0	0
McLachlan	14,379	0	0
Adamson	13,880	0	0

For rebuilding the "Queen's Head," Gosset-street, Bethnal-green, for Mr. John Higgins. Mr. Edward Brown, architect. Quantities supplied:—

Whiter & Young	£2,323	0	0
Salt	1,720	0	0
Marr	1,620	0	0
Stamp & Bowtle (accepted)	1,497	0	0

For alterations at the "Cat and Mutton," Londonfields, Hackney, for Mr. E. Mills. Mr. Edward Brown, architect:—

Salt	£249	0	0
Chillingsworth	238	10	0
Christofler	195	0	0
Stamp & Bowtle (accepted)	178	0	0

For the erection of a vicarage-house for the parish of Twyford, Berks. Messrs. Morris & Stallwood, architects:—

Sheppard	£2,235	0	0
Higgs	2,276	0	0
Reavell	2,025	0	0
Dodd	1,995	0	0
Sharpington & Cole	1,921	0	0
Silver	1,891	0	0
Lawrence (accepted)	1,875	0	0

For new schools and residence at Chalgrove, Oxon, for the Chalgrove School Board. Messrs. Morris & Stallwood, architects:—

Reavell	£1,550	0	0
King	1,520	0	0
Selby	1,505	0	0
Simmonds	1,425	0	0
Walter	1,325	0	0
King & Brown	1,268	0	0
Howland & Wells	1,208	0	0

For mission-hall, Saint Ann's, Stamford-hill. Mr. William Reddall, architect:—

	Mission Hall.			Addition for One-pair Story.		
Humphries	£1,685	0	0	£160	0	0
Browne & Robinson	1,397	0	0	142	0	0
Perry & Co.	1,380	0	0	145	0	0
Conder	1,377	0	0	135	0	0
Patman	1,368	0	0	132	0	0
Pritchard	1,324	0	0	135	0	0
Cook	1,296	0	0	161	0	0
Chapman	1,130	5	6	114	3	6

For general alterations and new cabinet fittings at the "Rutland Arms," Pearson-street, Kingsland-road, for Mr. S. Walker. Messrs. Williams & Sons, architects:—

Marr	£4	0	0
Anley	372	0	0
Eaton	369	0	0

For new cabinet and fittings at the "Rose and Crown," Stoke Newington, for Mr. Mills. Messrs. Williams & Son, architects:—

Eaton (accepted).

For the erection of schools and boarding-house, Borden, Sittingbourne, Kent, for the Governors of Borden School Trust. Messrs Hay & Oliver, architects. Quantities supplied by Mr. G. R. Tasker:—

Watkinson	£8,460	0	0
Naylar	8,153	0	0
Bottrell	8,011	0	0
Cornelius	7,539	0	0
Colover	7,500	0	0
Adcock	7,421	0	0
Avard	7,365	0	0

For the erection of new schools and teacher's residence, Boxmoor, Herts, for the School Board. Mr. J. Ladds, architect.:—

				Less Old Materials.		
Noble & Co.	£2,717	0	0	£60	0	0
Monk	2,410	0	0	20	0	0
Dover & Co.	2,337	0	0	100	0	0
Pattison	2,309	0	0	None.		
Sears	2,271	0	0	35	0	0
Larder	2,270	0	0	35	0	0
Allaway	2,250	0	0	35	0	0
Cole	2,220	0	0	40	0	0
King & Brown	2,197	0	0	None.		
Chalk	2,140	0	0	29	0	0
Snell	2,100	0	0	50	0	0
Frobble	2,093	0	0	55	0	0
Andrews & Sons	2,079	0	0	11	0	0
Twelvetrees	2,010	0	0	None.		
Spencer	1,968	0	0	None.		
Harris (accepted)	1,700	0	0	35	0	0

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The Liverpool Address on Health.

ANY address by Mr. Hawksley must be interesting, and that was so which he delivered as president of the Health Section of the Social Science Congress in Liverpool. It is probable that it will have disappointed the expectations of many persons, but by many others the tone of it must have been foretold. It might have been safely predicted that Mr. Hawksley would say something about Government interference in sanitary affairs, but not, perhaps, that he would have deprecated the advance of money to local authorities for sanitary purposes from the national exchequer (that money being repaid by annual instalments extending over a certain number of years), and that he would have spoken of this as an interference with the legitimate use of private capital. Clearly Mr. Hawksley would prefer that works of drainage and water supply, and the improvement of the condition of towns generally, in respect of health, should be matters of private speculation for capitalists.

As to the fouling of river-banks with manufacturing refuse, the manufacturers "cannot afford to be put to large expenses in first cost and hourly working, in order to render rivers clear." Perhaps so; for, how do they obtain trade, and, when obtained, how do they keep it? Of multitudes of manufacturers, now-a-days, it may be said that they get it by making inferior articles and underselling other manufacturers, a game which pays for some time, but which, to be maintained, demands the exercise of further ingenuity in the reduction of quality. This is hindered too much when attention is demanded to the manner in which the business shall be carried on. The manufacturer is not making the best use of his time and money in paying attention to the question whether he is injuring his neighbours by his trade. They have, Mr. Hawksley says, their common-law remedy if they are injured, and that should be sufficient for them. It, however, is not sufficient, as a matter of fact; and then, forsooth, we are told from the Chair of Health, at the Social Science Congress, that "numerous Acts of Parliament for effecting sanitary improvements have of late years been passed, but they are nearly all impaired and disfigured by the spirit of centralisation which pervades their enactments, and which operates most depressingly on the freedom of our municipal and other like institutions, and on the development and exercise of the skill and ability in which this country is so redundant."

Skill and ability of the British workman?—for, to judge of the President's meaning by his opening remarks concerning the "working classes," he must mean the workman. Where is the evidence of skill and ability, unless it be in getting as quickly as possible out of hand the thing made? Alas! no; the skill which the British workman inherits from his forefathers is smothered in a whirl of cheap and rapid work, of no intrinsic value; its value is in its being a chattel which the master exchanges for money, paying therewith what wages he must, and keeping of it what he may. The thing made may be a torment to its purchaser as long as it continues in use; but what of that? The manufacturer cannot afford to make it better, he is so hampered by Government interference with the freedom of his trade!

If a river is fouled as a necessary consequence of the exigencies of trade, on the banks of which river, below, some thousands of fellow workmen reside; what of that? We have Mr. Hawksley's assurance that the waters of rivers so fouled, "although as black as ink, have never been proved to give off emanations seriously injurious to the health of the people residing on their banks."

Whatever nastiness may flow past or near to the houses inhabited by workmen who reside on the banks of rivers, it has never been *proved*, says he, that it gives off emanations *seriously* injurious to their health. But that is a mistake, and shows a momentary forgetfulness, for it has been abundantly proved in several instances;—to say nothing of the known deadly results when such water is taken internally.

Touching the much-debated question of the proper treatment of sewage, so as to deprive it of its offensive solid contents, and at the same time render the liquid portion fit for admission into a river or stream, Mr. Hawksley says there are two methods in use for its purification, irrigation and precipitation. Good; but would any one believe that Mr. Hawksley could have said,—"The former necessitates an eventual expenditure of 5*l.* or 6*l.* per head of the community drained; the latter about 10*s.* or 12*s.* per head, and the absolute loss by the former is considerably greater than by the latter method"?

The main feature of the address is its reference to the evils and the imminently dangerous effects of over-population under the circumstances in which this country is placed. Looking at the means of living and the preservation of life and health of the enormous increase of population of the working classes, it appears to Mr. Hawksley a matter of the greatest and most immediate concern and anxiety. After enumerating the present population and what it probably will be,—or would be if we could go on as we have done,—he begs us to keep in mind the fact that calculation has already shown the impossibility of finding room, either at home or elsewhere, for the teeming millions our country produces. "Nor is it," he says, "any answer for an enlightened statesman to say, 'Oh, but something providential will happen,' or, 'sufficient for the day is the evil thereof.' Yes; something will happen, and I venture, without presumption, to tell you from this chair that the evil is even now upon us." Assuming that the increase could go on as it does now, over a prolonged course of years, he asks, "How then stands the question we have at this moment under consideration? Surely thus: at the end of the first generation the population of England will become 42,000,000; at the end of the second generation 74,000,000; at the end of the third generation 130,000,000; at the end of the fourth generation 230,000,000; at the end of the fifth generation 400,000,000; at the end of the seventh generation more than the world now contains; and at the end of the twentieth generation, more than fifteen such worlds would contain, each as densely populated as our globe is at present. Now, what are the inferences we are to draw from these calculations, apart from other momentous acts which I am about to lay before you? It is very obvious that the later events which the calculations tell us might arise, if they could arise, will never occur, because of their essential impossibility. But what is it that will prevent their occurrence? The world is old; older than any of us can surmise, and it is not filled with people yet. Why is this? Because it has sad stories to tell of famine, war, poverty, destitution, and pestilence; of mouths to be filled, and of an insufficiency of food to put into them; of diseases to be cured, which the art of the physician has been unable to arrest in their fatal career; of popular discontent, which no Government has been able to allay. A sadder picture of a possible future could not be drawn from the evidence of the past. The Customs returns enable us to estimate that about 40 per cent. of the most important articles of the food of the people now comes from abroad, and this, too, for the daily sustentation of the existing population of twenty-four millions, a per-centage which will be year by year sensibly added to as the population of the country continues to augment. We look at our Board of Trade, and at our Customs returns,—we rejoice because we find so many millions of exports and so many millions of imports, and we exclaim with vast exultation, 'Eheu! was there ever so great a nation as the English? But we are utterly oblivious of the all important fact that our exports consist of commodities we cannot eat; whilst our imports consist largely of commodities, without which we should surely sicken and starve. Now I ask you, as earnest

sociologists, whether a nation can, in the proper sense of the word, truly say of itself 'I am great,' so long as it is unable, if need be, to maintain itself? I look, indeed, with alarm to the signs of the times, the general restlessness of European nations, and the possibility of our being entangled in a war—perhaps a war of creeds, ultimately to extend itself to a war of aggrandisement and conquest—for, without in the least doubting the prowess of England, and her ultimate ability to come with glory from the fray, I cannot avoid expressing the apprehension that our supplies of food from abroad may be for a time very seriously interfered with, if not wholly interrupted."

Notwithstanding his picture and the terrible inference one might be led to draw, namely, that Mr. Hawksley thinks it is not desirable to save life, we must still strive earnestly to do so; and we must maintain the belief, too, that this may be done. Mr. Hawksley asserts that notwithstanding what has been effected in the way of drainage, water supply, and other works in the interest of health at enormous cost, no effect whatever has "been produced in or towards the prolongation of life." And, what is unfortunately worse, this must remain the state of things. According to Mr. Hawksley, the wear-and-tear of the mechanism of the human frame is due mainly to natural organic changes and the repeated action of its parts, and particularly of those parts which are the subject of involuntary movement. "The human heart cannot beat 100,000 times a day, nor the lungs expand and collapse 20,000 times a day, without suffering the usual effects of wear and tear—effects which manifest themselves in all of us, even when disease has no part in them." And yet the human heart has beaten, and the lungs have expanded at this same rate in thousands of men who have reached 80, 90, and 100 years of age! He adds,—"I do not intend to convey the idea that by sanitary efforts we cannot diminish the undue waste of life we observe on all sides—but most amongst the labouring classes,—a silent waste greater than that of a battle-field."

Surely this is a little contradictory, because if we diminish the waste of life, this is very like prolonging life. While men, women, and children die in thousands, not from the wear and tear of heart and lungs, but from known preventible diseases; while 32 out of every 1,000 die annually in one place, and only 16 out of the same number in another, or 40 out of every 1,000 in one half of a London parish, though only 20 in the 1,000 die in the remainder of the same parish, there can be no question about the necessity for continuing endeavours to bring about sanitary improvements, and there need be no fear but that by so doing we shall produce an effect in the prolongation of life.

There is much to be done, moreover, short of the saving of life. By far the greater number of those who form the increase of population are early deteriorated in physical and moral status. There are churches, but the people do not go into them; and there are schools, which must do something; and there are many minor institutions which may do a little; but all these means together make but very little impression on, or alteration in, the moral status of the people. The evil does not lie in the mere increase of population, but in the undue increase of that part of the population whom nobody knows, and for whom nobody cares; and sentimental philanthropy, even if there were much more than there is of it, will never touch the root of the evil. The people are not taught practical morality, but a variety of doctrines, not two of which are alike in the same Christian country. The substance is lost while a shadow is pursued. And while religionists dispute the people perish before their eyes.

Let us hope that Government will not be deterred from advancing money to local sanitary authorities until the homes of the people,—for so they must be called, however unworthy,—are made fit places for human habitation, and likely to produce healthy and worthy men and women. We resume our old war-cry,—"Homes are the manufactories of men: as the Homes so the People."

Carlisle is to be congratulated on the exhibition of a very low death-rate. Dr. Elliott, the medical officer of health, in his last periodical report, shows, according to *The Lancet*, that the mortality of the town is only a fraction over 11 per 1,000 annually. It is to be hoped that this condition of salubrity will be maintained.

THE FINE ARTS APPLIED TO INDUSTRY IN FRANCE.

THE EXHIBITION AT THE "PALAIS DES CHAMPS ÉLYSÉES."

THE twenty-five large rooms at the Palais de l'Industrie constituting the "Salon," filled with more than 4,000 works of art, closed on the 30th of June, the last week being devoted to a special horticultural show, and on the 1st of August the "Union Centrale des Beaux Arts appliqués à l'Industrie" opened to the public an exhibition occupying the same twenty-five rooms, together with, in the interior garden, a varied multiplicity of objects sufficiently numerous to gratify the most prodigious appetite for novelty. The whole of the pictures, and more than 600 pieces of statuary, the embankments of the horticultural show, all gave place in less than thirty days, and allowed the exhibition to be arranged which we are about to describe.

The oldest exhibits are here the greatest novelties, and consist of a very complete series of ancient tapestries. Sir Richard Wallace has contributed some very valuable specimens in magnificent repair, which appear not to have suffered by the work of the restorer, the reparation in Paris being so completely done that it is very difficult to detect the restoration from the original work, and hence lovers and purchasers of tapestry had better be careful how they invest their affections or their capital, as they are exceedingly likely to obtain what they may esteem and value very highly, but what would be estimated by experts at a very trifling cost,—in some sad cases considerably less than the value of the repairs.

The South Kensington Museum has contributed the magnificent series of tapestries reproduced from Raffaelle's celebrated cartoons. These reproductions, as is well known, were executed at Mortlake in the seventeenth century, under the direction of Sir Francis Crane, whose pretty cipher is distinguishable on the outer edge of the border. It is to be regretted that two of this series are festooned as *portieri* at the door of the room in which the other five are hung,—however, in places of honour. Why these two were not hung opposite the others it is difficult to conceive, for they are two of the finest,—that of the "Gate of the Beautiful Temple" and the "Elymas struck Blind."

Instructive and magnificent as these famous pieces are, whether it is that the glory of the cartoons, now so happily familiar to us all, leave too vivid an impression of their beauty on the mind to admit of our admiration for the worsted copies, or whether, which is probably the case, Raffaelle's designs are not suited for tapestry, it is quite certain that those in the adjoining room from the designs of Giulio Romano are much more satisfactory as splendid wall coverings.

A series of five pieces from designs by a Milanese painter, are still more lovely in their cool green-gray tones, with their noble borders, not an inch of which fails to supply a meaning and a history; these five pieces are from the collection of M. Jourdain, who may fairly claim to have, and may be congratulated on possessing, some of the finest tapestry work of the sixteenth century.

But the special attraction in these rooms consists of the splendid series of Gobelins tapestry representing the history of Louis XIV., from designs by Lebrun. This room exhibits a truly regal appearance, and completely supplies the historical antiquary with data for the grandest paraphernalia of royalty. They are, of course, not so unfamiliar to the artistic world as many other specimens here shown, from their having been so long known at the Gobelins manufactory. They entirely satisfy even the fastidious tastes of the greatest lover of earlier art. In fact, one must almost admit that as wall-coverings they are far more successful for domestic decorative purposes than some of the older pieces here exhibited.

There are some smaller specimens of Flemish tapestry, grounded in gold and silver, that look precisely like magnified reproductions of the illuminator's art of the fifteenth century.

Some modern Gobelins work, executed between 1820-30, is positively deceptive in the way it reproduces the touch and colour of the painter. Those in particular from the pictures by Rubens appear to have culminated in entire perfection. From the date of these reproductions (1822-1838) to the present time there appears to have been a gradual decline. It has not been, as M. Chevreul has so clearly shown us, from any inferiority of modern colours, or the material in which the worker labours, for in these respects we have the advantage of our ancestors, but the fault is clearly owing to the deficiency of those who design for the copyist. They appear to have entirely lost sight of the peculiar character of the old drawing, such as the artists of Italy or Flanders produced, with so much skill, indeed, as to make one regret that we have only still existing, to show us what treasures we must have lost, the drawings prepared for the tapestry worker in the "Cartoons," as they are called, of Raffaelle. No one, for instance, could be perfectly satisfied with the costly series of emblematic figures that have been produced, and are here exhibited, for the refreshment-room of the Grand Opera-house. Several of these were shown in one of our exhibitions at South Kensington, and were remarkable for their unfortunate resemblance to highly-coloured French pictures.

In this exhibition there are two looms at work, one of the *haute lisse*, and one of the *basse lisse*, and it is curious to watch, from week to week, the slow but exact progress that is made in reproducing the pictures that the artists have *behind* them. At the same time, to the thoughtless observer the beauty of the work is considered to surpass all that ancient art has ever done; and, indeed, when we consider the perfection of the surface, and the exact imitation of the original design, one must admit the highest praise due for, at least, so much dexterity.

Much is said by visitors, and many questions are asked relating to what is meant by the terms *haute lisse* and *basse lisse* which distinguish so many of the pieces of tapestry. An impression exists, and has long existed, in the minds of well-informed persons, that all tapestry is needlework. In a sense it is, but not in the sense that the beautiful workers with the needle attach to that term. We can thus explain the difference between the *haute* and the *basse lisse*.

The *haute-lisse* loom consists of two wooden standards supporting large rollers between them, on which are arranged the threads of the warp. The design to be copied is placed *behind* the workman, while a tracing of it is drawn on the warp-threads, up to the lines of which he works, passing his *flûte* or shuttle charged with the necessary coloured silk or wool between the odd and even threads of the warp, which are kept apart by a tube of glass. From time to time he consults the design at his back, and, when he judges it necessary, goes round to the front of the loom to observe his progress, adjusting any threads that may be out of place with an *aiguille à presser*, as it is called. The progress the worker makes is extremely slow,—almost as slow, indeed, as that of needlework, but the high warp, or *haute lisse*, from the accuracy which can be obtained, and from the minute inspection it undergoes during its progress, is specially adapted for copying such works of art as pictures, where a variety of tones come into play. Indeed, it has always been in vogue for that purpose.

With the *basse lisse* the loom is horizontal, and the worker, seated, leans over the warp, the threads of which he separates by lowering or heightening them with treadles worked by means of his feet. He is directed in his work by means of a tracing of the design to be copied placed below the warp-threads, and it is only in looking through these perpendicularly down on it that he sees what he has to do. The original design, however, is hanging, as in the *haute lisse*, behind him. But owing to the fact that he has always the wrong side of the tissue he is weaving turned towards him, it is only when the whole is finished, and taken off the loom, that he can see his work in entirety. Hence there can be no comparisons of tones, no corrections in the course of the work, as in the *haute-lisse* loom. Like in that system, the worker also uses a *flûte* or shuttle charged with the silk or wool of the colour necessary, which he passes under and over the odd and even threads of the warp, the stitches being driven up close to each other by means of a wooden comb. The worker with the *basse lisse* is, however, able, owing to the position of the loom, to work very much quicker than with the *haute lisse*, and hence the former is chiefly used for ordinary hangings where a simple design has to be copied, or where an even tint of colour pervades the tissue.

Each piece of tapestry here exhibited being in itself a history, to describe either one or all of them fully would be a lengthy business, but the artist who worked for the tapestry manufacturer in the industrious ages of the past very wisely made his piece of tapestry an instructive lesson,

and we are all familiar with delightful old stories of how the youthful mind has been strengthened by the early legendary history and the precious Scriptural lessons gathered from tapestried walls and the corridors and chambers of ancestral mansions.

In addition to these magnificent realities, the work of men who are described in Motley's "History of the Netherlands" as moving through the streets of the Flemish cities on their way to work in the morning like an enormous army, there is a long series of photographs from other tapestries at a distance, those from the Madrid galleries offering far more interesting historical details than any here shown. The subject is a delightful one to dwell upon, and might well repay a most elaborate research. Here is to be found the tapestry of the high warp such as Madame de Gondelaurier admired, and some charming handpieces such as Demoiselle Colombe de Gaillefontaine and the little Bérangère de Champchevrier busied their fair fingers upon; but there is little of ladies' work in this exhibition, some very few small pieces, the whole consisting of the magnificent art and commercial industry of past centuries. We shall say nothing of the tapestry of the Pompadour period, which may be seen here in tolerable perfection, but the pieces in private hands in Paris are so well placed, and still so fresh, that doubtless their fair owners have been unwilling to trust them to comparatively careless and unholy hands. In the rooms adjoining the tapestry, the exhibition of Historic Monuments, although not so attractive to the general public, is perhaps of even greater artistic interest than the tapestry. Here we find together such a collection as has never been seen before, and so complete in itself, so far as the architectural part is concerned, that it is a matter of regret that it should not remain intact for future reference.

The pictures, drawings, and engravings representing old Paris are greatly disappointing, although we admit the difficulty of making, in so short a time, any such collection. The authorities of the city of London some time since, aided by Mr. Gardner, exhibited at the Guildhall many of their topographical treasures, and if it were possible that the Bibliothèque Nationale should admit the overhauling of their collection of Paris views, they could probably here exhibit even a finer show than any of our illustrated Pennants. But at the Palais de l'Industrie they are far behind London in its ability to display pictorially their city as it was.

But as regards the architectural drawings of the remains of Mediæval art, it is impossible to imagine more exquisitely-executed works, and so thoroughly and exhaustively classified as to show one, with very little trouble, representations of examples of schools of architecture that have existed for the last thousand years in France. Here we have examples of Roman buildings, of the school of the Ile-de-France, of the Champenois school, the Burgundian, of Poitou, Saintonge, Perigord, Auvergne, Languedoc, Provence, Picardie, Normandie, Anjou, and Brittany, examples of the military and civil architecture of France. The drawings of M. Viollet-le-Duc are marvels of skill, and appear to leave nothing whatever to desire. Of all artists, architects begin by being the most truthful; *they* never sketch an object without understanding its form and its use. Their subjects never occupy more or less ground than they ought: their perspective, and their local colour at least, are invariably correct, and without doubt some of the most precious works of art that the present age will hand down to future generations will be the elaborately accurate drawings, representing the present condition of antique monuments in France.

The series of coloured studies made by M. Hébert during last year, all but reproducing on a small scale the mosaics of Ravenna and Rome, constitute perhaps the most valuable addition to the knowledge of the lover of archaic tones of colour, besides the extraordinary interest they possess in connexion with the earliest years, or rather centuries, of Christian history; and if the whole series could, as it could easily, be reproduced by chromo-lithography, and published, say by the Arundel or some other similar society, the world of art would have reason to rejoice, for here are to be found in M. Hébert's work, in all the sober and noble propriety of antiquity, the glorious harmonies of colour, as perfectly suitable to modern art and its decorations as it was found a thousand and more years ago, by the patient and obedient artists, who, listening reverently to their teachers, availed themselves of already-established rules and methods. The modern portion of this exhibition is of the character to excuse, we suppose, the not uncommonly expressed opinion in England, that such exhibitions "bore." Of course, there is an enormous amount exhibited that may supply cash, but very little credit, to the producer, and but small profit to the purchaser, but "the brain of the world" even admits some strange irregularities from the strictly beautiful; and the useful here is not invariably associated with the ornamental, notwithstanding the tremendous efforts made by the thousand workers in the art of making things attractive. The names of Barbedienne, Christophle, Deck, and Boucher, and many other ornamentalists, are as familiar to us as Jackson & Graham, Hunt & Roskell, Phillips, Mortlock; but the Frenchmen make the greater show in every instance, except that of jewelry, and we suppose that Messrs. Hunt & Roskell could display bigger results from Sumbulpoor or Golconda, and one is apt to give the palm to the heaviest diamonds, although they may not be quite so well or tastefully mounted as their smaller sisters.

Of clocks and chimney ornaments the world seems as much enamoured as ever, and Paris more than ever desirous to gratify the passion; we all know what they can do in this way, and we all really seem to want for our chimney-pieces some of their pretty things, and "pity 'tis" that so few of us give our time to the acquirement beyond the means of acquiring, to a tolerably correct taste on the subject of how to decorate that chimney, the corner and the hearth of which we are so proud of. The last new things in the art of the ceramists are certainly farther than ever from the correct, but notwithstanding there appears a demand and a supply for vases roughly painted with poor imitations of bad pictures, the firms of Messrs. Ulysse, of Blois, continue faithfully not only to reproduce the established favourites in the delightful art of faïence, but continue to successfully design new objects in the true art spirit.

The makers of luxurious furniture have here perfectly succeeded in reproducing costly objects for household use, contenting themselves, however, with sixteenth, seventeenth, and eighteenth century art, and avoiding altogether the furniture of the Gothic period, that people in England try to, but will *not* like. Who can be the purchasers of the many hideous objects here shown? How is it that such gross taste is here exposed by the side of the most exquisite refinement? The Parisian shop-keeper can tell you the standard of excellence that he naturally approves is precisely that which experience has shown him leads to large pecuniary gains. The taste of the modern Asiatic who spends his hoarded wealth in Europe has lost its archaic, or what we so nearly got into trouble by calling "barbarous" character, and he spends his money with Oriental magnificence, and has but little time during the happy days he passes in Paris to question the correctness of the objects he sends to his agent to be packed for home. The things glitter with gold and enamel. They are expensive, and are precisely adapted for mantel-pieces, windows, and corners of rooms, and are exceedingly like what he has seen in many highly respectable quarters. Attractive splendour is everywhere, and the thousands who are allured to purchase seem rarely to experience a glimmer of the caution "don't."

Beautiful, decorous, enchanting simplicity has no place here, and one looks in vain for well-designed, useful, beautiful objects; nevertheless, as if Parisians knew that we are not all Rothschilds, they have contrived to make one of the attractive features of the exhibition to consist of a sofa, so ingeniously constructed that the most inveterate hater of the idea of a "shut-up bedstead" would bow before this new deceiver.

The Education section of the exhibition displays many highly interesting and useful methods and means of making difficult things more easy to understand, and the interest taken in this portion of the exhibition by Mme. la Maréchale and many of her lady friends redounds greatly to the credit of the Republican court.

Architect v. Clerk of Works. — With reference to a list of tenders, in our last, for a house in Cadogan-square for Major Arbuthnot, Mr. F. N. Kemp writes to say that he was the architect employed to make the drawings, and did make them; and that the gentleman who attached his name to the list as architect, is only the clerk of works employed to carry them out.

ART AT THE SOCIAL SCIENCE CONGRESS: A CRITICISM.

In spite of doubts experienced or felt in various quarters as to the advisability of the Social Science Congress touching upon the field of art, we are inclined to think that one result of the experiment has been to encourage the idea of its repetition as a section of future programmes. Although the Marquis of Huntly in his opening speech entirely ignored the Art Section, and though its proceedings were treated with only the most grudging and apparently unsympathetic notice by the press, the local papers in a good many cases dismissing some of the best papers with a mere paragraph, stating that Mr.—— read a paper advocating so-and-so; yet there seemed to be a feeling engendered that these subjects were not so alien from the original objects of the Congress as was at first supposed, and there were even suggestions that on a future occasion the field of art taken into consideration might be extended, and music and poetry considered in their relation to Social Science. The latter, however, is so much more than an art that the subject would really merge into the relation of literature to society: the subject of Art must, for the purpose of the Congress, be limited to those arts whose boundaries can be clearly defined by their employment of a special technique. This can hardly include poetry; but it may undoubtedly include music, which was mentioned more than once during the Congress as a fitting subject for consideration at future meetings. The degree and manner in which this and other fine arts contribute to the happiness, instruction, and elevation of society forms unquestionably an important element in that systematic study of the conditions of human welfare which has in modern times developed into Social Science; the point to be seen to is, that the discussion of such subjects should not stray from the special objects of sociology into questions relating purely to art criticism or technique. In the main this object was very well kept in view at the recent Congress.

A general review of the proceedings shows that we were at least not much beside the mark in some of the suggestions we offered in advance in a previous number (p. 965, *ante*). We took occasion then to point out that the mind of the people was in a totally different relation towards art and artists from that which prevailed in the great period of Italian painting, for example: that whereas then art was a matter of national interest and universally in demand, now the project is in the first place to create if possible a demand for it: and in regard to the question of street architecture we dwelt on the necessity of any improvement therein arising from and complying with practical conditions of modern town life. This latter branch of the subject was ably worked out, in just the spirit we should have wished to indicate, by Mr. Stevenson and Mr. William H. White; and the central address of the Art Department, that of Mr. Poynter, went almost entirely towards indicating how a new life in art must arise from a more deep and genuine popular love of art and desire for it, insomuch that the title of the address, "The Influence of Art on a Nation," might almost as fitly have been inverted into "The Influence of the Nation on Art." It is true that Mr. Poynter did in one rather extraordinary sentence express the opinion that at the best period of Italian art the mass of the people were as indifferent on the subject as they are now. We should have said that there was a large amount of, at all events, indirect evidence to the contrary; but the accuracy of the expression depends partly on what is meant in speaking of the mass of the people. There was a stratum of ignorance and indifference, no doubt, among the lower orders then as now, which may be left out of account in the argument; but the important distinction would seem to be, that there was then a large middle class which was interested in art, and there is in the England of to-day a large middle class who care about almost anything rather than art. Taking the view (and we believe it is in the main a perfectly sound one) that a demand for an intellectual and a true art is necessary before the supply is likely to be forthcoming freely, we come to the rather puzzling position, that we must endeavour to educate the nation to care for what art it has in the first instance, in order to induce the demand for what is better and higher. No doubt this seems at first sight, and is in some

measure, a sort of practical arguing in a circle; but the idea must not be too hastily condemned on that ground. Art is, in fact, a thing which seldom comes by a logical process. What is hoped by those who believe in the improvement of art in England is, that if we can get the bulk of the nation (or a qualitative if not a quantitative majority) to see and feel that a true artistic spirit in the surroundings of their lives is a thing to be much desired, that we are very far from it now, and that it is worth while to think seriously about it, we shall have laid the foundation for an artistic England in the next generation. And a step in this direction is to get the English public into the habit of thinking of art as something that is, or may be, in close connexion with their daily lives, and not as a far-off or *recherché* luxury. In this relation, whatever tends to popularise art among the many, even if not at once fulfilling the highest standard of culture, is a gain, and it was in regard to the importance of this popularising element that the work by the Art-Union of London in this respect was made the subject of a special statement at the Congress.

The practical portion of Mr. Poynter's very admirable address amounted, as we have observed, to not very much more than a conviction that the more universal establishment of instruction in drawing, as a necessary part of education, would have its effect in developing a spirit of art, a love of beauty; not that teaching the rudiments of geometry, and perspective, and freehand-drawing to any number of children would give them artistic instincts, but it would be the means of "giving a chance to natures which might otherwise remain undeveloped." And, furthermore, he counted on the gradual influence of museums of artistic productions for giving rise to a refinement of taste on the part of those who frequented them; though adding a caution against expecting too much from this source of general education. This is not much encouragement, and it might be said that it needed no Art-Congress to tell us that; but Mr. Poynter's cautious words may have had a wholesome effect in checking the Utopian anticipations of some artistic reformers. The notable quality of his address lay in the broad view which he took of art as a quality to be exemplified in all classes of work, and not merely in painting and sculpture. The breadth of view evidenced in his address was, in fact, rather remarkable as coming from one whose own reputation is specially connected with painting; and we might have been tempted to think the latter art had been unnecessarily or disproportionately slighted, had not the speaker avowed it as his intention to give prominence to the economic and social side of the subject rather than to painting in particular, because there was a fear that the high price of pictures in the market at present was causing a rush of all the best artistic genius of the day to that branch of art, to the neglect of others. Mr. Poynter deserves special thanks for having, as a painter, gone out of his way to point out the broader view of art which should prevent us from restricting the definition to one or two departments of artistic expression, even though these may be justly regarded as the highest and most intellectually interesting. And this idea of the unity of art, we may observe in casting an eye over the reports of the various papers read, seems to have been a good deal uppermost among those who took prominent part in the proceedings; and we repeatedly find attention directed to the fact that art is to be looked for in small as well as great things; that it is to be found, as Mr. Eastlake put it in his paper, "below the pedestal of a statue and outside the frame of a picture." To find this idea of the unity and pervading character of art, which has been always practically a reality in every great artistic period and with every thoroughly artistic nation, thus receiving, though so late in the day, a general theoretic sanction among those Englishmen who give any thought to such matters, is certainly evidence of an advance of critical feeling and critical faculty among artists and amateurs. The recognition that "art" is something of universal meaning, behind and beyond the several processes called "the fine arts," is one absolutely essential to any true ideas upon the subject. Mr. Poynter put the matter in a very suggestive way in the opening sentence of his address, in the remark that "the very essence of good art is to be found in honest and good workmanship above all things"; a remark which comes very near to the definition of Mill, who called art "the endeavour after the perfection of execution." But while welcoming this wide and generalising perception of the essentials of art, we should guard against expanding this idea into a kind of levelling estimate of art, which would place a trinket or a vase on the same footing with a work of painting or sculpture. There is certainly danger of this view being actually and seriously preached in some quarters; so much so that a very thoughtful contemporary writer, Miss Frances Power Cobbe, publicly expressed not long since a decided opinion that the present mania (as it almost is with the wealthier section of society) for ornamental furniture and decorations, so far from being a proof of a prevalent artistic feeling, was rather an indication that such a feeling did not exist in the highest sense, otherwise people would not be content with works of art of this less intellectual class; and there seems some reason for such a remark when we find one essayist at the Congress (Mr. Audsley), after admitting that he did not know much about painting, expressing the opinion that the "widely-diffused idea" that art is especially to be found in framed and glazed pictures has been one of the most injurious to popular love of art. This is riding the hobby too far. Great as is our love of tasteful and artistic furniture—long as we have done what in us lay to recommend and promote its production—we cannot but point out that pictorial art has, intellectually considered, an interest and a standing such as no mere decorative design can ever attain; and we have no hesitation in saying that a room in which the furniture and decoration were open to question, but which was hung with masterpieces of the painter's art (or even engravings and etchings from them), would present much more of intellectual interest than a room completely and tastefully furnished in a harmonious style, but garnished with inferior and merely "decorative" paintings, whose only value was that they harmonised with the general scheme of decoration (a style of painting which is getting carried quite to the extent of an abuse in England at present), and that the poorly furnished room with the good pictures would give evidence of a higher culture on the part of its owner also. Nor is the contrary opinion to be necessarily gathered from the discourse of Mr. Poynter, who, we imagine, would have no wish to wrest from his own art its true and high dignity, as appealing to the highest feelings and passions of humanity in a way which mere decorative art never can achieve. Taken in relation to its specially expressed object, his address has no such tendency, and was in every way an admirable one, one or two points in which we will touch upon again; and we may take opportunity here to express our sense of the inadequate and unworthy reception accorded to it by certain journalistic critics who, like Gallio, "care for none of these things," except as the occasion for a piquant leading article, like that of the *Daily News* of the 20th ult., the writer of which managed at least to prove that he had not any idea of the real scope and intent of Mr. Poynter's argument. That, when an artist of genius gives a lecture of more than usual ability and comprehensiveness on the subject of national art, a newspaper professing to represent the opinions of a good proportion of the more intellectual section of Englishmen can put the occasion to no more worthy purpose than to indulge a few shallow sneers, is only rather too good evidence of the deep-seated indifference to this class of subjects in the English mind.

The question of the improvement of the painter's art, in its highest sense, received, however, due attention at the Congress in the two papers read by Mr. Richmond and Mr. Cave Thomas, on the encouragement of mural decorations. Here again it may be observed that the art is considered in its connexion with general design, architectural and decorative. The art of mural painting has been so much neglected in England, and its claims to attention and development are so high on many accounts, that it was only natural that a decided effort should be made to "awaken" society on this point, on such an occasion. The development of mural painting was specially urged, however, by Mr. Richmond and Mr. Cave Thomas (whose views did not materially differ), on account of the influence it might be expected to exercise in raising and ennobling the English school of painting, introducing a loftier and broader style, and one rendering necessary for its due cultivation a higher intellectual training of the artist. The exercise of such a branch of painting involves, as Mr. Thomas observed, "the casting aside of all the trivialities of art for the sake of a severe simplicity and grandeur"; and Mr. Leighton, commenting in the same strain on the remarks which had been made, said that "as long as the English people gave themselves up to the seductive charms of realistic art there was very little hope that the severe style of the great heroic works of antiquity would be encouraged." Now there is a great deal of truth in all this, with a certain forgetfulness of part of the truth. Speaking as architects, we feel every sympathy with a view of the painter's art which tends to bring him into closer relation with the architectural designer; to render them fellow-workers in realising one great ideal, and to ally painting with architecture in one great decorative scheme. There is much that is exceedingly inspiring in the idea; nor can we question that anything like general adoption of mural decoration in our public buildings would tend to quicken public interest in art, and would afford new and much more numerous opportunities for the practice of the higher class of painting; and it is not improbable that it would also have the effect of turning the minds and the studies of our artists towards a higher type of design than they are very much in the habit of cultivating at present. And this, it may be said, is a good deal to gain, and the chance of it is quite enough to warrant making the experiment on a large scale. Certainly; only let us be allowed to question whether this system would necessarily or probably have all the effect in giving reality and a national character to modern English art, which some persons seem to expect. Doubtless, that heroic style, which Mr. Leighton desires to see better "understanded of the people," and which he has done his best to exemplify in his own beautiful works, is the highest manner in art when it is true and arises really from the spontaneous feeling of the artist, and answers to that of the people. But we cannot avoid the vision of a manufactured grand style, a pre-determination to be heroic and severe, such as has been seen before in art, and is one of the most unreal of all things. And when it is said that only by the encouragement of mural painting can we have any "real, living, national art," we may ask whether the school of which Teniers and Ostade were the ornaments was not a living and national one? When we are told that mural painting is necessary to promote a great style of pictorial art we may ask where there is a painter with a greater style (considered as apart from his subjects) than, for instance, Velasquez, a confirmed painter of easel-pictures. When the realistic school of painting is disparaged in comparison with a more ideal and conventional standard, we may ask, which is the most real work, the most valuable possession to the nation, the "Blind Fiddler" or the "Daphnephoria?" These are questions certainly germane to the matter. We are most desirous, once more, to see mural painting encouraged. We only wish to guard against it being too hastily accepted as an infallible panacea for producing artists and an artistic public.

Mr. Watkiss Lloyd's sketch of the influence of academies on the art of a nation amounted on the whole to a conviction that academies can do much in the promotion of art if they are well organised for giving systematic teaching and systematic rewards, and maintaining a high standard which should make it a coveted honour to be in their ranks; and that this could hardly be accomplished without extensive State subsidy; in reference to which the writer of the paper instanced the high standard maintained by the national theatre in France, which could not have been maintained without governmental aid. Readers who remember how often we have urged a similar foundation of a national theatre in England will not question our general adherence to the idea of subsidy, if found necessary, as a feature in the scheme. For the rest, Mr. Lloyd's ideal academy would doubtless be more efficient than any body of that kind at present constituted in England: and perhaps one may say that no such institution can very well do harm. At the same time it is quite true that academies have not ever done much to promote an artistic spirit in a nation; their practical value has consisted in furnishing a systematic technical education to students; and the remarks of Mr. Aitchison, in the discussion which followed the reading of the paper, to the effect that academies had in the whole history of art been established only when the art had passed its climax, and required artificial means to prop up its decaying influence, is almost strictly true historically, though the idea seemed to cause as much astonishment among the audience as if it were something that no one

had ever heard of before. Mr. Aitchison's parallel with literature, in which, as he observed, no Academy of Fiction had been required to produce Thackeray and other great writers, was quite to the point; and any one disposed to believe too much in academies in the abstract has only to recall the relation between French literature and the French Academy. Granting the desirability of an Academy, however, Mr. Lloyd's suggestions are very well calculated to promote its usefulness in an administrative point of view. His proposition of a Central Academy of Arts, to which special academies of sculptors, painters, and other branches of artists, should send representatives, looks very complete and very dignified on paper. One unfortunate thing is, that artists of really original genius are generally too independent and self-regarding in their modes of feeling to work smoothly in these complicated pieces of social machinery; and it is but too probable that a good Academician under such a scheme would be a mediocre artist, and a powerful artist but a lukewarm Academician, from causes which are inherent in human, or at least in artistic, nature, and not easily eradicable. On the whole, of the two chief suggestions for the improvement of the painter's art in England, and the furtherance of a knowledge and comprehension of it on the part of the public, we place more faith a good deal in the development of mural painting than in Mr. Lloyd's reformed Academy.

To the suggestions more directly connected with architecture and decorative art, we may take an opportunity of returning.

ON MURAL DECORATION.*

"How best can the encouragement of the practice of mural painting, especially in fresco, be secured?" The direct answer to this question is a very simple one, viz., by making the public comprehend the important and beneficial influence which the study and practice of mural painting exercise over the whole of the arts of design, as well as the rank which it holds as an index and monumental record of the culture of a people.

The use of fresco, or of some other suitable method of mural painting, would, as a matter of course, follow upon the persistent pursuit of the highest style of decorative art. The method of fresco has long since been recognised as that which best fulfils all the required architectonic conditions. Nevertheless, it should not be forgotten that the question as to the method of executing mural painting is quite secondary to that of the kind of art which is fittest to adorn a grand national edifice.

It is very doubtful whether the Grecian painters ever painted directly upon the wall. But no one doubts that whether the Grecian painters painted directly upon the wall or upon panels to be let into the wall, the Grecian decorative painting was, as the Italian mural painting, monumental and grand in its style. Fresco would have been a great boon to the Grecian painters, but to Rubens, Teniers, Rembrandt, and some of the painters of the Spanish school, perfectly useless. The mural painter requires a more comprehensive education and training than that which is ordinarily considered sufficient for the painter of cabinet pictures. Therefore, to transfer the painter who has indulged in all the exuberance of oil painting to the limitations of a higher style, and of a more difficult method, is almost sure to end in failure, and to prove unsatisfactory both to the public and the artist himself, as the country has already experienced to its cost.

The grandest existing examples of pictorial art are executed in fresco; this important fact is too often forgotten. Of course, I refer to the works of Michelangelo and Raffaelle in the Sistine Chapel and the Vatican. But there are also fine Italian works in *tempera*; fresco and encaustic have been used in Munich; Kaulbach adopted the water glass process in the new Museum at Berlin; Maclise and Herbert the same process in the Houses of Parliament; whilst the large picture by Paul de la Roche, the Hemicycle, in the Paris Academy of the Fine Arts, is painted in oil upon a stone wall. Yet all these works which we have enumerated, although executed in different methods, in the main, fulfil the conditions of monumental painting.

We may perceive, then, that there is a far more important question before us than that of "how can we best encourage any special method of painting?"—be that even fresco,—and that is, "how can we best encourage the study and practice of that kind of art which is the fittest to adorn our monumental, our grand public buildings?"

As I have been a steadfast advocate of the practice of the method of fresco, from the time I acquired a thorough knowledge of it under Cornelius and Hess until now, the foregoing remarks will not be interpreted as designed to slight that noble method of painting, but to more forcibly impress upon the student the kind of study which must be pursued if fresco or any other suitable method of mural painting is to be of the least use to him. Fresco, notwithstanding recent attempts to supersede it, may still prove superior to the water-glass and encaustic processes; but, on the other hand, it is not at all improbable that the resources of modern chemistry may furnish us with some method which, whilst it involves fewer technical difficulties, will, in all other respects, be equally adapted to the purpose.

The absurdity of painting in oil upon walls into the composition of which lime has entered, is so evident that it can never be attempted again. The lime and its salts are certain to cause the rapid decomposition of such works, which usually end in turning perfectly black. The inclination of oil colour on plaster is always towards the dark and heavy, whereas fresco has the reverse tendency, or to become lighter; and though this is also a defect, it must be admitted that it is the lesser evil of the two, for the gloomy depth of the changed oil colour breaks up the architecture by producing the effect of deep recesses in the wall, whereas fresco, though it becomes lighter, never destroys the breadth of the wall surfaces.

But let us proceed to examine and describe the characteristics of that grand style of art which is alone suited for the purpose of the highest order of mural decoration, and also to state the reasons why it is the bounden duty of the nation, the true policy of the nation, to encourage its study and practice.

In glancing over the history of Grecian and of Italian art, one cannot fail to be struck,—first, with the different kind of art which was practised by the great masters; secondly, with the different kind of organisation which was adopted for the education of the artist; and, thirdly, with the very different relation in which the arts stood to the people. Now, these three essential differences between ancient and modern art furnish us with the very strongest reasons why we should revert to mural painting on a grand scale, to the system of scholarships, and to the ancient art policy.

1. The difference between the kind of painting of our own time and that of either Greece or of Italy is, that the works of English painters, for the most part, consist of cabinet pictures suited to the tastes of private purchasers, and aiming at the picturesque, whereas the works of the great masters were chiefly monumental paintings, *i. e.* works designed to play an important part,—the leading part,—in the grand whole together of some great public building.

This different or grand style of art which was practised in Greece and Italy is usually styled *decorative* art; but the word *decorative* has been so degraded in more recent times, by being used to designate all kinds of loose and intemperate ornamental painting on the walls of palace, theatre, and private mansion, that whenever the word "decorative" is now used, even with the best intentions, it is inevitably depreciatory. It must, therefore, be discarded in favour of either the word "mural" or "monumental." We must not, however, lose sight of the fact that the finest works of art which remain to us were "decorative," using the word "decorative" in its highest sense,—that is to say, the greatest works in painting and sculpture ever executed were designed to adorn public buildings.

That different kind of art,—that grand "mural" or "monumental" art which was practised in Greece and in Italy,—requires a greater mental grasp, a greater facility and versatility of invention, and of adapting art to a purpose, than is required in the painting of easel pictures.

In all periods of national, and, consequently, of architectural magnificence, mural painting and sculpture have in a greater or less degree played a conspicuous part. Architecture was in the great epochs of art the mere setting to the gems of painting and sculpture.

These two noble arts were not then, as now, the last consideration; they were, in any project for a grand public structure, the first.

The numerous public edifices which have of late been completed in France and Germany have almost in every case been embellished with the productions of painting and sculpture. This application of the imitative arts has prompted inquiries into the principles which should regulate their adaptation (especially that of historical painting) to architecture.

The best Italian mural painters were always fully impressed with the necessity of adapting their works to the architecture, so as to make one harmonious whole. The nature of fresco fits it for such a purpose. It is, indeed, impossible to produce that illusion which is considered so desirable in oil pictures. The same depth of shade is not in the artist's power, but this very circumstance, whilst it compels attention to composition and form, indicates the proximate limits of colour and effect, and renders fresco more directly appropriate for the purpose of mural painting.

The same question which is now proposed for solution has been considered and practically answered, with various results, in Munich and Paris. The experiments which have been made in those cities by artists of eminence, and the opinions that have been expressed thereupon by competent judges, form, therefore, an important addition to the evidence of older works of art, and may assist in the examination of the subject.

A French writer, commenting on the great picture painted by Paul de la Roche in the *Beaux Arts* at Paris, says:—"When first the architect opened to the painter the doors of a recently finished edifice, and showed him the walls which were to be adorned by his skill, an elevated art arose, the essential principles of which were at once defined by the conditions of this union. This art may be called mural, or monumental, painting. Its characteristics are so pronounced and so distinct from easel painting, that perhaps the relation between the two might be aptly expressed by the circumstances attending their respective modes of execution, by comparing the durable walls of a temple with the fragile stretching-frame under which the easel trembles."

Monumental painting, then, being employed to decorate large and solid surfaces, the artist is no longer intent on the reproduction, however ingenious, of *reality* in its most limited sense. A dignified subject is essential; and to this genius is required to add ideality, or elevation of treatment. Lastly, simplicity, the indispensable characteristic of great works, must be apparent in the composition and the execution. Hence arises the especial condition of excluding from mural or monumental painting all that may interfere with grandeur of effect,—all that aims at literal imitation and illusion. It is to be remembered that the painter is, in this case, not alone; his art is employed together with the work of the architect, in decorating the same interior. There ought, therefore, to be no difference of purpose between those two exponents of one and the same thought. Although it may suit modern requirements to sever art into specialities, art itself is one and indivisible. It is further to be remembered that the walls must always be felt to exist under the decorations that cover them, and the skilful and magical effects by which the painter of cabinet pictures gets rid of the surface would here be out of place. Thus, under whatever point of view this question is considered, monumental painting must still be limited to an elevated region, where all is grand, simple, and unaffected. It was thus that its style was defined by the great masters who, from Giotto to Michelangelo, covered the walls of the palaces and temples of Italy with their works. They painted in fresco; and Michelangelo, foreseeing the decline of the grandest style, and the superior energy and self-denial required of its votaries, bad reason to call easel-painting an occupation for women. From this period (the middle of the sixteenth century), the tradition of elevated art was unstable. Succeeding painters, down to Pietro da Cortona, poured over vast surfaces their crowded compositions in which the qualities of fresco became useless. To complete the decline of monumental art, it remained only to neglect the process of fresco itself. Accordingly, from the beginning of the seventeenth century oil-painting was introduced, commonly on walls, particularly in France; and the artists looking on this mode of

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* By Mr. W. Cave Thomas. Read in the Art Section of the Social Science Congress, at Liverpool.

painting as an opportunity for displaying the effects of foreshortening, perspective, and colour, produced what the Italians called, "vast machine," differing only from the decoration of the theatre by better-studied forms and a more finished execution. We have no right to consider modern artists responsible for this practice; it is to be dated from those painters who first lost sight of the conditions which regulate the style of painting when that art is applied to architecture.

The very necessity which exists for studying the drawing and composition of large mural paintings, separately in cartoons, is in itself a highly beneficial training, as the mind of the painter, being freed from the blandishments of colour and effect, is the better able to concentrate its attention on the perfections of form and composition. Monumental painting has thus earned the distinction of the first place amongst the plastic arts. In the cartoon the artist determines his composition, and studies every portion of it from models,—in fact, makes a work complete in every respect but that of colour,—an exact working drawing; but although monumental painting admits of the design being studied to any extent in cartoons, yet in its ultimate execution it is not an art for the hesitating and timid. It requires a grand style of drawing, a broad and simple treatment, an eye steadily fixed on the whole effect, and an energetic and rapid hand, all qualities which, it must be confessed, are rare in these days. Palomino, in his work on fresco-painting, referring to the methods taken by the painters of the "Decadence" to evade the study and care which it demands, observes, in speaking of Michelangelo and Raffaelle, that since their time artists had become impatient of so much toil, having found that their enthusiasm evaporated before the period arrived for the execution of their work.

In this brief exposition of the general characteristics of mural painting, we see that monumental painting in all its phases makes a demand upon the highest intellectual qualities of the artist. Mural painting is in its highest development—is in its stately grandeur—the very epic form and measure of painting; and the relative value of all art work is ultimately adjudged as greater or less as it either approaches or falls short of the highest mental standard. It is on this account, on account of mural painting demanding the very highest mental qualifications on the part of the artist, that it has the greatest claims to national encouragement. For it is the highest order of mind ruling in each department of intellectual culture which makes the greatness of a nation.

2. Having now given a brief sketch of the characteristics of that different or monumental style of painting which prevailed in Greece and Italy, we will proceed to enlarge on that second point of difference which we noted, viz., the difference in the ancient mode of educating and training the artist. This was consequent upon the very different nature of the work, the grander kind of work, upon which, of old time, the painter and sculptor were employed. The superiority of that ancient and different system of art-education is manifest in its results, and should strengthen our determination to encourage the practice of mural painting by all the legitimate means at our command.

Our modern system of art-education consists in founding art-school after art-school. Now, most unfortunately for the student, the modern art school only conducts him to the threshold of art. All the more important part of an artist's education commences precisely where our modern system abandons him. They did things very differently in Greece and Italy. They were better political economists than we, at all events in art matters. They knew of old time that the only direct and practical means of raising a grand school of art was to employ painters and sculptors on great public works, but they were not content with this mere theoretical knowledge, they acted upon it.

In those days, every public building as it was erected became a school of art, and the great demand for mural painters and for sculptors led to the adoption of the system of scholarships. Every Italian painter of mark had, as you well know, his retinue of scholars, without whose assistance he never could have got through the immense amount of work which was generally confided to him. Now, to make these scholars of any use to him, he had not only to teach them to draw, but to think. The master had to impart to them not only his technical experience, but his theoretical views, to give them the reasons for doing this and that. Thus the scholar received a thorough training in art, and was very frequently, long before receiving his first independent commission, master of his profession. We may see, then, that another great reason for encouraging mural painting is, that it leads to an art schooling of a thoroughly complete and practical kind,—a schooling infinitely superior to that of our own times, when most English artists have to lose half a life in discovering what they might have been easily taught in a comparatively short space of time. In this country the system of scholarship is almost unknown, or at all events has not been adopted; and English painters, for the most part, die without the rising generations being theoretically or practically one whit the better for their labours.

Another great advantage of a national school of mural painting is this,—that it trains the faculty of adaptation to purpose or of design. The painter when he has a great public building to adorn is not free to will what he will, as on a piece of canvas: he has to do what is set him to do, under certain conditions of position, light, &c. A certain unity of style has to be preserved through a series of works, and that not only in the pictures themselves, but also in the subordinate surroundings and ornamentation, down to the most trivial accessory. The great national edifices in Greece and in Italy were real schools of design, and were the cause of their art manufactures attaining the first rank. We are too apt to think of Phidias only as the great sculptor of the frieze and pediments of the Parthenon, but we may gather from works on ancient art that he ruled all art matters in his day. The very tapestry work, for the robing of the Minerva, was under his supervision and direction.

We have tried our own system of art-education now for a great number of years, and I do not think we are altogether satisfied with it. Why, then, should we not adopt that ancient system of art-training which was productive of such magnificent results? I myself feel perfectly assured that had we spent a tithe of the money on the adornment of the public buildings with mural painting and sculpture that has been spent upon art-schools, English art and English art-manufactures would have made a much greater mark in the world. I trust, then, that I have again shown good cause why mural painting should be encouraged.

3. A third point of difference which we noted between the relative conditions of ancient and modern art was the very different relation in which the arts stood to the people. This was the result of the very different art-policy which was favoured and obtained in Greece and Italy. The leaders of the people during the periods of the two great art-epochs did not collect specimens of ancient art, and form museums of antiquities for the purpose of raising artists, in Greece, for one very good reason, that there were no antiquities to collect. Greece had to create her own art-treasures. The Italians took the same course. The Italian magnates did not turn their attention to antiquities till the character of Italian art had already been determined. The leaders of the people in the two great art-epochs became, either from culture, public spirit, or religious fervour, the promoters and encouragers of art, and more especially of mural or monumental painting.

The leaders of the people employed painters and sculptors to embellish with painting and sculpture either their private mansions or the grand national edifices. The people were thus taught to take an interest in all great public buildings, and to desire that their monumental edifices should wear an air of magnificence, and prove lasting records of the state of culture to which their cities or their country had attained. The grand example set in ancient days is, I am happy to say, not altogether lost on modern times. I believe I may venture to state that we owe Mr. Poynter's fine picture of Atalanta to Lord Wharncliffe's taste for mural painting.

Our object, therefore, should now be to find opportunities fit for the display of mural or monumental painting on the large scale we have just indicated; for this is precisely the class of painting which, more than any other, requires encouragement beyond the means of private patronage. The want of such encouragement has long been regretted, not by professors only, but by the few who have turned their attention to the state of painting in England,—a proof that the promotion of historic art is an object of interest with at least some portion of the public. The decoration of public buildings with a view to moral or religious purposes has always been necessary for the formation of a school of historical painting.

Knowing the vast importance which the encouragement of monumental painting is to the manufactures as well as to the intellectual grandeur of the country, I have not only advocated its encouragement by the pen, but have from time to time made suggestions in the hope that they might lead to a grand initiative being taken. One of these was a proposal to build a grand gallery, to be called the National History Gallery. It was to consist of a series of halls, each of which was to be devoted to some special period of English history, and embellished with mural paintings and sculpture on a grand scale. Here is an enterprise worthy of the enthusiasm of that devoted band which desires the encouragement of mural painting.

Liverpool has now an opportunity of emulating the public spirit of ancient days, and of setting a noble example to the rest of the kingdom, if she will but resolve to employ artists to adorn her public buildings, on a magnificent scale, with painting and sculpture, and with a munificence that she can well afford. But if she take the initiative, she must be cautious in her proceedings in this important art-reform; she must not labour under the very common misconception that decorative art is an inferior kind of art, and either call in ornamentists or house decorators. Nor must she imagine that giving painters commissions to paint frescoes here and there will bring about an era of mural painting. She must place a public building, or at least a single hall of a public building, under the charge of one painter, some one in whose talents she has confidence, under the charge of one who must be able to do more than paint a picture: he must be competent to conceive a series of pictures, and the mode of appropriately setting these in ornamental accessories, so that when completed the interior shall wear the aspect, not of patchwork, but of one compacted whole. Neither must Liverpool expect too much at once, and that all that she may at first have done will be immortal work. She must be prepared to have erasures as the art of mural painting shall progress. Neither Greece nor Italy leaped at once to the finest art. Each reached it as the reward of patient labour and well-directed study through the centuries. Therefore, the sooner a beginning is made, the sooner will the country be crowned with perfect work. Neither must Liverpool fall into the mistake of placing painters under architects. The painter and sculptor must be supreme in their spheres.

And now I trust I may have, in some measure, proved that the practice of mural painting is of the highest importance to art and the art industries, and that the country ought to take immediate steps for its revival and encouragement.

THE POSITION OF ARCHITECTURE.

By Mr. J. A. Picton, F.S.A.*

Union amongst those having a common pursuit has always been desirable, and never more so than at the present day. From an artistic point of view, no man possesses a monopoly of the sense of beauty in design and fitness in art. Man's creative power really consists in the combination of ideas and forces already existing, and to be found by observation on every side. Nothing tends so much to bring out these as the interchange of ideas, conference, discussion, continual efforts to realise in a concrete form the kaleidoscopic images floating before the mind's eye. Professionally considered, the advantages of union and co-operation are great. There is the *esprit de corps* which ought to distinguish every liberal profession, and which can only be maintained by the acquaintance of its members with each other. Separate and apart, each man looks upon his neighbour with an eye of suspicion and jealousy; wrong motives are imputed by mistake. Actions are misinterpreted, gossip and tattle intervene, and a low standard of professional etiquette injurious to the best interests of all concerned is necessarily the result. Whatever may be said of poor human nature, I have always found that the better we know each other, the more attachment and respect we feel. Every profession has its own standing to maintain against an outside public, who are always ready to serve their own interests without much consideration for others, and it is only by friendly

* Address delivered as President of the Liverpool Architectural Society at the opening meeting, Oct. 4th.

union and mutual support that this tendency can be counteracted. Again, there are points of practice continually occurring, and difficulties arising, where the aid of friendly counsel would be most valuable; such, for instance, as the effect of the various building and sanitary acts and by-laws, which are not unfrequently framed in error and oppressively carried out. The strength and combination of materials, and the introduction of new inventions and appliances, are also subjects on which experience and advice may be advantageously interchanged. I greatly fear that the architectural profession has not been sufficiently alive to the disadvantages of disunion, and has suffered accordingly. Compare for a moment the position of the architect with that of the members of other professions. The doctor and the lawyer are supreme in their several vocations. Neither patient nor client presumes to question the opinions pronounced on their respective cases. The engineer commits his employers to the expenditure of untold sums of money, in the great majority of instances without check or control. Even the surveyor and valuer is master of the situation. In the lending of money on mortgage, or in the settlement of railway compensations, although subject to severe collisions, his clients never presume to dictate the conclusions at which he should arrive. Far different is the fate of the unfortunate architect. The great majority of those who expend money in building consider themselves quite capable—if not of designing—at least of dictating to those who do. The magnificent schemes which are broached, the inflated ideas which are indulged, only to collapse when the estimates come in, are familiar to you all. Then there is the perpetual meddling as the work proceeds, one alteration leading to another necessarily springing out of it, until a bill of extra work is incurred ending in disputes and litigation, the blame of which too often is thrown on the architect. These evils are not altogether of modern growth. Sir Christopher Wren had the same cause of complaint in his day in the continual interference and thwarting of his plans by those in office who had the power. Think, again, of the abuses connected with the system of competition designs; the paltry premiums offered, which yet are eagerly grasped at by needy aspirants; the extravagant demands made for extensive accommodation at a price altogether inadequate; the debasing influence of eager rivalry, leading too often to tricky and meretricious colouring, false perspective and imperfect construction; the touting, canvassing, and jobbery in the adjudication; and it will be found that the architect is subjected to a martyrdom not suffered, at least to the same extent, by any other profession.

In France they manage these things differently, if not better. The architect as a skilled expert is compelled to pass through a certain course of instruction and examination, and obtain a certificate of competency. Competitions are not unknown and are frequently very severe, but they lie within a limited circle, and are adjudicated by skilful arbitrators. When an architect is appointed to construct a building, he assumes a responsibility and exercises an authority hardly known in this country. Whether a system of this kind would be compatible with the principles of free trade and open contract, so dearly prized amongst ourselves, is more than questionable; but, at all events, the evils existing demand a remedy, and certainly indicate the necessity of some closer union and association for mutual protection.

So much, then, for the strictly professional aspect of the case. But beyond this there is a wide field open for cultivation, for which societies of this kind are eminently qualified. Architecture lies on the border land of art and science, partaking partly of both, and is connected at various points with almost every subject of human inquiry. The wide realm of natural beauty in form and colour lies open for exploration. The adaptation of these in conventional forms to the purposes of design and construction is the foundation of all taste. The study of the harmonies and proportions to be found in natural objects has been the fertile source of many of the most successful constructions. Thus the broad base and upward curves of the massive oak tree gave to Smeaton the idea of stability of form, which he worked out in the Eddystone Lighthouse, whilst the tapering chambered shell of the Tarritella furnished Sir Christopher Wren with the principle of construction, so beautifully carried out in the spire of St. Bride's, Fleet-street.

Since it is the object of the art of architecture to provide shelter and convenience for mankind in all their various occupations and pursuits, there is no information on any subject of human inquiry which can come amiss to the architect, who may say with one of Terence's characters, "Homo sum; nihil humanum à me alienum puto." History and antiquities, chemistry, geology, natural history, voyages and travels, philology, may all be laid under contribution, and serve either to indicate the wants, or to suggest the materials and method of supplying them. A signal instance of the versatility to which I am alluding is to be found in the recent elaborate work of M. Viollet le Duc,—so well known as an architectural writer,—on Mont Blanc, its geology and its glaciers. In the introduction, he thus alludes to the connexion of the subject with his architectural pursuits:—

"Je devais en quelques mots à ceux qui voudront me lire, expliquer comment et pourquoi un architecte a laissé de temps à autre l'architecture pour entrer dans un domaine qui semble n'être pas le sien.

"De fait, notre globe n'est qu'un grand édifice dont toutes les parties ont une raison d'être; sa surface affecte des formes commandées par des lois impérieuses et suivies d'après un ordre logique.

"Analyser un groupe de montagnes, leur mode de formation, et les causes de leur ruine; reconnaître l'ordre qui a présidé à leur soulèvement, les conditions de leur résistance et de leur durée au milieu des agents atmosphériques; noter la chronologie de leur histoire; c'est, sur une plus grande échelle, se livrer à un travail méthodique d'analyse analogue à celui auquel s'astreint l'architecte practicien et archéologue qui établit ses déductions d'après l'étude des monuments."*

In the few remarks I propose yet to make, I will not drag you through the wearisome round of the history of the styles; whether architecture originated in wood or stone; whether the stream was derived from a single fountain head, modified in passing from age to age and from country to country, or if the sources were as numerous as the races who developed them. Suffice it to say, those who have preceded us in our art adapted it to the times, places, and circumstances in which they found themselves. Their work cannot be revived unless we could bring back the institutions, thoughts, feelings, and associations by which they were surrounded. To resuscitate a dead style is as impossible as to revive a dead body. We may gather the dry bones from the valley of vision and put them together in orderly array; nay, we may clothe them with a certain amount of beauty of form, but still these forms want the free play and vigour of life, and we have no power like the prophet to say, "Come from the four winds, O breath, and breathe upon these slain that they may live." Our predecessors in every age had their own work to do and we have ours; not by servile imitation, or by galvanising into spasmodic action obsolete and abandoned styles, but by studying the wants of the age and the enlarged means at our disposal, by going to nature for analogies and principles, and clothing their adaptations with such beauty as the wide stores of nature and art enable us to select and apply. In this way we shall work in the spirit of the old masters, and best carry out their aspirations adapted to a different age and different circumstances.

The present aspect of architectural taste and design offers some curious phenomena. In every previous age of the world down to the period of the Renaissance, and even subsequently, the provision for human wants in the way of building, and the decoration of the structures, followed in each age and in every land a single and specific course. Styles might differ in one country from another; but each country and period expressed its ideas in one architectural language,—its own vernacular, so to speak. The Renaissance of Classical forms in the sixteenth and seventeenth centuries did not alter this; when the revulsion from Mediævalism took place, it carried public opinion with it all along the line. It was the revival of Gothic architecture at the commencement of the present century which first introduced the element of confusion, which was further increased by the rage amongst the *dilettanti* for pure Greek forms brought before the public by the researches of Athenian Stuart and others. Fresh light breaking in from such a multitude of sources, the vision of our architects became dazzled; the public taste became distracted, and a laxity of tone set in which has been anything but favourable to the progress of architectural design.

For the revival of Gothic architecture a great deal may be said. Its first application was naturally to ecclesiastical structures, where it had the prestige of historical and traditional associations. It was further promoted by the reversion to patristic literature and rubrical development of an earnest party in the Church of England, in which the Gothic Renaissance operated both as cause and effect. The energy and progress of the Roman Catholic Church in England of late years, which has manifested itself in a great degree by the erection of many buildings pure in style and beautiful in design, has contributed powerfully in aid of the movement. But even in the adaptation of Gothic architecture to churches, there are many signs of unreality and sham. I will not go back to the time of Thomas Rickman, with its cast-iron window tracery and crockets, its wooden galleries and stucco fronts. I will take the church architecture of the present day, in which there is no doubt an amazing amount of progress, many of the buildings recently erected being noble specimens of liberality in the founders, and of taste and skill in the designers. Even here there is a want, an unavoidable absence of the singleness of mind which characterised the grand old masons of the Middle Ages. William of Sens, or Wayneflete, or Wykeham, when they designed the buildings which have perpetuated their names, never paused to consider the "period" from which their details should be taken,—whether their style should be Norman Transition; First, Second, or Third Pointed; whether their tracery should be geometrical, flowing, or perpendicular. An English author proposing to write a book does not hesitate whether it shall be composed in Latin, French, or English; nor even whether it shall be in the Anglo-Saxon of the Venerable Bede, or the half-obsolete phraseology of Chaucer or Gower. He writes in the current language of his time, intelligible to all. So all the architects of preceding ages carried out their ideas in the prevailing style of their age and country, improving and advancing no doubt, but true to the principles which were ready to their hand. The necessarily eclectic practice of the present day is certainly inimical to originality in design. The architect is fettered within the limits of the style or period adopted, and precluded from combinations and adaptations which were perfectly open to the architects of old. The German architects have felt this so much that they have thrown off all restraint, and in their Gothic designs adopt combinations of any style or form which recommend themselves by their intrinsic beauty or convenience. The result may be matter for discussion; but the church of Au, at Munich, and several churches in Berlin, may be pointed to as very successful examples of this freedom of treatment.

If instances were wanting of success in working in a common style with the introduction of original features, perhaps no better illustrations can be found than the works of Vanbrugh, at Blenheim and Castle Howard. The basis of the designs is the ordinary Italian style of his time; but unrestricted by this he has developed features of grandeur, salient points of picturesque effect, which were beyond the appreciation of the small critics of his day, but in which succeeding times have acknowledged the stamp of originality and genius.

In the eclectic styles of the present day, especially in Gothic architecture, such a mode of treatment is hardly possible. The artist aims at purity and consistency, and hardly dares venture to introduce a feature not found in the specimens of the period. Hence a certain degree of feebleness resulting in a prodigious amount of what Falstaff calls "damnable iteration." Génius, of course, will break through fetters of this kind. The designs of Mr. Street may be cited as presenting striking

* "I owe it to my readers to explain in a few words how and why an architect has from time to time forsaken architecture, to enter upon a domain which does not seem to belong to him.

The fact is, our globe is nothing but a huge structure, of which all the parts have a reason for their existence; its surface assumes forms which are enforced by imperative laws, and connected according to logical order.

To analyse curiously a group of mountains, their mode of formation and the causes of their decay; to recognize the arrangement which has prevailed at their elevation, the conditions of their resistance and duration in the midst of the atmospheric agencies; to note the chronology of their history; this is, on a larger scale, the carrying out of a methodical analysis, analogous to that within which the practical architect and archæologist restricts himself in establishing his deductions after the study of the monuments."

instances of original power, whilst keeping strictly within the essential principles of his prototypes.

In the almost exclusive application of Gothic architecture to the erection of churches, it is a question whether the whole system is not an anachronism. In the absence of any association of ideas with the past, it is hardly likely that for Protestant worship any one would have adopted the basilica form of nave and aisles. The piers present serious obstructions to seeing; the lofty centre and low sides are acoustically bad; the open roofs are hot in summer, and in winter render inevitable currents of cold air. For a ritual in which the people only indirectly partake, and in which processional displays are a constant feature, the basilica form is admirably adapted; but in the Protestant churches of England it is only the sentimental association and the presence of the old cathedrals constantly before our eyes which reconcile the mind to a large amount of inconvenience and unsuitableness. For all purposes of Protestant worship, nothing can be better adapted than the London churches built by Wren, which it is now the fashion so much to decry. The seeing and hearing are good, and the interiors are generally of noble design. If Gothic architecture be essential, it is rather remarkable that attention has never been directed to the churches in the south of France, which are in many cases without aisles, with vaulted roofs in domical compartments. The application of this principle would be a relief from the usual monotony.

From churches the Gothic style has spread to secular buildings: banks, town-halls, courts of justice, council-chambers must reproduce the outward and visible forms of Mediævalism. Sometimes this has a grand and noble effect, as in a great hall with its arcaded perspective, but applied generally the eye becomes wearied with the perpetual repetition of the same forms. This is to a great extent the case in the exterior of the new Town Hall at Manchester, which, with many merits, especially in its exterior, satiates the eye externally by its multiplicity of pointed arch openings, all nearly alike.

If there be one class of buildings which more than any other should associate itself with Roman architecture, it is that of courts of justice. The Romans gave laws to the world, and the elaborate code established by them forms the basis of law over nearly the whole of Christendom, and has had considerable influence amongst ourselves. If association is to be taken into account, nothing could be so appropriate as the visible connexion and affiliation of the external surroundings of the administration of justice with the great lawgivers of the world, whilst the Roman buildings, in their design and construction, are every way suitable. But "*Dis aliter visum est.*" The great centre of law and fountain of justice in our land is in one style of Gothic, the palace of the Legislature where the laws are framed is in another, and the various official buildings where the national business is transacted constitute an Italian colony between the two. We have thus an architectural "olla podrida" suited to tastes the most diverse.

The application of the Gothic style to street architecture cannot, on the whole, be considered a success. We meet occasionally with a few designs combining taste and simplicity, but in the great majority of instances there is a flutter and straining after effect which too often results in bizarre eccentricity. As an example of this I may point to the buildings in Church-street, erected by the late Mr. E. Pugin, in which the design is defaced by useless buttresses standing on nothing, and only adding superfluous weight.

In the city of Chester the rebuilding in the old streets has been very appropriately carried out in the original style, refined and adapted to modern convenience. In the erection of country villas and mansions, a modified style of Gothic seems to prevail; and many recent erections display considerable taste and effect. The freedom of treatment, which is so valuable in accommodating the design to the surrounding features, sometimes degenerates into a studied irregularity which mars its object by the very labour bestowed upon it. Whatever the cause may be, we seem committed at the present day to a plurality of styles of architecture.

Fashion in this, as in all other departments, exercises a powerful influence. Pure Greek, after running its course through town-halls and churches, of which that of St. Pancras is a memorable instance, came down to villas and terraces, and finally to shop-fronts, and having run its course may now be considered—in this country at least—utterly extinct. Italian architecture maintains its position, especially in our towns; and from the facility with which it can be handled, and the fact that the ordinary features of our common houses have been derived from that source, it is not likely to fall into desuetude.

The latest innovation is that of the so-called Queen Anne style. It is curious to note how "the whirligig of time brings in his revenges." It is not so long since the modified Italian, brought over from the Low Countries, and patronised from the Restoration to the reign of George I., was held up to scorn and ridicule, as impure and meretricious. We now find it brought prominently forward and introduced into public buildings of high pretension. That the Flemish architecture is capable of very picturesque effects, none who have seen the results in Amsterdam or Antwerp will deny; but to imitate defects, such as heavy-timbered casements, with small squares of glass studiously imperfect, is contrary to every principle of good taste. Our new Exchange, in Liverpool, which is free from absurdities of this kind, has many features derived from this school of art. Whether it will stand the test of criticism, in comparison with the stately structure which it replaced, time alone can show.*

CONVERSAZIONE OF THE ARCHITECTURAL ASSOCIATION.

DISTRIBUTION OF PRIZES.

THE opening *conversazione* of the Architectural Association was held on the 27th ult. The walls of the lower galleries in Conduit-street were hung with a large number of water-colour and other drawings of architectural subjects by Messrs. R. Phené Spiers, John O'Connor, J. D. Crace, Aston Webb, and many others equally well known, and there was a good display of tapestry and furniture by Mr. A. Lasenby Liberty, Messrs. Jackson & Graham, Collmann, and other firms, in addition to a large number of art objects and curiosities lent by various friends. By the courtesy of the Council of the Royal Institute of British Architects, their meeting-room and library were placed at the disposal of the Association for the evening, and the former apartment was devoted to the exhibition of the drawings and studies submitted in the various classes of the Association during the past session.

About nine o'clock the formal portion of the evening's proceedings commenced with the distribution of prizes, all consisting of standard works on architecture, decoration, &c. The following is the list of prize-winners:—

Class of Design. In this class ten members of the class submitted a sufficient number of sketches to entitle them to compete for the prize. The first prize was awarded to Mr. Sydney Vacher (78 marks), and the second prize to Mr. G. Langford (65 marks). Honourably mentioned—A. W. Hennings, 55 marks; H. M. Robinson, 49 marks; L. Stokes, 49 marks; F. Hemings, 27 marks; J. Twerdale, 27 marks; J. W. Fisher (country member), 9 marks; C. Dark, 3 marks; C. Richardson, 1 mark.

Elementary Class of Design. First prize awarded to Mr. H. W. Burrows, who seems to have attended and submitted a design at every meeting of the class. Second prize to Mr. H. W. Stock. The judges considered the designs of Messrs. James Robbins and J. F. Hennessey worthy of honourable mention.

Class of Construction and Practice.—First prize awarded to Mr. Turner. Second prize to Mr. Jackson.

Class for the Study of Colour Decoration.—Prize awarded to Mr. H. W. Pratt.

Essay Prize.—The judges reported that the essay of "Student" (Mr. R. Philip Day,) on "Concrete as a Building Material," was entitled to the prize, because, firstly, it noticed, in a practical common-sense manner, the important points connected with the composition and employment of this artificial building material; and secondly, although suggesting nothing new, the essay did not misstate facts or pervert the too slight historical description it sketched, while authorities quoted were, in every case, scrupulously recorded.

Measured Drawings Prize.—The judges reported that they were of opinion that the large amount of conscientious labour involved in measuring and delineating the five subjects of different character submitted by Thomas C. Yates, the candidate under the motto "Spes" (namely, Lincoln Cathedral,—Triforium in Presbytery, Chapter-house Entrance, Choir-stalls, Roman Pavement; Lindstone Hall,—Drawing-room and Breakfast-room), entitled him to receive the first prize. They awarded the second prize to Mr. George W. Browne, the candidate under the motto "Labor ipse Voluptas," for his measured drawings of Felmanham Church, Bedfordshire.

Prize Fund Prize.—Awarded to "Foi est tout," H. M. Robinson, four drawings. First Honourable Mention.—"Dos" (A. W. Hennings), five drawings. Second Honourable Mention.—"A Student's Attempt to Design," five drawings.

Mr. H. C. Boyes, the president, then delivered an address, the pith of which we will give in our next.

In response to an invitation by the Chairman, Professor Kerr said he always looked upon the Association's *conversazione* as the opening of one more session of architectural endeavour in London. In the course of a week or two there would be another opening meeting upstairs, under the auspices of the Royal Institute of British Architects. It struck him that there was a signal difference between those two meetings which rendered it peculiarly appropriate that the Association's opening meeting should be held first. Both societies gave their attention to the progress of architecture, and he presumed that all, or nearly all, the members of the Association, like the members of the Institute, were directly or indirectly more or less sincerely interested in the progress of architecture. When this subject was discussed upstairs, it was idle to ignore the fact that it was associated, in the minds of those who discussed it, not so much with the progress of architecture as an art as with the progress of architecture as a business. Men who were fifty or sixty years of age, and who had passed a considerable portion of their lives in the profitable pursuit of architecture as a profession, were not likely to be led away by enthusiasms (he would not say "whims") of any kind. Their attention was fixed upon the solid, substantial results of successful practice. But downstairs, under the auspices of the Association, there was a constantly maintained enthusiasm for the more sentimental, and, therefore, perhaps, more charming view of the subject. On such an occasion as the Association's *conversazione* the elder members of the profession who were present felt that they were putting on the shelf for a time the mere substantialities of business (which were all very well in their way, and without which they did not pretend for one moment that they would be able to exist), and were engaged in setting before themselves higher considerations and objects. Now, considering the circumstances of this country as a field of practice for the young architects in connexion with the Association, the fact should not be overlooked that the country was peculiarly constituted as regarded public opinion with reference to any such subjects as architecture. It was an old story that we were a nation of shopkeepers; it was a formula constantly used that we were a commercial community. That this was the case, architects and others found to their melancholy cost; for, with the public generally, commercial considerations availed to the exclusion of all others, and sooner or later architects were entirely disappointed in expecting anything like public-spirited encouragement of their profession. As an instance of the "commercial" way in which architecture was viewed by the public, he remembered that a country gentleman desired to build himself a house. He was at a loss (as such gentlemen generally were) to discover any person who could assist him in building it, but in the course of a ramble on the Continent he made the acquaintance of a certain noble lord, who should be nameless, to whom he communicated his intention. Said the noble lord,—"Let me give you my advice: don't have anything to do with those 'swell' architects; I know them all, and they are of no use! But there is a man in my corps who is a good practical man: he will do you justice." Now, that was not exactly the ground upon which the Architectural Association would consider that the question of architectural practice of the higher order should be based, but if, amongst cultured men, architects were looked upon in such a light, it became extremely necessary that the younger aspirants to the profession should be extremely careful to maintain the dignity of their art and profession, and therefore in connexion with the Association it could never be out of place to urge upon the members the necessity for maintaining—even at the risk of being charged with over-enthusiasm—a high tone of judgment, and a seriousness amounting to a grave self-assertiveness as regarded their functions in the State. This would prevent outside interference, and would preclude the setting up of low standards and the pulling down of high ones. There was too great a tendency on the part of the public to regard architects as mere "ornamentists," and this tendency was, in his opinion, increased by the acts of architects themselves. The members of the Association and all young architects should bear in mind what Mr. Boyes had expressed in his able address respecting the fact,—which became more and more plain the longer a man lived and practised as an architect,—that the average Englishman wanted very little art. If his business matters were properly transacted he would forgive his architect for the total absence of art in his building.

* To be continued.

Now, one circumstance which sprang out of that fact was that a certain class of architects, in their over-anxiety to advance the progress of art in such channels as the design of furniture, had caused the public to give currency to the idea (which he was afraid was becoming a matter of permanent belief amongst the more cultured classes) that a 'swell' architect was not to be trusted, but that the man to be trusted was he who made no such pretensions to art. As a matter of course, architects denied that this was true, but it was exceedingly necessary that architects should avoid leading their artistic desires too far afield in subjects which might be collateral, but which detracted from architecture when they were too closely identified with it. At the meeting of the Social Science Congress in Liverpool the other day a great deal of attention was bestowed on the subject of the design of furniture by architects. Now, the designing of furniture was a very pretty art, but, at the same time, it was greatly to be regretted that it should be identified with architecture at all: it had not been so in modern times until lately. No doubt members of the architectural profession, with the very best intentions, and with the greatest success in some cases, devoted themselves (for reasons of their own, or from causes over which they had no control) to the designing of furniture, and no doubt they did much to lead the public taste in the right direction, but they ought to let it be distinctly known that they did not design furniture in their capacity *as* architects, or the public might be led to believe that the qualities which sufficed to enable a man to excel in the comparatively trifling work of designing furniture would necessarily enable him to excel in the more magnificent work of designing buildings. The proprietors of one of our theatres lately determined to reproduce one of Shakspeare's plays upon a complete scale, and promised that the costumes, &c., should be archæologically correct. Now there could, of course, be no objection to that, especially if the people who went to see the play were competent to judge of the archæological accuracy of the costumes, which he (Professor Kerr) did not think they were. The proprietors of the theatre accordingly retained the services of a gentleman in the architectural profession, and possessed of archæological knowledge, and they publicly announced that the costumes were designed by that gentleman; and so, indeed, they were, but the people at the head of affairs in the theatre found that they could save a little money by sundry little deviations from the designs made for the costumes and heraldry. If these deviations were made, argued the managers, no one would know. What followed? Another gentleman of eminence in the profession went to see the revived play, and found it necessary to criticise the heraldry and to question the archæological accuracy of the costumes designed by his brother architect. A controversy was got up on the subject, and the result was that the public had come to the conclusion that architects were adding one more "whimsy" to the many with which they were already chargeable, and that, from being engaged in archæology up to the hilt, and in ecclesiology up to the hilt, and, more recently, in furniture-designing, they were now going in for the designing of costumes for stage plays. He thought that the rising architects who were identified with the Association, and who would be the leading architects of the country twenty years hence, could not be too careful in avoiding such courses of procedure as would lead the public to entertain the impression that architects devoted their attention to anything and everything but architecture.

Mr. James Fowler (mayor of Louth) made a few remarks as to the success of last summer's excursion of the Association, notwithstanding the much-regretted absence of that devoted friend of the Association, Mr. Edmund Sharpe.

Mr. F. H. Fowler (of the Metropolitan Board of Works) followed with some observations, in the course of which he said that, in view of the great public improvements which had been, which were being, and which would be carried out in London and other great cities, there were great hopes for the future of architecture in this country.

Mr. H. H. Statham said that, returning for a moment to the subject of the excellent address of the President, it seemed to him rather a curious indication of the turn which architectural thought was taking just now. We heard year after year of new revivals of old styles. For the past three years the subject had been the "Queen Anne" style. At first it was approached very doubtfully, then it was rather "pitched into," and now we were looking to what should be done when it had gone into its grave. He quite agreed with the President as to the advantage of taking a broad view of the subject, and of cultivating a knowledge of several styles rather than keeping to one. But why should not that principle be carried further? Why should not architects, instead of seeking to excel in any one or in any six styles, aim at the attainment of "style" quite irrespective of particular styles,—style in the abstract? This was a very abstruse subject, into which he did not propose to enter, but, broadly speaking, when the architect thought merely of the practical requirements of his building, and of the most practical way of using his materials so as to produce the best effect, he *made* "style." In illustration of what he meant he quoted a passage from the last volume of lectures by M. Viollet-le-Duc, to the effect that a modern musket had "style" in it, because it was suited for its purpose; but if it were sought to make the musket like a cross-bow, it would at at once lose that element of style. When architects had learned how to attain to style in the abstract, they might then go one step further, and consider "style" with reference to the right treatment of buildings for the present age. That was a phase of the question which had been very much neglected. In the buildings of our great towns what had to be done was first of all to make them healthy to live in. This was one of the great problems put before architects in the present day, and young architects would do well to keep constantly in mind the sanitary requirements of large cities.

Mr. R. Phené Spiers having made a few remarks, the formal part of the proceedings was brought to a close.

WARMINGTON CHURCH, NORTHANTS.

Warmington parish church has just been re-opened, after being for eighteen months in process of restoration. The church, which is dedicated to the Blessed Virgin, consists of a nave, side aisles, chancel, north and south porches, and tower, surmounted by a spire. The ground story on each side of the church is of the Transitional period; the tower, with its broached spire, is of the Lancet period; as also the west doorway, which is adorned with a profusion of tooth and flower ornaments; and the whole of the belfry windows and the three tiers of spire lights are also filled with tooth ornaments. The clearstory windows, with cusp foliations, indicate more approach to the Geometrical period. The wooden vaulted roof, of the Early English (or Lancet) period, is a very fine and somewhat remarkable one. The edifice has been repaired and restored throughout, the old material having been retained where possible. The work, which has cost somewhere about 4,000*l.*, has been carried out under the direction of Sir Gilbert Scott and Mr. Ferrey. The work has been contracted for by Mr. Thompson, of Peterborough, and Messrs. Barnes, Dale, & Clarke have done the woodwork.

Sir Gilbert Scott was present at the luncheon given after the re-opening of the church, and in responding to the toast of his health as architect, said it was a very curious circumstance that certain districts of England—and it was the same in other countries—were more replete with beautiful architectural examples than other districts. In England there was a district, not wholly in this county, but part in Lincoln, part in Norfolk, Cambridge, and Huntingdon, which might be marked out as the favoured land of architecture, particularly with regard to village churches; but what the cause of that was he did not know. If the Architectural Society were getting through their labours of a practical kind, they should devote themselves to investigating the history of the county as it bore upon the religious houses, and the causes of the wonderful fulness of the district of glorious specimens of architecture. It might be that it was the religious houses, and particularly was that the case with the great Abbey of Peterborough, which influenced it; but not wholly that. It might be that by their example they led other influences to bear strongly upon that; but not wholly that. In this particular instance they saw that "the cellarer" had had much influence; but if "the cellarer" produced such effects, what would the Abbey itself do? Having mentioned other churches in the district, the building of which had been influenced by the abbeys of Durham and Salisbury, Sir Gilbert went on to say that whether it was the race of people that inhabited the county—the good old Mercians, who were said now to be the central stem of the many-branched English race—whether it was their innate energy which led them to do it, he did not know; but we found the same influence pervading the earliest attempts. Look at Brixworth, among the numbers of Anglo-Saxon churches, all finer than in most other parts of the country; and in Peterborough, what was more glorious than the Norman nave, choir, and transepts, or more admirable than the Early English west façade of that church? Coming back to smaller buildings, they found in Warmington Church, so far as it did go back, a perfect carrying out of that principle, that this county had produced the best architecture at all periods. The earliest was not quite Norman, but almost. The arcades of the nave were semi-Norman, of that period when Norman was verging into Early English, perhaps about 1180 or 1190, just as good as they could be with moderate means, and nothing could be better in a moderate and simple way than they are. They were not quite so rich as the contemporary work at Stamford, but quite as good. The tower was of the same age probably as the west front of Peterborough Cathedral, not quite so good, but quite as rich as the work carried out at the patron abbey. At the same time that the tower was erected, the aisles of the church were rebuilt, but they were not such as they now stand; they were much narrower. The windows of the south aisle were built about the same time as the tower, though they were afterwards taken down and replaced in a different position from what they were in at first. The roof, however, was at a steep slope, and as there was not room for such magnificent windows, that was provided for by gables, each window having its own gable. In the course of the restoration one of those gables was discovered. The widening of the aisle was effected in the reign of Henry III., or in the reign of King John, and that widening was accompanied by the adding of the clearstory, which did not exist at the time the nave was built, or at the time the magnificent tower and spire were added. The clearstory being raised, it was found that a high-pitched roof would almost bury the newly-erected tower, and so a flat roof was put on, and there was added to it that beautiful timbered groining, the details of which were the most beautiful of that age. It was the age which produced Westminster Abbey, but he did not think that even Westminster Abbey contained any capitals so splendid as those of Warmington. So beautiful were they that when Butterfield was building St. Margaret's he sent to Warmington to get a cast of the capitals. About the same time the chancel was built, and, therefore, he should say that the nave was erected about 1180, the tower about 1220, and the widening of the aisles, the clearstory and the groined roof were completed about 1280, or a century later than the parts now existing. The chancel was of the same age, but from the walls having given way, the south wall was rebuilt in the fifteenth or perhaps the sixteenth century. The roofs of the aisles were renewed at a later period. The chancel screens were beautiful specimens of the later period, or the middle of the fifteenth century, most invaluable coloured decoration remaining. The pulpit did not differ much from them. The two screens he could not mention without a somewhat painful feeling, because as long as they were not restored one lived in dread that they would not be. There were little chantry or chapel screens at each end of the north and south aisles. The remains of that in the south aisle were as old as the aisle itself. They belonged to the reign of Henry III., and not to restore that part of the church, as it had come down to them would, he thought, be the most lamentable and most grievous error into which they could fall. There were also some beautiful remains of the screen which inclosed the chantry or chapel at the end of the north aisle. Their history was of curious value, not from their earliness, but oldness. Coming to another part of the history of architecture they had about the time of Henry VIII. several wonderful indications of Italian taste. Henry began it by bringing over here Torrigiano to execute the monuments of his father and mother in Westminster Abbey. The work, though wholly alien to Gothic architecture, was in itself most beautiful. About the same time in King's College Chapel, Cambridge, he employed the same architect to produce a screen upon which were his initials and those of Anne Boleyn. A little earlier he employed the

same Italian architect to make the royal pew at St. George's Chapel, Windsor, and on that were the initials of Catherine of Arragon. They had reason to know that some of the property in that parish belonged to Catherine of Arragon, and also that in the year 1528, a certain George Wickham left money for renovating the chantry chapel at the end of the north aisle, and there they found the beautiful remains of Italian work, as early, nearly, as that of Torrigiano of Westminster, and as early as that of King's College, Cambridge, and that of the royal pew at Windsor. Having those remarkable specimens of Italian architecture, he thought they might set themselves down as barbarians if they let those fragments be thrown into the fire, as he was ashamed to say a parishioner of Warmington had said they deserved to be.

THE HAMPSHIRE BANKING COMPANY'S NEW BUILDINGS IN THE CITY.

A new block of buildings which has just been erected in the City for the Hampshire Banking Company, whose head establishment has hitherto been at Southampton, was last week opened for business. The new premises, which are situated at the corner of Threadneedle-street and Bishopsgate, have three distinct elevations, with an aggregate frontage of 150 ft. Up to the first-floor level the building is in Portland stone rusticated, whilst the upper portions are in Boxground stone. The elevation at the angle of Threadneedle-street and Bishopsgate, facing eastwards, is circular in form, and, in addition to the ground-floor contains two upper stories. The façade is of an ornamental character, with elaborate carving, the entrance to the banking-house being in the centre. The ground-floor windows are large and bold, having arched heads, with massive sculptured heads for key-stones; and between the windows are circular fluted columns, with Corinthian capitals, carried up to the upper cornice of the elevation. The first and second floor windows have segment and pediment heads, with heads for key-stones, and a profusion of carving, and the elevation is surmounted by a bold cornice. The ground-floor of the Threadneedle-street elevation and also that in Bishopsgate, are uniform with that already described, and at the north-west corner of the Threadneedle-street frontage there is a separate entrance to the upper part of the building, with a stone staircase 11 ft. in width. In the upper portion of this elevation there are fluted pilasters between each window. The Bishopsgate-street frontage, in addition to the two stories above the ground-floor, contains pediment dormers, with a balustrade. The whole of the carved and sculptured work on the several frontages has been executed by Mr. Bromfield.

The entire ground-floor is intended to be devoted to the banking purposes of the establishment. The banking-house is about 60 ft. square, and 16 ft. in height. The floor is laid with Minton's encaustic tiles, and the walls and ceiling are artistically decorated. All the fittings and furniture are in polished oak. In addition to the banking-house there are the manager's private rooms and several offices. The building contains a large and spacious basement, and in the latter the strong rooms have been constructed. These are two in number,—one for the deposit of cash, 8 ft. square, and the other, which is intended for books and deeds, being 22 ft. by 16 ft. and 9 ft. in height. The walls of the strong rooms are faced with iron plates, and each is secured by massive doors and ventilating gates, the former of very strong construction of steel between iron, and lined with double fire-resisting chambers 3½ in. in thickness, and secured by three locks. These, along with the massive iron strong rooms, have been supplied by Milner's Safe Company, of Liverpool and London. In connexion with the strong rooms there is a lift for conveying the books, papers, and cash, to and from the banking-house. The whole of the floors of the building are filled in with concrete. It is intended to let portions of the upper part of the building for general business purposes.

The architect is Mr. H. Green, and the contractor, Mr. Shepherd, Mr. King having acted as clerk of works. The premises have cost upwards of 40,000*l*.

The American Institute of Architects. – The American Institute has held its tenth annual Convention, in Philadelphia. We will give some particulars of the proceedings in our next, space failing us in our present issue.

GLASGOW INSTITUTE OF ARCHITECTS.

The above Institute held its ninth annual general meeting on the 18th ult., at the Office, 157, St. Vincent-street. Mr. John Baird, I.A., president, was in the chair, and the meeting was well attended. Mr. Wm. Moffatt, architect, of Hamilton, having been admitted a member, the secretary, Mr. Wm. MacLean, submitted the annual report, and Mr. James Sellars, jun., treasurer, the statement of accounts, and both documents were unanimously adopted. The following local architects were then elected members of the council for the ensuing year:—Messrs. Campbell Douglas, John Gordon, David Thomson, John Honeyman, John Burnet, Wm. Leiper, Hugh Barclay, Wm. Forrest-Salmon, Alex. Petrie, and J. L. Cowan. At a previous meeting it was mentioned that the Royal Institute of British Architects submitted to the consideration of the Glasgow Institute a copy of the proposed general building regulations of the Local Government Board, and the Council now presented their report on the subject. It was recommended, among other matters, that the Institute should use its best endeavours to impress upon the various municipal bodies in Scotland the importance of the subject indicated, and to urge them to united action in obtaining a good Building Act, suitable for the whole kingdom, there being many obvious advantages in such a course, besides its economy. At a subsequent meeting of the newly-elected Council, Mr. John Burnet was elected president for the ensuing year, and Mr. John Honeyman vice-president. The names of the secretary and treasurer remain as before.

RESTORATIONS AT ROWLAND HILL'S CHAPEL.

It was generally understood that the new edifice at the corner of Westminster Bridge-road and Kennington-road, called Christ Church, which has just been built and opened for the services of the Rev. Newman Hall, was erected in anticipation of the old octagonal building in Blackfriars-road, known as Surrey Chapel (Rowland Hill's), being taken down. It now appears, however, that this well-known historical structure will in all probability remain undisturbed. The remaining portion of the lease, which has about six years to run, has been transferred by the trustees to the Primitive Methodist body, who have obtained possession of the edifice, and we understand that negotiations are now in progress under which it is very likely that the lease will be renewed, and the building preserved. It is at present undergoing restorations, both externally and internally. The contractor for the work is Mr. W. Hobern, of New Kent-road.

The remains of Rowland Hill are buried in a vault in front of the pulpit, and it is stated that the authorities of the new edifice in Westminster Bridge-road, which is designated as a "perpetuation of Surrey Chapel," contemplate the removal of the distinguished preacher's remains, with the view of having them re-interred in some public cemetery, where a monument is to be erected.

THE NATIONAL SAFE DEPOSIT COMPANY'S BUILDINGS.

It appears from the proceedings at the meeting of the shareholders of the National Safe Deposit Company, held last week, that the business of the company has not so far answered the expectations of the promoters, and that the returns upon the large outlay incurred on the building are disappointing. The report stated that owing to the unprecedented depression in commercial business since the company commenced operations, there had been little demand for new offices in the City, and that the greater part of the superstructure of the company's building, on the rents for which the directors relied for the funds necessary to pay ground-rent and other expenses, had remained unoccupied to the present time, but that during the last few months the whole of the ground-floor had been let to the Bank of New Zealand, and portions of the upper floors had also been let on terms which would produce an annual income of 4,500*l*., exclusive of the revenue derived from the safes and other sources, amounting to 3,000*l*. a year. It added that the objects of the company were still very imperfectly known or understood by the public. The chairman, in the course of his remarks, said that when the company was first constituted the directors anticipated a far greater measure of success than that which they had met with, for they had never expected that their premises would have remained so long unlet. In order to complete the building 100,000*l*. in debentures at 6 per cent. had been issued as a first charge upon the building, and although they had now been opened a year the income still remained far short of the expenses. A shareholder complained that the expenditure upon the building had been unnecessarily extravagant, as one instance of which he mentioned that the vaults for the deposit of valuables had been made even more secure than those of any bank. We are obliged to agree with the aforesaid shareholder, although we should have taken another point for our illustration. A strong simple building in a less costly thoroughfare might have been made a success.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The first general meeting of the new session will be held on Monday evening, the 6th of November, when the President, Mr. Charles Barry, F.S.A., will deliver his opening address. The following papers will be read during the present session:—

Nov. 20.—"The Influence of Business Requirements upon Street Architecture." By Samuel Knight, Associate.

Dec. 4.—A Notice of the Recent Travels of Lieut.-Col. Playfair, H.M. Consul in Algeria and Tunis, illustrated by Bruce's original Drawings." By Professor Donaldson, Past President.

Dec. 4.—A Description of the "Metroscope" (an Instrument for Measuring the Height of inaccessible Buildings). By Thomas N. Taslett.

Dec. 18.—"On the Internal Fittings of Wren's City Churches." By E. B. Ferrey, Associate.

Jan. 8 (1877).—"On Sanitary and Practical Appliances calculated to increase the Comfort of Dwellings." By John Lanyon, Fellow.

Jan. 22.—"On the Optical Refinements of Greek Architecture." By F. C. Penrose, M.A., Fellow.

Feb. 5.—"On the Ecclesiastical Architecture of Scotland." By R. Anderson, Fellow.

Feb. 19.—"Description of the Manchester Town Hall." By A. Waterhouse, Fellow.

March 19.—"The Benedictine Abbey of St. Mary, Sherborne, with Notes on the Restoration of its Church." By R. H. Carpenter, Fellow.

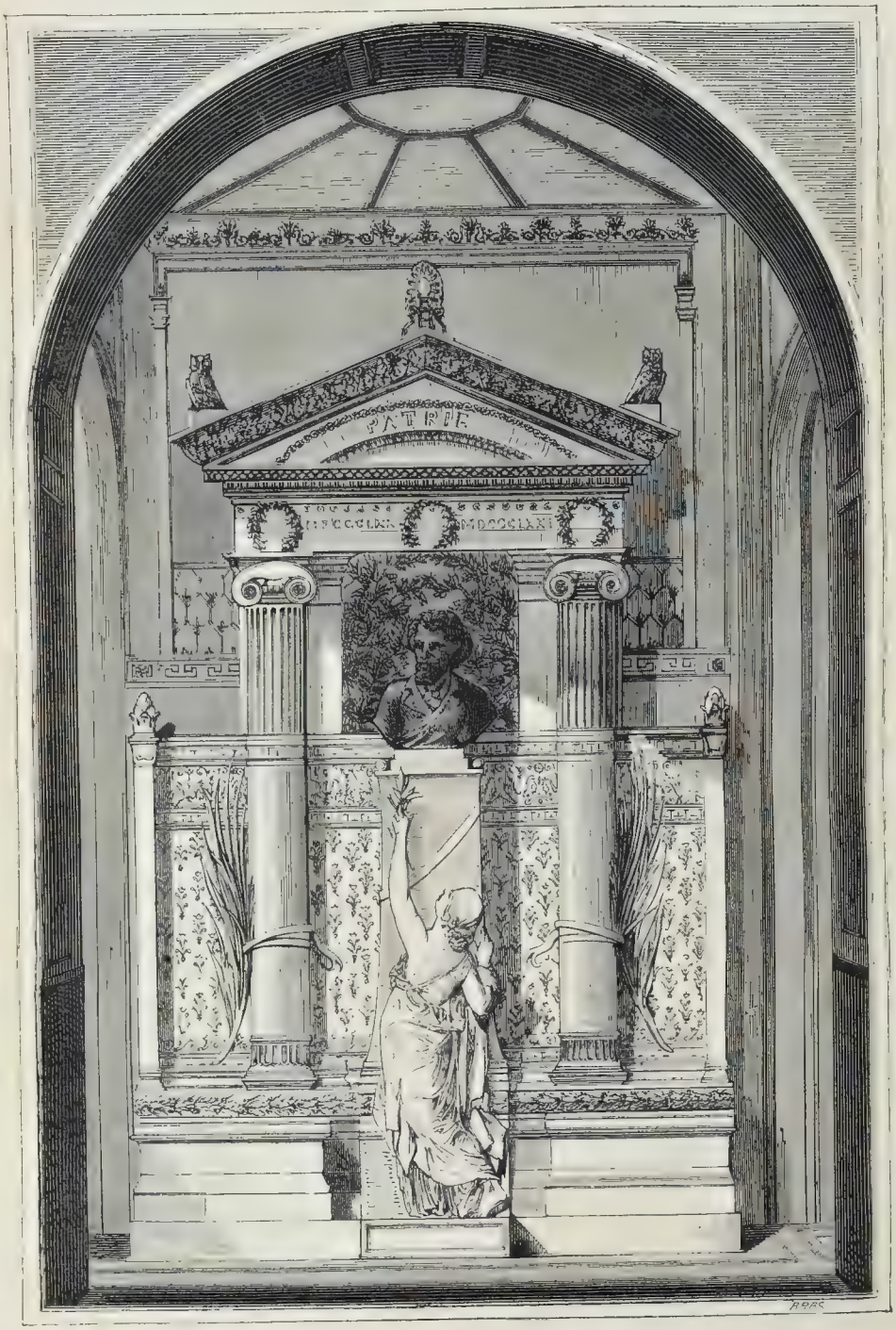
May 28.—"On London Improvements,—Past suggestions and future Possibilities." By H. H. Statham, Associate."

THE MONUMENT TO HENRI REGNAULT, PAINTER.

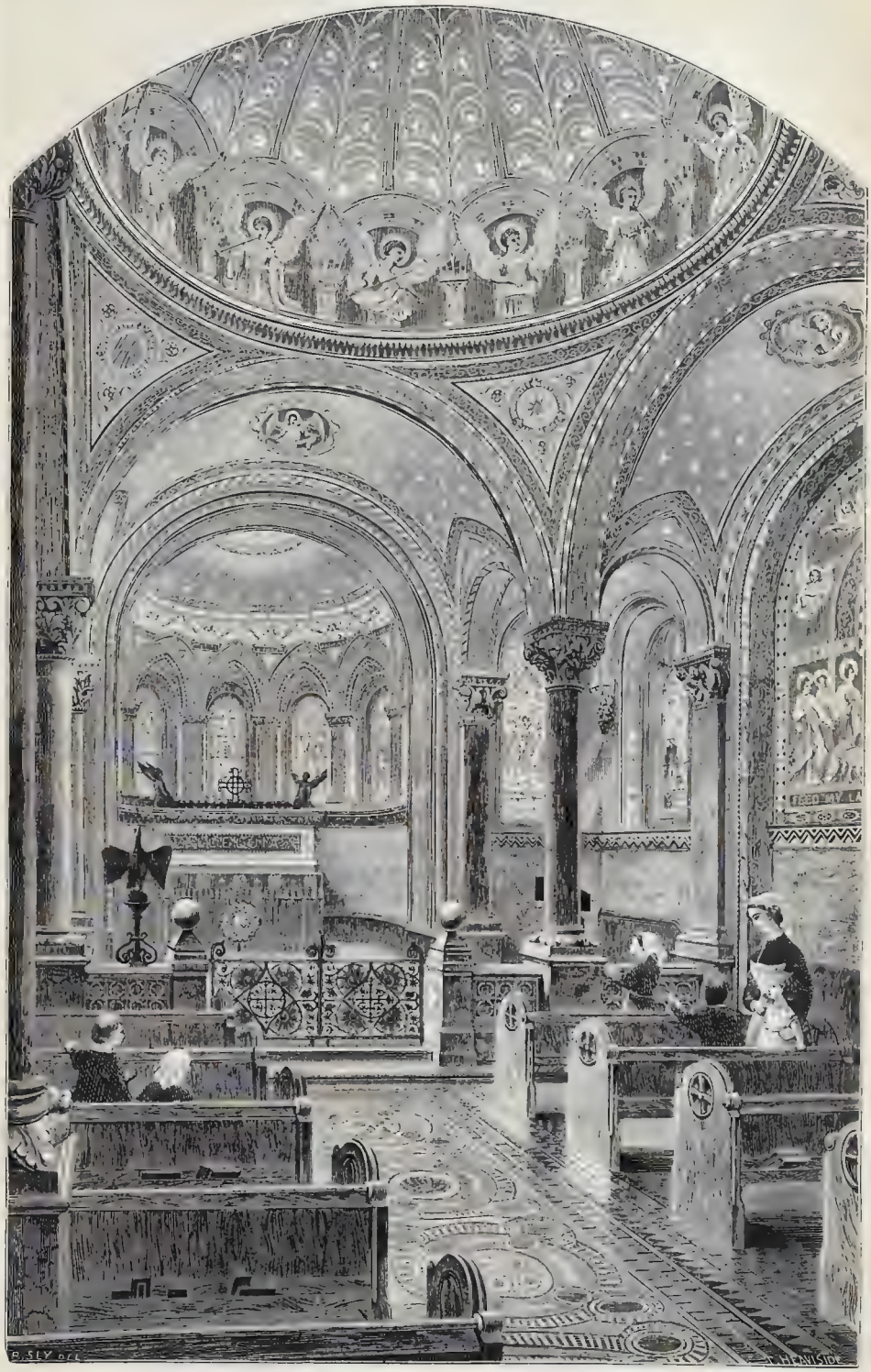
No death, the result of the late Franco-German war, has been more lamented than that of Henri Regnault. Leaving the East, where he was pursuing his art, he at once returned when Paris was menaced, and took his part in the defence. More heroic or less prudent than his companions, after the momentous battle of January 21st, 1871, he hesitated to quit the scene of the disaster, and was killed by one of the last shots fired by the enemy. As a man and as an artist, he has been loudly wept. No wonder, then, that his country has raised a monument to his memory. It was inaugurated quite recently, and we now give a view of it. It is the tradition of the *École des Beaux Arts* that when one of its pupils claims a monument, a pupil of the same year is charged with the design of it. Following this out, M. Pascal, assisted by M. Coquart, the architect in ordinary of the school, has produced the work we illustrate, a work which is not wanting in originality and beauty. Marble and gilding aid in giving a richer effect than can be conveyed by black and white. The bust, of bronze, was executed by M. Degeorge, also one of Regnault's comrades, and the ideal figure *La Jeunesse*, which raises the golden laurel towards the bust of the departed artist, is the charming work of M. Chapu.

In connexion with the subject, it may be mentioned that at the Crystal Palace Concert of Saturday, the 21st ult., there was played a "Marche Héroïque," composed in memory of Regnault, by M. Saint-Saëns, organist of the Madeleine, at Paris; so that the deceased painter has not been without special homage from three sections of the artist community.

Stonyhurst College.—This Roman Catholic seminary, which was founded by the Jesuits in 1840, is now receiving extensive additions in an enlargement of the buildings behind the church. For this purpose a large portion of the land hitherto used as a playground will be required. The contractor for the excavations is Mr. Bradwell, of Bath, who has about 200 men at work.



THE MONUMENT OF HENRI REGNAULT, PAINTER, PARIS.



THE CHAPEL OF THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

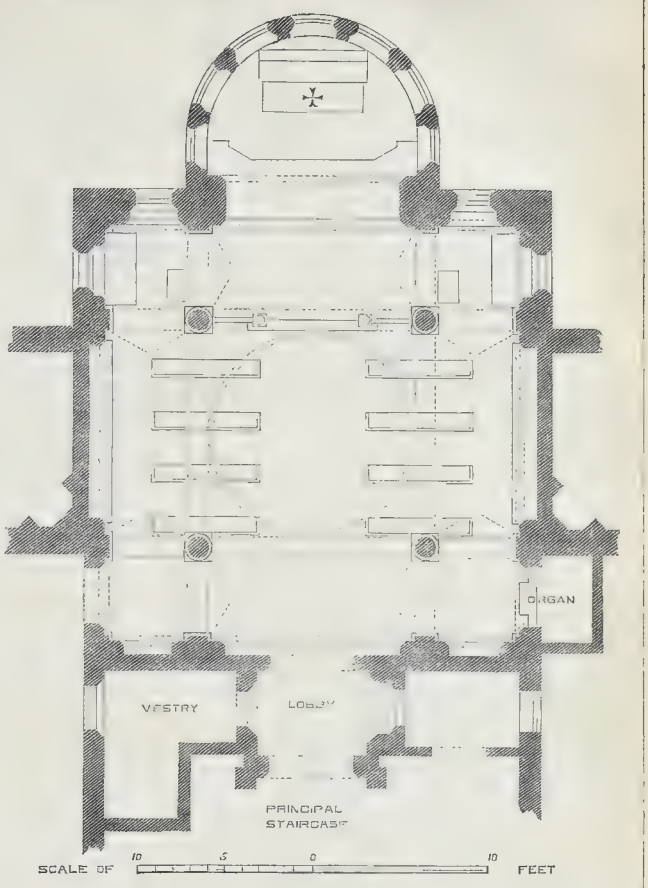
PROFESSOR EDWARD BARRY, R.A., ARCHITECT.

THE CHAPEL OF THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

The new hospital in Great Ormond-street, as designed by Mr. Edward Barry, R.A., has already been illustrated in our pages. A portion of it is now complete; but the whole design cannot be carried out until further and sufficient funds are forthcoming. In the central block, towards Powis-place, which is finished, and has recently been opened, the chapel is a conspicuous feature. It is placed immediately opposite the main entrance, and is entered through the principal staircase. The plan is rectangular, being about 24 ft. square, domed, and with an apse in addition to these dimensions. The apse is semicircular on plan, and forms a sacrarium or chancel. The main body of the chapel is subdivided by the introduction of four columns, from which spring arches, the corners being occupied with small domes, or rather groined ceilings. A dome of greater height occupies the central part of the chapel. The walls are lined with alabaster on marble plinths. The columns are of polished red Devonshire marble, on alabaster bases, and green marble pedestals. The capitals, which are gilt, are richly carved, and in common with the rest of the chapel they display a Byzantine type of architecture. The reredos is of alabaster and marble, and the paving about the altar is of marble in small pieces, recalling in design some of the pavements of St. Mark's, Venice. The sacrarium is divided from the body of the chapel by a low screen. This is constructed of alabaster in panels. Each panel contains a brass rose, and the plinth and capping of the screen are of polished marble. In the centre are gates of solid brass, elaborately modelled. The centre aisle or passage is paved with pottery mosaics, in bold and effective patterns. All the windows are filled with stained glass. Those in the apse represent the birth of Our Lord, and the various events of his childhood, as the adoration of the Magi, the presentation in the Temple, the flight into Egypt, and the youthful Saviour teaching in the Temple. The other windows in the body of the chapel are devoted to the representation of Old and New Testament saints. We find here Samuel, Timothy, and little children in the Temple, also St. John the Baptist. The walls are covered with pictures. These have reference to childhood as depicted in the Bible, and their subjects are indicated by the texts written beneath them. "Suffer little children to come unto me," "Feed my lambs," &c. In the centre of the ceiling of the apse there is a medallion containing the "Spotless Lamb," bearing a cross, and the domed ceiling over the body of the chapel displays a pelican feeding its young. The whole of the painting, as well as the stained glass, is by Messrs. Clayton & Bell.

The prayers are said and sermons preached from desks placed one on each side, inside the sacrarium, and there is also a brass eagle for the lessons fixed on the low screen before referred to. An organ has been constructed in a recess in the angle of the chapel at the right of the entrance doorway. The ceiling is richly decorated with gilding and colour, and the apse is ornamented with angels on a gold ground, displaying the characteristic graces of children, such as Faith, Truth, Patience, Purity, Obedience, Charity, Honour, and Hope. The seats and all the wooden fittings are ebonised black, and polished.

From the foregoing description our readers will have gathered that, although the dimensions of the chapel are small, no expense has been spared in its construction and decoration. It is right, therefore, to add that this work has not been carried out at the cost of the hospital. No portion of the funds of the latter have been expended upon it, and every charge connected with the work (even to the cost of the altar-cloth, hassocks, and books) has been defrayed by a relative of the architect, Mr. William Henry Barry, who has presented this elaborate offering to the hospital, an unobtrusive inscription over the door stating that the work has been done "to the glory of God and in loving memory" of a dearly-loved wife, cut off in the prime of life, and devotedly attached to little children. The chapel has thus been a labour of love, and nothing has been spared for its successful realisation. It now forms an essential part of the Hospital for Sick Children, to which we may wish every success in its endeavours to minister to the afflicted in mind or body, among the poor and suffering classes, for which this and kindred institutions have been founded.



THE CHAPEL OF THE HOSPITAL FOR SICK CHILDREN.—*Plan.*

ON THE PNEUMATICS OF THE HOUSE-DRAIN AND A SIMPLE FORM OF TRAP.*

As there are evidences visible to those who are concerned in sanitary pursuits, that the general public are becoming more alive to the value and importance of personal attention to domestic sanitary arrangements, I am induced to refer briefly to a simple device—if so small a matter is worth notice—for preventing the ingress of sewage emanations into the interior of the house, through the most usual, but far from only, medium, the drains. It at once acts as a ventilator to the sewer or cesspit and lower parts of drain, also effectually ventilating the house-drains, soil-pipes, sinks, closets, bath, or other pipes in communication with the house-drainage system, by the agency of a continuous circulating column of air fresh from the external atmosphere, sweeping through the pipes, if they are maintained open at the upper extremities to the outer air.

It is a good many years ago since I first had occasion to devise some scheme for excluding sewer exhalations from the house atmosphere, and I have generally found that the plan about to be referred to has successfully accomplished the object in view.

In the absence of provision for sewer ventilation, it is now tolerably well recognised that sewer air does more or less find an entrance into any building with which the drainage scheme is connected. Such every-day appliances as bell-traps, D-traps, syphons, &c, with which 99 per cent. of houses are furnished having any claims to drainage at all, readily permit of the discharge of gaseous sewage into the various offices of the building they are attached to, either by defective joints and materials, or simply forcing the water-seal, and blowing into the interior; and, again, by the subtler and more frequent mode of *conduction* through the water.

In cases where the sewer and drains are ventilated by rain-water down-spouts, or by the soil and other pipes conveying fluid refuse, by apertures at the upper ends, it is not so widely known that injurious results often follow. Nay, amongst jobbing builders and their staff, to whom is generally left the care of the house, it is a standing article of belief that with a sewer ventilating into the street, and the drain by an upright pipe, mal-odours cannot exist in a house from such source.

A considerable improvement is to ventilate the sewer by one channel, then outside the house wall to introduce a syphon trap, so as to obstruct aërial connexion between the house and sewer, leaving, as before, the upper orifices of the house pipes open to the outer air. Even this course is not always satisfactory; for air currents within the pipes are often downwards, and the vaporous emissions from foul pipes, and that which passes the syphon by *conduction*, are blown into the house.

On this subject the general opinion would

* By Mr. Richard Weaver, C.E. Contributed to the Social Science Congress, Liverpool; but, in absence of writer, not read.

seem to be that, given a tube open at its summit discharging effete matter from a building, there is necessarily an upward aërial flow. This, however, is by no means so universally. Charge a pipe with visible and nearly imponderable matter, such as smoke, and it will be observed that the current will as likely be downward as ascendant. Sometimes it is intermittent, the puffs oscillating up and down alternately. Not unfrequently it may be noted the course is fairly uniform in one direction, then again in the opposite: with the same pipe under observation, these alternations of aërial currents inside the tube are witnessed; also, when a number of pipes connected with different buildings are under experiment, it may be observed that equally confusing results ensue. When the conditions of working are apparently alike, the currents are again dissimilar and erratic. With a wind of moderate pressure, a strong blast descends the ventilator, and blows through not alone defective joints, but water-seals also. I have known houses rendered uninhabitable by this descendant motion of wind rattling down water-spouts and soil-pipes, up through the closet-pans and sink-traps, sucking sewer air from the lower pipes, and carried forward into the interior of the dwelling.

Now, observation has led to the fact that where a proper opening connected with the external air exists near the base of pipes delivering from the house,—at a point, however, above the water-trap, placed beyond the building, which certainly no house ought to be without, but which, in reality, few possess,—no tainted air passes into the interior of that building. There is at all times a current flowing in one direction or the other, which, in calm cold weather, with steady barometer, is barely perceptible. In a hot, calm season there is a quickened upward flow, while, with a strong wind, a sharp blast passes either upwards or downwards. Should the breeze blow squarely and steadily across the orifice of the ascendant pipe, the blast is upwards, caused by a reduction of pressure within the pipe by rapid passage of a gaseous body over the mouth, as is witnessed in the toy spray-disperser. If, however, wind deflections are created by projecting bodies, as gables and chimney-stacks, the motion of the air is downwards.

These and other observations, culled years ago in the course of professional practice as a sanitary adviser, led me to provide an opening in the lower exit drain-pipes, just outside the house, to facilitate the passage of air through them, thus cutting off aërial communication with the sewer, except such sewer-gas as effects a passage by conduction through the water-seal of a syphon, by means of a trap at a lower point, and reducing the stagnant foul air of the pipes within the house to approximately the same quality as the external atmosphere. This result I always arranged by local materials, and obtained the object in various ways, according to the position and circumstances of the particular house or other building to be treated. In one the end would be achieved by inserting a small inverted syphon tapped into the soil or other down-pipe externally fixed, with its mouth uppermost, into which a current of air passed. In another the desired result was attained by delivering the sewage over a D or other trap, with the grate removed to the ground-line to carry away surface water, and provide for the passage of fresh air into the house-pipes. An effective mode is by removing the upper half of a sewer or drain pipe, building up the sides vertically to the ground and fitting a grid, at a lower point fixing a syphon or dished channel of cement, with a lip dipping a few inches into the water.

Some three or four years since several of these methods were advised by me at her Majesty's Convict Prison, at Chatham, for excluding sewer gas from the various inhabited buildings there. Owing to peculiarities of site and tidal influences, the sewer emissions in that place were voluminous in quantity and strong of scent; but the means devised of cutting off direct contact with the sewers and the circulatory system of ventilating drains by introducing air at the lower points, above the outer traps, finally prevented contamination to the internal air of the rooms.

Extemporaneous ways of the sorts here sketched are equally sure, if carried out under skilled direction, in ventilating house-drains and sewers, when the vertical pipes are open above, and are tolerably certain in severing gaseous connexion between the sewer and house through the drains. There is, however, a numerous class of persons, very worthy folks no doubt, and possibly actuated by honest intentions, but whose actions I fear are often more obstructive than beneficial. With these gentlemen the effects of makeshift expedients of the kinds described may be the reverse of satisfactory, and constitute all the difference between a healthy and an unhealthy house.

Having in view the requirements of a large section of householders, and experiencing the difficulty of obtaining a satisfactory sewer-gas trap, which is at once economical in cost and effective in action, I have registered a design which in one piece secures the combined advantages just referred to.

Conceive, if you please, an ordinary 6-in. syphon pipe, with a 3-in. junction attached at the spigot end, with a square slice about 4 in. by 4 in. cut out of the upper surface of the pipe, at the socket end, into which a grate is dropped, and that is what I present as a cheap, simple, and thoroughly effective house-drain trap. Sewer gas is prevented from passing the water seal by force as it is conveyed away to a convenient outlet through the small junction. Any foul matters,—partly gaseous, partly vapours,—the volatile products of organic decomposition within the sewers effecting a silent passage through the water-seal of the syphon by the process I have termed *conduction*, are immediately diluted with a large volume of air, fresh from the atmosphere and swept outwards. With the equilibrium of pressure established between each side of the trap secured by the junction-pipe delivering the aërial sewage into the outer air, there is a reduced tendency to absorption of such matter by the surface-water of the syphon on the sewer side; consequently less mephitic air passes the trap upon saturation, to be given off again on the house side, but such small quantity, as before stated, at once mingles with the fresh air copiously pouring in through the grid, and is ultimately discharged into the outside air above the house-top, after flowing through the system of house-drains and internal pipes, which are so maintained in a comparatively sweet condition.

I am professionally able to affirm, from an intimate acquaintance with the condition of house drainage in the metropolis and provincial towns, as well as of country districts, from information personally gleaned on the spots, that by far the bulk of English homes are less salubrious, indeed much less so, than they ought to be. But I believe that the exercise of judgment and discrimination on the part of heads of establishments in occasional amateur sanitary inspection, or by the safer and really economical system, the principle of which is highly approved by Sir William W. Gull, bart., of periodic inspection by a skilful sanitary engineer, will help to improve materially the salubrity and comfort of homesteads.

A large majority of houses are unhealthy through sewer exhalations penetrating into them, but most of them may be improved by using the inexpensive contrivance I have submitted to you. Messrs. Stiff, of the Lambeth Potteries, I think, will undertake the manufacture of the apparatus, and, from what I hear, those gentlemen will be in a position to supply it for a few shillings, at a charge very little above the price of a common syphon-pipe, which is really so reasonable as to be within the reach of every cottager.

ENGINEERING WORKS IN PROGRESS.

INSTITUTION OF ENGINEERS AND SHIPBUILDERS IN SCOTLAND.

At the opening meeting (October 24th) Mr. R. Bruce Bell, C.E., as president, delivered an introductory address. Towards the close of it he said:—It has been usual in the opening addresses of our presidents to give a summary review of the various engineering works of consequence in course of construction throughout the country; but this field has been so well gone over by my recent predecessors, and there is so little to add regarding any recent works of very great magnitude in civil engineering, that I will not touch upon this ground. I may notice, however, that we are at last to have in Scotland one if not two respectable railway stations, viz., that of the Union Railway in St. Enoch-square in Glasgow, and the Caledonian in Gordon-street, crossing the Clyde, which is to be approached by a viaduct.

In allusion to this, I cannot help remarking upon the unsightly structures which engineers seem universally to adopt when crossing our large rivers with railway viaducts of iron. Why this should be the case when iron is used seems strange, because when stone is adopted as the material we have often very fine examples of viaducts for railways; but on the Thames and the Clyde, although we have fine roadway bridges, both of stone and iron, the railway bridges are as artistic specimens simply execrable, and in connexion with this railway station at Gordon-street I am sorry to find that another eye-sore is about to be inflicted on Glasgow, whereby a great opportunity has been lost, as by a proper arrangement of the same amount of iron, and with the height and width of the span at command, a most artistic structure might have been produced.

The North British Railway is also engaged upon a work of great magnitude in the construction of the Tay Bridge by Mr. Bouch, otherwise in railway work in Scotland there is not much calling for any special remarks. In sea works we have not done much of late years in Scotland of any great importance, although in this branch of engineering I have to notice the advance that has been made of late years in the use of concrete as a building material.

In works exposed to the fury of the ocean the great object has been to obtain blocks of stone of such size as to be placed beyond the possibility of being lifted by the force of the sea. The old mode of building by stones obtained from the quarry, clamped and fastened together, involved great care and cost in workmanship, and as blocks of five, ten, and even twenty tons would not of themselves by their own weight resist the upheaval of the waves, it was hardly possible to get stones quarried of sufficient size. This is now, however, effected by the adoption of artificial blocks of concrete. The first engineer who adopted this on a very large scale was Mr. Bindon Stoney, of Dublin, who built, and lifted, and set in place, blocks of 350 tons weight in the construction of the river-wall in Dublin Bay. The machinery by which this was effected was of a most elaborate and costly character, nevertheless the work was executed at a moderate cost. The situation of this work, however, was in comparatively smooth water.

In the Tyne piers, with an exposure to the open sea of the German Ocean, Mr. Messent is laying blocks of 40 to 60 tons, and Mr. Dyce Cay has also been executing some heavy work in Aberdeen, exposed to very heavy seas; but a work at present in progress subject to the greatest exposure is Sir John Coode's work at Jersey Harbour, exposed to a sea and tideway unsurpassed anywhere in its destructive character. Mr. Imrie Bell, the engineer, who is constructing this work, is now forming blocks of 100 tons weight, which are carried out to sea suspended under the bottom of a large welled barge and set in their places, the bottom foundation having been previously prepared with concrete in bags containing 10 to 20 tons in each, lowered through the wells of barges.

Another mode of using concrete is by setting it in a mass *in situ*, thus making the pier or wall a monolith, although it is not many years since this mode of using concrete, or of setting concrete in any form under water, was looked upon by engineers with distrust. Its first introduction for habour works on a large scale placed *in situ* under water was in the foundations of the sea-walls of the Albert Harbour at Greenock, which were built without cofferdams by Mr. Miller and myself in 1861, and at that time we could hardly get any engineer to support our view as to its being a reliable mode of building. Of late years, however, concrete has become a universal system of building sea works where cost and time are matters of importance.

The great engineering problem for Glasgow is at present the means of getting quit of the sewage. This has been grappled with by Sir John Hawkshaw as Her Majesty's Commissioner, and whose report is before the public; but it appears to be a question whether he has exhausted the subject, or arrived at any such definite conclusion as can lead to active measures being taken, or has on the contrary left the matter very much where it stood before. One provision, however, which he has suggested will, if properly acted upon, pave the way for definite action, which is the constitution of a Board of "Sanitary Commissioners of the Clyde." All that can be said at present, however, regarding the prevention of the pollution of the Clyde, is that it is still a problem for the future.

Having, what with Bateman, Bazalgette, and Hawkshaw, so far exhausted the talent of London in purely engineering expedients, the ground may be now free for the proposal of some more

scientific combination of chemistry and engineering.

I do not intend to refer further to engineering works in the country; but will, in connexion with what I have previously referred to, take some notice of what is doing in America, where I have had some opportunity lately of seeing what our neighbours are about; and I can only say that, whatever pride we may take in our great undertakings here, we must be prepared to recognise that American engineers have in some things surpassed us.

I was last year appointed upon a committee, along with an American and a Canadian engineer, General Newton, of the United States army, and lieut.-colonel of the corps of military engineers, and Mr. Sandford Fleming, engineer-in-chief of the Intercolonial, and of the Canadian and Pacific Railways, in an examination of one of the largest rivers in North America, with the view of carrying out an improvement of the harbour of Montreal. General Newton afforded me the opportunity, whilst in New York, of inspecting the works of one of the most interesting undertakings of the present day connected with the improvement of river navigation, — the removal of Hallet's Point Reef forming the threshold of Hell-gate, which has long been the terror of navigators and underwriters, but which was, on the 24th of September, reduced to a thing of the past. As is well known, there are two entrances to the sea from New York, the one by Sandy Hook and the other by Long Island Sound, through the East River. The East River Channel is the shortest and most direct route to the north, and has besides a great amount of local navigation, although it is a dangerous channel, and has been the scene of much shipwreck and loss of life and property. This so-called East River is not properly a river, but a narrow strait, separating Manhattan Island, upon which New York is built, and the mainland beyond this, from Long Island. The strait, after passing Hell-gate and Throg's-neck, widens out into the Long Island Sound, and enters the sea at a distance of 130 miles further north than the Sandy Hook entrance. We have thus two bays entering from the ocean at a distance of 130 miles apart, and connected by the East River channel. The tide in the bay of New York rises to its full height at the entrance of the East River nearly three hours earlier than it does at the other end of the strait, at its entrance from Long Island Sound; and although the rise and fall of tide is not more than 6 ft. in New York Bay, and 9 ft. in Long Island Sound, yet as this channel is only eighteen miles in length, this head is sufficient to cause a very rapid current to flow through the strait; and where obstructions and contractions occur it is turned in fact into rapids and whirlpools. The worst of these obstructions occurred opposite Hallet's Reef, where the strait takes a rapid turn, and from this point a reef of rock jutted out into the channel, with only 9 ft. to 12 ft. of water upon it, the stream rushing and seething past it at a rate of from six to ten miles an hour, according to the direction of the wind and tides, and bearing direct upon it. The strait, besides, is at this point divided into separate channels by islands and submerged rocks. This is the portion called Hell-gate, and it is certainly well named, as it is something appalling to see vessels passing down apparently helpless, a sight only equalled by the passage of steam-vessels down the rapids of the Canadian rivers. Ideas regarding the improvement of this channel have occupied the thoughts of the New York people for many years, and a considerable amount of money was privately subscribed and expended in surface-blasting with nitro-glycerine, about thirty tons of explosive materials having been employed in clearing off the prominent rocks and projections; but no material improvement was effected until the Government undertook the work in 1866, and placed General Newton in charge, who since that time has succeeded in removing many of the prominent rocks by drilling from scows specially arranged for the purpose, and blasting with charges of nitro-glycerine; but the Hallet's Point Reef was a matter which could not be acted upon by any such ordinary means.

The rock itself being solid gneiss, the extent of the reef nearly four acres, and the constant change in the current in rapidity, force, and direction, during the various changes in the tide,—besides the impossibility of carrying on operations in a channel where vessels navigating have no power of steerage,—rendered it impossible to work in the ordinary way from craft, or erections in the river; and as no diver could descend into such a vortex, it was, therefore, boldly determined to undermine the whole mass and shiver it to pieces in one operation.

Some time prior to this, a large rock of elliptical shape, 195 ft. in length by 105 ft. wide, called the Blossom Rock, had been removed in the Bay of San Francisco, by Colonel Williamson, of the United States corps of engineers, by undermining and blowing it up; and, as far as I am aware, this was the first operation of the kind in subaqueous blasting.

The rock was metamorphic sandstone, its highest surface being 5 ft. below low water. A shaft was sunk through the rock, a space in its surface being enclosed within a cofferdam, and a telescopic iron shaft sunk down through the rock. The interior was then chambered out by excavation, leaving a thin crust of roof above. Into this chamber was placed about twenty tons of giant powder, enclosed in thirty-eight ale-casks and several old iron tanks, and fired from a boat by means of a galvanic battery. The mass of water displaced was 200 ft. in diameter, and was said to have been thrown up in the air, mixed with the *débris* of the roof of the vault and the shattered shoring timbers, to a height of 300 ft. The effect was completely satisfactory. The cost of the work was 15,000*l*.

The removal of the Blossom Rock was thus effected by chambering out a vault and blowing off the roof by sheer force of explosion. But in the case of Hallet's Reef, owing to its vast size and peculiar position, this arrangement could not have been carried out.

The reef, which is triangular in shape, extends outwards from a point of land at a sudden turn in the river to a distance of above 400 ft. where it reaches the 32 ft. water-line: all within this required to be removed. The work was commenced in 1869 by the formation of a cofferdam in front of the point on the shore, and the face of the rock squared down inside of this to form the shore line of deep water. The space thus formed inside of the cofferdam is 117 ft. long and 62 ft. wide, and this formed the main shaft, the bottom of which was 33 ft. below low-water line. From this shaft ten main headings were driven into the reef, radiating out from the shaft as a centre; these were crossed by a series of lines of cross galleries; from these again intermediate headings and cross galleries were driven until the whole space was mined out like a coal-pit, entirely resting on pillars, 173 in number. The headings and galleries were from 20 ft. to 22 ft. in height, leaving a roof from 7 ft. to 10 ft. thick, above which rushed and roared the waters of Hell-gate. The aggregate length of tunnel and galleries was 7,425 ft., and the quantity of material excavated and removed 50,000 cubic yards, to effect which nearly forty miles of holes were drilled, principally by machines driven by compressed air, and about 30 tons of nitro-glycerine and other explosives used in 75,000 blasts. After the whole of the reef had thus been completely honeycombed the pillars and roof were bored full of holes to an average depth of 10 ft. The number of holes were about 5,000 in all, charged with dynamite rend-rock and giant powder, the quantity of explosives used in charging being about 26 tons. In each hole was placed an explosive cartridge and an electric wire; these wires were all collected and formed into two cables, and led direct to the batteries. When the connexions were completed water was allowed to flow into the mine, which effected all the tamping required.

The charge was fired on the 24th of September last, by General Newton's daughter, 2½ years of age, by means of a Morse telegraph key.

The upheaval of water, as anticipated by General Newton, was comparatively slight, although in reality a vast affair, as the mass of water over the whole surface of the reef was said to have been raised to a height of 60 ft., with rocks of large dimensions spinning on its surface like tops.

The difference of the nature of this blast from that of the Blossom Rock was that in the latter case the roof of the vault was actually blown up by an actual explosion in the Guy Fawkes style, but in the case of Hell-gate it was simply the smashing up of the pillars and roofs themselves, causing a complete disintegration of the rock, no more power being expended than what was necessary for this purpose, and from the account of the blast this appears to have been a complete success. It reflects the highest credit upon General Newton and those under him by whom the works were conducted, that with all the manipulation of such a vast amount of explosive material no accidents have occurred, with the exception of five or six cases which resulted from the carelessness of the men themselves.

This is the first work of the kind which has ever been executed, and certainly never before, either above or under water, were so many isolated charges spread over such a vast area discharged at one blast. The work reflects the highest credit upon the Government who undertook it, and upon the scientific knowledge and ability of the engineer, who has carried it to such a successful result.

There is still much arduous work to be done before a clearance of Hell-gate can be effected, as a great part of the *débris* has to be cleared out to get the requisite depth of water; for although the pillars and roof now form a crushed mass filling up the excavated vault, yet they occupy in this state probably twice the amount of room which they did as part of a solid rock, and much of this must be removed to get the required depth of water.

Another great work which I had the pleasure of seeing under progress at New York is the Brooklyn Viaduct, spanning the East River, from Manhattan to Brooklyn, in one span of 1,500 ft., for railway and road traffic. The clear headway is 140 ft. from high water to the under side of the roadway, and one may imagine the strength of towers required to carry such a span across at such a height. This is greater than anything of the kind that has ever been attempted in this country, seeing that Telford's Menai Bridge is only 790 ft. span. The widest span of the Britannia railway-bridge, over the same strait, is only 400 ft.; and that these two are the greatest works in bridge-building which have been done in this country. In Canada, also, there is much to interest us both in civil and mechanical engineering.

A great work which has thus been brought to a successful termination, after many years of arduous labour, is the Intercolonial Railway. The intention of the originators of this railway was to connect the maritime provinces with the Canadas, and give an outlet to the trade by access to the Atlantic during the close of the interim navigation by ice. The proposition was mooted by Henry Fairbairn, seven years after the opening of the first passenger-railway in England,—the Stockton and Darlington,—and in 1835 the project was brought by the Canadian before the Imperial Government. After many delays the Government undertook a survey through the heart of what was then the province of New Brunswick, but which became part of the State of Maine in 1842, under the famous, or, rather, infamous, Ashburton Treaty, much to the astonishment of the Yankees themselves. This was effected by the muddling management of the British Government, in first refusing good terms of arrangement offered by the States Government, and then sending out an ignorant English earl, in place of a few practical surveyors, to define and agree upon the boundaries between Canada and the United States. The colonists had then to commence afresh, and did so by each province setting to work, independent of the Home Government, and the result was the construction by the Canadian provinces of the Grand Trunk Railway, from Sarnia, at the foot of Lake Huron, to Rivière du Loup, 120 miles east from Quebec,—780 miles in all,—and by Nova Scotia and New Brunswick, of the railways from Halifax to Truro, 60 miles in length; and St. John's to Shediac, 108 miles. So stood matters in 1862.

There was still the long link wanting to connect the provinces through the wilderness, the length of which was increased by an additional 250 miles, by the folly of the Imperial Government giving up the portion of New Brunswick, under the Ashburton treaty.

In 1863 the Imperial Government and the three provinces came to arrangement about this, and mutually proposed Mr. Sandford Fleming as engineer-in-chief, who commenced the surveys in 1864; and by the time these surveys were finished, the provinces were united in one dominion; and the first great work undertaken by the new Government was this important railway, the works of which were commenced in 1869; and their completion this year has brought our colonies of the Canadas for the first time into connexion, overland, with the maritime provinces of New Brunswick and Nova Scotia, which were formerly divided by an almost impassable wilderness, and we now have a continuous line of railway from Halifax and St. John's right through to Sarnia, at the foot of Lake Huron, the western

extremity of central Canada, which, there joining the United States railway, goes right across the continent to San Francisco on the Pacific.

Canada is not, however, content with this mode of access to the Pacific, but is actually now engaged upon a Pacific line, carried entirely through her own territory, to the north of the lakes. The whole of this line has been surveyed by Mr. Sandford Fleming, a great part of it is located for contract, and several long links already constructed.

The canals of Canada are on a grand scale. The Welland Canal connecting Lake Erie with Lake Ontario, and thus overcoming the falls of Niagara, and the canals of the upper St. Lawrence, continuing the navigation past the rapids and unnavigable portion of the river, right into the harbour of Montreal. The locks of these canals have been increased in size from time to time, and are now being reconstructed throughout and made large enough to pass vessels of 270 ft. in length and a draught of 12 ft. of water, from the lakes right on to Montreal and Quebec. The cost of this renewal of works of the Welland and the St. Lawrence canals, and the St. Lawrence river, will not be less than four millions and a half sterling.

So much for this young country, which was only formed into a dominion eight years ago. The mechanical industries of the colony are also taking a high position, and steam-engines and machinery are now manufactured which would do credit to the best factories in the old country itself.

UNIVERSITY AND TOWN IMPROVEMENTS AT OXFORD.

In accordance with annual custom, *Jackson's Oxford Journal* at the commencement of Michaelmas term gives an account of the more important building improvements and additions that have been executed or projected during the past twelve months. From the long list furnished by our contemporary we give a *resumé* of the most salient items.

At *Christ Church*, the alterations in Tom Quad and elsewhere have been rapidly pushed forward during the year. The old lines of the building are being endeavoured to be re-traced, and for this purpose the terrace has been lowered considerably, with a view at some future time to the erection of cloisters around the quadrangle on the buttresses which have been discovered and made good. About one-half of the ancient Classic parapet, the work of Sir Christopher Wren, has been removed, and a new architectural battlement substituted. A small tower has been erected over "Kilcanon" archway, and the old statue of Wolsey, which was formerly on the opposite side of the quadrangle, has been placed in a more appropriate position near Tom Gate. But a more arduous task yet remains, namely, the bell-tower. The difficulty arises from the great width of the basement line of work left by Wolsey. To build a tower in proper proportion to this basement-line would mar the effect of the present Cathedral tower, which, probably, in the original design was to have been removed. Under the circumstances, therefore, a suitable tower will be constructed over the belfry in fair proportion to the surrounding buildings, and without destroying the old basement-lines. The interior of the old almshouses opposite Tom Gate is being pulled down, and it is intended to convert them into a residence for the treasurer, the Rev. R. G. Faussett. The architects are Messrs. Bodley & Garner. The building formerly used as stables for the Provost of Oriel have been razed to the ground, and the materials sold. This improvement, when completed, will give a much more convenient entrance to King Edward-street. The builders are Messrs. Symm & Co., of St. Giles's.

At *Balliol College* the work of enlargement is nearly completed. The new hall, 90 ft. by 30 ft., is finished, as also are a new buttery, common-room, lecture-room, and laboratory. Four sets of rooms have been erected for Fellows at the east end of the hall, and eight sets for Undergraduates at the west end, and the old hall is being fitted up as a library. A new roof has been put on Fisher's rooms at the west end of the college, and a new facing of white stone is being put on the front in Broad-street, together with new sashes and windows. The cost of the improvements at this college will amount to 30,000*l*. The architect is Mr. A. Waterhouse; the builder is Mr. Horsman, Wolverhampton; and the clerk of the works is Mr. Simmonds.

The work of restoration at *All Souls College Chapel* is now nearly complete. The reredos occupies the whole of the eastern end, and the thirty-five large niches and the eighty-four small ones have been filled in with statues and statuettes, and the work has been executed by Mr. E. Geflowski. Mr. Hill, of Oxford, has done a considerable part of the work of decoration, the bay over the reredos having been painted by him from the designs of Sir G. Scott. The floor of the chapel has been repaved, the stalls have been restored, a new cornice has been substituted, the sedilia and piscina have been restored, and a new altar, composed of a single slab of Devonshire marble, has been provided. The greater part of this work, and that of the reredos, has been carried out by Messrs. Farmer & Brindley, Mr. J. Medland acting as clerk of the works.

The extension at *New College*, which has occupied the past three or four years, is rapidly approaching completion, at least for the present. The new block which has been added to that which was completed for occupation twelve months since, in Holywell-street, provides rooms for twenty Undergraduates, with a Fellow's residence at the west end. The buildings are fronted with Milton and Taynton stone, and the length of the front is 273 ft., with a depth of 33 ft., and a height of 75 ft. to the ridge. There is some carving on both the College and Holywell fronts. Further extensions are contemplated. Messrs. Jackson & Shaw, of London, have carried out the designs, from the plans of Sir G. Scott, and Mr. H. Roome is the clerk of the works.

The addition of new buildings at *Keble College* still progresses, and the Society bids fair to become one of the largest in the University. The chapel was opened on St. Mark's Day last, as reported in our columns at the time.

Various alterations and additions of a minor character have been executed at nearly all the colleges. An organ-gallery has been erected in the ante-chapel of Trinity College, and a new lecture-room has been built from the designs of Mr. E. G. Bruton, architect, having accommodation for a lecturer and twenty-five students.

The Bodleian Library reading-room has been dismantled, and a new floor is being laid, the books having been removed to the Music School, and accommodation provided for readers in another part of the building.

Upon the recommendation of the New Schools Delegacy towards the close of the summer term, Convocation has determined to authorise the curators of the University Chest to obtain contracts and proceed with the execution of Mr. T. G. Jackson's plans for the schools quadrangle, entrance-hall, and other buildings on the site of the old Angel Hotel, in the High-street, power being given to borrow a sum not exceeding 60,000*l*. to defray the cost. Workmen have been employed levelling the ground during the Long Vacation. The buildings will consist of a quadrangle, surrounded on three sides by buildings containing the examination schools, with their offices, and standing back from the High-street, and a building interposed between the schools proper and the High-street, containing a general hall, and two large rooms for the private use of examiners, below which are the offices of the clerk of the schools, and the residence of his subordinate. The building will be two stories in height, and the *viva voce* schools placed above and the writing-schools below. The latter will be three in number, two providing accommodation for 200 and one for 150 candidates. The *viva voce* schools will be removed from the noise of the streets, and will be quite quiet. The estimated cost of the entire building, including warming and ventilation, is 63,884*l*.

The new University Running-ground, adjoining the Christ Church Cricket-ground on the Iffley-road, is now nearly completed. It will be adorned by a pavilion of the Italian style, of white bricks with red bands. The whole of the arrangements have been entrusted to Mr. Hobdell, of the well-known firm of Messrs. Fisher & Hobdell, builders, &c., of Oxford, and the entire cost of the work will be nearly 2,000*l*.

In the city the principal work has been the drainage, of which we recently published some particulars in the *Builder* (p. 1031, *ante*).

At St. Clement's Church the organ has been removed from the west end of the building to the south side of the chancel, and a stained-glass window will be placed in that portion of the church previously occupied by the organ. At St. Frideswide's Church a new vicarage-house is being erected on the south side, at a cost of 2,500*l*., from designs of Mr. H. G. W. Drinkwater. It is connected with the church by a corridor and parish room, and is built of Gibraltar stone with Bath stone dressings, and the tiles to be used will correspond with those of the church. The church tower will shortly be commenced, and an iron palisading will be placed round the church. A new vestry is being placed adjoining the north transept of St. Philip and St. James's Church, and a similar addition, with an organ-chamber, is being made to Holywell Church.

A new school has been erected in New Inn Hall-street for St. Michael's parish, adjoining Shoe-lane, and the master's house adjoins the street. The architect was Mr. E. G. Bruton.

The new cemetery at Cowley St. John is approaching completion.

ECCLESIASTICAL DILAPIDATIONS.

LINCOLN DIOCESAN CONFERENCE.

At the Lincoln Diocesan Conference on the 13th ult., the Rev. Canon Clements read a paper entitled "The Ecclesiastical Dilapidations Act of 1871; Consideration of the House of Commons Committee's Report." He said that the Act left untouched and even aggravated one great evil; since in the case of an insolvent predecessor it compelled his successor to pay down the whole amount of the dilapidations assessed, of which, perhaps, he could not recover one single sixpence, and to pay it in advance was almost sure to be distressingly inconvenient. On the face of it, then, the Act was imperfect, and on this point, if nowhere else, harsh in its operation. But in its general working also there had been very considerable friction. No doubt, it must be admitted that some friction was certain, because they might assume it to be necessarily true that the bringing in of any better system upon an old and lax system, must always entail inconveniences. Present incumbents must suffer more or less from the fact that they came in under the lax system, and were going out under a strict system. But allowing for this to the full, and for the necessary hardship and irritation caused by it, he could but believe both that the Act itself was needlessly oppressive, and too often had been oppressively worked. The most suffered and paid; the few did battle against the official administrators of any Act of Parliament. As it stood, most unquestionably the Act was causing very widespread uneasiness, not to say dismay. Well, then, what was to be done? He replied that the Act must be amended, and amended at once. He concluded by suggesting that an attempt should be made to define what dilapidations were in a schedule; that the archdeacon should be substituted for the bishop in the wording of the Act; that the remuneration of the surveyors of each diocese should be increased; that the time should be extended for making objections to the surveyors' report, as to matters of fact or law; and that some local tribunal, perhaps the County Court, should hear and determine such objections; that the term of five years in which an incumbent is required to have his buildings subjected to an inspection shall be extended to fourteen years, &c. These and such like changes would make it more palatable, and not destroy its value.

After some discussion, the bishop put the following to the Conference:—

"That in the opinion of this Conference, the Dilapidations Act urgently needs immediate amendment; that it be a request to the archdeacons and rural deans of the diocese to meet as soon as possible and consider the subject, and to frame a report upon it after communication with the laymen of the diocese, whose presence and co-operation should specially be invited, and to communicate with members of the Legislature before the meeting of Parliament."

The resolution was carried *nem. con.*

Make a Note of it.—At the last meeting of the Tiverton Highway Board, the chairman complained of the long and, as he considered, unnecessary delay which had taken place in the reconstruction of the bridge at Bickleigh, which was washed away by the floods twelve months ago. He thought the county surveyor was to blame for such waste of time. The surveyor (Mr. Besley) said that was not so. There had been many causes to contribute to the delay, the chief thing being the transfer of a small piece of land which was required. The land cost 15*s*., and the expense of transferring it was 25*l*. The chairman thought that fact should be made a note of.

SALE OF THE BUILDING MATERIALS OF KNIGHTSBRIDGE BARRACKS.

On Tuesday, by order of the Commanding Royal Engineer, Messrs. Horne, Eversfield, & Co., sold the first portion of the building materials of the Hyde Park Cavalry Barracks, at Knightsbridge, which are about to be taken down and rebuilt. The materials disposed of comprised that portion of the building consisting of the stables for the troops, with the dwelling-rooms above, enclosing the parade-ground, and which are three stories in height. The structure, it was stated, comprised 1,500,000 bricks, 500 squares of slates, and eighteen tons of lead, in addition to the floors, timber, and other general building materials, and the stable fittings, the whole being divided into 194 lots. There was an unusually large attendance of persons connected with the building trade, and it was considered that the several lots fetched prices much above the average realised at such sales, more especially the bricks and the slates, for which there was an active competition. The present scarcity of bricks caused a great demand for these portions of the materials, and it was a noticeable feature in the sale that they were almost all bought up by builders as distinguished from dealers or the trade. The lead also was in great demand, and sold at high prices. The entire proceeds of the day's sale were about 4,300*l*. The conditions of the sale were stringent as to the immediate clearing away of the materials, which is to be completely effected by Saturday, the 16th of December, the time for removing the lead, slates, sashes, doors, paving, and fittings, being limited to four days after the sale, so that during the present week the building has already been dismantled of these several materials. The portions of the materials of the structure yet remaining to be sold are the officers' quarters and the riding-school, and we learn that these will be disposed of in a few weeks, when the entire site will be cleared for the intended new barracks, the erection of which, it is stated, will occupy about three years, and the troops which occupied the old building (the 1st Life Guards) are in the meantime stationed at the Regent's Park, Hampton Court, Kensington, and St. John's Wood barracks.

NETLEY ABBEY.

We are sorry to find from a report in the *Hampshire Independent*, that the public are threatened with the loss of the old approach from Southampton water to the ruins of Netley Abbey. In an antiquarian point of view this road is full of interest, and, from its antiquity, privacy, and beauty, ought not to be lost.

We find in Bullar's old notice of Netley Abbey, and in the more recent work on Hampshire, by Mudie, this roadway spoken of as being the most favourite approach to these well-known ruins by water, and we hope efforts will be made to preserve this ancient right of way from destruction, the parish vestry of four persons having, to the surprise of the parish generally, agreed to accept a new road to the beach more remote from the abbey in lieu of this ancient way, on the plea only that it is somewhat less steep.

SKETCH CLUB COMPETITION.

An interesting competition, which, we are inclined to think, does not receive its fair share of public attention, took place at the South Kensington Museum on Thursday, the 26th ult. We refer to the annual competition of the Sketch Clubs in connexion with the various metropolitan Schools of Art. The competition is yearly growing, inasmuch as in 1874, when the challenge was issued by the Gilbert Club (St. Martin's School of Art), Lambeth Club only responded, on the present occasion two additional clubs accepted, viz., South Kensington (Female) and West London. One hundred and seventeen sketches were exhibited; and Messrs. Alma-Tadema, A.R.A.; H. S. Marks, A.R.A.; and E. J. Poynter, A.R.A., officiated as judges. Prizes of the value of 3*l*. each were awarded as follows: Figures, subject, "Waiting," Mr. H. Schäfer (Gilbert); and an extra prize given by the judges, Mr. H. Glindoni (Gilbert). Landscape, subject, "Far from the busy haunts of men," Mr. J. Seymour Lucas (Gilbert). Animals, subject, "A Chase," Mr. W. K. Stevens (Lambeth); and Sculpture, subject, "Waiting," Miss Henrietta Montalba (South Kensington). The award of honour for the best aggregate of work fell to the Gilbert Club.

The show of sketches was, on the whole, very creditable; and we noticed amongst the competitors, in addition to those who obtained prizes, Miss Hilda Montalba, Messrs. E. R. Breach, W. H. Dolman, Frith, Phillips, H. J. Rhodes, &c.

We understand that one or two additional clubs have signified their intention of taking part in next year's competition.

ST. LAWRENCE CHURCH, NORTHAMPTON, COMPETITION.

A competition was advertised for this church some months ago, to which no fewer than ninety-one architects responded. Competitors were required to send in a block plan, a ground plan, and one elevation, under motto. These were to be submitted to Mr. Ewan Christian, and six were to be selected whose authors were to compete a second time for the final commission. These six designs, which were to be explained by plans, elevations, and sections, accompanied by an outline perspective, if thought desirable, were to be also submitted to Mr. Christian, who was to advise the committee as to the best design. The church was to accommodate 800 persons, and the cost not to exceed 8*l*. per sitting, exclusive of heating, lighting, boundary-walls, and architect's commission.

The conditions distinctly stated that the design selected should be capable of being carried out within a limit of 10 per cent. of this amount, which gave a total cost for the church, exclusive of heating, &c., of 7,040*l*.

The design selected by Mr. Christian was that bearing the motto "Deus volens," and was found to be by Mr. Alfred W. N. Burder and Mr. Arthur Baker, of London. A limited number of builders last week submitted tenders, when that of Mr. John Watkin, of Northampton, was accepted for 5,803*l*. The church is to be immediately proceeded with.

"THE MYSTERIES OF THE BUILDING TRADE."

"Inquirer," in a letter to the *Northern Daily Express* (Newcastle) writes:—"I notice in your impression of to-day an interesting paragraph relative to the prosperity of the building trade, which, I am afraid, is not applicable to this district at the present time. It must have been long apparent to the most casual observer that there is an extraordinary elasticity in the operations of the trade which an outsider will have some difficulty to understand or to reconcile. If we take up the *Builder*, or any other journal connected with the trade, we shall probably see every week the greatest diversity of opinion exhibited by the trade themselves in the shape of estimates—the amount of the tenders often ranging from 5 to 30 per cent. difference for the same job; so that an unprofessional builder can only entertain a most vague idea as to what any proposed structure may cost, though he may possess a good notion of the value of labour and material. At the present time, when the subject of artisans' dwellings is before the Council, and the problem of how to build them in the most satisfactory and economical manner is so much studied, any information as to the data on which builders base their diverse estimates may be of service. The anomaly of one class of workmen receiving a high rate of wages, whilst their brethren in other trades have the greatest difficulty in making ends meet, cannot exist long. The great number of houses now to let at the outskirts of the town, and the trouble in selling them, except those in choice situations, is a significant sign of our return to a more healthful state of trade with regard to house building."

Banff.—A stained-glass window, by Messrs. Ballantyne & Son, of Edinburgh, has been placed in the east end of St. Andrew's Church, Banff, and the original window of Powell's quarries transferred to the west. The new window is the gift of Mrs. Morison, of Boguie and Mountblairy. The subject of the window is the three Apostles of the Transfiguration, Peter, James, and John, who at various times were taken into closer relation with our Lord than the other Apostles. Over the heads of the figures is some canopy-work, with an inscribed scroll.

LOCAL STANDARD MEASURES OF LENGTH.

Mr. Chisholm, the Warden of the Standards, has issued a circular letter to county authorities. The communication states that the Standards Department has been frequently called upon to notice the serious errors found in the length of measuring chains, tapes, &c., used by surveyors and others for the measurement of land, as well as the others in 1 ft., 2 ft., and 3 ft. rules used by mechanics and other persons. The standard measures of length at Trafalgar-square have been constructed in the most complete and durable manner, particularly the 100 ft. measure and the chain measure of 66 ft., as they are intended to be constituted the legal secondary standards of these measures at length under the provisions of the Standards Act, 1866.

"They have since" (continues the letter) "been so constituted by Her Majesty's Order in Council, dated 27th June, 1876, and published in the *Gazette*. But it should be pointed out that it is by no means requisite that similar public standards should be constructed in other localities in so costly a manner as these more authoritative standards. It is, however, necessary in order that any such local measures of length should be duly authenticated by the official stamp as public standards, that they should be properly constructed with respect to their sufficient stability and durability, and to their due conformity with the standard. A low platform of masonry should be erected for the support of the measures of 100 ft., and 66 ft., and the total length of the measures, with their subdivisions accurately determined and inscribed, should be defined by lines upon metal blocks let into the masonry. The Standards Department will be prepared upon application to furnish proper instructions for laying down these standard measures of length, the cost of which must be defrayed by the several local authorities; and also to verify them by comparison with the official standards and authenticate them with the official stamp of verification, without any fee for such verification being payable by the local authorities so soon as they are completed to the satisfaction of the department. But the actual cost of travelling and hotel expenses of one of the officers of the Standards Department and of one of the mechanics must in that case be borne by the local authorities, in accordance with the practice of their also bearing the cost of sending their local standards to the Standards Office for verification or re-verification. Mr. W. Airy, the engineer, under whose immediate superintendence the work of laying down the standards in Trafalgar-square has been executed, has furnished me with the following estimate of the expense of laying down similar standard measures of 100 ft., and chains of 66 ft., in other localities:—Preparing for and erecting a platform of brick, 103 ft. long, 3 ft. broad, and 1 ft. high, with a covering of York paving flags 3 in. or 3 in. thick, upon a base of concrete 18 in. thick, 42*l*. 9*s*.; cutting holes and fixing blocks, 4*l*.; two zero terminal blocks, 29 division blocks, and two descriptive tablets of cast iron, 3*l*.; total, 49*l*. 9*s*. The cost would of course be materially lessened in all cases where a sufficiently stable base for the standard measures may already exist. I have only to add that I trust the several local authorities will recognise the importance of thus publicly exhibiting authentic copies of the standard measures of length, more especially of the surveyors' chain of 66 ft. and the building land measure of 100 ft. From the mode in which these measures are ordinarily used, they are liable to vary continually in length, and require frequent readjustment. Much of the now existing uncertainty and disagreement in the measurement of land would be avoided if accurate standards of these measures of length were exhibited in various localities, and made readily accessible to the public."

A NEW SUBURB FOR GLASGOW.

Within the last few years the extension of railway facilities has done much towards the creation of purely residential suburbs. Pollokshaws and the extremity of Hillhead not long ago were considered pretty far distant from the bustle of business; but now we have large numbers building and selecting houses for regular residences at three and four times such a distance from Queen-street. When Lenzie was laid out for feuing the ground was quickly taken up, and in that place there is now a perfect colony of Glasgow merchants. On every side of the city villages have cropped up, and now there is a tendency to stretch the morning and evening travel a little farther. Since Lenzie has been such a success, situated as it is on the track of the western section of the North British Railway, and at a distance of some six miles from the city, there is now a proposal to open up Dullatur and Dykehead, two small estates lying between the Cumbernauld policies and the eastern boundary of Dumbartonshire. The two places, in fact, form one district, and though Dykehead is the larger of the two, the proprietor and occupant of the old mansion of Dykehead, Mr. Lennox, has selected the better known name of Dullatur for the new village.

Dullatur is situated about two miles from Kilsyth and a mile and a quarter from Cumbernauld, and by rail it is about thirteen miles from Glasgow. Lying on the brow of a slope to the south-east of Kilsyth, it commands a fine view of the long range of hills that stretch from Campsie to the Carron, and of the picturesque valley of the Kelvin that intervenes. The district has at pre-

sent a somewhat forlorn look, but if the feuing plan which has been prepared by the proprietor is properly carried out, there will (says the Glasgow *Evening Times*) rise up in the course of a few years one of the best situated and healthy villages in the midland counties of Scotland. The lands consist of 80 acres of Dallatur and 84 of Dykehead—164 in all; and it has been arranged in the meantime to feu 31 acres. A new station has been opened just at the bridge which crosses the public road from Cumbernauld to Kilsyth; and the ground set apart for feuing is on the Cumbernauld or south side of the line. A new road—the Victoria-road—has been formed from the station to Dykehead or Dallatur House; and the old avenue is to be absorbed in one of the new streets, The Victoria-road will be the main thoroughfare, and there will branch off it Prospect-road, Plantation-road, and four or five other roads not yet named. The plan shows feus for fifty-four houses, and one condition is that the feuars shall have a right to erect terraces or crescents as they may think fit.

"DUSTING AND SLOPPING" IN WHITECHAPEL.

Mr. S. W. Iron, surveyor to the Whitechapel District Board of Works, has just presented a report as to the collection and removal of the dust and slop from the district. The report is of some interest, inasmuch as Whitechapel, following the example of some other Metropolitan parishes, a year ago took into its own hands the work of collecting the dust and removing the slop. The result has been (according to the report) that the work has been much better attended to than was the case under the system of contracting, and, moreover, with a saving to the ratepayers of nearly 1,000*l.* on the year's work. The report shows that the net cost of the work of collecting and removing the dust was 2,656*l.* 1s. 7d., while the cost of removing the slop (including rent of shoot) was 5,046*l.* 10s., making a total for the two items of 7,702*l.* 11s. 7d. As compared with the cost of the work for the last year under the contract system, this shows a saving of 826*l.* 12s. 10d. The number of loads removed was,—dust, 10,606 (maximum number of carts employed fifteen; minimum, six); slop, 10,656 (plant employed, five wagons, carrying two loads each, six vans, and four carts).

AN AQUARIUM FOR BIRMINGHAM.

The *Birmingham Gazette* announces that arrangements which for the last few months have been in progress are now nearly completed, and that it is probable a marine aquarium upon an important scale will shortly be established in Birmingham.

From a circular which has been privately issued by Messrs. Ryland, Martineau, & Carslake, our contemporary learns that an association has been formed to provide, by means of an aquarium and high-class music, recreation and instruction of a kind not at present to be found in Birmingham. A plot of land in a suitable position has been secured, and plans for a building have been prepared by Mr. Chatwin. The aquarium will be similar in importance and extent to that of the Crystal Palace. It is intended that the space inclosed by the corridors of the aquarium shall form a concert-room to accommodate from 2,000 to 2,500 persons. This will, it is thought, supply a want long felt in the town. The concert-room and aquarium will be available, together or apart, as occasion may require.

CLAIM FOR DILAPIDATIONS.

DEACON AND OTHERS *v.* MORLEY.

In this case, heard in the City of London Court before Mr. Commissioner Kerr, the plaintiffs were Mr. John Deacon and the Earl of Leven and Melville, trading as Neville, Reid, & Co., brewers, Lambeth, and the defendant Mr. William Morley, 152, Bishopsgate-street.

The action was brought to recover 16*l.* 10s., the amount of alleged dilapidations to a public-house, by name the King's Head, of which the defendant had been a tenant. Mr. Rolland was for the plaintiffs, and Mr. Kemp for defendant. The agreement under which the defendant held possession was put in. It stipulated that he should do all the customary tenants' repairs to the interior of the house, particularly the painting, glazing, whitewashing, and cleansing. These things were to be done to the satisfaction of the plaintiffs' surveyor. When the defendant left the house, and Mr. William March took to it without, it is said, having made any repairs, the amount in the action was put down for dilapidations. Defendant allowed it only under protest, pointing out that he had painted the outside of the house. Since then he had incurred a debt of 16*l.* 16s. to the plaintiff's for beer supplied, and now paid 6s. into court in discharge of the entire claim of the plaintiffs.

The learned judge put the following three questions to the jury:—Was defendant indebted to plaintiffs to the extent of 16*l.* 16s. for beer supplied? Did the plaintiffs retain 16*l.* 10s. for alleged dilapidations to the premises? and, Did the defendant consent to this detention? The jury replied in the affirmative to the first two questions, and in the negative to the last question. On the instigation of Mr. Rolland, the learned judge put another question to the jury:—Did the 16*l.* 16s. represent the dilapidations, the surveyor of the plaintiffs (Mr. Carey) having given evidence that it did? To this the jury replied, in effect, that they could not answer it, the defendant not having been called upon to give his testimony upon the point. The learned judge decided that the case should stand over for two months, directing an action by the plaintiffs against the defendant for dilapidations. He took occasion to say that these proceedings had been necessitated by the insufficient way in which the incoming and outgoing was settled. If two brokers had met, one on behalf of the plaintiffs and another on the part of the defendant, they might have settled this matter by an agreement signed by the litigants. He would not then make any order as to costs.

SOUND-PROOF FLOORS.

Sir,—It has long been a common error to suppose that solid substances stop the transmission of sound, whereas the very contrary is the case. Solid material is a better conductor of sound than a loose open material. You hear constantly of concrete being advocated *because* it is so solid that sound cannot possibly pass through it,—and Mr. T. Roger Smith and Mr. W. H. White actually propose its use for floors for the separation of flats because it is fire and *sound* resisting.

All fire-proof houses conduct sound from one apartment to another far more than ordinarily built houses. The reason is that solid substances conduct sound; and an ordinary floor with joists and lath-and-plaster ceiling is a better non-conductor than a concrete floor made in the way described by your correspondent "Inquirer."

This was found to be the case years ago by Mr. Thomas Cubitt in many of the houses which he built as fire-proof, and he endeavoured to remedy the defect, and was partially successful, by taking out some of the solid materials and substituting cockle-shells. The object was to create air-spaces or air-cells, which is the only effectual way of stopping the passage of sound. The usual precaution of "pugging" floors when put in solidly, I know, from experience, does more harm than good. Why the partition described by your correspondent was less sound-proof than the common lath-and-plaster one was because the boarding and hair-felt were put close together, while the other had an air-space in the centre. Let him separate the materials and form a central air-space, and he will soon find the difference.

James K. Colling.

SOUND AND FIREPROOF FLOORS.

Sir,—As an exemplification of the method of making fire-resisting floors proof against the evil of conducting sound by placing a second floor above or below them I refer to the whole of the flooring of the Westminster Palace Hotel, which, answering the principle of construction referred to is also provided with a perfectly independent ceiling below it, and in which, more perfectly to secure the non-continuity of material, the ceiling joists rest on binders carried from wall to wall in parts where, otherwise, the space would be too great for the ceiling joists alone.

William Moseley.

MASTERS AND MEN.

Darlington.—The plumbers of Darlington struck last week, in consequence of the masters refusing to sign certain rules submitted to them by the union on the part of the men. Several of the rules are already acted up to, but others the masters considered arbitrary and unjust. Some of the more objectionable conditions are stated to be,—that men working at a distance shall be allowed tram fare even when they do not come home; that no more than one apprentice be allowed to each man, and that no improver be employed; that non-society men be not permitted to work in a shop longer than a fortnight unless they join the society; with other regulations which the masters considered unduly exacting. The plumbers at present are paid 7½d. per hour, and work fifty-three hours per week.

Aberdeen.—The *Aberdeen Free Press* says that considerable depression has set in in the granite trade, which for a number of years past has been increasing in extent, until it has come to be looked upon as one of the leading industries of the city. To a great extent the trade has depended upon orders from the United States of America, and these for a considerable length of time past have been flowing into the town in a constant and regular way. But the orders have, within the past few months, been exceedingly small in number and of inconsiderable amount, and the consequence has naturally been that trade in the various yards in town has become unusually dull. The chief employers of labour in this industry—Messrs. Macdonald, Field, & Company—have, within the last few days, been compelled on account of the scarcity of orders, to put their workers upon short time. Instead of, as heretofore, nine hours per day the working time is now reduced to eight hours, and as winter draws on it is understood that there will be a further reduction of another hour. The workmen in the employment of Mr. Petrie are now working eight hours and a half, and the slackness is so general that it is anticipated that similar if not more serious reductions will be made in other yards in the city.

SURVEYORSHIP ITEMS.

Ryde, I.W.—Mr. John Cardell Trounson, of Penzance, has been appointed assistant borough surveyor of Ryde; and Mr. A. Sivell has been elected assistant surveyor for the Ryde Urban Sanitary District.

Gateshead.—At a meeting of the Gateshead Town Council on the 25th ult., the finance committee reported that upon the application of the town surveyor, the committee had pleasure in recommending the increase of his salary from 450*l.* to 500*l.* per annum, the increase to take effect from the 1st September last. The report was confirmed.

Newmarket.—At a meeting of the Newmarket Local Board of Health, on the 25th ult., the chairman submitted the applications and testimonials of the following persons who were candidates for the office of working surveyor and inspector of nuisances, viz.:—Mr. E. Hoskins (Exning), Mr. Chas. Griffin (Soham), Mr. Alfred Cook (Mildenhall), Mr. Simeon Fenton (Mildenhall), Mr. Wm. Paine (Bury St. Edmund's), Mr. J. J. Hook (Soham), and Mr. J. Rowling (Cambridge). Mr. Hook was selected as the most fitting person for the office.

THE STATUS OF ARCHITECTS.

Sir,—I served my time in a leading architect's office, and for some years struggled to get a living as one myself, until I found that, from over competition and the want of position that an architect has to put up with—but chiefly from the latter cause—it was a most undesirable profession to follow.

Are matters improved? Taking up to-day's *Builder*, I notice two competitions open,—new Board Schools for "Thetford" and "Thurlby"; while, in passing the Horse Guards, I find that "saddlers, architects, tailors," &c., are still invited to join the British army as privates. It is not often that a man in after-life looks back with pleasure to his want of perseverance in earlier life; but I do, for I am glad I never continued the struggle; the more so as, out of the many pupils I knew, very few are now in practice; and out of that few, some of whom possess great ability, I know not one who has done half so well for himself as I have, although that is not saying much.

I think you could do all parties a kindness in endeavouring to prevent young men joining a profession in connexion with which such advertisements as mentioned, particularly coming from official quarters, are possible.

Henry Merceron.

TENDERING AT RIPLEY (DERBY).

Sir,—Your correspondent, "One of the Lowest Six," appears to have somewhat hastily jumped to a conclusion, without troubling himself, first of all, to inquire into the facts of the case. Will you allow me to inform him that, in this instance, the clause, "The Board do not bind themselves to accept the lowest or any tender," was, from the first, intended to allow of the *designs* sent in with the tenders being considered quite as much as the *prices* quoted: and I have yet to learn that this is a meaning which "respectable engineers" would hesitate to attach to the clause.

Be that, however, as it may, in the present case design, workmanship, and price, were all carefully considered; and, so far as I am able to judge, the Board came to a *wise* and *just* decision.

Possibly, if your correspondent will in future pay a little more attention to other matters than price, he may yet discover a more excellent way than being "One of the Lowest Six."

R. Argile, Jun., Engineer.

PRINTING ON WOOD.

Sir,—With reference to this decorative process, which you were so good as to notice in your issue of October 28th, permit me to say, that I, being a nurseryman, merely furnish premises and other conveniences, and that the responsibility of the manufacture rests entirely with the inventor and artist, Mr. T. Whitburn, under whose superintendence it is carried on.

Maurice Young.

THE CHELSEA EMBANKMENT.

ATTENTION has been drawn by reports in the daily papers this week to the condition of the Chelsea embankment, which has been for some weeks showing a serious degree of settlement and displacement, chiefly noticeable in its effect upon the footway of the embankment immediately adjacent to the Battersea and Chelsea Suspension-bridge. It is said that the officials of the Metropolitan Board of Works were at first of opinion that the girder-bridge connecting the embankment with the steamboat-stage was acting prejudicially on the masonry in drawing out the front portion of the river wall. The bridge was disconnected, but the subsidence of the embankment was not checked, nor could we see, when we looked at the spot on Tuesday last, any appearances which should have countenanced such a supposition. There was then a slightly-perceptible bulge in the face of the river wall, to be detected on running the eye along the masonry eastward of the landing-stage bridge; but it was evident that the failure and disturbance were behind the river wall rather than in the wall itself. The broad flagged walk had sunk considerably in the centre, along a space of 30 yards or so; the flags were more or less tilted at the edges and disjointed, and the margin of the flagging next the roadway had separated by several inches from the granite curb, which still remained unmoved. If the gap left between the curb and the flagging represented the amount by which the river wall had moved from the perpendicular, it would be a very serious thing; but this did not seem to be the case, the drawing down of the inner margin of the flagging being evidently partially due to the subsidence of the ground in the centre of the foot-walk; if the whole mass had moved with and was following the front wall, the surface of the flagging would probably have been nearly undisturbed; it would have only canted bodily. The appearances plainly point to a softened state of the earth forming the backing of the wall and the foundation of the foot-walk, which has caused the subsidence of the latter, and is also pressing outwardly upon the river wall. We understand the mischief is now attributed to the softening of the ground by an unsuspected spring, which seems not improbable. A shaft had been sunk, at the time we mention, through the carriage-way of the embankment, from the bottom of which were being brought bucket-loads of wet clay, which one might suppose to have a great capacity for "sliding." The affair may be rather troublesome, but does not seem likely to present any insuperable difficulty. The papers seem rather to have made the worst of it.

THE ROYAL AQUARIUM, WESTMINSTER.

IF we may judge from the large number of people assembled at the Aquarium last Saturday evening, a better prospect exists for its success than some have lately entertained. We have felt surprise that this agreeable place of amusement has not hitherto been better attended. So large and so interesting a collection from sea and river as there now is alone should attract the public. In the Fine Art Department, though there is much that is good both in pictures and sculptures, doubtless, an improvement should be made. But what should be said of the band? The greatest credit is due to those who had the office of its selection, to the conductor, and to the musicians themselves. The manner in which the judiciously-chosen music is performed calls for the highest praise. Nothing but mismanagement has kept this place down.

THE ARCHÆOLOGY OF ROME.

SIR,—The critique on my chapter on the Roman Forum is fairly done from the writer's point of view, but he makes no allowance for the great difficulties I have had to contend with from circumstances beyond my control: he does not understand the plan of my book, which is, as far as possible, to make each chapter or part complete in itself; but as the booksellers strongly object to pamphlets, two parts are necessarily bound up in one volume. If you will be kind enough to send to the writer the copy sent herewith, in which the two parts are done up separately for use in Rome, and the advertisement sheet inclosed with it, which explains the plan of the book, he will see what I mean. It is evident also that he has not received an important leaf of the description of the plan, which was omitted by accident by the bookbinder, and a copy was sent to your office with an explanation as soon as the mistake was discovered. He is mistaken also in talking of "after-dinner" speeches. The late Lord Stanhope said,—repeatedly and formally, as President both of the Society of Antiquaries of London and of the Kent Society, sometimes when I was present, at other times when I was not present,—that "if other people would teach archæology in the same simple, natural, easy manner that I did, the study would be far more popular than it is; the importance of the subject can hardly be overrated, but it is usually taught in such a dry, technical manner, that persons of ordinary education soon become disgusted with it." The reason of this is that I always endeavour to teach by the eye as far as possible, and I know that technical words are only half understood.

JOHN HENRY PARKER, C.B.

MESSRS. DOULTON AND THE BRICKLAYERS.

Too late for insertion we received a letter on this subject from Mr. Coulson, secretary of the Bricklayers' Society. After replying to some statements made by Mr. Doulton, the writer says,—"To prevent, if possible, any longer continuance of this unhappy contention, I, on behalf of the Bricklayers' Society, offer to submit the question to a Board composed of any number of architects. Mr. Doulton himself may decide upon architects to be chosen by him and the Bricklayers' Society. The Board to take evidence from some members of Mr. Doulton's firm and workmen in the building trades. Should this be adopted by Mr. Doulton, there is no reason that I know of why it should not become a permanent Board for the adjustment of all future disputes between employers and workmen for the building trades in London."

WHITTLESEA SCHOOL COMPETITION.

SIR,—I have neither time nor inclination for a controversy in a public paper, but noticing in your last issue, under the above heading, a direct attack upon me, impugning my right to enter an architectural competition, I beg to say that the letter of Messrs. Bell & Lovegrove commences with an unwarrantable insinuation that I "turned architect because I happened to have powerful local influence." The Whittlesea schools were not the first for which I competed. I studied and practised architecture long before I entered the employment of Mr. Elworthy as general foreman, and have, since leaving that gentleman, been professionally engaged in architectural pursuits, and am happy to say can produce testimonials from those whom I have had the honour of serving, of their unqualified satisfaction in the results of my labours. The assertion that I "cannot have that special knowledge," &c., is simply absurd, as your correspondents could not possibly know my resources in that respect. The implied accusation against the integrity of the School Board, I leave in the abler hands of the chairman and gentlemen of that body to repudiate. In conclusion, may I ask whence the "high opinion" of Messrs. B. & L. of builders' foremen? Is it that they (as frequently occurred to me when in that capacity) have had to reduce to practicable application the senseless though prettily-coloured pictures of so-called professional gentlemen?

C. F. LANGFORD.

SCHOOL BOARD SCHOOLS.

Tylers' Green, Penn, Bucks.—New Board schools have just been opened here accommodating 200 children, with teachers' residence and outbuildings. The style is of Early English Domestic character, in red bricks, and axed flint work, surmounted with shingled bell-turret. All the exterior walls are hollow and ventilated, Mr. Wm. Woodbridge, of Maidenhead, was the contractor for the work, and Mr. Arthur Vernon, of High Wycombe, the architect. The total expenditure amounts to about 1,850*l.*

Shelf.—A new Board school is now being erected at Shelf, from plans by Messrs. Jackson & Fox, architects, of Halifax. The site, 2,200 square yards, is on the Shelf Hall-lane, fronting south towards Belle Vue. The building is in one story, presenting twelve windows to the front, also the porch window, and the four-light window of the infants' school, which is set at right angles with the main building. The mixed school is 60 ft. by 22 ft., and the two class-rooms attached each 20 ft. by 16 ft. The infants' school-room is 30 ft. by 23 ft.; and its class-room 14 ft. by 23 ft.

Slamannan.—A new Board school at Slamannan was opened on the 11th ult. The building has been erected from plans drawn by Mr. Watt, architect, Glasgow. It is placed at the west end of the village in a very airy situation, and is in the form of a parallelogram. The building consists of a principal school-room, 64 ft. long by 26 ft. broad, which can be converted into two rooms by a folding door. At each end of this room is a class-room, 16 ft. by 18 ft., and a retiring-room for the teachers, while at the back is an infant school-room 24 ft. square. The whole building, as also schoolmaster's house, out-houses, walls, &c., have been built at a cost of upwards of 2,500*l.*, being at the rate of 7*l* 7*s.* per scholar, the school being intended to accommodate 350.

Radstock.—New Board schools were opened at Radstock on the 16th ult. The site on which the buildings are erected is three-quarters of an acre in extent. The schools, which accommodate 200 children, have a teachers' residence attached. Sixty boys and sixty girls can be taught in an old school-room, 50 ft. long by 18 ft. wide, with a class-room adjoining, and eighty infants in another school-room, 32 ft. long by 20 ft. wide. The style of architecture is Early English. The buildings are of stone, quarried from the site, with outside freestone dressings. Inside, the walls are roughly faced and pointed. The walls are 15 ft. in height above the ground-floor, the whole of the roofs are open to the ridge, are covered outside with Roman tiles, and inside ceiled. The supporting woodwork that may be seen is stained and varnished. The cost was estimated at 1,560*l.*, but there have been a number of extras. The architect for the work was Mr. Alfred Harford, of Bristol; and the builder, Mr. Joseph Bird, of Writhlington.

Stonehaven.—On the 18th ult. the schools which have just been erected in the New Town of Stonehaven by the Fetteresso School Board were formally opened. The schools have been erected on a site in Ann-street, overlooking the town and commanding a view of the German Ocean. They have superseded what were formerly the Parish and Free Church Schools. The plans of the new schools were prepared by Mr. M'Kenzie, architect, Aberdeen. On the sloping ground in front of the schools are large playgrounds for the boys and girls. On the ground-floor is the infant department. The principal class-room in the south end is lofty and commodious, and in the north end is a teachers' room, a board-room, &c. In the north end of the second floor is the principal class-room of the senior teacher. All the walls are lined with dados of stained wood. The total cost of the schools has been fully 4,000*l.*

Shieldhill.—On the 30th ult. the new public school at Shieldhill, erected by the Polmont School Board from plans drawn by Mr. T. B. M'Fadzen, architect, Edinburgh, was opened.

Melverley.—The new Board school at Melverley was opened on the 29th ult. It is in the Gothic style, and has been built of Breidden stone with red-stone dressings, from the original designs of Mr. J. Martin Kerry, with alterations made by Mr. John Morris, clerk to the Board. It will accommodate about forty-five children. Mr. W. Griffiths, of Knockin, was the builder and the cost of the erection was 380*l.*

SCHOOL-BUILDING NEWS.

Cowley (Uxbridge).—The new Church schools which have been erected in this parish were opened on Michaelmas-day. The site was presented by Mrs. John Tylden Pattenson. The school accommodates 45 children. A mistress's house is attached. The cost was 700*l.* The work has been carried out by Messrs. Fassnidge, of Uxbridge, under the superintendence of Mr. Augustus Frere.

Bradford.—New Sunday schools in connexion with the congregation of College Chapel, High-street, Bradford, are about to be commenced. The site adjoins the present chapel, having frontages both to Park-gate and Barnet-street, and upon it is intended to be erected a building in the Italian style. A peculiarity which will distinguish the new College schools is that the great bulk of the scholars will be accommodated in separate class-rooms instead of in the open school. In the new College schools there will be eighteen class-rooms (including two of large size for young men's and young women's classes), all communicating directly with an assembly-room, besides a lecture-room so arranged that it may be used as two large class-rooms. This assembly-room will be 75 ft. by 42 ft., with an open-timbered roof, and having a gallery at one end and the sides lighted by "lantern light" from the roof, and three large windows in the gable to Park-gate. At the opposite end will be a large platform. The infants' class-room will

be 27 ft. by 24 ft., fitted with a gallery; and the lecture-room, 39 ft. by 24 ft., will be suitable for week-night services. The architects are Messrs. Hargreaves & Bailey, of Bradford, who propose to heat the building by a combination of hot air and hot water. The accommodation will be for 750 scholars, and the estimated cost (exclusive of the site) will be about 4,000*l.*

Glentworth. — The new school-building at Glentworth, Lincolnshire, erected by the Earl of Scarborough, and containing two class-rooms, cloak-rooms, &c., together with school-desks and seats capable of accommodating 100 scholars, was opened on the 10th ult.

Cardiff. — The St. Paul's Roman Catholic Schools, Tyndall-street, Cardiff, were opened on the 12th ult. The school, which is of Gothic design, was built by Mr. David Jones, of Park-street, from a design of Messrs. James & Seward, and was built at the sole expense of the Marquis of Bute, the contract being taken by Mr. Jones for 3,500*l.*, exclusive of internal fittings. There are two rooms, each capable of accommodating 250 children. The lower room is fitted with a screen and altar, and will be used as a chapel on Sundays.

York.—The new Adult School in Lady Peckitt's yard, York, was opened on the 18th ult. The structure is a commodious four-storied edifice, which, when furnished, will cost about 3,000*l.* It has been erected from the designs of Mr. E. Taylor, of Stonegate, York.

East Chinnock.—A new National School at East Chinnock was opened on the 28th ult. The school, which is built for the accommodation of about 100 children, is in the Gothic style, and is of Ham stone in random work. The schoolroom measures 33 ft. 9 in. by 20 ft. 4 in., and the class-room connected with it is 21 ft. 8 in. by 20 ft. It also possesses a porch. A comfortable house for the schoolmistress adjoins the school. Mr. Draper, of Crewkerne, is the builder, and Mr. Shewbrooke the architect.

Books Received.

Lectures on Architecture: Translated from the French of Viollet-le-Duc, by BENJAMIN BUCKNALL. Part II. London: Sampson Low, Marston, & Co.

THIS is the second volume of the English translations of M. Viollet-le-Duc's Lectures on Architecture, which are to be completed in six parts. We noticed at some length the first volume (p. 585, *ante*), intimating at the same time that any further review of the work in detail would probably be best deferred till it was completely before us. We therefore content ourselves for the present with calling attention to the second volume of these remarkable lectures, which are full of subtle critical thought and analysis, expressed in a perfectly clear literary form (very satisfactorily rendered by the translator), and which are not only highly suggestive to the professional architect, but may prove the most valuable lesson-book possible for the general public, upon architectural style and its constituents, if only the public can be induced to read them, instead of the text-books of Gothic mouldings, or the vague aspirations of Mr. Ruskin, which form the two boundaries of architectural study with most of the few amateurs who give any attention at all to the subject.

The two lectures included in Part II., which are on a sufficient scale to make a pretty good volume in themselves, deal, the first (VI.) with the decline of ancient and the rise of Christian architecture, the two being connected by remarks on the essential qualities of style and design; while the second (VII.) treats of "the principles of Western architecture in the Middle Ages." The illustrations are conceived and drawn in that admirable style which is characteristic of all M. Viollet-le-Duc's publications, in which the artistic expression and the practical construction of the work illustrated are shown with equal care and precision, in a manner combining pictorial effect with strictly architectural drawing. To the young student of architecture these drawings, showing in so plain and practical a manner the relation between appearances and construction in building, are in themselves a kind of education.

In commencing his remarks on "Style," the author illustrates what he means by "style" in the abstract (as distinguished from *a* "style"), by the description of three different ways of making a simple implement, such as a copper vessel for holding water. He takes the art at the time when the workman discovers that by beating a sheet of copper in a particular way he can give it the form of a vessel. He only needs for this a piece of iron as a point of support, and a hammer. The three imaginary stages in the progress of the "art" will give an idea of the author's line of reasoning:—

"The workman can thus, by beating the sheet of copper, cause it to return on itself, and of a plane surface make a hollow body. He leaves a flat circular bottom to his vessel, so that it may stand firm when full. To hinder the liquid from spilling when the vessel is shaken, he contracts its upper orifice, and then widens it out suddenly at the edge, to facilitate pouring out the liquid. There must be a means of holding the vessel; the workman therefore attaches handles with rivets. But as the vessel must be inverted when empty, he makes the handles so that they shall not stand above the level of the top of the vessel. Thus fashioned by methods suggested in the fabrication, this vessel has style: first, because it exactly indicates its purpose; second, because it is fashioned in accordance with the material employed and the means of fabrication suited to this material; thirdly, because the form obtained is suitable to the material of which this utensil is made, and the use for which it is intended. This vessel has style, because human reason indicates exactly the form suitable to it. The coppersmiths themselves, in their desire to do better or otherwise than their predecessors, deviate from the line of the true and good. We find, therefore, a second coppersmith, who wishes to alter the form of the primitive vessel in order to attract purchasers by the distinction of novelty; he gives a few extra blows of the hammer, and rounds the body of the vessel, which had hitherto been regarded as perfect. The form is in fact new, and all the town wish to have vessels made by the second coppersmith. A third coppersmith, perceiving that his fellow townsmen are taken with the rounding of the vase, goes still further, and makes a third vessel which is still more popular. This last workman, having lost sight of the principle, bids adieu to reason, and follows caprice alone; he increases the length of his handles, and advertises them as of the newest taste. This vessel cannot be placed upside down to be drained without endangering the shape of these handles; but every one praises it, and the third coppersmith is credited with having wonderfully improved his art, while in reality he has only deprived a form of its proper style, and produced an unsightly and relatively inconvenient article."

The sketches, given by the author, of the three stages in the progress of the pot, quite bear out his remarks as to style, and, moreover, illustrate a distinction which every one must have noticed in comparing common forms of modern articles of this kind to the forms of the same kind of object in the best Greek or Mediæval age. The author carries the illustration out in regard to other objects: "A gun has style, but a gun made to resemble a crossbow will have none." Architects, he says, have for a long time been making guns to resemble crossbows, or, at least, arquebuses; "and there are persons of intelligence who maintain that if we abandon the form of the arquebuse we are barbarians,—that art is lost,—that nothing is left for us but to hide our heads in shame." The consideration is, of course, not new to our readers; but M. Viollet-le-Duc has a very graphic way of putting things.

Miscellanea.

New Asylum and Poorhouse at Greenock. The foundation-stone of the Greenock new Asylum and Poorhouse has been laid, with Masonic honours, by the Earl of Mar. The building when finished will be one of the most extensive of its kind in Scotland, and will, it is estimated, cost over 100,000*l.* The architect is Mr. Starforth, of Edinburgh, and according to his plan the building will form four distinct sections—namely, the Poorhouse, Lunatic Asylum, Hospital, and Administrative Department. The style will be Old Baronial. The ground covered by the entire parochial premises will be fully four acres. The asylum, which will be situated to the east of the block, will be two stories in height, 290 ft. frontage, with a finely-designed tower in the centre. The poorhouse proper will be situated to the west, having the administrative department between it and the asylum. The poorhouse will be the largest section of the buildings, being three stories in height, 250 ft. in length from north to south. The hospital for treating cases of common disease will be situated westward of the poorhouse. There will also be a separate building, devoted to the treatment of contagious diseases, and probationary wards. Accommodation will be provided at present for 750 inmates.

New Schools, Bristol.—The Bristol School Board recently advertised for designs from architects for new schools, for 750 children, at Minaroad. In response, fourteen sets of drawings have been sent in. The designs of three architects were reported to the Board by the committee of selection as being of special merit, and one of three designs submitted by Mr. Stuart Colman, of Bristol, is chosen for execution.

Roman Coins.—A large number of Roman coins have been found upon the estate of Mr. John Clayton, of the Chesters and Newcastle-upon-Tyne. Mr. Clayton has extensive properties upon and adjacent to the Roman wall. As lord of the manor, Mr. Clayton has made many discoveries of interest during the past quarter of a century. He recently had workmen exploring land upon the farm at Corraborough, four miles west of Chatterford, on the North Tyne. They came upon a treasure-chamber containing many altars and thousands of Roman coins. It appears to be the greatest find of Roman treasure which has occurred in the North of England for some time. A military chest seems to have been dropped into a bath as soldiers had retreated from the Roman station of Procolitea, before the enemy, and there it has been marvellously preserved until dug out the other day. Mr. Clayton will lay the particulars of his great find before the Newcastle Antiquarian Society at its first winter's meeting.—— The *Derbyshire Times* reports an interesting antiquarian discovery just made on the eastern border of that county. Workmen have been employed by Messrs. W. & S. Burkitt, the eminent maltsters of Chesterfield and King's Lynn, in laying down pipes, from Scarcliffe to their large new malt-houses at Langwith, on the borders of Derbyshire and Notts. In digging the necessary trench, one of the workmen laid bare a large earthenware vase, of Roman workmanship, buried about 2 ft. below the surface. Before he could be prevented, the man broke it open, and it was found to be nearly full of copper coins, probably 200 or 300 in number. Many of them are in tolerably good preservation, and the majority are coins of the reigns of Tetricus, Victorinus, Claudius, and Gallienus, judging by a sample of about fifty submitted to the inspection of the editor of our Derbyshire contemporary.

Paving from Furnace Slag.—There is now a possibility of the "Staffordshire oysters," as the scoriæ from blast-furnaces are facetiously called in the Birmingham district, being turned to profitable account. Mr. Joseph Woodward, of Bedale, Yorkshire, having patented an invention for making the scoriæ into blocks for road and footpath pavement, has put down a plant at Messrs. Turley's blast-furnaces, the Factory, Tipton, in order to produce blocks for the purpose. The molten slag runs from the furnace into moulds, which are fixed upon a rotary frame, and as fast as one mould is filled another presents itself to the stream. The moulds are opened whilst the blocks are red hot, and placed in a kiln at a certain heat, and there they stay for twenty-four hours. This is all the process, and it requires two men and two boys to use up 30 tons of slag per day. When ready for use the blocks are said to be very clean and hard. They turn a chisel, and the inventor claims for them that they are impervious to wet, and consequently to frost; the surface is level, but of such a nature that it bites the iron of the horses' shoes; the surface is chamfered, and so no horse could slip, whilst the chamfering, provided the street were laid upon a convenient gradient, would render the pavement a self-cleansing one. The blocks are made in five sizes in order to provide for different purposes.

A Composite Church. — The *Worcester Journal* contains an account of an outing of the Worcestershire Field Club. In the course of their rambles, the members visited Eastham Church, which deserves especial notice, from its chancel being built of slabs of travertine. To observe this travertine *in situ* was the object of the excursion. All the hills bounding this part of the Teme Valley belong to the old red sandstone system, which includes a stratum of cornstone, and all the springs that flow from the cornstone are loaded with calcareous particles, which are deposited by the waters of the brooks, and thus in various spots great masses of travertine are formed, like that at Southstone Rock, near Stanford. This process has been going on for thousands of years, and quarries are still apparent from which tons of travertine have been taken every year from the Norman times to the present day. Eastham Church presents a somewhat incongruous appearance, with its clean-looking travertine chancel, plastered nave, and modern square brick tower at the west end, for renovators took it in hand both within and without in tasteless times. The round northern doorway, however, shows its original aspect was Norman, and above it are some intersecting arcades. Grim bits of sculpture of Norman date are scattered also about the fabric.

German Iron Trade.—The German Government has published some interesting statistics as to the production of iron in Germany for 1874. From these statistics it appears, according to the *Pall Mall Gazette*, that during that year there were 324 blast furnaces, which worked for a total of 2,801 months, or, upon an average, for about eight months and twenty days each out of a possible total of twelve months. The quantity of iron ore used amounted to 4,342,184 tons, of which 4,130,000 tons were produced in Germany itself. The total quantity of pig iron and cast iron of the first quality produced was 1,660,208 tons. The mean working population employed in the trade was 22,765, of which number 853 were women. A table is appended to these returns giving the quantities and value of the pig and cast iron produced during the last ten years. From 960,879 tons and a value of 4,129,142*l.* in 1865 the totals increased without intermission until 1871, in which year they were 1,420,830 tons and 5,946,589*l.* In the following year, when the produce of Alsace-Lorraine was included for the first time, there was a further increase to 1,807,345 tons, and a value of 10,585,049*l.*, the rise in value, as will be seen, being considerably greater than the rise in quantity. There was an increase again in 1873 to 1,983,163 tons and 11,283,938*l.*, but a fall in 1874 to 1,660,208 tons, as stated above. The reaction of prices was also very considerable, as the 1,660,208 tons realised but 7,243,589*l.*, or about 4*l.* 8*s.* per ton, as compared to nearly 6*l.* per ton in 1873.

The Chateau de Chantilly. — A correspondent of the *Pall Mall Gazette* says:—"The restoration of the Château de Chantilly, which has been undertaken by the Duc d'Aumale, is advancing very rapidly, and the Bishop of Beauvais has given permission for the work to continued on Sundays, 'for reasons of extreme urgency.' The south-west wing, facing the race-course, is almost finished, and from its windows will be obtained, not only a fine view of the course, but of the large stables in which Condé gave his celebrated entertainment to Louis XIV., and which is almost the only part of the château not destroyed at the time of the Revolution. The main building is not nearly so far advanced as the south-west wing, but the large towers which are to flank the new château, precisely upon the site of the ancient manor, are beginning to rise from their foundations. The courtyard will be almost triangular in shape, and the copings of the walls will be surmounted by campaniles similar to those which decorate the Rohan and Sesdiguières pavilions of the Louvre. The *Journal des Débats* has mentioned that this is not the first time Chantilly has been restored, as, during the reign of Philip of Valois, William Le Bouteiller, seigneur of Chantilly, rebuilt the ancient fortress, which had fallen into ruins.

A Colossus for America.—American papers mention the arrival from France of the first shipment of portions of the great statue of Liberty, which is to be erected on Bedloe's Island as a light-house. There are eight sections, packed in as many boxes, in this consignment. The casting is of dark bronze, and hollow, the bronze being between 1-16 in. and ⅛ in. thick, and braced throughout with wrought-iron stays; centre rods run through these portions, taking the same direction as the casting, and are bolted to the stays. The box containing the hand and wrist is 20 ft. long and 12 ft. high. The casting is about 14 ft. by 9 ft. between extreme points, and the thumb-nail 2 ft. long by 1½ ft. wide. This section required twenty men to handle it, but was lifted by the ordinary derricks from the hold of the vessel and lowered to the wharf on skids. This consignment embraces the right arm, hand, and wrist.

Tool Sharpening. — The *Tischler-Zeitung* states that a razor recovers its edge if left for half an hour in water which contains sulphuric or muriatic acid in the proportion of one part by weight of acid to nineteen of water. The razor is carefully wiped on being taken out of the acidulated bath, and passed over an oil-stone. The acid bath is said not to hurt the blade; on the contrary, the quality of the metal in some cases improves by the immersion. So with scythes and sickles. The time lost in the harvest-field in the early morning in sharpening scythes would be spared by laying the blades for half an hour in a bath prepared as above described. As soon as taken out of the bath they should be wiped, and a soft sandstone hone passed along would leave a good and uniform edge behind it.

Ancient Houses at Ipswich.—The *Ipswich Journal* says:—We are proud of the Ancient House in the Butter-market as a connecting link between the Ipswich of the present day and that of the days when Elizabeth was Queen of England. We have, however, recently discovered an older house, and one which is in no less degree a characteristic example of fourteenth or fifteenth century architecture. In repairing a house in the Butter-market, occupied by Mr. Thurston, at a short distance from the Ancient House, it was found that the front was half-timber work in a very good state of preservation. It had been covered with lath and plaster work. The front of the house is built with the upper tenements overhanging in two stages, one at the commencement of the first-floor story, and the other at the next. Further search revealed a window, the mullions of which belonged to the Early Tudor style. The moulding on the beams, &c., is also Tudor work, and Mr. Binyon, architect, confidently pronounces the house to be at least 200 years older than the Ancient House. The proprietor, Mr. William Brown, timber merchant, is restoring this patriarch amongst our houses, as nearly as may be to its original condition.

An Awkward Point of Law.—At the Surrey Sessions, at Newington, on the 17th ult., it was reported that the proceedings which were pending between Surrey and Middlesex as to the liability to repair Walton Bridge had been stopped for the present, owing to the want of a proper tribunal to decide the question. The county of Surrey initiated the proceedings against the inhabitants of the county of Middlesex for the non-repair of the bridge, and from the recorded decisions it appeared clear that no inhabitant of either county could act as a juror in the case, and the venue was changed to Kent. An application to fix a day for the trial, it may be remembered, was made at Maidstone, and a point of law was raised that as the Lord Chief Justice and the other judge of assize were inhabitants of Middlesex they were interested in the cause, and could not therefore try it. The Lord Chief Justice held the objection to be fatal, and the case accordingly stood over until some means could be suggested by which it could be tried. Some members of the court suggested that either a private Bill or Act should be taken into Parliament, but after a short discussion the question remained *in statu quo*.

Elementary School Buildings in America. From the recent annual report issued by the Board of Directors of the St. Louis Public Schools, we learn that it is the policy of the Board to build twelve-roomed buildings, three stories in height, having four rooms on each floor, and each room placed in a corner, so as to get light from four large windows,—two in the rear of the pupils and two on the side. The school sites usually contain about 2,500 square yards, of which about 650 yards are covered with buildings. These buildings are furnished with "combination furniture," each seat adapted to two pupils; each room seats about sixty pupils. The two rooms on either side of the hall are separated by moveable partitions, so that they may be united for general exercises, such as singing, &c. It is thought that 700 pupils are quite as many as it is desirable to bring together in one building. The isolation of the pupils in rooms containing fifty or sixty pupils each, placed under the special charge of a teacher for instruction and discipline, secures, in the maximum degree, the personal influence of the teacher upon the pupil.

The Friends' Retreat, York.—A new building in connexion with the Friends' Retreat, in Heslington-road, York, is in course of erection from plans by Mr. E. Taylor, architect. The style is Elizabethan. The lodge set apart for gentlemen patients in the establishment having been found inadequate, the promoters resolved upon the erection, in its stead, of a large and commodious one-storied building, fitted up with every convenience that the care of Dr. Baker, the superintendent, could suggest. This new edifice is now nearing completion, and will entail an expenditure of 8,000*l.* to 9,000*l.* Mr. Cook is clerk of the works. Mr. Hebden has the masonry contract; Mr. Lee, the bricklayers' work; Mr. G. Mansfield, the joinery; Mr. Rawling, the plastering; Mr. Cattley, the slating; Mr. Yarker, the plumbers' work; and Messrs. G. N. Haden & Son, of Manchester, are entrusted with the arrangements for heating the building.

House Building in the Suburbs of York.—The *York Herald* says that for a long time now, notwithstanding that blocks of houses have been erected in many quarters, the demand has been largely in excess of the supply, and at the present time several plots of land in Fulford-road, off Heslington-road, Hull-road, and other parts of the city and suburbs, are being built upon. In those localities which are not within the jurisdiction of the Corporation regulations are now enforced by which it is secured that the buildings raised shall be such as sanitary science calls for, the York Rural Sanitary Authority having just lately obtained from the Local Government Board sanction to certain bye-laws for the townships of Heworth, Clifton, Gate Fulford, Dringhouses, Holgate, and St. Olave's, Marygate, which are quite as strict against "jerry building," if not more so, than those of the York Urban Sanitary Committee. The Rural Sanitary Board, with a view of carrying out the building clauses of these regulations thoroughly, are about to appoint a surveyor of buildings.

Alleged Failure of the Highway Act.—The highway district system, which has been in operation in Bedfordshire for a period of thirteen years, has been the subject of much dissatisfaction. On the 17th inst. a deputation of wardens and ratepayers, representing upwards of seventy parishes in the county, attended at the Shire-hall, Bedford, to memorialise the magistrates assembled in Quarter Sessions. The memorial expressed the opinion that "The Highway Act had proved a failure, the expense being greater — in some cases more than 100 per cent.,—without any commensurate improvement in the condition of the roads." In some parishes the roads were stated to be in a worse condition than when under the old system of management. It was also argued that "The maintenance of turnpike and main roads should be a charge, not upon districts or parishes, but upon the county rate or consolidated fund." In response to the deputation, the Court appointed a committee to investigate the subject.

The Burns Statue for Glasgow.—Some years ago a movement was set on foot to erect in Glasgow a fitting memorial of the national bard of Scotland. The execution of it was entrusted to a gentleman whose name is intimately associated with art in the West of Scotland, Mr. G. E. Ewing, and on the 24th ult. his labours were brought to fruition by the casting of the figure in bronze at the foundry of Messrs. Cox & Son, Thames Ditton, near London. The statue is of heroic size, and represents the poet as in physical embodiment he is familiar to most Scotchmen, and more especially to those who know the Nasmyth portrait. The bard holds lightly in his left hand the daisy which his muse has immortalised, and seems carried away by the thoughts which his destruction suggests. Under his right arm is the broad Kilmarnock bonnet. The costume is, that of the period—knee breeches, ribbed stockings, and shoes with broad buckles being the chief characteristics.

Fall of a Market Roof in Leeds.—A portion of the new market works at Kirkgate, which are being carried out by the Leeds Corporation, has come to grief rather suddenly. The portion which fell was the roof and upper part of the walls of an open arcade fronting a small portion of the row of shops now being erected on the south side of the market, the cause being that, owing to the bricklayers' scaffold being in the way, several framed bindings, which were in the contract, and were delivered on the ground, could not be fixed. The roof being proceeded with before this part of the work was completed, the weight of the slates upon the rafters thrust over the upper part of the walls. Fortunately no personal injuries were sustained, the principal damage being to the slating and brick arches, which damage will not exceed 100*l.*

The Centennial Exhibition. — We have received several strong expressions of dissatisfaction from exhibitors on various grounds, but it does not seem to us that it would be useful to foment differences when matters are coming to a close. Some of our readers may have heard that the packing-cases belonging to the English exhibitors and others were burnt. The commissioners having refused to provide others, counsels' opinion was to be taken, and the matter has become a "burning question." The additional awards to painters, after the appointed committee had done its work and left, is also matter for comment.

The Female School of Art.—Prominent among the prize works is Miss Ida Lovering's drawing of a girl's head, draped after the fashion of the Puritan period, for which she obtained the Queen's Gold Medal. The National Silver Medal was also awarded to Miss Ida Lovering. The National Silver Medal and Gilchrist prize of 50*l.* have fallen to Miss Florence Reason, for a water-colour drawing of "Passion Flowers," which deals with the subject in its various stages of growth. Miss Alice Hanslip has obtained the National Bronze Medal and the Queen's prize of 40*l.* for two heads from the life, in charcoal. These are "time sketches," and are clever drawings. For a piece of vigorously-painted still life, in oil, Miss Emily Austin won the National Bronze Medal. In addition to these, National Book Prizes have been awarded to Miss Gertrude Hamilton and to Miss Holmes for studies in water-colours.

New Business Premises at Nottingham. New premises for Mr. Rowe, outfitter, Low Pavement, Nottingham, have just been completed, from the designs of Mr. Alfred Smith, architect. The decorative work was done by Mr. Hindley, of Milton-street, while the general contractor was Mr. John Brown, of Bridlington Quay.

Mycenæ.—Dr. Schliemann continues his account of the important excavations he is conducting at Mycenæ in the *Times* of the 1st inst.

TENDERS

For construction of drainage works for the Hastings Urban Sanitary Authority in the parishes of St. Andrew, St. Mary-in-the-Castle, and Holy Trinity :—

Vidler	£2,398 0 0
Cruttenden	2,352 0 0
Gasson	2,297 0 0
Geary	2,273 0 0
Downs	2,250 0 0
Reeve	2,082 0 0

For the restoration of the Parish Church of Granston, Pembrokeshire. Mr. E. H. Lingen Barker, architect :—

James & Thomas	£445 0 0
Jones & Jenkins	379 14 0
Lewis & Phillips	375 0 0
T. & J. Lloyd (accepted)	373 0 0

For house, Prospect Hill, Walthamstow, exclusive of chimney-pieces and stoves, for Mr. T. W. Fladgate. Mr. Humphries, architect :—

Fuller	£1,443 0 0
Boome & Co. (accepted)	1,419 0 0

For repairs, &c., to house at Keston, for Mr. W. C. Ellis. Mr. Wm. C. Banks, architect :—

Marriage	£190 0 0
Farnacott	157 15 0
Copping (accepted)	155 0 0

For alterations to the Book Depôt of the United Methodist Free Church. Mr. C. N. McIntyre North, architect :—

Downs	£351 0 0
Woodward	303 0 0
Richardson	288 0 0
Horwood	268 0 0

For alterations and additions to the Northumberland Arms, Tottenham Court-road. Mr. William Paice, architect :—

Kirk	£975 0 0
Perkins & Co.	962 0 0
Patman & Co.	935 0 0
Cohen	850 0 0
Lamble*	847 0 0

* Allowance for old materials, £20.

For repairs at Lesney Farm, Erith. Mr. Hide, architect :—

Blake	£540 0 0
Vickery	475 0 0
Miles	467 0 0
Hills	459 0 0

For house and shop at Harrow-on-the-Hill, for Mr. W. Winkley :—

Staines & Son (accepted)	£783 0 0

For alterations and improvements to the Jamaica Tavern, West India Docks, for Mr. H. Mackenzie. Mr. James Harrison, architect. Quantities by Mr. H. T. Gordon :—

Ashby, Brothers	£2,796 0 0
Merritt & Ashby	2,750 0 0
Browne & Robinson	2,6 8 0 0
Newman & Mann	2,116 0 0
Little	2,049 0 0
Curtis	2,015 0 0
Enor	2,733 0 0

For a public-house at Borough-green, Wrotham, for Mr. H. Simmonds. Mr. G. Friend, architect. Quantities by Mr. T Potter :—

Wiltshire	£1,819 0 0
Bridge	1,573 10 0
Clements & Wallis	1,543 10 0
Durtnell	1,514 0 0
Bishop (accepted)	1,396 15 6

For a residence at Wednesfield Heath, for Mr. E. Birch. Mr. J. R. Veall, architect :—

Gough (accepted)	£740 0 0

For a new infant school at Coleshill to accommodate fifty scholars. Mr. J. R Veall, architect :—

G & F. Bigham	£210 12 8
J. & W. Cockerill	193 10 0
Morton (accepted)	172 0 0

For a house at Sevenoaks for Mr. O. N. Swann. Mr. G. Friend, architect. Quantities by Mr. T. Potter :—

Bridge	£1,849 18 0
Clements & Wallis	1,801 0 0
Dove	1,728 15 0
Wheatley	1,725 0 0
Durtnell	1,699 0 0
Ashton	1,677 0 0
Wiltshire (accepted)	1,557 0 0

For additions and alterations proposed to be carried out at Nos. 149 and 151, Euston-road, for Mr. E. Stenning. Messrs. Tolley & Dale, architects :—

Kelly, Brothers	£1,000 0 0
Williams	995 0 0
Pritchard	987 0 0
Hoare	983 0 0
Wells	932 10 0
Kirk	950 0 0
Bird	945 0 0

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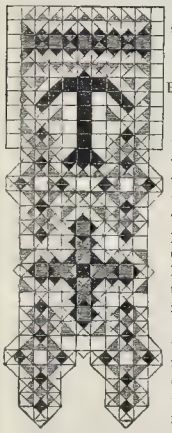
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Central London: its Rulers and Ground Landlords.

HERE have been known instances of men and women—inhabitants of the Temperate Zone—who, having passed through two-thirds of the allotted span of life without washing any part of their bodies except just face and hands, have died from the shock of complete immersion in water. Such experiences being verified and accounted for, any proposal to deprive the capital of the British Empire of its accustomed abuses should be received by the inhabitants at large with caution. For when a Chief Commissioner of Public Works does his duty, unbiased by the obligations of political party, or the commercial interests of powerful individuals; when a Metropolitan Board effects a useful improvement with artistic method; when a vestry enforces the provisions of the Metropolis Local Management Act in their integrity and without favour; when historical landowners, holding territory by the right of a custom which has in it something of feudal privilege, remember, in return, the duties they owe to those who live upon their lands; when against the commercial procedure and artistic judgment of one who may own the soil of an entire parish, there shall exist a different and perhaps more appropriate Court of Appeal than the offices of an Inspector of Nuisance; when a serious attempt has been made to keep the outsides of public and private buildings decent; when a real effort has been made to keep the streets clean: if such things ever come to pass, what if London should succumb?

That craving for the innocent enjoyment of "home," said to be innate in and peculiar to the natives of this country, is grimly neutralised by the perpetual temptation held out to all grades of Londoners to play truant or leave it. While in Continental capitals the endeavour of authority is to render the centre of town pleasing and enjoyable to the middle and lower classes, the usual method, in Central London, of "spending a happy day" is to take a railway-ticket to the suburbs or the more distant country. To form a correct judgment of the British capital, it is necessary to examine its centre during the twenty-four hours of Sunday,—the period of hebdomadal rest, when, in theory, the human mind, while the body reposes, soars with sweet surroundings to the Infinite and Sublime. What, then, is done to aid a consummation so devoutly to be wished? Erring but hopeful man opens all the churches and closes all the public-houses during certain hours of the day. The respectable middle classes attend some place of worship; the upper classes are invariably orthodox, and, leaders of profane fashions, they are in duty bound to set righteous ones. But those who inhabit the bye-ways of Clare-market, of Gray's-inn-lane, of Drury-lane, of Bedfordbury, of St. Martin's-lane, and of the Seven-dials, do not, as a rule, bend the knee under either Gothic vault or Basilican ceiling; nor do a great many men,—albeit educated, thoughtful, and honest,—go to church; and the argument is that those who will not seek Sunday consolation there shall be made to suffer all that authority can do, or leave undone, to render the seventh day wearisome. Men of science and art, authors, press men, club men, and the majority of working men, are not church or chapel goers; so the national pictures, the national treasures of every kind, bought and maintained with the public money, shall be hidden from their sight; and the filth which encumbers the streets and public places on a Saturday night shall fester for thirty-six hours after under their very nostrils. Therefore a club man turns his chair to the wall, and sleeps the sad Sunday afternoon away (for all Englishmen are not husbands and fathers); the painter paints; the press man pens a leader for to-morrow; the man of science continues his researches; and those who love grand great things and beautiful little things, often shut themselves up with their books, draw curtains and light gas, while the sun still peers over the housetops, below which mud-stained walls and black-coated highways mock the light of God's Day.

We have been led to these reflections by an announcement that a piece of land in Northumberland-avenue has been hired for building purposes at an enormous sum per annum during eighty-nine years. After that, in the year 1966, the land, and whatever may have been built upon it, will revert to the landowner or owners,—that is, to the heirs of him or those who may choose to purchase, of the Metropolitan Board of Works, the annual ground-rent for eighty-nine years. Now, what are the particular advantages, besides commercial ones, which render the vicinity of the finest of sites worth an exorbitant rental? There are no delights in Trafalgar-square; artistically, it is the biggest blunder in Europe; and, although the "lords of human kind" condescend to pass by it, the hum of human life, which is heard there, is not more agreeable than that which pervades other places,—even where trees and flowers are railed in against a supposed enemy,—in Central London. There is nothing remarkable in the Nelson Column, except the folly which placed it in such a position as to mask the portico of the National Gallery to the eyes of an observer coming up the hill from Whitehall. Although tall columns and minarets are beautiful and useful accessories to a large building,—witness the mosques,—when they are in their proper places, they become absurd out of them. It is too late, however, to deprecate the error; but it is neither too late nor too extravagant to suggest the substitution of flowers, foliage, and turf for flag-stones; of trees for the present cab-ranks, because there are other places equally fitted for "Hansoms" and "Growlers"; and, above all, the expeditious rebuilding of the National Gallery façade.

Indeed, it may be a not-impertinent question for the *Builder* to ask why a much-abused but certainly not altogether abominable Greek building has been rendered ridiculous by the addition of a larger pepperpot and an Italian campanile of decidedly native application? Was it done under a misconception that these excrescences would not be visible to the world without? We are convinced that it was not so done. Rather, perhaps, the subordinates of authority,—the present Chief Commissioner, to be just, has not had much opportunity yet of exhibiting his judgment,—are of a Gothic turn of mind; and, struck with the imposing beauty of the rising Law Courts, they may wish to introduce something of the same kind in Trafalgar-square. Indeed, in the existing chaos of sentiments and styles it is impossible to say what may be the vagaries of those who direct the design of our national monuments.

We do not deny that the state of some public buildings, which, nominally completed and really occupied, vex the regard of both natives and foreigners, is sufficient to induce even a wish that no further accumulation of such works be permitted until the more recent ones are satisfactorily finished. The Parliament-street façade of the new Home Office offers either an enigma, which we should willingly hear explained, or an omission, which ought to be supplied. Over a portion of the front the crowning feature—a balustrade—is made to stop abruptly as it approaches each extremity, leading the spectator to infer that either pedestals to hold sculpture, or an extra story, had been intended by the architect; for it cannot be supposed that any one with the smallest judgment in such matters would have left the skyline of the new Home Office in its present condition of incompleteness, even when examined in a utilitarian point of view. The useful, however, asserts itself in a very remarkable manner, in other of our national buildings. There is the British Museum, the front of which is neither more nor less than a mask of Greek columns, entablatures, and pediments. These colonnades, having been objected to by the critics as mere specimens of mistaken sacrifice to misplaced beauty, have been converted by the skill of the carpenter into wooden houses for treasures which the nation has neither the will nor the money to house elsewhere. The consequence is that the front of the British Museum resembles somewhat the condition of an antique temple in the days of monkish exclusiveness, or a Mogul Palace in the occupation of Royal Engineers, both of which, at different times, have been choaked with the extemporised hovels of wanderers, who have been permitted to desecrate them without protest or perhaps even a sigh of regret. Nor are a few pretty remi-

niscences of Swift's and Bolingbroke's day much better respected by authority; which, having begun life with a blind adherence to the most degraded form of Mediæval architecture, broke in its prime with youthful convictions, and in its age finds itself without "a taste." At a time when, in any part of England, the news that an old barn which was known to have borne, three or four hundred years ago, an open-timbered roof, would draw from respected members of the architectural profession offers to restore it to its original integrity, at the usual rate of commission, not a voice is raised,—not even a sentimental tender is made,—to re-erect the great entrance to the famous Earl of Burlington's town house. The bleached stones lie, exposed to the mischievous curiosity of all the world, on the banks of the Thames! In spite of empty ecclesiastical thrones and sedilia, of a brand-new piscina in every old town and country church, of Gothic manses and schools, of Japanese pots and pans and all kinds of æsthetic upholstery, the old verse still holds good, if the real and not the affected sentiment of the country be gauged; and men, with the smallest help of their imagination, may still believe,—

> "The love of arts lies cold and dead
> In Halifax's urn;
> And not one Muse of all he fed
> Has had the grace to mourn."

It is the same, although not to the same extent, with the little archway at the foot of Buckingham-street, in the Adelphi. It remains a receptacle for refuse, and we suspect affords, through a broken iron gate, a surreptitious entry to the Embankment gardens after the other entrances are closed. This unique archway ought not to have been buried in the manner in which it now appears. The earth should be even now dug from around it; its original level restored, drained, gravelled, and protected from intrusion by a railing or dwarf wall; for there are few things in the neighbourhood which equal the constructive elegance of the little Buckingham-street Water-gate.

It would be possible, however, to forgive a disregard for the works of the last two centuries if any evidence showed that there was a real desire to make use of the works of the present one—to regard the best of them as parts of a great whole to be worked into new schemes of improvement. Had the Nelson Monument been a work of art comparable to the Vendôme Column, it would have been monstrous to lay out Northumberland-avenue in such a way as to lose a distant view of the monument; but, we repeat, the Nelson Column is out of place in its actual position; and when the public is better educated than it is at present, some pains may be taken to remove it as well as its companion eccentricity at Hyde-park-corner. But the Metropolitan Board, we are told, are devising means for making a wide and direct thoroughfare between Charing-cross and Holborn; and, for a long time, rumour has suggested a new street from the Strand, *vid* King William-street, to the top of the Haymarket. Now, at the present moment, parts of Panton-street and neighbouring streets show vacant sites of freehold property, while, at the back of the National Gallery, the land belongs to the Government. As the approaches to form the new street to Holborn will necessitate the purchase of property, perhaps on both sides of St. Martin's-lane, it is advisable to consider the feasibility of making at the same time another street almost at right angles to the former. The purchase also of a few houses on the Pall-mall side of the National Gallery would not only admit of a direct opening from Trafalgar-square to Leicester-square, but permit the complete isolation of the National Gallery itself—thus securing it from the constant danger of immediately contiguous fire.

Some years ago an attempt was made to penetrate the huge slum of Soho by continuing Dean-street in a straight line to Leicester-square, and to do this it would have been necessary to purchase the land upon which Saville House, burnt down several years ago, once stood,—land which, up to the present day, has been occupied by a subterranean *café*, burrowed and hidden away under blackened ruins. It is quite needless to say that in few other European capitals would such a spectacle as that so long presented by the barricaded remnant of Saville House have been tolerated. The cause of the nuisance lies in the rights, not the duties, of the landowner; and in the easy licence of leasehold speculation. The land belongs to a freeholder rich enough to be careless of property worth perhaps from 15,000*l.* to 20,000*l.*; and is is hampered by a leaseholder who can hold a one-story *baraque* extemporised upon it for life. Thus, for a whole generation, and perhaps much longer, the unsightly ruins of Saville House may remain in their present condition. There is no law to remonstrate either with freeholder, leaseholder, or tenants, representing that peculiar combination of interests which renders any one owner absolutely impregnable against all attack. Nevertheless, in the interests of the public, and in the face of the present condition of metropolitan building,—its consequences to health of body and mind,—we must fain place the saddle upon the right horse; and that horse is the ground-landlord. It is the current custom to attribute the actual condition of our houses to the wilful carelessness or invincible ignorance of architects in general; but, however much it may surprise outsiders, we feel bound to declare, as we have declared a hundred times before, that very few architects have anything at all to do with the town-houses, or even the suburban villas, of London: they are built by speculators, who, if they do employ an architect, simply pay him for his plans and elevations; and often refuse to listen to his advice concerning drainage or foundations, the proper material for floors, and horizontal divisions, or the necessary covering for rooms in a roof, &c. The architect, at the best, is only an adviser; he can do with his client no more than the doctor can do with his patient. He can order a concrete foundation over the whole site of a new building, but he can no more compel the owner of the building to pay for it than the doctor can make a sick man swallow a bolus. It is, therefore, not the architects who are responsible for the present state of house property in Central London. Is it, then, the speculating leaseholders who should be condemned? We think not; for in building they always run a risk, and sometimes enter into arrangements with money-lenders, which may ultimately land them in the Bankruptcy Court. Is it the householder, or the tenant-lodgers? We know that it is not; for they have not, and never have had, a voice in the building of the houses which they inhabit. The fault, the blunder, the great responsibility, lies with the chief and first speculator—the freeholder of the soil. Now, the greater part of this soil, in Central London, belongs to nine owners, and their names are,—the Duke of Bedford, the Duke of Portland, the Duke of Westminster, the Marquis of Exeter, the Marquis of Salisbury, the Marquis of Northampton, the Marquis Camden, the Earl Craven, and the Earl of Portman.

It is probable that if the majority of these noblemen were questioned concerning the interiors of the houses built upon their lands, they would be utterly unable to answer one word about them. Their business, executed by their agents, is to lend land, and upon the lending of this land their incomes largely depend; the incomes of their fathers, grandfathers, and great-grandfathers largely depended; and to which same lending their sons, grandsons, and perhaps a remote posterity will look for support. Upon one great estate, which comprises the entirety of one parish and the larger portion of others, this is how things are managed, we venture to believe, to the doubtful benefit of both landowner and his tenants. There is, of course, a steward, who is the respected terror of leaseholders, present and future. There is a surveyor, whose duty it is to spy out any nakedness or building corruption which may prejudice a noble employer, and he is very wisely restricted from acting as surveyor or pseudo-architect on behalf of any person building upon the estate he is deputed to survey. But he has a brother, and what more natural than that the latter should profit by the restriction placed upon the surveyor's powers? Thus, when the expiry of a lease is at hand, the usual notice is served upon the leaseholder; the conditions under which he may renew the lease are intimated to him; the defects of the existing house and the necessity of rebuilding are pointed out. The tenant, whose business perhaps depends upon the locality, seeks the freeholder's surveyor. He is, perhaps, coldly received; his suggestions treated with polite contempt, and his demand for advice referred, perhaps, to the surveyor's freer relative. The consequence is, that the latter gentleman often acts as a tenant's professional adviser; and, with the aid of a builder, who may be also a tenant on the estate, and perhaps a member of the vestry, the house rises. There is nothing dishonourable in such a mode of carrying on business, and we admit that such a system may be accompanied by the exercise of the strictest integrity. It is found sometimes to answer in diplomatic concerns, in Parliamentary matters, in commerce, and in trade; but it is not found to answer in building houses upon the great estates of Central London; and it has produced neither satisfactory results in particular cases which have been brought under our notice, nor is the general result satisfactory, as the public knows full well.

The circumference of town is covered principally with rows of villas, terraces, and shops, and, as a rule, each house is there occupied by a single family. For the present, therefore, even its mismanagement is not sufficient to excite reformers who have far more pressing work on hand. The plague-spot of the metropolis is its centre, in and between the estates of the great freeholders. Let these noble owners take the matter up, seriously and honestly, for the public good, if not for their own. Let them suggest a means of co-operation to the different vestries and Boards. Even the homes of those poor who are now hopelessly located upon some of these estates might thereby be brought within a possibility of redemption. The miseries and temptations they endure, in the worn-out houses in which they are huddled together, appeal to the mercy of those who own the soil; and we cannot but think that, sharp as is the business-eye of a ground-landlord, he is still often half-blind in many particulars affecting his own private interests almost as perniciously as those of the dwellers upon his estate. A word in conclusion. There have been given in the pages of the *Builder* too many proofs, and for too long a time, of the conservative temper of our suggestions and mode of argument to allow any one to suppose that we entertain sensational views upon great political or moral questions. We have but lately, and in the most unreserved manner, condemned the working-man for unreasonable and mistaken attempts to advance his own welfare; but when he has come to us with the story of his wrongs—of his satire of a home—we have helped his cause with words and remonstrance. More a journalist cannot do; but everything points to a likelihood that, if the present tenure of land be aggravated by the continued heedlessness of a few hereditary owners, a great evil may befall not only themselves, but the whole community. We commend the present state of Central London to the serious attention of those families whose privilege is the perpetual inheritance of its soil, and who in connexion therewith, and by present arrangements, are rapidly absorbing the accumulations of the middle classes. That the position is pregnant with danger needs no recital of either precedent at home or of historical parallel abroad.

MR. CHARLES BARRY'S ADDRESS AS PRESIDENT OF THE INSTITUTE OF ARCHITECTS.

At the opening meeting, held on Monday last, Mr. Charles Barry, president, said,—

In addressing you for the first time as your president, the responsibilities and duties of the position become very real to me, and cause me no small hesitation as to my power to discharge them as I feel they ought to be discharged. I am fully conscious that many another member of the profession has higher claims than I to this office, and yet when such a distinction is conferred on a man by his peers, and even by his superiors, it cannot fail to stimulate his best energies for the duty thus cast upon him, which is inseparable from the honour itself. We are, indeed, all fellow labourers for the advancement, the honour, the purity, and the better appreciation by the public, of our noble profession, and, as in a racing University crew, all being good men and true, one is of necessity chosen as "stroke" to guide and harmonise the efforts of the rest, so I feel that you have placed me in a like position, and that in helping so far as I may to the success of all our members I have a much more than personal responsibility to discharge. In attempting to do this I shall need, and, I am sure, receive, your hearty good wishes and most necessary help. I look back on the honoured names of those who have preceded me as presidents, some of whom are happily still among us, and I naturally fear that I may not be able to render such good service as many of them have done: all I can promise you is to do my best. And here I hope I may be pardoned if I allude to one near and dear to me above all men, who, though never president of this Institute, held a name revered by all its members as one of themselves, personally loved by many of them, and

honoured throughout the world as one of the architects of history. My father always took deep interest in the welfare and progress of this Institute; was, I believe, one of its founders; and, I well know, esteemed the honour of the Queen's Gold Medal, voted to him by his colleagues and friendly rivals here, the highest among the many honours of a like nature he received from home or foreign artistic bodies, second only, indeed, to the personal honour conferred on him by his Sovereign. It is not ordinarily given to two consecutive holders of a distinguished name to be distinguished; at the same time, it is a great spur to exertion to be the holder of such a name as mine, and I feel it is no small part of the honour you have done me in electing me to this chair, that it indicates as I trust that in endeavouring, however humbly, to follow in my father's footsteps, I have not discredited the high position achieved by him.

You will naturally expect me to say a word of thanks in your name to your late distinguished president, whose great learning, not only as an architect, but as an antiquary, has so often thrown light on questions which have interested the Institute, and whose large circle of personal and professional friends feel attachment as well as esteem for him. His very numerous and engrossing professional occupations were rarely allowed by him to interfere with his attention to his duties here when he felt his presence was desired or desirable. Only during an anxious period of some months, when his health gave way, was he continuously away from us; and now that he has returned to us with renewed strength, we feel great regret that his term of office has expired, and trust that, from the intimate knowledge he has acquired during his presidency of the needs and objects of our Institute, he will still devote his time and abilities to aiding those who have now to take the labouring oar which he has relinquished.

It is usual and useful in these addresses to place on record some of the statistics of our Institute during the past year. I will therefore state that whereas in November, 1875, there were 293 Fellows, 290 Associates, 12 Honorary Fellows, and 9 Contributing Members, making a total of 609 members; now we number 306 Fellows, 309 Associates, 12 Honorary Fellows, and 9 Contributing Members,—in all, 636, or an increase of 27 members. I venture to hope these numbers may still be largely increased during the present year. In the year 1875 there were also 33 Students, this number is reduced now to 21.* Now, satisfactory as the above numbers are, I think we must all feel that our profession is nevertheless not as fully represented as it ought to be by the Institute, especially when we see that the Institution of Civil Engineers has no less than 2,400 members, of whom 155 have become members during the past year, and even the recently-constituted Institution of Surveyors has 440 members, of whom 52 have become members during the same time. I name these two bodies as being to some extent cognate with ourselves, but chiefly as evidence of what may be done by hearty action for a common object. We have no reason to complain of our financial position if we simply compare it with past years, for the income of last year was higher than that of the two previous years, and I have some reason to hope that the income of the present year will be still higher, but here again we cannot but feel that our income ought to be very much larger than it is (some 1,600*l.* or 1,700*l.* a year, exclusive of trust funds and special donations) if the Institute is to fulfil all its functions in the efficient way we all desire, but to do which much larger funds than the above are obviously necessary. Here, again, individual members may do much, if they will only be mindful, when opportunity arises, to point out the present, and we hope the increasing, advantages of membership here, and if they will be earnest in making the best use of such advantages themselves. During the year, 53*l.* 11*s.* have been received on account of the Library Fund for purchase of interesting and important works, either at public sales or from the collections of deceased members of this Institute.

My next reference must be to the mournful but ever-recurring subject—that of noting those of our members whom we shall see no more among us. They have finished the work on which we are still labouring, and it may be some little encouragement to us to note the esteem in which they are held when their work is done. The list is unhappily a long one. We have to deplore the loss of nine Fellows, viz., Messrs. E. Roberts, Richard Tress, D. A. Cobbett, H. H. Vale (of Liverpool), James Noble, John Tarring, Henry Roberts, David Bryce, and Thomas Bellamy; also of three Associates, viz., Messrs. T. H. Stevens, Albert Bridgman, and T. Barwell. In the list of our Honorary Members we must henceforth look in vain for the name of Sir Gardner Wilkinson. Among those foreign brethren in art whom we are pleased and honoured to have associated with us as Honorary and Corresponding Members, a band lately so honourably represented in this room by the Queen's Gold Medallist of this year, Mons. Duc, we can no longer number—Mons. F. Lange, Herr T. H. Wolff, Herr Rudolph Weigmann, Herr Frederick Ziebland, and Mons. Edouard Metzger. The memory of Mons. Labrouste has been duly brought to your notice by the feeling sketch of him and his career read to you during the past session by our Foreign Secretary, Mr. Cockerell. As I had not the pleasure to be personally acquainted with some of these gentlemen, but as I feel a desire (shared I am sure by you) to give expression to our feeling of regret at having lost them, I would briefly record, so far as possible, the story of their efforts and successes. I have, with the kindly help of the two secretaries and others known to them, drawn up some few notes of their claims to kinship with ourselves.

Edward Roberts, F.S.A., Fellow, was born in the year 1819. His architectural works were not numerous, but among them may be mention the Institution and Market at New Swindon, illustrated in the *Builder* (for 1854); and the Buildings of Christ College, Finchley. His practice for many years chiefly consisted in the management for his clients of compensation cases connected with metropolitan improvements and railway projects, a branch of professional business on which he bestowed great care, and with very notorious success. He took interest in the formation of the Junior Athenæum, and was professionally employed for the club in adapting a small house in King-street, St. James's, for Club purposes; when the Club removed to Hope House, Piccadilly, he added a handsome and commodious smoking-room for the members. Mr. Roberts was a Fellow of the Society of Antiquaries and a member of the British Archæological Association, of which latter he became in 1862 one of the hon. secretaries. He frequently attended the meetings of the latter society, and contributed to its transactions many valuable descriptions of ancient buildings, which he illustrated with measured drawings by his own hand. As a Freemason he was a member of the Grand Lodge, as well as of the Methuen and the Middlesex Lodges, of which latter he held the office of secretary for thirty years. Mr. Roberts's then recent death was mentioned in the President's opening address of last session.

Richard Tress had a large business connexion, principally in the city of London, and during a practice of above forty years was engaged in many public works, and buildings of large extent for mercantile clients. He was surveyor to several of the City parishes, and superintended the alterations to and restorations of a good many City churches, notably those at St. Mary-le-Bow, St. Michael, Paternoster Royal, and St. Augustine, Watling-street. Among his other works are the City of London Union Workhouse at Bow, and the hall of the Cutlers' Company, to which he was the surveyor and afterwards a member of the court. He carried out the present Sadler's Wells Theatre; the warehouses of Messrs. Copestake & Co., Coben & Co., Smith & Lister, Messrs. Allan's in St. Paul's Churchyard, and many others; while among his suburban and country works may be named the London District Schools at Hanwell, and mansions at Huddersfield, Taplow, and several in the vicinity of London. It will thus be seen that he was essentially a City architect, and was enthusiastic in his feelings for all that appertained to the City, its traditions and customs. He resided for many years of his life in an old house in St. Thomas Apostle, which had been once the residence of a City merchant of the olden time, and had many artistic features still remaining, characteristic of the age of its erection. Mr. Tress was many years in partnership with Mr. Francis Chambers, and at the time of his decease was professionally associated with Mr. Charles Innes. He was a friend of my father's, and on one occasion assisted him in superintending his designs for the additions and alterations to Ensham Hall, Oxfordshire, the seat of the Earl of Macclesfield, where I first had the pleasure of making his acquaintance. He was for many years a Fellow of this Institute, and I find that his nomination paper was signed by Sir Charles Barry (then Mr. Barry), Sir William Tite (then Mr. Tite), and Mr. John Shaw, a sufficient evidence of the esteem in which he was held by his contemporaries. He was also an active member of the Society of Arts, &c., in its early days. He died on the 29th October, 1875, at his residence, in Regent's Park, aged 65.

David Bryce, R.S.A., Fellow, was born in 1803. His father carried on the business of a builder in Edinburgh, at the High School of which city our deceased friend was educated. Having shown an aptitude for drawing, he entered the office of the late Mr. Burn, the well-known architect, and afterwards became his partner, until in 1844 Mr. Burn left Edinburgh to practise in London, and Mr. Bryce succeeded to much of his Edinburgh practice. Mr. Bryce was remarkable for his skill in planning buildings. He was largely employed on the alteration of country houses, &c., and he converted many inconvenient dwellings into comfortable residences. He designed buildings of every description, and in many of them adapted (not unsuccessfully) the Scottish Baronial style to modern requirements. His works are characterised by great freedom of treatment and were vigorous rather than refined in detail. Among his most important public works are the Life Assurance Company's Offices, the Exchange Bank, the Western Bank, the British Linen Company's Bank, the Edinburgh and Glasgow Bank, the Subscription Library, the Surgical Hospital, the Standard Assurance Office, Fettes College, the Sheriffs' Court, the Bank of Scotland, the Royal Infirmary, and the Union Bank, all in Edinburgh. In Glasgow and Dublin he erected several public buildings of a similar class. Of private mansions he designed or remodelled an extraordinary number, during a period of active practice extending over a period of thirty years. He died at Edinburgh on the 7th of May, 1876.

Henry Roberts, Fellow, was a pupil of the late Mr. Charles Fowler, and subsequently entered the office of Mr. (afterwards Sir) Robert Smirke. His most important work was the Fishmongers' Hall, London Bridge. He also built a church on the site of the unfortunate Brunswick Theatre in Whitechapel, as well as some private mansions for friends, among others one for Mr. Kekewich, near Alphington, in Devonshire. His name is, however, best known in connexion with Lord Shaftesbury's Society for Improving the Dwellings of the Labouring Classes, a work to which he devoted great attention and gratuitous labour. It formed the subject of a paper which he read at this Institute in 1862, and which was deemed of sufficient importance to be printed in the form of a pamphlet and circulated among our members. An animated discussion, extending over two evening meetings, showed the interest (still unabated) that the subject naturally has for architects. In Streatham-street, near the British Museum, he built the first block of model lodging-houses erected for the above Society. With the same philanthropic object in view he afterwards followed up his efforts to improve the dwellings of the working classes in Belgium and Italy, but with what success I am unable to state. In earlier life he competed for Mill-hill School, Hendon, when the late Sir William Tite, who was also a competitor, was successful. Sir Gilbert Scott was for a while in Mr. Roberts's office. Mr. Roberts died in the spring of the present year at Florence, where on account of his failing health he had resided for some years.

John Tarring, Fellow, was born at Holbeton, near Plymouth, where he is said to have worked at the bench as a young man. He came to London in 1828, and entered the office of Mr. Brown, architect and surveyor; he gained the Royal Academy Silver Medal for measured drawings, and records of his early studies are still preserved at the Institute, of which he became a Fellow in 1845. From the time of his commencing practice as an architect, his business steadily increased. He was employed by the late Earl of Combermere on the restoration of Combermere Abbey, and he carried out extensive alterations at Thornton Hall, Bucks, the seat of the Hon. Richard Cavendish. He also executed a large number of churches and chapels, chiefly for dissenting congregations, and also carried out some warehouses and factories of considerable extent. Mr. Tarring made suggestions and submitted plans to the Govern-

* This reduction is due to the fact that the term of studentship has expired in the case of some passed candidates in the Architectural Examination admitted gratuitously.

ment for concentrating the Government offices in one block of buildings on a site adjacent to that occupied by the present Government offices. Particulars of this scheme were published in the *Builder*. When Sir Benjamin Hall, as First Commissioner of Works, subsequently initiated the competition to the architects of the world for the same object, Mr. Tarring submitted fresh designs adapted to the then suggested site, and these, though gaining no premium, were criticised favourably by the press. He died at St. Audires, Torquay, on the 27th of December, 1875, aged 70.

James Noble, Fellow, was one of the oldest members of this Institute, having been elected a Fellow in 1835. In the following year he published a work on "The Professional Practice of Architects and Surveyors," which he dedicated to Lord de Grey, then president of the Institute. This book, which is in our library, deals in turn with the subjects of metropolitan improvements, the value of building ground, sewage, water supply, materials, valuation, and contracts, and concludes with a schedule of the then recently-erected churches under the Act of 1819, and has, therefore, some historical interest. Mr. Noble's name is, however, chiefly associated with valuations, in which he was a professional adept. He lived to a very advanced age, and died at his residence in Chelsea last year.

Thomas Bellamy, Fellow, was one of the original founders of this Institute, being elected in 1834; his death was announced at the closing meeting last session. He was born in 1798, and died in the early part of this year, aged seventy-eight; he was a pupil of Mr. David Laing, and had for his fellow pupils men afterwards as distinguished as himself, among them Sir William Tite, Mr. Chas. Fowler, and Mr. Thomas Lee. He was a really conscientious student of his profession from his youth until the day of his death, scrupulously accurate in the working out the details of his designs, an honourable upright architect in the best sense of the word, and a great loss to a circle of friends, who, notwithstanding his naturally retiring disposition, knew enough of him to esteem him highly and lament his loss sincerely. As his old friend, Professor Donaldson, has most kindly undertaken to draw up a memoir of our lost colleague, I need say no more here, but confidently leave the matter in his able hands. King's College Hospital; the Law Fire Office, Chancery-lane; Corsham-court, Wilts; and many other works, will prevent posterity from forgetting the name and merits of Thomas Bellamy.

Henry H. Vale, Fellow (of Liverpool), was born in the year 1831. He belonged to a Warwickshire family, and was a pupil of the late Mr. Henry Roberts, architect, of Liverpool, from whose office he passed into those of Mr. Trubshaw and Mr. Grayson, before commencing to practise on his own account. Although he had not at the time of his death carried out many important works, his local practice was considerable; he designed the Oxford and Cambridge Chambers, in Lord-street, Liverpool, and two Congregational Churches in that city, besides another at the Hague. In conjunction with Mr. C. Sherlock, he designed the Walker Art Gallery, and many other buildings at Liverpool, besides many buildings of a domestic character. He was for some time president of the Liverpool Architectural Society, and his name was well known and respected. It would seem, indeed, that the constant demands on his time and thoughts proved too much for his bodily and mental organisation, for he could have had no anxiety as to his professional position and success; he was found drowned towards the end of August last year, and this melancholy act was no doubt rightly attributed to temporary insanity produced by over-pressure of work.

Albert Bridgman, Associate, became a member of this Institute in 1874. Although a very young man, he has executed a number of works, among which may be named the club at the south-east corner of Ludgate-circus, the Imperial-arcade annexed to it, and extensive buildings on Ludgate-hill and other City thoroughfares. Mr. Bridgman gained the second premium in competition for the Paddington Baths and Washhouses. It is said that in 1873 he was the first to conceive and advocate the idea of an aquarium for London. With this object in view, he prepared and submitted to the Metropolitan Board of Works designs for a group of buildings on the Embankment, near Waterloo Bridge. This design included an art club, museum, and library. In consequence of some difficulty in obtaining the site, Mr. Bridgman's scheme was delayed, and ultimately abandoned on the erection of the Royal Aquarium at Westminster. He died at Torquay, at the early age of thirty-five.

While our feelings have thus been occupied by those who have passed away, it seems not unfitting to allude to two operations going on in distant lands, which evidence how close are the feelings of sympathy connecting distant generations of artists with their still living brethren,—a sympathy which so ennobles the study of art, and distinguishes it from the mere pursuit of wealth by trade and commerce. In the early part of this year architects were interested greatly by sundry accounts of the successful explorations and excavations undertaken by Professor Curtius, at the instance of the German Government, in the plains of Olympia. The results hitherto of these labours have been recorded in the form of a portfolio of photographs of the fragments found, with description of each of the subjects, and the supposed positions of the fragments and their relation one to another. The labours of the professor and an able staff have again been resumed, and are to be vigorously prosecuted during the winter months, and other portfolios will record the result of other years' labours, until the whole work is complete, when all will be brought together, revised and formed into a comprehensive work of doubtless extraordinary interest. Our best wishes must accompany Professor Curtius in his labours, and as he has accomplished so much at his first attempt, when working comparatively in the dark, we have every reason to hope that sufficient fragments of the sculptures and details of the architecture will be gradually recovered, to enable us to restore the most famous of Grecian temples in a manner so complete as to render not only its form but its beauties intelligible to and easily appreciated by all. We may, I think, look forward at Olympia to a result as gratifying as we have seen in the transformation of the uninteresting Campo Vaccino at Rome, as it remained for centuries, into the now excavated and explored Roman Forum.

We cannot speak so hopefully of another work of exploration (but one of no less interest) undertaken, also, by a distinguished German. I mean the excavations made by Dr. Schliemann at Hissarlik, to ascertain, if possible, the site of Ancient Troy. He has been obliged (let us hope only for a time) to abandon his interesting work here, in consequence of the obstructiveness of the Turkish Government and the subordinate officials, but with characteristic ardour he has turned his attention in the meanwhile to the ruins of Mycenæ and Argos, and is at present occupied in exploring the so-called treasuries and other monuments connected with these ancient cities. His explorations have not, however, proceeded far enough as yet to enable any reliable opinion to be formed how far his efforts are likely to be crowned with success, or to open up important archæological discussions, and we can only bid him also "God speed."

And now, gentlemen, having completed our retrospect, let me ask you to consider with me our future—the past is out of our power, but that which is to come may be influenced or even directed by ourselves. Stirring in the minds of us all have been thoughts, desires, schemes, as to how we may make the organisation of this Institute more effective and more generally available; and here I would venture to say, that, in my opinion, the number of members who attend our evening meetings and take part in the discussions, although frequently taken as a test of our vitality and usefulness, is not the only or even the most important evidence in that respect. The real test, as I think, of the usefulness of a body like ours, is the respect paid to it by members of our own profession within, and, above all, the esteem in which it is held by the public outside its ranks. I would fain see more and increasing evidence that these are facts, and it is by our exertions to strengthen these two lines of thought and consequent action that I think all our efforts should be animated. I feel convinced that, if day by day these two feelings can be shown to increase and strengthen, we need have no anxiety as to our financial position, or as to the increased interest of our meetings and discussions. Let us then consider, so far as we may, what hindrances have existed or do exist to the above desired objects,—whether the hindrances are supplied by ourselves, and how far, therefore, they are in our power to lessen or to remove; whether they arise from the public want of confidence in us; or lastly, to any want of sufficient capacity on the part of the public to appreciate us as we think we ought to be appreciated.

I think it will be found that there is much under each of these three considerations. Now, first as regards ourselves, we may be quite sure that unless we have real confidence in and respect for each other, we cannot blame the public if they they have not. It is to the credit of this Institute that one of the chief objects of its original foundation was not alone to promote professional study, research, and talent, but to maintain and enforce professional honour; never let us forget that. It must be a subject of unfeigned satisfaction to those old enough to remember the infancy of the Institute to see how much has been done by its action and influence in this respect; but I appeal to the experience of all whether there is not much more to be done in the same direction. Are there not instances still to be found where by insincere criticism, or more unworthy means, architects have superseded a professional brother in the work which he fondly had deemed to be his own, and by means of which,—if he could reckon on the friendly help and advice of his professional brethren when their duty made them his critics, or, if he could depend upon their praises for what might be good in his work; for their kindly suggestions how its imperfections might be removed, in place of their only noting (as we too frequently see) the defects of his design,—he might to have been enabled to rise one more honourable step on the ladder which we all find it so hard to mount.

Are there no cases known to us, where, when public bodies (as they are only too prone to do) take a low view of the professional services which yet they feel are essential to them, and offer remuneration in total ignorance of the value of the services they require, or the live-long study and costly education necessary to make an efficient architect, the architect frequently feels that he is almost bound to submit to the hard terms laid down, because he knows that other members of his profession will take his place if he relinquishes it, and on the principle that half a loaf is better than no bread? And if this be so, how can we wonder at public bodies persisting in the pernicious and unfair action to which I have alluded, and continue to value our professional services far too meanly?

Again, if (as I fear) we are not yet permitted to hope that the present baleful system of architectural competition may be given up for some mode more rational and more just of attempting to discover rising talent, is it too much to expect that the professional rivals in each case shall remember that they are still professional brethren, and that as a point of honour they are bound to refrain from all artifices of drawing, misleading estimates, or from showy and inflated description which does not truly represent their design, or which may be calculated to mislead the very singular and frequently incompetent bodies who affect to act as judges?

The example recently set by the town of Leeds of choosing a skilled architect as the judge of designs sent in competition for their new municipal buildings, and proposing an unexceptionable list of architects, all well qualified for such a duty, in order that the competitors themselves might select the one to decide between them, seems to me to be the beginning of better things, and to be a course most likely to result in a just and satisfactory decision. Our good friend Mr. Cockerell, who has been chosen by the competitors, will, I feel sure, discharge his rather delicate duty with all the talent requisite for such a task, and with the most perfect impartiality. I hope the result in this instance will be so satisfactory to all parties that it may really be the commencement of a system.

Again, do we not also see, from time to time, cases in our courts of law where professional evidence is asked for, and too readily obtained from professional men, to discredit a professional brother,—evidence given (as we must frequently think), not with the simple desire to make evident the truth, but with the spirit of an interested advocate, or to curry favour with special persons?

Now in all these cases, we, as a profession, have it in our power to do much if we will to diminish or abolish these scandals, abuses, and consequent hindrances to our efforts. In some few cases (I wish they were more) this Institute has been able by kindly advice or mediation to prevent differences of opinion between employer and architect, or between members of our body, from growing into disputes. Of course, this

action can only be beneficial if both parties, while they honestly differ, are yet sincerely desirous to do what is right by one another; and it is further evident that if this were more universally the line taken by architects in their dealings with each other, and with their clients, courts of reference, or arbitrations of any sort, would be little needed, for the majority of differences would never arise.

While, therefore, I would advocate the utmost professional freedom of opinion, taste, and judgment, I would press the advantage of *personal* brotherhood and unity. We should differ broadly still from trade unions, to which we have sometimes been improperly compared, in which personal freedom of action is required to be sacrificed to some arbitrary rules, frequently those of the minority, and to rules which favour the worst and not the best men. With us, on the contrary, an unwritten and unenforced law (no less potent from being unenforced), such as I have ventured to shadow out, would be all-powerful with honourable minds, and would also effectually stamp all unworthy men. In the attempt to ensure this, I would gladly see all the members of this Institute continue the good efforts begun by its founders, and I rejoice to believe such efforts are still made among us. All good men wish to be led and represented by the best; and the better they are themselves the more they wish this. In believing that the men of our profession are good, I credit them with this wish; and they will thus naturally desire that by every possible means this, as the representative body of the profession, shall be supported in carrying out these principles. So only shall we, with increasing respect for each other, and perfect faith in each other, command respect and confidence from the public, among whom we live, and whom we desire loyally to serve.

Leaving now what I may term our internal abuses and grievances, let us consider whether the difficulties we often meet with arise from want of the public confidence in us. Now that there is a want of entire confidence of this sort is true, and I think it may be taken as arising from one or all of the following causes:—1st. A belief that the architect, as a rule, thinks more of the outward effect of his design than the uses for which the building is needed; 2nd. A want of credence in the accuracy of architects' estimates, and a tendency to rely rather on those of the tradesman, thus producing an indisposition to employ an architect at all, and to rely on what are called practical men, *i.e.*, less educated men, and not artists at all; 3rd. A sort of half-ashamed and half-expressed belief that architects will so far forget all principles which should actuate honourable men as carelessly or even knowingly to increase the cost of their works in order to increase their professional emoluments therefrom.

Now, of course, there are architects *and* architects, the like in name but greatly different in fact; and we must, I fear, admit that, as to the two first reasons for want of confidence, there are illustrative instances to be found, though hardly any (if any at all) for the third reason; and the only way in which we can hope the public may be disabused of these in the main most erroneous ideas is to be able, in the future, to challenge and disprove the accusation that internal usefulness is really sacrificed to external effect by defying the accuser to find an instance in point in the work of an educated architect of recognised position in his profession, and to show that such unreality, when it shall exist, shall only be found in the works of mere builders and pretenders to a professional position to which they have no title either by education or ability. With reference to the second cause I have suggested, when public bodies, or private clients, ask an architect to design and carry out a work of which they describe the extent, and mistakenly expect it to be executed for an insufficient sum, it should be at once declined, and the reason stated, instead of being undertaken, as it often is, with the knowledge that there must be finally a large extra cost, which it may or may not be possible to attribute to changes of view on the part of the employer. Thus, and thus only, I think, would public confidence in architects' estimates arise, or be strengthened. In this matter I consider the employer, whether public or private, chiefly to blame. He has no right to name a sum as the cost to be incurred, in an entirely arbitrary manner, inasmuch as, unless it be a hopelessly unreasonable one, the architect has strong temptation to indulge in a fond hope that, by some means or other, he may be able to meet his client's wishes,—a hope in such cases rarely, of course, realised.

I deem it quite unnecessary, within these walls, to say one word as to the third reason I have alluded to; but I think you will agree with me it sometimes exists, and therefore I felt bound to allude to it. When it is suggested it has only to be boldly challenged, and generally the accuser is happily ashamed of his own suspicion when plainly stated in terms intelligible to honest men.

In combating all the difficulties and discouragements to the prosecution of our noble profession to which I have alluded (though, perhaps, at too great length for your patience, not in undue reference to their importance), I think we have a power in this Institute, if only we will use it with united effort and all our might, that can do good to the public and ourselves. Already, amongst ourselves, the Institute has done, and is doing, a good work,—setting up a standard of professional purity; endeavouring to number in its ranks the best men of all countries; promoting good fellowship among professional rivals; endeavouring to compose differences when they arise; preserving some supervision over the buildings of the empire, whether modern or centuries old, in which we all feel pride; promoting study of the works of past architects by affording the use of our really fine library to our members, and in a variety of other ways; while to the Government and the public it is ready, in its corporate capacity, to be of real use whenever requested, and to devote time and ability of the highest order attainable to make our public works and public buildings creditable to their age, not only scientifically and constructionally, but so that they may be "a joy for ever" to those who come after. In some very few cases this aid has been asked, and has, I think, been efficiently rendered; but I could wish to see the profession, through this Institute, deemed by our public authorities a body whose opinion and advice it was felt necessary to ask for on all artistic or social questions involving the construction or æsthetic treatment of our public buildings or public improvements; and, further, that such opinion and advice, when obtained, should be deemed of sufficient value to abide by. I cannot avoid noting an illustration of what I have said by referring to several points in which one of the finest works of our times makes an architect sad,—I mean the Thames Embankment; and I have only to call your attention to the indirect approach to the Clock Tower, the neglect and part burial of York-gate, the absence of any attempt to connect the river front of Somerset House with the new Embankment road, the like absence of adaptation of the land arches of the bridges spanning the road to their new position, the omission of the once proposed new direct street to St. Paul's Cathedral, and other minor matters, to justify my remarks. Noble work as it is as a whole, in all the above and other matters it cannot be considered, æsthetically, so satisfactory as it might have been; and I do not hesitate to say that, in no other country than England would such a public work have been executed except with the assistance of an architectural public body like our own asked for officially and carefully attended to.

Did English architects take the position which they should do, and, I assert, could do, with credit to themselves and advantage to their clients, were they better understood and the value of their services better felt, we should not hear, as unhappily we often do now, the theory ventilated that Government and public bodies will do better to carry out works of more or less national importance under the sole direction of gentlemen connected with them as permanent officers, under the imposing appellation of "the Department," or "the Board," but whose salaries, being permanent, and leading to a life pension, are necessarily on so moderate a scale that their positions can only be acceptable to second or third rate men, whose training and antecedents cannot have fitted them to discharge the functions of true architects, and who would themselves be the first to confess that while they were under the necessity of doing any service their principals may require of them, they frequently feel their own incompetence to fulfil those services in the best way, and would gladly be relieved (and, indeed, have a right to be relieved, on grounds of public policy) from dealing with buildings where the best art and the most trained intelligence should be employed, for the credit as well as the art instruction of that public who finds the funds.

That there is an increasing desire on the part of the general public to see our great city take more creditable rank than heretofore architecturally among the capital cities of the world is, I think, clear, from the treatment of the buildings erected in the past few years along our new lines of thoroughfare. We need not wonder at this when we call to mind that in the history of the world, as regards architecture (especially civil and municipal architecture), its development was always mainly connected with the great centres of trade and commerce, as, for instance, in the Low Countries, and in Italy, when its Republics were traders, and most active traders, too. So, too, it was in our own country in past times. Witness the fragments, alas! now very few, that remain, showing the magnificence and love of art of our English merchant princes in the adornment of their residences in the city of London itself. Shall it not be so now in the present and our immediate future? Surely it only needs a race of architects worthy to direct the public taste, and, above all, it needs better artistic education among our traders and the public in general to appreciate really good work. I think, therefore, that Lord Mayor Cotton, at our recent Conference dinner, was not unjustified in the pardonable pride with which he referred to what, not only the City, but metropolitan London, has done in past and present times, and when he expressed some bright hopes for the future. Though, alas! we frequently find work in our streets of the lowest class of taste, and executed by evidently incompetent hands, we happily are able to find there also works of which no country need be ashamed. We may assume, then, that the public have a craving for something beyond the mere utilitarian brick fronts of 100 years ago. They are ready to have that craving directed into a right channel; and what would be more likely to induce a rich merchant, who proposed to occupy some conspicuous site in London, to do so creditably, than to have the evidence before him that those holding the highest official positions in the country recognised the duty, to their own and future generations, of leaving monuments behind them, the creations of, at any rate, the best architects of the day, instead of unknown and unjustified pretenders to that name, or of those who know that their names will not be handed down to posterity because they work for a Department, and who, therefore, miss the strongest incentive an artist can have to animate him to his best efforts?

You are aware that ere long a report may be expected on the scope, functions, and future action of the Institute, from a Special Committee of the Council and Past-Presidents and Vice-Presidents. I know the anxious care and the expenditure of valuable time that have been given by its members to what, I may truly say, will be the most important report ever placed before the Institute. I shall not of course forestall their special recommendations, but I venture to hope and believe that such recommendations will have for one of their main objects the realisation of the views I have expressed in this address. It has been frequently suggested that the members of the Institute should be distinguished by some diploma. Now you all know the difficulties in the way of this; some are real, some may be fanciful. For my part, I think such documents of little value, and that they are not often duly understood by the public, while the modesty of their possessors frequently prevents them being even known of. Whether, however, any such diploma is ever instituted or not, I would cut the knot of the difficulty at once, by an effort to enrol among our members all men of talent in the British Empire, members who shall invariably and only be those who will inflexibly uphold the honour and purity of the profession. The real diploma would then be, *position in this Institute*, and if it can only be felt among us that to enter this Society, and gradually though surely to attain, and when attained, to retain, a seat on the Council, was a thing to be coveted, the blue riband as it were of our profession, we shall have done much. When the youngest member among us shall feel, without envy, that in the honour of the older members he and all the members are honoured too, and when the older members who may thus have been placed on its Council shall think it well worth the labour of a life to have attained that honour, then depend upon it the public will give us honour and confidence too, and self-respect among ourselves will be the surest guarantee of respect from without.

It is the wish (one in which I cordially join)

that our Institute should be as its name imports, "The Royal Institute of British Architects," not as it now too much is "of Metropolitan Architects." Of course, we cannot shut our eyes to the tendency of many of the most distinguished among provincial architects to gravitate to London, and therefore acquire the latter designation; but it is also true, as many of us know, that there are at least as many architects who, from family or other reasons, do not choose to emigrate, and whose talent and originality displayed in works for our great provincial cities and in different parts of the country may put many of us to shame. Now I wish those men also to feel it an honour, I had almost said a necessity, to belong to us as the national representative body of their art. I believe but little inducement is needed to lead them to take this view; they are for the most part already loyally attached to this Institute, and only need to be shown how they can work with us more fully. These architects are always members,—and respected members,—of architectural societies in their own localities, and one suggestion I would venture to make to those local societies is, that it should become a yearly custom with each of them to ascertain which of their members wish to join us, or who really ought from their local distinction to do so. I believe few years would pass without some honourable additions being made to our body from all parts of the country. The same action might even be extended to those countries among our colonies or the United States where the English tongue is spoken and English architecture is more or less taken as a basis for the designs of their buildings; and I may here allude to the evidence we had at the last Conference that our provincial and foreign brethren do think a personal communication from time to time with their metropolitan brethren a sufficient inducement to sacrifice time and money to come to us in London. It was no small pleasure to me (then new to the office in which you have placed me) to welcome a larger attendance at the Conference meetings and at the concluding dinner than there had been at any previous Conference, and it is quite unnecessary to dilate on the benefits to us all that such meetings confer.

Lastly, if my hopes should ever be realised and the Institute made personally strong, I cannot doubt that it would also be strong financially, and we may then be able to carry out those artistic and other developments of which we can only dream at present. We may be able to grant travelling exhibitions, accompanied by medals, of which the gainers shall be proud all their lives. We may largely extend our library till it is the most perfect professional library in the world.* We might possibly be able to initiate and conduct an annual exhibition of the works of architecture, truly a national one, and altogether beyond the feeble annual display of the architectural room in the Royal Academy. We might even have a permanent gallery of drawings given by our members or distinguished foreign architects of their most important works, and thus form a series of which the historical no less than the practical use would be great. We might some day (I hope that may not be very distant) be housed in premises of our own. Our brethren the civil engineers have done this, and having provided for a very large expenditure in doing it, have now means, did they wish it, to do it over again. I am aware that I have been saying few, if any, new things, and only repeating the wishes and hopes of those who have gone before me; but as few good and great objects have ever been realised except by perseveringly keeping them in view, so I hope I have not wasted your time in recapitulating them,—that we shall not give up our objects in despair, but only see in every delay and every obstacle a reason for that dogged persistence which is said to be characteristic of Englishmen, and which in the end is almost sure to secure success.

A "Church House" at Barming, Kent.—On the 1st inst. a Church House was opened in the parish of Barming, intended for various parochial purposes. It is built of ragstone, with a roof of red tile. An open porch, surmounted by an oaken cross, looks out on the little green. The house consists of two rooms, so arranged that they can be used separately or together. It has been designed by Mr. H. Bensted, architect, the work having been carried out by Mr. J. Elmore and Mr. T. Simmonds, of Maidstone.

* The library of the Institute now contains about 3,000 volumes.

OLD LONDON AND THE LORD MAYOR'S SHOW.

THERE are few things more notable than the growth of great cities, and nothing certainly more remarkable about such growth than the changes which take place insensibly, year by year, in the character of their architecture. The old city, it is true, does not altogether disappear, for the lines of street ways, more or less, are retained, so that we may pass along a really quite modern town of to-day, and yet tread in the very footsteps of those who founded and built up the older city so many generations back; and not only this, but in spite of so many changes, and sometimes, though not always, social "improvements," and ways of life, there still go on, and are occasionally visible, not a few of the ways and manners of a far distant and perhaps well-nigh forgotten age. Huge London city, as it was and is, and the annually still going on Lord Mayor's Show, will illustrate what we have said in a way not a little remarkable and instructive. Well may we say,—he that hath eyes to see let him see, and look around; and then, go as deeply into the matter as he will, or can, and it will be found that there is here so ample a field for thought and wonder that the difficulty is where to stop, and how best to avoid roaming away into what might seem matter somewhat remote from the main subject itself. To thoroughly realise this passing away, and yet the retaining, of the old, and to be conscious, as we needs must be, of the new, and even present, we need but to look with attention at the sketch map of London left us so fortunately by Joannes Norden, in the year of grace 1593, and to compare it with a map of London as plotted and engraved for us to-day. Norden's map is much easier of comprehension than the modern map, for you may see in it the boundaries of the City, and where it begins and ends, while in the modern map of to-day it is quite impossible to find either the beginnings or the endings of mighty London. In the London of 1596, when Her Most Gracious Majesty Queen Elizabeth made a royal entry, with great and picturesque show, into London, her loyal city, there might have been seen a really artistic and thoroughly harmonious scene. All things went to help the show, and to make a picture af it. The very street architecture, and the quaint character of the houses, and their very irregularity, and even what would now be thought their out-of-repair condition, all went to make it up. Then, again, the quaint and heavy carriage and horse trappings, and the costume of the time, which would almost seem to have been designed with an eye to suit the street architecture, must have made up a "show" by the side of which our royal processions and Lord Mayors' shows, however much money may be spent on them, make, and can but make, a poor display.

It is in the looking back to such a scene as this that we may get, though perhaps somewhat dimly, at a notion of Fleet-street and the Strand, and Whitehall, as they once were, and the mental view thus obtained will be found right full of wonders, artistic and architectural, and even human. The whole is full of contrasts with the present: all things and ideas were different. In the first place, there were no "restorations" anywhere. A building out of use was pulled down forthwith, and a new one put up in its place, and in the prevailing style of the time; and a quite newly-built house or other building must have looked somewhat strange among the surrounding *old* houses. A walk round and through the London of Shakspeare, could such now-a-days be made, would startle us not a little, as would doubtless the comparative emptiness of the streets, the small amount of carriage traffic, and perhaps more than all, the quiet and silence of the town. The Strand and Fleet-street of the year 1593, and of the year 1876, though the line of way is the same, must contrast with each other, either on an ordinary day or on occasion, of a Lord Mayor's Show, on a 9th of November. And when we come to define the word "progress," now in all mouths, and as here visible, we might well ask at times what it does really mean and imply. One of the chief signs of progress, as we are assured on all hands, and from numberless lecture-tables, is the constant presence and sight of *art, i.e.*, living and ever active art, in our mind's eye, and all about us; and if this be so, and if the picturesque in the new streets and highways of a city be an element in it, which it is, then indeed there can be no manner of doubt that the men, women, and children, whether in or out of school, of Queen Bess's day, were much nearer the ultimatum of progress than we of Queen Victoria's day can possibly pretend to be. A quiet walk up and down Fleet-street and the Strand will soon make this evident enough. We might here afford some novel details, but had better, perhaps, forbear, for they would lead us into somewhat deep and difficult matters.

The quaint map of London which J. Norden, of the year 1593, has left us (and thanks to him for it), is worth attentive study, for in it we see very many of the things which have made this now huge metropolis so famous. There is the Tower of London,—and here we might ask why are the public shut out from the river side of it? This is a late "improvement," and would seem to be a quite needless one, for the Tower is now converted into little else than a military warehouse or storehouse, and the purpose for which it was built is all but lost altogether. A long lament might be said over the Tower, for it has gone, a good deal of it, through a fearful process. Where is the Traitors' Gate, of historic renown, now? And where is the portcullis which closed it at the bottom of the stairs washed by the river, and up which so many have gone to their final doom? The Traitors' Gate was a part of English history in stone, why was it destroyed? The White Tower again, what a mercy it is that it has not been improved away, and the ground built upon! It is all but inaccessible, it being filled with little better than military lumber, for which surely a better and more suitable and useful place might be found, and the whole building opened to view now and then for those who like to dream in such places. It is a somewhat singular circumstance, and is worth noting, that the only tower left standing as it was built, with its rough walling, within the Tower precincts, besides the White Tower, is the Bell Tower, and in Windsor Castle that the only one remaining as originally built and unrestored is also called the "Bell Tower,"—doubtless accident this, but worth note.

The Tower "posterne" took you by the side of the City wall to Aldgate, and then to Bishopesgate, More-gate, Creple-gate, Alders-gate, Ludgate, and thence to the silent highway, the river Thamys. This line of way marked out the size of Roman London, the town of 1593, extending somewhat beyond these narrow bounds and outside the walls, the map only showing as far as Temple-bar, and a few yards to the west of it. Through London, from east to west, and starting again from the Tower posterne, a right quaint and picture-forming way must it have been down Eastcheape to "Paules," and so to Ludgate, London stone being passed on the way. From north to south starting from Bishopesgate, down Bishopesgate-street to Eastcheape, to —after, may be, the Tower itself—the most far-famed of all, London Bridge, and over it to Southwarke, and then, turning to the right, past Winchester House, to Bankes-side, we find ourselves close to the Beare-house, and the Play-house, the Rose Play-house, in which, and others like it, at Black-friers, and Shoreditche, Shakspeare must have both worked and "played" many and many a time; and he must not only have day by day passed along the quaint streets named and depicted on this map, but must needs have lived in one of them. How many times must he have crossed London Bridge, and paused to look through the openings between the houses on it, at the then-rapid flood through the narrow arches of the Gothic bridge, and must have needs been attracted by the picturesqueness of the narrow roadway, with gable-ended houses on either side of it! Did this "influence" help or hinder him in his work, we might in some wonder ask, and would he have liked better to pass over our now improved bridge, wherein most utility has had it all its own way, and where most surely no poetical imaginings have stood in the way to hinder its strictly business arrangement and planning? Deep questions these, and Will. Shakspeare himself might have been puzzled to analyse and solve them. Shakspeare could not have written his plays in modern London, as we now read them—in antique type!

We might follow the immortal play-writer into yet stranger ways and places, and tell a little of his way of life, as it needs *must* have been day by day; and, may be, say a word on what he thought of lordly processions and "shows," as they passed along through the ill-kept and darkened streets of bygone London. But there is one thing he did see, but which we cannot in our improving city,—the sombre natural colouring which comes over all things if left to nature's influences only, and to which the

Titians and Turners, with all their painting, can but approximate.

The first Napoleon was not much given to compliments, and he distinctly told us that we were nought "but a nation of shopkeepers"; and it is certainly to be feared that the trading instinct now masters all others in the long run. But, nevertheless, it has at times a hard battle of it. A "Lord Mayor's Show," though but once a year, stops business in certain quarters not a little, and the tendency of the time, utilitarian as it is, has sought, and still seeks, to do away with it. But it must die hard, and there is even a tendency to not only perpetuate it, but to make more of it, and to *add*, as we have seen, to its artistic character and interest. Indeed, to speak generally, it is somewhat remarkable that there is a tendency to *return* to some of the old world's ways,—ways which have been all but lost entirely. The "Halloween" has but just been celebrated at Balmoral, in the very presence of Royalty, and the effigies of "witches and warlocks" were tossed into the flames as of old. And what is, perhaps, as strange, the "curfew," in some few places still tolls the "knell of parting day," and efforts are being made here and there to revive it. Why not? It is a touching reminder of past ways. Improvements are all around us, though in the Strand the church clock of St. Clement Danes strikes the hours *twice* over; so you must, at least, know the time of day and night; and, what is more, it has a peal of bells, which, after the clock striking, *plays a tune*, but what that is, or can be, who shall say?

It should be noted, by the way, that the most interesting map of Old London spoken of, though called "Norden's Map," was doubtless drawn, and certainly engraved, by Peiter Vanden Keere, 1593.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The first ordinary general meeting of this Institute for Session 1876–77 was held on Monday evening last at Conduit-street, Mr. Charles Barry, president, in the chair. There was a good attendance of London and provincial members.

Mr. Thomas Semancke Archer, of Gresham-buildings, E.C., was balloted for and duly elected as an Associate. Twelve nominations for membership were read, the Chairman referring with satisfaction to the fact that five of the twelve were from the provinces.

Several valuable donations to the library were announced, and the Secretary (Mr. C. L. Eastlake) stated that during the recess twenty-six works had been purchased by order of the Library Committee, some of the works so purchased coming from the libraries of Sir Digby Wyatt and the late Mr. Thomas Bellamy.

The President announced that the "Scott Portrait Fund," which it was hoped would ultimately reach the sum of 300*l.*, already amounted to 240*l.* It was thought that for the first-named sum the Institute would be able to secure a portrait of Sir Gilbert Scott which would be not only a pleasing memento of his presidency, but an admirable work of art.

The President then proceeded to deliver his inaugural address, which will be found on another page.

Sir Gilbert Scott begged leave to propose a vote of thanks to the President for his admirable address, which had touched upon almost every topic that bore upon the present circumstances of the architectural profession. Mr. Barry had preached a sermon of a kind which, even from pulpits, was too infrequently heard. He had stuck to questions of morality rather than to opinions and doctrines, and he (Sir Gilbert) heartily wished that the code of morals laid down by the President might be thoroughly appreciated and acted upon. The President had told them how they ought to endeavour to raise their profession in the eyes of the public. He (Sir Gilbert) was quite sure that at no previous period had such advice been more necessary than at present, when we heard that the Government contemplated giving up the employment of architects, and substituting that of officials and clerks. If this were acted on, the highest prizes of our profession would be made over to others; a course inconsistent with the due appreciation of art by our governors. Passing to another subject, he thanked the President, in the name of the Institute, for the generous and appreciative notices which he had given of some of their deceased members. Too little had, perhaps, been done by the Institute in putting on record the works and labours of those associated with it, and he hoped that henceforth this would form an essential feature of presidential addresses. With reference to Mr. Henry Roberts, with whom he had in early life been connected, he would say that a more honourable, excellent, and high-minded man he never knew.

Professor Kerr, in seconding the motion, said that, in common with others, he felt somewhat alarmed at the information conveyed to the meeting by Sir Gilbert Scott, viz., that in future the services of professional architects would be dispensed with in connexion with our public buildings, and that only clerks were to be employed. He believed that the Imperial Government of the British nation and its dependencies were quite capable of taking such a course, judging by what had occurred during the past few years. He hoped, however, that it might not be true; if it were true, the Government, to be consistent, should go a little farther, and, dispensing with lawyers, employ lawyers' clerks; dispensing with doctors, they might employ, perhaps, chemists' assistants; and, dispensing with generals and admirals for our army and navy, a large field would be open for amateurs. It was quite as absurd to suppose that good public buildings could be built and maintained without the aid of specially-trained architects as to suppose that men would excel in Law, Medicine, or Arms, without special education. Looking seriously at the purport of Sir Gilbert Scott's communication, it was impossible not to agree with the President in the apprehension that by some means, or owing to some reason or other, a suspicion had got into the minds of the Government with regard to architects. They in that room, who knew each other well, and who knew their work, knew that that suspicion was unfounded. True, there might be matters on the surface of things which led people to come to conclusions unfavourable to the architectural profession. Unfortunately, there were men in the profession ever ready to disparage each other's work on the score of want of professional skill, and therefore too great stress could not be laid upon the principle enunciated by the President, that if architects were true to each other,—he would not say true to themselves, he would take higher ground than that,—they must inevitably in course of time establish that confidence in them in the public mind which other professions enjoyed. He would not say that distrust of the architectural profession existed throughout the country, but he would say that so far as it did exist it might be counteracted by architects being true to each other. He was afraid that they were not a united profession, but it had been the policy of the Institute to make the attainment of unity almost its paramount object. The feeling of the Institute had always been that if a number of men who were honest would but lay their heads together in their honesty, and manifest before the public of this (on the whole) honest country, that which they professed to be able to do in the service of the public,—if they would manifest their qualifications to perform the public work, it was impossible that the public would not, sooner or later,—and rather sooner than later,—recognise the justness of their claims. If, then, they were suffering from mistaken prejudices, the one remedy was to take a common stand on high ground. In conclusion, the Professor congratulated the chairman upon occupying the presidential chair of the Institute, and upon having delivered an address which was practical from beginning to end.

The vote of thanks was carried by acclamation, and the proceedings terminated with the announcement that the next meeting would be held on the 20th inst.

The Portland Stone Trade.—The *Dorset County Express* says that the Portland stone trade would have been still more brisk lately but for the comparative scarcity of railway trucks. The merchants' (stone) railway has been almost blocked for want of these trucks for a month past, but things have been a little easier within the last week. A leading member of the trade has complained that they have had scarcely enough to keep one firm going on the average; but there are enough orders to make trade brisker than it has been for the two month previous to the last. The new Law Courts in London are still absorbing the Portland stone fast, and are likely to do so for three years and a half or four years, if the London men are pleased with the supply.

THE FRENCH GALLERY.

The twenty-fourth winter exhibition of cabinet pictures at Mr. Wallis's Gallery, now open, is a good one, and has some points of interest. Among them is the appearance of a painter new to this exhibition-room, M. Gierymski, whose comparatively large picture of "The Trial Scene from the 'Merchant of Venice'" (109) occupies, deservedly, the central position at the top of the room. The work is a very unusual one to see from the hand of a modern artist; it is evidently an emulation of the Venetian School, and recals in motive and in colour Giorgione to a considerable extent; and, like one or two compositions of that painter, is distinctively decorative in character. It is a long painting, showing the interior of the Hall of Justice, the marble columns and inlaid wall of which form an architectural background to the whole, the architectural detail admirably finished in regard to drawing, surface and harmony of colour, but certainly too hard and pronounced to keep its proper place behind the figures. These are spread out in a long line, in a somewhat (apparently intentionally) artificial manner; the Duke and "magnificoes" on the left; before the group Shylock on one knee presenting the bond, Portia and Nerissa on either side of him; behind comes the group of Antonio, Bassanio, and Gratiano, and the "composition" (for such in every sense it is) is carried on to the right by other figures more or less interested in the proceedings. The figure of Shylock is original in conception, and certainly differing from the conventional ideal of the "currish Jew." Portia is a figure well conceived, standing meditatively with her doctor's gown folded close around her; Nerissa, with a large bulk of papers bearing on the case of "Shylock *v.* Antonio," sits in the foreground, enveloped in a green mantle, which is a very valuable element in the total effect of colour. The other figures want character, and seem too little in earnest, and there is no doubt that the real life of the scene is sacrificed to decorative effect; but for all that the picture is worth looking at, as at least a remarkable instance of the revival of an old manner with some modifications. Next to this in interest we should place "The Knitting-School" (49), by T. Spring, as realistic as the last-named work is the reverse, but not over-laboured: it is very broad and free in style, and each of the little learners has her own distinct manner and character; we would notice especially the anxious, attentive face of the little girl who is listening to the criticism of the teacher, and the attitudes and expressions of the group on the bench in front, of whom the centre one is indulging in a broad and very mischievous smile at some whispered naughtiness of her companion. Every figure, however, is a study, and the work raises further the reputation of which the painter has already laid the foundation by his former works exhibited here. Looking round at the other leading figure subjects, we notice Mr. Dicksee's large "Cleopatra" (19) chiefly for the admirable drawing and foreshortening of the arms; the colouring is hard, though brilliant, and the face might belong to any Eastern model of ordinary good looks. On either side of this, two works by Miss Hilda Montalba, "A Study" and "Fishing" (4, 23), introduce us to another new name here, and pleasantly; the first is a half-length of a pretty girl in a dark dress, painted with much freedom and force; the other is a landscape of that undefined and *spirituel* style of handling which is to be traced to the influence of certain French artists; in the foreground is a boat with two figures, the seated one very graceful and suggestive, the standing one totally destitute of substantiality, a bundle of clothes without a figure in it,—but the painter has the feeling of an artist, in spite of this lapse. Moreau's "Winter" (40), a very old couple cowering over a stove, has a certain pathos, though not remarkable in execution. "The Fortune Teller" (24), by Seignac, is a very pleasing work, but again somewhat below what it might have been in point of expression and manner in the figures; the colouring is very harmonious. After that we must step on a little way to No. 76, "The Reprimand," administered by a benevolent-looking old priest, seated at a table, to two pretty Spanish girls, at the instance of a most forbidding old woman, whose sour face is well contrasted with the expression of the meekest of the two offenders, who bows her head down in a very contrite manner; this picture is interesting, as showing that its author, Mr. Burgess, is getting beyond that mere commonplace and picture-making style which was all

that his works used to attain to. Béraud's "Avenue de Neuilly" (119) is a picture very cleverly concocted out of very unpromising materials, as to colour especially; the costumes of "Les Anglaises" in the foreground are skilfully used to half blend with and half break up the mass of nondescript grey of the flagged pavement. Meissonier has an admirable single figure, the "Traveller" (191), a booted semi-military personage of doubtful antecedents who has appeared on his canvas several times of late; and Mr. Long exhibits a life-size three-quarter figure under the name of "Fanchette" (170), with some power in the head, and a want of modelling in the arm. Among the small things which are often so attractive in this gallery are one or two of Chevilliard's satirical studies of ecclesiastics, not quite so good as usual; Kauffmann is capital in his small study of an odious old boor counting out "Die Rechnung" (25), and in some other pieces of the same class; Palmaroli's sketch of a young lady under the title "Dolce far Niente" (45) has brilliancy and ease of manner; Pasini's "Scene in Constantinople" (58) is one of those little corners of Eastern street view which he paints so solidly and effectively; Knaus's "On Mischief Bent" (192) is a most clever study of the head of a roguish *gamin*; and the name of C. Haag is attached to several capital bits of child-life, of which the "Scrap-book" (176) is perhaps the best.

Among landscapes there is rather a good average than any remarkable work; the two paintings by Meadag, illustrating "The Rescue," the putting off and return of the life-boat at Scheveningen (54, 69), form a very good pair of landscapes, if one may so speak, the first being the best; the groups on the shore are very carefully studied also. Weber's "Old Pier at Flushing" (31) is a picturesque subject, very effectively treated; it reminded us of a line in Matthew Arnold's poems,—

"The swinging waters and the cluster'd pier,"

for the tops of the uprights which sustain the pier form most curious groups and clusters jumbled together like the Giant's Causeway imitated in wood; the water may be a little mannered in treatment. Windmaier's small scenes, especially "A Coming Storm" (15), are full of the true sentiment of landscape art; and a very admirable and truly artist-like work is that of Mr. S. R. Percy "On the Surrey Hills" (71), notable for its unity of feeling and breadth of handling, and the fine painting of the sky. "On a Surrey Common" (88), by R. Gallon, and Gabriel's "Dutch Homestead" (165) are worth mention. Miss Clara Montalba is wasting her brilliant talents in painting as she does in "A Canal, Venice" (180); the tone of the buildings is rich and fine, but nothing is finished, and the treatment of the water, though telling, has now become a kind of trick of the artist. We might apply to her the criticism mentioned by Goldsmith, that "the picture would have been better if the painter had taken more pains," for Miss Montalba has gifts which should serve her better than in this.

THE HISTORY OF GAS-LIGHTING.

Gas has become so familiar to the present generation in our streets and theatres, in our manufactories and dwelling-houses, that it requires some effort of the imagination to conceive the condition of a big city when oil-lamps, few and far between, served but to reveal the universal gloom, and respectable citizens found their way home after dark by the glare of smoky torch or feeble flickering of a lamp. It is a rare thing nowadays to see those gaunt extinguishers with which our grandfathers put out their lights on reaching safely their own door-step. They are passing away into the limbo of a forgotten age, and yet it is barely seventy years ago since the enthusiast Winsor startled London by lighting one side of Pall-mall with the mysterious gas, which, he pretended, he alone knew how to develop and control.

An invisible agent has always something of awe and mystery for the ignorant. The sacred fires of Central Asia were caused by the evolution of combustible gases from fossil coals; the unseen vapours issuing from the ground, once lighted, kept up the perpetual flame which seemed divine. Such natural gasworks exist in many quarters of the globe. In the Szlatina salt-mine in Hungary, on the shores of the Caspian, in the State of New York, and in the Chinese Empire, there exist bituminous deposits which are continually giving off illuminating gas. The first account of inflammable air in England was given by Thomas Shirley, who visited a burning spring near Wigan in 1658. The gas was bubbling up through some ditch-water, giving it the appearance of a boiling liquid throwing off inflammable vapour. Shirley, after satisfying himself that the water was *cold*, demonstrated to the bystanders that the flame was due to a combustible gas, by draining off the water from the ditch, and lighting the gas as it issued from a crevice in the ground. This scientific explanation bore no immediate fruit, and we hear no more of gas till 1733, when Sir James Lowther communicated a paper to the Royal Society on the "Inflammable Air" met with in a coal-shaft near Whitehaven at a depth of forty-two fathoms. Very soon afterwards the Rev. John Clayton succeeded in producing illuminating gas artificially from coal. Attracted, like Shirley, to a burning spring near Wigan, he dug down into the soil till he came to a shaley coal, the air round which caught fire on bringing a lighted candle near. He collected some of this coal, and distilled it in a retort. In the Philosophical Transactions of 1739 he thus records his first observations on artificial coal gas:—"At first there came over only phlegm, afterwards a black oil, and then likewise a spirit arose which I could no ways condense; but it forced my late and broke my glasses. Once, when it had forced my lute, coming close thereto, in order to try to repair it, I observed that the spirit which issued out caught fire at the flame of the candle, and continued burning with violence as it issued out in a stream, which I blew out and lighted again alternately several times. I then had a mind to try if I could save any of this spirit, in order to which I took a turbinated receiver, and putting a candle to the pipe of a receiver whilst the spirit arose, I observed that it catched flame, and continued burning at the end of the pipe, though you could not discern what fed the flame. I then blew it out and lighted it several times; after which I fixed a bladder, squeezed and void of air, to the pipe of the receiver; the oil and phlegm descended into the receiver, but the spirit, still ascending, blew up the bladder. I then filled a good many bladders therewith, and might have filled an inconceivable number more, for the spirit continued to rise for several hours, and filled the bladders almost as fast as a man could have blown them with his mouth, and yet the quantity of coal distilled was inconsiderable. I kept this spirit in the bladders a considerable time, and endeavoured several ways to condense it, but in vain; and when I had a mind to divert strangers or friends, I have frequently taken one of these bladders and pricked a hole therein with a pin, and compressing gently the bladder near the flame of a candle till it once took fire, it would then continue flaming till all the spirit was compressed out of the bladder; which was the more surprising, because no one could discern any difference in the appearance between these bladders and those which are filled with common air."

Though the possibility of producing a permanent illuminating gas was thus established, yet no one dreamt of applying the discovery to practical use. For fifty years this inflammable air was nothing but a scientific curiosity, one of the marvels which serve to enliven a lecture, and shed fascination on philosophy. To William Murdoch belongs the real credit of applying gas as an illuminating agent.

In the year 1792 Murdoch lighted his house and offices at Redruth, in Cornwall, with gas, which he manufactured from coal; and five years later, on removing to Scotland, he lighted up his premises at Old Cumnock, in Ayrshire, in the same manner. In 1798 Murdoch erected a retort at the foundry of Boulton & Watt, at Birmingham, and in March, 1802, when the town was illuminated for the peace of Amiens, he exhibited at either end of the building a Bengal light burning coal gas. In the following year the foundry was lighted all over. The gas was led from the retort without purification to a gas-holder containing some 300 ft., whence it passed by copper tubes to cock-spur burners. The first retorts used were upright and cylindrical, but it was found that the coal at the lower end, being heated too quickly, became incrusted with a layer of carbon, which prevented the heat from penetrating the mass within. Horizontal retorts were then adopted, at first cylindrical, and afterwards ∩ shaped, and this form and manner of setting are still most generally observed. In 1805 Murdoch lighted the great cotton-mills of Phillips & Lee, of Salford. To prevent the pipes becoming choked with tar, Murdoch placed tar-wells along the whole line of pipes, into which the condensed hydrocarbons drained, but no other means of purification were adopted. From a report read before the Royal Society in February of that year, the results of the trial appeared very satisfactory; the interest on outlay, and the cost of coal for one year, being 600*l*., while the same degree of light with candles could only be obtained at a cost of 2,000*l*.

Though coal-gas was found to give a light peculiarly soft and clear, and to burn with the steady flame, especially in manufactories, its introduction to dwelling-houses was hindered by the unpleasant effluvium from the products of combustion. When burnt in close rooms coal-gas caused depressing headaches, and in some cases acted injuriously on the lungs. Samuel Clegg, a pupil of Messrs. Boulton & Watt, was the first to attempt purification of gas by means of lime. The pipe from the retort was caused to dip beneath water, holding lime in suspension, at the bottom of the gas-holder, and a horizontal paddle was made to revolve under the water to prevent the suspended lime from settling. By this means Clegg succeeded in removing the obnoxious sulphuretted hydrogen, without acting on the light-giving carburetted hydrogen, but the difficulty of removing the spent lime from the gas-holder led him to make a separate lime purifier, through which the gas passed on its way to the gas-holder. This separate purifier was set up at Stonyhurst College, in Lancashire, where Clegg received every facility for conducting his experiments. The plan was simple and effectual, and for many years was the only method in use for freeing gas from sulphur.

While Murdoch and Clegg were busy in the North, lighting manufactories, perfecting their apparatus, and feeling their way surely, by trial and experiment, to higher results, an enthusiast in London was endeavouring to excite attention towards the "marvellous gas." Mr. Winsor set himself to his task *con amore*. With little scientific knowledge and less mechanical skill, he contrived to mystify and interest the public by the new light. French writers have accorded to their countryman, Philippe Lebon, the merit of first introducing gas for illumination. According to some authors, Lebon patented his "thermo-lampa" in 1786, an apparatus for warming dwelling-houses, by burning wood or coal, and at the same time for lighting them with the gases given off. This crude idea was really patented in 1799, seven years after Murdoch had prepared coal-gas to light his premises in Cornwall. In 1802 Lebon had so far improved his apparatus that he gave an exhibition of gas-lighting in a house in Paris. The fame of this exhibition appears to have reached Winsor, then at Frankfurt. He went to Paris, and, struck by the invention, offered Lebon 100 louis d'or for his secret. Lebon refused to disclose his process unless the purchase of 200 of his stoves was guaranteed. Winsor, unable to comply with this demand, left Paris and began experimenting on his own account. Whether he heard of Murdoch's method is uncertain, but the following winter he exhibited gaslights before the Duke of Brunswick and his court. In 1804 he came to London and began a gas agitation. He took the Lyceum Theatre and lectured on gas; he lighted jets of it in various parts of the building, and impressed his audience with the purity and clearness of the light, maintaining meanwhile strict secrecy as to the mode of production and conveyance of the gas. His lecture became a favourite show, and Winsor himself notorious by advertisement and puff. For three years he continued to amuse and astonish his hearers, but at last hit upon the really original idea of lighting some lamps in the public street, and letting the world judge for itself. Accordingly in 1807 he removed his apparatus to a house in Pall Mall, on the site of the present Carlton Club, and lighted a few lamps on one side of the street, the other side being illuminated by the oil-lamps then in use. This experiment was an undoubted success, and, emboldened by the result, Winsor endeavoured to start a company to carry out his scheme on a large scale. In 1809 an application was made to Parliament for an Act to incorporate "The London and Westminster Chartered Gas-light and Coke Company," but the plan for thus lighting even public thoroughfares with gas was condemned by the highest scientific men of the day, and the introduction of gas into dwelling-houses was denounced as dangerous, injurious, and impossible. Watt and Murdoch

opposed the Bill, on the ground that the latter, being the first to apply coal-gas as an illuminating agent, had the exclusive right of its application. These objections, backed by the ignorance of engineering and chemistry displayed by the promoters, caused the rejection of the Bill. But Winsor never lost heart. Next year he renewed his application, and after a severe struggle and great expense an Act was obtained, authorising his Majesty to grant a charter within three years to a company, for the purpose of lighting a small portion of the metropolis with inflammable gas, and under the powers of that Act the present Chartered Gas-light and Coke Company at Westminster, the earliest of the London gas companies, was established. With his way clear, Winsor at once began the work of construction, and was assisted by a chemist named Accum, a dealer in the marvellous after his own heart. Their united attempts ended in a miserable failure. Time and money were alike squandered, and the shareholders were for giving up the enterprise in despair. At this juncture Winsor obtained a competent engineer, and the fortunes of the Chartered Company began slowly to revive.

Clegg had been busy among the cotton-mills of Manchester; he had invented and brought into use the hydraulic main, had improved the mouth-pieces of the retorts, and introduced an apparatus for regulating the pressure in the gas-holders. In 1812 he came to London and lighted Ackerman's shop in the Strand. The success of his method, which attracted the greatest attention among all classes, procured him the appointment of Engineer-in-Chief to the Chartered Company. Under the new *régime* the works at Peter-street—then a swampy marsh, frequently overflowed by the Thames—were begun in 1813, and before the end of the year Clegg had overcome the enormous difficulties of his task. On the 31st of December of the same year Westminster Bridge was lighted with gas, and so great was the curiosity roused that the bridge became, while the novelty lasted, a fashionable promenade. It is recorded by his son that Clegg himself had to light the lamps for the first few nights, in consequence of the lamp-lighters "striking" through fear of the gas. The parish of St. Margaret, Westminster, next applied to have their streets thus lighted, and in April, 1814, the new gas-lights replaced the old oil lamps.

Though the Chartered Company was thus fairly started on its way by the exertions and skill of its engineer, enormous difficulties had to be overcome before the use of gas became general enough to allow the shareholders a dividend on their capital. It is hard to conceive the prejudice felt on all sides against the new undertaking. People imagined the gaspipes to be dangerously hot, and when the House of Commons was lighted with gas, the architect insisted on the main being placed several inches from the wall lest it should catch fire. The insurance companies refused to insure buildings supplied with the inflammable vapour,—a prejudice which Clegg overcame by inventing a self-acting burner so contrived as to shut off the supply of gas, by the contraction of a small brass rod, if the flame were accidentally extinguished. This complicated burner never came into use; but it attained the object of its inventor. The insurance companies withdrew their objections. But people shrank from the danger of gas and gasworks. When a committee of the Royal Society, headed by Sir Joseph Banks, visited the Westminster works to report on the apparatus, some of the members expressed alarm lest the gas-holder should happen to leak, and its contents catch fire and blow up. Whereupon Clegg, calling for a pickaxe and a candle, dashed a hole into the side of the holder and set fire to the issuing gas. No one, of course, was any the worse; but the committee strongly urged the Government to compel the company to erect no gas-holder containing over 6,000 cubic feet, and to insist that each holder should be surrounded by a massive brick building. The erection of several small gas-holders instead of one large one may have been a measure of safety, but to surround the holders with massive buildings was like putting gunpowder into a shell: if an explosion did occur, the more the explosive was confined the worse for the neighbourhood. Yet for several years gas-holders were safely secured within substantial houses, and inconvenience and expense multiplied. Nor were the difficulties the Company had to meet only in men's minds. The whole *matériel* of a public gas supply was wanting. A fresh trade had to be learnt, a new manufacture devised and carried out. So great was the difficulty in procuring service-pipes that old musket-barrels were employed, screwed one to the other, and a patent was even taken out for making gas-pipes out of wood and paper! No skilled labour could be obtained, workmen had to be specially trained. The price of stop-cocks and burners was almost prohibitive. The meter was not yet invented, and gas had to be sold on an estimate. By such obstacles was the public use of gas impeded in the first years of the young Company, and no dividend was forthcoming to keep up the spirits of its promoters.

Little by little the ground was cleared. Machinery was contrived for making and welding pipes. Burners were manufactured in numbers sufficient to bring down their price to the public need. A meter was devised by Clegg to be used in the consumer's house; a meter, which, improved by Malam and afterwards by Crossly, became almost universal. After five years the Chartered Company declared their first dividend, paying the shareholders 6 per cent. for the year 1817. In the same year, emboldened by the success of the Chartered, another company was incorporated for lighting the City. In 1821 the Imperial Company was incorporated for the object of lighting all London, outside the City, to the north of Oxford-street and Holborn. Then followed the Ratcliff and the Phœnix, though the latter, under the name of the "South London," had begun operations in 1814. These companies, though incorporated to supply particular districts, were not granted the exclusive privilege of lighting the area assigned to them; they were unrestricted as to the price they might charge for gas, and as to the dividend they might pay their shareholders. They were bound neither to supply gas of a particular quality, nor to furnish a supply at all unless they pleased. Fifteen shillings for 1,000 cubic feet was the price charged when meters first came into use.

In 1822 a Commission, headed by Sir William Congreve, was appointed to inquire into the London gas-supply. They strongly advised the division of the metropolis into districts, to be supplied exclusively by one company. But the desire of the public for free competition was too strong, and, notwithstanding the recommendation of the Commission, Parliament gave their sanction to the formation of new companies to compete, in their several districts, with the old. Speculators were found everywhere ready to invest their money in what they considered promising ventures. Bodies of consumers co-operated with local vestries, who contracted to supply the public lamps at low rates. The Independent Company was launched in 1829, to compete with the Imperial; the Equitable Company, in 1831, to compete with the Chartered; in 1844 the London Company was started to compete with the Imperial, the Equitable, and the Chartered; the Great Central, in 1848, to compete with the City Companies; and the Surrey Consumers, in 1854, to compete with the older companies on the south side of the Thames. The Western Company, too, though not incorporated by Act of Parliament, was permitted by the several vestries to compete with the other companies supplying the West End. For nearly thirty years there was no lack of competition, but the public hardly reaped the full benefit of the free trade in gas. True, the price of gas fell, and the severe rivalry of companies may have done much towards economy of management. But it is doubtful whether the public were better or more cheaply served than they would have been without the competition. Many of the streets were occupied by the mains of no less than four different companies, each of which required to open the roads to repair or make connexions with their respective mains. The workmen would confuse the different pipes, and one company would lay on gas from another company's main. In case of leakage each company would pull up the road on its own account, so that, among them, the thoroughfares were seldom clear. But the worse result of the system arose from the fact that in a district of severe competition, the expenses of four mains had been incurred where one would have sufficed for the wants of the consumers. The returns on the total capital expended could be no more than would have accrued to a single company with one-fourth that capital. Supposing the receipts equal, each company got one-fourth the per centage it might have done had it supplied a district of its own. Such a system could not last. There was nothing to compel the companies to ruin themselves for the sake of the public. A tradesman will sometimes sell at a sacrifice for the sake of ruining a rival over the way, fully intending, when the enemy has closed his shop, to recoup himself out of the pockets of the public; but if his rival prove a tougher foe than he counted on, the two quietly make it up and continue business with legitimate profits. In 1857 the different companies agreed to keep themselves to particular districts. London was again divided into separate areas, and in consequence of the increased economy in gas-distribution the cost has been considerably reduced.

But the cry of "no monopoly" was soon heard once more. The companies might raise the price of gas, and no redress could be obtained. Public feeling was aroused, and Parliamentary inquiries were held. The agitation resulted in the passing of the Metropolitan Gas Act of 1860. The wisdom of confining each company to a separate district was recognised in this Bill, but at the same time most stringent rules were laid down as to the supply of gas in consideration of granting a monopoly. The maximum price of twelve-candle gas was fixed at 4s. 6d. the 1,000 cubic feet, unless a sudden emergency should arise, in which case the Home Secretary had power to grant an increase in price up to 5s. 6d. The companies were obliged to supply gas wherever it was required, and furnish meters at a fixed rental. The gas itself was never to fall below a fixed standard of purity and illuminating power. The shareholders were to receive a maximum dividend of 10 per cent. A small reserve fund was allowed in order to maintain that rate of dividend, but all further profit was to go towards reducing the price of gas.

In carrying out these conditions, the companies found themselves obliged to raise capital for the purpose of enlarging their manufactories, and extending their mains, as the demand for gas increased. The Corporation of London and the Metropolitan Board of Works sought on these occasions to obtain further concessions. Some of the companies had to submit to a reduction of the "initial price" to 3s. 9d. per 1,000 ft. of 16-candle gas, and to abolish altogether their reserve fund. In case of need they could appeal to three Commissioners appointed by Government to sanction an increase of price for a year succeeding one in which they had not paid 10 per cent.; and the same Commissioners could be called in by the local authorities to authorise a reduction of price, if it appeared that the maximum dividend could be paid at a less charge than 3s. 9d. per 1,000 ft. During the years of coal famine, in 1872 and 1873, when the cost of coal was more than doubled, the Imperial and Chartered companies appealed to the Commissioners, who sanctioned an increased price.

Since this time further efforts have been made against the London gas companies. In the sessions of 1874–75 three Bills were promoted by the Metropolitan Board of Works and the Corporation of London; the first, to authorise these bodies to erect new gasworks and supply gas in competition with the companies; the second, to force the companies to sell their works at a sum fixed by the purchasers; the third, to enact that for every penny above 3s. 9d. per 1,000 cubic feet the companies should charge, a reduction of ¼ per cent. should be made in the rate of dividend to the shareholders. The first and second Bills were quickly withdrawn, and while the third was being considered by a special committee, the Board of Trade intimated that they would agree to the companies paying an increased dividend should they reduce the price of gas below 3s. 9d. The committee approved the suggestion, but the Bill was dropped owing to the lateness of the season, only to be re-introduced during the last session.

Late in the past session of 1876 the Regulations Bill was withdrawn. The Chartered and South Metropolitan Acts were, however, passed, in which the sliding scale of charges was introduced, the initial price for the Chartered now amalgamated with the Imperial and the Independent, being fixed at 3s. 9d., and for the South Metropolitan at 3s. 6d. The dividends of these companies may now rise, as well as fall, above or below the standard 10 per cent. inversely with any increase or decrease in the price of gas above or below the initial price.

The public prejudice against the gas companies seems to arise from a notion that, having a monopoly, the companies may supply bad gas with impunity, and profit during a coal famine by raising their prices. As a matter of fact, the illuminating power of London gas is carefully

tested day by day in different parts of the metropolis by chemists appointed by the Board of Works. Any falling off below the standard of sixteen candles is punished by a severe fine on the offending company. Not a trace of sulphuretted hydrogen is allowed in the gas, and a maximum for ammonia and for other sulphur compounds is fixed by three gas referees, who have power to lower these maxima whenever new methods are discovered for the more effectual purification of gas. The fines inflicted for infringing these rules are deducted directly from the dividends of the shareholders. For the defective lighting of the public streets, the local authorities, not the gas companies, are responsible. The latter supply the gas of the standard quality; the former determine the number of lamps and the kind of burners used. Official inspectors are appointed by the Board of Works to examine the accuracy of the meters used by household consumers, though the modern gas-meters are wonderfully exact in their mechanism. The wretched light often seen in private houses is usually due to obstructions in the internal gas-pipes, which are made by the gasfitters so small as to be easily choked at their bends by rust or dirt.

Compared with other cities, London gas is cheap and good. While we pay on the average 3s. 9d. for 1,000 cubic feet of sixteen-candle gas, in Paris the charge is 6s. 8d.; in Vienna, 5s. 8d.; in Berlin, 4s. 3d.; and in New York 10s.*

J. Gardner.

A LADIES' TRACING-OFFICE.

Among the various schemes which are brought forward for enabling women to extend their possibilities of earning an independent livelihood, one has accidentally come under our notice which seems to call for a word of recognition and encouragement in our columns, not only from the philanthropic, but from the business point of view, as far as regards the work incidental to architectural and engineering drawing. This is the establishment by some ladies of an office where the tracing of engineers' and architects' drawings is carried on as a regular business. The necessity of keeping duplicates of drawings by tracing gives rise, it need not be remarked, to a considerable proportion of the desk-work in professional offices. It is work requiring chiefly neatness and care, with a certain degree of acquaintance with the methods of architectural and engineering drawing, but not necessitating any practical professional knowledge. In Glasgow and Manchester we understand that women have been for some years employed in engineers' offices in doing this kind of work; the movement having been first prompted partly by economical considerations. The success of the experiment in the North led to the idea of trying it in London and some ladies who desired to do so met with encouragement from a large and well-known engineering firm, who gave them a room in their establishment, where they were enabled to acquire whatever technical training was necessary, and to habituate themselves to the work, under very advantageous circumstances. They were employed there about two years and a half, with so much success as to lead to the idea of opening an office for themselves for carrying on the same work on a larger scale and with a more public connexion. Accordingly these ladies have opened an office at 42, Queen Anne's Gate, Westminster, under the title of the "Ladies' Tracing-office for Architectural and Engineering Plans," where they have carried on this business since February last, and have already received a sufficient number of orders to lead them to hope that they are supplying a real want in the engineering and architectural world.

The importance, in the general interests of society, of extending the opportunities of remunerative work for the number of women who have to depend upon their own exertions can hardly be over-rated; and from this point of view we may say that the particular work referred to seems to us eminently suited for women's fingers, which are so successful wherever delicacy and neatness are essential, while it is in no way over-taxing to their strength; indeed, as a lady who had tried it observed, "it is very like sewing," a light employment requiring neatness of hand, without unduly fatiguing body or mind. And to those who require a good deal of tracing done, we imagine such an establishment ought to be really useful. It has been a modest beginning, not much advertised or proclaimed, and some of our readers who were not aware of the existence of the Ladies' Tracing-office will, perhaps, on hearing of it, be glad to avail themselves of its assistance.

* To be continued.

LIVERPOOL ARCHITECTURAL SOCIETY.

We have printed part of the address read at the opening meeting of the twenty-ninth session of this Society, by the president, Mr. J. A. Picton. The Society, which for a long time was by far the most able and active of the provincial architectural societies, has, after a period of less active existence, made something like a fresh start, which, we hope, will be instrumental in leading to the development of all, or more than all, its former energy and activity. As we gather from the remarks of Mr. Picton, the Society had suffered recently from the loss of the original professional members, without their place being adequately supplied from the younger generation of professional men, a result partly arising, we believe, from a feeling on the part of some members of the profession that the amateur element, which was a constituent part of the Society from the first, had acquired too great an ascendency, numerically, at all events; and at length it became clear, says the President, "that the Society must either be broken up or reconstituted on a new basis. Thanks to the untiring efforts of a few zealous members, the latter course was resolved upon. The profession was canvassed with considerable success. A new code of rules and a more definite basis to its operations were drawn up, and the Society this year enters upon a new epoch of its existence." We congratulate the Liverpool profession on having made up their minds to pull more together. The kind of influence, which may be called cliqueism, which gave rise to the recent state of disunion, is not unknown in other places besides Liverpool; indeed, the architectural profession seems to be peculiarly subject to it; but it is a source of disunion which is calculated, if indulged and encouraged, to seriously injure the advancement and progress of the profession, and its social status and dignity in the eyes of outsiders. We see in the list of council and officers of the Society the names of several gentlemen known as successful and able architects, including four Fellows of the Royal Institute of Architects. We heartily wish success to the Liverpool Society in its future career. In former days many able and interesting papers from its Transactions appeared entirely or in part in our columns; we shall hope to find the future proceedings of the Society more than keep up the prestige of the past. Mr. Picton's very thoughtful address is mainly a review of the situation, especially with the object of pointing out the peculiar requirements of the present time in relation to architecture. We shall print the remainder in our next.

COMPLETION OF THE METROPOLITAN RAILWAY EXTENSION TO ALDGATE.

The extension of the Metropolitan Railway from Liverpool-street to Aldgate, which runs along the east side of Houndsditch, and terminates in Aldgate, nearly opposite the Minories, is all but completed. The opening of this extension will complete the inner circle between the east and west of the metropolis, with the exception of the length between Aldgate and Cannon-street, which would unite the Metropolitan with the Metropolitan District line, and by means of the last-named line admit of more direct railway communication than at present exists between the East End of London and the south-western districts. The station buildings have a frontage to Aldgate 92 ft. long, and 32 ft. in height, and are of stock brick with Portland cement dressings. The elevation has a range of seven lofty arched windows, and two entrances, and a verandah 9 ft. in width projects beyond the frontage.

The works have been constructed under the superintendence of Mr. Brady, the company's engineer. Messrs. Lucas & Aird were the contractors. The whole of the ironwork was supplied from the Thames Iron Works at Millwall. Mr. Woolfall has acted as clerk of the works.

The Hampshire Banking Company's new Buildings in the City. — The name of the architect, instead of Mr. H. Green, as stated, is Mr. Theodore K. Green.

A GIPSY COLONY AT DULWICH.

Accounts reach us from Dulwich from which it is to be feared that the mansions and other buildings and property in a portion of that charming suburban locality are likely to be seriously depreciated in value unless some local authority interferes to remove a nuisance which is reported as intolerable. It appears that a gipsy capitalist has succeeded in purchasing a large field in Lordship-lane, in that portion of the valley around which large mansions and residences of a high character have for some time past been in course of erection. The purchaser of this field has manifestly become the owner of it specially for the purpose of accommodating the members of his tribe, having let it in plots to various bodies of gipsies, at weekly rents, and the fraternity forming the new population is already said to number between 100 and 200. Like the rest of their tribe, they of course live in tents pitched upon the ground, and ordinary sanitary regulations, such as exist amongst the community generally, being ignored, the repulsive and disgusting practices which are daily witnessed will be easily imagined. The nuisance is also intensified by the general social manners and conduct of the tribe, which go to make up a constant and continuous Saturnalia both day and night, and the approaching winter is looked forward to with painful anxiety by the owners and occupiers of property in the locality.

THE EPISCOPAL AMERICAN CHURCH IN ROME.

Ancient Rome is repeating herself, in one sense of the word, and that the better sense, as regards toleration in matters of religion. Papal Rome had banished every sentiment of civil toleration and liberty. Rome of to-day, on the contrary, receives with open arms every manifestation of human thought. If in old times she admitted the gods of all nations within her temples,—now can all religious creeds find in her a place without molestation or obstacle,—the effects of the free institutions by which Italy is now governed, and of which foreigners are now also gladly availing themselves.

Five or six years ago, the Anglican Churchman of Great Britain or America thought himself much favoured by being allowed to make use of a barn outside the walls of Rome, for public worship; now, not only the Anglican Episcopalian, but the Methodist and the Baptist have their elegant chapels, and in some of the best parts of the city; and the consecration of these buildings takes place in the presence of Roman citizens and aristocratic women, whose difference of faith does not impede their taking part in this religious ceremony.

The most imposing of these ceremonies was that which was performed on the 25th of last March, when the church of "St. Paul within the Walls," erected in the handsome new street, styled "Via Nazional," was consecrated. The church was built from designs by Mr. Street; the style is something between Lombard and Gothic. The exterior presents alternate courses of travertine and red brick. The interior, to judge of the effect when entirely completed from what has already been done, promises greater success than the exterior. The simplicity of the lines, the subdued light, the harmony of the whole, tend to meditation and devotional feeling,—a very oasis of peace and tranquillity in the midst of the glitter and pomp of Roman Catholic ritual. The new church was consecrated by the Bishop of Long Island, New York, a considerable number of American prelates and clergy attending, many of whom had come expressly to be present at this ceremony. They walked (rebed) in order from the Hotel of the Quirinal to the church, at noon, through an immense crowd, looking on in reverence and silence. The chanting during the service was accompanied on a harmonium (pending the placing of an organ) by Dr. Monk, of York Cathedral. Like all churches in America, this in Rome was erected by private contributions, costing about 30,000*l*. One individual, Mr. Scott, took upon himself to defray the expense of the tower, amounting to about 3,000*l*.

Society of Engineers.—At a meeting of the Society of Engineers, held November 6th, in the Society's hall, Westminster Chambers, Mr. V. Pendred, president, in the chair, a paper by Mr. Charles E. Hall, "On the Conversion of Peat into Fuel and Charcoal," was read.



THE EPISCOPAL AMERICAN CHURCH, IN ROME.—Mr. Street, R.A., Architect.



PROPOSED PALACE ON THE TROCADERO, PARIS: INTERNATIONAL EXHIBITION, 1878.—DESIGNED BY MESSRS. DAVIOUD AND BOURDAIS, ARCHITECTS.

PROPOSED PALACE ON THE TROCADERO, PARIS.

We have already alluded to the work going forward on the Trocadero in preparation for the palace to be erected there, and we are now enabled, through the courtesy of the architects, MM. Davioud and Bourdais, to give an engraving of the proposed structure. The general style of the building is a modification of the Arabesque; its form is semicircular, accompanied by two spacious wings; proceeding from these are half-circular galleries, forming, as it were, the sides of an immense horseshoe as large as the Trocadero itself, and enclosing the whole of the park. The termination of these galleries is not seen in our view. From the centre of this half-circle springs the rotunda, which will be used as a theatre (with its domed roof surmounted by a winged Genius), flanked by two lofty minarets, and encircled by two tiers of galleries giving access to every part of the theatre, and forming a covered promenade looking out upon the wonderful panorama of Paris and its environs, Meudon, Sèvres, Clermont, &c. The architects have succeeded in combining lightness with strength. All the iron framework of the buildings will be furnished with materials of different colours placed one over another, and further enlivened with bright-coloured panels of enamelled clay.

We shall have occasion at some future time to return to this creation of MM. Davioud & Bourdais,—the Palace of the Trocadero. MM. Krantz, Duval, and Regnault examined a few days ago M. Hardy's design for the principal façade of the Exhibition building, when some modifications were suggested, and their form then and there decided upon.

Although several journals here have asserted that the buildings on the Trocadero will be devoted to an International Retrospective Exhibition, and to agricultural and horticultural shows, we have received official information that up to the present moment nothing whatever has been decided upon, and cannot be, until the plan and interior arrangements of the buildings are finally settled. The Government at Versailles have received official notice from Germany that she will take part in the Exhibition.

WHAT STYLE NEXT?

THE ARCHITECTURAL ASSOCIATION.

At the opening *conversazione* on the 27th ult., mentioned in our last, the president, Mr. H. C. Boyes, said we seem to have reached a stage in the history of modern architecture when we may well pause and consider what is to be our next step. The history of our art, since the great Renaissance and the dull Georgian period which succeeded it, has been a history of *revivals*. We have been engaged in a continual succession of attempts to revivify past forms of art and adapt bygone styles of architecture to our modern tastes and requirements, or even, as it has often seemed, to force modern tastes and requirements into ancient styles of art,—to make the foot fit the shoe, since the shoe would not fit the foot.

One style after another has been revived till at length the whole range of the past has been explored, and the modern architect is left at last to deplore that he has no more worlds of architectural style to conquer. We are the heirs of all the ages, and we have been "rummaging" amongst our heirlooms, discovering and trying on one after another the dresses and trinkets of all our ancestors. Most of them have fitted us very badly indeed. Some have, however, given us a transient satisfaction by their quaintness and peculiarity; others have quickly disgusted us by their incongruous unsuitableness. The Classical toga was too thin and cold for our climate. The Mediæval armour was too cumbersome and rusty. But at last we reached nearly the end of our search, and came upon the wardrobe of that august, but notoriously defunct monarch, into whose tight-fitting garments we have of late been trying to thrust ourselves. Vainly do some of our cleverest friends try to convince us that they fit us beautifully—vainly, though only too ingeniously, do they try to make them fit. We can only marvel and regret that so much cleverness and ingenuity should be so mis-spent, and wait in patient expectation to see in what direction they will next exert themselves. Are we now to expect some entirely new fashion, or can there yet remain some old one to be revived? At such a time, I think we may do well to ask ourselves, can we manage to dispense with this constantly-changing tyranny of fashion in our art? Is there anything we can substitute for it? It is surely hardly necessary to show that these constant changes of fashion are not promoting the real interests of architecture. The history of a fashion in art as in dress may be quickly summed up. Your new fashion goes very well at first; there is a charm of novelty and a piquancy about it; the best people take it up, and with them for a while it thrives; then clumsy and vulgar imitators produce burlesque inappropriate imitations. Molly, the housemaid, appears in a gigantic chignon, and the thing is at an end. Begun for the sake of eccentricity, continued for fashion's sake, it ends in vulgar absurdity. In dress you have only the pages of *Punch* to remind you of its short-lived popularity, and to amuse you at the notion of how people could ever be such fools as to dress so. In architecture, unfortunately, though the fashions are nearly as transient, the effects of them are comparatively permanent,—and we are met at every turn in town and country with the evidences of the constant fluctuations of architectural taste.

These changes in architectural fashion are not, I think, produced by any popular demand for change insisting on our architects continually producing something new and strange. The late Queen Anne fashion, for instance, was not produced "to meet a great public want"; it was the invention of a few clever men in the profession, who had become tired of the Gothic fashion, and were probably disgusted at the vulgarities and barbarisms of the less skilful imitators of their works in that style. There is, indeed, but very little demand amongst the public generally for any architectural fine art whatever. Your typical representative of the British public regards with complete apathy and indifference the momentous changes which transform the skyline of the view from his dining-room windows. The long array of "soup-tureens and tea-urns" on the opposite parapet wall is swept away, and curved gables, broken pediments, and cannon balls take their place; to-morrow perhaps there will be pinnacles and buttresses, but, like Gallio, "he careth for none of these things." The architectural world is convulsed at the new revival, our meetings here become the scenes of almost angry contest, but for him these great facts have little interest and no charm. Even the comparatively small section of the public who do take any interest in such matters, always wait to have their fashion supplied them by the fashion-monger, and as little think of influencing the question of what it is to be as any lady here present hopes to influence the design of the next pattern of fashionable bonnet to be produced in Paris.

The cause, then, I think, is not to be sought for outside the profession. It is a matter which we can ourselves control, and, if we will, remedy; and I believe we should go far to do so if we would resolve to abandon the pursuit of fashion and novelty, and strive more earnestly towards the attainment of what is meant by those old watchwords of the Association,—"Beauty and Truth."

In *all* these past styles that we have been studying, and forming all that in them is worth reviving, are to be found, if we will seek for them, *true principles of art*, as applicable to our own time as to theirs, unchangeable amidst the constant changes of their outward forms. The essence of all good art is to be found, as Mr. Poynter has lately reminded us, "in honest and good workmanship above all things"; and this is especially true of architecture above all other arts. Honest and good workmanship—truth and beauty—are not the monopoly of any one style. In every style they exist in a greater or less degree. Honest and good design, combined with honest and good building, make the highest goal of architectural art. Fitness for its purpose is the first great attribute of every good building. Appropriateness is the *only* true test of beauty in ornament.

The more we resolve to be guided by these principles of art, the less, it seems to me, does it matter what style we work in. We shall, of course, reject at once as unfit and inappropriate styles essentially unsuited to our climate, however beautiful and appropriate they may be or may have been in their own time and place. We shall study them still, not only for the education of eye and hand which such study affords, but for the decorative *motifs* which they will provide. But if we take any of the revived styles, either of Italian or Gothic, which modern experience has proved to be suited to modern requirements, and if we will resolve to be guided in our treatment of them solely by these two principles of fitness and propriety, honest and good workmanship can hardly fail to result.

Through all the changing fashions which have so quickly succeeded one another during the last thirty years, there has been a steadily increasing appreciation of these true principles of art, insomuch that when we *now* turn to the books in which the ideas were first formulated, such as Ruskin's "Seven Lamps" or Pugin's "True Principles," we feel a sort of surprise to find that what struck us on first reading them as little short of original inspirations, read at the present time very like trite truisms.

Much that was extravagant and much that was narrow-minded in these writings has sunk without effect almost into oblivion; but the hatred of all shams, the love of truth and beauty, of honest and good workmanship, which their teaching inculcated, has become popular, not merely amongst architects, but with all who take any interest at all in modern art; and though, of course, in the works of our best artists we find plenty of examples to show how far short of our theory our practice has often fallen, yet the standard of architectural taste then set up has been practically that which we have been striving to attain to, and by which we have been contented to judge both our failures and successes.

I suppose that the promoters of our latest fashion scarcely admit that "free Classic" is to be judged by any such rules; yet even the apparently intentional violations of them in their works are often excused in a rather shame-faced manner by their perpetrators as something very "naughty," but rather "nice." This is the sort of homage that bad art pays to good. The tribute which one who still believes in the "true principles" feels compelled to pay to such charming offences is something of this sort:—"Your little exploded shams, such as graining and marbling; your gables, with no roofs behind them; your exaggerated chimney-stacks, twisted gables, and broken pediments; your false, if fair, constructed ornament of all kinds, has been so very cleverly treated, that one feels disposed to say with Burke, 'Vice has lost half its evil in losing all its grossness.'"

We have seen it, however, in all its grossness in some of the later works of the less successful imitators of the first apostles of the movement; and when seen robbed of its charms of novelty and clever treatment, the foolishness as well as the ugliness of it is only too apparent. But this is a digression.

I have said before that I claim no exclusive monopoly of truth and beauty for any one style. To me it seems that the influence of the writers I have referred to has been rather weakened than strengthened by their attempts to show that Gothic art alone contains the elements of truth and beauty. I believe certainly in the *greater* fitness of Gothic than Italian for all our modern purposes; but I fully admit the existence of plenty of honest and good work in both styles, and I see no reason why both should not continue side by side to exist, if only they be *both* treated not as masters, but servants. We must make our style, whatever it may be, fit our buildings, and give up the vain effort to make our buildings fit our style. We must get rid of the trammels of that archæological or artistic pedantry which would stereotype our styles and still keep us under the thraldom of used-up precedents.

Choose your style and stick to it, and to it alone, is the advice constantly urged on us by those who have tried this course themselves, and seem to have found it satisfactory. It is quite as much as you can do, they say, to properly master the details of any one style. If you try more you must become a "Jack-of-all-trades, master of none." You will never work well in any other style unless you devote the *whole* of your efforts to its study and practice; and they will go on to give instances of men great in their own *one* style, who have failed miserably when attempting to work outside it. I fear I shall be thought presumptuous in expressing my doubts of the truth of what seems at first sight to be the teaching of experience in this matter, and what is certainly the view of many far better entitled to be heard on such a subject than myself. But it seems to me that such a course as that suggested is only good if we are to go on in the future as we have in the past, continually imitating and reproducing.

If one man is to pin his faith, say, to thirteenth-century Gothic, French or English, another to Grecian, another to Italian, and another to Queen

Anne, and each is never to travel beyond the narrow limits he has imposed on himself, no doubt we shall get more faithful imitations of the styles I have named.

If this is what is wanted, then certainly stick to your one style. But if it be true that there are principles of beauty and truth underlying all great styles,—that good honest work may be done in each and all by constantly keeping those principles in view,—then, I think, it follows that, even at the expense of accuracy of imitation, we may work in whatever style or styles may seem best suited to our purposes or tastes, and need not confine our study or practice to any *one*. The greater our knowledge of those styles, the more we have studied their details, the better, no doubt, will be our work; but are not those very failures of good men who have tried to work in a style to which they were not accustomed instances which should teach us not to so accustom ourselves to one style only: that we shall be unable to walk alone when called upon to work outside it? I know well that a man will not be able to acquire so complete a mastery over the details of six styles as over those of one; but I think we have more chance of getting something like progress and development in architecture by a catholic appreciation of the beauties of six styles, than by narrowing our minds down to the study and use of one only. I do not believe in a new style which is to be the spontaneous invention of any one man or of any school. I doubt if we shall ever get beyond the period of revivals, the *régime* of fashions; but if ever we are to do so, it must be by a very gradual growth and development. The battle of the styles will never end in the complete ascendancy either of the Gothic Revival or of the Italian Renaissance. If anything like unity is ever to come, it will be by a very gradual fusion, not by a sudden jumbling together of details of all styles and periods in one inharmonious whole, as the manner of some is. If any real progress is ever to be made, I think it must be by a carefully *free* use of all styles alike, bringing them all alike into service in turn, as occasion seems to dictate; not by a narrow and fanatical adherence to any one style only. If we are to give up all hope of such progress, there is little left for us to work for.

Already there are many of us who have quite given up in despair all real artistic interest in their work. The rapid changes of fashion seem to have fairly dazed them. They began perhaps with as much youthful hope and enthusiasm as any of us. They learned perhaps their one style well, and as soon as they had acquired it, it went out of fashion, or their clients would not stand it, and if they were to get a living they must try something else. They soon found how little the public cared for any art whatever, and that they could carry on their business with profit to themselves and without much harm to their neighbours if they would only contrive buildings that shall keep out wind and water, and not be too inconvenient.

If the client wants plate-glass in a handsome stone front, with Italian cornices, entablatures, and pilasters *ad libitum*, he can have it. If he wants a Gothic castle, or a house in the Latest Elizabethan or Queen Anne craze, he can have it. There is plenty to imitate; he can choose what he likes since he has to pay for it himself; but as for fine art—why, "there's nothing new and there's nothing true, and it doesn't matter."

Others there are who have found their one style pay, — perhaps they were fortunate in choosing it, perhaps they were able to persuade a large or influential number of people that "there is but one true style of architecture, and Jones is its prophet." For them there is no need to submit themselves to the whims and caprices of their clients. Nothing succeeds like success: the more they do the more they are likely to do. A big railway-station hotel, half a dozen churches, a dozen mansions, a town-hall, and a few colleges, make up the pleasing round of their year's work, with perhaps a cathedral restoration or two to fill up their spare moments. With so much work thus entrusted to our foremost men, who shall wonder at the rapid progress our art is making?

Few of us, alas! can expect to attain to the proud pre-eminence of the latter class. Let us, at any rate, strive not to drift into the condition of the former. We have an art worth living for if we will only make it a living art. We have *all* that is beautiful in the past to study, we may learn *all* the grand lessons the men of former days have to teach us; we may learn by *all* their victories; we may learn still more by *all* their failures; but let us beware lest the feeling of reverence which every true student must feel for the past lead us to forget that we should not study it merely for its own sake, but for the sake of the present. The present is with us; the future is before us, to fashion as we will. Art is long—time is short, but long enough, if we use it aright, for each and all of us to do something towards a true Renaissance, not a mere revival of ancient forms, but an infusion of the spirit of truth and beauty into our modern buildings.

BUILDERS' BENEVOLENT INSTITUTION.

ANNUAL DINNER.

THE twenty-ninth anniversary festival in aid of the funds of this deserving charity was held on the 2nd inst., at Willis's Rooms, St. James's, Mr. Charles B. Waller, president, in the chair, supported by about 260 of the subscribers and friends of the Institution. The usual loyal and patriotic toasts were duly honoured, Major Brutton, the secretary of the Institution, responding for "The Army," and Captain George Trollope for "The Reserve Forces," the latter gentleman remarking that he had the honour to command a company of volunteers composed exclusively of the *employés* of the firm with which he was connected. He thought that builders might be counted as amongst the most loyal of her Majesty's subjects.

The President, in proposing the toast of the evening, "Prosperity to the Builders' Benevolent Institution," said that during the period of nearly thirty years since its foundation, the Institution had done a vast amount of good. Much as it had done, however, it had not accomplished all that it might have done, simply because it had not had more ample means. It had frequently been unable to elect on its funds all who had good claims for election,—men who were at one time well-to-do, prosperous tradesmen engaged in the building trades, and employing a fair number of men, but who, from the varied misfortunes which frequently befel the members of those trades, had been reduced from circumstances of comparative affluence to almost the lowest depths of poverty. It was a very painful thing for those who managed the affairs of the Institution to have five or six deserving candidates before them at each election of pensioners, while there were only two or three small pittances or pensions for disposal. He could personally testify to the energy and unremitting attention given to the affairs of the Institution for a long term of years by some of the most respected members of the London building trade, and he could only regret that such praiseworthy labours had been attended with such comparatively small results. It was true that many of the leading members of the trade were large subscribers to the funds of the Institution, but, on the other hand, there was a large class of prosperous and well-to-do builders who at present only subscribed a guinea or two a year, and to whom an extra guinea or so would be but a trifle. The pensions of 24*l.* or 20*l.* per annum granted to male and female pensioners respectively were in almost every instance the sole means of preventing the pensioners from ending their days in the workhouse. He found that the average amount of yearly subscriptions to the Institution was something like 800*l.*,—a sum which was not enough, by a long way, considering the importance and magnitude of the building trade. Since 1868 the Institution had been gradually on the decline in the amount of its annual subscriptions, which had shown a tendency to decrease from 20*l.* to 10*l.* downwards, instead of increasing from 10*l.* to 20*l.* upwards. This was rather a reflection on the liberality of the trade. Surely it was worth while to make more strenuous efforts on behalf of the Institution, especially in view of the fact that the amounts of the pensions were very small, considering that their recipients were men who had lived in comfortable, if not in luxurious circumstances, seeing that they had been masters and capitalists to some extent. Now it was the desire of the committee of the Institution to increase the amounts of the annuities, which were fixed many years ago, when the prices of all the prime necessaries of life were much lower than at the present time, and it was hoped that after this year the committee would be in a position not only to increase the amounts of the pensions, but to add to the number of pensioners. He had personally made a special appeal on behalf of the Institution, and he was proud to say that that appeal had been really handsomely responded to. He had been rather struck, however, by the fact that very few new annual subscribers had been obtained; and while the Institution was very thankful for donations, to enable the invested funds to be augmented to the sum of 20,000*l.*, it was necessary that the amount of the annual subscriptions should be increased. In the year 1867 these amounted to 937*l.*, whereas in 1875 they only amounted to 792*l.*, a circumstance which, as already hinted, was not creditable to the trade, and he really hoped that in future the managers of the Institution would be entrusted with resources commensurate with the importance of the trade. Many deserving applicants for relief came to the Institution, time after time, and had to go away empty-handed. This was more to the discredit of the building trade when it was remembered that, collectively, master builders had very few claimants upon them in the shape of charitable institutions. The Builders' Benevolent Institution, and what was called the Builders' Society, were, in fact, the only two societies to whose funds they were called upon to subscribe as a body, and he therefore ventured to ask the company to drink the toast with enthusiasm, and, farther, to show their sympathy practically by subscribing liberally to the funds of the Institution.

The toast was received with acclamation.

Mr. Robinson (Cubitt & Co.) proposed the health of "The Chairman and President," remarking that the name of Waller had long been known in connexion with all that was fair, equitable, and good in the building trade. Mr. Robinson, in a speech of some length, endorsed what had been said by the Chairman as to the claims of the Institution upon the building trade.

The Chairman having responded, the subscription lists were read, the total amount raised being 880*l.* Of this sum, the chairman's list amounted to 460*l.* 11*s.*, including 100 guineas given by Messrs. Lucas Brothers, and 15 guineas collected by Mr. Chapman amongst the clerks and workmen of Messrs. Waller & Son. Amongst other principal donations was the sum of 50 guineas given by Messrs. Cubitt & Co.

The Chairman, in announcing the sum total collected, said that the Committee of the Institution would now, thanks to the generosity manifested that evening, be able to increase their invested fund to the amount upon which they had long set their hearts, namely, 20,000*l.*, while the new annual subscriptions would enable them to add two, if not three, new pensioners to the list.

Mr. Hopgood next proposed "The Vice-Presidents and Trustees," and adverted to the important services rendered to the Institution by those gentlemen. Mr. R. Freeman, whose name was associated with the toast, briefly responded.

The Chairman next proposed the health of "the Treasurer" (Mr. George Plucknett, of the firm of Cubitt & Co.), remarking that thanks to the earnest and unremitting attention of that gentleman, the finances of the Institution were administered with the utmost effectiveness and economy.

Mr. Plucknett, in responding, thanked the company for the loyalty shown to the Institution that evening, and proceeded to say that he regarded the occasion as the commencement of a new epoch in the history of the Institution, which had now been in existence nearly thirty years. In that time there had been subscribed to its funds nearly 50,000*l.*, of which 30,000*l.* had been devoted to the objects of the charity, and the remainder invested. As a result of the evening's subscription, the Institution would now be enabled to increase its funded property to a round sum of 20,000*l.* In attaining this amount of funded capital, the committee felt it would be unnecessary to go on funding any more money, and they would therefore, in future, instead of investing (according to the rules of the Institution) donations, devote them, together with the annual subscriptions and interest on funded capital, to the purposes of the charity, i.e., in the payment of annuities, &c. This was a very important consideration, seeing that the donations to the Institution had averaged, for the last ten years, 400*l.* or 500*l.* per annum, and presuming that there would be no falling off in the amount of donations in future years, the Committee would have the income at its disposal for the objects of the charity increased by that amount. Another very important element in the future of the Institution might be said also to date from that evening. Some years ago, a building fund for the establishment of almshouses in connexion with the Institution was commenced, and special donations on behalf of that object were collected. It soon became evident, however, that almshouses would be unpopular with the *bénéficiaires* of the Institution, and it was therefore considered that it would be very much better to devote the interest of the accumulated building fund (3,500*l.*) in pensions. In proof that the building of almshouses was not desirable, the Institution some four or five years ago had the offer of one of the almshouses belonging to the Bricklayers' and Tilers' Company, with very comfortable accommodation, and carrying with it an income of 10*l.* a year from the Company, besides two tons of coals, these gifts being quite irrespective of the pension given by the Institution. The question was put to the forty-five pensioners of the Institution whether they would accept the almshouse and its attendant advantages, but only three of them were willing to do so. The fact was that the aged pensioners of the Institution much preferred to live with or near their relatives and friends. This being the case, the committee had recently promoted the necessary proceedings in the Court of Chancery to enable them to invest the amount of the Building Fund (3,500*l.*) to the credit of the Relief Fund, and arrangements for doing this had now been completed. The interest from this would give another 100*l.* a year to be devoted to pensions. He thought all present would agree that it was advisable to increase the amounts of the annuities by at least 5*l.* each. This the committee would now be able to do, and it was hoped and believed that if the donations and subscriptions were fully maintained, all candidates who had claims on the Institution would be enabled to participate in its benefits. This was

a position which the Institution had never been in before. In conclusion, Mr. Plucknett expressed his high appreciation of the services rendered to the Institution by the president.

Mr. Rogers proposed "The Architects and Surveyors," coupled with the names of Mr. Robert Walker and Mr. Franklin.

Mr. Walker, in responding on behalf of the architects, acknowledged the indebtedness of architects to the executive skill brought to bear on the realisation of their designs by the builders. To a certain extent the interests of architects and builders were identical, and therefore he was glad to note that there were now fewer disputes between them than was formerly the case.

Mr. Franklin, on behalf of the surveyors, said he was glad to say that the day was at hand when the building surveyor would no longer be thrust in the background and paid *sub rosa* for the very important services he rendered. The surveyor's services had been too long ignored, but he believed that there was a growing disposition on the part of builders to take care that surveyors should be employed to watch their interests. As to the Builders' Benevolent Institution, he thought its income would be much larger if more attention were devoted to making its existence known amongst the trades and professions connected with building.

The remaining toast was "The Directors and Stewards," proposed by Mr. Waller, sen., and coupled with the name of Mr. Thomas Stirling.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

At a special general meeting of this Institution, held at the offices, 27, Farringdon-street, Mr. G. Plucknett in the chair, assent was given to the modifications in the orphan rules as required by the Registrar of Friendly Societies, whereby presentations for periods of twenty-one years may now be purchased (in existing orphan homes) in the names of the trustees as a body, instead of "life" presentations in the name of one member only, as at first provided for. In consequence of this alteration, the sections in the original orphan rules relating to the insurance of the presenters' lives, not now applying, were repealed.

The orphan fund thus being in working order, the purchase of a twenty-one years' presentation to the Orphan Working School, Haverstock-hill, was ordered at this meeting; and the election of a builder's clerk's orphan for education at this school will be shortly announced.

THE CRYSTAL PALACE AND ITS FUTURE MANAGEMENT.

For some time past, as is tolerably well understood, the financial condition of the Crystal Palace has been anything but satisfactory, and it seems to be admitted that some alteration in its management is necessary. In proof of this the directors have just issued a circular to the shareholders, in which they state that in order to make the Palace pay, more profitable use must be made of its space, and they feel that they must for the future look to permanent business rather than special attractions for an improvement in their position. With this view they propose to take the Industrial Courts into their own hands, and to further develop the Education Department. In order to carry this out they state that there must be a re-arrangement of the Company's capital, there being no available funds at present for the purpose. They add that while it is expedient to diminish the nominal amount of ordinary capital, it will be necessary to create a new one, and they recommend that the ordinary stock, which now stands at 1,002,675*l.*, be reduced by 40 per cent., and the balance divided into 20 per cent. A, or Second Preferred Stock, and 40 per cent. B, or Redeemable Stock, and that 50,000*l.* new stock be created and raised to form an addition to and rank in value with the proposed Second Preferred Stock. The directors state that they anticipate the result of these changes will afford a reasonable prospect of obtaining for each 100*l.* of Ordinary Stock, now worth only 15*l.* in the market, an ultimate cash payment of 40*l.* Whether the shareholders will fall in with this proposal or not remains to be seen. In the meantime another proposition of an exceptionally enterprising character has been made by a private individual, which, if accepted, will transfer the entire management and control of the Palace to one man, who is himself ready to undertake the carrying on of the concern as a commercial speculation. Mr. Sawyer, of the refreshment department, who some time ago offered to lease the Palace, has again made a similar proposition. He proposes to take a lease of the Palace and the whole of the grounds, for a term of either seven, fourteen, or twenty-one years, paying an annual rent of 56,000*l.* a year, for the due payment of which he is ready to give security. It is stated that this offer, if accepted, would give a dividend of 2½ per cent. on the ordinary stock, representing, at the present market price of the shares, about 12½ per cent. Some of the shareholders are said to be taking active steps with the view of inducing the shareholders generally to sanction this offer, and we understand it is not improbable that an extraordinary meeting will shortly be called, when it is expected that both the directors' proposals and that of Mr. Sawyer will be discussed and considered. In the meantime an opposing body outside are maturing schemes.

CONCRETE BUILDING.

EXETER DIOCESAN ARCHITECTURAL SOCIETY.

At the last quarterly meeting the report of the Committee, which criticised some of the works in Exeter Cathedral, having been read,

The Rev. Mr. Williams, of Rewe, read a paper on the use of concrete as a building material, and contended that for cheapness, durability, and warmth it was superior to any yet employed. Few houses were internally colder than English houses; and expensive scientific contrivances and costly fuel were necessary to make them warm and comfortable. Wherever he went, in town or country, the great blot visible,—in spite of our marvellous wealth,—was the wretched dwellings of the poorer classes, which he held to be accountable for much of the intemperance which they all deplored. Therefore, philanthropists were devoting much care, attention, time, and money to this subject, in order that they might provide wholesome dwellings instead of the old rookeries, nests of filth and disease, where many of the working classes were obliged to live simply for want of better places. He was glad to notice the praiseworthy attempts made in this direction in Exeter. There was such an enormous need of new houses all over the country, that if a material could be found at half the cost of brick or stone, it was worth considering whether it could not be brought into more general use. Such a material, he believed, was to be found in concrete. Of course, there were disadvantages, and the chief of these was the liability to sudden collapse if bad cement were used, or the work "scamped" by the builder.

In the course of a discussion, the chairman (Mr. H. S. Ellis) said the subject was a most interesting one at the present moment. He did not know whether Mr. Williams had any idea of building churches of concrete; but cheap churches were much wanted just now, and some in districts where the soil was of a character which adapted itself to that kind of work. He directed the attention of the meeting to some important works now being carried on at Seaton, where a three-arch bridge was being built of concrete, on a new principle invented by Mr. Brannon, of London. 3,000*l.* or 4,000*l.* had already been spent on it, and there was every prospect of its proving a great success. The idea of the inventor was that concrete would, for such work, prove far more endurable than stone. There were piers to this bridge, but his principle of composite arches relieved the piers of a great part of the pressure—indeed, the architect believed he could construct a bridge double the length without piers. The toll-house at the end of the bridge was being built on arches. Mr. Brennan suggested that by constructing cottages on arches, instead of on the solid ground, all fear of fever caused by exhalations from the soil would be avoided; and he understood that Sir Walter Trevelyan, on whose estate the bridge was being built, was about to have a number of workmen's cottages built on that principle at Seaton. Flints had been mentioned by Mr. Williams. Hemyock Castle, built in the time of Richard II., was constructed entirely of local flint and cement; and so hard was the material that the present proprietor told him it required the use of gunpowder, and no end of trouble, to pull it down, as he was anxious to do some time ago.

Mr. Williams mentioned that Mr. Rowe (of Exeter) had built a store and dwelling-house of concrete, but they had not been completed long enough to justify him in saying anything as to the success or otherwise of the experiment. There were large gasworks being erected at Sidmouth, the masonry of which was concrete. The mixing was there done by steam machinery, and the process was a very interesting one.

Mr. Hayward, jun., said that one of the objections to concrete from an architect's point of view was that it was difficult to introduce any constructive ornament; it was perfectly adapted for the building of working men's cottages.

ARCHITECTURAL SOCIETIES.

Birmingham.—The opening meeting of the third session of the Birmingham Branch of the Architectural Association was held on the 31st ult., at the rooms of the Association, No. 40, Bennett's Hill. There was a large attendance, and the chair was occupied by Mr. A. Freeman Smith, in the unavoidable absence of the president, Mr. Yeoville Thomason. After the reports of the various classes had been read and adopted, the chairman delivered an address. A large number of drawings (upwards of 200 sheets), including the work of the London members, was exhibited on the walls.

Manchester.—The second winter session of the Manchester Architectural Association was inaugurated on the 31st ult., by a *conversazione* at the Memorial Hall, Albert-square, at which about a hundred ladies and gentlemen were present. The room had been tastefully decorated, and architectural drawings of buildings, most of which have been erected in Manchester, which had been lent for the occasion by several of the architects practising in this city, were hung on the walls. During the evening Mr. T. H. Oldham, the president of the Association, delivered a brief address, in which he stated that the Association was formed for the benefit principally of architectural pupils, and that the number of members was now from sixty to seventy. He enumerated the means which the Association adopts for imparting to its members that knowledge upon subjects connected with their profession which they are not likely to learn in the office, and said that their efforts met with the most encouraging success. The prize offered by the Association for elementary designs the umpire, Mr. Worthington, the president of the Manchester Society of Architects, has this year awarded to Mr. H. Gribble, a pupil with Mr. Davies Colley, of Manchester. A vote of thanks was passed to the president for his address, on the motion of Mr. Murgatroyd.

COMPETITIONS.

Nottingham University Buildings.—In April last the Nottingham Town Council, in pursuance of a recommendation of the Public Buildings Committee, resolved upon the erection by the Corporation of a group of educational buildings in the Horse Fair Close. It was also resolved to advertise for designs for the buildings, the competition being an open one, and premiums amounting to 300 guineas being offered for the designs first, second, and third in point of merit. The designs, numbering twenty-five, have now all been submitted to the judges appointed by the Public Buildings Committee, and on the 30th ult. a meeting of the committee was held at the Drill-hall, to consider the awards of the adjudicators (Mr. Alfred Waterhouse, Mr. Fawcett, of Cambridge, and Professor Clifton, F.R.S.). The plans, with their accompanying sectional drawings, were displayed in the hall, and the members of the committee were engaged some time in examining them. The Mayor (Alderman Manning) occupied the chair at the meeting, and the chief business to dispose of was the supporting or rejecting of the awards of the judges. The decisions were found to be as follow:—"Labor Omnia Vincit" first, "Trent" second, and "Red Cross" or "Maltese Cross" third. The committee adopted the awards of the judges (subject to the confirmation of the Town Council), being unanimous as to the first prize, and on the Mayor opening the sealed envelopes the names of the first three architects were discovered to be as follow:—First prize, "Labor Omnia Vincit," Messrs. Lockwood & Mawson; second prize, "Trent," Messrs. I. Tate & J. Langham, Leicester; and third prize, "Red Cross," Mr. Thomas Oliver, Newcastle-on-Tyne. The block plan of Messrs. Lockwood & Mawson's design shows the position of the buildings upon the site, the principal front being towards Shakspeare-street, and the return wings towards South Sherwood-street and Bilbie-street respectively. The Scientific and Chemical Department occupies the centre of the front of Shakspeare-street, and the Museum is placed next to Bilbie-street. The buildings are set back from the various streets to which they will front at a distance of 50 ft., with the principal front towards Shakspeare-street. The building is designed in the Pointed style, simple in character. The authors say that—"Without the aid of excessive ornament, it has been endeavoured to impress a public character upon the edifice, and to treat it somewhat in the

collegiate style. The entrances are clearly and distinctly marked. The windows are numerous, and every room and corridor throughout the building will be thoroughly well lighted. It is proposed to construct the building in brick work, of sound, hard, and well-burnt bricks, and to face the front towards Sherwood-street, Shakspeare-street, and Bilbie-street, with Ancaster stone, selected as far as possible of uniform colour." The staircases, landings, and passages to be of Northowram hard stone. The corridors to be covered with Dennett's arching. The architects could have wished that all the other floors throughout the building should be on Fox & Barrett's principle, but as the sum placed at their disposal is too small to admit of that being done, it is proposed that 4 in. of pugging should be introduced between the joists as a preventive against the rapid spread of fire. Taylor's damp course is to be built in the walls at the ground line, to prevent the damp rising. The roofs are to be covered with Westmoreland green slate in bands. All the gutters to be lined with lead, and the fall-pipes in iron. The carpenters' work to be constructed of the best Riga, Memel, or Dantzic fir. The joiners' work throughout to be in pitch pine of selected quality, and varnished. Messrs. Tate & Langham, of Leicester, winners of the second premium, have adopted the English Renaissance style. Mr. Thos. Oliver, of Newcastle-on-Tyne, winner of the third premium, chose for his style an early form of Geometrical Gothic, purely treated.

Handsworth Public Buildings.—The designs submitted in competition for the new public buildings for the Handsworth Local Board were on exhibition on the 28th, 30th, and 31st ult. The requirements of the promoters comprise Local Board offices, a room for the holding of meetings of the Board, committee-rooms, and a large public room, together with stables, cart and implement sheds, and other requisite accommodation. One of "the conditions" of competition was that the cost of erecting the buildings should not exceed 7,000*l.*, a sum which certainly will not be found too large (according to the *Birmingham Gazette*), if some of the designs are carried into effect. The site selected is now occupied by the Wagon and Horses Inn, situated on the Wolverhampton-road. It comprises about 4,000 yards of land. No fewer than twenty-nine sets of designs have been sent in by the various competing architects. The members of the General Purposes Committee of the Board were entrusted with the selection, and called in the aid of Mr. Yeoville Thomason, architect, in accordance with whose advice the committee reported to the Local Board, at its meeting on the 1st inst., that the three best sets of designs were those which respectively bore the mottos "Compact," "Utility," and "Postulata," and recommended the Board to award the premiums of 50*l.*, 25*l.*, and 10*l.* in the order named. They recommended the Board to erect the proposed building in accordance with the designs marked "Compact," subject to modifications the Board might decide upon. The report was adopted. The chairman afterwards announced that the authors of the design bearing the motto "Compact," were Messrs. Alexander & Henman, of Stockton-on-Tees. Mr. Robert Walker, of London, took the second premium, and Mr. William Wykes, of Birmingham, the third.

THE MONUMENT TO BYRON.

The models submitted in competition for the proposed monument to Byron were open to private view on Wednesday last, at the South Kensington Museum, and to public inspection since then. Between forty and fifty designs have been sent in, all of which have been rejected by the Committee in the first instance; a course we cannot blame, as there is not one among those exhibited which we should wish to see carried out as the national monument to Byron. Six, however, have been selected from these as the most promising, the authors of which are to be asked to enter into a second competition, we presume with some further intimation from the committee as to the result which they desire, or the manner in which they consider the present collection to fall short of it. The designs selected as the best are those numbered 6, 27, 28, 2, 12, 14: the numbers being placed in what has been considered the order of merit; the names of the artists were not officially made known when these remarks were written. We concur in the judgment which placed No. 6 at the head of the list; indeed, on first looking round we had noted it as the best figure of the collection. The poet is represented leaning on a broken pillar, his chin resting on his hand, with an attitude and countenance expressive of melancholy reflection; it is perhaps a little too melancholy; the attitude and the lines of the drapery leave little to be desired, but the few who remember the poet are not satisfied with the face, which especially wants refinement in the treatment and expression of the mouth: there is, moreover, no indication whatever of any architectural setting for the figure, which is without even a pedestal. A difficulty in treating the figure of Byron in sculpture is that his countenance was so different in character when in repose and when aroused, so that two opposite expressions which may each be in themselves correct, may each seem deficient according to the ideal of the man which is uppermost with the spectator; his whole literary and social personality, indeed, had this kind of dual character, and where most of the competitors have failed has been in forgetting one side of his character, making him either too wild or too tame, the latter defect predominating. No. 27, however, is a fine energetic figure, showing the poet in his younger days, standing with bright upturned countenance, and with one hand on the head of his faithful Newfoundland dog; the statue, which is realistic in costume, is shown as occupying a niche in a well-designed Greek shrine, so as to give a front view only: this is a very good work, but then it is purely Byron the man, or the lad, while it is to Byron the poet that the monument is to be erected. No. 28, with something of the same general character as the last (and which, indeed, seems to be by the same sculptor), bears this in mind; a mass of drapery falls from the right arm, which is raised (the hand holding a pen), while the left drops by the side of the figure, which in this case is under a canopy open all round. No. 2 is a very ambitious work, with a great deal of what critics of two generations back would have called *brio*; the figure, garlanded and heavily draped, stands with one foot on an Ionic capital, on a well-designed pedestal, at the foot of which a lion crouches with his paw on a lyre and a palm-branch. The lion is the best part of it, as a piece of design, though his significance is not very obvious; the figure is not like Byron, and is theatrical in the extreme; but there is a certain power and "go" about the whole thing. Nos. 12 and 14 show each a seated figure on a simple pedestal,—the first heavily and rather finely draped, the second more realistic in costume; both are far too placid in expression and very deficient in character. Demands upon our space this week compel us to be brief. We may just mention that Nos. 7 and 8, though too melodramatic and faulty in their accessories, show force of expression and some originality, the former at least; No. 9, with a well-designed pedestal with figures from the poems in a bas-relief (in which Napoleon appears rather oddly behind Juan and Haidee), is a well-balanced work; No. 22, with a rather "Roman-toga" figure of the poet, and a "Muse" writing underneath, has a certain dignity, and the life-size head shows careful study; No. 23 has a somewhat original architectural pedestal with bronze figures of Cain, Gulnare (?), and the prisoner of Chillon, and a principal figure not without energy and character. Some of the designs are absurd enough; what fun Byron would have made of them!

The private view did not attract as good an attendance as was expected, but we cannot deny ourselves the pleasure of recording that among the few visitors was one lady whose recollections of Byron were listened to with great interest by some of those present, and whose own girlish charms had been celebrated by the poet, more than sixty years since, in those "Stanzas to Ianthe," which have had a hundred thousand readers, and will have as many more.

SIR GILBERT SCOTT AND THE NEW ASSIZE COURTS, NEWCASTLE.

Sir,—As chairman of the Newcastle Council Assize Courts Committee, my attention has just been called to a letter which appeared in your paper of the 21st ult., signed "A Provincial Architect," conveying the insinuation that Sir G. Gilbert Scott had "touted" for the above work. The character of Sir Gilbert stands so pre-eminently high that this dastardly attack might be safely left to recoil on the head of its author; but as you state other letters had been received on the same subject, I feel it my duty to give you the actual facts.

The necessity for the erection of joint Assize Courts with the county of Northumberland had been agitated in our town during the last forty years. At length, through a combination of fortuitous circumstances, there was every probability of such an arrangement being carried out, our Corporation having offered, upon certain conditions, to erect a building suitable for that purpose upon a plan to be approved of by the county of Northumberland. The latter having accepted such offer as a basis for further negotiations, Sir Gilbert Scott, happening to be in our town at the time looking after the restoration of St. Nicholas Church, and being an old and valued friend of my own, I incidentally mentioned to him what our Corporation had done. He at once replied,—"I have paid considerable attention to the construction of Assize Courts, and should be happy to send you a design." I explained to him that we, as a committee, had no power to spend money for procuring designs, but if he thought proper to furnish us with one, and to take the risk of its adoption with the Council afterwards, that would be a different matter: to this he assented. Our conversation was brought before my committee. They all considered it a most handsome and liberal offer, and it was unanimously agreed to accept it,—of course, subject to the final ratification of the Council. Though the offer was not formally submitted to that body, it was pretty well known for months before Sir Gilbert had completed his plans that he was engaged in their preparation. He had had personal conferences with the members of my committee; with our borough architect (who had himself prepared plans for joint Assize Courts, which had been laid before the county authorities, but had not been accepted by them); with Mr. Crosier, C.E. (who had so successfully remodelled the Durham Assize Courts, and has been engaged by the Northumberland Justices to draw plans for the reconstruction of their Moot-hall); also with Mr. Charlton, their surveyor, all of whom, instead of showing any jealousy towards Sir Gilbert, treated him with the greatest courtesy and highest possible respect, and voluntarily offered to afford him any information which might be of service to him in the preparation of his plans. No exception whatever was taken to the course proposed by Sir Gilbert until after his design and plans had been produced. They had been unanimously approved of by my committee, and met with so much favour from those interested in the erection of new Assize Courts outside the Council, that a memorial from some of our largest ratepayers, headed by the firm of Sir W. G. Armstrong, was presented to our Council, urging their adoption. Meanwhile, some of our less noted architects succeeded in prejudicing the minds of certain members of our Council by grossly exaggerating their probable cost. Sir Gilbert had estimated the cost would be little above 60,000*l.*, whereas two of the gentlemen referred to, from motives that will be readily understood, had industriously circulated a report that the cost would be at least 100,000*l.*! Hence our Council became alarmed, and refused to adopt the report of my committee recommending Sir Gilbert's plans, thus retarding a great work, which, if it were carried out, would secure the proper administration of justice, and add to the town another memento of the genius and constructive ability of one of the greatest of living architects. However, Sir Gilbert may solace himself with the reflection that,—

"Be thou as chaste as ice, as pure as snow,
Thou shalt not escape calumny."

Charles Henry Young.

Newcastle-on-Tyne, Nov. 8.

Photographic Society of Great Britain. On the 31st ult. the president and council of the Photographic Society of Great Britain gave a *conversazione* at the house of the Society of Painters in Water-colours in Pall-mall East. The spacious gallery of the Society was for a time divested of the usual display of water-colour paintings, and in their stead were shown an admirable collection of the productions of photographic artists of greater or less celebrity. Amongst the contributions were some views of ruined buildings in Hindostan by the corps of Royal Engineers. A collection of photographs taken on sensitive tissue, a new process which obviates entirely the necessity of using any glass negatives, were also exhibited. The exhibition will remain open until about the middle of November.

CHURCH-BUILDING NEWS.

Sevenoaks.—A meeting was held at Sevenoaks on the 23rd of September, to receive the report of Mr. Ewan Christian, the architect appointed to report to the Restoration Committee upon the present state of the churches and their capabilities for improvement. Commencing with the parish church of St. Nicholas, Mr. Christian, in his report, first gave a brief sketch of the early history of the fabric. So far as he could discover, no portion of the existing church was erected before the middle of the thirteenth century, but it was most probable that an earlier church stood on the same site. The interior of the church was entirely reconstructed in the fifteenth century, when the present south aisles of the nave and chancel appear to have been erected. The western tower was raised towards the latter end of this century, and it is clear, from the marks still existing on the east wall, that the nave was then covered with its early and high-pitched roof, but it was quite probable that when building their lofty tower the constructors had in view the addition to the nave of a corresponding clearstory, which was never carried out. It is difficult otherwise to understand why the tower was raised so high, as it is now quite out of proportion to the other parts of the church. And, externally and architecturally considered, such a clearstory was necessary to give proper and dignified proportion to the edifice. Passing on to the present condition of the building, the walls were reported as thoroughly sound, with some few cases of surface dilapidations. The roofs were all modern, all ill-designed and ugly, but generally substantial. The following is Mr. Christian's estimate for the works required in the restoration, ten per cent. to be added for contingent expenses:—For the north aisle, 385*l.*; south aisle, exclusive of porch, 308*l.*; porch, 165*l.*; vestry, and an extra window, 77*l.*; drainage, &c., 20*l.* For the tower—external repairs, 405*l.*; internal repairs and re-stuccoing the nave and aisles, and providing a new ringing-floor, 632*l.* For a new high-pitched oak roof on the nave, 889*l.*; panelled ceiling under the aisle roof, 498*l.*; new floors and fittings, with oak seats, 1,749*l.*; gallery in the tower for children, 150*l.*; warming and lighting, 350*l.*; total, 5,628*l.* Entirely new roofs would cost 1,160*l.* extra. The estimate for the improvement of St. John's Church is as follows:—The north aisle, 539*l.*; arcade in stone, 302*l.*; raising of the walls of the nave, 539*l.*; chancel and vestries, including the arch next the nave, 1,494*l.*; tower and spire, 975*l.*; completion of the nave by the western extension of the south aisle and porch, 1,980*l.*; total, 6,415*l.*

Brigg.—The foundation stone of the new chapel at Brigg Workhouse has recently been laid. The chapel, to be dedicated to Our Saviour, is to be built from a design furnished by Mr. Goddard, of Lincoln, of plain bricks, with lancet windows, and the interior will be of best red pressed bricks, with white string-courses. The cost will be 500*l.* Mr. George Dent is the builder.

Prescot.—The formal re-opening of the large and ancient parish church of Prescot, which has been closed several months for restoration, took place on the 6th ult. The whole of the old fittings have been removed, including the galleries which so disfigured the interior, and the church now displays its full proportions. The flooring is entirely new, and instead of the old-fashioned pews, with high doors, the nave is filled in with open benches of pitch pine. At the west gable, where the organ was, the wall is now adorned with Gothic tracery-work, and towards the chancel end of the church great improvements have been made by the construction of a new chancel arch and organ-chamber, with arches opening into the nave and chancel. The old nave columns and arches have been cleaned of their paint, and now appear in red stone; and the walls throughout have been replastered, and there are new panelled ceilings over the side aisles. The works have been executed by Messrs. Jones & Sons, Mount Pleasant, Liverpool, from the designs and under the superintendence of W. & G. Audsley, architects, of Liverpool. The estimated cost exceeds 3,000*l.*

Farway.—Farway Church, Devon, has been recently re-opened, after restoration at a cost of nearly 4,000*l.* The roof and walls have been stripped of the plaster with which they were covered, and, as the oak roof was found to be rotten, a new stained deal roof has been substituted. A new floor of encaustic tile has also been laid throughout the building, and at the entrance to the chancel is a wide step of Merechurch marble. The chancel and west-end windows are now filled with stained glass at the expense of Lady Prideaux. The figures in the chancel window represent the birth, crucifixion, and ascension of Christ, and those in the west window illustrate the scene of Simeon and the Infant. It was found necessary to replace the old masonry of the west window with new, but the original character has been strictly observed. A new chancel arch, supported by red marble pillars, has been added, and at the east end of the north aisle a new chapel has been erected over the Prideaux family vault at the expense of Lady Prideaux. This chapel is reserved as the family seat, and is filled with low solid oak sittings. A new stone reredos, also the gift of Lady Prideaux, has been placed in the chancel. The church has been reseated, the pews being made of stained deal. A new carved oak pulpit, standing in the south corner of the nave, has been erected, and the reading-desk and lectern, which stand in the chancel, are made to correspond. A new stone font has also been added. Externally, the stones have been cleaned, and the joints filled in with cement. Strong wire guards are placed as a protection to the stained-glass windows. Mr. Faulkner was the contractor for the masonry. The decorations were by Mr. Donne, and the stained windows were erected by Mr. Drake, all of Exeter; and the work was executed under the direction of Mr. Edwards, architect, also of Exeter.

Edgmond.—The parish church of Edgmond has been reopened, after extensive repairs and improvements, which have cost between 2,000*l.* and 3,000*l.* The walls throughout have been thoroughly repaired where needed, new windows put in nave and chancel, and the latter has been new roofed. A new pulpit of white Caen stone has been substituted for the previous inelegant structure. The new one was made by Mr. Maddock, of Shrewsbury. The design is plain, and its panels are of Gothic character, in keeping with the architecture of the church. Opposite to it is a lectern, the gift of the working classes of Edgmond, and quite in keeping with all the other appointments of the church. The east window is retained. Those on the north and south are glazed like those of the nave, except two small ones, and one which Mr. Asterley, churchwarden, has put in the south, in memory of his sisters. The glazing was entrusted to Mr. J. Davies, of St. Mary's-place, Shrewsbury.

Hawick.—The parish church of Southdean, Hawick, was opened on the 1st ult. The church is in the Early English style, and the windows are filled with stained glass, one of these being in memory of Thomson, the poet, whose father was for some time minister of the parish. The plans were by Mr. Wright, architect, Edinburgh.

Chelsea.—The Bishop of London has consecrated a new church at Chelsea, near Cremorne Gardens. It is dedicated to St. John, and is the outcome of a mission established on the spot some three years ago by the Diocesan Home Missionary Society. The church will seat upwards of 700 people. The cost of the building was about 5,800*l.*, which has been raised by public subscription, supplemented by grants from the Bishop of London's Fund, and similar organisations.

Butterton (*Derbyshire*).—A spire is about to be erected upon the tower of the parish church at Butterton, to the memory of the late Miss Gaunt, of Leek, by her niece, Mrs. Byrom. Mr. Sugden, of Leek, is the architect, and Messrs. Bassett & Wilson, of Sheen and Grindon, are the builders.

THE CHANNEL TUNNEL.

Soundings have been taken in the English Channel with a view to finding the exact depth of the sea, and to examining the nature of the sea bed, in connexion with the projected Channel Tunnel. No less than 3,257 specimens of the bottom formation have been taken, and these will be classified in order to compile a chart of the sea-bottom. The shaft on the French side (at Sangatte) has reached a depth of 125 mètres (410 ft.), thus leaving only 16 ft. to complete the distance at present contemplated.

The Institution of Civil Engineers.—The first ordinary meeting of the fifty-ninth session of this scientific Society will be held on Tuesday, the 14th inst., at the house of the Institution, Great George-street, Westminster.

CLIMATE OF THE S.W. OF IRELAND.

GLENGARRIFF—BANTRY BAY.

A large tract of Ireland, extending fifty miles from Killarney to the Southern Ocean at Cape Clear, and from E. to W. about thirty miles, although the most beautiful and picturesque portion of the United Kingdom, is but little known even to tourists. The Atlantic bounds it on the S. and W., and the bays of Dingle, Kenmare, and Bantry, all great and reputed harbours, fed by the Gulf ocean stream, bestow upon the whole range of coast from Dingle to Bantry a richness of scenic beauty and commercial facilities hitherto but little appreciated. The scenery of mountain range, of hill and crag, throughout the whole extent is unequalled; but there is also a temperature of climate, occasioned by the continuous flow of the Gulf stream against this portion of the coast, which attempers the atmosphere, and which, flowing into Bantry Bay at the S.W. extremity of the island, distributes a warm and unfailing supply of pure ozone for the mitigation of the climate, and fertilisation of the whole region in the growth of tree, shrub, and flower.

At the extremity of the bay, sheltered by picturesque mountains on the E., N., and N.W., stands the large hotel of Glengarriff, in tastefully-laid out grounds, near to the charmingly-wooded demesne of the Earl Bantry, and built on the lands of George Preston White, esq.; thus it is protected from all cold winds, and although 1° more N. than Torquay, the registered temperature is 6° higher, being 7° above that of London! Thus, as a sanatorium, it cannot be surpassed. Many high authorities have written on it; and amongst others Thackeray said,—"Were such a Bay upon English shores, it would be a world's wonder. What sends picturesque tourists to the Rhine and Switzerland? There is a country within five miles of the pretty inn of Glengarriff, of the magnificence whereof no pen can give an idea."

As to the usual places of resort for invalids, those who have been there cannot forget the baneful influence of the south wind, called the "Mistrale," at Nice, Genoa, and Marseilles; nor the chilling influence of the "Bise," or north wind, at Montpelier, and other French towns, the usual places of refuge for invalids. The writer hereof has felt those winds severely.

To close a short description, Lord John Manners says,—"The twenty miles from Kenmare to Glengarriff form the grandest scenery I know of; an ascent of four miles brings you to a tunnel 600 ft. long; on emerging from which the head of Glengarriff opens upon you; thence, at every step you descend, the scenery becomes more beautiful, every turn of the road revealing some new charm, with Bantry Bay and the Atlantic ever bounding the view; a glorious sunset was lighting up that noble arm of the sea and its swelling mountains, as I crossed its broad surface, which from its situation and natural advantages ought to rival Plymouth or Brest."

T. H. H.

THE EDUCATION OF ARTISTS.

Sir,—In an article on the papers read at the Social Science Congress, you say that mine and Mr. Richmond's papers do not materially differ. Allow me to point out a very essential difference, a difference which affects the importance of mural painting as the most effective means of raising art to the highest status. The vitality of the ancient art organisation inhered in the system of scholarship and the building to be embellished being itself the school.

Mr. Richmond, in advising that the education of the mural painter should be provided in the departmental schools, has missed the heart of the matter. Moreover, the education required could not be so obtained.

W. C. T.

P.S.—The point which I have thus made also shows wherein the present system of art-schools is at fault.

UNDER METROPOLITAN BUILDING ACT.

Mr. Jarvis, the district surveyor of Camberwell, summoned Mr Leonard before Mr. Chance, sitting at the Lambeth Police-court, the other day, for not having inclosed one side of a building with a wall, he having made use of the wall belonging to the owner of the adjoining house. Mr. Mayhew, solicitor, appeared for the defendant. The Magistrate, after hearing the evidence, adjourned the case for a month to give the defendant time to build a wall or to enable him to make some arrangement with the adjoining owner for him to use the wall as a party wall upon its being made in conformity with the Act.

SELECTION OF SANITARY OFFICERS.

SIR,—From my own experience, I find that the greatest obstacles to sanitation, as far as sanitary engineering is concerned, are the uneducated builders, who, possessing a very primitive notion of the laws which govern sanitary requirements, fail to voluntarily receive instruction from more competent authorities, and, allowed to work, as is too often the case, upon the principle of non-interference, constitute one of the chief causes of the unsatisfactory condition which exist in places under sanitary boards. I find it a comparatively easy matter to convince the entirely uneducated masses of the necessity of such requirements, for instance, as an efficient system of house-drainage, but am resisted with much more opposition when I endeavour to convince those whose little learning in sanitary matters fills them with that conceit which defies the instruction of others as well as reveals unwittingly their own ignorance. As nearly all works that are purely of a sanitary character are under the jurisdiction of sanitary boards, what is wanted is a better class of men to administer the sanitary laws, and advise upon sanitary measures; and for this purpose let the Local Government Board appoint an examining body, consisting of architects, civil engineers, physicians, and surgeons, to examine the competency of persons aspiring to fill the offices of inspector of nuisances, medical officers of health, and town surveyors (who are the principal advisers of sanitary boards), and reject all candidates failing to come up to the prescribed standard. This would be a much better system of electing competent candidates than to elect them upon the strength of testimonials, and, forsooth, by other even more ludicrous and absurd means; and, indeed, this I think is not the worst feature about appointments under sanitary authorities, for, as soon as an appointment is advertised, what is the procedure of intended candidates? 1st, an invocation of the goddess of patronage; 2nd, getting up a correspondence with "my friends' friends," asking them to write little introductory notes to their friends, and following up this preliminary by resorting to the degrading custom of interviewing the "powers that be." This is another means by which sanitary progress is retarded. When a selection is thus unadvisedly made, what must be the inevitable result but a to al or partial failure of those sanitary works upon which their duties may hereafter call upon them to advise? I have resorted myself to this hackneyed system of—well, I may say—touting, simply because others do it, yet, personally, I detest a custom so derogatory; but could not the Association of Municipal and Sanitary Engineers and Surveyors be doing good service (as far as town surveyors are concerned) by inculcating a feeling of *esprit de corps* among its members, and, so to a certain extent, watch over and endeavour to prevent this kind of practice? If they would I should be extremely happy to follow their example. It would lead to a more rigid observance of the laws of health, and raise the dignity and status of the office of town surveyor, get a more independent class of men, and accordingly enable them to receive that which they do not now sometimes get, namely, respect from those whom they serve. L. L.

WAGES IN LIEU OF NOTICE.

LIDDARD *v.* STEPHENSON.

IN this case (heard on the 25th ult. at the Brompton County Court) the plaintiff sued the defendant, a builder, of Mulman's-row, Chelsea, for the sum of 30*s.* for a week's wages in lieu of notice. The plaintiff said he was engaged by the defendant as a temporary clerk at a salary of 30*s.* per week On Monday, the 7th of August, being Bank Holiday, he did not attend the office, and on the Tuesday morning one of the defendant's clerks called at his house, and said, as Mr. Stephenson was not busy, he need not come for a few days. On the following Monday he was told that his services would not be required, and he thought he was entitled to a week's notice.

A clerk from the defendant's office said that the plaintiff was dismissed, as he absented himself on the Monday.

His Honour held that even if the plaintiff should have attended business on the Bank Holiday, his absence had been looked over, for the witness had told him that Mr. Stephenson was not busy, and did not want him for a few days. He thought the plaintiff entitled to a fortnight's salary, and had he sued for it, he should have given him a verdict. He gave judgment for the plaintiff with costs.

Institution of Surveyors.—The first ordinary general meeting of the session will be held on Monday, November 13th, when the president, Mr. Edmund James Smith, will open the session with an address.

NEW SHOREHAM CHURCH.

SIR,—I took the opportunity whilst in the neighbourhood of visiting new Shoreham Church, and was very much shocked to find this splendid monument of our forefathers being wantonly defaced by a gang of men who were at work on the "restoration." The whitewash inside is being removed by the application of chisels, small flat crowbars, and rasps, these last being used on the delicate carving of the capitals. If this work is allowed to proceed many more weeks, or even days, there will be no ancient face left to the internal stonework.

The flat crowbars were pieces of iron, about 18 in. long and 1½ in. wide, with sharpened ends, and used not only to scrape, but to chip off the whitewash from the mouldings.

On the outside cement is used to plaster over the decayed or weather-eaten portions of the stone, and the new stones in some places are stained with cement to imitate old.

The ancient windows in the choir aisle are being taken out to insert copies of the older windows, of which one remains, already scraped as clean and white as the whole of the east end was, I hear, a year or two ago.

Surely there can be no faculty issued by the Bishop which would cover such destructive work of "restoration."

In the hope that something will be done to save the yet untouched portions of the church, I ask you, sir, to insert this letter in your next issue. AN ANTIQUARY.

USE OF CHALK IN BUILDING.

SIR,—I regret some of your readers have not replied to my inquiries respecting the proper treatment of chalk "previously to its being used as a building material, for both inside and outside work." Some information would be a public boon, as I feel sure the real value of chalk for building purposes is not generally known, more especially its proper treatment first. The information I require is:—

1. Should it be dug in the autumn, and exposed to the frost, wind, and rain of winter, or in the spring, and then exposed to the sun?
2. Should it be dug at any time, and carefully housed and kept dry?
3. If it requires to be laid in its natural bed like stone?
4. Does chalk for outside work require different treatment to that used inside? Z. W.

"THE EMBANKMENT AND THE DROWNING."

SIR,—Would you permit me to make an improved suggestion to the very excellent and necessary one in your recent issue, viz., that long planks or poles should be secured with iron guides to the face of the wall and so arranged as to rise and fall with the tide. This would be less unsightly than the chains, and certainly more useful, as their whole length would appear on the surface of the water. F. N. K.

SURVEYORSHIP ITEMS.

Kingston-on-Thames. — At a meeting of the Kingston-on-Thames Highway Board, on the 28th ult., a letter from the surveyor (Mr. James Bateman, C.E.) was read, asking for an increase of salary. In answer to a question, the clerk said that the surveyor's salary was now 240*l.* a year. An estimate drawn up by Mr. Bateman showed his annual expenses, which last year, including the purchase of his horse, were 239*l.* The clerk pointed out that Mr. Bateman had the horse in his possession now, and Mr. Burnett stated that the expenses, excluding the purchase of the animal, were estimated at 150*l.* per annum, so that the surveyor had only 90*l.* a year for himself. Mr. Burnett at first moved that Mr. Bateman receive a salary of 400*l.* a year, but he ultimately moved, "That the surveyor's salary be increased to 350*l.* a year, as long as he gives satisfaction to the Board, and that he shall not accept any other appointment without the sanction of the Board." This was carried unanimously.

St. Pancras.—Mr. Frank F. Buckham has been elected assistant-surveyor to the St. Pancras Vestry, in the place of Mr. Brunnell, who was lately appointed surveyor to the Local Board of Health for Sevenoaks.

Newington.—Mr. W. H. Wellsted has been appointed engineering-surveyor of the Newington Local Board and Urban Authority.

Guy's Hospital Drainage. — We have received intimation from Mr. A. Billings, surveyor to Guy's Hospital, that Banner's system of sanitation has been applied to the oldest portion of the hospital, and that he anticipates it will be a complete success. We shall be interested in learning how time deals with it.

MASTERS AND MEN.

Glasgow.—At a meeting of the Glasgow master slaters on the 30th ult., to consider the advances asked by the operatives, it was unanimously agreed to concede the advance of ½d. per hour, but that the pay-days should remain fortnightly. The men asked for weekly payments.

Burton-on-Trent.—The plasterers of this town struck work on the 30th ult. for an advance of wages. They demand 9d. per hour, which the masters refuse.

Liverpool.—The Liverpool lodge of the Operative Plumbers' Association have given six months' notice to the masters of a new code of by-laws, which are to come into force on the 1st of May, 1877. In regard to the hours of labour and the rate of wages, it is proposed that from the 1st of March to the 1st of November the hours of labour be fifty per week (a reduction of five hours), at the rate of 9d. per hour (1½d. advance per hour). From the 1st of November to the 1st of March the hours per week are to be forty-seven and a half, at the rate of 9½d., or an advance of 1d. per hour. Quarter time is to commence at 9 o'clock instead of 8.30 a.m.

Plymouth.—A piece of trade-union tyranny at Plymouth, reported by the *Western Morning News*, is (says the *Pall Mall Gazette*) even more remarkable than that which has of late attracted so much attention at Messrs. Doulton's works in Lambeth. "It seems that a large building is being erected near the Hoe, at Plymouth, by Mr. Pethick. His men come to work at six o'clock in the morning, and leave at five in the afternoon. Finding that at six o'clock the mornings are now so dark that the men could not properly see to work, and that it was not safe for them to be climbing about the scaffolding, Mr. Pethick suggested that they should begin at half-past six and work up a quarter of an hour of the time lost at dinner-time and the other quarter after five o'clock. The men were quite willing to accept this proposal, but the Masons' Society interposed, and prohibited the arrangement under a penalty of 50*s.* per man. The unfortunate masons have thus unwillingly gone on strike; and the labourers are necessarily rendered idle also, although both able and willing to fall in with the proposed arrangement."

Darlington.—The following is a copy of the Rules which the Plumbers' Union submitted to the masters. The refusal of the latter to sign them led to the strike of last week, which still continues:—

1. That the rate of wages be not less than 7¾d. per hour, with all the necessary working tools found by the masters. Apprentices just out of their time exempt from this rule for six months with the same employer.
2. That the hours of labour be 53 hours per week—commencing on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 6 o'clock a.m. until 5 p.m., allowing one hour and a half for breakfast and dinner; and on Saturdays from 6 o'clock to 12 p.m., allowing one half-hour for breakfast. All men to be at the shop at 12 o'clock on Saturdays. When exceeding that time to be paid as overtime.
3. When the work is at a greater distance than one mile from the Town Hall, the men shall be allowed time to walk in at the rate of three miles per hour such distance as may be in excess of one mile. And the men shall remain at work on all jobs until 5 o'clock within a circuit of one mile from the Town Hall, but if required to go to the shop, to be at the shop at 5 o'clock.
4. When men are required to lodge away, that lodgings and travelling expenses be allowed, and to be allowed to come home every week's end within a distance of 20 miles, above 20 and under 40 once a fortnight, above 40 once a month; if the men do not come home they will be allowed the train fare.
5. That all overtime be paid at the rate of time and a quarter from 5 o'clock to 9 p.m., and from 9 p.m. to 6 a.m. time and half. Saturdays from 12 o'clock to 12 at night, time and half. Sundays and Christmas Days double time. 53 hours to be worked per week before overtime be charged.
6. That all apprentices be legally bound, and that not more than one apprentice to each man be employed in all shops, and that no improvers be employed.
7. That no non-society man be allowed to work in a shop longer than two weeks unless he joins the society.
8. That no labourers be allowed to do plumber and gas-fitting work.
9. One month's notice in writing shall be given on either side of any alteration of the foregoing rules.

It is stated that the portions objected to by the masters as arbitrary and exacting are the last clauses of rules 1 and 2, the demand of train-fare in rule 4, if the men do not come home; the limitation of apprentices in rule 6; and the exclusion of non-society men in rule 7.

North of England Iron Trade.—For several months past a dispute, involving not merely the successful working, but the very existence of the North of England Iron Trade Arbitration Board, has been repeatedly considered, without a settlement being come to. The ironworkers represented on the Board were called upon to pay half a claim of 663*l.*, losses incurred through the strike of men connected with the Board at the Moor Works, Stockton. Their employers considered that the whole should come out of the

men's pockets, but rather than jeopardise the existence of the Board they agreed to pay half the claim. The men at the several meetings of the Board have not been prepared to pay that share, but on the 6th inst. the operative representatives in the manufactured iron trade of the North of England met at Darlington, and agreed to the employers' proposition.

WHITBY JET MANUFACTURE.

When we say that more than 1,500 persons are employed at Whitby in the preparation of jet ornaments, and that the work supports at least one-fourth of the population of the town, its importance will be seen. Endeavours are being made to improve the artistic character of the work produced, and should be vigorously prosecuted. Every child in Whitby should be taught drawing as it is writing; a good museum should be established in the town, if there be not one already, and courses of good lectures on art should be continuously given. With proper efforts, the interests of the town might be advanced immensely.

We take the following from the *Whitby Times*:—"Sir George Elliot's Jet Prizes.—The prizes given by Sir George Elliot, bart., M.P., for the best works in jet have just been awarded. The committee of the Whitby Institute who had charge of the matter, anxious that the specimens should be well and impartially judged, applied to the Society of Arts, London, for assistance. That Society very kindly undertook the matter, and delegated the duty of judging the work sent up to Professor Tennant and Mr. George Godwin, F.R.S. These gentlemen, in a communication to Mr. Bate, the secretary of the local committee, stated that they have examined the various works in Whitby jet submitted in competition for the prizes offered by Sir George Elliot, and report that they have awarded the prizes as follows:—

Class 1.—For the best necklet of any kind. No prizes awarded.

Class 2.—For the best bracelet of any kind. 1st prize, 2*l.*, V. Austin; 2nd, 1*l.*, R. Barker.

Class 3.—For the best brooch. 1st, 2*l.*, R. Page; 2nd, 1*l.*, R. Barker.

Class 4.—For the best ear-drops of any kind. 1st, 1*l.*, R Barker; 2nd, 10*s.*, R. Page.

Class 5.—For the best art work of any kind. 1st., 3*l.*, W. Baker; 2nd, 1*l.*, Thos. Tose.

Class 6.—For the best design of any kind. No prizes awarded.

Class 7.—Young men under 21 years of age.—For the best brooch of any kind. 1st, 1*l.* 10*s.*, W. Baker; 2nd, 10*s.*, C Kingston.

Class 8.—For the best bracelet. 1st, 1*l.* 10*s.*, W. Baker; 2nd, 10*s.*, Thos. Falkingbridge.

The judges add that they do not propose to accept any fee, and are glad to be able to assist in the promotion of so important an industry as the working of Whitby jet. We are sure that the thanks of the Institute and the jet trade are due to Mr. Godwin and Professor Tennant for their kindness and liberality."

It should be mentioned that the names of the competitors were wholly unknown to the judges: the various specimens being submitted to them under numbers alone. The recurrence of the same names in the prize-list makes the mention of this fact the more necessary.

THE ARCHITECTURE OF THE CENTENNIAL BUILDINGS.

THE AMERICAN INSTITUTE OF ARCHITECTS.

At the Convention recently held in Philadelphia,—

"Architecture at the Exhibition" was discussed in an essay by Mr. Richard M. Hunt, of New York. Some of the effects occasioned by the great architectural revival since 1851, the natural outgrowth of the first world's fair and the succeeding ones of London, Paris, and Vienna, were first considered. One of the most useful and practical benefits of these great international exhibitions is the familiar manner in which the industrial arts have been presented to the general public, as well as to the specialist, and which has been of the greatest possible service in educating and cultivating laymen as well as instructing professional students. Alluding to some of the important bearings which international exhibitions have on modern progress, he discussed the location and the buildings themselves comprised in the Centennial Exhibition. "The grounds," he said, "are tastefully laid out as a landscape garden, with asphalted roads and walks following the natural contour of the land. The Exhibition buildings, with few exceptions, are generally well adapted to their various purposes, and are appropriate in design and neatly executed. It is to be regretted, however, that more attention was not paid to the various structures erected by the different States and by special exhibitors. With the exception of a few typical structures erected by foreign nations, little can be said in commendation; in fact, the great majority are beyond criticism, architecturally considered; whereas a proper attention to this important subject would have added much to the exterior beauty of the Exhibition." Speaking of the main building, Mr. Hunt said:—"The general effect of the building is satisfactory, considering its temporary character and the consequent enforced restriction as to cost, and also in view of the materials used, glass and iron. It should be here stated that the columns and trusses are so constructed that they may be taken down and used elsewhere. As might be expected, there is a total absence of anything like monumental grandeur or even apparent substantiality about the building. A certain stiffness and monotony also pervade the whole structure, whilst the relative height, as compared to the vast area covered, produces a squatty appearance. The interior is light and pleasing, but is wanting in effect and variety. On account of the great similarity in plan between Machinery Hall and the main building, the effect produced by Machinery Hall is much the same. The interior of Machinery Hall, however, appears more substantial, due in part to the use of wood in its construction. The admirable arrangement of the hydraulic annex, which forms so marked a feature, is deserving of great praise. As to Agricultural Hall, its disposition is well adapted to its purposes, and it owes much of the effectiveness of its interior to its grand arches springing directly from the ground,—a very satisfactory feature, contrasting favourably with the stilted and rather unstable appearance of the perpendicular supports employed in the two buildings just alluded to. The United States Government Building, with its naves and aisles in the form of a Latin cross, and the Women's Pavilion, in the form of a Greek cross, are effective in their appearance, both externally and internally. This is particularly due to their ground-plan. A peculiar feature of the Art Annex Building is the communication between the numerous rooms, which is provided for in the angles. Good hanging space is thus secured, but at the expense of considerable perplexity to the visitor. The State buildings of New Jersey, Massachusetts, Ohio, and Connecticut are to be commended. Horticultural Hall is constructed in the Moorish style. The *ensemble* is satisfactory, especially when viewed at an angle. Memorial Hall, erected by the State of Pennsylvania and the city of Philadelphia, is by far the most pretentious structure on the Exhibition grounds. At a certain distance the general effect of the mass is rather satisfactory, but upon a nearer approach the building, which is built of granite and designed in the Renaissance style, loses much,—the ornamentation being very commonplace and meagre in design, whilst in execution it leaves much to be desired. Great defects also exist in the interior distribution, amongst the most flagrant of which is the poor accommodations of the upper stories of the corner pavilions. Greater simplicity in design, breadth of treatment, and less ornamentation, would undoubtedly have produced a bolder effect, and been more in harmony with the material used. A want of scale pervades the details throughout; this is especially observable in the main central hall, the dome of which rests clumsily on the walls. In view of the fine and varied exhibits made in paintings and sculpture, it can hardly be said that their sister art of architecture has been fairly represented. The Exhibition is wanting in much that would render it interesting and instructive, not only to the profession but to the public, who would certainly appreciate a thoroughness both in architectural design and construction which prevailed abroad and is wanting with us, due to more scientific and judicious use of the various building materials and to the higher standard of taste which naturally prevails in the Old World. The important problem, viz., the amelioration of the dwellings for the labouring and industrial classes, has been almost entirely ignored. This absence is especially to be remarked upon, so much attention having been paid to this subject, particularly since the Paris Exhibition of 1867. That such buildings can be made a practical success is proved by the report of the 'Improved Industrial Dwellings Company, of London,' which states that no less than 10,000 persons occupied dwellings under their control in January, 1876, while their available capital was then 1,000,000*l.*"

BUILDING IN CHELSEA.

The report of the surveyor (Mr. G. H. Stayton, C.E.), which appears for the first time this year, shows that sanction has been given by the Vestry to the construction of nearly six miles of new sewers. In addition to the above, the Vestry have taken up and relaid a number of old sewers, and have constructed additional sewer ventilators, new gullies, and two new public latrines in the parish.

Six miles of new streets have been sanctioned during the year. Notices of intention to build no fewer than 2,294 new houses were given to the Vestry, the proposed drainage thereof being approved. The surveyor observes,—

"The erection of so large a number of houses is a most important matter, inasmuch as provision will thus be made for an increase in the population of the parish of upwards of 20,000 in a period of a little over a year (?). Of that number it is expected that a provision for 16,000 people will be made on the Queen's Park Estate alone."

ST. BUDEAUX CHURCH, PLYMOUTH.

This, the daughter church of St. Andrew's, Plymouth, has been re-opened by the Bishop of Exeter after a thorough restoration. Built not long after the Reformation, and at a time when very little was thought of Gothic architecture or ecclesiastical art of any kind, this structure is interesting as showing how the old forms of church construction lingered in the country after the spirit of them had departed. Roger Budockshed erected the three aisles, but either forgot or intentionally omitted the chancel. In other respects his masons kept pretty closely to the Devonshire church type, and the pillars and arches, the windows and doorways, are much the same as in the churches built a century or more earlier, only that the details are coarser and less exact. Here and there may be noticed an eccentric label or string-course entirely un-Gothic in character, and attributable, no doubt, to the insubordinate taste of one or two of the founder's workmen.

A chancel has been formed at the eastern end of the nave, surrounded by a low screen moulded and pierced with quatrefoils. Within the chancel are the choir-seats, having oak ends, with carved poppy-heads.

The ancient font, which has not been in use for a great number of years, has been restored and placed on a granite cross in the pavement at the west end of the central passage, outside the tower arch.

The lower portion of the opening into the tower is occupied by a screen of pitch pine, traceried, and having glazing in the heads.

The interesting monuments of the Fortescue, Trevill, Knighton, Byard, and Stukeley families, have been restored in proper colours by Mr. Fouracre, at the cost of the representatives of the respective families. The fine monument to the memory of the Georges will, it is hoped, be soon taken in hand.

The contractor for the restoration of this church was Mr. Hoskin, of King's Tamerton. The restoration has been carried out from the drawings and under the direction of Mr. James Hine, Plymouth.

The great Sir Francis Drake was married in this church, and his wife was buried here. During the civil war of the seventeenth century, it was occupied by the Royalist troops, who did it much injury.

MESSRS. DOULTON AND THEIR BRICKLAYERS.

Sir,—In your issue of the 4th instant appears an extract from a letter upon the above subject from Mr. Coulson, the secretary of the Bricklayers' Society. On this I beg to offer a few remarks. First, as to the "contention." What contention? Who are the contending parties? I take it as a recognised principle there must be two parties to a contention. Here we see on one side Mr. Coulson, as representing the Bricklayers' Society, but where is the other contending party? Mr. Coulson assumes that the Messrs. Doulton occupy that position; but how can he bear out his assumption? I opine that from the hour those bricklayers struck work—no matter what the cause,—and received the wages due to them, the Messrs. Doulton ceased to be a party to the contention. It was perfectly optional on the part of the firm whether they should employ these men, and on the part of the men whether they chose to be so employed;

consequently, the men had perfect liberty to leave work as they did, but in doing so all connexion with the firm ceased. And, according to the law of common sense and reason, and, moreover, the law of England, Messrs. Doulton were at perfect liberty to engage others in their stead, which, if I am rightly informed, they have done, and, having done so, it is downright nonsense to talk of the contention as between Messrs. Doulton and their bricklayers. Had the men through their society succeeded, by their dog-in-the-manger tactics, in preventing the firm from obtaining other bricklayers, it might perhaps have been argued that they were, or at any rate they might have been induced to become, a party to the contention; but, were they *compelled* to employ bricklayers at all? Could they be denied the right to construct their buildings entirely of terra-cotta, and employ plasterers or masons to fix it, or of concrete, and employ labourers to execute the work? Is there any law to prevent them adopting either course, or any other practicable one that would answer their purpose? Well, then, how can it be said they are a party to this contention, unless they choose? But Mr. Coulson, seeing he failed to force them, is now trying persuasion; he even condescends to offer them the privilege of accepting or rejecting the parties selected to form the Board who are to decide. To decide what? Most likely that the firm were wrong from the first, in not submitting to be dictated to as to how they should conduct their business arrangements or spend their own cash. It is pretty certain that any other decision would fail to satisfy Mr. Coulson or his constituents. If Mr. Coulson had been so anxious to have this and all such other matters submitted to a Board of Conciliation, why did he not prevail upon the men to keep to their work, and in the meantime apply for arbitration? He would have shown at least some consistency. What would be thought of a magistrate who sentenced a prisoner before he had investigated the charge against him?

Again, does Mr. Coulson believe architects would consent to be dragged into such controversies? I doubt it; but even if they would, why architects? When arbitration was first named in reference to this matter, the Society suggested that representatives from the different trades should form the Board. Now, architects are named as more likely to catch, and if this should succeed, it is coolly proposed to apply the process to all future employers who should fail to accommodate their business arrangements to the complete satisfaction of the several societies in the building trade.

To conclude, I beg to suggest that a great blunder has undoubtedly been made, originating over a few pots of beer, which reflects but little credit upon Mr. Coulson or his constituents, and the sooner the subject is left to die out the better for all concerned. AN OUTSIDER.

THE CITY COMPANIES AND THEIR HALLS.

MR. ROBERT TAYLOR, the chairman of the Lambeth Vestry, and one of the representatives from that body at the Metropolitan Board of Works, and who is also a member of the Corporation, delivered a lecture last week at the new parochial room, Brixton, on the "City Guilds," in which he made some interesting references to the origin, property, and general character of these guilds, and gave descriptive notices of the halls and buildings belonging to several of the companies. There were no less than eighty of these City guilds. All historians agree as to their great antiquity. As to their origin, it might be traced to those combinations which, in a commercial country such as ours, grew up from influences that for four centuries had been gradually imported from Rome. After sketching the history of many of the companies, and dwelling upon the revenues, charities, and hospitalities, he alluded to the princely halls belonging to many of them, more especially to that of the Drapers' Company. Its alabaster staircase, and the fittings, together with all the arrangements, were the most extraordinary and costly that he knew of. As a proof of the enormous increase in the price of land, he stated that the garden in which the members of the Drapers' Company formerly took their walks, had been let for building purposes at a ground-rent of 10,000*l.* a year. He adduced the schools and institutions which the companies from time to time built, and the various charities which they supported, as a proof that they were not so selfish as they were represented to be. He admitted that they enjoyed themselves, and he asked why should they not? Their wealth, he said, had come to them from their ancestors, and had been well nursed, whilst the original objects for which the guilds had been established had been carried out; and so long as that was done he did not see by what right they could be interfered with.

BERKS ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETY.

THE annual general meeting of this Society took place at Reading on the 25th ult., Mr. Joseph Morris presiding. The annual report recorded the continued steady progress of the Society during the past year. Forty-three new members had been elected since the last report was presented, and eight names had been withdrawn, chiefly owing to removals from the district of the Society's operations, so that the actual numerical increase was 35, the total number of members being 142, viz., 9 life members, 95 ordinary members, 31 lady members, and 7 associates. The committee, acting under the provision of Rule 11, had appointed Mr. E. J. Shrewsbury as local secretary for the Maidenhead district. There had been two general and three committee meetings held during the year, and two excursions. At the general meeting held on the 6th of April, a paper on "Chancel Screens and Roods" was read by Mr. C. C. Rolfe. The report then referred to the success which had attended the two excursions, and thankfully mentioned the great assistance rendered on the occasion of the excursion to Stratford-on-Avon and Warwick by the Rev. Dr. Colles and Mr. J. Tom Burgess; and of the second excursion to the Wantage district, by Mr. S. E. B. Pusey. The report concluded by strongly urging upon the members of the Society the desirability of increasing the Reference Library. The financial position of the Society continued good, all accounts received up to September 29th, 1876, having been paid, and a balance in the hands of the treasurer of 23*l.* 3s. 3d. remaining, which, with 7*l.* for arrears, made an aggregate of 30*l.* 3s. 3d. The report was adopted.

HITCHINS'S RAPID SYSTEM OF PLASTERING.

By the use of this system, the lathing and two coats of plastering, with lime and hair, give place to large slabs fixed to the joists, which form the body of the ceiling at once. The edges of these slabs are bevelled reverse ways, and fit into each other so that the stopping cannot be shaken out. The face of the slabs are made rough, and the whole receives a thin finishing coat of cement or stucco, which effectually conceals the joints, and produces ceilings of good appearance. By this means no time is lost in waiting for drying; and the annoyance of dirt and rubbish caused by mixing, and using lime and hair, is entirely avoided. The manufacture of the slabs may be briefly described. A sufficient quantity of plaster and fibre is mixed with glue-water; half of this, while in a plastic state, is spread evenly upon a plate-glass bench, the edges of which are raised ⅜ in. and bevelled. A sheet of strong open canvas is then stretched tight across, and wrapt round two laths which are embedded in the two opposite edges of the slab. The object of having these laths is to tighten the canvass, and stiffen the edges of the slabs in their span from joist to joist. The remaining portion of the plaster and fibre is spread evenly upon the canvas, which then remains firmly embedded through the centre of the slab. A bass broom is then passed over the face of the slabs to form a "key" for a finishing coat. When sufficiently set, the slabs are removed from the bench, and exposed to the air to dry. These slabs are made 2 ft. 6 in. wide, and of sufficient length to reach across four joists, and are secured to the joists by driving 1½ in. zinc nails through the laths before-mentioned, and about 4 in. apart, along wherever the joists come. The joints are then roughly stopped with cement, and the whole receives a thin "setting" or finishing coat of cement or "stucco," as in the ordinary way. The system certainly has its advantages.

STATUES.

Prince Bismarck.—A memorial statue is to be raised to Prince Bismarck at Cologne. Public competition having been invited, no less than twenty-seven artists have sent in models in a variety of postures, and indicating a variety of conceptions.

The Right Hon. C. P. Villiers.—A meeting of the committee appointed to consider the form which should be taken by the proposed memorial to the Right Hon. C. P. Villiers was held in the Town-hall, Wolverhampton, on the 30th ult. A letter from Mr. William Theed was read, stating that very hard Sicilian marble would be adapted for Wolverhampton, or any out-of-door purposes. He mentioned, as examples, his statue of the late Sir Robert Peel, erected at Huddersfield, and his group of "Africa," at the Albert Memorial in Hyde Park, both of which were executed in that material, which was very easily kept clean. The durability of bronze, he said, was unquestionable, but it soon lost its original appearance, and became black and dirty-looking. A replica of the statue just completed for the new town-hall in Manchester, of the same size, in statuary marble, could be executed for 700*l.* The same statue, increased in size to between 8 ft. and 9 ft., for out-of-doors, in hard Sicilian marble, including granite pedestal, would cost 1,000*l.* If bronze should be determined upon, the total cost of the statue would be 1,150*l.* It was resolved "That the offer of Mr. Theed, for the execution of a Sicilian marble statue for 1,000*l.*, be accepted." The selection of a site was deferred until the completion of the statue.

Sir James Simpson.—Mr. William Brodie, R.S.A., has now given the finishing touches to his bronze statue of the late Sir James Y. Simpson, and the work is ready to be removed to its place in Princes-street, Edinburgh. The casting produced by Messrs. Masefield & Co., Chelsea, is stated to be one of remarkable excellence, reproducing the artist's design with the utmost fidelity to every detail of modelling and texture. The statue represents the Professor in his robes, and seated; and is one of the finest of the many works of art produced by the eminent sculptor.

The Hyde Park "Achilles."—The *Lancet* regrets to state that "Achilles," who was presented to Arthur Duke of Wellington by his countrywomen, and who was made presumably of the best gun-metal, shows symptoms of decay which must ultimately prove fatal. The sulphurous acid in the London atmosphere has been too much even for his iron constitution. His right shin is covered with a serpiginous ulceration; his thighs, like those of Sir Simeon Stylites, are "rotted with the dew," and daylight comes sadly through the very centre of his shield.

Books Received.

Lectures, Reports, Letters, and Papers on Sanitary Questions. By ROBT. RAWLINSON, C.B., &c. London: P. S. King. 1876.

WHENEVER a sanitary question has come prominently before the public, Mr. Robert Rawlinson has seldom failed to throw such light upon it through the newspapers as his large experience and matured judgment prompted. Some of these contributions collected together, some able papers read at the Society of Arts, a lecture on Meteorology delivered at Chatham, and his Report on the Drainage of Windsor Castle, form the little volume now before us. It is full of valuable information clearly conveyed, and deserves other than a paper cover. It is appropriately inscribed to Mr. Edwin Chadwick.

Miscellanea.

A Machine for Cleaning Water-Pipes.—We noticed a few weeks ago the method adopted at Elgin for cleaning old water-pipes by heating them in a furnace, and so removing the incrustation. The *Elgin Courant* gives particulars of an experimental attempt to clean the incrustation out of pipes not intended to be lifted; and though all that was contemplated was not accomplished, it was proved that the thing can be done. A little machine, about 3 ft. in length, was obtained some time ago from Mr. Kennedy, Kilmarnock, who has a patent for it. It consists of two pistons and two series of flanges that exactly fit into the water-pipe intended to be cleaned, the pistons being about an eighth of an inch under the inside size of the pipe, while the flanges press hard against it, and take off the incrustation. The machine was put into the pipes at the railway crossing at Linkwood. The full force of the water was then put on, and away the machine went, grinding through the pipes, and clearing off every obstruction, making a noise like a railway train heard a quarter of a mile off. Unfortunately, it stuck at an air-cock at the back of the New Cemetery, where there had evidently been some fixed obstruction, which it could not overcome. Notwithstanding the accidental hitch, enough was done to prove that the pipes, at a mere trifling expense, can be cleaned without lifting.

Art Endowment in Birmingham.—The *Birmingham Gazette* understands that at a meeting of the School of Art Committee on the 26th ult., Mr. Arthur Ryland attended on behalf of the donor of 10,000*l.*; that a deed of trust was executed for the administration of the fund in accordance with the scheme prepared by the committee and approved by the donor; and that Mr. Ryland paid 6,000*l.* of the fund to the treasurer, the other 4,000*l.* to be handed to the committee at the time appointed in the deed of trust.

The North Sea Canal.—The King of Holland has opened, in person, the greatest engineering work which his country, so prolific in such works, has ever undertaken. The idea of joining Amsterdam with the sea by a direct communication had long been entertained and investigated by various committees, and though many were incredulous of its ever being possible to carry out such a work, a concession was given in 1861. In 1863 a company was formed, and in 1865 the well-known firm of contractors, Messrs. Henry Lee & Sons, of Westminster, undertook the execution of the entire work for a sum not far short of two millions and a half sterling. The first part was executed by Messrs. Lee, in conjunction with, and under the management of, Mr. T. C. Watson, C.E. The engines and pumps, constructed by Messrs. Easton & Anderson, are the largest in Holland, being each seventy-five horse-power, and discharging together over 74,000 cubic feet of water per minute. The second part was in the hands of the late Mr. S. Freeman, C.E., but its completion is now entrusted to Mr. Watson. It consists of cutting the canal through the sandhills or dunes near the North Sea, and of the construction there of large locks with two basins, the bigger one being able to accommodate vessels 390 ft. long, 59 ft. wide, and drawing 27 ft. of water. Mr. Darnton Hutton, C.E., has charge of the third portion, which consists of making a harbour on the coast at the entrance of the canal. It is situated just half-way between the Hoek van Holland (entrance into Rotterdam) and the Helder or Nieuwe Diep, which are nearly 100 miles apart. This extensive work was planned by Sir John Hawkshaw. He and Mr. Waldorp are the consulting engineers for the company, and Mr. Dirks is the resident chief engineer.

An Ipswich Building Estate.—The estate recently purchased by the Freehold Land Society, and abutting upon the Norwich-road, Chevallier-street, the Bramford-road, and Bramford-lane, Ipswich, has been divided into 100 allotments. All these roads will be made up, kerbed, channelled, and drained in accordance with the specifications of the borough surveyor, and in due course will be handed over to the town authorities, and the outer fencing, &c., will be constructed by the Society. Tenders for making the roads and for the fencing were as follow:—

For Making the Roads only.—T. Ruddock, 1,165*l.* 10s.; A. Flude, 839*l.*

Roads and Drainage.—C. Fisk, 1,090*l.*; J. B. and F. Bennett, 1,009*l.*

Drainage.—H. B. Smith, 201*l.*; S. Blasby, 285*l.*; T. Ruddock, 203*l.* 12s. 9d.

Fencing.—C. Hastings, 16s. 9d. per rod, 11s. 6d. each gate, and 4*l.* 10s. to remove and refix old fencing; J. Hobart, 14s. 9d. per rod; R. Girling, 14s. 6d. per rod and 3s. 6d. per rod old fencing; J. Mallett, 13s. 6d. per rod; J. B. and F. Bennett, 250*l.*; J. C. Pells, 220*l.*; H. B. Smith, 210*l.*; T. Ruddock, 185*l.*; Jas. Barker, 175*l.* 10s. (sent in too late).

The tender of Messrs. Bennett was accepted for the roads and drainage, and that of Mr. Mallett for the fencing.

New Factory Regulations.—Some important amendments on the law relating to the employment of children in workshops and factories are introduced by the new Elementary Education Act, which comes into operation on the 1st of January next. With the view of giving those interested timely notice of these changes, Mr. Alexander Redgrave, her Majesty's Inspector of factories, has addressed circulars to the occupiers of factories and workshops, and to the parents of the children employed therein, in which he explains their new responsibilities. After the 1st of January, 1877, it will be illegal to employ a child under nine years of age, and on January 1, 1878, the limit will be raised to ten years. Children must attend school from the first day of their employment, either morning or afternoon, on every day on which the school is open, or both morning and afternoon on every other day, in every week. They must also attend an efficient school in any school district which has been declared to be provided with sufficient school accommodation.

The "Clinometer."—A small instrument with this designation has been invented by Mr. Alon Bagot, of Rugeley, and, according to the *Staffordshire Advertiser*, it promises to supersede in a great measure the unwieldy and complex impediments of the surveyor. It is alleged that by the aid of this diminutive instrument,—it is 6 in. in length, and only weighs as many ounces,—trigonometrical surveying, levelling, and calculations hitherto necessitating the use of the theodolite and dumpy level can be accomplished with a great saving of labour.

Sale of New River Shares.—At the Auction Mart, on the 1st inst., Messrs. Edwin Fox & Bousfield sold some New River shares. One-thirtieth of a King's Original Share was first submitted, and after a spirited competition, realised 3,135*l.*, or at the rate of 94,050*l.* for an entire share. The speciality of these shares is that they are freehold property, and even a fractional part confers votes for the counties in which the company's estates are situated. Twenty-nine of the 100*l.* New Shares (70*l.* paid) were next offered, and were all sold at 310*l.* and 315*l.* per share. These are the highest prices ever obtained, and a considerable increase on those obtained by the same firm at their sale in June last, when the King's Share realised at the rate of 88,000*l.* per share, and the New Shares, with 60*l.* paid, fetched 285*l.* to 295*l.* At the early part of this century a King's Share was sold for 7,000*l.*; and even at Messrs. Edwin Fox & Bousfield's sale of these shares in 1870, the price of a King's Share was 42,360*l.*, which was at the time thought to be remarkably high.

A Hint from Mark Twain.—It is stated that a short time ago Dean Howson was lecturing in the choir of Chester Cathedral to a number of well-dressed persons. On leaving the choir for the nave the dean gave strict orders for the choir to be cleared. In apology for what seemed a harsh command, he informed his hearers that a few days previously he had discovered a "gentleman" in the act of cutting off the wing of an angel from some carved work. There is no real occasion to do this sort of thing. Mark Twain, in his new Pilgrim's Progress, gives an interesting description of a fellow-traveller, whom he refers to as Old Blucher, who would pick up a stone in any out-of-the-way place, and, after breaking it into twenty or more fragments, would label the pieces with the names of as many distinct and widely-apart localities, remarking, "The old woman will not know the difference."

Bad Management of "Improved Dwellings."—The *City Press* publishes the following letter:—

"Sir,—We, the undersigned inhabitants of Granville-buildings, Luke-street, wish, through the medium of your paper, to give publicity to the disgraceful state of things existing in these so-called 'Improved Dwellings.' In some instances where there are large families there is no water from mid-day until the next morning; also very offensive smells arising from closets where the water is cut off, simply because they require some little repairs, and if respectable tenants request that it may be attended to, they only receive insults, and are told, if they do not like it, to go as soon as they please. Two children were removed last week through illness. It cannot be a matter of surprise that there should be an outburst of disease, or that it may rapidly spread in these (in some cases) overcrowded dwellings, with a very scanty supply of water. This has long been a great grievance to the respectable portion of the tenants,—in fact, such will not now go into them, or remain long if they do."

[Here follow the signatures of twelve residents.]

Chinese Overcrowding in San Francisco. Mr. Thomas J. Vivian, in *Scribner* for October, says:—"Fifteen Chinamen will live, sleep, and cook in a hovel or cellar 12 ft. square, having only a door as a means of admitting light and air. Clouds of rancid smoke issue continually from the common chimney, window, and door, through which John and his fellows may dimly be seen crawling, cooking, smoking, and sleeping; for when Coo Lee has nothing to do, he generally crawls into his hole to sleep or smoke. The large companies' boarding-houses are no better. Every story is reflowered, and made into two, and often three, the standard height of a room being a trifle over or under 5 ft. Clean at first, the building soon becomes grimy, and then black, and then dirt-encrusted from garret to roof. Once occupied by Chinese, a building must always remain a pest-hole, or be torn down."

Pevensey Church.—An appeal is being made by the vicar and churchwardens of the parish of Pevensey for assistance in "the faithful and legitimate restoration" of their venerable church. Mr. Gilbert Scott, jun., the architect who has been called in, reports that the condition of the building is about as bad as it can be, and points out what is necessary to be done. The estimate is:—Nave, 2,200*l.*; tower, 400*l.*; chancel, 790*l.*; and side chancels, 970*l.*; making a total of 4,270*l.* About 2,380*l.* have already been paid or promised.

All Souls' Chapel, Oxford.—With reference to particulars of work here, quoted in our last from an Oxford paper, Mr. Maurice Geflowski writes to say that he executed the carving of the reredos, not Messrs. Farmer & Brindley; the erection of the reredos being entrusted to Mr. E. E. Geflowski.

The Alexandra Palace.—Two petitions for the winding up of the Alexandra Palace Company were presented on the 24th ult. before Baron Huddleston, the vacation judge. The first petition was that of the company, supported by the London Financial Association; Messrs. Kelk & Lucas, contractors; Messrs. Barclay, Bevan, & Co., bankers; and other creditors, for about one million sterling. The second petition was presented by Messrs. Wright & Son, trade creditors, who opposed the making of a winding-up order on the company's petition. His Lordship made a compulsory winding-up order on the company's petition, and dismissed the second petition with costs.

Edinburgh and Leith Engineers' Society. The first meeting of this Society for the session was held on the 1st inst., Mr. A. Leslie, C.E., in the chair. The opening address to the members was delivered by Mr. W. Allan Carter, C.E., who first directed attention to the great success with which blasting had been conducted in the Holyhead quarries and at Hell-gate Reef, pointing out that this success raised the question for the serious consideration of engineers, whether it would not be more economical as well as more advantageous in every respect to undermine and blow away such rocks as the Bell Rock and Eddystone Rock, rather than risk the erection of lighthouses, not only costly to build, but also costly to maintain.

Extension of Aberdeen Harbour Works. Sir John Hawkshaw and Mr. James Abernethy, C.E., consulting engineers for Aberdeen Harbour Works, paid a visit to the port recently, and they have communicated to the Harbour Commissioners their suggestions with regard to a proposed extension of the north pier. The report concludes with the following sentence:—"Having regard to the long periods elapsing between the official communications made to us and our consequent visit to Aberdeen, variations in the order and manner of executing the works have occurred, for which we are not responsible, nor, under the circumstances, for the expenditure incurred in carrying out the works."

St. David's Cathedral.—The *Western Mail* states that on the 24th ult., Mr. King, Sir Gilbert Scott's assistant, visited St. David's Cathedral for the purpose of examining the west front, that portion of the grand old edifice which is to be restored as a memorial to the late bishop of the diocese, Dr. Connop Thirlwall. The earth surrounding the foundation was cleared away, and it was found to be in a very sound condition. By excavating, a flight of three stone steps in perfect preservation was discovered leading from the west door. These steps are supposed to be part of the old road leading from the cathedral to Bishop Gower's Palace.

Uncourtly Buildings.—The judge of the Wrexham County Court took a vigorous step the other day in adjourning the proceedings for a week in consequence of the unwholesome state of the court-room. The registrar has at present no option but to hear cases in the same court with the judge. Unfortunately, this is far from being the only wretched county-court building in North Wales. At Bangor, an old and miserably small chapel is used; at Llanrwst, the apartment is little better than a loft; and at Holyhead, even the darkness and unwholesomeness of Wrexham are eclipsed.

Iron Rails v. Steel Rails.—The Darlington correspondent of the *Daily News* states that the experiments which have been carried on by Mr. I. L. Bell, M.P., at the instance of the North-Eastern Railway Company, with the view of producing a cheap and durable iron rail, have been singularly successful. It is affirmed that iron rails, more durable than steel rails, can be produced by a new process, at a much less cost and at a price but 1*l.* per ton in excess of ordinary iron rails. Steel rails, when worn out, are worth little, but iron rails are worth two-thirds of their original value for reconversion.

The Docks at Wisbech.—The Town Council of Wisbech have decided to promote a Bill in the next session of Parliament for the construction of a floating dock, and for making a new channel for the river Nene from a point just below Wisbech. The estimated cost of the works is 192,000*l.* Captain Wood, of London, has undertaken to pay the expenses of the Bill in passing through Parliament, and will contribute 50,000*l.* towards the capital required. A meeting of the ratepayers has been held, and the scheme was approved by a large majority.

"The Oxford Arms, London."—One of the most interesting examples remaining of the old London Inn, with its external galleries, is "The Oxford Arms" in Warwick-lane, close to Newgate. Its destruction is imminent, so Mr. John Sandford, of Goldhawk-road, Shepherd's-bush, has made a capital set of photographs of the old place, which will be prized by all who are interested in the antiquities of London.

Adams's New Circus in Leeds.—Mr. Adams has built a new circus on the site formerly occupied by Mr. Newsome's circus, between Portland-crescent and Cookridge-street. The building is 122 ft. long by 84 ft. wide. The whole has been designed by Mr. Henry Mortimer, the general manager. The circus will accommodate 5,000 people. The decorations are by Messrs. Dawson Bros., Leeds. The roof is supported by ten columns upon each side.

Society of Arts.—A course of lectures on the History of the Art of Coach Building is about to be delivered by Mr. George A. Thrupp. The first, on November 20th, will treat of the carriages of the ancient world,—Egypt, Syria, Greece, and Rome, and native carriages of Hindustan. Workmen connected with the trade can obtain tickets for a nominal fee.

The Laws of Health.—It is proposed by the council of the Trades' Guild of Learning, in conjunction with the committee of the National Health Society, to organise a course of twenty lectures on the Laws of Health, to be delivered by Dr. W. H. Corfield, in the large room of the Society of Arts, by permission of the council of that Society, on consecutive Saturdays, commencing November 11th.

Tollgates between London and Brighton. It has been reported that on and after Nov. 1st all the tollgates on the road between London and Brighton were to be abolished. This, says a Brighton paper, is too good to be true. Certain gates, opposed by the Brighton Town Council, on the Cuckfield-road, have been removed; but many are still left.

TENDERS

For alterations, additions, and repairs to the late Governesses' Asylum, Prince of Wales-road, Kentish-town, for the purposes of the lower school to be called the Camden School for Girls. Mr. E. C. Robins, architect. Quantities by Mr. G. R. Tasker:—

		Less old materials.
Brass	£7,065 0 0	£2 0 0
Adamson & Co.	6,888 0 0	168 0 0
Kelly Bros.	6,583 0 0	150 0 0
Scrivener & White	6,514 0 0	116 0 0
Manley & Rogers	6,477 0 0	193 0 0

For Congregational church and other buildings at Preston, near Brighton. Mr. J. G. Gibbins, architect:—

Lockyer	£4,829 0 0
Barnes	4,448 0 0
A. & J. Stenning	4,338 18 0
E. Nash & Co.	4,125 0 0
Bruton	3,785 0 0
Cheesman & Co.*	3,720 0 0

* Accepted for a portion.

For schools in Norfolk. Mr. J. M. Hooker, architect. Quantities supplied by Mr. Thomas Ladds.

For St. Peter's, Upwell:—

Rhands	£3,612 0 0
Saint	3,532 0 0
Allister	3,300 0 0
Farrow	3,280 13 0
Elworthy	3,187 0 0
Dawes	3,154 16 0
Broadhurst	2,811 0 0
Everson (Egbert)	2,800 0 0
Everson (Edgar)	2,670 0 0

For Lakesend:—

Rhands	£1,637 6 0
Saint	1,462 0 0
Farrow	1,358 6 0
Broadhurst	1,357 10 0
Elworthy	1,239 6 3
Dawes	1,221 0 0
Everson (Egbert)	1,170 0 0
Everson (Edgar)	1,160 0 0

For Nordelph:—

Rhands	£1,830 8 0
Saint	1,598 0 0
Allister	1,481 0 0
Broadhurst	1,450 10 0
Farrow	1,397 7 0
Dawes	1,347 0 0
Elworthy	1,340 13 2
Everson (Edgar)	1,198 0 0
Everson (Egbert)	1,183 0 0

For the erection of new board schools, with teacher's residence, Harmondsworth, Middlesex. Mr. E. H. Lingen Barker, architect.—

Wickes	£2,370 0 0
Garratt	2,341 1 0
Ball	2,307 13 11
Hardy	2,278 18 6
Kean & Sons	2,201 11 3
Taylor	2,200 0 0
Messom	2,197 0 0
Kearley	2,139 0 0
Gibson (accepted)	1,930 0 0

For alterations and additions to No. 8, Chapel-place, Ramsgate, for Rev. R. Patterson. Mr. Robert Wheeler, architect:—

Duckett (accepted).

For new buildings for the Builth Public Hall and Market-house Company (Limited). Messrs. Haddon Bros., architects:—

Stephens & Bastow	£3,542 0 0
Sholl & Jones	3,258 0 0
D. G. & D. Davies (accepted)	3,120 0 0

For four shops and manufacturing premises, Tottenham Court-road. Messrs. Ford & Hesketh, architects:—

Newman & Mann	£13,476 0 0
Jackson & Shaw	13,081 0 0
Simpson & Sons	13,035 0 0
Perry & Co.	12,946 0 0
Ashby Bros.	12,778 0 0
Peto Bros.	12,589 0 0
Kirk & Randall	12,550 0 0
Downs & Co.	12,529 0 0
Brass	12,372 0 0
Adamson & Sons	12,274 0 0
Dove Bros.	12,119 0 0
Scrivener & White (accepted)	11,702 0 0

For main sewerage works, Preston-road, North Shields. Mr. J. P. Spencer, engineer:—

Contract No. 1, exclusive of ironwork.

Bell	£1,186 0 0
Hall	1,132 4 6
Smith	1,149 0 0
Craig	1,055 15 0
Atkinson	800 0 0
Harvey (accepted)	780 0 0

For stables, &c., Whitehill, Luton. Mr. T. C. Sorby, architect. Quantities by Mr. J. Scott:—

Gregory	£874 0 0
Spencer	813 0 0
Patman & Co.	803 0 0
Tayler	796 0 0
Smart	750 0 0
Sharman	660 0 0

For gardener's cottage, Bramingham, Luton. Mr. T. C. Sorby, architect. Quantities by Mr. J. Scott:—

Miskin	£667 0 0
Gregory	637 0 0
Spencer*	605 0 0
Sharman	590 0 0

* Accepted at 559l.

For the erection of a warehouse, St. John-street, Smithfield, for Mr. E. N. Perker. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

Kilby	£3,290 0 0
Thompson	3,260 0 0
Coleman	3,120 0 0
Scrivener & White	3,115 0 0
Marsland	2,997 0 0
Bangs	2,890 0 0
Woodward	2,700 0 0
Niblett	2,700 0 0
Downs	2,699 0 0
Tarrant (accepted)	2,272 0 0

For the erection of a Wesleyan chapel, at Clacton-on-Sea, Essex. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

	In brick.	In concrete.
Hook & Oldrey	£2,467	£2,232
Turtle & Appleton	2,399	2,299
National Co-operative Builders' Society	2,230	1,994
Regis*	2,049	1,739
Saunders & Son	2,030	1,987

* Accepted for concrete, subject to modifications.

For the erection of Wesleyan schools at Clacton-on-Sea, Essex. Mr. Charles Bell, architect. Quantities by Mr. Henry Lovegrove:—

	In brick.	In concrete.
National Co-operative Builders' Society	£859	£685
Hook & Oldrey	821	697
Saunders & Son	695	638
Regis	699	612
Turtle & Appleton	525	430

For roads and sewers at Westcott-place, Swindon, for Mr. A. L. Goddard, M.P. Mr. W. Read, surveyor:—

Wiltshire	£560 0 0
Phillips	540 0 0

For offices, stables, &c., Wootton Bassett, in connexion with brewery, for Mr. H. Horsell. Mr. W. H. Read, architect:—

Barrett (accepted)	£926 3 8

For house and shop in Bridge-street, New Swindon, for Mr. J. Green. Mr. W. H. Read, architect:—

Phillips	£659 0 0
Forshaw	633 4 4
Barrett	610 10 0
Wiltshire (accepted)	601 10 0

For two houses in the Estcourt-road, Watford, for Mr. Marshall. Mr. C. L. Humbert, architect. No quantities given:—

Clifford & Gough	£820 0 0
Pratt	785 0 0

For erection of north wing and completion of the hospital, Swansea. Mr. Alex. Graham, architect. Quantities by Mr. Samuel Thacker:—

Morgan	£10,643 0 0
Richards & Billing	8,739 0 0
Jones & Co.	8,447 0 0
Lewis	8,235 0 0
Davies	7,801 0 0
Watkins & Jenkins	7,755 0 0
White	6,820 0 0

For carcass of second house and shop at Harrow-on-the-Hill, for Mr. W. Winkley:—

Staines & Son (accepted)	£376 0 0

For two pairs of cottage residences at Cranborough-cross. Messrs. Satchell & Edwards, architects:—

Paine (accepted)	£1,920 0 0

For new cellars, alterations, repairs, &c., to premises, Folkstone, for Mr. F. J. Jarvis. Mr. Burgess J. Reeve, architect:—

Webster	£286 0 0
Prebble	180 0 0
Dunks	164 10 0
Brooks & Slade (accepted)	160 0 0

For the erection of five houses and stabling, &c., in Mare-street, Hackney, for Mr. E. Hook. Messrs. Lee & Smith, architects:—

Stamp & Bowtle (accepted).

For the erection of detached residence and stabling, for Mr. R. Dyson, Barry-road, Peckham-rye. Mr. Alfred Wright, architect. Quantities supplied:—

Nutt	£1,896 0 0
Marsland	1,747 0 0
Mallett	1,746 0 0
Almond	1,670 0 0
Phelps & Rice	1,589 10 0

For two shops and dwelling-houses at Park-side, Knightsbridge, for Mrs. E. A. Gamble. Mr. F. Nesbitt Kemp, architect:—

Smith (accepted)	£2,200 0 0

For Adcot Manor, near Shrewsbury, for Mrs. Darly. Mr. R. Norman Shaw, architect:—

Jarrett	£23,800 0 0
Horsman	22,000 0 0
Treasure & Sons	20,877 0 0
Lovett	20,000 0 0
Braid & Co.	18,690 0 0
Brass	17,987 0 0
Lascelles	17,860 0 0
Hale	16,455 0 0

For additional story to 31, Belgrave-square, and alterations to stables in rear, for Mr. C. Meeking. Mr. C. J. Shoppee, architect:—

McLachlan	£1,886 0 0
Colls	1,678 0 0
Bywater	1,476 10 0
Braid & Co.	1,469 0 0

For the erection of offices in Chancery-lane, for Mr. W. J. Bayley. Mr. H. H. Bridgman, architect. Quantities by Messrs. J. & W. Barnett:—

Burman (late Willson Bros.)	£2,473 0 0
Hunt	2,363 0 0
Kelly Bros.	2,332 0 0
Scrivener & White (accepted)	2,241 0 0

For the erection of lavatories, water-closets, &c., at the St. Pancras Workhouse, for the Guardians of the Poor. Mr. H. H. Bridgman, architect:—

Builders' Association	£580 0 0
Manley & Rogers	576 0 0
Sharman	575 0 0
Steed Bros.	567 0 0
Burman (late Willson Bros.)	550 0 0
Prebble (accepted)	498 0 0

For new stables at the Old King's Head, Upper Clapton, for Messrs. Truman, Hanbury, & Buxton. Messrs. Williams & Sons, architects:—

Marr (accepted).

For alterations at the Bricklayers' Arms, Gloucester-street, Commercial-road, for Messrs. Ellis. Messrs. Williams & Sons, architects:—

Marr (accepted).

TO CORRESPONDENTS.

Erratum.—At Warmington Church the whole of the work was executed by Mr John Thompson, of Peterborough.

W. H. R.—J. P.—J. G. H.—S. M.—S. H.—S. & B.—A. W.—S. & E.—H. S.—C. B. S.—J. C. C.—S. & Co.—J. W.—H. S. E.—F. C.—Mr. G. N.—T. B. G.—J. W.—J. C. E.—G. H. S.—P. F.—T. K. G.—Genl. N.—*Civis.*—B. S. G.—J. P. S.—J. W. S.—R. W.—A. B.—F. & H.—T. C. S.—J. H. E. R.—T. D.—J. B. McG.—J. T.—D. C. (an architect may act as clerk of works. The question is, was Mr. Campbell correct in calling himself the architect of the building in question?)—M. O. T. (thanks).—J. & Co. (amounts should be sent).—O. S (thanks. No room).—G. H. P. (next week)—A number of communications are unavoidably postponed.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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The Builder.

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The Byron Monument Competition.

THE first series of designs, of which we gave a brief notice last week, are still on view at the Kensington Museum, and we take the opportunity to offer one or two observations on this important competition, beyond what our space allowed of last week. In the first place, we believe we are correct in saying that the second competition is to be an open one, and not confined to the authors of the six designs selected for commendation, though they are specially invited to be among the number. This is satisfactory in one respect, since, without quarrelling with the award of the committee, a further inspection convinces us that there are others besides the favoured five (two of the six designs are by one artist) whose co-operation in the second competition would be very desirable on the ground of the artistic ability displayed, though their present ideas may be unsuitable. The five selected sculptors may nevertheless complain of want of justice in the proposed opening of a fresh competition, and most righteously so, indeed, if others than those who have already competed are to be allowed to enter with the enormous advantage of seeing all that has been done, and hearing all that has been said. A word now as to the conditions of the competition, and the question of adherence to them. This has not been strictly observed by competitors at all. The first circular issued was rather vague, in regard to scale, merely stating that the models were "not to exceed 3 ft. in height," leaving it optional how much of this was to be occupied by the figure. The second circular, which we presume was issued not long after the first (there is no date to either document), gives the much more sensible guide of a special scale for the figure, 2 ft. To judge fairly between one design and another, it is absolutely essential that the same scale of figure should be preserved. But in the present competition there is quite a wild irregularity of scale; in some cases the figure is hardly 1 ft. in height; in one design (No. 2) it is about 4 ft., and the whole thing stands about 8 ft. high from the floor, thus directly transgressing both sets of conditions. This work probably owes its position in the competition and in public favour, to some extent, to the effect produced by its scale. It is amongst the selected six, whereas, in strict justice, it should have been disqualified. The one which was placed first, again (No. 6), though, as we have said, a very admirable figure, ignored the condition that there should be "an appropriate pedestal." The artist has, in fact, saved himself the trouble of a pedestal, and devoted all his attention to the figure, which is more highly finished than most of them; but this is hardly fair to other competitors who have devoted some trouble to considering and elaborating the pedestal. The same remark would apply, to some extent, in the case of Nos. 27 and 28, where the author has contented himself with drawings only of the architectural portion of his designs, which do not, of course, show the effect in the same way that a model would, and are much more easy and inexpensive to execute. In arranging the second competition, we think the committee should reassert as distinctly as possible the conditions as to scale, and as to the precise amount and method of work to be sent. It ought not to be optional to send a drawing only of the accessories without a model. The whole should be on the same footing; though, of course, if a competitor chooses to send a drawing in further illustration of the intended effect of his work, there can be no harm in that. Another point is that as the model is judged of, in the main, by the character of the principal figure, it would be desirable in a future exhibition of the new competition designs to arrange them so as to bring the figures more nearly to an average level, and put them in the same position in regard to the eye. The difference is very great in the present exhibition.

The first circular left a choice of material; either "bronze, Sicilian marble, or Pentelic marble" (which latter we observe is spelt "Pentellic," a barbarism that we hope will not be repeated in the new circular, if the word has to be used). In the second circular, upon which most if not all of the present designs seem to be professedly based, the pedestal is decisively specified to be of marble, which it appears the Greek Government intend to give, and the figure of bronze. This consideration has perhaps led to the great development of the pedestal in some of the designs, from a prudent resolve to make as much as possible out of the liberality of the Greek Government. As to the question of the material generally, a single bronze statue on a marble pedestal does well enough, of course; but the case seems different when figures are introduced on the pedestal. It would be out of place to bestow a finer material on the accessory figures than on the principal one; but, on the other hand, the bronze figures connected with a marble pedestal look too *un*connected,—as if they did not belong to the work, and had sat down there by accident, or chosen to climb up and stand there. This effect may be seen in some of the models in which the materials are shown realistically, and which have a very broken and spotty effect; though no doubt that great blending and harmonising agent, London smoke, might be trusted to remove this in no very long time. The gift of the marble for the pedestal, and the use of bronze for the figure, seem to indicate a decidedly large scale for the work, in comparison with the means at present counted upon. We can scarcely, however, see the desirability of restricting the material for the principal figure to bronze; it would surely be well to allow the option of marble, especially as the style of some artists lends itself better to marble than bronze, and it is possible that a better result would be obtained by leaving the competitors more unfettered as to material. The facts which we published the other day concerning the condition of the Achilles statue suggest, moreover, the doubt whether metal be the most durable material in our modern London atmosphere.

In regard to the accessories of the statue, the present competition suggests some points worth attention. In the first place, all such rubbish as artificial rocks and rustic pedestals should be utterly condemned; there are some ridiculous things of this kind in the competition, though the judges, certainly, have not favoured any so far. To make the public in general understand why such a thing is absurd seems hopeless, we admit. In the second place, architecturally-constructed pedestals should be treated with more consideration of architectural propriety of design and detail than is shown in most of these. It is an entire misuse of architecture to seat a statue on the top of a temple, as in the case of one design, not without merit, in which the poet is seated on the top of a modification of the Lantern of Demosthenes. Nor are architectural details to be clipped and cut about by sculptors in a manner which argues ignorance or neglect of the origin and meaning of such details. As a flagrant instance, we may mention one design which has coupled Doric columns at the angles, supporting a piece of cornice without the architrave and frieze, the cornice coming right on the capital of the column, while the "composition" is decorated above the cornice by square finials over each column, looking like the top of a joiner's stair-newel, and utterly alien from everything in Greek architecture. Other pedestals which are better in idea are spoiled to some extent by want of familiarity with architectural detail, and others show a complete forgetfulness of the relative scale implied by certain classes of architectural detail; No. 23, which we a little too hastily commended for originality (which it has, certainly) in our former hurried notice, is an instance of this, as it employs on a very large comparative scale, details (such as scrolls and foliage) which are generally used in architecture on a smaller scale; with the effect, of course, of dwarfing the figures. One of the best-designed pedestals in the room is the one to the large No. 2, before mentioned; this is apparently a French work, and the French have a much better perception of the fitness of things in such accessories than we generally find among English artists. Then, of course, there is the question between a mere pedestal and an architectural background or canopy. This is to some extent a mere question of expense; and we may recal Allan Cunningham's opinion expressed to the late Sir Robert Peel, in reference to a similar case,—"Don't starve the statue!" Apart from that we should earnestly strive for something like an architectural erection of which the statue should be the central point; it has a more dignified effect, and gene-

rally acts, also, as a preservative to the statue. The question between a niche, in which the figure would only be seen in front, and an open canopy, which would allow it to be seen all round, is practically suggested by the collection of models; the former is by far the easier problem for the sculptor, and can be efficiently carried out for a less sum than the latter scheme; only when we find artists pointing out that a statue should never be seen all round, and that it must have a bad effect from the rear, we must add the proviso, "unless it is so designed as to look well all round," and may recall Thorwaldsen's determination that his works should be so seen, and how he surreptitiously made his Apostles just too high for their intended niches, after having in vain tried to argue them out of the niches in the face of the opposition of his committee. However, as the funds for the Byron memorial stand at present, we fear it would be useless to look for a canopy, which must be a large erection or it will smother the statue. The danger of a low canopy is unintentionally but forcibly exemplified by one of the designs in this very competition,—No. 37. This is a single figure under a gracefully-designed simple Greek canopy with a flat ceiling and a column at each angle (the poet's faithful dog bears him company on the *top* of the erection, rather oddly); the artist gives a duplicate of the figure, one standing under the canopy, which casts a shadow on him, the other free; the two are identical, but the one under the canopy seems an absolute nonentity from the nonaccentuation of the features, and could scarcely be believed to be the same model. The fact shows the importance of having a model of the whole accessories, and not trusting to drawings.

The alternative to a niche treatment (if an architectural canopy is out of the question) would be to leave the statue perfectly free, but to give dignity to it by an extended treatment of the base or pedestal, with or without figures. By this method an admirable pyramidal composition may be made, and which gives opportunity of an added intellectual interest in the accessories. Only, one thing must be remembered: that subsidiary figures, if on a different scale to the principal one, must be so treated, either as bas-reliefs in panels, or in some other decidedly different manner from the principal figure, as to remove them entirely from immediate connexion with the latter. To place upon the lower part of the pedestal figures treated in the same manner as the central figure, and even in directly connected action, but on a different scale, is a blunder so extraordinary, and so absurd in its results, that it would seem unnecessary to say a word in condemnation of it, did we not see instances of what even clever sculptors will do sometimes in this way.

Of the six preferred designs mentioned in our last, it is pretty generally understood that No. 6 is by Mr. Storey; No. 14 by Mr. Boehm; Nos. 27 and 28 by Mr. Williamson. No. 9, which has a very elaborate bas-relief on the pedestal, as well as most extensive architectural surroundings shown in a drawing, is understood to be by Count Gleichen: it is extravagant as to cost, of course. The figure is bright and life-like in expression and attitude, but to our thinking there is more of the "happy peasant-boy" than of Byron about it. Among those which we have not previously mentioned, and which deserve a word, is a model on a small scale, No. 17, evidently by a French sculptor,—a remarkably good composition; the pedestal is a cross on plan at the lower part, with four seated figures illustrative of the poems; those of Don Juan and Manfred are especially good: the principal figure is not remarkable, but the whole gives a very good impression. No. 21, a seated figure, is in too stooping an attitude,—not quiescent enough for sculpture, but it is not commonplace; the head and countenance have been carefully studied, and it is among the most successful in this point, giving strongly-marked character without going into heroics. Even this latter excess, however, would perhaps be better than the very quiet countenance and manner which some of the most favoured competitors have adopted for the principal figure. One of the most marked characteristics of Byron was, that he was what would now be called an "anti-Philistine"; he had nothing to do with British respectability; nothing could be worse than to stereotype, in bronze or marble, a "genteel" Byron; and the taste of the committee seems too much to incline that way. Another design worth attention is No. 40, also we suspect) French; the figure of Byron is, as Dugald Dalgetty would have said, "slighted or overcrowed" by that of Fame, which is grouped with him,—a mistake, perhaps, but there is a certain power and effect about it; and the circular pedestal with alto-relief figures is (except for some lapses in architectural detail) very good; the figure representing "Greece," writing the poet's name, is admirable, and sketched in with a masterly hand. Some of the designs submitted are indeed fearful and wonderful; but as they have not a chance of execution, it is not necessary to undertake the unpleasing task of characterising them more particularly.

His lordship's own impressions of the designs for his monument, which have been kindly communicated to us, we print in another column.

TUNNELLING.

HOWEVER justly we may despair, at the present day, of any prospect of excelling, or even of rivalling, the purity, elegance, and majestic splendour of the temples of Classic Greece, or the loving, patient, picturesque work of the founders of the Mediæval cathedrals and abbeys of England and of France, there is one department of the work of the builder in which the nineteenth century may hold its own, when compared with earlier Christian or pre-Christian dates. That work, indeed, in our present minute division of labour, is attributed to the engineer rather than to the architect. But it is truly structural work; and not only so, but it is often executed under circumstances that call for the fullest display, both of scientific knowledge and of practical skill, demanding the ready adaptation of apparently small means to ensure great ends. Not that we are by any means justified in considering that we have made an unmeasured advance on the practice of those master-builders, the Romans, even in our tunnels. In one or two instances, indeed, we have accomplished, or attempted, tunnels of greater magnitude and difficulty than any with which we are acquainted in times past. If we confine our views to the simplest form of subterranean gallery, that of the miner, there is no doubt that both in the depth to which we have sunk, and the distance which we have penetrated from the bottom of the shafts, the mines of modern times are far more prodigious works than any with which we are acquainted that preceded them. But when we come to true tunnels, subterranean perforations lined with brickwork or masonry, it is rather to our unacquaintance with the ruins of the ancient Roman works than to the non-existence of such works that we owe any feeling but that of great respect for our Italian masters. The long and lofty viaducts that span many a valley in Italy and southern France are conspicuous objects. Even in their ruins they are magnificent. But the tunnels, which formed a part of some of those long water-courses, are less apparent; often, the only parts which would betray their existence,—the mouths,—have been buried by earthquake or by landslip. Yet we all know how the great *cloacæ* of Rome have resisted pressure, decay, and wear, for much more than two thousand years. We have ourselves traced, in the spurs of the Apennines, long stretches of carefully-built tunnel, lofty enough to allow a man to walk in them erect, perfect for the conduction of water as on the day on which they were completed, floored by 10 in. or 20 in. of a fine silt, that shows for how long a period they must have fulfilled their object,—and yet so forgotten that it is uncertain to which of the rich and flourishing cities of the Campanian plain,—Herculaneum, or Stabiæ, or Pompeii, or Pagani, or Nocera,—they formerly conveyed an ample stream. In referring to these Roman works, we must bear in mind that the more intimately we are acquainted with their details, the more sturdily shall we hesitate to adopt the current idea that it was ignorance of the simple laws of hydraulics that led the ancient architects to carry water over long, level, open aqueducts, instead of descending and ascending hills by pipes and syphons. It is ridiculous to suppose that the Romans were unacquainted with the hydrostatic law that underlies the soundness of any hydraulic work. Although they may not have been informed of those properties of iron which have been discovered and developed in this country since the first cast-iron railing was erected around the Cathedral Church of St. Paul, they could make pipes and connexions as they thought fit. There is a large bronze cock in the Museum at Naples, recovered from Herculaneum, which formed the connexion of a pipe (speaking from memory) of 9 in. or 10 in. diameter, in which water is yet inclosed,—water that has been contained in that brazen chamber for 2,000 years. And the command of earthen material, pozzuolana, and cement, still retained by the Italian builders is such as to leave no difficulty in constructing conduits that will bear a heavy head of water, if such are required. It is rather on a balance of advantages, as building for centuries, not for years,—above all not by contract, that the Roman architects laid out their viaducts *au jour*, and only employed tunnels where it was necessary to pierce some transverse spine of hill. Our own experience of such masters as the silting up of sumps and syphons, of the rapid erosion of iron pipes by hard water, of the consequent deposit of sinter in these pipes, and of the unsuspected fact that a deep fall of water very rapidly erodes and destroys iron, is enough to lead us to the opinion that, perhaps, after all, the water-lead system of Imperial engineers was quite as scientific, and quite as practically economical, as is that of the present day.

Our attention has been drawn to this interesting architectural subject by a republication of the very excellent work on Practical Tunnelling, by Mr. F. W. Simms, C.E., with much additional matter, contributed by Mr. D. Kinnear Clark, illustrative of the great Alpine Tunnels, one of which was opened in 1871, while the other is still in course of construction.* Mr. Simms, resident engineer on the South-Eastern Railway, has given an account of the Bletchingley and Saltwood tunnels on that line, which is quite a model for that kind of monograph. He has first described the geological features of the country to be traversed; then gives a general outline of the design of the tunnels; explained the construction of the observatories built for determining the centre line; the transit instrument fixed and adjusted on its solid brick pillar; the setting out of the shafts; the ranging of the line both above and underground; the determination of the levels; the sinking of the shafts; the driving of the headings, the excavation, timbering, and lining of the tunnels; the tunnel entrances, shaft towers, and culverts; the frames and centreing employed; and the labour and cost of construction. In tracing the careful details thus placed on record, it is interesting to remark how closely the experience obtained by Mr. Simms on the South-Eastern Railway resembles that of Mr. Robert Stephenson and his assistants on the London and Birmingham Railway. Each engineer seems to have started with about the same amount of information,—that, no doubt, yielded by the best text-books of the day. Each, under similar circumstances, was driven to adopt certain modifications of his original views. Yet the earlier experience of Mr. Stephenson does not seem to have been made available for the guidance of Mr. Cubitt and Mr. Simms. The sinking of the shafts of the Bletchingley tunnel was commenced in the beginning of August, 1840. Mr. Stephenson's long tunnel at Watford was commenced in 1834. Observatories (three in number) and a transit instrument, exactly resembling those figured by Mr. Simms, were erected for the setting out of the Watford tunnel, and proved entirely useless, as the line run over the ground by the theodolite was accurately true, and was actually used for giving the points below ground. It is curious to see how in this, as in other instances, the distance of a few miles of country, or a year or two of time, prevented one engineer from effecting a considerable saving, both of time and cost, by acting on the experience of his predecessor. Mr. Clark, in his preliminary chapter, cites the experience of the Primrose-hill and the Kilsby tunnels, as showing the action of clay. If the cutting was left for a few days without having the brick arching completed, the timbers were broken. In the former case, the expansion arising from air appeared to be nearly the same as in the latter case from exposure to water. In the construction of the former tunnel, the lengths were limited to 9 ft., and strongly timbered until the arching was complete. But the clay, acting as a semi-fluid, exerted so great a pressure on the brickwork as to squeeze the mortar from the joints, to bring the inner edges of the bricks into contact, to grind them to dust by degrees, and to reduce the dimensions of the tunnel slowly but irresistibly. The danger had to be met by using very hard bricks, set in Roman cement, in three 9-inch rings. Yet on the commencement of the

* "Practical Tunnelling: Explaining in Detail the Setting out of the Works, Shaft-sinking and Heading, the Brickwork of Tunnels, &c." London: Crosby Lockwood & Co., Stationers' Hall-court.

Primrose-hill tunnel an attempt was made to save the cost of the invert, because in the Watford tunnel, made through solid chalk, it had been found possible to dispense with this troublesome portion of the section. Even this experiment might have been anticipated by consulting the experience of practical well-sinkers. Mr. Clark tells us that the London clay has a notorious reputation with these workmen. Even in the absence of moisture, if left exposed to the atmosphere, it swells and bulges upwards. A well at Richmond, of 4 ft. in diameter, was completely closed in one night by the swelling up of the bottom, although there was not any water in it. In the same way, in the construction of the Tower-hill tunnel, if the shield was not rapidly advanced as soon as the excavation was ready to receive it, it became almost immovable from the binding of the clay. And yet provision was made for filling up the inch or two of space, which in a few hours would have filled up of its own accord, with the destructive material, grout. It is evident that works which give full accounts of all the numerous details obtained from actual experience, are of the utmost value to the engineer.

While it is thus important to collect and to set in order the whole experience of a single school, or of a single country, on one great branch of structural work,—as, for instance, in the account of the English tunnels,—such a book is rendered of far more value when, as in the present case, it includes information as to the progress of the most important foreign works of a like nature. Such information is valuable, often, in proportion to the difficulty with which it is obtained; or with which, in some cases, it is sought in vain. Thus it would be of great importance to engineers and contractors in this country to be made acquainted with the actual cost, per cubic yard, of the excavation of the Suez Canal. But the best study that can be given to the reports of the company, or to the two or three books that have been published in England on the subject, will not throw any definite light on this important point. On the contrary, we find estimates rise and fall, swell or diminish, according to circumstances. At one time so much money is wanted for certain purposes, and we find an estimate at one rate, at another time something altogether different. The value, therefore, of the minute and careful detail of cost, as well as of engineering construction with which Mr. Clark has supplied us as to the great Alpine tunnels, is evident, and the work possesses extreme value for the practical man.

The range of cost in tunnelling is very wide. There is, indeed, a difficulty as to the unit of comparison to be employed. The price is usually quoted at per yard lineal, and this, no doubt, is for short purposes the best guide. But the area of the tunnel has to be taken into account in making such a comparison. Thus the price of the tunnel for the Loch Katrine Waterworks at Glasgow is quoted exceptionally low, being only, where made through the clay slate, between 9*l.* and 10*l.* per yard. But, then, this tunnel was only 8 ft. in height, and the same in width, giving a sectional area of some 6 square yards. The tunnel section used on the South Wales Railway, on the other hand, was 28 ft. wide, and 21 ft. 6 in. from the surface of the rails to the crown of the soffit of the arch; and the Thames Tunnel masonry filled a rectangular section 38 ft. wide and 22 ft. high. Thirty pounds a yard is a price at which several tunnels of the ordinary dimensions common on the 4 ft. 8½ in. gange lines have been constructed. This was the price of the London and South-Western tunnels at Guildford and at Salisbury, through chalk, and of the Lydgate tunnel on the London and North-Western, through the coal measures. Through dry sand the price has been higher, as although the excavation is somewhat easier than in chalk, more timbering and greater care in polling are required. The price of a tunnel through sand on the London and South-Western Railway, at St. Catherine's, was 40*l.* per yard; but dry sand is one thing and wet sand another. In the latter it is hard to anticipate the cost. The Saltwood Tunnel, on the South-Eastern Railway, is through wet sand. It cost 118*l.* per yard. In the Kilsby tunnel, on the London and Birmingham Railway, a quicksand, which had not been discovered by the trial-shafts, was encountered. The cost, delay, and discouragement were so great that the directors of the railway debated as to the abandonment of that part of the line. The ultimate cost was 125*l.* per yard over the whole 2,398 yards of the length of the tunnel. This was the largest cost incurred on any English tunnel, with the one remarkable exception of that under the Thames, which cost no less than 1,137*l.* per yard for its 400 yards of length. Even the Metropolitan Railway, according to the last Board of Trade returns, only averages 117 33*l.* per yard linear of line and works complete. The cost of the tunnel through the Alps, at the St. Gothard Pass, has, up to this time, been very close upon that of the Saltwood tunnel, being returned at 116*l.* 9s. per yard; but this work is only in course of execution. The cost of the Mont Cenis tunnel, 7 60 miles in length, has been 167*l.* 12s. per yard run.

The Mont Cenis tunnel is remarkable as being the spot where the use of excavating machinery was first attempted. Water power is available at each end of this tunnel, and it has been adapted to the compression of air, by which at the same time the machinery for drilling the well was driven, and the works were ventilated during progress. The tunnel was commenced in 1857, at both ends, by ordinary hand-mining. This was continued for three years, during which the pneumatic machinery was in course of construction. In 1861 machine-boring replaced hand-labour at the south, or Italian, end, and in 1862 it was introduced at the north end. A heading, or advanced gallery, 10 ft. square, was first pierced, eleven air-drills, or pneumatic perforating machines, being employed for the purpose at the north end, and nine at the south end. After several experiments as to the best size for the heading, it was finally settled at 9 ft. 6 in. in width, by 8 ft. 6 in. in height, for which seven perforators were employed. This gallery was, for a considerable period, enlarged to the full size of the tunnel by hand-labour. But in 1868 perforators were applied to the whole of the work, at a considerable gain in point of speed, although, contrary to our usual experience in substituting mechanical power for human labour, at a greatly increased cost as compared with hand-labour.

Nearly eighty holes were ordinarily made by the air-drills in the forehead or face of the heading. These were charged with dynamite, and successively fired, until the whole section of the headway was blown out or loosened. Two lines of railway were laid, one for removing the material loosened by blasting, which was filled by hand into trucks, and the other to carry the perforating machines. The rock was removed in these small trucks to the end of the advanced gallery, which was carried some 300 yards before the face of the main trains, and then tipped into large wagons, which were drawn by horses to the mouth of the tunnel.

The work subsequent to the piercing of the headway was carried on in successive stages The gallery was, in the second place, enlarged to a section of 12 ft. square by the use of five additional perforators. It was then enlarged to the height of 18 ft. by the use of two more of these machines, and a conduit for drainage was formed in the floor. The upper part of the tunnel was then enlarged to its full size by manual labour. It was then arched or lined with masonry. Finally, the lower part of the section was completed. Very little water was met with in the progress of the work, and timbering was not required.

As to rate of progress the heading at the north end, from the end of 1857 to the end of 1862, was driven by three sets of twelve miners, each working for eight hours, and the rate of advance attained averaged 1·65 ft. per day. At the south end three shifts of twenty miners were employed, and their advance averaged 2·148 ft. per day. The rate of progress was considerably less than that which we have ourselves attained, in Ireland, through wet rock, under extremely disadvantageous circumstances. But the superiority of the English miners is, or, at least, was in 1857, a point which both French and Italian engineers were quite ready to admit.

On the first introduction of the perforating apparatus the rate of progress materially slackened, owing to breakages in the machinery. Only 170 mètres were executed in 1861; but, as experience was acquired and defects remedied, more progress was made year after year. In 1863 the advance was 802 mètres; in 1864 it was 1,087 mètres; in 1870 it attained the respectable figure of 1,635 mètres. On December 25, 1870, at 4·25 p.m., a machine perforator working on the Italian side knocked a bore-hole through the diaphragm of rock then separating the advanced galleries, leading from France and from Italy. A number of bore-holes were then made in the curtain of rock, and having been fired on the 26th of December, 1870, at 5·20 p.m., the advanced galleries were brought into communication. The engineers had for some time been anxious lest the headings should have missed one another, as the estimated length of the tunnel had been pierced. It turned out, however, that the actual length, measured in the tunnel itself, was 11½ mètres more than the length arrived at from survey and measurement over the mountain. Only 1 ft. error in level was found on the meeting of the galleries, and no appreciable error in direction. This was a severe test of the accuracy of the work, and the result deserves to be commemorated.

On the whole better progress was made on the Italian than on the French side, owing in part to the more favourable nature of the rock, and in part to the adoption of a smaller section for the advanced gallery. An advance from a mean rate of 4·01 ft. per day, taking both ends together, to that of 14 9 ft. per day, shows the great progress made in the command of machinery. But the cost of the latter was excessive. The apparatus employed consisted of two divisions. On the surface, at either end of the tunnel, was fixed the machinery for compressing atmospheric air, and for forcing it to the face of the work. Water was the motive power employed. At the south end a head of 85 ft. was available, and eleven hydraulic rams were fixed, which compressed the air to five atmospheres above the ordinary pressure, in a wrought-iron cylinder of 5 ft. in diameter. It appears that about one horse-power per cubic foot of air compressed was exerted per minute. At the north end there was an abundant supply of water, but a fall of only 20 ft. Rams were at first employed, but horizontal air-pumps, worked direct from water-wheels, by means of cranks on the shaft, were afterwards substituted with advantage. The leakage and loss of pressure were found to be inconsiderable. Cast-iron 7-in. pipes, with caoutchouc fittings, were used to convey the compressed air to the perforators. The pressure at the face, where eight perforators were at work, expending 64 cubic feet of air per minute, was equal to 96⅔ per cent. of the original pressure at the mouth of the tunnel. The perforators were constructed with percussion cylinders, fed with compressed air, each of which gave both a blow and a rotary motion to a drill. A jet of water was sent into the hole to wash out the broken rock, as the boring proceeded. It proved to be necessary to have a stock of four times the number of perforators that were at work at any moment, repairs being so constantly required that only 25 per cent. of the number could be kept at the same time in working order. A set of forty-four machinists worked for six or eight hours. They were succeeded by a set of nine chargers; and these, in their turn, after the explosion, by thirty clearers. A second set of machinists then came on, and were followed by the same chargers and clearers who had worked before. Thus the total number of men in a day in the advanced gallery was 127. During the latest stage of the work, upwards of 4,000 persons were employed directly on the tunnel.

The cost of the heading, when executed by hand-labour, averaged 8*l.* 5s. 2d. per lineal yard; as executed by machinery, the cost was 26*l.* 11s. 1d. per lineal yard. Thus, by the employment of machinery, the rate of progress was more than doubled, and the cost per yard was more than tripled.

With regard to the cost per mile of the completed tunnel the amounts somewhat vary. It was finally let to MM. Sommeiller & Gratfoni, at a price equal to the sum before cited, of 167*l.* 12s. per lineal yard. In 1863 the cost was reckoned at 125*l.* per yard, and in 1870 at 120*l.* But the actual cost of the whole tunnel is said to have amounted to 3,000,000*l.*, which is equivalent to 224*l.* per yard.

The experience of the action of the perforators in the Mont Cenis tunnel is likely to be of advantage to the undertakers of the tunnel under the St. Gothard. But large quantities of water have been met with in the latter. It is true that the evil effects of water in tunnelling are comparatively slight when the work is entered by an adit, or open gallery, which allows the water to flow out by gravity, instead of being pumped up a shaft. In a moderately wet tunnel the cost of excavation may be reduced to one-half or less by the opening of an outflow. But with increasing length from the face expense and inconvenience always increase. It will not be before the completion of the St. Gothard tunnel that it will be safe to count its cost.

THE POSITION OF ARCHITECTURE.*

Let us now extend our vision a little farther, and take a general survey of the state of architecture over the civilised portion of the world. During the last half-century an enormous change has taken place. The mighty power of steam, whether applied to manufacture or to locomotion by sea and land, has broken up the old lines and established new channels of thought and progress: no arts have felt the change more than engineering and architecture. In the seats of ancient civilisation, whether at home or abroad, the old towns have been renovated and rebuilt. Paris, usually considered the centre of the arts of civilised life, is the most eminent example. Under the auspices of the late Emperor and his henchman, Baron Haussmann, the city over nine-tenths of its area has been rebuilt; districts of squalid, tortuous alleys, the abodes of fever and the hotbeds of insurrection, have been replaced by stately arcaded avenues and boulevards lined with trees, faced with handsome stone-built mansions, hotels, and public buildings. Never in the history of architecture has there been such a transformation within so short a period. On the whole the effect is decidedly good. There is nothing in the way of street architecture equal to that of Paris, whilst the taste displayed in the vistas and intersections, and the open *places* where these occur, give a piquant charm not to be found, to the same extent at least, in any other city. Some of the public buildings and churches are of a very high class. The New Opera House, the culminating point of modern Paris, is doubtless open to criticism; but for lavish expenditure and grandeur of interior effect it will be hard to find its equal. The impulse thus given to Paris has spread over the whole country. Quiet Mediæval towns, which had slumbered on for countless ages in picturesque stagnation, suddenly awoke with a burning thirst for improvement and progress. Not only the great cities, such as Marseilles, Lyons, and Bordeaux, but Rouen and Rheims, and Orleans, and their sister towns in countless numbers, even to such a relic of the olden time as Avignon, have been rooting up their Mediæval features, destroying their old buildings, and converting their streets into a *réchauffé* of modern Paris.

The spirit of progress in architecture has not been confined to France. All over Europe, in every town of importance, the same revival has taken place. Vienna has built a new town over the ancient ramparts between the old city and the suburbs, and adorned it with many noble buildings and works of art, amongst which may be mentioned the New Opera House and the Votiv Kirche, structures fit to take rank with the noblest works of modern times. Italy, the home of architecture and art, is pressing on in the same direction. Milan possesses a unique feature in the magnificent Galeria Vittorio Emanuele, connecting the two principal squares, the Piazza della Scala and the Piazza del Duomo, erected within the last few years. Genoa and Florence are following in the same track; and Rome, the Eternal City, as she is called, has taken a fresh start, and is vigorously pursuing a course of improvement, which has already enhanced the value of property to an almost fabulous extent.

Our own country, as you all know, has not been behind in the race. Here our progress has been further stimulated by the sanitary movement, which has led to very important consequences, never originally contemplated. The metropolis, as was natural, took the lead, and is still working energetically, opening out new streets, pulling down objectionable quarters, and re-arranging them with an eye both to health and beauty. Amongst these metropolitan improvements two are worthy of special mention—the Holborn Viaduct and the Thames Embankment,—which structures are each in their several way amongst the finest of modern times. Others of our great towns have kept abreast of the movement. Glasgow is engaged in a noble scheme for the reconstruction of the lowest portion of the city, and Birmingham is about to spend two millions sterling in rendering the town worthy of its high position in the country.

In Liverpool we have not been altogether idle. Streets have been widened, new avenues opened up, and parks for the people constructed round the edge of the suburban district. Looking over the country generally, the spirit of improvement is manifest everywhere. The wealth of the nation has prodigiously increased of late years, and has been liberally expended in the direction of architecture. This is seen in the increased attention to design, and in the quality of the materials employed. The vile covering of compo, which half a century ago was all the rage, and was a mask for the most wretched material and work, has almost entirely disappeared, and is replaced by honest brickwork and ornamental stone facings. The architect has wider scope for the display of ability, and more is expected from him. The houses of our gentry and merchants at the present day display an amount of comfort and elegance which a century ago were never dreamt of, even in houses of much higher pretension.

Let me glance for a moment at several classes of the most prominent structures which the architect is now called upon to design. To begin with churches and chapels. There has of late been quite a rage for church building. Private benevolence has extended itself in that direction, and very large sums are continually laid out in places of worship for all denominations. On the whole, great progress is visible, and nowhere more than in our own neighbourhood. If I might, without being invidious, point out a recent specimen, I would allude to the church at Mossley Hill, designed by Mr. Paley, which carries out both externally and internally the true spirit of the old masters. The Nonconformists have partaken in the onward movement, and churches have arisen in our neighbourhood of late years which would astonish by their style and pretence the Baxters and Bunyans of old. Town-halls have of late been a favourite channel of municipal expenditure, and some very fine buildings of this character have been erected,—amongst others those of Hull, Halifax, Bradford, Rochdale, culminating in the magnificent structure at Manchester, costing nearly a million sterling. The majority of these are in a Mediæval style, to some extent founded on the model of the Belgian Hôtels de Ville. Some, however, have adhered to the Italian model, and it would be difficult to find any municipal buildings in the country surpassing in dignity and beauty the Town-hall, Liverpool, and St. George's Hall.

Cemeteries have in all parts of the country called forth the competitive spirit of our architects, and there are many, which for the combination of beauty of site with the pleasing effect of the architecture, are worthy of all commendation. These, so far as I am aware, have all been designed in the Gothic style, which lends itself by its solemn associations much more readily to such purposes than any modification of the Classical.

The People's Park has become an institution in most of our large towns, and has done much to neutralise the squalidity of our lower quarters, and to brighten the life monotony of our industrial classes. Architecture, to a certain extent, has lent its aid in their embellishment.

In Liverpool, commercial buildings on a large scale have become a prominent feature. Insurance offices, banks and piles of mercantile buildings, occupy the best situations in our leading streets, and take the place with us of the palazzi in Rome, Florence, and Genoa. The exigencies of commerce require a peculiar treatment. Light, which in Italy is rather something to be avoided, with us is the most essential element. Whatever our buildings may thus lose in dignity and grandeur, they may gain in cheerfulness and brightness of aspect.

The introduction of the suburban park has naturally led to a superior class of suburban dwellings. We find this the case everywhere. In our own town a fringe of noble mansions is gradually surrounding Sefton Park. The styles adopted are fairly open to criticism, but in the amenities and elegances of life they will be found quite equal to the demands of modern luxury.

Shop and street architecture has hardly made the same advance as the departments I have alluded to, but there are even here signs of improvement which are full of promise. The new streets in the City of London have many façades of great beauty, and the street architecture of the West End, where stone and brick have replaced cement, exhibit a wonderful advance over the fashionable squares of half a century ago.

There is one department of modern art to which I desire to make special allusion,—I mean the architecture of engineering. In the olden time the architect and engineer were one and the same person. Leonardo da Vinci, Michelangelo, and Albert Dürer were painters, architects, and engineers. In modern times, however, a separation has taken place. The architect is confined to buildings properly so called, and to the engineer is confided the execution of works supplying the public wants where durability and strength are required. In these respects our modern engineering is unsurpassed. The old Romans, with all their constructive power, and it was vast, never executed any works equalling the docks of Liverpool, or the London and North-Western Railway. It is much to be regretted that æsthetically there should exist almost universally such an utter want of taste in carrying out our engineering works. In many cases where a very slight or probably no additional expense would have crowned a noble work with the finishing grace of beauty, the opportunity has been neglected or even ostentatiously rejected. Could anything, for instance, be more utterly hideous than the railway bridge erected by Brunel over the Wye at Chepstow? Look at the Albert Dock warehouses at Liverpool, consisting of a noble mass of building fronting the river with breaks and projections, only requiring the hand of genius with a few graceful touches to stamp it with the character of dignified beauty. It is now merely a huge mass of deformity. I may also refer to the railway bridges over the Thames, leading to the Cannon-street and Charing-cross Stations. The bridges in every great city spanning a river are a great source of picturesque beauty. The graceful curves of the arches, the proportions of the piers, the opportunity for tasteful ornament, have rendered them a favourite study with architects in all ages. Paris and Florence are justly proud of the effects produced by their numerous bridges, and London Bridge, Waterloo, and Blackfriars have always been considered as adding materially to the beauty of the metropolis. The railway bridges over the Thames, which I have mentioned above, are about the most conspicuous examples of ugliness and pretence to be found in the country. Turn your eyes again to the two bridges over the Menai Straits. Thomas Telford was an architect before he was an engineer, and had executed buildings in which considerable taste was displayed. His Bangor Suspension Bridge is a model of lightness and beauty, of strength and grace. Compare that with the Britannia Railway Bridge, its neighbour, where the highest engineering talent, combined with unlimited outlay, could devise nothing better than a square hollow beam. I must, however, in justice mention a more recent work nearer home—the Railway Bridge at Runcorn—which has to a considerable extent redeemed the charge of want of taste made above. The lattice, which is the only true principle for structures of this kind, has been very skilfully applied with very good results. There are few things finer of its kind than a distant view of this bridge, with the graceful sweep of its arcaded approaches on each side.

There is one recent engineering work which may be mentioned in terms of unqualified praise; I mean the Thames Embankment. It is a work worthy of the metropolis of a great empire. It has converted into a source of beauty and utility a site which was previously a by-word for deformity and wretchedness. The grandeur of the design, and the magnificent way in which it has been carried out, are worthy of all commendation.

There is one department of engineering which affords abundant scope for beauty and design, viz., the Railway Stations. In some of these—*par excellence* the Midland Station at King's-cross—the aid of the architect proper has been called in, but the vast majority have been left to the same hands which designed the retaining walls and set out the embankments. The result in most cases has been grievous disappointment that so fine an opportunity for artistic display has been lost. At the same time many of the roofs over the stations possess the elements both of grandeur and beauty, from the vastness of the span and the scientific mode of their construction. Amongst the most noteworthy stand out the roof over the Midland Station above alluded to, and the more recent construction in Lime-street, Liverpool.

The revival of Mediæval architecture naturally led to a closer study of our old buildings, particularly the ecclesiastical ones, which were suddenly discovered to be in a state of decay, discreditable not only to those who had the charge of them, but to the nation at large. This having been seriously enforced on the public, an enthusiastic feeling set in towards their restora-

* By Mr. J. A. Picton. See p. 1066, *ante*.

tion; and the work has been carried on most zealously for a number of years. The amount of funds raised for this purpose by the liberality of the public is a marvellous sign of modern times. This result has been one of a very mingled character. In one point of view, the idea of restoring a cathedral to the appearance it presented in its palmy days, when it was turned out fresh from the hands of the freemasons of old, is one to be commended, but in other aspects it cannot be looked upon without a sigh of regret. A great part of the charm of ancient buildings consists in the association of ideas, in the feeling that we are gazing on the very stones which were put in their places in the days of the Plantagenet or the Norman kings. We feel identified with the ages past and gone when we look up at the glorious roof of Westminster-hall, and reflect what chequered scenes of English history have been enacted under its shadow. But scrape the rust of antiquity from the stones, replace the woodwork by an exact *fac-simile*, and the charm is fled. The flavour is gone; we are gazing on a substitute instead of the original, the link of connexion is broken and can never be replaced.

I am quite aware that in many cases this is inevitable. Where the substance is so far gone as to be incapable of repair, it must of course be renewed; sentiment must not be allowed to stand in the way of urgent necessity. But where it is at all practicable, I would plead for tenderness with the old work. Let it be replaced stone by stone. Let the venerable rust be disturbed as little as possible, that we may feel that we are united with our gallant sires of old, not only by sympathetic historical associations, but by a tangible chain uniting us link by link with all that is great and picturesque in the past. Who would wish to scrape the interior of Westminster Abbey or of Henry VII.'s Chapel?

> "If such there be go mark him well,
> For him no minstrel raptures swell."

The highest position would not preserve him from the execration of every one with the soul of patriotism within him.

This spirit of renovation is not confined to our own country: it rages with even a more thorough fanaticism in France and Germany. Time was when the city of Cologne, with its host of venerable churches, seemed like a section of the Middle Ages drifted down to our own times. Visit it now. The moss-covered façades, with their mildew of ages, are scraped and chiselled out of all connexion with the past. The brick-work looks as if it had just been turned out of the contractor's hands. We turn away with a sorrowful feeling, something like that expressed in the old Scottish song:—

> "O, this is no my ain house,
> I ken by the biggin o't;
> For boro-kail thrave at my door-cheek,
> And thristles on the riggin o't."

Closely akin to this question of restorations, is the propensity for the polychromatic decoration of old buildings. On the Continent this unfortunate propensity has had the effect of obliterating, or at least of concealing from view, the most characteristic features of some of the most interesting relics of antiquity. In England the principal object to which the advocates of polychromism have directed their attention is the decoration of the interior of St. Paul's Cathedral. Several gorgeous designs have been produced, but they have made very slow advances towards securing public opinion. A very rich and glowing effect may no doubt result from lining the building with coloured marbles, mosaics, and gilding, but it would no longer be the St. Paul's of Sir Christopher Wren. The effect of the design was intended to be brought out by harmony of proportion, beauty of form, due play of light and shade, and a moderate amount of sculptural decoration. Three of these elements would be entirely ignored by the introduction of the style proposed. Where richness of material and glow of colour are the main sources relied on, mouldings and sculptured features are altogether out of place. Flat surfaces as a ground for the ornamental material are all that is required. Thus at Ravenna, where mosaic is so profusely introduced, at St. Mark's, Venice, and at San Paolo without the walls at Rome, the costliness of the material dispenses with elaborate architectural details.

The nature of the material should have some reference to the locality in which it is to be displayed, particularly in exterior decoration. Works of art in marble, and richness obtained by colour and gilding, in the dry atmosphere and cloudless skies of Italy and the South, may keep their brilliancy for ages, whilst when exposed to the murky atmosphere of London or Liverpool, charged with humidity and soot, a very short time is required to destroy their beauty and precipitate their decay. It is grievous to see many beautiful and costly monuments in our cemeteries, of a date comparatively recent, with their surfaces corroded, their sculptures dropping to pieces, and their inscriptions obliterated. Gilding, colour, and metallic decoration fare little better. Iron will rust, gold will tarnish, colour is soon begrimed with soot. The introduction of polished granite, whether grey or red, has been a great boon for monumental purposes, combining colour, beauty of surface, and durability. It is somewhat surprising, considering the vast advances which have been made of late years in the art of pottery, that terra-cotta has not been more freely introduced for architectural and monumental purposes. In Italy, in the sixteenth century, it was freely employed with excellent effect, as may be seen by the examples at the Certosa near Pavia, the Ospedale Maggiore at Milan, at Bologna, and other places. Perhaps the most beautiful specimens of the kind are the friezes or panels on the façade of the Hospital at Pistoja, by Lucca della Robbia, which combine beauty of form, colour, and durability, to an extent unapproachable by any other material.

The literature of our art would require a treatise to itself. I need not refer to the standard works, such as Vitruvius, Palladio, Leoni, Chambers, Stuart, Britton, Pugin, &c., which are familiar to every student. Architectural literature in more modern times has not been found wanting. At the head of recent writers we must undoubtedly place M. Viollet le Duc, whose multifarious works, commencing with the "Dictionnaire Raisonné d'Architecture," down to his most recent volume, "Histoire de l'Habitation humaine," are replete with the most valuable information, and illustrated with a profusion and correctness not previously found. The magnificent work on Rome, by Francis Wey, though not entirely architectural, may be consulted with advantage for its beautiful illustrations.

In Germany, the "Geschichte der Architektur," by Lübke, gives a comprehensive view of the art, and is particularly valuable for its illustrations of German buildings.

In England, Mr. Fergusson's works are too well known to require more than a passing reference. His most recent volume on the Architecture of India supplies a missing link in the history of the art. The numerous works of Mr. Edmund Sharpe have afforded most valuable aid to the students of Gothic architecture in its practical application. Nor is it likely that the supply of architectural works will diminish. The facilities for illustration are now so numerous, with the aid of photography, lithography, and improved methods of engraving both on wood and metal, that scarcely an architectural example of the slightest value will long remain without illustration. In this slight survey of the literature of architecture, it would be unpardonable not to make honourable mention of the periodicals. The *Builder* has pursued its useful course for about thirty-four years, and has disseminated an amount of information quite incalculable. The *Building News* is remarkable for the profusion of its illustrations. The *British Architect and Northern Engineer* is pursuing a useful course in our own neighbourhood. In France the *Revue Générale d'Architecture*, edited by M. César Daly, and in Germany the *Architektonisches Skizzenbuch*, will keep the reader *au courant* with the most recent designs and erections. I am not acquainted with any American periodical devoted to architecture, but I perceive in the report of the recent National Convention of the American Institute of Architects, in November last, that a weekly architectural journal was announced to commence on the 1st of January in the present year. The interchange of these various publications from country to country cannot but exercise a beneficial influence in the interests of the art.

In taking a general bird's-eye view of the state of architecture in the civilised portion of the globe, we find great divergencies. Each nation has its own peculiar tendencies and idiosyncrasies. It would be almost impossible to mistake a German for a French building, or either of these for an English one. Much of this arises from the different habits of the people, and this again is dependent to a considerable extent on climate. In Italy the buildings are arranged to keep out heat; in Russia and the northern parts of Europe the object is to keep out cold. The *motif*, therefore, the principle of design in each case, starts from a different centre, and has widely different aims. So, again, in church building. Protestant Prussia models her churches on an entirely different principle from Catholic Austria. The orthodox Greek ritual imposes on Russian churches a mode of arrangement entirely different from both. France and Italy, of course, preserve in their church building the original basilica form. England is the only Protestant country which adopts the Mediæval Catholic arrangement for its churches.

Again, in domestic architecture, the tendency of the people to live in self-contained houses, on the one hand, or in the flats and apartments of a large mansion, on the other, has very marked and important influence on the style of building and the appearance of the towns. The stately streets of Paris, with their six and seven storied *maisons*, each with its *porte cochère* and inner quadrangle, contrast very favourably with the interminable ranges of three-storied houses in London. The second-rate towns in France and Germany present a still more striking contrast with the country towns of England in the loftiness and scale of their habitations.

Climate also, as affecting social habits, exercises a powerful influence on the laying out of towns. Where the people can enjoy out-door life for nine months in the year for the most part in bright sunshine, the arrangements must necessarily vary from those in a country where fog, and rain, and mist, are the normal condition. The blooming gardens interspersed amongst the houses, the trees lining the streets and quays, the parterres of flowers in every open space, which distinguish Italy and the south of France, would be an anomaly in Scotland or Sweden.

Another cause of diversity in architectural displays is the great difference of material found in different countries and districts. The centre of France, and the province of Normandy, possess freestone of the finest quality in the oolite formation, and their architecture has profited by the boon, in the refinement and beauty of their cathedrals and public buildings, and in the care bestowed on their private mansions. Brittany and the north-west of France is almost entirely a granite district, the result of which is found in the massiveness of the architecture, and its plainness even to sombreness. Compare again the brick architecture of Flanders and Holland, much of which combines richness and beauty, with the timber buildings of Switzerland or Norway; or the dull brick buildings of most of the English towns, with the stone ashlar fronts of Edinburgh or Glasgow, and it will be seen that the nature of the materials at hand exercises a most important influence on the nature of design and construction.

To a great extent the modern facilities of carriage have neutralised advantages and disadvantages of this kind, whilst invention is ever at work to furnish new materials and increased opportunities for the architect. The vast improvements in the manufacture of iron and glass have furnished the means of combining lightness and strength to an extent previously unknown. This has already manifested itself in the variety of Crystal Palaces already erected, and is destined to effect ere long still greater changes in the art of building.

To what should all this lead? The architecture of a people is the expression of its life and thought. The character of a nation is stamped upon its buildings. In the Egyptian, the Assyrian, the Greek, and Roman structure, we find indelibly fixed the despotic gloom of the first, the gorgeous state of the second, the elegance and grace of the third, and the iron will and power of the last. Equally so the power of the Church and the warlike habits of the Middle Ages are unmistakeably impressed upon their architecture. What character will the buildings of the present age hand down to those that come after us? One stamp will undoubtedly be that of utility. The great majority of modern buildings of any importance are for the many rather than the few. Our railways, churches, markets, exchanges, town-halls, libraries, baths, are for the people at large. Another character is that of comfort. The standard of life is higher than at any former period, and all classes require attention to details which would have been utterly ignored a century ago. With regard to mansions of any pretence, it may be added that another characteristic is that of luxury. By this I mean something beyond either comfort or amenity,—billiard-rooms, conservatories, marble halls, polychromic decoration, &c. I see nothing to condemn in this. It

stimulates invention and design, and taxes the genius of our architects to the utmost.

At the opposite end of the scale the provision for healthy and commodious dwellings for the working class, at a rent within their means, becomes an increasingly difficult problem year by year, from the additional cost of land, labour, and materials. Efforts are constantly being made in this direction with a certain degree of success, and the impulse thus given must ultimately lead to a solution of the problem.

Architecture is history in stone and brick; and you, gentlemen, in your ordinary occupation are constantly engaged in writing that history. It ought to be a noble one based on truth and honesty, and aspiring after the useful, the beautiful, and the good. In aiming at these ends personal aggrandisement may not always be the reward. The race is not always to the swift, nor the battle to the strong, nor, I may add, do the prizes uniformly fall to the lot of unpatronised merit; but I have great faith in perseverance and determination; and even if fortune should not ultimately crown your efforts, you will have had the satisfaction of adding to the conveniences and comforts of life, of producing some thing of beauty which may be a joy for ever. Who would not rather be a Sir Christopher Wren, with all his vexatious disappointments and the base ingratitude with which he was treated, than have been the richest millionaire who ever lived?

Let the ideal of your art and calling be a high one,—too high to stoop to shifts, meannesses, or jealousies; sympathise with each other in your difficulties and trials; lend a helping hand to a brother in distress; be always ready to encourage the young seeking for advice and information; hold out the right hand of fellowship to all who are travelling in the same path, and in so doing you will find that union constitutes strength, you will magnify your office, and help to raise your profession to its right position, inferior to none of those which minister to the highest needs of mankind.

A PLEA FOR THE FUTURE PROTECTION OF OUR ANCIENT CATHEDRALS.*

In conveying to me the request of the Council that I should read a paper before the Society this session, the hon. secretary remarked that it was thought in the meeting I might have something to say about Chester Cathedral. What I now bring before you is not about Chester Cathedral, for I had already said enough on that subject, and more than was pleasant to me to say. But it has arisen out of views and feelings to which the recent "restoration" of that structure gave rise; and which I expressed at the time in letters of some length to the *Athenæum* and *Builder* and to the Liverpool and Chester newspapers. I trust it will not be attributed to a censoriousness of spirit or love of contention on my part. I have no abstract liking, I assure you, for the subject; I would much rather be discussing some other and more exclusively architectural topic,—one more connected with the principles and essence of architecture. But I have a strong persuasion of the magnitude of the evil I am seeking to expose, that whatever is done to expose it should be done at once, and that if I do not do it nobody else will.

If this paper contain matter offensive to individuals or classes of individuals, I beg you to recollect that it is in the nature of the subject it should do so. My older friends present can bear me testimony that, however I may in times past have dealt in disagreeable truths, I have never indulged in personal abuse, and that my censure has been confined to what I deem false principles or mischievous practices without reflecting on individuals. I have pursued the same line of conduct in this paper, and have the consolation of believing that if the views expressed therein were acted upon, it would be the best in the long run for all parties concerned.

Architecture, for obvious reasons, has suffered more in her works from the various destroying agents, natural and artificial, that are abroad on the earth, than any other of the fine arts. But there is one that has sprung into existence within the present generation, which, under pretence of calling back to ancient buildings their pristine perfection, commits greater havoc in two or three years than a combination of the former usually effect in a century; which is done by substituting for the old familiar face of a building submitted to the process, first cut away to a depth of 9 in. or 10 in. to receive it, an integument of new masonry, which may be observed gradually stealing over aisle and clearstory, gable and tower, till it engulphs the whole. This mask, as I have said, usurps the place of the original face of the building, which, with what remains of its once delicate contours, and various outlines, exquisite carvings, details and tintings, in which all artistic life, all grace, expression, poetry inheres, is hacked away. This is "church restoration," which is necessarily architectural destruction, or the letting out of artistic life,—a mode of treatment suited, perhaps, to utilitarian and engineering works, but surely fatal to those of a soul-born art. Its results on the ancient churches are the greatest losses which architecture has to mourn, at least within the United Kingdom.

This, it will be thought, is saying a good deal, and I may be reminded of the devastations of the Parliamentary armies in the Great Civil War. These I remember hearing reference to on first paying my respects to the cathedrals, and regretting that they could not have pulled down tyranny without pulling down architecture along with it, and that Oliver Cromwell had not added to his other great qualities some taste and reverence for the beautiful such as his victim Charles is known to have possessed; or that his Latin secretary, the poet of "Paradise Lost," a votary of the beautiful in another form, did not exert his influence with him to protect the great poems in stone. The injury done to these buildings during the Rebellion in England was very great, and that in Scotland at the Reformation by Knox and others was still greater. But is it not far less destructive architecturally and archæologically to knock down a portion of a building than to replace its live walls, breathing of ancient times and generations, with dead walls breathing of nothing, and afflict the whole as with a leprosy? Throw down a choir and the nave and transepts still live and exhibit their wonted beauty, as a mutilated man deprived of arms and legs may still maintain health and perform all the functions of life; but envelope the whole of the cathedral in new stone, and you not only do not restore, as is pretended, its formal beauty, for that is impossible, as impossible as to recall the bloom of youth to the cheek of the octogenarian, but you destroy all relics of that beauty, and all the beauty and interest that ages had conspired to bestow on it, and paralyse the whole. Nay, the remains of the demolished portion will, should one stone be left upon another, be more interesting than a "restored" structure. There is more of the original beauty still lingering in the ruined choir of St. John's, Chester, than in the entire exterior of the neighbouring cathedral, and its power of giving pleasure to the pure and refined taste is far greater than any restored cathedral can boast. If I refer to Chester Cathedral more frequently than to any other example it is simply because I am best acquainted with it.

"Restoration" seems to me the most anomalous practice ever introduced into the republic of art.* Its process, or way of working, is the reverse of that of art, which is analogous to that of nature. The architect from the inert quarry calls up, like the sun-bright butterfly from the worm, the glowing palace or minster. At the touch of a Phidias, the marble block leaps to life, a god; but "restoration," reversing this, turns architecture into masonry; and a cathedral, from a living and eloquent work of art, teeming with mementoes of the past, becomes a mountain of lifeless stone. If there be no irreverence in the comparison, it is the story of Lot's wife over again.

It has, in all ages and lands, been deemed a legitimate expression of piety to bestow all possible excellence upon houses built to the Deity; and, accordingly, temples, and mosques, and churches have been the fairest structures that could be reared, and show the art of their day and nation at its highest point. And if beauty be the signature and seal of God upon His works, a voice addressed to the immortal part of us from Him who is the fountain of all loveliness, it is surely a proper quality to give to His house. But here are temples that have fallen into the hands of the Church of England the original beauty of which a thousand cosmetic agencies and influences have enhanced, and which are crowded with historic memories and associations; and instead of carefully preserving them in this state, pious men, desirous of honouring God, through lack of taste and art-culture, go about to reduce them from this interesting state to one the most uninteresting that could well be conceived.

It is true the preservation of the interior of these buildings is more important in a utilitarian point of view than that of the exterior; and "restoration" might at first sight seem a worthy sacrifice of the latter to the former. But it should be remembered that it is the exterior of a building that has become related and assimilated to surrounding buildings and scenery, and received the beautifying action of Nature by which it is constantly renewing itself and disclosing fresh charms. It is the exterior that has kept record of the ages that have gone over it, and received the glow of an immortal interest from time; every passing year imparting to it richer and more eloquent expression. Time, of course, can and does act upon the interior; but there all signs of antiquity must of necessity, in the process of cleaning and decorating, be constantly disappearing, except, perhaps, in old carvings; and even these must lose evidence of age in being cleaned periodically. Interiors may have all the beauty that architecture, sculpture, and painting can give them, but they can have no more: time may add but little, and sun and rain nothing to their charms, which can bear no comparison to those of the exterior, all of which are entirely dispelled by the prosaic process of "restoration."

This has been the case, more or less, at Westminster Abbey, and at Chester, Canterbury, Lichfield, Ely, and other cathedrals, which are now, therefore, defunct, or only live in the works of the painter, such as those of David Roberts, Turner, Prout, S. Reed, and others; and in photographs and engravings, which the restoration mania has rendered of great value. Even the architectural illustrations of them by Britton, Winkle, and others, wherein they are in some sort immortalised, have an increased interest; and I, for one, could take more pleasure in examining those illustrations than in the restored cathedrals, which, indeed, give me pain rather than pleasure. They are now merely examples of Modern Gothic, and are not a whit more interesting generally than other specimens of that style.

I have already attributed this treatment of the cathedrals to a deficient appreciation of them on the part of their clerical custodians, who seem less capable of dealing with architecture, and less tender of its precious relics than might have been expected, considering the natural connexion of the beautiful with the good and the true, of which they are the high priests, and of which the former (the beautiful) is the complement. But if the power to receive ideas and sensations of beauty depend chiefly, as I believe it does, on purity of heart and justness of moral perception, it should at least not be wanting among the constituted and recognised spiritual guides of the people.

Another, and active cause, a love of architectural display, lies also, I fear, at the bottom of the evil, and this exhibits its working lower down in the church, where it is equally mischievous, and leads to waste of money and energy: while the spire, as it rises into the depth of the sky,—

"Star high, and pointing still to something higher,"—

is very properly looked upon as a symbol of Christian hope and aspiration; it is too often also the gratification of the desire of the eyes or the pride of life, or of piety with a considerable alloy of terrestrial yearning.

An instance of this that really deserves comment has lately occurred in the immediate neighbourhood of my abode, where a sum of money collected with difficulty from people not very well able to afford it, sufficient of itself to build a small place of worship, has been spent in enlarging a church that nobody had ever seen filled, and in metamorphosing it from the Anglo-Greek style of its day into the Ecclesiastical Gothic.

In this case, of course, no fault is to be found with the architect employed, who has solved the somewhat hard problem assigned him as well as it could be, which was not unlike turning an

* Read to the Architectural Society of Liverpool, November 1st.

* The Mediævalists pulled down and altered the work of their predecessors, just as it suited their purpose or whim; but they never did anything like restoration,—a practice now introduced for the first time in the history of art, which is no longer embodied in its remains. History in brick and stone—history as told by its monuments and ruins,—will not exist for the future archæologist, for restorations must destroy all faith in that medium or vehicle of historic record. So many buildings will be telling falsehoods that those will not be believed which may happen to be telling the truth.—S. H.

apple into an orange. But unless He who has promised to be present wherever two or three are gathered together in His name, and who is no respecter of persons, can be shown to be a respecter of architectural styles, this must be considered an entire waste of money.

The foregoing remarks apply chiefly, if not solely, to exteriors. I find no fault with what is generally done within, where there is great scope for improvement by removal of successive layers of whitewash, and the application of painting and gilding, as well as pictorial and sculptural embellishments, which are usually very much needed. Generally speaking, however, "restorations" are accompanied by re-arrangements, in which the changes are often too sweeping, and not always judicious. Screens and time-honoured monuments, around which associations and passions have crowded, are removed without sufficient cause or object. At Bebbington Church, in this neighbourhood, repaired or restored some years ago, I remember being pained at the sight of alterations for which there was no conceivable need, and which must have been made, not from the desire of improvement, but the mere lust of change.

As far as I know, or can learn, York Minster, and the cathedrals of Wells, Lincoln, Winchester, Peterborough, Durham, and a few others are for the most part uninjured. Let me respectfully suggest to the ecclesiastical authorities that these remain intact; and remind them that, whatever legal right they may have over these buildings, they have no moral right to alter or modify them against the wishes of the people, as they belong to the nation,—to the world; and not to the present generation only, but to posterity, to whom as to us they have been bequeathed by those who gave their strength and wealth and life to accomplish them,—"a legacy," to quote a well-known and eloquent writer whom I shall shortly have occasion to name, "of more than their hearts' blood, for it is their souls' travail."

This subject would come within the scope of any future Bill that Sir J. Lubbock may think fit to bring before Parliament for the "Preservation of Ancient Monuments."

I am frequently asked by architects and others who sympathise in my feelings towards "restorations," what would you do with these old places when they become dilapidated? My answer invariably is that nobody that had a due appreciation of their beauty and æsthetic value would ask the question. I repeat this here. Nobody that knows and feels how infinitely superior they are in their natural state to what they become under the hand of the "restorer" would hesitate a moment as to the propriety of continuing them by the best means possible in their present surpassingly romantic condition. I have known persons of the most undoubted artistic taste and feeling stand in rapt admiration of the beauty, original and acquired, of these edifices, and express themselves to the effect that there was nothing so beautiful elsewhere in England, or, perhaps, in the world. Now, the feeling which so appreciates this beauty is not an exceptional or questionable feeling. It is not a myth; but man's instinctive delight in the beautiful and the true; and a real element in human nature, the holiest, the divinest part of it; and the foundation in every artistic mind of such excellence in art as was achieved by men like Turner, Wilkie, Etty, Landseer, Mulready, who without the feeling which would so appreciate these edifices could not have been the men they were.

If this is a sentimentalism to which the spirit of the age is opposed, as some of my antagonists have insinuated, then the spirit of the age, to be consistent, must oppose itself to the whole of the fine arts—poetry, painting, sculpture, architecture, music,—for, and it follows from what I have said before, they are all built on and are exponents of it. It is the basis of everything that administers to our higher needs, including ethical or moral philosophy, and even religion itself, so far as it attracts by its moral beauty. But it is pleasant to think that in most other matters we have not come to this, and that Jeremy Bentham and Malthus, as apostles of utilitarianism, are not enthroned in the public heart and mind above Milton and Shakspeare. Nor is it irrelevant to observe that even the great demi-gods of science, such as Newton, Bacon, Davy, Watt, come in the second rank, and are still, in the estimation of all true appraisers of intellectual worth, below Homer, Dante, Raffaelle. Science is great, but art is greater—the first discovers, the latter creates; and that principle or fact has insensibly regulated throughout history the relative rank of men, or classes of men, and their works.

The peculiar beauty, therefore, of these edifices, however it may be slighted by the utilitarian or worldling,—all who would not repudiate the entire circle of the fine arts, and turn their backs on everything refining and elevating to the mind, must acknowledge. By it, and being half-embosomed in Nature, they enter into rivalry with rocks and trees, with hills and mountains, and the most beautiful features of the earth. In them there is more of poetry than any new building could possess. They feast the eye and the mind, and sometimes exhibit a pathos that thrills and moves the heart. In many of them every stone is literally a picture. I have seen stones with markings very similar to the design on a Paisley shawl, and quite equal to it in beauty, both for variety of form and colour. We may deplore the loss of mouldings and details, and if we had the Talisman by which we could recal that state of each building just before the mouldings and carvings became mutilated it would be well to use it. But as we have not, we may well be content; for Nature has given to it what is a richer adornment than mouldings, and a greater perfection than it has lost.

Even Classic buildings under the same benign influence become eminently picturesque. After the assaults and battery of 1,800 or 2,000 years the triumphal arches of Rome never looked so triumphal as they do now. Though much bruised and injured, and stripped of many an ornamental detail, the arch of Septimius Severus is one of the most glorious objects of the city, and the same, I doubt not, may be said of many other similar relics of the Classic time. But the buildings I am now pleading for add to many qualities of these a more picturesque style and form and are more extensive and varied in plan and outline. No other buildings in England, or anywhere, perhaps, except the Egyptian temples, present such complete and varied composition and design, or exhibit so fully the capabilities of architecture for poetic effects. Wander through one of our first-rate cathedrals, and you find it an epic poem or romance in stone, with its episodes of lady-chapel, chapter-house, and cloister; the latter, beneath the antique arches of which the spirit of past ages seems to linger, being for beauty perhaps equal to any court in the Alhambra, though essentially different from it. The pictures of Canaletto, Turner, David Roberts, Prout, Watteau, and others, prove the high appreciation of the greatest students and delineators of physical and picturesque beauty of such subjects.

While interesting and delightful to artists, and all people of taste, these buildings have a peculiar value for architects. In the infinite variety of minute markings and tracery, spread over their walls, which seem the ideal of mural decoration, and often presents a scene of romantic beauty, nature has given a detail and adornment of her own that was beyond human invention, and a lesson in mural ornamentation which, rightly read, might enable us to communicate to our works something of the power and pathos that these possess. Such power and pathos are possessed by mosques and tombs of the Saracens in Egypt and India from original design; and the secret of it lies doubtless in the greater fidelity of their architects to such teachings of nature as I have suggested. Among other lessons it shows how a building may be literally covered with rich decoration, without destroying the quality called breadth; a secret known to the architect of Henry VII.'s Chapel, Westminster Abbey; but possessed by few moderns, if we may judge by their works, among which we too often find an otherwise good design cut up by its coarse detail, and so failing utterly in unity of effect.

A friend showed me, a few days ago, an eloquent and powerful protest against "Restorations," in the "Seven Lamps of Architecture," which I had either not seen before or had entirely forgotten, feeling no interest, perhaps, in the subject at the time of reading that book. In this protest, in which the author has used stronger language than I have ventured on, characterising restoration as the most total destruction which a building can suffer,—a destruction out of which no remnants can be gathered, a destruction accompanied with a false description of the thing destroyed,—he pleads for the preservation of the cathedrals on the ground of there being yet in the old buildings *some* life, some mysterious suggestion of what they had been and of what they had lost; some sweetness in the gentle lines which sun and rain had wrought, while there can be none in the brute hardness of the new carving. I plead for them on this ground also; but more on the ground of what has been added to them by nature. I allude to the endless imagery woven by lichen and mosses, producing the most exquisite harmonies of colour, which, I think, more than compensates for what they have lost, and renders them more impressive than they were in their prime.

I would just remark here that another well-known writer, Mr. Edmund Sharpe, has also spoken out as to the destructiveness of restorations, at least archæologically, and that similar views to my own are held by Lord Sandon, as a note from his lordship in my possession will testify.

What renders the preservation of these buildings the more desirable is, that they are our oldest monuments. Most other countries of Europe contain structures more ancient still,—remains of Classic times; and Spain, Belgium, Germany, and even France, are not destitute of architectural mementoes of the power and grandeur of the Romans. In Spain are also remains of the Moors; while in Italy, temples and theatres, and early Christian basilicas, make the works of the Lombards look modern. In Greece and Turkey are yet older works,—Greek temples and remains of the Pelasgi; but in Great Britain, except a fragment or two of Roman work, Irish round towers, and some rude Druidical remains, we have nothing that goes farther back than the times of the Normans and Saxons, the earliest constructors of the ecclesiastical architecture of Great Britain, and founders of most of the cathedrals. What is more, they usually form each of them the central and uniting feature of a larger picture—the old metropolitan city of the diocese, where, situated generally on the summit of a hill or highest ground of the place, and joined by an ancient castle or other relic of antiquity, it is seen for miles round, seated like a patriarch among his descendants, and touching it is disturbing the genius of the place, and affecting the identity of the city. Most of our old cathedral cities, as Canterbury, Wells, Chester, Chichester, York, Lincoln, Lichfield, Durham, Worcester, Coventry, Hereford, &c., situated in a beautiful country, appear to the susceptible traveller like the work of magicians. Compounded of elements of beauty, material and moral, the combined bequests of art and nature, time and history, chance and change, they form a whole far beyond the reach of art. The city of Chester, for instance, may be looked on as one vast museum of British antiquities, containing vestiges of every epoch of our history, every change in Church or State from Roman invasion downwards, like the successive strata in the crust of the earth—the deposits of so many pre-historic periods. Here have been history and legend, Roman castrametation, and Roman mythology, Christian monachism, feudalism, and chivalry, Catholicism and Protestantism, municipal and commercial institutions, and, I may add, happy English homes, interpolated on the fair face of nature, on "the divine sky and the immortal year," rendering the spot more interesting and impressive than any Eden or Temple of pure nature could possibly be. Even the shadow of the tomb, which is cast over everything, and is almost everywhere felt, enhances the effect. Such cities are the gray hairs of the land, and despoiling them by renewing their chief and characteristic features, the cathedrals, is modernizing and disfiguring the country, lessening its art-treasures, and falsifying its historic page. It weakens our attachment to fatherland, diminishes the pleasure of travelling in it, and renders it less attractive to our American and Australian kindred, as well as to foreigners.

The error of the Restoration scheme will be more apparent if we, adopting the logical method of argument, "*reductio ad absurdum*," suppose it universally carried out, which we clearly have a right to do; for if it is good for our ancient cathedral and abbey churches, it is good for all kinds of old buildings, for old palaces, old castles, old temples, which must be all more or less superficially decayed. Imagine it is so applied, and what are the consequences? It would render the Old World,—Europe, and Asia and Africa,—as young as America; Egypt would succumb to California; Cairo and Athens and Damascus to San Francisco and Chicago. It would modernise the most ancient and disenchant the most romantic spots on the globe. Florence, Venice, Genoa, what would they be-

come if restored? It would make Constantinople coeval with Llandudno. It would destroy the historic renown of the Eternal City itself, which in future might be the rival of Birkenhead or Southport. Nay, but for our old books and old pictures, and a few other old things, to which the genius of the past would have to confine herself, the very term antiquity would become abstract, or have no more significance than the words red and yellow to the blind; and the objects for which the science of archæology, and archæological and antiquarian societies were established, would vanish from men's minds.

"But," says the holder of what is deemed the practical view of the matter, "the cathedrals are going to pieces; they are wanted for use, and must be fitted for use." As this is a view well deserving of consideration, let me say a word thereon. I believe that none of the cathedrals are really so dilapidated as they appear; the more as I never heard of a cathedral going to pieces. Nor do I think that, with their very substantial walls, from 5 ft. to 6 ft. thick, and with buttresses 6 ft. or 7 ft. projection, they are at all likely to go to pieces. At Chester Cathedral, one of the most dilapidated, from its being of a perishable stone, I have the best authority for saying that the walls were so sound within a few inches of the surface that great difficulty was felt in bonding the new work. If the cathedrals were likely to come to pieces, would the hacking away of the surface, and further for the bonding, be likely to prevent them? And would it not be strange that, varying so much as they do in age and degree of strength, and other circumstances affecting power of endurance, they should all be coming to pieces just now in the latter half of the nineteenth century, and within a single lifetime?

As to being wanted for use, I believe they are really very useless things to their present possessor, the Church of England as by law established, being built by another church for a very different service,—one arising out of a more complex system of religion, which, among other differences, called for a plurality of simultaneous masses. The choir, termed also the sanctuary, was for what is called the Divine Office; and, containing the high altar (which was likewise placed in the crux, or under the tower), was used for pontifical high masses and other great solemnities. The lady-chapel was for low masses and minor feasts of our Lady; and the side chapels for low masses for the dead or living; while the nave aisles were left vacant for sacerdotal processions; and are all, therefore, useless and unmeaning in a Protestant cathedral, the present service of which is a compromise,—an adaptation of the religion, or form of devotion, to the building. Hence James I., when he first saw an Anglican cathedral service, remarked that it was like a mass badly said.

Such being the truth, my suggestion in former essays on this subject to supersede, in each case, the old building, as regards its practical use by the erection of a new transept or other block of building for the service, and keep the former intact as a relic of antiquity, must be deemed worthy of consideration as a rival scheme to restoration. As such new building would not be detached, but joined up to and made part of the cathedral, there would be no loss of association with the old place or foundation; while it could be made of the proportions, as to height and width, essential to comfort, and indemnity from colds and draughts, for a seated congregation, which the cathedrals, some of them approaching 100 ft. in height (York Minster being 92 ft. and Westminster Abbey 99 ft.), are not. Our cathedrals are worse in this respect than most of the Continental ones, especially the French, which, having fewer parts internally, are so far more suited to Protestanism than the English,—among which there is only one, that of Ely, which, from its having a large octagonal centre space, could by screens and fittings, be rendered tolerable. So disproportioned and unfitting are the rest, that the erection of such an addition as I have suggested would be an improvement, whether the old building was dilapidated or not. The latter I would preserve by the best means possible, holding it together, if needful, with iron rods, and shoring it up with iron struts, which would be less unsightly than wooden ones; and so aided, with roofs and gutters duly cared for, it would never come to pieces, but every year become more venerable and more pathetic in its appeal to the spectator of sensibility. I do not follow Mr. Ruskin in his anticipations of the evil day when it may be necessary to pull it down. I believe it need never be pulled down, though it would be infinitely better to do so than to "restore" it, as there would then be a chance of getting some original and meritorious design in its place; which was the result of the removal of Old St. Paul's, Old Somerset House, and Greenwich Palace, which gave place to three of the finest structures of modern times.

If I am right in what I have advanced in this paper, then the "restoration" of a cathedral is an enormous waste of money; for the new wing or transept, and the due repairs and preservation of the old building, would not cost more than half what is spent in restoring it; and a large sum is consequently expended mischievously that might have been applied to church-erection in spiritually-destitute districts, which are numerous everywhere, especially in London. Or, if you prefer a more tangible object, but which is closely allied with the former, to the replacing with comfortable abodes some of the "hovels," "rookeries," "human styes,"—as the dwellings of too many of the poor of the metropolis and the large provincial towns are variously termed,—as it would also have given relief to the disdressed, and means of health to the afflicted.

It is painful to make this remark; but it is still more painful to think that, during the last quarter of a century, an amount of money has been expended in an operation of at least a questionable character upon the chief ornaments of the country,—which ancient buildings of the first class undoubtedly are,—which, judiciously spent, would have reduced the death-rate of England.

SAMUEL HUGGINS.

BYRON AT SOUTH KENSINGTON.

Hiles: November.

DEAR SIR,—As I was snoozing t'other day
Upon a bed of "heap'd Eysian flowers"
(That phrase is Milton's, I confess, but pray
Excuse the licence), from his murky bowers
Old Pinto waddled up to where I lay:
Says he, "I've heard within the last two hours
They're making" (here he roused me with a shove)
"A precious fuss about you, up above.

"Although your priests and people were but shabby
In former days, refusing you the glory
Of snugly decomposing in the Abbey,
They wish to make amends now, less or more, I
From Hermes hear (and, though at lies a dab, he
Would scarcely venture to invent this story);
They've got a lot of models,—you can see 'em;
You'll find them in the—What-d'you-call-'t Museum."

I yawn'd, and stretch'd myself, and, thanking Pluto,
Concluded I would see the things, although
Deeming the honour tardy (so would you, too,
If you had been so many years below
Without a monument); and with a view to
My passage over Styx, to reach the show,
I saunter'd to the bank and hail'd old Charon,
And cross'd (the rascal clapp'd a double fare on),

And came up into London,—I don't mention
Precisely *where*, lest dull investigation
Should set on foot a charge of mere invention
On my part, and discredit this narration,—
Suffice it that, according to intention,
I reach'd the Art Museum of the Nation;
"A mighty mass of brick," but plann'd with what I call
A lack of due precision mathematical.

For, after turning right and left and right
Amid a maze of objects of *vertu*,
Statues and bas-reliefs and vases, quite
Bewildering, unless you have the clue
Which may enable you at last to light
Upon your object, after hunting through
A wilderness of glass-work and *bijouterie*
(Such as they can't make now, although a few try),

I got at last into a regular bother,
When a polite but very stolid officer,
Seeing I did not quite know what to do there,
Show'd me a corner from which leading off is a
Passage, on one side statues, and on t'other
A room for "chops and steaks, and tea and coffee, Sir!"
(And *other* places, too), and up a stair,
And through a gallery cramm'd with crockery-ware,

Which (being no *connoisseur*) I don't dilate on,
But stay'd to note some sketches by Maclise,
And paused where Spencer's beauties keep their state on
Reynolds' and Gainsborough's canvas, with the ease
And native dignity that seems to wait on
The lady of those days, whom on my knees
I could adore—when lo! a dirty curtain,
Which was drawn back, and there I was, for certain.

Gods! what a medley! figures of "ourself"
In two-or-three-and-forty different attitudes;
Some squatted on a temple, or a shelf
Of rock, some gazing upward in beatitudes
Of inspiration, as if spurning pelf
And publishers; but most were cursed platitudes,
And (which I think's a "matter" worth "inditing")
They nearly all held pens, but none were writing.

One was all gown and laurels, while a lion
Spasmodically claw'd a lyre beneath;
One show'd the "noble poet" placed on high on
A block, while two fair maids each held a wreath
At arm's length towards him, who turned ne'er an eye on
Their futile stretch the guerdon to bequeath—
Now, though I'd quit my pedestal for no man,
I never could resist a pretty woman,

Much less a couple (though perhaps embarrassing—
"Happy with either" were my judgment here);
But to pass on—although it's almost harassing,
The various looks and dress I'm made to wear—
A simpering dandy, or a swaggering Saracen,
A coat and breeches here, a toga there,
And boots of every sort, including Hessians,
(Things that I never wore, preferring easy 'uns):

One meditates on Marathon's past glory
In high heroics; two, seated, hold a volume
Blandly (they're more like Campbell and Tom Moore, I
Should say, than me); one leans upon a column,
(A thing that, in two senses, tells a *story*,)
Looking most preternaturally solemn,
Though graceful; but I'd better features than the
Sculptor shows; if you doubt it, ask Ianthe.

Here two girls hold one garland, but (which vexes
Me, and must puzzle readers of this true ditty)
They're *only half my size*; here, more complex, is
A group with angle figures, with some crudity,
But clever; the artist separates the sexes,
Wisely, *I* say, considering their nudity;
For, though I've no strict notions about *He's* and *She's*,
I always much approved of outward decencies.

(That last rhyme limps a little, I allow,
But you must recollect I'm out of practice,
For, to say truth, I find that here below
Composing verse a most unusual act is,
And then your English tongue's castrated so
By modern taste and habits, that the fact is
We're hamper'd quite with sentiment and sham,—
They'll scarce permit ye e'en a modest "D ——n.")

But where the devil was I? To digress
Is my old weakness: here is, on a pyramid
A figure reading; pretty, I confess,
But a preposterous pedestal to rear amid
The Green Park; here another, by his dress
A naval youngster, but as I was ne'er a "Mid"
In H. M. service, this is quite unsuitable,
Although the artist's talent's irrefutable.

One, made of substance something like plumbago,
Is evidently looking for a lark;
One has a devilish twist, as if lumbago
Afflicted him (though not below the mark
In all points); here is one that might some day go
For antique, with a Muse in classic sark,
Fed, I should say, on very solid *pabulum*
(The sculptor's name in Latin 's *Tintinnabulum*).

In some 't would utterly perplex the sagest eye
To trace my likeness: one resembles "Dizzy"
(Whose fame precedes him here), and, though a badjest, I
Allow, yet I can't help suggesting quizzi-
-cally, that one's like his Satanic Majesty;
And one's so like Napoleon, you'd say '*tis* he:
I think they've "caught some boobies and a noddy,
And given 'em *carte blanche* with my "dead body"

(That's in *Don Juan* somewhere—I've forgotten);
In short, I must admit I fairly swore
(Shocking the visitors) at seeing what on
Some pedestals was placed: may I no more
Be mention'd, may my fame be dead and rotten,
And pious persons dub my Muse a ——,
Rather than *this* be honour'd! I'll waste ire on
Such things no longer, though:

Yours ever,
BYRON.

A GOLDEN WEDDING AND A FUNERAL, IN PARIS.

MANY of our readers will remember as well as we do when, more than thirty years ago, Bouffé acted at the St. James's Theatre for the first time in England, and delighted all true artists with his exquisite delineation of the old man, who wanted but three weeks of a hundred, the Père Turlututu.

Last Thursday week, at Auteuil, in the quiet old church of that retired suburb, Bouffé celebrated his golden wedding, surrounded by his family of artists and loving friends, who, after the ceremony, returned to the charmingly embowered home of the artist, who proudly showed them the wedding certificate, notifying how on Thursday, November 9th, 1826, presented themselves at the *mairie* of Bercy, to celebrate there their marriage, Hugues-Marie-Désiré Bouffé, twenty-six years of age, born at Paris, September 4th, 1800, dramatic artist, and Alphonzine-Marie Bitter, daughter of D. Bitter, painter, aged twenty-one.

Bouffé's is a rare case (though we remember, not long ago, Mr. Samuel Carter Hall celebrating also his golden wedding), an isolated one it is

said in the theatrical world. His poor friend, Frédérick Lemaître, who died but the other day, would scarcely have cared to celebrate his *noces d'or*, and thought little enough of its precious reminder; indeed, it is said that married artists are not invariably like other men, fortunate in their married lives. But Bouffé has been, and the good old curé, Michel Perrin, wept all his tears of joy on the happy occasion.

The fine arts, so nearly related, rarely in Paris misunderstand each other, and the friends of the separate arts are found always ready to appreciate the difficulties, and to rejoice in the successes, of their fellow-labourers.

The sculptor Perraud, who died last week, was buried on Sunday at the cemetery of Mont Parnasse, and as a member of the Legion of Honour he was accompanied by a detachment of infantry, which, according to the new ministerial instructions (brought about by the recent incident at Félicien David's interment), retired after the religious service, and did not accompany the *cortège* to the cemetery.

M. Meissonier delivered an encomiastic discourse in the name of the Academy; and as he stood by the grave we were struck by the resemblance of his physiognomy to an excellent artist of our own, Mr. Fred. Leighton, notwithstanding the difference of years between the two great painters. Perraud's friend, M. Pasteur, said,—It may be salutary to recall to those cities who forget it, that they alone live through ages by the genius and the talent of some of their children. You well fulfilled your wish that your life should be devoted to work. Your house was ever open to the affection of friends and closed to the indifferent: *odi profanum vulgus*. That was one of the spurs of your genius. Look at those artists who mourn your loss,—Dumont, your old master, whose pride you were, and who loved you so dearly; Thomas, Bouguereau, Cabanel, Guillaume, Baudry, Cavalier, Garnier, Delchelle, Aubert, Ballu, Normand, André, Louvet, Bénouville, Crauk, Duprato, Villain, Boulanger, Merley, Lebouteux, Lepère, Curzon, ... the friends of Rome, the friends of your manly youth and noble ambition, Meissonier, Henriquet-Dupont, Robert-Fleury, Paul Dubois, Henner, Chapu, François Bazin, Lehmann, Gerôme, Martinet, Delaborde, Bonnassieux. . . . . I cannot cite them all. Listen to them; they repeat the names of the marbles to which you have given life,—the *Faun*, the *Despair*, the *Adam*, the *Adieux*, those marbles which antiquity would have envied. All repeat that one of the highest summits of French art has just been humbled under the hand of Him who reigns in the heavens, and who raises all empires.

Perraud, who was born in 1819, is but little known in England except by his figure of "*Despair*," now in the Palace of the Luxembourg: indeed, our acquaintance with French artists is exceedingly restricted; the works and names of a few well-known men are familiar to us, and Mr. Wallis does his best every year, in his gallery in Pall Mall, to familiarise us with the smaller works of French painters; but of their architects and sculptors we know but little, which, after all, is not much to be wondered at, as even when we know the names of our own artists, those at least who work with the chisel, we care little for the statues that they discover in the blocks of marble.

Here, when Sarah Bernhardt exhibited her clever group at this year's *salon*, the charming actress was at once noticed by all, and praised or criticised as she deserved. But not many of us took much pains to discern the merit of Schwenck Gilbert's bust of a Lady and we certainly were not too lavish in our praise of the same artist's "Wicked World," nor can we imagine much sympathy existing between Leighton or Millais, or Vicat Cole and Alfred Hunt, neither can we imagine Mr. Irving and Mr. Toole "cottoning." The friendliness of artists in Paris, and the conservative opinions on the subject of art, are owing doubtless to the teaching of the *Conservatoire* and to the influence of the *Académie des Beaux-Arts*, which makes artists regard each other, and the public respect them. Imagine the horror of French artists, on hearing that the Government now sitting at Versailles should propose to entrust the duties of the professors of the great science of architecture to the tender mercies of "officials and clerks," as Sir Gilbert Scott stated the other night * was threatened by our Government, which surely must be a melancholy joke.

Paris.

* See *Builder* for November 11th.

PROFESSIONAL TOPICS FROM A PROFESSIONAL POINT OF VIEW.*

THE INSTITUTE.—COMPETITIONS.—THE VOLUNTARY EXAMINATION AND ARCHITECTURAL EDUCATION.

We might do much as a society by hearty co-operation with other bodies (and especially with the Institute) for the advancement and improvement of the profession, whose interests we all have at heart. I propose to devote a few minutes to the consideration of what the Association can do as a body to benefit the profession of its members. I do not think it would become us to discuss here the internal affairs of the Royal Institute of British Architects, but since it is no secret that two important special committees of that body have in succession for several years been engaged in drawing up schemes for its reform and improvement, I think we may assume that it is felt by its own members that such reform and improvement have become necessary. What, then, should be the attitude of our society towards it at such a junctnre,—at a period which may almost be called a crisis in its history? The Royal Institute is the only recognised professional body which has any title whatever to regulate or guide all those questions of general policy which must constantly arise in such a profession as ours. Possessing a Royal Charter, and numbering amongst its members almost all the foremost men in the profession, in town or country; with a history of considerable achievements in the past (as any one who will read Mr. Eastlake's late paper on the subject will readily admit); and with the prospect, if only it be properly supported by the members of the profession, of still greater usefulness in the future, I think that we have in the Institute the best hope of that professional organisation which we all admit to be necessary. And when I find, as I am sorry to say I do find,—a large number of my friends amongst the younger members of the profession, in this Association and out of it, who refuse to join the Institute because it does not, in their opinion, come up to the standard of efficiency which they think it should reach, I am convinced that these very men are doing the best they can to prevent the Institute achieving the position which they assert it ought to hold. If they do not wish the Institute to acquire authority with the public in matters relating to the profession, or if they do not wish it to become the recognised tribunal for all disputed matters in the profession itself,—if, in fact, they think (as their action seems to prove they do) that there is no necessity for any such recognised professional institution to exist at all, then I can understand their abstention from membership. But while their deeds seem to show this, the language they use with reference to the Institute is very different. They say they think its constitution so bad, its policy so weak, and the advantages which it offers to its members so small, that they do not care to enrol themselves. Now, as I said before, I do not think this the proper time or place to discuss the internal affairs of the Institute. I do not mean to attempt any defence of its constitution or policy. But I do say that if these are to be improved, and if it is to hold the position at which it aims, and which, I confidently trust, it will attain, it will be by a large increase in the number of its members that it will be chiefly strengthened and made more useful, and those who are standing out and declining to join are not, in my opinion, doing their duty to the profession to which they belong. I would strongly urge, therefore, all those amongst us who are eligible to join the Royal Institute of British Architects. This is, I think, the duty of our members individually; and I think that as a body it is both our duty and our interest to support the Institute by every means in our power. It is not long since some gentleman, whose motives, I am sure, we all respected, and whose sole object was the good of the profession, proposed an amalgamation of the two societies, or rather an affiliation (I think that was the term used) of the Association to the Institute. It was, however, felt by most of us that the scheme as proposed would not work, and by almost all of us that it was, at any rate, premature; but I am very glad indeed that in the way in which the negotiation was conducted on both sides, and in the manner of its termination, there was nothing to disturb the good feeling which has of late subsisted, and which, I trust, will always continue, between the two bodies. Indeed, I think I may say that our relations have become even more cordial than before, and that the great honour done us by the presence of the president of the Institute at our annual dinner, and his kind words of encouragement and congratulation, have had the best possible effect. I trust we shall continue to maintain the integrity and complete independence of the Association as the junior professional society. I believe that each will get on better by itself, and that the good of the profession will be best advanced by our continuing as separate bodies, actuated by a common desire to promote the interests of our craft,—the junior body looking to the senior for encouragement, advice, and support; the senior regarding the junior as its nursery for the production of members.

We cannot attempt with propriety any general scheme for the regulation of the professional conduct of members; but I think it is in our power to aid the efforts of the Institute in many important particulars,—especially, I think, in the matter of competitions. At first sight it might appear that the interests of the senior and junior members of the profession might not be identical in this matter; but I think that a little consideration will show that they are. It is often said that the practice of offering work to competition gives younger men an opportunity of coming to the front, and no doubt this is so; and this is the chief, if not the only, advantage of the system, so far as the profession is concerned. It is, therefore, certainly to the advantage of the younger members of the profession that competitions, if fairly conducted, should continue to take place. But it is as much to the disadvantage of the juniors as the seniors that unfair terms should be offered, and that there should be always a number of men ready, on *any terms*, however unfair, to come forward, and, on the chance of obtaining work, to practically cut one another's throats, to the prejudice of the profession generally. It brings the profession into contempt that such a state of things should exist, and the younger men uselessly waste a great deal of time and money which might all be saved by a little combination amongst ourselves. If we will be true to one another in this matter, and combine to adopt measures for obtaining fair terms from the proposers of competitions, I think a sphere of great usefulness in the profession would be opened to the Association. I do not want to convert our society into a trade union, but I see no reason why we should not take a leaf out of the trade-unionists' book in this matter. There need be no fewer competitions,—I think there would be more if the conditions could be made fairer. It is not to be expected that they will be made any fairer whilst, as at present, the supply of gratuitous designs more than comes up to the demand. If this supply were to fall short (as it is in our power, by combination, to make it), better terms would certainly be offered. How such a combination is to be made is the practical question. This I commend to your serious consideration. I think, if we could all agree to refuse to enter into any competition except on some such terms as those contained in the Institute paper of conditions of competitions, we are now such a numerous body that our influence on the production of designs gratis must at once be felt. But I feel sure that your committee will gladly consider any feasible scheme for carrying this suggestion into effect, if you think it desirable to do so.

There is another point on which I wish briefly to touch. I have been asked to refer to the Voluntary Architectural Examination, which, I am informed, is once more to be held this year, and on its success this time is to depend, in a great measure, its continuance in the future. I am one of those who are opposed to the introduction of the system of compulsory examination into our profession. I know there is a good deal to be said in its favour, and I consider that it is merely a question of a balance of advantages; but to my mind I confess the disadvantages seem to outweigh the advantages. Still, the arguments against a compulsory examination have far less force when applied to the question of a voluntary one, and the great advantage to be gained by the study necessary in preparation for such an examination cannot be gainsaid. I certainly think, therefore, that all those who believe an examination to be a good thing should use every endeavour to maintain the one now in existence. I do not wish to be misunderstood on this question of Examinations, and I will state briefly my reasons for thinking that a

* From the address of the President of the Architectural Association, Mr. H. C. Boyes, at the opening general meeting on the 10th inst., elsewhere mentioned.

compulsory examination is unnecessary, and would even be injurious, in our profession. The question seems to me to divide itself into two branches:—Firstly, is it necessary or desirable for the sake of the public? Secondly, is it necessary or desirable for the sake of the profession? Now, I admit that if by a compulsory examination the public could be assured that none but men practically and artistically competent could practise as architects, such an examination would be desirable. But I maintain that an examination cannot ensure such a result. You may by a severe examination ascertain that a man has a thorough scientific knowledge, theoretically, of the scientific branches of his profession; but it is often the very man who has the largest store of theoretical knowledge who has the least capacity for practically employing it; and your man of ready wit, tact, good sense, and experience in practical work (points which you cannot examine in at all), who may have but a tithe of the theoretical knowledge of the other, will yet be by far the better architect. As to art, you cannot examine in that at all. You may ascertain that a man can draw, but until he has tried his hand at building, you cannot tell how he will build. In Law and in Medicine, the public demand such guarantees as an examination can afford of the fitness of those who practise them, because lives and property depend on such fitness. But even here the guarantee afforded by an examination is a very slight one, and too often fallacious. In architecture, I believe, the guarantee of fitness afforded by an examination would be still less, and since at present our buildings, as a rule, when an architect is employed, do not prove dangerous to life and property, there is no general demand on the part of the public for such a slight guarantee of fitness as an examination affords. In the profession the outcry for an examination and a diploma chiefly arises from a pretty general wish to limit the number of architects, and to obviate what is certainly felt to be an evil in the existing state of things,—the possibility of any unqualified person who chooses to call himself an architect starting in practice without any proper training or education for the profession. But here it seems to me that a compulsory examination would not meet the evil; for either you must make it so severe as to exclude many men who would be perhaps better, practically, than the few who managed to cram in enough theoretical knowledge to pass; or you must make it so easy that anybody, by a very moderate amount of preparation, could get through, and so you would still have to admit all but absolute fools into the profession. No system of examination which is not combined with, and used as a test of, instruction, has ever yet been invented which a man of decent capacity could not cram for and pass without much difficulty. And all these examinations come to be ends in themselves, not means to an end. What is really wanted is a guarantee that a man has been properly trained in practical work, and has sufficiently studied theoretically the scientific side of his business. I think that a preliminary examination in general subjects to test the question whether or not the candidate has what is usually called "the ordinary education of a gentleman," and a certificate from an architect in practice that such candidate has spent three or five years in practically learning his profession, before he should be allowed to practise for himself, would answer the purpose of keeping improper persons out of the profession far better than the proposed examination. I look forward to the time when we shall have a proper school for teaching the theoretical part of our profession to a young man while he is learning the practical part of it in his employer's office. With such a school, examinations would be most valuable. A regular course of study would be laid down, and periodical examinations held to see that it had been followed with industry and success. But to begin with an examination without affording any such training is putting the cart before the horse. It reminds me of the story of the two shipwrecked Yankees, who, when at the point of death, wished for the consolations of religion, but the only religious exercise of which either of them was capable was comprised in the suggestion, "Let's have a collection." Training and education are wanted; as a substitute we are offered an examination. Still, this voluntary examination is the only thing we have at present in the profession which can be pointed to as a sign of our wish to raise its status to the level of the other recognised professions in the country, and as such I should regret to see it fall through. An attempt has been made to make our Class of Construction and Practice the preparatory course for the examination, and this is a step in the direction which I have pointed out. Perhaps it may lead to such a school for theoretical instruction as I have suggested, and while the examination is not compulsory there is little fear of its leading to the excessive cramming which I should anticipate if it were made compulsory. If ever it becomes compulsory we shall have a number of "crammers," who, for a few guineas, will guarantee to get any one who is not an incurable idiot through it.

MOVEMENT IN INDIA.

The Indian journals are full of accounts of the disasters occasioned by the recent floods. Chief among these is the destruction of the Nerbudda Railway Bridge, twenty-five spans of which have been swept away, and when the mail left the rest were expected to follow. This bridge was regarded as one of the greatest engineering triumphs of the country, and consisted of sixty-seven spans, each span being 62 ft. 6 in. long, and supported by five thin cast-iron columns, two of which, and a double line of superstructure, have been added since the floods of 1867. The columns penetrate for a distance varying from 25 ft. to 40 ft., first into a bed of gravel, and then into blue and yellow clays, and are at the greatest depth as deep as the deepest in India. When the bridge was broken there were 59 ft. of water in the river.

A design is being prepared for a monument to be erected over the grave of Dr. Milman, the late Metropolitan of India, at Rawul Pindee. The work will be executed at Agra, at the express wish of the late bishop's family.

An hospital is about to be erected in the Great Valley, Travancore, in memory of Mr. John Grant. Mr. Horsley has provided the design for the building.

A very largely-attended meeting of civil engineers in Bengal was recently held in Calcutta, when it was resolved to found an Institution of Indian Engineers and to establish a professional journal in connexion therewith. The members of the Institution are to be divided into two classes — members and associates. Members are to be engineers, whether civil or military, whether in Government service or not, elected by ballot, under rules framed by a general council. Associates are to be scientific men, other than engineers, connected with the educational, telegraph, survey, geological survey, forest, and other scientific branches of the Government service.

The discussion with respect to Ranikhot *v.* Simla, as a sanitarium, still continues to excite much interest. Colonel Colley, who was deputed by the Government of India to visit the former place, is said to hrve reported concerning it that it is more central than Simla, and can be made much more easily accessible. It is also said to have better building sites, but the available space is more limited than was supposed, although the water supply is better than that of Simla. The report drawn up in Lord Mayo's time was rough and imperfect. The requirements, therefore, of the summer residence of the Government of India will have to be estimated afresh before an opinion for or against Ranikhot can be formed.

At a recent meeting of the Bombay Municipality, it was stated that Messrs. Gotto & Beesley, of London, propose to come out to Bombay, make the necessary studies for a project for a complete system of rain-water drainage and house-sewerage, and for the disposal of the sewage, for the sum of 10,000*l*. These studies to include a report describing the system proposed, detailed and working drawings, specifications, form of contract, and estimates, and all other information necessary for submitting the works to the competition of contractors of eminence. The *Madras Mail*, from which we derive the information at second-hand, seems to think the proposal rather an expensive one, and says that Mr. Clark's drainage scheme for Madras cost only 3,500*l*. It adds that the Hon. Mr. Ellis has stated, in an official report to the Government, that he has submitted Mr. Clark's scheme to competent authorities in England, and that they have pronounced it an excellent one.

The depreciation in the value of silver is likely to have an unanticipated effect. In consequence of the unfavourable rate of exchange, the Government of India have called on all departments of the public service, including guaranteed railways, harbour, and other public works, to note that in future they should refrain as much as possible from including English materials in their indents, designs, estimates, &c., and that they should call into requisition materials locally procurable to replace what has hitherto been wholly obtained from England, and that they should utilise and depend on local supplies as far as possible.

This year Mr. Juland Danvers, the Government director of the Indian Railway Companies visited India, and was much impressed with the dwellings of the European artisans employed on the various lines. In his annual report, which has recently been published, he says, "At certain places, on most of the railways, where more Europeans than usual of the mechanical class are brought together, consisting principally of drivers and those who belong to the locomotive workshops, dwellings are provided which collectively form a kind of railway town. On approaching these places they present quite an imposing appearance. Large square brick houses are seen placed in compounds or gardens, bearing a resemblance to the villas and mansions occupied by the wealthy citizens of a London suburb. A closer inspection, however, shows that this impression is deceptive. The grand appearance is produced by the broad verandah, so necessary to an Indian dwelling, and by the double story, which was, until lately, rarely seen in India. Each house contains perhaps eight rooms, and these are occupied by several men, some with families, who pay at the rate of from 9 rupees to 10 rupees a month for each room. In connexion with these colonies there are generally institutes, libraries, swimming-baths, billiard-rooms, churches, schools, co-operative stores, hospitals, recreation-grounds,—everything, in fact, that can be thought of to afford occupation for the mind and body. It is very desirable to attend to the health, comfort, and amusement of European mechanics in India, as well as to the education of their children. There are great temptations to indulgence and excess, and it is obviously expedient to secure well-behaved, steady, and intelligent European communities of this class in the heart of India. This is now the case, and at several stations well-disciplined and efficient corps of volunteers have [illegible] railway servants."

[illegible] reported to have given to the Bishop of Pondicherry the sum of 10,000 francs to be employed in constructing an hospital exclusively for old people of all religions. The bishop has given a site on the ground belonging to the French Mission, and a lottery has been set on foot to obtain funds to carry out the project to the extent which is desired, and which will suffice to meet the wants of the population.

The Secretaries in the Department of Public Works, Madras, are working away at the re-organisation of their Department, and at the forming of a code. District engineers, it is stated, are to be abolished; superintending engineers are to be revived; there are to be seven instead of eight superintending divisions; and the ranges are to be doubled up, so that a range will in future always be in charge of no one below the rank of assistant engineer.

When Mr. Noble, the sculptor, died, he was engaged on a bust of the late Lord Hobart, Governor of the Madras Presidency. The work was so far advanced that he had succeeded in producing,—with the aid of a post-mortem cast, photographs and other portraits, and his own personal recollection of Lord Hobart,—a clay model that is said to be a wonderful likeness, and under these circumstances there will be comparatively little difficulty in producing the marble bust, which is intended to be placed on a monument in Fort Church, close by Lord Hobart's grave.

The Allahabad paper says it is rumoured that the Government of India have offered to let the East Indian Railway Company have a certain number of assistant engineers from the railway branch of the Public Works Department. It adds:—"This looks ominous for the hopes of a further State Railway extension, and points to a general reduction of the engineers' establishment. It is, also, we fear, a bad look out for Cooper's Hill, and, indeed, for the service generally." The forthcoming Railway Conference in Calcutta will probably be opened by the new Finance Minister, and the members of the Supreme Council are expected to take part in the proceedings.

The *Madras Mail* contains a copy of a long letter of Mr. Parkes, which the Secretary of State for India has forwarded to the Local Government, relative to the harbour works.

Mr. May, the late superintendent of the works at Madras, had evidently become alarmed at the subsidence which had occurred at the Madras Breakwater, Kurrachee, also in course of construction under Mr. Parkes's direction; and through the Government he propounded various queries.

A NEW DOCK FOR TIMBER.

The Surrey Commercial Dock Company opened on the 7th inst. an extension of their already elaborate system.

The new dock, named the Canada Dock, is designed to meet the necessary requirements of the timber trade, the present demands of which are attested by the quantity of timber in the Company's yards and ponds, which at the present time consists of 80,000 loads of floated timber, 7,876,000 pieces of landed timber and deals, 2,590,000 pieces of boards, and 2,158,000 staves. There are also 120,000 quarters of grain in the extensive system of granaries.

The Canada Dock is almost in the south-west corner of the Company's system. It is rectangular in shape, and its western quay is over the East London Railway, just before it enters the Thames Tunnel. Its dimensions are 1,500 ft. in length, 500 ft. in width, with a water area of 16¼ acres, and a depth of 27 ft. of water under Trinity high-water level. It communicates with the existing Albion Dock by an entrance of 50 ft. in width. The quay space surrounding the new dock is upwards of twenty-one acres in area. The walls are mostly built of concrete, that for the facing being set in blocks from a ton and a half to two tons in weight, dovetail-shaped, and bonded into the concrete backing.

The Surrey Commercial Docks have been extended from time to time, until they now comprise ten docks and seven timber ponds, with an aggregate water area of 176 acres, and land or wharfage area of 193 acres, making together an area of 369 acres of dock property. The docks have four entrances from the Thames, at different points, extending over a length of 1¾ mile of the river. The length of the quays available for shipping is five miles. The new dock has been constructed from the designs and under the direction of the Company's engineer, Mr. James A. McConnochie, C.E., the contractors being Messrs. Thomas Docwra & Sons, of Ball's-pond, Islington.

The first vessel to enter the dock was the steamer *Argyll*, of 1,185 tons, belonging to Messrs. Bailey & Leatham, of Hull and London; and this was followed by the fine sailing-ship *Greyhound*, of 1,411 tons register, belonging to Mr. Nelson, of South Shields.

NEW RAILWAY WORKS AND THEIR COST.

THE MIDLAND.

There is no railway company which has spent more money on new lines and new works, during the past few years, than the Midland, and probably no other company gives a fuller or more detailed account of the expenditure. Each separate work is fully set forth in the accounts, and in addition to the outlay already incurred, the further amount required to complete unfinished works is also given. We have compiled from the directors' reports the subjoined summary and analysis which shows the amounts expended and charged to capital under all the different heads during the ten half-years ending June last.

Under the first head of "Lines open for Traffic," it is shown that, in their original construction, the capacity of the lines was very far short of the actual requirements for traffic purposes; and in further land purchases, duplicating lines, making new sidings, extending the station and warehouse accommodation, and generally improving the carrying capacity of the line, an enormous amount has been expended, the lines having been only gradually brought up to their present state of efficiency. The additions made in this way to the original cost have been at the rate of about 1,050,000*l.* per annum, or on the mean "open" mileage not less than 6,000*l.* per mile in the period of five years. In other words, the property has been, in five years, improved at a cost almost equivalent to the construction of an additional single line throughout the entire system. On referring to the last-issued report, we find also the expenditure of this character is by no means exhausted, for in the current half-year 821,000*l.* were to be laid out in providing increased station accommodation, sidings, engine-sheds, workshops, &c., on the lines already open for traffic; and even afterwards the known necessities of the lines would take 849,000*l.* further to meet them. The whole of this additional outlay has already received the sanction of the proprietors.

Under the second head we have the expenditure upon the construction of new lines. Spread over a lengthened period, and embracing a vast number of new lines variously situated, this branch of the expenditure throws some light on the relative cost of (1) land, and compensation paid for property taken over by the company; (2) the construction of the lines, including structures, signals, rails, &c.: and (3) the by no means inconsiderable amount represented by legal and Parliamentary costs, including conveyancing, &c. The proportion of the cost attributable to each of these distinct heads would appear to be:—

Land and compensation.....	11 per cent.
Construction, including rails, &c.	88 „
Law and Parliamentary.....	1 „
	100

The gross outlay under this head, it would appear, has been 4,892,000*l.*, for which about 200 miles of new line have been added to the Midland system, the cost being equal to about 25,000*l.* per mile. The further expenditure under this head will be no less than 3,500,000*l.*, to complete the 122 miles wholly, and 49 miles partly, owned by the company, and still under construction or to be constructed.

The further heads of expenditure during the five years comprise 2,336,000*l.* for new rolling stock, and a similar amount subscribed to other connecting lines in which the Midland are interested. For the latter object 1,000,000*l.* further will be subscribed in the current and future half-years.

It will thus be seen that the company have been laying out 3,000,000*l.* per year for some years back, and we may believe that it has been judiciously applied, judging from the high dividend position the company has been able to maintain concurrent with this enormous expenditure.

PROGRESS IN VENICE.

Since the "Queen of the Adriatic" was welcomed back into the arms of a United Italy, great steps have been taken to improve the city, and render her condition more worthy of her old renown, and more favourable to the new growth which it is hoped her commerce will assume. The works of excavating and deepening the harbours and the leading canals for the navigation of the port have been continued and extended. New warehousing docks have been erected, portions of which are already open, while extensions are in progress. A large graving-dock has been completed, with a spacious basin of 17 ft. in depth. 40,000 cubic mètres of cement are said to have been employed in this work. According to a report by Consul Smallwood, this makes the second graving-dock recently constructed, the smaller of which is of the following dimensions: Length, 297 ft.; breadth, 66 ft.; depth, 26 ft. The tides vary in an extraordinary degree here; ordinarily they rise or fall 3 ft. at the equinox. The depth of the graving-dock under the medium height of water is 20 ft.

A new opening to the arsenal has been recently made, and is being further deepened; and a small island between the two dockyards, Nuova and Nuovissima, is being removed, in order to admit of the entrance of the largest vessels.

The improvements in the city, and the deepening of almost all of its internal canals, have been incessantly continued. Squares and streets have been enlarged, new and ample bridges constructed, the navigation of the canal of the Seriola reorganised, and important works built at the Lido. Besides this, the construction of a new cemetery has been pressed forward, and the new building for the safe storage of the art-treasures of the city museum has been completed. The erection of special warehouses for the storage of petroleum shows both the growing importance of this trade and the care that the city shall not be endangered by its existence.

On the island of St. Clement, says Mr. Smallwood, which is about two kilomètres distant from Venice, has been erected and opened a new and magnificent female lunatic asylum; its area is 12,000 square mètres. It is divided into nine spacious courtyards; and 300 very healthy rooms, lighted by 900 windows, have been constructed. At present about 100 lunatics are inmates, but 600 might be accommodated, besides the physicians, nurses, and servants.

An aqueduct for conveying water to the city from the canal della Seriola Veneta is in course of construction. Mr. Ritterbrandt, who represents British capitalists, is now taking the necessary steps for carrying on the works.

LIVADIA.

As Sanssouci was the favourite retreat of Frederick the Great, so Livadia is the quiet resort of the Russian imperial family. It is the first of the handsome villas on the road from Jalta to Alupka, and belongs to the Empress Maria Alexandrovna. Three versts from the former place begin the vineyards and the extensive park. The castle of the heir-apparent, built in Eastern taste, peeps through luxuriant vegetation. The deep balconies, shaped like kiosques, surrounded by fine lattice-work, the coloured brickwork of the high chimneys in form of turrets and minarets, create a wonderful effect among the mass of foliage. The interior arrangement of the castle corresponds to the surroundings. Variegated couches, carpets, small cosy rooms—everything breathes simple splendour and comfort. A neat, light staircase leads to the roof of the castle, where there is a spacious terrace-also surrounded by fine lattice-work, and pro-

Analysis of Capital Expenditure from July, 1871, *to June*, 1876, *inclusive* (*compiled from the Directors' Half-yearly Reports*).

Half-year ending	Upon Lines open for Traffic.					Construction of New Lines.				New Rolling Stock.	Subscriptions to other Lines.	Sundries.	Gross Total.
	Land and Compensation.	Construction of Way and Stations (including Rails, &c.).	Law and Parliamentary Charges.	Block Telegraph.	Total.	Land and Compensation.	Construction of Way and Stations (including Rails, &c.).	Law and Parliamentary Charges.	Total.				
	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.
Dec. 1871 ...	86,627	268,886	15,242	4,747	375,502	60,312	389,687	6,893	456,892	268,777	161,586	—	1,262,757
June 1872 ...	160,699	289,596	6,775	7,017	464,087	53,100	350,478	2,695	406,273	142,431	42,613	—	1,055,104
Dec. „ ...	137,075	306,033	11,808	2,883	457,799	77,858	329,974	10,526	418,358	243,508	408,176	6,802	1,534,643
June 1873 ...	112,360	355,182	2,978	2,687	473,207	42,301	346,588	2,386	391,275	264,156	242,885	14,327	1,385,850
Dec. „ ...	222,489	414,494	15,716	1,109	653,808	17,007	412,299	1,867	431,173	258,776	211,682	4,928	1,560,367
June 1874 ...	119,470	382,589	12,706	5,833	520,598	18,799	480,849	6,460	506,108	160,034	322,825	4,298	1,513,863
Dec. „ ...	86,888	301,531	15,571	1,680	405,670	30,725	545,408	3,127	579,260	105,096	211,247	12,065	1,313,338
June 1875 ...	87,593	343,346	22,806	2,068	455,813	61,857	482,020	3,413	547,290	297,459	156,739	10,696	1,167,997
Dec. „ ...	218,060	413,411	13,955	3,940	649,366	121,356	664,057	8,404	793,817	306,449	296,182	38	2,045,852
June 1876 ...	160,824	632,648	15,057	5,221	813,750	52,924	306,679	2,716	362,319	289,570	216,780	514	1,712,963
Totals...	1,392,085	3,707,716	132,614	37,185	5,269,600	536,239	4,308,039	48,487	4,892,765	2,336,256	2,330,715	53,698	14,883,034

vided with a cover for protection against the fiery rays of a Crimean sun. From hence the chain of the Yaila and the Black Sea offer the most charming and animated view, bordered on the one side by the beauties of Jalta, Massandra, Nikita, on the other by the fantastic forms of the rocks of Orianda, the graceful bays towards Alupka, and the whole unbounded extent of the ocean, which seems to reach beyond the horizon. Behind the seat of the heir-apparent rises the castle of the emperor, which also corresponds entirely to the purpose for which it was erected. For here in the salubrious climate of a scenery rich in natural beauties its illustrious owners seek solitude and rest from the labours of governing. On that account the imperial castles are distinguished neither by great splendour nor by large dimensions, but strike only by their artistic simplicity and comfort. This castle was built by Count Potocki. It has remained almost entirely unchanged, and has only been enlarged by the addition of a spacious gallery serving as dining-room. In the latter is placed a fountain and the statue of Penelope, in white marble, a present of the merchants of Odessa. The Roman Catholic chapel of Count Potocki has been changed into a small Greek church, of sombre beauty of style. The principal façade of the castle is turned towards Jalta. The arrangement of the balconies, windows, galleries, and external decorations of the building bespeaks a clever artist and architect. On the terraces before the castle are flower-gardens of rare beauty, and at a short distance rises a charming arcade covered by roses and creepers, and supported by slender cast-iron pillars. Amongst others, a species of white and light yellow roses attracts the attention by its exquisite fragrance. From hence, as well as from every other point, there is a splendid view towards Jalta and the surrounding mountains. The foreground to this landscape is supplied by the large park and the vineyard, with its neat keepers' cottages and its platform, and surrounded by a balustrade. The view towards the other side is no less beautiful: the whole sea-shore to the Cape of Ai-Todor, descending almost perpendicularly to the edge of the water, and fringed by castles and villas; the whole Orianda with its gigantic rocks overhanging the Black Sea; and somewhat further, Gaspra, Koriis, Mischoe, and finally Alupka. On one of the rocks, between dark pine-trees, glimmers a white lighthouse. The prospect by moonlight, when the sea trembles under the soft beams of the moon, and Luna sheds a fantastic light over the rocks of the shore, the gorges, and the luxuriant gardens, is quite enchanting. The lighthouse throws a bright ray of light far into the sea. The scent of orange-blossoms, the murmuring of the ocean, and the dark blue sky, complete the beautiful, fairylike scene, reminding us of the shores of Sicily. This is the paradise in which the imperial family of Russia spend their leisure-hours.

THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM ROAD.

For some time past a new bridge has been in course of construction across the Regent's Canal, in Chalk Farm-road, in place of the old bridge, built in the year 1815, which had not only become unsafe, but also quite unsuitable to the heavy traffic constantly passing over it, owing to the old arch making the gradient severely steep. The new bridge, which is being built at the cost of the St. Pancras Vestry, has been designed by Mr. W. B. Scott, C.E., and will be a great improvement on the old structure which it replaces. The bridge consists of five wrought-iron girders on Aberdeen granite bed stones, which rest on massive brick abutments, on the north and south sides of the canal. The foundations of the abutments are on a bed of concrete, 2 ft. 6 in. in thickness, which rests on the London clay, 12 ft. below the bed of the canal, and reached during the borings. There is an exceptional peculiarity about the girders, which rise up several feet above the level of the carriage and footways. The central girder divides the carriage-way in a manner similar to that in which the up and down lines are divided by the bridges on several of our railways, whilst the two inner east and west girders respectively separate the footways from the carriage-way, the two outer girders forming the parapets. Another novel feature in the construction of this bridge consists of two of the girders (those between the footways and the carriage-way) having been so constructed as to be utilised as gas-mains. These mains, formed in the girders, are 34 in. in diameter. They are made perfectly gas-tight, the expense of this portion of the work being borne by the Gas Light and Coke Company, with whose mains they will be connected at the north and south sides of the bridge. One of these girder-mains was tested on Monday, the 6th inst., whilst we were present, by the gas company's officials, the results of the testing being perfectly satisfactory. The platform of the carriageway and footways will be built upon the lower flanges of the girders, which, whilst it will materially reduce the gradients and improve the approaches to the bridge, will at the same time maintain sufficient headway for the barge traffic on the canal. The roadway over the bridge will be formed of cross and longitudinal girders, covered in by curved floor-plates and bituminous concrete, the face of the roadway being laid with wood pavement. The upper portions of the main girders will be surmounted by ornamental cast-iron work, with stone pilasters at each end supporting handsome iron columns and globular lamps. Each side of the main girders will also be ornamented with panelling and mouldings. A new towing-path has been constructed in front of the north abutment. It is 10 ft. in width, leaving a clear water-way of 40 ft. as against 22 ft. before the old bridge was removed, being nearly double what it was formerly. It is continued round the north-west side of the abutment, and comes into Chalk Farm-road on an inclined plane.

The works are in a very forward state. The whole of the girders are already fixed, and half the bridge has been thrown open to the public for traffic. The tow-path, incline, walls, and railings are in an advanced state, and the bridge will be entirely completed and opened in a few weeks. The roadway and approaches, which at present are only of a temporary nature, show the great improvement which has been made in the gradients. It may be stated that in order to expedite the completion of the undertaking the works have been in progress both day and night, and by the aid of temporary wooden bridges the traffic has not been interfered with.

The contractors are Messrs. Wall Brothers, Mr. Duguid acting as superintending engineer, and Mr. Abbott as clerk of works.

MONUMENT TO THE LATE MR. DINGWALL FORDYCE, M.P.

The tenantry and friends of the late Mr. Dingwall Fordyce propose to erect a monument to the memory of that gentleman, according to a design furnished by Mr. Matthews, architect, Aberdeen. The proposed monument, which is in the Roman style, is in the form of a steeple. 15 ft. square at the base, and rising to a height of 84 ft. Above the square base rise three stages or sections, the highest tapering to a point. The lowermost stage is about 23 ft. in height; and on one side there is an opening with iron gate, arched top, and moulded archivolt. The second stage has a niche on each side with splayed base, arched top, and sunk panel, in one of which, over the gateway, is space for an inscription. The third stage is octagonal, and is about 17 ft. in height, with arched openings on each side, and pilasters at the corners. The fourth or topmost stage is a tapering spire.

The site selected for the monument is the Hill of Culsh, in the vicinity of the village of New Deer.

The monument is estimated to cost 500*l*.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

This Society held its first meeting for the present session on the 7th inst., at 9, Conduit-street, Dr. Birch, president, in the chair. The following papers were read:—"Memoir of the Life and Labours of George Smith," by W. St. Chad Boscawen. In this *éloge* a grateful tribute was paid to the memory of an Assyriologist whose life and labours were from the first associated with the interests of the Society. "Notes on the Himyaritic Inscriptions contained in the Museum of the Royal Asiatic Society of Bombay," by Captain W. F. Prideaux. This paper contained an analysis and translation of several interesting votive inscriptions, two of them being of some length, and forming an important addition to Himyaritic philology; also "Some further Notes and Observations upon the preceding Inscriptions," by Dr. Heinrich Müller. This paper consisted of further critical remarks written by the author at the request of Captain Prideaux. An interesting paper "On the Writings of Ephræm Syrus" was read by the Rev. J. M. Rodwell, M.A. The last paper of the evening was read by Mr. C. T. Newton, of the British Museum. It was on a Greek inscription from Caria, and its interest lay in its bearing on the Carian language, which as yet may be ranked among the unknown tongues.

The Society of Biblical Archæology have just taken rooms for their library at 33, Bloomsbury-street, which will be shortly opened, and will thus give members the advantage of being able to consult works all more or less bearing on the subject of Biblical knowledge. The Society has now existed since 1871, and its members have very largely increased in number.

THE WAR OFFICE, PARIS.

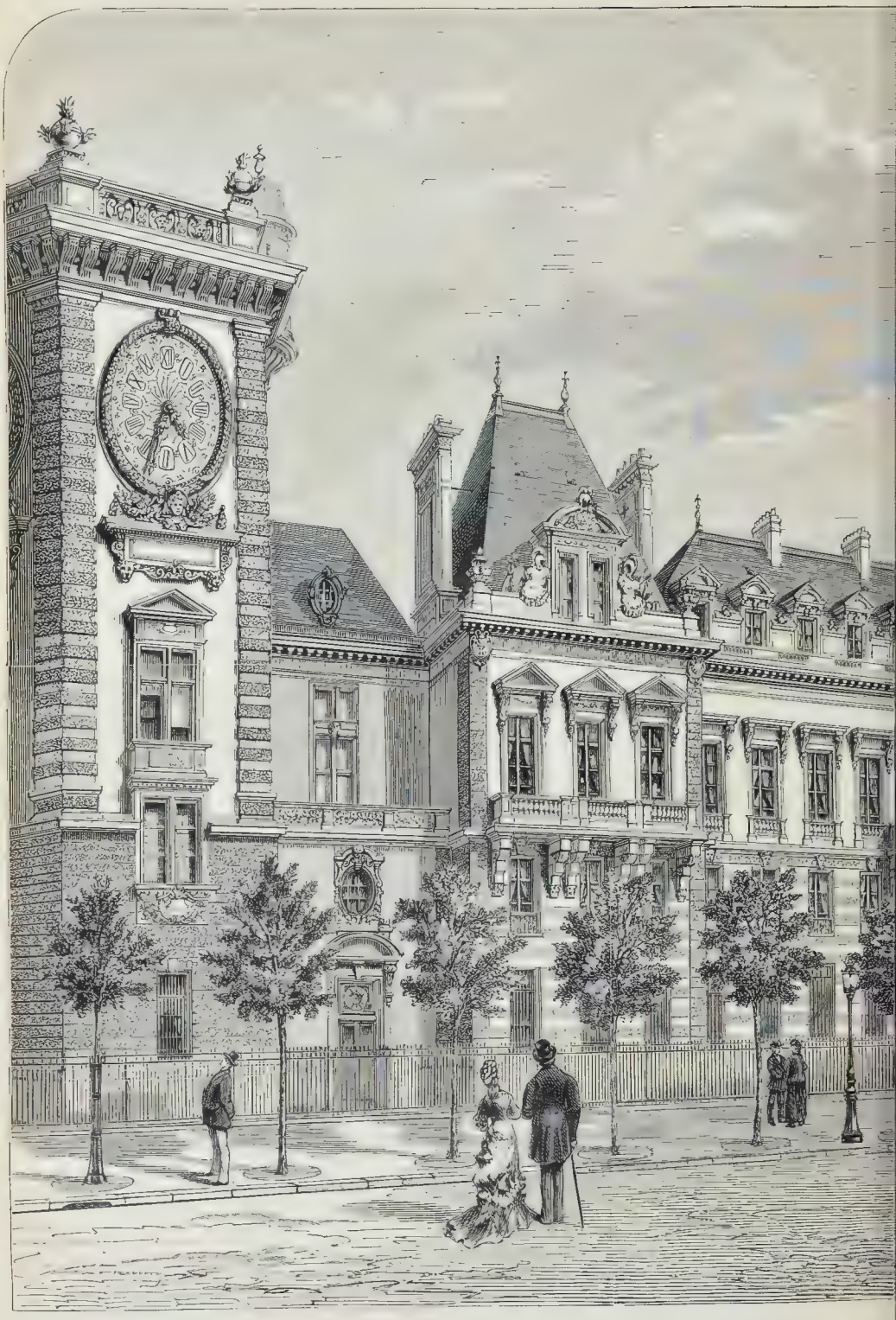
One of the most important works undertaken by the municipality of Paris is the construction of the Boulevard St. Germain, commencing at the Pont de la Concorde and terminating near the Jardin des Plantes. The piercing of this boulevard will disturb the quiet old legitimist quarters, and the late *royal fournisseurs* of the Rue du Bac will be put to confusion. Further away, workmen have already laid low a portion of the Rue de l'École de Médecine, and the Rue Larrey has completely disappeared. It was in the back room of a wine-shop which stood at the corner of this street that the terrible trio, cynical Marat, blustering Danton, and cunning Robespierre, *toujours gentilhomme*, nightly met to prepare the list of next day's victims. The only object of interest worth preserving (an old *tourelle*) has been deposited in the Carnavalet museum. Trees are already planted in this portion of the new thoroughfare, and light and life abound.

When the commencement of the Boulevard St. Germain was completed, now more than twelve years ago, the Imperial Government charged one of their architects, M. Bouchot, with the construction of a new façade to the War Office. The work was begun in 1867, and continued without interruption up till 1870; it was then discontinued on account of the war and the Commune, and recommenced at the end of 1871 It was finished on October 20th, with the exception of the interior arrangements.

The two façades, the old in the Rue de Solferino, and the new one on the Boulevard St. Germain, forming, as they do, a very obtuse angle, M. Bouchot boldly ventured upon the elevation of a tower, which harmonises admirably with the remaining part of the façade, consisting of a central pavilion, on the pediment of which, in the centre, is seated an allegorical figure of France, with two lions reposing at her feet; over the portico is a finely-sculptured head of Hercules; and emblems of war form the remaining portion of the decorations. Over each window on the first story are sculptured heads of mythological heroes. This central pavilion is flanked by two similar ones, less richly decorated.

The decorative sculpture was executed by M. Hamel, under the direction of the architect. The heads, figures, and trophies are the work likewise of M. Hamel, and of a very talented carver, M. Duchoiselle; the lions are the production of M. Rouillard, sculptor, professor of drawing at the Government National School of Design. The total cost of the building amounts to 2,400,000 francs (96,000*l*.)

Tunnel Building.—Mr. John C. Trantwine C.E., of Philadelphia, has patented a new method of constructing sub-aqueous tunnels. He proposes to abandon the usual method of tunnelling under the bed of the stream, and in its stead to construct the tunnel above water upon a strong, solid, wooden platform, several feet in thickness, which shall serve as a base for it to rest upon after it is finally deposited in its place. The tunnel and its platform are to be sunk into a trench dredged across the bed of the stream for their reception, the depth of which, varying with circumstances, will sometimes leave the greater part of the tunnel above the bed of the stream, and at other times it will be more or less below it. In either case the tunnel may, if necessary, be protected from injury by ice or other floating bodies by being surrounded by loose earth and stones. When the bottom of the stream bed is soft or unstable, piles must be driven to receive the platform.



THE WAR OFFICE: BOULEVARD ST



MAIN, PARIS.—M. Bouchot, Architect.

ARCHITECTURAL TEACHINGS IN AMERICA.

AMERICAN INSTITUTE OF ARCHITECTS, PHILADELPHIA.

THE closing address at the tenth annual convention of the American Institute, already referred to, was delivered by the Rev. Dr. E. L. Magoon. Parts of it were greatly disfigured by sectarian feeling. We print the concluding portion of it. After some good set abuse of Wren, and pointing to the restorations at Ely and Chester, to show that, "so far as an architect feels repugnance to Catholic dogma he is incapable of reproducing Mediæval art, even when the purest specimens are directly before him," the lecturer said,—

Look out upon this goodly city, or any other of our land, and you will see at a glance a score of pretentious churches, with towers guiltless of bell or clock, having spires that taper away into nothing but glaring ball and pointed iron bar,—a pumpkin and poker,—absolutely nothing more! Why allow yourself to be a party to such absurd perpetrations? As obelisk and cupola are irrelevant to Greek entablatures, a true spire is an architectural impertinence upon any structure either Byzantine or Romanesque. Upon a Christian edifice no summit is complete without its congruous finial, and the crowning apex never properly ends but with that divine emblem alone, by which, from nave, transept, and sanctuary foundation, up through a thousand converging lines, all was inspired and unified, the cross. It costs no more to build consistently than absurdly. Architects who understand their business know that 1,000 or 10,000 dollars can be put into chapel or church of rustic materials, free of all constructed ornament, and yet marked by as true lines of distinctive beauty as any metropolitan fabric that has cost millions to execute. Are you applied to for a specific design? Ask where and for what use is the prospective edifice, and at what cost. You know the material, see the ideal, and indicate in sharp outline, the perfected creation to be realised. That done on your part, the elaborated plan which was carefully studied, each separate member in its relation to every other, as an organic whole, may, to please capricious whim, or shrink under parsimonious demand, be outrageously mutilated. Well, let the pious parties so murderous in their conduct be speedily hanged without benefit of clergy. It is a sad necessity, doubtless; but better that a few nuisances be put under ground at once than that a disfigured masterpiece of art be obtruded upon the agonised public in perpetual gaze. In all true architecture it is impossible to separate the soul from its body; as in the vegetable and animal kingdoms, every integral part is the result of structural necessity. In nature, this organic law admits of exemplification infinitely diversified, and no less in art, as Mediæval works most abundantly attest. Then, the exponents of a vital growth did not struggle to adapt fresh conceptions to effete forms, but perpetually modified antiquated shapes, thereby playing forth with yet gladder freedom the full advantages of new ideas. A competent architect will create beauty out of the means that are furnished him by the nineteenth century, as in the thirteenth a prodigious number of churches, palaces, and châteaux, all different in plan, were achieved, yet each one as original in form as it was related to distinctive time and use. Wealth is most wisely used in giving grandeur to public works, adding ornament to utility, and shedding splendour on the profitable, thus rendering every structure connected with popular progress a monument of national magnificence. The divinest authority taught that artistic excellence is not extravagance, but beneficent thrift.

Architecture commemorates departed nationalities when their dominion is no more. It is our high privilege to rake the ashes and garner the wealth of universal remains, striving to emulate when we can neither rival nor restore. To strip earth of foliage, and reduce it to a naked ball; shear the sun of his beams, and blot effulgence from the stars, would be no more devastating to physical welfare, than it would inflict mental injury to ignore the ennobling influence of architecture on mankind. The bases of the arts touch each other, and no devotee can be expert in either who does not earnestly relish all. Magnanimous admiration appropriates the excellence it confronts, while ungenerous depreciation is its own punishment, because envy is impotency. Since God will not have His work made manifest by one who is ashamed of truth anywhere, the cowardly are never creative. Only as divine integrity kindles the fearless but friendly heart will fluent fingers elaborate works divine.

Every nation can do something which others cannot, showing that the net amount of mankind does not greatly vary. As each person is superior to all others in some individual faculty, that one is altogether the noblest who most assimilates himself to the best in each competitor, and so aggregates every variety of worth. We are most divinised by closest contact with truest symbols of divinity, those temple glories which have been the culture of humanity in all ages. In their presence the mind spontaneously opens, responsive to laws which traverse the universe, suggest infinite relations, and inspire the wish to admire evermore. In rendering worship to exalted worth, we elevate ourselves, and just so far as we evince sensibility to superior merit we are by it imbued. Great masters raise us from our own dead level by their generous aspirations; they lift us into the magnificent scope of their own free souls, and endow us with a more heavenly existence. Lapsing centuries only add preciousness to such men and their works; time, which defaces or obscures the fairest things, but dissolves temporary mists which overshadow them, and they reappear with enhanced splendour to the clarified vision of remotest generations. Great architects are ever-living wealth. They constitute the foremost life of the eras to which they pertain, and send vitality down to ages which long after supervene. There is a power in architective genius to quicken disintegrated clods. The dead in the limbo of extinct marvels hear it, responding to its call in the resurrection of a newer and more divine existence. At ten o'clock in the evening of October 11th, 1492, near this very hour, lurid light was first seen by Columbus on the eastern shore of a new hemisphere. Out through the dusky view before the great discoverer that night lay a whole world of all possible productiveness. And so, from the terminus of our first century in national progress, we contemplate the magnificent domain of predestined development. You cannot fail to perceive in sublime perspective the noblest arena ever offered to artistic competition, nor will you cease to ennoble your own manhood as the best guarantee of professional success. The Divine Architect has designed earth as an institute in which Himself is superintending the education of our race. Therein we should learn that the true, the beautiful, and the good are exactly co-ordinate, and neither of them can fully effect its end without the co-operative ministry of its associates in every sphere. It follows that the æsthetic virtue is its own reward. As the love of nature grows with the study of nature, so delight in art deepens and strengthens with magnanimous progress in devout pursuit. The laws of earth and heaven are connate, centralised in the human soul, that microcosmic temple wherein all creativeness unfolds. Parthenon and Pantheon, Santa Croce and Cologne, are only specimen copies after a divine model as yet but inadequately expressed. According to classic legend, Helen, when she explored nature for a model of a golden cup that she should offer upon the altar of Diana as perfectly beautiful, found nothing more exquisite than her own bosom. Nor is there anything in creation we can present to the Creator more worthy or acceptable than our own immortal being, when fairly dealt with and elicited. May each of you exemplify masterly skill in all charming design, and execute in your own person a consummate temple of the Holy Spirit.

ARCHITECTURAL ASSOCIATION.

THE first ordinary general meeting of this Association for the present session was held on the 10th inst., Mr. H. C. Boyes, president, in the chair. The following new members were elected, viz., Messrs. R. C. Gleed, C. M. Hudson, J. Bilson, F. W. Watts, A. S. Gover, J. J. Downes, R. F. Piotrowski, F. G. Coward, T. Townsend, H. T. Sugden, G. L. Luker, E. J. Butcher, W. G. Scott, J. E. Hatch, J. Irwin, jun., S. Everitt, J. Tolley, jun., G. Mann, A. Causton, T. W. Barry, and J. Smith.

On the motion of Mr. Aston Webb, the thanks of the Association were accorded to the entertainments sub-committee of the Association for their labours in connexion with the opening *conversazione* of the Association, and to the various gentlemen who had lent objects for exhibition on that occasion. Special mention was made of the services of Messrs. T. W. Cutler, H. H. Stannus, and R. Phené Spiers.

The Annual Report.

Mr. Hayes moved the adoption of the annual report, of which the following is a brief summary:—The committee congratulates the Association, not only upon the large number of new members* elected during the past year, but also upon the increased support given to the different classes, and the greater interest taken by the members in the working of the various branches. After detailing the work of the past session, in the shape of prizes competed for and papers read and discussed, the report goes on to say that an examination of the reports of the various classes shows that a larger number of names was entered, and that the attendance throughout the session was also better, than usual. "It is satisfactory to be able to add that the quality, as well as the quantity, of work sent in, shows the earnestness of the members, and their desire to carry out the objects of the Association." The Library has been used by as large a number of members as in any former session, although the number of country members availing themselves of its advantages has been less than usual. An important change has been made in the constitution of the Association during the past session, which has enabled the Birmingham Association to become a provincial branch of the London Association. "Perhaps there has scarcely yet been time for the committee to form a decided judgment of the advantages which may be derived from this step, but at least they may remark on the good feeling it has promoted between the students of London and the provinces, which, it is hoped, will strengthen the Association, and extend its usefulness. Many country members have availed themselves of the facilities for joining in the work of the Association, and the labour thrown on the secretaries of the classes and the librarian, by them and by the branch society, has been loyally and efficiently performed." The committee acknowledge the receipt of donations to the Prize Fund from Messrs. Quilter, Barnes, Boyes, Ferrey, Mathews, McLachlan, and Todd. The Architects' Benevolent Society has again received support from the members of the Association, and the committee invite further subscriptions to this most useful Institution.

The report was adopted, and on the motion of Mr. Douglass Mathews, treasurer, the balance-sheet for the past session was also adopted. The total income for the year was 496*l.* 16s. 9d., including 341*l.* 13s. 6d. for members' subscriptions, 59*l.* 6s. 6d. for new members' entrance-fees, and a balance in hand at the commencement of the financial year of 10*l.* 13s. 3d. The total expenditure (including 30*l.* granted to the library) was 447*l.* 16s. 2d., leaving a balance in hand of 49*l.* 0s. 7d. The assets are put down at 633*l.* 12s., including arrears of members' subscriptions, estimated at 100*l.*, and estimated value of library, furniture, &c., 465*l.* The liabilities are only 45*l.*, leaving a balance in favour of the Association of 588*l.* 12s.

Library.—Mr. Pownall, the librarian, read the report of the Library Sub-committee for the past session, which stated that during the year 3,264 books had been taken out by the members, or rather more than 40 every time the library had been opened. Only five country members had availed themselves of the privilege of obtaining books from the library, owing, probably, to the expense of carriage. 30*l.* had been voted to the Library Fund by the Committee of the Association, and many donations in books had been made, notably by Mr. Edmund Sharpe, Professor Hayter Lewis, and the Council of the Royal Institute of British Architects. The best thanks of the Association were due to the various donors. The library now contained 800 works, 80 of which had been added (29 by presentation) during the past year. The amount received in fines for undue detention of books was 7*l.* 19s. In most cases it was believed that these fines were not incurred through inadvertence, but intentionally, the borrowers of books cheerfully paying a small sum for the use of the books beyond the time allowed by the rules. The receipts of the Library Sub-committee from all sources amounted to 45*l.* 8s. 3d.

Class of Design.—From the report of this class (read by Mr. Trubshawe), it appeared that the total number of members who joined the class at the commencement of the session was thirty.

* The "Brown Book" of the Association, issued before the commencement of the present session, states that the total number of the Association's members is 673, of whom 555 are resident in London.

four. The average attendance of members at the class had been twelve, and the average number of sketches submitted, eleven. These figures were stated to compare advantageously with those of past years. The number of members who rendered themselves eligible for the prizes offered to the members of the class by contributing a minimum number of eight sketches, was eight.

Class of Construction.—The report of this class (read by Mr. Hemings) stated that the progress made during the past session had been, on the whole, satisfactory. The number of members had increased from sixty-four at the commencement of the previous session, to seventy-six at the commencement of last session, although the number of *working* members had not shown a corresponding increase, seeing that while 111 papers were contributed during the previous session, only 114 papers were contributed during the past year.

Elementary Class of Design.—Mr. Berry read the report of this class. During the session the average number of members present at each meeting was twenty, as compared with seventeen in the previous session, and twelve in the session before that. The average number of sketches contributed at each meeting was fifteen.

Architectural Science Class.—The report of this class, read by Mr. Hesketh, stated that during the session ten meetings of the class had been held, at which nine papers were read and discussed.

Colour Decoration Class.—Mr. R. L. Cox read the report of this class, which stated that the past session had been a very successful one, both in respect of the number of members attending and the amount of work done. The number of names enrolled was fifteen, and at the eight meetings of the class there were seventy attendances. Thirty-three designs were submitted, comprising forty-seven separate drawings. The Council of the Institute kindly allowed the members of this class the use of the Institute library for purposes of reference, and the value of this privilege was enhanced by the kindness of the librarian, Mr. Kershaw.

The President then proceeded to deliver his opening address to the members. The substance of the address will be found on another page.

In the discussion which followed,

Mr. Phené Spiers characterised the address as an extremely practical and useful one. In reference to the Architectural Examination, he might say that there had never been any idea amongst its promoters that it should be made compulsory. Indeed, it could only be made compulsory, he presumed, by Government, and it was not likely that the Government would ever lay down a law by which every architect would be obliged to pass an examination before he could commence to practise. Some men, it was well known, had by talent and indomitable industry risen from the workshop bench to a high position in the profession, and the institution of a compulsory examination would exclude such men,—a result which no one would desire. But what was wanted was the laying down of some curriculum through which a man must have passed before he was publicly recognised as an architect. At present, almost any one who chose to assume the title was regarded by the public as an architect. As an amusing instance of this, Mr. Spiers related that a house-agent was once called upon to give evidence on an architectural question which came before one of our police magistrates. The evidence was objected to on the ground that the witness was not a professional architect. The magistrate asked him whether there was any ground for the objection. His reply was, that although he had not been brought up to the profession himself, he had a brother who had been educated for the profession, and with whom he had been in partnership. It was true that his brother had not "followed" the profession, and it was also true that his brother had been dead for many years; still he felt justified in calling himself an "architect." This story, Mr. Spiers said, reminded him of the man who, when asked if he could speak French, said he had a brother who could play on the German flute; but, notwithstanding, the magistrate admitted the evidence! But if such men as this house-agent could find people who were willing to entrust him with the building of their houses, it was impossible to put a stop to such a state of things at present. What was wanted was that young architects should pass the Voluntary Examination in such numbers as to make it generally understood that the certificate of having passed was the best guarantee of its possessor's qualifications as an architect. He strongly urged the members of the Association to go in for the examination this year. The Institute had done all that could be expected of it in relation to the matter, and it behoved the younger men of the profession to do their part. Although the examination would never be made compulsory in point of law, he believed it would, sooner or later, become morally compulsory; for pressure would be brought to bear upon the Institute, with the view of making the Associateship of that body dependent upon candidates for that position having passed the voluntary examination. The Institute must sooner or later yield to the pressure so applied, and therefore all who wished to become members would do well to pass the voluntary examination. In conclusion, he moved a vote of thanks to the president for his able address.

Mr. Lacy W. Ridge, in seconding the motion, said it was not within the range of human probabilities that the architectural examination would ever be made compulsory; therefore that consideration might be at once dismissed. As a voluntary institution the examination had failed, or had only been partially successful, simply through the apathy of the younger men of the profession themselves, and from no other cause.

Mr. S. Flint Clarkson deprecated the "patronising" tone which was sometimes adopted by senior members of the profession in speaking of the Association.

A Member suggested whether it would not be possible to make some of the work done in the classes of the Association serve in lieu of the probationary work required of students at the Royal Academy, and of candidates for the District Surveyors' Examination at the Institute,—in other words, whether work once gone through under the auspices of one of these bodies should not be "taken for granted" by the other bodies? By some understanding of this kind, much needless labour would be saved.

Mr. H. H. Statham said he heartily concurred in the remarks made by the President as to the necessity of maintaining the utmost cordiality of feeling between the Association and the Institute, and he hoped that such feeling would continue to exist. As to the system of competition, the President had spoken in favour of its retention, but he (Mr. Statham) confessed that the longer he thought about it the more he felt opposed to it. Why should architects be expected to devote so much time and skill to the preparation of designs on the mere chance of being appointed to carry them into execution?

The President.—They ought to be paid for it.

Mr. Statham said he thought that would be rather a difficult thing to carry out. One of the arguments in favour of competitions was that they brought unknown men to the front; but promoters of competitions would not go to unknown men if they had to pay them. On the whole, he thought the disadvantages of the competition system by far counterbalanced its advantages. The aggregate amount of gratuitous work done by the profession in the form of competition drawings in one year was something enormous. The profession ought to enter its emphatic protest against the system.

Mr. Stannus defended the practical character of the architectural examination, and denied that it was an examination for which it was possible to "cram." Many of the questions put by the examiners to the candidates could only be answered by those who had gained experience by actual contact with bricks and mortar. It was said that it was impossible to examine in "design," but he maintained that it was possible to do so. The "five-hours' design test" of the examination might, perhaps, with advantage, be prolonged to two or three days; but as it was it afforded no mean test of a man's ability to design. As to the suggestion for combined examinations made by one of the speakers in the discussion, he did not think it would be advisable that work done under the auspices of one society or body should be counted in another. The president had spoken of the want of an architectural school, but a most admirable school existed at the Royal Academy, and if architectural pupils joined it in large numbers, it would most probably be greatly improved and extended in its scope.

The President having made a few remarks in reply, the meeting terminated.

The next meeting will be held on the 24th inst., when a paper on "Binocular Perspective and Natural Drawing" will be read by Mr. A. Frere.

THE ARTISANS' INSTITUTE, CASTLE STREET.

We have received from Mr. Samuel Morley, M.P., copy of a report by Mr. J. F. Iselin, H. M. Inspector from Science and Art Department, South Kensington, on the technical classes held at the Artisans' Institute, and which is very satisfactory. Mr. Iselin says:—

"In these classes an intelligent man can see and learn all the branches of his trade. Should one fail, he is ready without loss of time for another. Or if a foreman be selected for his knowledge of the general details of the manufacture, a workman who attends a class of this kind and takes full advantage of the instruction is eminently qualified for the post. In this way, therefore, as a connecting-link between the sciences of individual processes and the handicraft of the workshop, technical classes of the character which are carried on at the Artisans' Institute should, I believe, not only be of very great benefit to the workman, but might be instrumental in furthering the industrial progress of the country.

"Under the regulations of the Science and Art Department, no Government grants can be made in aid of such classes, but I think that nothing could be more worthy of the support of the manufacturers whose trades can be improved by the skill of the artisan, or of public bodies who can and will give money to raise the position of the working classes."

Mr. Morley adds:—"The subject is generally admitted to be of vital importance, not only to workmen themselves and their employers, but to the nation at large. But it is not easy to get the public (with all the numerous claims for pecuniary assistance put forward at the present time) to recognise the need of giving due support to an institution of the kind in question. Hence Mr. Iselin's remarks, at the close of his report, appear specially deserving of attention from large employers, and our wealthy and public-spirited City companies."

PUBLIC HEALTH AND THE WORKING OF SANITARY LEGISLATION.

At the seventh annual conference of Poor-law Guardians for the South-Eastern District, held at Reading on the 31st ult., Dr. Wells delivered an address on "Public Health, and the Working of Sanitary Legislation," dividing his subject into three heads,—1st. The habitations of the poor; 2nd. The removal of excreta from their homes; and 3rd. The supply to them of wholesome water. As regarded the first of these matters, he was afraid it must be admitted that in the majority of country villages the dwellings of the poor were neither conducive to health nor to morality. He quoted different authorities to prove the complete inefficiency of the present habitations of the poor, and remarked that the question for the conference to consider was the best mode of putting those dwellings into a healthy condition. A cottage for an ordinary family of the labouring class should be furnished with at least three bedrooms, though on some occasions two bedrooms might suffice. One sitting-room on the ground-floor should be laid with wood, as the brick or stone floors were not fitted for constant use, being under such circumstances injurious to health. The size of the rooms was as much a matter of importance as their number; for it was necessary to health that each inhabitant should be able to draw upon a certain number of cubic feet of air. To meet this requirement the rooms ought to be at least 8 ft. in height, and their cubical contents should be between 600 ft. and 900 ft. for bedrooms, and from 1,200 ft. to 1,500 ft. for the sitting-room. Then a proper change of air by means of ventilation must be provided. The facility of obtaining on necessary occasions a direct draught of air from one side of the house to the other was all important, considering how many generally occupied one room, and how much sickness might occasionally prevail in it. Windows should, therefore, open on both sides of a house. The formation of the windows themselves was of consequence. They should have sashes at the top, which was seldom the case, as well as at the bottom. Where these sash-windows could not be managed, a window swinging on a horizontal pivot was the next best arrangement, being superior to the old lattice. It was desirable, as much as possible, to avoid draughts, and a simple and well-known expedient for admitting fresh and getting rid of the effete air without creating unnecessary draughts, was by placing a plain flat board upon the sill of the window behind which the air came up into the room, and there were a hundred other plans for the same purpose. The roof should consist of tiles or slates in preference to thatch, and the walls of the apartments should not be covered with cheap papers, which harboured dirt and

insects, but so constructed that they might be washed with lime at periodical intervals. The means of improving or regulating the dwellings of the poor were much impeded by the fact that Rural Sanitary Authorities did not possess the same powers as those who presided over the health of towns. The power of making and enforcing bye-laws added immensely to the efficiency of all Boards of Health, affording a summary process of carrying out sanitary reforms; and there seemed no reason why Rural Sanitary Authorities should not possess such facilities. At present, all sanitary defects in existing houses in the country came under the head of "nuisances," and were to be dealt with under the 97th clause of the Public Health Act. It seemed very desirable that the rural authorities should be authorised to issue regulations respecting the proper construction of cottages, and to see that they were duly executed. Having thus obtained a properly-constructed domicile, they must endeavour to keep it in a healthy condition by a well-regulated removal from it of the refuse and excreta. The discharge-pipe from the sink should always empty itself outside the house, nearly 1 ft. above a perforated gully-plate. A trap should be placed under the plate to prevent the annoyance of foul smells in its neighbourhood, and the plate should be immovable by the inhabitants. It was necessary, in addition to trapping, also to ventilate the sewers by a shaft-pipe carried up above the eaves of the house, away from any windows, to discharge the foul gas. There were two principal modes of dealing with sewage, either of which might be adopted, according to the nature of the place and its surroundings—the one being the dry system, or earth closet, the other the water-closet system. One point it was absolutely necessary to bear in mind, whichever might be adopted, namely, all fœcal matter should be removed from the premises very speedily. In a well-ordered village, where the earth-closet system was adopted, a scavenger should be appointed to attend to the earth closets.

With reference to the supply of wholesome water to the houses of the poor, he said it had been estimated that 75 per cent. of the wells in the villages were more or less contaminated by sewage; out of 429 samples from different wells 307 were unfit for drinking purposes. The local authorities, rural as well as urban, appeared to be empowered to guard every cottage from impure water, and to require houses to be supplied with good water, if it could be furnished at a cost not exceeding two-pence a week. It was much to be wished that the question should be taken up by the Rural Sanitary Authorities, who were empowered to construct and maintain waterworks or dig wells, to hire or purchase any waterworks, or to contract with any person for a supply of water for their district or any contributory place therein. Where other sources of supply failed, recourse might always be had to the rain water collected from the roofs of the buildings or upon properly-prepared gathering-grounds. The average rain-fall for England and Wales was about 32 in. in the year. An inch of rain falling on an acre of ground realised 22,600 gallons, so that the total amount of rain during the year was 27,019,632 millions of gallons, and yet poor people in a dry season could get no water. It had been calculated that at present two gallons of water a head was all that was consumed in the day in a cottage, whereas from 10 to 25 gallons for each person for all purposes was the smallest quantity which should be provided.

Mr. Garland advocated the compulsory adoption of the earth-closet system in all rural places.

CHAPEL, COLSTON'S ALMSHOUSES, BRISTOL.

The chapel to these old almshouses (erected A.D. 1691) has been altered and embellished, and made more fit for divine worship. The building in plan consists of a rectangle, 24 ft. long by 18 ft. wide, and formerly had a flat lath-and-plaster ceiling, 16 ft. 6 in. from the floor. As the chapel is situated in the centre of one side of the quadrangle, with the almshouses flanking it, there are only windows at the east and west ends, the entrance being at the latter. The only interesting and architectural parts of the structure, *i.e.*, the high wainscoting round the walls, the angle pilasters, &c., and the oval west windows, have been preserved. The flat ceiling has been replaced by a semicircular wagon-headed one, with moulded ribs, forming panels and a carved cornice. A circular window, with Renaissance tracery, has been inserted in the east gable, and filled with painted glass by Messrs. Joseph Bell & Son, of Bristol, the subject in the centre being Colston distributing alms. The lower west windows are glazed with cathedral rolled glass in ornamental lead quarries. Oak stalls and altar-chairs, with altar-table and lectern, have been added, and a floriated cross to the east end. The floor is laid with polished parquetterie. One of Porritt's underground stoves warms the chapel. The works have been carried out by Messrs. Stephens & Bastow, builders, of Bristol; Mr. Honey, clerk of works to the cathedral, acting in the same capacity here. The cost has been about 350*l.*, which has been met by the Society of Merchant Venturers. Mr. Edmund B. Ferrey was the architect.

PARISH CLAIMS FOR ROAD-MAKING.

At Hammersmith Police-court, last week, Mr. Edmund Tattersall, of Coleherne Court, West Brompton, appeared to answer a second summons, taken out by Mr. Harding, clerk of the Kensington Vestry, calling upon him to pay a large sum towards the roads, &c., of Redcliffe-gardens, under the compulsory powers of the Metropolitan Local Management Act.

Mr. Hewitt, from the office of Messrs. Pontifex, solicitors, supported the summons; Mr. Bosanquet appearing for Mr. Tattersall.

It appeared from the evidence that Coleherne Court, house and grounds, abutted on Redcliffe-gardens, which were formed by the owners about ten years ago, partly on a parish footpath, known as Walnut-tree-walk, connecting the Fulham-road with the Richmond-road, Earl's Court. The owners paved the whole length of the road with the exception of that part abutting on Coleherne Court, which was left untouched up to the centre of the street. The vestry, in their resolution to pave that part, dealt with the whole length of the road; but the apportionment made by Mr. Weaver, the surveyor, was confined to one section only, not any of the expenses being apportioned on the other. The total amount of the apportionment was 350*l.* 19*s.* 7*d.*, 289*l.* 15*s.* 7*d.* of which were assessed on Mr. Tattersall. The first summons, which was dismissed, was for the estimated cost of the paving; the present summons was for the actual cost.

Mr. Bosanquet cited the case of "Whitchurch *v.* The Fulham Board of Works," in support of his argument that the Vestry were wrong in apportioning the expenses upon a section of the road only. His second objection was that it was not an apportionment, but an assignment to each house.

Mr. Bridge said his impression was that it was not an apportionment within the meaning of the Act of Parliament. The fairest thing would have been for the owners of the houses to have paved the whole street throughout. He then dismissed the summons.

The real point, as it seems to us, has scarcely obtained that recognition we should have expected. Walnut-tree-walk is an ancient parish way, next Mr. Tattersall's garden-wall, and has been repaired by the parish again and again. How can it be deemed a new road, which condition is necessary in order to make him liable? The widened way, like the old way, is used by the public and not by Mr. Tattersall, except as one of the public if he wish to go south. If the parish should ultimately succeed in so framing their case as to compel the defendant to pay the large sum of money claimed, it will be one of a series of injustices to which individuals have been subjected under the same clauses of the Metropolitan Local Management Act.

ST. NICHOLAS, SEVENOAKS.

Sir,—In your notice, under the head of "Church-Building News," of my report on St. Nicholas, Sevenoaks, last week, there is an error in quoting from my history of the church which I think it worth while to ask you to correct. Instead of saying, as quoted, that "the interior of the *church* was entirely reconstructed in the fifteenth century," I said "the interior of the *chancel*," which is very different. I should be sorry that any one who knows the church should suppose it possible that I could make such a blunder, and for this reason I write.

Ewan Christian.

TOWN IMPROVEMENTS AT WOLVERHAMPTON.

The town council of Wolverhampton are about to carry out extensive street improvements, for which they have purchased a large amount of property, and they have also decided to adopt the Artisans' Dwellings Act. This subject was discussed at a meeting of the council held last week, when Mr. Butler, one of the members, remarked that the prospect of the adoption of the Act was already diminishing the number of artisans' dwellings, whilst, in consequence of its not paying to put up such dwellings on the present plan, a great difficulty was arising, which might be met if the corporation would, as an experiment, erect blocks of buildings to be let out in groups of rooms on the new principle, and then, if the plan succeeded, doubtless private persons would come forward and build such dwellings. Several other members expressed themselves in favour of the suggestion, observing that there was a great deficiency of house accommodation in the town for the working classes. On the other hand, the ex-mayor expressed an opinion to the effect that the artisans of the town, having been accustomed to single and complete houses, would not take to such general dwellings as those suggested. Another member (Mr. Hill) protested against the corporation turning house builders and owners. In answer to a question as to the provision to be made for those whose dwellings were about to be demolished by the adoption of the Act, the town clerk said that the Act required the corporation to provide land on, or adjacent to, the condemned area, on which dwellings could be erected, before they pulled down the dwellings within the area, and there was plenty of land available in connexion with the improvement in question.

CHURCH BELL FOUNDING.

The bellfounders of the metropolis have of late years been well employed, consequent on the rapid increase of new churches, and some delay has to take place in executing orders.

A new foundry has been successfully commenced at Bideford, in the county of Devon, at some expense.

Recently, the first peal of church bells were cast for the ancient Church of St. Mary, Bideford. In order that the work should have no hitch, the founders, Messrs. Abbot, have had constructed on the premises a framework of well-seasoned oak, with all necessary tiebolts and stays, and the bells are first hung here for trial, prior to fixing them permanently in their proper places.

The old bells of the church had got cracked and out of tune, being cast in 1722, by the old bellfounder, Abraham Rudhalls, of Gloucester, a descendant of a family whose bellfounding dates back to the time of Henry VIII. The process has not greatly deviated from that period. At present the first necessary thing is to decide what note the new bell shall be. Resort is also had to mathematics, for by calculation alone are the relative sizes, &c., obtained. Having arrived at the proper form and dimensions, a mould corresponding with them is produced in sand prepared for that purpose, and placed in iron cases. The alloy of metal for casting bells is made from selected copper and tin fused together in a furnace of special construction. Where expense is no object silver may be employed, which adds to the mellowness and sweetness of tone. When the alloy is thoroughly and effectively made it is run into ingots, which are again melted in the bell-furnace. When the metal has arrived at a proper state of fluidity for running, the aperture in the furnace is opened, to allow the molten metal to flow into the channel communicating with a large cup or vessel made of a refractory material, and under which, in a pit, is made the mould for the bell. When, in the judgment of the workman, a sufficient quantity of metal has run into this cup, he withdraws a plug, and the liquid mass descends rapidly and silently into the bell-mould. The above is the *modus operandi* in this new foundry.

As a rule, the pitch of a bell is higher the smaller it is, and when a less quantity of metal is used than is due to the calibre of the bell, although giving the same note, a harsh, instead of a mellow, rich tone is produced. Hence the superiority of some of the old bells over those of modern construction, where economy has been of more consideration than correctness of tone.

The old tenor of Bideford Church,—weight,

1,606 lb., cast 1722,—had the well-known inscription on it,—"I to the church the living call, and to the grave do summon all." The inscription on the new treble just cast is,—"Let everything that hath breath praise the Lord. Praise ye the Lord.—Ps. cl."

GOLDINGTON HALL, BEDFORDSHIRE.

This interesting old English home is being thoroughly restored for the Misses Harvey, under the superintendence of Mr. John Day, architect, of Bedford. Mr. Day's designs not only embrace a thorough restoration of the old work, but very extensive additions; the whole being in accordance with the Elizabethan character of the old work. The greater part of the main front is old work; a new wing, however, has been added to one end. The grouping of the new portions in the garden front especially is picturesque. The dressings are of Bath stone, whilst the walls generally are of red brick interspersed with diamond-shaped bands of similar material, but of a darker hue. The roofs are covered by red warm-looking tiles of pleasing tint. In the interior, the ceilings are of a deeply-recessed panelled oak work, the ribs being richly moulded. A carved oak mantelpiece in the hall is a notable feature. It is carried right up to the ceiling, and exhibits a wealth of carved and moulded work. The massive oak staircase is similarly treated, and is terminated upon the floor above by an open oak screen of carved work, also reaching up to the ceiling, and forming an arcade. The carved work in wood and stone is from the chisel of Mr. Harry Hems. The contract for the whole of the works generally at Goldington Hall is being carried out by Mr. Spencer, builder, Bedford, under the immediate supervision of the architect.

WINCHESTER SCHOOL OF ART.

This institution, accommodated for the past two years in the Close by the dean and chapter in one of their houses, has now entered on a new existence, so far as its habitation is concerned, the ratepayers having been taxed to build a new school close to the Guildhall, where Mr. Stopher has designed and supervised the erection of a building which is a bolder example of Gothic than the Guildhall. The cost of the building has been upwards of 2,000*l.*, and even allowing for the small sum furnished by the authorities in London, the ratepayers will incur at least this, if not a larger sum. The materials used in the new building are flint and stone, and the subjects of the caps of the columns, &c., taken are from local botany. The builder was Mr. Macklin. The opening of the school and the exhibition of the "works" of the students, and the presentation of the prizes, took place on the 3rd inst., the duty being undertaken by the Earl of Northbrook. The interior of the new building includes in the basement a public reading-room and attendant's apartment, and upstairs are the "school,"—a panelled-ceiled room, some 60 ft. by 30 ft., and of proportionate altitude, divisible into three by curtains,—a ladies' retiring-room, a curator's room, &c.

The committee report that Mr. J. H. Tanner has been appointed master, in the room of Mr. C. M. Clarke.

NEW FREE LIBRARY AND MUSEUM FOR DERBY.

Six years ago, last May, a public meeting of the ratepayers of Derby was held in the Guildhall, at which it was unanimously decided to adopt the Free Libraries Act of 1855. A Free Library Committee was formed to give effect to the wishes of the ratepayers, and an arrangement was shortly come to, by which the County Library, with its extensive premises in the Wardwick, together with a large collection of books, and the existing contents of the Museum, were transferred to the town for the purposes of the newly-established institution. To this nucleus was added a large assortment of modern standard works. So largely was the Free Library made use of by the inhabitants of the town that it soon became manifest that the premises in the Wardwick were structurally inadequate and unsuitable for the purposes of the institution. The want became known, and Mr. Bass, M.P., the senior member for the borough, with his usual generosity, made an offer to give a sum of from 4,000*l.* to 5,000*l.* for the erection of new premises for the Free Library and Museum. The offer was at once accepted with thanks by the Council, and, after some delay,—necessitated by the desire of all parties to obtain the best available site in the town for the new institution,—the present Free Library premises in the Wardwick were purchased. Plans for the new building were then advertised for, and that which found most favour with the committee was the design of Mr. R. K. Freeman, of Bolton. Mr. Bass approved of the choice of the committee, who, however, candidly informed the hon. gentleman that the carrying out of Mr. Freeman's plan would cost,—not 5,000*l.*, but a good deal over 7,000*l.* Mr. Bass at once said that he should have great pleasure in increasing his gift to 8,000*l.*, and that is now the amount at the disposal of the committee for the erection of the new building, which is estimated to cost about 7,600*l.* The new building will stand in the Wardwick, on the site of the old Library. The plan is as nearly as possible a square.

The style of the building is Early Gothic. The front elevation has the entrance-hall carried up as a tower with octagonal angle piers, finished with open timber turrets. The central part of the tower is also of open timber work, surmounted by circular roof. The wings have the roofs hipped back, and the ridges finished with wrought-iron ridge-cresting and finials. The space between the tower and wings is arcaded in both stories, but in general treatment it is subordinated to the more important parts of the design. Large oriel windows, with splayed angles, are placed in the wings, and a circular one is over the main entrance.

The exterior of the building will be faced with Derby pressed bricks, with moulded strings, arches, &c., of Coalville bricks. The dressings, oriel windows, turrets, &c., will be of Stourton stone. Terra-cotta, specially designed, will be introduced in panels and other places.

The staircase, corridors, steps to front entrance, &c., will be of Hopton Wood stone, polished. The roof will be covered with strawberry-coloured Broseley tiles. The glazing of the windows and screens in the principal parts will be of cathedral glass, of different tints, in lead lights, arranged in geometrical patterns. The internal joiners' work will be of yellow deal, painted. Special attention has been paid throughout to thoroughly efficient lighting and ventilation. The contract for the whole of the works has been let to Messrs. Woods & Son, of Blackburn, the amount of their tender being 7,600*l.* Mr. R. K. Freeman, of Bolton-le-Moors and Derby, is the architect.

PROPOSED AQUARIUM AND WINTER GARDEN FOR TORQUAY.

A scheme has been proposed at Torquay for the erection of a winter garden, aquarium, and skating-rink, upon the site known as the Braddons, on the Babbicombe-road, between the post-office and the museum. According to the scheme,—now in the hands of the "Torquay Aquarium, Winter Garden, and Skating Rink Company,"—the grounds are to be laid out in an ornamental manner, with walks, promenades, and skating terraces. There will be two distinct buildings upon the ground,—the aquarium and winter garden, and the skating-rink, the latter of which will be capable of conversion into either a closed or an open-air rink. The winter garden and aquarium building will be of Italian type, having a frontage on the Babbicombe-road of 320 ft., and standing behind terraces some 40 ft. above the level of the road. The first division entered will be 40 ft. square, and will probably contain six tanks round the sides and a large fountain in the centre, over which will be a glass dome. Going straight through the winter-garden portion, which will run the whole length of the building, the next division entered will be 70 ft. long by 40 ft. wide, and will contain large tanks and beds along the sides, with three octagonal ones down the middle. Next will come a large concert transept, which, including the stage and dressing-rooms, will be 110 ft. long by 55 ft. wide, and at the back of this transept will be waiting-rooms and an entrance-lobby. Crossing the transept two divisions similar to those first passed through will be entered, the last having a dome and fountain. The main dome of the building will be over the concert transept. To the right of the two last divisions of the winter garden will be a refreshment-room, large dining-room, and a complete suite of ladies' rooms; service-rooms, kitchen, larder, and store-rooms being farther back still. Leading out of the second division of the winter garden, on the right, will be the entrance to the tank section, which, exclusive of a large corridor at the back, will measure 120 ft. by 75 ft., and will contain thirty-one tanks placed in two sub-divisions, one being set apart for fresh water and the other for sea fish. The basement of the building will contain huge reservoirs for both salt and fresh water, and will hold the heating apparatus. The second floor will be set apart for science and art.

The cost of the scheme is estimated at about 30,000*l.* The plans have been prepared by Mr. John Watson, architect.

CAVENDISH COLLEGE, CAMBRIDGE.

The proceedings connected with the opening of the new Cavendish College, Cambridge, took place on the 26th ult. The ceremony was performed by the Duke of Devonshire, Chancellor of the University, who laid the foundation-stone of the building, which is situated opposite what is known as the road to Linton, about two miles out of the town. This is but the first block of a building that is to accommodate 300 students. At present only about 70 of that number can be received. The plan of the portion erected is cruciform, 110 ft. from east to west, and 70 ft. north to south. The building is four stories high, and in addition to apartments for students there are tutors' rooms. On the ground-floor, which is 14 ft. high, there are rooms in common, 14 ft. by 25 ft.; dining-hall, 46 ft. by 18 ft., with central hall, &c. The style of architecture is Tudor, and the material used is red brick with stone dressings, covered with Staffordshire tiles. The space of ground purchased is about ten acres, and the company by whom the college is built have done their utmost to secure the comfort and health of the residents. The work has been entrusted to Messrs. Giles & Gough, of London, architects; and Mr. Thoday, of Cambridge, is the builder. Concerning the objects of the college, the main feature of the institution is to place a University education within the reach of those who are obliged to commence the active work of life at an earlier age than ordinary undergraduates.

STREET IMPROVEMENTS.

In consequence of the opening of the new and broad throughfare, Fitz-John's-avenue, from the top of St. John's Wood, across the Conduit-fields to Hampstead, it has been found necessary to improve the access to it from the High-street and Heath-street; and the Hampstead Vestry have now before them three plans for the carrying out of this scheme practically. Two of these plans would involve the widening and partial demolition of Perrin's-court and of a portion of Church-lane at a cost of from 11,000*l.* to 14,500*l.* A third scheme has also being laid off before them for the continuation of Fitz-John's-avenue and the Greenhill-road by a gentle and graceful curve to the bottom of Heath-street, thus making one continuous thoroughfare from St. John's Wood up to the top of the Heath itself, near "Jack Straw's Castle." This thoroughfare, it is estimated, would cost about 45,800*l.*, out of which upwards of 21,000*l.* could be realised by the sale of the freehold land not actually required. Each of the two first-named plans shows an estimated increase of about 850*l.* upon the annual rateable value of the property as it now stands; but the third scheme, if carried out, would raise the rateable value from about 1,700*l.* to upwards of 3,550*l.*, or about 60 per cent.

Some months ago it was resolved by the Metropolitan Board of Works to widen the Harrow-road, by which access is obtained by omnibuses and other traffic from Paddington-green to the Edgware-road. In consequence of that resolution, notices were served in due course on the occupiers of all houses on the north side of the road, who, within the last week or two, have made an exodus in the wholesale, and on the 6th inst. Messrs. Horne, Eversfield, & Co. offered for sale by auction the vacated premises as building materials. The first four houses on Paddington Green also are to come down along with the rest, and a like fate, within the course of the next week, awaits the small, crowded, and gloomy tenements in the rear of the houses in Harrow-road, known as Lion-passage, White Lion-place, Vine-place, and Alfred-place. Among the houses which will disappear are the old inn bearing the significant sign of the "Horse and

Sacks," reminding us of the old days of pack-horses, and also "Paddington House," at the south-east corner of the Green, a mansion which was built by a citizen of London, who retired with a fortune to that rural quarter in the reign of Queen Anne.

The road will be thrown back about 20 ft. or 30 ft. all the way, and new shops of an imposing appearance will be erected on the site of the buildings now about to be demolished.

NORDEN'S MAP OF LONDON.

SIR,—I think the last paragraph in the article on Old London, in last week's *Builder*, is unjust to the memory of Norden, for there is no reason to believe that Van den Keere did anything more than engrave the map, and Norden allowed him to take all credit due to him. Norden seems to have been a very painstaking surveyor. I suspect we had no engravers of sufficient skill in England to do Norden's work, and that he was forced to send it to Holland for engraving, just as we had to import types in old times.

HENRY B. WHEATLEY.

*** The opinion expressed in the article referred to is supported by the map itself. In connexion with the references, Norden's name appears, printed, not written; and as thus:—"Joannes Norden Anglus *descripsit*, anno 1593." Norden sold the map, without doubt. In the left-hand corner of the map is "Pieter Van den Keere, *fecit*, 1593"; and from the mode of engraving it has evidently been done by the original draughtsman of it. If further evidence be wanting, it is in the name-writing of the streets, &c.

"A PIECE OF LIMESTONE."

THIS was the title of the fifth of a course of "Gilchrist Lectures," delivered by Dr. Carpenter, on the 1st inst., at Halifax.

Dr. Carpenter said that, in his last lecture, he had showed how the surface of the earth had been altered by glaciers; but he had now to speak of the manner in which a portion of the crust had been built up. In England,—that little corner of Europe,—they had almost a complete set of the beds of stratification, which had done much to aid geological science. Limestone, he believed, did not crop up near Halifax. They had at Halifax chiefly millstone grit. Carboniferous limestone was the basin of the coal producing strata. There was a strong reason to suppose that the different coal-basins in England were originally one vast tract; but had been crumpled up into basins by upheavals. The carboniferous limestone was the limestone of the greatest thickness. The question he had to bring before them was how limestone was formed. They found that beds of limestone were intercalated among other beds. The wearing down of granite gave them sandstone from the quartz and clay from the feldspar; but limestone was not formed in that manner. The general doctrine of all geologists now was, that limestone was formed by animal agencies,—the accumulation of the shells of animalculæ, which obtained the carbonate of lime of which their shells were composed from the water in which they lived. Chalk, whiting, limestone, marble, were all different forms of carbonate of lime. Marble was carbonate of lime in a crystalline state. Carrara marble was an oolite, or like Bath-stone or Portland-stone. It was of this marble that the most beautiful statuary was formed. The beds of Carrara marble might be traced in a line to the other oolite beds in Europe; but the Carrara oolite had undergone a metamorphosis by volcanic action, which had changed it into marble. The section of the carboniferous limestone near Bristol showed that it was about 2,500 ft. thick. They found that these limestones were almost entirely composed of fossil shells. Professor Hull, at the head of the Irish survey, showed that where the limestone was the least disturbed the fossils were most numerous, and where it had been greatly disturbed there was the least number of fossils preserved. They found that heat and pressure were sufficient to produce a crystalline limestone. All limestones were directly or indirectly the production of animal life. One indirect manner was where rocks were formed by the wearing away of coral rocks. The lecturer then pointed out the different beds of limestones. In the Laurentian, of which they had an instance on the west coast of Scotland—and he had been referred to as an authority on the subject—he found distinct traces of animal life. Then there was the great thickness of the gneiss, which was altered limestone. The oolite was a limestone composed of shells, corals, &c. Oolite really meant egg-stone, from the shape of the grains of which it was composed. The numulitic limestone was so called on account of the appearance of the fossils, which were about the size of a shilling. The Pyramids of Egypt were built of numulitic limestone. The limestone of which the buildings in Paris were composed was a modern limestone. It did very well for Paris, but it would not do for that purpose in England, on account of the acid which was contained in the atmosphere, which would decompose it. At the conclusion of the lecture a large number of limestone fossils were represented on the screen by the aid of the limelight, some of which had been dredged up by the *Challenger*. Dr. Carpenter pointed out in what beds the different fossils could be found, especially alluding to those that could be found in the lias near Saltburn, Whitby, &c.

THE STATUS OF ARCHITECTS.

SIR,—Among many professional brothers I am able to substantiate the truth of your correspondent's statement as to the position of architects.

The last of my small patrimony, some 450*l.*, was expended as a premium to place me in the *profession* of a gentleman with a London architect and district surveyor. At the expiration of my indentures, my master having become bankrupt, I struggled for some months to find employment, and ultimately entered the office of a valuer and surveyor, who was largely connected with a celebrated firm of civil engineers. After being four years and a half in this employment, I became architect to the latter; with them I remained, also, over four years. At forty years of age, with the professional experience of twenty-three years, I am now in an engineer's office with a salary of 2*l.* per week; and, but for literature and other assistance entirely independent of architecture, the tempting and discriminating offer of the Horse Guards ("To saddlers, architects, and tailors") might have saved the ratepayers of my parish from the burden of my support.

Whilst the work of an architect is attempted, I will not say performed, by those who have never been educated to the profession, any improvement in this state of things is scarcely to be hoped.

I have a friend who served his time to a *sanitary engineer*, and went straight from the office of his employer to the *architectural* department of the Horse Guards; he could not, of course, pass any examination, and, doubtless, went in as a so-called supernumerary. To such proceedings, and others of much less credit to the country, the occurrence I am about to relate is in all probability due.

A barrack was built in India, and after its completion was found to be unfit for its purpose: this was a small matter compared with the sequel. The barrack was pulled down, the materials were sold, and the architect (?) (a Royal Engineer) bought back from the brother of the purchaser the identical stone of which it was previously built, not knowing, we will hope, that it was the same.

CIVIL ENGINEER, late Architect.

"SKILLED AND UNSKILLED WORKMEN."

SIR,—Having seen a letter in the *Builder* (p. 1079), from "Inquirer," in reference to the "Mysteries of the Building Trade," I wish to make a few remarks applicable to the subject.

As to the great diversity of opinion which exists at the present time in the trade, nothing more fully confirms it than the vast difference in the amount of the tenders for the same job; and while the system of paying skilled and unskilled workmen the same amount of wages remains in force, it is a matter of impossibility for any employer of labour to form a correct estimate as to the cost of the work he is about to undertake.

A few evenings ago I was in conversation with a very intelligent foreman, whom I believe to be a most valuable servant, and who is now superintending the construction of a large building in the south-western district. He told me that his employer gave him orders if he saw any workman under his charge was worth more money than he was receiving, he was to have it, for those were the kind of men who paid him best; and it is well known that well-paid labour is the cheapest of labour, when judiciously managed; and if skilled workmen do not receive a wage in proportion to their work, it takes all the stimulus from them to improve themselves.

The following argument is sometimes raised, that it would be imprudent to make a distinction between the first and second class workmen, on account of the dissatisfaction it would create in the trade; but if those in charge of the work were competent to distinguish between the two (which they should be), the difficulty would be no greater than in any other trade; but when we see skilled hands discharged to make room for inferior ones, and the latter are paid as first-class workmen, we must still expect to hear employers exclaim "This work is costing too much"; and where such a state of things exists it forms another mystery in the building trade, which an outsider might well be puzzled to understand.

A LOOKER ON.

TRANSMISSION OF SOUND.

SIR,—The partition described by your correspondents, Messrs. T. Robinson & Co., is as well calculated as possible to transmit sound from one room to the other. It consists of two faces of sonorous boarding joined together by the studs of the partition framing, and is covered with varnished paper, which will greatly facilitate the reception and the delivery of the sound at the two surfaces. With such construction the filling of the air spaces with sawdust can be but of small avail. The simplest remedy would be to canvass one or or both of the sides again and hang with a heavy flock paper so as to deaden the sound as much as possible by means of the soft rough surfaces. As an experiment some rough material might be tacked to each side of the partition so that the effect could be observed.

THOS. BLASHILL.

CHALK FOR BUILDING.

SIR,—I see one of your correspondents asks for information respecting the treatment of chalk for building purposes. Perhaps it may be a help to tell him that on the top of Wrotham-hill there are two cottages, the walls of which are built entirely of chalk. They stand close to the high road leading from London to Maidstone, and have been built at least thirty years. There is another cottage at Wrotham Chalk-pits, occupied by a workman in the employ of Mr. Spencer, lime-burner, Wrotham, Kent, who would possibly give your correspondent, "Z. W.," the information he requires.

S. T.

THE SOCIETY OF ARTS.

SIR,—Seeing that a series of Saturday evening lecture on the Laws of Health were to be given at the Society o Arts rooms, by a gentleman who is believed to have considerable theoretical and practical knowledge of the subject, I went to hear the first one on Saturday last, and on arriving at the time when the lecture should have been commenced (eight p.m.), found the entrance-lobby blocked by a number of persons, all, like myself, desirous to enter, but detained apparently in order to carry out the slow process of each one separately signing his name in a book. Having waited for some minutes in the very draughty lobby, I came to the conclusion that a lecture, where things were managed in such an unbusinesslike manner, was not worth the trouble.

Is it a "Shibboleth" of the Society that no one can enter its dreary and comfortless rooms without first writing his name? I can understand the ceremony at a members' meeting; but when a lecture is publicly advertised, with a money charge for admission, one would suppose that the payment of the stipulated coins should be sufficient, without requiring from every one of a crowd of persons a specimen of his caligraphy.

HYGIENE.

TILING.

SIR,—I should be very much obliged to some of your correspondents if they could give me, through your columns, an opinion as to the best manner of putting tiles on a house,—first, so as to avoid snow and rain driving in; secondly, for warmth; thirdly, for durability. I have put them on with hay, with felt, boards, and mortar, without perfect success, and now my clerk of the works recommends *moss* (which I never heard of before), while my foreman recommends mortar, and then lathing the rafters, and putting on them inside a rough coat of plaster.

G. HORSLEY PALMER.

The Theatre Royal, Southampton.—This building has just been decorated by Messrs. Buoban & Son, and the orchestra having been removed to underneath the stage, has given much more room, whilst a new retiring-room for ladies has been built on the ground-floor.

ABERDEEN CITY IMPROVEMENTS.

A SPECIAL meeting of the Aberdeen Town Council was held lately for the purpose of considering three new schemes of improvement. One of these is the utilisation of the sewage of the town for the purposes of irrigation. At present the sewage of the more lowlying parts of the city discharges itself into the harbour, and the proposal is to pump it up, so that it might be used for irrigation purposes, along with the sewage from the higher lands, which is at present utilised on the Spittal Irrigation Farm. The subject was remitted for report to Mr. Boulton, the police surveyor, who details two schemes for the diversion of the low-level sewage, and the junction of it with the high-level system as desired, the total cost of the one being 31,221*l.*, and the other 29,540*l.* The annual expenditure for pumping of the first-mentioned scheme would be 1,000*l.*, as against 500*l.* in the other case; but Mr. Boulton recommends the more expensive scheme as the "best and most satisfactory under all the circumstances." In order to properly utilise the sewage, if the proposal is carried out, Mr. Boulton thinks that about 624 acres of land would be required, 216 acres near the south side of the Don for the sewage of the 27,000 inhabitants residing in the district drained by the mid-level sewer, and 408 acres at Murcar for the 51,000 inhabitants in the district drained by the low and high level sewers.

Another scheme is the opening up of Rosemount, or, in other words, the connecting of that important suburb, which lies at the north-west corner of the town, with the city. It is proposed to bring the district into closer connexion with the business part of the city by the construction (1) of a new street, commencing at the High Stocket-road, nearly opposite Watson-street, passing thence through the property recently acquired by the Town Council to Upper Leaside-road, and running thence across the Den Burn to Skene-street, which it would join nearly opposite Chapel-street; and (2) of a street running in a straight line from the north end of Union-terrace to the foot of South Mount-street, and including the opening up of the north end of Union-terrace into Skene-street. The estimated cost of the last-named street is between 13,000*l.* and 14,000*l.*, but no estimate of the other street has yet been made known.

The third scheme is the construction of a carriage-drive along the north bank of the river Dee.

The Improvement and Sewage Committees, having fully considered these schemes, have recommended that the Council should make application to Parliament in the ensuing session for a new Improvement Act, which, in addition to these three schemes, might enable them to effect several minor improvements.

The Council discussed the report of the committees at great length. The whole of the speakers were in favour of an Improvements Bill being obtained, but eventually the report was held over for further consideration.

THE RUINS OF IONA.

THE *Oban Times* details the "improvements" that have been made by the Duke of Argyll at the grand old ruins that adorn the Island of Iona. Among the most important of these have been the opening and repairing of the east window, north and south windows of the choir, and south window of the transept, and restoring them to exactly their original style. All the walls right round the cathedral and monastery, wherever there were any flaws, holes, or cracks, have been carefully repaired, and the original foundations laid bare, and where any defects existed they have been made good with stone and cement. All doorways and windows which had been decaying have been secured, and the old patterns been adhered to. The chapter-house, which is the only part of the building that has a roof to it, and which was in a very ruinous condition, has been thoroughly overhauled. Tons of earth and rubbish were taken off the top of it, and replaced by good lime, stone, and cement. In the cloister court great improvements have also taken place. Some beautifully-carved pillars were exposed in excavating the court; they formed the sides of a series of little doors which led into the square from the court. They are now carefully preserved as being good specimens of work. Some very fine tombstones have also been brought to light, the last of them being that of M'Duffie, or M'Phee, of Colonsay. This stone is below the east window of the south aisle, and has an inscription upon it, although much broken, and is considered to be as fine a tombstone as there is in the island. The inscription has been read by Mr. James Drummond, Edinburgh. There has also been a heart-shaped stone, with a cross on the face of it, found some few hundred yards north-east of the cathedral. It is very carefully preserved in a strong iron box with lock and key specially made for it, by the orders of the proprietor, his Grace the Duke of Argyll. It is supposed by him and other antiquaries to date as far back as the time of St. Columba. Another of the same shape, with a cross also upon it, has since been found near the same place.

TENDERING AT SALFORD.

EARLY in September of this year the Salford Corporation solicited tenders for the construction of a reservoir at Highfield. The specifications were announced in the advertisements to be ready on a certain day, but for some reason or other they were not issued until some days afterwards. In each specification it appears that the words "white bricks" had been printed instead of "red bricks" or "hard-burnt bricks." The moment that this "mistake" was noticed, the word "white" was crossed out, and "red" or "hard-burnt" written over. Thus each contractor was treated precisely alike in the correction. On the 15th of September their respective tenders were opened by the Water Committee, and found to be as follow:—

M'Gregor & Badman, Darwen	£11,867	0	0
G. Lawson, Northwich	11,424	0	0
W. & J. Worthington, Manchester	9,511	0	0
A. Pilling, Bolton	9,237	9	3
J. B. Maguire, Lancaster	8,644	13	3
King & Hawn, Wigan	8,480	0	0
G. Gilbert, Salford.....	8,454	0	0

The estimate of the borough engineer was 8,182*l.* The consideration of these tenders was deferred until the 20th of September, when the committee selected for consideration the lowest three; and, nine days afterwards, on the 29th of September, they again met, and had a letter read to them from Mr. Pilling to the effect that he had estimated for "white" instead of "red" bricks, and that, therefore, his amended tender would be 1,144*l.* 5*s.* 4d. less than his first tender, *i.e.*, 8,093*l.* 3*s.* 11d. instead of 9,237*l.* 9*s.* 3d. On the 11th of October the committee again met for further considering the tenders, when they decided to accept "conditionally" that of Mr. Pilling. That gentleman having complied with the "conditions," this decision was confirmed by a meeting of the same committee on the 23rd of October, when it was ordered that the Council should be recommended to approve of their proceedings and accept the contract.

These facts coming to the knowledge of Mr. Councillor Dyson, he was in his place at the Council meeting on the 30th ult. to make inquiries in regard to them; and, upon Mr. W. Brown's motion for the confirmation of the Water Committee's minutes and the acceptance of Mr. Pilling's tender, he put the following questions to the chairman of that committee, viz.:—First, how was it that the specifications were not ready till the Wednesday evening or Thursday morning, instead of the Monday, so that only two or three days were given to the contractors in which to prepare their tenders? Second, how was it that Mr. Pilling's specification said "white bricks" and all the other specifications "hard-burnt bricks," "white" being crossed out? And, third, who informed Mr. Pilling after the second meeting of the Water Committee, called for the purpose of opening the tenders a second time, that he had made a mistake in tendering for "white bricks" instead of "hard-burnt bricks"? Why was Mr. Pilling allowed a third chance of tendering and the other contractors only two chances?

In reply, Mr. Farmer, chairman of the Water Committee, admitted that what was done in the matter of Mr. Pilling's tender "was entirely at variance with his ideas of what was fair and right"; and, in thus expressing himself, he was not alone; others took the same view, and the matter was referred back to the committee for further consideration, with the intimation that they will do well to cast aside the whole of the estimates and begin *de novo*. The *Salford Weekly News* asks how it was that Mr. Pilling alone, of the seven firms tendering, should read "white" for "red" bricks, when the word "white" was crossed out of the specification and "red" written over it?

DRAINAGE AT BURSLEM.

THE Burslem Local Board at their last meeting considered and unanimously adopted a scheme prepared by their surveyor (Mr. E. M. Richards) for disposing of the sewage of the district by irrigation and downward filtration upon the Bradwell Hall Farm, situated about one mile north-west of the village of Wolstanton. The sewage, amounting to about 900,000 gallons per day of twenty-four hours, will be pumped through a cast-iron rising main, 1 ft. 4 in. diameter, to a vertical average height of 190 ft., and thence distributed over the farm. The farm, comprising an area of 314 acres, will be leased at an annual rental of 2*l.* 10*s.* per acre. The cost of carrying out the necessary works is estimated at 25,000*l.*!

MASTERS AND MEN.

Greenock. — The masons in the employment of Messrs. John Coghill & Son, Greenock, who struck work on account of an alleged infringement by their employer of the society's rules referring to apprentices, have returned to their work, the difference having been amicably settled.

Bradford. — The journeymen plasterers in Bradford are on strike. They wished to be paid "walking time," and to have two hours' notice before leaving, and the employers offered to pay the men by the hour, but they have been unable to agree as to terms.

Swansea. — The master-builders of Swansea, who, some months ago, during the strike of the operative masons, formed themselves into an association for mutual protection, have received notice from the Operative Masons' Association that in May next they should demand an increase of wages of 6d. a day. The Master Builders' Association have since met, and come to the unanimous conclusion to give notice to the men that on the 1st of January next they will reduce the wages 6d. per day, in consequence of the depression of trade and the state of the money market.

Liverpool. — The second annual *soirée* and ball of the Liverpool House Painters' Association was held on the 6th inst. It appears that during the past year there have been paid out of the funds of the Association about 378*l.*, as follows:—For deaths, 198*l.*; accidents, 116*l.*; benevolent purposes, 42*l.* 5*s.*; and travelling-money (to allow members to go to other towns), 22*l.* The number of the members is 1,456.

CLAIM FOR WAGES BY A BUILDER'S FOREMAN.

BARTLETT *v.* ROWLAND.

THIS was a claim (heard in the Bloomsbury County Court, on the 10th inst.) made by the plaintiff, a builder's foreman, to recover from the defendant the sum of 2*l.* 10*s.* for a week's wages, and 13*s.* 6d. petty cash; total, 3*l.* 3*s.* 6d.

The plaintiff stated that he was engaged by the defendant on the new buildings at the corner of Bolsover-street, Euston-road, and was paid up to the day before Good Friday. Had applied sixteen times to the defendant for the money due to him. He received a week's notice to quit on the Tuesday after Easter Sunday. The defendant told him he (the plaintiff) was superseded, and he wanted plaintiff to make up his accounts and measure up the excavations. He measured up, made up the time-sheet, and paid the men's wages; but on Saturday he was told he would not be paid until he brought a note from Rowland, and Rowland would not give him one. The defendant said he gave the notice to the plaintiff because he had no interest in the works, and the surveyor complained of the conduct of plaintiff. He never promised to pay plaintiff, but would have done so if he had made up his book. Judgment was given for the wages without the petty cash.

Skating-Rink at Rock Ferry.—A new skating-rink has just been opened at Rock Ferry, Liverpool. The site is central, being on the Bedford estate, adjoining the New Chester-road, and close by the Wesleyan chapel. The building is externally of a plain style of architecture, being built of brick with stone dressings. The covered and open rink together have an area of 750 square yards. The covered portion is roofed over by open timber, stained and varnished. The usual retiring-rooms are provided, together with a refreshment bar, and a gallery overlooking the skating surface. The sole contractor for the erection was Mr. W. Davies, of Nelson-place, Rock Ferry, and the architects were Messrs. Troughton & Prescott, of Cambridge Chambers, Lord-street, Liverpool. The floor was laid by the Manchester Limmer Asphalte Company.

CHURCH-BUILDING NEWS.

Seend (*Wilts*).—On the 7th inst. the Bishop of Salisbury re-opened Holy Cross Church, the parish church of Seend, on the completion of the rebuilding of the chancel, at a cost of nearly 1,000*l.* raised by public subscription, aided by a grant of 100*l.* from the Ecclesiastical Commissioners. The nave and aisles of this church were rebuilt in the latter half of the fifteenth century, and are good specimens of Perpendicular architecture; but the chancel which was "restored" early in the seventeenth century was quite unworthy of the church. It was, therefore, resolved to rebuild it on the old foundations, preserving those portions of the walls which belonged to the original chancel. The new work is constructed of Bath stone, the interior facing being of ashlar and the exterior of range work similar to that in the nave. The details of the windows, parapet and string-courses, and the carved pinnacles are copied from those of the north aisle. The roof, which is covered with lead, is of oak with pine panels. The prayer-desks, lectern, &c., are of carved oak, and the paving is of Minton's tiles. The brass standard lights and the altar-rails were cast by Mr. Singer, of Frome, from the architect's designs. During the progress of the work a "squint" was opened between the chancel and the north aisle, and a portion of a Norman shaft and some fragments of two Decorated windows were found in the walls. The architect was Mr. Arthur J. Style, of Thames Ditton and London; and the contractor was Mr. R. B. Mullings, of Devizes.

Newington (*London*).—The new church of St. Andrew, New Kent-road, was consecrated by the Bishop of London on the 8th of November. The building has been erected from designs of Messrs. Newman & Billing, and is of Early French type. The nave is 80 ft. long and 28 ft. wide, and 37 ft. to the plate, in five bays. The chancel is 28 ft. long, 23 ft. wide, and 31 ft. high. On the north side are nave and chancel aisles, and on the south side nave aisle, vestry, organ, transept, porch, and the baptistery, being the lower stage of the tower, vaulted with stone. The nave roof is open, and the chancel roof is a barrel vault in wood. The church accommodates 766 persons, and is free and unappropriated, the district being a very poor one. The font is the old one from the demolished church of St. Mary, Newington, of bad Late Decorated Design, about twenty years old, and only valuable from its associations, as it is very unsuitable to the new church. The church is faced with stocks internally, and externally with red brick, and stone bands and tracery, and cost 4,800*l.* The builders are Messrs. Dove, Brothers; the tiles are by Mr. Godwin, of Lugwardine; the heating by Mr. Eyre, of Codnor, Derby; and the lighting by Mr. Mason, of Harrow-road; the fittings are by Messrs. Jones & Willis; Messrs. Warner supplied the bell; and the builders' clerk of works was Mr. H. Buck.

DISSENTING CHURCH BUILDING NEWS.

Romford.—The foundation-stone of a new Congregational Chapel in South-street, Romford, was laid on the 5th ult. The new chapel is to replace an old structure in North-street, which was erected in 1823, and afforded accommodation for only 250. The architect of the new chapel is Mr. E. C. Allam, of Romford, Messrs. Staines & Co., of London, being the builders, the contract sum being 3,210*l.* In addition to this amount, the site cost over 1,000*l.*, and the total outlay is about 4,500*l.* The style adopted for the new chapel is Gothic, of an early and simple character. The building will be oblong in plan, 61 ft. long by 37 ft. wide internally, with a tower at the south-east corner, surmounted by a slated spire 60 ft. high. In the rear of the church behind the pulpit will be a large class-room, and over this the organ-gallery, with accommodation for the choir. In the front elevation will be a large four-light window, and beneath it the principal entrance; a smaller door on the left will give a separate entrance to the tower staircase. The side elevation will be divided into five bays by bold projecting buttresses with a large two-light window in each bay. The walls will be faced with Kentish ragstone, with dressings of Bath stone. The roof of the building will be semi-octagonal in form, or wagon-headed. The church will accommodate 340 persons on the ground floor and 130 in the end galleries, and, should further accommodation be required, side galleries can be added, giving 200 additional seats.

Kilmuir-Easter.—The new Free Church at Kilmuir-Easter was opened recently. The building was commenced in October last year. The architects are Messrs. Maitland, Tain. The length of the building is 68 ft. and the breadth 33 ft. The roof is open—29 ft. from floor to ridge, and is supported by five coupled principals, resting on stone corbels. The design of the roof is wagonheaded, with quatrefoil ventilators of pitch pine in the centre of each bay. The work has been all executed by local tradesmen, the following being the various contractors for the work:—Mason work, Messrs. D. Munro & Co., Alness; carpenter and slater, J. & D. Munro, Milntown; plaster-work, J. Reid, Tullich; painter work, Urquhart & Mackay, Tain. The church is seated for 500, and is in the Early French Gothic style. The cost is 1,500*l.*

Bridge End (*Halifax*).—Bridge End Chapel has been reopened, after being closed seven weeks for renovation and redecoration. The stencilled ornaments used in the decoration were specially designed for the work by the decorators, Messrs. Hirst & Barraclough. Mr. Thomas Bottomley has executed the woodwork in connexion with the alterations and additions that have been made.

Bury St. Edmund's.—The Baptist Chapel in Garland-street, Bury St. Edmund's, has been reopened, after being closed three months for alterations, &c. Open benches have been substituted for the old-fashioned high-backed pews, and a new platform for the preacher, with baptistery beneath, has been erected. New sunlights have been provided by Messrs. Hudson & Jaggard. The painting work was done by Messrs. Mead & Neagus, and Mr. Lot Jackman was the builder, to whom the benching and renovating of the interior of the building was entrusted, under the superintendence of Mr. John Watson.

Cricklade.—The foundation stone of a new Congregational Chapel has been laid at Cricklade. For nearly eighty years past a Congregational chapel has stood in Calcot-street, Cricklade (it having been erected in 1799), but as it would seat only about 200, it has recently been thought that a more commodious and spacious building was desirable. Accordingly, Mr. Orlando Baker, architect, of Swindon, was instructed to prepare plans for a new chapel. The front wall of the old chapel has been pulled down, and the new building will occupy the ground in front, which has hitherto been used as a graveyard. It will be joined to that part of the old chapel which is left standing, which will form a schoolroom for the 150 scholars attending the Sunday school. The schoolroom will be divided from the chapel by a screen, removable at will. The new structure, which will cost about 1,000*l.*, will be 45 ft. by 30 ft., and, with the galleries, will be capable of seating about 450 persons. The contract for the masonry has been let to Mr. J. Pinnock, of Cricklade.

Chertsey.—The memorial-stone of a new Congregational Church at Chertsey has been laid. The building will be of red brick, with stone dressings. Mr. John Sulman is the architect, and Messrs. T. & W. Knight are the builders.

Rastrick.—The memorial-stone of a new United Methodist Free Church, at Oakes-green, Rastrick, has been laid. The estimated cost of the building is 2,000*l.*: it comprises a commodious room for public worship, a school-room beneath the same, two class-rooms, and a house for chapel-keeper: the style is Classic. The contracts are let to the following: masons' work, John & Wm. Crowther, Rastrick; joiners', Jonathan Charnock & Sons, Halifax; plasterers and slaters', Joe Wood, Rastrick; plumbers', John Shaw, Rastrick; painters', J. Stuttard, Huddersfield. The rooms will be warmed with hot air. The plans and designs are by Mr. R. F. Rogerson, architect, Brighouse.

Forfar.—A new Baptist Church has recently been opened at Forfar. The building has been erected from the designs of Mr. J. A. Johnston, architect, Forfar, and the total cost will be 1,700*l.* The site is in Manor-street, having a considerable frontage to the street. The building is of concrete, the execution of which, along with the painting, was taken in hand by the managers themselves, and these parts of the works have been carried out by their own *employés*. The structure is in the Early Gothic style. The chapel, which is seated for 400, is 56 ft. by 40 ft., and the height from floor to ceiling 25 ft. Behind the chapel is a hall fitted up to accommodate sixty persons. This is stated to be the first erection in Forfar in which concrete construction has been tested. The walls are 18 in. in thickness. The contractors were:—For the joiners' work, Mr. Hay; for plumbers' work, Mr. Howie; for slaters' work, Mr. D. Shepherd; for plasterers' work, Mr. Masterton.

Gateshead.—A new English Presbyterian Church is being erected in Gateshead, from designs prepared by Mr. J. J. Lish, architect, Newcastle. It will be a stone building, in the Gothic style, and will have a spire rising to a height of 150 ft. Seats will be provided for about 800 persons. The session-house, lecture-hall, and vestries are already erected at the west end of the chapel; and the total cost of the entire works will be between 6,000*l.* and 7,000*l.* The contractors are Messrs. White & Sproat, of Blyth, and Mr. Thomas Gibson, of Newbiggin-by-the-Sea. The ceremony of laying the foundation and corner stones of the church took place on the 13th ult.

Stoke-on-Trent.—The Congregational Church at Stoke-on-Trent has just been reopened, after alterations and improvements, and the erection of lecture-room, class-rooms, and other conveniences, at an outlay of about 1,000*l.* Mr. Sugden, of Leek, was the architect, and Mr. Barlow, of Stoke, the builder.

Liverpool.—The new Presbyterian church here is situate on the east side of Shaw-street, corner of Everton-brow, the principal façade fronting that way, the side elevation to Shaw-street. The street in front being a very steep gradient, a lecture-room was formed underneath, the floor of which is only 24 in. below the level of Shaw-street, thereby giving all the necessary light; there are also vestries and class-rooms. The plan of the church comprises a nave 67 ft. long by 33 ft. wide, and two transepts 15 ft. by 7 ft. 6 in. There is also a gallery over the entrance end 33 ft. by 17 ft., the whole filled with pews made upon the most approved principle, and all framed and filled with flush narrow boarding, providing seat-room for about 500. The ceiling is wagon-headed, showing all the wood ribs dressed and moulded, with a corbelled cornice at the spring and perforated space above that acting as ventilators. All the panels are relieved with stencil patterns in prominent colours. The whole was designed and carried out under the superintendence of the architect, Mr. Richard Owen, Breck-road, the contractors being Messrs. Nicholson & Eyre, Wellington-road, Toxteth Park. The total cost of land, building, and furniture, will be about 4,500*l.*

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Birkenhead.—Our Lady's Church, Birkenhead, which is situated near the northern extremity of Price-street, Birkenhead, has been erected nearly sixteen years, the foundation-stone having been laid on the 6th December, 1860, by the Roman Catholic Bishop of Shrewsbury. The cost of the building was about 6,000*l.*, but only the nave and aisles were constructed. Steps are, however, now being taken for the completion of the edifice, and the bishop has laid the foundation-stone of the chancel, which, with two side chapels, sacristies, and tower, will carry out in their entirety the plans of the architect, the late Mr. Welby Pugin. The tower will be 70 ft. in height. The contractors are Messrs. Woolley, of Chester. The material employed will be chiefly Stourton stone.

Market Harborough.—A new Roman Catholic church is being erected here near the Lubenham-road. The ceremony of laying the foundation-stone was performed on the 21st ult. by the Bishop of Nottingham.

Sutton.—On the 27th Sept. the new Roman Catholic Church of St. Edward, King and Confessor, was consecrated at Sutton, near Guildford. The church stands on an eminence adjacent to Whitmoor House, and is of plain exterior, in the Early English style. It is built of brick, faced with flint and stone dressings, and consists of nave, apsidal chancel, and north aisle, forming the lady-chapel. The principal entrance is by the south porch, on the gable of which is a statue of St. Edward, sitting on his throne, holding a sceptre, with the dove and the emblematical ring. The high altar is in three compartments, with carved groups in stone, representing the meeting of St. Edward and St. John the Evangelist, the latter habited as a pilgrim, the Coronation of St. Edward, and the opening of the tomb of St. Edward by St. Thomas of Canterbury. The architect is Mr. C. A. Buckler, Hereford-square, London; and the builder was Mr. James Harris, of Woking. The whole of the carving was executed by Mr. R. L. Boulton, of

Cheltenham. The edifice will seat about 150 persons.

Workington.—The new Roman Catholic Church of "Our Lady and St. Michael," at Workington, was opened recently. The building,—the style of which is Early English,—is from a design by the late Mr. E. Welby Pugin, architect, and consists of a nave, chancel, and transept, two confessionals, and a vestry. The plan is cruciform, and at the east end is a belfry, the summit of which is 90 ft. from the ground. The walls are of stone,—the ashlar work consisting of stone from the St. Bees and Aspatria quarries, and the remainder of stone from Lezonby. The clearstory is supported by eight massive pillars of polished granite, and each pillar is surmounted by the figure of an angel carved in stone. There is no gallery, and the seats in the church are open, and made of Baltic timber. At the east end is an organ-loft, and at the west end the altar, with a space on each side for side altars. The church is about 130 ft. long by 70 ft. wide, and has cost 10,000*l*. The whole of the work in connexion with the building has been performed by the contractor, Mr. Hugh Yates, of Liverpool.

Middlesbrough.—On the 3rd ult. the R.C. Bishop of Beverley laid the foundation-stone of a new Catholic Church in Sussex-street, Middlesbrough. The new church, which adjoins the schools and residence of Father Lacy, will be in the Gothic style, from plans prepared by Messrs. Goldie & Co., London. It is to accommodate some 1,200 persons, and the estimated cost is about 12,000*l*. The contractors are Messrs. Craggs & Benson, of Stockton; the clerk of the works is Mr. William Watson.

STAINED GLASS.

Cheltenham.—A stained-glass window, an anonymous gift, has recently been placed in the parish church. It is in the south side, to the west of the porch. There are two subjects, the one representing our Lord as the Good Shepherd, and the other the miracle of healing the blind man. In a panel in the tracery-piece is a dove with an olive-branch, a coloured border surrounding the light, and the spaces are filled with rose foliage. The work was designed and executed by Messrs. Bell & Son, of Bristol.

Bunbury.—A stained-glass window, in memory of the late Mr. Cawley, for a number of years agent to Lord Tollemache, was placed in its position at the west end of Bunbury Church on the 7th ult. The window is a three-light one, with tracery above, and the figures which fill it are emblematical of a wise steward, the story represented being that of Joseph as steward to Pharaoh. In the centre light is seen Joseph presiding over the selling of the corn at the time of the famine in Egypt, while before him are his brethren, in the act of purchasing and counting out the money into the hands of an Egyptian. In the left-hand light is represented the departure after buying, a servant being in the act of loading the asses, while one of the brethren stands by with uplifted face.

Lambeth.—A stained-glass window has been placed in the Church of St. Mary-the-Less, Lambeth, by the parishioners and other friends of Canon Gregory, in memory of the twenty years,—1853–1873,—during which he was vicar of the parish. The window consists of three lights, and the design and all the work connected with it has been executed by the students of the Lambeth School of Art, a school that Canon Gregory was instrumental in founding.

Elsted (*Petersfield*).—The east window of two lights has been filled with stained glass by W. H. Constable, Cambridge, at the expense of the rector, and in memory of his son. They contain the Crucifixion and Ascension of our Lord, under canopies and bases, with an inscription at bottom.

Great Shelford (*Cambridgeshire*).—The large five-light east window has been filled with stained glass. The three centre compartments contain one picture of our Lord's Ascension, extending over the three openings, and at the base the Last Supper,—under a floriated canopy. The left-hand light contains Christ bearing His Cross and the Betrayal. The right-hand light, the Crucifixion and the Entombment. The south window, of three lights, is filled with the Six Acts of Mercy. These windows are erected by the Rev. A. T. Crisford, rector, in memory of his son, and was designed and executed by W. H. Constable, of Cambridge.

Edinburgh.—The Stained-glass Windows Committee of St. Giles's Cathedral, Edinburgh, having examined the memorial window to the late Dean of Guild Lorimer, proposed to be inserted in the north wall, approved of the same, and authorised its insertion. The window has been put up in the course of the last few days, and now that this is done all the windows in the north wall are filled in with stained glass. The Lord Provost stated that he proposed to insert, at his own expense, and as a gift to the city, the great east window, and that some months ago he had instructed Messrs. Ballantine & Sons to prepare a design, which he now submitted. According to this design, the five lower lights of the window illustrate the Crucifixion, and the five upper lights the Ascension; the tracery being occupied with the angelic choir. The committee approved of the design, and authorised the work to be proceeded with. The east window will cost between 1,100*l*. and 1,200*l*. There now remains to be taken up only one window in the south wall of the choir of the cathedral, looking into Parliament-square.

Ottawa.—Messrs. Pitman & Cuthbertson have just executed a large stained-glass "Trinity" window for a church in Ottawa, representing the Ascension. In the centre compartment is the figure of our Lord within nebulæ of vesica form; the outer part of the rose foil is ornamented with vine branches; above the rising figure is a scroll, with the words "I will come again," and below, on another scroll, is the greeting, "Peace be with you." In the four smaller trefoil compartments are the emblems of the evangelists, and in the outer are floating angels.

Books Received.

Notes on Building Construction: arranged to meet the Requirements of the Science and Art Department of the Committee of Council on Education, South Kensington. Part II.: commencement of second stage or advanced course. Rivingtons.

THE second volume of this series of handbooks (to be complete in three volumes) contains further instruction on the subjects gone into in the first volume, and also such additional instruction as is necessary for students wishing to pass in the second stage or "Advanced Course" in the examinations in Building Construction in the Science and Art Department at South Kensington, except a few subjects reserved for the third volume, such as the nature of stresses and characteristics of materials used in building. The book is, of course, not intended to be exhaustive; its use would be to bring the outlines and principles of each subject before the student, and give him a starting-point from which to work out the subject further in detail from actual observation and the study of special works. Masonry and bricklaying, roofs (timber and iron), joiners' work generally, fire-proof floors, plasterers' work, glazing, riveting, are among the subjects treated of. The book is well printed and adequately illustrated; but in general it seems exceedingly conservative in its tendencies; the chapters dealing with joiner's work, for instance, treat as necessary parts of the subject various old superstitions, as one may call them, about "quirks" and "beads" and "ovolos," and sundry other ways of finishing, which were accepted as gospel by our grandfathers, but which are not always consonant in their methods with sound workmanship or in their results with architectural appearance and style. The book is, however, useful, compact, and suggestive; but not to be too implicitly followed, at least by those who desire to advance, in the science of building, beyond the standpoint of to-day, or of yesterday.

A Suggestive Hand-book of Art Criticism. By THOMAS GILKS. Pickering.

THIS is merely a small pamphlet, of such a length as might be read as an evening lecture; and to give it so high-sounding a title was rather absurd: "a few thoughts on art-criticism" would describe it more correctly. Most of the writer's remarks, taken separately, are true; but he wants himself one of the most important qualities of a critic, viz., a logical method and style. Short as his essay is, half of it is not to the point, and the connexion of the various stages of his discourse is by no means apparent: the essay is what we should call "invertebrate." It would be quite possible to lay down the lines of a theory of art-criticism within the space occupied, but to do so would involve keeping within the limits of a general but a concise and clear summary of the leading principles of the art, without going into any particulars which do not serve to enforce the main argument. Mr. Gilks, however, wanders off into passages of mere reflection and talk about this and that artist, which add nothing to his argument, and would only be in place in an extended essay on painting. The pamphlet, in short, proves nothing, though it contains agreeable writing in parts. It is prettily got up, and illustrated with four nicely-executed engravings.

A Journey due East: being a Journal of a Five Months' Trip to Lower Egypt, Palestine, and Turkey in the Winter of 1862-3. Revised edition. London: A. Hall. 1876.

THIS is what may be termed an ordinary tourist's account of his impressions of an Eastern journey fairly done; and as this is a new edition, we may presume that the book has had a certain success, and has found readers. It tells nothing new or special, however; and when the writer diverges from mere description to touch upon old and new theories in regard to history and topography, he is quite "behind the age."

The Sanitary Drainage of Houses and Towns. By GEORGE E. WARING, Jun. New York: Hurd & Houghton. London: Sampson Low, Marston, Searle, & Rivington. 1876.

ADDRESSED to householders in general, although some of the points discussed are specially intended for the information of town authorities, and intended rather as an incentive to the securing of good work than as a guide to the manner of its performance. This is the author's modest estimate of his own work, but a perusal of the book discloses further claims to attention. Writing from and of American towns and villages, the author yet has recourse to our own experiences, and quotes freely from some of our own authors. We are thus led to think that in the few passages, which we quote as follow, the author intends to refer to our own country as well as to America:—"Houses, even of the best class, which are free from sanitary objections are extremely rare. The best modern appliances of plumbing are made with almost no regard for the tendency of sewer-gas to find its way into living-rooms, nor for other insidious but well-known defects. So generally is this true, that it is hardly an exaggeration to say that unwholesomeness in our houses is practically universal. Hardly less universal is a curious sensitiveness on the part of the occupants of these houses to any suggestion of their shortcomings. Singularly enough, no one whose premises are subject to malarial influences seems willing to be told the truth with regard to them. No man likes to confess that his own well and his own cesspool occupy the same permeable stratum in his garden." This is a home-truth which is not confined to any particular country, and the consideration of it, and recognition of its truth by each individual householder, will anywhere create a wholesome demand for a proper water-supply.

The book consists of ten chapters, and we receive it with welcome, as conveying some sound and practical instruction. It would add to the value of the book if, when a second edition may be required, some information could be given bearing upon climatic influences on the process of decay of organic substances in respect of its rapidity or otherwise.

Principles of Construction and Efficiency of Water-wheels. By WILLIAM DONALDSON, M.A., Assoc. Inst. C.E. London and New York: E. & F. N. Spon. 1876.

THIS is a treatise on the principles of construction and efficiency of turbines rather than of waterwheels, as we commonly understand the term in England. The efficiency of turbines is stated to be only half the power of the water expended through them; whereas the efficiency is generally stated to be three-fourths, and in some cases even four-fifths. The author says that all waterwheels may be divided into two classes:—1. Those which are driven partly by the statical weight of the water acting through a portion of the whole fall, and partly by the momentum acquired by the water before it strikes the wheel; 2. Those which are driven only by momentum acquired by the water. But he does not appear to comprehend in this classification those wheels which are driven wholly by the weight of the water

the impulse given to it before it strikes the wheel being designed to fill the buckets merely, and not to act upon the wheel by way of momentum; and these weight-driven wheels are more efficient than wheels driven partly by momentum and partly by weight, and their efficiency is much greater than one-half of the power of the falling water.

Neither does the author seem to state the case correctly of the quantity of water discharged over a weir, in saying that, by the ordinary formula, the depth is measured directly over the weir; for, in fact, the ordinary formula requires that the depth be measured from the level of still water. A special, and not the general, formula must be used in ascertaining the quantity when the depth is measured in the manner stated by the author.

GROUND LANDLORDS OF LONDON AND THEIR TENANTS.

SIR,—Thousands will endorse your remarks concerning the evils that exist under the present system of management, and could the noble proprietors but bear a tithe of the bitter complaints and ruin to very many occupants of their shop property, through undue advantage being taken of "landlords' undue and strained rights," it would cause them to consider well the wisdom of their tenants having no further court of appeal than to their agents. I quote my own case as a sample. My father and myself have occupied the same spot over fifty years; four years since the premises were completely destroyed by fire, and most substantially rebuilt by Messrs. Holland & Hannen. Last Michaelmas my seven years' lease expired. One month previously a claim of 20*l.* was sent in from the Bedford Office for dilapidations, to be paid before any arrangement could be made for a new lease. I resisted so far as a business man dare do, with the fear of removing from a known shop, and employed professional advice; but although no dilapidations could be found, save one cracked pane, it was,—Pay or go. I elected the former, and have the receipt for dilapidations to a *new house* hanging in my office, not being able yet to harmonise it with the erection of a statue to John Bunyan at Bedford. In charity, I hope the noble Duke knows nothing of this.

The remedy seems to be a "Shop Property Act" empowering the tenant to demand, not less than three years before the expiry of his lease, the terms on which a new one will be granted, thus giving him timely notice for not fixing him in a corner to liabilities he cannot compass. There are many noble landowners who, preferring a good name to gain, could frame an equitable arrangement, and add lustre to their coronets. WILLIAM HOWARD.

22, *Great Russell-street.*

Miscellanea.

Newcastle Society of Antiquaries.—The monthly meeting of this society was held on the 1st inst., in the Old Castle, Newcastle, under the presidency of Mr. R. Carr-Ellison. A letter was read from Mr. John Clayton, of the Chesters, Humshaugh-on-Tyne, in which the writer said:—I had hoped to be able to give some account of the recent discovery of Roman remains at our meeting to-morrow, but, until all the inscribed altars can be read, I feel that no account of the particulars of the discovery which would be satisfactory can be given to the society. The altars bearing inscriptions are not more than one-half of the whole number found, but the lettering on many of them is very indistinct. The well or bath described by Horsley, in his "Britannia Romana," is certainly identical with the structure now explored, which appears to me to have been a reservoir for water in the temple of a deity as yet unheard of. She appears to have been a water goddess, being represented on one piece of sculpture as floating on the leaf of a gigantic water-lily. This reservoir has at a subsequent period been used for other purposes than those for which it was originally intended, and has been made a place of deposit of coins of a low denomination for the pay of the Roman army. Two unique vases have been found with some ornamental Samian ware, and other objects of interest, of which I trust I shall be able to give a description.

A Strong Room.—Messrs. Chubb & Son have just completed, at their works in Glengall-road, a large fire-resisting strong room for a London bank. It contains a lobby in which will stand several iron safes. The remainder of the room is subdivided into two principal strong closets, one to receive safes for cash, bullion, &c.; the other and largest compartment being fitted up on all sides, from floor to roof, with tier upon tier of iron shelves. The outer door is constructed of wrought iron and hard steel, weighing nearly a ton, and is secured by two of Chubb's locks throwing bolts all round its four sides. A folding grille in the doorway is used to ventilate the room by day while the door remains open. The room measures 20 ft. by 12 ft., and 9 ft. high, and weighs about 23 tons.

The Boilean Drinking Fountain, Norwich. The drinking-fountain, for the erection of which at the junction of the Ipswich and Newmarket roads, Norwich, the late Sir John Peter Boilean bequeathed the sum of 1,000*l.*, was unveiled on the 30th ult. Some years elapsed after the death of Sir John before the Corporation finally gave their consent to the erection of the fountain on the site stipulated, and the work since its commencement, from one cause or another, proceeded but tardily. But no pains have been spared by Sir Francis Boilean and his co-executors to carry out the wishes of the testator. The fountain is a lofty, richly-decorated red-brick structure, consisting of a canopy supported at each corner by pillars, and beneath the canopy is a life-size bronze figure of a seated woman, representing Charity, giving water from a shell to a child standing at her knees. This figure rests upon a square pedestal containing the taps and basins. The canopy is richly decorated. It is in moulded bricks. One tympanum contains the arms of the donor, while the opposite one contains the arms of the city. The other tympani contain floral work. All the work, save the group in bronze, was designed by Mr. T. Jeckyll, the statuary being designed and executed by Mr. J. E. Boëhm, sculptor. The ornamental pateræ, &c., of the canopy were cut by Mr. Minns, of Heigham; the brickwork was executed by Mr. Hubbard, of Dereham; and the water apparatus supplied by Messrs. J. & J. King.

Architects' Commission at Winchester.—At a meeting of the Winchester Town Council, on the 2nd inst., a report was presented by the Finance Committee recommending payment of bills due, 653*l.*, on the city account, including Mr. Pocock's (architect) professional charges for the erection of galleries, &c., at the Guildhall. Mr. Jones, in reference to this latter sum, pointed out that it was more than 20 per cent. on the amount of the builder's contract, 393*l.* He thought it was an enormous charge, and one which should make them careful in the future. Mr. Councillor Stopher (who is himself an architect) said he would rather not have had occasion to say a word about the architect's charges, but he could not allow it to go forth to the public that these charges related solely to the construction of the new galleries, for there was a sum of 15*l.* 15*s.* for the plans of a new room and kitchen which were not carried out, and there was the cost of several visits from London, and the usual commission of 5 per cent. would not cover those. The report was adopted.

The New Viaduct at Carlisle.—A Carlisle paper states that the abutment of the Corporation Viaduct on the east side of English Damside is now up to "springer" height, and the contractor is engaged in making the foundation for the second pier eastward. In carrying out this work some difficulty has been experienced. At a depth of 10 ft. the workmen came upon an old Roman way, paved with cobbles set in hydraulic mortar, and so firmly embedded that it could only be broken through by the use of bars and sledge hammers. Below this old roadway a stratum of soft earth was found, and it was not until a depth of nearly 18 ft. had been sunk that a gravel foundation was reached. This is now being made the foundation of the superstructure by the use of concrete and rough rubble. The new Nelson Bridge is now nearly finished, and if no check comes in the way it is hoped the Viaduct may be opened for use by about the month of May.

Public Baths for Northampton.—Messrs. P. & R. Phipps have for some time past had under their consideration plans drawn up by Mr. William Hull, architect, for the erection of a large swimming-bath, &c., on the ground at the rear of the Half Moon Inn, Bridge-street. The project has now assumed definite shape, the contract of Messrs. Dunkley, of Blisworth, for the work, having been accepted, the estimated cost being 1,400*l.* The building will face the new road leading by the Cattle-market to the Southbridge. Red bricks, relieved by Casterton stone, will be used in the façade, which will be of two stories. The swimming-bath will be 63 ft. by 25 ft. in extent, and from a depth of 3 ft. 6 in. at one end, will gradually deepen to 7 ft. 6 in. at the other. There will be twenty dressing-rooms round the side of the interior, with the usual accessories.

St. John's, Chelsea.—The architects of St. John's Church, mentioned in our last, were Messrs. Newman & Arthur Billing.

Destruction of an Old Railway Bridge near Edinburgh.—On the 5th inst. a bridge across the Caledonian Railway immediately beyond Dalry was destroyed by means of dynamite, being no longer necessary in view of the new structure now being thrown across the line at a point which will give direct communication between the villas at Merchiston and the houses on the other side of the railway. Preparations for the explosion had been made on the previous night, so that after the London train passed in the morning all requiring to be done was to lay sleepers above the rails for their protection. The charge of dynamite used was a large one, and the cartridges having been inserted in a cutting carried across the key-stones of the arch, the result of the blast was the instant demolition of the bridge. The work was carried out under the superintendence of Mr. Stoddart, district engineer on the Caledonial Railway.

Preserving Timber.—The improvements in saturating wood and timber, invented by Mr. H. Sainsbury, of Paris, consist in employing a solution formed in the relative approximate proportions of water, 1,000 litres; alum, 16 kilos.; sulphate of copper, 16 kilos.; bromide of sodium, 1 kil.; and iodide of sodium, 1 kil. For the purpose of the invention he prefers placing the timber or wood to be treated in a close vessel from which he draws off all the air, and in which he immediately injects the above-mentioned liquid with a pressure varying from 15 lb. to 150 lb. to the inch. It is stated that wood thus injected not only acquires thereby a considerable degree of hardness, whereby it is better fitted to resist wear and tear, friction, exposure to the atmosphere, and deteriorating causes, but it is also rendered completely incombustible.

Royal Scottish Academy.—At a general meeting of the Royal Scottish Academy, held on the 8th inst., Mr. William Brodie, R.S.A., was elected secretary, in the room of Mr. J. Dick Peddie, resigned. At the same meeting, Mr. R. Anderson, architect, was elected an Associate of the Academy, in the room of Mr. George Hay, who in February last was promoted to the rank of Academician. Another vacancy exists in the list of Associates, occasioned by the recent death of Mr. Thomas Clark; but this, it is stated, will not be filled till November, 1877. In February next there will, it is understood, be an election of Academicians to supply the places of Sir George Harvey, Mr. David Bryce, and Mr. R. T. Ross; and as these blanks will be made good from the Associates, three additional vacancies will be created in that body.

The Late Mr. C. J. Hemans.—We have heard with great regret of the death, at Lucca, of Mr. Charles J. Hemans, a son of Mrs. Hemans, the poetess. Mr. Hemans left England in early life, and, after residing in various parts of the Continent, finally settled in Italy, and latterly in Rome. It was here that his chief studies were made in history and archæology. His more recent ones, "A History of Mediæval Christianity and Sacred Art in Italy," and "Historic and Monumental Rome," contain the results of his most mature studies. Mr. Hemans was for a long time our correspondent, and our earlier volumes contain a series of valuable articles by him descriptive of the antiquities of the Eternal City.

Chicago Ironworks.—The growth of ironwork in the Western States is well illustrated in the case of Chicago, which is situate remote not only from the iron mines, but also from coal suitable for the purpose. Of the ten Bessemer steel works in the United States two are located in Chicago, and of the 291,000 tons Bessemer steel rails made in the country last year, 85,000 tons, or nearly one-third of the entire amount, were made in Chicago. The iron industries have 200 establishments, employ 10,000 workmen, and manufacture to the amount of $35,000,000 annually.

The Artisans', Labourers', and General Dwellings Company (Limited).—On the 8th inst. the shareholders in the Artisans', Labourers', and General Dwellings Company (Limited) invited about three hundred of their workmen to a "raising feast" at the Westminster Palace Hotel, to celebrate the partial completion of the large batch of houses the company are now erecting on their Queen's Park estate. Dr. Baxter Langley presided. It was stated by one of the workmen on the estate that the company, during the nine years of their existence, have never had a serious dispute with their men.

Birmingham Society of Artists.—On the 10th inst., Mr. J. T. Bunce delivered a lecture, at the rooms of the Birmingham Society of Artists, on the Life of David Cox. Cox's life, Mr. Bunce said, was free from dark shades as it was from brilliant lights; it was noble in the greatest sense, and was valuable in an incalculable degree, having opened a world of beauty and a vast region of instruction and enjoyment to those who without that aid could not have interpreted, and would have failed to enter upon either.

Overcrowding at Swansea.—A serious case of overcrowding came before the Swansea magistrates on the 31st ult. The house alluded to was No. 3, James-court, James-street, and Mr. Inspector Thomas, who brought the case forward, proved that in a small room, 11 ft. 3 in. by 11 ft. 6 in., nine and sometimes ten persons slept. There were thus only about 82 cubic feet of air for each person, instead of 250 or 300 ft., as required by the Act. The stipendiary gave orders that the parties should at once remove from the premises.

Wigan Benefactors.—A public meeting of ratepayers at Wigan has resolved to adopt the Public Libraries Act in the town. Mr. Thomas Taylor, cotton-spinner, at his own expense, and at a cost of nearly 10,000*l.*, has almost completed the erection of a building, which is to be presented to the town, for the purposes of a free library; and in addition to this, Mr. Winnard, surgeon, left by his will a sum of 10,000*l.* for the purchase of books.

Chester Archæological and Historic Society.—The opening meeting of the session of the Chester Archæological Society was held in the Society's room, Lower Bridge-street, when Mr. Beamont, of Orford Hall, delivered an interesting address on "The Obsolete Peculiarities of English Law."

New Shoreham Church.—The architect engaged, Mr. A. Loader, says that the letter in our last issue in reference to the works now being carried on at New Shoreham Church is "entirely void of truth." The same statement has, nevertheless, been made to us by another correspondent.

Mechanics' Institute, Leeds.—The interior of the Albert Hall here has been decorated. The directors have laid out 1,000*l.* upon the ornamentation. The sunlight overhead is lighted up by electricity. Messrs. W. Perkins & Sons, of East Parade, were the architects employed.

TENDERS

For cemetery chapels, lodge, &c., at Bromley, Kent. Mr. George Truefitt, architect. Quantities by Mr. Morris Evans:—

Taylor	£3,950 0 0
Payne & Balding	3,845 0 0
Coles	3,744 0 0
Staines & Son	3,582 0 0
Prebble	3,545 0 0
Carter	3,530 0 0
Copping	3,320 0 0

For roads and drainage at Bromley Cemetery, Kent. Mr. George Truefitt, architect. Quantities by Mr. Morris Evans:—

Coles	£874 0 0!
Heath	613 0 0
Hawkes	530 0 0
Payne & Balding	518 0 0
Prebble	496 0 0
Copping	460 0 0
Lansbury	399 0 0!

For the erection of a pair of semi-detached villas, at Great Marlow, for Mr. C. Jubber. Mr. Chas. Carter, architect. Quantities supplied:—

Silver & Son	£1,620 0 0
Woodbridge	1,597 0 0
Carter	1,495 0 0
Plumridge	1,460 2 0

For building house and stables, Heron-road, Brixton, for Mr. Havill. Messrs. Habersbon & Pite, architects:—

	House.	Stables.
Haynes	£550 0 0	£250 0 0
Edworthy	534 0 0	244 0 0
Judd & Hawkings	526 0 0	217 0 0
Taylor	515 0 0	203 0 0
Leathley	485 0 0	200 0 0

For Primitive Methodist Chapel, Bromley, Kent. Mr. A. J. Rouse, architect. Quantities supplied:—

Stephenson	£1,054 0 0
Taylor & Son	1,019 0 0
Wyeth	983 0 0
Cox & Son	977 0 0
Ridge & Kingsland	947 0 0
Prebble & Co.	940 0 0
R. & E. Smith	939 0 0
Parker & Evans	938 0 0
Willis	935 0 0
King & Brown	880 0 0
Lose	795 0 0
Hocking	790 0 0
Copping (accepted)	759 0 0

Accepted for alterations to the Sunderland and North Durham Liberal Club. Mr. J. W. Bounthwaite, architect:—

Bricklaying, Masonry, &c.	
T. & A. Cooke	£182 10 0
Joinery and Carpentry.	
Hodgson	277 10 0
Slating.	
Nelson	32 10 0
Painting and Glazing.	
Kirkup	139 14 0
Plumbing and Gasfitting.	
Hudson	20 0 0

For ten houses and one house and shop in Wellington-street, Whitechapel, for Mr. M. Samuels. Mr. Edward Clarke, architect. Quantities supplied:—

Crockett	£4,676 0 0
Jarvis & Sons	4,599 0 0
Cohen	4,573 0 0
King & Brown	4,561 0 0
Tully	4,537 0 0
Davis	4,511 0 0
Richardson Bros.	4,478 0 0
Aitchison & Walker	4,353 0 0
Wythe	4,297 0 0
Lewis	4,286 0 0
Mattock & Co.	4,126 0 0
Hutchinson Bros.	4,100 0 0
Judd & Hawkings	4,028 0 0
Howard	3,974 0 0
Brealy	3,893 0 0
Oliver	3,823 0 0
Andrews & Co.	3,802 0 0
Cocks & Co.	3,785 0 0

For alterations at the Castle Inn, Stratford New Town, for Mr. Thomas Proctor. Mr. Edward Brown, architect.—

Stamp & Bowtle	£325 0 0
Pringle	248 0 0
Salt (accepted)	208 0 0

For alterations (exclusive of painting, glazing, and decorating) to 64, Church-street, Greenwich, for Mr. E. B. Fountain. Mr. Henry Roberts, architect:—

Holding & Son	£466 0 0
Smith	280 0 0
Sanderson (accepted)	243 10 0
Wheeler	242 0 0

For warehouse and manufacturing premises in Whitecross-street, E.C. Messrs. Ford & Hesketh, architects:—

Dove Bros.	£9,716 0 0
Kirk & Randall	8,671 0 0
Downs & Co.	8,668 0 0
Lawrence	8,662 0 0
Newman & Mann	8,628 0 0
Peto Bros.	8,621 0 0
Brass	8,524 0 0
Browne & Robinson	8,430 0 0
Ashby Bros.	8,353 0 0
Merritt & Ashby	8,245 0 0
Crabb (accepted)	7,929 0 0

For warehouse in Jewin-street, E.C. Messrs. Ford & Hesketh, architects:—

Morter	£2,833 0 0
Merritt & Ashby	2,819 0 0
Lawrence	2,786 0 0
Brass	2,755 0 0
Browne & Robinson	2,643 0 0
Ashby & Horner	2,591 0 0
Ashby Bros.	2,554 0 0
Boyce	2,513 0 0
Crabb (accepted)	2,165 0 0

For painting the interior of the Borough Market, Southwark. Messrs. Henry Jarvis & Son, architects:—

Beguley	£395 0 0!
Downs	387 0 0
Sayer	415 0 0
Knight & Son	398 0 0!

For rebuilding premises, Laygate-lane and Brunswick-street, South Shields, for Mr. E. Breuninger. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Joeurs (accepted)	£949 0 0

For rebuilding premises in Fowler-street, and Denmark-street, South Shields, for Mr. R. Jackson. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Monat	£725 14 2
A. & P. Marshall	685 0 0
Joeurs	607 0 0
Shields (accepted)	589 0 0

For new public-house, High Bridge, Newcastle-on-Tyne. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Harrison	£1,815 1 6
Maughan	1,713 8 0
Suddards	1,664 2 10
Hutchinson	1,668 0 0
Harbottle	1,515 0 0
Atkinson	1,509 0 0
Nichol	1,410 0 0
Simpson* (accepted)	1,441 5 10

* Extra for patent facing bricks, 83*l.*

Ironwork.

Hall (accepted)	£85 0 0

For additions to the Southwark Branch of the London and Westminster Bank. Mr. E. N. Clifton, architect. Quantities supplied by Messrs. Williams & Gritten:—

Holland & Hannen	£6,067 0 0
Brass	5,789 0 0
Lawrence	5,777 0 0
Conder	5,644 0 0
Macey	5,552 0 0
Peto Brothers	5,482 0 0

For the completion of St. Andrew's Church, Croydon:—

Hobbs (accepted)	£1,350 0 0

For erecting four houses in Upland-road, Peckham, for Messrs. Ross & Co. Mr. W. Palce, architect:—

Stowell (accepted)	£1,890 0 0

TO CORRESPONDENTS.

R. T. (we prefer not to advise. We would not spend any money upon it.)—S. T.—A.—G. T.—A. J. S.—A. B.—A. B. M.—H. S.—Mrs. B.—J. & H.—C. & Son.—C. C.—R. W.—A. L.—A. Sussex Architect.—Old Shoreham.—Provincial Architect.—J. K. C.—J. P. S.—J. C. C.—R. C. P.—C. E. F.—G. C.—H. E.—H. H.—W. E.—Genl. N.—R. C.—C. H.—J. M. R.—H. J. & Son.—J. G. B.—H. R.—M. P.—W. S.

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VOL. XXXIV. No. 1764. SATURDAY, NOVEMBER 25 1876.

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*"Italy, from the Alps to Mount Etna."**

HIS splendid book comes before us with less than the usual amount of introduction. It has no preface. There is nothing on the title-page to indicate the authorship; and although it is mentioned as a translation, it is not said from what language it is translated. It is not, in all probability, until the reader has been perplexed by the marked difference in the style and ability of the latter part of the volume, as compared with the earlier pages, that he discovers, half hidden in the sub-titles of the different sections, that from the Alps to the Arno has been described by Karl Stieler; from the Arno to the Tiber, by Edward Paulus; and from the Tiber to Etna,—we cannot say described, but written about,—by Woldemar Kaden. Again, the engravings all bear German signatures; although, as there are often two or three on the same print, and as no names are attached to the list of illustrations, we are left to conjecture as to who is the draughtsman, the engraver, or perhaps, in some cases, the photographer, of either. We are thus led to the conclusion that we have before us the reproduction of a German work. It is the more to be regretted that some light has not been thrown on these questions by the editor, from the fact that the book, though on the whole one of extraordinary beauty, is of unequal merit. In speaking as highly as we are prepared to do of a charming contribution to drawing-room literature, it is the more necessary to be wary, lest indiscriminate praise should be conferred by the citation of such an engraving as that of "Orlandini's Beer Garden, Florence" (p. 166), or the "Peasants of Seva" (p. 338).

It is only fair, as a set-off against this, to refer to the masterly drawing and great beauty of some of the chief gems of the book. Such are "After the Mass in S. Trinita di Monti, Rome" (p. 276); the "Head of a Peasant of the Campagna" (p. 242); "Stella, a Roman Model" (p. 241); the "Fisherman of Gaeta" (p. 350); "The Entrance to the Blue Grotto at Capri" (p. 428),—which has all the swell of the sea, never resting at that spot, and the very life of the Neapolitan *marinaro*, though the passengers should have been shown as crouching low in the boat, to avoid a blow against the roof of the entrance to that unique piece of fairyland;—the "Neapolitan Fisher Girl" (p. 360); and the "Boy and Girl of the Sabine Hills" (pp. 330, 331). These engravings show the influence of the vigorous style of Kaulbach on German art, and are of a very high order of artistic merit. Again, in the literature of the book there is a gravity of tone, and vividness of narration in the writing of Herr Stieler, and perhaps even more so in that of Herr Paulus, which are worthy of their noble theme.

To do justice to a work on such a subject, and so full of charming illustrations, under the different points of view from which it may be regarded, would far exceed the limits at our command. To our own readers it will probably be most acceptable if we glance at what the volume brings before us of the rich and varied architectural treasures of Italy, remarking that the effect produced by their contemplation on cultivated German scholars is fully as profound, however different in its form of expression, as that experienced by the English traveller, if not by the Italian himself.

The book commences with brief but graphic descriptions of the five chief mountain passes by which the traveller crosses the Alps. The account of the sensations of the passengers on entering the Mont Cenis Tunnel is very true to life. What we may call the Alpine architecture, with its wonderful devil's bridges, and yet more wonderful tunnels, is rather local than national in its character. It is at Trent that the Teutonic element seems first to yield its ground to the Latin taste. The gateway of the Palazzo Sardagna, in Trent, with its chamfered and rusticated doorway, its bold caryatides, or rather Atlantides, supporting the projecting balustraded balcony, and the armorial shield upborne by the carved Amorini, in the place where the pediment is not, is a very characteristic specimen of the sumptuous Domestic architecture in which Italy is so rich. There is a view of the ancient Castle of Trent. "*Il buon consiglio*, said a man who accompanied us unasked, pointing with his hand towards the mighty castle which bears this name; its battlements, which masterfully dominate the city, were glowing in the evening light. High above them the mountains stretched in noble outlines. The castle was built in days when every palace was a fortress, and when power manifested itself defiantly. Here dwelt the Prince Bishop with his chapter; the latter claimed the privilege of having only noble, or the most renowned men of learning, amongst its members. Above the long range of windows rises the battlemented masonry wherein hawks make their nests." With a companion who thus enters Italy, and whose nervous sentences are rendered, by a lady's pen, into such classical English, it is a delight and a privilege to wander. We listen with him to the tales of the ruined glories of the great saloon, of the noble staircases, the majolica, and the frescoes of Giorgione and Giulio Romano. Over the house-tops, close to two slender turrets, rise the severe tower and dome of the cathedral, where lie the bones of the famous martyr Vigilius, who built the first church in Trent, and fell a victim to his disrespect for the worship of Neptune, the patron god of the city, which yet bears the device of the trident. The builder of the Duomo, or cathedral, was one Adamo de Aragno. The blocks of reddish marble have been blackened by time; at a considerable height the wall is broken by airy arcades where pigeons flutter in and out. In the neighbouring church of Santa Maria Maggiore the famous Council of Trent was opened in the year 1545. A fresco painting in the choir commemorates the event, and contains portraits of many of the members, while the Madonna with her infant floats serenely over their heads.

After a charming peep at the Lago di Garda, we come to Verona,—a name famous in English ears as much from the reflected glory of the work of our great national poet as from its own antiquity and beauty. Here, shaded by the lofty, slender campanile, we are shown the street which leads to Juliet's house,—still bearing the sculptured hat, the cognisance of the Capulets,—each building in which is rich with an architectural style of its own. Here, amid the tombs of his family, the Scaligers, is the monument of Can Grande, the mysterious Veltro of Dante. Among the effigies in the neighbouring church of Santa Maria Antica are those of Roland the Paladin, and of Queen Bertha, the mother of Charlemagne. But it is the modern history of Verona that dates from Charles the Great. The ruins of the Amphitheatre are of the time of an earlier empire. Who built this noble edifice is uncertain. According to the measurements of Maffei, the arena is 450 ft. long by 360 ft. wide, with forty-four rows of seats that would accommodate 40,000 spectators. To provide for the safe ingress and egress of such a prodigious crowd, as many as seventy little doorways open on the great wedges of the circular incline.

A characteristic little architectural sketch is that of the courtyard of a house in Verona, where the garden is seen through the low arches of the loggia, and the canopy of the draw-well is veiled with creeping-plants. The bridge of Borghetto, near Valezzio, is a picturesque ruin, which makes a highly imaginative picture. We have a view of Verona from the Giardino Giusti, with lofty campanile towers above a sculptured fountain, girt by an arcade. Then we come to the old castle, which threatens the distant Mantua; the towers of which "rise boldly, with sharply-cut battlements, into the blue sky,—a veritable falcon's eyry." It was built by the Scagligers and the Murazlia, a fortress-wall erected by the same family in the fourteenth century, extends for a distance of 6 kilomètres to Valezzio. It was at Villafranca that the Emperor Francis Joseph met Louis Napoleon on the 11th of July 1859, and that the conditions of an unexpected peace were suddenly concluded.

* "Italy, from the Alps to Mount Etna." Translated by Frances Eleanor Trollope, and edited by Thomas Adolphus Trollope. Illustrated with upwards of 100 full page, and 303 smaller engravings. London: Chapman & Hall.

In passing from Verona to Venice, Herr Stieler takes us over a mountain route, now neglected for the railway, and introduces us to I. Sette Communi, the Seven Communes, ancient German settlements which stand, like outposts of the empire, in Italy. The ancient Porta Rusteri, at Feltre, with its narrow-arched doorway, its quasi Egyptian batteries, its frowning machicolis, and the tower, gardens, and balconies of the tower peeping over the lofty wall, is another charming scene. Still journeying towards the Adriatic we reach Vicenza, the city of Palladio, born there in 1518, and first educated as a sculptor. Three noble Corinthian columns, still *in situ* on their lofty bases, are filled up by windows, balconies, and decorations of Palladian taste. Such is the aspect of the old seminary, Vicenza, one of the most curious compounds of Classic and Mediæval Italy to be found south of the Alps. Vicenza is but a small town, of some 40,000 inhabitants. But the Piazza dei Signori, which was the forum in imperial times, is immense; surrounded by arcaded and columned public buildings, shadowed by a campanile which rises to the height of sixteen times the width of its sides, and adorned by a marble statue of Palladio.

After a glance at Padua, where the Church of St. Anthony, with two lofty octagon towers, crowned, like the great tower, with conical roofs, and rising above a group of five domes, visible at the same time, shelters a never-dying flame that burns before the shrine containing the bones of the saint, we come to Venice. This locality has been so often described that we refer those who, like ourselves, love the guidance of Herr Stieler, to the book itself, for his account of the ocean city. The view in Chioggia, showing the industry of the fishers and peasant women, under the shade of one of their vast ribbed arches, that offer so grateful a shelter from the Italian sun, is the most originally striking of the Venetian illustrations. Then we have a view and description of Trieste, and are told how, since May 16th, 1837, when the first Lloyd's steamer, built in London, sailed from Trieste for Constantinople, the tonnage of the port has increased, so that by the year 1870 the capital of the Austrian Lloyd's Company had been raised to ten times its original amount of 1,500,000 lire; the number of steamers owned by the company was seventy; and in the voyages of a single year, extending over 1,118,000 miles, more than 300,000 passengers, and 6,000,000 cwt. of goods had been conveyed. Here, too, we are shown the tomb of Winkelmann, murdered by his guide in 1768. Not far distant is the Castle of Miramar, represented as a stately building; the house of the Archduke Maximilian before he left Europe, under ill-starred advice, and relying on perfidious support, to wear the blood-stained crown of Mexico, and to expiate, in his own noble person, some of the foul deeds committed by the servants of his ancestors on the race and the subjects of Montezuma.

Passing Mantua, with a view of its quaint drawbridge, we come to Milan, a city which struck Herr Stieler as more cosmopolitan, in fact, more modern, in its aspect than any he had yet approached in Italy. Here stands the fine monument and statue of Leonardo da Vinci, of the design and execution of which we enable our readers to judge for themselves, by reproducing the engraving.* The view of the columns of San Lorenzo,—the pillars of a noble Pagan temple thus baptized,—flanking the line of road, are, however, of imperial antiquity; though a Gothic arch is associated with this façade. The church of Santa Marie della Grazie reminds one of an enormous carved and inlaid box for the preservation of relics and sacred treasures. There is a fine view of the interior of the Duomo, and a distant glimpse, from the busy street now called the Corso Vittorio Emanuele, at the roof of the huge building. The thousands of marble statues surmounting airy pinnacles seem to be the work of enchantment. From among these may be seen in the distance the blue chain of the Alps, with the deep shadowy clefts of its chief passes, and Mont Blanc shining whitely aloft. On a clear day the Duomo at Milan is visible from the Superga near Turin,—a day, that is to say, so exceptional among all the bright Italian days, as only to occur two or three times in the year.

Fifteen miles from Milan is Pavia, a view of the famous Certosa of which city we reproduce, by the kind permission of Messrs. Chapman & Hall. The word "Certosa" denotes a building,—abbey, convent, or church,—belonging to the Cistercian order of Monks; the French *Chartreuses*, and our own Charterhouse establishments. The Certosa of Pavia was built about the same time as the Duomo of Milan. It contains a church, a cloister, and numerous conventual buildings. All are designed in the same style, as parts of one grand whole, and show an artistic unity such as few buildings in Italy, at all approaching them in magnitude, exhibit. From the effective engraving our readers may form a general conception of the design. There are, if we do not mistake, numerous casts and reproductions of many of the more beautiful details to be seen in the South Kensington Museum.

We cannot linger with our guide amid the three lovely lakes, the Lago di Como, the Lago di Lugano, and the Lago Maggiore; and only pause to refer to the combination of architecture and vegetation in the beautiful rotunda of Hercules on Isola Bella, in the second, and perhaps the most exquisite, of these three water stations on "the way to Paradise." A sketch of the castle of Moncalieri, one of the strong cradles of the sturdy race of Savoy, while we can find no fault with its draughtsmanship in matter of accuracy, fails altogether to impress the mind with the sense of vastness, and of stern and hoary antiquity, which the actual aspect of this fortress-palace awakens. The chapter on Turin is all too short. We get no idea of the brilliancy of the little city. The Parisian elegance and regularity of its modern portions; the peculiar veil of false antiquity thrown on so many of its buildings by the decay of the ill-burned bricks of which they are built, and which it has been intended, some time or other, to coat with plaster; the fine fountains; the beautifully clean and arcaded streets, which are swept with a river of some 2 in. or 3 in. deep of clear water when a thunder-storm rushes from the Alps; the magnificence of the mountain views; the noble flood of the Po, which we can understand how Virgil called *Rex fluviorum*; the brilliancy of the Corso; the beauty of the horses; the quaint and incredible ugliness of the dogs; the solemn awe of the black marble crypt in the cathedral; the beauty of the Vaudois Temple; the noble armoury; the stately palaces;—of all these who can speak in six pages, half of which are filled with engravings? There is a good view of the Porta Palatina, which we conclude has been drawn from a photograph, as it gives much of the grey and crumbling effect of which we have spoken. There is a peep,—only a peep,—at the Superga, the most magnificently situated basilica in Italy, perched on a mountain peak, on which stood the Duke of Savoy to reconnoitre the position of the troops of Louis XIV. of France, who were besieging the little capital. The Duke then vowed, in the event of victory, to build a church in honour of the Virgin on the spot where he stood. He conquered, and he kept his word. A beautiful moonlight view of the Monte dei Capucini, to the south-east of the Po, gives little indication how close Turin itself lies to the left bank of the river.

From Florence the reader is taken to Genoa, the illustrations of which are hardly the best which the picturesque *vicoli*, the stirring port, and the lofty palaces of that superb city so abundantly furnish. There is a view of the Salita San Paulo which gives some idea of the mountain environment of a city, the impregnable strength of which has been destroyed by the long range given to the projectiles of modern warfare. An account of the sea-board country, called the Riviera di Ponente, and the Riviera di Levante, or the western and eastern coast, illustrated with very good vignettes of Bordighera, San Remo, Monaco, and Mentone; a glance at the marble quarries of Carrara, at the castled crag of Canossa, at the leaning towers of Bologna, and at the tomb of Theoderic in Ravenna, bring us to the close of the rapid sketch; and we part from Herr Stieler with regret.

Only fifty-five pages have been filled by Herr Paulus with a brief description of Italy from the Arno to the Tiber. Space forbids us to accompany his hasty footsteps even with the same slight degree of detailed attention that we have given to the first portion of the work. Florence, Pisa, and Siena are the three cities comprised in this division of the book. A view of Florence, from San Miniato; the Ponte Vecchio, the Piazza della Signoria with the fountain of Neptune, the massive outline of the Palazzo Pitti, the view from the Boboli gardens, the Loggia dei Lanzi, and the Courtyard of the Bargello are the best of the illustrations of Florentine art. The view of the Piazza del Duomo at Pisa, showing the baptistery, the cathedral, and the leaning tower, is taken, we think, from a photograph. The view of the interior of the ruined abbey of San Galgano, near Chiusdino, several miles to the westward of Siena, is a remarkably fine representation of a rarely visited spot. The style is an Early Italian Gothic, closely akin, in its severe grace, to our own Early English. The shadow cast by the southern wall, the six lancet windows, and the vacant frames of the larger and smaller rose-windows above them, appeal powerfully to the imagination. The curious half arch, supporting the external staircase of a house in Viterbo, is the last of the architectural gems contained in this portion of the work.

With Herr Kaden we could not travel, had we space and time for the purpose. If we entered into any detailed account of Italy from the Tiber to the Ionian Sea we should have to describe the scenes illustrated by the engravers from our own recollections, as little or no aid for that purpose is to be derived from the letterpress. Herr Kaden tells us that he is a poet. Certainly his prose is not such as a cultivated English taste can endure, and we hope that we are not likely to witness a change in our national feeling in this respect. Herr Kaden has passed, it would seem, through the great Adriatic cities, rich as they are in sculptured architecture, in which the Saracenic influence blends with the Italian treatment, without entertaining the slightest sense of the charm and the lesson of the buildings. One of the rarest of the architectural gems of the Adriatic sea-board, Bitonto, a little city of nobles, he does not even name. Of Naples, he says, "This people needed but a roof, a shelter for the night, a covering against the rain, and straightway built, with slight care or pains, their unadorned houses, leaving the arrangement of them to chance, and the decoration of them to the sun, the sky, the sea, and above all to the rich vegetation. Who could think of building for eternity in this city, where man cares but for the gifts of to-day?" It is difficult to believe that the writer of this question could ever have visited Naples. Seen it, as an observant and intelligent describer, he certainly has not. His account is not only projected from his own imagination, but, further, reverses the direction of the shadows. Built as it is within the range of the great earthquake-waves that emanate from Basilicata, and subject, moreover, to special local agitation from the subterranean forces of Vesuvius, Naples is a city built with walls unusually massive. We have measured the thickness of those in the old palace of the Spanish viceroys; they are 9 ft. thick. A hundred years is the proper life of a Neapolitan palazzo before substantial repairs are needed. A glimpse is given of domes, towers, spires, and massive buildings. The views of the Porta Capuana, of the triumphal arch of King Alfonso, of the Church of Santa Maria in Portico, are only casual examples of the great architectural wealth of Naples,—hidden, as it often is, in a labyrinth of narrow *vicoli*. Over the gateway of one ancient edifice (if we remember rightly, it is that of the Palace of Justice) stretches a hood wrought in stone, boldly shadowing the gateway, worked with a delicacy that recalls that of a sea-shell, and yet unfractured by centuries of earthquake.

It is to the illustrations that the reader must turn in order to obtain any notion of Southern Italy. The "Fountain in a Roman Courtyard" is a real bit of Roman life; the *pose*, the dress, and the face of the woman waiting for the filling of her pitcher are those of many a Juno of the Trasteverini. The "Roman Model" (p. 245) walks as no other women walk. The view of the half-buried columns in the Forum of Nerva is taken, we think, from a photograph; but it is an admirable woodcut. We have glimpses of the Coliseum, the Forum, and the Temple of Vespasian; a peep at the Ghetto; a view of the interior of St. Peter's. Further south, the attention will dwell on the fine print of the Temple of Neptune at Pæstum, and the romantic tufa cliffs under and around the quaint little archiepiscopal city of Sorrento, the capital of the very garden of Campania. The full-page illustration, "From a Villa, Castelamare," should be entitled "Castellamare, from a Villa near Posilippo;" the little white dots at the foot of the distant Vesuvius denoting Portici, Torre del Greco, and Castellamare. The two prints, "Dolce far Niente" and the "Grotto of Posilippo," are real bits of Naples. The gas-lamps fixed in the latter, more commendable matter of police than as matter of taste, are instances

* See p. 1144.

of the changes effected by the substitution of the rule of Victor Emanuel for that of Ferdinand II., under whose sway, however, be it remembered, the brigandage that now scourges the Southern part of the Italian Kingdom was almost entirely put down. We think that we have said enough to show how delightful an hour can be spent over the pages of "Italy from the Alps to Mount Etna." Notwithstanding the objections we have been obliged to make, it is a very beautiful book.

ARCHITECTURAL SUGGESTIONS AT THE SOCIAL SCIENCE CONGRESS.

We offered some comments lately on the suggestions in relation to the furtherance of art in its more ideal forms, which arose out of papers read at Liverpool. We consider that we shall be promoting the practical objects of the Congress in returning to what was said on the same occasion as to architecture and decorative art, and thereby giving further emphasis to whatever suggestions seem worth keeping in mind for more mature consideration.

The papers read by Mr. Stevenson and Mr. W. H. White on the subject of town architecture formed about the most practical portion of the proceedings of the Art Department: it may be admitted, perhaps, that in dealing with a subject so closely connected with the wants of every-day life, the writers started with a decided lead towards the practical side of things. Mr. Stevenson, indeed, took professedly the art side of the subject of street architecture, but showed a practical sense and moderation in his remarks which was commendable. He had the courage (for among a certain set of persons it requires a little courage just now) to decline to regard art as "the be-all and end-all here," looking at it as one side only of the life of the individual or of the nation, which, however, ought to be duly and fully developed; and his moderate and well-weighed language contrasts advantageously with the style of philippic which is so common, and which was not unrepresented at the Liverpool meeting, against "shams" and "abominations"; for calling names and showing things up to ridicule is now too often considered a part of the *rôle* of an apostle of art. Mr. Stevenson seems not to have known, any better than we did, what to make of the ambiguous sentence in the programme, which dictated that street architecture should be considered "especially in reference to public buildings." Discarding the latter as far too large and extensive a subject for a paper, he claimed for the treatment of ordinary street houses an important place among the architectural questions of the day; decorations with gold and mosaics, and such sources of rich effect, could never be general; what to do with the ordinary house and the ordinary street was the question. His predilections for adopting the most plain and unadorned of brick styles (of anything that can be called a style at all) have been made prominent on various occasions recently: the decisive point which he has made in its favour appears to us to be in putting forward the fact (as it certainly is) that the detail both in brick and wood of this Queen Anne and Early Georgian style forms "the vernacular" of the modern bricklayer and joiner, which they work in when left to themselves, and understand the use of, just as the Mediæval mason worked in his vernacular of mouldings and carved foliage. It does not follow, however, that this should always be the vernacular of the modern workman. Mr. Stevenson did not press the point, or override his hobby, as we think he has done on some other occasions, but when he says that in street architecture we must take what we can get, and that we can get something founded on the builder's vernacular more easily than anything else, this is being rather easily contented, and one is tempted to ask why we should be satisfied with so much lower a level in modern street architecture than has been attained in past times, when buildings and streets were erected, for everyday purposes, which the architect is now glad to fill his sketch-book from, if merely for a reminiscence of their pleasing and interesting effect. But he is ready to admit that the particular style in which streets are built is "of little matter" (we would rather say, "of secondary consequence") so long as the building is good in the style it attempts. Mr. White put the same sentiment rather better and more completely in his remark, that what was wanted was not "a style," but *style*. This quality cannot be created all at once, either on the basis of "builder's vernacular," or on any other style or manner, but perhaps a better way of putting the general requirement of our town architecture is in the more limited requisite named by Mr. White, who thought that what we required in the first place was a real and serious determination to have, along with good, solid, and honest building, something like order and harmony in the disposition of town structures; and even the rule of a central authority to control the whims of speculators, and the autocratic doings of railway companies and their engineers. He wished for "a technical tribunal," which should decide whether this or that scheme was, as far as architectural appearance and respect for existing structures were concerned, advisable and to be permitted, or the contrary; such a tribunal, we presume, as might have prevented the erection of Ludgate-hill Bridge, or compelled the substitution of a less hideous design for the present one.

There are two sides, however, to this latter idea. One may be disposed to say that any system which would prevent such disfigurement of cities would be an advantage; but that is a kind of matter in which the lines of operation would need to be very carefully and cautiously defined. A "Committee of Taste" is a kind of institution which has seldom answered any very good purpose, at all events without doing a good deal of positive harm in its endeavour after negative good; and over-legislation is one of the very things from which town architecture is now suffering. Mr. Stevenson recognised this, and repeated almost in our own words the remark made in our previous article as to the effect which Building Acts had produced in rendering illegal most of the variety and play of fancy in building which go to form what we admire in the picturesque effect of many old streets in old towns. We are disposed to concur with him in his preference for liberty in street architecture, even at the risk of some vulgarity, to what he calls "the dull safety of despotism."

The question of regularity or irregularity in the designing of contiguous houses is one rather difficult to come to a decision upon. A good deal may be said on both sides of the question. Viollet-le-Duc has spoken sarcastically of the modern system of building a whole square as one design, though it is composed of many buildings sometimes for various uses, or, if they are all dwellings, at any rate separate buildings practically: a kind of practice which, he says, that a Greek architect would never have thought of. We have always upheld that a row of houses, even if similar in general design, should have distinctiveness of detail: a quality which, as Mr. Stevenson reminds us, is to a certain extent realised in the houses of the Wimpole-street date, in which the doorways are carefully designed, and each has its own character. But this question seems to us to depend very much on the degree of similarity in the uses of the buildings, and the point of view from which they are collectively to be seen. If there is no point of view from which the group can be taken in as a whole,—if the houses composing it can only be inspected separately at close quarters, there seems no excuse for making them all alike, and it is better to seek a variety of the picturesque in each tenement. But if, as in the case of a square or a terrace seen from a little distance in an open park, the whole can be taken in at once as a group, we cannot see the objection to combining a group of dwelling-houses, especially if belonging to the same property (which makes a kind of ground of unity), into an extended design, sufficiently broken up and diversified, but symmetrically arranged in subordination to a general idea. Variety in detail can still be carried out, and there is no doubt that a great appearance of dignity is gained by such a treatment. Absolute uniformity is dull and wearisome in every case, and unsuitable also; and most readers will concur in Mr. Stevenson's criticism on the Grosvenor-place houses, and the waste of material and cost, in proportion to the effect produced, involved in carrying out the same design and the same heavy stone porch to each house. There is no practical difficulty in avoiding this: it is as easy to build a terrace of houses with varied design as with one design, when the drawings are once made; the only difficulty is with owners of land, who sometimes make a stipulation that all the houses on a site shall conform in design. This, however, is probably stipulated under a real idea that they are thereby keeping up the respectability of the property, and making the site more attractive to the best class of tenants: if they find that the development of taste alters this condition of things, and that the best class of tenants begin to prefer houses with a distinct character to those which can merely be distinguished by their number in the row, the ground-landlords will soon be converted to the same view. The question between artificial regularity and the reverse becomes more difficult when we come to consider the laying out of towns. As every one knows, nearly all new streets in our towns are laid out as straight as an arrow (where circumstances permit), and at precise right angles to the streets or squares formed in connexion with them. Mr. Stevenson says, truly enough, that this formality has done more than anything else to rob modern towns of the picturesque, and that nothing would do more to improve street architecture than aiming at a little irregularity of line in the setting out of streets. He quotes several instances of the good effect of a winding or curved line in foreign towns; he might have added one nearer home, which has been poetically immortalised in the line,—

"The stream-like windings of that glorious street;" *

but he adds the conviction that, from the surveyor's point of view, such things appear merely silly, and he is not sure that two doctors might not be found who would consider it as evidence of insanity for an architect deliberately to plan a street so. The question of distance, of the shortest route, we may observe, does not practically affect the case much. A street may be turned very considerably, to the eye, from its normal direction, without materially interfering with its definition as the shortest distance between two points. A more serious consideration is the interference with the regularity of building sites, and the consequent impossibility of arranging and planning the houses without leaving awkward and useless angles, or having ill-shaped rooms. This certainly is a drawback to the idea of what may be called studied irregularity; but that sort of irregularity which is half regular, depending upon the introduction of regular curves, semicircles, &c., may be carried out without any inconvenience to properly. What may be done in the way of effect in this way, even with bad architecture, is shown in such an instance as Regent's-quadrant. It is certainly desirable that some check should be put on the tendency to arrange new suburban sites in square and oblong patterns, with roads crossing like the bars of a gridiron, and the forbidding monotony of interminable streets, along which the eye looks without break or relief of any kind, while the thought of walking to the end seems to tire one beforehand. Formerly any natural turns in the boundaries of property through which a line of street passed were naturally followed; now, the object is to run straight through them all. Contrast the road out of London by Notting-hill and Shepherd's-bush with that by the interminable straight line of the Edgware-road, and the difference in effect needs no comment; yet the windings in the former route are very slight, not such as to lengthen the distance in any appreciable degree. We must, however, demur to Mr. Stevenson's illustration of the superiority in artistic effect of curved lines over straight, by the example of the Greeks, as shown in the curves of the Parthenon lines. These, except the swell of the columns, were curves inappreciable except by measurement, and intended, in fact, to intensify the effect of squareness; the illustration is, therefore, inapplicable. We cannot accept, either, his depreciation of the value of wide streets. Circulation of air may, as he says, go on as well in narrow streets, provided they interpose no bar to a continuous passage of air; but what about light and the conveniences of traffic, and the important advantage of a cheerful open uncrowded aspect? We can scarcely be brought to think that these are secondary considerations. Upon the desirability in modern towns of extending dwellings upwards so as to get more accommodation on a given base, both Mr. Stevenson and Mr. White were agreed; the former touching upon it, the latter devoting a considerable portion of his remarks to the point. The advantages and possibility of the farther development of this principle of building have recently been fully urged in our columns, and all we can now do is to wait and see whether any enterprising persons will do anything towards realising a system which we believe to be now called for.

The subject of the general artistic aspect of towns, though not purely in relation to

* Wordsworth's "Sonnet on revisiting Oxford."

street architecture in the strict sense of the term, occupied a large proportion of Mr. Poynter's address, and it is interesting to notice what defects in modern towns seem specially to strike the eye of a painter. Mr. Poynter referred at some length, and in a very hostile spirit, to the disfigurement of often the most picturesque or architecturally effective portions of a town by the sudden introduction of some hideous railway bridge; an intrusion which seemed to cause the majority of persons little or no concern, save in very exceptional cases. What had been given by the engineer with one hand, in the great work of the Thames Embankment, had been taken away with the other hand, by defacing the river side with monstrous and hideous railway sheds. His contention was that there was no need for these structures to be so ugly and ungraceful, but that nothing was to be gained by covering them over with applied ornament, utterly unsuitable, and drawn from past ages and a different order of things. If the results of engineering were ever to be less objectionable than now, it must be by seeking for such results within the necessary conditions of its existence. "In short, the exercise of ingenuity in works of pure utility may be made to occupy the place filled by decoration in ornamental art." We have so continually and so recently urged this view of the æsthetic side of engineering work, that we merely quote the above remark as another piece of good evidence in favour of our own view.

The third division, as we may count it, of the art department subjects of the Congress, the influence on society of decorative art and art-workmanship in household details, is one upon which it is possible to say a good deal which is more high-sounding than practical. The influence on society of well-designed furniture and of decorative art generally can only be very vague and partial, and is scarcely susceptible of definition. When people begin to talk, as they often do, about the influence of good and artistic workmanship in such articles, in promoting Truth and Goodness (with capital letters), one is perversely reminded that a great deal of the very best and most truly artistic ornament has been the production of semi-savage peoples, and that periods marked by the greatest refinements of decorative art have at the same time exhibited the phenomenon of a society in which vice, cruelty, and deceit were the everyday rule of life. Mr. Eastlake steered clear of any exaggeration in his paper, which was throughout moderately expressed, and a good part of which went to re-affirm the principles he has before recommended in his work on Household Taste, which has become deservedly popular, and is a kind of text-book with a considerable proportion of those who pay any heed to the subject. His paper, indeed, like Mr. Poynter's address, deals in some degree with the influence of society upon art, rather than the reverse. He made a good point, however, in suggesting that expenditure lavished on gastronomic luxury might be better laid out, and with a return better worth having, on the superior workmanship and thought required to produce good and artistic furnishing to our rooms. Our impression, however, is that at present the two things, with the wealthier class, go together a good deal, and that those who are particular about the taste and style of their furniture are exceedingly careful of their own comforts in other respects; in short, we see little evidence that there either is or has been any very close or necessary connexion between high art in furniture and a high tone in life. We fear the balance of facts is on the other side. The connexion may be traced so far as this, that a very artificial and luxurious age, in past times at all events, has often shown a predilection for very ostentatious, showy, and rather gew-gaw decoration. Take the Louis Quatorze style as an example. It is, perhaps, equally true that a simple and unaffected standard of social life will be and has been accompanied by a preference for simplicity and unpretentiousness of style in regard to its surroundings; but it serves no purpose to push this kind of parallel too far. Most common-sense people, if anxious about the formation of a child's character, would much sooner inquire what books and pictures he had been accustomed to see, than what sort of carpets and chairs he had been brought up amongst; and at present many of the most high-minded characters are, we are inclined to think, found among those who would not trouble themselves very seriously about matters of household taste One reason of this, however, is that a good deal of modern household taste is, like architecture, only a revival, and therefore only partially real; and what is called "dilettantism" has little genuine connexion with character. What we want is not the taste for any particular style of furnishing and decoration (and that is all that a great deal of the present movement amounts to), but a general feeling of the superior value and refinement of good and durable work, executed in a manner suitable to the material and to practical utility; and the tone of mind which leads to this kind of predilection is, certainly, in a less degree, the same which would lead to a desire for a general truthfulness of life. But even in this modified way of putting it, the influence is from the personal character to the decoration, not the reverse way. With Mr. Eastlake's remark as to the beneficial effect upon the artisan of being employed to produce work which "the classes above him" (a phrase we do not quite like) not only require but *enjoy*, we are quite in sympathy; that again, tends in the direction of Mill's definition of art, "the endeavour after the perfection of execution"; something to be enjoyed, beyond the mere utility of the object made. We should have been glad to have heard something of the remarks of Miss Rhoda Garrett, who read a paper (when we happened not to be present) that was not furnished to us, and which not a single journal seems to have cared to report, though its author has a double claim to notice, not only as a persevering student of decoration, but as a pioneer in the new movement for giving to women a place and occupation in this "gentle craft" of decorative design,—as suitable an employment for feminine taste and habits as anything which has been suggested by way of extending the sphere of woman's work.

In conclusion, we are glad to think that the new department of the Social Science Congress seems likely to be further developed, and to be productive of practical good, as it already has had its advantages in the opportunity afforded for interchange of ideas on art in its relations to society. We would suggest on future occasions a little study, on the part of writers of papers, of that quality which has been said to be "the soul of wit." Some of the communications were quite over-long, even with many omissions in reading, for such an occasion. Art is a fertile and fascinating subject to talk about, no doubt, but zeal should be tempered by the consideration that the objects of the Social Science Congress are practical rather than literary.

THE SOCIETY OF BRITISH ARTISTS.

The Winter Exhibition of this society is now open; its special title as an "Exhibition of Sketches and Studies" has been dropped, and it is merely a double of the Summer Exhibition,—that is, a collection of mostly common-place pictures with ambitious subjects. It is a great pity that this and other exhibition societies have not kept to the idea with which these Winter Exhibitions were first started,—of making collections of studies, in which the value consisted in the idea rather than in the finish. That element was exactly what we wanted more of in our exhibitions. But then Smith and Jones, who are beginners, think that, in an exhibition where the great Robinson, who is an R.A., sends only a rough sketch, they will have a chance of standing out prominently if they send a finished painting, and so the Winter Exhibitions are flooded with second-rate pictures instead of (what are often among the most interesting and valuable productions of art) the sketches and first thoughts of first-rate men. This is a real mischief. We want more of idea and thought, less of mere brush-craft, in our exhibitions, and the Winter Exhibitions at first seemed likely to supply this in some cases, as they were professedly instituted with that object; but this result was only attained in the first two years or so. Now we know that when we go into a winter exhibition, we shall see just the same things as usual, painted in the same manner, or mannerism.

The present collection in Suffolk-place is, perhaps, rather above than below the usual mark there; the President of the Royal Academy sends two works, on which we cannot, however, comment with any pleasure, considering them in reference to the position and repute of their author. Among the few figure-subjects we may notice two pictures by Mr. Haynes King, "Tired" and "Scribbling" (57, 73), companion works; "Parted," by Mr. Cattermole (85), and one or two smaller works by the same hand; "My Little Model," — a child in white frock and blue sash (142), by Mr. Gaunt; "A Musical Rest" (215), by Mr. E. Deares; "With the Past,"—a head showing some feeling, by Miss Tovey (194); and "Blanche" (177),—a clever head by Mr. Grosmith. The exhibition is much stronger in landscape than in figures, and there are some good things, large and small, among them. Those of Mr. Wyllie (212, 225) sustain his reputation as one of the best contributors; Miss Hilda Montalba has two works, "Landscape, Naas," and "Winter" (89, 156),—the latter a very clever sketch of a snow scene; "Dungeon-wood, Todmorden," by Mr. Bayes (76) is good; so is Mr. Ellis's "Bramber, Sussex" (114), though a little in the regulation "fine landscape" style; "The Return from Market" (337), by J. W. B. Knight, should be noticed; "Evening," by Mr. C. A. Calthrop (399) is a very powerful sketch (the class of work we alluded to as desirable in these winter exhibitions); so is, on a larger scale, "Near Beddgelert" (378), by Mr. (?) F. W. Meyer; and Mr. Ellis's "Sussex Farmstead" and Mr. Peel's "Near the Suffolk Coast" (372, 380). Among the figure-subjects we should have mentioned one by Mr. Wallis, "Arranging for the Marriage" (191), and Miss Beale's "Paris Sweepers" (257),—an unusual and very clever thing: a troop of old women going through the blank street lined with posters about a "*bal masqué*," &c., in the first chill of a winter morning, to sweep away the snow. Mr. Marks sends another sketch of a young lady with her back to the spectator, under the title of "The Maid and the Magpie" (240); and Mr. Semper's "Young Jessica,"—a girl reclining on a sofa (284)—is a good sketch.

MR. DESCHAMP'S GALLERY.

The collection of works by English artists at this gallery might claim a long article from us as far as artistic excellence goes; but it is not our practice to notice in detail what may be called dealers' exhibitions, where the works are not specially painted and sent for exhibition by the artist. In the interests, however, of those of our readers who like to find themselves in a room full of original and high-class paintings, we mention the collection as one that will well repay a visit, even for those to whom the principal works are not new. It illustrates certain qualities of thought and style which are out of the usual run of English art.

DEATH OF THE PAINTER, DIAZ.

On Saturday last, November 18th, Diaz, the French painter, died at Mentone, at the age of sixty-seven.

Diaz's landscapes may be compared with Linnell's, possessing in a high degree a romantic idealism and liveliness of invention easy but dangerous to imitate.

Unlike the greater landscape-painters, Rousseau, Corot, or Millet of the past, or the living Dupré and Daubigny, all of whom have looked at Nature, and represented her as our own Constable represented Nature, with sober, truthful, cool colours, Diaz delighted in bright exceptional contrasts of effect, and in details and accessories not always, perhaps rarely, satisfactory to the critic, and hence he had detractors that, during his lifetime, denied to Diaz the right to the highest honours of his profession; with time, his admirers will be less violent and his detractors more lenient.

Diaz belonged to that group of artists who, like Delacroix, Rousseau, Troyon, Corot, and Fromentin, inaugurated a Renaissance in landscape-painting, and acknowledged as their master our own great Constable; nor do we wonder at their admiration,—rare with Frenchmen for English painters,—when we remember the extraordinarily beautiful specimen of Constable's work that they possess at the Louvre to guide them, and which seems to combine the subtle charms of atmospheric effect and truth of local colour that French landscape-painters of the present day so eminently succeed in reproducing. Diaz was buried on Thursday, the 23rd inst., at the cemetery of Montmartre.

Esclusham Church Competition.—A competitor wishes us to request the gentlemen who competed in May last for a proposed church at Esclusham, near Wrexham, to communicate with him in order to take steps against the committee. We know nothing of the matter and cannot take part.

THE INFLUENCE OF BUSINESS REQUIREMENTS UPON STREET ARCHITECTURE.*

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

To speak of the influence of business, at the present day, and in this great city, is to speak of one of the most powerful agencies. With that immense majority of the people who have in some way or other to earn a livelihood, it is an axiom of daily life — "business first." Whatever else a man may neglect, to neglect his business is the one cardinal offence for which society will not pardon him; indeed, inattention to business interests will bring upon him certain loss and possible ruin. As a consequence we find that obstacles and difficulties, otherwise insurmountable, are most certain to be subjected if business requires. Science, in its varied and magnificent discoveries and inventions, has been the handmaid of man's business far more than of his pleasures. It is therefore but natural to expect that business requirements have exercised a strongly-marked influence upon our street architecture.

It is not my intention to enter into any archæological researches as to the street architecture of Mediæval times; my desire in this paper is to be practical rather than historical; and though it may be desirable in reviewing the work of the present to compare it with that of the past, that past for my purposes may be limited to the present century—a period co-extensive with the memory of that well-worn individual, the "oldest inhabitant." Seventy years ago, however, it may be doubted if the aspect of London streets, so far as the houses and shops were concerned, had much changed from their condition for the previous seventy years. From the reign of Queen Anne, the earlier monarchs of the house of Brunswick did not preside over a high order of constructive art; and, from what we may judge by contemporary works left to us at the present day, builders, for at least a century, were content to run in the established grooves of their matter-of-fact predecessors.

I have been able to collect for exhibition some reprints of old engravings, representing well-known London thoroughfares and centres of business as they stood about 120 years ago. Despite some evident and pardonable exaggeration in the widths of some of the streets, notably Cornhill and Cheapside, these views are particularly interesting from the minuteness, almost comparable with photographic detail, with which the houses and shops are distinguished in the several prints. The varying heights of the windows, their architraves and entablatures, the curious signs swinging above the doors, the incidents about the streets, all contribute to impress upon us the reality and correctness of the picture. Some of these old shops remain in bye city streets and out-of-the-way alleys, which have hitherto escaped improvement. Within the last few years I saw removed one very characteristic shop-front, with its small heavily-barred panes, delicately moulded pilasters, fascia, and dentilled cornice, from a house in Paternoster-row, which had been, I think, tenanted for about 100 years by Dollonds, the famed optical-instrument makers. And in fixing for the support of the superstructure a wrought-iron girder in the interests of another tenant, who believed in plate-glass, we had special cause to be thankful for the tough oaken framework of the superincumbent floors.

At this point it may be opportune to notice some modern revivals in our business architecture of the style of good Queen Anne. By the kind courtesy of their authors, I have been enabled to place upon your walls very many drawings of buildings lately erected; and prominent amongst them, if not in scale of illustration certainly in picturesque effect, are some which arrest the eye and seem to challenge criticism. New Zealand-chambers, with its quaint gables and latticed oriels, takes us back to an earlier and lovelier type of English architecture than the fashion named after that prim little Queen who has come more boldly to the front in the opened area west of St. Paul's. But the building in Leadenhall-street, and the artistic shop-front designed by the same accomplished architect for No. 395, Oxford-street, are alike remarkable for the adoption of small squares of glass in somewhat heavy framework.

It is certain that the window sashes of a hundred years ago were limited in the size of their panes by the manufactured tables of crown glass; and the picturesqueness of the small squares was the fitting outcome of necessity. With our improved manufacture of glass in plates of any reasonable size, it may be a safe prediction that these examples will not be largely followed as a precedent by business people. Individual tastes will, however, exercise considerable influence, and we may pay willing homage to the fearless and vigorous treatment of an artistic conception. There are positions, nevertheless, in which glass in small squares is most suitable, from their liability to breakage and economy in repair. I refer especially to warehouses used for storage rather than for display, of which some good examples may be found among the designs lent for my illustration. For similar reasons the windows favoured in the buildings of the London School Board may be considered fit and appropriate.

Having taken a rapid glance at the business streets of London in the last century, the practical objects of my paper will be best promoted, perhaps, by bridging a considerable interval down to some twenty-five or thirty years ago. Such a date is the more convenient as representing probably the experience comprised in the professional life of the greater number of the senior members of this Institute. It marks, moreover, a period when by the reconstruction and improvement of certain business thoroughfares an opportunity and impetus were alike given to the erection of special business structures.

At that date Regent-street and the City thoroughfares leading to new London Bridge were about the latest streets of any consequence which had been formed for business purposes; and the first-named thoroughfare retains its celebrity for shops of a high-class trade. Oxford-street (its western portion), Holborn, the Strand, Ludgate-hill, Cheapside, and some other busy streets, were similarly noted; and here and there along their course individual business premises of considerable pretensions had been built; but the streets first-named had been the latest extensive additions to London street architecture. The competition between tradesmen in the display of their wares, and the advantages afforded by plate-glass for this object, was working a rapid transformation at this time in the ground stories of the houses, and producing a result confessedly unsatisfactory to our art. The great business requirement of our shop-keeper being a large unobstructed surface of plate-glass, the builder was called in (most frequently without the architect) to put in, in common parlance, a "new front." All the visible intermediate piers and supports of the ground story were swept away with the old chequered sashes; a huge bressummer was fixed upon the weakest apparent pilasters at the extreme flanks of the elevation, and any necessary intermediate supports given by iron columns or the like, were most carefully hidden by neutralising colours; and, as the large plates of glass were taken as nearly to the pavement level as absolute safety would permit, the architectural result was to show a superstructure, sometimes massive in composition (in the Regent-street of to-day may be seen a heavy Greek peristyle), carried upon a basement of plate-glass! It was vain for critics to deplore, business interests were paramount to all æsthetics, save those comprehended in an enticing display of shop goods!

The curved colonnade of the Quadrant will be remembered as an architectural feature of considerable beauty; and though it had its merits of usefulness also as a sheltered promenade in sunny or stormy weather, it was cleared away, I believe, mainly for the reason that it interfered with business display. Bearing in mind, however, the thriving trades carried on under similar conditions in parts of Paris, as the Palais Royal and Rue de Rivoli, it may be this clearance of the Quadrant colonnade was a mistake.

About this time the fortunate purging of some of the worst human dens in St. Giles's was the means of forming New Oxford-street, by which direct communication was made between the City and the West End by way of Holborn. Here an opportunity was afforded of building to business requirements. The row of shops known as the Oxford-arcade on the north side of the new thoroughfare may be cited as a notable improvement; advantage seems to have been taken to erect a well-lighted ground and mezzanine story, with some regard to architectural effect. Further eastward the bold site forming the angle of Hart-street with the new thoroughfare, was secured by those enterprising and ubiquitous traders, Messrs. Moses & Son; and the structure there erected, despite many defects of treatment, was really a distinct advance in business architecture, and not without results upon the future. Eastward still towards Holborn some picturesque effects of sky-line are produced by some Elizabethan gables, in which regard has been shown to the value of window light; but the incongruity of shop-fronts as sub-structures in so purely a domestic style has an unsatisfactory result.

In the City a clearance was made of some old streets and buildings, south-eastward of St. Paul's Churchyard, and the construction of Cannon-street as a new broad thoroughfare uniting St. Paul's with London Bridge, and intersecting a number of lesser streets and lanes between Cheapside and the Thames, afforded another and valuable opportunity for improving our street architecture. In time the new thoroughfare was steadily flanked by rows of stately warehouses, most excellently planned, and for strength of construction few of them are to be surpassed, if equalled, by any recent erections.

It is to be noted, however, that though at this time such warehouses were entirely devoted to business purposes, and few (if any) persons dwelt in them, yet the fenestration, as a rule, follows domestic precedent, and sufficient regard does not appear to have been paid to the requirements or capabilities for light. This particular defect may probably be traced to a natural disinclination on the part of their architects, and especially in an Italian façade, to set aside those principles of design which have been impressed upon us by early studies of Vitruvius, Chambers, and the best writers and examplars of our profession. The proportion of heights to breadths, of voids to solids, had become canons of architecture, and to transgress them beyond certain well-ascertained limits did not seem possible to any such expediency as a trade requirement.

Far be it from me to say one word in depreciation of those rules of design to which I have made reference. I hold an opinion that the study of Classic art in its highest development,—architecture,—has an influence in educating the eye to a correct appreciation of form and proportion, corresponding in some degree to the influence of classic literature upon the mind; and I share with not a few of my professional friends and seniors in a regret that its study has become so neglected by a section of the rising generation of architects. Further, I think I may be safe in hazarding an opinion that some of our most distinguished Gothic architects would willingly acknowledge the beneficial training of their earlier experience from the study of Classic art. Still, it should be said that the best and truest architecture of all times has been developed in adapting the best available materials, by the most efficient means, to the required purpose. This proposition granted, necessity, which knows no law, can evolve from the vast storehouse of our art a fitting structure for every occasion.

The construction of the Holborn Viaduct, with the large disturbance of surrounding property, resulting in the formation of many new and important thoroughfares, brings us to a point of departure from which might be traced some of the most striking developments of street architecture. Holborn-circus, Farringdon-street, Saint Andrew-street, Charterhouse-street, Ludgate-circus, the flank approaches to Blackfriars Bridge and the Embankment, and lastly, the long sweeping curves of Queen Victoria-street towards the very heart of the City, and opening to view upon its route not a few old churches and buildings of more than passing interest,—all these have given golden opportunities to test the resources of our art; and I venture to submit that there is evidence in the business structures of the past ten or fifteen years that architecture can keep pace with the utmost requirements of the public without sacrificing the governing principles of proportion and beauty.

In referring to the drawings placed in illustration of my subject, it is due to their authors to state that none of them have been specially prepared for the purpose of this meeting, nor have they been grouped with particular regard to their degree of merit or importance; although some of them may have been exhibited elsewhere, I shall, I hope, be excused for bringing them together for this purpose. The series is far from exhaustive, yet it may be considered sufficient for the object, and I desire here to thank my friends for their important contributions to the interest of my paper. In all these recent designs, one especial characteristic may be

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* By Mr. Samuel Knight, Associate. Read at the ordinary general meeting of the Institute, held on Monday, November 20th, Mr. Charles Barry, president, in the chair.

traced,—abundance of light. It is the chief business requirement after space and strength have been secured. As a rule our clients in consultation upon the design of new business premises, are often dubious as to the arrangement of their plan, more or less indifferent as to style, and will leave such matters with confidence to our judgment; but they will insist most strongly upon an abundant light; and overset our most cherished elevation if it seems to limit unduly the number or size of the windows.

This fundamental requirement has had immence influence upon modern design and choice of style. As rectangular openings admit the largest amount of light, and arched openings, especially when pointed or semicircular, limit it, it is not surprising to find that square-headed windows play a very leading part in modern fenestration, and, by consequence, the horizontal features of Classic design form the basis of by far the larger portion of our new street façades. Apart from the superior lighting power of a square-headed window, the greater facilities afforded for such fittings as blinds and shutters give it a practical advantage over an arched form. Architects of Gothic proclivities have not been slow to recognise this comparative defect in their favourite style, and have met it (somewhat successfully, it must be granted) by forming a solid tympanum or spandrel in their Pointed arches, finishing the window-light square at the springing. Though ancient precedents are not wanting for this treatment of a Pointed arch, I confess to an impression that when applied to window arches in storied structures, the result is not entirely satisfactory, mainly, perhaps, for the reason that it involves a compromise of the construction. The level of window-heads finishing close to the ceiling, the section of the upper floor framing crosses the arched portions instead of resting upon them, as consistent design would require.

It might be convenient here to refer to the varied causes which have otherwise affected design in street architecture. Recent legislative enactments have not had as much visible influence upon architecture as the removal of certain vexatious restrictions. The window duty has been removed within my own recollection. A veritable tax upon light, limiting the size of windows, and treating all above a certain small number as a luxury to be enjoyed only by the extravagant classes, could not fail to have an unhappy influence upon the architecture of that day. About the old West-end streets, and especially at corner houses, may be still seen whole tiers of blank windows; and it was common to see their panels painted in imitation of sashes and frames, blinds and tassels included, with a pre-Raffaellite fidelity enough to deceive the very tax-gatherer. The duty upon bricks, limiting their size and shape to a given square mould, and, by consequence, preventing the manufacture of moulded or ornamental varieties, also contributed to the dull "hole-in-the-wall" character of former buildings. With little or no extra cost, but with a greater choice of materials, we are now able to give character and enrichment to our buildings, which could formerly only be obtained by the employment of masonry or questionable stucco. The extended application of iron as a constructive material plays a very prominent part in the modern development of street architecture. With girders of inconsiderable section to span large voids, and stanchions or columns doing the duty of more massive brick piers, very enlarged areas of light and space are obtainable, and there are examples of very admirable buildings displaying these features of construction. From the liability of wide stone lintels to fracture, rolled iron joists of small section are now not unfrequently used for that purpose; and with this advantage, that they enable the window lights to be safely carried very near to the ceiling. This construction, by forming a lateral tie between piers, is an element of strength in the building. In plain warehouses it also contributes to economy in cost. Instances, however, are not wanting in which the architectural effect of iron construction is injured by injudicious treatment in completion. Attempts to conceal the iron stanchion by a weak ashlar pilaster of stone, frequently having a base and capital of still weaklier design, have a disastrous effect upon the composition. And painting such iron supports in stone-colour instead of some pigment representing the metal, often contributes to a loss of proper vigour of design. It should be noted, however, that this latter defect frequently occurs from the employment of a working painter after the architect has resigned his charge. That honesty is the best policy is, however, a truism as applicable to art perhaps, as to morals, for structures fail or succeed in satisfying in large proportion to their consistency of treatment.

It cannot fail also to be observed that the best of constructive materials have of late years come into more general use. Twenty or thirty years ago, stucco for surface and ornament was still largely used, and in the more important business premises of that time to which I have made reference, not excepting many City warehouses, stucco and cement play a considerable part. Now, its use is exceedingly rare. Bath stone and the softer oolites have also had their day, and may be truly described in their decadence as a London material. Portland stone has, however, resumed the pre-eminence given to it by Wren's sagacity, and here and there we find the splendid quarries of Yorkshire and the north contributing to the strength and beauty of street architecture.

It may be guaranteed that Macaulay's New Zealander will find among the ruins of London City an abundance of well-preserved details with which to encumber the vaults of his museum in the far Pacific.

Bricks, of whatever variety, are usually of the very best, and not ashamed to show their faces. Since the fortunate decline of speculative building, place and other inferior bricks have become a comparative drug in the market. Glass, not only for shops, but for all front windows, is now usually of the best plate, and (Queen Anne notwithstanding) in squares of otherwise royal dimensions. Apart from its strength, and the value of free unrestricted light to the interior, it can scarcely be disputed that plate glass improves the exterior of buildings to an extent far exceeding its commensurate cost. Coiling shutters of wood or iron are of universal adoption; their facility in use and economy in space will repay their extra cost from a business view, whilst the substitution of their broad unbroken lines when closed for the worn panelling of the old wooden shutter contributes not a little in breadth of effect to the new buildings.

The entire devotion of premises to business purposes has had another improving effect by the omission of the small private side-door: this may seem at first an insignificant matter, but those of us who have had to provide for the feature in our designs may not be unthankful that it is no more. In the City, where the upper floors are often sublet as offices, the portals from streets in modern buildings are treated with becoming dignity, and some very excellent frontispieces will be familiar to you. The formation of bulk-heads below ground-story windows to give increased light to the basement, has long been a familiar expedient. The extension of the principle to upper stories is, however, of recent origin, and, by the increased light thrown into the interior, likely to be largely adopted, especially in narrow and otherwise darkened thoroughfares. This application is, moreover, peculiarly adapted to ware-rooms for display of goods, as the bulkhead on each floor forms a convenient counter running beneath the windows. The effect of this construction on a large scale may be observed in Messrs. Waterlow's new factory in Finsbury. It cannot at present be said that this treatment has an improving effect upon the elevation; nevertheless there should be no real difficulty in treating it architecturally, and it seems to suggest an emphasis of vertical lines, rather than horizontal, in the composition.

The increasing widths of streets should be noticed, and the salutary effect upon architecture. Light and air are more freely admitted, and the buildings stand at a greater advantage from the improved stand-point of the passer-by. The mistake of crowning the sky-line with enormous overshadowing cornices—some projecting as much as 4 ft. or 5 ft.—has been corrected. The practice (compulsory in most cases) of canting or rounding off the plan in all structures standing at the angle of two streets, has had business advantages, and influence upon design, and should be remembered.

We are familiar with the additional light and prospect provided by a bay window; and it is pleasing to see this advantageous plan restored here and there in the form of shallow oriels above the ground story. New Zealand-chambers has been before noticed; Messrs. Collinson & Lock's gable-crowned elevation in St. Bride-street exhibits a good example; and amongst others some new frontages in Holborn exhibit their designer's appreciation of the principle. Now and then it might involve a slight sacrifice of ground-floor space, but when the upper stories are valuable such value might be often increased by such oriels.

Suggestions have been made at times to utilise the vast acreage of London roofs, as terraced flats, or conservatories for plants and flowers: one or two attempts have been made, by Mr. Lascelles in Finsbury, amongst others, to launch this idea. Upon the walls is a drawing of Messrs. Barr & Sugden's new premises in Covent-garden, erected two or three years since. With an extraordinary view of the possibilities of future London, the agents of the noble duke, who is lessor of the property, required that the buildings, with a frontage of about 36 ft. only, should be so planned as to admit of ready conversion into two dwellings! This explanation is necessary in apology for the design, which is only noteworthy for the large conservatory constructed upon the roof for the business requirements of our clients. It is planned in three separate houses of varying temperature, and is a compound structure of walls, wood and iron. The design will be recognised as a simple adaptation of the familiar Paxtonian semicircular roof. It was erected as an experiment; and though it has, I believe, answered to some extent the trade requirement, it may be feared the London atmosphere is too poisonous to the growth of flowers to expect such costly structures to be extensively erected as pleasure-houses.

Whilst noticing roofs, it should be remarked that the importance of ancient lights to buildings, and the care requisite to be exercised by architects of adjacent structures to prevent injury to them, has occasional influence upon the construction and roofing of topmost stories. The familiar construction of a mansard roof is frequently adopted with success to avoid undue interference with neighbouring lights, and the litigation and heavy compensation often ensuing thereupon. This construction may be, and is, often adopted for less urgent motives, and in tall storied structures it forms a very picturesque sky-line, especially when broken by really well-designed dormers; too often, it is to be feared, the zinc-worker is left to his own fanciful devices, and some vulgar incongruities result. The new block of buildings forming the south-eastern end of Holborn-viaduct may be favourably distinguished among other things for its handsome and characteristic roof.

A few words upon a consideration particularly affecting internal plan. The enormous value of land in business thoroughfares, and the proportionately high rentals obtained for the buildings, has led to a system for calculating that rental, whether for a whole building or a single floor, in close ratio to its superficial area. The result is, that sometimes in the desire to enclose the utmost space, sufficient regasd is not paid to the reservation of a proper amount of open area for light and air to the inner portions of the building. In storage warehouses this defect will not be manifest; but in the case of premises divided into chambers and offices, and a large part of them necessarily lighted otherwise than from the street, serious mistakes are sometimes made. It is not unusual to see the entire ground-area enclosed and covered, and the rear portions of the upper five (or more) stories lighted inefficiently from *shafts* rather than areas carried up from the first-floor.

I should say that some otherwise valuable sets of offices have been damaged from this cause, the more from the circumstance that the lower rooms, for which the highest rents should be obtained, are the dingiest and worst ventilated. It would be well perhaps in the public interest if the Building Act was more stringent in this matter.

From the same anxiety to enclose every foot of space, the most acute or oddly-shaped corners are sometimes preserved in important rooms throughout the several stories. To make every apartment perfectly rectangular, upon the irregular sites common to the crowded city is not possible, nor always perhaps desirable; yet it is not sufficiently noted that odd or acute angles in rooms are but rarely of real value,—more frequently they are a positive nuisance from the difficulty in furnishing or utilising them. Such excrescences of space may often with economy and advantage be added to the external area.

There is another business influence continually at work, affecting in an important degree our street architecture, namely, the gradual, yet rapid conversion of rows of private houses into shops, and in what may be called the inner suburban districts this transformation is daily going on. It usually takes the form of building a one-story shop over a garden or forecourt,

some 20 ft. or 30 ft. in depth, and uniting it to the original dwelling. From the divided tenure of these properties, this change is wrought in a very irregular fashion; an architect is rarely, if ever, consulted upon the work, which is usually done in the cheapest manner by a local builder. It will occur to us what fine architectural features might be wrought were the matter treated on a comprehensive scale. The shops of symmetrical elevation, crowned by cornices and balconies enclosing an upper terrace of communication with the upper floors, which in turn might be converted into shops; or, in any event form most attractive dwellings.

Having concluded my observations (necessarily brief and incomplete) upon those practical and constructive considerations, which, from the business aspect, form the chief branch of my subject, it is desirable, perhaps, that I should make more extended and general reference to the apparent results of those considerations upon the æsthetics of design. It would be but affectation on my part, and an ill compliment to the matter under consideration, to say that I had no opinions to offer. Such, however, of my remarks as may have a critical tone, are made with some diffidence, and much deference to the body of this Institute. I am far less desirous to advance any views or suggestions of my own than to place this subject in such a manner before you as may lead to its profitable consideration, and perhaps in some small degree advance the street architecture of the future.

May I say that one strongly-pronounced result of business requirements upon design is to confirm, apparently, the appropriateness of styles wherein a need of vertical composition does not exist? This refers with greatest force to structures of considerable length in frontage, and in which the ground-floor is devoted to large areas of shop-fronts. Following this view, it may be noted that such vertical surface-features as pilasters, or even quoins, are best avoided in the upper stages of the composition, unless they can be carried through to the ground-level. Any emphasis given to such features by moulded capitals and bases, or by bold rustication or vermiculation of quoins, will also usually aggravate their ill effect. And from this cause, horizontal bands of ornament, such as carved strings to imposts, and piers between the upper windows, should rarely be allowed to assume the proportions of capitals. In fact, it would seem desirable to treat all compositions above a long unbroken shop-front in the broadest horizontal manner.

Shop-fronts themselves seem best with plain square lines of framing. Elliptic or other arched forms, whether in wood or metal, are so visibly inadequate to any support of the superstructure, and, as mere decorative lines, are so foreign to the fitness of the materials, that they are best avoided. It seems, certain, also that, for the attractive display of shop-wares the window needs but an unostentatious frame; and the more neutral and subdued its tone and colour, the more likely are the objects displayed, if themselves of richness or beauty, to be seen to the best advantage. These principles seem to be fairly understood and recognised in the most notable of recent shops. A scarcely better example of this treatment could be brought to your notice than Messrs. Jackson & Graham's improved premises in Oxford-street (laughter); in simplicity, breadth, and refinement, the frontages of shops are eminently pleasing; and the carefully-subdued features of the superstructure, considering the difficulty of constructing harmony out of discord in adapting existing buildings, bear high additional testimony to the architectural attainments of an artist whose authority upon "ornament" has become world-wide. I think the public, at any rate, will say that it is successful.

I have before referred to the fact that the larger proportion of our new business structures are of Classic or Italian design. It would be more correct, perhaps, to say that they are not of Gothic design, as we understand its leading vertical features. There are a number of erections, and more than one from its size and position, of architectural pretension, in which there have been attempts to engraft Gothic details upon Classic outlines of form. Shall I be supported in the opinion that they are among the least successful of modern buildings? Restlessness is written upon their limbs, inconsistency graven upon their brow! The roll and hollow which give beauty and vigour to a Gothic jamb, become a weak bead upon an Italian impost. The natural treatment of Gothic carving lacks, upon broad and deep surfaces, the sturdy yet refined strength of the more conventional Classic volute. And when the difficulties of the union of styles are felt to be overcome by the ever-ready stratagem of a "stop-chamfer," further criticism may be withheld. Nemesis will overtake them.

Of consistent Gothic design, it is, however, impossible to infer that it is incompatible with full and fair compliance with business requirements. There are many admirably treated buildings in various directions, and some of the very best, perhaps, adorn the collection I have been able to bring here to-night. The most satisfactory appear to be those wherein the centre of the composition is given up to light by mullioned and transomed domestic windows of broad surface, the solid flanking piers carrying an arched superstructure at the topmost story. The pointed gable is a mode of finishing a roof towards a street as consistent in construction as it is expressive and picturesque in effect; the open valleys between the gables, where repeated in rows, lets light into the street. Most of these Gothic buildings, however, suffer from being placed between broad square Italian elevations. It would be interesting to see a really large group, as one side of a street, with its gables, restoring the features left to us here and there in a few Mediæval towns, and not disturbed by too close contact with Classic breadth.

The Thames may for business uses be considered sufficiently a street for me to call attention to Paul's Wharf,—a storage warehouse familiar to most of us as a most appropriate application of this style to a purpose. Nearer to London Bridge is another water-side warehouse, Messrs. Spicer's, of considerable merit, though differing in treatment; their architects have kindly contributed to my illustrations some other thoughtful studies of street architecture.

A massive Gothic wedge has been driven into the very heart of the City in the shape of that handsome block of shops and offices known as Mansion House Buildings. As the largest experiment, perhaps, yet made in adapting the style of business requirements, it demands and deserves more than a passing remark. The experiment is a bold one, for the site is opposed and flanked upon all sides by Classic buildings of more or less acknowledged merit and importance. The Royal Exchange, the Mansion House, the Bank of England, and last, though by no means least, that magnificent structure, the building of the Safe Deposit Company. All these hem it in and confront it, whilst the circular turret artistically terminating its roof is challenged in rear to a contrast by the famous steeple of St. Mary-le-bow. Its accomplished designers, having regard to the primary importance of business requirements, appear to have shown much discretion in the selection, for this long façade, of precedents suitable to horizontal treatment, and seem to have done the utmost under the circumstances to minimise the vertical tendencies of a Pointed style. Had it been possible to give to the ground story a vigorous arcade, and to reserve the structure for quiet, unobtrusive official or professional occupation, its success as a design would have been more complete. That substructure of shops, however, seems fatal to its success; and the discomfiture is somewhat increased by the close vicinity of its sturdy Classic rivals.

It may be but an unreasoning sentiment, and difficult of logical defence, but in this country Pointed architecture *is* associated in the popular mind with religious, or at all events, non-secular uses. It is the one style in which our Mediæval churches and monastic and collegiate buildings were erected, and the examples left to us of the castles and domestic buildings of those times almost invariably show features quite distinct from those of ecclesiastic structures. Taking the very latest type of our English Pointed, as affording us more abundant proofs, it may be noticed that it is scarcely possible to confound the features of a Tudor house with those of a church of the same date. It is something of this sentiment which receives a slight shock at seeing dressing-bags and hosiery enshrined in windows having the foliated framework of a chancel screen. And one feels sure that the architects must be grieved in spirit at seeing those beautiful geometric windows on the upper floor, recalling to memory the Pointed arcade of some cathedral clearstory, disfigured by business announcements in letters bold as brass, and ranging from "Accidental death" to livelier subjects. It would appear that for such buildings Gothic architecture should confine itself more absolutely to its domestic types.

Of business structures other than those I have been able to bring pictorially to your notice, may be mentioned some granite buildings in Cannon-street, and, in Cornhill, the Office of the Scottish Widows Fund; both are remarkable for the bold and successful dealing with light, and for the splendid polished granite largely used in construction. In the Cornhill building the manner in which the entrance to Change-alley is brought under the general elevation without impairing its light, use, or general effect, is also worthy of notice. No. 39, Cornhill, another enterprising tailor's, shows the keen appreciation of this trade of light; and the bold efforts occasionally made to gratify it. Palmerston Buildings, in Bishopsgate, and some similar structures by the same authors in Gracechurch-street, are notable as successful blocks of offices; and in Queen Victoria-street are interesting and more or less satisfactory structures, all working out the business problems of the day.

We can, however, scarcely leave Queen Victoria-street without a regret that in the building of new offices better opportunity was not taken to house the leviathan of the press in a temple more worthy of the *Times*. It is some compensation, however, for us to see its conservative contemporary asserting the virtue of consistency in a far higher appreciation of the *Standard* to which such architecture should strive to attain.

I feel that having arrived at the utmost limits by which my paper should trespass upon your time, I am yet little more than across the threshold of this great subject. To cross the threshold is, however, to be within the walls; and once there, I may safely and properly resign the conduct of it to the consideration of those more experienced and distinguished members of our body; who, to the scattered and incomplete materials thus laid before them, will be able to add all that is essential to advance the business architecture of the future. An enlightened and unprejudiced recognition of public wants, and a consistent application of architecture to those wants, will line our streets with stately and solid structures, regarding which future writers will merge all questions of style in one significant sentence: "The style of Good Queen Victoria."

THE HISTORY OF GAS-LIGHTING.*

HAVING traced the introduction and progress of gas-lighting in London, we will give a short description of the actual manufacture and purification as adopted in the best gas-works.

1. *Preparation of Crude Gas.*—Durham coals mixed with about 10 per cent. of cannel are heated to redness in large fire-clay retorts placed horizontally in a furnace. Five or seven, and sometimes in large works as many as twelve or sixteen, retorts are heated in one furnace. The retorts in the upper part of the furnace are often of cast iron. In some London works, retorts are used built up of fire-bricks cemented with quartz sand and a little lime. At the end of the retort, which projects beyond the furnace, is fitted a cast-iron mouth-piece by means of screw-bolts, and a lute of iron filings and gypsum made into a paste with a solution of ammonium chloride. From the upper part of the mouth-piece issues the pipe conveying the mixed gases and vapour from the retort; at the end is fitted the iron lid, which is removed when the retort has to be freshly charged. The coal is inserted in an iron scoop, which is pushed into the red-hot retort, overturned and quickly withdrawn, leaving the charge behind. The iron lid is fastened on, and the distillation continued for four or five hours. The lid is then loosened; the gas at the mouth set on fire to prevent it forming an explosive mixture with the air. As soon as possible the red-hot coke is raked out and a fresh charge inserted. The coke is partly used for firing the furnaces, the rest being quenched with water and sold. The gas and vapour passing from the various retorts enter a large iron pipe, from 1 ft. to 2 ft. in diameter, called the hydraulic main. At the bottom of this main is a layer of tar, into which the pipes from the retorts dip, the whole forming a valve preventing the return of any gas to the retorts. The gas has now to be cooled down, and the condensable products of the distillation to be removed from the permanent gas. For this purpose the gas is made to pass through a series of vertical iron pipes, which are sometimes cooled externally with water. At the bottom of these condensers is an iron tank in which water and tarry liquid collect, and from which the fluids are drawn off

* See p. 1092, *ante*.

by means of a syphon-tube to the tar-cistern. The most volatile and most troublesome to remove of the tarry impurities is naphthaline. Its flaky crystals are found deposited in the mains at great distances from the gasworks. It cannot be entirely removed by merely cooling the gas. It is found in practice undesirable to cool gas below 45° Fahr.; for below that temperature much of the light-giving hydrocarbon vapour is condensed, and consequently the quality of the gas injured. The best absorbent of naphthaline is coal-naphtha itself; accordingly it is usual to prolong the pipe leading from the hydraulic main to the condensers, so as to present a large surface of naphtha to the gas as it passes. In most of the larger works, the gas, after passing through the condenser, is made to ascend through chambers of cast iron, filled with fragments of coke kept constantly moistened by a stream of water. The effect of this "scrubber," as it is technically termed, is to thoroughly wash and cool the gas, whereby a great saving of purifying materials is secured. Between the scrubber and the purifier, or sometimes between the hydraulic main and the condenser, is placed a machine, called the "exhauster," for pumping the gas from the retorts, so as to reduce the pressure inside them. When the tension of the gas inside the retorts rises much above that of the atmosphere, the gas escapes through the pores of the fireclay, and through the joints of the mouth-piece. The exhauster is necessary also for conveying the permanent gases quickly away from the retort, for the illuminating constituents of coal-gas are soon reduced and their light-giving property destroyed by contact with the red-hot fire-clay or coke. The pumping apparatus consists of a series of wrought-iron bells, inverted in a water-tank over cylinders communicating with the main. Each bell and cylinder has a flap-valve at the top, which allows gas to pass in one direction. When the bell is raised by means of a crank-shaft, worked by a small steam-engine, the gas is sucked out of the cylinder into the bell, while in the descending stroke the valve of the cylinder closes, and the gas passes out through the valve of the bell. The water in the tank keeps the apparatus gas-tight, and, as there are no parts of the bell and cylinder in contact, the friction is reduced to a minimum. Another form of exhauster, much used on the Continent, consists of two solid cams made to revolve rapidly, almost, but not quite, in contact. The partial vacuum caused by their rotation in opposite directions pulls the gas through the exhausting-chamber.

On leaving the exhauster, the gas has to be purified from all compounds of ammonia, from sulphuretted hydrogen, and from carbonic acid. To effect this purification, an immense number of processes have been adopted at different times. Originally, Clegg's wet-lime method was the only one employed, but the great pressure required to force the gas through the column of fluid, and the difficulty in disposing of the fœtid liquid, so as not to cause a nuisance, led to the adoption of the dry-lime process. This method is now almost universally employed, but only after the gas has passed over some other purifying material; in fact, lime is used chiefly to absorb the carbonic acid present in the crude gas. Laming, in 1847, patented the use of calcium chloride and oxide of iron mixed up with sawdust; but it was not till two years later that he took out a patent in France for the revival of the spent oxide by exposure to the air. The sulphuretted hydrogen in the coal-gas reacts with the oxide, forming sulphide of iron and water. After some time the purifying action ceases. The mixture is removed from the purifier, and atmospheric air passed over it; or the coal-gas is passed through another similar purifier, while air is drawn through the one that has been in use. The sulphide of iron is thus decomposed, and oxide of iron re-formed. The sulphur is partly deposited and partly oxidised to sulphuric acid, which combines with any ammonia present. The oxide after "revival" is again employed, and this process of absorbing sulphur and replacing it by oxygen can be repeated until the material gets choked up with deposited sulphur. Cyanogen is also removed by oxide of iron, and methods have been employed of extracting the ferro-cyanogen to form Prussian blue. The ammonia, after losing to the oxide its sulphuretted hydrogen, forms with the carbonic acid carbonate of ammonium. The chloride or sulphate of calcium in the Laming's mixture acts on this body by double decomposition, calcium carbonate and either chloride or sulphate of ammonium being formed. The rest of the carbonic acid is removed by passing the gas through a dry-lime purifier. The best lime is employed for this purpose. After being crushed and finely sifted, it is slaked with water until it just preserves its consistency when moulded. The lime is spread evenly on screens to the depth of 2½ in.; in France beds of moss are placed on the trays, over which the lime is spread, to expose a larger surface to the gas. After passing through the porous lime, and losing its carbonic acid, the gas is passed into large iron gas-holders and is ready for use. Between the lime purifier and the holder the gas passes through a meter, called the station meter, in which it is measured and the quantity registered. Attached to this meter is a piece of mechanism which registers, by tracing a curve on paper, the *rate* at which the gas has been passing through the meter. If any irregularities in the flow of gas have occurred, the pencil line will show when the decrease took place, and when the deficit was made good. By means of this tell-tale the manager of a gasworks knows which set of men have been to blame.

The gas-holders are composed of two parts, the tank containing water, and the holder itself, in which the gas is contained. In erecting gas-holders, much depends on the nature of the ground. In a rocky or hard soil it is cheaper to dig a tank and make it water-tight with bricks and hydraulic cement; but where the soil is marshy or unstable, it is better to erect an iron tank above ground. The gas-holder proper consists of a sheet-iron vessel, open at the bottom, and inverted into the tank of water. It has perfect freedom to rise and fall, being held in position by upright rods fixed round it. The gas enters the holder from a pipe opening just above the level of the water, and owing to its lightness, it pushes the iron holder up and supports its weight. The outlet-pipe also opens just above water level, and, when it is open, the weight of the iron-holder forces the gas down it, and so into the mains. The water in the tanks prevents any communication between the gas and atmosphere. The tension of the gas in the mains varies with the height of the holder above the water in the tank, and also with the quantity of gas being consumed at any particular time. When shops and other large consumers turn out their lights at night, the pressure in the mains at once increases, the lights left burning increase in brilliancy, and gas is wasted. To remedy this change of pressure, an instrument styled a "governor" is now usually adapted to the main. It consists of a small gas-holder and water-tank, the inverted bell being counterpoised, so that it can be adjusted at any particular height. Attached to the bell is a conical stopper, passing through a diaphragm in the outlet pipe, with its apex pointing upwards. If, now, the bell is raised, the cone rises in the outlet-pipe and retards the flow of gas to the mains. Now, when lights are turned out, the tension of the gas increases both in the mains and in the holder, for it cannot escape so fast as it did before. In consequence of this increased tension, the bell in the governor is lifted, and as it rises it plugs the outlet and so prevents too much gas passing into the mains. By this simple contrivance a supply of gas, adjusted to the need of the consumers, is secured.

The history of gas-lighting would be incomplete without some reference to the many methods which have been tried of making gas without distilling coal. Lebon, it is said, began his first experiments by carbonising wood. Taylor and Martineau took out a patent for distilling oil in retorts, and this method of preparing gas was tried on a large scale in many towns in England. Oil-gas works were erected at Edinburgh, Liverpool, Bristol, and many other places; but the process proved a failure, and the several companies employed in the manufacture adapted their works to distilling coal.

Where coal is inaccessible for distillation, wood, peat, and resins, are profitably employed for making gas. These substances do not require the same high temperature as coal does for its carbonisation. Bituminous shale sometimes supplies the place of cannel. The process in all such cases is essentially the same, namely, distillation in retorts, condensation of tarry compounds, and more or less purification according to the nature of the substances distilled. In England, the cheapness of coal renders it the most economic agent for producing light.

In 1829, Michael Donovan patented a method of preparing illuminating gas by carburetting the gas formed by the decomposition of steam passed over red-hot coke. This patent has been the father of innumerable "water-gas" patents wearing many forms and many names. The specification runs, "This invention relates to the enriching those gases which afford little light while burning, by substances which will impart to them a higher illuminating power, and may consist in bringing the gas (by preference) produced by the action of steam on coke, &c., heated to redness, into contact with the liquid or vapour of spirit of turpentine, spirit of tar, coal naphtha, naphthaline, or other substances, heated or otherwise, and employing the combined mixture as the illuminating agent." Among other patents taken out for practically the same invention may be mentioned those of Lowe, Manby, Cruckshanks, and Stephen White. White's process, patented in 1850, was tried on a large scale at the Manchester Gas Works, and at the works of the South Metropolitan Company. The cause of its failure was the irregular supply of hydrogen. Sometimes the diluent was in excess, and then the burners gave scarcely any light; at other times the supply of hydrogen failed, and the rich hydrocarbons, insufficiently diluted, burned away with a smoky flame, producing a bad light at a great expense. After a long trial the process was found a heavy loss, and was given up entirely. About the same time a company was started in Paris, under the name of the "Compagnie Générale du Gaz électrique," with the idea of carburetting the gas obtained by decomposing saline solutions by electricity. The company proposed raising a capital of two millions sterling, and their prospectus stated that the hydrogen could be made at the small cost of about 3½d. the 1,000 cubic feet. They issued a report signed by certain French *savants* favourable to the new process, but a practical trial soon convinced them that to make hydrogen by electrolysis would cost just one hundred times what the prospectus stated. The great bubble burst, and the world heard no more of *Gaz électrique*. Notwithstanding the experience gained at Manchester and elsewhere, "water-gas" has lately made another bid for public favour. The "New Gas Company" appeared in 1873 with a vast flourish of trumpets and a proposed capital of 250,000*l*. The first part of the process consists in "the production of mixed gases by bringing super-heated steam into immediate contact with highly-heated coke, or coke and iron, or charcoal, in a series of retorts, through which it is passed in such a way as to effect, as nearly as possible, its entire decomposition; and thus a gas is generated composed of hydrogen, carbonic oxide, carbonic acid, and sulphuretted hydrogen, which is the *heating gas*." The sulphuretted hydrogen is removed by passing the gas through oxide of iron, and the carbonic acid, if necessary, by caustic soda. The second part consists in "passing the heating gas through rectified petroleum spirit of the specific gravity of about 65°, thus converting it into lighting gas." The idea of making economic *fuel* by such a process is absurd on the face of it. To make *one* fuel, *four* supplies of fuel are consumed: one to boil the water, one to superheat the steam, one to put into the decomposing retorts, and the last to heat those retorts to redness. The economic aspect of water-gas for lighting is scarcely if at all better. The process is far more complicated and costly than that of making coal-gas, but in spite of warnings from men who had actually proved the fallacy of the "new gas," the money was subscribed and works commenced. The "new gas" made its *début* at Chichester. The light was good, but unsuited to burners with the ordinary narrow openings. A mixture of equal volumes of "new" and coal-gas was then employed with better results, but the new gas was soon abandoned and the use of coal-gas resumed.

Water-gas before carburation is a mixture of hydrogen, carbonic oxide, and carbonic acid. This mixture burns with a non-luminous but hot flame, the temperature of which is increased if the gas be purified from carbonic acid by lime or otherwise. Carbonic oxide is an active poison; 2 per cent. in any atmosphere, it is said, would prove fatal to human beings. An escape of water-gas would, therefore, be highly dangerous, and its presence in gas was forbidden by the authorities in Paris. It is possible to remove the carbonic oxide and carbonic acid, but the cost of such removal, though the illuminating power is increased, is too great for the commercial success of the system.

The principle of using common air to convey the vapour of volatile hydrocarbons to gas-burners was first patented by Mansfield in 1847. His idea was to "manufacture from bituminous

matters, by acting on them at suitable temperatures, spirituous substances, which are so volatile that a current of atmospheric air (at ordinary temperature) passed through them may, when ignited, continue to burn with a luminous flame till all, or nearly all, such substances are consumed." Lowe applied the method, but abandoned it after a fair trial. In 1862 Mongreal took out a similar patent and set on foot the "Photogenic Gas Company." 40,000*l.* were to be raised, one half of which was to go to the patentee. The money was subscribed, but went in fruitless experiments. The "crude idea" could not be reduced to a practical form. After three years the company was wound up, and "air-gas" was lost to sight, only to re-appear the following decade with a fresh company and a new name. The "Air Gaslight Company," Limited, sprang into existence in October, 1872. It differed from previous air-gas schemes in no important particular. The new patentee was to receive 100,000*l.* for his invention, which claimed to surpass similar inventions by reason of some gum or resin being dissolved in the petroleum spirit. This air-gas was exhibited in 1873 at the Crystal Palace, one-half the nave being lighted with the ordinary coal-gas, and the other by the air-gas. Some doubt was expressed at the time whether coal-gas had not mixed with the air passing through the petroleum. Though reported as a great success, the Crystal Palace Company did not adopt air-gas for lighting the Palace. Air-gas was tried again at Richmond, and again at Fulham, but after a career of rather more than twelve months the directors petitioned to have the company wound up. The patentees naturally opposed the petition, and a majority of shareholders wishing to proceed with further experiments, the Court of Chancery refused the petition. The company has since been wound up.

Another air-gas was started in 1873, called after its patentee, the Kromschroder gas. The inventor only claimed an improved method for making air-gas, by passing the air through a chamber containing wool or horsehair soaked in hydrocarbons, instead of making it bubble through a layer of liquid petroleum. The air-forcing apparatus was driven by clock-work, and the vaporising chamber surrounded by a thick jacket of non-conducting material. This, the patentee claimed, kept the generator at a uniform temperature, and protected it from extreme cold,—a doubtful claim, when it is remembered that liquids passing into the gaseous state render heat latent, and external heat was prevented from reaching the chamber by means of the non-conducting covering. Great Marlow was lighted by this gas, and a mixture of it and coal-gas in the summer of 1873, and a company was formed, with a proposed capital of 120,000*l.*, to carry out the scheme on a larger scale.

Of the late Eupion Gas Company little need be said. It was the Kromschröder scheme under a more taking title. The company was floated early in 1874. The business of its promoters was to take in the public, and dispose of their shares while still at a premium. They succeeded only too well, but their zeal outran their discretion. They paid the penalty of making their prospectus a trifle too rosy. Of Eupion gas itself the public never made the acquaintance.

That air or water gas should ever be able to *compete* with coal-gas in England is impossible, so long as our coal supply holds out. The only available source of the light petroleum, which all the new companies use for the production of light, is the crude petroleum from America, especially from the oil region of Pennsylvania. The total annual yield of all the wells in the United States and Canada is a little above 250 millions of gallons. The commercial spirit, which has to be separated by the refiner from the crude petroleum to render the latter safe for burning, is about 10 per cent. of the whole, and has a specific gravity of ·705. There are, therefore, a little more than 25 millions of gallons of commercial spirit, which yield only 25 per cent. of spirit sufficiently volatile to be used by the air or water-gas companies, who require a liquid below ·660. Seven millions of gallons, then, is the total annual supply of "light petroleum," a quantity insufficient to carbonise 6,000 millions of cubic feet of gas, a quantity one-third more than that supplied by the Imperial Company alone, before its late amalgamation with the Chartered.

The demand for petroleum spirit is now far below the supply; should these schemes prove partially successful, the price would rise with the demand, and the cost and danger of freight would make it more profitable for the Americans to keep it to compete with coal gas in the New World. On a small scale, and where coal gas is not to be had, one or other of these petroleum gases may be found useful. Air-gas has been successfully employed in country districts.

The Air Gas-light Company, after failing in their attempt to supersede the use of coal-gas, have found, under the title of the Protector Lamp and Lighting Company, their sphere in the manufacture of a small apparatus, driven by clockwork, for supplying air-gas in country houses and buildings at a distance from coal-gas works. The apparatus consists of two parts, a blower and a generator. The blower is constructed like a wet-meter, the wheel being set in motion by a weight which requires winding up. It is placed in a dry cellar of the building to be lighted, where the temperature is fairly uniform throughout the year. Air is driven from the blower through the generator, which contains the volatile hydrocarbons, and which is best placed outside in an out-house or underground vault. The generator consists of a reservoir for the gas-oil, communicating with a series of flat metal tubes, which are kept partially filled with the liquid hydrocarbons, a space being left for the air to pass over them. After traversing the tubes, the air, saturated with hydrocarbon vapour, passes into a small holder, which acts as a governor to regulate the pressure in the service-pipe. In hot weather, when the hydrocarbon vapour comes off more freely, the air is passed through fewer of the metal tubes, and thus an excess of light-giving gas avoided. When a burner is turned on, the pressure in the holder diminishes, and the weight begins to set the blower in motion, keeping up a continual stream of air through the apparatus. When the burner is turned off the gas accumulates till the pressure counterbalances the weight, and the blower comes to rest. With oil-gas at 2*s.* a gallon the company estimate the cost of 1,000 cubic feet of thirty-candle gas at 7*s.*

The principle of carburetting coal-gas with hydrocarbon vapours has also been applied many times in this country. White's original hydrocarbon process consisted in distilling coals at a high temperature, and passing steam into the same retort. By this means a large yield of a poor illuminating gas was obtained, which was rendered luminous by passing it through spirit from resin. A project was started a few years ago in the city for carburetting coal-gas by causing it to pass through a small "generator," containing liquid hydrocarbons, attached to the street lamps. The light proved to be very irregular, and the inventors had to remove their generators. Failing to profit by this experience, the "Patent Gas Economiser Company" started in 1874 to carry out a patent for the carburation of coal-gas, the carburation to be effected on the consumer's premises by means of a "generator" containing petroleum. The process had the same defects as the previous one, and failed accordingly.

The "patent gas" was another "crude idea" dearly paid for by sanguine investors. The process was an attempt to combine the manufacture of coal-gas and that of oil-gas, or rather tar-gas. The method consists in distilling coal at a comparatively low temperature, collecting the condensed oil and tar and submitting them to a second distillation, passing their vapours over heated charcoal, and finally mixing the permanent gas so obtained with the gas originally obtained from the coal. A larger volume of highly-luminous hydrocarbons are so obtained, than by the single distillation of coal at a high temperature, but the process takes longer time and is less economical than mixing cannel with ordinary coal and distilling the mixture once for all. The "Patent Gas Company" started operations at the Barnet Works. Their operations were a dead loss to the shareholders. The "second distillation" was confessedly a waste of money, as their published report stated the value of the coal-tar to be greater than its value when converted into gas. Complaints were made of the quality of the gas, and finally the works at Barnet were abandoned, and coal-gas reigned in its stead.

Other schemes of improving coal-gas without the aid of hydrocarbons have been mooted from time to time. About 1838 Gurney brought out his "Bude Light." His plan was to convey oxygen to the interior of the flame, either of oil or gas lamps. His method was found too expensive for common use. The same principle has, however, been lately brought forward again by Tessié du Motay. An exhibition of this oxygen light was given at the Crystal Palace in 1871, and during the Vienna Exhibition in 1873 the Empress Elizabeth Railway Station was so lighted. The oxygen, prepared by the action of steam on sodium manganate, was led by a separate pipe to the interior of a flame produced by a specially carburetted gas. The light was described as being wonderfully clear and steady, delicate colours and green foliage appearing as distinctly as in daylight. Previously, du Motay had lighted the space in front of the Tuileries and before the Hôtel de Ville by a modification of the lime-light. Jets of ordinary coal-gas and oxygen were made to play on cylinders of Zirconia. The Zircon light is easier to prepare and more constant than the lime-light, and may be useful for military purposes, signals, and illuminations. The light produced by coal-gas or hydrocarbon vapours burning in oxygen, as tried at Vienna, is too expensive for common use; oxygen deteriorates in passing through the mains, the cost of service and repairs is double, and the supply requires to be carefully regulated by the consumer.

Another invention, brought out about the same time as the Bude light, is "platinum-gas," introduced by Cruckshanks. The light is derived from a coil of platinum wire heated to whiteness in a flame of hydrogen. This plan was tried on a large scale at Narbonne, and continued in use some four years. To heat the platinum, water-gas, freed from carbonic acid, was employed. The process was given up in favour of coal-gas, but the steady light, and the absence of sulphur compounds, led to its employment in several silver and gilding manufactories in France.

Strand. J. Gardner.

STABLES AND COACH-HOUSES IN THE OLD BAILEY.

When the London, Chatham, and Dover Railway Company constructed the Holborn Viaduct Station they purchased a considerable area of very inferior property in the neighbourhood of Fleet-lane and adjoining courts, extending from the railway boundary to the west side of the Old Bailey. On the site of a portion of this, immediately opposite the principal entrance to the prison, a large and substantial block of buildings, of a novel and composite character, has just been erected. The elevation fronting the Old Bailey is 60 ft. in height, and in addition to a deep basement and ground floor, contains four stories, each story containing a range of six windows. The ground floor is carried up with Portland stone piers, and the rest of the elevation is in white brick, with Portland stone pilasters. A carriageway at the south side leads to the rear of the premises, which may be described as a spacious court-yard, extending westward to the railway. From the Old Bailey the floor level is reached by a descending gradient, and around the entire area have been erected coach-houses, stables, warehouses, and workshops. The coachhouses, twenty-four in number, are on the lower portion, nearly on a level with the basement of the front part of the building. Above the coach-houses are the stables, with stabling for sixty horses, the approach to the stables being by an inclined plane and a gallery carried round the courtyard, immediately above the coach-houses. The stable fittings are of a substantial character. The floors are in concrete. The floor above the stables is in immediate connexion with them, and for forage purposes. The story above the last named contains the warehouses, the floor of which is strong, and of fireproof construction,—iron and concrete. The workshops are in the floor above, the floor being like that of the warehouses. Stone staircases at each end of the building, and altogether distinct from the stables, lead to the warehouses and workshops above, all of which can be either let separately or in portions. On the ground floor at the west end, immediately contiguous to the coach-houses, is a forge and veterinary department. The site has thus been utilised for a building combining mercantile offices, warehouses, workshops, together with a mews.

The architect is Mr. W. S. Witherington, of Leadenhall-street; and the builder, Mr. Elkington, of Golden-lane.

A Popular Mayor.—Mr. James Fowler, architect, has just completed his second year of office as Mayor of Louth (Lincolnshire), and was entertained at a banquet by the members of the Council, on Thursday evening, the 9th inst.



MONUMENT TO LEONARDO DA VINCI, MILAN.

[See p. 1130, *ante*.

A WARNING NOTE FROM HACKNEY.

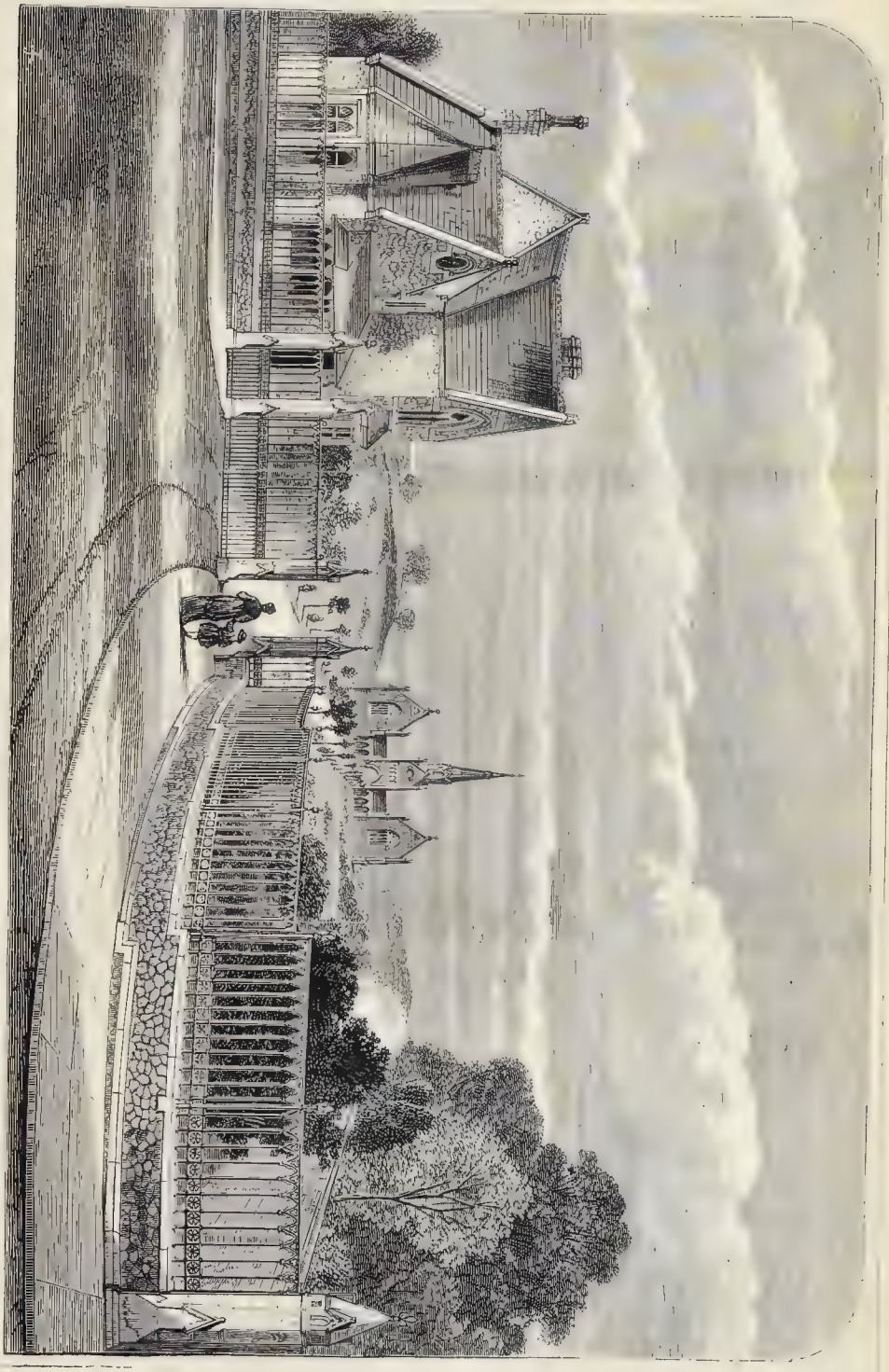
In confirmation of the creed long preached in this journal were needed, the outcome of the series of nefarious building and subsidiary abuses in the parish of Hackney and vicinity would in itself put an end to all doubt upon the question. For several weeks past small-pox and other zymotic diseases have been prevalent in the quarters indicated, and each week has witnessed an increase of the epidemic. What is most noteworthy in relation to this outbreak, and escaping the notice of the medical officer of health, is the fact that a large number of cases have occurred in houses built within the last few years, and others built quite recently,—houses whose exact character we have over and over again described in these pages. At the last meeting of the Hackney District Board of Works, Dr. Tripe, the medical officer of health, stated that an unusually large proportion of the cases of small-pox had occurred amongst servants and other young persons above fifteen years of age, the largest number occurring in the district of Homerton. In speaking of reported cases, the doctor instances the rapidity with which the disease has spread since September, when only five cases came under his knowledge, advancing by forty-one in October, as against sixty-two in the first ten days of this month. We could supplement the doctor's list by some dozen more cases of small-pox that have come under our notice, happening in well-to-do families, and nearly a like number of scarlet fever. The cases are mostly amongst children.

As we write we learn that the small-pox has broken out in Hackney Wick, a district of the parish adjoining Homerton, even worse situated, and notorious for its run-up houses, its bad drainage or no drainage, its monster dust-shoots, and its unpaved roads and streets. If the epidemic once takes firm root in the low marshy and made-up land of Hackney Wick, we fear there will be a sad tale to tell. We witnessed a number of houses recently built upon made-up ground in this district that were occupied almost as fast as they were finished. Into their construction went green timber, and mortar and plaster of the most vile description. Before the plaster was dry upon the walls, the cheapest kind of paperhangings procurable was put on them, and as soon as these houses were occupied by weekly tenants, the whole "eligible" lot was put into the hands of the auctioneer, and sold as a "good investment." It is in houses of this description in the Hackney and adjoining districts that small-pox, scarlet fever, and other cognate diseases are rife. The medical officer of health of Hackney is not unaware of the danger that exists in some of the low-lying localities, and he is evidencing an anxiety and activity which are but poorly supported by the Local Boards of the district at the present moment.



THE CERTOSA, NEAR PAVIA, ITALY.

[See p. 1138, *ante*.



THE HAMPSTEAD CEMETERY.—Mr. Charles Bell, Architect.

NEW CEMETERY AT HAMPSTEAD.

This cemetery was consecrated by the Lord Bishop of London on Friday, the 10th inst., and is now open for interments. It consists of about twenty acres of beautifully situated land, in Fortune Green-lane, in the parish of Hampstead, the surface of which is undulating and commands fine views of the surrounding country.

The ground is divided by a central avenue 25 ft. wide, forming the division between the Church and Nonconformist spaces, and is otherwise prettily laid out by paths and tastefully planted with the good kind of trees and shrubs. The chapels are in the centre of the ground, and are connected by a tower and spire, beneath which is a central archway. They are precisely alike in every respect, and are built in the Decorated style, of Kentish rag and Bath stone. There is a four-sided chancel to each, with seats for mourners and the public. The roofs are open timber, the principals resting on carved stone corbels, representing the wild flowers of the neighbourhood. The chancel arches are carried by red Mansfield shafts with devotional figures as bases to them.

The coffin rests are of a special design, and are stained and varnished, with brass mountings, and have none of the usual sombre look of those usually adopted.

Both chapels are warmed by stoves, and handsome brass standards are provided for gas. A small vestry is attached to each chapel. The central tower and spire are 90 ft. high. The roofs of chapels are covered with green slates.

The lodge is also of stone, as shown, and contains a commodious set of rooms for the superintendent, and also a board-room with open timber roof.

The whole of the work has been designed and carried out by Mr. Charles Bell, architect, of Union-court, Old Broad-street; the contractor being Mr. J. D. Hobson, of the Adelphi, whose contract for the chapels, lodge, &c., was 4,593*l*. The drainage of the ground has been executed under the superintendence of Mr. C. H. Lorne, surveyor to the Hampstead Vestry, and the landscape gardening by Mr. Weston, at a cost of 2,500*l*.

The entrance-gates and railings are of cast iron, and evidently produced with much care. All the members are worked in symmetrical form and sharpness, thereby giving the general outline a very pleasing effect. The castings were executed and fixed by Messrs. Alexander Macphail & Co., ironfounders, Upper Thames-street, whose very satisfactory work we had occasion to notice on a former occasion in connexion with the opening of the Deaf and Dumb Asylum, Margate, by the Prince and Princess of Wales.

The chairman of the Board is Mr. P. H. Le Breton; and the clerk is Mr. A. N. Baptie.

FALL OF AN IRON AND CONCRETE FLOOR.

Dr. Diplock has brought to a conclusion a prolonged inquiry at the "Wellesley Tavern," Robert-street, Chelsea, touching the death of George James Clements, aged seventeen, who was in the employ of the London General Omnibus Company. On the 31st of October the flooring in some stable buildings in the course of construction by the company in Church-street, Chelsea, suddenly gave way, and the unfortunate youth being beneath was killed on the spot. The building in question was a two-storied one, and it appeared that a brick pier bearing an iron girder had collapsed.

The Coroner said he had applied to the Home Office for a Government inspector to view the premises, but he had been referred to the Board of Trade, and that without success.

Mr. Coger, of 5, Gloucester-street, Pimlico, said he was an architect and surveyor. He was the surveyor to the police, and, at the request of the Home Office, had surveyed the premises which had fallen. In his opinion the structure could not be deemed a dangerous one.

Mr. Sancton Wood, the district surveyor, was then called, and he deposed to having seen the plans prior to the commencement of the building operations, and he had seen nothing whatever to object to. He considered the building a safe one, and all the materials used were of the best quality.

The jury returned a verdict of "Accidental death."

It is to be regretted that something more precise could not be learnt. We saw the place after the fall. The weight of the floor must have been very great, judging from the thickness of the concrete on the parts left. It should be remembered that every cubic foot of concrete means more than a hundredweight. Another thing should also be remembered. A brick pier, or end of a wall, so long as it remains upright and whole, will carry a great weight,—a weight to be calculated,—provided the weight is carried down to the bottom. But if by accident the bonding is such as to permit a triangular piece of the pier or wall to be forced off, a comparatively small weight may be sufficient to bring about a catastrophe. For which reason not merely one good stone templet under the end of a weighted girder is necessary, but two, and even three at times, one under another, at small intervals, and covering as large an area as is practicable, may be desirable.

Dr. Diplock deserves great credit for the pains he took to arrive at a clear understanding as to the cause of the accident in Church-street.

PHILADELPHIA EXHIBITION AWARDS.

Sir,—As Englishmen connected with the Centennial Exhibition, it has given us great pleasure, now that the awards are published, to find that Great Britain has secured so many, and in a country where pulling the wires to obtain a certain object is always practised. With one exception, and that is only a supposition, in which a New York firm was agent, has there been the slightest charge of foul play. The case alluded to is that of a prominent London manufacturer of umbrellas, and one who has obtained a medal at every Exhibition in which he has before exhibited. His case was opened, and the articles exhibited inspected and handled by the jury of the group. His rival competitor's case was never unlocked, nor the goods inspected, yet the medal was awarded to him. Is this fair play?

Shortly after the opening of the Centennial, difficulties arose from a breach of confidence of the American Commissioners. On our Commissioners being appealed to they declared their inability to do anything to help us. A public meeting was held at which the various foreign exhibitors were represented, and a deputation was sent to the Treasury department at Washington, where, after a considerable amount of red-tape work, certain concessions were obtained. Owing to the financial state of the country at the present time, the expectations which were held out to foreign exhibitors by the projectors of the Exhibition have never been realised, and all the valuable articles exhibited here will have to go back to the place whence they came. The attendance, taking the whole time, will, we suppose, exceed that of any other Exhibition, as many as 260,000 being registered in one day, and the sum total will in all probability reach the respectable figures of 7,000,000. The principal exhibitors of artistic metal work are Elkington & Co., of Birmingham. Their display is truly magnificent in metal, gold and silver, and electrotype; the Helicon vase and the Milton shield being the principal objects in the collection. A number of *fac-similes* of original art-treasures in the South Kensington Museum, purchased in England from this firm some time ago by the Pennsylvania Museum and School of Art, are exhibited here. This firm takes four medals.

Messrs. Barnard, Bishop, & Barnard, of Norwich, make a large display of artistic iron work in the shape of a summer pavilion in design very like a Chinese temple. The ornamental railing that surrounds it consists of an oblong panel formed by a sun-flower and six drooping leaves. The castings and workmanship show great skill in the working of iron, and the design has certainly the merit of being original. In the useful as well as the artistic combined in iron work, Messrs. Feetham & Co., of 9, Clifford-street, Bond-street, London, take pre-eminence. Their display of stoves and grates is the finest in the Exhibition, and they richly merit the two medals awarded them.

Steel & Garland, of Sheffield, make a very creditable display in the same line.

In household furniture several London firms compete, amongst them being Shoolbred & Co., Cooper & Holt, Collinson & Lock, and Wright & Mansfield. The latter firm takes the post of honour, and their display of inlaid furniture in satin and mahogany wood is, from an artistic point of view, perfect, and has raised both admiration and envy in the breasts of their American competitors. This firm takes two medals; the others before mentioned one each.

In church decoration, Class 217, it is universally admitted that Mr. Harry Hems, of Exeter carries the palm for genuine art work. The oak chest he exhibits is altogether unique in the Exhibition, for, elaborate and profuse as it is, every item of carved work upon it is a study. It well deserves the laudatory terms in which the American *Art Journal* and the American press generally have referred to it. Mr. Hems also exhibits a large figure in alabaster of Our Lord with a child in his arms, entitled "Safe in the Arms of Jesus." This figure goes far to sustain the reputation England bears or thinks she bears for her sculpture. His exhibits have attracted considerable attention, and it is amusing to see the difficulty his representative in charge—a Mr. Charles Pickard, the very beau ideal of a jolly Englishman,—has to keep the crowd off at times; for such is the natural curiosity of the American people that anything that attracts their notice must either be handled or tapped with a stick (a necessary companion to every Yankee) in spite of the cards which are everywhere stuck up, "Hands Off, Please." A medal is awarded to Mr. Hems.

Singer & Son, of Frome, make a small but interesting display of ornamental brass-work, artistic metal-work, alms-dishes, and mural brass plates for churches. In terra-cotta work, for originality of idea and beauty of finish the Watcombe Terra-cotta Works, Torquay, take the first place. Exquisitely modelled little figures, suitable for the parlour, form the principal feature of their exhibit.

The largest exhibitors in this line are Doulton & Watts, of the Lambeth Pottery Works. Taking the whole of the exhibits of this firm in the different branches, they make a very fair display; and when we take into consideration that the commonest kinds of clay are used in their construction, it seems marvellous how such a high degree of excellence could be obtained.

As manufacturers in the finest kind of pottery, Brown, Westhead, & Moore have the largest and (excepting their next-door neighbour in the Exhibition, Messrs. Daniells, of London, who do not manufacture) finest display. The drawing and painting on the objects exhibited are executed in the highest style of art.

In tile work, Minton, Hollins, & Co. make a charming display, and it is amusing to watch the faces of the people when they are informed that the beautiful colours and designs shown them are made out of clay and burnt by fire. All that are in this country are importations from England, so that before this Exhibition the great majority of the people had never seen anything like it, and the price, owing to the high tariff of everything imported, practically excludes it from the reach of the people. Anything that is got up in a showy, cheap manner will sell, while real art may go begging for a customer.

In glass work, Messrs. Green & Nephew, of Queen Victoria-street, London, carry all before them, and their magnificent chandelier has attracted considerable attention. In the smaller ware exhibited by this firm the artistic taste shown, both in design and finish, are unequalled by any other competitor, either from our own country or any other country represented here. But, although living in this our adopted country, we are not so lost to judgment, nor blinded by conceit, not to look fairly at the whole matter. There is no doubt the awards cannot be rated very highly, their value is *purposely* spoiled, deliberately depreciated, by the awards being all alike, given as they are to wondrously different degrees of merit. The jealousy of America as a country has made its judgments and its prizes almost valueless as awards. G. H.

DOMESTIC ECONOMY, AND A MUSICAL EXPERIMENT.

At the annual meeting of the Watford Public Library, lately held, Sir Henry Cole, who presided, said in the course of his address,—I am not going to preach to you the great importance of biology, physiology, or any other ology; but I am going to ask the attention of Watford to a subject which I think involves a knowledge of all the sciences which are important for working people to know, and that is domestic economy. The Education Department in its wisdom has inserted domestic economy in the Code. I want to induce you to take an interest in domestic economy. Young ladies will never be married if they do not study it, and those who are married will never make their husbands comfortable and happy if they do not encourage it. Lord Sandon, the Vice-President of the Com-

mittee of Council on Education, announced two years ago that domestic economy was to form a part of primary education, and he took great credit to the Government for introducing it, which I think the Government greatly deserved. Domestic economy is in the Code defined to give a knowledge of food and cookery. You cannot do without food, and you would be no better than Esquimaux if you did not know how to cook it. It is also to give a knowledge of the laws of health—to do without doctors, although you have such admirable doctors on your committee. The next subject is "The dwelling, its heating, and ventilation." What a deal of science there is in that. It is a subject which puzzles everybody to this day. You do not know how to get the house cool when it is hot, or hot when it is cold. The next subject is "cleanliness," washing, washing materials, and all that. You know somebody was asked what is the evidence of the civilisation of the people, and one answer was "Why, printing," and somebody else guessed at something else. At last somebody said, "The real evidence of the civilisation of the people is the amount of soap used." Another subject under the head of domestic economy is cottage economy and thrift—not to spend more money than you have, not to get into debt, to economise all your resources, save up your money for a rainy day, and not to go to the workhouse,—all of which are worth consideration and practice. It seems to me that this embraces all the sciences which the people of this country should be instructed in. The Government has proclaimed that the people are to know this domestic economy. As practical subjects affecting the daily welfare of the people they rank in my opinion more important than even the three Rs. Good food is more necessary than reading. I think you must eat food before you begin to read. A clean and healthy home is more necessary than writing, and I consider that practical thrift is more necessary than decimal fractions. Our ancestors without public education practised them. We must all have known some old body who kept her cottage a model of cleanliness, did not get into debt, and kept her husband sober, notwithstanding he might have had a glass of beer. I do not undervalue reading, writing, and spelling, but I think the other things more important. Never did a Government proclaim a policy in education more valuable than the necessity of knowing what domestic economy is; but I regret to say it has been left as a theory only, and no practical steps have been taken to make the words a reality. There are no text-books suitable for elementary schools, and the Department has not cared to stimulate the production of any. The subject is not named in the table of qualifications of pupil teachers in training colleges. Not even an individual has been charged with the direct responsibility of seeing if the subject is in motion. The Central Executive of the Education Department has more than enough to do to direct and control the annual expenditure of two millions of pounds for elementary education. It has no force to spare for special subjects. The inspectorial power has been constituted under old traditions, and the inspectors are chiefly University men. The Universities themselves have not hitherto much cultivated the sciences involved in the knowledge of health, food, or household economy. Such knowledge carries no degrees, it gives no fellowship. Many inspectors are not even qualified by marriage to know anything of domestic economy. The inspectors are but mortals, and each acts according to his temperament. They have no responsibility whatever to urge schools to study these subjects, yet as being virtually the distributors of the grants they have a kind of omnipotence. When the public mind is sufficiently alive to the value of domestic economy and the value of the Parliamentary grants, Parliament itself will move, and then the subject, which has been talked about in Blue Books since 1849, will be effectively administered. In the meantime, let me tell you, as is the custom of the country if it does not find the Government doing its work, some private institutions have taken the matter up, though their abilities are poor when compared with Parliamentary money. The National Training School for Cookery has been established. I am also happy to say that Watford is one of the few places in the whole United Kingdom which has started a practical school for cookery. It is some distance from here, and I could wish that Watford, in the town itself, taught the principles of cookery. There is scarcely a single lady, young or old,—there are such things as old ladies,—that might not be much benefited by attending to this matter of cookery, and if you think it worth while, you have only to apply to the Rev. Newton Price, who has already done the work at Watford-heath, and will show you how to do it in Watford. There is another subject which I see you do take care of in this institution to some extent, and that is music. I am of opinion that there is no subject that is more calculated to benefit the people of this country than the proper cultivation of music; and I trust the managers of this institution will do their best to establish musical classes if they have not already done so. During my time I have tried the experiment of music. I have had a little to do with the National Training School of Music; but I am not going to talk about that. I have long held the opinion that the churches of this country are not quite as much used for the benefit of the people as they might be; and I once was instigated (Heaven knows how) to see if I could not make use of my parish church at Brompton. Of course I was all allegiance to the vicar, and I said to him "Doctor, I think I could show you how to bring the people to your church." He said, "I wish you would." I said, "I think I could invent a plan," and I commend this to the notice of the clergy who have charge of the churches in Watford and the neighbourhood. I said, "The people are usually very fond of music, and I think if you were to invite them to come to the churches once a week and allow them to take part in the evening service, giving them as much simple music as they can well sing and understand, you will find they will come." All that in theory sounded very well, and my vicar said, "I will lend you the churches for four Tuesdays." So I did as your Committee and other people do, stuck up some placards, and invited people to come. Then I said, "Let all the seats be free, and everybody come and take his place where he likes." Well, my pastor agreed to that condition, and I said to him, "The next condition I would make is that there should be a sermon, but that it should not exceed ten minutes." Then I said, "They shall have five or six hymns or psalms, which they shall sing to good old tunes — the Evening Hymn, the Old Hundredth, the Austrian Hymn, and others." I said, "I have been at Rome and in Germany, and in both—at one in a Lutheran cathedral and in the other at St. Peter's—the effect of ancient musical instruments—trumpets, as mentioned in the psalms, and shawms (represented by a kind of trumpet also)—was very grand; and if you will allow the hymns to be accompanied by these instruments properly administered, I am sure it will produce a great effect. So we had silver trumpets and two trombones. In addition to them we had two kettle drums; and I declare, if they were the last words I had to speak, nothing more solemn I ever heard. The church was crowded, and they sang their hymns. My friend the Doctor was the only one who disturbed the regulations by preaching seventeen minutes instead of ten. [Oh, Dr. Irons! But it was a good sermon: we happened to hear it.] The result of the affair was, that on each occasion the church was fuller than ever. I met a member of Parliament in the church, and he said to me, "I have been shedding tears all the service; I never heard anything more affecting." I established an offertory after the first service, and at the second I got more than 3*l.* in pence (I requested everybody to give 1*d.* if he could); at the next service I collected 3*l.* 10*s.*, and at the last nearly 5*l.*; so that we paid the expenses. If you wish to take the people away from public-houses, and perhaps their uncomfortable homes, you might do it by a very simple process in your churches if you tried it.

TILING.

SIR,—I have used all the methods mentioned by Mr. G. Horsley Palmer. I prefer moss to hay and lime, and hair mortar to either.

The whole secret of keeping a tile roof dry lies in having no mortar below the gauge—the exposed portion; the mortar or moss should be put under the *top bed of tile only*, and the bottom left clear.

I begin with a 3-in. gauge at the eaves, and finish with a 5-in. at the ridge.

The tiles may be pointed (or torched) underneath; but lathing and plastering, or indeed any work under the tile when once bedded, is likely to disturb it, and to do more harm than good.

ROBERT PHILLIPS.

HEALTH AND SEWAGE OF TOWNS.

THIS was a prominent topic in the address delivered at the opening meeting of the Society of Arts by Lord Alfred S. Churchill, as chairman of the council.

The Chairman said, in drawing attention to some of the topics which I may fairly expect will fully occupy the deliberations of the Society during the session, I must be permitted, at the risk of repeating to some extent what has already appeared in the council's report at the close of the session, to refer to our proceedings of late; inasmuch as, doubtless, our action of the past must be continued in the present session. In May last, a conference was held in these rooms on the Health and Sewage of Towns. It was numerously attended, representatives from all parts of the kingdom were present, and the interchange of the experience and opinions which then took place created much interest. The Society's report of the proceedings forms a valuable contribution towards the elucidation of the subject. The sewage question still remains a problem for solution, notwithstanding all that has been done for nearly a quarter of a century. How to deal with our sewage, and how to get rid of the nuisance at the smallest possible cost, and with the greatest advantage to health, is a difficulty which still confronts us. Exaggerated notions at one time prevailed as to the fertilising value of the sewage, and there was a popular belief that, in lieu of the burden on the ratepayer, it would become a source of wealth to each town. Scheme after scheme was propounded on this supposition, but only disappointment followed. Chemical analysis, it is true, showed certain valuable fertilising constituents and fostered delusion, no account being taken of the cost at which they could be secured, even if any process had been discovered by which they could be made available. Experience, however, has led to the entertainment of more sober views, and the public are now beginning to learn that profit must not be looked for. Our health and comfort demand that the nuisance must be got rid of in some way or other, and at any reasonable cost; and if by some method of treatment a return can be obtained to diminish this cost, so much the better. We are no longer permitted to pollute our streams with it, and other means must be adopted for the removal of, and dealing with, our sewage. Experience would seem to show, and our Conference enforced this lesson, that perhaps a profitable, as well as healthful, way of dealing with sewage, is to apply it to the land; but, unfortunately, it is not every locality that can supply, at a reasonable price, land suited for the purpose, either in soil or position. There are, doubtless, various processes for treatment of the sewage, chemically and by precipitation, which result in the production of a good effluent, generally sufficient to meet the requirements of the Rivers Pollution Act, passed last session; but the precipitant, sludge or solid matter, produced, is but of little value, and must not be reckoned upon as giving a return in money covering the outlay for works and cost of carrying out the process. At Leeds, I understand, where, probably, a larger amount of practical experience has been obtained on an extended scale than in any other town, the difficulty has been to get rid of this sludge or solid matter; and it is only within the last few weeks that arrangements have been made with a contractor to purchase it and take it away at 12*s.* per ton, a sum totally inadequate to defray the cost of treatment. All that can be looked for in any case, wherever the water-carried sewage is applied to land, or treated by any known process, is, that under the most favourable conditions, some small return may be obtained in diminution of the necessary cost of getting rid of the nuisance.

While I am on the subject of sewage, there is another point of very considerable importance to which attention was drawn at the Conference, viz., the construction of house-drains, and their connexion with the sewers. It is of little avail that we spend our money on an admirable system of main sewers, so long as but little care is bestowed on the means for taking advantage of them. Indeed, these very sewers themselves thus become a source of annoyance and disease. Under the Metropolis Management Act, and other Acts of Parliament, the vestries and district boards of works have powers to a great extent over these house-drains, and in reference to all houses built, or re-built on old sites, since the passing of that Act in 1855, the plans for the house-drainage must be previously approved by these authorities. It is obvious that, except in

the outskirts of the metropolis, where extension is going on, but little practical supervision can thus take place in reference to house-drains. Even in these cases the supervision in many instances does not extend beyond approving the plans; the construction of the work takes place without any notice to the vestry or board of works, even had they a staff who could be continually employed in watching each individual case of construction. Plans in these cases are deposited, and are accessible to the ratepayers. In the vast majority, however, of the houses in the metropolis there is no clue whatever to the course of the drains,—no plans are forthcoming. The unfortunate householder who desires to amend the unhealthy condition of his dwelling has no resource but to submit to a thorough search, and this means total upset of all the lower portions of his house, with its concomitant disagreeables and long bill. Take the parish in which our Society of Arts stands; there are, I understand, about 2,320 houses, and the vestry have accumulated, since 1855, plans of the drainage of 320 only, and this from no fault of the vestry, or its active and intelligent officers. In an old and central parish like St. Martin's, it is obvious there is little or no amount of new building going on except on the sites of old buildings. It is only on the occasion of rebuilding, or on complaints made of nuisance, or on a report of the medical officer, or private application on the part of an owner, that any action of the vestry takes place. In the case of rebuilding, a notice is sent from the vestry-office requiring a plan of the proposed drainage to be sent in, and the sanction of the plan by the vestry, guided by their surveyor, is imperative. The plan is retained, and filed at the office for reference. In case of complaint or report by the medical officer, the drains are inspected by the surveyor; on his report an order is made for their being put into proper condition, to the satisfaction of the surveyor; and a plan is then deposited. In this way, since 1855, the 320 plans above referred to have been obtained. As regards the remaining 2,000 houses, the vestry have no information whatever as to house-drainage. The vestry have plans and particulars of all the sewers within the parish, and their surveyor is ready at all times to give every information to parties on this point, in order to facilitate the arrangements of the house-drainage, and its proper junction with the neighbouring sewer. Here, however, the action of the vestry ends. The plan or arrangement of the drains may be perfect, but the execution may be and frequently is faulty, and all the evils of imperfect drainage still remain. There is no guarantee that the work will be properly effected. The work is covered in, and all defects are thus concealed; and when, after a time, these are discovered, it is too late to get any satisfactory remedy or compensation against the builder or his men, the former probably believing in good faith that the work has been properly constructed.

To undertake the actual supervision of the execution of approved works of house-drainage would involve an increase in the surveyor's staff, and a consequent increase of charge on the ratepayers, but the benefit in return would over and over again repay the cost. How far it would be practicable to get plans of the drainage of all the remaining 2,000 houses is a question not easy of solution. That such a deposit of plans should be made imperative by Act of Parliament is demanded in the interest of health and comfort on the part of occupants. Such a measure is greatly needed, and in the end the expense and trouble incurred would be well compensated for by the improved comfort and improved health to the population which would ensue. In these 2,000 houses about whose drainage we have no information, it may fairly be estimated that, in the majority of cases, the drainage is of an antiquated character, and consists of the old-fashioned square brick drain, ill adapted for its purpose. At our conference the other day, Dr. Whitmore, the medical officer for Marylebone, gave some remarkable instances of the imperfection in drainage which had occurred in Marylebone, and especially in Harley-street, and which, under direction of the vestry, had been remedied. There was scarcely a single house in that street that was perfect, as regarded its connexion with the sewer, and notices were served on twenty-eight or thirty houses which were found wholly unconnected with the sewers. It was, however, only the occasion of a new sewer being made which brought these defects to light, and enabled the vestry, through the vigilance of its able officer, to take cognisance of them. While speaking of the old square brick drain, let me point out a defect in our metropolitan drainage which I am informed is still existing in many parts, notwithstanding all that has been done. We have, at a heavy cost, constructed a magnificent and complete system of main sewers. The District Board of Works have supplemented them in their various localities by subsidiary sewers, also of approved construction, to enable advantage to be taken of the main sewers; but there still remain many districts in which the houses can only avail themselves of these works through a net-work of the old square brick drain sewers working into them. It is needless to point out the imperfect character of these latter drains, which, from their shape and material, are necessarily most inefficient. The district in which we now stand is an instance of this. The house-drains of this building empty themselves into a small square brick drain belonging to the parish, at the back of the premises, which, by some means or other, following a somewhat circuitous course, at last comes round to the great main sewer running under the Thames Embankment. If I am rightly informed, such a state of things is by no means uncommon in many parts of the metropolis. I throw this out for consideration. But, to return to the house-drains. I will not enter here into how far the law confers powers on the vestries or district boards, to secure a perfect house-drainage. We know that under Acts of Parliament they are large, but whether sufficiently extensive for their purpose I must leave to the learned to discuss. We do, however, know this, that whether sufficiently large or not, the great bulk of the house-drainage is practically under no effective supervision. At a conference lately held in these rooms, when many of the medical officers of health and parish surveyors were good enough to attend on the invitation of the Sewage Committee, there appeared to be a large confirmation of the existence of these evils, in many districts at all events, notwithstanding that very extensive powers, it was stated, existed; but it was admitted on all hands that the practice of the vestries in availing themselves of these powers varied in every district; that whilst in some districts a great deal was done to remedy the mischief, in others the practice was lax, and the law all but a dead letter. It was the unanimous feeling of those assembled at the Conference that some steps should be taken to ensure the enforcement of the law and secure uniformity of action. I know it will be said that to attempt to deal with existing houses would lead to an interference with the proverbial Englishman's castle which would never be tolerated, and that a system of centralisation would be set up only worthy of Continental despotism. Whilst I am no advocate for centralisation or undue interference with individual action, yet it must be admitted that there are numerous cases constantly arising in which individual action is practically inadequate to procure those comforts and conveniences essential to the well-being of society. Day by day, as civilisation progresses, so does individual action become less and less competent to deal with the complex problems of society. Combined action and restraint on the individual necessarily follow. If we look back but a few years we see how largely this system has now become interwoven with our daily life. Compulsory vaccination and the Building Acts are noticeable instances. In health matters especially, the law and the inspectors are perpetually at work, but nevertheless more is needed. In this matter of drainage we already do much, and in the interest of public health much is demanded. If the Englishman will persist in individual action, and build his "castle" in contravention of the laws of sanitary science, it is time that the law should step in, and that Government should secure, so far as lies in its power, a sound and healthy population. Public health is, after all, public property. It is all very well to say, as some do, that the duty of the parish vestry, or other public authority, should extend to the external wall of the house, and no further, and that then all further responsibility should fall upon the occupant. But how is the occupant to be assured that all the internal arrangements are of a suitable and effective character? The occupant is at the mercy of those who own and those who build houses. Can it be expected that a tenant finding his house defective in these arrangements, is to be at the expense of putting all these defects right? Surely it is not unreasonable to ask that some competent public authority should insist on certain sanitary arrangements being carried out. We have a Building Act,—whether sufficiently stringent or not may be a question,—which, in the interests of public security, compels the constructors of our houses to comply with certain conditions, enforces the building of party-walls, and such like, as a safeguard against the spread of fire. Surely, in the interest of public health there is nothing unreasonable in suggesting that the internal sanitary arrangements of our houses should equally be under competent supervision. An intending occupant would then have some security that, in taking a house, he was not incurring the risk of himself and family being subjected to suffering and disease. On this subject the Council propose to continue its labours, and it is confidently expected that the second conference on Health and Sewage of Towns, intended to be held in the course of the spring, will be as successful as the first.

Whilst speaking on sanitary matters, I must not omit to draw special attention to the enlightened action of the King of the Belgians in relation to this subject, the more especially as it affects one of the objects early treated by the society, viz., the improvement of the dwellings of the wage classes. His Majesty offers, to be awarded at the next International Sanitary Congress, "a gold cup, of the value of 5,000 francs, to that municipal or local authority or to that private association which, by its improvement of the dwellings of the wage classes, shall effect the greatest reduction of their death-rates at the lowest cost."

This is an international prize, which may be said to be new in principle, great in itself, and capable of extended application. It is new in this respect, as proposing a competition, not between individuals, but between collective communities. To the ratepayers and to the shareholders, whose money is being expended, it will be of value, and should be promoted by them; and, indeed, it should be required by them of those who expend their money, that they should avail themselves of the great opportunity of proving their competence.

It will be for the Council to consider in what way they may in England contribute to the attainment of his Majesty's wise and beneficent object, by calling local attention to it, and supplying suggestions of means for its attainment.

HAS HOUSEHOLD ART DETERIORATED?

The Rev. Mark Pattison thinks it has. In delivering the prizes in the Oxford (city) Schools of Science and Art, he said,—There never was, in England, so much talked and written about art; yet, if I may judge from the upholsterers' shops and the general aspect of my friends' drawing-rooms, all this talk and all this writing have failed to get beyond the outward ear. The purchaser is still content to have, the manufacturer is still intent on making, the same flimsy, awkward, unmeaning utensil, covered with tawdry ornament to hide its unintelligent scamped construction. Neither the public we buy, nor the manufacturers who make, nor the retail dealers who sell appear to be at all aware of the absence of art impulse, which seems to the educated eye so extraordinary in persons who live by producing art objects. It seems to me, but I shall be told I am a pessimist,—that things are worse instead of better in the last thirty years. Thirty years ago, if we could not make, we could, at least, import from Smyrna carpets whose graceful patterns and deftly-associated tints left nothing to be desired, and which themselves are education to the eye. Where is the old Turkey carpet now? Carpets are still imported from the Levant, but a mechanical European pattern has been foisted upon the Oriental loom, and the staring mineral dyes of coal-smoked England have supplanted the delicate vegetable tints which the Greek had learnt from the Phœnician more than 3,000 years ago. The muddy waters of the Thames have infected the clear stream of the Orontes. Some twenty years ago an English company infused life, or capital, which is the life of manufacture, into the decaying glass manufactory of Murano, a suburb of Venice. English capital combined with the traditional skill of the Murano glass-blower brought over to this country a quantity of table-glass which threatened at first to displace at our dinner-tables the cut-glass which we had brought to mechanical perfection. But the beautiful artistic glass ware which Venice at first sent to us did not establish itself,—it did not sell. In order to keep the market, the company was compelled to adapt its productions to

the taste of the home purchaser, a taste formed on a mechanical, not on an artistic ideal. The company prospers, the depôt in St. James's-street has an exclusive custom, but what it sells is no more the Venetian glass of the early days of its existence. Mechanism, with its mindlessness and its precision, has ousted art from Murano. The ruby, the amber, the olive, the aqua marina, the opal, are still there, but they are vulgarised representatives of the originals; the bosses and the *ritorto* look out of place on the transformed material, and the whole product is a kind of cross road between the Staffordshire cut and the Venetian blown glass.

It is sometimes thought that there is an antagonism between use and beauty. There is not only no antagonism between them—it is impossible to draw a distinct boundary line between the two spheres of the useful and the beautiful. The word "artist" in English has come in colloquial usage to mean "a painter"; but in its original and proper sense "artist" is simply "workman." We contrast "artist" and "artisan," and for many purposes the contrast points to real differences. But, if we go to analyse the elements of character and intelligence which make up the good artist and the good artisan, we shall find that these are to a great extent identical. The term "workman" is falling out of use. It is a pity that it is so, for it just expresses that which artist and artisan have in common. All art, whether fine or industrial, is a making, a calling into being of something which did not exist. Each single art is a collection of the best rules, ascertained by long experience, for producing something. But, as you well know, no mere observance of rules will make a skilled workman. His hand and eye must, indeed, in youth, have been trained by the rules laid down in his craft. But beyond the rules there lies a manipulation which no rules can touch, where the watchful eye and the deftly dexterous hand act in obedience to an attentive brain. Concentration of thought upon the job in hand is the essential condition of good work from the lowest to the highest. Genius has even been defined to be only "a transcendent faculty of taking trouble." And what is the precondition of painstaking, of this concentration of thought which art requires? It is taking pleasure in what we are doing. What a man likes to be doing, to the doing of that he will give his whole attention. All good art-work in all time has been done by thoughtful and happy men. Imitation kills art. This principle pervades all art, from the highest to the lowest. The Sainte Chapelle at Paris is a beautiful architectural monument of the fourteenth century. A reproduction of the Sainte Chapelle by Gilbert Scott in the nineteenth century would have no art value, because it would be a copy; because the mind and art of the architect were not in act to create, but in act to imitate. When a man takes a pencil or a chisel into his hand, he must think about what he is doing, and feel. The expression of this thought and feeling is what gives value to his work, not the fidelity of his representation. When we find pattern or model repeated, reproduced, copied, this thought and feeling are absent. What is wanted is not that a design should be new, but that it should be thought out, given the purpose, place, use, and other conditions of the object to be made. What is in the man must come out in his work, if his work is to have quality. The character comes out of the fingers' ends of the draughtsman as soon as he begins to draw. The honest desire to do the thing one has to do as well as possible, the delighting in doing it, is the one only source of workmanlike skill.

These things being so, the workshop, if it is to be a school of true art, must not be a mill to turn out endless copies. Where the designer is a distinct person from the handicraftsman, where one man invents the pattern or model, and merely hands it to another man to be exactly copied, there a school of art cannot arise. By the habit of mechanical multiplication invention is killed and the soul degraded. The workman is unfitted, not only for producing, but for enjoying, beauty of work. The article produced by a system of division of labour, in which design is confined to one brain and execution remitted to another, can never have the freshness and originality of native work. It may, however, have a secondary degree of merit. There is such a thing as a pattern, say for chintz or wall-paper, which is good in itself; but the multiplication in thousands of such a pattern, and the spreading it through the country, is not art progress. If better articles are now made in Stafford ware, it is due wholly to one or two enlightened manufacturers. I do not see any evidence that our public is at all nearer than it was thirty years ago to the perception that an old Greek pitcher, used for bringing water from the well, without ornament of any kind, is more beautiful than anything we make now. Great stress is laid by the persons who preach this doctrine on the multiplication of beautiful forms and colours as an education to the public eye. I am compelled entirely to dissent from this doctrine. It seems to me psychologically erroneous. The presence of beauty alone does not educate the eye to see it. Is not Nature, with its thousand forms and colours of unrivalled beauty, always before us? Has it not been there since the world began? If looking upon grace and beauty would educate the eye, men have had it always before them, even in the most debased periods of the arts. Natural appearances and artistic representations are subject to a common law of beauty. All art is one. The man who, without copying, can arrange a cluster of rose-leaves nobly can design anything. A French-woman can do this; an English-woman cannot. Is it because roses do not grow in England?

Time will not allow me to follow out this investigation, interesting as it is. I must be content with saying that, instead of this doctrine of the multiplication of objects of beauty, I am compelled to believe what Mr. Poynter told us the other day at Liverpool, that mechanical production is in its nature opposed to art production. In our Schools of Art throughout the country, we certainly aim, not at the production of better specimens of work, but at the elevation of the workman. We care not that the work should be good, but that the children should be well trained. I am here to distribute prizes according to results. Yet I must say, with all the emphasis in my power, that the only valuable results of a school of drawing are not beautiful specimens of design, but the results on the understanding and the heart of the pupil. An hour of well-directed and well-corrected effort, rubbing out and putting in, issuing in a blurred sheet of paper totally unpresentable, is of far higher merit than a showy and complete pattern, which is either copied or worked in servile compliance with some rule. If in the competition of the markets of the world British goods have acquired an evil notoriety for bad material, scamped construction, clumsy finish, the fault is a moral rather than an intellectual one. It is to be cured by refining the habits and increasing the happiness of the workman, opening to him new thoughts and new recreations. Instead of thinking only of the wages of his work and hating the work by which they are earned, trying how little he can do for the money, only when he begins to find his pleasure in his work and his pride in making it as complete as possible will art revive and flourish in England.

RICHMOND PARK AND THE PUBLIC.

For some time past considerable dissatisfaction has been manifested in the neighbourhood of Richmond in respect of the management and appropriation of Richmond Park, the principal grievance appearing to be that the public are excluded from a large area which it is contended belongs to them, for the sake of the breeding and preservation of game for sporting purposes. It is stated that large portions of the park have from time to time been enclosed, ostensibly for the purpose of renewing the trees, but in reality for the rearing and sheltering of game, and it is urged that whilst the recreation of the public is thus interfered with, the national exchequer bears the expense of this game preservation, principally for the amusement of the Ranger and those who have direct control over the park. It is added that, in addition to the large space inclosed, and the cost incurred for game preserving, upwards of 100 acres is also inclosed in winter for feeding the deer, notwithstanding that a large sum is annually voted for food for them over the park generally; and a further complaint is, that although the park is more than 3,000 acres in extent, cricket and all other athletic exercises are strictly forbidden. The local press of Richmond and Kingston has for several weeks back had a lengthened correspondence on the subject, and much agitation at present prevails, it being urged that game-preserving in such a public park, not more than eight miles from London, ought to be abolished, and the large area now inclosed thrown open for the recreation of the public. It appears that a committee has been formed, and that arrangements are in progress under which it is expected that a public meeting will shortly be held in relation to the present management of the park.

SALE OF THE CATHEDRAL HOTEL, ST. PAUL'S CHURCHYARD.

The value of hotel property in the City was shown at the sale of the lease and goodwill of the Cathedral Hotel, St. Paul's Churchyard, which took place at the Auction Mart on Tuesday, when there was a very crowded attendance and a keen competition. The hotel comprises five houses situated in St. Paul's Churchyard and Cheapside respectively, let on lease for varied terms, some of them having twenty years to run, and the annual rental being 1,723*l.*, but by the tenant of the hotel underletting the lower portions of a part of the property as shops, the rental of the hotel is reduced to 843*l.* per annum. The auctioneer, Mr. Lovejoy, in introducing the property, stated that the several leases gave the tenant of the hotel power to make structural alterations in the buildings, but that any new elevations or reconstructions of that character would have to be subject to the approval of the Corporation. There was also a clause in the lease of that portion of the property held from the Corporation,—No. 5, Cheapside,—prohibiting its conversion into a vault or dram-shop for drinking purposes. The first offer made for the property was 5,000*l.*, which was immediately followed by a bid of 12,000*l.*, and by succeeding advances of 1,000*l.*, 500*l.*, and 100*l.*, the property was brought up to 17,200*l.*, at which sum it was sold to Mr. Sweeting, fishmonger, St. Martin's-le-Grand, immediately opposite the hotel. In addition to the purchase-money, the purchaser is to take the furniture, fixtures, and stock at a valuation, which the auctioneer stated was estimated at 2,500*l.*

CONFERENCE OF VESTRIES ON THE THAMES PREVENTION OF FLOODS BILL.

The vestries connected with the parishes more immediately affected by the Bill promoted by the Metropolitan Board of Works for the prevention of the flooding of the Thames within the Metropolitan area, have resolved to offer a united opposition to the Bill, on the ground that its provisions are inequitable. At a conference held on the subject at the Lambeth Vestry-hall, eight vestries and District Boards of Works were represented, namely, St. George the Martyr, St. Olave, Rotherhithe, Wandsworth, Fulham, Limehouse, St. Saviour's, and Lambeth.

Mr. Fowler, architect, the representative from Lambeth at the Metropolitan Board of Works, presided, and in the course of some prolonged remarks endeavoured to show that the Bill promoted by the Board of Works was unjust, inasmuch as it proposed to throw upon certain parishes the cost of works which were of a purely metropolitan character. He observed that whether the overflowings were due to the Northern Embankment and similar improvements, which had narrowed the channel of the river, or to any other cause, the fact remained the same that at present there was no control over these floodings.

Ultimately a resolution was unanimously passed to the effect that the Conference felt bound to oppose the present Bill, on the ground that by its adoption a great injustice would be inflicted upon many of the metropolitan parishes. The resolution added a request that the Metropolitan Board re-draft their Bill, with the view to the protection of property generally from damage by flood, and that the cost of the works be made a charge upon the metropolitan area.

The delegates at the conference from the several vestries numbered upwards of forty, but they did no good.

THE PREVENTION OF ECHO.

Sir,—In the *Builder* of June 6th, 1874, there is an article on the use of wires to improve hearing in churches where there is an echo. It would be a favour if you could inform me of the name of any one who has had practical experience of the application of such wires, as it is desired to make the experiment in a church here, and we are at a loss to know how to choose wire, as regards material and size, and how to apply it as regards position, tension, &c.

Edinburgh. J. N. A. Macdonald.

*** Since our notice of the experiments referred to, we have not received any satisfactory information on this subject.

THE NEEDLEMAKERS' COMPANY'S PRIZES.

The Company of Needlemakers having determined to offer prizes by way of encouraging and developing the art of needle-making in the neighbourhood of Redditch, in which locality this manufacture has been established for many years past, the Court of the Company appointed a special committee to arrange a scheme for that purpose, and to confer with some of the leading manufacturers as to the most desirable mode of inducing competition in the respective processes necessary to the development of the art. A Committee of Manufacturers was selected from the manufacturing district, and the various details of the prize scheme were considered by it. The scheme of prizes sought to develop the art of needle-making under three heads, for which prizes were offered. The judges have awarded the first prize to Benjamin Hill, needle-hardener, of Studley, for a pair of foot-shears; and a second prize, consisting of 1*l.*, from local sources, with a certificate of merit, to Richard Bennett, junior foreman, of Redditch, for a "Double Polishing Buff." Section No. 3, prizes for handicraft (tool-making) produced, as might have been expected, the greatest number of competitors, and the keenest competition. The prizes in this section were offered for the best specimens of tool and work for sewing-needles and sewing-machine needles. The art of tool-making has always been considered, in this and kindred trades, one requiring the greatest skill, and it will be readily understood that the delicate needles used in the manufacture of gloves and fine cambric sewing, whether by hand or by sewing-machine, must be made from dies of the greatest nicety and finish; undoubtedly the tool-makers were much stimulated by the prize scheme and exhibition, and, as a consequence, the merits of many of them became better known. In this section the judges awarded the principal prize to Charles Townsend, toolmaker, of Redditch.

For sewing-machine needle tools the judges awarded the first prize to Jonah Warner, of Redditch.

The prize for the best essay was not awarded; a second prize for an essay was given to W. Shrimpton.

LIVERPOOL MASTER BUILDERS' ASSOCIATION.

The annual dinner of this Association was held on the 15th inst. Mr. Lett presided, supported by the Mayor (Mr. A. B. Walker), Messrs. Sherlock, Boult, Weigatman, and Geo. Holme, architects, and a large number of the members and their friends. The chairman, in proposing "The Town and Trade of Liverpool," coupled with it the name of the Mayor. He said it was most gratifying to have among their guests his worship, whose magnificent gift to the town,—the Art Gallery,—could not be too highly prized. "The Liverpool Master Builders' Association," the toast of the evening, was afterwards given. Mr. S. H. Holme responded, and, referring to the relations between masters and men, he said that the Association was ready to settle all disputes that might arise if the men would only be reasonable in their demands. He believed that within the ten years the Association had been in existence the wages of the operatives had gone up 15 or 20 per cent. They did not grudge the prosperity of the working classes, for the prosperity of the working classes meant the prosperity of the country, but he thought the demands that the men had made some time past were unreasonable, and it was highly creditable to the master builders that they had been able to meet them. With regard to the question of arbitration, he thought that if the working classes expected the employers to meet them on equal terms in time of dispute, their word must be depended upon. In 1873 the employers of the painters had a difference with their men, and it was agreed to allow the matter to be settled by an umpire. The award, which was in favour of the men, was agreed to by the employers. In 1875 there was a dispute between the master plasterers and their men, and as the award did not give the latter all they required, they refused to resume work, and the masters were at last obliged to accede to the original demands. He thought there should be a distinct understanding between the parties when questions of this description were referred to an independent person, and that the policy of "Heads, I win, and tails, you lose" should not be tolerated. He was afraid that in the majority of instances good times for the operatives were bad times for the employers, and he did not believe that advances in wages ought to come altogether out of the builders' profits. He had been informed that there were no fewer than three kinds of demands being prepared for the coming year.

MASTER BUILDERS AND APPRENTICES.

Year after year is the old system of apprenticing lads to the building trades falling into disuse, and in no district is this more carried out than in the metropolis. In the first place, the trade societies of masons, carpenters, joiners, and bricklayers enforce, in many shops, a restriction as to number, and the large firms appear quite indifferent, unless a very heavy premium is paid with a lad; this at once prevents a mechanic indenturing a son with a large employer, and consequently lads are apprenticed to small master-men, and generally in the country.

Some trades, however, object to a man coming into their shops without he can show his indentures; but unless new blood be let in more freely the requirement will in a few years be difficult to meet. In the last revision of the stamp duties the House of Commons and the Chancellor of the Exchequer had the subject brought under their consideration, and it being stated that the stamp duties on apprentice indentures seriously militated against the system of apprenticeship, the stamps were altered. Thus we find from an old stamp-duty list of 1810, any premium under 30*l.* had to pay 15*s.* stamp duty, and running up to 500*l.* the stamp rose to 20*l.* The present stamp duty is, if no premium be paid, 2*s.* 6*d.*, and for every 5*l.* and fractional part, 5*s.*; so that the present scale is higher, as the premium rises, than the old one; but the lower premiums paid for mechanics are easier in stamp duties, hence an advantage to the working-classes.

One of the chief obstacles in procuring apprentices is unquestionably the high tone of freedom pitched by the lads nowadays, and their horror of being bound to a stranger for the ancient term of seven years; and this feeling is likely to be increased by a legal decision recently given on the oft-disputed question, as to whether an apprentice who attains the age of twenty-one is a free man. It has, however, been decided that, where an apprentice's indentures set forth "to serve him from the day of the date hereof for and during the full term of seven years next ensuing," such indentures cannot legally be cancelled, until the full seven years have expired; and that the next friend who entered into the covenant is liable to damages where the apprentice refuses to complete the full term. Here the shoe pinches the father whose son, having arrived at his majority, sets his authority at defiance, for the law casts the father in damages.

How the City Chamberlain acts with refractory apprentices over twenty-one years of age is a Bridewell secret, but it appears that there is a remnant of the old Bridewell yet remaining in Bridge-street, kept up for the special behoof of naughty apprentices.

The only way to obviate this ruling of the Courts of Law is for the indenture to expressly determine the end of the agreement to be when the apprentice arrives at his majority.

SEWERAGE MATTERS.

Birmingham.—On the 17th inst., on the invitation of the Duke of Sutherland, chairman of Scott's Sewage Company, the members of the Sewage and Health Committee of the Birmingham Town Council, inspected the works of the company at Birmingham. The sewage of Birmingham is dealt with in two departments. The liquid sewage, consisting of the drainage of the streets, houses, and water-closets, is conducted to Saltley by means of the sewers, and is treated according to the plan devised by Mr. Hawksley, C.E. The other department is that known as the "night-soil department," and to which is assigned the removal of the contents of middens and ashpits, and the carrying out of the pan system introduced as an improvement on the midden system some time back. General Scott's patent, which has been taken in hand by a limited liability company, is for the purpose of dealing with the pan excreta by converting it into a sulphate of ammonia and a phosphatised manure, both of which are merchantable.

Broadstairs.—For some years the local sanitary authority at Broadstairs have had before them the question of providing some proper scheme of drainage for this popular watering-place, but considerations of economy have prevailed over those of health and cleanliness, and till recently nothing has been decided upon. In the present year, however, Dr. Robinson, the medical officer of health for West Kent, strongly urged the adoption of some system of filth disposal; his representations were strongly backed by the Local Government Board, and at last plans have been actually prepared for comprehensive works.

Newmarket.—The Newmarket Local Board having applied to the Local Government Board for sanction to borrow 3,500*l.*, for the purpose of carrying out certain plans prepared by Mr. John Francis Clark, architect, for the disposal of the town sewage, at an outfall to be constructed on land on the east side of the Exning-road, an inquiry, directed by the Local Government Board, was opened on September 28th, and was resumed on the 10th inst., when Mr. Samuel Joseph Smith, C.E., one of the inspectors for the Board, attended for the purpose of taking evidence. As the sewage of Newmarket runs into an ancient watercourse, which passes through the town, and afterwards takes its course northward through Fordham and other villeges, the passing of the Rivers Pollution Prevention Act, which will come into force in August next, imposes urgent obligations on the local authority, which they are endeavouring to meet by means of the proposed works, adopted in place of more elaborate and comprehensive plans prepared by Mr. Baldwin Latham, who estimated the cost at upwards of 22,000*l.* The scheme of Mr. Clark is opposed by the Rural Sanitary Authority, who were represented at the inquiry by Mr. Rogers Field, C.E.

Great Crosby.—Mr. Robert Morgan, Inspector to the Local Government Board, held an inquiry on the 7th inst., at Great Crosby, on the application of the Local Board to borrow 3,000*l.* for the reconstruction of a portion of the present outlet sewer, which is defective and insufficient for the purpose. Mr. T. Mellard Reade, C.E., of Liverpool, the engineer employed by the Board, attended to give evidence. He produced a section of the present sewer, which is of fire-clay pipes, 24 in. diameter, showing where the imperfections occur, and also the flood line and gaugings at several points. The intention is to make a new brick sewer in substitution of the old one for a distance of 810 yards parallel with it for the greater part of the course, and for the remainder laid in the old one. This, it is expected, will relieve the cellars in Victoria-road from the flooding which now takes place during thunder-storms.

Crewe.—As to the sewage farm here, the *Birmingham Post* says the announcement has just been made to the ratepayers of Crewe that an additional rate of 5*d.* in the pound has been imposed by the Local Board, in order to meet the extraordinary deficiency on the sewage farm, raising it at one bound to meet farming expenses alone from 11*d.* to 1*s.* 4*d.* Last year the ratepayers were called on to make good a deficiency of 3,919*l.* on the sewage farms, and this year they will have to pay 4,000*l.* The Chancery proceedings and establishment of the place as a sewage farm as a first expense are said to have cost the town nearly 70,000*l.*

DAMP AND VENTILATION.

Sir,—As one of a perplexed and hitherto baffled congregation, I come to you, asking you kindly to allow this letter a place in your columns, believing that if there is help for us in science, it will come from you.

Simply, then, our enemy is damp, and it is the more provoking because soil and situation are on our side. Still the enemy has an advantage over us, and we are as yet a conquered people. Many schemes have been suggested for ventilating our church. Among others, pipes through the windows to admit air. In the present state of things the windows do not open, and the ventilators do not act! Most thankful should we be for information of any plan of ventilation that is found to be perfectly successful.

In the case of this church expense is a grave consideration, as no large outlay can be incurred; in fact, only a very small sum can be expended. The question of stoves, too, has been under consideration, and as a result the difficulty of a good draught. Here, again, we should be thankful for any valuable hints. Q. Q.

THE LAND AND BUILDINGS, EPPING FOREST, AND THE NEW SCHEME.

Some interesting statements have been made before the Commissioners now sitting for the purpose of hearing objections and suggestions respecting the scheme for the preservation and future management of Epping Forest.

Amongst those who have appeared in opposition were the British Land Company, on behalf of whom it was stated that the company were large holders of land within the boundary of the forest and the neighbourhood, and had within the last twenty years bought and laid out for building, and otherwise improved, a large quantity of land in the locality, considerable portions of which were affected by the proposed scheme of the commissioners. It was urged on behalf of the company that in common with all the owners of the land which it was proposed to charge with a rent-charge, they had purchased such lands in total ignorance of the right of intercommonage, and that it would be most inequitable that the owners of inclosed land having, as they thought, extinguished all rights of common, and having given full market value for such land, should now be made to pay a yearly rent-charge.

Mr. Robin Allen entered into a long defence of his rights as a grantee, in opposition to the scheme of the commissioners. He pleaded that so far back as 1855, "being daily engaged in London, in employment involving a good deal of brain work and responsibility, he availed himself of the opening of the railway to purchase three very small contiguous plots of land at Loughton, and by enlargement of a labourer's cottage made a home for himself and family." He afterwards obtained a grant of 7½ acres, and that "the machinery by which he obtained it seemed to him to be well established and unquestioned, consisting of a survey by a professional man, a petition to the Lord of the Manor, a conveyance as copyhold at a customary court, by 'seisin of the rod with consent and in the presence of the homage representing the manorial commoners,' and by payments of admissions, fines, and fees, and annual quit-rents, representing, as he believed, full value." He contended that it was unjust to impose "an agricultural value in favour of a recreator on land over which he had no legal right," and that "irresponsible officials and landscape gardeners with large ideas ought not to be allowed to injure the privacy or cause the demolition of certain well-established homesteads."

Mr. Henry Hill, another grantee, in opposition to the scheme, urged that it was "merely high-flown sentiment to state that the public had a right to roam about the forest."

Mr. Tindal Atkinson, barrister, on behalf of the Epping Forest Fund Committee, was satisfied with the general provisions of the scheme, but suggested that the members for Hackney and the Tower Hamlets for the time being should be members of the committee of conservators of the forest. Under the provisions of three of the clauses of the scheme, there were 760 acres of enclosed lands to be dealt with. The price of enclosed land near London was from 500*l.* to 600*l.* per acre, and he urged that the conservators of the City of London ought not to be left to deal with a question involving such an enormous aggregate expenditure. The Commissioners ought to decide whether they could make the purchase of the land so inclosed compulsory or not. He suggested that for the purpose of dealing with the matter the 760 acres should be divided into two classes, namely, the land that was built upon, and the land that was not built upon; because, in the first instance, Parliament would never sanction the pulling down of the houses which had been erected thereon, for the purpose of making it common land again. The proceedings of the Commission would greatly enhance the value of the land already inclosed, and the scheme, as it stood, would (in case compulsory powers of purchase were exercised) provide for giving the occupiers compensation on that enhanced value of land, and to which land they had not the slightest legal right. The Forest Fund Committee also objected to the provisions in the scheme allowing sites for the building of new churches, chapels, or charitable buildings, and they hoped those provisions would be omitted. In the case of existing institutions they saw no objection to a portion of the forest being granted in the manner proposed for their protection, but should new sites be allowed there would be no end to the number of claims upon the Conservators.

A LECTURE-HALL FOR HACKNEY.

On the 14th inst. the new lecture-hall which has been built in Gore-road for the district parish of Christ Church, South Hackney, was opened. The building has two frontages, one towards North-street, in which is the entrance, and the other towards Gore-road, facing the west end of the church. The hall is 61 ft. long, 31 ft. wide, 14 ft. 6 in. high to the plate, 30 ft. high to the ridge. The roof is of open timber, with plastering between the principals.

The walls are faced with picked stocks, with dressings of Bath stone. The front towards Gore-road has four two-light transomed windows, with gablets; the entrance-front has three lofty two-light windows, with arches and carved finials of late fifteenth-century Gothic character. Mr. Forrest, of Victoria Park-square, was the builder. The cost of the building has been about 800*l.* The architects were Messrs. Henry Jarvis & Son.

BIRMINGHAM BUILDERS' ASSOCIATION.

The thirteenth annual meeeting of the above Association was held on the 14th inst. Mr. J. Webb, in the absence of the president, occupying the chair.

The committee's report and balance-sheet, which had been previously distributed among the members, were taken as read, and, being approved, were ordered to be entered upon the minutes.

The Chairman announced that no notices for alterations in the working rules had been received from any branch of the trade.

After the transaction of the ordinary routine business, Mr. W. B. Briggs was unanimously elected president for the ensuing year, and Mr. E. Davis, vice-president. Mr. J. Webb was elected treasurer in the place of the late Mr. J. Hardwick.

The following gentlemen were appointed a committee for the ensuing year:—Messrs. J. Horsley, Parton, T. Surman, Garlick, Bloore, Cresswell, Brooks, Moffat, Lidzey, W. T. Bennett, W. R. Wilson, C. Jones, jun., Jeffery, Barker, Sapcote, and Collett.

The remaining business was of a private nature.

The annual dinner of the members of the Association took place in the evening, when Mr. W. B. Briggs presided, and Mr. Parton and Mr. Moffat occupied the vice-chairs. Amongst those present were representatives of most of the principal local firms, including Messrs. W. & J. Webb, Horsley Brothers, Jeffery & Pritchard, Surman & Son, W. J. Whitterel, Barker & Son, W. Matthews, W. T. Bennett, Jones & Son, W. Brooks, Ravenscroft, Cresswell, &c.

AUCTIONEERS' CHARGES.

At the Kingston County Court, Mr. Henry Abrahams, an auctioneer, sued Mr. William Buckwell, late owner of the Lamb Brewery, Surbition, for 21*l.* 10s., commission for services rendered in endeavouring to dispose of his business.

From the statement of counsel it appeared that in December, 1874, the defendant called upon the plaintiff and said that he wished to dispose of his business. The plaintiff informed Mr. Buckwell that his terms were 5 per cent on the first 1000*l.* and 2½ per cent. on the balance, including all expenses. Mr. Abrahams visited the property, and valued it at 750*l.*, including goodwill and rolling-stock, but the defendant refused to take less than 800*l.* The plaintiff advertised the property, and received many offers, but could not get more than 700*l.* Early in this year the defendant disposed of the business privately, without informing Mr. Abrahams, and refused to pay him any commission. 5*l.* had, however, been paid into Court by the defendant, and by that counsel submitted that the liability had been admitted.

Mr. Abrahams and Mr. Long, also an auctioneer, gave evidence as to the custom of the trade for auctioneers to be paid their commission, once properties were placed in their hands, whether they disposed of them or not, unless they were taken off their books.

Mr. Leone, an auctioneer, was called to disprove the custom alleged by the plaintiff. If an auctioneer did not sell a business he had no claim beyond out-of-pocket expenses.

The Judge gave a verdict for 14*l.* 10s. commission on the amount for which it appeared the business had been sold.

DISPUTE AS TO MARBLE POLISHING.

KELLY *v.* RADEJAR.

The plaintiff in this case (heard in the Shoreditch County Court, on the 7th inst., before Mr. J. P. Dasent, judge) is a marble polisher, and he sued the defendant to recover money for work done by him at the Marble Universal Company's Works. The defendant was an overseer at the factory in question, and the summons was an adjourned one. At the first inquiry the defendant failed to appear.

The case for the plaintiff was that he was engaged to work at polishing marble, at the price of 7d. an hour, and he worked for thirty-three hours.

The defendant's reply was that the plaintiff was only taken on trial, and it was agreed that he should be paid for his services the sum only of 4d. per hour. Some cornice-work, 5 ft. 6 in. long, was spoilt by the unsatisfactory manner in which he went about his work, and he was accordingly dismissed. The defendant also produced a book, showing that good work of the class had been and was performed at even less than 4d. an hour.

The plaintiff, an old man, who declared that he had not sufficient time to dry the cornices mentioned, said that he had been employed in the business of marble polishing for fifty years, and that he gave no cause for dissatisfaction.

In answer to the judge, the plaintiff said that he could neither fix the amount he claimed, nor could he tell the date upon which he performed the thirty-three hours' work.

Having no witnesses to call, the judge nonsuited the plaintiff.

SCOTTISH CATHEDRALS.

Sir,—Your account of the repairs lately effected in the Abbey Church (not cathedral) of Iona induces me to beg you to grant me a few lines' space for the purpose of correcting a mis-statement, so often made that it has now almost become one of the rooted fallacies of popular literature. I have seen it asserted, I believe, a hundred times in print, that the cathedral of Glasgow is the only one in Scotland which has survived the destruction of the Reformation. The statement, however, is quite untrue. There were twelve Scottish Episcopal sees in pre-Reformation times,—St. Andrew's, Glasgow, Whithorn, Dumblane, Dunkeld, Brechin, Aberdeen, Lismore or Argyll, Ross, Caithness, Orkney, and Elgin or Moray. The cathedrals of Aberdeen and Dornoch (Caithness),—poor enough specimens, it is true, yet not inferior to those of Wales,—were as little injured by the Reformers as that of Glasgow. The same is true of Kirkwall, which, as a specimen of the Romanesque style, ranks with Romsey and Wimborne, Minster. Brechin, Dunkeld, and Dumblane were only partially overthrown, all three being still used for public worship. Some of the remainder were too small to be very important, yet one of these, Fortrose, which I have not myself seen, is extolled in its highest terms for its beauties by an English ecclesiologist, the late Mr. Neale. The principal losses were St. Andrew's and Elgin. That of the latter is particularly deplorable, as it is believed to have remained comparatively perfect until 1707, the year of the Union, when the towers fell and broke through the roof, a fact which, if correctly reported, may seem to indicate an original defect of construction.

The last writer, I think, who has made the above statement is a contributor to the *Frankfurter Zeitung*, who is now publishing his notes of a tour in Britain. Judging from some of his statements, he must be a remarkable specimen of that *rara avis*, the intelligent foreigner. He likens Glasgow Cathedral to the old synagogue of Prague,—a building smaller than the smallest church (whichever that may be) in London or Glasgow, the curiosity of which consists in its dating, or being said to date, from the eighth century. He might just as well compare Westminster Abbey with Bonchurch or St. Lawrence, in the Isle of Wight. He does not seem sufficiently well acquainted with the monumental edifices of his own country to know that there is one of them which strikingly resembles Glasgow cathedral, in the style of its exterior at least,—I mean that of Magdeburg. The interiors, however, differ widely; tha latter being all First Pointed of the earliest type, whilst Glasgow is one of the best specimens of the Second Pointed and Decorated which can be found within the four seas of Britain. Magdeburg is equally fine in its own style, and is now seen to great advantage, since its restoration by the late King of Prussia. I have often regretted that it should be unknown, or almost unkpown, to English antiquaries and architects.

From what I have written, it appears that four of the old Scottish cathedrals remain much as they were, whilst three others are not very far from perfect.

Vitruvius Minor.

CHALK.

Some cottages of chalk and flint, in panels, were lately destroyed at West Croydon. They appeared about 100 years old. The chalk was built in blocks of about 20 in. by 14 in., and the thickness of the wall. They were laid on their natural bed, and still bore the marks of the adze the faces were dressed with. They were interesting and unique specimens of construction, and looked fit to stand for many years.

R. Phillips.

The Chief Engineer of Newcastle.—Mr. Hugh M'Kie (formerly city surveyor of Carlisle) has been selected, out of fifty applicants, for the Chief Engineership of the borough of Newcastle-on-Tyne, at a salary of 1,000*l.* a year. Owing to circumstances, however, the actual appointment has been deferred for three months.

LEEDS MUNICIPAL OFFICES COMPETITION.

The committee have awarded the premiums as follows:—1st, "Crayon," Mr. George Corson, Leeds; 2nd, "Hoc Securior," Mr. D. Brade, Lowther-street, Kendal; 3rd, "Spero," Messrs. Hill & Swann, Park-square, Leeds. We are informed that the designs will be open to the inspection of the public for one week from Tuesday morning last, in the Law Library, Townhall, Leeds.

The following is the report made by Mr. Cockerell on the eight designs selected by the committee from the twenty-four submitted:—

"Having made a preliminary examination of the eight designs, and formed a rough estimate of their relative merits and of the apparent capability of the authors, I submitted them to a further very minute examination, adopting a system of marks which by ascribing to the several parts of the designs (whether of a practical or an artistic nature) a separate value, established a more accurate comparison of the several designs in their parts, and in their whole. This second examination, which considerably modified my first impression, in addition to furnishing a more reliable standard of the merits of designs as set forth in the drawings merely, was besides of a nature to give a clearer appreciation of the capability of the authors for carrying out such a work than would be furnished by the designs considering their positive aspect only.

I should, however, observe that, while I attach great weight to this last consideration, I have not taken it into account in the assignment of marks. Having made a third general examination and a revision of the scores, I added the following further considerations as motives in the recommendations which I should have to make:—(1.) That the first place as likely to lead to the carrying out of the work should be assigned to the competitors who, while receiving the highest number of marks, should also give evidence of the greatest capability and general knowledge. (2.) That for the secondary prize some additional consideration might be given to artistic merit and ingenious arrangement, apart from the question of the strict adaptability of the designs for execution. Having thus, as is due to the confidential commission with which you have honoured me, laid before you the method and notices of my selection, I have to state my conclusions. I consider the order of merit to be as follows:—(1) 'Crayon,' (2) 'Hoc Securior,' (3) 'Spero,' (4) 'Plato,' (5) 'L. P. C.,' (6) 'NotaBene,' (7) 'Leodiensis,' (8) 'Q. E. D.' The three first compare in number of marks as 75, 61, 57 respectively. I have further to express my opinion that the designs of 'Crayon' give evidence of a degree of experience as well as of talent which may well justify you in entrusting him with the commission. 'Hoc Securior' exhibits considerable merit in artistic design, especially in the elevations. The design of 'Spero' is carefully considered, but is wanting in sufficient appreciation of scale in the elevations.

With regard to cost, I am of opinion that the sum assigned as a limit by the instructions, is insufficient for any building of an adequate character, and of the capacity required.

The design of 'Spero' approaches most nearly of the three to the limits, but this result is attained by somewhat contracting the areas of some of the spaces, as well as the height of the rooms and the elevation. Except in this respect, there need be no great difference between the cost of this design and of that of 'Crayon.' I shall be happy to furnish any further explanations of the above remarks, and to wait upon your committee should you require it.

Finally, I would venture to express a feeling, which I trust may not be regarded as an encroachment upon my office, namely, some regret that the instructions precluded my examining the whole of the designs sent in, as the considerable distance between the design which I have placed first and the others leads to surmise that a closer approximation of merit might possibly have been found. The more as the very precise and well-considered instructions left comparatively little scope for variety in the plans, and therefore necessarily made so much to depend upon the elevation."

COMPETITIONS.

Margate Drainage.—At a meeting of the Town Council, on Tuesday last, the first premium, 200*l.*, was awarded to Mr. Lewis Angell, and the second premium, 100*l.*, to Messrs. Gotto & Beesley. The plans were sent in nearly three years ago, and the award has been made on the recommendation of Sir Joseph Bazalgette, to whom the schemes were referred.

Wimbledon Local Board Offices.—In response to an advertisement issued by the Wimbledon Local Board for designs for new offices (not to exceed 2,750*l.* in cost), twenty-two sets of drawings have been sent in. The committee appointed to make the selection reported in favour of the final selection being made from four, bearing the respective mottoes of "Ars longa, Vita brevis," "Delta," "Utility," and "Sanitas." Mr. Townsend (one of the committee) said (at a meeting of the Board) that the first-named was in the "Early English style of the sixteenth century" (!) with an overpowering quantity of glass; that of "Delta" was bold and attractive in design; while that of "Utility," he was persuaded, could never be carried out for the money the Board had resolved to pay. The plan marked "Sanitas" be considered decidedly the best for their purpose, and it was the only one that gave plate-glass windows, Minton's tiles for paving, and a Portland-stone staircase, and the estimated cost was within their limit. Mr. Ashby expressed the hope that the Board would not be guided in their selection by the pretty appearance of the drawing, and Mr. Paxton having spoken briefly in favour of "Utility," the chairman proposed, and Mr. Wedlake seconded, that the plans marked "Sanitas" be accepted, which was agreed to without a single dissentient, Messrs. Ashby, Haynes-Jones, Paxton, and Thomas not voting. The letter accompanying the plan was then opened, and the author announced as Mr. Thomas Goodchild, of Duke-street, Adelphi.

ALDGATE EXTENSION OF THE METROPOLITAN RAILWAY.

Three-fourths of this extension are underground; but the breaks are so frequent as to promise ventilation. The line passes from what is called the Bishopsgate-street station under Liverpool-street and Bishopsgate-street; running thence parallel with Devonshire-street it goes through and under Devonshire-square, passing so as to touch the vast tea-warehouses of the St. Katharine Dock Company in Cutler-street, under Harrow-alley, Meeting House-yard, and Gravel-lane, and thence into High-street, Aldgate. The gradients are very satisfactory, being in fact almost nominal. The curve formed by the line is extremely gentle, having a radius of only 2,000 ft. The greatest depth of the rails below the surface is 28 ft., the level 17 ft., the average thickness of earth above the arches being 6 ft. As would naturally be expected in such a case, the excavations disclosed Roman and other remains of considerable interest. Among the former there were found fragments of urns, specimens of pottery, and bronze coins. The most remarkable discovery was that of a thick stratum of bullocks' horns, commencing about 20 ft. below the surface, and extending to an unascertained distance beneath. Although the deposit was doubtless made many centuries ago, the horns had suffered so little by decay that they found a ready sale in the market. The extension will tap the general passenger traffic of the whole of the eastern part of the City and the East end of London,—the Docks, Fenchurch-street, Mark-lane, Mincing-lane, Whitechapel-road, and Commercial-road; and, on stepping out of the Aldgate Station, one cannot fail to be struck with the vast stream of moving population to whose wants and convenience it will minister. The engineering superintendence of the extension works was entrusted to Mr. Francis Brady, engineer of the South-Eastern Railway; and, considering that a considerable portion of the buildings on the line of route had to be underpinned, and that the tunnel had to be made of extra thickness in consequence of the great weight of the structures above, the virtual completion of the works between the beginning of March and about the middle of November may be regarded as creditable alike to the engineer and the contractors.

ROYAL EXCHANGE EXCAVATIONS.

Sir,—Can any of your readers favour me with the address of Mr. Russell, who was some time clerk of the works to Sir W. Tite during the building of the Royal Exchange, and who made careful drawings of the antiquities, &c., discovered there? W. H. Overall.

Library, Guildhall.

MASTERS AND MEN.

Staffordshire Potteries.—Fresh complications have arisen with regard to the wages question in the Staffordshire Potteries, which question is to be referred to arbitration, the employers having given notice of a reduction of 10 per cent. in wages. The turners and handlers of Burslem and Tunstall have resolved to hold aloof from the arbitration, and not to be governed by the decision of the Arbitration Board. Only the Hanley section of these branches of the potting industry will consequently be represented at the Board. The cratemakers have met and resolved to resist a proposed reduction of wages, notice of which has been given at Burslem only at present. The men say they have suffered a reduction of 20 to 25 per cent. in their wages in the last two years.

Leeds.—The Leeds Master Builders' Association has received six months' notice of a demand for an advance of wages from the operative masons. The masons ask that the wages be 36*s.* per week in summer, 33*s.* per week for the first month, 30*s.* per week for the second, and 33*s.* per week for the third month in the winter quarter. The bricklayers, in a similar notice, state that they are satisfied with 1*l.* 15*s.* 5*d.* for fifty hours per week, but they demand walking-time to work at a certain distance; that no employer shall have over two apprentices at one time; that masters shall not sub-let; and that six months' notice of departure from these arrangements be given on either side.

Huddersfield.—The masons of Huddersfield have sent in a demand to the Masters' Association for an increase of wages to the extent of 4*s.* per week.

WHO WANTS A CHURCH?

Sir,—As some friends of mine desire to build a handsome church for a clergyman of talent, I should feel obliged to any of your readers who would favour me with particulars of a district in or near London where a good new church is needed. Possibly some architect or builder who has recently laid out, or is about to lay out, a new district can furnish the required information.

T. K.

*** The writer has sent us his name and address. The offer is so liberal, that one is led to ask whether it is made in earnest?

THE BIRMINGHAM BOROUGH SURVEYOR.

The town council of the borough of Birmingham has just raised the salary of the borough surveyor,—Mr. William Spooner Till, C.E.,—to 1,000*l.* per annum. Mr. Till may be said to have been brought up in the corporation service, as he was a pupil of the late Mr. Piggott Smith, borough surveyor, and at whose death Mr. Till, at a very moderate salary, became his successor. Gradually, but without any interference on the part of Mr. Till or his friends, the town council, upon reports of its Works Committee, who had most experience of the ability and untiring industry of Mr. Till, has, from time to time, recommended an increase of salary, until now it stands at 1,000*l.*, which has been well earned and is richly deserved.

PAVING APPORTIONMENTS.

At the Hammersmith Police-court, on the 18th inst., Mr. Jones, clerk of the Fulham Board of Works, attended in support of a number of summonses for paving expenses under the compulsory powers of the Metropolis Local Management Act.

In one case the defendant complained of being charged more on account of a long frontage.

Mr. Bridge (the presiding magistrate) said he was of opinion that apportionments should be made according to the value of the property, and not by so much per foot frontage.

Mr. Paget (the other magistrate of the court), who happened to be on the bench, said he quite concurred in that opinion. He had not had any conference with Mr. Bridge on the subject, but he had looked upon it in precisely the same light.

Mr. Bridge said it would be worth the while of the Board to consider the question.

Mr. Jones asked the magistrate if he considered the apportionment was bad.

Mr. Bridge said he did not. He made orders for the payment, with costs.

SEWAGE IRRIGATION.

The unfortunate Local Board of Crewe state that the loss upon their sewage operations last year has been, in round numbers, not less than 4,000*l.*, which is a very serious state of things for a young town, constituted mostly of working men. At Ashby-de-la-Zouch, we are informed, there has been an income from the sewage farms amounting last year to 285*l.* 8*s.* 11*d.* Twenty-eight acres of ground, rented at 7*l.* per annum per acre, have, under sewage culture, in market garden produce, yielded an income equal in gross to 711*l.* 14*s.* 1*d.*, or about 35*l.* per acre gross. At Wrexham, Colonel Jones, V.C., makes sewage farming pay. At Aldershott, Mr. Blackburn has sold upon his sewage-farm this year thirty-five acres of potatoes for 700*l.*, the parties to dig, clean, and remove them at their own cost; viz., these potatoes have sold at a rate of 20*l.* per acre, the crop having cost nothing specially for manure. At Worthing, 1,000 tons of mangolds were grown by sewage, selling up as high as 1*l.*

per ton for a portion of the crops. So, that with good land, good sewage, and good farming, there will be some good obtained. Extravagance in law and in works must, however, be avoided. When the long-expected sewage report is out, we hope to learn something about the question.

INTERVIEWING A "JERRY" BUILDER.

BY AN AMATEUR GOVERNMENT INSPECTOR.

Scene—On the "Shoots."

"Tell me, brickl'er, is this mortar ?
Are these cinders ?—is this sand ?
Who's the 'riddler' ? who's the 'sorter' ?
Who's the 'boss' or master hand ?"
But the brickl'er kept on grinning,
Raised his trowel and struck a brick;
One half went away fast spinning,
T'other he in mud did stick.

"Tell me, hodman, is this plaster ?
Is this 'ballast' ?—is this 'breeze' ?
Is this scavenge ?" "Ask my master,"
Said the hodman, "if you please."
Turning to the master-jerry,
Who was list'ning in my rear,
He replied to my first query
(With a curse), "What brings you here ?',

"Business, sir, has brought me hither,
From Whitehall I have come down.
When I've done I'm going thither;
But enough—I serve the Crown."
At these words the "jerry" stagger'd,
Closed his mouth, and bit his tongue,
Wiped his brow, and felt quite haggard,
Like one going to be hung.

Thus I "sold" the rampant "jerry";
Then with pencil pointed neat,
Took some notes to prove what very
Rotten work my eyes did meet.
All the brickl'ers stared and wonder'd,
All the hodmen watched me off,
And the "boss" that erewhile thunder'd,
Gave a dismal churchyard cough.

Books Received.

Tramways: their Construction and Working. By J. EMERSON DOWSON, and ALFRED DOWSON, AA.I.C.E. London and New York: E. & F. N. Spon. 1875.

THE rails and sleepers of a tramway, and their supports, have to be considered very differently from those of an ordinary railway. Originally, in the permanent-way of railways, the rails were laid on stone blocks,—at least in cuttings and on solid ground,—but the permanent-way thus formed was too rigid. Heavy weights running at high speed require some elasticity in the permanent-way. In an ordinary railway, the sleepers are laid in loose ballast, which is well drained, easily accessible, and the sleepers can at any time be packed up to their proper level; but tramways are usually laid in public roads, the paving of which is rigid, and therefore the rails and their supports should be so too. As it is necessary to cover up the sleepers with the paving or other materials of the roadway, they cannot be readily packed up, as in a railway, and it is, therefore, additionally necessary to make them so that they may not require this attention, the benefit of elasticity being unattainable.

The form of tram-rails is somewhat difficult. They must not project above the roadway, in order that they may not obstruct the wheels of ordinary vehicles, and the surface of the rails being thus level with the roadway the drivers of carts and wagons endeavour to let them run on the tram-rails, because the traction is easier for the horses; but the wheels cannot be kept fairly on the rails, and run sometimes on them and sometimes on the adjoining paving, wearing it away unequally, and when the carts and wagons are heavily laden and without springs the jolting causes the tramway to be much shaken and loosened, and the paving at the sides to be worn away. It is the object of the authors of this well-written treatise to show how the defects of tramways may be lessened, and the excessive cost of repairs reduced; and this they do under the several heads of *Construction* and *Equipment*, *Working Expenses* and *Maintenance*, *Mechanical Motive Power*, and the *Working of Traffic*.

It appears under this latter head that, "when on a level, or nearly so, it is found in practice that a pair of horses can draw about double the load on a tramway that they can on an ordinary road; but on inclines, although the smooth rails make the traction easier, the force of gravity tending to draw the car backwards is not counteracted in any appreciable degree by friction, and if heavy cars are used the strain on the horses is seriously increased on inclines steeper than 1 in 50 or 45. On this account, as well as for economy in working, steep gradients should be avoided, or, if used, they should be as short as possible."

In a tramway, unlike a railway, one of the greatest difficulties is to keep the rails fastened down. When the rails are laid on continuous timber bearers, the fastenings work loose, and when iron supports are used at intervals a jolt or shock is given to the car as it rides over them. To meet these objections the authors have designed an iron permanent way, with continuous cast-iron bearers, and they say it is considerably cheaper than the system with continuous timber bearers.

In an appendix are given the returns of fourteen horse-lines in the State of New York, from which it appears that as much as 70 or 80 per cent. of the gross receipts is absorbed by the expenditure, which is chiefly owing to the great cost of horse-renewals and horse-keep. The total expenses of ordinary steam railways do not usually exceed from 45 to 50 per cent. of the gross receipts.

The authors have given a good deal of practical information on the subject of tramways within a small compass, in every part of the book going straight to the point in question.

The Extravagant Expenditure of the London School Board: showing how a Quarter of a Million of Money has been Thrown Away. London: Effingham Wilson.

THE author endeavours to make out his case thus. The earlier Board schools were erected from the designs of architects holding no permanent official position in connexion with the Board; all the subsequent ones were designed by the permanent architect of the Board. The author gives figures to show that those designed by "outside architects" provide accommodation for 26,358 children, at a cost, exclusive of site, of 209,245*l*., or 7*l*. 18s. 9d. per child, and that the schools erected from the designs of the Board architect have, up to the present time, provided for 98,182 children, at a cost of 1,010,320*l*., or 10*l*. 5s. 10d. per child. This simply means in plain English, he says, that if the School Board had even only continued to erect schools upon the same principle as that upon which they began, they would up to the present time have saved to the ratepayers an expenditure of nearly a quarter of a million of money.

The writer adds, in arriving at these figures, "the cost of each school designed by what I may call the 'outside architects,' includes the architects' commission and other expenses of superintendence, whilst the remaining Board schools, having been designed by an officer of the Board, are not charged with any commission."

Something depends on the accuracy of his figures, and something more on the answer that would be given to the question,—Is the same amount of accommodation afforded to scholars and teachers in the earlier as in the later schools? On economic grounds the inquiry is worth settling. From an artistic point of view there needs no discussion at all.

VARIORUM.

"THE Rose and the Lily, and how they became the Emblems of England and France," is the title of a Fairy Tale, by Mrs. Octavian Blewitt, just now published by Chatto & Windus. It is a charming little story, charmingly told; parts of it with a vigour and brightness which lead us to expect it will not be long before we find Mrs. Blewitt in another path. "The Rose and the Lily" has an additional attraction in the shape of a frontispiece "designed and etched by George Cruikshank, age 83, 1875." It is both powerful and graceful, and etched with so firm a hand, that many will ponder over "age 83." Mrs. Blewitt's story, in its cover of white and gold, will make a charming little gift-book for Christmas.——A third edition has been published of "Mushrooms and Toadstools," by Worthington G. Smith (Hardwicke & Bogue). The object in view is to teach the reader to distinguish easily the difference between edible and poisonous fungi. Mr. W. G. Smith, who is *facile princeps* in fungi, illustrates his remarks with reduced copies of two valuable plates, published by him some time ago, one showing twenty-nine edible and the other thirty-one poisonous species. Our author evidently says, with Friar Lawrence:—

"For nought so vile that on the earth doth live,
But to the earth some special good doth give."

——"An Architect's Letter upon Sewer Gas and House Drainage," by Henry Masters, Architect (Spon) re-urges the necessity for cutting off the house from the sewer, and describes a double trap used by the author.——Fourteen Stories by Mr. Sala, Mr. Dutton Cook, Miss Braddon, and others, with eight page-illustrations, which go to make up the *Belgravia Annual* for Christmas, cannot be dear at a shilling.——Mr. Walford, in the last published part of "Old and New London," writes thus as to Knightsbridge:—"In the early Saxon days, when 'Chelsey,' and 'Kensing town,' and 'Charing' were country villages, there lay between all three a sort of 'No Man's Land,' which in process of time came to be called 'Knightsbridge,' although it never assumed, or even claimed, parochial honours, nor indeed could be said to have had a recognised existence. It was a district of uncertain extent and limits; but it is nevertheless, our purpose to try and 'beat the bounds' on behalf of its former inhabitants. The name of Knightsbridge, then, must be taken as indicating, not a parish, nor yet a manor, but only a certain locality adjoining a bridge, which formerly stood on the road between London and far distant Kensington. There is much difficulty as to the derivation of the name, for in the time of Edward the Confessor, if old records are correctly deciphered, it was called 'Kyngesburig'; while some hundred years or so later we find it spoken of as 'Knightsbrigg,' in a charter of Herbert, Abbot of Westminster. A local legend, recorded by Mr. Davis, in his 'History of Knightsbridge,' says that:—'In ancient time certain knights had occasion to go from London to wage war for some holy purpose. Light in heart, if heavy in arms, they passed through this district on their way to receive the blessing awarded to the faithful by the Bishop of London at Fulham. For some cause or other, however, a quarrel ensued between two of the band, and a combat was determined upon to decide the dispute. They fought on the bridge which spanned the stream of the Westbourne, whilst from its banks the struggle was watched by their partisans. Both fell, if the legend may be trusted; and the place was ever after called Knightsbridge, in remembrance of their fatal feud.'"——The *American Architect* says:—"Among the interesting things that were shown to the architects in Philadelphia, during their Convention, was the patented process of Messrs. Struthers & Sons, for sawing granite. Hitherto it has been found impracticable to cut granite with a saw, since the ordinary sand process would cut only 1½ in. or 2 in. per day. The inventor of the Messrs. Struthers's process hit upon the idea of using chilled iron, finely divided, instead of sand. A jet of steam is directed upon a fine stream of melted iron, and blows it into spray, just as in the common 'atomiser' a jet of air pulverises, so to speak, the stream of liquid upon which it is turned. The iron, divided into fine globules of (say) 1-40th in. or 1-50th in. in diameter, falls into cold water, and is chilled into excessive hardness. It is used under a saw of soft iron, and with a stream of water, as sand is used in sawing marble. Most persons would have supposed that the scratching of angular grains of sand would be more efficient than the rolling friction of globules of iron; but it would seem that the sand is speedily crushed into dust, while the tough iron, simply wearing down into smaller and smaller globules, crushes its way through the felspathic and other crystals of the granite (which with us is usually sienite, by the way, and not granite). The rolling of the globules is curiously shown by fine channellings, or flutings, which score the under-edge of the saw from end to end. By this device granite can be sawn at the rate of 3 in. or 4 in. per hour, and at small expense, the waste of the iron being about 3 lb. for every square foot of kerf, or two square feet of sawn surface."

A Bishop's Throne for St. Finbarre's Cathedral, Cork.—A movement is on foot to erect a bishop's throne in the new cathedral of St. Finbarre, Cork, as a testimonial to the present bishop, Dr. Gregg. The estimated cost is 500*l*., and the work will be carried out from the designs of Mr. W. Burges, the architect of the building.

Miscellanea.

Barrow Opening at Whitby.—The Rev. Canon Greenwell, with the Rev. C. J. Atkinson, vicar of Danby, has just been conducting the examination of a series of barrows on Sir Charles Strickland's moors, near Whitby, and now gives the result of his investigations. A large barrow near the Flask Inn was found to have been previously disturbed at the centre, but a secondary interment,—a burnt body,—was found, accompanied by flakes of calcined fluid. Beneath a large, irregularly-shaped flat stone, near the central disturbance, was found a small grave, 2 ft. square and 16 in. deep, over and in which the fire had evidently been made that had burnt the body within it. Additional interest attached to this barrow from its peculiar formation; the appearance indicating a conically-shaped "hone" of about 40 ft. in diameter, and 4 ft. to 5 ft. high. Subsequent enlargement of the area had taken place at the secondary interment, and a ring of stones 2 ft. in height had had soil heaped upon them to form a circular platform, with a gradual slope from centre to periphery. Near the above, a smaller barrow was opened, and a grave was found sunk about 2 ft. below the natural surface, and about 4 ft. square. This was filled up with tempered clay, below which was a very thick layer of charcoal; and scattered over this the bones of a burnt body were found, which had possibly been burnt in position. A larger barrow (60 ft. in diameter) on the farm of Mr. John Stanghow, Lythe, was opened, and a cist (which seemed to have been disturbed) was met with.

The Portico of St. Martin's-in-the-Fields.—At a meeting of the St. Martin's Vestry on the 15th inst., the chairman (the Rev. W. G. Humphrey, vicar) stated that he had received a copy of a report purporting to come from the engineer and architect of the Metropolitan Board of Works upon certain improvements that it was proposed to make by forming a new street from Tottenham-court-road to Charing-cross. There was but one point in the proposal to which objection might be urged, and that was the plan of the street included the taking away of the steps from the portico of the parish church, and to place the columns upon a wall similar to that at the National Gallery. He considered that to take away those steps would be simply to mutilate and spoil one of the monuments of the metropolis. If altered in the way proposed, he held that it would become an architectural monstrosity and absurdity. He did not believe that the alteration was necessary for carrying out the improvement. As the vaults extended beyond the church, the steps were parts of the consecrated portion. Mr. Churchwarden Scott agreed with the remarks made by the vicar, and considered the removal of the steps would be a great mutilation to the church. It was then resolved that, having heard the statement of the vicar, the Metropolitan Board of Works be informed that this vestry deprecates any interference with the parish church. Mr. Dalton said he had opposed at the Board of Works any interference with the church, and had said it would simply be vandalism to touch the portico.

Burning Public Lamps by Meter.—The Gas and Water Committee of the Vestry of Paddington report that the average meter system has now been in operation for a period of two years, ending the 30th of September last, and that the actual saving effected thereby, after payment of inspector's salary, and maintenance of meters, governors, &c., has been 678*l.* 12s. 7d. or at the rate of 7s. 10d. per lamp per annum, being 7d. more per lamp than last year. This amount, when added to the sum gained by closing the lamp-rental account, and the saving to be effected by the readjustment of governors, &c., will relieve the lighting rate to the extent of 1,650*l.* per annum. There are 1,730 lamps in the parish alluded to.

Plumstead Common.—The Metropolitan Board of Works has somewhat tardily decided to take the Plumstead-common question in hand. At its last meeting it was resolved,—"That it be referred to the Works and General Purposes Committee to consider and report what steps, if any, should be taken by this Board to secure Plumstead-common for the public as a recreation ground, with power to confer with her Majesty's Government thereon."

Scavenging in Dublin.—The streets of Dublin must be even worse than those of London to justify the *badinage* of Mr. C. J. O'Donel, one of the magistrates at the Dublin Police-court, who on the 9th inst. had to hear a case of assault in which one of the plaintiffs said her husband "was a scavenger." The following dialogue is reported to have ensued:—His Worship.—Why, then, you are a widow? Complainant.—No, your worship. His Worship.—Sure I thought you said your husband was a scavenger? Complainant.—Yes, your worship, and he is a scavenger. His Worship (surprised).—A scavenger! and is he alive? Complainant.—Yes. His Worship.—And is he working? Complainant.—Yes sir; every day. His Worship.—Is it in Dublin? Complainant.—Yes. Mr. O'Donel (evidently astonished).—Who ever saw such a thing in Dublin, these years, a living scavenger! Is he a real living scavenger? Complainant.—Yes, sir. His Worship.—The idea of there being actually a living scavenger in Dublin!

Brompton Consumptive Hospital.—At the last quarterly Court of the Governors the report of the Committee of Management stated that ever since the previous Court of Governors the western half of the hospital had been in the hands of the engineers and builders, who had been carrying out extensive improvements in the warming and ventilation of that part of the building. With the view of improving the sanitary arrangements, additions to both wings were also in progress. All these works had necessitated the closing of more than half the wards; hence the list of applicants had become much more crowded than usual, and the period of waiting was unavoidably lengthened, which the committee much regretted. The inconvenience arising from the unlooked-for delay in the completion of the works had been great, and their cost would be very considerable; but the committee believed that the well-being of the inmates would be materially promoted by the improvements.

Health Lectures for the People.—The first of a series of "Health Lectures for the People," organised by the Manchester and Salford Sanitary Association, was given on the 15th inst., by Dr. Ransome, Professor of Hygiene at Owens College, on the subject of "Foul Air and Lung Disease." Dr. Ransome said that three-quarters of a million of people died during the last ten years from diseases of the lungs not consumption. He discussed at length the evils arising from smoke, various trades and manufactures, putrefaction, and other causes. The Artisans' Dwellings Bill, which was intended to aid local governments in opening up crowded portions of towns, had been adopted with success in many large towns; but as yet Manchester had not adopted it, though the need that something should be done was very great, for there were parts of the city, especially in Ancoats, where it was a mockery to call the houses homes.

Paving and Road-making at Islington. At a meeting of the Islington Vestry on the 17th inst., it was resolved:—

"That, in all cases of roads and footpaths in which the compulsory powers of the Metropolis Management Acts have been, or shall hereafter be, put in force (the moneys for which have been received), or which the Highways or Sewers Committees have directed, or shall direct, to be made or flagged, tenders be invited and contracts entered into by the committee having charge of the works on behalf of the vestry; that the surveyor inspect the works, and see that they are properly executed, and that the materials are such as are required by the existing regulations, or by any regulations hereafter to be made."

At the same time, the vestry decided to take steps for borrowing 40,000*l.*, the estimated cost of cubing the macadamised margins alongside the tramways in Upper-street and Holloway-road (to and including the intersection of the Seven Sisters-road), and in the Essex-road, up to and including the intersection of the Ball's Pond-road.

Fall of a Building in Sheffield.—On Wednesday night last week an accident occurred in a row of new buildings, called Prospect-terrace, in Grimesthorpe-road, Sheffield. Mr. Curtis, contractor, and four of his workmen, were engaged in putting the rafters on a house at the end of the terrace, when the gable end gave way, the whole building, with an adjoining workshop, falling with a great crash. When a clearance could be effected it was found that all the five persons were badly hurt. Two were taken to an infirmary, where they now remain in a dangerous condition. Mr. Curtis and two of his workmen were taken home seriously injured.

Polluted Well-water at Tottenham.—At the Edmonton Petty Sessions, on the 20th inst. Mr. Henry Baynard was summoned at the instance of the Local Board of Health, to show cause why an order should not be made as to a certain well, situate at the rear of Seven Sisters-cottage, Hanover-road, Tottenham, the water of which was used, or likely to be used, for drinking or domestic purposes, and was so polluted as to be injurious to health. Dr. Watson, the medical officer of health for the district, had reported that the water was very bad, and unfit for drinking purposes, and the defendant had made an offer to close the well, so far as the water was used for drinking purposes. An order was then made to close the well, so far as the water was used for drinking purposes. Another owner and occupier was summoned in a similar case, and in this instance an order was made for closing the well in six months.

British Archæological Association.—At the first meeting of the session, held last week, in the course of the proceedings an elaborate paper by Mr. Roach Smith was read by Mr. Isaac, detailing his survey of the Roman stone street from London to Chichester. The perambulation was commenced at Ewell, and continued to its termination. Mr. Loftus Brock, F.S.A., detailed the discovery of a part of the Roman wall of London in Camomile-street, and also that of several sculptures of much interest, found built up as old material within it, on its demolition. The discovery of further sculptures, and the head of a statue of large proportion, and probably of the period of the Antonines, was also announced, and Mr. Haviland exhibited a rubbing from one of the stones.

The Parliament House of Owen Glendower at Dolgelly.—A correspondent writes to the *Athenæum*:—"I do not remember to have seen in any London newspaper notice of the threatened destruction of a building which must nevertheless, I suppose, be of interest, not only to all Welshmen, as a monument of the final struggle of their country for independence, but to antiquaries and even, in a less degree, to every reader of Shakespeare,—the Parliament House of Owen Glendower at Dolgelly." He hopes that it may yet not be too late to call attention to the subject, which was referred to in the *Builder* some months ago.

"Back-to-Back" Houses in Altrincham. The Altrincham Rural Sanitary Authority has determined to prevent the erection of "back-to-back" houses in future, and, more than this, to insist on the demolition or alteration of many of the existing houses of that kind in its district. The unhealthiness of such buildings has long been demonstrated, yet one of the members of the Altrincham Authority said he "thought it was a great mistake to do away with those 'back-to-back' houses, unless they would compensate those people for the loss of their rents." He confessed, however, that he was the owner of "back-to-back" property in Salford.

Association of Employers of Labour in the Building Trade.—The Association, which numbers among its members a large number of gentlemen interested in the building trade of Croydon and district, held its first annual dinner at the Greyhound Hotel on the 14th inst. In many of the after-dinner speeches allusion was made to the strong desire felt by employers that a good understanding should exist between their workmen and themselves, but at the same time it was stated that the combined masters would resist any unjust demand which might be made by the workmen in their pay.

Death of a District Surveyor.—At the last meeting of the Metropolitan Board of Works, the Superintending Architect (Mr. G. Vulliamy) brought up a report relative to the vacancy in the district surveyorship of Bethnal-green (East), caused by the decease of Mr. Robert Culver James. The subject was referred to the Building Act Committee. Mr. James was one of the most recently appointed officers of the Board.

A River of Ink.—Report has it that a river of genuine ink has been discovered in Algeria. It is formed by the union of two streams, one coming from a region of ferruginous soil, the other draining a peat swamp. The water of the former is strongly impregnated with iron, that of the latter with gallic acid. When the two waters mingle the acid of the one unites with the iron of the other, forming a true ink.

Hoardings in the Holborn District.—At the meeting of the Holborn District Board of Works, on the 20th inst., Mr. Clarke drew attention to the great height of hoardings in different parts of the district. They generally exceeded 20 ft. in height, and one was so high that it got blown down. The surveyor (Mr. Isaacs) replied that he believed he had no control over the height of hoardings, though he had power to determine the projection, and the length of time they should stand. He would confer with the clerk on the subject.

A Trade Book.—Messrs. Jas. Shoolbred & Co. have issued a book of "Designs for Furniture," illustrative also of Interior Decoration. As a whole it is superior to the ordinary run of upholsterers' pattern-books, and people who happen to have good taste may get good things out of it. No names of designers are given. The illustrations are all produced by Messrs. Whiteman & Bass.

TENDERS

For boilers and baths, gas-fitting, and stores, Newington Workhouse, Walworth-common. Messrs. Henry Jarvis & Son, architects: –

Boilers and Baths.

Jeakes & Co.	£378	0	0
Lefevre & Co.	706	0	6
Green & Co.	647	0	0
Fraser Bros.	629	0	0
J. & F. May	591	17	0
Smeaton & Sons	525	0	0
Chandler & Sons	510	0	0

Gas-fittings.

Jenrick & Morgan	£573	0	0!
Cannon	498	10	0
Green & Co.	485	0	0
Heath	450	0	0
Miner	444	15	0
Bliss & Co.	400	0	0
Lefevre & Co.	332	4	7
Chandler & Sons	280	0	0!

Stoves.

Jeakes & Co.	£513	0	0
May	508	0	0
Downs	489	0	0

For fittings, Northumberland Arms, for Mrs. Green. Mr. W Paice, architect.

Pewterer's work.

Richards	£70	10	0

Gas-fitting.

Wilman	£120	0	0

For alterations, &c., at the Blade Bone, Bethnal-green-road. Messrs. Bird & Walters, architects:—

Kelly Brothers	£1,425	0	0
Brown	1,410	0	0
Newman & Mann	1,370	0	0
Lawrence	1,315	0	0
Williams & Sons	1,294	0	0
Hockly	1,215	0	0
Nightingale	1,197	0	0
Anley	1,095	0	0

For butcher's premises, on Harding's-hill, South Shields, for Mr. G. Birkitt. Messrs. Penning & Rudge, architects. Quantities by the architects:—

Young	£414	3	0
Harwood	392	7	8
Joeurs	335	0	0
Hunter	290	0	0
A. & P. Marshall (accepted)	288	4	0

For additions to Westoe House, Westoe, South Shields, for Mr. T. B. Barker. Messrs. Penning & Rudge, architects. Quantities by the architects:—

A. & P. Marshall	£398	16	0
Nichol	389	16	2
Harwood (accepted)	371	17	10

For repairs and decorations to the late residence of Alderman Challis, Enfield. Mr. T. J. Hill, architect:—

Heeps	£612	0	0
Bentley	595	0	0
Patworth (accepted)	429	0	0

For restoring Vicarage House, St. Botolph, Charterhouse-square, for the Rev. Flood Jones:—
Jarvis & Sons (accepted).

For residence at Birdhurst, Croydon, for Mr. G. E. Brock:—

Hobbs (accepted)	£1,700	0	0

For the erection of dwellings, Peel-street, Kensington, for the National Dwellings Society (Limited). Mr. E. Evans Cronk, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

Rider	£21,938	0	0
Sewell	21,300	0	0
Bywaters	21,080	0	0
Adamson	20,800	0	0
Sheppard	20,650	0	0
Hill, Higgs, & Hill	20,400	0	0
Downs & Co.	20,150	0	0
Chappell	20,000	0	0
Colls	19,870	0	0
Kirk & Randell	19,860	0	0
Nightingale	19,432	0	0

For labour only to a waste factory at Daybrook, near Nottingham, for Mr. John Harrison. Mr. T. G. Alderson, architect. Proprietor finds materials:—

Davis	£196	10	0
Lewin & Carter	166	0	0
Carlin & Co.	157	10	0
Terry & Langley	159	0	0
Parnall & Flinders	139	15	0

For pulling down and rebuilding No. 15, and for additional story to No. 16, Bartholomew-close, for Mr. R. T. Collins. Mr. George Judge, jun., architect. Quantities supplied by Mr. W. H. Brayshaw:—

Palmer & Son	£2,324	18	0
Colls & Son	2,235	0	0
Titmas	2,141	0	0
Hawtrey & Son	2,128	0	0
Boyce	2,074	0	0
Sewell & Son	2,064	0	0
Conder	1,985	0	0
Deards (accepted)	1,844	0	0

For a portion of the ironwork in the construction of the new public baths at White Rock-place, Hastings. Messrs. Cross & Wells and Jeffery & Skiller, joint architects. Quantities supplied:—

Rother Ironworks Company	£3,392	11	0
Rosser & Russell	3,322	9	3
Fraser Brothers	2,988	0	0
Homan & Rodgers	2,460	0	0
Bunnett & Co.	2,417	2	0
Turner	2,361	9	6
Turner & Co. (too late)	2,315	14	0
Geilgud	2,304	5	0
Shaw & Co. (accepted)	2,241	10	0

Messrs. Moreland & Son, Fowler, and McLaren & Co. tendered for a portion only of the work.

For erection of a chapel, vestries, and schools, Redland-road, Bristol. Mr. Robt. Curwen, jun., architect. Quantities by Messrs. Newton & Bamford:—

Pugsley	£8,999	0	0
Davis	8,495	0	0
Wilkins & Son	8,200	0	0
Krauss	8,080	0	0
Howell	7,813	0	0
Church & Philips	7,650	0	0
Stephens & Bastow	7,490	0	0
Foster (accepted)	7,421	0	0
Baker & Son	7,300	0	0

For erection of a chapel and vestry, Thornbury, Gloucestershire. Mr. Robt. Curwen, jun., architect. Quantities by the architect:—

Hudson & Tucker	£2,760	0	0
Saise & Son	2,450	0	0
Brown	2,091	0	0
Williams-Mark	1,991	0	0
Foster & Son (accepted)	1,636	0	0

For building a factory in Nelson-street, Peter-street, Hackney. Mr. Mundy, architect:—

Thomason	£1,695	0	0
F. & T. J. Wood	1,575	0	0
Batchelder	1,573	0	0
Ennor	1,532	0	0
Croker	1,492	0	0
Nightingale	1,473	0	0
Hearle	1,445	0	0

For building warehouses, Bethnal-green-road. Mr. Mundy, architect:—

Wire	£1,498	0	0
Batchelder	1,443	0	0
Croker	1,387	0	0
Thomason	1,293	10	0
Hearle	1,247	0	0
Wood	1,224	0	0
Nightingale	1,197	0	0
Hall	1,075	10	0

For alterations and additions to the Rookery Mansion, Westcott, for Mr. George Arthur Fuller. Mr. F. J. Dibble, architect:—

Colls & Son	£568	0	0
Heselgrave	549	0	0
Lynn & Dudley	495	0	0
Putney	453	6	0

For the erection of a detached villa at Barnett, for Mr. T. M Weston. Mr. Fras. L. Pither, architect:—

The National Co-operative Builders' and Contractors' Society (accepted)	£800	0	0

For building superstructure of warehouses in Miles-lane, City, for Messrs. Mezzeson & Co. Mr. F. Chambers, architect. Quantities supplied by Mr. Mark W. King:—

Newman & Mann	£3,065	0	0
Ashby & Horner	3,030	0	0
Brass	2,997	0	0
Macey	2,983	0	0
Fatman & Fotheringham	2,968	0	0
Harrison & Wood	2,937	0	0
Holland & Hannen	2,915	0	0
Browne & Robinson	2,723	0	0
Conder	2,685	0	0

For building new premises, Cannon-street. Messrs. Taylor & Locke, architects. Quantities supplied by Mr. Wm. Birdseye:—

Newman & Mann	£22,382	0	0
Browne & Robinson	22,138	0	0
Brass	21,471	0	0
Deards	21,297	0	0
Sewell & Son	21,180	0	0
Killby	20,970	0	0
Sheppard	20,800	0	0
Morter	20,200	0	0

For the erection of an hotel on the site of the Three Nuns Tavern, Aldgate, in the City of London. Messrs. Tarring & Wilkinson, architects. Quantities supplied:—

Browne & Robinson	£10,799	0	0
Newman & Mann	10,543	0	0
Perry & Co.	10,270	0	0
Burman	9,800	0	0
Bracher & Son	9,150	0	0
Wagner	8,950	0	0
Stephenson	8,382	0	0

For a house, corner of Frognal-lane, Hampstead, for Mr. W. Read. Mr. T. K. Green, architect. Quantities supplied by Mr. John Scott:—

Sharpington & Cole	£2,699	0	0
Newman & Mann	2,649	0	0
Dove Brothers	2,647	0	0
Browne & Robinson	2,612	0	0
Scrivener & White	2,591	0	0
Burford	2,568	0	0
Longmire & Burge	2,568	0	0
Manley & Rogers	2,433	0	0

For additions and alterations to White Hall, Hornsey-lane, for Mr. G. Wills. Messrs. Lander & Bedells, architects. Quantities supplied:—

Axford	£3,850	0	0
Brass	3,817	0	0
Newman & Mann	3,736	0	0
Dove Brothers	3,675	0	0
Williams & Son	3,617	0	0

TO CORRESPONDENTS.

Bricklayers' Technical Education Committee, and Institute of Architects.—We have received a copy of correspondence; it shall have attention next week.

J. W. H.—R. P.—L. & M.—R. W.—B.—Mrs. M.—C. C. H.—Mrs. J. L. M.—J. W.—J. A. M.—R. C.—E. S. R.—E. L. B.—H. S.—G. & B.—F. J. D.—W. H. B.—Town Clerk, Leeds.—Surveyor.—J. P. A. H.—H. W.—R. W. G. H.—J. J.—Dr. P.—W. H. O.—C. J. S. & W.—C. B.—F. B. P.—Dr. N. (we are compelled uniformly to decline).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Builder.

VOL. XXXIV. No. 1765. SATURDAY, DECEMBER 2, 1876.

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"A Book on Building."

SIR EDMUND BECKETT has placed his friends and enemies under a fresh obligation. He has just written another book; and it is offered, as a kind of building guide, philosopher, and friend to that vast mass of the community entirely ignorant of the building art by one who undoubtedly possesses a little knowledge of it.* To those who have listened to Sir Edmund's utterances upon architecture, to those who can read between the lines of his book, it will prove useful; and it is full of excellent instances and practical exposures. It records petty reminiscences of crass professional stupidity counteracted by the ready wit of an employer determined to be master of the man whom he pays to advise him; and, moreover, two or three dicta concerning legal points not yet entirely understood by either architects or lawyers, which, coming from a distinguished Queen's Counsel, are of too much value to both professions to be overlooked or disregarded. The book is divided into six chapters, and contains a catalogue giving the dimensions of churches which originally appeared in our pages, and will be found valuable for purposes of reference. The legal portions fill but a few out of some 350 pages; the pith of the work treats of principles of construction and house building; and our intention is to examine the first four chapters, leaving the two last relating to church-building and domes for another occasion.

The author, though his foot is planted firmly and with no light tread, upon the path marked out by himself, has not disdained to give several reasons for "offering advice on architecture and building." One of these is that in spite of the multitude of treatises relating to both there are none which give "practical information how to avoid legal or structural mistakes"; another that he has been building for other people or himself during nearly a quarter of a century; and also because, in his own words,—

> "I have substantially designed sundry churches and other buildings of considerable size, viz., the two Great Northern Railway Churches of St. James, Doncaster, and the one a mile north of Peterborough, St. Mary's, Lichfield, except the tower which had been rebuilt before; St Chad's, Headingley, near Leeds; a small church at Cliffe in the East Riding; and Mr. Bass's, St. Paul's Church, at Burton, which is of unusual size for a modern one; also the Grammar School at Doncaster; the extension of Lincoln's-inn Library; the tower top of Worcester Cathedral, which had never been finished in Gothic times, and was formerly of a mean design in brick and plaster; and a house of my own near St. Alban's, covering 1,000 square yards; besides some smaller buildings not worth mentioning. I mean, that in all these cases the architects accepted my designs, and added little or nothing of their own. I do not include the great parish church of Doncaster, with which I have seen my name more associated than with these others, because that was designed in all its leading features, and especially its dimensions, by the greatest of modern Gothic architects, whom I need not name, though some things in it were modified at my suggestion, and others added or altered since the building."

This quotation serves to exhibit the kind of authority to whom the public, not the profession of architects, is invited to listen; and, though a part of it may not please some perhaps to whom allusion is made, we may remind them and everybody else that it is capable of diverse interpretation. The happiest home is often one in which the husband reigns as constitutional monarch, and the wife, like a wise cabinet-minister, "never shows she rules."

But we shall better prove our indebtedness to Sir Edmund by commending the incisive manner in which he exposes the fallacy of architectural competition as it is at present, and has long been, conducted. Practically a competition does just the reverse of what it is intended to do in theory. Instead of being a fair stand-up fight between architects in large practice and others with little or none, it often excludes the former, who do not think the game worth the candle; instead of being a means whereby genius is enabled to emerge from obscurity, or gifted poverty to descend from a garret, it is simply a trial of skill and pictorial device between men who work, not up to their own, but down to the public taste; and who seek to attract, often by systematically false drawings or fantastic designs in a novel style,—that is, a style with which the judges, sometimes vestrymen and their friends, are not familiar. To use Sir Edmund's own words:—"In a discussion on the 'Hope of Architecture,' at the Royal Institute of Architects, in December, 1874, I said that any architect would make me a very different design if I employed him directly from what he would send in for any competition; when the president, Sir Gilbert Scott, most significantly interjected, 'We are obliged.'" This little anecdote, the circumstances of which we distinctly remember, is literally correct; and it tells in a few words, not only the secret of architectural competition, confirmed by one who, from long experience and some profit, must know, but also the origin of half the new public buildings which disfigure the metropolis, and annoy all educated men, though probably none more than those architects whose names are indelibly written upon them. From the fallacies of competition to fallacious tenders is but a step; from the responsibility of individuals to the power of a general body is another; and our author, with a compliment to Mr. Ayrton, advises people who desire to build to adopt the course of the Government by making a preliminary arrangement with an architect about the sum he is to be paid and the manner of its payment,—hitting a little roughly at the "Rules for Professional Practice" accepted by the majority of London architects; and describing them, in the words of a certain judge, as a private code presuming to set itself above the common law. Though declining to reprint or even criticise those "Rules," which, "as a lawyer," he says, produce the exact contrary to what they are intended to effect, he gives all the clauses of the usual agreement between Government commissioners and an architect employed upon public works. These, he thinks, are capable of improvement in minor points; and to clause 17, which is,—"No rules of the R.I.B.A., or any other society, to be held binding on the commissioners,"—he adds, in a parenthesis,—"This is *ex abundanti*, since the whole agreement is opposed to the whole principle of those rules." He also gives a suggested form of conditions for architectural competitions; a form of contract between a building firm and a committee; some practical talk about "quantities," schedules of prices, tenders, "extras," divided contracts, an architect's responsibility, and the modern necessity,—we may add the almost English necessity,—for a clerk of the works.

It is not, however, as a lawyer that the author of "A Book on Building" seeks the suffrages of the public; nor does he care to be recognised either as a scholar or a man of science. He voluntarily presents himself,—and with some little emphasis,—as the pure and simple "practical man"; and, as if to show his contempt for higher things, he confounds the third and fourth epistles of Pope, misquoting,—

> "What brought Sir Visto's ill-got wealth to waste?
> Some demon whisper'd, 'Visto, have a taste,'"—

in a sentence at p. 67, where he declares that "the best builders' houses . . . . are infinitely better . . . . than the vulgar monstrosities . . . . which architects are planting over the estates of some of the great metropolitan landlords, to whom, as to Sir Balaam in the poem, 'Some demon whispered, Have a taste.'" He neither permits the supposition that there is any philosophy in architecture, nor admits the use of reasoning by analogy in discussing it. His doctrine about styles, and his apparent disregard of the difference between *a* style, *the* style, and style (admirably explained by M. Viollet-le-Duc) demand more elucidation than he has given. He says that the word "style" is a technical one, and that the only question now is, which of the old or existing styles we are to use for any particular building. In all humility we presume to dispute this proposition, and to deny that the word "style" is a technical one. What is the style of our time amongst ladies and gentlemen? Is it not to be simple, unaffected, honest, to be decent and forbearing rather than pious, to break down the barriers of class, and to be intolerant of a snob? Men nowadays aim at being comfortable rather than showy in their private dwellings, economical rather than ostentatious in their public buildings. They provide for the wants of the greatest number rather than the luxuries of the few; and therefore they encourage manufactures which mean the diffusion of manual labour rather than

* A Book on Building, Civil and Ecclesiastical; with the Theory of Domes and of the Great Pyramid; together with a Catalogue of the Sizes of Churches and other large Buildings. By Sir Edmund Beckett, bart., LL.D., Q.C. (Crosby Lockwood & Co.)

the exclusiveness of artistic workmanship. In Athens and Rome the State was everything,—all the talents were devoted to the "public magnificence," and the individual was ignored. In feudal times the problem, not inadequately solved, was the harmonising, beneath one head supported by a spiritual power, of several potentates under whose rule communities often lived, and for whom they fought. After a long period of transition, a state of things exactly opposed to that of antiquity is slowly developing in Western Europe; and to-day, comparatively speaking, the individual is everything and the State nothing.

For each individual to masquerade in some discarded fashion of the past is a perfectly legitimate proceeding; but is it compatible with the average good sense of the English people? The novel argument, offensive to poets and some painters, but based on a right foundation and the laws of progress, is that it is better for a thousand inferior families to be able to travel from one prosaic and vulgar centre of business to another,—from one hideous railway station to another—over hundreds of miles of ugly rails, than for ten noble and rich families to travel, each in a state coach and six, with a glittering escort, over winding roads—unkempt but bedecked with natural beauty,—from a city of picturesque gables and spires to ivied castles of towers and battlements. So reasonable, indeed, is the age and country, that if only half a dozen of those thousand families arrayed themselves in the costumes of half a dozen different epochs of history, they would be immediately laughed at as mad or worse than affected. Yet Sir Edmund Beckett—a thinker and a man of the world—treats the recognised difficulty in the following manner:—

> "What we want is not a new style, but the genius or taste to build decently in any style. If a new one were invented to-morrow, it would very soon be old, and would be only one more than we have already to choose out of and copy. If the old Gothic builders could make the variety they did with only one style lasting for a century, surely our architects might manage it with half a dozen. Only two things are wanted to produce good architecture: taste, or the power of designing what is pleasing; and practical or scientific knowledge, which is only to be acquired as it is in engineering; which differs from architecture in requiring no taste. One can be taught, but unfortunately the other cannot, though it may be cultivated and improved."

People who know the principles of the *Builder* will be able to account for the sort of amazement with which we have read and digested this same paragraph; we admit, however, that it may possibly be a defect of our own intelligence which allows us to feel astounded by such words. We are told that good architecture depends partly upon the power of designing what is pleasing. Now, we have stood under the dome of the Táj Mahál and it pleased us; it pleases every one who sees it. The power of designing something exactly similar to it (funds being provided), is undoubtedly possessed by at least a score of English architects; a building of the kind once reared in Hyde Park and kept clean would delight all London. But it would not be architecture, at least in any much higher sense than the figure of Cobbett taking snuff at the Baker-street Bazaar is Mr. Cobbett; or than collegiate hexameters and pentameters are Latin verses. Yet the architectural language of the Táj Mahál is a living one still understood in parts of India. In Hyde Park, however, it would be a foreign one—*a* style, but not *the* style, and wofully defiant of style. Nor is practical knowledge the same as scientific knowledge; the latter is a vastly higher and more comprehensive thing. "The two real requirements," as Sir Edmund has farther put it, "are taste and knowledge." But he owns to being unable to define "taste," and he, an advocate, says, "The only test of it is that things in good taste are admired in the long run permanently, and those who have seen them once desire to see them again." Now taste has been defined, and by practical men. Sir Joshua Reynolds has said that "every object which pleases must give us pleasure upon certain principles." "The sentiment of taste," according to M. Viollet-le-Duc, "is, very often, perhaps always, only an involuntary reasoning of which the terms escape." Taste, as it has been elsewhere put in our pages, is only culture,—the product of example and slow inheritance; and far from our architects wanting "taste, or the power of designing what is pleasing," as Sir Edmund Beckett describes the æsthetical section of design, superabundance of such "taste" is the rock upon which architectural galleys now split. We admit with him that taste does not follow education; at least, in its progress it takes a different phase or quality of sentiment. A Parsi woman of good family at the present day is more tasteful in dress and graceful in bearing than her similarly-situated English sister; the actual population of Japan has more artistic feeling than that of England. But the difference in both cases assimilates to that which exists between the youth of a people and their maturer development, — between the imagination of twenty and the judgment of forty years. We have no hesitation in asserting that, at home, taste, in whatever sense the word be taken, has made marvellous progress in the course of a generation. Style is developing. All classes of the people have improved. The age is better in morals, simpler in manners, nobler in aim, than it was even thirty years ago. The very confusion in the arts, which perplexes onlookers, is indicative of movement perpetually going on, accompanied, as it inevitably must be, with all sorts of affectation and exaggerated earnestness.

A few words more on this head. Sir Edmund Beckett affirms that "in the days when there was real architecture there was no architectural philosophy." We think that there was. Philosophical deduction applied to the arts means nothing more than systematic or methodical criticism. To say, as people did a hundred years ago, and even less, that the "Tuscan style" was intended for garden gateways, the Ionic for summer temples, the Corinthian for ornate edifices, the Gothic for rustic dwellings or country churches, and so on, is neither philosophical, nor critical, nor, indeed, anything at all but caprice, or even worse. But Xenophon's "Memorabilia" abounds with the reasoning of Socrates in arguments and maxims relating to building and the arts then subservient to it. It would be just as logical and as true to say that in the days of Bacon there was little science, and there were few manufactures. But these things have grown and developed from the English philosopher's labours and the practical turn he gave to his teaching. That very "eye for defects," on which Sir Edmund prides himself, has often caused him to philosophise even against his will. "I suppose," says he, in his definition of an architect, "the nearest approach would be, that he is a man who designs buildings which answer their purpose, and continue to be generally admired." But in the absence of "a natural good taste" amongst architects, in the general ignorance of the lower classes, and the increasing perplexity of the upper ones, who is to admire? Who is to be the arbiter of admiration? To find out whether anything answers its purpose requires merely mother-wit; but to admire—and for a building to be generally admired it must have a touch of something of art, like that of nature, which makes men akin—appreciation must be based upon reason; and a system of *pros* and *cons.* must be employed to estimate the beauty and utility of its constructive parts. That is the criticism of ordinary common sense, and it may be, and is, refined into a higher one. Indeed, now that all the remains in the world of ancient and mediæval architecture are photographed, and lie at the service of every one for commercial application,—now that the chain of native building traditions is severed, progress and improvement are impossible without some recognised, even though unwritten, laws, to guide men in the work of material creation.

The portion of the book relating to matters of housebuilding contains a great deal of information, interspersed with personal experiences. In discussing the position and "posture" of country houses, our author begins, *suo more*, by describing how "one of the grandest houses in Shropshire was left to the architect to plant as well as to build, who put it, as they often do, to be looked at rather than looked from,—looking north along a sunless valley in a large park, with plenty of fine sites and large views; and that the owner came to see it once after it had advanced too far to stop it, and was so disgusted that he never came again." Undoubtedly not only too little attention is paid to the planting of a new house, but too much is accorded to the desire that it may be seen from certain points of view, and also to the sentiment inspired by the position of any old one which perhaps it supersedes. Sir Edmund thinks that it is not the north-east, but the south-west face of a house which needs screening from the weather; and trees planted on that side are a sure protection to it. At the same time trees placed too near the walls of a house render them damp, since they exhale damp in rainy weather. Ivy, on the contrary, tends to keep the wall it covers dry. "I have heard," he says, "of west rooms which never could be kept dry until they were covered with ivy. . . . . I stayed several summers in another house where the library, which ought to be the warmest from its position, always wants a fire three or four weeks earlier than the corresponding east room, and papers become soft and damp after a very little rain, from having been built too near some large trees on the south-west. . . . . The owners of country-houses with lodges generally condemn their lodge-keepers to live in houses steeped in damp, and often cut off from the sun by large trees overhanging them." The plans of a model country-house are also given, and their different portions are very fully examined.

Nor are the details of town-houses passed over without almost equal scrutiny. We were inclined to smile on reading that a covering of concrete, at least 6 in. thick, ought to be placed over the soil, under the basement floor of a house, until we remembered that there is no law to compel such a procedure; and that no ground landlord, in the numerous restrictions he imposes upon the lessees of his land, thinks of inserting a clause which would not only improve his property and impede one of the prolific agents of premature decay, but preserve the health of those who are almost forced to live in the house, —in spite of the damp fumes rising from putrid soil through the lowest flooring. The vexed question of sound and fireproof construction is also alluded to; and, as two or three correspondents have lately interrogated us on the subject, we can here say something about it. In the book we are criticising, mention is made of Sydney Smith, who, in his lectures on moral philosophy, always begged his audience to remember that "when I say a thing is so-and-so, I only mean that I think it is so-and-so;" and in like manner, when people talk about things being proof against the elements, they necessarily use the term in a conventional sense. There is nothing absolutely proof against fire or sound. It is possible to interpose barriers to resist noise; and fire may be interrupted in its course until the natural means of quenching it can be applied, and with sufficient force and endurance. There can be no doubt that through fire in London houses hundreds of lives are periodically sacrificed, two-thirds of which would escape with impunity or slight injury in those of Paris; for the general use of floor-divisions or party-floors composed of rolled iron joists and plaster concrete, to say nothing of oak parquetry, renders this horizontal partition almost equal to a vertical party-wall. But some of the best and the newest houses in the metropolis possess no better barrier between story and story than an inch of lath and plaster and an inch of deal boarding—the space between being hollow, and intercepted only at intervals by joists of inflammable wood. Indeed, to upset a pail of water on the bedroom-floor of a London mansion is to deface the drawing-room ceiling. To prevent this it is necessary to interpose some solid substance; and all solid divisions vibrate, and are more sonorous than hollow ones. In this we can learn much from our neighbours, bearing in mind that plaster of Paris is quarried from their own ground, and consequently cheap; and that we have no alternative but to use Portland or more ordinary cement as a substitute. Even in France, though, a good floor is a costly and complicated piece of business: first, there are the rolled-iron joists to be laid at some 30 in. apart; then, at right angles to them at about 3 ft. apart are placed wrought-iron bars, which are bent at the ends so as to clip the upper flange of the joist and permit the bottom of the bar to be level with the lower flange; and upon these bars, in lines parallel with the joists and of equal length, light iron rods are laid. Under this skeleton a *temporary* ceiling of planks is propped up; and thereupon concrete of plaster and ballast is composed over the whole floor between the lower and the upper flanges of the joists; and in an incredibly short time afterwards the temporary ceiling can be removed. In very good work the real ceiling is often formed by incrusting bits of oak into the concrete, and nailing upon them the necessary laths to receive the coat of plaster. The woodwork over is put together with great precaution. Pieces of oak (*lambourdes*) are placed upon the solid filling, and in lines parallel with the joists; these pieces are laid in bitumen, and long channels are thus formed from one end of a room to the other. The oak parquetry (always tongued) is nailed upon the *lambourdes* generally in short slips about 3 in. wide; and in extremely

good work a figured parquetry floor is frequently laid upon a common one of deal. We need hardly urge that such a horizontal partition, for plaster is a non-conductor of heat, is up to a certain pitch a formidable barrier against fire. If, during the real atrocities of the Communists in Paris, some floors and stairs of similar workmanship succumbed after long endurance to the flames, it must not be forgotten that the houses of which they formed part were systematically fired; and flooded previously with oil of petroleum.

As if to show the sort of constructive finish to which the people of this country are accustomed, Sir Edmund Beckett advises as follows:—"Ordinary floors are all the better for the ventilation between the boards, which never remain so close as to be airtight." A French joiner, who does not dream of fixing his parquetry until the plastering is entirely finished, and in a fair way of drying, would be astonished to learn that "unfortunately nailing down a floor over a ceiling is apt to shake it loose." He would be still more astonished to hear that in England parquetry floors consist of squares made up of bits of oak glued together in patterns and sold separately, and then nailed and glued down on a deal floor." We are forced to believe that the author of "A Book on Building" has combined in his "quarter of a century" the experience of Macaulay's two ages. In 1830, the essayist, referring to the buildings then recently erected in London, wrote,—"In a bad age the fate of the public is to be robbed outright; in a good age it is merely to have the dearest and the worst of everything."

A hasty or casual perusal of this book may lead superficial people to think that it is published as a peg on which to hang its author's aversion for architects in general, and one or two in particular. But after a careful examination we are convinced that such a conclusion would be incorrect and unjust; and we commend the book to the thoughtful consideration of all who are interested, or who take an interest, in the building art. The tone in parts is perhaps not quite agreeable, because no one likes either himself or his kind to be held up to scorn; but here is no partial castigator. Duchesses and ladies with "a contempt for the laws of nature," "commercial gents," M. Viollet-le-Duc, who, by the way, is not "the most eminent of the French architects," archdeacons, and rural deans,—all and many others come within the sweep of a vigorous lash. Nor can we omit to state that though a few technical misconceptions and expressions of opinion, founded upon an undeveloped acquaintance with materials and workmanship, — not to speak of some instances of tautology, — do certainly occur, such slight blemishes may be remedied in a second edition, which, we doubt not, is almost immediately inevitable.* But it is not so easy to rectify generally careless composition. In "A Book on Building" passages such as the following are of frequent occurrence:—"It was never used in real Gothic, except for the roughest kind of walls, or when it was intended to be plastered; *which* Gothic buildings were a great deal more commonly than is allowed by our architectural prigs and inventors of maxims." "Nearly every country *house* (which *are* more spread out, and catch much more water than town ones) *catches* as much water as *its* inmates want." "If anybody *wants* to see what it is liable to become let *them* look." Sir Edmund Beckett has possibly thought that to "compose" for ordinary every-day use is to waste the time of a practical man; but simplicity and terseness are absolutely necessary to make a technical book readable and popular. The true way of reaching the public ear is to talk distinctly and concisely with plain words and in short carefully-rounded periods. Unfortunately, too many writers,—and our author knows better,—fancy that it is only necessary to cause a clatter in print to make their bow to the world, and gain the notice of those they denounce. As a French wit has said,—"On écrit ce que l'on n'ose pas dire;" and one or two very new books, by ladies as well as men, prove the justice of the remark. Yet in the case of a woman, however pretty and accomplished, talking at the sex upon whom nature more than custom has made her largely dependent; or in that of an amateur architect, however clever and experienced, aspersing the whole building fraternity about the occupation to which they studiously and commercially devote themselves, there is much more to regret than to condemn. For, though rudeness may sooner attract, courtesy holds people longer; and in one respect we are fortunate, since, in assuring a learned baronet of our hearty wishes for the success of his last book, we need use no other language than that of polished men.

* At p. 87 of the book, some remarks on the "destruction of plaster" in churches are said to have been delivered at Northampton by Sir Gilbert Scott, R.A., remarks opposed to his recently-published utterances. They form, however, part of an excellent paper read before a Lincoln Society by Mr. G. G. Scott, M.A.,—an architect, and a son of the former.

LEEDS MUNICIPAL OFFICES COMPETITION.

THE designs submitted in competition for the proposed Municipal Offices at Leeds, and which have been publicly exhibited in the Town-hall, present a higher average of merit than is usual in such cases. They are not, to be sure, very numerous (about three or four and twenty), nor are there many that we positively admire much; but there is a smaller proportion than usual of designs that are manifestly unsuitable or preposterous. This is perhaps partly owing to an influence which at the same time has had in another sense an injurious effect on the character of the designs. The site for the proposed building immediately faces the longer front of the Town-hall, on the other side of Calverley-street, which will divide the two buildings. The competition designs illustrate forcibly the responsibility which attaches to the architect of a great central building in a large town, for they are nearly all influenced more or less by the desire to be in keeping with, in some cases almost to imitate, the Town-hall. We will not be so rude to the architect of the latter as to infer that this result must be entirely disastrous. From one point of view the Leeds Town-hall is admirably in keeping with its neighbourhood; its square heavy masses and absolute uniformity seem the proper culmination of the architecture of Leeds, the dullest (in its modern portions at least) of all large towns, whose wide empty streets and square warehouse-looking buildings oppress the sense of the visitor. But when we see a second edition of this same squareness and heaviness resolved upon, indeed striven after with emulation by various industrious and not untasteful architects, we cannot help wishing that the new building had been further from the Town-hall, so as to have allowed its architect liberty to break through this dominating influence a little. In a more detailed manner we fancy we can trace the influence of the central building upon the new designs in an altogether wrong direction. The plan of the site for the new building is irregular. It is bounded at one end by Centenary-street, and at the other end by Great George-street,—streets returning at a little more than a right angle at each end from Calverley-street; but at the Great George-street end there is a break in the back line of the site, which is narrower here; and this portion of the land is specially purchased for School Board offices, though immediately contiguous to the portion devoted to ordinary municipal offices. According to the natural principle of designing buildings, there is, of course, a direct suggestion here for a variety of treatment, by giving to the School Board portion, which is completely isolated in plan from the rest, a special and separate character. But the architectural atmosphere of the neighbourhood is conventional; the Town-hall is absolutely uniform, consequently it seems to be taken for granted that the new building must also be uniform; and so every one of the competitors, without exception, has thrown away this obvious "lead" towards a varied and more or less picturesque combination, and has laboriously masked the two departments behind an absolutely symmetrical screen, in nearly all cases with a more or less heavy effect, in some cases with absolutely injurious results on the plan, which might have been easily avoided,—which there was every reason in the condition of the building for avoiding,—if only they would have gone to work the natural and not the artificial way.

The municipal portion of the building was to provide, according to the conditions, a principal floor, accommodating the borough engineer's department, the main offices of the gas and water departments, and the public accountant's office; a ground floor, or raised basement, accommodating the lamps, highways, and police departments, and some subsidiary offices of the gas and water departments; and a second floor, devoted to a public reference library, lending library, and reading-rooms. It will thus be seen that while the conditions suggest a sub-division vertically into School Board and municipal sections, which, as we have said, has been ignored by all competitors, they suggest vertically a principal story predominant over the rest, and a library story which might give occasion for special treatment.

In the first premiated design, "Crayon" (Mr. Corson), the principal floor is duly emphasised by large arched windows, with an "order" between them on the wings and centre; a rusticated podium, pierced with windows for the ground-floor, forms the basis to the principal floor, and a strongly marked cornice crowns it, carried all round the three principal fronts; over this cornice comes the library department, as a rather large and heavy attic, with flat fluted pilasters and a balustrade over, with the usual style of flower-pot finials. There is not an original feature or idea in the whole; but the author treats the stock-in-trade properties of "Italian" design with knowledge and good taste, as far as they go; and from a Leeds point of view (perhaps we should say, "a Leeds-Town-hall point of view") there is not much complaint to make in regard to the selection on architectural grounds: it is certainly the best plan out of the eight selected ones; and, though a most heavy and uninteresting building, does not sin against good taste or common sense. The roof forms, of course, no part of the design, except in so far as regards five convex-lined Mansards, a large one crowning the centre feature over the principal entrance, and four others on the angles of the wings, and we hope added to the drawing as afterthoughts, as they have not the slightest relation to the substructure, and look very awkward and unmeaning; but this, we suppose, will be modified before the building is carried out. The first paragraph of the architect's report confirms curiously what we had said above as to the influence of the Town-hall upon the designs. "I determined," he says, "that the new buildings adjacent to the Town-hall should be similar in style to the Town-hall, but not identical in treatment. I think that a certain extent of variation from that building would be to the advantage of the effect of both": so that it appears that Mr. Corson regarded the notion of actually copying the Town-hall as by no means out of the question, but on the whole undesirable! The plan of the building, without aiming at "points," is very simple, compact, and practical. The accountant's public office is near the principal central entrance, which gives access also to the main corridor running parallel to Calverley-street, and returning parallel to Centenary-street,—a type of corridor arrangement followed by the greater portion of the competitors. The central portion of the site is occupied by an open court, also parallel to Calverley-street, for light and access to the basement offices, across which the back block of building, containing the main portion of the water offices, can be reached by a bridge in a direct line from the main entrance, as well as by the return corridor at the Centenary-street end. As nearly all the competitors have this open court in pretty nearly the same position, though varying very much in extent, and a large proportion show the bridge over it, we presume there has been official suggestion in this matter. The corridors will be fairly, but hardly amply lighted; the library stairs are kept, as they should be, quite unconnected from the business part of the building, and have a separate entrance from Centenary-street; the library floor is very well arranged, with two corridors marked "Reference Library" and "Lending Library," leading at right angles from the main staircase to the two departments; the reference library occupies the central space in the front block, and the lending library the long narrow block in the rear. The space for the public in the lending library counter-room is awkwardly shaped, and might be improved. The author provides a mezzanine story next the inner court, not suggested in the conditions, but really the only practical way of utilising space in a collection of rooms of such different sizes (several of the competitors adopt the same course). The School Board buildings are carefully planned in regard to the provision of staircases for each of the classes of persons who have to use the buildings in connexion with the Board-room, architect's office, and large examination-room; this latter, which has proved a difficulty in some

of the plans, the architect treats as a long room parallel to the Great George-street front, a break in which naturally suggests the opportunity of a provision for temporarily dividing the room into two portions here when desired. As to the cost, Mr. Cockerell, the referee, has already expressed his opinion that the committee's estimate of 60,000*l.* for the whole buildings is too small for any satisfactory structure, and we cannot think Mr. Corson's would come within the sum; but it is by no means one of the most extravagant of the set.

Of the other eight designs selected by the committee for special consideration, that placed next in order of merit is "Hoc Securior," a design with a large Corinthian order of three-quarter columns carried through two stories, and exhibited in a beautifully executed pen-perspective of admirable freedom and boldness of execution, which seems to have carried away the (presumably) cooler judgment of the referee, as well as that of the committee; for, in spite of the fine drawing, the design is faulty to a degree, if considered in regard to the true basis of architectural treatment. The principal story is not emphasised at all; the ornamental details are in most meretricious taste,—

> Quips and cranks and wreathed pots,
> Garlands twined in wanton knots

(to "adapt" Milton a little): and the wings are crowned each with a lofty and heavily-built-up pedimental erection, picturesquely conceived, but without a shadow of excuse in the roofing (no roof is shown at all), mere masses of stone piled up to tell a falsehood. This is the kind of thing that makes the study of a set of competition drawings such a melancholy task. We fancied such flagrant falsities of design as this were now universally condemned, but here we find them all flourishing as lively as ever, and an able professional referee praising them. The plan is adequate in general, but the library staircase is mixed up with the business traffic of the building in what would prove a very inconvenient manner.

"Spero" (Messrs. Hill & Swann, of Leeds)* looks well in elevation, but not in perspective, the large order running through two stories having the cornice, blocking, and everything broken round the top of each column, so as to cut up the design, when considered in perspective, into a series of vertical lines. This is in the wings only; the recessed portions are much better treated, with no "order," only large windows, with semicircular-headed panels over them, filled with sculpture; this portion, we admit, seems out of keeping with the wings, which is perhaps the meaning of the referee's rather ambiguous statement that it is wanting in "sufficient appreciation of scale." The plan is up to the mark; the corridors are rather wasteful of space, and we may remark on the curious anti-climax shown in this and other plans, in leading a broad corridor and bridge straight across from the principal entrance, to end only in a narrow passage, and the window of the sample-room of the water-department. Corridors should have a relation, in size and position, to their object, so that the plan may tell its tale at once. (The entire want of subordination in this respect is one of the great faults of the Town-hall, where any door may lead anywhere—or nowhere.) The library entrance and staircase are sufficiently separate, but the library floor is badly planned: see the position of book-binding and store rooms close on the principal stair, and with no subordinate stair or lift; and the lavatories so placed as to have a raking fire from the counter of the lending library. The examination-room in the School Board Department is very awkwardly shaped.

"Plato" (Mr. W. Bakewell): a capital design,—for a warehouse. It is not apparent why the author adopts the Greek philosopher's name as his motto, for his building is further from Greek reminiscences than most of them; it is an oblong block of building, in which the effect is entirely obtained by fenestration and either tiled or carved ornament (it is not very apparent which) in panels, the treatment being flat in general effect; there is a balustrade railing over the cornice, but the roof is frankly shown,—in fact, predominates too much, being all on one level, and unbroken except by dormers which do not rise as high as the ridge. The principal entrance is marked by a kind of projecting canopy, which is the only break in the squareness of the whole. There is a simplicity and honesty of treatment about this design, but it is greatly wanting in dignity and effect: the plan has very defective points, the library entrance and staircase are badly managed; space is wasted in the passages; and, at the Great George-street end, the obtuse angle of the street has been followed, while the difficulties entailed by this choice have been shirked: the examination-room thus becomes an irregularly-shaped trapezium, and the author does not show how he proposes to accommodate the design of its large roof principals to the varying width. It is difficult to account for the position of this design in the competition.

"L. P. O.": a Palladian design; rusticated basement, Corinthian columns and pilasters through two stories, with windows of no very particular character between, neither story predominating; no roof is shown, but *en revanche* the architect has utilised the regulation terminal vases on the balustrade as chimneys, and takes care to tell us that those which are not used as chimneys are made to resemble the others. There is something poetic in the idea of these smoking vases, recalling the celebrated pot in the story of the "Fisherman and the Genie" in the "Arabian Nights." The plans were hung too high to be very well studied; they seem good, and with well-lighted corridors, &c., the design seems to have even less reference to the plan than usual. There is something in the way in which the entrance-door at one side of the principal portico is balanced by a corner window of the engineer's office, and a centre door is contrived opening on to a blank wall,—all for the sake of symmetry,—which is refreshing, and takes us back to the days of our youth. There is a certain sort of old-fashioned good taste about the exterior, and it looks well in perspective, but we cannot go back to that sort of thing now.

"Nota bene" (Messrs. Adams & Kelly, Leeds) is a design with a good deal of merit, in what might be termed the French hôtel-de-ville style, a free Renaissance, producing, in fact, rather a Gothic effect *en masse*. It looks less well in perspective, from the design when so seen cutting up into vertical segments too much, and there is not breadth and solidity enough in the treatment to bear carrying over so large a block of building. If the authors, instead of aiming at this unbroken mass, would have broken up the building, as we have already said the site suggests, they could have made a much more pleasing design with nearly the same materials; as it is, they have got picturesque detail grouped in an unpicturesque manner. The library entrance is not well managed, and seems jumbled up with the sanitary department (perhaps on the principle of securing *mens sana in corpore sano*), but in other respects the plan seems a much better one than some others that are placed ahead of it, and makes the most of the space. The amount of elaborate stonework would render it, however, a very expensive design.

Of the other two designs included among the eight, "Leodiensis" and "Q. E. D.," it is scarcely necessary to speak particularly, as they have not the slightest claim to selection on their merits; in the latter the architectural detail is simply what might be described as "flummery," and that of the most puerile description. That such a design should have been among the selected eight is little less than an insult to the authors of some of those not so selected, and the fact proves at least the utter incapacity of the committee to form a judgment on architectural design.

Passing to some of those which have not had the good fortune to fascinate the committee, we notice (taking them in the order of hanging) a very nice and refined design under the title of "Spes," by Messrs. Bell & Roper, of Manchester. This is a design of Jacobean type, treated with some originality; the principal floor lighted by large round-headed windows, with mullion and transom frames, between a kind of compound buttress, the lower part a flat projection with a niche and statue and finished by a little curved pediment, on which stand light coupled columns, which rise to the main cornice, cutting through the second-floor string line. The whole is very elegant and well considered, and, moreover, economical; nor do there seem to be any serious defects in the plan, though it is not equal to some others. The perspective view, lightly tinted in Indian ink, is a very nice drawing, and the whole set very meritorious.

"Leodiensian," judging from a letter we saw in one of the local papers, considers himself an ill-used man; and (though that is, of course, the normal state of mind of unsuccessful competitors), we are rather disposed to agree with him. His plan will not bear very close examination; the library floor is ill-planned, or hardly planned at all; there is insufficient staircase accommodation, and what there is is not well placed, and there are other weak points, but also some good ones. The architectural treatment appears to us to be among the most pleasing of all the designs exhibited, though not shown in such able or effective drawings as some others; it is Early Italian Renaissance, with two orders and a cornice between, and windows between the columns; the roofs are made part of the design and effectively treated; behind the centre pediment is a rather graceful, though not very original, tower. The author carries a mezzanine over nearly the whole of his principal floor, which is cleverly worked into the fenestration of the design so as to indicate it as a separate story: in taking this course he has, however, injured his principal story, perhaps practically, certainly architecturally, depriving the design of some dignity and of subordination of effect. This is, however, a much more logically designed building in relation to its contents than the formal structures with one big order which we have noticed; and it is a more pleasing structure, as a matter of architectural effect and grouping, than the first premiated design: but then it is not so practical in other senses; the tower means nothing, for instance, and is actually in the way in the library plan, and the detailed treatment of design and plan may argue a want of experience. Still, we think the author of this design deserves more credit than he seems to have got.

"Harmony" (Messrs. Alexander & Henman, Stockton-on-Tees) is a very ambitious and very able set of drawings, completely beyond the mark in cost. A large order of square pilasters is carried through two stories, from a heavy rusticated basement, with the two ranges of windows between,—the lower circular-headed, the upper smaller and square-headed. The perspective view, a fine sepia drawing, has a powerful effect. The plan is not bad, but has defects: imperfectly-lighted corridors, and the library-entrance confusedly planned. It is no use stating on a plan that a particular entrance is for such a department alone: the plan itself ought to render any other supposition impossible, or it is faulty. But this is a design showing considerable talent and spirit, and first-rate draughtsmanship. The authors add a large detail drawing.

"Utility" is a design hardly corresponding to its title (designs labelled "utility" seldom do), as its only noticeable point is a rather effective treatment of a central and subordinate cupolas, which have no obvious use.

"Omne Verum" (Mr. Mason & Mr. Powell, London) is one of the few designs which attempt what we should regard as a matter of course, viz., a characteristic treatment of the library portion. The principal story has an order of columns with pedimented windows between, carrying a strongly-marked cornice, over which the library story is treated without windows, with flat fluted pilasters and panels, with central ornaments on the wall between. No roofs are shown, and the long unbroken line of parapet adds to the heaviness of the upper story, which overweights the lower portion somewhat; but this might be modified without affecting the character of the design, and the attempt is meritorious. The plan has defects, but not of the most serious nature.

"Comme il faut" (Messrs. Holtom & Connon, Leeds) shows some originality of treatment, but is wanting in refinement; the plan has the merit of well-lighted corridors. The same architects exhibit a Gothic design (the only one) under the motto "Finis coronat Opus," an application of Geometric Gothic in which a certain municipal type is achieved, with no special originality: the perspective view is a good drawing, but the design is hardly suited to the site, and the tower which is introduced is absolutely without motive or excuse on the plan; it develops from nothing, and in architectural design *ex nihilo nihil fit*.

"*Pro rege et grege*" (Mr. E. R. Robson): one of the cleverest designs in the room; in saying which we by no means commit ourselves to admiring it. From the colouring it is apparently a brick building, of the most pronounced "Queen Anne" type, but treated in a manner which realises something very like absolute originality from an exceedingly ingenious combination of mongrel details. On a plain basement, with a balustrade like wooden stair-rails in front, comes a

* We give the names of authors where they had been appended to the drawings, which was not the case with all.

range of flat pilasters fluted at the upper part, the flutes stopping at the impost level of the semi-circular-headed windows between them. A light cornice with a Greek key pattern as frieze comes over this, above which the library story is here again treated characteristically as a windowless wall, relieved occasionally by a slight projection, finishing in a curved pediment, or by "pots" placed over the pilasters where the upper wall falls back sufficiently to allow space for them. Square masses, presumably chimneys and ventilators, rise at intervals from the cornice, with "stair-balusters" between, and the wall is further decorated by terra-cotta festoons, introduced as if looped along under the cornice. A centre erection, with extraordinary pepper-pot angle turrets, breaks the line of roof. Except this and the festoons (which look simply silly) there is, with all its oddity, a remarkable absence of commonplace or vulgarity in the design (which is further illustrated by a fine detail drawing); and the plan is an admirable one, about the most compact in the collection. This is also almost the only one, as far as we noted, which attempts giving any character and style to the inner elevations towards the centre court; in most cases these are just left in a hole-in-the-wall state, while all the "style" is concentrated on the exterior,—a vicious, but nearly universal practice. Many would probably think this design ugly (we should possibly be of the number), but no one who understands the matter can question its ability. That a set of drawings like this should have been left out of the running in favour of some among the chosen eight is almost laughable, unless we are to attribute the selection to something else than mere ignorance.*

"S. P. Q. L." we take to be the work of a young designer; it wants refinement and restraint; but there is a good deal that is really clever about it. The author has thought for himself, and has aimed at treating the buildings in a characteristic and effective manner; nor has he failed in doing so, but he has not succeeded in uniting the whole into a homogeneous conception. The plan is rather effective than practical; but the author has ideas.

"The Bride Elect": under this high-sounding title Messrs. Caws & Eltringham (Sunderland), embody their ideas in a very ambitious and showy design of Roman type, with a large order through both stories, a big dome in the centre, and cupolas on the roofs of the wings, treated in a somewhat original manner. There is effectiveness of a theatrical description in the design.

"Argos" shows a pretty Indian ink perspective of a nicely proportioned and balanced façade, also of Roman proclivities; the general effect is tasteful of its kind, but the design will not bear criticism in detail.

"Alps" (Messrs. Hornblower & Son, Liverpool) is a plan in which the authors have sacrificed real convenience of arrangement to the *ignis fatuus* of an apparent symmetry and effectiveness of plan; entrances are made at each angle of the front, leading to a circular lobby in the centre of each wing, carried up and ending in a cupola on the roof. The arrangement is very good at the business end, where the circular space might form a sort of ventilating shaft to this portion, and the library stairs wind round it; but it is very different at the School Board end, where the arrangement leads to awkward angles and corners, and the circular shaft cuts through the centre of the examination-room in a way that is preposterous, and would in itself condemn the plan. The design is a nice one, but somewhat weak in detail, and not drawn in a style to make the best of its effect: there are symptoms, however, of want of time, and consequent hurry in the drawings; but we have seen much better things with the same names to them.

"Felix" (Mr. H. L. Florence), is a very clever and original design, by no means unsuitable for its position. It is "Classic, freely treated," with rusticated pilasters and circular-headed windows between, in the centre portion, and larger circular windows in the wings filling up the space to the main cornice; in the centre portion, the wall above the windows and pilasters, which carry a light sub-cornice, is filled up with panelling. Above the cornice are semi-circular dormers, piquantly but not quite satisfactorily treated. The roofs form part of the design. The plan presents nothing special for comment,—the examination-room is treated in an effective manner,—but as a specimen of some novelty of style and treatment this design merits mention.

Some few others, which have no special point for commendation, we pass over it. As a whole, the designs were an interesting set, and showed here and there an unusual degree of cleverness, unfortunately thrown away. It is much to be regretted that some good designs have been thrown out of court, and that the real advantage of calling in a professional referee has been to a great extent nullified by the committee anticipating part of his office; in their mode of doing which, however, they must have the credit of having evinced a laudable spirit of Christian charity and brotherly feeling towards their fellow-townsmen among the competitors.

* The author of this design, Mr. Robson, is the salaried architect of the London School Board, and we are called on to inquire whether or not these drawings have been prepared with the assistance of the staff provided for Mr. Robson at the public expense. This we do with some emphasis. Correspondents suggest that Mr. Robson ought to have quite enough to do in the proper discharge of his public duties without competing with his less favoured contemporaries.

THE GIBSON GALLERY.

RATHER tardily the Gallery required by Gibson for the reception of his works, as a condition of their bequest to the Royal Academy, has been completed, and was opened to the public on Monday last. The first impression of most visitors will probably be the same as our own: that the room is not large enough for the works collected in it. They are crowded together in a manner which confuses the eye, and in every sense, practically as well as æsthetically, quite precludes an abstracted contemplation of any one work. The small bas-reliefs are too high above the eye to be well seen, and the colossal Mars, which is placed in the centre of one side of the room, cannot be seen in front view from any point sufficiently distant to take it in at the proper angle. In other respects the room falls short of what we might have expected, and very far short of what might have been done. It is simply an oblong apartment, with walls coloured a deep red, a rather commonplace tiled floor, and good wood fittings (doors, architraves, and skirting), in rather handsome style. Around this room are ranged the works, marble and plaster, on sham marble pedestals of different heights, tints, and sizes, in most admired disorder; and the bas-reliefs in plain wooden frames or brackets against the wall above. The lighting is good, and the general colouring of the room such as not to distract the eye. But there is not the faintest attempt to design a room suited to the particular works which it was to contain, or to give any effectiveness of arrangement or background to the statues. They convey the idea of being miscellaneous works sent for temporary exhibition, and therefore necessarily crowded and on miscellaneous-looking pedestals. In the sculpture-room of the annual Academy exhibitions this heterogeneous kind of jumble, however one may regret its effect on the works, cannot be helped, as no one knows beforehand what will be sent. But here was a collection of designs which have long been in the hands of the body to whom they were bequeathed, which therefore might be perfectly well classified; the precise size and shape of each, and the space it would occupy, were known; and yet, in planning a room on purpose for them, not the slightest special arrangement has been made for them, not the slightest appearance of the room having been designed for these particular works: an oblong room has been built and the statues put round it to take their chance, the only special treatment to which the mind of the Royal Academy has soared being apparently the provision of pedestals of two or three different heights and of two different tints of marbling. We venture to say it was not this kind of gallery that Gibson contemplated when he made his bequest.

It may be replied that economy has been the stumbling-block to the provision of a more suitable gallery; and that argument, unanswerable from a certain point of view, it is not, at all events, our business to answer. Apart from that, it is not difficult to see how the Gibson statues might have been far better placed than they are. One or two arrangements suggest themselves at once. The gallery might have been planned in two comparatively lofty compartments, in one of which the large works in marble could have had place, and in the other those in plaster, so as not to injure the effect of the latter so much by bringing them into immediate contiguity with the finer material. There should have been nothing so paltry as irregularly-shaped pedestals of sham marble placed against the wall, but a continuous stone dais or podium round the sides, which might have been architecturally designed so as to give the varying heights required, by foresight and not by accident. It might be impossible, and would probably be undesirable, to place all the statues in niches, but for those which seemed most to require such a framing niches might have been formed, which, occurring at intervals in the wall, would have given a motive for the architectural design. Between these two imaginary chambers might have been a lower one, the vestibule to both, on the walls of which, not stuck about irregularly, but in panels specially designed for them, the smaller bas-reliefs could have been arranged. Or another principle might have been to have a longer room, to arrange the large works along one side of it, the marble ones in niches and connected with the architectural design, the plaster ones standing separately; the spectator placed under a lower ceiling with no light through it, and looking through a low range of columns at the statues: thus the disagreeable effect of the top-light would be kept from the spectator's eyes. The bas-reliefs might have gone on the wall behind the colonnade, with a special light provided for them, which could easily be done. In both the supposed cases the works on a small scale would be separated from those on a large scale, and the marble works differentiated from the plaster. Surely it would have been worth while for the central Art Society of the nation, with all its wealth and prestige, to have taken the opportunity of making some little attempt to solve the problem of a successful sculpture gallery, under the peculiarly advantageous circumstances of knowing exactly the limit of what they had to provide for.

That the present room is not such as Gibson contemplated may perhaps suggest the reply that the importance of the gift was exaggerated in his own eyes; that he had over-rated his own place in art, as his own friends and admirers, and the public in general, in fact, certainly did over-rate it at one time. At the time of his death, Gibson's fame had been a good deal questioned and weakened in this country; partly, perhaps, owing to the unfortunate turn which he took towards tinted statuary; an idea which, as he applied it, has never won the suffrages of the most thoughtful critics. Apart from this, too, he had come to be regarded, in a society no longer satisfied with Classic ideals, as a mere modern reproducer of Greek art. It is known that he himself held the maxim that the Greeks could do no wrong in art; so that when the idea was promulgated that Greek statuary was coloured, Gibson did not think of asking "Were the Greeks right in doing this?" but immediately adopted the conclusion, "This is right, because the Greeks did it,"—of course a mere begging of the question. But it is gratifying to feel that, in contemplating Gibson's collected works and casts, even under the disadvantageous circumstances we have described, the result is to bring us back to the conclusion that the sculptor's fame has a more solid basis than has recently been allowed; that the limits of his ideal in the art were less narrow than we have permitted ourselves to think. Gibson's latest works were not his best, it must be admitted; his "Venus," even (as it is in the Academy collection) without the objectionable tinting, adds nothing either in finish of modelling and perfection of bodily form, or in artistic conception, to what other sculptors, ancient and modern, have given us as the ideal of the goddess of beauty. His tinted "Hebe," with the blue eyes and unimpassioned features, which was exhibited at one of the winter loan exhibitions, is disagreeably doll-like, although the arms and hands are beautifully modelled. The tinted marble loses its characteristic crystalline surface, and reminds us of the soapy-looking *jade* in which Indian carving is often executed. But other classicalities are not so devoid of life and character as these. His "Paris" holding the apple, the easy voluptuousness of the figure heightened by the peculiar head-dress, half-womanish in appearance, is a fine epitome of a legendary character. Much thought has preceded the modelling here; and the same impression is created by the figure of the wounded Amazon, and the serious concern of her countenance as she raises her skirt to examine the wound; there is a certain realism rather than mere "antique" style here. There is the same sort of realising intensity in the conception of Bacchus, the large marble figure carrying the

Thyrsus, and which is rather Asiatic than Greek in its full contours: this is a work, if we mistake not, less known than a good many of the sculptor's productions. In this, and the "Cupid and Butterfly" that stands next to it, as well as in the better-known "Narcissus" (the first thing popularised as a statuette by the Art-Union of London), Gibson adopts a type of head and of hair which we are familiar with in the Greek figures of Thorwaldsen; a rounder face and fuller and more luxuriant hair than belong to the most usually accepted antique Greek type. The head of the "Narcissus" in this edition of the figure (which Gibson executed repetitions of, as he did of other works) is beautifully finished. But superior to any of these in conception and attitude is the "Sleeping Shepherd," of which the model only is in this collection, and which is a more poetic conception than most. We have the model, too, of the "Hylas and Nymphs," of which the National Gallery has the marble, where it is placed so that no one can properly see it. We have always been disposed to think this Gibson's finest work; the Nymph on the left of the spectator could hardly be surpassed for grace of line and movement in the long shapely limbs and beautiful (one might say "aristocratic") turn of the neck and head.

Of the bas-reliefs some remind one a little too much of Flaxman, to the advantage of the latter: "Phaëton trying to drive the Horses of the Sun," however, is a composition of great spirit and beauty. The companion work, "The Hours leading the Horses of the Sun," is, in the action of the figures, too strongly reminiscent of Guido's "Aurora." But what pleases and at the same time vexes one a little in the bas-reliefs, is the evidence some of them give of Gibson's power of treating subjects of purely human interest, with the pathos and feeling of modern life. It is vexing, because one cannot help feeling he might have been better employed on more of such works, than in turning out replicas of "classic" figures. Indeed, some of the latter half unconsciously take a form capable of a modern rendering. A plaster figure of "Venus and Cupid," life-size, for instance, where the goddess raises the little boy to kiss him, might as well be called "Mother and Child": and why not? Surely as large and universal a subject. But in some of the bas-reliefs Gibson seems to show a peculiar felicity in handling subjects in connexion with real life, and bringing them into the domain of purely sculpturesque art. The monumental figure of "Mrs. Henry Sandbach," for instance, in low relief, but with the head slightly turned so as to come out in higher relief, is beautiful: the expression and pose are perfectly real and unforced; the hands rest one over another in the most natural and expressive attitude; the drapery is so closely assimilated to modern costume as to seem quite in keeping with realism; yet the whole falls into the most pure and sculpturesque pose and lines, so that the claims of feeling and of artistic propriety seem perfectly balanced and satisfied. There is the like kind of excellence, the like seriousness of expression, combined with sculpturesque breadth of treatment, in the portrait bas-relief of "Mr. William Earle." These portraits, and one or two busts in the collection, are those of members of families whose names have been long connected with Liverpool, in which town Gibson found his first encouragement, was brought up, and whence he set out, with the help of appreciative friends, for Rome. His larger portrait statues are less successful, because more mannered. In them he adhered to the "blanket" style of drapery which recent taste has wisely discarded in the representation of men of the present day; in the smaller bas-reliefs he seemed to have felt more at liberty to break through conventionality. If the collection cannot be looked at with all the interest and enthusiasm which the genius of Gibson was once supposed able to command, it is well worth while to go up the stairs at Burlington House, and revive impressions of his works in this collective form; we only wish they were placed in a manner more advantageous to their effect.

Projected Tramways.—The Clerk of the Islington Vestry has received preliminary notices with reference to further tramways in that parish. One line is in Holloway-road, St. Paul's-road, Canonbury-road, Canonbury-square, Essex-road, New North-road, and Balls Pond-road. Another line would be in Caledonian-road, and Camden-road.

ON THE CHIEF SYSTEMS OF SEWAGE DISPOSAL NOW IN OPERATION.

The attention of the Local Government Board having been directed to the great difficulties experienced by sanitary authorities in devising means for the disposal of the sewage of their districts; and, having regard to the frequent applications which are made to them for advice on this subject, deemed it expedient that special inquiry should be made under their direction into the practical efficiency of the chief systems of sewage disposal now in operation, and for which loans have been sanctioned by them.

So they appointed Mr. C. S. Read, M.P., one of their secretaries, and Mr. Robert Rawlinson, C.B., their chief engineering inspector, in conjunction with Mr. Smith, the secretary to the late Rivers Pollution Commission, as their assistant, to visit a limited number of localities in which the processes in question are in operation, and report fully thereon to the Board.

These gentlemen accordingly visited Edinburgh, Wrexham, Chorley, Blackburn, Doncaster, Harrogate, Wolverhampton, Leamington, Warwick, Rugby, Banbury, Bedford, Croydon, Norwood, Reigate, Worthing, Aldershott, Romford, Tunbridge Wells, Cheltenham, Merthyr-Tydfil, Barking, Norwich, and Enfield; Kendal, where the downward intermittent principle is carried out; Leeds, Bolton, Coventry, Tottenham, Edmonton, and Hertford, where sewage is treated by a chemical process; Bradford, Birmingham, and Luton, where sewage-sludge is precipitated by the addition of lime; and Halifax, Rochdale, Salford, and Manchester, where the pail system is partially used for dealing with excreta. They also visited Leyden and Amsterdam, where the pneumatic system is partially in operation; Paris, where only a portion of the sewage is utilised in irrigation; and Brussels and Berlin, where the sewage is about to be disposed of in irrigation, and their report is just now issued,* and contains the following

Conclusions.

"1. That the scavenging, sewering, and cleansing of towns are necessary for comfort and health; and that, in all cases, these operations involve questions of how to remove the refuse of towns in the safest manner and at the least expense to the ratepayers.

2. That the retention for any lengthened period of refuse and excreta in privy-cesspits, or in cesspools, or at stables, cowsheds, slaughter-houses, or other places in the midst of towns, must be utterly condemned; and that none of the (so-called) dry-earth or pail systems, or improved privies, can be approved, other than as palliatives for cesspit-middens, because the excreta is liable to be a nuisance during the period of its retention, and a cause of nuisance in its removal; and, moreover, when removed leaves the crude sewage, unless otherwise dealt with by filtration through land, to pollute any watercourse or river into which such sewage may flow. We have no desire, however, to condemn the dry-earth or pail systems for detached houses, or for public institutions in the country, or for villages, provided the system adopted is carefully carried out.

3. That the sewering of towns and the draining of houses must be considered a prime necessity under all conditions and circumstances, so that the sub-soil water may be lowered in wet districts, and may be preserved from pollution, and that waste-water may be removed from houses without delay; and, that the surfaces and channels of streets, yards, and courts may be preserved clean.

4. That most rivers and streams are polluted by a discharge into them of crude sewage, which practice is highly objectionable.

5. That as far as we have been able to ascertain, none of the existing modes of treating town-sewage by deposition and by chemicals in tanks appear to effect much change beyond the separation of the solids, and the clarification of the liquid. That the treatment of sewage in this manner, however, effects a considerable improvement, and, when carried to its greatest perfection, may in some cases be accepted.

6. That so far as our examinations extend, none of the manufactured manures made by manipulating town refuse, with or without chemicals, pay the contingent costs of such modes of treatment; neither has any mode of dealing separately with excreta, so as to defray the cost of collection and preparation by a sale of the manure, been brought under our notice.

7. That town-sewage can best and most cheaply be disposed of and purified by the process of land irrigation for agricultural purposes, where local conditions are favourable to its application; but that the chemical value of sewage is greatly reduced to the farmer by the fact that it must be disposed of day by day throughout the entire year, and that its volume is generally greatest when it is of the least service to the land.

8. That land irrigation is not practicable in all cases; and, therefore, other modes of dealing with sewage must be allowed.

9. That towns situate on the sea-coast, or on tidal estuaries, may be allowed to turn sewage into the sea or estuary, below the line of low-water, provided no nuisance is caused; and that such a mode of getting rid of sewage may be allowed and justified on the score of economy."

The statements of the Commissioners accord so nearly with the views which have been set forth and urged in this journal that little comment will be necessary. We shall content ourselves with giving the pith of the more important parts of the Report, commending the whole, with its appendices, to the serious attention of all who are interested in the subject.

With respect to the laboratory value of town refuse and of sewage, or of the manipulated solids of sewage, they have not found a single case where it is sold at a profit; and, as a consequence, there have been local disappointment and accumulations of several thousands of tons of manufactured manure, asserted to be worth from one to several pounds sterling per ton, which prices are not realised; consequently there are these vast heaps encumbering the premises where manipulated. In the case of town sewage, its unceasing flow and the great volume of water to be disposed of day by day detract from the undoubted manurial value which there is in it, so that sewage containing ammonia, representing a manurial value of 2d. per ton, has to be given away, or has to be wasted into the sea. With respect to the solid manure made from town refuse and extracted from sewage, its bulk and weight reduce its value, and as, like sewage, the production goes on all the year round, it must be heaped up until farmers can be induced to remove it,—the inducement for them to do so being a price far below the cost of production.

Town Scavenging.—Town refuse, both fluid and solid, must be got rid of, and the more completely and rapidly the process is effected the better will it be for the inhabitants. The cost of any process should, however, be a secondary question,—always provided that due skill has been and is used in devising the local works, and proper care has been and is exercised in supervision and labour.

Sewage not Profitable to the Extent estimated.—In 100 tons (224,000 gallons) of sewage, having the equivalent of eight grains of ammonia to the gallon, the ingredients are estimated as having a manurial value of 17s. 7d. The suspended matter, which will subside when at rest, or which chemicals will assist to precipitate, is worth 2s. 2½d.; other dissolved matter which remains in the clarified water being worth 15s. 4½d. This makes the value 2·1 penny per ton, or say 2d. per ton; the Royal Commission (1858 to 1865) accepting this estimate of 2d. per ton after a set of exhaustive experiments fully recorded in their three Reports, came to the conclusion that a farmer having to take and dispose of sewage day by day, all the year round, would not give more than a ¼d. per ton, if even this could be afforded. An examination of the abstracts in this Report will show that sewage has very generally been used in irrigation at a loss. Although this estimate appears so favourable, we find that it fails to be commercially productive in practice, and we may repeat that no chemical or other treatment of town sewage with which we are acquainted is a commercial success. The suspended solids may be precipitated, and the sewage so far clarified by these processes; but the sewage is not purified, nor does the sludge appear to be increased in value as a manure so as to command a sale sufficient to pay the costs of production. The pail system, as practised at Rochdale and other places, does not produce a solid manure of sufficient value to repay the contingent expenses, and command a ready sale.

Sewage not to be stored in Cesspools.—Sewage should not be stored in cesspools beneath houses, or near to houses within a town; neither should it be allowed to rest stagnant in badly formed

* London: Eyre & Spottiswoode. 1876.

sewers, nor, indeed, in any sewers; but all waste water and excreta should pass to the drains unperceived, and should then flow in an unceasing stream; and, if practicable, at once over and through land properly prepared for its reception and agricultural use.

Mechanical Power of Water.—Water is a purifier, a cleanser, a dissolver, and a mechanical power, and will carry along down an incline the solid ingredients of town sewage, with road *detritus*,—such as grit and silt; the moving power of water being in proportion to the volume, the vertical depth, and the gradient down which the flow is directed. Flushing by volume and head, artificially formed, will remove *detritus* from sewers of low gradients where accumulation may have taken place. A velocity in the sewage of 2 ft. 6 in. per second will remove any solids likely to be passed into drains and sewers.

Sewage Irrigation proved not to be Injurious to Health.—There is no record of any special outbreak of disease at or near the sewage farm. The men working on the land and amongst the sewage are reported to be healthy, the men cutting the grass are healthy, and the cows fed upon the grass are also as healthy as other cows, producing wholesome milk; and with respect to tapeworm, the medical men who attend the Edinburgh hospitals do not find any exceptional excess of this disease amongst their cases; but, on the contrary, less than in other hospitals. The Craigentinny meadows were made the subject of an exhaustive inquiry by the War Department during the time that Lord Macaulay was member for Edinburgh and Parliamentary secretary for that department. Official inquiry was made by army medical officers, who took the returns of health and mortality for twenty years back from barracks situate in different parts of Great Britain, where troops similar in numbers and performing similar duties had been quartered, and these returns were tabulated, the results obtained proving that the barracks adjoining the Edinburgh sewaged meadows had the lowest sick and death rate in the list, so that the allegations against the Craigentinny meadows fell to the ground. It must not, however, be supposed that rough-and-ready sewage irrigation is advocated, as the evidence should only be taken as proving that the application to land of putrid and crude sewage in the most gross form does not necessarily breed a pestilence, though such mal-arrangements may produce an offensive nuisance which ought not to be continued.

The Pneumatic System.—One of the most complicated and costly processes for dealing with the solid of human excreta (not with town sewage), is the system known by the name of the inventor, Capt. Liernur. The pneumatic system has been partially introduced at Leyden, Amsterdam, and Dordrecht, where they have seen it working. They agree that the pneumatic system is ingenious, but it is complicated in its construction and working arrangements, and consequently it is liable to derangements which are sometimes difficult to mend. They do not know one English town in which the apparatus, if adopted, would be other than a costly toy. As may be imagined, when the nature of the arrangements and complications are considered, the pneumatic apparatus gets out of order, the slightest crack in any pipe or pipe-joint will reduce the force of the partial vacuum, and even where all the apparatus remains sound the closet-pans may not be emptied; and, in fact, neither the pipes nor the pans ever are entirely emptied; the power of air and water to remove solids through pipes being as their relative weights and velocity, and air is to water, by weight, about as 800 to 1.

Town Sewage: Its Treatment and Characteristics.—All chemical treatment of sewage, by patented processes or otherwise, aims at deodorisation; that is, a clarification and purification. The processes are reported to take from sewage turbidity, colour, and scent; but no such process has ever restored sewage water to its original purity, though most of the suspended solids may have been removed, the salts of sewage remain, and generally some of the chemicals, mixed with the water. The only safe way to utilise sewage is by a daily application of it to land whilst it is comparatively fresh, as at Bedford, Aldershott, Carlisle, Doncaster, Chorley in Lancashire, Leamington, Rugby, and other places where sewage irrigation has been established and the sewers transmit in a continuous stream the daily volume. Receiving sewage in tanks to abstract the solids will add to the impurity and offensiveness of the fluid if there is any lengthened retention, or if the tanks are not rigidly cleansed at short intervals, so as to remove any of the leaven of putridity from the surfaces. All sewage-tanks should be simple in form and construction; the material should be either of a vitreous character on the surfaces, such as glazed bricks, or of Portland concrete; no sewage-tank should be arched or vaulted over. There may be an open-sided shed louvred at the ridge, and the area of land occupied by both yard and tanks should be fenced in. The sludge separated from sewage contains from 80 to 90 per cent. of water, and if deposited on the surface in this state it will not dry in any reasonable length of time, but will skin over and remain wet. Artificial drying is not practicable on account of the cost. Mixing with dry ashes and street sweepings appears to answer best.

Unventilated Foul Sewers and Sewage Tanks Dangerous.—Foul sewers and foul vaulted sewage-tanks, if unventilated, will contain carbonic acid gas, and will give off sulphuretted hydrogen, both of these gases being generated from decaying vegetable and animal matters. A complete and perfect disinfection of sewage and sewage deposit by the addition of any known materials, solid or fluid, would be so costly as to be impracticable, and the materials so disinfected would have no equivalent increase in commercial value. To completely disinfect one cubic foot of sewage-sludge and excreta would cost, in the materials, about 1s., or 27s. per ton.

Details of the Modes of Dealing with Sewage.—The application of town sewage to land is shown in this report to be the cheapest mode of disposing of it. The first cost of purchasing land for a sewage farm, of preparing this land to receive and filter sewage, and of constructing the necessary works and machinery, may require a rate in aid during the term allowed for repayment of the capital; but in most cases, where the sewage can be applied at a reasonable cost, by gravitation, so far as our investigations have been extended, there will be an available income from the farm at the termination of the temporary debt. Sewage irrigation should in all cases be practised where there is land to be obtained, and the prospect of a balance of income in its favour, as sewage-grown grass is wholesome, and when used for dairy-cow feeding produces good milk, and affords employment to a large number of labourers. The application of sewage to land need not in any case produce a swamp, nor generate malaria, as the volume of sewage applied at any period should be delivered in a thin film, such as the land can absorb at once; that is, within a few hours of its delivery. Sewage should not in any case drench the land to which it is applied, as is usual with water irrigations, where extensive areas are laid under water for several days at a time. The volume of sewage from any town being known, the sewage-farm should be from 10 to 15 per cent. greater than the area required for one week, and no more than one-tenth of the area of a sewage-farm should ever be under sewage at one time.

Rent of Land used for Sewage Irrigation Excessive.—At Croydon some 515 acres of land are under irrigation, the population being about 56,000. This is at a rate of nearly 10 acres for each 1,000, or about one acre to 100. The land in use had an average rental of 26s. to 30s. before the Croydon Local Board of Health required it; the rent now paid averages 10*l.* per acre per annum.*

Sewage Farms.

A sewage-farm should be so laid out and managed that a sufficient area of land shall be under sewage every day in the year, winter and summer; and as town-sewage is seldom below 40 degrees in temperature, irrigation can be carried on. And if sewage should freeze on the surface of land which is without crop no injury is done, and when thaw sets in absorption takes place. The mode of laying out a sewage-farm cannot be fully described in this report, but see the maps and diagrams for partial elucidation. As a rule it may be stated that the works should be simple in character, that they may be cheap in construction. Good examples may be seen at Doncaster, at Bedford, at Leamington, and at Aldershott. Permanent sewage-carriers should contain the land and be laid so as to be level, the grade of the land being provided for by vertical steps, regulated by stops, overflows, and wash-outs; side-junctions to be provided on the lower sides of the carriers to draw off sewage for distribution over the land. If a permanent sewage-carrier is laid with a fall, it will be impracticable to block the flow at any point and preserve an even surface, as sewage blocked in a sloping channel would flood over the point of stoppage; hence the necessity for level lines at the surface. Tributary-carriers may be made by a plough, the cross-sectional form and the gradient being suited to the character of the soil; the larger carriers may have a grade of 1 in 400; the smaller, or "herring-bone lines," may have a grade of 1 in 300. These temporary carriers will be broken up with the plough at intervals, and be renewed as required.

Area of Land required for a Sewage-Farm will depend on Local Conditions.—The area of land required for a sewage-farm will be governed in a great measure by the character of the subsoil, as if it is very porous or otherwise; as also by the volume of sewage and subsoil-water in proportion to the population. At Doncaster, with a sewage-farm of 264 acres, and a population of 20,000, the average daily flow of sewage being about 600,000 gallons, 120 acres of land of a light sandy and open character have for three years absorbed the entire sewage, only about five acres at any one time being under sewage, and one acre has occasionally absorbed the entire volume of one day. At Croydon about one acre to each 100 of population has been provided. For a population of 60,000 there are about 15,000 water-closets in use; or one to four of the inhabitants. There are the contents of 25 water-closets in 20 tons of sewage each day; or, about 7,000 tons of sewage per acre per annum. Small fields enclosed by large fences will be detrimental to sewage farming; land which is open and without inner fences, having a uniform surface and gentle slope to the south, will be most advantageous. Italian rye-grass is probably in all respects the most advantageous crop to be grown under sewage, as it absorbs the largest volume of sewage, occupies the soil so as to choke down weeds, comes early into the market in spring, continues through the summer and autumn, bearing from five to as many as seven cuttings in the year, and producing from thirty to fifty tons of wholesome grass upon each acre. It is most profitable for feeding milch cows. A dairy and a sewage-farm should, therefore, wherever practicable, be associated. A portion of each farm should be specially deep-drained and prepared for land-filtering the sewage during winter or wet weather.

Drains and Water-closets.—Drains must not traverse the basements of houses, but must commence at an outside wall and be fully ventilated. Water-closets must not be within the body of a house, but against an external wall, the soil-pipe being ventilated above the roof, with an open top, so as to ventilate fully, the water-closet room having full and free ventilation at the ceiling. The main sewers must be true in line, having smooth and even gradients, and be fully ventilated. The water supply must be constant and abundant, laid on to each house and to each water-closet; contamination by sewage-gas within dwelling-houses will then be practically impossible. Sewage is the waste water from towns, and the polluted water and liquids from manufactures. Where the privy, cesspit, and cesspool are retained the corrupted fluids from these pass into the sewers. Sewage is injurious in proportion to its age and putridity. Fresh sewage, if removed day by day, does not, in that time, become putrid; and, consequently, is not so injurious to health as putrid sewage is. Where water-closets are in full use, as in London (about 700,000), in Croydon (15,000), in Leamington (about 8,370), in Harrogate (about 1,620), in Cheltenham (about 8,500), and in like proportion in some other towns, the entire of the polluted fluids, with the effete matter of the water-closet, passes at once to the common outlet. The London sewage is at present wasted into the river Thames; but at Croydon, Leamington, Harrogate, and Cheltenham the sewage is purified by irrigation, in each case producing useful crops of grass and vegetables. Where towns are situate on the sea, or on the estuaries of tidal rivers, sewage is wasted,—as at Brighton, at Liverpool, at Sunderland, and even at Edinburgh, where the Water of Leith intercepting sewer discharges the sewage from a population of about 100,000 by a cast-iron outlet direct into the Frith of Forth. When sewage shall be wasted in preference to utilising it, must depend upon local conditions. The waste of sewage must not, however, produce a nuisance injurious to health, and this wasting of it certainly ought to be cheaper than using it under any of the precipitating and

* A sewage-farm will not bear a rent of 10*l.* per acre. About half this sum is as much as should be paid if the income is to cover the expenditure.

chemical or irrigating processes at present known.

Clarification of Sewage.—Clarification by deposition in tanks and treatment by chemicals remove *detritus* and suspended matters from sewage, but, as explained, will not fully purify the fluid. This removal of the solids will, however, be an advantage, as a vast mass of matter liable to choke the bed and banks of a stream or river will be removed, which, when allowed to accumulate, becomes putrid and offensive. The gross cost of purifying sewage by irrigation is, per ton, at Doncaster $\frac{3}{80}$ of a penny, at Bedford $\frac{1}{24}$ of a penny, at Leamington $\frac{3}{44}$ of a penny, at Cheltenham $\frac{1}{80}$ of a penny, and at Banbury $\frac{1}{44}$ of a penny. These farms may be accepted as fair samples of thus utilising sewage. The use of sewage in agriculture is comparatively new, and the best mode has not in all cases been practised. They, however, indicate Aldershott, Bedford, Doncaster, Leamington, Wolverhampton, and Wrexham as good examples. At Leamington Lord Warwick leases the sewage to be used upon a portion of his estate, and at Aldershott, Wrexham, and at Doncaster the sewage and the land are leased, and are worked independently by gentlemen of intelligence, who make such experiments as they think proper, and vary their modes of culture as best suits the sewage, the land, and the crops to be grown. The attempts to economise in town scavenging and sewering by removing human excreta separately has been a failure; by the dry-earth system, the Goux system, the Rochdale pail system, or by any other of the patented systems, so far as are known to them; the local costs have been largely increased, and the local nuisances also, in proportion to the time of retention of the excreta before removal; there is also the inconvenience suffered by trespass on the privacy of the household.

Details as to Irrigation by Town Sewage.—As they recommend the application of town sewage to land, they at the same time wish to guard against some extravagant expectations of the agricultural benefits it will confer, which are held and advocated by a few zealous and enthusiastic theorists. The continuous application of town sewage to all soils is by no means an unalloyed benefit; as in some cases and seasons, and especially upon clay land, it may be rather injurious than otherwise. Very few crops are actually benefited by the direct application of sewage upon a stiff and retentive soil; indeed, Italian rye-grass, cabbage, and mangold-wurtzel seem to be the only farm crops that persistently flourish upon any soils, heavy, or light, under continual doses of town sewage. No growing crop, save natural grass, should be sewaged during the depth of winter; and for potatoes, turnips, most vegetables, and certainly for all pulse and cereals, the land ought rather to be enriched by frequent irrigation in the preceding season, than treated with sewage when these crops are growing; except in times of great drought, and even then care is requisite. A very limited experience soon teaches us that the purification of a constant flow of sewage, and which is frequently greatest when least wanted on the farm, must bring certain difficulties in its train. The cultivation of sewaged land, for instance, requires more than double the amount of manual labour which is usually employed upon arable land, and more horses must be kept than upon an ordinary farm. The amount of capital, even where the produce is sold off as soon as grown, must be greatly in excess of that required for the general ordinary cultivation of the soil; while to properly stock and work a sewage-farm upon which the main produce is consumed, quite five times the usual amount of money will be needed. One of the greatest difficulties is to keep the sewaged land clean, as not only does every seed and the minutest portion of a root-weed grow, but sewage itself often contains the seeds of numerous weeds which have been washed down from the fodder and straw of stables and cowhouses in towns. There can be no doubt now, after the experience of some years, that the land best adapted for sewage irrigation is a warm friable loam. The only instance in which town sewage irrigation is a decided financial success is that of the Craigentinny Meadows, at Edinburgh. These meadows are, however, in reality for the most part only a deposit of sea sand, washed and blown from the adjoining estuary, and the main produce grown is nothing more nor less than luxuriant couch-grass. The enormous amount of coarse forage which is produced from such a naturally sterile soil shows the fertilising properties of town-sewage, and also points still more distinctly to the fact that a sewage-farm should consist of land through which the sewage can readily filter. It is strange that although deluges of crude town-sewage have been poured upon portions of these Craigentinny Meadows for 200 years, the discolouration of the sandy soil only extends a few inches below the surface, and that at the depth of a foot the sand appears as bright and clean as that upon the adjoining seashore. There seems no doubt that even the lightest soils should have a few deep underdrains, as at Doncaster, and Heathcote Farm, Warwick, so as to prevent the sewage-water from lodging in the subsoil. All land of medium staple should be thoroughly underdrained, and clays require the drains to be multiplied, so that the interval between them shall not be more than 15 ft.; and care should be taken that the drains are so formed that no sewage-water can flow vertically into them. To prevent this, upon the top of the drain-pipes, a foot of the most retentive portion of the soil should be damped or puddled, and tightly rammed down, so that the sewage-water after percolating through the subsoil shall flow horizontally into the drains, and not rush into the drain-pipes through the loose mould or cracked clay directly from the surface. As most sewage-farms are at present under the control of ever-changing town councils and local boards whose members must as a rule be ignorant of practical agriculture,—and whose theories upon the subject may be wild and visionary,—is it surprising, the Commissioners ask, that such poor returns have hitherto resulted from the application of town-sewage to the growth of crops? Disappointment has been expressed at the poor financial results of sewage-farms. Agriculture is never a specially lucrative business, and during the last few years it is probable that strictly accurate accounts would prove that very little profit has been derived from the ordinary cultivation of arable land. Farms to which town-sewage is applied have invariably many unfavourable circumstances to contend with. The rent, except where the local authority has land of its own, is certain to be extravagant; the application of sewage is often too costly; the management is frequently changeable and faulty, and the prejudice against the produce of the farm is, in some districts, obstinate and widespread. But they, nevertheless, arrive at the satisfactory conclusion that where a fair rent is charged for suitable land, the sewage cheaply and regularly delivered, and a good market is close at hand, there is no reason to doubt that the return for capital judiciously expended upon sewage-farms will produce a higher rate of interest than the money invested by the majority of the tillage farmers throughout the country.

AGRICULTURAL PROGRESS AND LEGISLATION.

THE INSTITUTION OF SURVEYORS.*

The Agricultural Holdings Act was the most prominent of our discussions during the last session, but those upon the Valuation Bill were scarcely less important. That Bill was withdrawn owing to the pressure of Parliamentary business, in order to be renewed in the coming session, and that discussion was understood to have attracted the attention of some at least of those who are responsible for legislation. Whatever its provisions may be, the new Bill relates to a question of so much importance that it can hardly fail to be one of the subjects to occupy your attention in the coming session; I trust that county boards may be adopted.

The working of the Sanitary Acts, and the disposition of sewage, is another matter which requires much consideration. The protection of the domestic life and health of the people has been recognised only recently as a fit matter for legislation, notwithstanding that few subjects can compare with it in importance. It ramifies in so many directions—the pollution of rivers, and consequent defilement of the waters of the towns; the utilisation of town sewage; the frequent contamination of wells by the proximity of cesspools and house drains—that the provisions of these Acts are constantly recurring in practice.

The Commons Inclosure Act of last Session was probably the best that could be passed: certainly was better than none at all. Public opinion, which thirty years ago applauded the man who made two blades of grass to grow where one grew before, is now exercised in keeping common lands unimproved. Except in the neighbourhood of towns, I know no common which is not a nuisance to the vicinity. It is the abode of a vagrant, lawless population, whose miserable hovels are the disgrace of the neighbourhood, and whose presence is its terror. The suburban common and village green undoubtedly require to be preserved for the sake of recreation and enjoyment, the proprietors being properly compensated for their rights; but the commons which lie at the backs of cultivated parishes, far away from the villages, and frequently at considerable elevations, require no protection. A few miserable sheep maintain an unhealthy existence upon the poor and starved herbage, while the well-grown sheep of the adjacent cultivated farms are jealously kept away for fear of infections. The whole productive power of the land is probably less than one-third of its power if in severalty. Such a common has been supposed to belong to the lord of the manor and the commoners, and to be as much private property as an enclosed field, subject like the field to roads and pathways for the public. The recent Act contains a section enabling other persons, besides the lord and the commoners, to take steps to prevent any inclosure of portions of the common, by action in the County Court, subject to an appeal to the Courts above, and this provision introduces an entirely new element in the inclosure of commons.

The Artisans' Dwellings Act was fully discussed in this room. Parliament wisely left the initiative to the persons locally interested, but in its desire to provide a prompt remedy for neglect, it has given its sanction to somewhat summary processes for the purchase of property. There may be reason in withholding the usual allowance for compulsion where property has been suffered to become a public nuisance, but it is not so easy to see why an owner of adjacent good and habitable houses, required for the full development of the improvement scheme, should be subjected to the same provision. If the words "within such area" in the 3rd clause of the Act mean only the area covered by unhealthy houses, the provision may be reasonable; but if they mean the whole block, including neighbouring properties not condemned as unsanitary, but needed to be taken to give completeness to the scheme of improvement, then the owners of good houses are punished for their proximity to bad ones. It is stated that a case involving the question of giving the allowance for compulsion upon healthy houses of large value has actually arisen, and the owner of this valuable adjacent property is waiting for the decision. The right of petitioning Parliament against any scheme is reserved, but subject to the liability, on the part of the appellant, of being saddled with the whole of the costs should a *majority* of the committee present be of opinion that the petition is (not vexatious, but) not justified by the circumstances. This is a risk which few petitioners would care to incur, and renders the right of petitioning of little value. This power of awarding costs was conferred on a Committee of Parliament so recently as 1865, by the 28 Vict., cap. 27, and was "exercisable only where the Committee shall unanimously report that the promoters of a Bill have been *vexatiously* subjected to expenses." The difference between a majority of a Committee deciding that an opposition is not justified by the circumstances, and a Committee deciding unanimously that an opposition is vexatious, is very great.

One of the most remarkable events from our point of view that has occurred during the year has been the publication of what is known as the Domesday Book of 1873. Collated as it is from written records in the care of the Assessors of poor-rates, it contains many inaccuracies and many items,—such as gas-works, railways, and iron works,—which are misleading, culminating in the river Wear Commissioners with three acres of land and a rental of 20,609*l.* per annum. Its appearance adds to our admiration of the fulness and completeness of the Domesday Book of William the Conqueror. Eight hundred years have elapsed since the king's scribes passed through the length and breadth of that same England (which has never since been diminished), and recorded not only the proprietorship of the land, but, as was said at the time, every horse and pig that was maintained upon it. Information of this latter nature is now given yearly in the Agricultural Returns, which afford such full and valuable details of the acreage under each kind of corn and green crops, and of pasture land, and of every kind of stock which is maintained by our alternate system of husbandry. No inter-

* From the opening address by Mr. Edmund James Smith, president, at the ordinary general meeting, November 15th.

mediate record exists relating to the whole country. As regards the properties of most of the bishoprics and chapters, a complete account was obtained about 1650, and the renewal of leases septennially for the succeeding 200 years would afford much information as to the rise and fall of rents in that period. It is probable that the Oxford and Cambridge colleges would be able to supply the same information as regards their property, and some principal landowners must have continuous rentals of their estate; but in future no doubt the record will be revised not less frequently than each quarter of a century.

The recorded owners in the original Domesday are stated as 5,000 out of a population probably of 3,000,000, and the new Domesday gives about 1,000,000 of owners, three-fourths of whom are the possessors of not more than an acre, leaving possessed of more than one acre about one quarter of a million out of a population of 20,000,000, of whom one-half inhabit towns and invest very little in land. In Northumberland the ownerships over an acre average 500 acres each; in Wilts they average 200 acres. In the rest of England they average from 100 to 150 acres. In the counties of Cambridge, Chester, Derby, Gloucester, Lancaster, the ownerships average more. In Somerset, Stafford, Surrey, Worcester, and West Riding of York, they average about 10 acres, and in Middlesex 50 acres. It is curious on reading over the names of the untitled nobility in the several counties of England, to note how many have occurred in the chronicles of Crecy, Poitiers, Agincourt, and the French wars, and how many more distinguished themselves in the histories of the internal affairs of the country before the reign of George III. Some names, such as Musgrave of Edenhall, take us back to the fairy lore or the unwritten traditions of a high antiquity. Some rest upon success in trade or professional distinction in law or in arms; some upon the distribution of property of the Tudor Sovereigns; and some upon the accidental possession of estates brought by the extension of our towns into fabulous value. Whether the law of entail which secures the estate for the most part against the extravagance and the folly of the direct heir by providing that it must pass in its integrity to the next descendant of the founder, is based upon a better principle than that which divides each estate amongst all the children of the founder, is a question which we need not stop to discuss, but it certainly has the effect of maintaining a long connexion between the family and the tenantry, and secures the latter from the danger of the sale of the estate and its consequent transfer to strangers.

It would repay any one interested in the particular farms described in 1851 by Mr. Caird, to compare their condition at that time with their state under their present occupations. He would find a more spirited husbandry, effective drainage, better buildings, much better cottages, much better wages, and general improvement; but he will rarely find any material increase of rent, irrespective of interest on the cost of improvement. There will be a larger capital employed, and a much larger yearly produce, but the rent will generally have increased barely to the extent corresponding to the capital expended in improvement. The fee-simple value will have materially increased, and, in consequence of the enormous accumulation of capital in the interval, I have an ordinary farm, lying between two competing proprietors, sold at fifty-four years' purchase on the utmost rent obtainable.

Some portion of the increased produce from farming is appropriated to interest on capital expended in drainage, in cottages, or in buildings; some to interest on tenants' increased capital; more is absorbed by increased wages; a portion pays the increased rates and taxes.

The better buildings speak for themselves to the eye; the thorough drainage will hardly be disputed, but a comparison can be made as regards wages more easily than with regard to any other portion of the increased expenditure as compared with 1851. According to a table in page 512 of Mr. Caird's book, the average wages in twelve northern counties in 1851 were 11s. 6d. a week, and in twenty southern counties were 8s. 5d. a week; and it is added that in the preceding eighty years there had been no increase of wages in several southern counties, for instance, in Suffolk and Wilts; and an increase of less than 14 per cent. in the eighteen southern counties mentioned by Arthur Young in 1770.

It was time that wages should increase; and their increase in the twenty-five years since 1851 cannot be taken to average less than 50 per cent. on the rates above mentioned. In Durham and the manufacturing counties the increase is more than 50 per cent. The reaction which has recently set in will prevent the present rates from increasing for many years.

Nor does the increase of 50 per cent. in the rate of wages measure the improvement in the condition of the labourer. All those articles of consumption which may be called home comforts,—tea, sugar, tobacco, &c.,—are reduced in cost some 40 per cent., while clothes and other necessaries are both better and cheaper. The cottage is frequently a little more costly than in 1850, but more comfortable, and in a sanitary point of view generally unexceptionable. The maintenance of close parishes has been rendered useless by the extension of the area of rating, and in consequence the cottage is placed as near as may conveniently be to the labourer's work, and the fatigue of the daily walk to and from his place of labour reduced to its minimum.

One cause of the disproportion, in 1850, between the wages of 11s. 6d. in the north, and 8s. 5d. in the south, was the manufacturing demand for labour in the north; but this was intensified by the operation of the law of settlement which chained the labourer to the parish where he was born. This law was practically abolished in 1865, and only from that date has the labourer been free to take his labour—the only commodity he has to sell,—to any part of the kingdom. This freedom was largely exercised during the demand, in 1873, for more men in the coal and iron districts in the north, many hundreds leaving the eastern and south-eastern counties, and obtaining in the north 21s. a week or more for their labour, instead of 11s. or 12s. in the south. But if the wages were higher the work was harder, and the habits of life quite different from those to which the strangers were accustomed.

A colliery life, even if the man be employed on the surface, is rather a town than a country life. The pit is sunk, and a pit village of probably 300 houses is built very near to the pit. The houses are arranged in streets, and, the population causing a demand for consumable articles, the corners of the streets and perhaps a row of houses in the main road are made into shops. Every man lives under the observation of his neighbours.

Until a few years since, the cost of building a collier's house was barely 50*l.*, and it was one story high; the least costly now involve an expenditure of 100*l.*, and many of 120*l.*, and none are less than two stories. The new collieries have for some time a large proportion of persons of roving and unsettled habits, the refuse of the older collieries and inexperienced strangers; but the colliers in the older collieries are a remarkably orderly set of men; generally Dissenters, for until within a few years the Church of England did not provide any means of worship save at the Parochial Churches, and the Parochial Church was generally miles distant from the colliery. Now, church and school are generally to be found at a new colliery, as well as dissenting places of worship.

In 1851 wheat was 40*s.* a quarter, beef 5½*d.* per lb., and mutton 5*d.* per lb. We may now take wheat at 47*s.* a quarter, beef at 10*d.* per lb., and mutton at 8*d.* per lb., and such of us as have lived through the panic of 1851, and still more through the distress of 1836, when the year's average price of wheat was 39*s.* a quarter, with barley under 30*s.*, and oats 22*s.* a quarter, can but feel that this year's distress, though severe in many districts, does not present the same features or press upon the country to the same extent as in that period in 1851, which has been so faithfully and graphically described by Mr. Caird, in his "English Agriculture." In 1853, the best harvest occurred that has ever been known, and agricultural distress became a thing of the past.

One half of our population is at present fed with wheat imported from distant countries, and that half of our consumption is brought from the Western States of America, or other distant places, at such prices that the other half of our consumption cannot, it is said, be grown so as to be remunerative to the English grower; and suggestions are made for the adoption of a different system of cultivation.

There is a wide difference between panic fear and a grave consideration of existing facts, and the impossibility of growing wheat at a price of 47*s.* a quarter is not to be admitted without clear proof. In the last forty years wheat has ten times averaged less than 47*s.* a quarter for the year; in 1835 it was 39*s.*, as before mentioned; in 1851 it was 39*s.*; in 1864 it was 40*s.*; and in 1870 it was 47*s.*: and on each occasion it soon rose materially. Whatever the causes, the facts are certain, and it may fairly be inferred that what has so often happened is not unlikely to happen again; although it may be difficult to predicate the precise form and the cause of the change. The reaction from the excited prices of almost all articles of commerce, but especially of iron and coal, in 1874, necessarily affects the price of all articles of consumption, and it is much more difficult to say why the loan of money should be cheap, than why wheat should be cheap.

How a good state of moral and intellectual character in the labourer, supported by a full rate of wages, is to be managed so as to enable this country to compete with the labour of other countries where the labourer is not cultivated to so high a standard, nor used to the same comforts, is one part of the present difficulty; and this may be met, in some degree, by the substitution of intelligent supervision of machinery for the exercise of manual labour wherever such substitution is possible.

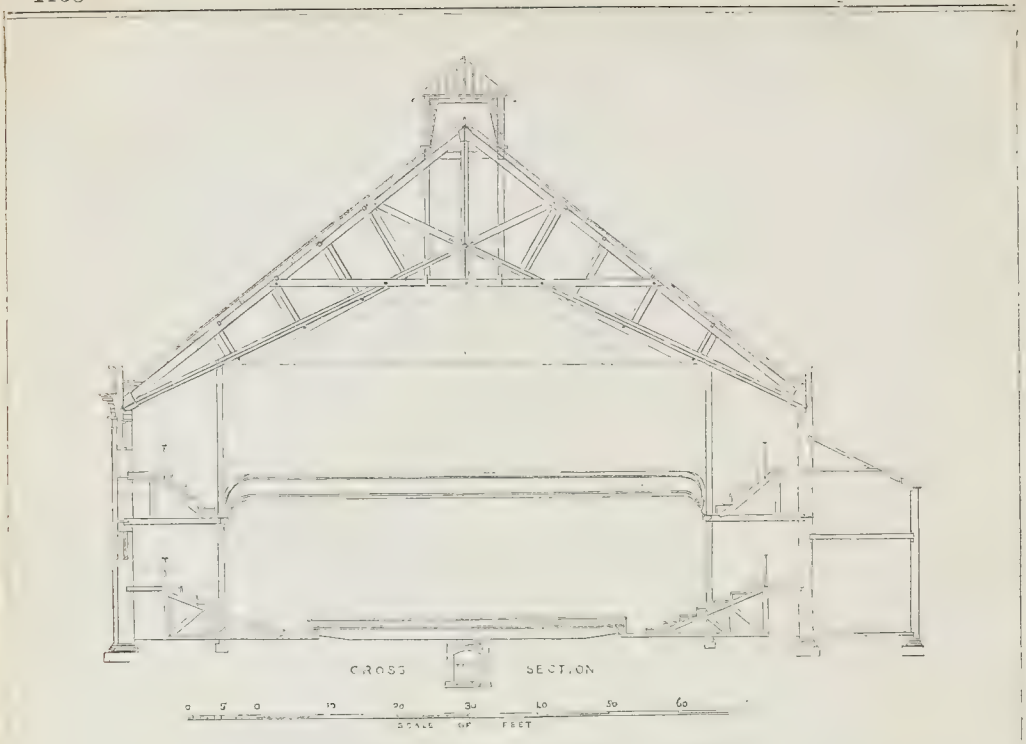
In 1851 the thrashing-machine had hardly established itself, the imperfect arrangements for ploughing by steam were just commencing, and after that came the reaping-machine, all successively requiring more mind than mere manual operations. At the present time all these pervade the land, and are gradually assisting to exercise the intelligence of the agricultural labourer. And when this higher standard of intelligence is attained generally, it may well be that the increase of wages will be greatly compensated by more intelligent work. Possibly one of the points to which we have not sufficiently attended is, that the implements necessary to enable us again to produce at such prices as to be able to meet foreign importation have not been adopted more thoroughly.

As I have before pointed out in this hall, the rent of the Whitfield Example Farm was 44 per cent. of the value of the gross produce before the outlay upon it in 1840, and was 20 per cent. of the value of the subsequent gross produce, and yet was 375*l.* as against 200*l.* previously; the value of the produce having been 1,912*l.* in the one case and 463*l.* in the other. The further increase of produce will probably afford room for the satisfaction of all the various claims upon it, and every mechanical and manual economy in cultivation will increase the margin required to recompense the additional outlay.

And again, every quarter of wheat brought from foreign countries, as it increases the demand for labour at its place of produce, tends to raise the labourers' wages there, so that the foreign grower has to undergo difficulties similar to those borne by the English grower. When prices become unremunerative the reflux of labour materially affects the rate of wages in this country, and it is stated that, in the last year, the immigration to England from America was only one-third less than the emigration from England to America.

The present depression may be expected to pass away as previous depressions have passed away, searching out, however, in its progress the estates which remain unimproved, undrained, without good cottages, without efficient buildings, and without confidence of tenure. But the estates of this class will, in 1876, bear a very small proportion to their extent in 1851.

The systems of tenant-right in Surrey, Sussex, and the West Riding are the subjects of deserved reprobation, as unjust to incoming tenants, ruinous to the land, and injurious to the landlord, as producing a system of fraud and chicanery which all intelligent farmers were desirous of seeing terminated; while, in Lincoln and Nottingham, the system of husbandry, with compensation to out-going tenants, is described as no whit superior to that of West Norfolk, where capital was not protected by any system of tenant-right. The land round Stamford, lamented over by Arthur Young in 1770 as unenclosed, with the words, "It is melancholy to think that, in an age wherein the benefits of inclosing are so well understood, such tracts should remain in such a comparatively unprofitable state"; and which in 1851 remained as they were in 1770, have since that period been inclosed, and are recovering from centuries of neglect. There are still, however, some common fields not far from Stamford, which are in as discreditable a state as they



HENGLER'S NEW CIRQUE, LIVERPOOL.—*Section.*

were a hundred years ago. The extent of improveable land in Cannock Chase, some 14,000 acres, is remarked upon; the whole lying uncultivated. But, since 1851, this barren land has been found to contain coal, and the heretofore worthless property has realised not unfrequently 700*l.* an acre. Cottages, coal pits, railways, have been made upon it, and the greater part is covered with a busy, industrious population.

HENGLER'S NEW CIRQUE, WEST DERBY-ROAD, LIVERPOOL.

The annexed engraving represents one of the largest permanent circuses in the kingdom, and which was opened a few days ago. It stands at the junction of Walker-street and West Derby-road, Liverpool. The front elevation faces the West Derby-road, and is carried out with red pressed bricks, relieved by ornamental dressings. In the front of the main building there are five shops, with principal entrance to the Cirque in the centre leading to stalls and boxes, below the level of the wall at the end of it, shown on the plan. This entrance has iron ornamental gates. The floor is laid with tesselated pavement, and glazed doors are placed at the end to prevent draughts. A commodious vestibule is provided here with cloak-rooms for the audience of stalls and reserved seats. On the right-hand side is the entrance to pit, balcony, and promenade. The entrance to the gallery is in Walker-street, and is reached by a stone staircase, with level landings. An extra exit door from the pit is provided in this street; also an extra exit for parterre and gallery.

At the rear of the building is stabling for fifty horses, with carriage-shed, and the usual stable requirements. Six dressing-rooms and commodious wardrobes are at the side and back of the main building.

The interior of the building is fitted up after the arrangement of Mr. Charles Hengler's other permanent circuses in Glasgow and London, which have been carried out by the same architect, Mr. J. T. Robinson. The seats are all arranged so as to give a view of the arena, and are divided into five private boxes, 200 reserved stalls, 600 seats in the parterre, 2,000 in the pit and balconies, and 1,600 in the galleries, thus having accommodation for 4,500 people.

The construction of the roof is novel in design, the span being 100 ft., and the collar-beam is 18 ft. from the feet of the double principal rafters; 1½ in. tension rods are placed from the feet between these rafters, running to the bottom of the king-post, and thence to the top of same, thus forming a light timbered roof and an iron one at the same time; 9 in. by 3 in. purlins are placed every 3 ft., resting on the principals, and are covered over with dry 1¼ in. boards, and then slated. A syphon ventilator is formed in the centre of the roof, 12 ft. square, and inlets of cold air are fixed in convenient places to assist this ventilation and avoid draughts. Special care has been given to this part of the arrangement, with what result we have yet to learn.

The ceiling is constructed of wood and canvas, formed into panels and ribs, with bosses at each intersection of the ribs, from which drop chandeliers of brass, containing fifty lights; there are twelve of these in number. The sunlight has a domed silver plated reflector over it, the idea of the proprietor. It was executed by Messrs. Z. D. Berry & Son, Regent-street, Westminster.

The front and side balconies have ornamental fronts; the caps of pillars have the Prince of Wales's feathers. In the spandrels of the arches are large trophies and flags of all nations. The decorations are carried out in gold on a mauve and pink ground. The ring is fitted with an extra fence, to prevent the soil being kicked over into the face of the audience.

The contract for the main building, stables, and entrances was let to Mr. S. Campbell, contractor, Liverpool. The slating was done by Messrs. Wild & Sons, of Hull. The gas-fittings are the work of Mr. Price, of Liverpool. The fittings for the sunlight, and lights to the exterior, are by Messrs. Z. D. Berry & Son. The iron stable-fittings have been supplied by Messrs. Alderman Bennett & Sons, of Liverpool. The iron gates and seat standards from Messrs. Smith & Co., Sun Foundry, Glasgow. The decorations were entrusted to Mr. Thomas Rogers, of London. The raised ornament to the balcony fronts, &c., was carried out by Messrs. Jackson & Co., Rathbone-place, London.

Mr. Gilbert, of London, acted as clerk of works and foreman of interior fittings.

COMPETITIONS.

Whitworth, near Rochdale.—The plans of Messrs. Maxwell & Tuke for the chapels, &c., in the New Cemetery have been chosen by means of a limited competition. The design places the three chapels parallel, like the arms of the letter W, with vestries and covered hearse entrances between a central tower and spire over the north end of the central or Episcopal chapel. The vestry for this is at the back of the building. The buildings will be of stone, roofed with slate, and overhanging eaves with oak barge-boards. The chapels will be warmed with superheated pipes, conducted from the fireplaces in each vestry.

St. Andrew's, Upper Norwood.—Messrs. Power & Wheeler, the successful competitors, write to complain of a letter addressed by another competitor to the chairman of the Building Committee, after the decision, impugning the correctness of their estimate. We think it unnecessary, however, to print their statement.

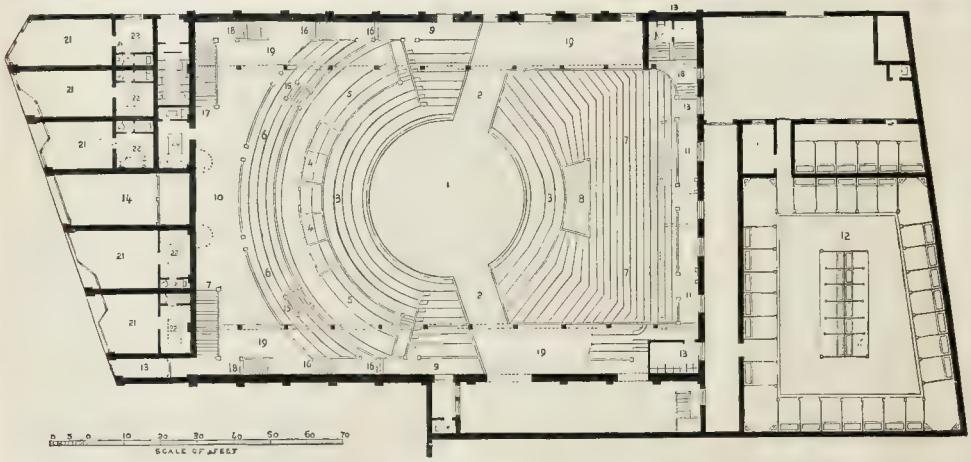
COMPENSATION CASE.

JENKINS *v.* THE SCHOOL BOARD FOR LONDON.

This case (heard in the Sheriff's Court, Red Lion-square) was a claim for land required for a new school at Kensal-green, and it was stated that property was rising in value in the neighbourhood. Several witnesses were examined. The value, as alleged on one side, was 2,500*l.*, with the 10 per cent. allowed for compulsory sale, being at the rate of 3,500*l.* per acre, and on the other side the estimate was 1,076*l.*, or 1,500*l.* per acre.

Counsel addressed the Court, and after the learned Under-Sheriff had placed the case before the jury they consulted. A verdict was given for 1,800*l.* The jury had in the early part of the day inspected the land.





1. Ring.
2. Entrance to ring.
3. Parterre.
4. Boxes.
5. Stalls.
6. Pit.
7. Gallery.
8. Orchestra.
9. Promenade.
10. Promenade: gallery over; pay-boxes under.
11. Promenade: property-rooms under.
12. Stables.
13. Entrance under.
14. Principal entrance under.
15. From principal entrance to boxes, &c.
16. Steps down.
17. Steps up.
18. Gallery-stairs.
19. Gallery over.
20. Ladies' cloak-room.
21. Shops.
22. Sitting-rooms.

HENGLER'S NEW CIRQUE, WEST DERBY ROAD, LIVERPOOL.—Mr. J. T. Robinson, Architect.



LONDON STREET ARCHITECTURE: NEW BUILDINGS AT THE CORNER OF CHANCERY LANE AND HOLBORN.—MR. LEWIS H. ISAACS, ARCHITECT.

NEW BUILDINGS AT THE CORNER OF CHANCERY-LANE AND HOLBORN.

AT Michaelmas Day, 1875, the leases fell in of the plot of land containing five houses in Holborn, two in Chancery-lane, and the restaurant at the corner of the two thoroughfares; and the governors of St. Bartholomew's Hospital, deeming this the right opportunity for effecting the long-needed improvement of Chancery-lane, gave notice to the respective tenants that, on the expiration of their terms, the premises would be pulled down, and the land let on building leases.

Negotiations were at the same time opened with the Metropolitan Board of Works, who readily availed themselves of the favourable circumstances thus presented, and the purchase of the Hospital's interest in the land required for widening the roadway of Chancery-lane was soon effected.

A further strip of land belonging to the Honourable Society of Lincoln's-inn is still needed to complete the improvement, but some delay has arisen in regard to the acquisition of this, owing to the fact that the Government hold a lease of the plot with a right of pre-emption, and as yet no terms have been arrived at for the purchase of this right. Meantime carriage traffic has received the full benefit of the improvement, for the roadway is now sufficiently wide to admit of two vehicles passing abreast. Pedestrians, however, must cross from the west to the east side of Chancery-lane on approaching Holborn, or run the risk of being squeezed or mud-bespattered by the wheels of passing vehicles—a state of things barely safe and certainly highly inconvenient. The Government's interest in the narrow strip of land must be so small as scarcely to be worth consideration, and it is earnestly to be hoped in the interest of the public that the department charged with settling the terms upon which the land can be added to the highway will speedily dispose of this preliminary.

The advantages resulting from the instalment of this street improvement already made are so great and so obvious that it appears almost incredible its accomplishment should have been delayed until the present time.

In arranging the plan of the building plots, Mr. I'Anson, the Hospital Surveyor, appropriated the old corner site to the roadway, thereby reducing the number of the new houses from eight to seven; and, by a further re-arrangement of the areas, three frontages were obtained in Chancery-lane, three in Holborn, and the corner block looking on to both streets. The area belonging to the Hospital Authorities absorbed in the public way is, in round figures, between 1,000 ft. and 1,100 ft. For this area the sum of 5,000*l.* was paid by the Metropolitan Board of Works, or, taking the land uncovered as being worth twenty years' purchase, at the rate of nearly 5*s.* per square foot per annum. In determining the reasonableness or otherwise of this purchase, it should be remembered that the most valuable part of the whole site, viz., the old corner plot, was entirely given up, as also, that the strip in Chancery-lane was all frontage. The purchase of the Lincoln's-inn land not being completed as yet, we are unable to give the total cost of the improvement. Whilst on this part of the subject, we would remind our readers that the terms upon which the new building plots were let to the respective lessees were quoted in a recent number of this journal.

Five of these lessees, taking six out of the seven plots, agreed to avail themselves of the services of one architect, and our illustration shows the result of this arrangement. It is not often that adjoining owners exhibit so neighbourly a feeling; and the public thoroughfares of the metropolis evidence, by the want of harmony in the buildings which skirt them, how sadly architectural effect is frittered away by the little bits into which London is thus cut. In the present instance, as we have said, the owners of six adjoining properties, with practically unlimited powers to determine how their domiciles should be fashioned externally, agreed upon one design, and employed one architect, and one firm of builders to carry the same into execution, rather than exhibit their respective idiosyncrasies in bricks and mortar.

Touching the design, we would remark that novelty is displayed in the treatment of the dressings round the third-floor windows, and the incorporation, so to speak, of the salient features of the principal cornice therewith. The corner next Chancery-lane has received consideration, as have also the dormer windows and sky-line generally. The materials employed in the front elevations are white Suffolk bricks and Portland stone, the pilasters of the shop-fronts being of polished Aberdeen granite.

The works have been carried out under the personal superintendence of Mr. Lewis H. Isaacs, architect, by Messrs. Scrivener & White, whose representative was Mr. Turner. The contract price for the block of six houses was 20,044*l.* We must not omit to mention that since the completion of the street widening, the District Board of Works have paved the carriageway of Chancery-lane with wood—a boon which, no doubt, is duly appreciated by the occupiers of chambers in Lincoln's Inn and other professional men living in the locality, let the future of wood-paving be what it may.

HOUSE BUILDING IN OLD LONDON.

ON looking carefully down a long list of dates appertaining to any particular country or town, it is singular to note what comparatively small and unimportant occurrences go to make them up, and how many really momentous matters in its history are omitted. The curious reader will find numerous examples of this in a categorical history of London, from its first foundation to the present time. How many items, for example, in the *architectural* story of London city have been altogether forgotten, no notice apparently having ever been taken of them; and how many things of house-building interest have there been of which no record whatever has been kept. It will be a curious thing to note when the very last record of old London shall disappear, to make room for a more improved state of things. There may, perhaps, be no help for all this, however much it is to be regretted; but two things at least can be done. The *past*, as Mr. President Barry noted the other evening, is certainly beyond control, but the future, and what to do next, may be dealt with. We may, therefore, yet preserve intact as much as is possible remaining of the London of past days, and we may gather together and carefully keep, and publicly exhibit sometimes, all and every *pictorial* representation of old London that can be got at, and there is a very great deal of such scattered about, here and there and everywhere. It may be useful to call attention to a little of this, and note its importance and interest.

There are many, doubtless, who may fancy that it is an easy matter to picture the London of the past to themselves, but the fact really is that but little notion can, in the present day, and in the midst of present surroundings, be formed of a state of things so totally unlike it. Looking down a new London street in an "improved" quarter is simply to look for a something to take the eye, and, if possible, to interest the mind of the observer; but, as all must know, the effort is altogether hopeless in nine cases out of ten. There is nothing to be seen but two parallel lines of uniform building; the house nearest you is simply repeated to the end of the perspective and back again, all and everything are alike. More than this, you are quite conscious that the interior of the houses are all of them precisely similar. But in an old London street all these conditions were reversed. Every house was different, not only in external look, but in internal arrangement and planning; and looking down such street the eye could not do otherwise than rest and pause at each house, even while at the same time it took in the whole perspective. No two things, or methods of work, can be more unlike, and there may be some interest, now that architectural practice is going through, as was heard at the Institute, a new ordeal, in looking into and balancing the merits and demerits of the two modes of work, the *antique* and the *modern*. And one other item too, and a most necessary one, we would include in it is to cast a glance practically, before it is too late, at one or two things yet remaining of old London house-building. The London house of the past was not only a quaint and picturesque structure, but, as we take it, a "comfortable" house.

We are somewhat at a loss, it must be confessed, for a due and sufficient quantity of evidence, in the way of paper records, of the past system of "building" generally. At times we almost doubt whether a plan or a drawing at all was made of a timber-built house. It would seem rather to have been built up out of the head of the master builder as it went on, in pretty much the same way as scaffolding and temporary shed building is now. There is hardly any other way of accounting for the strange oddities found in some of these quaint buildings. We are to seek, first, for the whereabouts of the fast-disappearing remains of old London, and then to find out any special value there may be in those remains in detail, and to then contrast it with our modern and more improved system of doing things. We do not propose to exhaust the list of house-building memorials, but only to indicate a few of them. The extension of a town, by the way, of course commences by the adding to the outskirts of it, as seen in the map we have before alluded to; but the "improvement" of a town begins in the thickest and most crowded part of it, so that ancient London began to finally disappear at the centre. The houses, as shown in Norden's map, evidently extended for some distance down and up the River "Thamys," on both shores of it, and there is a right tumble-down fragment to be met with, washed by the tide, between Shadwell and the West-India Docks basin. These timber-built houses face the river, and are to be got at through a narrow street parallel with it. They are, of course, inhabited by a somewhat rough race, with decided waterside proclivities, and this fragment of London antiquity, without doubt, affords a glimpse, though, may be, but a glimpse, of the character of London town in the fifteenth and sixteenth centuries, and, indeed, down to the date of our modern improving era. Only few, probably, find their way into this begrimed locality; but many must pass it on the river, and, if so, they must have noticed,—and it is worth note,—not far from it, the sole present representative (in London, certainly) of Gothic boat-building, harmonising completely with the buildings on shore. We refer to the Dutch fishing-boats, five or six in number, admirably built, and, it may be added, *designed*, with delicate mouldings and curves here and there, and which are well worth careful note. We have improved since the days of Elizabeth in ship-construction, that is certain; but most certainly not in artistic refinement of details. The curious-looking craft drawn by Van den Keere, on his sketch of "Thamys Fluvius," might well have had one of these Dutch fishing-boats among them. And while here,—should our reader ever get so far,—it is instructive to get a little farther until he come to a quite *new* locality, Cubitt-town, and there see numberless lengths of long straight streets, all of them alike, and the houses alike,—a complete contrast to any notion that is to be formed of the old ways of house-building and street laying-out.

But we need not travel into quite so outlandish a region to get a glance at the aspect of London in past days. It may be got at close at hand, and with surroundings on all sides full of interest and suggestive of much. Holywell-street, Holy-well, at the back of the Strand,—and Wych-street, close to it, illustrated in our pages long ago, both contain, strange to say, memorials of the London of past days. They are doomed to destruction, and that in no long time, it is quite certain; so that if any instruction does happen to lie in them, no time is to be lost. Looking up Holywell-street, or, as now named, "Booksellers'-row," a long narrow street is before you, with improvements, many already commenced, and yet going on; but in the midst of it are some of those plaster-covered houses, with gables and quaint overhanging upper stories. This special street is narrow, and will admit but of one "London gondola,"—Hansom cab,—up or down it at a time, so somewhat inconvenient, but in this very narrowness its special character and picturesqueness lie. It gives at least an imperfect idea of past street-building. Some quite new and improved house-building may be viewed on its north side, contrasting with its more ancient portions. What makes it the more telling is the fact of its shops being for the most part open bookstalls, so that here, in spite of drawbacks, a good idea of an old-world way may be found.

One special house, with front in Holywell-street and another front in the Strand itself, is in woeful plight, and covered all over with posters and advertising sheets, so that it is difficult to find the whereabouts of the street-door even, much less the window openings. Its "title deeds" are uncertain, and no man can therefore claim it,—typical of things passing away.

We may well enter, if only for a moment, one of these houses yet remaining of the past, and doubtless so soon to pass away and make room for what is now thought to be so much better a human dwelling. We take a rough one, almost

at a venture, and in an out-of-the-way locality. It is sadly out of the upright, it must be owned, and equally out of order, and in need of the three or four coats of common oil-colour. It is of plaster, by the way, both outside and inside. For quaintness of plan and internal arrangement it might satisfy even Charles Dickens himself, were he but in the flesh, and in need of a place of abode for one of his special favourites. We need not see the basement, for it was evidently constructed as cellarage and storehouse; but the ground-floor arrangement exhibits the great distinction between the house-building of the past and the present. The "passage" is low and narrow, widening a little as you come to the oddly-constructed, but really convenient, staircase, with its many landings and quaint balustrading. The front room is small, but the back room is a magnificent apartment, intended as a kitchen, with huge fireplace, and with convenient shelves round about. It was evidently built as both kitchen and living-room, or "parlour," and so takes one to the simple manners of our unfashionable forefathers. Nothing can be more convenient, and nothing more homely; but the idea, even if changed into more modern shape, is a good arrangement, and suggestive. There are some other small rooms here with purposes not so evident. The rooms above, on the first-floor, have those always quaint and right useful features, projecting windows, so that you can see up and down the street perspective. Here, certainly, is a hint worth the taking. Some of these houses are well worth measuring and plotting by the student, for they are full of ingenious contrivances.

And now it may perhaps be asked what advantage, or gain, or merit had such a system of house planning and building over that of the present day,—that is, if it had any, considering, at the same time, the multitude of disadvantages and drawbacks on all hands which such a mode of work undoubtedly entailed. We might urge that there can be, and certainly should not be, any reason whatever why houses thus designed should not be fully as good as the best that are now built, as to drainage, water-supply, lighting, heating, and so on; but the main question is, does this individuality of house-building yield enough to pay for the pains taken, and the thought expended on it? Is the mental eye-gain equal to the cost? That is the real question. We maintain that it does afford this, and that the loss entailed by the present machine-like and dull uniformity of house-planning to be seen mile upon mile all round London, and making up in the main this vast metropolis, is a tremendous evil, not in any way at present to be duly and sufficiently estimated. It would seem impossible to fully satisfy human nature with a bald utilitarianism, however perfect that may happen to be, or however fully it may seem to supply every material want. The eyes even of those who may seem all but insensible to any but animal wants need objects special to them, though they know not what, and the absence of such, though apparently unnoticed, cannot be unfelt.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of the Institute on Monday, the 20th ult., Mr. Charles Barry, President in the chair, several donations of books for the library were announced.

M. Paul Abadie and M. Theodore Ballu (members of the Institute of France) were proposed as Honorary and Corresponding members; and Mr. W. Kidner, of Shanghai, was recommended for membership as a Fellow.

The Chairman announced that the Manchester Society of Architects, desiring to do honour to the Institute, had cordially invited Mr. Eastlake and himself, as official representatives of the Institute, to the annual dinner of the Manchester Society. The invitation was accepted and the engagement fulfilled. The most kindly expressions were used towards the Institute by the chief architects in Manchester, and three of them at once agreed to join its ranks; others would probably follow. Such of the members of the Society who had important works in hand were courteous enough to accompany the representatives of the Institute on a visit of inspection, in the course of which much that was noteworthy and valuable was seen. Irrespective of the kindness shown to him and Mr. Eastlake by their Manchester friends, he highly appreciated the courtesy manifested towards the Institute.

Mr. T. H. Wyatt said he had the honour to receive a similar invitation during his presidency, and he could fully bear out what had been said by the President as to the fraternal feelings evinced by the Manchester architects.

Mr. Samuel Knight (Associate) then read a paper on "The Influence of Business Requirements upon street Architecture," printed in our last.

In the discussion which followed,

Mr. John Hebb said he was rather afraid that Mr. Knight had been somewhat unfortunate in his illustrations, which did not at all adequately represent the architectural ability of the city. Few or none of the city buildings most conspicuous for their ability were represented by the drawings on the walls. In many cases, he ventured to think, the difficulty which Mr. Knight had pointed out of dealing satisfactorily with the superstructures of shop premises had been successfully surmounted.

Mr. Knight wished to explain that, if the drawings on the walls were not so widely-representative as could have been desired (and he confessed that they were not), it was no fault of his. He had tried to obtain drawings of many of the most notable modern buildings in the city; but in almost innumerable instances he was unable to do so. Not that the architects of those buildings were unwilling to assist him; but because they were unable. He had a large pile of letters, of which the substance was:—"I should be most happy to oblige you if I could; but I assure you that I have no perspective of the buildings, and such drawings as I have are very dirty; they are in pencil, and unfit to show." Such letters would seem to show that many City architects had such confidence that their buildings would "come out" well in execution that they did not trouble to make perspectives, the geometrical elevations sufficing for their wants.

Mr. H. Dawson said Mr. Knight had alluded to the colonnade formerly existing in Regent-quadrant, comparing it with the colonnade in the Rue de Rivoli in Paris. But there was a great difference between these colonnades. In the first place, the Regent-street colonnade was very much wider in proportion to its height than that in Paris; and it should be remembered that the entresol in the Rue de Rivoli arcade so raised the height of the soffits of the arches above the shafts as to admit a very large amount of light to the shops; whereas in Regent-street the great width of the colonnade and the smallness of the height made the shops perfectly gloomy. If the Regent-street structure could only have been altered to resemble that of the Rue de Rivoli it would have been a very beautiful feature made suitable for business purposes. He regretted that Mr. Knight had spoken disparagingly of the use of Bath and similar soft stones. It was a very important thing that the old prejudice as to Bath stone should be got rid of as soon as possible. That Bath stone was perfectly capable of standing the London atmosphere he had no reasonable doubt, although many buildings in which Bath stone had been used might be pointed to as very serious failures. The reason why Bath stone—by which he meant not only the stone which came from the immediate neighbourhood of Bath, but almost all the stones of the great oolitic series—so often failed was simply that care was not taken in its selection, and that it was not laid in its natural quarry-bed. That Bath or oolitic stone, when these conditions were observed, would retain its perfect preservation, even in the London atmosphere, was proved by the exterior of Apsley House, Piccadilly, in which stone from the old Combe Down quarry was exclusively used, and in which there was scarcely to be seen a defective stone. The west front of Westminster Hall was also of oolitic stone. Such stone was largely used in Bristol and other large towns in the West of England, and was, under the conditions he had named, found to wear well. In talking of "Bath" stone, it should be recollected that the best oolitic stone did not necessarily come from Bath. The great oolitic series spread over a very large area. To what was called Corsham stone he had a very great objection, although some of it was good. During the last two or three years he had used a very good oolitic stone from the Bradford district. Farleigh Down stone had got a fearfully bad name in some quarters; but the two lower beds furnished some good stone, and if properly selected and bedded no finer stone could be used. In texture and colour it was equal, if not superior, to Portland; and where weight was not an object Farleigh Down stone was better than Portland for many purposes. But, whatever variety of stone was used, much depended on its selection. Had the particular bed of Bolsover stone chosen by the architect of the Houses of Parliament been used we should not have to lament the premature decay of the exterior of those buildings.

Mr. Woodthorpe agreed with Mr. Knight as to Bath stone, and strongly deprecated its use for external work. Three years ago he had serious thoughts of bringing to the notice of the Institute a long list of comparatively new buildings in London which were rapidly decaying through the use of Bath stone, but he shrank from the task when he thought of the unpopularity he should incur. But he felt no such delicacy in speaking generally. Buildings which had been faced with Bath stone seemed to be subject to a disease which might be called the "stone small-pox." He could point to two churches, for instance, which had not been built twenty years, and in which the stone on the exterior had had to be almost entirely renewed from pinnacle to base. There were eight or ten varieties of stone which he could mention as being far superior to Bath or Caen stone.

Mr. H. H. Statham said it was not necessary to go to Paris for examples of the colonnade in streets. The Chester "Rows" were very nearly as broad as the pavement in Regent-street, and they were admirably adapted for shop purposes, and there was ample light. The colonnade in Regent-street was removed, he believed, not so much because it interfered with the light, as because it was supposed to give rise to scenes inconsistent with the highest theory of social life. He could not agree with one of the conclusions to which Mr. Knight's paper seemed to lead, viz., that business architecture was the apotheosis of plate glass, because plate-glass destroyed the scale of a building. The necessity for such large squares of glass as were to be seen in modern shop-fronts was more fancied than real, and he did not believe it would in the least affect a tradesman's business if shop-fronts were constructed more in accordance with architectural principles. The shop architecture of the present time afforded another illustration of the fact that architecture always represented the spirit of the day, and the spirit of to-day was "show." This got rid of, we should have better and more solid shop-architecture. As to masking ironwork "uprights" by veneerings of stone in the form of pilasters, it was bad enough, but not so bad as the carrying of the superstructure of a building on iron girders masked by arches or lintels of masonry, which, to the outside observer, were really structural features instead of shams. This practice was sometimes resorted to by architects of whom better things might fairly be expected.

Mr. Jennings said, with reference to oriel or bay windows, there seemed to be a growing tendency on the part of the Metropolitan Board of Works to allow of the use of these features, as evidenced by the provisions relating thereto in the proposed new Building Act of two or three years ago. Bay windows were not only capable of being very effectively treated as architectural features, but they very often greatly added to the comfort and convenience of the inmates of a house, as, for instance, when such a window faced the south, it would not be necessary to entirely shut out that prospect with the view of excluding the sun. Mr. Knight had made no reference to the use of terra-cotta in street façades, but that material was destined in his (Mr. Jennings's) opinion to have a great influence on the street architecture of London. One great advantage possessed by brick over stone was that it was fireproof, for in most cases the walls of a brick building would not be materially damaged by fire; but in the case of a building whose walls were of stone complete reinstatement would be necessary after a fire, owing to the calcination of the walls. As to the warehouses in Cannon-street, it was stipulated by the Act passed for carrying out the work that at least one-third of the area of each façade should consist of solid brickwork or masonry, but this provision was not uniformly adhered to.

Mr. Waterhouse, in proposing a vote of thanks to Mr. Knight for his paper, said that with reference to the capabilities of the oriel window, not only as an architectural but as a utilitarian feature, an excellent example was to be seen in a block of offices known as Oriel Chambers, in Liverpool.

Professor Kerr, in seconding the motion, said that the removal of the Regent-street Colonnade was to be regretted, but its removal was mainly

brought about, he believed, by the fussiness of the tradesmen, and not because it was found that the shops were not sufficiently light. There seemed to be a great prejudice against covered ways or arcades in London. Some years ago a very good suggestion was made to form an arcade from Bond-street to Regent-street, but many of the clergymen and noblemen of St. James's predicted that the carrying out of the scheme would be so detrimental to the morality of the neighbourhood that the project was abandoned. The great question opened up by Mr. Knight's paper was whether any attempt was to be made to group the houses into long façades, or were we to be for ever content to allow every man to build his own bit of property according to his peculiar whim? Something was to be said on both sides. By having a multitude of façades, designed by different architects, a great variety of effect was obtained, and many individual façades might be well worthy of study. But was this jumble of façades to be preferred on artistic grounds to the grandeur of the Paris streets? He thought not. The architecture of London was not altogether a question of plate-glass fronts or of sham iron construction, but it was very largely a question of sky-line.

Mr. Seddon agreed with much that was expressed in Mr. Knight's paper, but he thought the Gothic school had not yet had an adequate opportunity of showing what could be done in street architecture.

Mr. Roger Smith thought that "business architecture" naturally divided itself into two sections, viz., those buildings which had shops on the ground story, and those which had not. In buildings of which shops formed part, it was desirable to make the girder or bressummer which carried the superstructure as prominent and marked a feature as possible, and in the upper stories, to have as much window space as possible, in order to give an appearance of lightness to the façade. With regard to buildings not encumbered by shops, he thought it was obvious that much more satisfactory results could be obtained from an architectural point of view. The advisability of using washable tiles for street façades should not be lost sight of.

Mr. Aitchison said that the question of window openings for business premises was one largely dependent on the widths of streets, and what would be necessary in one building would be out of place in another. One great objection to the use of iron was the cost of keeping it constantly painted. He denied that the huge sheets of plate-glass to be seen in London were essential for the display of goods or to the interests of tradesmen, for the lofty buildings of Paris had shops which were really part of the architecture of the structures, and the Parisian shopkeepers were able to display their goods in a manner quite equal, if not superior, to that adopted by London tradesmen.

The President, in closing the discussion, agreed in deprecating the use of large sheets of plate-glass in shop-fronts. With reference to what Mr. Knight had called the "semicircular Paxtonian roof," he begged to say that the Paxtonian roof was not semicircular at all. The great building by which Sir Joseph Paxton gained his fame was designed as a series of packing-cases, one upon another, without any circular roof, and it was only by the persistent efforts of his (the President's) father that a semicircular roof was adopted for a portion of the Hyde Park Exhibition building in 1851, and afterwards adopted throughout on the removal of the building to Sydenham.

AN EMPLOYER OF LABOUR ON CONTRACTS.

AT the fifth annual dinner of the Newcastle and District Foremen Engineers and Mechanical Draughtsmen's Association, the chairman, Mr. Edward Crawshay, said that for thirty years past his tongue had been heard from time to time in the district; but upon one subject his tongue had been silent, and that was the industrial question—the relations between masters and men, and questions of that class. If he had not been a manufacturer, he should doubtless have said a great deal about it long ago. He believed he had read every book of importance on this subject, and there was no doctrine that he had not tried to get the most truth of he could; but he had never ventured to say anything, because to say anything was to act, and he had to be cautious in what he had to say. He had derived from a work, not included by any means in works on this subject, a few expressions which he thought might be put forward without mischief. He alluded to the work of a writer who did not deal with the present at all, nor with the conflicts of labour or capital, or any question of our own days. He referred to Sir Henry Maine, in whose work upon Ancient Law he was very much struck with certain observations. Sir Henry Maine, in speaking of ancient societies, traced the gradual growth of the custom of entering into contracts—what he called the free agreements of individuals with one another,—as gradually superseding the ancient state to which he gave the term, not patriarchal, but the scientific term of imperative; meaning that the only question to be considered was, who was to give the order, and who to obey? All progressive states gradually grew out of that, and came into a state in which that order ceased to exist, and men entered into free agreements and contracts with one another. Sir Henry Maine told them of a time when even a free market was unknown; and it was only by gradual concessions and arrangements that people were allowed to come and sell with one another in a market; everything was the subject of ordinances and regulations. Sir Henry said that some people regretted that that order of things had passed away,—that order in which it was all command on one side, and obedience on the other; but Sir Henry Maine said he did not agree with them at all; he said we had come to a state when men make bargains, one engaging to do something, and the other engaging to do something in return; and that implied a very high condition of humanity indeed,—it implied that people should enter into agreements one with another, and should faithfully keep those agreements. Sir Henry Maine showed that in the early stages of society the infraction of a contract was not thought much of an offence, because contracts were very rare, and really violations of the established order; and they could not, therefore, get into that position to have free agreements until they got the basis of one man undertaking to work for another. That was the basis of this age—that men should freely agree, and, having agreed, should keep their agreements. In this age, which he ventured to call the age of contract, there was room for not only all the virtues of mankind, but the state of things could not endure unless on both sides there was the utmost fidelity, and the religious observance of all agreements. That was the lesson he drew from Sir Henry Maine's remarkable work, and which enlightened him as to what he considered to be the true character of the age in which we lived. As to themselves and men he might say truly that the imperative age was past. We had come to the age of contracts. We made our engagements and we had to keep our engagements, and nothing had given him greater satisfaction throughout the strife that had unfortunately existed at times between capitalists and workmen in this country than the gradually growing sense on the part of workmen that, whatever the cause of quarrel might be, all contracts should be observed. That was the lesson he ventured to put before them. It was simple, but it was the best thing he could find to say. Let them understand that they were in that relation to one another, and if that relation be faithfully acted upon, then there must ensue in the first place mutual respect; and if there was mutual respect, every other feeling would spring up beside it.

NEW BUILDINGS FOR POOR-LAW ADMINISTRATION.

Fulham and Deptford.—At a meeting of the Metropolitan Asylums Board, on the 18th ult., a letter was read from the Local Government Board on the subject of the proposed buildings on the sites at Fulham and Deptford, for the accommodation of small-pox and fever patients, at an estimated cost of about 12,000*l*. The communication advised the erection of temporary instead of permanent buildings, as being the better course, in view of the present epidemic of small-pox and of the desirability of relieving Hampstead Hospital. The General Purposes Committee had met and considered this letter, and they now reported in favour of the erection of permanent buildings, observing that temporary ones could be erected if an emergency required it. Dr. Bridges, Local Government Board Inspector, who was present, remarked that permanent buildings could not be finished till next March, and then they would be too damp for the reception of patients. Mr. Galsworthy referred Dr. Bridges to the promise in the report to erect temporary, in addition to the permanent buildings, if necessary. The report was adopted.

Salford.—At a meeting of the Salford Board of Guardians, on the 17th ult., the chairman said the committee appointed to carry out the removal of the small-pox hospital sheds from the yard of the workhouse to the land recently purchased at Hope had visited the Manchester Infirmary Infectious Diseases Hospital, and Mr. Booth, the architect, had met them. The committee had intimated to Mr. Booth that they desired that the building should be placed on the further corner of the ground on the line of railway, so as to isolate the building from the surrounding grounds. The committee thought the hospitals should be erected in the shape of separate sheds or pavilions, each containing not more than eight or ten beds, and each being complete in itself and having rooms attached for the nurses. There would be eight pavilions, and all would be connected together by a corridor.

CASE UNDER THE METROPOLITAN BUILDING ACT.

DIVISION OF LARGE WAREHOUSES.

Scott v. *Legg.*—This case, in the Court of Appeal, Westminster, raised an important question under the Metropolitan Building Act, 1855. The appellant, Mr. Scott, was employed by Messrs. Charrington & Co., brewers, to enlarge their brewery. The respondent is the district surveyor, acting under the Metropolitan Board of Works. The appellant had pulled down the side wall of the building in question, with the intention of extending the building laterally.

By section 27, sub-section 4, of the Metropolitan Building Act, it is enacted (with the view of lessening the risk of, and localising, fire) that every warehouse or other building used wholly or in part for the purposes of trade or manufacture, containing more than 216,000 cubic feet, shall be divided by party-walls, in such manner that the extent of each division thereof shall not exceed 216,000 cubic feet. Old buildings are not subject to the provisions of the Act. By section 9, any alteration of or addition to an old building is, to the extent of such alteration or addition, subject to the provisions of the Act. By section 28, sub-section 2, it is enacted that no buildings shall be united if when so united they will, considered as one building only, be in contravention of the Act. In the present case the area of the added building would be less than 216,000 cubic feet, but the area of the old building and the added building, without a division, taken together would be more than 216,000 cubic feet. The magistrate had ordered this area to be divided by a party-wall. For the appellant, it was contended that as the addition did not exceed 216,000 cubic feet, and as the building was only subject to the provisions of the Act to the extent of such addition, the order of the magistrate should be quashed. It was further contended that section 28, sub-section 2, did not apply, as the present was the case of extending one building and not uniting two.

The Court, however, were of opinion that, although there might not be any words in the Act which exactly met the present case, yet, looking at the working of the second sub-section of section 28, the present case was clearly within the meaning of the Act, and they dismissed the appeal.

Mr. C. Scott, on behalf of the appellant, asked for leave to appeal. He stated that the effect of the order would be to put Messrs. Charrington to the expense of some thousands of pounds, and he submitted that the question was one of importance to the metropolis generally.

His lordship said that, although the Court entertained no doubt on the point, still, as it was on the construction of a statute, and raised a matter of considerable importance, the appellant should have leave to appeal.

BANKS.

THE erection of a new bank and manager's residence has been commenced at Boston, for the Stamford, Spalding, and Boston Banking Company, from the designs and under the superintendence of Messrs. Lockwood & Mawson, architects, whose designs were recently selected in a limited competition.

The plans of the same architects have been selected for the new bank and offices at Wakefield by the directors of the Wakefield and Barnsley Union Banking Company, in a limited competition, and the works are to be commenced immediately.

Liverpool Plumbers' Association.—On the 13th ult., the tenth annual tea party and ball, in connexion with the benevolent fund of the above association, took place in St. George's Hall. There were about 1,000 persons present. Mr. James Little, the secretary of the ball committee, read the annual report, from which it appeared that the balance from the last ball amounted to 144*l*. Out of that sum 107*l*. 16s. 6½d. had been paid to widows and orphans, leaving a balance of 36*l*. 3s. 5d.

PROGRESS OF THE PARIS EXHIBITION BUILDINGS.

If any amateur pedestrian, desirous of creating a sensation, is on the look-out for an idea, we would suggest to him the feat of walking across the Champ de Mars at the present moment, against time. We have done it, but with this exception, that we had time at our disposal. In a heavy, driving rain, with the wind not in our favour, constantly sinking in the mud, and finding

"At every deep a lower depth,"

we traversed the Champ de Mars, avoiding occasionally the slush and mire by balancing ourselves on the truck-rails or taking a series of leaps from one sleeper to another. We will not attempt a description of the vast plain, beyond saying that it is strewn all over with stones, trucks, bricks, heaps of sand, iron piping, pails, planks, and an abandoned boot deeply embedded in the clay. Heavily laden with the latter substance, we were glad to find repose in the offices of M. Henberdon, the superintendent of the works, which is in the centre of this chaos of building materials.

The 700 workmen now employed are busy with the foundations of the building, which are being pushed forward with great activity. Steam power is employed in mixing the mortar, for the manufacture of which 50,000 kilos. of Portland cement are required for every 500 cubic mètres of masonry, being the amount of work the contractors are obliged to perform daily, in order to complete the 60,000 mètres for the 1st of next July, at which date also 13 kilomètres of masonry-work for drains must be finished. During the rainy weather the men are protected by movable covered sheds. They are now erecting a powerful steam-engine to extract the sand from a quarry which lies between the site of the Palace and the military school. For the work on the Trocadero more than 1,200 men are employed, who are enabled to continue their work after dark by means of the electric light.

M. Krantz and the members of the superior Commission are greatly annoyed at the engravings of the Exhibition building which have appeared in the illustrated papers here, seeing that they only represent M. Hardy's original design, and this will be considerably modified before it is approved of by the Commission. The great difficulty appears to be the form and the dimensions of the domes, and these when decided upon may possibly necessitate the heightening of the whole of the façade, thus ensuring an imposing effect, which, in our opinion, is wanting in the original project.

Paris.

GRANITE BUILDING.

As the propriety of substituting granite, as a building material that would resist the effects of the destructive and smoky atmosphere of London, for freestone has often been favourably discussed, and as it can now be procured in abundance, and at a moderate cost, it may be interesting, and perhaps expedite so desirable an event as its introduction, if we briefly describe some of the buildings executed in this material, which we have lately seen at Aberdeen.

It is, perhaps, necessary to premise that, with the present facilities of railway-carriage, and the substitution of flat ornamentation for carving, the beauty of which is soon begrimed with smoke, the extra cost upon freestone would be inconsiderable.

The discovery, some years ago, at Kemnay, in the neighbourhood of Aberdeen, of a beautiful white granite, has enabled the local architects to improve their buildings, by using the white, blue, red, and grey varieties in judicious contrast. Considerable beauty is thus obtained, and the necessity of introducing any large amount of carved and moulded detail much reduced. The Imperial Hotel, the Presbyterian Church, the Baptist Chapel, and other buildings are thus treated. The style of the Hotel is Venetian Gothic, with moulded jambs and arches, and some carving in the capitals. Other buildings are in the old Scottish, others in the Flemish, style, with bold turrets. The Presbyterian Church, a church at Alford, and a school at Fraserburgh are in the Early English style. The last building has a beautiful spire, in two colours of granite. The church at Alford is entirely lined internally with contrasted granites, to the exclusion of plaster on the walls.

The new County Buildings in the Flemish style, by Messrs. Peddie & Kinnear, have a fine tower, and they are executed in the beautiful Kemnay granite.

The North of Scotland Bank shows what it is possible to do in granite when cost is not limited. It has a Corinthian portico, the details of which correspond with those of the Temple at Tivoli. The workmanship and jointing are so perfect, and the material so beautiful, that this building looks as if it were executed in marble.

The cost of working granite has of late years been greatly reduced by the introduction of machinery. A style of ornamentation is now common, and comparatively inexpensive, viz.: polishing the whole surface, and then removing the polish in beautiful patterns. This answers well in the grey, blue, and red granites, and when the pattern is delicate, and the rough ground gilt, a very rich but refined effect is produced. London smoke would require the granite to be polished, and, indeed, the great beauty of granite—or marble—is only revealed by this process. The purity of effect of the Aberdeen buildings amounts almost to tameness, and it might be well, therefore, to introduce a moderate quantity of majolica of delicate pattern and subdued colour in the string panels, architraves, and cornices.

This material having a bright surface would harmonise perfectly with a wall surface of polished granite, and it is absolutely durable for external work. With the above examples of granite building at the present day before us, and knowing how subject to decay and soot-blackening all freestone buildings are in London, is not the adoption of it here well worth our attention?

THE CHELSEA EMBANKMENT.

At the meeting of the Metropolitan Board of Works, held on the 24th ult., a report was presented by Sir J. W. Bazalgette, the chief engineer, on the settlement of the Chelsea Embankment, from which the following is an extract:—

"That the Chelsea Embankment was completed early in 1874; that up to September, 1875, its lines and levels were perfect for its whole length of 4,300 ft.; that about that period its foundations at one point became honeycombed, softened, and undermined, and the foreshore in front of it lower d by the withdrawal of the foundations of old Cadogan Pier by the Thames Conservators; that settlements on the Embankment began to be observed about this time, which have more or less injured a length of about 300 ft. of embankment nearest the pier, and that the levels and lines of the remaining 4,000 ft. of embankment continue as perfect as ever. We are now driving sheeting piles and groins in front of the toe of the embankment, and have lightened the outward pressure upon the back of the wall, and this appears to have arrested any further movement. It is proposed to protect it permanently by forming concrete counterforts at the back of the wall, which will also form piers for arches under the footway."

Mr. Roche, in moving the adoption of the report, said it would be necessary that they should confer with the Conservators of the Thames, and he suggested that it should go back to the committee for that purpose.

The report was received, and referred back to the committee for the purpose indicated.

THE SANITATION OF HEREFORD.

This was the subject of a paper read by Mr. George Cole, city surveyor of Hereford, at the recent meeting of the Association of Municipal and Sanitary Engineers and Surveyors at Kidderminster. He said that Hereford and its suburbs contained a population of nearly 20,000, but there were not more than 10,000 or 12,000 within the district of the sewerage and water supply. The works were carried out under the direction of Mr. T. Curley, C.E., in 1854, but had been considerably extended since, under his (Mr. Cole's) direction. There was scarcely a house in the city which was not connected with the sewers; all had their water-closets, and nearly all were supplied with the sanitary syphon and trap-system, with self-closing valves, and were supplied with water direct from the mains. The surface water was conveyed into the sewers, and when running full, flushed them effectually after heavy storms. At other times they were flushed weekly by flush-wells at the end of every street. The sewers were well ventilated by open gratings in the centre of the street, varying from 50 to 100 yards apart, and no complaints had ever been made of bad smells from these openings. The sewers were further ventilated by rain-water pipes when these were not near windows, and in some instances by special 6-in. pipes. The cesspools were for the most part filled up. It had often been his lot to find two or three at gentlemen's houses, and Mr. Cole commented on the danger arising when the imprisoned gases escaped into a house. All sewers and drains should be ventilated as much as possible, and no drain in connexion with a sewer should be allowed to enter a house without there being carried up from it a perfectly jointed ventilator. Water-closets should be made outside the external walls of a house, or at any rate adjoining them, so as to admit of free ventilation, not only from the closets themselves, but from the soil-pipes below the traps. The water-closets, in many instances, in Hereford, were not properly ventilated; and Mr. Cole remarked that the better class of society ran more danger from this source than the poor. Earth-closets had been used, but not found successful,—it might be through mismanagement. The inspector had been compelled to report them as nuisances, and had caused them to be made into water-closets. The great drawback to the Hereford sewage was, that it was made to empty itself into the Wye and polluted the stream for a considerable distance. The commercial value of sewage was, he thought, generally much over-estimated; but in an agricultural district, if anywhere, it ought to be utilised. The water supply of Hereford was pumped from the Wye, passed through filter-beds, and delivered in the usual way.

ARBITRATION COSTS.

LOCAL BOARD OF TROWBRIDGE *v.* GENERAL WALKER (IN APPEAL).

At a meeting of the Board the Chairman made a cheque for 121*l.* 15s. in order to meet an award against the ratepayers on arbitration. General Walker claimed compensation for alleged damage occasioned by the construction of a main sewer. The General, in the first instance, claimed 500*l.*, but his agent, when before the joint arbitrator, agreed to take 200*l.*, the question of costs and other trifling matters being left for the taxing-master arbitrator.

The decision of the arbitrator fixed the compensation to be paid by the town of Trowbridge for building a public sewer under the General's field at 21*l.*, as per agreement. The town considered this somewhat a heavy verdict if assigned by a jury, and the cheque for the 200*l.* was made as above stated, when the clerk to the Board politely informed the Chairman some more figuring was required. The arbitrator had ordered 115*l.* 10s., the costs of General Walker, to be added to the 21*l.* The clerk next made the not over-pleasant report that he had received a demand from the arbitrator's solicitor for his and the umpire's costs, to the tune of 12*l.* 15s., and this was also to be paid by the Local Board of Health.

The Chairman, before he made out the other two cheques, observed, "He did not like it; he thought it very wrong. When a man asked in the first place 500*l.* for a public improvement, and afterwards, when all expenses had been incurred, came down through his agent to 200*l.*, it was too bad to saddle the ratepayers with the whole of those extraordinary costs in addition."

Another member of the Board observed, "Why, this is not all, for I find that the sum to be paid by us, 437*l.* in rough figures, does not include any of our witnesses or our costs."

The Chairman, scratching his head, replied, "Dear, dear me! Don't you think the Board had better have paid General Walker his 500*l.* and have done with it?"

STRAITS OF BROMPTON.

MARLBOROUGH-ROAD.

The importance of this thoroughfare, to which allusion was made in the *Builder* of the 12th of August, makes it essential to recur to the subject, as since that period the two shops in Fulham-road, adjacent to the corner of Marlborough-road, have been pulled down, and the proprietor is about to erect three new houses, with shops upon a frontage of 42 ft.

Now, the necessity of seizing the opportune moment to effect an improvement induces the suggestion that as the frontage of the draper's shop at the corner is 32 ft., if 20 ft. were given to the road there would remain a frontage of 12 ft. to the Fulham-road, with a lateral frontage of 36 ft. to Marlborough-road and also ample back space for storage and the erection of a spacious and commanding house of business.

This fine and open thoroughfare, connecting the Chelsea and Fulham roads at the most central part, has been long neglected; and now that the Chelsea improvements are being so extensively carried out, it becomes essential that this point of junction should be adapted to the character of the neighbourhood and the requirements of the time. It leads from Chelsea Hospital, direct to the South Kensington Railway and Museum, and the issue would be intermediate between Pelham-crescent, Alexander-square, and Brompton-crescent. This block of two houses, 36 ft. by 32 ft., stands out over 20 ft. across the line of thoroughfare into the

Fulham-road; but the corner house was built nearly a century back, when the neighbourhood was suburban and of small comparative value; since then Whitehead's-grove, Cadogan, and other street-ranges have been erected, issuing into Marlborough-road, which has also been completed within the last century. Seeing that the corner block of buildings (two houses with 36 ft. frontage) projects over 20 ft. into the centre of Marlborough-road, obstructing at its entrance the most frequented and spacious thoroughfare of Chelsea, surely it behoves the Vestries of the two parishes wherein these houses are situated to look after public interests, to rectify so great a blot upon the south-western district, and to open and make straight the way. "Q."

COST OF BOARD SCHOOLS.

THE Brighton School Board, in its triennial report, just issued, gives some statistics with regard to the cost of school buildings obtained from the towns enumerated below, which were selected for a similar return made to the House of Commons about two years since, but as the figures have somewhat altered during the interval, the statistics are given by the Board corrected to the present date, so far as they could be obtained. The amounts given are the average cost per head for sites and buildings.

Board.	Sites. £. s. d.	Buildings. £. s. d.	Total. £. s. d.
London	5 0 10	9 8 4	14 9 2
Huddersfield	0 15 8	10 2 7	10 18 3
Bristol.....	1 9 0	6 12 0	8 1 0
Nottingham .	3 0 0	9 0 0	12 0 0
Sheffield.....	1 15 0	8 0 0	9 15 0
Leicester.....	1 11 0	6 11 6	8 2 6
Manchester..	3 10 10½	9 11 2½	13 2 1½
Liverpool ...	1 16 0	8 17 5	10 13 5
Bradford.....	5 6 1½	17 7 10½	22 14 0
Leeds	2 12 9	9 0 0	11 12 9
Birmingham.	2 5 11	9 4 0½	11 9 11½
Newcastle ...	1 7 0½	11 5 8	12 13 2½
Brighton.....	3 14 8	8 12 7	12 7 3
Halifax	1 17 6	9 18 7	11 16 0

"THE STATUS OF ARCHITECTS."

SIR,—In answer to "Civil Engineer, late Architect," allow me to state my case. I was articled to a firm of architects with a large and varied practice in the country. A premium of 120*l.* was paid down for me, and I had to give my services for five years without any remuneration whatever. At the completion of my articles I attempted to practise for some little time on my own account, but very soon got tired of the not very interesting employment of daily dusting my drawing-board and square, and then looking wistfully out of the window waiting for clients. Occasionally I broke the monotony of my life by going in strongly for competitions. Once I very nigh succeeded, being third in a competition of over thirty. I then tried architect's assistant, but soon found that there was plenty of work, but little or no prospect. Unlike, therefore, your correspondent, I went in for the tempting and discriminating offer of the Horse Guards, and at forty years of age I have an income of about 150*l.* per annum as a first-class military foreman of works, and in two years more shall be entitled to a pension of 1*l.* 1*s.* per week for the remainder of my life; therefore, I contend I have saved the ratepayers from the burden of my support for the remainder of my existence, whereas your correspondent shadows forth that he may ultimately become a pauper. I think you will agree with me that he had better have taken the tempting and discriminating offer. The latter part of his letter I cannot answer, but doubtless there is another side to his statement there. F. W. E.

CARBURETTING GAS.

SIR,—I have read with pleasure the article by Mr. J. Gardner on the manufacture of gas in your last issue. He glances briefly at most of the processes by which, in modern times, particularly during the last few years, it was sought to enrich the quality of ordinary coal-gas, or to substitute the vapours of hydro-carbons. Nearly every one of these latter, as he justly observes, proved conspicuous failures; but he omits the mention of one process for carburetting ordinary gas with the heavy or dead oils of tar which has proved highly successful, and is the property of the Sim and Barff Company.

In proof of this statement, I would beg to refer you to the report of Professor Bloxam upon the carburettors used by that company, which he drew up at the close of a series of exhaustive experiments. In it he says that "these experiments appear to justify the conclusion that the illuminating power of coal-gas may be increased threefold by burning it from a carburettor charged with dead oil"; and farther on he gives fifty-four grains as the consumption of this dead oil in one of these carburettors burning 2·9 cubic feet of gas per hour.

The St. Pancras Station of the Midland Railway Company has been lighted by this method since the day it was opened in 1868; and it is beyond doubt that no other station in the kingdom can compare with this in brilliancy of lighting, combined with economy in the consumption of gas. Again, the committee appointed for selecting the best method of lighting the new Royal Exchange in Manchester have also adopted this after the most careful examination, and it has given the most complete satisfaction.

It is a fact that a process does exist by which large consumers of gas can effect a considerable saving at a minimum of cost and trouble.

FREDK. LIVINGSTONE.

TILING.

SIR,—In reply to your correspondent upon this subject I can, from a lengthened experience, confidently recommend that tiling should be *properly* laid in mortar at the top of the tile; for these reasons:—

1. The tiles lie solid. 2. The mortar will get hard, and resist the moisture, which neither hay, straw, nor moss will do; on the contrary, either will court it, and communicate it to the lath and timbers, and the result is early decay. Either will also harbour vermin, which mortar will not. Mortar will also keep out the snow and driving rain, equally if not more so than the others; because the latter in time becomes flattened, the result of continual moisture, and the draught passes over it, taking in snow or rain. If in very exposed situations, the mortar bedding fails to thoroughly resist the driving storms of rain, then point the tiles inside,—called in the country "torching." This is best done while the work is fresh, before the mortar with which the tiles are bedded is dry, as it will be done much easier, and more successfully. Lath and plaster to the underside of the rafters will certainly add to the warmth.

Tiles should not be bedded at the bottom, because in that case the frost will lift and break them. Moreover, as most tiles are at first more or less porous, if bedded at the bottom, the moisture could not find exit.

J. W.

P.S.—Do not entrust your tiling to inexperienced workmen,—a large proportion of the bricklayers know but little about it.

SIR,—In answer to your correspondent, a simple and effective method is to lath the rafters as in the usual method, and tile with nib tiles. If possible, dip the tiles into a tub of water to take off the dust, and take out the suction, then lay in the usual manner in good lime, and hair not too coarse; and, when you have laid from 4 ft. to 6 ft. up from the eaves, get under and point with the lime and hair that have pressed through the joints, and when the whole is done in this manner, and the lime and hair have got hard, put half Portland cement and half fine sand into a pail, with sufficient water to make it about the thickness of paste, keeping it stirred while applying it with a grass brush to the whole of the underside of the tiling, taking care to well fill in all the crevices and round the laths with the lime and hair.

WILLIAM PULHAM, Plasterer.

SIR,—I beg to submit the following opinion for the information of your correspondent, G. H. Palmer. First, the roof timbers should be strong, well supported, and of Gothic pitch; the double oak lath is best, and should be 3½ in. from top to top, the first lath 3½ in. from the face of the building. For brick, stone, or concrete buildings no eave-lath should be used. The under eave of ⅜ tiles, 7½ in. long, and tile width should be bedded, the hollow side up, solidly on the top course of brick or stone, and jointed from top to bottom, and should have 2½ in. projection from the face of the wall, and reach 1 in. above the first lath. When dormer windows or other obstructions interfere with the eave, the tiling should be carefully set out, that the bond may work correctly over such obstructions. The tiling should then be started with a half tile or straight from the right-hand side as you face the work; should in all cases be bedded on as much as it covers of the under tiles, and jointed the whole length. The mortar should be composed of fine, clean, sharp sand, and rather more than the usual quantity of lime. The tiles should be used damp, and the bed and long joints kept as close as possible. In no case should a narrow tile be used; and to avoid this and keep the bond true, it is necessary to gauge the width of a few of the tiles, selecting wide ones as No. 1, and narrow ones as No. 2. The mediums go with the ungauged tiles. By judicious use of these gauged tiles not only may the bond be kept, but the design (when necessary) worked with geometrical accuracy. To keep tiling clean when in progress a little clean dry sand should be kept strewn upon the work. When the bed joints are fairly set they should be struck with the thick end of a lath, and finely swept along the courses with a birch-broom. When tiling is executed as above, hay, felt, boards, or moss may safely be dispensed with, without fear of snow or rain drifting in. When an air-tight job is required, the *tiling itself* might be rendered on the inside between the rafters. J. H. JOHNSON.

THE ORIGIN OF TOBIN'S SYSTEM OF VENTILATION.

SIR,—It is perhaps hardly worth while to revive the Tobin question, but I have, whilst referring to your past volumes, come across the following passage, and cannot resist the temptation to recall it to your notice. It is an extract from a work called "The Gentleman's Stable Manual." In treating of the ventilation of stables, it directs certain openings to be made in the walls, and then continues:—"Each opening must terminate in a square tube, placed within the stable. Each tube must be 5 ft. high, having an upright position, and secured to the wall by means of holdfasts. They should be 5 in. or 6 in. square, having three sides of wood, the fourth being formed by the wall against which they are fixed. On the top of every tube fix a thick plate of zinc, well perforated with small holes." Is not this "Tobinism"? It appeared in *The Builder*, November 5, 1859. P.

"USE OF CHALK IN BUILDING."

SIR,—Many years ago my client was desirous of erecting a lodge to his park, in which he had the opportunity of quarrying chalk, and we determined to construct the walls above the foundations with that material.

For this purpose chalk was dug out of the lower beds in the autumn, and stacked on its natural bed under cover, but exposed to the wind during the ensuing winter. In the spring it was dressed, and the walls were built, it being again laid on its natural bed. The external face was covered with "rough-cast." The last time I saw the lodge, a few years back, it was standing well.

The result of our experiment did not lead us to think we had adopted an economical scheme on account of the large amount of chalk necessarily quarried above that ultimately available for use. JOHN TURNER.

THE LARGEST ROASTING-JACK IN ENGLAND.

MESSRS. FEETHAM, of Soho-square, are at present engaged in fitting up a jack for the kitchen of the residence of the Duke of Westminster known as Eaton Hall. It is 22 ft. in length. The motive power is water, which is conveyed from the cistern to the water-wheel by a ¾-in. pipe. The wheel is 4 ft. in diameter and 5 in. in breadth, and it sets in motion six horizontal and four vertical spits. Over the wheels which communicate motion to the spits are five oil-boxes. The jack is capable of cooking about a ton of meat. It is entirely under the control of the cook, who can regulate its speed by simply turning a water-tap. The wheel will not be hidden from view, and will be enclosed in a glass case, and surmounted by an arch in ornamental brickwork. The design, with some few alterations, is that of Mr. W. Eden Nesfield, who has also supplied working drawings of the machinery.

Death of a Belfast Builder.—The death is announced of Mr. Thomas M'Keown, builder, of Grosvenor-street, Belfast, at the comparatively early age of 48. The contracts for the erection of the Masonic Hall, Arthur-square, and of the Theatre Royal, were entrusted to Mr. M'Keown.

BELL FOUNDING.

In reference to the details on this subject published in the *Builder*, p. 1127, some interesting intelligence reaches us from France. Some experiments have been carried out by Messrs. de Reolz, Montchal, and De Fonteuay, on the application of the new metal of phosphuret of copper and phosphorised bronze to various industrial purposes. Phosphor-bronze is now well known as the material from which the guns of the Austrian artillery are being made. The above-named gentlemen have discovered that bells cast of this metal are much superior to those of ordinary bronze. Two bells, presented by them to the French Academy of Sciences, were tested before that society. One made with phosphuret of copper, in the proportion of $\frac{8}{1000}$, gave sounds much superior in acuteness, intensity, and tone, to those produced by a bell of ordinary bronze,—seventy-eight parts copper and twenty-two parts tin. Its composition was also more homogeneous. A bronze alloy with the proportion of $\frac{8}{1000}$ of phosphorus sustains friction well, and can be indefinitely recast without appreciable loss of bulk.

The clear sounds produced by glass vessels when struck are well known. The brittleness of the material, however, prevents its use for this purpose. It would be interesting to discover whether the "toughened glass" of M. de la Bastie could be made available for the manufacture of bells. If the clearness of tone is not affected by the toughening process, experiments in this direction are worth trying, and we would suggest the idea to those practically engaged in the subject.

A CYCLOPEAN HOUSE IN MYCENÆ.

In the course of the accounts sent to London of the excavations now going on in Mycenæ, Dr. Schliemann says:—To the south of a circular parallel double row of sepulchres my excavations have brought to light a vast Cyclopean House, which, so far as it has been uncovered, contains five chambers intersected by four corridors of 4 ft. breadth. The walls still retain here and there their clay coating, which, however, shows nowhere a trace of painting. The walls are from 2 ft. to 4 ft. 6 in. thick, and one and the same wall is in some places 6 in. to 8 in. thicker than in others. The largest room is 18 ft. 6 in. long by 13 ft. 6 in. broad, and its east side is cut out in the rock to a depth of 1 ft. 4 in. As well below this as below the adjoining room a deep cistern is cut out in the rock; the water is conducted into it by a cyclopean water-conduit, which leads down from the hill. Although there are no windows in the house, and although the scanty daylight through the doors must have been still diminished by the cyclopean circuit wall, which is only separated from the west side of the house by a 4 ft. broad corridor, yet this seems to have been the royal palace, because no building in a better style of architecture has been found yet in the Acropolis. Certainly his Royal Majesty was not comfortably lodged in such a house, but comfort being unknown, it was unmissed. On the other hand, the objects discovered in this house prove that the family which occupied it had pretensions to luxury. In one of the chambers, at a depth of 23 ft. below the surface, was found a finger-ring cut out of a splendid white onyx, with a seal, on which are incised two animals without horns. At first sight they certainly appear to be hinds, but attentive examination shows that the artist's intention had been to represent cows; both turn round their heads and look on their calves, which suck the milk from their udders. Though in a very archaic style, the incision is nevertheless well done, the anatomy of the animal is observed with accuracy, and one feels astonished how it ever was possible to do the work without a magnifying glass. In seeing the incision and thinking that it belongs to an antiquity by centuries preceding Homer, we are ready to believe that all the works of art mentioned by Homer—the wonderful shield of Achilles, the dog and the hare in Ulysses' mantle-clasp, Nestor's goblet, &c.—all existed at his time, and that he merely describes what he saw with his own eyes. There are further found in the cyclopean house perforated convex pieces of agate or serpentine, derived from necklaces—some with an incised spiral ornamentation, others with incised ornamentations of horses or deers. There was also found a formstone of jasper, showing on all six sides most fantastic types for casting gold or silver ornaments; it had also a type for casting those frequently-found curious conical objects of a black glassy substance, with spiral lines and a perforation on each side for suspension with a string. Further on some beautiful axes of jasper or green stone, many whorls of blue stone, and a great many splendid terra-cottas, of which the large vases with two or three handles, the ends of which have been modelled into the shape of crocodiles, deserve particular attention. The whole vases are covered with representations of warriors of a dark red colour on a light yellow dead ground, wearing coats of mail, girdle belts, κνημίδες, sandals, and either shaggy helmets, with stings or pricks like the skin of a porcupine, or helmets with long crests. From the front side of the helmet always protrudes an object in form of a horn. The warriors are invariably armed with large round shields, the lower part of which is always cut out in form of a crescent; also with lances.

MONUMENTAL.

Edinburgh.—It will be remembered that Mr. John Hutchison, R.S.A., had just completed, towards the end of July last, his statue of the late Mr. Adam Black, when, by an unfortunate accident, the model was almost entirely destroyed. It is stated that, in the short interval which has since elapsed, the sculptor has made good the damage, and has once more got his work nearly ready for casting. While the limbs and torso of the statue were completely wrecked, the head, in which the artist was considered by Mr. Black's friends to have secured a telling likeness, happily escaped without injury. It has, therefore, only been necessary to remodel the figure from the neck downwards.

Denbigh, North Wales.—On Thursday, Nov. 23rd, a statue in honour of Dr. Evan Pierce, coroner and magistrate of this town, was unveiled by Sir W. Grenville Williams, bart., M.P. The statue is of Sicilian marble, of colossal proportions, and rests on a column 50 ft. in height. The doctor is represented and clothed in a professor's gown, in the act of addressing an assemblage, the right hand resting in folds of drapery, the other holding a scroll. It is the work of the sculptors W. & T. Wills, of London. Mr. Underwood was the architect, and Mr. Jones, of Rhyl, the builder.

Glasgow.—Messrs. Stewart, McGlashen, & Son, of Edinburgh, have just completed a monument for erection over the grave of the late Rev. Dr. Buchanan, in the Necropolis, Glasgow. The monument takes the form of an Ionic cross, the pedestal of which is 3 ft. 3 in. in height, and the cross 8 ft. 9 in. in height, making the total height from the ground 12 ft. The whole design, which is in keeping with the early sculptured crosses of Scotland, has been executed in Sicilian marble, chastely but artistically worked. The front and edges are enriched with ornament of a Celtic type.

Kidderminster.—Well-nigh forty years have flown since the establishment of the penny-postage system, and only now when Sir Rowland Hill, the organiser of the reform, is in his eighty-fifth year, is it proposed to erect a statue in his honour. The movement has begun in Kidderminster, his native town, where, at a public meeting, it has been determined to raise a substantial memorial, at a cost not exceeding 2,000*l*.

AN INDIAN PALACE.

The *Times of India* gives a description of Scindiah's new palace at Gwalior in which he entertained the Prince of Wales when his Royal Highness visited Central India, in the course of which it says:—"There is no doubt that the Maharajah's new palace and grounds at Gwalior are the handsomest of their kind in India. The Prince and suite pronounced this opinion, and in all probability Gwalior will, in time, attract sightseers in much the same way as Delhi, Lucknow, and Agra. The building has been erected in the Phoolbagh, and has been named Jye-in-dur-bhovan, or Abode of the Illustrious. The palace alone covers an area of 124,771 square feet, exclusive of the inner square, which is 321 ft. 6 in. by 321 ft. The palace is double-storied throughout, and in some places has three and four stories. Its highest parts measure 106 ft. from the ground. The first story is of Tuscan, the second Italian Doric, and the third Corinthian architecture. The interior of the durbar-hall measures 97 ft. 8 in. in length, 50 ft. in width, and 41 ft. in height. Its roof is arched with solid stone slabs, each measuring 21 ft. in length, which enabled the architect to make the ribs so prominent. They run from one end of the hall to the other, and rest on each end on double Corinthian columns, which form a colonnade all round the interior of the hall. The room is magnificently painted, and the whole hall is lavishly gilded. Upwards of 3,000,000 gold leaves were used for this work. The walls have been almost hidden by gigantic mirrors, and the huge chandeliers which hang in the centre are the largest ever imported. All the glass fittings are by Messrs. Osler & Co., even to the grand staircase at the main entrance of the durbar-hall. This staircase is entirely of glass and marble. In addition to the large ruby chandelier which hangs between the wings of the staircase, statuettes and the other *objets de vertu* adorn the room, which is roofed with stone slabs, each 30 ft. in length. The room on the opposite side is roofed in the same way. The two rooms which flank the durbar-hall are furnished superbly. One is the banquet-hall, and the other contains the costly gold and jewelled throne and canopy, and the portraits of her Majesty and the Prince and Princess of Wales. This room is a sort of ante-room to the durbar-hall. Another room contains a life-sized oil painting of his highness Scindiah, and has some very costly fittings. All the apartments are beautifully carpeted. The palace itself cost a little above 11 lakhs of rupees, but the garden-walls, iron railings (all cast in Gwalior), the garden furniture, glass staircase, chandeliers, have cost nearly nine lakhs more. The area of the garden and palace park is above one square mile. The grounds are tastefully arranged, and the water runs here in a stream, falls like a crashing cataract there, and springs up in a hundred places in lively fountains. The water which feeds the garden stream comes down in a canal for a distance of fifteen miles. The whole plan of the palace and park, and the construction of them, the plan of the watershed, and the construction of the canal,—in short, every bit of the work, has been done by Major Michael Filose. . . . . The Prince of Wales spoke so highly of the palace, and so often broke out in enthusiasm about the picturesque park, that after the departure of his royal visitor Scindiah made Major Michael Filose a present of a lakh of rupees."

DRAINAGE WORKS.

Arnold Local Board of Health.—At the monthly meeting of this Board, held at the Public Offices, Arnold, Mr. Phipps in the chair, Mr. Fred. Jackson, of Nottingham, the consulting engineer of the Board, attended, and submitted plans and sections of the proposed sewerage works to be constructed in Arnold, and to join the main sewer in Church-street, Basford, in connexion with the Leen Valley sewerage scheme. The estimated cost of the works is 6,500*l*. The plans provide for flushing near Queen-street, Gedling-road, and at Daybrook. It was agreed that the works be passed, and that application be made to the Local Government Board to lend the money, repayable in fifty years.

PARTY STRUCTURES.

Sir,—I shall feel obliged if you will kindly let me have a brief reply to the following questions:—

Jones, under sec. 88, clause 7, and sec. 83, clause 7, of the Metropolitan Building Act, pulls down the party fence wall separating his garden from Smith's, and, under sec. 83, clause 6, raises same for the purpose of erecting stables on his land. Some four or five years elapse, when Smith wants to build stables, and he serves notice on Jones, under s. 83, clause 8, of his intention to cut into the party structure to insert corbels to hold plates to support his floor. Query, Is Smith bound to pay Jones for a moiety of the wall built by him in excess of the height of the old party fence wall? and, if so, under what Act?

F. H. Basley.

*** Yes. It belongs to Jones, and Smith, if he make use of it, must pay his proportion of the value of it, Jones could recover, we apprehend, at common law. As a matter of fact, a party garden wall is not a party-structure under the Metropolitan Building Act.

New Waterworks for Galashiels.—The heavier part of the works for introducing a water-supply to Galashiels has been undertaken by Mr. James Young, Roslin. The contract comprises the large compensation reservoir at Stantling Crags, and the clear-water reservoir at Knowes Dean, as well as the intake dam and piping from Caddon to Knowes Dean. The contract price is stated to be 17,788*l*. 11*s*. 11½*d*. It is believed the total cost of the works will not exceed the original estimate of 30,000*l*.

A NEW PARK FOR PARIS.

THOUGH possessing so many parks and public gardens, not to mention innumerable broad streets and boulevards resplendent with foliage, the Parisians are not yet satisfied. Another park is in the course of construction, and more than three hundred workmen are employed over the task. For this purpose a sum of 12,000*l.* has been at the disposition of M. Alphand; the various roads and paths are already traced, the greater part of the trees are planted, and the workmen have begun to dig out the three artificial lakes, which will be among the chief attractions of the park. The place selected for these pleasure-grounds certainly wanted improvement. Its general aspect and associations were not of the most pleasant description. The new park is situated to the south of Paris, on the hillocks which form the left bank of the Bièvre, and from whence a splendid view can be obtained of the Observatory, the Val-de-Grace, the Panthéon, Paris, and the hills which shelter the north-east of the city. The park will extend over more than than sixteen hectares of land, and will be entered by four gates, giving respectively one to the Boulevard Jourdan, Rue Nansouty, Rue Gazan, and the Avenue Reille; but the principal entrance will face the prolongation of the Boulevart d'Enfer. The portion of this thoroughfare, extending from the Sceaux Railway Station to the park, will henceforth be called the Avenue de Montsouris. The park also will be named after the quarter on which it is laid out, notwithstanding the dismal significance of the word. Montsouris was formerly a miserable little hamlet called Mange-Souris; for the inhabitants were so poor that they were described as feeding on mice. It was here also that the celebrated giant or brigand Isoire, the hero of so many romances, was buried in 1664. His tomb, one of the curiosities of Paris, was reconstructed by Antoine Cabot in 1777. This place, indeed, has always been associated with the burial of the dead. All ghosts and goblins, giants and other mystic personages of ancient legends are generally made to issue from the Tombe Isoire, and the superstitious Parisian looks in the direction of Montsouris when he anticipates some supernatural apparition. Nor is it difficult to account for these delusions. The chief entrance to the catacombs is at Montsouris, and it is here that all the bones collected from the Cimetière des Innocents and other burial-grounds were brought and deposited.

These gloomy associations will, however, be soon obliterated by the exceptional attractions of the new pleasure-grounds. Besides the beauty of the flowers, and the verdure of the park, visitors will be able to examine the Palais du Bardo, which was one of the curiosities of the Exhibition of 1867, and now serves as an observatory. This and other observatories close at hand have been established by the War Department to be used as special laboratories, to facilitate geographical studies among naval and military officers. Altogether, therefore, the Parc de Montsouris will be to the Parisians who live south of the Seine what the Parc des Buttes de Chaumont is to the inhabitants of the northern districts. So much has already been done to increase the beauty, the luxurious aspect, and sanitary condition of the western or wealthy quarters of Paris, that we cannot but welcome this effort to place a garden of health in the midst of the poorer dwellings of the industrial classes.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-sixth election of pensioners on the funds of this Institution was held on Thursday last at Willis's Rooms, St. James's, Mr. Charles B. Waller, president, in the chair. There were two vacancies,—one for a man and one for a woman. The following is the list of candidates, with the number of votes recorded for each, viz.:—Henry Atkins (third application), 4,522; J. T. Brown (first application), 838 (including 52 votes allowed in consideration of Mr. Brown having been a subscriber to the Institution for thirteen years); Eleanor Winter (second application), 2,098; Susannah Webb (second application), 1,644; Elizabeth Thorn, 1,277; and Ann Noyes, 193. The successful candidates were therefore Mr. Atkins and Mrs. Winter.

Votes of thanks to the scrutineers and the chairman concluded the proceedings of the election, after which Mr. Thomas Stirling was presented with a piece of plate, subscribed for by the members of the committee of management, in recognition of the zeal and efficiency with which he discharged the duties of honorary secretary to the Institution for a period of several months after the death of the late secretary, Mr. A. G. Harris.

At the next election of pensioners, there will be a larger number of candidates elected.

Mr. F. W. Keeble has accepted the position of hon. secretary to the annual ball of the Institution, which will take place on the 18th of January, 1877.

SURVEYORSHIP ITEMS.

Chiswick.—At a meeting of the Chiswick Improvement Commissioners, held on the 22nd ult., Mr. H. O. Smith was elected engineer and surveyor, at a retaining salary of 300*l.* per annum, with no restrictions as to private practice, but to hold no other public appointment without their consent in writing. There were ninety-six applicants, and these were reduced to eight, from which the final selection was made.

Croydon.—From six candidates who had been selected by the General Purposes Committee of the Croydon Local Board of Health, Mr. Laffen has been chosen to fill the office of Assistant Surveyor.

A NEW HALL IN KENSINGTON.

AT the vestry on Tuesday night, Sir W. Fairfax in the chair, a report was brought up with reference to particulars for the guidance of architects in designing plans for the new building to be erected for the vestry and its officers. The style of architecture agreed upon is Classic; the front walls may be brick and stone, but stucco is not to be used. The estimated cost (exclusive of furniture) is not to exceed the sum of 18,000*l.*

Mr. Boutcher wished to know what the vestry meant by the term "Classic."

Mr. Davis said it was put in to exclude Gothic.

After some discussion with regard to the style of architecture, it was resolved that it should not be either Gothic or Elizabethan. With a few verbal alterations the particulars were adopted.

THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM-ROAD.

SIR,—We notice the description of the above bridge in your issue of the 18th ult., and request you to be good enough to notice in your next that this firm supplied and erected the whole of the iron-work. It is not correct to say, "There are mains formed in the girders 3¼ in. diameter."

The novel feature of utilising the two main girders to serve as gas-mains emanated from, and has been carried out by, us. We have constructed these girders so as to be quite gas-tight; they, of themselves, serve as gas-mains, and the passage in them for the gas is 3 ft. by 1 ft. in the clear, = 3 ft. square in area.

MATT. T. SHAW & CO.

RICHMOND PARK.

SIR,—I have read your article on Richmond Park, in last week's *Builder*. I think it quite time that the Office of Works had the entire control of the park, and that preservation of game in a public park so near London was abolished. The enclosures should be thrown open to the public. Certain portions of the park should also be set apart for football, cricket, and other athletic sports. I trust you will assist to obtain such a desirable change in the management. A RICHMONDITE.

PHILADELPHIA EXHIBITION AWARDS.

SIR,—In your last issue is a letter signed "G. H.," which speaks of the productions of certain particularised exhibitors. This would have been of more value had the writer given his name, which would possibly have satisfied us to his judgment and claim to speak with authority on this subject. We observe that our exhibit is not referred to by your correspondent, and we take a course unusual with us, in asking your permission to state that we are recipients of two medals for metal work; that a portion of our exhibit has been purchased by the Pennsylvania Museum and School of Art, and that that Institute has signified its desire that some further portion thereof may be placed on loan with them.

HART, SON, PEARD, & CO.

The District Surveyorship of Bethnal-green (East).—This office, vacant by the death of Mr. R. Culver James (as announced in the *Builder* last week), will be filled up on Friday next, the 8th inst., by the Metropolitan Board of Works. There are many candidates for the appointment.

ACCIDENTS.

A TELEGRAM received at New York, on the 19th ult., announces that the floor of a crowded theatre at Sacramento, in California, fell in on the previous night. Seven persons are said to have been killed and 100 injured, many of the latter fatally.

On the 17th ult., while a number of men were at work upon a scaffold on the spire of the new Wesleyan Church, Windsor, 90 ft. high, one of the supports broke, precipitating three men from the roof. Two were dreadfully injured, one, it is feared, fatally. Both were removed to the Royal Infirmary.

CHURCH-BUILDING NEWS.

Warthill.—The new church of St. Mary, Warthill, near York, has been consecrated by the Archbishop of York. The church has been erected from designs and under the direction of Mr. J. G. Hall, of Canterbury, and is in the early Geometrical style of architecture. The building consists of a nave 40 ft. long by 19 ft. wide, chancel 18 ft. long by 16 ft. wide; on the north side is the vestry, and on the south side a tower, under which is the principal entrance to the church. The roof to the nave is open timbered, stained and varnished, with moulded ribs resting on stone corbels. Sitting accommodation has been provided for 120 persons. The exterior of the building is faced with grey or mottled brick, with Yorkshire stone dressings to the buttresses, body of tower, and windows. The roofs are covered with thick Welsh slates. The tower contains three new bells, cast by Messrs. Warner & Sons, of London. The whole cost of building the church has been borne by Mrs. and Miss Agar, of Brockfield, near York. The contractors were Mr. Clark for the masonry, Mr. Rookledge for all the joinery and carving, Mr. John Nichols for bricklaying, and Mr. Hodgson for the coloured and plain glazing.

Felkirk.—The parish church of Felkirk, near Barnsley, has been re-opened for divine service, after having been closed for twelve months. During that period it has undergone a process of renovation. The galleries have been removed, and the high-backed pews of the nave and aisles replaced by open benches in oak. The walls were in a tolerably good state of repair, and it has not been found necessary to rebuild any portion of them. The aisle roofs have been completely restored in substantial oak. The pulpit, which was formerly in the nave, has been placed against the north pier, and the reading-desk on the opposite side. A carved oak lectern, the gift of Mr. Ramsbottom, stands midway between them, at the top of the nave. The total cost of the alterations amounts to 2,600*l.*

Bryn Eglws, Denbighshire.—The parish church of Bryn Eglws was re-opened on the 31st ult., after restoration under the direction of Mr. Arthur Baker, architect, at a cost of nearly 1,000*l.* Bryn Eglws is situate in a romantic valley at the extreme end of the Clwydian range of hills. The old church and private chapel connected therewith, which is the property of the Yale family, of Plas yn Yale, date back beyond the Conquest.

Birmingham.—An effort is now being made to restore, or rather to completely rebuild, St. Luke's Church, Bristol-street, Birmingham, any attempt to patch or repair it being declared to be utterly useless. In its present condition it is said to be positively dangerous, and both Mr. Chatwin, the architect, and Mr. Briggs, a builder, who have been consulted on the matter, agree that nothing short of taking it down will effectually meet the case; for although erected only a little over thirty years ago, the sandstone of which it has been constructed is completely decayed. Mr. Chatwin has prepared designs for a new structure, and these having been fully approved of, all that is now required is the necessary amount of money for carrying on the work. Altogether the rebuilding will cost about 7,000*l.*

St. Mary Cray.—The chancel of the parish church of St. Mary Cray has been re-opened, after restoration. The church, which has many points of interest, and dates from about the end of the thirteenth century, was partially restored in 1862, but much remained to be done in the chancel. In June last the Ecclesiastical Commissioners undertook to completely restore the chancel, and this has now been done under the direction of Mr. Ewan Christian, the Commissioners' architect. The south wall was found so rotten (the church is built of flint throughout)

that it had to be rebuilt all but about 100 square feet; in this part has been opened out a perfect hagioscope. The works have been carried out by Mr. Bridge, builder, of Maidstone.

Epsom.—Christ Church, Epsom, was consecrated by the Bishop of Winchester, on the 17th ult. The church has been erected on a piece of waste ground at Epsom Common, in the manor of Horton, and is situate about three-quarters of a mile to the south-west of the town. It is built in the Decorated Gothic style, of rough whole flints, dug from the neighbourhood, with Bath stone quoins and dressings, and measures 120 ft. by 45 ft., intended to be increased at some future date to 56 ft., by the addition of a south aisle, and a tower has yet to be constructed. The sittings number 464, all plain and open, and of which 400 are to be free. The flooring in the body of the church is plain wooden, save the aisles, which are paved with Godwin's quarry tiles, while in the fine chancel encaustic tiles are laid down. Nearly the whole of the fittings, including an organ, built by Hill & Sons, have been given by members and friends of the congregation. The edifice was designed by Mr. Blomfield, and the builders are Messrs. Adamson & Sons, of Putney. The total cost of the structure has been 6,500*l.*

Pebmarsh.—The parish church of St. John the Baptist, Pebmarsh, has just been restored at the hands of Mr. Harcourt Runnacles, of Halsted. The church formerly belonged to the Priory of Clare, in Suffolk, founded by Elnric, son of Wighar. In the reign of Edward the Confessor, Gilbert de Clare, son of Richard Fitz Gilbert, Earl of Brion, gave the Priory with all its Prebends to the Abbey of Bec, in Normandy, about the year 1090.

Polegate.—The new church of St. John, in the hamlet of Polegate, Sussex, was opened for worship on the 10th ult. It is built externally of Kentish rag, Bath stone being used for the facings and tracery of windows, the internal walls being of red brick. The roof, an open timbered one, is covered with local red tiles, and a tower and spire are situate at the north end, the lower part of the tower forming a porch entrance. The extreme inside length is 82 ft., and width, 26 ft., the chancel being 24 ft. by 20 ft. The height of the nave is 36 ft., the chancel 30 ft., and the spire 63 ft. The plan consists of a nave, with open seats to accommodate 210 persons; a chancel, fitted with choir-stalls, &c.; a vestry adjoining the chancel, with space for an organ at the back of the choir-stalls on the south side. The aisle and open spaces of the nave and the floor of the chancel are paved with Minton's tiles. The heating is effected by means of Gurney's patent stove apparatus. Messrs. Blessley & Spurrell, of Eastbourne, are the architects, and Mr. Peerless, of the same town, was the builder, the total cost being 2,620*l.*

Hyssington.—In the summer of last year it was determined to pull down the old church and to build one as nearly as possible on the same site. The old church was a plain rectangular building, with rubble walls, 5 ft. thick, without a single architectural feature worthy of preservation. The roof was covered with heavy old stone tiling, which was rapidly breaking the back of the church. The interior consisted of a nave and belfry, divided by a lath-and-plaster partition, and the arrangement and fittings quite accorded with the generally dilapidated state of the building. The new church is in the Late Decorated style, and consists of nave and chancel under one roof, and a small vestry. The distinction between the nave and chancel is marked by a buttress, and the chancel is further distinguished by a string-course. The old bells (one bearing the inscription *Sancta Etheldreda ora pro nobis*) have been fixed in a double bell-cote. Internally, the chancel roof consists of carved rafters of pitch-pine, boarded diagonally on the upper side, and the nave roof is similarly boarded on the top of plainer rafters. The chancel floor is laid with Godwin's encaustic tiles, and the nave floor with Corndon flag. The old carved oak Jacobean pulpit and the sexagonal font have been remounted and retained, at the expense of the late vicar. The new church was consecrated on the 24th ult.

Chudleigh Knighton (Devon).—The little church of St. Paul, built by Sir G. G. Scott, R.A., some six-and-thirty years ago, has just been restored. Cruciform on plan, and consisting of nave, chancel, and transepts, the church was built entirely of flint, with limestone dressings. It is in the Early English style, all the windows being lancet-headed ones. A general renovation being necessary, designs were prepared, and have been carried out under the supervision of Mr. R. Medley Fulford, architect, Exeter. The various defects which three dozen years have brought to light in the building have received careful attention, and the whole of the body of the church has been reseated throughout with open pitch-pine benches. A new pulpit is in the same material. There is a low chancel-screen with traceried panels and carved terminations, also in pitch pine, and forming a unique and good feature. The avenues are laid with encaustic tiles. The communion-table has been elevated, and is now reached by four steps. Behind it is a carved Bath stone reredos. This is divided into three compartments, the central one being gabled and further ornamented by the introduction of a large foliated cross in polished alabaster. The backs of the three panels have sgraffito work introduced into them, and this style of ornamentation is, we believe, to be used in other parts of the church. A new stained glass window over the table is by Mr. Drake, of Cathedral-yard, Exeter. The carved work and the reredos are by Mr. Harry Hems. The contractor for the whole of the works was Mr. John Mills, builder, of Newton Abbott.

Wanstrow (Frome). — The parish church of Wanstrow, near Frome, has been recently repaired and altered to a considerable extent. New roofs have been put throughout (the church in plan consists of nave and chancel, north and south transept, tower, chancel, aisle, and a new vestry), the west wall and the chancel arch taken down and rebuilt, the chancel rebuilt, and a great portion of the south transept and chancel aisle also. The tower being modern has scarcely needed any repairing. The roofs are of fir timber, with wagon-headed wood ceilings under, panelled and cusped, the nave and chancel ceilings being the most ornamental. Externally, the new roofs, like the old ones, are covered with the stone tiles so characteristic of the neighbourhood. The whole of the old pews, also west gallery, have been removed, new floors put, and open square moulded-end benches put. The church will now accommodate 160 worshippers. The walls have also been re-plastered. The gangways of the nave and north transept have been paved with adamantine clinker bricks, banded and bordered with slate. The chancel, south transept, and chancel aisle are paved with encaustic tiles. In the new chancel a great deal of the jambs of the old windows has been reused, and the ancient piscina discovered embedded in the walls has been reinstated, in proper position. A small vestry has been added on the north side of the chancel, roofed by a lean-to. Traceried wooden screens divide the south transept and chancel aisle from the rest of the church. New doors of different design have been placed to each entrance. There is a new pulpit, with perforated oak panels in the upper part, and a Ham-hill stone base; the font, with its square moulded and carved panels on each side, is of Corsham Down stone. In style, the church was Early Decorated, the unusually low pointed segmental arches being remarkable. The church is warmed by one of Porritt's underground stoves. The works have been carried out by Mr. John Vallis, builder, of Frome, Mr. Ferrey, F.S.A., and Mr. Edmund B. Ferrey being the architects. The total cost has been about 1,500*l.*

WINCHESTER HOUSE.

The recent purchase of this building by the Government was announced in No. 1750 of the *Builder*. In the recent biography of the late Dr. C. R. Sumner, D.D., by his son, it is explained how this house became the property of the bishop, and his town residence as prelate of Winchester. In Mudie's "History of Hampshire," vol. i., pp. 63–4 (1839), it is stated that "The palaces erected in Winchester have been subject to the same fluctuation and decay as monasteries and fortified castles. To the southward of the ivy-clad remains of Wolvesey Castle, and near the chapel, a structure of modern date, Bishop Morley began in 1684 a splendid palace for an episcopal residence. The building proceeded slowly, and was completed by Bishop Trelawny, the successor of Morley; and after his demise, in 1721, seven years after, the laying of the foundation, and scarcely ten years after its completion, it was partially in ruins. The bishops having preferred the castle of Farnham as their principal country residence, Bishop Morley's palace has disappeared, except one of its wings, used as an occasional residence of the prelate." Mr. Joseph Moser, A.D. 1803, a notable antiquary, stated that at Bishop's Sutton, A.D. 1773, were ruins of a large building supposed to be the walls of a former palace of the bishops of Winchester, one of ten palaces or manor-houses, at Wolvesey, Southwark, Waltham, Marwell, Esher, Farnham, Wargrave, Taunton, and Highclere. Waltham Palace, at Bishop's Waltham, is described and engraved in Warner's "History of Hampshire," vol. i., p. 266, and in Mudie's, vol. ii., pp. 170–2. It was founded by Bishop de Blois, in the middle of the twelfth century. William of Wykeham repaired and rebuilt this edifice. The remains of the hall indicate a length of 66 ft., a breadth of 27 ft., and a height of 25 ft. In Warner's work, the remains of Wolvesey Castle, and the chapel of Wolvesey, are engraved (two views) and described (vol. i., pp. 270–1) at length.

At the commencement of the twelfth century, Giffard, Bishop of Winchester, erected a residence in Southwark for this see, which had a park of sixty or seventy acres. A.D. 1642, this palace was abandoned, and A.D. 1663–4, Bishop Morley purchased a new Chelsea mansion from the Duke of Hamilton, at the price of 4,250*l.*, pursuant to an Act of Parliament. A.D. 1821, Bishop Tomline, by virtue of an Act of Parliament, sold this residence for 6,000*l.*, described and engraved in the *Gentleman's Magazine*, vol. xcii., p. 516; and when Dr. Sumner became bishop of this see, A.D. 1827, the residence in St. James's-square was bought with the proceeds of sale and of timber. Until now it has remained as the town residence of the bishops of this diocese. Wolvesey and Farnham Castles were erected by Henry de Blois. At Wolvesey Queen Mary lodged before her marriage with Philip of Spain. It was destroyed by Sir W. Waller's army during the civil war. See Milner's "History of Winchester," vol. ii., chap. v.; and Leland, Itin., vol. iii., p. 99. In Mr. Cassan's "Bishops of Winchester," vol. ii., the palaces at Waltham, Farnham, Winchester, Chelsea, and Southwark are described at length. Farnham Castle, built by De Blois, belonged to this see originally, A.D. 1129. It was seized by Louis, the Dauphin of France; but shortly afterwards Henry III. recovered the castle. In 1642 it was injured by the rebels, and subsequently it was dismantled as a fortress. The *Gentleman's Magazine*, N. S., vol. ii., p. 372 (April, 1839), contains an engraving of another Winchester House, then recently destroyed. But this ancient building had belonged to the Paulets, the site having been given by Henry VIII. to the 1st Marquis of Winchester. The land had belonged to the Austin Friary until the Reformation. The outer gate shown in this view, with its shell-formed pediment, is stated to have been an example of the massive entrance-porches to old London mansions. These buildings were on the west side of Broad-street, and on the south side of Winchester-street, in the City of London. The *Gentleman's Magazine*, vol. lxi., p. 1160 (1791), and vol. lxxxiv., p. 529 (1814), contain an engraving of Southwark Palace, showing that it must have been an extensive building. Farnham Castle is engraved in Manning and Bray's "History of Surrey," vol. iii., pp. 134–5. The three views show, respectively, the castle, the keep from the south-west, and an inner room, then (1814) used as the servants' hall. Chr. Cooke.

Books Received.

The Complete Practical Machinist. By Joshua Rose. Philadelphia: Henry Carey Baird & Co. London: Sampson Low, Marston, Searle, & Rivington. 1876.

This is essentially a book for those who are usually called "practical" men,—workmen,—mechanics. It treats of tools and how to use them, in lathe work, vice work, drills, taps and dies, hardening and tempering, &c., illustrated by many excellent engravings; and thus far it conveys instruction how to do good work in a machine-maker's shop. Towards the end of the book is an explanation of the action of the slide valve, which is very plainly stated.

A Treatise on Lathes and Turning. By W. Henry Northcott. 2nd Edition, with 338 Illustrations. London: Longmans, Green, & Co. 1876.

The author is a member of the Turners' Company. In addition to numerous illustrations of parts of machines, and of tools, views of complete lathes are given from photographs furnished to the author by Sir Joseph Whitworth & Co.,

Messrs. Fairbairn, Kennedy, & Naylor, and other eminent makers. Besides the ordinary operations of turning, boring, drilling, planing, wheel-cutting, &c., ornamental turning, cutting, and carving, are treated of to some extent; and the author promises another volume which is to be devoted exclusively to examples of plain and ornamental turning.

The Timber Merchant's and Builder's Companion. Third edition. By WILLIAM DOWSING (Timber Merchant, Hull). London: Crosby Lockwood & Co. 1876.

CONTAINS new and copious tables of the reduced weight and measurement of deals and battens of all sizes, from one to a thousand pieces; also the prices per foot relatively to the prices per Petersburg standard hundred; and other useful and valuable information concerning foreign timber.

Wood Conversion by Machinery. By JOHN RICHARDS, M.E. London: J. & W. Rider. 1876.

SAWS and sawing are what the author treats chiefly upon. He offers also some useful remarks on foundations for machines, and enumerates the inventions of Sir Samuel Bentham pertaining to wood-cutting, and adds some remarks on longitudinal and transverse planing. The articles are reproduced from the *Timber Trades Journal* of 1875.

Miscellanea.

The Philipson Orphanage, Newcastle-on-Tyne.—The Philipson memorial building, erected at the Moor Edge, for the boys of the Northern Counties Orphanage, and named the Philipson Memorial Orphanage, has been opened. The building has been erected mainly at the cost of Mr. Hilton Philipson to perpetuate the memory of his late mother (the wife of Mr. R. P. Philipson, the Town Clerk of Newcastle). The new building has cost about 10,000*l.* The building, which was designed by Mr. G. T. Redmayne, of Manchester, is simple Gothic in style, and it is built of local grey bricks, with a slightly red brick in bands of one brick every four courses. The building has round-arched window heads, with stone labels and string courses, and moderately steep-pitched roofs, broken up with dormer lights to the top story. It has a frontage of 123 ft., and a tower rises at the south-west corner to a height of 20 ft. On the ground-floor there are school, class, and dining rooms, committee's room, matron's room, apartments of the master and assistants, and kitchen, offices, lavatories, &c. There are two school-rooms; one 34 ft. 6 in. by 18 ft., and the other 37 ft. 3 in. by 20 ft. The dining-hall is 34 ft. by 23 ft. The contractors for the building were Messrs. Lowrey & Scott, and Mr. Yates has acted as clerk of the works.

Wren's First Church.—Under the order of the Ecclesiastical Commissioners, the Church of St. Dionis Backchurch is now being demolished. The church, named after Dionysius the Areopagite,—who, converted by St. Paul at Athens, travelled on to France, where, after his martyrdom, he was adopted under the name of St. Denis as the patron saint,—was the first church completed by Sir Christopher Wren after the Great Fire of London. Originally built in 1288, the present edifice, which stands in Fenchurch-street, was completed in 1674, its length being 66 ft., the breadth 70 ft., and the tower 90 ft. in height. Grinling Gibbons carved the pulpit, and according to Godwin's "City Churches," it possesses in the vestry (and these were seen yesterday) four of the large syringes or squirts which were used by the City forefathers for the extinction of fires. They are about 2 ft. 3 in. long, and are attached to straps which cross round the body of the person using them. These will be conveyed to the Guildhall Museum. The monuments and tablets will be removed to the church to which the parish is affiliated, and the bodies removed to Ilford.—*Times.*

Technical Education for Bricklayers.—A correspondence between members of the Artisans' Institute, St. Martin's-lane, and the Institute of Architects, in type, has been cancelled, having appeared elsewhere. The class asked for some encouragement from the Institute in the way of certificates and diplomas. The Institute replied that it was established for purely professional objects, and could not entertain the idea.

Tinsley's Improved Bedstead.—Mr. Wm. Tinsley, the well-known publisher, not content with the elevation of the mind, his more immediate object, has been trying his hand, and with success too, at the elevation of the body. Observing, at hospitals and elsewhere, the labour and pains required at times to raise a patient in bed to a more upright position, he has devised and patented a very simple arrangement by means of which this is effected in "the twinkling of a bed-post," as people say. By a turn or two of a handle the upper part of the body may be raised to an almost upright position, the bed-clothes being undisturbed and following on the body, and it may be lowered again as rapidly and as easily. There must be many cases in which such an arrangement, cheaply applied, would be a boon. Nor, as it seems to us, is it the sick or wounded alone that might wisely take advantage of the invention. Persons who deem it advantageous to take their breakfast in bed, read their letters and make arrangements for the day, before getting up, would find Tinsley's elevator a great comfort at little cost.

The New Hall for the Phrenological Museum, Edinburgh.—An addition to the Watt Institution, Edinburgh, comprising, together with further class-room accommodation, a large hall for the Phrenological Museum, in Surgeons'-square, is nearly completed. The building is in the Palladian style, but the architect (Mr. David Cousin) is stated to have imparted a French feeling to the details. On the ground-floor is the Phrenological hall; on the first and second floors are class-rooms, with retiring-rooms, for the lecturers in the School of Arts; while the whole of the upper flat is set apart as a drawing-class hall, being excellently lighted from the roof, as well as from either end. All the new class-rooms will be entered from the great staircase in the building, erected for the School of Arts two or three years ago. The front of the Phrenological Museum is enriched by a large oriel window, which forms a prominent feature in the design.

Additional Dock and Wharf Accommodation at Runcorn.—On the 14th ult. the Weston Canal, which connects Runcorn with Weston Point, and is about one mile in length, was re-opened, it having been closed for several months for the purpose of being deepened and made into a ship canal. It has now an average width of 100 *ft.*, and vessels drawing 15 ft. of water are able to pass along it. This canal will afford extra wharfage space of more than a quarter of a mile in length. It is being fitted with five wooden stages and steam cranes, and a high-level tramway is in course of erection, so that the loading and unloading of vessels will be greatly expedited. Since the transfer of the Runcorn and other property to the Bridgewater Navigation in 1872, upwards of 50,000*l.* has been expended in improvements at the port, which has had the effect of materially increasing the trade.

The New Monster Clock at the Crystal Palace.—The monster clock by Messrs. E. Dent & Co., which has been in course of erection during the past six months at the south end of the Crystal Palace, is now completed and in working order. This clock is almost a counterpart of the great Westminster clock (which was built by the same firm), with the exception of the striking and chiming apparatus, and the dial is the largest ever yet constructed, being 40 ft. in diameter, or nearly 1,300 square feet in area. The diameter of the Westminster clock is but 23 ft. The hands, with their counterpoises, weigh nearly a quarter of a ton; the minute-hand measures 19 ft. in length, and moves ¾ in. at every beat of the pendulum. The distance travelled by the point of the minute-hand is nearly four miles a week. During seventeen days of observation the variation was eight seconds only. The face of the clock has been designed by Mr. F. Fenton.

Norwich School Furniture. — Messrs. Colman & Glendenning, of Rampant Horse-street, Norwich, have just erected an additional manufactory on Chalk Hill-road. The building is composed of Portland cement concrete, and has three stories—the upper floor being used as a show-room, the second being devoted to the carpenters and machinery, and the ground floor to the blacksmiths. The manufactory is 113 ft. long, 65 ft. wide, and 40 ft. high to the wall-plate. The whole building is stated to have been designed and carried out under the direction of Mr. J. Holmes, foreman to Messrs. Colman & Glendenning.

New Horse Repository, Canterbury.—A new horse repository was opened at Canterbury on the 11th ult. It has been erected from the drawings of Mr. John Green Hall, architect, Canterbury, the builder being Mr. Frank Fetherstone, of Littlebourne, for a contract sum of 2,167*l.* The walls are of the red Canterbury brick, and the roof of Bangor slates, lighted by skylights. The building is fitted with iron mangers and racks cast by Messrs. Drury & Biggleston, ironfounders, Canterbury. The buildings consist of four separate stables, each 38 ft. long, 28 ft. wide, and 22 ft. high up to the collar, giving to each horse 1,600 cubic feet of breaking space. Also a carriage-house, 36 ft. long by 24 ft. wide, with office and rostrum at the end.

New Literary Institutes in the North.—On the 14th ult. an interesting ceremony took place at Skinningrove, a large and thriving mining village on the Cleveland coast, below Saltburn. Messrs. J. W. Pease & Co. are the principal owners of the place, and with their accustomed liberality they have provided for the intellectual wants of their workpeople, who are compelled to live away from the advantages of towns, by the erection of a literary institute on the same plan as that just opened at New Marske. The total cost of building and furnishing has been about 2,857*l.*, and the work has been carried out, as at New Marske, from the plans and under the superintendence of Mr. Carrington, Messrs. Pease's architect.

The Midland Railway.—At the annual dinner of the engineers connected with the Midland Railway at Derby, held recently, the chairman gave, as an instance of the magnitude of the company, the mileage of railway, canals, and tramways, being, in round numbers, about 1,500, the coal consumed for locomotive power amounting annually to 600,000 tons, and for the conveyance of passengers and goods there were 31,000 vehicles. These in line would form a train the rear van of which would be in St. Pancras Station, and the front van six miles north of Derby, with 11¼ miles of locomotives in front; and the number of men employed to work the line is upwards of 36,000.

Drainage at Whitby.—At a special meeting of the Whitby Local Board, a few days since, the plans and report of Mr. Mansergh, C.E., for the construction of a new system of drainage, at a cost of 34,000*l.*, were taken into consideration. Mr. Stevenson presided. The meeting considered that the estimated cost was a serious impediment to the execution of the works, and that the scheme was further defective by reason of the length of the main tunnel to the outfall at Saltwick, the syphon across the harbour, and the non-utilisation of present drains. Mr. Mansergh will therefore be requested to modify his scheme so as to make its execution practicable for about 10,000*l.*, failing which premiums will be offered for the best plans.

Entrances to Theatres.—We have frequently noticed the bad arrangements for admission to theatres. As we said recently (p. 945, *ante*), in regard to the crowd waiting, the "guardian of the streets remains *within*, while the people press *outside*," though to do so might seem "a folly in a man, and in a woman a negation of modesty." An instance occurred at the Haymarket pit-door on Tuesday night, when a young gentleman was surrounded by thieves, and a valuable watch and chain were taken from him. The *modus operandi* is to pinion the hands, and knock the hat over the eyes, while the adept thief takes the plunder. What is the use of a policeman *inside* calling out "Take care of your pockets!"

Sewer Ventilation at Carlisle. — Mr. Rawlinson has confirmed the advice given to the Carlisle Urban Sanitary Authority by their medical officer and others to convert the sewer manholes into ventilators, and allow the deadly gases that accumulate in these subterranean storehouses of disease to escape into the open air. The *Carlisle Journal* anticipates the best results from the adoption of Mr. Rawlinson's suggestions. The Carlisle sewers are said to be well constructed, but they were made in the early days of sanitary engineering, and require to be improved in accordance with the results of subsequent experience.

Proposed New Pump-room at Tunbridge Wells.—A company is in formation at Tunbridge Wells for the erection of a pump-room. The capital of the company is 6,000*l.*, and plans for the building have already been prepared.

A Petroleum "Pipe-line."—An American correspondent says that one of the principal engineering projects claiming attention in Philadelphia is the proposed construction of a "pipe-line" for the conveyance of oil from the oil regions to the Atlantic seaboard, a distance of three hundred miles. It is proposed to construct this line and force the petroleum through a four-inch ordinary main. This is no experiment, as pipe-lines of great length are already working satisfactorily. The line will be laid 30 in. under the ground, over mountains and down to valley stations, where the distribution of the labour of forcing is carried on. When complete the capacity of this pipe-line will supply Philadelphia with no less than 1,500,000 gallons of oil per year for refining.

Staffordshire Potteries. — The dispute between the earthenware manufacturers of the potteries and their workpeople is in a fair way of being settled by arbitration. Business has been generally resumed, excepting in the case of some of the ovenmen, who at first refused to go to arbitration. This led to a meeting of the manufacturers being held, at which, it is said, a look-out was resolved upon in the event of the ovenmen adhering to their determination. The employers met again on the 23rd ult, and received a deputation of ovenmen from Burslem and Tunstall, who said they were agreeable to a reference. On the evening of the same day the Hanley ovenmen came to a similar decision, and all danger of a conflict seems now to be at an end.

Harbour Improvements at Shoreham.—At the first meeting of the new Board of Trustees appointed for the management of Shoreham Harbour, recently held at the Town-hall, Brighton, the trustees, in furtherance of a projected scheme for deepening and improving the harbour, unanimously agreed to hire at once a steam dredger. It was also stated that the arrangements for raising a loan of 100,000*l.* for the purpose of paying off old subscribers and for further works, were in a satisfactory way of settlement. The trustees have initiated an active policy, the carrying out of which will, it is hoped, raise the harbour into a port of importance, and worthy of the neighbouring town of Brighton.

Compensation Case.—The case of Coles *v.* The Metropolitan Board of Works was heard at the Sheriffs' Court, Red Lion-square, on the 17th ult., before Mr. Under-Sheriff Burchell and a special jury. Compensation was claimed in respect of leasehold interest in a house in Theobald's-road, required for the formation of the new street extending from New Oxford-street to Shoreditch. The jury went to the *locus in quo*, and had a personal view of the property. On their return a verdict was taken by consent for 225*l.* The claim exceeded 1,000*l.*, including the 10 per cent. for compulsory sale.

The Military Centre at Bedford.—Mr. J. Hill has supplied about 400 locks and furniture for this building, the keys of the former all differing throughout. The builders of the Bedford Depôt are Messrs. Hill, Higgs, & Hill, of Lambeth, and the works, which are now all but finished, have been carried out under the superintendence of Lieut. Thompson, R.E.

The Chief Engineership of Newcastle-on-Tyne.—In reference to the paragraph in last week's *Builder* (p. 1154) we have received a letter stating that it is by no means certain that Mr. McKie is the fortunate candidate, "no appointment having been made." Our paragraph was based upon a statement in one of the Newcastle papers.

Goldsmiths' Company.—The Court of this Company have voted 500*l.* in aid of the fund for extending the buildings of the University of Edinburgh. The Company's annual expenditure out of the general corporate funds, quite irrespective of any charity foundation for educational purposes, now amounts to nearly 6,000*l.* a year.—*City Press.*

The Victoria (Philosophical) Institute announces a paper on the "Egyptian Myth of Ra" for Monday, when the Institute meets in its new rooms.

TENDERS

For alterations and repairs at the White Hart, Turner-street, Mile-End, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. W. E. Williams, architect:—

Palmer	£252 0 0
Mer	218 0 0
Anley	199 0 0

For the erection of a villa at Tring, Herts, for Mr. J. T. Pickburn. Mr. W. P. Griffith, architect. Quantities supplied by Messrs. Arding, Bond, & Buzzard:—

Brass	£5,306 0 0
Perry & Co.	5,163 0 0
Snell	5,059 0 0
Hill, Higgs, & Hill	5,048 0 0
Lawrence & Sons	5,027 0 0
Pocock	4,770 0 0
Brown	4,482 0 0
Pinchar	4,492 0 0
Honour	4,287 10 8

For the construction of new storm-water sewer, for the Hastings Urban Sanitary Authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—

Vidler	£2,398 0 0
Cruttenden	2,332 0 0
Gasson	2,287 15 0
Geary	2,273 0 0
Docwra	2,250 0 0
Reeve (accepted)	2,092 0 0

For the construction of new sea and parade walls, &c., at West Marina, St. Leonard's-on-Sea, for the Hastings Urban Sanitary Authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—

Geere	£17,900 0 0
Botterill	17,028 0 0
Marshall	16,700 0 0
Cruttenden	15,720 0 0
Parks	15,527 0 0
Munday	15,439 12 0
Rodda	15,200 0 0
Reeve	13,700 0 0
Geary	12,100 0 0
King	12,000 0 0
Jenkins	10,000 0 0

For the construction of seven new groynes at West Marina, St. Leonards-on-sea, for the Hastings Urban Sanitary authority. Mr. W. Andrews, surveyor. Quantities by Messrs. Cross & Wells:—

Reeve	£4,250 0 0
Marshall	3,300 0 0
Botterill	2,789 0 0
Geary	2,760 0 0
King	2,670 0 0
Winser	2,652 0 0

For nine houses on the St. John's Estate, Wakefield. Mr. W. Watson, architect:—

Fawcett & Co. (accepted)	£3,893 0 0

For Board schools at Goole. Mr. W. Watson, architect:—

Elliott, Calam, & Co. (accepted)	£2,694 0 0

For Board school and master's house at Goole. Mr. W. Watson, architect:—

Jackson & Co (accepted)	£520 0 0

For altering and refitting the old Market-house, for the Wakefield Borough Market Company. Mr. W Watson, architect:—

Fawcett (accepted)	£1,509 0 0

For a detached residence at Doncaster. Mr. W. Watson, architect:—

Anelay (accepted)	£2,200 0 0

For a detached villa at Manygates Park, Wakefield. Mr. W Watson, architects:—

Elvey & Co. (accepted)	£1,100 0 0

For a lodge, Manygates Park, Wakefield. Mr. W. Watson, architect:—

J. & J. Summers & Co. (accepted)	£255 0 0

For alterations at the Skiddaw Tavern, Chippenham-road, Kilburn, for Mr. Clifford. Mr. Cotton, architect:—

Temple & Forter	£449 0 0
Lamble	427 0 0
Toms	382 0 0
Anley	320 0 0

For alterations and repairs at the Portland Arms' Portland-road, Notting-hill, for Mr. Binks. Mr. Cotton, architect:—

Mills	£649 10 0
Collins	615 0 0
Anley	580 0 0

For additions in rear of the Plough Tavern, Hoxton-street, for Mr. Lock. Mr. Hammon, architect:—

Rawhurst	£734 0 0
Hodson	685 0 0
Page	574 0 0
Anley	549 10 0

For the erection of schools and teacher's residence at Langley, near Macclesfield, for the Sutton School Board. Mr. E. H. Lingen Barker, architect:—

Grosvenor	£2,780 0 0
Lea & Son	2,052 15 0
Massey	1,975 0 0
Cartlidge	1,898 18 0
Webber	1,867 0 0
Roylance	1,8 4 0 0
Smith	1,785 0 0
Biggs	1,670 0 0
Ford	1,619 0 0
Balcombe (accepted)	1,578 0 0

For enlarging the Prudhoe Memorial Convalescent Home at Whitley, Northumberland. Mr. T. Oliver, architect. Quantities by Mr. G. Connell:—

Elliott	£6,312 0 0
Jackson	6,064 0 0
Mitcheson	5,971 0 0
Reed	5,848 0 0
Millar	5,683 0 0
Nicholson (too late)	5,663 0 0
Lee	5,191 0 0
Robson (too late)	4,913 0 0

For alterations to the Royal Oak, Columbia-road, Bethnal-green, for Mr. B. Hyams. Mr. E. Brown, architect —

Marr (accepted)	£240 0 0

For foundations, basement-story, and rainwater-tanks, for Cudham Vicarage. Messrs. Tress & Innes, architects:—

Sewell	£903 0 0
Hawtrey	885 0 0
Dartnell	880 0 0
Fish	878 0 0
Payne & Balding	860 0 0

For alterations and additions to the Prince of Wales's Tavern, East-road, City-road, for Mr. Elston. Mr. John Viney, architect:—

Staines & Son (accepted)	£340 0 0

For the erection of new premises, Old Bond-street, for Messrs. Thos. Agnew & Sons. Mr. E. Salomons, architect. Quantities by Mr. Bagg:—

Dove, Bros.	£33,317 0 0
Smith & Co.	31,620 0 0
Jackson & Shaw	30,113 0 0
Trollope & Sons	28,613 0 0
Holland & Hannen	27,688 0 0

For forming new entrance to the Clerkenwell Mortuary, now being erected in Spa Fields Burial-ground, for the Vestry of St. James and St. John, Clerkenwell. Mr. H. Saxon Snell, architect:—

Dickens	£388 0 0
Parker & Evans	380 0 0
Ebbage	379 0 0
Sharman	349 0 0

TO CORRESPONDENTS.

"*Who Wants a Church?*" We have received various replies and inquiries, and have forwarded them to the writer of the letter, with whom the matter must now rest.—Bideford Bells (next week).—"Damp" (next week).—"Glass Roofs" (next week).—"Prevention of Echo" (next week).—C. P. H. (it depends on circumstances that should be inquired into. Consult a competent surveyor).—H. N. L. (article has not been received).—R. M. P. (shall appear in due course).—G. C. (we do not propose to return to the subject).—G. T. S.—O. C.—F. P.—E. H. L. B.—J. G.—J. H. T.—W. E.—R. F.—Landowner.—T. W.—A. W. R.—L.—F. B.—S.—F. J.—T. B. W. C. W. O. S.—A. B.—H. H.—P. & G.—J. G. H.—Mr. G.—J. W.—J. S.—A Churchwarden.—T. K.—An Old Reader.—J. W.—E. H. H.—T. E.—W. H. L.—J. A.—G. G.—A. J. S.—G. S. & Co.—L.—T. M. F. P. C.—M. & S.—L.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, Lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings rests, of course, with the authors.

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*Water Supply of Cities and Towns.**

IT has been known for several years that Mr. Humber was preparing for publication a book on waterworks, and now that we have it before us we can congratulate him on having been able to give so large an amount of information on a subject so important as the water supply of cities and towns. In a great work such as this it was necessary to say something of the history of the subject, and accordingly Mr. Humber gives an historical sketch of the ancient methods of procuring water. In ancient Egypt large reservoirs were filled every year by the overflowing of the Nile, but, as a matter of antiquity, the tanks of India are probably still more remote. In his presidential address to the Institution of Civil Engineers in 1870, the late Mr. Vignoles said that "In the Presidency of Madras there are upwards of 53,000 tanks or reservoirs for irrigation purposes alone, exclusive of small tanks near the villages, all executed by the natives prior to the occupation of the Deccan by the British. The aggregate length of the embankments of these reservoirs is fully 30,000 miles,—that is, more than double the length of all the railways in the United Kingdom; and the bridges, culverts, and sluices are more than 300,000 in number. The stored-up waters sent forth at the proper season still bring to the exchequer of the Madras Presidency a yearly income of a million and a half sterling (one-sixth of the whole revenue), although many of the finest of these reservoirs are in ruins, or useless from want of being properly kept up. One of them, the Poniary reservoir, in the district of Trichinopoly, has a superficial area of about 80 square miles, say 50,000 acres, and the banks are 30 miles in extent."

Some of the aqueducts constructed by the Romans are referred to by the author, and the old and more recent works for the supply of Paris and London are described.

Of the eight different companies who now supply London with water the first place in any description of the London water supply is usually given to the *New River* Company. It appears that in addition to the river Lea and springs at Chadwell, the company at present obtains a large quantity of water from wells on the line of the New River and elsewhere. Their works now consist of steam engines at Hornsey, Hornsey-lane, Highgate, Stoke Newington, and New River Head, of about 1,450 horse-power in the aggregate; covered service reservoirs at Claremont-square, Maiden-lane, Highgate, and Hampstead, of a joint capacity of about 20,000,000 gallons; and main and service pipes of a total length of about 630 miles, varying in diameter from 3 in. to 3 ft. About 340 miles of roads and streets contain New River Company's pipes. The quantity of water distributed in 1870 was 23,160,000 gallons per day to a population of 830,000, living in 114,730 houses.

The *Chelsea* Water Works Company now take water wholly from the Thames at Seething Wells, where the reservoirs and filter-beds comprise an area of 9 acres. The water is pumped to reservoirs on Putney Heath, through two cast-iron mains. One, 30 in. diameter, conveys filtered water for domestic use, and the other, 15 in. diameter, is for unfiltered water, for road-watering and other purposes. The mains are carried across the Thames at Putney, on an iron aqueduct. The engines are about 1,000-horse power, collectively. The daily supply is about 8½ million gallons, to a population of 200,000, living in 27,000 houses.

The *Lambeth* Waterworks Company obtain water also from the Thames, at Long Ditton, about three miles above Teddington Lock. The reservoirs comprise an area of about 4½ acres,—by the bye, the author does not seem to have taken account of a new and large reservoir which this company have recently made higher up the river, opposite to Hampton, or thereabouts,—and the water is pumped through cast-iron mains, 30 in. diameter, to Brixton, a distance of 10½ miles, by engines of a nominal power of 970-horse power. At Brixton water is pumped further, to Streatham, Selhurst, and Rock Hill, by five engines, of 330-horse power. The Kingston district is supplied by a separate main, delivering water into a reservoir on Kingston-hill. The average daily supply is 10½ million gallons, to a population of 290,000, living in 45,000 houses.

The *Grand Junction* Company have their works at Hampton, where the water is admitted from the Thames into two subsiding reservoirs of a joint area of about 2 acres. Two engines, each of 110-horse power, pump water through a 33-in. main, to Kew Bridge, a distance of 7¾ miles. At Kew there are three subsiding reservoirs, together about 9 acres, and holding 28 million gallons. There are also three filter-beds, with a joint area of 5½ acres. The engines at Kew are of about 1,270-horse power in the aggregate, and pump water through a 30-in. main into covered reservoirs at Campden-hill, Kensington, which contain 18 million gallons. Here are also three engines, of 200-horse power, for the supply of the higher portion of Paddington. The average daily supply is 10½ million gallons, to a population of 288,000, living in 32,000 houses (estimated for the year 1870). The total length of this company's mains is upwards of 220 miles.

The *West Middlesex* Company have their works also at Hampton. Here are two engines, 105-horse power each, which pump the water through two 36-in. mains to reservoirs at Barnes, a distance of 8¾ miles. The subsiding reservoirs at Barnes have an area of 20½ acres, and adjoining them are five filter-beds, with an area of 8 acres. From these the water is conveyed in two 36-in. mains to Hammersmith, whence it is pumped into the district. The service-reservoirs are at Campden hill and Barrow-hill. Part of the water is further pumped by 90-horse power engines into the Kidderpore reservoirs, near Child's-hill, containing 2½ million gallons. The daily supply averages about 9 million gallons, to 321,000 inhabitants, living in 43,000 houses.

The *Southwark and Vauxhall* Waterworks Company also take water from the Thames at Hampton, into depositing reservoirs of about two acres in extent. Three engines, of 390 horse-power collectively, pump the water through a 36-in. main to the reservoirs at Battersea,—a distance of thirteen miles. The Battersea reservoirs have an area of about 12 acres, and hold 46 million gallons. Here are two filter beds, with a joint area of 8¾ acres. The company have six engines at work, of 1,200 horse-power collectively. At Hampton, there are a subsiding reservoir of 3½ acres, three filter-beds of 3 acres, and two engines of 450 horse-power together. A 30-in. main, ten miles long, conveys the water to London. This company have about 660 miles of mains and service-pipes in about 360 miles of streets and roads. The daily supply is about 15 million gallons to a population of 480,000, living in 76,700 houses.

The *East London* Waterworks Company have a series of reservoirs or lakes on the Walthamstow side of the river Lea, which have a water area of 250 acres, and a capacity of 700 million gallons, of which 400 millions can be drawn off by opening the sluices, the space below the sluice level receiving the solid matter deposited by subsidence. These reservoirs render the company independent of the river for a month at a time. From these settling-reservoirs the water passes to the filter-beds at Lea Bridge, nineteen in number, with a sand area of 18 acres, whence it is conveyed by a brick culvert, 6 ft. by 3 ft. 6 in. to the engine-wells of the northern, or Lea Bridge, pumping station, and by an iron main, 4 ft. in diameter, to the southern, or Old Ford, pumping station. At Lea Bridge, there are three engine-houses, containing 630 horse-power. At Old Ford there are five engine-houses, containing 620 horse-power. The author remarks, and we are glad of the opportunity to repeat, that the Cornish engine was here first applied to the pumping of water for the supply of towns, by Mr. Wicksteed. Most engineers prefer the rotatory engine for pumping through mains, but nevertheless great credit is due to the memory of the late Mr. Wicksteed for what he did at Old Ford.

* Water Supply of Cities and Towns. By William Humber, Assoc. Inst. C.E., Mem. Inst. M.E. London: Crosby Lockwood & Co. 1876.

At Lea Bridge, it is said, water power is usually employed in addition to the steam engines above referred to, and at Walthamstow there are auxiliary engines (steam and water) of 60 actual horse-power. The average daily supply in 1871 is stated to have been 20,437,000 gallons to a population of 750,000 living in 102,624 houses. The length of streets supplied is estimated at 350 miles. The East London Company have since constructed large works at Sunbury, for taking water from the Thames, above the intakes of the companies already named, by which the company are empowered to take a supply of 10 million gallons per day.

The *Kent* Waterworks Company obtain most of their water from three wells in the chalk at Deptford, each of which has a separate pumping-engine. Other engines pump the water for distribution. There are also two wells at Charlton, one at Plumstead, one at Crayford, and two at Bromley. The company have 18 engines, together working on an average up to about 1,200 horse-power. The service-reservoirs are at Greenwich Park, Woolwich Common, Plumstead, and Chislehurst, holding in all about 4,500,000 gallons. The average daily supply is over 7,000,000 gallons, to a population of nearly 300,000, living in 40,000 houses.

Now, if these several works for the supply of London with water be regarded, it will be seen that they embrace all the three systems of water supply, viz, by gravitation, as in the New River works; by pumping from rivers, as the Thames and Lea; and by pumping from wells, as in the Kent works.

The quality of the water from these several sources varies considerably, as is shown by the author; but we will not dwell upon this point, further than to quote that "It is asserted that water contaminated with sewage contains that which is noxious to human health, and that there is no process practicable on a large scale by which it can be removed to render the water suitable for domestic use." The author treats fully of the chemical qualities of these various waters, but perhaps the best guides we have on this point are the periodical reports of the water examiner, published in current journals. Rainfall and evaporation are next treated of, and the propriety is recognised of the now well-known practice of taking for calculation not the mean annual rainfall of any locality, but five-sixths of it, as being the approximate quantity which falls in any three consecutive dry years, and from the records of rainfall at the Greenwich Observatory, three consecutive dry years appear to occur at intervals of about twenty-two years. The greatest fall in twenty-four hours is an element of much importance, and the following rule is given as being conformable with observations:—"With a mean fall of 20 in. it is 16 per cent. of the mean annual fall (*i.e.*, 3·20 in.); for each increase of 4 in. in the mean annual fall it decreases one per cent., until the latter reaches 60 in.; beyond that point it remains stationary at six per cent, however great the annual fall may be." An important chapter on springs and the water-bearing formations of various districts follows, in which are recounted the remarks of Professors Prestwich and Hull, and numerous observations of Mr. Dickenson, Mr. Charnock, Dr. Dalton, and others, both at home and abroad. In a chapter on the "Measurement and Estimation of the Flow of Water," the formulæ deduced from the experiments of many observers are given from some of the well-known authorities on hydraulics, including the experiments of Mr. Blackwell on the flow of water over weirs, made on the Kennett and Avon Canal, and by M. Boilean and MM. Poncelet and Lesbros at Metz.

As to the quantity of water required for a town-supply, the author says the average quantity actually consumed per head of the population, varies from about 15 gallons per day to more than 50 gallons—the former example being that of Norwich, and the latter that of Glasgow. These quantities include water for domestic purposes, trade purposes, street watering, flushing sewers, and extinction of fires; but in taking the domestic consumption separately at 10 gallons, derived from experiments made by placing meters on pipes supplying known numbers of houses and inhabitants, as has been frequently done when it has been desired to ascertain how small a quantity of water people use, the author makes, as it appears to us, the same mistake as others have done on this subject, or rather, perhaps, we ought to say, leaves the same wrong inference to be drawn from the statements of quantities thus measured. In *all* works, large and small, and new as well as old, there is a large quantity of water, necessary to be supplied, which is not used. This may be called waste, but as it is unavoidable, it must be included in the total supply, and a fair proportion of it should be added to the quantity shown by the meter under the circumstances described, in the same ratio that the number of those inhabitants bears to the whole population. Besides, the meagre quantity now used for baths may be reasonably expected to be largely increased within no very long time; not, perhaps, for such baths as we have now, where the purchase of the ground costs so much that an insufficient sum is left for what is wanted, but for baths on a different system, and of more general use. There is another point worthy of being mentioned when the example of Norwich is adduced as a guide to the quantity of water required; it is stated by the author, and is that in that city not more than one-fourth of the inhabitants have access to water-closets. It is not necessary to raise the question whether water-closets are advisable or not in any town, but the fact above stated should be borne in mind when the comparatively small quantity of 14 or 15 gallons per head per day supplied to the population of Norwich is adduced. In gravitation works the method adopted to ascertain the available quantity of water from any given area is fairly stated by the author, but on this point he might have easily given some examples from executed works which would have been useful to waterworks' engineers. The next kind of works referred to is that in which the water is pumped from a river or stream, and two methods of ascertaining the mean velocity of a stream are stated, one by observations of the surface velocity, and the other by instruments immersed in it. The chapter on wells and well-sinking is particularly good, and in the one which follows it, on reservoir embankments, it is very properly stated that the usual inclination given to the outer slope is 2 to 1, and to the inner slope 3 to 1, and that the reason why the inner slope should be greater than the outer is that the angle of stability of the material is somewhat reduced by the presence of water.

An apparatus for "automatically regulating the height of the water in filter-beds" is described and illustrated by a diagram. Why might it not have been stated where this apparatus is in use? We know of but one place, although its applicability is common to many works.

The purification of water forms another chapter and sections of the London filter-beds are given, showing the thicknesses of the filtering materials.

Pumps and pumping machinery follow, including valves and their action, and some examples of boilers are given, and then follows a chapter on conduits, with the cross sections of the conduits designed by Mr. Bateman and by Messrs. Hemans and Hassard for supplying London with water from the Welsh hills and from the Cumberland lakes respectively.

Under the head of "Distribution of Water," the thicknesses of cast-iron pipes are treated of, and a very useful instrument for measuring the thickness of the body of a pipe is illustrated.

In taking 15,000 lb. as the cohesive strength of cast-iron pipes per square inch of section of metal, however, we think the author has overestimated the strength, at least of large mains. The apparatus of distribution includes hydrants, meters, lead service-pipes, and lead-encased tin pipes, ferrules, house fittings, &c.

Coming to the economy of waterworks, tables are given of the cost of gravitation works, the average of sixty-six towns being about 32s. for twenty gallons per day, and of pumping works about 23s. 3d.; but although gravitation works are more expensive in their first cost, the annual expenses are much greater, for pumping and wear and tear of machinery. An extensive table of rates and charges is added.

Perhaps one of the most interesting chapters of the book,—and especially just at this time,—is that on the Canterbury Waterworks, describing the practical application of Dr. Clark's process for removing the excess of carbonate of lime from the hard chalk waters.

Specifications of various parts of several executed works are given in an appendix.

The plates, fifty in number, are mostly drawings of executed works, and alone would have commanded the attention of every engineer whose practice may lie in this branch of the profession. The book is inscribed to Mr. Rawlinson, C.B., M. Inst. C.E.

THE WITNESS OF ART.

"Who shall read these pages? Men, perhaps, with grave eyes, who will detect faults in every line, and yet, seeing that I am in earnest, will not cast them hastily aside." In these words the author of the book published under the above title* has perhaps very nearly hit the truth as to the feeling with which thoughtful readers will regard his meditations upon art. His writing is very deficient in clearness of form and style; it is very redundant: indeed, the author openly avows that he can see no objection to repeating a whole paragraph which has before been used in another place, when the particular point it deals with is to be again enforced,—a kind of literary method which is clumsy, absurd, and objectionable in the highest degree. His method of treating his subject borders on what may be termed the mystical, and his perpetual dealing in tropes and figures gives further vagueness to a style which is by no means very connected or logical. Against all this is to be set the fact that the author is in earnest, and really cares for his subject, and that his conclusions are nearly all good and true, however oddly he seems to arrive at them. And perhaps Mr. Bayliss has a further claim to sympathetic reception at our hands, inasmuch as he is known on the walls of our exhibitions as an artist specially devoted to architectural subjects, whose fine and richly-coloured interior views of great buildings, cathedrals especially, may count among the means by which architectural beauty is brought home to the minds of the people.

The main object of Mr. Bayliss's pages is to lead their readers to a feeling of the sacred and ennobling mission of Art, as "not a plaything, but an influence upon our lives, real and distinct; and to show that this influence is altogether for our good." This has been said, no doubt, often enough in one way or another; not often, however, in the tone of serious, almost religious, gravity with which the author invests his subject. Borrowing a metaphor which has been used in allegory of a more distinctly religious character, he calls art "The King's Messenger," a simile the import of which is obvious enough; but we fear Mr. Bayliss's first two chapters, in which the idea thus implied is blended with another simile taken from the time-honoured fairy tale of "Beauty and the Beast," will be found too involved for its meaning to reach juvenile minds, and too (we fear we must say) childish in tone to be very satisfactory reading to maturer minds. This is a pity; because, though this is not the best part of the book, there is a really important thought included in it, as to the contrast between art and mere symbolism, a subject which is returned to several times in the course of the book, and on which the author's idea is as clear as possible, and expressed occasionally in a forcible and piquant manner. Symbolism he regards as the forerunner of art. A little child is found embracing with the greatest affection a hideous and disfigured black doll. A primitive rustic people bow before an almost equally hideous image, which to them represents the Mother of Christ; or, to look further back, through a long vista of centuries,—

> "We see a people sunk in black darkness like that which still reigns where the sweet light of Christianity is unknown. We see them, with outstretched arms in the darkness, as if trying to touch but the hem of His garment who sitteth upon the throne. First make your gods; this they proceed to do. Two pillars of stone, placed side by side, stand very well for Castor and Pollux, and a bar or slab laid across from one to the other suffices to express their mutual affection."

First make your gods. "Ah! not so," says the author, "that is the finishing stroke." To make something, anything, as a symbol and then attribute beauty and sanctity to it, is an operation satisfying to the childish or (which is in a sense the same thing) the barbarian mind only. But art must be the embodiment of a beauty before conceived in the mind, not an arbitrarily chosen symbol. This seems a truism when we look at the question in relation to such primitive symbolism as in the instances referred to, but there have been and are phases in the practice of art which show what confusion often reigns, in the minds of those who have once dabbled with symbolism, between the idea and the means of expressing it in art. This subject is well touched upon in the last section of Mr. Bayliss's book, on "The Supernatural in Art," which is an amplification of a paper read under this title at a meeting of the Architectural Association not very long since, great part of which was

* "The Witness of Art, or the Legend of Beauty." By Wyke Bayliss, F.S.A., Vice-president of the Society of British Artists. London: Hodder & Stoughton.

printed in our columns. In this portion of the book, which constitutes a separate essay in six chapters, a difficult and very interesting subject is treated with considerable critical insight and some novelty of illustration, and the author's sometimes rather rhapsodical style is not out of keeping with the subject. Mr. Bayliss contrasts the reticence of Classic art in treating of the Supernatural with the opposite character of Mediæval art,—

"where this unknown quantity, which cannot be legitimately expressed, is by any means and every means attempted to be implied. The nimbus round the head, varying in colour and design, according to the dignity of the sacred character. The wings of the angels, which *must* be anatomically false; and, above all, the curious expedient of representing the saints as of a larger size than the other figures of the group. . . . . Of such expedients we may at least affirm that they do not tend to the elevation of art. Perhaps it is as true of the artist as it is of the philosopher and the divine, that he cannot predicate too little of the unknown.

For, consider to what such symbolism will lead. If beauty of form and truth of drawing are to be abondoned for a supposed sacred purpose, it will inevitably follow that the deviation from truth and beauty will be required first of all in the very figures which are to be especially reverenced. The accessories will be allowed to retain their normal conditions, there is nothing supernatural about them. But will the accessories consent to retain their normal condition? Ah! not so. The knowledge of what is beautiful and the power of drawing truthfully from nature are not to be attained by the half-hearted labour given to accessories. The painter who begins by dethroning Beauty and Truth need not be surprised if they refuse to wait upon him as his servants. At first relegated to the background, they will presently slip out of his canvas altogether, and the painter will find himself alone, with nothing but his own inventions to stare him in the face. In other words, the law of art will become, that all things should be ugly,—and the more ugly the more divine."

This is a clear and uncompromising statement of a fallacy especially illustrated in what is called religious art; and though it never at the present day sinks to such a complete *reductio ad absurdum* as is implied in the closing lines of the above quotation, the wrong principle alluded to has been only too much illustrated in much of our ecclesiastical decorative art, which only escapes the extreme consequences by stopping half way. Much of the further illustration of the subject by the author, especially in his examples drawn from the supernatural element in "Paradise Lost," and its possibilities in regard to representation in art, is very good, and well worth reading; the whole tendency of the argument being to show that art can only successfully speak to us through the medium of the material beauties which we are conscious of through our ordinary senses; and it is gratifying to find this healthy view of the supernatural in art so strongly put forward by a writer whose general tone of mind, inclining, we may say, towards the mystical, is what we are more accustomed to find associated with the false view of art which he opposes here. In some of his illustrations he is less happy, as in bringing examples from the "Ingoldsby Legends" to illustrate the false use of the supernatural, which is giving a great deal too much importance to a vulgar *jeu d'esprit*; and Mr. Bayliss ought not to have taken the whole story of the "Christ of Andernach," word for word, from the pages of Longfellow's "Hyperion" without acknowledgment.

But what pleases us most in the book is Mr. Bayliss's critical discrimination of what he classes as the three great typical periods in art, so far; Greek art, Renaissance painting, and modern landscape painting. The limits of Greek art he very well defines; and this is a useful definition, as among those who appreciate fully the transcendant power of the Greek artist within his own limits there is often a tendency to regard his productions as fulfilling every need of art. This, however, has perhaps never been done yet by any artist or any school, taken alone. As the author says, we must "revere intelligently. If Polycletus was greater than Michelangelo in ideality, Michelangelo was greater than Polycletus in fervour; but this implies that an excellence is conceivable that should surpass both." Carrying the consideration of Greek art a little further, we may all admit that "if the realisation of strength, grace, and beauty is the one aim of art, there is an end of the matter," Greek art has achieved perfection, and we are only called upon to be its disciples.

"But if art has no such limits, then the schools of Greece and Rome are weak as well as strong. The intellectuality of Apollo finds expression through the splendour of physical development, but there is no place in the studio for Aristotle's poor deformed face. Yet surely there must have been times when a fire flashed from his eyes as worthy of the artist's labour to immortalise as were the muscles of the wrestler. *But what was the expression either of character or of passion to the Greeks, who rewarded Socrates with a draught of hemlock, and Phryne with a niche in the temples of the gods?*"

This is admirably put. We are not so sure of the correctness of Mr. Bayliss's judgment in regard to the Laocoön, and the question which has been so often debated, in reference to that work, as to the fitness of representing in art, and in sculpture especially, the realistic expression of bodily pain. Mr. Bayliss holds that the Laocoön does express this, and expresses it intensely, and that it has thus proved that such expression is within the domain of high art. But while we agree with him that the expression of pain in the Laocoön is much more intense and real than many critics have considered it, we deny that it is realistic; and if it were, we believe the statue would be found nearly intolerable. In the last Academy exhibition there was a clever figure of the Spartan boy suffering from the bite of the fox bidden under his cloak, which in a certain way was successful; but here the aim was to represent the forcible control of, not the indulgence in, the expression of pain; and, even so, the figure was one we certainly should not wish to see before us continually.

The true strength of the Renaissance painting lay, as Mr. Baylis observes, in its passionate expression; but this was essentially the art of painters, not of sculptors. The "heresy of infidelity," of want of love for and faith in human nature, made the weakness of Classic art; the "heresy of superstition," the effort at something vaguely supposed to be above human nature, made the weakness of the Renaissance. Then with the Reformation epoch came also the iconoclastic movement, breaking up the art which had been identified with superstition; as the author says, ploughing up the ground, roughly enough, for the next growth of art. The world of Nature had been neglected by both Greek and Mediæval* artist. "Claude, indeed, and Poussin, had ventured into the good land; but at best we may liken them to the spies of old, who brought back a doubtful report; and the venerable Titian seems to have stood, like the great leader on Pisgah, seeing, but not permitted to enter." In the Greek landscape "we have the cloud-compelling god, but nothing of the cirrus or cumulus that fills the sky. Instead of the sunrise we see Aurora; instead of the fields we see Pan." This is very nearly true; not quite, perhaps, for Mr. Bayliss seems to forget the "hoary sea" and "shadowy mountains" of Homer.

"And yet Virgil was a landscape poet, and Claude was a landscape painter; but neither of them knew the full glory of Landscape Art. They trusted to a Cyclops, or a nymph, or a goddess in the clouds, to help them in a difficulty, when they should have listened only to the whispering of the leaves, and seen only the tremor that runs through the cornfield when the sun rushes up from behind the purple mountains. . . . .

Hitherto men had worked in schools and systems; the theories of Art were transmitted from master to disciple. Thus the Caracci followed Correggio, and Guido followed the Caracci. It was a new thing when Paul Potter took his canvas out into the fields, and, as the cattle munched the clover, or gazed dreamily into his face, painted meadow and cattle simply as he saw them, without reference to how they should be painted according to the schools."

This, which at first sight might seem but the material aspect of landscape-painting, was the necessary training it had to go through before reaching its deeper and more spiritual development. And what is the one point in which Landscape Art, more than in any other, differs in its appeal to us from the schools of art that have preceded it? The manner in which this question is answered is the best point of criticism in Mr. Bayliss's paper. It consists in the manner which, in contemplating this class of art-productions, we are compelled to bring our own feelings to meet those of the artist,—to make ourselves a part of what we see. In the representations of the deeds and passions of human beings we are outside the picture; we contemplate them as personages with whom we may or not sympathise, whom we may hate or admire. But in looking at a landscape "the passions awakened are within us: they are our own; we are not witnesses, but actors." This view of the subject is illustrated at some length, and not inaptly; but the simple statement of the case must be recognised as true by all who have an innate feeling for landscape art. It is this which makes modern landscape appeal so strongly to the interest and sympathies of this generation of men, responding as it does to that vague and indefinite emotion so characteristic of modern feeling, and of which modern music is, in another way, an expression.

We have touched upon the main conclusions led to in Mr. Wyke Bayliss's book, seeing that they are not only true, but such as are to some extent overlooked at present. It is not often that the mean is hit, in art or art-criticism, between love of mere realism on the one hand, and too unreal and vague aims at what is beyond the reach of art; though certainly, on the whole, realism, in England especially, may be said to be rather predominant at present. The specialty of Mr. Bayliss's view of his subject is that he inculcates realism as the true *means* in art without mistaking it for the *end*, and that he brings to his task an enthusiasm and earnestness of feeling, a conviction of the serious and beneficent purport of art, which is too rare a characteristic at present, when art is looked upon by so many as merely a means of decoration. His method of illustrating and setting forth his subject contains a good deal that is pleasant to read, and picturesque, with the literary defects we have already mentioned, and with what we might be tempted to call an affectation of highly-wrought imagery and sentiment, did we not see reason to think that in this case there is none of that intentional effort at fine language which constitutes the vice of literary affectation. Still, when the author reminds us that art is not for the artist, but for all,—that Raffaelle alone has aided the intellectual education of millions,—we cannot but remember that great part of the force and value both of art and of criticism, with the masses especially, lies in simplicity and directness of purpose. A good deal of what Mr. Bayliss has said would have been more effective to the majority of readers, and more pleasing to the minority, if clothed in a simpler and less fanciful literary garb. The main end of his reflections is very well and much more simply expressed in a few lines of Emerson's on "Art," which, as they are hardly popularly known, we may quote as a finish to our remarks:—

"Give to barrows, trays, and pans
Grace and glimmer of romance;
Bring the moonlight into noon,
Hid in gleaming piles of stone;
On the city's paved street
Plant gardens lined with lilacs sweet;
Let spouting fountains cool the air,
Singing in the sun-baked square:
Let statue, picture, park, and hall,
Ballad, flag, and festival,
The past restore, the day adorn,
And make the morrow a new morn.
So shall the drudge in dusty frock
Spy behind the city clock
Retinues of airy kings,
Skirts of angels, starry wings,
His father's shining in bright fables,
His children fed at heavenly tables;
'Tis the privilege of Art
Thus to play its cheerful part,
Man on earth to acclimate
And bend the exile to his fate."

THE INAUGURATION OF THE NEW MANUFACTORY AT SÈVRES.

ON Friday, the 17th ult., the new buildings of the manufacture of Sèvres were formally inaugurated under the presidency of M. le Maréchal MacMahon. The ceremony was one of great interest to the Parisian world of art and science, and afforded the Marshal President one of the first opportunities he has had since his tenure of office of associating himself with the artistic and royal traditions of the past.

The manufacture of Sèvres porcelain is not by any means so old as many other ceramic industries in Europe; it only carries us back to the end of the seventeenth century. Just at about the same period in England the Chelsea works were set up, one Morin, a chemist from Toulon, established himself at Saint Cloud, near Paris, with Chicanneau as his manager. An interesting record of this manufactory is left us in the mention of it by Martin Lister, an Englishman, who, in the train of Lord Portland's Embassy to Paris, in 1698, described his journey.*

"I saw the *Potterie of St. Clou*, with which I was marvellously well pleased, for I confess I could not distinguish betwixt the pots made there and the finest *China wares* I ever saw. It will, I know, be easily granted me that the *paintings* may be better designed and finisht (as indeed it was), because our men are far better masters in that art than the *Chineses (sic)*; but the glazing came not in the least behind theirs, not for whiteness nor the smoothness of running without bubbles; again, the *inward substance* and matter of the pots was to me the very same, hard and firm as marble, and the self-same grain, *on this side vitrifaction*. Farther, the *transparency* of the pots the very same."†

* "Mediæval" seems to be used by Mr. Baylis in a more extended sense than usual, as including all art between the Classic and the modern period.

* Martin Lister is one of the few travellers of the seventeenth century, the only Englishman, who have left us any account of their travels in France.

† See Martin Lister's Journey to Paris in the year 1698, p. 138, Ed. of 1699.

The manufactory was much patronised by the great, and the *Mercure Galant* does not forget to mention the visits made by royalty, ambassadors, distinguished foreigners, and others to the establishment at Saint Cloud; and we can easily imagine the interest with which the dainty *marquis* and the still daintier *marquise* of that elegant period must have watched the progress of the work they had given orders to be executed to decorate their gilded *salons*.

According to Alexandre Brongniart,* the manufactory at Chantilly was founded about 1735, and the authors of the first productions were workmen from Saint Cloud, by name Dubois, brothers. But official documents carry us back to 1720, the attempts of Cicquaire Ciron, the true founder of the establishment, and prove that in 1735 the works were in full activity, and satisfied already several foreign demands. That the Dubois, "those nomads of pottery," quitted Saint Cloud and passed by Chantilly before going to Vincennes, cannot be denied. Only the incapacity which they showed in their personal enterprise suffices to prove how useless they must have been to Ciron, or to Louis-Henri, Prince de Condé, protector of the manufactory. By the letters patent granted to Ciron under date October 5th, 1735, and registered in the following year, his plan is evident: it was to imitate the finest quality of Japanese porcelain, classed by collectors under the name of the "archaic family," the first that was introduced into Europe. Without doubt the Prince de Condé, a great amateur and possessor of a fine collection of Oriental vases, directed him in this way.

The constant perfection of the porcelains of Chantilly would never allow one to guess how many vicissitudes the factory went through. It, however, several times changed masters. To Ciron succeeded Antheaume, Potter, Baynal, and Lallemont, who, after having seen the factory sink in his hands under the blow of political events, did not hesitate to re-enter as a simple potter in another establishment. There is nothing which this factory did not produce, from the most costly vases down to the most ordinary services of china.

The Brothers Dubois, not having been able to maintain themselves at St. Cloud, nor divide the success of their comrade Ciron at Chantilly, were obliged to seek elsewhere their fortune. In 1740 they proposed to M. Orry de Fulvy, *intendant des finances*, and brother of M. Orry, Louis XV.'s Minister, to make known to him the secret of the manufacture of porcelain.

For some time past a desire had been expressed in high quarters to erect an establishment which should rival that in Saxony. The Dubois were consequently welcomed with open arms, and the Minister gave them a laboratory at Vincennes, and M. Orry de Fulvy was charged with providing the necessary funds. The incapacity, however, of the brothers was soon discovered, and, after several acts of misconduct, they were at length dismissed, after three years of useless work, which had cost no less than 60,000 francs. One of their assistants, however, Gravant by name, an intelligent and active man, had followed with interest the attempts of his patrons, and, continuing his researches, succeeded in obtaining a tender porcelain, the secret of which he confided to M. Orry de Fulvy. Again aided by his brother, this gentleman formed, in 1745, a company, whose seat was to remain in the historical fortress of Vincennes.† The following year the celebrated chemist Hellot was attached to the factory, and contributed powerfully to its progress.

Legrand d'Aussy tells us that from the creation of the royal manufactory public criticism was invoked. "The first important work which the manufacture (of Vincennes) produced was a service for the king, in 1754. It was exposed in Paris for public admiration." From this date till 1790 the chief works of the royal manufactory were annually exhibited in the *salon* of the Œil de Bœuf, at the Louvre, from Christmas-day to Twelfth-day. Presents and New Year's gifts were made by the king to the crowned heads of Europe, and as rewards to Ministers and others.‡ In the accounts of the manufactory may be found, in addition to the mention of numerous presents to foreign ambassadors, a list of the pieces composing the service to be presented to the Directory, the price of which, *in assignats*, is fixed at 2,304,240 francs, and in coined money at 38,404 francs. In 1815 the system of private exhibition at the Louvre was again introduced, and continued till 1848; and in 1832, under Louis Philippe, the public were freely admitted.

Before long numerous spurious pieces of china flooded the market, and great complaints were uttered by the administrator, M. Charles Adam; but the Court, believing them to be exaggerated, at last, in 1753, transferred the power to Eloy Brichard; the decree further stating "the pieces of porcelain of the said manufactory shall be marked with a double L interwined in form of a cipher, which shall be the distinctive mark of works coming thence." This important innovation furnishes a precise date for the vases signed with the two Ls with numeral letters.*

In effect, from the year 1753 Louis XV. took upon himself a third of the expenses of the Vincennes establishment, which from this time takes the official title of the "Manufacture Royale de Porcelaine de France," and the mark becomes obligatory. Thanks to the skill of the administrator, who, by means of law and heavy fines, succeeded in stopping the fabrication of false porcelain, the factory arrived at considerable prosperity, and a renown without equal.

In 1754, the Empress of Russia commanded the famous service, ornamented with imitations of antique cameos, the enormous price of which was to raise, later on, a serious correspondence between the statesmen of the two countries. From the archives of the manufactory of Sèvres we are able to describe how, in a long memorandum prepared with care, the Minister Birtin explains to the empress how 360,000 livres is no exaggerated sum to pay for a unique *chef d'œuvre*, at which all the ceramic artists of the period were obliged to work. The number of commands, however, continued, and brought about necessarily a need of an increase of hands on the establishment; the *matériel* no more supplied the daily needs, and the manufactory found itself restricted for want of room in the old fortress; in addition to which, the company determined to lodge at the factory, and purchased therefore with this view a house and property at Sèvres which had belonged to Lully, the famous musician. Here an immense building was erected, which, notwithstanding its numberless annexes, did not suffice for the wants of the late imperial manufacture. Little was that dreamt of in the middle of the eighteenth century when, in 1756, the royal manufactory established itself at Sèvres.†

Whatever may have been the reputation of the Vincennes establishment, it rapidly gave way to the new factory at Sèvres, or Sève, according to the orthography of the time (Boswell in his "Life of Johnson" spells it thus, in giving the journal of the "great man's" visit to Paris in 1775‡), and the name expressed the perfection of tender porcelain, as much as Dresden the supreme degree of European hard porcelain.

Difficulties soon rose, however, from the immense number of imitations with which the market was supplied, and Eloy Brichard declared, just as his predecessor had done, his powerlessness to stop this: notwithstanding, it was ruining him, as the cheapness of these falsifications injured seriously his prices. At last matters reached such a pitch that the king took the matter in hand, and resolved to arrogate the supreme authority, and a decree of the 17th of February, 1760, declared that from the 15th of October, 1759, this privilege accorded to the company (whose term was fixed at the end of the year 1764) should be withdrawn. This decree ordered that the manufactory should, for the future, be administered for the king.

In addition, in order in every way to aid the new administration, vigorous measures were immediately adopted. By order of the celebrated lieutenant-general of police, De Sartines, all persons were strictly forbidden, under heavy penalties, in any way to produce any imitations. In all pottery work the use of gold was strictly reprehended. So harsh were the articles of this decree, that complaints were made by numerous manufacturers, and a new decree was passed in 1766, allowing more liberty of action. Establishments were now springing up in large numbers; but an important discovery was soon to work a great change in the manufacture, that of kaolin in France. In 1753, a citizen of Strasbourg, Paul Hannong by name, had offered to M. Boileau, director of the Vincennes establishment, the secret of the compositions of Germany. His price was, however, so exorbitant, that the offer was refused, it being doubted, also, whether Hannong had not procured his materials on French soil. Forbidden, in addition, to introduce his pottery into France, he offered his services to the Elector Palatine, and founded the manufacture of Frankenthal. In 1765 Guettard read before the Academy of Sciences a paper, stating the existence in France of clay suitable for the making of hard porcelain. This was denied by the Comte de Lauraguais; but from geological proofs it became evident that the spot near Alençon yielded the necessary material. At last a happy circumstance settled for ever the difficulties of the discussion. Madame Darnet, wife of a surgeon, near Limoges, remarked in a ravine near that town a white unctuous earth, which seemed to her suitable to replace soap in washing her linen. Making known her idea to her husband, he communicated it to an apothecary at Bordeaux, who, in his turn, having procured a sufficient quantity of the earth for experimental purposes, carried it to the chemist Macquer, whose studies were specially leaning in that direction. From this time it became evident that France might rival Germany and the East in their productions in hard porcelain. This had occurred in 1768, and after five years of experiment and trial the royal manufactory at Sèvres was able to produce the two kinds of translucid pottery.* In 1773 M. Boileau was succeeded in the directorship by M. Parent, a man of large views, but with order in his operations or in the management of the accounts. In 1778 he was arrested, and M. Regnier succeeded him next year. This epoch may be considered as that of the greatest development of the royal manufactory.

The discovery of kaolin, in France, gave an immense field to private enterprise; indeed, so great was the number of factories, especially round Paris, that at one moment the quantity of fuel they used threatened the capital with a want of wood. The market in addition became filled with every kind of porcelain decoration, and at last a decree of 1784 restricted the making of certain ornaments, such as the royal manufactory produced, allowing alone the fabrication of ordinary useful china. The mark of the maker was more than ever obligatory, and all imitation of the two Ls was heavily fined. At this period also commenced, in consequence of the restriction of wood made on the fabricants, the use of coal in lieu of wood for the purpose of baking the porcelain. But the large number of factories above spoken of was now becoming worthy of consideration, and a decree was at last passed in 1787, with a view to obliging all manufactories to pass a competition before being allowed to produce for the public.

But a great storm was now bursting over France, and the awful scenes of the Revolution were visible on the horizon; blacker and blacker grew the clouds, till at last they broke over the country and crushed it. It is extraordinary, however, that at such a period of general levelling the manufacture of Sèvres should remain; remain, however, it did.† Notwithstanding the numerous jealousies that such a favoured establishment must have roused, no harm came to it. It was generally seen, that by continuing the Government support to the factory, advance might be made, while, if it were left to the care of private individuals the expense of trials, and the consequent loss in case of failure, could not do otherwise than retard any chance of progress. The emulation engendered also by the success of the parent establishment was considered as certain to have wholesome effects on private ventures. Under the Directory the manufacture of Sèvres was administered by a triumvirate composed of MM. Salmon, Ettlinger, and Meyer. In 1800 M. Brongniart took the whole direction, and preserved it till the epoch of his death in 1847. M. Ebelmen succeeded him,—his early death in 1852 was much lamented. His successor was M. Regnault, a member of the Institute.

The history of porcelain manufacture in France having thus been treated of, another task remains,—a difficult one, indeed,—in the words of M. Jacquemart, the learned compiler of the history of porcelain,—it is "to appreciate the artistic merits of pottery vicious in its elements, and of

* Director of the Sèvres manufactory at the beginning of this century.

† Situated just outside the eastern gates of Paris and surrounded by a beautiful wood.

‡ Probably the last service of Sèvres from the royal manufactory presented to an Englishman was that given to John Martin, the painter, by Charles X.

* The letter A indicates the year 1753, from which time the alphabet continued. I and J are two different letters.

† A portion of the old house of Lully still exists, and serves as a water-tower.

‡ "October 26 (1775), Thursday.—We saw the china at Sève curious, glazed, and painted."

* Till 1802 the two kinds were made, but after that year the manufacture of all objects in feldspathic porcelain ceased.

† Along with the Statue story of the Gobelins.

which, in spite of the technical superiority of certain contemporary works, in spite of the successive discoveries of science, the ancient specimens remain quoted at the highest price among the curiosities with which fortune and taste surround themselves."

After the violent commotions of the end of the eighteenth century, after the successive devastations that all the royal *châteaux* and the public monuments underwent in France, the finest works of Sèvres manufacture disappeared. At least, if it were impossible to form a museum of the actual objects, old models of half a century back could be found, and so all the *ateliers* of the kingdom were ransacked, and out from the dust were produced the old moulds and forms which the genius of former and more inventive days had created. Here were productions from the hands of Falconnet, Clodion, La Rue, Boizot, Bachelier, Duplessis, all the illustrations of art at a period of abundant invention and a sensual exuberance. In these may be remarked a wise proportion existing between the surfaces left to be painted and the happy mouldings; in the words of M. Jacquemart, "there is to be found there what would make the most vehement enemy of the eighteenth century, and its errors, admire."

Among the forms in use between the years 1740 and 1780, we may cite as particularly elegant those of the *vase Falconnet*, the *vase du milieu du Roi*, whose graceful appearance recalls the best productions of goldsmiths' work, the *vase écritoire*, the *vase fontaine Dubarry*. In a form more simple, derived from the egg, it is the *vase console* rendered light by the deep depressions of its base, the *vase à chîne*.

From 1780 to 1800, some modifications were introduced. In trying to purify the manners of the court, Louis XVI. essayed also to bring back simplicity in art; in 1785 he purchased from M. Denon his cabinet of antiques, destined to furnish new models of the French ceramic art, this collection has served as a base for the museum at Sèvres, where it still may be seen. The study of this second series is not without interest, the *vase Bachelier*, the *vase œuf garni*, the pure Greek urns, the *vase Médicis* with its antique bacchanal and its acanthus-leaves. But these transformations are not without some motives worthy of notice. Here it is Boizot, who, as if to follow the way opened by Clodion, developes on a slender vase, pretending to the Hellenic form, groups of *amorini*, impressed with the pure French style. This mixture, frequent in the product of Sèvres, during the second half of the eighteenth century, contributes powerfully to the charm of what is named the "style Louis XVI."

Before going further and seeking what has been in this century the progress of the manufacture of Sèvres from the point of view of form, let us say a word of the groups and figures. The collection of models, as complete as one can desire, is most instructive as a mark of national sentiment; at first occupied with imitating the Germans, and the easy pastoral subjects, the modellers follow the trace of Boucher and his meretricious school. But soon serious artists enter the manufactory, and introduce something better. Falconnet, rendered famous by the figure of the *baigneuse*, which opened the doors of the Academy to him, reduced with success his charming work, and produced others in the same style. There is yet another kind of group, created beyond a doubt by Bachelier, representing hunting subjects, in which wild boars, wolves, &c., are vigorously attacked by the dogs.

With the nineteenth century, commences what M. Jacquemart calls "the era of the architects"; Percier, Brongniart, under the direction of the Baron Denon, produce those large vases borrowed from the Greek and Egyptian; and the best artists of the period assisted with their designs. The mechanism advances rapidly; busts the size of life, and pieces of furniture, are produced resplendent with paintings. About 1820, Chenavard introduces the ornamental style borrowed from the Renaissance; he is followed by Diéterle, making use of the *chefs d'œuvre* of all periods.

Among the colours called to decorate the porcelain produced at Sèvres, some have acquired, perhaps without meriting it, an immense reputation: foremost stands the *turquoise blue* invented in 1752 by Hellot. It so pleased Louis XV. that at first the courtiers named it *bleu du roi*, but that colour existed already, and the modern name was eventually given it. The second decorating colour is the *rose Pompadour* (invented in 1757 by Xrhouet) which Marryat and others call *rose Dubarry*, although it was anterior to 1764.

M. Jacquemart protests against a statement made by our Marryat that in the first year of the French efforts the painters were so feeble that German help had to be called in; this appears to be incorrect, and arises probably from the great resemblance which exists between the early efforts at Vincennes and the works produced at Meissen, from the fact that both took their ideas from the same source; but nothing can be more different than were their styles as they became more established. Nothing shows better the character of painting on tender paste in France than the magnificent *plaque*, executed in 1756 by Castel, after Despartes, which is exposed in the museum.

The porcelains of the time of the First Empire are remarkable for the stiffness of their forms and the academic ugliness of their decorations. From this period commences the mistake of copying pictures and historical subjects on vases, plates, and other objects. In an article on the subject in the *Revue des Deux Mondes* of June, 1862, M. Adalbert de Beaumont has given some very determined and sensible views, desiring the manufacturers to look to Chinese decoration to learn lessons from, and not attempt what is not of the domain of pottery decoration.

At the end of the Second Empire the manufactory of Sèvres was enlarged by the addition of a number of new buildings at the extremity of the park of St. Cloud, and it is these new annexes which were to have been finished by 1869 that are now finally opened. At that epoch, the manufacture which costs 480,000 francs, and scarcely gains more than 80,000 francs from what it sells, fell into a terrible state of decay, and this was eminently remarkable at the exhibition of 1867. After the unhappy events of 1870–71, an effort was made to commence again, and in 1875 a competition was decreed, to take place annually, for a vase to be executed at Sèvres, the successful author of which was to receive 2,000 francs. At the same time a school of mosaic was founded.

The new buildings which have just been opened occupy a vast quadrilateral, the façade of which looks on the Seine. To the right and left respectively are the collections of the manufacture, which occupy four large rooms, and the offices and library. Of the two museums, one is destined to receive the works of artists of Sèvres, and the other, specimens of the pottery of all nations and all epochs. Both are unique in their way. The latter, we may mention, has just been enriched, thanks to M. Champfleury, the curator, by the purchase, for the sum of 8,000f. (320*l.*) of a Virgin in white faïence, in the school of Lucca della Robbia.

The workshops are composed of several buildings, each of one story high, and all contiguous, which, however, will have to be connected by glazed passages. Only a portion of the manufactures is as yet installed in the new building, and it will be at least eighteen months before the complete change will have been made.

Nor must we forget to mention how, after the Marshal President had been shown the admirable architectural arrangements due to M. Laudin, M. Robert, the director of the establishment, was decorated as an officer of the Legion of Honour, and M. Champfleury, the curator, an officer of the Academy. The recollection of this day will not remain vivid in their minds alone, and we hope that the wish expressed by Marshal MacMahon, who, in giving all praise to the perfection of the modern painter's art, regretted the degeneracy of the forms on which they exercise their skill, and expressed his confidence in the ability of the present art-directors of the establishment to encourage a return to a more faithful adherence to the beautiful models, of which so many examples exist for our admiration and emulation, may be fulfilled.

SOCIETY OF PAINTERS IN WATER-COLOURS.

THE fifteenth of the winter exhibitions, now open in Pall-mall East, is really, as the title-page of the catalogue describes it, an exhibition of "Sketches and Studies," and, moreover, it is a very good one of its class. We are glad to find the most important of our water-colour exhibitions keeping to the style of productions which the winter exhibitions were started for, and not presenting a mere repetition of the spring exhibition; and in regard to water-colour art this is all the more desirable, because a collection of drawings like this, in which finish is not the aim so much as effect, seems to bring us back a little to the special characteristics of this art, its power of giving atmospheric effect and tone in landscape by a broad and comprehensive rendering, and with comparative rapidity of execution; whereas the recent practice of water-colour has tended so much towards minute finish and realism that the most marked capabilities of this medium of expression are in danger of being overlooked and slighted. Some of the contributors appear to us to show more power and artistic feeling in their slighter works in the present exhibition than in the average of their works for the spring exhibitions, simply because their attention has been turned less to finish and manipulation than to the expression of a thought or an effect.

We can only just refer to some of the best items in a collection including a great deal that is interesting. Among the few figure subjects Mr. Tadema's "Balneator" and "Balneatrix" (332, 353), companion works representing respectively a male and female attendant in a Roman bath, are little masterpieces both of character and colour, steeped, like all the artist's Roman subjects, in an atmosphere of habit and personality utterly alien from modern experience. Perhaps no historian has done more with his pen than Mr. Tadema with his brush in making Roman society under the Empire something like a reality to us. What a change to go from these to Mrs. Allingham's sweet and delicate studies of rustic children,—"Over the Hill," "May," "Little Johnny" (366, 388, 369), the latter a baby looking aimlessly out of a cottage window; little drawings whose quality is in inverse proportion to their quantity, and which would make one love children if one never did before. Among other figure subjects Mr. R. Thorne Waite's "The Ferry Side" and "Caught in a Shower" (121, 383) are very good, the latter especially. Mr. Radford's works have the same hard finish as before; "Caveat Emptor" is the best, but this artist has done nothing to raise the tone of the Society's exhibitions. Mr. J. D. Watson sends a good many of those studies of nooks of landscape with a figure or two, which he seems to achieve with almost too great facility, falling below himself at times; "The Rendezvous" and "Homeward" (151, 350,—high life and low life respectively) strike us as the best. Mr. Walter Duncan is vexatious; his "Cup of Tea" and "In the Stocks" (132, 151) are both indubitably original and both very ugly; the latter really *almost* vulgar. Some small studies by Mr. Lamont, Mr. Smallfield, and others, should be noted, and a clever sketch of a "Spanish Mendicant," by Mr. F. W. Topham (202); there are sundry sketches by Sir John Gilbert, too like many predecessors with the same kind of merits. Animal life is represented by two capital studies, by Mr. Riviere, of young lions and young tigers well known to the frequenters of the Zoological Gardens at present; by an admirable "Sketch of a Cow" (126), by Mr. H. Brittan Willis; and by Mr. Otto Weber's several landscapes with cattle, which are of rare excellence, and force us out of our usual indifference to "Cattle pictures."

At the top and bottom ends of the room the places of honour are given to a beautiful drawing by Mr. Alfred Fripp, "The Quarry Path" (95), and a very fine broadly-sketched "Surrey" landscape (258) by Mr. Thorne Waite; a model type of "sketch." The various sketches of Mr. J. W. North are marked by great individuality of tone and feeling, and a peculiar manipulation which at least exactly answers its author's object. The "Sea Belle" (111), a yacht coming lazily over an expanse of nearly calm sea, with broken reflections of sunlight, has "Mr. Francis Powell, his mark," imprinted on it with more than ordinary distinction of excellence; the same artist's figure-study, "Hesitation," (308), induces, we confess, the same mental attitude on the part of the critic. Drawings by Mr. Dodgson, Mr. Davidson (whose studies of Surrey landscapes are admirable), and the late Mr. Whittaker, are to be noted; Mr. Albert Goodwin has some admirable slight sketches, including a small view of "St. Michael's Mount" (357), remarkable for force and reality of colour; Mr. A. H. Marsh's "Evening" (277), a twilight lane backed by a high bank of trees deep brown against the fading light, is full of genuine feeling; Mr. Matthew Hale's "Low Tide, Sunset" (205), is a beautiful study of sunset colour and light. Among architectural sketches Miss Clara Montalba has two drawings, rather more than sketches, of the "Interior of St. Mark's (147, 170); M. Carl Haag two interesting little studies of a "Temple of Bacchus in the Campagna," and an "Old Chapel

at Oberwesel" (65, 104), and "Old Houses at Bacharach," and a study of "A Gable at Cologne" (387, 392). Two or three little landscape-sketches by Mr. Marks are beautiful in their way, and much more to our taste than his designs for "The Months," which are not humorous, but only "funny,"—a very different characteristic.

THE CEMETERY OF CALLISTUS.

It had been feared that the works of the Italian archæologists, among the Roman Catacombs, arrested seven years ago, would not be resumed; but an indomitable spirit has prevailed over the difficulties which then threatened, and a third series of discoveries will shortly be unveiled to the world. There is no chapter of written history more speaking and truth-telling than that which may be deciphered in these catacombs, enigmatical and mysterious though they frequently are. Their exploration has now been a ten years' task, and is, as yet, far from being completed. But the farther back they go the more delicate is the ground to be trodden, and the greater tendency, among the monuments, to mingle the Pagan with the Christian record. Of course, the field of conjecture widens from this point; but we are enabled, by the latest labours of the archæologists, to select a particular ground for consideration, and this is the celebrated Cemetery of Callistus. It had been examined, to a certain extent, in and before 1869; but the new report will show that this examination was altogether superficial, and that even the outlines of that famous burying-ground were then scarcely known. Recent investigations suggest the inquiry whether it was not a Pagan converted into a Christian place of sepulchre. There are painted galleries and chambers; the arrangement of the tombs seems to date from before the first century; the brickwork employed is of an antique date, older than that used in the pavement of the Appian Way, and among the epitaphs are not a few which must have been, even in the days of Marcus Aurelius, those of long extinct families. That is a matter of antiquarian chronology, however, a discussion of which may be deferred, perhaps, until the "Third Statement" has actually been published. The one important historical fact is that this great burial-ground became dedicated to Christian uses before the reign of the Antonines, and that in it tradition recognises the tomb of Saint Cecilia, which, for eleven centuries, had been lost, with the inscription, half-obliterated,—"I am free, I am noble, and I am the daughter of a Senator." This is conjecture, no doubt, but the grave is unquestionably that of one who must have answered to such a description. Whether, therefore, its marble splendours belonged to the Saint of Song, or to one of her Imperial votaries, matters little. The Cemetery of Callistus means the cemetery of the Cecilias, at all events. It was at first their private sepulchre. Passing out of their hands, it became the property of Callistus, Pope Zephyrin's favourite deacon, whose ambition it was to have the bodies of the early Popes translated thither from the crypts of the Vatican. He procured it to be styled, in public documents, "The Cemetery," *par excellence*, as though no other existed, and traces are evident that, from and long after this date, it was the only one exclusively devoted to the burial of Christians. It grew, however, into a splendid grave, of which the description has been given to us, for the first time, now. M. Rossi began by identifying, beneath the dust and ruin of ages, the tombs of the third-century Popes, from Zephyrin to Miltiades,—all contained in a moderate-sized chamber, such as would have attracted little attention among the hollows of an Egyptian Pyramid. The walls and roof had fallen in; on the floor lay a heap of fragments, and a door at the further end was nearly choked. Penetrating it, however, by means of the axe and spade, the explorers came upon a magnificent gallery of mural paintings,—large spaces covered with superb decoration, wall-ornaments of tinted marble, fallen capitals of richly-wrought columns, broken pilasters, and sculptural fragments, suggestive of an exquisite art. It is pretended that the names of certain illustrious Popes, all belonging to the third century, are legible upon these remains; this, then, was the Papal Crypt, so it was believed at the time; yet the recent discoveries somewhat shake our faith in the confident "restorations" of M. Rossi, with his elaborate altars, tombs of saints and martyrs, and so forth. It is remarkable that in no instance does the Papal title accompany the name. There is only the word "Bishop," with, in a solitary case, the addition, obviously attributable to a far later date, of "martyr." However, it is not claimed for the Popes that they occupy the entire cemetery of Callistus. On the contrary, it might be supposed to contain a nation of the obscure and humble dead. The earliest explorations were baffled, in every direction, by walls that seemed like the solid rock; but which have just proved to be no more than ingenious masonry. These, being broken through, expose, perhaps, a ruder method of excavation, and a more crowded disposition of the dead; yet the same characteristics obtain throughout, and the inscriptions, with a solitary exception, are in Greek, or Latin written in Greek characters. The latest discoveries sustain the former, so far as regards the perfect and pure simplicity of these early Christian epitaphs,—the name and date, followed by "Peace be with thee!" "Sleep in the Lord!"—no style, no title, no blazonry of achievements or of rank, though occasional ejaculations occur of intercession for the souls of the dead. All this is curious, and becomes more so the farther the investigations are carried. Still more interesting are the funereal frescoes so long hidden away in the darkness of these cavernous tombs. Christian art, we are often told, had its origin in the catacombs, and certainly it must have been nursed here at a very early age. It is to be suspected, however, that most of the sculpture brought to light in the course of the excavations was Pagan; that, for example, of the great sarcophagi, which are distinctly mythological in their adornments; one of them is wrought over every inch of its surface with incidents from the fable of Psyche and Eros, a fact lending probability to the theory that the catacombs existed long before they were adapted to the purposes of Christian secret assemblages or obsequies. At the same time we do find these early and obscure Christians condemned to meet, worship, and work in the privacy, as it were, of a tomb, imitating, in the matter of decoration, the Romans, the Greeks, and even the Egyptians, without hesitation or scruple, and Tertullian himself justifies the practice. To adorn the walls and vaults of their funeral chambers, they copied, from the boudoir and the saloon, arabesques, birds, flowers, winged genii, even nymphs, and all else that could give a grace to the home of death. In the Cemetery of Callistus was discovered, years ago, one beautiful fresco, representing Orpheus playing on the lyre, and quite recently, a strange apparition of the same heathen deity, transfigured into the image of Christ, with the Lamb, instead of the lion, at his feet. The age of this singular work it is impossible to ascertain; but it ranges with a large class, all exemplifying a transition of ideas from one stage of art and thought to another. In this respect the discoveries in the Cemetery of Callistus have proved invaluable. There have been found, too, a multitude of historical and dogmatic illustrations, especially in two chambers, adjoining each other, hollowed in the solid rock, and covered with illustrations from the Old and New Testament narratives. The discoverers, eight years ago, confessed themselves unable to interpret the symbolisms thus expressed; but, with what accuracy it is impossible to say, they at length declare themselves capable of reading the entire parable, from beginning to end, which may be doubted, because, from what is permitted to be seen of the copies taken, the confusion of allegory with history makes up a cypher unintelligible without a key. Thus, Moses and Peter in one strike the rock; the water, at one point, sickens, and at another refreshes those who drink it; here a fish is a soul redeemed, there it is the Lord Himself; now, the vessel bearing Jonah carries a cross upon its mast; there, a vast ocean is swallowing up the creation, from the ark to Julius Cæsar. It is a characteristic, and even grotesque, portfolio, the outlines and colours of which belong to a period long anterior to that in which Christian art began to be touched by an Italian grace; yet none the less valuable on that account. It was the rude, unassisted, independent expression of a faith, and the artists worked in twilight. They represented miracles, persecutions, martyrdoms; they drew the Jewish and the Grecian types on the same panel; they had no choice of pencils, colours, or canvas; their materials were as clumsy as their creed; and so they sought to whiten the sepulchres of Rome; and so, after many years, the monuments of their imagination and their industry have been found. Not all barbarous or misshapen, however. Beyond, as we have said, rough and hideous corridors, resembling the corridors of coalmines, we have infinitely richer embellishments, incrustations of ornamental marble, miniature chapels of delicate sculpture, staircases carefully balustraded, though in the solid; on each side dark adyta plunged far down in a marvellous solemnity of silence and gloom, yet wonderfully wrought, as though the dead had sight to admire them; and, above, as though with the object of deception, airy, lighted galleries, which, in the age of Constantine, it is recorded, were lined with plates of silver, "shining like mirrors." They, of course, have disappeared, with thousands of the *graffiti* or tablets that might have told a precious history of the past. But the archæologists are indefatigable, and declare that there are miles of excavations still to be made, when they hope to penetrate beyond even the march of ancient Vandalism, and detect traces which Time itself has spared. The Italian Government accords them every help, and when their latest chronicles are made public, it will doubtless be seen that they deserve it.

"ART AT HOME."

Under this title a series of small treatises is being issued dealing with the subject of domestic art in various branches, of which the first two parts* are just published. The idea is not a bad one, more especially as the volumes are so cheap as to come within the reach of a great number of readers; but unless the series is carried on better than it has been begun, it will hardly be of much value. The first part, "A Plea for Art in the House," by Mr. Loftie, is one of the most silly and shallow treatises we have had the misfortune to look into. The first chapter, a very long one, is all upon "the prudence of collecting"; in other words, the advantage, in a commercial point of view, of buying cheap what is likely to rise in value; than which we can hardly imagine a lower motive for purchasing works of art. The author's recommendations are seasoned with anecdotes which he seems to consider amusing. His ideas of decoration may be judged of from his description of the decorative scheme of a room in which the walls, being painted a cool grey, were made the ground for black-letter inscriptions painted at intervals diagonally up the walls, "a different slope being adopted, to avoid uniformity of effect." There is Mr. Loftie's notion of "design"; which would be an easy matter, at that rate, certainly. He confounds etching with engraving (p. 59), and sneers at the etchings of Whistler and Legros, which certainly may have a kind of excellence beyond the comprehension of a critic who on the next page thinks it necessary to tell us that if we frame on the wall one of the big prints which the illustrated papers occasionally "present" to their readers, we shall be "disappointed" with its effect. On the next page to this we read that photography, though of little use for portraiture, is very well suited for landscape (!). What we find a little further is still better:—

"To many people it will be new to hear that we had a school of art in England in the twelfth and thirteenth centuries, such as we have never had since, and that there were painters and sculptors among our ancestors in the reign of Henry III. whose works excel anything that has been produced in our island in the nineteenth century."

Such a statement, in regard to the country of Flaxman, Reynolds, Gainsborough, and Turner, is simply impudent; one of the silly paradoxes by which shallow and pretentious writers pass themselves off upon more ignorant people as very profound critics. However, after this specimen we may quit Mr. Loftie's lucubrations, merely regretting that an apparently well-intended project should have been started so badly.

The second part, "Suggestions for House Decoration," by the Misses Garrett, deserves a different reception. They aim especially at promoting artistic treatment of middle-class houses, where good taste, without costliness, must be the aim. The average house, as it is at present, is described, truthfully enough, and without any unnecessary attempts to be witty at its expense; and the details of the improved picture are then suggested, for the most part sensibly and practically, and with good taste up to a cer-

* "A Plea for Art in the House," by W. J. Loftie; "Suggestions for House Decoration," by Rhoda and Agnes Garrett; Nos. 1 and 2 of the "Art at Home Series." London: Macmillan & Co.

tain point. The necessity for this reserve in commendation arises in the partiality of the authors' studies, which are based upon the facts of a single and very corrupt style (not, indeed, to be called strictly a style at all) instead of the general *principles* of style, of which they seem quite unconscious. They have based their ideas of what is right and in good taste solely upon the "Queen Anne" manner, and, knowing nothing of design beyond this, seem to imagine that no one else knows any more either, and that the whole theory of architecture and decorative design is comprised within the horizon of the very small but rather self-sufficient clique of "Queen Anne" architects and *dilettanti*. They are kind enough to tell us (p. 55), that "much has lately been done by the architects and designers of the Queen Anne school to improve the public taste"; the *naïveté* of the remark, implying that nothing had been done to "improve public taste" until the Queen Annists came to the rescue, is really delightful. They commence their "introduction" by stating that "not long ago, at a meeting of the Royal Society of British Architects, a paper was read upon 'the Queen Anne style of architecture.' This was followed by a discussion, of which not the least curious part was the evident wish to disbelieve in the existence of such a style. One venerable professor went so far as to ask querulously where he could see any examples of the so-called style, with a sneer in the pronunciation of the last word which it is not possible to express by any form of print." No corporate body under the title of the "Royal Society of British Architects" exists; however, we know what body is intended to be referred to; but as the paper in question was not read at a meeting to which ladies are invited (though we see no reason why they should not be), it is difficult to understand how the Misses Garrett could be able to describe so graphically the peculiar sneer of the "venerable professor." What we are quite sure of, however, is that the venerable professor knew a great deal more about the matter than these young ladies, who think themselves competent to criticise the whole architectural world, either know or are likely to know, unless they extend the range of their studies a good deal. The fact is that, what is called Queen Anne architecture is *not* a "style," but simply a "manner," which is a perfectly different thing. It is true, as the authors observe, that since the occasion above referred to a good many houses have been built in this manner, and that it has shown signs of getting popular. That, however, no more makes it a style than the popularity of chignons and crinoline made them tasteful adjuncts of costume. If the Misses Garrett wish to know what constitutes "style" in architecture and ornament, we may refer them to No. VI. of Viollet-le-Duc's Lectures on Architecture. That they do not know at present is obvious; for in the illustrations and the letterpress they recommend things absolutely at variance with any true idea of style: for example, they recommend (p. 62) the adoption of the "old-fashioned door-head" in interior doors, by way of obviating "the ill-proportioned and mean-looking" appearance of the ordinary room-door as it is at present. What they mean to recommend is the pedimented doorway familiar to us in Jacobean as well as Queen Anne interiors. Now, did it ever occur to the Misses Garrett to reflect for one moment what that feature really is? It is a slice of the Classic architrave, frieze, and cornice, cut out from the Greek building (or, rather, the Roman corruption of the Greek building), where every feature in it had a meaning, and applied where it has no meaning whatever; and it is the execution, moreover, in framed wood of details which originated in, and are only really suitable to, built-up masonry. Æsthetically and constructively the feature is in reality opposed to the most fundamental principles of true taste and "style," which imperatively demand that every feature in such a construction should arise from the constructive method employed, and should be such as the nature of the material suggests. The sideboard, again, shown in the illustration forming their frontispiece, is simply a misapplication of stone architectural forms, very badly used and shorn of the proper proportions, to a piece of wooden furniture. To the Greek architect, whose details are here stolen and vamped up again, such a thing would probably have appeared utterly absurd; it is only the prevalence of specimens of this false and uninstructed taste, which the Misses Garrett are here once more recommending, which prevents many who are used to them from feeling them as such. Again, in the two illustrations of a drawing-room (pp. 61, 62), the furniture in the first one is in a very good and truthful *wooden* style, while that in the second illustration is totally different in style, and about as bad and weak as can be: yet the authors seem to see no difference, and equally recommend both. In short, the book has no basis in art-principles whatever; it is simply based on an exclusive admiration for Queen Anne furniture. Now, the study of no *one* style, even a good one, can afford a basis for critical principles, still less the exclusive study of one which all whose tastes are better founded than to be shaken by every new fashion, know to be full of blunders, contradictions, and offences against pure taste. If the excellent ladies who write this treatise merely profess to be decorators in the Queen Anne style, well and good; every one has a right to his or her taste, and we have had ocular evidence that the Misses Garrett can do much better in the actual treatment of room-decoration than their illustrations here would lead any one to suppose. But we must really hint that a proficiency in this branch of artistic work scarcely gives its practitioners a critical insight into the whole subject of decorative art: and, as to architecture, we are of opinion that they simply do not understand what it is. When they learn in what architecture, as "the art of building nobly," really consists, and at the same time discover how much more there is to know about it than they have yet found out, they will perhaps see that their dogmatic tone in regard to the subject is out of place,—not to say just a little absurd.

PERSONAL LIABILITY UNDER THE NUISANCES REMOVAL ACT.

WHEN a prime minister has announced that the prominent feature of his home policy is the improvement of the sanitary state of the country, this subject obtains even greater notice than it would attract from its own inherent qualities. We propose, therefore, very shortly to point out the bearing of some important legal decisions on personal liability under the Nuisances Removal Act. In the first place, it is well that the public generally should know the rights they possess against those who cause nuisances; and in the next, there are, no doubt, persons who may from time to time be dragged into litigation rather from ignorance of their position than from any distinct wish to violate the law. Everybody, says a well-known legal maxim, is supposed to know the law, a maxim which any one who is aware of the vast mass of modern statutes and judicial decisions must consider more hopelessly absurd than even most maxims, which, as Macaulay remarked, are only useful in children's copy-books. The Nuisances Removal Act (18 and 19 Vict., c. 121) enacts that "the person by whose act, default, permission, or sufferance the nuisance arises or continues" may be summoned before the justices, who may make an order on such person for the abatement, discontinuance, and prohibition of the nuisance. From this it is quite evident that, if from want of care or from wilful neglect works are constructed so as to violate this Act, they may be a source of great loss to the owner; for it must be pointed out that this section has a very wide bearing, and that the Courts of Law have held that these words apply indirectly as well as directly.

It is this question of what may be called indirect liability that is the most important to be properly apprehended, for when a nuisance is directly caused by some person there can be little doubt of his liability. The test of indirect liability which appears to us to be the surest one for discovering the true bearing of this point may be shortly stated as follows:—Would the nuisance have arisen if it were not for the act of the person alleged to have caused it? If it would not, then even though others may be apparently blameable, this person whose act is a cause *sine quâ non* in the matter is liable under the Nuisance Removal Act. We shall so simplify this proposition, which we have stated in a form capable of being apprehended by lay readers, by the facts of two cases, one of which was decided in the course of the present year, whilst the other took place about ten years ago.

In the first case, Brown *v.* Bussell (37 *Law Journal*, Magistrates' Cases, p. 65), a brewer at Esher had discharged the sewage and refuse-water from his works into a covered drain running along a turnpike-road. This drain ultimately discharged itself into an open ditch or water-course on the Sandown Park Estate. For many years the owner of this estate had used the contents of this open drain for the purpose of irrigating and fertilising his land. A subsequent owner discontinued the practice, and hence this open drain very naturally became a nuisance to the locality, for the sewage water had then to run off the Sandown Estate into various open ditches. The question arose, was the brewer liable under the Nuisances Removal Act? It will be evident that here he was clearly not the direct cause of the nuisance, but that without the refuse water from the brewery it would not have arisen. Even if there are other persons who are also the cause of it, this will be no excuse for any one who is clearly also a cause for the present. Lord Blackburn observes, "if it is proved that a man sends from his premises enough refuse to cause a nuisance, it is surely no answer for him to say that there are other persons who cause a similar nuisance. He himself causes a nuisance and may be ordered to abate it."

Turning now to the more recent case of the St. Helen's Chemical Works against the Mayor of St. Helen's (45 *Law Journal*, Magistrates' Cases, N.S., 50), we find that there was first of all a public sewer forming part of the drainage system of the town of St. Helen's. Next that sulphuretted hydrogen gas was generated in the sewer below the works of the company, and escaped into the street from this main sewer in such quantities as to be injurious to the health of the inhabitants and passers by. Next came the cause, namely, two drains from the Company's works, which they had a perfect right to use to drain their works into the public sewer, down one of which came liquid impregnated with muriatic acid, and down the other liquid impregnated with sulphur. These elements combining and mingling with the sewage and with each other caused the various gases. But there was also this important fact: that if the main drain had not been improperly trapped the gas would not have escaped. Nevertheless, the Court held that the Company was liable under the words of the Act which have been already given. Here was essentially an instance of indirect liability. But whilst, no doubt, this very extensive personal liability should be enforced by the law, it is still impossible not to see that a certain amount of injustice was done in this case. Because, although Mr. Justice Grove observed that if the sewer was completely trapped, it might burst, yet no such inference was stated in the case before the Court. The direct fact was, that the sewer was improperly trapped. So that to place all the liability on the person without whose intervention the nuisance would not have arisen, and to let the person or corporation go scot free by whose approximate neglect the nuisance was not prevented, seems to be stretching the Act almost further than is quite justifiable. We do not wish to prevent persons from being liable for nuisances they commit,—let the law be stringently administered—but at the same time influential corporations should not be permitted to escape scot free when they neglect their duty. But with these observations we may fairly commend these two examples to our readers as clear instances of the law which has been stated in the proposition at the commencement of this article, and which at the present time should be well understood by all whom it may concern.

DAMP.

ONE of the effects of the changeable weather that we have had lately has been to draw attention to that terror of housewives—damp,—an evil which, with all the apprehension that it engenders, is but little understood, and very inefficiently guarded against, both in the design of a building and in its subsequent management.

That form of damp which is caused by the absorption of moisture from the soil is so well known, and the ordinary precautions against it—such as the dry area and the damp-proof course—are now so commonly employed, that it is unnecessary to do more than mention them. The damp which affects the upper part of a house—its wall surfaces, fittings, and furniture—requires more particular study and more care in counteracting its effect.

The third week of November began with severely cold weather that would penetrate into any imperfectly-warmed house where the access of air is pretty free. To this succeeded a day of soft, warm, heavy weather, the air being filled with moisture. On the Thursday the internal walls of the staircase of a house in the City of London, with which I am well acquainted, and which was built with unusual care in all

respects about twenty-five years since, were covered with moisture so as to produce the effects following:—Upon the smooth, hard plastering, which is painted with a "bastard flat" surface, beads of water formed similar in appearance, but larger than those often seen on a window-pane. They then ran together, and streamed down the wall, till the whole surface was covered with water as if it had been laid on with a brush. The water settled first upon the skirting, and then ran down to the stone steps and landings, on which it spread itself in pools for as much as 6 in. from the walls. The steps were otherwise dry, but the polished mahogany handrail was thoroughly wet, the water running down it to the bottom. A painted wooden ledge, 2 ft. by 1 ft. 3 in., that is bedded on brickwork, and on which a certain portion of the wall and of the handrail could drip, was covered with as much water as it would carry.

Now if anything like this had happened to the *external* wall of a house having a south-western aspect, it would have been assumed that the moisture had come through the walls, although when the same thing happens to a window nobody is so ignorant as to think it has come through the glass. The bricks would have been blamed, and such devices as indurating solutions, or cementing the external surface, would have been suggested. It is therefore important to remember that this is an *internal* wall, and one that is exceptionally sound and well finished. Moreover, the external walls of rooms in the same house (hung with varnished oak paper) were not observed to be damp, though the staircase walls of another house had their varnished paper somewhat blistered, for a time, through moisture.

This dampness is, of course, due to the deposit of moisture by the air upon those surfaces that are best fitted to attract and retain it, just as the night dews are deposited upon the grass. The unusual cold of the preceding days had penetrated easily into the staircases, less freely into the rooms. Then came the warm south-west wind, laden with moisture, filling the staircases, penetrating less readily into the rooms, and parting with its moisture freely to the cold, hard, smooth surfaces, but less freely or not at all to such as, being rough and porous, were bad conductors of heat. Thus, painted or polished surfaces will become more wet than such surfaces as are presented by stone, by the softer kinds of wood, and by unvarnished paper, and, where the damp penetrates into a cold, neglected bedroom, the blankets are less affected than articles of cotton or linen.

The effect upon the walls of a church at this time was to produce damp patches upon the moderately smooth plastering, but not on the Bath stone window-dressings that were coloured like the plastering of the walls.

The remedy for this form of "damp" is clear, and it seems a pity that it should be necessary to enforce it at this day; for the old-fashioned house-wives were well aware of it. It is to keep the house or other building well warmed by means of ordinary fires, or, in the case of large buildings, by hot-water pipes, or such means as will most economically supply warm air, in times of excessive cold, in sufficient quantity to keep the warmth in the wall surfaces above the point at which the moisture in the atmosphere begins to condense. This warmth, having been kept up during the period of excessive cold weather, should be continued, to some extent, during the succeeding damp weather, in order to check the tendency which the air then has to part with its moisture. In a small house, the two or three fires which are usually kept burning in the kitchen and living-rooms are sufficient to keep up a certain degree of warmth in the staircase and the bedrooms, through the circulation of air which takes place when doors are frequently opened; but this becomes insufficient in times of unusual variation of temperature, and for most houses the provision of a stove in the hall or staircase (perhaps a small gas-stove) supplying fresh warm air from without, would be a great source of comfort, dryness, and health. In a large house such a provision is essential, and in all houses occasional fires should be lighted in all the bedrooms and spare rooms, particularly in cold and damp weather. If people will keep up the absurdity of a "best room," they can surely contrive to live in it once or twice a week during the winter, for the sake of keeping out the damp.

Perhaps the case which most requires care in respect of damp is that of a church,—especially a village church,—unless the parishioners are willing to keep it in the state of neglect which has by habit become characteristic of the place. The best way to keep a church dry is to fit it with one of the stoves which have a fresh-air flue conveying air from the outside of the church first to some sort of heating chamber, and through it to the interior of the church. The fire should draw its supply of air from the body of air within the building, for by this means it will draw in the fresh air, and thus keep up a constant renewal of the air in the building, and produce at once warmth and ventilation. The ordinary arrangements of hot-water pipes produces the warmth, but not the change of atmosphere.

Damp arising from Human Breath.—If we breathe upon anything that is smooth and cold, as upon glass, it becomes clouded over with moisture. If a room full of people continues for any length of time without sufficient change of atmosphere, their breath parts with its moisture to the smooth parts of the walls, the windows, and other smooth surfaces. This is most noticeable in cold weather, but it goes on in all states of the temperature. The remedy for this evil is not the mere warming of the atmosphere and the walls, but the introduction of a copious supply of fresh air, together with the expulsion of that which is damp and otherwise vitiated. In cold weather a sufficient apparatus on the principle above described will effect this most easily. In warm weather the fresh air should be introduced directly into the room, instead of being passed through the stove. It may be introduced by such means as the ordinary hopper ventilator, Sheringham's ventilator, or, in exceptional cases, by the vertical tubes which it has been attempted to patent; the object of all these contrivances being to direct the current of air towards the top of the room, and so to avoid draughts. Some considerable change of atmosphere may also be effected by these means alone, or by open doors and windows judiciously contrived without the aid of heat.

Damp arising from the Burning of Gas.—I believe that gas-lighting as a cause of damp has never been recognised by writers on this subject, though the way in which water will condense in the long chimney or flue of a "ventilating globe light" has been noticed. In a paper which I read before the Society of Arts last year ("Health, Comfort, and Cleanliness in the House"), an abstract of which was published in the *Builder*, I gave some hints on this subject. A few particular instances, such as I am now frequently observing, will best show the nature of this evil.

I was first led to notice it in a mansion which was designed by me a few years ago. When it was on the point of completion, I advised my client to keep up plenty of fires as a means of drying the plaster, and to open the windows on all dry warm days. The price of coals had then risen considerably, while gas remained cheap, so he had temporary burners fitted, and burnt gas night and day. On my next visit I found the plastered walls, which before had been simply moist, covered with a heavy dew, the ceilings were in the same state (but in a less degree), except where they were heated by the gas flame. The plasterer observed how nicely the walls were "drying out," and my client was much pleased. I was as much dissatisfied, for, in my experience, the water contained in plaster does not dry out in drops, but in the form of insensible moisture, which is conveyed away by the atmosphere. As this is a common error, I would point out that whenever new plaster is wet with beads of water this is due to condensation of moisture from the air on the cold surface of the wall. On several weekly visits I found matters grew steadily worse, but as I had amply protested, and was seeking information on the subject, I was not sorry to watch the experiment. It did not come to an end till I asked my client whether more water had not run down a particular wall, or been wiped off its surface with cloths, than had been put in to make the plaster.

In the meantime, an equally interesting experiment was going on in the cellar under the dining-room, the floor of the latter being pugged and ceiled below. Communication with the outer air was cut off, and flaring gas-jets were lighted. The moisture that soon began to stand in beads on the ceiling (away from the heat of the gas) soon formed one sheet of water, and then the ceiling became hung with large drops containing half a teaspoonful of water, which fell on the floor, till that became wet also. My client, who had full charge of his cellar, insisted, with British obstinacy, that all this was "damp" rising from the floor, and from an old well. I lived and learned, till one day the late Dr. Letheby kindly gave me the approximate amount of water produced by the combustion of 1 ft. of coal gas with the needful quantity of air, the hydrogen in the first combining with the oxygen in the atmosphere. In that house 500 ft. of gas were being burnt per day, and I calculated that during the "experiment" not less than a hogshead of water had been produced. Any one may satisfy himself as to this by observing the phenomenon which first gave me the hint as to this cause of damp. Light an argand gas-burner fitted with a clear glass chimney: in the first moment a flush of moisture, like condensed breath, will appear in the chimney; the next moment it will disappear, being vapourised by the heat of the flame. But the moisture continues to be produced, and will go about the room (or even about the house), searching for any damp corner or cold wall where it may settle. There is also moisture produced by the burning of oil lamps, but to a much less extent. I have had complaints of "damp" which affected the clothes hung up in mahogany wardrobes, and which could be traced to nothing but the excessive consumption of gas which many people practise to save trouble,—lighting up every burner at nightfall, and thus keeping the whole house light and warm. I have just had to report upon the damp which is destroying the paper in the handsome drawing-room of a well-built house, where, after observing that these walls were the only walls in the house that exhibited signs of moisture, I found it was the practice to light up a large chandelier early in the evening, the door being usually closed, and no fire kept up as a general rule. From the same cause a friend had his drawing-room thoroughly drenched with water one very cold Christmas, the gas having been kept burning night and day in the closed room during the absence of the family.

With regard to public buildings, I have just been in a church that I have recently completed, and found the windows covered with water, and the walls patchy with moisture, through the gas having been burnt for a whole day in order to warm the building for Wednesday evening service, every means of ventilation being at the same time closed. This is a constant habit in many churches where choir practice or short services are frequent, and is highly objectionable.

One other instance is instructive as showing the effect of different ways of "finishing" wall-surfaces. I sometimes attend concerts in a building which is two or three years old. The walls of the room are designed with pilasters, which were finished in polished parian cement, the panels between them being in ordinary plaster. When first used the room was unpainted, and the moisture from breath and from the gas condensed on the smooth pilasters only. The whole wall-surface has been lately painted, and now, when the ventilation is inadequate, the moisture condenses pretty equally all over the wall.

The remedy is, first, to burn as little gas as possible, and next to apply all the means of ventilation I have noticed, particularly such as keep up a supply of warm fresh air and a draught of spent air towards the fire. Polished surfaces should also, where possible, be avoided.

Without questioning that in many instances the dampness of a house is rightly attributed to the driving of rain against the walls, I am satisfied that it usually arises from one of the causes here indicated. I believe that frequently where the ties used in hollow walls seem to transmit the damp so that one may count them by the wet spots on the paperhanging, the real cause of the damp is that the ties have simply carried off the heat from the inner face, and so facilitated the condensation of the internal moisture of the house on these particular spots. I am sure, however, that the subject urgently requires attention, and ought to be better understood by persons who are responsible in any way for the condition of houses and public buildings.

Thomas Blashill.

South Shields Builders' Association.—The annual dinner of the South Shields Master Builders' Association was held on the 22nd ult., and was attended by about sixty gentlemen. The chair was occupied by Mr. E. Suddards, president of the association, and the vice-chairs by Mr. William Harwood, vice-president, and Mr. James Pollard. Mr. Councillor W. H. Bell proposed "Success to the South Shields Master Builders' Association," to which the chairman responded.

PRIVATE BILL LEGISLATION FOR THE NEXT PARLIAMENTARY SESSION.

NEW PUBLIC WORKS, TOWN IMPROVEMENTS, &c.

THE notices in respect of private Bills to be applied for during the session of 1877, which have been deposited during the present week, in accordance with the Standing Orders, show that several projects of an important character are intended to be prosecuted. The entire number of Bills for which notices have been given is about 250, in addition to which there are no less than 50 Board of Trade and Local Government Board applications, in respect of undertakings of a varied character, bringing up the aggregate number of projects for which Parliamentary sanction will be sought to about 300, and closely corresponding with the number dealt with last year. The applications in respect of railways are upwards of 100 in number, of which 60 are in connexion with English lines, 12 Scottish, and 8 Irish. There are 9 Tramway Bills, in addition to 4 Board of Trade applications. The gas and water Bills are 40 in number, besides 16 Board of Trade applications. Town improvements form a prominent feature in the list, there being several Bills in which building and sanitary powers of a very extensive character are sought by the local authorities of the different large towns in the country. There are likewise several Bills in connexion with piers and harbours, together with others of a miscellaneous character. Of the entire number of Bills 24 are in respect of undertakings within the metropolis.

The proposed railway works affecting the metropolis include a project by a new company for the construction of what is designated the Greenwich Extension line, consisting of a new railway from the Blackheath Station of the London, Chatham, and Dover Railway to the east end of London-street, Greenwich, to form a junction with the Greenwich and Woolwich Extension of the South-Eastern line. A new company have a Bill for constructing a subway under the Thames for railway traffic, between Greenwich, and Millwall, and the Isle of Dogs. The proposed line is to commence in Poplar, on a piece of ground belonging to the London and Blackwall Company, and terminate in Greenwich at the junction of Billingsgate-street and Church-street. The Midland Company's additional powers Bill contains a clause for the purchase of land and buildings in St. Pancras, between King's-road and the Regent's Canal, for the enlargement of a goods station; also powers to purchase land and buildings for station and other accommodation, near the Hammersmith Extension of the Metropolitan District line, between the Lillie Bridge Works of that Company and North End-road, and to enter into traffic agreements with the Metropolitan District Company. The Great Northern Company seek powers to construct a new line in Hornsey from their main line to the Tottenham and Hampstead line; Tottenham; also powers to purchase land and buildings in Hackney, near the North London line, for new goods warehouses; and also land in Caledonian-road, Islington, and near the company's cattle station in Caledonian-road, for station enlargements. The London and South-Western Company's Bill contains clauses sanctioning the closing up of several thoroughfares in the neighbourhood of Waterloo-road, Lambeth, in connexion with the enlargement of the Waterloo Station; and also powers to purchase land between the Wandsworth-road and Nine Elms for the enlargement of the Nine Elms Station. The London and North-Western Company's Additional Powers Bill contains clauses empowering them to purchase land and buildings for new works, and for that purpose to divert King Henry's-road, Regent's Park-road; also powers to widen the company's line near Chalk Farm-road. The London and Blackwall Company promote a Bill seeking powers for the construction of a new line and an extension from Stepney to Bow. The London and Brighton Company's Bill contains clauses empowering them to make a new junction line at Mitcham; also powers to purchase the Deptford Wharf, and to enter into agreements with the London Bridge Land Company, with the view of enlarging the London Bridge Station. A new company, designated the Kew Bridge and Ealing Railway Company, promote a Bill for the construction of a line from the South-Western line at Kew Bridge to Ealing. The Metropolitan Company apply for powers to purchase lands and buildings in Aldgate, High-street, consisting of Ball's-yard, Aldgate, and other property, and also property in the Minories, in order to enable the company to construct a tunnel under Aldgate, in continuation of the Aldgate High-street Station just opened. The Great Eastern Company have a Bill for the construction of a new branch line between Enfield, Edmonton, and Tottenham.

The Metropolitan District Company apply for a Bill to construct branch lines and junctions with the Hammersmith and City, and South-Western and Great Western Railways, and to build a new station at Westbourne-park.——A new company, called the "Metropolitan Central," promote a Bill for the construction of an underground line from the Portland-road station of the Metropolitan to Oxford-street, at its junction with Great Portland-street; and powers are also sought for the construction of another new line, called the "North Metropolitan High Level," from the Metropolitan and St. John's-wood to Hampstead-heath, Hornsey, and the Alexandra Palace line of the Great Northern Company.

The London Street Tramways Company promote a Bill for powers to construct additional street tramways in Pentonville-road, and to form a junction with the North Metropolitan tramways in Holloway-road. The North Metropolitan Tramways Company seek powers to make new lines in Kingsland, along the City route, Limehouse and the Hackney route, and New Oxford-street and the Old-street route. Their Bill also contains a clause sanctioning the use of other than animal power in working their lines.

A new company, called the "London Central Tramways Company," apply for powers to lay down tramways between Farringdon-street (Ludgate-circus), King's-cross-road, Pentonville, and Camden-road.

A Bill is promoted for making a subway under the Thames between Limehouse and Rotherhithe; and Mr. J. Barnett, C.E., also gives notice of his intention to apply for powers to construct a bridge, together with loop-bridges across the Thames, between Little Tower-hill and Horselydown.

Amongst the gas and water Bills is one promoted by the Sunningdale District Water (new) Company, for powers to construct new works for the supply of Sunningdale, Chertsey, Egham, Staines, and the neighbourhood. The Kent Water Company, the West Surrey Water Company, and the Croydon Gas and Coke Company, have each Bills for new works, and extension of limits of supply.

The Metropolitan Board of Works promote three Bills, the most important of which is their Street Improvement Bill, a measure of a very comprehensive character, and under which the Board also asks Parliamentary sanction for the extension of the Thames Embankment at Millbank. The street improvements are divided in the Bill into various sections. The Charing-cross and Tottenham-court-road and Piccadilly improvement will consist of six distinct new streets between the Regent's-circus, Piccadilly, Bloomsbury-street, and New Oxford-street, and will involve the widening of Piccadilly, Coventry-street, Princes-street, Tichborne-street, and Great Windmill-street, with a new street from Trafalgar-square, rendering necessary the removal of a portion of the steps of St. Martin's Church and the curtilage of the National Gallery. The street terminates at Tottenham-court-road, near its junction with New Oxford-street. The Millbank improvement involves the widening of Abingdon-street from the south end of the Houses of Parliament to a point opposite Great College-street; also the widening of Millbank-street and Grosvenor-road, together with the embankment of the Thames southwards as far as Mowlem's wharf. The Gray's-inn-road improvement provides for the setting-back of the east side of Gray's-inn-road from High Holborn to Henry-street, and a new street from Gray's-inn-road at its junction with Liquorpond-street to Mount Pleasant-street, Coldbath-square. This street will be partly carried across Tothill-street, Laystall-street, Great Warner-street, and Coldbath-square, by a viaduct. The widening of Kentish-town-road and Monte Video-place is another of the improvements. The "Angel," Islington, improvement comprises the widening of Goswell-road and St. John-street-road. The Southwark Bridge-road and Great Dover-street improvement consists of the making of a new street from Southwark Bridge-road to Blackman-street, Borough, near the church of St. George the Martyr. The several other improvements contemplated by the Bill consist of the widening of streets in the neighbourhood of Tooley-street and other parts of Bermondsey, Rotherhithe, Camberwell, and Peckham respectively; also the widening of Deptford Bridge on both sides, and the widening of Greenwich-road for a length of 300 ft. Of the other two Bills promoted by the Board, one provides for the consolidation of the bye-laws as to the management of parks, with power to contribute towards the formation of a recreation-ground at Forest-hill; whilst the other Bill is that known as the Thames River Prevention of Floods Bill. Jointly with the Corporation the Board also promote a Bill for freeing the Thames bridges from toll. The Alexandra Palace Company promote a Bill seeking powers to sell part of the Palace grounds, with provisions for keeping up the remainder, and carrying on the business of the Palace, together with agreements between the Muswell-hill Estate Company and the Palace Company. The Crystal Palace Company also apply for a Bill, which provides for the reduction of the nominal stock of the company, and the re-arranging of the capital; also to provide for the transfer to the company of the Crystal Palace Aquarium Company and the Wurtemburg Stuffed Animals Company; and to empower the company to raise new stock to enable them to carry on business within the Palace.

The Richmond guardians, as the Richmond Rural Sanitary Authority, apply for powers to purchase four acres and a half of land on Barnes-common, and one acre of land in Mortlake, the land to be purchased on Barnes-common being for the purification and disposal of the sewage of Barnes, Mortlake, and Kew, the construction of a pumping station, and other works. The land at Mortlake is also to enable the promoters to erect a pumping-station for the purpose of lifting the sewage. The sewage is to be conveyed off the lands by an outfall sewer, to be constructed, and the Bill provides that the effluent water, after purification, is to be discharged into the Beverley Brook, and thence into the Thames.

The Bills promoted by the several leading railway companies seek powers for the construction of new branch and other lines in the different counties through which they pass, and the Midland, London and North-Western, and Great Northern Companies apply for Parliamentary sanction to build hotels at their several stations, and furnish and conduct them by their own servants. The Midland and Great Northern Companies likewise seek powers for the construction of an aqueduct in the river Nene to the Companies' pumping-station and engine-house at Peterborough, for the purpose of taking water from the river Nene. The Bill of the Lancashire and Yorkshire Company provides, amongst other things, for station enlargement, and other large works at Bolton, including the closing and absorption of streets, and the construction of several bridges. The new projects include a railway under the river Mersey, between Liverpool and Seacombe, as distinguished from the "Mersey Railway" project, for which an Act of Parliament has already been obtained.

Amongst the pier and harbour projects is a Bill promoted by the Dover Corporation, in which for the purpose of sea defences, they seek powers to extend the Revetment Sea Wall and Promenade, together with powers to strengthen Castle Jetty, and to execute other works for protecting against incursions of the sea the lands and houses at the base of East Cliff. The Wisbech Dock and River Nene Improvement Board have a Bill applying for powers to make a diversion of the river Nene at Wisbech into a new cut; also the conversion of part of the existing channel into a dock and float, with quays, wharfs, warehouses, and sheds. It is also proposed to construct four bridges across the new cut, and a tunnel under it. The Ipswich Dock Board apply for powers to make a new entrance lock, together with a new pier, jetty, and bridges, and also to lay down tramways in connexion with the dock. The river Wear Commissioners apply for powers to remove Hendon Rock, and to erect protective works at the south outlet. The Hull Dock Company have a Bill seeking powers to purchase the Citadel Estate and Earle's shipbuilding and engineering establishment, for dock and warehouse extension. The King's Lynn Dock Company apply for powers to enlarge the present dock, and construct a new one, with wharfs, sheds, warehouses, and tramways. The proposed new dock will be eight acres in extent, and will be constructed on land belonging to the Norfolk Estuary Company. The Bristol Port and Channel Dock Company seek powers to construct a new graving dock, and two new piers, 450 ft. and

150 ft. in length respectively. The Maidstone Corporation apply for powers to construct a new bridge across the Medway at Maidstone. The Margate Corporation include in a comprehensive Improvement Bill powers to construct a sea wall and embankment on the beach or foreshore, for the protection of the cliffs within the limits of the borough as proposed to be extended.

The Bills in respect of town improvements show that many of the large municipalities are alive to the importance of possessing increased powers for the sanitary and general government of their respective localities. The Wakefield Corporation promote an Improvement Bill which includes large and varied powers. These comprise the purchase of the water company; also general powers with respect to laying out of streets, and the width of the same, together with sewerage and drainage; control over the erection of buildings as to site, elevation, mode of construction, materials, nature of foundations, thickness of walls, levels of cellars, spaces to be left between houses for ventilation purposes, construction of roofs, chimneys, and flues, height and dimensions of rooms, number and size of windows, and construction and ventilation of drains. Powers are also taken to close and remove uninhabitable houses, and there is likewise a clause in the Bill empowering the Corporation to build a new town-hall and police buildings. The Over Darwen (Lancashire) Local Board have a Bill, in which they seek powers for the improvement of the river Darwen, by scouring and dredging, and improving the channel and the river banks, so as to preserve a free and uninterrupted flow of water. Also powers to discontinue the use of and remove existing cesspools and ashpits, and to construct cesspools and ashpits of an improved character. Also powers to alter the present minimum charge for water supply. The Gateshead Corporation have a Bill empowering them to construct public pleasure grounds and carry out street improvements. The Newcastle-upon-Tyne Corporation also promote an improvement Bill, including powers for the widening of streets, powers to purchase a site on which to erect a free library, and also powers to enable the Corporation to construct tramways. The Leeds Corporation apply for an improvement Bill containing very comprehensive powers. The Bill includes powers to purchase both gas and waterworks, and to construct additional works; also powers to acquire land for sanitary purposes, and to remove dilapidated houses; powers to erect houses for the labouring classes, also hospitals, mortuaries, public dairies, cowsheds, bakehouses, and public water-closets; additional powers as to the regulation of streets and buildings, and powers to prevent the erection of houses and buildings on ground filled up with offensive materials. Powers are likewise taken for the construction and widening of streets on an extensive scale; for the building of a new police station, and for the construction of parks and recreation grounds on several hundred acres of ground to be acquired on Holbeck Moor and other suburbs. The Middlesbrough Corporation in an Improvement Bill seeks powers to erect a new market, slaughter-houses, a new town-hall, and police offices, on 15,955 square yards of land to be purchased for the purpose. The Ashton-under-Lyne Corporation promote a Bill empowering them to improve and enlarge the town-hall, police-courts, public offices, and markets. The Bill also contains clauses empowering the corporation to make extensive street improvements. The Margate Improvement Bill, which also contains clauses for the extension of the borough, seeks greatly enlarged powers as to building and other sanitary arrangements. Power is likewise sought for the widening and reconstruction of a large number of streets in the town, and there are clauses in the Bill enabling the corporation to enlarge and improve the existing town-hall, or to pull it down and build a new one. Further clauses enable the corporation to erect dwellings for the labouring classes who may be displaced by the works authorised by the Bill. The Bolton Corporation also promote an Improvement Bill, which provides for the extension of the limits of the borough, the construction of new roads and streets, new sewage works, and a new cemetery.

Concrete.—At the suggestion of Lord Elcho, M.P., a committee has been appointed by the Royal Institute of British Architects, with the view of reporting on the subject of "Concrete as a Fire-resisting Material," to a Select Committee of the House of Commons. The committee are now seeking information.

RESTORATIONS AT THE DULWICH PICTURE GALLERY.

For some months past the picture-gallery at Dulwich College has been closed, for the purpose of the building undergoing a complete renovation and mural decoration, and pending the execution of the works the pictures have been temporarily removed for exhibition at the Bethnal-green Museum. The roof and ceiling has been restored, and a new system of warming and ventilating the interior has been introduced. Hot-water pipes have been substituted for hot air, the new apparatus having been supplied and fitted on Haden's patent. The upper portions of the walls have been painted in a light warm tint, and the lower parts will be in red, the effect being heightened by gilt mouldings. This portion of the work is now in progress, and will be completed in the course of a week or two, but it is stated that the gallery will not be re-opened until the spring of next year, the pictures in the meantime remaining at Bethnal-green. Mr. Mitchell, builder and decorator, of Dulwich, has executed the work, which has been carried out under the superintendence of Mr. Charles Barry, the architect to the college estate.

BIRMINGHAM ARCADE.

ZINC GAS-FITTINGS.

The accompanying engraving illustrates the centre dome and circular vestibule of the great arcade recently built in Birmingham, some descriptive particulars of which appeared in our issue of the 2nd of September.*

Birmingham is the manufacturing centre of the gas-fitting trade, and from amongst a number of competitors Messrs. Best & Lloyd (of Cambray Works, Handsworth, and Holborn Viaduct, London) were the firm selected to light this extensive and popular structure; and having successfully introduced their innovation, the employment of zinc, in the manufacture of large and massive gas-fittings requisite to light up efficiently so considerable a range of building, we think it due to the ability and enterprise of the firm to notice the facilities afforded by them for providing large buildings with gas-fittings of suitably massive proportions and distinctness of detail, without incurring the heavy and often prohibitive cost of cast brass fittings, or sacrificing utilitarian necessities. If the appearance of these new zinc gas fittings were stamped by a manifest inferiority, their use in the lighting of even large buildings, where iron is often employed, would be much more limited than we venture to predict will be the case; but the mode adopted by Messrs. Best & Lloyd in the treatment of the baser metal, and in carrying a sound brass gas-way through whatever designs or shapes are given by the expensive metal-moulds employed in the production, and the good appearance imparted by the firm's antique bronze, justify the expectation that the small fittings (one-third or one-fourth the price of corresponding brass goods) will become very general in private dwellings.

We learn that their productions have been used at the Masonic banqueting-hall in Birmingham, the Arcade in Edinburgh, and the new municipal buildings in Kidderminster; and that they can hold their own against foreign competitors is shown by the fact that their fittings are used at the Houses of Parliament at Berne, the town-hall at Breslau, and Adelsberg Castle, Hanover.

MESSRS. DOULTON'S PREMISES, LAMBETH.

In our present issue we give a view of the block of offices and studios now being erected at the corner of High-street, Lambeth, by Messrs. Doulton & Co., from the designs of Messrs. Tarring, Son, & Wilkinson, architects, the building which led to the strike of bricklayers, concerning which much has been said.

The building is designed to form the angle of the plot of ground occupied by Messrs. Doulton's warehouse and pottery works, and it will be a conspicuous object from the Albert Embankment. It is not much advanced beyond the ground-floor at present. When completed it will be very lofty. The materials are chiefly red brick and terra-cotta, but black brick is also extensively introduced, the whole of the lower plinth and base being of the latter material, which, being highly vitrified, is calculated to resist the wear and tear of passing traffic better than ordinary brickwork.

Messrs. Doulton have of late years introduced and brought to great perfection the manufacture of a stoneware now generally known as "Doulton ware." This, as affording an indestructible medium for the introduction of coloured and artistic work, has been used by the architects for the decoration of reveals, cills, and panels, and as bosses. Terra-cotta blocks are prepared with sinkings and half-round hollows, which are keyed to hold the Doulton-ware tiles, rolls, or bosses, set in cement. The care which, with the aid of the pupils of the South Lambeth School of Art, under the supervision of Mr. John Sparkes, Messrs. Doulton give to the art-decoration of this special ware, renders it of value for use in the decorative parts of architectural works.

The work already laid by the special terra-cotta setters (the so-called plasterers of the bricklayers' strike) appears to be well done, and will go far to give an impetus to the extended use of terra-cotta, against which the chief complaint has been the irregular look of the joints and the winding of the terra-cotta.

It has been the care of the architects to design the terra-cotta details so as to show that these objections are capable of being removed, the latter one being obviated, in a great measure, by the use of incised ornament on the plain blocks, and by a careful arrangement of the break-joints, the whole of which have been arranged by them on large-scale drawings, in addition to the full-sized mouldings.

The building is arranged with a basement for stores. A ground-floor, with a highly-enriched triangular porch with doors right and left gives entrance to the offices. A spacious stone staircase at the back gives access to the first floor, which will be used as a show-room, and to the second, third, and fourth floors, which will be used as studios by the artists employed in the production of the Doulton and other ware. The entrance for the latter will be for the present a temporary one at the side of the building shown in perspective.

On the studio floors the depth of the window reveals will be used as flower-beds, in terra cotta and stoneware sides and fronts, for use in designing ornaments. The fourth floor opens on to a balcony on each elevation, which can be used for drying or other purposes.

The roof ridge is in the form of a ⊢, the hips and valleys resting on the recessed walls of the balcony level, which are carried internally on the lower floors by terra-cotta columns and arches. The fourth-floor binders also form ties to some of the principals, and hip and valley pieces.

The roof will be covered with tiles of a subdued reddish-brown hue.

The terra cotta will be both red and cream colour. The oriel, which forms a feature over the entrance-door, is carried on an enriched terra-cotta corbel, tied to the cross wall and internal pier with ⊾ and ⊤ irons.

The name and coloured tiles forming a band round the turret will be in faïence tiles set in cement, and keyed to the brickwork backing. The floors will be laid on joists wrought and chamfered on the lower edge, having fillets and wrought boarding between them, to form the ceiling of the room below, and to take pugging between the floor and ceiling boards.

Messrs. Doulton are carrying out the works themselves, with Mr. John Phillips as their manager.

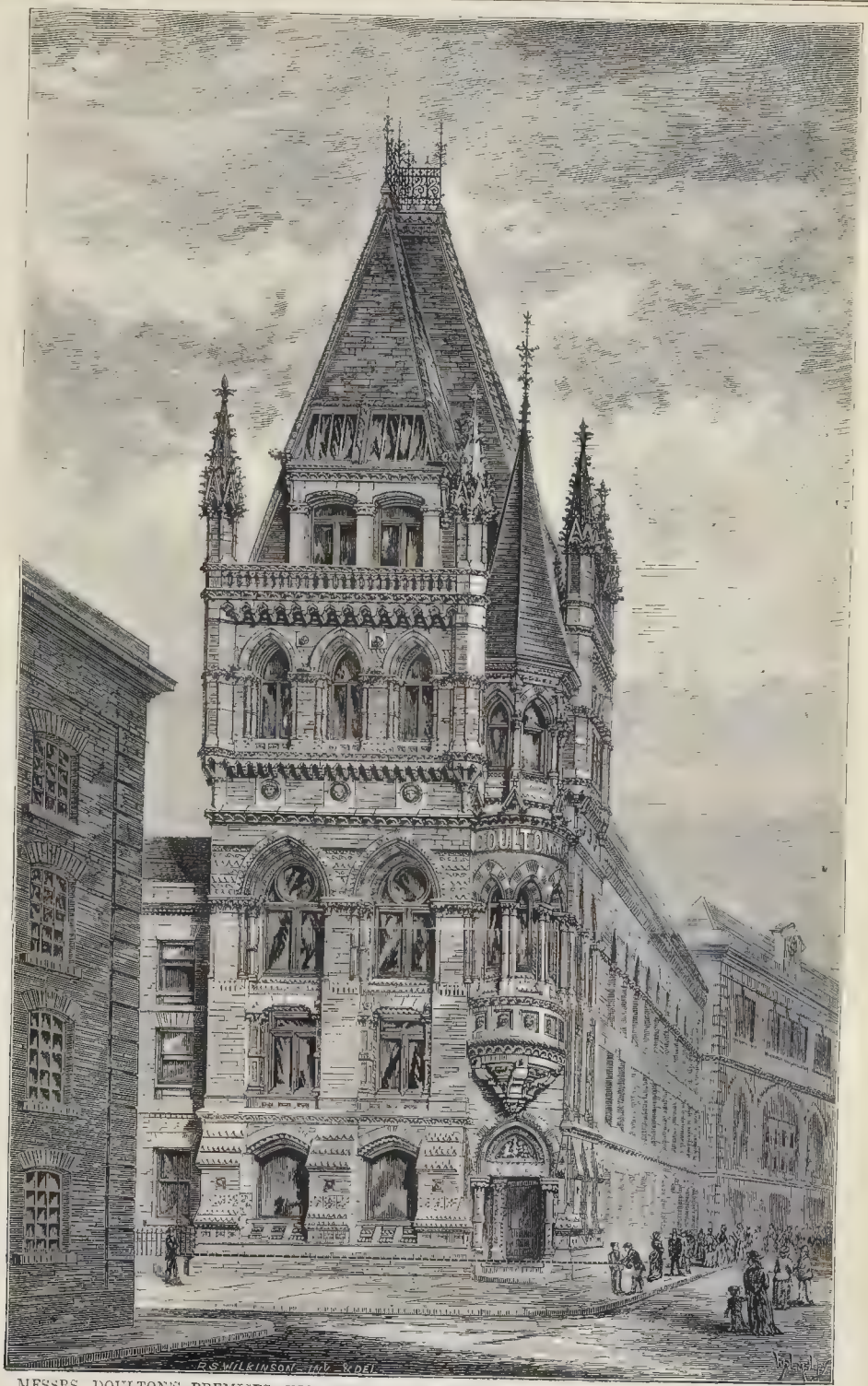
We hear with great regret that Messrs. Doulton's works here and on the embankment, where the strike really occurred, are still "picketed," and that, as a result, very slow progress is being made. What is going on is so like a conspiracy in restraint of trade that it would probably go hard with those concerned in it if law were appealed to. The public and individuals are alike damaged by it; and with what object? To prevent two fellow-workmen who have obtained skill in the performance of a special branch of business from peacefully pursuing their calling, and earning their bread by the exercise of that skill, a right which it is thought the laws of the country secure to every man. The more carefully this strike is considered the more preposterous, the more suicidal, and the more deplorable does it appear.

* See p. 862, *ante*.

The Curfew at Stratford-on-Avon.—The bell-tower of the Church of the Holy Cross, Stratford-on-Avon, has been put into repair in order that the ringing of the curfew-bell may be resumed.



BIRMINGHAM ARCADE.—Zinc Gas Fittings.



MESSRS. DOULTON'S PREMISES, HIGH STREET, LAMBETH. Introducing Terra-Cotta and Stoneware. Messrs. Tarring, Son, & Wilkinson, Architects.

A FRENCH VIEW OF COMPETITION.

MR. CHARLES BARRY's exceedingly interesting address at the opening of the Royal Institute of British Architects has been read in Paris by French architects with some little wonder. It breathes a tone of discontent with the position of architecture, and its followers in England, that Frenchmen find difficult to appreciate.

Mr. Barry's remarks on the subject of competition do not agree with the opinion of an eminent architect here, as will be seen by the discourse of M. Jobbé-Duval, who at one of the conferences of the *Société Nationale des Architectes de France* spoke on the subject of competition very much to the following effect.

M. Jobbé-Duval thought that few people in the present day could openly declare themselves enemies to competition; he suggests that as we all allow that competition is good at the commencement of life, shackled by all the theories of the schools, how much more desirable must competition be to bring forth the result of an experience of many years?

Work, M. Jobbé-Duval truly observes, is a great moraliser, and can there be anything more efficacious in inciting artists to do their best than is afforded by a wholesome competition? And these pacific struggles, do they not induce the artists to higher aims than they are likely to be led up to by any successes which may come to them through their claims by established position or the help of friends?

According to M. Jobbé-Duval, three things are essential to ensure a successful result from competition: clearness of the programme; the equitable composition of the jury; its responsibility.

The programme ought to define clearly the limits of the ground; its topographical situation; the aspect of the principal façade; the precise details of the interior arrangements; the nature of the materials furnished by the country in which the building is to be erected; lastly, the cost. The programme ought, according to M. Jobbé-Duval, to abstain from all dictation as to style, in order that the artist, synthetising his knowledge, shall exercise all the liberty desirable in the creation of his work. It is this liberty which alone will allow of the creation of works bearing the particular stamp of each individual, and which will create an art suitable to the epoch in which we live. In these conditions, it would seem to M. Jobbé-Duval that the programme would satisfy both contracting parties, in determining the services demanded, and leaving all liberty to realise for the best the interests of art.

In approaching the second indispensable, the equitable composition of the jury, M. Jobbé-Duval remarks that here he is touching on the most delicate point of the question, and he attributes the failure of the jury, which so often happens, to the fact that a large proportion of the jurors, owing to their being selected on account of their eminence, are opponents of the system of competition, and therefore, as human agents, do everything to avert, unconsciously of course, the just operation of the system.

In passing to the third point, the responsibility of the jury, he remarks that a great injury is done to the competitors in the judgment they undergo without being able to defend themselves. Thus, men have passed months in thinking, combining, and executing an intellectual work, and all this is to be annulled without their being able to reply to the objections raised. In this there is an absolute perversion of justice.

I believe, says M. Jobbé-Duval, that the jury should not be too large, in order that each member should represent an independent individuality. A jury composed of ten members presents every guarantee necessary.

The discourse was ended by a warm appeal to the profession to support his views on the subject of competition.

Paris.

Royal Military Academy, Woolwich.—Some important alterations are about to be carried out at the Royal Military Academy, Woolwich. The want of sufficient accommodation has been pointed out from time to time by the board of visitors, and works for increasing the accommodation for the cadets have been commenced, involving an expenditure of 20,000*l*, of which a fourth has already been granted by Parliament. The governor's house is also being re-constructed at a cost of 3,800*l*. A sum of 3,600*l*. has been expended in enlarging the space for cricket and other outdoor sports.

HOW TO DRAIN A HOUSE.

BY T. MELLARD READE, C.E.*

THE subject of my paper is not one to excite the imagination, to give scope to lofty ideas, or to raise emotions of the sublime and beautiful. It is essentially of the earth earthy. To what extent the great masters of our art had to condescend to consider so humble a subject as house drainage, I have not seen recorded in our text-books. Whether this has had anything to do with the grudging attention usually paid to house drainage by the profession I am not aware. Admittedly it is an unentertaining subject and not one calculated to excite the interest of the artistic mind, fed on the exciting but not very nourishing food of the competition perspective.

The architect, as a rule, not taking any special interest in this class of work, usually as regards the carrying out of his plans relegates it largely to the clerk of works, or, if there be none, leaves it in the hands of the bricklayer, who hands it over to a labourer, and as clerks of works are not always paragons of knowledge and accuracy, and bricklayers are not the most scientific of men,—even though as honest as the one to whom Professor Huxley would entrust the planning of a college in preference to engaging the services of an "eminent architect,"—the drainage works are, to speak in the mildest terms, frequently unsatisfactory.

But, as is often the case, that which at first repels us becomes interesting on closer study, and with the view of promoting a more exact and scientific way of carrying out the drainage of a house, I have ventured to submit to your consideration the following practical observations on "How to Drain a House."

With the introduction of the complex arrangements of the modern house,—complex, at all events, as compared with that which satisfied our forefathers,—but more especially as the natural complement of an abundant water supply delivered to each individual house, the modern system of sewerage became a necessity. It is not my present purpose to deal with the "sewer,"—that is, the duct in the street provided by the sanitary authority which usually, and especially in towns, performs the separate functions of a drain for surface-water and a duct for "sewage." For my present purpose I assume, in my first example, that it exists, and, in my second example, that our supposed building is away from the modern luxury of a sewerage system, in which the disposal of the sewage itself becomes one of the main considerations, and is of primary importance.

Before treating of the general principles to be followed in house-drainage, I may remark that in the selection of the materials of our drains there is not now much choice. The use of glazed fire-clay or earthenware pipes is almost universal. Cement pipes have been recommended by an eminent authority, but as I have had no experience of them it is not necessary for me to do more than mention them. No one would now propose to use brick or stone culverts, or drains square in section, with sides of brick, and bottom of slates, as were formerly in vogue. Practically, then, our choice of materials is limited, but as usual there are great variations in the quality of the article supplied, not only by different, but by the same manufacturers. What the architect should insist upon is a strong, well-burned, material, accuracy in form, both sectionally and longitudinally, true sockets, and a good smooth glaze. The smaller pipes are especially liable to be twisted longitudinally, and such should be at once rejected. Pipes having a rough interior should not be used, as lumps and blisters in the glaze accumulate material round them and injure the efficiency of the drain.

At the risk of being accused of putting the cart before the horse, I will also explain the practical art of laying drain-pipes and the fall it is necessary to give them before touching upon the general question of how to design house-drainage. I do this because I consider the proper laying of the pipes one of the most important parts of drainage, and the one in which failures most often occur, and without which any system of house-drainage will not perform its functions satisfactorily. The true laying of a pipe is of more importance than its quality. An inferior rough and crooked pipe may if laid properly under ordinary circumstances be made to perform its work satisfactorily, whereas the best made pipe in the world will only act for a time, and then inefficiently, if laid in those beautiful vertical and horizontal sweeps known as Hogarth's line of beauty, so frequently seen only in their full perfection when a drain is taken up.

The righteous indignation of the bricklayer and his labourers employed in taking it up, against the tradesman who laid it down, is only fully appreciated when, on having to take the drain up a second time, we find these honest men have put in a pipe without a socket, or a square junction, or a junction turned the wrong way, or accidentally omitted to make a joint good, or done or left undone some one of those multitudinous things essential to good workmanship. Truly the architect's bed is one more of thorns than roses.

The next thing to be determined upon is the fall, and I cannot too strongly insist upon the necessity, in all cases, of having the levels first accurately taken and a section made before the drains are put in. This is an additional trouble, no doubt, but will be amply repaid in the quality of the work. Of course, when the whole of the trenches can be opened at once, this is not always necessary; but it more often happens that the trench has to be filled up as the work proceeds, either from the nature of the ground or the exigencies of the site. The architect should, of course, aim at getting the greatest amount of fall from the sewer to the junction with the branch drains of the house, keeping in view that these should themselves have quicker gradients than the main drain. Without a section it is generally difficult to do this. A fall of 1 in 48, or half an inch to a pipe, is a good one for a main drain; but it sometimes happens that this cannot be obtained. Nay, I have myself had to lay them nearly level; but in such cases special flushing arrangements are absolutely necessary. The usual system pursued by the "honest bricklayer" is to start from the main sewer and lay each pipe to a fall by a straight-edge with a piece of wood planted on one end. The size of this piece is determined by some rule no doubt,—probably the rule of thumb; a rule, I need scarcely say, of very wide and universal application. By means of these implements the drain gradually rises towards the house; but whether it hits the exact level or falls below it, or is a foot or two higher, Providence alone can determine; at all events, I may say it is not so certain to work out right as were the two driftways through Mount Cenis. It not seldom happens that if the workman finds he has made a bungle and got too high, he either carries his drain on a level, or actually dips it the wrong way. And what does the architect do? He sees the end of the pipe at the proper level, and all the rest carefully covered up, and probably assumes that all is right.

There is another internal defect arising from this way of laying pipes; they are laid by the flanges, and the inverts, which are of primary importance, are left to take care of themselves. I have never seen outside of my own practice house-drains laid by their inverts; but I consider this should, where the fall is limited, always be done. It is readily done, but the drain-layer has to be taught, and it is a good deal of trouble to teach him, but not more than, I hope, any architect interested in the perfection of his work would undertake. The method of proceeding is by fixing sight-rails at the two ends of the drain, and sighting a boning-rod with a T-piece at the top, and a bent piece of iron or shoe to fit on to the invert at the bottom. This, of course, usually involves a correct system of levels and bench-marks, with the depths figured on the drawing. The joints should in all cases be made in cement; half Portland cement and half sand is a good proportion; and special care should be taken to scrape out the cement on the inside of the joint, so as to leave as perfect a tube as possible, free from lumps and obstructions. I need scarcely say half-bricks should not be left in the pipes, but I have not unfrequently found them there.

Having now described some of the more important structural details necessary to the efficient action of any system of drainage, I shall next discuss the best system to be adopted.

It is pretty generally admitted that all drains should be on the outside of a house, and in no cases, except through unavoidable necessity, should they be carried through it.

The soil and waste-pipes from water-closets, baths, and lavatories, should also be taken as far as possible outside. I assume, in the first place, that every sink, basin, and bath is trapped in-

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* Read before the Liverpool Architectural Society, November 29th.

side the house with an S trap, constructed so as to be readily cleaned. If this is not done, draughts of air will come up them into the room, conveying the stench from the organic matters coating the interior surface of the pipe, even though the sewer gases should be carefully excluded by external arrangements such as I shall presently describe. The water-closet is always fitted with an S trap, which should not exceed 4 in. diameter, though the soil-pipe into which it empties is better larger, and I frequently specify it 5 in. I consider the pan-closet objectionable, especially since the compulsory introduction of the two-gallon regulating cistern has increased the difficulty of getting the after-flush to fill the pan. The container is a reservoir coated with filth, hidden by the pan holding the water in the basin. A basin with a trap at the side or back, called a wash-out basin, is a far better apparatus. If a pan-closet is used, it should always have the container ventilated. Baths and lavatory basins should never have their outlets into the soil-pipe of the closet: this is often done to save expense, and even the trap of the closet is used to trap the waste-pipe from basins and baths; but this is still more objectionable. The soil-pipe of a closet should in all cases be an independent pipe, into which nothing but the soil enters, and it should be carried up above the eaves of the house, full bore; if to the top of a chimney-stack all the better, and it should be, except in those cases where it acts also to take the gutter-water from the roof, fitted with a wind-guard or revolving cowl to prevent down-draughts.

We now come to the drainage proper by which all the separate outflows of waste organic matter are to be carried off and into the main sewer.

In designing a system of house-drainage we must decide, in the first place, whether we keep our rainwater separate. In the case of a house supplied with hard water it is advisable to store the rainwater, and this is best done, as is usual, in an underground brick tank cemented inside, called a terras cistern. It will nearly always be found that there are some down-spouts that, through the levels, cannot be readily connected with this cistern. These should be turned into the drain, which they will help to flush and keep clean. In cases, however, where the sewage has to be disposed of independently of a main sewer, the rainwater is rather a trouble than otherwise, and those pipes unconnected with the rainwater cistern should be turned on to the surface channels or made to flow over a grass plot. The overflow of the terras cisterns should in no case, where it is possible to avoid it, be in any way connected with the drain; if it is we can never be sure of the purity of the water, and I have known instances where the whole of the house has been connected with the sewer through the rainwater cistern; the air-space above the cistern being connected with the space under the floor of the house, the overflow being taken into the sewer and untrapped. Even if trapped we have no security, as the water in the trap dries up before the cistern overflows again. On the other hand, if the overflow be taken into an air-chambered trap supplied with water from another source, there is always the possibility of the trap choking through inattention and the sewage water backing into the tank. The overflow should be taken into an absorbent well, or discharged on the surface of the ground, which, if the levels allow it, is still better.

In some cases the sewage from the baths, basins, and sinks is carried independently into a tank from which it is pumped to be used for garden purposes. The soil alone of the water-closets is taken into the main-sewer. This is an arrangement also suitable for a house supplied with earth-closets, and one I am adopting at the New Truant Schools at Hightown. Where there is a man employed constantly who can look after the tank, and keep it empty, or plenty of labour in the shape of boys to pump it dry every day, the arrangement is a good one, and combined with the earth-closet in such cases, with land on which to use it, the main-sewer can be dispensed with altogether. In all cases where it is possible the sewage should be used before decomposition sets in. In those special instances, and these constitute a large class of cases, where there is no main sewerage, and there is not labour to keep the tank pumped frequently, other methods must be adopted. The ordinary cesspool is an abomination, containing as it does a festering and decomposing mass of filthy matter which is not removed until it attains the consistency of a solid pulp. This is the absorbent well. If such a thing has to be adopted, it should be well ventilated, and the connexion of the house-drains with it effectually cut off. I am, however, trying another system, which, if it succeeds, I shall be happy to explain at a future time.

Let me describe the drainage of a large villa as recently carried out by me. The sewage or slop-tank is placed in a convenient position in the kitchen garden, and the levels so arranged that the inlet drain discharges into it above the level of the garden surface. I consider this a matter of great importance, for by doing so I get an overflow on to the surface, and it is impossible for the sewage to back up the pipe and seal the end of it to the atmosphere. I have known this purposely done, and indeed have in former times dipped the end of the pipe below the surface of the water with the mistaken view of "trapping it," but find by experience it is an entire mistake, as the first thing to be considered after providing for the flow of the water is to arrange for the circulation of the air. By no other means can we ensure the drains being kept sweet. The tank is constructed of brick in cement, vaulted over with an arch in which is an iron manhole cover; it is in no way an absorbent well, and the whole of the sewage must consequently be pumped out and disposed of on the surface or by the overflow. By such means the organic matters get oxydised in percolating through the pores of the earth, whereas in the case of an absorbent well such oxydisation does not take place, but all the surrounding subsoil becomes sewage sodden as the atmosphere is permanently excluded. From the tank a drain is laid on a bank at an inclination of 1 in 80 and 1 in 16, gradually increasing as it approaches the house. This a drain should always do. There is a manhole containing at the bottom one of Pott's air-chambered traps which I will presently describe. This effectually severs the connexion between the tank and the house, as all the slop-drains converge at this point. From the tank side of the S trap is carried a 4-in. ventilating pipe to the upright ventilator, which consists of a 5-in. cast-iron pipe terminating on a chimney-stack, with a cowl carried up above the chimney-pots. This also acts as a ventilator for the soil drains, as I will presently show. The slops are drawn from three situations, terminating in two cases in Pott's traps, which sever the connexion between the house and the drains between it and the manhole. This completes the slop drainage.

The soil-drain commences at the main sewer in the road with a 9-in. pipe, at an inclination of 1 in 10, 1 in 53, and 1 in 12. At the point where the branch drains converge is a manhole, and at the bottom is a 6-in. S trap built up solid in the brickwork. This trap occupies half of the manhole, the other half is an open duct, and as the drain is 9 in. on the other side this open duct converges. The bottom of the duct is of glazed brick, and is laid at a greater inclination than the sewer. The manhole is contracted towards the surface, and fitted with a cast-iron manhole cover and a side ventilator. It will thus be seen that all communication between the main sewer and the house is effectually prevented. Further on the drain diminishes to 6 in., and is connected with the vertical ventilating pipe by a 4-in. branch; it is then carried on to the waterclosets, as shown. The soil-pipe is carried up as a ventilator, and terminated with a cowl. Along the course of the drain are apertures for putting the garden-hose in for flushing it above the flushing-tank. There is a flushing-tank supplied with water from the main. It is of brick in cement, and is fitted with one of Doulton's valves. Occasionally the tank is filled with water by a tap from the main, the valve drawn up, and the hydraulic force developed is sufficient to clean out the drain. Had there been a convenient spot for it I should have placed the flushing-tank at the head of the drain. I have used these tanks for a good many years, and with most beneficial effect. As a rule, the amount of water running down a house-drain is insufficient to keep it clean, and frequently have I had to take up drains filled up solid with deposit, which, if they had been capable of being flushed out in the way named, might have been kept perfectly clear. By the combination of manholes and traps in every case I get a through current of air in the main drains.

The inlet is open, and the outlet is in one of the two ventilating shafts. This keeps the drain perfectly sweet. The house is entirely isolated from external influence, and the drains instead of being filled with fœcal matters are kept clean and free. The division of the slops and soil where there is main sewerage, is, of course, not by any means absolutely necessary, but is a refinement I should only recommend in a large house, where the slops are valuable in the garden, and where there is labour to dispose of them. The slops might be taken into the main sewer, the house being isolated therefrom just the same.

The manhole, with its contained trap, is a novel feature of great utility; by it, the drain can be inspected, and if the trap should get accidentally choked, such a calamity is found out and obviated at once; whereas, otherwise, the first notice of it in many cases may be the backing up of the sewage into the foundations. It is an inspection place, which no system of drainage should be without, as, otherwise, it is impossible to say whether the drains are working properly or not.

Formerly, trapping a drain meant bottling up the gases in it, now it is recognised that no system of trapping is perfect without ventilation combined with it. There are many patterns of traps for effecting this, besides those I have used here, but I have not space to describe them.

To conclude, there is no part of the house which more wants supervision than the drainage, and no part that is more difficult to supervise. Speaking to architects, I may say that 5 per cent. commission will not pay for the necessary labour. I never expect it to do so; but, as it is part of the whole, I think, it being so necessary to health, that attention should be paid to it all the same. I picture to myself the happy time when 7½ per cent. commission will enable an architect, without robbing himself, to do full justice to his client; but, I fear, at present, it is only a pleasing fiction of the imagination not soon to be realised. Admittedly the system of contract competition now in vogue, and its consequent demands on one's time, through having to specify every nail and screw, to foresee everything, and to provide for everything, is a great and increasing tax upon the mental resources of architects. Perhaps my little contribution may assist some in this difficult profession; at all events, practical description is of the utmost value to those who desire to learn, and I trust my remarks may be useful to them, if not to those who have grown grey in the service.

ARCHÆOLOGY AND ARCHITECTURE.

Sir,—In your report of Mr. H. C. Boyes's paper, which you entitled "What Style Next?" p. 1099, there is a cursory allusion to the archæological thraldom under which it may be said the profession is at present as a body labouring. As a young architect I feel that this subject is one which ought to be duly considered in its bearing upon the art training of the rising generation of architects. That the study of archæology is of great importance and assistance to the architect there cannot be a doubt, but if architecture is to assert its pre-eminence over other fine arts, archæology will have to be the pastime and not the serious business of its professors. It may appear somewhat paradoxical to assert that no event or circumstance that has occurred during modern times has been more derogatory to the true principles of architectural art than the archæological and antiquarian mania which has sprung up and developed itself since the revival of Gothic architecture by the elder Pugin and others.

During the whole period of architectural history there was a constant pouring out of fresh ideas, until the revival of letters in the sixteenth century, when a mighty retrogressive stride was taken extending over nearly 2,000 years, and forthwith the Classical styles were resuscitated and became universal throughout nearly the whole of Europe. This event, although in one sense an inestimable boon, yet, in another, was the greatest calamity that ever befel architecture before or since. At the same time that it opened up the vast treasures of art of bygone ages, it erected an obstacle to the advance of originality which architecture has never since been able to surmount.

Since the sixteenth century, architects have been busily engaged repeating the architectural history of the previous 2,000 years, and yet we have scarcely worked up to our own times again, but continue to linger with reverential awe around the fascinating beauty of the so-called "Queen Anne" period.

All known styles, both of architecture and art have had their own peculiar characteristics. Why should not this be so now? Has nature been exhausted, or have the inventive capabilities of man already attained their zenith? The one great reason why architects of the

present day are unable to advance beyond what has already been accomplished by their predecessors is owing to the faulty system of education which prevails. Students are requested to reproduce the various outlines that are set before them; when, having attained a certain degree of perfection in copying they are permitted to fall back upon their own resources, and consequently either sink into oblivion, or, if they have that within them which can aspire to higher altitudes than mere freehand drawing, they may ultimately rise to eminence. But, alas! how few of those who are educated at our art-schools ever aspire beyond the endeavour to excel in mere mechanical manipulation?

The present age ought to eclipse all that has previously been done in the way of art-productions, seeing that perfection has well-nigh been attained in the manufacture of all those necessary implements with which the artist performs his purely mechanical labours. That, however, which cannot be purchased, but which is nevertheless the one grand quality essentially necessary to be possessed by an artist, *i.e.*, the power of idealisation, is a gift bestowed only on a very limited number of art-students. The development of this power of idealism is probably in no case so much ignored as in the training of an architectural pupil. On entering an architect's office, where he is supposed to be initiated into the mysteries of his profession, his first lesson is usually to copy the Roman mouldings, capitals, &c., after which he will, in all probability make an elevation of a Grecian temple in the Doric style. He will now be quickly pushed forward through a course of Early English mouldings and traceried windows, canopies, crockets, and finials, after which he will make copies of designs carried out by his principal, which in many cases are themselves little more than plagiarisms. A little professional advice will probably be given him with reference to the desirability of copying old work upon every occasion that may present itself. The stock occupation of an architectural pupil consists mainly in tracing. The whole system of education, as far he is concerned, is one of copyism from the beginning to the end of his pupilage. To copy becomes in his case "second nature," and it rarely happens that he is incited by his superior to original efforts. The natural result of such a system of training being that instead of producing architects, we have only excellent manipulative draughtsmen.

The whole office education of the architectural student tends to smother originality and damp any spark of idealism that may be endeavouring to develop itself. Another of the evils of the present system arises from the class of critics it necessarily produces. A critic cramfull of archæology will censure all that is not archæologically correct, and by so doing disheartens many a rising and would-be genius. A young architect who attempts to introduce new and novel features into his design is not credited with being original in his ideas, but is invariably snubbed for what is too commonly regarded as ignorance of the correct archæological peculiarities of the style in which he essays to work. The fear of adverse criticism has prevented our leading architects from introducing reforms which they have themselves suggested; it is, therefore, not surprising to find considerable diffidence in younger members of the profession. As an instance of this, I may mention that Sir G. G. Scott in one of his works says that if he were using the Classical orders he should substitute natural foliage for the acanthus and other conventional leaves in use by the ancients. Since writing in that strain he has had a magnificent opportunity for carrying out such a bold reform, the like of which was probably never before contemplated. A glance at the new Foreign Offices will at once decide whether he has had the courage to defy precedent.

The battle of "styles," which has been raging for some time, I regard as derogatory to the dignity of art. There is a lack of unanimity amongst members of the profession which renders it next to impossible for a definite mode of action to be pursued or a particular train of thought systematically worked out, and so develope a new school of architecture. The very fact of a man proclaiming himself a Gothicist or a Classicist displays on his part a lack of originality. It is tantamount to saying, "I work like Wren:" "I work like Scott." It is this professor of a particular "style" or phase of art that is the greatest enemy to the encouragement of orginality. The man who permits himself to be fettered by "modules" and "minutes" cannot be expected to soar into the realms of fancy and imagery.

Every architect should have, and at the same time practise, a style of his own, for individual mannerism is far preferable to servile copyism. Another evil which is engendered by this archæological mania is the agitation of "style" which results, and the consequent division of opinion in the architectural camp. Between these varied and opposing currents of thought the architectural student has to decide, and he either takes sides unthinkingly, or his art ideas are so confused as to become a perfect chaos.

That the subjects of form, colour, and proportion will ever remain matters of individual opinion there cannot be a doubt, but it is, nevertheless, not a little discouraging to the seeker after truth on discovering that the fundamental principles of art after the lapse of centuries still remain subjects for diverse opinions and continual controversy. John Ruskin and Alexander Thomson are both names which cannot be but honoured by all architectural students, yet the opinions of these two men are diametrically opposed; for that which the former decries as "barbarous," the latter as emphatically pronounces "true and beautiful." If greater attention were given to the principles involved in art rather than to the mere forms of art, more originality would, I am convinced, be the result. Sir Joshua Reynolds, in one of his discourses, says "the more extensive your acquaintance is with the works of those who have excelled, the more extensive will be your powers of invention, and, what may appear still more like a paradox, the more original will be your conceptions." Some such similar arguments have been advanced in favour of archæological research and the desirability of making it the groundwork of architectural study. I venture to think, however, that the idea intended to be conveyed in the foregoing quotation is not that it is imperatively necessary that an artist be crammed with the conceptions of others before he is competent to display any originality; but that a larger acquaintance with the works of our predecessors enables us, by means of this more extended field of comparison, to discover whether our ideas assimilate with those of previous workers, or whether, on the other hand, they are so far distinct as to be deemed original. Dr. Samuel Johnson conceived it possible for the mind to be so overloaded with the ideas of others that, oppressed with such a weight of knowledge, it becomes incapable of exercising any originality, and can only reproduce that which it has already received from others, and even that only indifferently, unless fired by the same enthusiasm as the original authors.

So that we cannot but admit that a too fervent devotion to the shrine of archæology is attended with much that is detrimental to the interests of true art. If the leading principles of art were instilled into the minds of architectural students prior to their ideas being mystified and confused by a conglomeration of forms and arbitrary outlines, greater hopes might be entertained as to the possibility of every architect having and working in his own style, and thus founding schools of architecture analogous to the various schools of painting. Why not send the art-student direct to the fountain-head for inspiration,—the source from whence our predecessors obtained their inspiration,—instead of setting him to make a copy of a copy? There is no other profession where a state of affairs is to be found analogous to that which we find to exist amongst architects as a body, and which, unless a grand revolution be effected in the system of official pupilage, will continue to exist, and the despairing cry of the architectural student will ever be,—"Copy and copy again!"

JAMES G. BUCKLE.

ARCHITECTURAL ASSOCIATION.

AT the ordinary general meeting of this Association, held on the 27th ult., Mr. W. W. Robertson, vice-president, in the chair, the following new members were elected, viz.,—Messrs. M. Clarke, F. Ward, J. R. Withers, Vincent C. Brown, G. Tournier, E. J. Instone, W. S. R. Payne, E. W. Millwood, S. G. Parr, E. G. Fuller, G. G. Stanham, J. W. Ringrose, T. M. Steers, E. Gabriel, F. J. Mew, S. M. Herapath, W. W. Neve, E. H. Edwards, C. W. Reves, J. Smith, W. J. Burrows, H. Druery, jun., and G. L. Wood.

Mr. A. Frere then read a paper on "Binocular Perspective and Natural Drawing," after which a short discussion, somewhat opposed to the author's views, followed.

HOUSE DRAINAGE.

AT the Society of Arts on Wednesday, November 29th, Mr. R. Rawlinson, C.B., in the chair, the paper read was on the subject of "House Drainage," by Major General F. C. Cotton, C.S.I. It is no disparagement of the paper to say that it contained very little our readers have not seen already. In the course of the discussion which followed:—

Mr. Baldwin Latham said the engineer might bestow the greatest pains, probably, in carrying out the most perfect system of town sewerage, and yet, if the work connected with the drainage of private houses was not undertaken with some skill and attention, the whole system must prove a failure. The strength of a chain was tested by its weakest link; and the weak link in its system of sewerage was the private house drain. If persons only knew the absolute importance of paying personal attention to this they would not, he was sure, sit easy by their firesides, thinking of those malarious gases which might be escaping from the basements, and permeating their habitations to the permanent injury of themselves and their children. It was almost impossible to mention all the matters necessary with regard to this question, but there was one thing which only recently came under his attention in connexion with one of the largest houses at Queen's-gate, where there were seven housemaids' closets one over another. There was a 2½-in. lead pipe communicating with the whole of them, and ventilated at the top. He had found that a pail of water thrown down at the top untrapped every one of the traps below. This showed the absolute necessity of not laying down any general rule with regard to a simple ventilating pipe. The effect of the pail of water was to induce a current of air,—in fact, it acted like the piston of a pump, and drew out the air from the pipe, and so sucked out the water from the adjoining trap. The only way of getting security in this case was by putting in a second pipe alongside the other, and carrying it independently to a point above the highest sink. There could be no doubt that one of the greatest evils with regard to the laying of drain-pipes was the use of clay at the joints. Apart from the qualities of the material itself, it must be recollected that if you took two ordinary spigot and socket pipes, and filled the joint with a fillet of clay, and put the spigot into the end of it, they did not fit tightly, because there was room for the clay, and considerable play, and the moment the filling was put in at the top, the weight of it forced out the clay at the bottom, and left an aperture above, through which the sewage flowed into the subsoil, and thus the basement of the house soon became filled with sewer gas. Some of the best houses in the West End were the worst drained. In many cottages the sanitary authorities looked after them, but the large houses nobody except those living in them was interested in looking after. He had seen a house where a royal Prince lived, and in which two Cabinet ministers had previously died, where he found a cesspool at the foot of the staircase, and a brick sewer, running from one end of the house to the other, which had not even an apology for mortar in its joints, and there were only about 18 in. between it and the flagged basement. If such was the state of matters in a royal residence, what might be expected in other houses? With regard to covering the basement with concrete, he should like to draw attention to the lectures recently delivered at Munich by Professor Pettenkofer, in which he showed the enormous influence of aëration from the ground air, and stated that London would not be at all the healthy place it was if it were not for the fact that there were so many open basements between sewers and gas-pipes and the houses. This insensible ventilation went on with regard to every building, and he showed that the mud hut of the savage—where people were huddled together in a very crowded state—was comparatively healthy, because of this imperceptible ventilation which passed through the walls. The same thing took place with regard to the gipsies' tents. Then, with regard to concrete it was known to be extremely porous as a building material, and, therefore, it would allow of a remarkable degree of this imperceptible ventilation, even from the ground atmosphere, to pass into the house; and it might, therefore, be necessary, hereafter, in the construction of houses, to cover the concrete with asphalte, and provide proper means for admitting the external air; because, if you shut out the air at one point, there was a great stress at that place, unless you made provision to admit

air somewhere else. He could thoroughly endorse the saying that, in taking possession of a house, you should look to the drainage before you furnished the drawing-room.

Mr. Coneybeare said the importance of this subject could not be exaggerated, nor the great ignorance which existed upon it, both amongst builders and architects, as well as the general public. He had never lived in a house which was properly drained. There could be no doubt there ought to be one general system of drainage, and the sooner London was put under one management for the supply of air, water, and gas, the sooner they would be entitled to call England a civilised country. Sanitary arrangements, however, were equally wanting in country towns. He once slept in a house off the Cromwell-road, where he was terribly annoyed in the night by bad smells, and he found in the morning that all the other inmates had suffered in the same way; he should certainly have expected an attack of fever if he had remained there long. A very common evil was the use of the same cistern to supply drinking-water as served for the closets, and it would often be found that water left for any length of time in a jug would become exceedingly offensive.

Mr. Hale thought it would be well if the Society were to offer a prize for the best treatise on house-drainage, to be accompanied by models. He should like to hear some gentleman who professed to be well up in these matters get up and say that he lived in a house where the drainage was perfect, and describe the system for the benefit of the public. He also thought it would be a good thing if a company were started to build houses on sanitary principles.

The Chairman, in reply to a remark that there ought to be public functionaries appointed to certify to the soundness of house-drains, said the law, as it now stood, required the surveyor to see that there were proper plans laid before the Local Board, and it was also his duty to see that the drains were properly constructed. There could not be the excuse that he had not time, because it was the duty of the Local Board to furnish him with such assistance as was necessary. He was sure there were surveyors present who would give the meeting their experience, which would be much better than the speculative opinions of gentlemen who had not the opportunity of knowing what the law or the practice was.

Mr. T. Porter said his experience showed that these rules were not carried out, and he could instance hundreds of houses where, if such a law were enforced, bad drains could not exist, and yet where the drain-pipes were laid with butt-joints, and with no cement. If it was the duty of the local surveyor to certify that the houses were properly drained, how was it that, in nine cases out of ten, the drainage was so imperfect? It was true that plans were supposed to be deposited with the Local Board, but there was no guarantee whatever to the purchaser or lessee that the law had been carried out. A drawing was not sufficient; but if the surveyor had to sign it as a certificate that he had examined the drains, there would be some security to the public.

Mr. Greenstreet (surveyor to the St. Saviour's Board of Works) said he had patented a trap, which he believed would be found very useful and efficient. It was designed especially for street gullies, to meet the objections to the common block or D-trap, but would be also applicable to house-drains. He proposed to insert, about 9 in. beneath the grating, a piece of india-rubber, on a frame, in which there was a slit. When the wash from the road overcame the resistance of the india-rubber, it would give way, and allow the sewage to pass, and would then close again immediately.

Mr. Knight (surveyor to the Mile-end Vestry) was sorry to hear a number of architects denounced as being totally ignorant of house-drainage, and did not believe such was the case. No doubt, there were many cases of bad drainage, but they were mostly in old houses. In the district under his charge the practice was for either himself or his deputy to see the pipes of every house before they were covered up. He admitted that he had been guilty, like many others, of using clay for stopping the joints, but he now recommended the use of tow, coated with Portland cement, plugged in the same as in water-pipes. With regard to the india-rubber trap just mentioned, he saw it in use many years ago, but it was found that little bits of stick or straw got into it and kept it open.

Mr. Liggins said it was pretty well known that the Society of Arts had appointed a committee to go into this question, and he could not imagine a more important one, and rejoiced that they had done so; but it was important that they should not make statements which would not bear investigation. Not many months ago a report appeared in the *Times* of a deputation headed by Sir Henry Cole waiting on the Metropoliton Board of Works, which was the sanitary authority for London. Mr. Coneybeare regretted that this Board had not the gas, water, and drainage of the metropolis under its control; but the latter was under its control, and able surveyors were appointed, who did look after the drainage as far as their powers went. Those powers, however, only extended to houses built since 1856, and the horrible state of things which had been discovered in Harley-street no doubt existed in many other places. But if the Board had power to reconstruct the drains of all old houses, he should like to ask the ratepayers how they would care to have enforced upon them the employment of such a large staff as would be necessary to carry out these sanitary arrangements. He thought something must be left to the common sense of individual householders, who would naturally have regard to the interest of their families, and see when they took a house that it was properly drained. Let each man, when he took a house, employ a surveyor, and see that it was properly drained; that was the plan he had adopted, and he had never had a case of sickness in his house in nineteen years.

Mr. Weaver (surveyor of Kensington) said he had not heard any practical suggestion made to get rid of the evils complained of, though there seemed to be a great deal of hidden talent; and if the suggestion were followed of offering a premium, perhaps it might develop some of this latent talent. He should be very pleased to give 20*l.* out of his own pocket to any one who would tell him how he could look after every joint in every pipe in the 800 houses which were built every year under his supervision. To take the case mentioned, of the seven-storied house at Queen's-gate, it would require a clerk of the works, at 3*l.* 3s. a week, constantly on the spot, to prevent the defects which had been mentioned, and you must multiply the sum by 600 to arrive at the cost of insuring perfect drainage. The plan they followed was to give printed directions to every builder in the parish for his guidance, and he believed that, in the majority of instances, the man's self-interest would prompt him to make his house saleable, by taking reasonable precautions. But while land was so highly valued that no gardens were possible, and closets had to be crammed almost into the middle of the room, they must put up with imperfections. He was quite sure the vestries would be only too happy to adopt any reasonable suggestion for securing perfect drainage.

The Chairman said he could not agree with some of the remarks of the last speaker. The rates in Kensington had recently been raised nearly one-third; and he was satisfied that the income of the vestry was competent, if necessary, to meet even the extravagant expenditure suggested without levying an additional rate, and it would be money well laid out if perfection in drainage was accomplished. Human life was the most valuable thing in this world, and, therefore, whatever was necessary to its security was not extravagant.

The discussion was continued on Wednesday, December 6th.

ART FOR THE POTTERS.

THE WEDGWOOD INSTITUTE, BURSLEM.

The seventh annual meeting and distribution of prizes in connexion with the Burslem School of Science and Art was held on the 16th ult., when Mr. H. S. Marks delivered an interesting address. In the course of it he said:—"You have relations and friends who will gladly sit for you. The domestic cat is a capital subject for study. You may learn many a lesson in drawing the furniture of your homes,—the humble coal-scuttle foreshortened will puzzle some of you to draw correctly. You laugh, but I only wish to impress on you the fact that there is material for you to work on everywhere. Mr. Ruskin said very wisely—'The true artist thirsts to draw every thing.' This is equally applicable to the student, who should draw at all times, and in all places. In the special branch of art more particularly cultivated here (pottery), good drawing is as essential as in any other; though it cannot be the very finest that can be applied to other forms, there is no reason why it should not be first-rate of its kind. The Italian plates of the Renaissance period show unusual excellence in this respect, and great sureness of hand both in ornament and figure. Students who intend to decorate pottery might shade their preparatory studies with sepia instead of chalk as a means of familiarising their hand to the material they will use in their daily work. It is important, too, that they should learn to model broadly at first, and without surface finish, and I cannot help thinking it would do no harm if every student took a turn at 'throwing' that he might learn to make a pot before decorating it. It is quite possible that some of you may have a fine latent feeling for form which, encouraged in this way, might develope into producing for us new shapes of use and beauty. I understand the number of throwers is limited; that they work chiefly in a mechanical way; that there is no novelty in the moulds you employ since the time of Wedgwood. If so, this is not as it should be. We have surely men among us who can do something out of the beaten track. The importance of the study of flowers and plants for pottery cannot be too greatly insisted on, affording, as they ever have and will, such staple means for its decoration. Flower-painting is far more thoroughly taught in France and Germany than here, and the consequence is that we cannot compete with those nations. And this brings me to a delicate subject. Knowing the large amount of foreign talent occupied in these quarters, no one could more cordially recognise than I do the great abilities of MM. Solon, Mussill, Hürten, and of other foreign art-workers here. But their presence should stimulate you to friendly rivalry, and show that the English can do something too. It is not that I love the foreigner less, but that I love the Englishman more, that I do not like to see him thus behindhand in artistic work. Do not let our admiration for the art of the foreigner betray us into servile imitation of it. Let us learn from it all we can without sacrificing originality. All borrowed art is a mistake, to use no stronger word. To be good and lasting, art of all kinds must be national. Infuse a little patriotism into your art studies, and let each of you endeavour to show, as far as his abilities lie, that we here in England can originate a pot that is good and serviceable in form—pleasing and harmonious in colour. And now a word or two about colour. I am afraid you have not in your immediate neighbourhood very attractive landscape. Your atmosphere, if salubrious, is not more enviable than that of London; but whenever you can get the chance I would urge on you the great importance of sketching in colour from out-door Nature. You cannot very well apply landscape in a decorative way to pottery, but I can assure you that, so far as I know, no other study tends so much as this to improve the sensitiveness of the eye to delicate and beautiful colour. Nature never colours, as men will occasionally do, vulgarly. The colour of flowers, again, is more beautiful out of doors, or in the broad light of a glass house, where there are no heavy shadows (as in a darkened room) to detract from the purity and mass of colour. Of all art work there is none so instructive in the matter of colour as Oriental, and it is much to be regretted that you have little or no access to specimens. Eastern nations seem to have a natural instinct for colour, but for decorative colour and effect I know of none that exceed the Japanese. In form, often quaint and capricious, they seem ignorant of the beauty of the human figure, regarding it merely as a sort of clothes-horse, on which to hang rich and gorgeously-coloured draperies; but look at the action and 'go' of their figures, their birds, their plants, their quaint patterns, the numberless ways in which they decorate a surface, and you will allow them to be at once the most original and delightful of decorators. The Japanese work on the principles of nature, and, like her, abhor symmetry. You seldom, if ever, see in their work vast wastes of symmetrical ornament or endless lengths of unvarying and meaningless scroll work so suggestive of 'at per yard.' When the gushing novelist tells us that his heroine's face and figure are faultless in symmetry, we may be sure she is a very impossible and uninteresting young person. No two sides of a face,—of a limb, of a leaf,—are alike. Imagine, if you can, a man constructed on symmetrical principles! Think of the starry firmament with the stars placed at set and regular intervals! I wish you were surrounded by more of their work, and I would beseech those who have the interest of your schools at heart

and the means to testify that interest, that they would enable you to have at each of your schools here a little Japanese museum, consisting of screens, fans, books, pottery, &c., to serve as a means of colour education. The cost would not be excessive,—say about 20*l.* for each school,—and, by avoiding duplicates in the purchases, the collections might be transferred from one school to another, and thus keep up the supply of suggestive material. Speaking of the Japanese reminds me of a story I heard the other day. Kioto was formerly the seat of government in Japan, but, ceasing to be the capital, was falling off in prosperity. The governor, as a means of setting it up again, cast about to improve its manufacture of pottery. Hearing somehow of Smiles's 'Self-Help' and the story of Palissy the potter, he got a copy and had the story translated into Japanese. A play was fashioned out of the translation, and artisans were admitted free to the first twenty nights' performance; after which the piece was played on the usual conditions of payment. I do not know what the result was, but have little doubt that the lessons of indomitable energy, untiring perseverance, and singleness of purpose which the wonderful story of that patient potter teaches were not thrown away, but brought forth good and noble fruit. May we not also, whatever occupations we pursue, take example from this life of Palissy. Calumnies, disappointments, poverty, afflictions of all kinds, his wife even siding against him, all came in turn; but, nothing daunted, this brave man held on. He had set himself a task, and nought but death should make him throw it up. At length success crowned his efforts. He achieved a renown that will out-last even the work of his hands. His art was original, owing nothing to foreign imitation. In conclusion, let me impress upon you the necessity of work, and hard work, if you want to get on. Labour is the price set upon excellence in every study. Art in any shape is so absorbing an occupation that it is, perhaps, too much to expect that any one following it should come up to De Morgan's notion of an educated man as 'one who should know something of everything and everything of something'; but we should all endeavour to acquire as much culture and knowledge outside our immediate pursuit as we can. Cultivate a taste for reading, and store the mind with images and ideas. Read history, poetry, and good fiction; not trashy novels. Biography, again, is most interesting in its description of the struggles for success and the gradual achievement of the desired reward. Be simple and unaffected in your manners as in your art. Avoid eccentricity and conceit above all things. Be humble and hopeful, always doing your best, striving for the highest excellence you can attain. Patience and perseverance will overcome many an obstacle. As Shakspeare says:—

> 'Hercules himself must yield to odds,
> And many strokes, though with a little axe,
> Hew down and fell the hardest-timber'd oak.'"

Mr. Marks then distributed the prizes.

IN THE FOOTSTEPS OF BRUCE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the ordinary general meeting of this Institute, held on Monday evening last, Mr. Charles Barry, president, in the chair, M. Paul Abadie, and M. Theodore Ballu, members of the Institute of France, were elected by acclamation as honorary and corresponding members. The following gentlemen were then balloted for and duly elected, viz.:—As Fellows: Messrs. John Baird, John Burnet, John Carrick, James Salmon, William Forest Salmon (all of Glasgow), Thomas Mitchell (Oldham), J. T. Knowles, jun., and Thomas Porter (both of Westminster). As Associates: Messrs. Maurice B. Adams, Lewis P. Crace, and Frederick H. Reed (all of London), and Henry Barber (Ulverstone).

Professor Donaldson, past-president, then read a paper on the recent travels of Lieut.-Col. Playfair, H.M. Consul-General in Algiers and Tunis,—"In the Footsteps of Bruce." It seems that Colonel Playfair, finding himself the successor in office, after the lapse of a century, of the great African traveller, determined to search the Record Office for some account of Bruce's explorations. He did so, but found nothing; which is explained by the fact that Bruce had resigned office before setting out on his memorable travels. Colonel Playfair, however, subsequently found that Lady Thurlow, Bruce's granddaughter and heiress, of Kinnaird, was in possession of the traveller's MSS., drawings, and collections, and these were generously placed at Col. Playfair's disposal. The drawings were on more than 100 sheets, some with subjects on both sides, illustrating ancient monuments of interest from Algiers to Pentapolis. Bruce had frequently expressed an intention to publish a work on the antiquities of Africa; but it does not appear that he did more than commence the letterpress, and up to the time of his death, in 1810, it was never completed. He had engaged a Bolognese draughtsman, one Luigi Balugani, who was with him for nearly two years in Algiers. He was Bruce's only companion in Africa and Asia, and he died in Palestine. Bruce had a good stock of materials, and a large *camera obscura*, which, with other conveniences, were packed in a case like a folio, about 4 ft. long. This greatly facilitated his sketching. The drawings were offered about forty years ago to the British Museum for purchase, but were declined. They have, however, been more than once exhibited at meetings of art societies, and some of the principal ones were selected on this occasion to illustrate Professor Donaldson's lecture.

Commencing with the tomb of Juba II., near Algiers, the lecturer gave a detailed description of its architectural features, which resembled the Etruscan tombs at Cervetii and other ancient towns near Civita Vecchia. The next building mentioned in Colonel Playfair's diary is the Aqueduct of Constantina, memorable for the siege and gallant capture by assault of the French in 1837. It was built on the flat summit of an insular rock, which rises up nearly 1,000 ft., with perpendicular sides, surrounded by mountains. On this plateau was the residential city of Syphax and succeeding kings, adorned with palaces and other edifices of splendid character. Around the base of the rock flows a tributary of the river Ampaga. Professor Donaldson next described the once important town of Sufetula, in the Byzacene province, which formed part of the Carthaginian territory. In Bruce's time it was surrounded by a forest of white firs, which have all now disappeared. He mentions an inclosure, or hieron, of large dimensions, and entered by an archway. Here were three semi-detached temples, of which the central one was dedicated to Bacchus. To the south of the town is a triumphal arch, erected in memory of Constantius, A.D. 305–6, the inscription bearing not only his name, but that of Maxentius. Col. Playfair found the form and disposition of the ancient city still apparent, and many of the streets could be traced. He feels convinced that excavations, judiciously carried out, and especially in the hieron, would bring to light many objects of archæological interest. Makther, Assuræ (the modern Zarefono), and Thugga, or Dugga as it is now called, were next described. In the last-mentioned city is the celebrated mausoleum, from which the bi-lingual inscription now in the British Museum was obtained. Bruce left a mere pencil sketch of this interesting structure, which was almost entirely destroyed by Sir Thos. Reade, the British Consul-General at Tunis, in order to remove the stone on which the inscription was carved. Col. Playfair remarks that this mausoleum and the Madrassen, are the only monuments in North Africa of præ-Roman origin, and the only examples remaining of the style employed by the early aboriginal races. There are remains of numerous temples, a theatre, and other buildings, at Thugga, indicating great magnificence and architectural taste. At Tripoli, the most notable ancient monument is a triumphal arch, now buried in sand up to the middle. It was built of fine solid marble on which time and weather have had little effect. Many years ago it fell into the hands of the present owner, a Maltese wine-merchant, who, after converting it into the principal wine-shop of the town, made use of it as a warehouse, and it is now filled with casks and boxes. Hydera (the ancient Ammœdara) belongs to the Hyderines, though it is inhabited by the Welled Boogannim Moors of Tunis, whose saint is buried here. By the instruction of their founder they are obliged to live on lion's flesh as far as they can procure it! In consideration of the utility of this vow they are not taxed like other Arabs, with payments to the State. Here is another triumphal arch, dedicated to Septimius Severus, of peculiar design, but not equal in grandeur, to that of Thamugas, the finest of the series of which a drawing was exhibited.

At the conclusion of Professor Donaldson's lecture a vote of thanks was passed to the author by the meeting.

Mr. T. N. Laslett then read a short paper descriptive of the "Metroscope," an instrument for measuring the height of inaccessible buildings.

THE BROMSGROVE SEWAGE WORKS.

THESE works, which have just been completed at a cost of about 3,500*l.*, were formally opened by the members of the Bromsgrove Local Board on the 30th ult. They are situated in a field near Churford Mill, containing about four acres, upwards of two of which are covered by the different filtering-beds. Some five years ago the Board was threatened with an injunction to restrain them from turning the sewage into the town brook, and causing a nuisance by contaminating the stream. They called in the services of Mr. Bailey Denton, engineer, who advised them to purchase about forty acres of land and carry the sewage a mile away from the present site, which would have cost about 20,000*l.* The Board did not feel justified in expending so large a sum, and called into requisition the services of Mr. Taylor, engineer, who prepared plans, which were approved. The consent of the Local Government Board was obtained, and the works were carried out by Messrs. Brazier & Weaver, of Bromsgrove. The sewage is conveyed from the town by a pipe sewer a distance of half a mile, and at the outfall is led into a duplicate set of subsiding-tanks and filter-beds. From the outfall it flows into a shallow tank having an area of 200 ft. In this tank the heavy matter of the sewage precipitates itself. The sewage then passes into a second subsiding-tank, having an area of 900 ft., and at the end of this tank is a wall containing a number of pipes through which the sewage passes, and when the tanks are full these pipes are below the water, which prevents the floating matter in the sewage passing beyond the wall. It then runs into a subsiding tank with an area of 1,600 ft., in which further subsidence takes place. Beyond this tank is constructed a filter-bed of 600 ft. area, in which is fixed a perforated floor, covered with engine ashes; the sewage, passing upward and through the ashes, goes over a weir 30 ft. wide, by which a very gentle motion is given to the water. It then reaches a fifth tank, and beyond this is another filter, constructed similarly to the first, but having a larger area, and being a downward filter, the sewage passing through the ashes, and thence into an open carrier, which conveys it to the land-filters. Each tank is built and paved with brick, the bottom being made to slope to the centre into a well or pit, at the bottom of which is a large brass valve. Into this pit the mud is swept, and passes through the valve into a mud pit 18 ft. deep, in which is fixed a strong chain-pump, which is worked by two men. By this means the mud is raised to the surface, dried, and sold for manure. The whole of the tanks, wells, &c., are in duplicate, so that one set can be cleaned while the other is at work. After passing through this system of filtration the sewage goes into the land-filters, fifty in number, each having an area of 2,500 ft., formed by levelling the land and raising round each bed an earth embankment. The land has been closely drained, upwards of three miles of pipes having been used. The sewage passes from the open carriers through sluices into pipes, and on to each bed. The surface soil of each bed is thrown into furrows, and the sewage gradually filters through the ground into the drains, which empty into the main drain. The water comes out clear and bright into the brook. Arrangements have been made for dealing with storm water. Several gentlemen tasted the water, and pronounced it "good."

Mr. E. M. Ward, R.A., and the Windsor Town Council.—The Windsor Town Hall has recently been undergoing repairs, and in the work of renovating and restoring the pictures which it contains the Council has had the valuable assistance of Mr. E. M. Ward, R.A. At a meeting of the Council last week, Alderman Devereux proposed a vote of thanks to the ex-Mayor for the great attention he had paid to the restoration of these pictures; also a vote of thanks to Mr. E. M. Ward, for the voluntary manner in which he came forward to give advice, and assist the ex-Mayor in their restoration; also to the Town-clerk for the valuable assistance he had rendered.

BUILDING DISPUTE AT LINCOLN.

BAVIN *v.* FAULKS.

The parties to this case (heard in the Lincoln County Court) live in Lincoln, plaintiff being a journeyman builder, and defendant a master man. The claim was for 2*l.* 10s. 10d., balance of an account for work done.

The plaintiff's case was, briefly, as follows:—Plaintiff and a man named Giles in July last agreed with the defendant to complete the building of two houses, the property of the ex-mayor (Mr. Beard), for the sum of 6*l.* 10s. Defendant was to find all the materials, and plaintiff and Giles were not to do any work except in the inside of the house. They started on the work, but after they had been engaged a short time they found that the materials were not properly supplied by the defendant, with whom plaintiff and Giles had a conversation on the subject. They told him that if he did not supply the materials they should consider the arrangement which had been entered into was "knocked on the head," and they should charge him by the hour. Defendant then said in the future it would be all right, the proper amount of materials should be provided, and he would give them a sovereign to make up the loss they had sustained previously. Materials were not, however, supplied, and plaintiff and Giles were obliged to leave off the work; the contract could not be fulfilled as defendant did not supply the materials. Plaintiff and Giles each worked 388 hours, value 11*l.* 17s. 8d., or 5*l.* 18s. 10d. each. At different times they each received 3*l.* 8s., leaving a balance due of 2*l.* 10s. 10d. each.

A similar claim was brought for the same amount by Geo. Giles against Faulks, but after hearing the evidence adduced on both sides,

The Judge said he did not think there was any foundation for the actions, and gave a verdict for the defendant.

AN ARCHITECT'S CLAIM FOR SERVICES RENDERED.

LACEY *v.* HEENAN.

This was an action tried in the Exchequer Division of the High Court of Justice, on the 30th ult., before Mr. Baron Pollock and a common jury, and was brought to recover a sum of 121*l.* 16s. for work and labour done and commission.

It appeared that the plaintiff was an architect carrying on business at 12, Buckingham-street, Strand, and was employed by the County Fire-office as their consulting architect. The defendant was a wine merchant, and until recently on very friendly terms with the plaintiff. Some time back the defendant was anxious to have a house built for himself on his own plans, and engaged the plaintiff to carry out his design. Sites were looked at and almost decided upon at Hampstead and Finchley-road, but ultimately a plot of ground was purchased by the defendant on St Margaret's Estate, Twickenham. A contract was arranged with a builder, the land was laid out, and the house commenced, and the plaintiff claimed the above sum for his services.

Mr Cole, Q.C., and Mr Grantham appeared for the plaintiff, Mr. W M'Intyre, Q.C., and Mr. Thomas were for the defendant.

The Judge during the second day of the hearing, by the request of counsel on both sides, consulted with them, and expressed an opinion, in accordance with which a verdict was given for the plaintiff for an amount which was not made public.

FINDING SURVEYORS' INSTRUMENTS.

Mr. Brunton, surveyor to the Durham Board of Health, requiring a spirit-level, at a cost of 16*l.*, for drainage works, considered it was the Board's, and not the surveyor's, privilege to pay the mathematical instrument-maker, and accordingly applied to the Board to supply him with the requisite order.

A member of the Board inquired if there were not a special arrangement with surveyors, when they were appointed, to find their own instruments. His opinion was, that when Mr. Brunton was appointed some reference was made to expensive instruments of this description, and that he said, as they were so seldom wanted, he could borrow them.

The surveyor's written appointment was read, but it contained no mention of instruments, either one way or the other.

No action being taken on the application, it remains for Mr. Brunton to either find an instrument at his own expense, borrow one, take the drainage without a level, or leave the work undone. A proper understanding on the question should at once be arrived at.

Proposed New Railway Station, Dublin. Some stir has been caused in Dublin by a project, of which Parliamentary notice is given, to continue the Westland Row Railway from Kingstown on a viaduct through Trinity College Park and the Fellows' Garden, and to knock down the Provost's house in order to erect a Central Dublin Station in the neighbourhood of College Green. It is suggested that the money compensation obtained would solve the vexed question of a fund for retiring pensions for Senior Fellows.

THE OLD PALACE, RICHMOND.

A somewhat curious litigation is proceeding in the Court of Chancery, before Vice-Chancellor Malins, respecting a contract to purchase the remainder of the lease of the Old Palace at Richmond, a mansion of great historic interest, the reversion of which is in the Crown. The plaintiff is the Hon. Mr. Mainwaring, and the defendant is Colonel Wilbraham. The colonel, it appears, agreed to purchase the lease of the property on certain terms, "subject to approval of the lease." When the lease was perused, it was alleged that the Crown had imposed a fine of some hundreds of pounds upon the renewal of the lease in the year 1820; and it was objected by the defendant that as the lease he was buying would expire in a few years, he would be unable to renew it except on payment of a similar fine to the Crown. This, the defendant asserted, he was assured by the plaintiff, before the purchase, would not be insisted upon; whilst the plaintiff's case was that no representations, beyond an expression of opinion, were made on the subject. It appeared that no intimation had been received from the Crown that any such fine would be required, and that the matter was one of conjecture only. The performance of the contract was, however, refused by defendant, as he inferred that what had been done in 1820 would be repeated by the Crown at the expiration of the present lease. The suit, which is for specific performance of the contract, is proceeding on the oral evidence of the parties.

A COTTAGER'S WISH.

Our cottage has step-gabled ends,
Low drooping eaves, quaint nooks and bends,
With lattice windows, diamond-paned.
The sunny porch has jasmine train'd;
And midst the weather-beaten tones
Are moss and lichens on the stones.

A garden there is spread around,
With fruit-trees bending to the ground,
And on its mellow walls, as well.
Neat plaited hives, too, I may tell,
And drowsy bees are stumbling through
Our beds of lavender and rue.

And near, on daisied meadow low,
You see Sweet Pea, our brindled cow.
She seeks the shade of pleasant trees
That wave and whisper in the breeze,
Near where the spring, nor broad, nor deep,
Comes babbling down the hill-side steep.

To dine off herbs with love, not gold,
Is fare beyond stall'd ox, we're told.
I doubt it not; and, further, find
No home, not mine, quite to my mind;
And like to make myself content
With that the Lord of All has sent.

But, oh! the smells, the smoke, the damp,
The pools of mud through which we tramp,
The pools of water when it rains!
And all for want of proper drains!
I would the *Builder*, when he roams,
Would next inspect our cottage homes.

VENTILATION OF CHURCH.

Sir,—Your querist, "Q. Q.," has only to remember the simple rule of nature in treating his church so as to ensure a regular, uniform, and sufficient change of air for the wants of the congregation, viz.,—that consumed and effete air, from its warmth, always ascends to a higher level. It is a fallacy to suppose, as is sometimes taught, that the carbon di-oxide, and the volatile organic matter expelled from the lungs, or from the combustion of artificial lights, lies at a lower stratum. The contrary has been conclusively demonstrated by Pettenkofer, and also in my researches on the quality of air in buildings, published in the *Lancet* some few years ago.

This teaches us that there should be *inlets* for fresh air and *outlets* for foul air. The positions to be selected can only be determined by those on the spot, as also the superficial capacity of the apertures. Practice, however, shows that a *thin* stream of air is more regularly diffused, with less tendency to draught, than a more solid current. Cold air entering a room always inclines to flow downwards, — thus creating draughts; therefore it should be introduced at an angle of elevation of not less than 45° with the plane of the building, but not so much as 90°.

This desideratum may be obtained by a deflector, or by the sashes or other openings being permanently fixed at the requisite slope. The position of inlets should be not less than 6 ft. above the floor line, and where there are galleries additional openings at a corresponding height above the upper tier of seats. The outlets are best arranged in the roof, and may be of rather smaller superfices than the inlets. This is simple, natural, and inexpensive ventilation, self-acting and thoroughly efficient.

The heating medium may be any of the excellent stoves now obtainable. The supply of air for combustion, however, should be procured from outside the building. And,—need it be said?—care should further be taken to conduct the consumed air to the outside. This suggestion may seem superfluous, and some may smile at its simplicity, and I would not have ventured to refer to it, only from the circumstance of having this very day observed that the entrance-hall of a West End club is heated by a charcoal stove without a flue! Moreover, the number of gas stoves burnt during cold weather in shops and rooms without fireplaces or apertures for ventilation into which the vitiated air enters is alarmingly on the increase, at which, doubtless, our medical brethren will be much distressed! The condition of public buildings is simply disgraceful: churches, chapels, assembly-rooms, clubs, hospitals, institutions, lecture-halls of scientific and professional societies, schools, and all places where people collect for business or pleasure, from all these fresh, invigorating, wholesome air is shut out. The subject is one in which the public take no substantial interest. It is true we talk about it, write, discuss, and read lengthy papers,—in fact, do everything but perform; and I believe it is rather looked upon as a sign of delicacy of constitution and effeminate to make complaint or suggest remedial measures.

Take any of the national structures, completed, as it were, but yesterday,—buildings costing immense sums,—and they are no exception, as the same grave defects are tolerated and the simple rules of ventilation are ignored and thwarted.

It is satisfactory to find that one responsible member of the church has a desire to assist the material welfare of the flock, and seeks the help and advice of your columns. The clergy have the power, and only need the will, to set in motion very simple machinery for effecting great benefit to the millions by giving them clean air to breathe in God's House, and thus perform efficient aid towards reducing the enormous number of annual deaths from lung diseases, which exceed in the aggregate all the zymotic complaints combined.

Let there be light and pure air, the first of Heaven's gifts, and a rapid diminution of mortality will follow in that class of foul disease, fell destroyers of the breathing organs.

Richard Weaver, C.E.

THE PREVENTION OF ECHO.

Sir,—Your correspondent, J. N. A. Macdonald, may see the application of wires for destroying echo in the Chapter-house of York Cathedral, where I saw it a few days ago; but I may tell you it is a failure, and no wonder. I have seen it tried in two other instances with the same result. The theory of it seems to be to produce lesser waves of sound within the larger ones, as when two pebbles of unequal sizes are thrown into still water, the concentred waves are mixed up and neutralise each other.

I have tried large metal frames suited to the purpose (and which when upare almost invisible) and filled in with wire gauze in two thicknesses half an inch apart with a good effect, and better still when filled in with worsted threads. But the most effectual mode was found to be by suspending fringes, as I may term them, of worsted threads about 3 ft. long, more or less depending on circumstances, and fixed in such positions as the form and section of the building necessitate.

Geo. Glover.

Sir,—Since the date of the correspondence in the *Builder* in 1874 respecting the use of wires to improve the hearing in churches, an experiment has been made in Bath Abbey. If your correspondent were to communicate with Canon Brooke, the rector, probably he would be able to obtain some information as to the materials employed, and the success or otherwise of the system.

A. J. Stanton.

SCIENCE LECTURES AT SOUTH KENSINGTON.

The free lecture on Saturday evening last in connexion with the Loan Collection of Scientific Instruments was given by Mr. J. Starkie Gardner, F.G.S., and the lecture-theatre was crowded. The title of the lecture was "The Tropical Forests of Hampshire." Mr. Gardner said England at the present time has a climate far from tropical, but the time to which I refer was when the palm and spice plants flourished here; and before I have done I hope to have shown you that the climate at that time may rightly be spoken of as tropical, not in a poetical or metaphorical sense, but actually. The data on which our inferences are based are the fossil leaves which we find in the clays of the south of Hampshire. It is the middle fresh-water series which is so rich in the clay beds containing fossil leaves. These leaves are found in various conditions of preservation. In most cases the impression only of the leaves in the clay is met with, but in some cases they are so well preserved that the actual substance has been retained although chemical changes have altered its composition, and it will peel off and blow away. Among others the following fossil forms were mentioned as having been determined with but little doubt:—Feather and fan palms, dryandrae, beech, maple, azalia, laurel, elm, acacia, aroids, cactus, ferns, conifers, stenocarpus, and plants of the pea tribe, together with many others. After mentioning that in the two lower fresh-water series there are no animal remains but what have been blown in, among them insect wings and the earliest known English feather, the lecturer went on to speak of the physical conditions under which he supposes the beds were formed. He said that he regarded a river flowing from west to east as having deposited all these beds in a valley of from seven to ten miles, which it had made, and showed a picture of the restoration of what he supposed the view was like. The foreground of the picture was made up of plants from Mrs. J. E. Gardner's conservatory, being the nearest known living representatives of the fossil plants.

BUILDING AND TRADE UNIONS IN GLASGOW.

GLASGOW PHILOSOPHICAL SOCIETY.

On the 29th ult. the members of the Glasgow Philosophical Society met in the West Hall of the Upper Corporation buildings, when Mr. John Honeyman, president of the Architectural Section, delivered his opening address to that section, the topics dealt with in which were "General Building Regulations, Purification of the Clyde, Health of the City, and Trade Unionism." Dr. Wallace presided.

Mr. Honeyman, after some preliminary observations, referred to the subject of the classification of house property and general building regulations. He said,—Now it so happens that in Glasgow we have neither good building laws nor proper machinery for giving effect to good laws if we had them. The first assertion is, I think, admitted by all who are conversant with the subject; and, I believe, the second is about equally notorious. The Dean of Guild Court is an institution of the past—well suited for a state of matters which, so far as Glasgow is concerned, has long since ceased; and although I do not say that it is impossible to adapt it to the altered circumstances of our times, there can be little doubt that the attempts which have hitherto been made to do so have proved abortive. The Corporation cannot much longer delay applying for an Act to regulate the laying-off of land for building purposes, the erection of buildings, and other cognate matters; and I think that the members of this society, and especially the members of the Architectural Section, are bound to take the whole subject into consideration, and to encourage and assist our municipal rulers to obtain such a measure as shall, without unduly interfering with the rights of property, disturbing the proper owners of responsibility, or discouraging ingenuity and invention, ensure the erection of safe and comfortable houses, and protect the citizens from what I may call the three Fs,—"Frailty, Fire, and Fever." The Local Government Board are at present engaged on model building regulations, which will probably facilitate the labours of authorities who find it necessary to obtain special legislation. Such legislation may probably be necessary in Scotland, because good regulations are of no use without proper machinery for giving effect to them, and that we have not, nor does the Local Government Board intend to deal with that part of the subject. There may be, indeed there are, reasons why an Act of this sort should be applicable to Scotland alone, but I can imagine no reason why it should be applied for by Glasgow alone, or Edinburgh alone, or by any other large town; and it is earnestly to be hoped that the municipal authorities in all our large towns may combine and obtain a thoroughly good Building Act for Scotland. Referring to another subject which has been a good deal before the public of late—the purification of the Clyde — Mr. Honeyman ultimately said, — I would conclude my reference to this subject by making the following suggestion:—that our corporation offer a premium of 1,000*l.* to the author of the best practicable scheme for removing all excreta and other refuse from our houses and works, in such a way as not to affect injuriously the health of those occupying those houses, or of the inhabitants in general; and five premiums of 50*l.* each to the authors of schemes which may be deemed of secondary merit. Also, that they should offer a similar premium of 1,000*l.* for the best scheme for dealing with refuse from public works, with the view of preventing any noxious substances being thrown into the Clyde; and five premiums of 50*l.* each for schemes deemed of secondary merit. If they did so I have little hesitation in predicting that we would find ourselves in a position to dispense with the expenditure of 3,000,000*l.* on the purification of the Clyde for a good many years to come. After referring briefly to the exceptionally healthy state of Glasgow during the past year, the cause of which, he said, was worthy of being seriously investigated, as it was not by any means obvious, Mr. Honeyman proceeded to say:—There is only one other subject to which I shall allude before resuming my seat, and I am the more anxious to avail myself of this opportunity of referring to it, because I am perfectly satisfied that you do not, and that the general body of the community do not, realise as they ought how intimately it concerns them, both individually and collectively. The subject I refer to is the relations of labour and capital—trade unionism, in short, with its attendant train of strikes, high wages bad work, and little of it. Now, as I wish very strongly to express my abhorrence of trade unions as now developed, and the results of their action, I feel bound, first of all, to disclaim emphatically any abhorrence of workmen or any partiality for masters. Having given the subject much attention for many years, and watched with growing anxiety and alarm the development of issues long since foreseen and indeed inevitable, I shall tell you the conclusions I have arrived at, although it is obviously out of the question in the course of such an address as this to expound the reasons which have led me up to them, and these are:—First, that trade unions, in so far as they disturb the natural relations of workmen and their employers, and interfere with the exercise of private judgment and the right of every man to make the most of the abilities and manly vigour God has given him, are an unmitigated and irremediable curse to this country; second, that, while the chief sufferers are neither the masters nor the men, but rather the great body of the people, who have to pay for bad work, slow work, and work as dear as the men,—or the men and the masters between them,—choose to make it, this same public and their rulers utterly fail to apprehend this; and, third, that unless they do awake to the realisation of this fact, and, ere it be too late, take measures to counteract and sternly prohibit the gross abuses of trade unionism, it requires no great foresight to predict that the day which shall determine Britain's pre-eminence is not far off. To illustrate this subject as I should like to do would occupy a great deal more time than you can afford to-night. I shall only attempt in the few minutes still at my disposal to make one or two very general observations on the subject. The most remarkable thing about it, I think, is the apathy and unconcern of all classes who are not directly engaged in some of our trades; because it needs but little reflection to perceive that if the productive power of the country is paralysed by an abnormal state of things, which at the same time limits the produce and enhances the price of it without increasing the wealth of the consumers, these are put in the unhappy position of being compelled to pay more than the produce is worth, and ultimately more than they can afford to pay. Such a result could not follow the free operation of the laws of supply and demand, but the unnatural disturbing element of trade combinations makes all the difference. These aim at securing for the workmen more than their labour is actually worth, and, exactly in proportion as they succeed in doing this, they rob the community and undermine the prosperity of the country. There are branches of industry in which the influence of foreign competition offers, at the expense of our national prosperity, a certain check; but there are others, and notably those with which the members of our section are more immediately concerned where there is absolutely nothing to check the most extravagant demands, unless the great body of our long-suffering people arise and stand on their defence. It may be a matter of surprise to some that the men themselves fail to perceive that the consequences of their present mode of action must react upon themselves; that they are not only blind to their own true interests, but deliberately regardless of others; that they do not see that the despotism of any mere section of the community may be even more dangerous to the State than that of an individual irresponsible ruler; and that the protection they are bent upon establishing is of a character infinitely worse and more inimical to the prosperity of the country, and therefore to the true interests of the working classes themselves, than that which the great wave of free-trade agitation swept, let us hope for ever, away; but it were vain to expect any such enlightenment. It would be surprising, indeed, if they either saw or cared for anything of the kind, and much more if such foresight should affect their conduct in any way. The ignorance and perversity of some of those who speak for them, and attempt to guide them, is less excusable; but the truth is that patriotic considerations have very little, I may say nothing, to do with the commercial transactions of any section of the community, and it would be absurd to expect workmen to foresee or weigh the effect of their acts on the future destinies of the country.

BUILDING ON STOCKWELL GREEN.

Since the dispute was settled as to the right to appropriate Stockwell-green as building land, which was decided in the affirmative on behalf of Mr. Honey, the freeholder, the green has been laid out for building purposes, and already several houses have been erected, and are now almost ready for occupation, whilst others are in progress, and in a short time the entire area will be covered with bricks and mortar. The east frontage facing Stockwell-road, as well as that on the west side, will chiefly consist of shops, whilst about the centre a thoroughfare runs across the green. Immediately opposite the green, on the east side of Stockwell-road, extensive building operations are likewise in progress. In order to clear the site for these new buildings, one of the oldest mansions in the neighbourhood has just been demolished. It was built about a century and a half ago, and was for many years the residence of a family of London merchants, but for some time past it has been known as the Stockwell Collegiate School. The interior fittings showed its ancient character. The staircases and stairs were all in blocks of oak, and the hearthstones in marble. Mr. Snelling, an extensive builder in Stockwell, has purchased the property, and it is stated that it is the sixth of the old historical mansions which that gentleman has purchased and demolished within the last few years, Stockwell Hall being amongst the number.

STATUES.

Sir Robert Peel.—The foundation for the erection of a statue to the late Sir Robert Peel is now in active course of preparation in Parliament-square, Westminster. Some years ago a statue of the late statesman was erected in Old Palace-yard, designed by Baron Marochetti, but it was universally condemned and ultimately destroyed. It has now been decided to erect another statue in Parliament-square, and the proposed work was designed by the late William Noble.

Captain Cook.—Mr. Woolner, it is stated, has now completed the model of a statue of Captain Cook, the navigator, which is destined for Australia. The statue is 13 ft. high, will be executed in bronze, and will stand upon a pedestal 36 ft. high, in Hyde Park, Sydney. Cook is represented in an attitude of surprise at

the discovery of a new land, which he has just made by means of the telescope, which he holds in his left hand. The dress is that of a naval officer of his time, with broad lapelled coat, large cuffs and pockets, a long waistcoat, and broad-toed shoes. It is understood that the model will be Mr. Woolner's chief exhibit at the Royal Academy Exhibition in May.

OPENING OF THE VICTORIA SKATING-RINK, PECKHAM.

A few months ago large new swimming and warm baths, which had been erected by Mr. Higgs (formerly of the firm of Hill & Higgs, builders), in St. Martin's road, Peckham, were opened to the public under the name of the Victoria Baths. Mr. Higgs purchased between one and two acres of land for the purpose, which had been occupied as a market garden. A portion of this, at the south end, near Peckham-road, was reserved for a skating-rink, and since the opening of the baths the rink has been in course of construction, and being now completed was opened on Saturday last. The rink is about 200 ft. long, and 60 ft. wide, and contains a skating area of 12,000 square feet, in addition to spacious and convenient promenades, together with retiring-rooms. The floor is laid with asphalte, and the rink is partially covered in with an ornamental wooden and glass roof, uniform in design with those which inclose the baths.

OBITUARY.

We announce with personal regret the death of Mr. William Ifold, at his residence in Manchester-street, where he had carried on his business as a surveyor for upwards of sixty years. He was a pupil of the late Mr. Day, who, half a century ago, was a prominent measurer of the old school. Mr. Ifold enjoyed considerable practice as a compensation valuer; he was a man of rigorous integrity, and, perhaps, the senior surveyor in practice at the time of his death. He was in his eighty-second year.

THE ST. GOTTHARD RAILWAY.

The special commission appointed by the Swiss Federal Council to report on the reconstruction of the undertaking of the St. Gotthard Railway has concluded its labours. The commission rejects the proposed laying down of a single line of rails throughout the length of the railway. All the portions of the line the widening of which, at a later date, would be attended with too great an expense are to be constructed at once with a permanent way for two sets of rails, although they will receive at present only one set. It has also been resolved to abstain from using any of the special systems proposed, such as Fell's, Agudio's, &c. If the whole net of railways in the St. Gotthard district is carried out in accordance with the project contained in the international treaty, the deficit, estimated by M. Hellwag, the engineer, at 102,000,000 francs, will be reduced to 71,829,000 francs, and, if the lines from Zug to Arth, and from Lucerne to Immensee, are abandoned, to 59,454,000 francs. As regards the lines at the south side of the St. Gotthard, from Bellinzona to Lugano, and from Cadanazzo to Pino, no definite resolution has been come to, as the decision rests in the first place with Italy. The point whether, instead of a railway from Lucerne to Flüelen, a steam ferry is to be established on the Lake of the Four Forest Cantons, is left for the international conference to decide. The yearly traffic is estimated at 250,000 passengers, and 400,000 tons of goods, and the yearly revenue at 52,000 francs per kilomètre, which would give for the total length of 268 kilomètres a total yearly revenue of 13,936,000 francs, while the working expenses, inclusive of the reserve fund, are calculated at 26,000 francs per kilomètre, or 50 per cent. of the revenue. The yearly net income would consequently amount to 6,968,000 francs, or, in round numbers, 7,000,000 francs. This income would provide interest, at the rate of 5 per cent. for 140,000,000 francs; now, the whole capital amounting to 259,000,000 francs, 119,000,000 francs will remain to be covered by subventions. But as of this sum already 80,000,000 francs (45,000,000 francs by Italy, 20,000,000 francs by Germany, and a like sum by Switzerland) have been voted, there remain 34,000,000 francs still to be supplied; and if interest at the rate of 6 per cent. is paid, 54,000,000 francs. It will thus be seen that sacrifices will yet have to be made if the undertaking is to be carried out; but they will not be of such a nature as will not be commensurate with its magnitude, and as would be beyond the ability of the company. As regards the maximum rise of the railway, it was fixed by the commission at the highest points at 25 in 100, at the intermediate points at 26, and at the lowest points at 27 in 100. For the line of Monte Cenere, a rise of 20 to 21 in 100 has been adopted; for the valley railways, about 10 to 12 in 100. The smallest radius found practicable for short curves is 280 mètres, if thereby a considerable saving is effected; but as a rule 300 mètres is to be considered the minimum. If the means cannot be found for the works resolved upon by the federal commission, further reductions will have to be made by the international conference. The Federal Council has at once taken in hand the drawing up of the general report to be submitted to the conference, to ensure its being called together at an early date.

GRANITE.

Sir,—There is an article in your last paper about granite building. It is a pity that parties who supply polished granite for smoky towns like London do not recommend their clients to wash it at the same time that they wash their windows. London soot is so tenacious that it will adhere to the fine polished plate-glass, and it adheres equally well to the glassy surface of the polished granite. If the above plan were adopted with the polished granites, it might be said of them, in the words of the poet:—

"A thing of beauty is a joy for ever."

I strongly recommend all parties using polished granite to wash it quite as often as they do their plate-glass windows.

Samuel Trickett.

SURVEYORS' CERTIFICATES.

Sir,—I shall be glad to have an opinion on the following, as several of your readers are interested.

A, a solicitor, has advanced some money on mortgage to B, a builder, and the building having come to a standstill, B finds a person willing to help him to complete, if A will undertake to pay, on completion, a certain sum, say 300*l*, when the works are completed to the satisfaction of C, the surveyor, who has certified the advances. After considerable delay, the surveyor, relying on certain statements made by the builder, reports the completion. Through some discussion about other matters the money is not paid, and the surveyor, finding that the certificate was obtained by false statements, gives formal notice of its withdrawal. The amount has, of course, not been paid, but the solicitor calls upon the surveyor to complete the houses at his own expense. An independent solicitor gives an opinion that the solicitor has sustained no damage, and therefore the surveyor has incurred no liability. The question is, can a certificate be withdrawn if certain defects, discovered before the money is paid, justify such a course of action?

The surveyor has received no remuneration for his work in the matter.

Surveyor.

COMPETITIONS.

Leeds Municipal Buildings.—With reference to the observations made to us, and to which we gave expression, concerning the drawings submitted by the architect of the London School Board, Mr. Robson (p. 1163, *ante*), we are informed that the drawings were made at his private office, and wholly irrespective of the School Board staff. Mr. Robson is not precluded from private practice by the terms of his engagement with the Board.

Wakefield School Board Schools.—At a special meeting of the Wakefield School Board, a few days since, a report was received from the committee appointed to consider the merits of the nine sets of plans submitted by competing architects for the proposed new schools at Eastmoor. On the recommendation of the committee, the Board adopted the designs of Mr. W. Watson, architect, of Wakefield.

Monument to the Late Mr. Joshua Hobson, Huddersfield.—The executive committee met on the 27th ult. for the purpose of deciding upon which of the two designs, selected from forty-one sent in for competition, should be adopted and erected to the memory of Mr. Hobson. The designs submitted were the handywork of Mr. Walsh, of Woodhouse-lane, Leeds; and Mr. George Dyson, of Crosland Moor, Huddersfield. The voting was by ballot, and resulted in favour of Mr. Geo. Dyson. The obelisk will be 18 ft. high.

Serjeants' Inn.—Early in the spring of next year Serjeants' Inn, Chancery-lane, will be offered for sale by auction. The property is described as belonging to the Honourable Society of Judges and the Serjeants-at-law. We stated some time ago that this property would be sold, and were not believed.

A SELF-ACTING FIRE EXTINCTOR.

Chemistry and mechanism must be called in to stop fire from destroying houses. Carbonic gas puts out fire. Now, if this gas is brought to bear on a fire at the outbreak, the desideratum will be attained. I have made an extinctor (at a cost of ten shillings). I propose to remove a floorboard, to attach the extinctor to a rafter *over* any room to be guarded. I perforate through the ceiling a pinhole, to insert a tiny cotton fuse: this will not be seen, and cannot be tampered with. In the event of a fire, it instantly generates carbonic gas, precipitating it on to the fire. Carbonic gas being a heavy gas, it would not escape up the flue; doors and windows must be closed, to let the extinguishing gas do its work unmolested by firemen and others.

R. T.

Books Received.

Business. By James Platt. New Edition. London: Simpkin, Marshall, & Co. 1875.

We want in every parish, Mr. Platt says, a gymnasium and a proper system of physical exercise. Until we obtain this he advises us to get all the outdoor exercise we possibly can; but, says he, "you cannot be too particular in avoiding one fatal error—that of hardening yourself, as it is termed, by exposure. . . . After being indoors all day you cannot be too particular in keeping your mouth shut for some time after going into the air. Very few can stand with impunity talking or having their mouth open with the north or east wind in their face. It is a great mistake to imagine that by exposure men are either strengthened or rendered hardy; they must be strong and hardy before they are fit to be exposed; they must be seasoned first and exposed afterwards. This mistake has been engendered by seeing how hardy and apparently impervious to all weathers are those whose occupations keep them out-doors all day in all weathers; it is very different for the majority engaged in business, who are compelled from morning to night to breathe a close and vitiated atmosphere, arising from bad ventilation and often imperfect light." This is not the only piece of sensible advice given by Mr. Platt.

Molesworth's Pocket-book of Engineering Formulæ. London and New York: E. & F. N. Spon. 1876.

This is the eighteenth edition, with additions by the author, and a contribution by Mr. R. S. Brough, on "Telegraph Construction and Electrical Formulæ." "Molesworth" has become quite an authority in engineers' offices. On the principle that it is necessary only to do, not to know, assistants do not hesitate to adopt the formulæ given, without question of their truth. Fortunately, in this case this course does not lead to error. That is more than we could say of some other pocket-books.

Roorkee Manual of Applied Mechanics. By Captain Allan Cunningham, R.E. Printed at Roorkee, 1876.

A mathematical investigation of the strength of materials used in bridges and roofs, and of the strains to which they are subject.

Authorities,—a score,—have been consulted in the preparation of the work, beginning with Belidor, and including Barlow, Rondelet, Tredgold, Morin, Moseley, Hodgkinson, Rankine, and many others. The result is a useful little book.

Cremation in America.—The first cremation furnace in America has just been constructed on Gallows-hill, about a mile from Washington, Pa. It is described as being built of brick, one story in height, with a roof of corrugated iron; it has three chimneys and two rooms; in the reception-room there is a catafalque, with a few chairs for mourners; the furnace in the cremation-room is 7½ ft. long; coke will be used in heating the retort; the human ashes will be collected in a small box, and stored in a glass case in the reception-room, "with label, photograph, and poetry, if need be." No fees will be charged for incineration, inasmuch as the furnace has been dedicated to the poor by the owner, Dr. F. Julius Le Moyne. On the whole, it is described as a very pleasant place in which to roast a dead friend. The first utilisation of the furnace was upon the body of an Irish labourer who helped to build it, and who desired his remains to be thus disposed of.

Miscellanea.

The Royal Society.—The anniversary meeting of the Royal Society was held on the 30th ult., at Burlington House. The president, Dr. Hooker, in his address to the assembled fellows, gave a summary of the work of the Society, as carried out by the council, during the year then expiring, and particularised the subjects most worthy of attention. Among these were the long-pending Handley bequest of nearly 6,000*l.*, to form a trust-fund for scientific purposes; the late R. C. Carrington's bequest of 2,000*l.*; Mr. Dircks's, of 873*l.*; and the bequest of Sir Charles Wheatstone, of 500*l.* to the Donation Fund founded by Wollaston for scientific purposes; the gift of Mr. Jodrell, of 6,000*l.*, for the "encouragement among our countrymen of original research in the physical sciences"; and the proposal of Government to add, by way of experiment, during five years, 4,000*l.* annually to the yearly grant of 1,000*l.*, which the Society administers for the Treasury chiefly in "providing investigators with instruments and assistance" of the Council, which may occasionally include "personal allowances or grants of money." Dr. Hooker next explained the course taken by the Council of the Society in the matter of the Vivisection Bill, and their "earnest remonstrance" against "the admission into the statute book of a principle essentially antagonistic to the progress of all natural knowledge." With reference to the Loan Collection of Scientific Instruments, it was remarked that among the advantages which would accrue from a permanent museum of such instruments would be "the saving of time and labour to investigators, assisting teachers, informing constructors of philosophical apparatus of the form in which reproductions are wanted, and possibly the lending of instruments to investigators under suitable restrictions." The medals were afterwards presented.

New Recreation Grounds in Northampton.—The *Northampton Herald* understands that the plans prepared by Mr. Wm. Hull, architect, are under consideration for establishing recreation grounds in the rear of Mr. Mulliner's premises, and to the south of the new Midland Station. The proposed gardens will be laid out to have one large central lime-tree avenue, with statues and vases, and central fountain. There will be side paths, and an outer ring for foot racing. Archery grounds, large bowling-green, swings, bars, and giant strides, are to be provided. Shrubberies and avenues arranged for seats and tables in recesses will be connected with the north and south paths. A large central promenade, with circular paths, and benches to rear of same, will surround an orchestra. A new summer skating-rink, 140 ft. long, by 40 ft. wide, surrounded on two sides by flower borders, and lighted up for evening performances by large globe lamps, will be constructed at the west end. There will be a raised covered promenade on one side of the same, leading to and communicating with the present winter rink; and a large building for gymnasium, 120 ft. by 40 ft., with dressing-rooms and baths, and fitted with appliances, after the manner of the new gymnasium at Rugby Schools, is proposed to be erected in the rear of the summer rink. A large double refreshment-bar is to be put up, to serve both rink and grounds. The principal entrance will be from the Midland-road—a little to the west of the Midland Station—and there will be another entrance from the proposed new road to the Cattle Market, to the east of the Midland Station.

Pall-mall and Wood Paving.—At a meeting of the St. James's Vestry, on the 28th ult., the subject of paving Pall-mall with wood arose, and it was moved that a letter be written to Captain Bulkeley, who had communicated with the Vestry as the representative of the inhabitants of Pall-mall, notifying that the Vestry were prepared to undertake the laying down of a wooden pavement from east to west, *i.e.*, the entire length, conditionally upon the owners and residents agreeing to subscribe one-half the cost of the work. This motion having been seconded, an amendment was proposed to the effect that the Vestry would lay down a wood pavement if the inhabitants would undertake the entire amount of the first outlay (which it is understood would not be less than 6,000*l.*), the Vestry afterwards keeping it in repair. On a division, after a long discussion, the amendment was carried by one vote,—16 to 15.

"Art in the Community."—This was the title of a lecture recently delivered before the members of the Royal Birmingham Society of Artists, by Mr. J. Thackray Bunce, F.S.S., who gave a retrospect of the progress of art during the last forty years, and compared favourably our present position with that which we then unfortunately occupied. He advocated a system of loans from the British Museum and the other great metropolitan repositories of art to the various museums and galleries in local towns, which were unfavourably treated in comparison with London. The art institutions of the metropolis were founded and fostered by national grants and without expense to the local government, whereas the same institutions in the country were almost entirely reliant on the generosity of private individuals. The rate for which provision could be made was so limited, and the claims of literary education had so much pre-eminence, that no public fund was left for the support of art. The rate of a penny in the pound, which was at first all that was required, ought now to be extended to enable those communities which were willing to provide the means of art education so much needed in manufacturing towns.

North of England Institute of Mining Engineers.—We understand that the long-projected desideratum of a Royal charter for the North of England Institute of Mining and Mechanical Engineers has at length been obtained. The idea was first mooted by Sir George Elliot, bart., while president of the Institute; and Sir George gave expression to it in his inaugural address. It was, however, not received at that time with much favour; but the advantage which a charter would give was seen and appreciated by Mr. Bunning, the secretary of the Institute, who has lost no opportunity of forwarding the idea, and now it has become an accomplished fact. It may be said that scarcely any society has started with higher resolves, and has so persistently worked to carry them out, than has this Institute; and it is satisfactory to be able to add that its efforts have been appreciated, for its members have increased to nearly 1,000 in number, and include nearly all the leading mining engineers in England and the Continent.

The Agricultural Hall, Wolverhampton.—Extensive alterations have been made at the Agricultural Hall, Wolverhampton, in order to provide a more commodious room for holding concerts and musical entertainments than has hitherto been provided in Wolverhampton. The large hall will accommodate about 2,000 persons. The orchestra spans the whole of the east end of the building, and will accommodate a band and chorus of 300 performers, and, if required, may be extended, by the removal of a portable screen, to admit of the erection of an organ and an increase in the number of performers. The space underneath the orchestra is fitted up with reception, dressing, and waiting rooms. The acoustic properties of the room have been tested by the members of the Festival Choral Society, and declared most satisfactory. The entire cost of the alterations amounts to about 2,000*l.*

Friendly Societies and Trade Unions.—The first part of the Friendly Societies and Trade Unions Report for 1875 was issued on the 28th ult. The number of friendly societies registered was smaller than during the previous year, which itself was below the average. This is accounted for by the fact that legislation was pending during both years, a cause which always checks the formation of new societies; and although industrial and provident societies, trade unions, and loan societies were not included in the Friendly Societies Bill of 1875, still the anticipation of fresh legislation in respect to both classes of bodies, arising from their inclusion in the original Bill of 1874, had no doubt the same effect in diminishing the number registered. A very considerable increase is, on the other hand, observable in the number of Building Societies incorporated under the new Act.

Gun Cotton for Fog Signals.—A fog signal has been established near the north-west end of Heligoland, on the summit of the land, which is 165 ft. above high water, wherefrom during foggy weather will henceforth be produced, by the explosion of gun-cotton, a report similarto that of a gun, every fifteen minutes. This, the first employment of gun-cotton for signalling purposes by the Trinity House, is likely to open a new era in the history of coast warnings.

Asserted British Village in Oxford.—A discovery has been made in the course of preparing the ground for the New University Schools in the High-street, Oxford, which are about to be erected from the designs of Mr. Graham Jackson, M.A. In proceeding with the excavations there has been laid bare the site of what is considered by some an undoubted British village, or settlement, dating back, perhaps, more than 2,000 years. The site chosen for the erection of the schools, and on which this discovery has been made, was occupied, as is well known, by the Angel Hotel, and lies between High-street on the north, Merton-street on the south, University College on the west, and King-street on the east, and embraces an area of about two acres. Some, whose opinion is entitled to consideration, attach much less importance to the discovery.

Society of Engineers.—At a meeting of Society of Engineers held on Monday evening, December 4th, in the Society's Hall, 6, Westminster-chambers, Victoria-street, Mr. V. Pendred, president, in the chair, a paper by Mr. William McNaught, on the "Rolling of Ships," was read by the Secretary. The author observed that lifting or drifting could not be prevented, but rotation could be controlled to a great extent, by the use of one or two balanced rudders, under the bottom of the ship, so constructed as to be withdrawn into the ship when not wanted, or when in shallow water. These steadying rudders were proposed to be worked by an attendant, who would turn them, so that their inclined surfaces would always be acting in opposition to the angular motion of the ship.

Patent-Law Reform.—A petition is now being circulated for signature by the Society of Arts. It is identical in terms with one that has already been presented to the Lord Chancellor by the council of the Society. The memorialists humbly pray his lordship "to cause the provisions of the Act of 1852 to be put into force by the appointment of one or more additional Commissioners of Patents, to whom might be entrusted the fully carrying out of the duties of the office, and who should be responsible for the same, and that no further legislation be attempted until after such Commissioners shall have been appointed, and the system contemplated by the Act administered in its integrity."

South Yorkshire Asylum, Wadsley.—Operations have been commenced for the erection of two large blocks of additional buildings to the Asylum at Wadsley. It is only about four years since this large establishment was completed, and already the justices find it necessary to increase the accommodation for both male and female patients by at least two-thirds. Mr. Bernard Hartley, the West Riding surveyor, who designed the original buildings, has prepared the plans; and Mrs. Neill & Sons, of Manchester, who carried out the works under Mr. Hartley, have been employed to execute the additions.

Cumberland and Westmoreland Antiquarian and Archæological Society.—The next meeting of this society will be held in the Museum at Kendal, on Monday next, the 11th inst. Two days will be taken up by the reading of papers on local and other subjects, the more important being on "Roman Roads and Agricola's Line of March," by Mr. Richard S. Ferguson; "Saxon Crosses," by Canon Knowles, M.A.; "The Mauds," by Mr. G. Bellasis, Bluemantle; "Some Roman Remains," by Mr. William Jackson; "Kendal Parish Registers," by Mr. G. E. Moser; "Extracts from Kendal Records."

Martin's Anti-Fouling Composition.—This composition, patented by Mr. John Martin, is for preventing the fouling of iron ships' bottoms, and preserving iron and wood work generally. Some good testimonials in its favour have reached us. The composition has been under test during several sea voyages for a considerable time with perfect success, it is stated. It seems to us that it is especially advantageous for preserving harbour and pier works, whether of wood, stone, or iron, and in all situations exposed to alternations of air and water.

The Bideford Bells.—Messrs. Mears & Stainbank say it is not correct that the fine old peal of bells at Bideford, made by their predecessor, A. Rudhall, has been recast by Messrs. Abbott, of that town, and that the only cracked bell, the fifth in the peal, was recast by them in May last. On inquiry we learn that the bells cast by Messrs. Abbott were two new ones, to increase the peal, and that they rehung the whole in a new cage.

Proposed New Cemetery at Morningside, Edinburgh.—It is stated that steps are about to be taken by the Metropolitan Cemetery Company for the formation of the cemetery for which they recently acquired ground at Plewlands, Morningside. The site in question is an area thirty-two acres in extent. The suitability of its soil for the purpose of interment has been duly certified by Dr. Littlejohn and Mr. Buchanan, C.E., and the latter gentleman has been engaged in preparing a plan for laying out the ground.

Bristol and Gloucestershire Archæological Society.—A general meeting will be held in Bristol, on Wednesday, December 13th. A paper on the Origin of Bristol will be read by the Hon. and Right Rev. Bishop Clifford. Mr. G. T. Clark, F.S.A., of Dowlais, will give an account of the recent visit of the Society to Berkeley Castle, and will point out the relations of that very curious structure to the early castles of England.

Lewes Castle.—The work of thoroughly overhauling the exterior of Lewes Castle has been recently entrusted to, and successfully carried out by, Mr. H. Fold, of St. Ann's. It was executed by a man suspended in a cradle. The northern part of the northern tower was found to be very much dilapidated, as well as one of the turrets of the Barbican, showing that the work had been delayed quite long enough.

The Darlaston Nut and Bolt Makers.—A dispute has arisen between Messrs. Archer & Sons, nut and bolt makers, Darlaston, and their men, and the association to which the latter belong, after censuring the conduct of the masters, have decided to call their members out if they are not paid extra wages for dressing up larger nuts than those specified in the lists.

Proposed Cathedral for Liverpool.—A correspondent, "F. B.," urges that in the event of a cathedral being required for Liverpool, we could not do better than carry out Wren's original design for St. Paul's, of which his model remains. We cannot endorse his suggestion. "Let the dead past bury its dead." We must give the "living present" a chance.

English *v.* Belgian Girders.—Some North of England firms, it is stated, have turned their attention to the manufacture of girder iron, such as is required for building purposes. It is to be hoped they will do a good trade, for much of the iron of this class used in England has of late been imported from Belgium.

Arbitration in the North.—The executive committee of the Durham Miners' Association and the coal-owners of that district have jointly appointed a barrister, with a salary of 300*l.* a year, to sit as an independent person to hear evidence upon any dispute that may occur between employers and employed.

A Large Telescope.—The gigantic telescope at the Paris Observatory, for which M. Bischoffsheim made a gift of 26,000 francs, has been completed. On account of its dimensions a new building had to be prepared for it.

Northamptonshire Sanitary Inspectors' Association.—This Association recently held a quarterly meeting in Northampton, when Mr. Haviland, Medical Officer of Health and President of the Association, delivered an exhaustive address on the Rivers Pollution Bill.

The Corn Exchange, Stourbridge.—At the monthly meeting of the Stourbridge Commissioners on the 27th ult., it was resolved to proceed with the erection of new buildings, and to adopt plans by Mr. James Allsop, jun.

The Wrexham Art Exhibition.—The Wrexham Exhibition is now closed. It is estimated that 80,000 persons visited the exhibition; but this number failed to produce an adequate financial result.

Royal Architectural Museum and School of Art.—The Goldsmiths' Company have voted 100*l.* towards the special fund in aid of the classes for drawing and modelling at the Architectural Museum, Westminster.

The St. Pancras Iron Work Company have issued a new edition of their useful catalogue of stable-fittings to which we may fairly call attention, as it contains many new inventions and important improvements in this class of work.

TENDERS

For the erection of new school buildings, with fittings, offices, and fences for the Aberdare School Board, Abernant, Glamorganshire. Mr. E. H. Lingen Barker, architect:—
Morgan (accepted) £1,900 0 0

For Bromyard sewerage. Mr. T. Curley, engineer. Quantities supplied:—
Dowell £3,950 0 0
Cowdry & Sons 2,384 0 0
Law 2,197 0 0
Welsh 1,933 0 0

For alterations and additions to the Blue Bell Hotel, Scunthorpe, for Mr. R. J. H. Parkinson. Mr. Ernest W. Farebrother, architect:—
Juke (accepted) £2,566 0 0

For alterations and additions to the house, and building new stabling, &c., at Southfield, Louth, for Mr. Wm. Hyde, jun. Mr. Ernest W. Farebrother, architect:—
Clarke & Son (accepted) £2,179 0 0

For alterations to 197 and 199, Commercial-road, for Mr. E. Handley. Mr. C. A. Legg, architect:—
Pick £650 0 0
F. & F. J. Wood 486 0 0
Judd & Hawkings 459 0 0
Moyle & Son 380 0 0

For building four houses and one shop in Bedford-street, Mile End, for Mr. Marsdorf. Mr. C. A. Legg, architect:—
F. & F. J. Wood £1,643 0 0
Atherton & Latta 1,599 0 0
Judd & Hawkings 1,495 0 0
Thorpe 1,243 0 0

For new warehouse, Milton-street, London:—
Mobley & Rogers £6,324 0 0
Newman & Mann 6,868 0 0
Ashby, Bros. 5,695 0 0
Downes 5,616 0 0
Luzzell & Son 5,254 0 0
Riddell & Son 5,245 0 0

For the restoration of South Mills, Blunham, Bedfordshire. Messrs. Raynes & Shum, architects:—
Laugmead & Way (accepted) ... £4,031 0 0

For making up road at Harlesden green, for the Willesden Local Board:—
Watts £1,655 0 0
Sapp 1,605 0 0
Jackson 1,570 0 0
Pizzey 1,530 0 0
Neves 1,500 0 0
George 1,459 0 0
Nowell & Robson 1,415 0 0
Rowley 1,049 0 0

For making up Priory-road, South Park, for the Reigate Town Council:—
Rigby £512 0 0
Husband 413 0 0
Pizzey 395 0 0
Pitt 391 0 0

For paving the floors of St. Olave's Wharf, Pickle Herring-street, Tooley-street, with 1½-in. asphalte flooring:—
The Brunswick Rock Asphalt Co. (accepted).

For Messrs. Gibbs & Company's New Seed-crushing Mills, Burdett Wharf, Limehouse:—
The Brunswick Rock Asphalt Co. (accepted).

For alterations to the City Arms, West-square, Southwark, for Mr. J. C. Ring. Mr. John Viney, architect:—
General Alterations.
Beale £203 0 0
Downs 897 0 0
Blake 893 0 0
Atherton & Latta 715 0 0
Shurmur (accepted) 693 0 0
Wilson 690 0 0
New Counter.
Godden £70 0 0
Taylor 60 10 0
Hill (accepted) 43 0 0
Pewtering.
Edwards £38 17 4
Heath 63 0 0
Warne (accepted) 58 10 0

For building three cottages at Hackney Wick, for Mr. R. Coltman. Mr. John Viney, architect:—
Shurmur £990 0 0
Downs 989 0 0
Whiter & Young 800 0 0
Atherton & Latta 735 0 0
Goddin 670 0 0
Hooper (accepted) 630 0 0

For alterations to the Prince of Wales, East-road, City-road, for Mr. J. Elston. Mr. John Viney, architect:—
General Alterations.
Atherton & Latta £337 0 0
Shurmur 332 0 0
Staines & Son (accepted) 317 0 0
Adams 293 0 0
Fittings.
Taylor £190 0 0
Hill (accepted) 167 0 0
Shurmur 144 0 0
Brewer 118 7 6
Pewtering.
Edwards £130 5 0
Heath (accepted) 95 0 0
Saunders & Co. 88 10 0

For alterations to the Perseverance, Southgate-road, for Mr. J. Kendall. Mr. John Viney, architect:—
General Alterations.
Hill £234 0 0
Godden 225 0 0
Francis (accepted) 129 0 0
Painting, &c.
Hackett £115 0 0
Sparks (accepted) 82 4 6
Pewtering.
Padden £59 10 0
Heath (accepted) 49 10 0

For alterations to the King's Arms, Peckham-rye, for Mr. N. Wakley. Mr. John Viney, architect:—
New Stables.
Downs £257 0 0
Whitby 243 0 0
Shapley 242 0 0
New Counter, &c.
Downs £139 0 0
Shapley 125 0 0
Whitby 90 0 0

For house and baker's shop adjoining Holly Inn, Jamaica-level, Bermondsey, for Mr. I. J. Scotts. Mr. Geo. Trencher, architect:—
Downs ..... £1,100 0 0!
Battley 850 0 0
Wheeler 747 0 0
Cane & Creba ..... 650 0 0!

For alterations and additions to No. 40, High-street, Marylebone, for Mr. H. Broadbent. Mr. Thos. Durrans, architect:—
Gould & Brand £338 0 0
Taylor & Son 317 0 0
Edgar 308 0 0
Henderson 308 0 0
Ashwell & Stevenson (accepted) ... 265 0 0

For the erection and entire completion of a new manufactory, for Mr. Chas. Nesotti, on the site of St. Anne's schools, Rose street, Soho. Mr. Thos. Durrans, architect:—
Andrews £2,897 0 0
Mark 2,777 0 0
Ashwell & Stevenson (accepted) 2,397 0 0

For a section of works at the Royal Turkish Baths, Regent's Park. Mr. Thos. Durrans, architect:—
Edgar £250 0 0

TO CORRESPONDENTS.

R. R. W. we do not undertake to supply our readers with valuations; take proper advice).—C. E. (a notice already in type).—G. I. (send us particulars).—S. & K.—W. C. G.—T. D.—J. V.—R. G. W.—T. D.—L. & W.—R. C. P.—S. T.—A. H.—R. H.—J. C.—R. G. B.—T. B.—G. P.—W. L.—T. P.—T. C.—J. H. S.—F. M.

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Battersea and its Park.

OF the various improvements made of late years in the metropolis few have been of greater value than that by which the wretched waste known as Battersea Fields was transformed into the beautiful Battersea Park. The fields had become a public nuisance when Mr. Thomas Cubitt, in 1843, suggested to her Majesty's Commission for Improving the Metropolis the advisability of laying them out as pleasure-grounds, and this design was subsequently pressed upon their attention by the Hon. and Rev. Robert John Eden, afterwards Lord Auckland, and successively Bishop of Sodor and Man, and Bath and Wells. In 1846 an Act of Parliament was passed to empower the Commissioners of Her Majesty's Woods and Forests to form a royal park in Battersea Fields, and Mr. (afterwards Sir) James Pennethorne's plan was approved, by which 320 acres were to be enclosed, at an estimated cost of 154,250*l*. The fields were naturally very low, and they were, in fact, entirely overflowed by the river at high-water, until about 300 years ago, when an embankment was raised, and the land reclaimed. One of the first necessities, therefore, when the scheme of forming a park was entertained, was to raise the general level of the land, and fortunately at this time the extensive excavations for the Victoria Docks, in the Plaistow Marshes, were being proceeded with, so that there was no difficulty in obtaining the required loads of earth. The excavations from the St. Katharine Docks had been used in the same way, in 1827, to fill up the reservoirs of the Chelsea Waterworks, and thus form a site for a new town which grew up south of Pimlico. One million cubic yards of earth are said to have been deposited upon Battersea-fields from the Victoria Docks and other sources. This operation occupied several years, and there were great complaints of delay in carrying out the various proposals. In 1851 another Act of Parliament was passed to alter and extend the powers of the one of 1846, by which a Commission, incorporated as the Battersea Park Commission, was appointed, with power to sell, demise, or lease lands not required for the park. Still the works did not proceed very rapidly, and little was done before 1855 or 1856; then the drives and walks were laid out, and the ornamental water formed. The planting commenced in 1857. On March 28, 1858, the Chelsea Suspension Bridge was opened, by which the park was made easily accessible to the dwellers on the north side of the Thames, but great public dissatisfaction was expressed when it was found that a toll was to be exacted. By the formation of mounds and banks several acres were reclaimed along the sides of the river, and the total acreage of the park was about 200, rather less than was at first proposed. The park, besides the ordinary features which it has in common with its fellows, possesses a sub-tropical garden of four acres, that has been proved to be one of the most successful efforts of out-door gardening in modern times. Here the East and West Indies, Japan, South America, and Australia, all send their contingent, and the graceful foliage of warmer climes is brought to gladden the eyes of those used to a more northern flora. Every year adds to the beauty of the park, for the trees increase in height, and the shrubs in denseness; so that, as less is seen at one time, the sensation of size is increased. Such is the change that thirty or forty years have made in the once miserable expanse which was given over every Sunday to the low amusements of the dangerous classes, and was at one time considered a fit rendezvous for the duellists. Here, on March 21, 1829, the Duke of Wellington and the Earl of Winchelsea had their celebrated hostile meeting. Still, in spite of their bad name, the old fields had their admirers, who loved to seek in them for the abundant wild-flowers. A learned botanist in the last century compiled a flora of Battersea, and many of the plants that luxuriated in these fields were not to be met with elsewhere, except at places much farther from London. The noted place of entertainment called the Red House stood nearly opposite to Chelsea Hospital. It was a favourite resort for the lovers of shooting-matches. Pigeons were there sold (to be shot at) at 15*s.* a dozen, starlings at 4*s.*, and sparrows at 2*s.*

Battersea has a history of some interest, dating from the time when the manor was in the possession of Harold. At the Norman Conquest it passed into the hands of William the Conqueror, who exchanged it with the Abbey of St. Peter at Westminster for lands at Windsor. We have no earlier record of the name than that in Domesday Book, where it appears as *Patricesy*; and as Petersham, which belonged to St. Peter's Abbey, Chertsey, is there spelt *Patricesham*, it is supposed that the earliest form of Battersea originated in the connexion of the place with St. Peter's Abbey. The *c* in both these words was sibilant, and therefore the pronunciation could not have been very different from what it is now, but it is a curious anomaly that the *p* in *Patricesy* should have changed into *b*, while that in *Patricesham* has continued unchanged. What the final syllable represents is less clear, as there is no sign of an island at Battersea now, although there may have been once. Chelsea was originally *Cealc-hythe* or *Chelc-hythe*, and a haven on the Thames, not an island, just as Lambeth was "Lambe-*hithe*," or haven; but there is no recorded form of Battersea that would allow us to say that *ey* or *ea* represented *hithe*. There was, however, until about thirty years ago, a creek, up which tradition reports that Queen Elizabeth rowed. A bright little stream rising in Tooting, and passing by Wandsworth Common, flowed into the Thames at this creek, which is now a mere sewer, and its better character is only kept in remembrance by the name of Creek-street.

The manor of Battersea, which had remained in the possession of the Westminster monks for several centuries, was vested in the Crown at the period of the dissolution of the monasteries. Elizabeth, in the eighth year of her reign, granted it on lease for twenty-one years to Henry Roydon, and in 1593, Joan Holcroft, the only daughter of Henry Roydon, had another lease for a similar term. Subject to this lease, the manor was assigned in 1610 towards the maintenance of Henry Prince of Wales, and after his death it was appropriated in the same manner to his brother Charles, Prince of Wales. After Charles's accession to the throne, the manor was granted, in 1627, in fee, to Sir Oliver St. John, Viscount Grandison, a friend of the Duke of Buckingham, who had filled the office of Lord Deputy of Ireland, and in his family it remained for nearly 150 years.

In the reign of Henry VI. Thomas Lord Stanley possessed a considerable estate in Battersea, which, apparently to avoid its confiscation at that disturbed period, he conveyed to trustees for his own benefit and that of Thomas, his son and heir. In December, 1460, the trustees transferred this property to Lawrence Booth, bishop of Durham, and his heirs, and in the following year the grant was confirmed by the two Stanleys. In spite of this transfer the estate had escheated to the Crown before the eleventh year of Edward IV., in consequence of the action of John Stanley, who assigned the lands and tenements in trust to the Abbot of Westminster, in contravention of the Statute of Mortmain. The bishop, therefore, had to apply direct to the king, and on payment of 700*l*. he obtained a grant under letters patent, dated July 10, 1472, of the property forfeited by John Stanley. He also received the king's licence to enclose his mansion-house, called Brygge-court, which he had built "with walls and towers, and to impark his land there, with the right of free warren and free chase therein." Bishop Booth was translated to York in September, 1476, and prior to his decease, in May, 1480, he bequeathed this property to the Dean and Chapter of York, with a view to the accommodation of his successors in the see, so that they might have a convenient residence when their affairs called them to London. There is a tradition that Wolsey lived here, and the room in York House was shown where he was supposed to have entertained Anne Bulleyn, but it is little likely that the luxurious cardinal should have taken up his residence at Battersea while he possessed a more convenient palace at West-

minster. When Archbishop Holgate was committed to the Tower by Queen Mary in 1553, the officers who were employed to apprehend him, rifled his house at Battersea, and took away from thence "300*l.* of gold coin, 1,600 oz. of plate, a mitre of fine gold, with two pendants set round about the sides and midst, with very fine pointed diamonds, sapphires, and balists; and all the plain with other good stones and pearls; and the pendants in like manner, weighing 125 oz.; some very valuable rings, a serpent's tongue, set in a standard of silver gilt and graven; the archbishop's seal in silver; and his signet, an antique in gold."* He was deprived of his see in the following year, because he was a married man.

By a special clause in the lease of the person who farmed the York estate, four score acres of land were reserved to be surrendered to the Archbishop to use as demesne lands at a month's notice, whenever he should be resident at Battersea or within sixty miles of that place. This clause was systematically infringed, and the archbishops were unjustly deprived of their rights. Archbishop Grindal had a successful suit with the farmer, and leased the estate to a new tenant, but when he was translated to Canterbury he did not give up the property to his successor. Among the State Papers is a letter dated August 22, 1580, from Archbishop Sandys to John Wickliffe, keeper of his house at Battersey, in which he directs him to deliver up the house to the Lords of the Council, so that it might be turned into a prison for obstinate Papists. During the Commonwealth York House was sold to Sir Allen Apsley and Colonel Hutchinson for the sum of 1,806*l.* 3s. 6d., but it was reclaimed by the see after the Restoration. The remembrance of the connexion of the Archbishops of York with Battersea is kept alive by the name of York-road.

We will now return to the consideration of the successive possessors of the manor. Oliver Lord St. John and Viscount Grandison died in 1630, when his English title became extinct, and that of Grandison descended to his grand-nephew, William Villiers, father of the notorious Duchess of Cleveland. The Battersea estate also came into the hands of Villiers, who granted it to his cousin Sir John St. John, bart., who died in 1648. It then fell to Sir Walter St. John, the nephew of Sir John. He died on July 3, 1708, and was succeeded by his son Henry, who so long before as 1684 had pleaded guilty to the murder of Sir William Estcourt, bart., in a sudden quarrel arising at a supper party. In 1716 the above-named Henry was created Baron St. John of Battersea and Viscount St. John, with remainder to the issue male of his second wife. His eldest son by his first wife was then under attainder, and the titles so descended on his death in 1742. Henry St. John, the celebrated statesman, was born at Battersea, and baptised there on October 10th, 1678. In 1710 he was Secretary of State to Queen Anne, by whom, in 1713, he was created Baron St. John, of Lediard Tregoze, in Wiltshire, and Viscount Bolingbroke, with remainder, in default of male issue, to that of his father. On the accession of George I., in 1715, he was attainted for high treason; but in 1723 he was restored in blood, and in 1725 an Act of Parliament was passed to annul the attainder, in consequence of which he inherited the family estate on the decease of his father, and he held it until his death in 1751. The estates with the titles descended to his nephew Frederick (son of his half-brother, John Viscount St. John), who obtained an Act of Parliament in 1762 to sell his estate, which was purchased in 1763 by the trustees of John, Earl Spencer.

As the place of his birth, Lord Bolingbroke is supposed to have been peculiarly partial to Battersea, and he expressed the wish that he might breathe his last in the house of his ancestors there, which wish was accomplished. Bolingbroke House was a large mansion, situated near the church, which was mostly pulled down in the year 1777. Bolingbroke-gardens and Bolingbroke-terrace mark the site. Pope's "Essay on Man" is said to have been partially written in a room wainscoted with cedar, which overlooked the Thames, and was the poet's favourite study. Lord Bolingbroke's second wife was the widow of the Marquis de Villette, and the niece of Madame de Maintenon. She died on the 18th of March, 1750, the year before her husband. In Battersea Church is a monument to their memory by Roubiliac, on which is a highly laudatory inscription, commencing "Here lies Henry St. John, in the reign of Queen Anne Secretary of War, Secretary of State, and Viscount Bolingbroke; in the days of King George the First and King George the Second something more and better." It is also stated of the Viscountess that "she lived the honour of her own sex, the delight and admiration of ours; she died an object of imitation to both, with all the firmness that reason, with all the resignation that religion, can inspire."

The present church at Battersea was built according to Act of Parliament (14 Geo. III.), and was opened on the 17th of November, 1777. There is a river view of Battersea by Boydell, which shows the old church as it stood in 1752. When the old building was pulled down care was taken to preserve the monuments and the stained glass, which were re-erected in the new one. Besides the Bolingbroke monument already noticed, there are other memorials of the St. John family, and a curious monument to Sir Edward Wynter (died March 2, 1685-6, aged 64), who, according to the inscription in his honour, outstripped the actions of the boldest knights of chivalry. Unarmed he crushed a tiger to death, and on foot he routed forty mounted Moors.

. . . "What more could Samson do?
True to his friends, a terror to his foes,
Here now in peace his honor'd bones repose!"

The stained-glass window which was removed from the old church to the new contains portraits of Henry VII., his grandmother, Margaret Beauchamp, and Queen Elizabeth, but the work is not of early date. The new church is a brick building, with an octagonal spire, and about the year 1823 an entrance portico of the Doric order was added to it. The elder Charles Mathews said that Battersea steeple being of copper was coveted by the Emperor of Russia for an extinguisher, and that the horizontal windmill (which was erected about 1788 on the site of Bolingbroke House) was a case for it. His Imperial Majesty intended to take them with him, but left them behind from forgetfulness. The church is far from handsome either within or without. It has neither aisles nor chancel, and the communion-table is placed in a recess at the east end; the pews are of the old-fashioned regulation height. A little girl, who was taken to church for the first time, complained that she had been shut up in a closet and sat upon a shelf, which is not a bad description of these antiquated abominations.

The parish register records the burial of Arthur Collins, author of the well-known "Peerage," in 1760; of William Curtis, author of "Flora Londinensis," in 1799; and of Thomas Astle, author of the "Origin and Progress of Writing," in 1803. In 1648, Sir John St. John was buried at Battersea with such unusual pomp that the heralds were fluttered, and commenced a prosecution against the executor for acting contrary to the usage of arms and the laws of heraldry. William Riley, one of the heralds, deposed "that the funeral of the deceased was conducted in a manner so much above his degree that the escutcheons were more than were used at the funeral of a duke; and that he never saw so many pennons but at the funeral of one of the blood royal." This burial is omitted in the register.

About 1159 Lawrence, Abbot of Westminster, obtained the appropriation of the great tithes for his monastery, out of which the monks were to receive two marks, and sufficient was to be reserved to support the vicar. In the reign of Philip and Mary the rectory was held by John, Bishop of Winchester, and it was granted by Queen Elizabeth in her twenty-third year to Edward Downing and Peter Ashton. The rectory afterwards came into the possession of the St. John family, and passed with the manor to Earl Spencer.

Owen Ridley was instituted to the vicarage of Battersea in 1570, and appears to have encountered considerable persecution from his parishioners for several years. Some of them petitioned Dr. Swale, one of the Ecclesiastical Commissioners, that the vicar might be deprived of his cure, one of his chief crimes being that of conversing with a witch. Others presented a counter-petition to Lord Burghley, which was signed by Robert Cooke, Clarencieux king of arms. Thomas Temple, brother of Sir John Temple, Irish Master of the Rolls, was vicar during the Commonwealth, and was also one of the Assembly of Divines. He was succeeded by the learned Dr. Simon Patrick, afterwards rector of Covent-garden, dean of Peterborough, and successively bishop of Chichester and Ely.

Battersea Bridge, one of the structures which long offered a serious hindrance to the navigation of the Thames, was built in 1771 and 1772 in accordance with an Act of Parliament (6 Geo. III., cap. 6) which was obtained when John Earl Spencer expressed his wish that a bridge should replace the ferry, of which he was the owner. It was built by Holland, at the expense of fifteen proprietors, each of whom subscribed 1,500*l.* Within the last few years iron girders have been introduced in order to enlarge some of the arches.

Formerly the largest portion of the land at Battersea was occupied by the market gardeners, and the produce of the fields was in considerable repute. Fuller, writing in 1660, says,—"Gardening was first brought into England for profit about seventy years ago, before which we fetched most of our cherries from Holland, apples from France, and had hardly a mess of rath (*i.e.*, early) ripe peas but from Holland, which were dainties for ladies, they came so far and cost so dear. Since gardening hath crept out of Holland to Sandwich, Kent, and thence to Surrey, where, though they have given 6*l.* an acre and upwards, they have made their rent, lived comfortably, and set many people on work." (*Worthies.*) Now the builder is rapidly encroaching upon the fields and the hedges, and ditches are fast disappearing. By an old custom of the manor, lands descended to the younger son, and in default of sons were divided equally among the daughters. An Act of Victoria, however, annulled such local customs. There is little more to add to this description of Battersea, except to mention the factories for which it has long been noted. The English enamels formerly made here are now much sought after. Sir Marc Isambard Brunel's celebrated saw and veneer mills were burned down about the year 1814.

The chemical and other works that have found here so convenient a location are not altogether looked upon with favour by the other inhabitants. And it is supposed that they contaminate the air and injure the condition of the sewers.

* Strype's "Life of Cranmer," p. 308.

ART IN ORNAMENT AND DRESS.

An attempt to lay a foundation for style and taste in dress upon the ground of general principles common to all the non-phonetic arts, and thus to connect the architecture of costume with the more permanent forms of decorative structure, has a degree of novelty in it. This is what is attempted in the treatise of M. Charles Blanc,* which originally appeared in the shape of serial articles in the *Gazette des Beaux Arts*, and is now published in a separate form. No translator's name is appended to the English edition, which is not written in the best possible style, and betrays confusion in the transmuting of French idiom into English here and there, even without comparison with the original; however, like Mercutio's wound, "'tis enough,—'twill serve": it makes a very agreeable book, and an undeniably suggestive one.

We begin, with M. Blanc, at the very beginning—general laws of ornament; "repetition, alternation, symmetry, progression, and confusion": illustrated in the first instance by sketches of typical forms of architectural detail, which, to say truth, are by no means well rendered. The section which has the most important bearing on what follows is that on "symmetry," since that quality, in its conventional sense of a likeness between two halves on either side of a centre line, is peculiarly illustrated in the figure, which is the basis of costume. The author, like some other critics, overdraws the relation between architecture and the figure in this respect, as in saying, for instance, that a temple having its principal entrance in a corner of the building would seem to us outrageous, "because its façade would bear no resemblance to the aspect of the human face." That is not the way to put it at all, for we know that a principal entrance may be placed at the angle of a building with very fine effect: the correct statement would be that a building symmetrical in all other points would lead us necessarily to expect symmetry in so important a feature as the placing of the doorway. Still more incorrect as to fact is his statement, in illustration of the need for symmetry felt by artistic nations, that "the Athenians, the better

* "Art in Ornament and Dress." Translated from the French of Charles Blanc, Member of the Institute, and formerly Director of Fine Arts. With illustrations. London: Chapman & Hall.

to mark the central point of the Parthenon, took care that the space between the middle columns should be wider than between the others, while to right and left of the door the columns were closer and closer together." Where M. Charles Blanc got this from we know not. But he recognises the fact that symmetry is the highest law and realises the gravest and most dignified effect, and that departure from symmetry leads to a lighter kind of effect, to piquancy and picturesqueness, and that this principle is as much illustrated in dress as in architecture; though in both he seems disposed to lay too much stress upon symmetry, and to undervalue the effect of unsymmetrical grace, in ornament, as much as it is over-valued by the enthusiasts for Japanese irregularities at the present time. Among secondary qualities of interest in ornament the author rightly gives an important place to what he defines as "complication," the tendency of which is "to provoke the curiosity of the spectator and rouse him to an investigation which promises to be of interest." This is a most valuable element in ornament, not sufficiently recognised with us: it is what gives much of its interest to Saracenic ornament, and to such a design as that Roman mosaic pavement formed by intercepting circles, which has been copied in the Kensington Museum, and is so continually pleasing to the eye. Any ornament which displays what may be termed a "curiosa felicitas," which attracts the eye to consider how it is contrived, is sure to supply an element of interest.

In regard to the main object of his book, M. Blanc justifies the degree of attention he requests to the subject of dress and personal adornment, by the consideration of the superior beauty and interest of a living being over a lifeless object; and yet, while in a list of the decorative arts we find all honour paid to the jeweller, the glass manufacturer, &c., "we shall find no mention made of the man who invents a new style of dressing the hair, or of her who designs costumes and fashions." There is a certain truth in this also, only the interest we take in each other is not confined to appearances; and even a beautiful woman, if intellectual also, is valued by sensible people for her intellect more than for her beauty. We are quite at one with the author in thinking personal adornment, especially in regard to women, a beautiful art, and which deserves to be considered more directly in relation to general artistic principle than it mostly is, only do not let us exaggerate, and talk as if this outward adornment were as important in a man or woman as in an inanimate object, which is made simply for ornament and nothing else. Besides, it is a melancholy but undeniable fact, that we are not (even the fairer sex) all beautiful; it used to be said that a certain eminent philosophical writer, and his wife, and their favourite dog, were the three ugliest objects to be seen in London; and in such a case the treatment of man or woman as pre-eminently a work of art is beset with difficulty.

M. Blanc's remarks upon colour in dress, and its effects and affinities, are often brilliant and clever, and suggest new meanings and associations. Yellow striped with black characterises, he observes, the colour of the most formidable animals, and the most venomous insects,—the tiger, the panther, the wasp; "and this contrast of black and yellow is also much fancied in countries where the passions are hot and violent." Is, then, the liking for this strong vivid combination a taste connected in any way with a violent temperament? That might be going too far: it would, perhaps, be more correct to say that it is a taste nurtured in lands of brilliant sunlight, where feeble colours would seem weak and faded to eyes [accustomed to the glare of yellow light. But the author thinks there is a sort of moral character in colours as well as a merely optical one. "Red has an expression of dignity, magnificence, and pomp. There is something imposing and terrible in the robe of a criminal judge." (Here we might ask, perhaps, which is cause in this case, and which is effect?) "The expression of blue is one of purity. It is impossible to attach to this colour the idea of boldness, licence, or voluptuousness. Blue is an unobtrusive and imaginative colour, which, recalling the impalpable ether and the clearness of the calm sea, necessarily pleases the poet by its immaterial and celestial character. . . . . It is, moreover, of all colours that which ascends the highest and descends the lowest in the scale of chiaroscuro. Nothing so much resembles white as light blue, and nothing so much resembles black as dark blue,—the *bleu d'enfer*, as dyers call it. The result is that this colour is more susceptible than others of approaching extremes, and thereby changing its character. It may be suitable in its light shade for the dress of an innocent maiden, and in its dark for romantic affections and evening thoughts. It seems in this latter case to indicate a mind which is beginning to withdraw itself from the realities of life, and to incline to solitude, mystery, and silence." That is pretty, but a little too fanciful; and the very name given by the dyers to the dark blue suggests what will have occurred to the reader, that this tone of colour may be menacing enough in its effect; just as, on the other hand, we can at this moment recall Vandyke portraits clad in light blue, which have an effect and expression anything but modest and retiring. But his suggestions on the echo of colour in dress are very good; for example, if the upper and under skirt are of two contrasted colours, such as pale blue and straw colour (a charming combination), "if the blue skirt is ornamented with a deep-plaited ruche, the sleeves of the straw-coloured tunic should have small blue plaitings," an effect of repetition both in colour and surface-treatment, which is illustrated in a very pretty colour-printed sketch; and he makes a hit in quoting the remark of a lady,—"It is possible to dream in a sky-blue bonnet, but it is absolutely forbidden to weep in a pink one!"

We like, also, M. Blanc's remarks on the element of dignity in dress, as opposed to too much complication and angularity of line, or even to over-richness. He dislikes the tartan exceedingly, for this reason; and we know that when Mr. Charles Mathews dresses for "Cool as a Cucumber," he can find nothing so suitable for the ultra-impudence of the character as a very large check pattern. M. Blanc points out that in Paolo Veronese's "Marriage of Cana," the magnificent figured stuffs are reserved for the musicians and cup-bearers, while the Virgin and Christ and those who are in the seats of honour are simply clad in woollen tunics of pure red and blue. "But is it not wonderful," he observes, "that the same principles which govern greater things rule also lesser, and that unity is a necessity of nobleness even in the most frivolous art, as well as the secret of greatness in the highest efforts of the human mind?" But in spite of these "most excellent sentiments," we must quarrel with M. Blanc for the want of this very nobility and dignity in the illustrations to his book. His figures of ladies, illustrating various qualities in the design of dress, are for the most part artificial and affected to a degree, and come very near to the mere *modiste* type. The detestable chignon is shown everywhere in all its repulsiveness. And there is not apparently the slightest recognition in his pages of the possibility of the picturesque of dress in an economical form; there is no place in his scheme of the art for those who cannot keep long milliners' bills; no suggestion of the possible beauty and character in combinations of homely materials for the poorer classes. This is a serious defect; and we fear the author's notions of the artistic lie too much on the surface. He says, in his chapter on personal ornaments, that "an object destined for use may be embellished but cannot be intrinsically beautiful, for if its chief characteristic is beauty, it is no longer suitable for use. Only a savage would put salt into Benvenuto's famous salt-cellar, or use a Panathenian amphora in offering wine to his guests." Such a remark is simply nonsense, and indicates a totally false idea of the relation of art to utility.

The chapter on jewels contains, however, some very good remarks: the author, while observing that jewelry, more than any other class of personal ornament, should be governed by symmetry of arrangement or design, points out how unsuitable for this purpose is any design partaking too much of architectural character; and also urges that representations of the figure are out of place, as competing in interest with the real figure of the wearer,—turning what should be a subsidiary ornament into a predominant attraction. This may be more open to question, but we are inclined to agree with M. Blanc; jewels should not be pictures; they should preserve a purely ornamental character. He is quite right also in his admiration of the emblematic use of jewelry:—"In the earliest ages jewels were emblems. The gems worn by men and women bore the impression of profound sentiment, or contained some allusion to a religious idea." Symbolism, which is the bane of the higher arts, finds its true field in this beautiful and fanciful branch of art, adding to the object a meaning and an interest beyond that excited by its value or its beauty of form or colour. While dwelling with evident pleasure on "these treasures of concentrated light and colour with which human beauty can adorn itself," M. Blanc does not allude to one characteristic of these adornments, their imperishable nature in comparison with that superior but transient beauty of which they are the appendages. An old English poet can supply the reflection, in words of equal grace and tenderness. Herrick exhorts a fair one not to be proud of those eyes "that sparkle star-like," nor of the effect of her charms,—

> "Whenas the ruby that you wear,
> Sunk from the tip of your soft ear,
> Will last to be a precious stone,
> When all your world of beauty's gone!"

A melancholy moral, certainly, which "must give us pause," were there not also another side to it.

But, in spite of certain deficiencies we have named, we recommend M. Blanc's pages to those who are interested in the art of personal adornment.

THE FRENCH ACADEMY.

ON Thursday, November 30th, M. Charles Blanc, the well-known art critic and historian, the philosophic Vasari of France, was elected a member of the French Academy.

M. Charles Blanc's writings are well known in England, and, unlike most Frenchmen who have written about English art, he at least acknowledges some merit to our painters.*

M. Charles Blanc has peculiarly qualified himself for an art critic, having devoted the whole of his life to the subject, commencing early as a practical artist in the *atelier* of the famous engraver Calamatta, and working by the side of Mercuri, to whom we owe the beautiful engraving of the "Moissonneurs." This *atelier* being constantly visited by the enthusiastic art *littérateurs* of thirty years ago, M. Charles Blanc imbibed at this time, not so much a distaste for the practice of engraving, as a strong love for the literature and philosophy of art, and he has admirably shown us, in his Grammar of Arts and Design, an interesting account of the psychological processes that have led to the creation of modern French art. Unlike our own great Ruskin, M. Charles Blanc has made no attempt to disturb long established reputations. His respect and veneration for the efforts of other men to realise their ideal has been thoroughly catholic. He must be excused, as all Frenchmen it appears must be, for an egoism which gives so preponderating an admiration for the art of his countrymen, and he evidently partakes, as all Frenchmen do, of that hopeless view of English art, classing our painters and sculptors with the possession of no more claim to style than they find in our dressmakers or our cooks.

His election to the French Academy appears to have been made an exceedingly novel and most unsuitable occasion for political discussion, but, really, when one thinks that politics and art are the only two subjects the Parisians seem to consider, we must not wonder that the election of M. Charles Blanc, the brother of the well-known Louis Blanc, to the membership of the Institute, should call forth some remarks from that numerous *clique* of Bonapartists and Legitimists, who appear still to permeate all societies.

The constitution of the Institute, as it is called, is somewhat complex in its construction, and from its earliest days there was an indecision in its regulations. Founded by Cardinal de Richelieu some ten years earlier than our own Royal Society, the Académie Française received on January 2nd, 1635, its letters-patent signed by Louis XIII. Founded a few years later (1648) the Academy of Painting and Sculpture, as it was then called, was, properly speaking, the oldest of all the French academies, for as early as the fourteenth century we find traces of the existence of an association of this nature, and the society of Saint Luc had existed some time previously. In 1655 the Society was definitely constituted by Cardinal Mazarin, and in 1671 the far-seeing minister Colbert instituted the Academy of Architecture. Founded in 1666, also by this minister, the Academy of Sciences only received the approbation of his royal master in 1699. The Academy of Inscriptions

* The thin volume which treats of the English school in the great work of M. Charles Blanc is not from his own hand, but by his *collaborateur*, M. Bürger.

and *Belles Lettres* then followed, composed at its foundation in 1663 of four members chosen by Colbert; the business of this body was to prepare and write inscriptions for whatever monuments might be erected or medals struck in honour of their august master.

These four academies created in the seventeenth century, existed just as our English bodies of the same nature do at the present moment, each as a separate corporation, having no connexion with each other; and thus they continued to exist till the period of the French Revolution, which entirely broke up their constitutions, and formed, *by their union*, the body now called the Institute.

Suspected of monarchical sentiments, in 1793 the Académie Française was suppressed, but two years later was re-constituted, when, in 1795, the law of the 25th of October founded the modern Institute. In the beginning this was composed of simply three classes,—the Academy of Sciences; the class of moral and political sciences analogous to the present academy of the same name, and to a portion of that of the inscriptions and *belles lettres*; lastly, the third class, that of literature and the fine arts, embracing what we should now call the Académie Française, the Academy of the Fine Arts, and that of Inscriptions and *Belles Lettres*.

Once established, the Convention gave to the Institute the power of naming the forty-eight members, who were again to select the other ninety-six. By the law of 1796 it was decreed that the Institute should be composed of 144 members residing in Paris, of an equal number of associates chosen from the whole of the Republic, to whom may be added, as corresponding members, twenty-four foreign *savants*, eight to each class. When chosen, the Institute was installed in the Louvre.

Under the laws of 1795 and 1796 the Institute enjoyed much liberty, and hence it was that Napoleon, then First Consul, determined a change. In 1803 was passed a law by which the election of any member had to be approved by the head of the executive power. This arrangement is still kept up. A second article increased to four the number of classes, admitting this time history to a full share of honour; and separated more markedly the different other branches.

In 1806 the Institute, which since its commencement had borne the title of *Institut National*, took the name of *Institut de France*, but it was not till 1811 that it bore that of the *Institut Impérial*. This latter is now no longer in use, and it is again called the *Institut de France*.

The approaching days of the Restoration were, however, to bring mishap on the Institute, and during the first years of the Bourbon's reign, the work of the Convention was erased and the old academies of Louis XIV.'s time were re-established. Henceforth the mere protection of the Duc de Berry or the Duc d'Angoulême sufficed to procure an entry to the Academy. Indeed, in 1816 no less than twenty-two members were expelled from the Institute, among whom were to be found the well-known names of David, La Rana, Sièyes, Monge, and Carnot. The Revolution of 1830 brought better days to the Institute, though the Government of Louis Philippe determined to leave to time the care of arranging the difficulties that had arisen. In 1832 M. Guizot, then Minister of Public Instruction, recreated the class of the moral and political sciences, giving thus a place to philosophy, to legislation, political economy, and statistics. For a long time, however, the spirit of sect pursued the elections to the Institute, and thus, we find, during the reign of Cousin over philosophy, none but those who entirely agreed with his views entered the sacred pale. From that time to this the Institute has enlarged both in science and reputation.

Thus, what is now called the Institute is composed of these five academies,—the French Academy, the Academy of Sciences, the Academy of Inscriptions and *Belles Lettres*, the Academy of Fine Arts, and the Academy of Moral and Political Sciences; these sit at the well-known building opposite the Louvre on the other side of the Seine, at the building called the Palais de l'Institut or the Palais Mazarin.

Of these, the Académie Française, of which M. Charles Blanc has just been elected a member, is composed of forty members (called popularly the forty *immortals*). They are nominated by election, and the candidates can alone arrive at the position by a personal solicitation, and after this their nomination is submitted to the chief of the executive power, just as in England her Majesty gives her consent to the election of an Academician.

It may be remembered that one of the chief works of this Académie Française is the preparation of the famous Dictionary of the French Academy, the first edition of which appeared in 1694 and the sixth and last in 1835. Until the present century the French Academy, like the Della Crusca of Florence, confined its labours to the preservation of the language; since then, and for the last half-century, it has been opened to all comers in science and art.

The Academy of Sciences, which, at the Revolution, took the first place among the classes then instituted, is composed of sixty-five members, divided into eleven sections; each of these counts six members, with the exception of the geographical, which has only three; in addition to these there are two perpetual secretaries, ten free members, eight foreign associates, and a large number of French and foreign corresponding members.

The Academy of Inscriptions and *Belles Lettres* is composed of forty members and ten free members, its chief work being connected with history and archæology.

The Academy of Fine Arts, which received its present name at the time of the Revolution, when the Academy of Architecture was added to it, is composed, like our own Royal Academy, of forty members; it is, however, divided into five sections,—painting, sculpture, architecture, engraving, and music. It is this academy which directs the various competitions, distributes the annual *grands prix de Rome* in the five sections, presents candidates for the post of professor to the schools of art, and in many other ways directs the fine arts of the country.

The Academy of Moral and Political Sciences, founded in 1795, was suppressed by Napoleon in 1803, nor was it till the reign of Louis Philippe, in 1832, that it was re-established, by the advice of M. Guizot. It is composed of fifty members, and is divided into five sections; in addition, there are five foreign associates, and a number of corresponding members.

In looking hastily over the Annuary of the Institut de France, we find the following distinguished Englishmen have been connected with the body. In the Academy of Beaux Arts, the first name is one very familiar to these pages, that of Professor Donaldson, a foreign associate since 1863. His predecessor, as may be remembered, was Mr. Cockerell. Mr. John Pye, long a corresponding member, died, it will be recalled, in 1874, at a very advanced age,—very nearly, we think, a centenarian. Mr. Herbert has been a corresponding member since 1880; Mr. Fred. Leighton since 1873; the last appointed, Mr. Newton, of the British Museum, a much-esteemed correspondent, since 1866; and Mr. Charles Perkins, of Boston, the author of a work not sufficiently well known in England, giving a very complete history of the earliest days of Italian sculpture.

In the Academy of Moral and Political Sciences, we find as foreign associate the distinguished name of Mr. Gladstone, who has had as predecessors the equally well-known names of Hallam, Grote, M'Culloch, and Lord Brougham.

In the Academy of Inscriptions and *Belles Lettres*, we find as foreign associate Max Muller; as corresponding members, Sir Henry Rawlinson, Layard, Samuel Birch, Lane, and John Muir.

In the Academy of Sciences, as foreign associates, Sir George Airey, Owen, and the late Sir Charles Wheatstone, who had as predecessor Herschel. As corresponding members, Lockyer, Sir Charles Lyell, Hooker, Carpenter, and Adams.

Paris.

PUBLIC WORKS AT SOUTHPORT.

The rapid extension and growing importance of Southport is shown by the number of its companies for building and other constructive works. These companies, which are being organised in quick succession, include the Southport Artisans' and Labourers' Dwellings Company, the Southport and Gathurst Brick and Tile Company, the Southport Botanic Gardens, and Museum Company, the Southport Pavilion and Winter Gardens Company, the Southport Pier Company, the Southport Victoria Pier and Promenade Company, the Southport Zoological Gardens Company, the Southport and Ainsdale Brick and Tile Manufacturing Company, the Formby and Southport Land and Building Company, the Birkdale Park Land Company, the Skelmersdale Land and Building Company, the Ravenhead (Southport) Sanitary Pipe and Brick Company, and the Southport Glaciarium and Ice Manufacturing Company, which took possession last week of the estate on which its works are to be erected, and which are immediately to be commenced. The aggregate share capital of these several companies amounts to upwards of 500,000*l*. In addition there are several hotel companies, bath companies, tramway companies, and water companies, together with other companies of a miscellaneous nature, including a steam laundry company, parcels and luggage company, carriage company, aërated water company, storage company, hydropathic and other companies, representing in the whole a share capital of more than 1,350,000*l*. Several of these companies are already paying good dividends, the last dividend of the Botanic Gardens and Museum Company being at the rate of 10 per cent. per annum; the Victoria Pier Company, 10 per cent.; the Pavilion and Winter Gardens, 5 per cent.; the Tramways Company, 8 per cent.; the Southport Pier Company, 6 per cent.; and the Birkdale Park Land Company, 10 per cent.

THE SURPLUS LANDS OF THE EAST LONDON RAILWAY.

Last week Messrs. Farebrother, Ellis, & Clark sold, at the Mart, a large quantity of the surplus lands and buildings belonging to the East London Railway Company. The property, which consisted of twenty-three lots, is situated partly in Whitechapel, near the Station and London Hospital, and partly in St. George's-in-the-East, but the most valuable portion is in Wapping High-street. The Wapping property included, amongst several other plots of building land, a large area in High-street, situated in close proximity to the London Docks, the Company's station, and also to the Wapping pier of the Steam Ferry Company, whose works are now in course of construction. Before the lot was offered, the auctioneer said that under an arrangement into which the company had entered the purchaser would not be permitted to erect any buildings upon the land for a period of six months, or until the works of the Steam Ferry Company were completed and opened. The property, which contains an area of 12,000 superficial feet, was sold for 4,500*l*. The proceeds of the day's sale amounted to about 11,000*l*.

MONUMENTAL.

Lairg, N.B.—Mr. Westland, of the North of Scotland Granite Works, Inverness, who has just procured a lease of the granite quarry at Dalmore, parish of Rogart, from his Grace the Duke of Sutherland, has been commissioned by the duke to execute a monument, which is to be erected at Lairg, in commemoration of the recent extensive reclamations there. The stone is to be taken from the Rogart rock, and the monument, when finished, will be 33 ft. in height.

The Liebig Memorial.—The sum of 140,000 marks having been collected for the Liebig memorial, the committee have decided to close the subscription lists. A discussion about the site of the projected monument has arisen between the rival committees of Giessen and Munich, the former claiming the statue on the ground that from their university Liebig's fame first issued to the world; the latter, because their capital was latterly the scene of his labours. It has been decided that both towns shall have the same memorial, which shall be cast in bronze.

Wark Mechanics' Institute.—The need of a large hall and rooms for the accommodation of the members of the Mechanics' Institute at Wark-upon-Tyne has long been felt, and, chiefly through the liberality of Mr. Hugh Taylor, of Chipchase Castle, this public want has now been supplied. A neat stone building has been erected at Wark, and, in addition to a large hall, capable of seating about 400 persons, it contains reading and smoking rooms for the members of the Mechanics' Institute, and also rooms for the librarian; and in a neat tower, in the centre over the entrance, is placed a large clock. The total cost is nearly 1,900*l*., towards which Mr. Hugh Taylor has given about 1,500*l*. It is intended to add a large number of books to the library, and 80*l*. have been subscribed towards the cost of doing so.

TEMPLE BAR IMPROVEMENTS.

THE proposed removal of Temple Bar, and the recent debates thereon, more especially as regards the great improvement which could be carried out at this spot, and which in a very few years *must* be carried into effect, remind us that this is not the first time, by a great many, that the widening of Fleet-street hereabouts has been the subject of civic controversy.

The great highway which for so many centuries was the only thoroughfare between the City and Westminster was, as early as the reign of Edward II., one of the most uncomfortable roads to travel by that can well be imagined. In the rainy season there was a continuous interruption to the traffic, through faggots and bushes, and great holes, obstructing the traveller at nearly every few yards, and so bad did it become that a special tax upon wool, wine, and leather had to be levied for its repair. We are told that about this date there were two or three forges in the main thoroughfare, and sundry sheds of a decidedly mean appearance. To have allowed this state of things to continue any length of time is, to our more refined habits of the nineteenth century, a mystery; for, in the reign of Edward III. the banks of the river between Ludgate and Charing Cross had the town mansions of the greatest of our nobility, and their only land entrances were from the Strand and Fleet-street, the roadway of which, in the old chronicles, is described as "full of pits and sloughs, very perilous and noisome" to the passers-by. Five hundred years ago we find Bridewell a palace, Whitefriars a monastery, and the Temple on the eve of being occupied by the lawyers. The Bishop of Bangor lived in Shoe-lane, and the Bishop of Salisbury had his town-house where Salisbury-square now stands. In the Strand, the Bishops of Exeter, Durham, Bath, Chester, Lichfield, and Llandaff, had their "inns," as the mansions were then called; while the Savoy, the site of the great Simon de Montfort's residence, and where John, King of France, was held a prisoner, existed then in all its princely grandeur. The hospital of St. Mary Rounceval stood where subsequently was built Northumberland House. Hence it will be seen that the highway from Westminster through Temple Bar was by no means an unimportant thoroughfare, and yet it was not till a century later that a stone pavement was substituted for the miry road.

We do not propose to go into the history of Fleet-street or the Strand, or exhaust our readers' patience with memorials of Temple Bar; but our object is to give a few collected facts about the improvements which have been carried out in the district which Wren's gateway has now made famous throughout the world. After the Great Fire of 1666 we find, by a plan preserved in the British Museum, that the width of Fleet-street, between Whitefriars and Fetter-lane, was 70 ft., and from Fetter-lane to Chancery-lane, 37 ft. Wren proposed a straight street from Temple Bar to Tower-hill, 90 ft. wide, with a circus in the centre of Fleet-street, from which eight streets were to branch. To those at the present time who are holding strong arguments as to the requirements of Fleet-street for the "still-increasing" traffic, the following quotation from Mr. Noble's book may not prove uninteresting:—"Taking the width of Fleet-street at Temple Bar into calculation,—23 ft. 8 in. the roadway,—no benefit whatever would result in the demolition of the Bar, as, granting that the pier does take up a trifle of the way, fully 6 ft. would be required extra, so as to make a safe passage for another line of vehicles, by giving which, *unless the street were set back some 8 ft. or 9 ft.*, the present narrow pathway for pedestrians would have to be considerably narrowed." From actual measurement of the Bar we find that the width of the street, between the extreme piers by the houses, to be 43 ft. 2 in., and that the opening of the centre arch of the gateway is 21 ft. Now the foot-passenger traffic is to be studied quite as much as the vehicular, and it is well known that the former is very great at this point. For many years past this has been a great grievance, and it certainly would not have been of any use to pull down the Bar,—an expensive and obstructive process whenever it is done,—unless the houses had been taken down too. It was this argument that the Corporation raised years ago, but at the present time it has come to an end by the demolition of the buildings on the north side, and the proposed widening of the street at this part.

Looking at the St. Clement's side of the Bar, it is wonderful to observe the change hereabouts within the past century. The "dismal pass" was for centuries a standing disgrace to London. It may be described as a triangular block of houses extending along the centre of the present roadway of the Strand as far as St. Clement's Church. In Addison's time this narrow outlet from the City was known as "the Straits of St. Clement's." Branching from the Bar, the southern street formed the Strand; the northern, leading to Wych-street, was called Butcher-row. Mr. Diprose tells us it was chiefly occupied by fishmongers, butchers, bakers, and tinsmiths. The houses were wooden and large. The rooms had low ceilings and rickety casements. To the public-spirited Alderman Pickett, London was indebted for the removal of these dens. A brief account of this improvement will no doubt prove of some interest at the present time.

In 1787, at the request of several of the residents, the Alderman presented a petition to the City Council praying the removal of Temple Bar and the block of houses on the west. The subject was referred to a committee, and to this body Alderman Pickett submitted three proposals:—To take down the Bar and sell the materials; to ask Messrs. Child & Co., the bankers, to dispense with the six months' notice which the Corporation *were* (and still *are*) compelled to give them; and to obtain from the City Surveyor a report of the value of the property between the Bar and Essex-street in the Strand. The proposal to pull down the Bar was lost on a division, and the other proposals were thereupon withdrawn. A few months later the Alderman asked the Common Council to appoint a select committee to inquire into the matter, but the motion was outvoted by a majority of seventy-two. Although this persevering citizen was subdued he was not conquered. He sent round a lengthy printed letter, stating that he was not desirous to remove Temple Bar if the improvement could be carried out without doing so. At a subsequent Court of Common Council a motion to apply to Parliament for powers to carry out the scheme was rejected by a majority of thirty-six. At Michaelmas the Alderman asked the Common Hall to agitate the question, but he could not find a single liveryman to second his motion. And in the midst of the controversy up started Pasquin, the poet, with his "Metropolitan Propheoy":—

"If that gate is pull'd down 'twixt the Court and the City,
You'll blend in one mass, prudent, worthless, and witty.
If you league cit and lordling as brother and brother,
You'll break order's chain, and they'll war with each other."

In March, 1789, Alderman Pickett issued a thirty-eight paged pamphlet advocating his views. He described Temple Bar as a nuisance, a screen for filth, and a protection to pickpockets. He proposed to erect in the place of the stone structure "a noble and ornamental pilaster on each side, with chains agreeable to the ancient bars." He exhibited two plans at the Royal Exchange, and headed a subscription list for the improvement with 100*l*. Four years later a committee reported on his plans, and stated that the removal of 125 houses would cost 121,110*l*. Parliament was petitioned, and ultimately an Act was obtained 35 Geo. III., c. 126, June 26, 1795, which allowed seven years for purchasing the property, and ten years for completing the improvement. This Act was, however, only the first of six which were found necessary before the scheme was carried into effect, and in these was included another proposed work—the demolition of fifty-one houses at Holborn Bridge, and the construction of a new street, subsequently known as Skinner-street, and lately removed for the Holborn Viaduct improvements. Alderman Pickett did not live to see his great idea carried out; he died the 17th of December, 1796,—and, if coincidences are worth anything, exactly eighty years to the very day, later, we find the Common Council still holding debate whether Temple Bar shall be taken down!

With regard to the Temple Bar improvements, after the permission of Parliament had been obtained, the "island" of houses so long known as Butcher-row, was levelled at an expense of something like a quarter of a million of money, the Strand was thrown open as we now see it, and the whole of the vacant ground on the north side between the Bar and St. Clement's Church let to contractors for the erection of new building. Now, somehow or other, there was a decided fatality attending the whole of this property from first to last; for, after 150,000*l*. had been expended in new houses, the majority continued unlet for several years. Here was a dilemma never expected, and in the end Parliament was asked to sanction the disposal of the whole estate, and the other houses at Snow-hill, by means of a lottery. We could give an almost endless description of the result: how three lotteries were held—the first in April, 1807,—how they failed, how the property was sold to two speculators for a mere nominal sum, how those gentlemen in turn became bankrupts, how one of the partners obtained his certificate, bought up what remained of the estate, broke his contract, and left the original promoters with a loss of something like 54,000*l*.! We could also tell of many sad scenes that took place over this gigantic failure, but space will not permit. The property, even down to modern times, was never of the best paying description, and the names of Pickett-street and Pickett-place are well remembered to this day. And while the houses were being pulled down for the New Law Courts site, it may be recollected that one fell outwards into the Strand, thus being at the last a trouble to the owners. It is also a curious fact that while the buildings at Temple Bar and Snow-hill were called into existence at the same time, they were also demolished together,—the former for the Courts of Law, the latter for the Holborn Viaduct.

We have thus detailed as briefly as possible the history of the Temple Bar improvements. At the dawn of the present century they created the most lively amount of interest in all classes of society throughout England,—for the whole district between the Bar and Wych-street, extending northwards to Lincoln's-inn, was one of the most depraved, and contained the greatest number of dens of infamy to be met with in London.

The City architect informs us that when the Law Courts are finished, and the street widened, the width at Temple Bar will be about 64 ft. To span this width will require an arch of proportions by no means suited to the thoroughfare. In place, then, of Temple Bar what is to be erected?—for the Corporation, even while they have only lately resolved to pull it down, seem determined, to perpetuate the "time-honoured" site. A bar of some sort certainly existed from time immemoral, and from the time of the erection of the present building by Wren, the architect, and Joshua Marshall, the mason, in 1670-72, down to the year 1753, the gates were closed nightly and opened every morning. Such a practice could not be tolerated now, but we cannot see any reason why the site of the old bar should not have a distinctive landmark, which might be ornamental as well as useful. But it is that feature which terribly upsets the Council of the City.

Now, with respect to the "proposed" widening of the thoroughfare leading through Temple Bar, as shown on the plan lately issued by the City Lands Committee, we find three distinctive lines drawn, each of which will very materially widen Fleet-street and the Strand. But two only of the lines are really worthy of notice, and these are:—

1. A straight line from No. 227, Strand, to No. 33, Fleet-street (opposite St. Dunstan's Church), thus entirely or partially removing some forty houses on the south side, while on the north side, Nos. 203 to 193 (the corner of Chancery-lane) would be set back, in both cases, making the width of the street at Temple Bar 70 ft., instead of 43 ft. 4 in. as at present, and 62 ft. at Chancery-lane instead of 55 ft. 3 in.

2. The second, and most desirable "line" is from the corner of Essex-street (opposite St. Clement's Church) to the same place in Fleet-street, at No. 33. This would necessitate the removal of some forty-four houses, but in return we should have the street at Temple Bar 80 ft. wide instead of 43 ft. 4 in.; and at Chancery-lane 70 ft. instead of 55 ft. 3 in., the whole being not a foot too wide to exhibit the architectural façade of the new Law Courts, and any other new buildings that would be thereabouts erected.

But the great trouble at present is how is the cost to be met? Neither the Government nor the Metropolitan Board of Works appear the least desirous to hasten an advance as their share of the million of money which this improvement will cost, and the City, on the other hand, does not see its way clear to expend this amount of the citizens' money, when the improvement will be not so much local as it will be metropolitan. Time, however, passes quickly on, and probably one of these days there will be adopted a plan of such a nature that will be worthy of the site, and will make us feel surprised it was not carried out long before.

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"TEMPLE À LA VICTOIRE."

Under this title we have before us a publication, printed for private circulation only, which takes us back to a phase in the history of architectural taste and study in this country which is by many now almost forgotten,—when Greek architecture was, by common consent, admitted to be the subject most worthy of study, and of the highest enthusiasm of the modern architect. When Professor Donaldson was a student at Rome, in 1819, the restorations of some of the Classic temples made by his French fellow-students (a practice still forming an important part of the higher curriculum of the French student of architecture) suggested to him the idea of making a restoration not of a single temple, but of such a group of buildings as might have been sufficient for every purpose of celebration and commemoration in connexion with the great games of Greece, and of which the temple of the deity to whom the games were dedicated, and who was what in later ages might be called "patron saint" of the whole, would form the central point. This idea recurred to him in the course of his travel through Greece and Asia Minor; and on his return to Italy he endeavoured to put it into more definite shape. To quote from the Professor's own classic French,—"Je me souviens qu'un soir, après un représentation au théâtre San Carlo, je rentrai à mon hôtel, l'imagination encore impressionée par le spectacle et la musique dont je venais de jouir. Malgré l'heure avancée, je me vins au travail et j'essayai de donner un commencement de réalitée aux idées que m'absorbaient. En deux nuits, j'ens achevé l'esquisse d'un 'temple à la Victoire entouré de tous les édifices nécessaires à la célébration des anciens jeux de la Grèce.' Revenu à Rome, je consacrai toute une année d'études à l'achèvement de ce travail, à l'exemple des pensionnaires de l'École Française, qui sont tenus, pendant leur dernière année, d'exécuter la restauration d'un monument de l'antiquité. Cette obligation, qui était à peu près tombée en désuétude à l'époque dont je parle, a été remise depuis en vigueur avec le plus grand éclat par mes anciens amis Le Sueur, Blouet, Léon Vaudoyer, et d'autres dont le renommée est impérissable. On ne saurait méconnaître combien elle initie à tous les secrets de l'art antique et pénètre les artistes des vrais principes du goût en architecture."

The design when completed was shown to Canova, who had it exhibited at the Academy of St. Luke, and its author was elected a corresponding member of that Institution; and it obtained a gold medal when again exhibited at the Paris Exhibition of 1861. The illustrations, with an "explication historique," written purposely by Professor Donaldson, have been recently published in the *Moniteur des Architectes*, and the essay is now reprinted, with the plan and bird's-eye view of the design, as a folio pamphlet, in "hommage respectueux de l'auteur à ses amis et à ses confrères."

The design is a symmetrically-disposed group of buildings, crossed in front by the *stadium*, which is flanked by a colonnade and ranges of seats for spectators; behind this is an amphitheatre for a *naumachia*, or "sea-fight parade" (as one might translate it), with a naval and a military trophy on either hand of the structure; beyond this the *Academia* and the *gymnasium* facing each other, and between these we proceed to the temple, flanked by quadrant colonnades, as at the Vatican, and in the centre of a wide oblong enclosure, at the further end of which the theatre, overlooking the sea, closes the composition. The architecture is supposed to be of the period of Hadrian, in order to furnish the excuse for combining something of Roman richness and freedom of decorative treatment with the general forms of Greek architecture, and is placed on the slope of Mount Ithome, the beauty of which had struck the author during his travels.

We would rather have conceived the erection as pure Greek, since it is entirely a matter of imagination, and there are no clients to please. The design embodies a noble architectural scheme, more extensive probably than ever existed in Greece at one spot. The whole tone of the essay, and the nature of the architectural idea illustrated, imply a culture wider and more refined than, we regret to be obliged to feel, it would be easy to find illustrated in the younger generation of architects around us.

THE NEW SCHOOL BUILDING IN THE BOULEVARD MALESHERBES, PARIS.

We have long watched with interest the architectural progress of this building, in which we have been especially struck by the copious use that the architect, M. Hector Degeorges, has made of first-rate terra-cotta work. The establishment of this school is the result of an active movement in Paris—indeed, throughout France,—in favour of primary instruction. The *bourgeoisie*, who have been perfectly satisfied with the opportunities offered by the University, have overlooked the sanitary arrangements, which M. Waddington, the Minister of Public Instruction, is disposed to give such special application to, and he has advocated a greater attention to the advantages offered by healthful exercise, such as we in England have long paid almost too much heed to. What the Universities, therefore, have alone attempted to introduce by successive efforts, private initiative is about to realise,—an education and instruction suitable to the needs and aptitude of the child at every age.

The most remarkable creation of this nature, says M. Thomas Grimm in a recent article on this subject, from which, indeed, the following details are borrowed, is, without doubt, that of the *École Monge*, founded in 1869, by a former pupil of the École Polytechnique, M. Godard, and which a clever architect, M. Hector Degeorges, has just rebuilt under exceptional conditions, on some ground near the beautiful Parc Monceaux, in the Boulevard Malesherbes; a neighbourhood which, in course of time, promises to be the most favoured of Paris. Here the editor of the *Siècle* and M. Menier have built magnificent mansions, and here are centreing a number of fine residences.

We will not enter into the details of the method followed out at the École Monge; we will simply mention the considerable part played, with the children, by *lessons of things*, an American importation, which familiarises the mind with ideas of daily application, at the same time facilitating the study of abstract science. What we wish to praise is the building itself, and the talent with which the architect has known how to provide for the wants of the pupils. M. Degeorges has shown himself discreet in his exterior decoration; in revenge he has distributed with true prodigality air, water, and light. Every progress that has been realised within the last twenty years has been applied by him. The whole of the building pivots, so to speak, round an immense covered court, where M. Eugène Paz has disposed the most varied gymnastic apparatus. This court has a superficies of 1,600 mètres. Round it on the ground floor and on the first floor are the class-rooms, with their perfected fittings, maps, pictures of natural history, and glass cases containing mineralogical, botanical, and other specimens, which transform each of these rooms into a small museum for the use of the children.

From the covered court the staircases lead to the dormitories of the second floor, or to the refectory established below the ground floor. It is through the covered court that the pupils pass to go to their separate class-rooms; and it is on this court that open the director's study and the different offices; all the movement is, in fact, concentrated in it. Another court, not covered, of a superficies of more than 3,000 mètres, is destined for the ordinary recreations. Above the class-rooms are the dormitories, each pupil having a separate room. Below, half under ground, well lighted, are the immense refectories, of which the ceilings are in cement, the pavement of tiles, as also the walls. This costly but healthy disposition allows of the whole apartment being completely purified of bad air or dirt; unnecessary is the brush, for all is washed with sluices of water. The heating by hot-water, and the ventilation merit also special mention. The École Monge possesses 180 beds for boarders. It enters into the plans of the founders to fill their house especially with children and young people, preserving at the same time the interior life.

British Museum.—We are very glad to learn that in future the British Museum will be closed, for the purpose of cleanings, &c., during the first week in February, the first week in May, and the first week in October, instead of, as hitherto, during the first week in January, May, and September. We have before now pointed out the objections there were to closing the Museum on New Year's Day and at other holiday times.

A DOUBTFUL POLICY.

The occurrence of another "landslip" in the cutting of the Great Western Railway at Horbury, near Leamington, recalls the circumstances under which that cutting was first constructed, and has been allowed to remain a constant source of trouble and danger. When Brunel designed the railway from London to Birmingham he boasted that he would have no tunnels for the whole distance of 125 miles. The only point along the route where any difficulty was experienced in carrying out this wish was at a place called Horbury, where the line runs through a deep bed of blue clay, lying on high land, and extending for a couple of miles. The highest portion of this clay deposit is at the hundredth mile from London, where its surface is some 150 ft. above the average level of the surrounding country, and of the line of railway on each side. The great engineer elected to make a cutting instead of a tunnel, but the soft nature of the lias soil, and the depth of the cutting, proved such formidable difficulties that he was forced to yield to circumstances, and to bore through a small portion of the bank, and form a short tunnel, about 200 ft. long. This practically is not longer than many wide bridges, and it does in fact form a bridge for the old roadway across the line. But the open cuttings on each side, and particularly on the eastern end of the tunnel, have been a constant source of trouble; year after year landslips occurred, blocking up more or less completely the line of rails. By degrees an enormous excavation was made, which promised to afford immunity from danger, and the opening at the top of the cutting from one side to the other cannot be less than 300 ft. The heavy rains, however, of the last few days have proved too much for the stability of the soil, and many tons of earth have fallen down to the rails beneath, raising them several feet, and entirely covering the "up" line. There is now nothing for it but to continue the cutting still further outwards, or to face it with a thick masonry wall and buttresses.

The bed of clay contains many fossil shells, and is for many reasons—engineering and geological—an interesting locality. The works now going on afford an excellent opportunity to geologists to visit the spot and collect some valuable specimens of the former inhabitants of an upraised inland sea.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

In the winter exhibition of the younger water-colour Society there are some good but scarcely any remarkable works, and a considerable proportion of uninteresting matter. Mr. J. D. Linton contributes several drawings, of which the largest and most important, "The Huguenot" (214), hardly tells its story, and the figures lack character, except that of the soldier waiting stolidly to execute orders upon the victim. A single figure, "The Student" (195), is in the artist's finest manner and feeling; a strong figure clad in black velvet seated in earnest thought, facing the spectator; the expression of concentrated reflection is admirable, and the colouring very rich and harmonious, though sober; there seems something not quite satisfactory in the foreshortening of the left leg. "A Letter to Phyllis" (250), by Mr. Seymour Lucas, is a remarkably clever study of an elderly beau of the *Spectator* stamp laboriously inditing an epistle, his face three parts turned from us, but full of character: the dress and accessories are treated with admirable broad and perfectly effective handling. Mr. Collier's "Burpham Ferry" (201) is not a drawing of such excellence or importance as he is accustomed to exhibit here, but has his usual excellent characteristics of pure and bold water-colour treatment. Miss Elizabeth Thompson sends a large sketch of the "Scots Greys advancing," at Aldershott (144), the line of horses coming rather confusedly over the uneven ground, in a very real sort of manner, though the drawing of the animals seems rough enough in some particulars. Mr. F. Skill's small sketches, "On Yarmouth Beach" (189) and "Ploughing, South Devon" (235), are very good; the latter shows real originality. Mr. Townley Green's drawing of boating men taking their ease in their inn "Up the Thames" (55) shows conscientious study of character, and very careful execution; the types of humanity of the amateur athletic order are very well discriminated, and belong to

a phase of life which has not had due attention from artists of real originality as yet. Mr. C. Green's "Street Musician," with less refinement, has a half-humorous pathos which is noticeable. In landscape Mr. Syer is well represented, but with less originality of style and subject than he has sometimes shown: Mr. Orrock ditto; Mr. Mogford exhibits drawings a little out of his usual beat in effect and scale of colour. Messrs. Absolon, Hargitt, and Harry Johnson are duly represented; Mr. W. L. Thomas's Switzerland drawings are very good, and have some speciality of character; Mr. Hine has an exquisite little sketch of "Cuckmere Haven" (13), a white chalk cliff, topped with long folds of green sward; and Mr. Aumonier, whose name is always welcome, exhibits a beautiful study under the title of "Spring" (68), a bank of primroses for foreground, young shoots of trees and a bit of common land, backed by a sky most tender and atmospheric in its delicate tints. Several drawings by Mr. Hugh Carter, who derives his inspiration as to manner and subject a little from Israels, are worth attention; and so is Mr. Carrick's fresh and healthy-looking sketch of a pastoral scene, under the title of "The Skylark" (205). On the whole, the best things are to be found among the figure subjects, as is often the case at this gallery, in contradistinction to the usual tendency of exhibitions of works in water-colour, which is certainly pre-eminently a medium for landscape.

THE ARCHITECTURAL TREATMENT OF THE ROOF.

BY MR. H. H. STATHAM.*

WE all know how, when we are thinking a good deal of any special subject, it seems to turn up wherever we look, sometimes in a quite unexpected manner. Thus, no sooner had I communicated to our Secretary the title of my proposed paper, "The Architectural Treatment of the Roof," and was doubting whether after all there were anything profitable to say about it, than, in looking quite accidentally over a volume of Mr. Ruskin's Oxford lectures, I came on the sentence "All architecture is but a glorified roof." Here, at all events, I thought, is a text for my sermon, and one which happens exactly to express the point of view from which I propose to make a few remarks on the subject. No one, I trust, has been expecting a practical treatise on methods of roofing this evening. If that were not beyond the scope of my experience, it would at least be quite beyond the limits of an evening's paper. And yet I hope that we shall not be quite unpractical. It is useful sometimes to look back at the first principles of a form of building, and consider why we make it so, how it came into its present shape, and whether and in what way it is capable of improvement, in reference especially (in the present case) to its architectural suitability and expression.

Architecture, then, "is a glorified roof," or, to put Mr. Ruskin's comprehensive formula into plain prose, the object of every building is to cover in a space. Taking it this way, the subject forms the natural complement to that of plan, on which I had the honour of saying a little here last session. You define the area and outline of the ground to be occupied by your building, and the manner in which you propose to divide and arrange the space, so as to make the most of it; and that is *plan*. You then roof it in: and a great deal of the character and expression of architectural structures depends upon the mode of roofing, the material employed, but most especially the relation which the roof bears, in shape and proportion, in constructive principle and material, to the substructure.

The mere proportion, in size or height, between the roof and the walls of a building (in cases where the roof forms a visible portion of the architecture) has a most important effect in determining the predominant expression and character of the architecture; and I touch on this point first, because it brings us back to the first beginning of building. Most of the primitive structures we know of, those which constitute the first beginning of architecture, have no walls, in the strict sense of the word. In his suggestive though rather too fanciful treatise on "The Habitations of Man in all Ages," M. Viollet-le-Duc represents the first rude attempt at a house as constructed by planting young trees in the ground in a circle and then bending them over till their stems met and were secured in the centre. That is a not unlikely theory, confirmed by what we see or hear of the habitations of savage people in the present day. The tent, too, which is one of the earliest forms of habitation, is simply a movable roof. The Esquimaux snow-hut at present is a kind of diminutive dome, placed on the ground. In all these primitive forms architecture is simply a roof, though hardly a "glorified" one. We might perhaps go further than this, and notice that the oldest arched buildings we know of, the tombs or treasuries of the Etruscans, the topes of India (of one of which you may see a model in the Architectural Court at South Kensington) are vaults arched almost from their floor level; but in these cases the form is to be traced, perhaps, partly to the fact that the structures were intended as tombs. But, at all events, we connect the idea of the simplest and most unsophisticated form of architecture with structures such as the tent and the wigwam, which are simply a covering—a roof placed on the ground. Now this is rather a significant fact, because it is probable that it is to a great extent the half-unconscious association with this rude form of architecture which leads us to regard a building where there is a great deal of roof in proportion to the walls as "picturesque" and rustic in character, while for the attainment of a more grand and "architecturesque" effect (to use my friend Professor Kerr's word, which I think a much too useful one to be dropped) we feel that the walls must be raised to a loftier relative proportion. I think this general law will be found to hold good, and especially in those cases where the roof is of a different and lighter material than the walls. If the members of the Association here present were asked each to make a sketch for a country church and a town church, we should be almost sure to find that the majority of designs for the former showed low walls and a high roof, and the latter nearly the reverse proportion; and when we want to give characteristic expression to cottages, rural almshouses, lodges, or farmhouses, we nearly always run the roof up into high gables and ridges, which we feel give the character of homelike and simple picturesqueness more than almost any other expedient.

This picturesque and rustic effect, however, is partly dependent on having roofs of a lighter material than the walls, thus further keeping up the resemblance to the tent and wigwam origin. But this, with all its picturesqueness and character, cannot be regarded as a complete or a dignified form of roofing. The whole system of roofing may be divided into two main sections: roofs which are formed of a different material from the walls, laid on the top of them, and roofs which are of one homogeneous material with the walls and are, in fact, the walls continued horizontally or in an arched form until they shut in the space at the top as well as at the sides. Now, it appears to me that no architecture can be considered to be absolutely complete, or to have attained the highest and grandest monumental expression, which does not include the homogeneous construction of the roof, as a part of the walls. The bridging of the space enclosed with timber or other light and comparatively perishable material placed on the walls, is only a makeshift after all, a shirking of the real problem of the "glorified roof." It is the old tent or wigwam elevated on a stone wall. The Greeks were content with it, and it has been the one weakness of their architecture; their temple roofs have perished long ago, and for many years it was believed that their temples had no roofs and that the Greeks, like the wise men of Gotham, enclosed a space with walls, and left it open to the sky; as if anything that could be called architecture could be produced in that way. The Egyptians, who roofed their buildings, so far as they had a permanent roof, with slabs of stone, achieved thereby a monumental and thoroughly homogeneous character in their architecture, though, of course, the space that could be bridged between supports in this way was very limited, and compelled the use of a great number of supports. This is, perhaps, the earliest and not the least striking instance of the influence of methods of roofing upon the whole style and expression of architecture; for I should think it very doubtful if the forests of columns in the great halls of the Egyptian temples would have existed but for the necessity of numerous supports to a roof where neither the arch nor timber was to be used. The idea may have been extended for the sake of an impressive effect; but it must certainly have originated in constructive necessity. But without the arch, any monumental building in the grandest way and on the grandest scale is an impossibility. It is to the arch that we owe all the greatest achievements of the building art, more especially in raising architecture from its sombre or quiescent character, as among the Egyptians and Greeks, and giving it an upspringing life and energy.

At what time in the history of building the arch was invented no one can say now; probably, however, it was quite prehistoric, and was used long before the Greeks, whose neglect of it in building seems to confirm the idea that their architectural notions were derived mainly from the Egyptians to begin with. Viollet-le-Duc, who has such a remarkable faculty of putting himself in imagination in the circumstances of ancient builders, has given an imaginary sketch of the first introduction of the arch, which is as likely to be true as anything else, and is at least amusing. He credits the Assyrians with the invention, thus: they roofed their houses with a system of reed or bamboo framing with longitudinal bearers laid on it, forming a curved outline, and piled a mud or clay roof on this, which in course of time hardened and was found to be independent of the bamboo supports, which were sometimes removed. Then "a man held in great respect for his knowledge, whose name was Kabu, proposed to build on the curved reeds in the same way as walls are built; that is to say, laying the bricks as you see here; consequently, to pass from the vertical direction in which the wall now lies to the curved direction of the arch, without leaving any angle between the two directions; in a word, to carry the bricks round in a complete semicircle. Thus, the wall would be continued, so to speak, curving over more and more.

It appears that Kabu had much difficulty in getting his idea adopted; the elder men pronounced him crazed, asserting that a wall ceased to stand the moment it deviated from the vertical. Kabu constructed a small arch according to his system, but his model did not please the elders: they told him that though his principle might hold good on a small scale, such a construction executed on a large scale would infallibly break down. Then Kabu had wedge-shaped bricks made of the size of ordinary bricks, and placing them together dry, without the interposition of wet clay, demonstrated by experiment that the bricks would hold together of themselves."

After that there was nothing for it but to banish Kabu, as a man who had impiously contravened the laws of nature, and then proceed to work out his principle: a conclusion of the story which has its parallel in the history of some more modern inventions.

The two great applications of the arch to the realisation of the "glorified roof" were, of course, the dome and the Gothic vault; the mere barrel-vault stands on quite lower ground than these, as it so little affects the design of the substructure, its stability and support being a mere question of thick walls. But the dome and the Gothic vault have the most direct relation to the shape and arrangement and the architectural motive generally of the substructure. The dome is the covering of buildings in which wide central area predominates; the vault, of those in which length predominates. It is not necessary here to go into a description of the principles of the dome and the vault; what I especially wish to remark upon is the difficulty which seems to have been found in carrying out in its integrity the principles of homogeneous building for which these methods of construction appear to furnish opportunity. Although the dome and the vault have been used to such a great extent in Roman and post-Roman architecture, there are comparatively few instances of any note in which the built dome is used as the real roof, irrespective of any other covering; and as far as I know there is not one in which a vaulted roof is so used. Always we have the slated or leaded timber roof as a perishable covering over what is the real built and monumental roof. Perhaps the feeling of most people is that this exterior covering, especially when high-pitched, adds an important element of picturesqueness to the structure, and is the best architectural finish that could be made. But it is most important to take into account the immense effect which habit has upon the judgment in such matters. We are always accustomed to see Gothic churches and cathedrals finished with timber roofs, just as we are always accustomed to see a man finished with a chimney-pot hat; and we get into the habit of accepting each culmination as the natural and inevitable one. But if we could look

* Read before the Architectural Association on the 8th inst.

on Mediæval buildings afresh, and with unprejudiced eyes, or if we place ourselves mentally in the position of a person doing so, I think we should perceive that the monumental effect of a great and important building is seriously affected by crowning it with a perishable material. It is as if the real builder, the *mason*, tacitly confessed at this point, "I can go no further, you must now call in the carpenter and plumber." When the new building which has taken the place of the old Chester Cathedral was in progress, it was proposed to render the metamorphosis more complete by crowning the square centre tower with a high shingle spire. I remember seeing a drawing of the project. It was to me very much the same as if you were to place a bonnet (if such a thing is to be found now) on the head of a marble statue, as an appropriate finish. In the case of the vaulted roof there is a practical as well as an architectural difficulty: the natural upper surface of a vault leaves valleys and pits which render it impossible to accept it in its unsophisticated state as a bedding for a weather-proof covering. In the case of the dome, which leaves a regular and unbroken exterior surface, there is not this difficulty; the difficulty is here a more purely architectural one. The dome, which is to my thinking by far the grandest and sublimest architectural feature that has ever been invented, has almost always presented itself, nevertheless, in the shape of a most formidable dilemma to the architect, in the great difficulty which is experienced in rendering the same dome effective and well proportioned to the substructure both internally and externally. The greatest triumph of the dome is in its interior effect, but this is rather injured than otherwise by making the dome too lofty, taking it too far from the eye, and thereby diminishing its perspective. Externally, on the contrary, the dome almost requires exaggerating in height to produce an effect proportionate to its real height, because its lines are all falling away from the eye, and the result is that a dome always becomes stunted in perspective, except when viewed from a great distance. An extreme instance is the church of St. Sophia, probably one of the finest of existing interiors in effect, as it assuredly is in conception, but which externally, even in elevation, has a squat and dish-cover appearance, which must be still worse when seen in perspective. An increased difficulty in dealing with the dome externally arises from the necessity of having either a counterpoise or a chain at the branches of the dome, to prevent the chance of its rising there, and if a counterpoise is employed, by adding material to the dome at this point, it must almost necessarily be treated in design so as still farther to reduce the apparent height externally. (This was illustrated by the section of the Pantheon.) The two ways out of the dilemma are, either to employ a treatment of the dome in keeping with its appearance as a low covering, — to avoid attempting a vertical expression at all externally; or to have one dome for the inside effect and another for the outside. I need not remind you that this last has been the usual way of getting over the difficulty in the architecture of Western Europe; and for this object, not merely two, but even three domes are found one over another. We are in the habit of admiring many of these very much; no one can admire St. Paul's dome, as a mere matter of effect, more than I do; but when we look at the sections of such structures, can we say that the effect is really in any way proportionate to the waste of material and the introduction of a specious but in reality flimsy architectural falsity? Here, again, it is useful to consider things apart from the influence of habit; and surely if we were to be shown for the first time the section of such a dome as that of the Invalides, or some of those which figure in competition drawings (where the dome is often, as Byron profanely said of St. Paul's, "like a fool's cap on a fool's head"), without having been taught to admire it, we should be disposed to say, "What a house of cards built up about nothing!" If we compare even the most sober of these cooked domes, as one may call them, with the Pantheon, we must admit how much more satisfactory to the judgment is the latter, in its solid unpretending reality. Brunelleschi did indeed at Florence build his dome on the same lines within and without, but he had to make it a pointed dome, losing the beautiful effect of the internal hemisphere, and even then it depends on a tie at the weak point; and that is not a complete building which has to be tied together. The moral seems to be that we must not look to the dome for external effect in height, except on a small scale, at least if we would preserve the highest architectural consistency of design and construction; we must regard the dome on a great scale as mainly a feature for internal effect; or if we aim at external effect with it, it must be rather that of stability and repose than of aspiration.

[Reference was here made to a view and section of a Byzantine domed church (St. George at Thessalonica) which had a timber covering carried on a heavy mass of screen-wall built up above the dome, and a method suggested of carrying the sloping roof on light brick or stone spandrels built up on the haunches of the dome at intervals, and with a flat arch in hollow tiling connecting them and forming the bedding for the roofing-tiles; the screen-wall being altered in design and reduced in bulk, and made to appear as a merely ornamental wall. Sketches were shown of the application of the same principle to the roofing of a vault, the ribs being similarly built upon up to the required uniform slope, and tile arches built between them in the same manner. In each case, it was urged, the introduction of any perishable material was done away with, and the building upon the back of the dome * or vaulting ribs really gave increased stability, by weighting them on the haunches; and in the case of the vault, the ribs were really carrying the outer roof, and indicated the construction, instead of referring only to the inner ceiling. A method of avoiding the necessity for varying the radius or curvatures of the diagonal and transverse ribs in a quadripartite vault was suggested, by the intervention of an open circular light at the meeting of the diagonals (carried by the ribs, or by the ribs conjointly with the filling) which cut them off to the same length and height as the transverse ribs. By assuming the same radius also for the wall ribs, the three sets of ribs all spring from the impost with the same curvature; and though, from the wall-ribs being necessarily shorter than the others, the ridge of the transverse vault must be dropped considerably from the centre to the walls, this, in fact, only fell in with the whole scheme by accommodating this ridge to the slope of the roof, which came immediately upon it. The three sets of ribs did not, however, quit the impost at the same *angle*, nor was the carrying of the ring at the meeting of the diagonals quite satisfactory, as being dependent partly on the vaulting surfaces for its support (unless on a very small scale); it might be done more completely by a larger number of ribs arranged at equal angles, looking somewhat like a fan-vault, but in reality differing, as the ribs were the construction, which in the fan-vault they are not. It was observed that in this diagram the transverse rib was altogether omitted, the vaulting surface occupying its place, which might be considered a great heresy; but, in fact, the transverse rib in a Gothic vault was only an ornament after all. In a domical vault such as those of the Angoulême churches which the Association had visited this year, the transverse arch was as important as the wall arch, as it carried the doming; but in the true vault the only real problem was to intercept the thrust of the roof so as to concentrate it at the points buttressed, and the diagonal was all that was really necessary for this: the transverse rib was really nothing in the construction.]

But though we may deprecate the timber roof when used as a cover to what would otherwise be a homogeneous stone building, we certainly cannot deny to it an important place in architecture, the rather as it is in our own country that it has been more especially developed. Our "open-timbered roofs of the Middle Ages" have been a subject of admiration ever since the Gothic revival, though they have now fallen into disrepute, and are almost universally condemned as uncomfortable and dys-acoustic. I am afraid very little can be said in answer to these charges, on practical grounds: on architectural grounds I hold that no form of wooden covering is so good in effect internally as the high-pitched open roof with its massive timbers crossing and recrossing in perspective and making mysterious shadows and half-lights above. Certainly the more recent fashion of a panelled ceiling in cants, with an iron rod painted in corkscrew spirals to tie the concealed principals, is a sad falling off in truthfulness and effectiveness of treatment. I dislike and repudiate the iron tie altogether: as with masonry, so with timber, if you mean to make your roof in that special material, make it in the form which suits that material, and in which it may be warranted to stand secure without bandaging. Timber roofs may be divided into two main classes; those which exercise an outward thrust on the walls, and those which merely rest upon them with a directly vertical pressure. The latter class represents the tie-beam roof, which, of course, so far as the walls are concerned, is simply a beam laid across, and exercising not the slightest disturbing effect upon the substructure. Everything except a tie-beam roof comes under the former class; unless, perhaps, we may consider the low-pitched roofs of the late Gothic period as practically without thrust. For mere utilitarian purposes the tie-beam roof is the simplest and probably the most economical; but it can scarcely be considered as in any sense conducive to architectural effect, and is seldom made part of the design; when it is shown, I think the queen-post form is decidedly more elegant than the king-post. But architectural expression is far better fulfilled by a roof which may be said to spring *from*, not merely to rest *upon*, the substructure. The entire structure then becomes a complete whole; the roof and walls seem mutually dependent upon one another in the design, the timber roof becomes a part of the architecture, instead of a mere covering laid across. I think this junction between the timber roof and the walls may be more directly and logically effected than it generally is. (Reference was made to an illustration, showing a cross-braced roof springing from arched buttresses turned inwards from the wall, so as to bring the joints of the masonry at right angles to the thrust of the roof-principal.)

This style of roof, with the cross bracing of straight timbers, appears to me to be more architectural than the employment of timber in curved braces (except in the laminated form). The old hammer-beam roof is very rich in effect, but it is anything but scientific; so much so, that it is really wonderful how some of them have stood so long; and I fancy some of them are prevented from pushing the walls out chiefly by the heavy counterbalancing weight of timber which is hung upon them inside. A form of roof which is at present a favourite for churches and other large interiors, with a high collar and long curved braces, is really a kind of modification of the hammer-beam principle, with the advantage that there are fewer points to "give." But these large curved braces, cut out across the grain or scarved together, are really makeshifts. If you wish to use timber in a really characteristic and at the same time strong construction, keep to straight pieces as much as possible; and especially avoid, in open-timber roofs, any such absurdities as arcades and shafts, and such other imitations of stone architecture, which have a most gingerbread effect when introduced in a timber roof. And I hope no one here will ever perpetrate such a monstrosity as what is facetiously termed a "wooden vault." Anything more directly at variance with common sense and architectural propriety it would be impossible to imagine; a wooden imitation of the forms of a masonry construction hung on to the walls like an inverted cradle. The plainest tie-beam roof would be preferable. The defence set up for it is that the Mediæval builders occasionally did so; to which the only proper reply would be, "Then they ought to have known better."

No consideration of the architectural treatment of the roof could afford to pass over the specially modern form,—the iron roof. One class of structure, in particular, has given a great opportunity and impetus to this form of roof,—I mean, of course, the railway-station. How are we to class these great sheds architecturally? Externally, most of us should say that they are simply hideous; nor is it easy to see how they can be made otherwise, consistently with practical and economical considerations. Even these have their effectiveness, however, under some aspects; for instance, there is an admirable etching by Mr. Inchbold, of "Charing Cross," from the opposite side of the river, with the station-roof a black mass against the evening sky. It was published in the *Portfolio* some time since, and I could not have

* It was suggested to me after the meeting, by a member of the Association, that a plan of weighting the dome at certain points was hardly consistent with its true theory, as a building up of complete circular rings of masonry. This is a correct criticism: to make the design and construction actually homogeneous, the dome should be a ribbed one; but the constructive idea may perhaps be modified so as to coincide with the true theory of the ordinary dome.—H. H.

believed so much artistic sentiment could be got out of Charing-cross Station. Internally, a well-constructed iron roof has a beauty and fitness of its own, the more so if it is left as simple as possible, and no attempt made to bedizen it with what is called ornament hung on to it,—cast-iron rosettes, and such things. I think that, as in the case of the wooden roof, many of these larger iron roofs would gain immensely in effect if their abutments were better designed, and if they were thus more specially and directly connected with the architecture of the station, where there is any. (The St. Pancras roof, for instance, had its real springing underground, and merely came through the platform. Had it been sprung, however, from massive visible granite abutments, its effect would have been infinitely better.)

But the fact is that, in spite of all that has been said, with apparent good sense and logic, about using the materials of our own time, and so on, iron roofs never can produce a grand, or anything worth calling an architectural, effect; the hard thin lines of the material are so opposed to all that constitutes architectural breadth and repose, besides that the material will not harmonise with anything else. The great extent of the large iron roofs of our day is quite unaccompanied by any corresponding effect on the spectator. Take the Albert Hall as an example: the roof there is nearly the same shape as the centre dome of St. Sophia, and rather larger; but I never heard the slightest evidence of its having produced the same effect upon any spectator.* It is more than twice the diameter of St. Paul's dome, but it certainly never impressed me half so much. It is no use: extend the areas, increase the spans, as you will, you *cannot* produce architectural grandeur with a construction which, in comparison with a stone dome, is merely like a spider's web. As far as architectural grandeur is concerned, you must leave iron out of the category of methods of roofing.

Now, before quitting the subject let us give a moment's consideration to the ordinary everyday roof, on a small scale—the house roof. On this point I might again quote Mr. Ruskin, who, in the same lecture before referred to, observes that the modern architects never know what to do with their roofs, but that until the roofs are right nothing else will be. Fortunately, he is able to tell us how to make them right: "there are just two ways,"—one is always to make them of wood or stone and not of iron; and the next is, to take care that the little roofs are made before the big ones, and that every one who wants one has one. If you can make anything practical of that you are cleverer than I am; the second axiom is philanthropic enough, no doubt, but when an eminent critic tells us we do not know what to do with the roof, and he will tell us, and then presents us with a moral sentiment, it seems to me to do more credit to his heart than his head. Looking at house-roofs as they are, we can see that architecturally it is almost entirely a question of external effect, and that at present we are mainly dependent on timber framing and some sort of rain-proof covering,—slates, tiles, lead, zinc, or felt: the two former predominating. There are two distinct principles that may be followed in placing an ordinary roof on the walls: the one is to spread the roof over the wall so as to form a more or less overhanging cornice or "eaves"; the other is to keep it within the wall line and build a parapet round, so as either to hide the roof or make it look as if sinking down inside the building. The first of these principles is always right, the second nearly always wrong. The roof in this case is the lid of the building to keep out the wet, and you want it put on the top and overlapping, not fitted into the inside. A balustrade round a roof has no sense or fitness unless the roof is flat and is meant to be walked on. If the roof is not a flat one, it should, I think, always show so far as its pitch allows; it should never be artificially concealed. I observe a habit has come in lately, however, of using high-pitched roofs, but putting a balustrade at the foot. This is worse than all: as the balustrade is palpably useless, and contradicts the character of the roof. Now, as to the shape or outline the roof should take when it is visible, we know there is one fashion peculiarly prevalent now,—that of a truncated cone. This, which arose in France, is in reality merely the old high-peaked château roof with the upper half cut off. The Mansard roof scarcely deserves either the practical admiration or the theoretical abuse it has received. It is not a beautiful form at all, but it has been very useful to modern architects when at their wit's end to reconcile piquant outline with economical considerations. The erection of such a mass of timber framing and slate covering at the top of a building, sometimes with two floors of rooms in it, is, however, inconsistent with safety from fire in towns, and still more with architectural dignity and solidity of construction. On the whole, if a high-pitched roof is desired, there hardly seems to be a better way of breaking it up into picturesque outlines than the old fashion of gabling, always provided that the gables have a distinct reference to the plan of the house, and are not invented for the sake of effect. Carrying the roof a good way beyond the walls, either at eaves or gables, I think only has a good effect with low-pitched roofs. In that case something of the piquancy which would be obtained by the high pitch is supplied by this picturesque extension of the roof horizontally; but this is a style of treatment unsuited for towns, and only in harmony with rather rural buildings, in which it often produces a very good effect. As to bargeboards and elaborate finials, they are things only fit to make firewood of; they are simply vulgar, and so are those growths of spiky ironwork we so often see sprouting from the roof. All such things are mere gimcracks, at variance with anything worth calling architectural character. For town houses I cannot help thinking that flat roofs deserve a great deal more attention than they have received. "Oh, but we want skyline!" will be an obvious objection. But it is useless to think of artificially cooking skyline; to do that is beginning at the wrong end. And in crowded towns those who have not any garden space where the sun will reach might find the flat roof an opportunity for an artificial garden much more extended than the little conservatories we see on the porch roofs, or hung from the sides of London houses; and roof parties might even supply the place of garden parties.

Roofs of this description would demand a more solid and homogeneous construction than the sloping roofs, and thus this brings us back to the point before dwelt upon, the desirability of making the roof as permanent as the walls, and of the same class of materials. Of the materials which are used to cover our wooden roofs, tiles are by far the most pleasing and approach most to the character of the materials of which our walls are generally built. It is ungrateful to abuse a material which has been so useful as slate, but it makes a most uninteresting cover to a building, and the very quality which has made it convenient and economical for use, its thin cleavage, gives it a flimsy and unsubstantial appearance. Zinc is too glittering for any repose of effect, but lead might, I think, be used ornamentally on sloping roofs more than it is, with good effect, where cost is not an object. In fact, the artistic capabilities of lead are under-rated with us, and its practical value over-rated, for a big "lead flat" is one of the greatest nuisances possible, most disagreeable to walk on, and always getting out of order. But the question for the future of town roofs is, whether we can contrive to build them in a more solid manner, consistently with economy; for whatever is done with town or street architecture, it is an inexorable condition that it must *pay*. I cannot attempt to consider the possible methods of such a reform in roofing, at the close of a paper already too long; it may be suggested that concrete, even if it does not attract much as a material for walls, may have a part to play in roofing; but I leave the question for more mature consideration, on your part and my own, as an important problem to be solved in the improvement of modern building.

* It seems to me deplorable that Albert Hall should not have been domed as a masonry or brick construction. There is every preparation for it; there is abutment enough between the double walls to carry anything; and it would then have been, even with all its faults of detail, a great building.—H. H. S.

Death of Mr. Joseph Warren, of Ixworth. The death is announced of Mr. Joseph Warren, well known in the Eastern counties for his archæological researches. He was born at Attleborough, Norfolk, May 17, 1792, and in March, 1818, removed to Ixworth, commencing business there as a watch and clockmaker. About 1828 he turned his attention to archæological studies. He contributed an antiquarian map of Ixworth, with portions of Pakenham and Stowlangtoft, to the Proceedings of the West Suffolk Archæological Society.

A MARKET TOWN WITHOUT THE RAIL: WOOLER.

IN another quarter of a century, the number of our market-towns left at the stage-coach period,—that is to say, without a railway,—will, probably, be extremely small. It is not large even at the present day, but we have a few examples, and in them we may note the consequences of their isolation from the network of rails that has drawn so many other places nearer together within the last thirty or forty years.

Wooler is an example of the isolation in question. This was one of the baronies into which Northumberland was divided a short time after the Norman Conquest, and it was given by Henry I. to Robert de Musco Campo, or Muschamp. It lies at the feet of the Cheviot Hills, to the east of Cheviot, and close to a trout stream that winds about on a bright bed of porphyry boulders. It is the only market-town in the Glendale ward, being about eighteen miles distant from the nearest market-town either north or south, and about eleven miles from Belford, and is, consequently, the centre of a large tract of country. This tract is well farmed, and, in many respects, highly favoured, but the absence of the connecting link afforded by railways has entailed a very evident stagnation, both in the development and appearance of the town.

Twenty years ago the writer looked upon Wooler for the first time, and saw a small grey town of small grey houses and shops, and grey pebble footways, close under the grey and green hills of the district. In this grey town there was one wide, irregular street, which served also as the market-place, and in which stood the principal inn. This inn rose above all the other houses, for it boasted of two upper stories, both with a bow-window to them; but it was very shaky and aged, without being ancient enough to recall the old association of the place with Robert de Musco Campo, or, indeed, any of the successive barons who once lived in the ruined castle close by. A great fire raged in Wooler in the year 1722, and this date corresponds with the style in which the inn was fashioned: cosily, but with low ceilings, with here and there a beam depending, narrow ways, stout window-frames, small panes, and substantial balustrades to the dark stairs. The shops on either side and over the way were all small, and most of them were dull and dingy, though a few were bright and smart. A few openings to the right and left possessed a few more houses, and while a branching off of the main street led to the church at one end of the town, the last building at the other end was a lofty Roman Catholic place of worship. It was market-day, and the market seemed to be attended by less than a dozen farmers, none of whom apparently either bought or sold, for there was nothing visible for sale. The writer called to mind that this place was once famous for its large flocks of goats, and that invalids used to resort to it to drink goats' milk. A letter of Sir Walter Scott's is dated from Wooler, and states that he is staying there for that purpose, as a benefit to his health. But there were no goats to be seen. They and the invalids were all gone, and the little grey town seemed lost in a long day-dream. The writer called to mind, too, the reputation of a Wooler worthy, who, at the beginning of the century, enterprisingly discontinued the use of pack-horses for the transport of commodities, and organised a service of wagons, drawn by eight horses, for the improvement of the traffic of the district. But there was not a wagon to be seen. The stage-coaches from Berwick and Alnwick were left, horseless, before the inn windows, in company with a few farmers' gigs, likewise with their shafts thrown back; but there were no cracking of whips and tingling of bells; no cries; no noises; rarely a footfall.

After twenty years, within the last few weeks, Wooler has been revisited. There were the same little low houses, the same shaky old inn, the same poor pebbled footways, the same dull and dingy shops here, and the same bright ones there; the same lofty Roman Catholic place of worship at one end of the town, and the same stiff and square church untouched, untoned, even by time, at the other. It was as though not a breath had stirred, not a stone been turned in all the twenty years,—with one exception. This exception has arisen out of the establishment of a branch to the Alnwick and County Bank, for which enterprise new premises have been built on the opposite side of the road to the inn, and not far from it. It was market-day again. About a

dozen farmers passed in and out of the inn, or stood about the doorway, and one of them held in his hand a small bag containing a sample of corn, a handful of which he showed to two others who stood chatting with him. This was the only outward and visible evidence of any business transaction on this market-day, in this market-town for this wide countryside. Surely, in Robert de Muschamp's day there must have been as much going and coming, more clattering of horses' hoofs, more pomp and circumstance; for the barony was divided into as many as twenty-four members, and each division was held *in capite* by the service of four knights' fees. Surely, so recently as the days of the goat flocks and the invalids, there must have been more going on in Wooler than there is now. This quiet, this dead flatness, must be the result of being left alone, unconnected with the main arteries of the land, and is a fair sample of the unprofitableness of such seclusion.

A word as to the fabric of the church. It seems the barren, hard outlines are to be at last somewhat amended. Tracery is to be put into some of the ill-favoured square-headed windows. A gallery within is to be removed; and, eventually, a chancel is to be added. As it now stands, there are no aisles, no chancel, no porch, no pillar, not a buttress, or string-course; not a line, in fine, to cast a shadow, or make a break upon the spare rectangular block of excellent, but unmeaning, masonry. And at the foot of the rise on which the church stands, the stream we have mentioned purls and winds, and all round the horizon hill after hill breaks into fresh rising and falling outlines, setting the fairest example of movement and variety.

There is one more word to be said as to the consequences of being without the pale of railways, and this word is on the other side of the question. The old low prices for edibles still prevail at Wooler, or have been but comparatively slightly raised. Whereas the smart Railway Hotel, or Station Hotel, of the improving town, charges from 3s. upwards for a dinner, the old, last-century inn we have mentioned provides a good and substantial one, pleasantly served, for 2s., with a lower charge of 1s. 6d. for a post-boy's dinner. Though this is good news for the guest, it is, of course, of a piece with the limited fortunes of the place. Somewhat of the old spirit of Robert Muschamp, who was able to keep Wooler against the Scots and all comers, is evidently wanted at this day, at this place,—not, however, to keep comers away, but to induce them to come. Some strong, united effort should be made to secure the advantages of railway communication with the rest of the world, if the resources of the district are to be fully realised.

LIABILITY FOR THE DESTRUCTION OF COUNTY BRIDGES.

NICHOLLS *v.* MARSLAND.

On the 1st inst., in the Court of Appeal, Westminster, Lord Justice Mellish (with whom were Sir Baliol Brett and Sir Richard Amphlett) delivered the judgment of himself, the Lord Chief Justice, Lord Justice James, Sir Richard Baggallay, and the late Mr. Justice Archibald, the learned judges before whom this case was argued. It was an action tried before the Lord Chief Justice and a special jury at the assizes at Chester, and was brought by the county surveyor to recover the cost of rebuilding nine county bridges which were swept away by a flood on the 18th of June, 1872. The defendant was Mrs. Marsland, the tenant for life of an estate near Macclesfield, and it was alleged that through her default the sweeping away of the bridges occurred. The jury at the trial found for the plaintiff, with damages 400*l*. A rule was subsequently granted by the Exchequer Division to set aside the verdict on the ground that the calamity had occurred, not by any default of the defendant, but by the act of God. That Court gave judgment in the defendant's favour, and their decision was now affirmed.

MEMORIAL OF A LIBRARIAN.

We give an illustration of a sepulchral monument to the late Mr. John Perris, who was for fifty years librarian of the Liverpool Lyceum. It is erected in the Toxteth Park Cemetery, Liverpool, and is well placed near the entrance in Smithdown-road. The material employed is hard Yorkshire stone. The design, which is in the form of a Greco-Roman altar, is of simple character, and consists of a deep plinth and base supporting a large block forming the die, into one side of which is inserted a polished granite slab, containing the following epitaph, written by Mr. Charles Dyall, and inscribed in sunk and gilded letters:—

"Faithful to his trust, his duties were his pleasures. The student and the scholar are his debtors for valuable aid cheerfully rendered.



His long, useful, and honourable career endears his memory to numerous friends, who have erected this monument in testimony of their affectionate regard."

Around the necking of the cornice in large raised letters are the words:—JOHN PERRIS, DIED JAN. XXII., MDCCCLXXII. The whole is crowned by a pediment shaped like an open book as an appropriate symbol, and may be considered to be a successful blending of the realistic with the æsthetic. A dwarf stone kerb, enclosing some flowering plants, surrounds the grave.

The designs were prepared by Mr. Edward A. Heffer, architect, Kilburn.

THE NEW TOWN-HALL OF ERFURT.

As the history of the city of Erfurt, situate in the heart of Germany, and being one of the oldest towns of that country, is lost in the dim past, so the information regarding the origin of its principal buildings, of its churches, convents, and secular structures, is as precarious. As early as 954 A.D., when the Emperor Otto the Great granted certain privileges respecting Erfurt to his son, Archbishop Wilhelm of Mainz, a town-hall is said to have stood "on the street" (now called Market-street) leading from the oldest part of the city to the square in front of the cathedral. It has been proved that on the site now occupied by the new town-hall there stood in 1175 a building for municipal purposes, later chroniclers referring to a great fire extending as far as the town-hall. We learn further from old chroniclers that the town-hall was used already before 1258 as a house of assembly, or "Spelhaus" (modern German *Spiell.aus*, playhouse, used for dancing and other festivities), in which Archbishop Gerhard of Mainz is reported to have handed over the care of the administration of the city to a council consisting of twelve noble citizens and owners of neighbouring villages and two aldermen, to whose number were added later four representatives of the commune. In 1330 the treasury buildings and the tower adjoining it, with walls 18 ft. thick, were commenced. The latter, however, was left unfinished. There are later records of additions, alterations, and rebuilding; and thus the venerable pile, in the large halls of which many historical banquets were held, weathered all the storms of succeeding centuries until at last it had more the appearance of a ruin threatening to fall down than the meeting-place of the representatives of a city of 40,000 inhabitants. When, in 1830, in consequence of the outbreak of the French and Polish revolutions, industry and trade in Germany were almost at a standstill, the town-council of Erfurt, to find employment for the numbers of idle hands, came upon the idea of providing work for them by having old buildings pulled down, the tumble-down town-hall being one of them; but its demolition was not completed until 1866. In 1830 a fund for a new town-hall was formed, which, by donations, legacies, and accumulation of interest, had grown in 1869 to 110,000 thalers (16,500*l*.).

By that time the necessity of erecting a new town-hall had become imperative, for the Erfurters had then actually none, and the municipality resolved at last upon building. Among the seven designs sent, they chose that of the architect Sommer. The new town-hall of Erfurt, the subject of our illustration, is in the Gothic style, corresponding to the general character of the city. This style offers not inconsiderable difficulties for secular buildings to the architect. German domestic architecture of the Middle Ages has nothing of the showy decorative abundance of that of the neighbouring countries, nothing of the uncertain seeking after rules for ground-plan and building; the usual Gothic style of Germany is simple, animated by one law. This is testified by the town-halls of Brunswick and Münster, the houses of Nürnberg, the beautiful castles of the Prussian Order of Knights.

The architect of the Erfurt town-hall followed this German style, combining with it, however, an excellent element of Venetian Gothic: those open pointed-arch galleries in the ground-floor of the façade on the Marktstrasse, behind which is a row of shops. This part is interesting from the circumstance that the principle of an exaltation of the open arcade, which during the Middle Ages was only timidly attempted, for instance in the town-hall of Münster, has been resolutely, and consequent with and in close relation to the other parts of the building, carried out for the first time in a secular building of German Gothic. The back part of the building contains the municipal offices, the upper story the rooms of the town councillors. Corresponding with their more practical purpose, their outside is more sober in keeping as compared with the elaborate principal front, behind which are the rooms devoted to civic festivities. On this side, the narrow front of the building facing the Fischmarkt, is the open porch, with three entrances, occupying the centre three-fifths of the façade. Over this is the large hall, with three groups of windows, arranged in accordance with the window system of the aisles of Regensburg Cathedral. The two buttresses between the groups of windows bear upon corbels of original construction, under neat canopies, the statues, double life-size, of the present Emperor, William I. and of old Frederick Barbarossa, two fitting representatives of the new and the old German empires. The centre window is surmounted by the arms of the city, on both sides of which are battlements, the side gables towering over the other roofs. Thus this centre part shows also outwardly its festive character, by further masses extended forward and aloft, which contribute principally to the

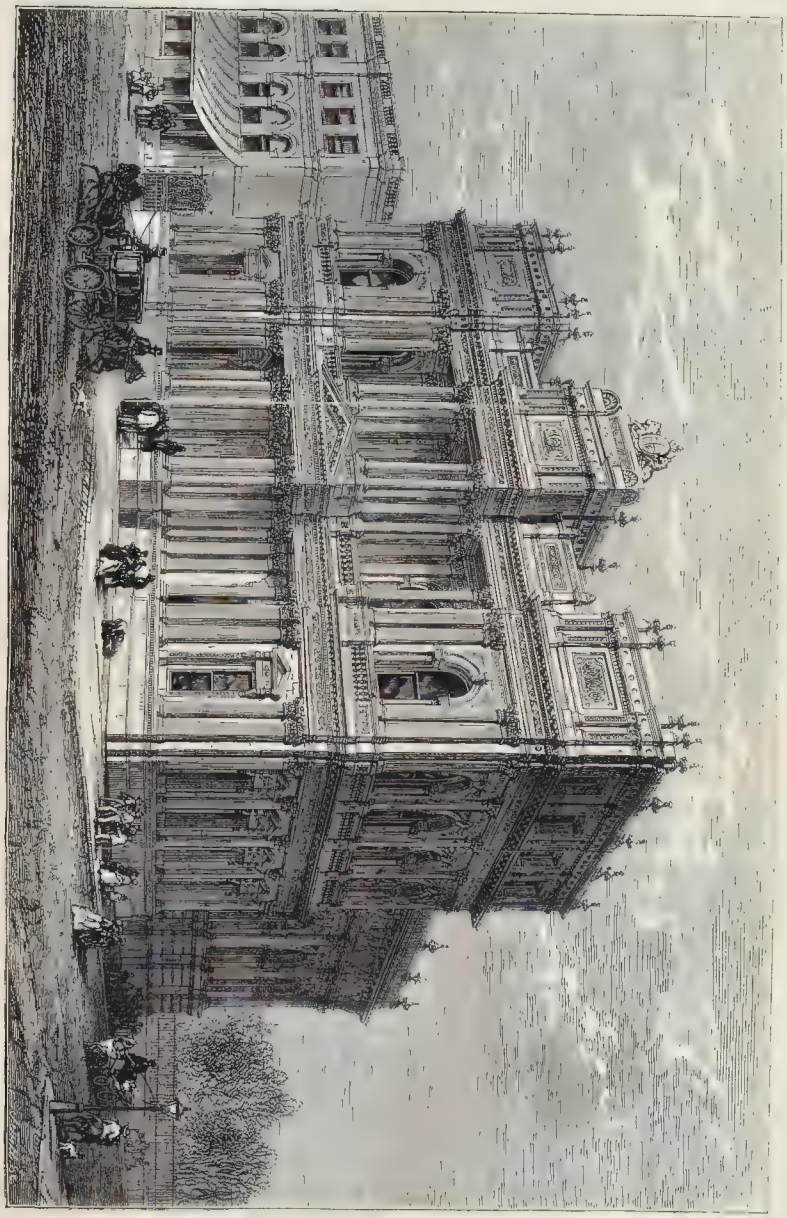


THE NEW TOWN-HALL OF ERFURT, GERMANY.—Herr Sommer, Architect.

imposing impression of the town-hall perspectively. The two other façades of the building, because they front narrow streets, are more simple, but are still in harmony with the style characteristic of the whole structure.

The arrangement of the ground-plan is of no less interest to connoisseurs than to persons not learned in architecture. In the vestibule may be recognised a subtly and practically transformed reproduction of the trefoil-like plan of Rhenish Gothic churches. It forms the entrance to all the stairs, rooms, and corridors of the building. The three aisles, to continue the comparison with Rhenish church architecture, correspond exactly to the treble outer porches, and form at the same time a delicate and simple mediation between the exterior and interior architecture. The constant trisection continues through the whole staircase as far as the great *foyer* of the large hall. Imposing staircases, as used during the Renaissance and the modern time, are scarce during the Middle Ages, which have only narrow winding stairs and large fliers, but no staircases in the modern sense. The stairs in Oxford University and in the castle of Meissen (Saxony) cannot be included. In consequence of the little disposable space that could be spared in the town-hall of Erfurt and the low corridor of the ground-floor, the construction of the staircase had to be attained at the expense of symmetry. The continuation of the stairs in the upper staircase, everywhere free and high, in connexion with the *foyer* of the large hall, on the contrary, is one of the most successful parts of the building. This *foyer*, forming a large hall of three aisles, with its delicate and slender pillars, arches, tracery, the picturesque openings, is a unique piece of work of its kind. The great hall, of nearly square form, is still unfinished, and will be decorated, like the larger wall spaces of the staircase and the *foyer*, with fresco paintings representing scenes from the history of Erfurt, the means for which have already been provided. The ground-story, on the side facing the market, has been fitted up for a restaurant, in which a flourishing trade is carried on.

The new town-hall of Erfurt, besides the ten shops in the ground-floor, and the rooms for a commissary of police and a housekeeper, will contain four large halls as well as fifty-four rooms for offices. It has cost the sum of 750,000 marks (37,500*l.*), including the cost of furnishing.



THE BANK OF SOUTH AUSTRALIA, ADELAIDE.—Messrs. Lloyd Tayler and E. W. Wright, Architects.

THE BANK OF SOUTH AUSTRALIA, ADELAIDE.

THE important building for the Bank of South Australia in Adelaide, of which we give a view, well illustrates the extent to which our colonial brethren are competing with the palatial buildings in the United Kingdom. The design was selected after competition among all the Australian architects, and is being carried out on a fine site situated in King William-street, the most important thoroughfare in the city of Adelaide. The building is faced throughout with stone from Australian quarries. It contains, on the principal floor, the banking-room, 67 ft. long, 42 ft. wide, and 32 ft. high, lighted by eleven large windows, fitted with embossed plate-glass of handsome design, protected by ornamental wrought-iron guards, and having the walls enriched with panelled pilasters and arches, with coupled Corinthian columns, with entablatures to the windows, massive ornamental consoles, and a deeply-coffered and enriched ceiling. The floor of the public space will be of Sicilian marble squares laid diagonally, with polished black marble dots at the junctions, and a bold fret border all round. The fittings embrace a recessed and enriched counter front, with carved consoles and moulded framing, with the upper parts filled in with ornamental bronze panelling. The approach to the public room is in the centre of the building through the vestibule, in which are detached columns and pilasters of fine Devonshire marble, with alabaster capitals, and a variegated marble dado on all sides. There are also some beautifully sculptured panels in the vestibule illustrative of the history of the colony, executed by Mr. Joseph Durham, A.R.A. The floor will be paved with marble to correspond with the banking-room. To the left of the entrance are the board-room, private entrance, and stone staircase. In addition, are ante-room, messengers' rooms, and second staircase; while on the right are the manager's and assistant manager's rooms, inspectors', clerks', and waiting rooms. The principal rooms are floored with Arrowsmith's parquetry, and the private entrance-hall and passages with Minton's ornamental tile-paving. The basement story, which is constructed in the securest possible way, both as regards fire and burglary, and occupies the entire area of the bank, contains strong-rooms in profusion, voucher-rooms, securities room, &c., surrounded by a patrol-passage. This portion of the building will rival many of the best strong-room arrangements in England. The first and second stories of the building are devoted to resident officers' apartments, and have every modern requirement; parquetry has been extensively used in the floorings. The banking-room is heated by hot water, and the other portions of the building by ordinary fire-places. The various internal fittings, electric bells, heating apparatus, &c., are all of modern character both in style and construction, having been sent out from this country.

The colonial architects are Mr. Lloyd Tayler, F.R.I.B.A., of Melbourne, and Mr. E. W. Wright, of Adelaide. The contractors for the general works are Messrs. Brown & Thompson.

It may be added that all the requirements from England have been specially designed or selected by the Bank's London architect, Mr. Ebenezer Gregg, who has also furnished the complete designs for the internal fittings.

ARCHITECTURE IN LEITH.

LEITH, like most of the old towns on the seaboard of the Frith of Forth, possesses some remains of quaint street architecture of a style which was influenced by that of the low countries with which the bulk of the traffic was carried on. Little care has been taken to preserve these remains, and some of them (notably a remarkably picturesque tower near the harbour) have been swept away.

A few attempts, and these not very successful ones, have been made to impart to new erections somewhat of the character of the old, but they are, without exception, forced and overdone. Most of the modern street architecture is, however, of the Vernacular type, and the public buildings, with the exception of some of the churches, are Italian in style. The Trinity House, situated in the Trongate, the commercial centre of the town, is in this style. The authorities of the Trinity House recently disposed of some dilapidated property adjoining that building, and a large block, to be called Trinity-chambers, now occupies the site, and is in course of completion. The new buildings are of dressed stone, and comprise a basement, four shops on the ground-floor, and two stories and an attic above. In the centre of the shops there is a doorway, giving access to the flats above, it is arched over, and has shafts of polished Peterhead granite in the ingoing with carved caps and an enriched architrave. All the window openings are spanned by semicircular arches, springing from red granite shafts with carved caps. The flanks of the first-floor are varied by oriel windows being projected over the shops. A cornice of good depth, with moulded corbels, runs along the wall head, and the attic windows are grouped so as to produce an effective skyline.

The thoroughfare of the Trongate being rather narrow, an arrangement was made whereby the new building is placed 7 ft. back from the old line of frontage, by which means a desirable improvement has been effected. The buildings were designed by Mr. R. Thornton Shiells, of Edinburgh.

ELECTION OF A DISTRICT SURVEYOR.

At the meeting of the Metropolitan Board of Works, on the 8th inst., the first business on the agenda was to receive applications from candidates for the appointment of district surveyor for the district of Bethnal-green (East), vacant by the death of Mr. R. Culver James, and to proceed to the election. There were twenty-seven candidates, whose names, and the number of votes received by each in the first voting, are as follow:—Messrs. A. Allom, 8; T. Blashill, 31; A. Bovill, 24; E. Carritt, 17; J. Clarkson, 24; H. H. Collins, 15; A. Conder, 3; J. M. Ferguson, 10; V. J. Grose, 25; F. Hammond, 11; J. Hebb, 5; F. W. Hunt, 18; W. A. Large, 17; W. C. Leonard, 3; G. McDonell, 14; A. Millwood, 4; A. Payne, 18; J. S. Quilter, 11; L. W. Ridge, 7; W. Seymour, 5; T. Stone, 18; W. Tasker, 23; F. Todd, 9; F. Wallen, 22; T. Williams, 17; T. W. Willis, 15; and J. Young, 13. The number of candidates was then reduced to the six who had received the highest number of votes, viz., Messrs. Blashill, Bovill, Clarkson, Grose, Tasker, and Wallen; and the second vote was taken as follows:—Blashill, 29; Bovill, 25; Wallen, 22; Tasker, 18; Clarkson, 15; Grose, 15. On a vote being taken as to which of the latter names should be struck off, the votes for retaining the names were,—Grose, 17; Clarkson, 15. Mr. Clarkson's name was therefore struck off. In the third vote the numbers were:—Blashill, 31; Wallen, 24; Bovill, 20; Tasker, 19; Grose, 9. Mr. Grose's name was struck off, and the fourth vote resulted as follows:—Blashill, 29; Bovill, 21; Wallen, 21; Tasker, 15. Mr. Tasker was therefore out of the running. On the fifth vote, the numbers were:—Blashill, 29; Bovill, 19; Wallen, 18. Mr. Wallen's name being dropped, the contest now lay between Messrs. Blashill and Bovill. The final voting was:—Blashill, 31; Bovill, 9. Mr. Blashill was therefore declared duly elected, subject to the usual conditions, viz.:—

"That the appointment of district surveyor be subject to the condition that he shall make no claim for compensation in case a diminution of income shall at any time hereafter arise from any reduction or alteration of fees by the Board, or from any change of system which may be adopted, either as to the office, its duties, or emoluments, or from any division, reduction, or re-adjustment of districts.

That the appointment of district surveyor be subject to the condition that he shall furnish the Board with information of those cases in his district in which the orders of the Board, or the requirements of the Local Management Amendment Act, 1862, with regard to the width or entrances of streets, or to any building, structure, or erection, or projection therein beyond the general line of buildings are not complied with, and of those cases in which the limitations contained in the building Act, as to the cubical contents of buildings, are exceeded.

That the district surveyor be required to keep his district office open, daily, from ten a.m. until four p.m."

Bromley Science and Art Classes.—The annual meeting and presentation of prizes in connexion with these classes was held recently, at the Town-hall, Bromley. Mr. E. H. Scott presided, and incidentally stated that he had last year great happiness in showing his desire to encourage the classes by a gift of 400*l.*, the interest of which was to be devoted to the purchase of prizes for successful students; but it was now his intention, by the addition of 600*l.*, to make the foundation (with the sanction of the committee) of a School of Art. The report, read by Mr. T. Davis, one of the honorary secretaries, recorded much useful work. Dr. Puckett is the head-master.

THE ART-UNION OF LONDON.

THIS Society,—following its general rule of constantly changing the *pabulum* provided to satisfy the yearly-reviving appetite of its subscribers, and diverging widely in subject from the works of the last two years, which portrayed two most important events connected with the career of England's greatest captains, the victories of Trafalgar and Waterloo,—now selects for its annual plate a far different scene; and, in the words of the Council's report, "addresses a far larger circle; it strikes a chord to which the soul of all Christendom must respond, leading up as it does to one of the most important epochs of the Saviour's life on earth,—the first occasion, namely, on which he appeared as something beyond 'the carpenter's son' dwelling under a lowly roof in Nazareth. At the close of the scene represented in the picture, it is recorded, as the first instance of any peculiarity in the child's nature, that he was found sitting in the midst of the doctors, both hearing them and asking them questions." While, some three years since, the subject chosen was Mr. Goodall's charming picture of "Rebekah at the Well,"—of her who seemed to express, by her looks, a kind of inspired awe at being chosen as the one who was destined to be the mother of "thousands of millions," and in whose seed should "all the nations of the earth be blessed,"—we had one of the most important events described in the Old Testament; we must now go forward nearly 1,900 years, and find, in the present subject, from the New Testament, an incident of the foreshadowed event.

Joseph and Mary, with their friends and kinsfolk had gone up to Jerusalem, according to the annual custom, to be present at the great Feast of the Passover, in the Temple; and on their return, in the course of the second day's journey, not finding their son in the company, they set out to return to Jerusalem seeking him. The moment selected by the painter is that in which, arrived within the walls of Jerusalem, Mary, weary with the prolonged journey over the hot plain of Palestine, and fearfully anxious lest the child might have been kidnapped by some of the tribes which constantly roved through the country, leans on the edge of the fountain, and seeks from the women who come to fetch water for tidings of her son. We are not prepared fully to endorse the opinion expressed in the Council's report, that the figure of Mary "will compare not unfavourably with the conceptions of Raffaelle himself," but there cannot be any doubt as to the touching sentiment, as well as feminine loveliness, in Mr. Armitage's representation of the Virgin Mother.

As to the interpretation of the picture by the burin of Mr. Jeens, we cannot bestow on it higher praise than is conveyed in a letter of Mr. Ruskin to the engraver, in which he calls it a "marvellous engraving," and says, "I hope you will derive some pleasure from my fervent admiration of your work, and the extreme interest taken in it, and the subject it illustrates, by my pupils."

We are informed that the impressions of the plate will be ready for the subscribers on the 1st of February next.

GRANITE BUILDING.

CONTINUING our remarks on this subject, it may not, perhaps, be uninteresting to notice a few Mediæval works in granite. It is, we believe, a somewhat prevalent idea that these exhibit in their design a necessary regard for the intractable nature of the material, and that their general character is bold and simple. Probably the greater number of ancient granite buildings have this character; but it is certain that the more notable examples of churches are particularly rich and ornate, and appear to prove that religious zeal was sufficient in those days to overcome all the practical difficulties in working the material with very inferior tools and machines to those of the present day. Granite is comparatively soft when immediately quarried, and probably advantage was taken of this, induration taking place after the details were worked.

The Church of St. Mary, at Launceston, in Cornwall, is one of the most elaborate Tudor buildings ever erected. Not only are jambs, arches, buttresses, cornices, and parapets, handsomely moulded as usual in this style, but every stone of the ashlar has some ornament or device carved upon it. The ancient cathedral of Aberdeen, dedicated to St. Machar, is the only

cathedral in Great Britain constructed of granite; but the following buildings are of this material, viz.:—Craigievar, Drum, and Crathes Castles in Scotland, and Harlech and other castles in Wales, and the buildings on St. Michael's Mount, in Cornwall. Brittany may be said to be the home of granite building, rich in details, and ranging in date from the twelfth to the sixteenth century. The Church of St. Thegonec is exceedingly handsome, and the churchyard is surrounded by singular buildings, forming a picture of extraordinary architectural richness. At the entrance is a triumphal arch, elsewhere an ossuary, calvary, &c., all in granite. Notre Dame de Folgoat is a fine Middle Pointed church, with transepts, west towers,—one with a spire,—and two magnificent porches, executed in Kersanton stone,—a nearly black basalt, harder than granite to work, but imperishable. The east window is a large circle filled with beautiful tracery, with an open arcade below. Here, externally, in a recess with carved and moulded jambs and a figure of the Virgin, is a holy well. This, according to an inscription, was the cause of the erection of the church.

The granite cathedral of St. Pol de Leon is very complete; and, in addition to western spires, has an eastern chevet and radiating chapels. The western arch of the transeptal crossing carries a large stone sanctus bell-cot, and there is an external gallery at the west end for giving the episcopal benediction.

The Collegiate Church at St. Pol de Leon (Notre Dame de Kreisker) has a central spire said to be 400 ft. high. It is said to have been built by an English architect invited to Brittany by Mary Plantagenet, daughter of Edward III., who had married one of the dukes.

Many other granite buildings in Normandy and elsewhere might be mentioned, but those we have referred to are sufficient to show that in a past age when tools and machinery were very primitive as compared with those of our own times, the workman had no hesitation in carrying out the most elaborate designs in this hard but most enduring material.

Sir,—In a letter addressed to you last week on this subject, Mr. Trickett says,—"It is a pity that parties who supply polished granite do not recommend their clients to wash it at the same time that they wash their windows, for then," he adds, "it might be said of it,—

'A thing of beauty is a joy for ever.'"

This, at all events, is not bad praise, the washing notwithstanding; and as any one can decide for himself whether polished granite really does require any more washing than it gets from occasional showers of rain, by taking a walk of ten minutes round about the Exchange, it is not necessary to discuss the question at length,—a few words will be sufficient. Where rain has access to it, it is as clean as anything can be in this mundane city that does not receive constant attention. Under cornices or other projections, the polish is temporarily deadened, and it would of course be well if owners or tenants would have these parts washed with a sponge occasionally, which is all that this hard, unabsorbent material requires. It is a pity that beautiful moulded and carved details in stone cannot be as easily cleaned.

The desirability of using polished granite for the façades of London buildings is a question of means to ends. It is perfectly well known and acknowledged that stonework is utterly spoiled by soot-absorption. New Portland stone is white; but, with about a year's exposure, the small portion of the New Law Courts already built may be said to be almost black from this cause. Ordinary bricks are little better than stone. Glazed bricks, though not absorbent, are unsuitable for a building of any architectural pretensions, and, therefore, polished granite is the only available substitute for stone if we are determined that our buildings shall look as well years after they are finished as when just completed. This is assuredly a desirable aim. At the present day the cost would be little, if anything, in addition to elaborate stonework, because the various colours of polished granite judiciously disposed by a competent designer would be almost sufficient without further ornament; but, if considered necessary, the incised work seen at Aberdeen would not be expensive, as compared with stone carving, as it can be executed by the steam sand-blast. The result would be, that instead of Cimmerian dulness reigning in our streets, we should have cheerfulness, richness, and cleanliness; and perhaps it is not too much to hope that we should be impressed with the truth of Mr. Trickett's quotation. If, however, while we are waiting the advent of the new architectural era, Mr. Trickett can persuade his own clients to clean their moulded and carved stonework he will do immense service in improving the present dingy appearance of London streets; but,—as nobody knows better than himself,—cleaning stonework is a very different thing to cleaning polished granite. It has been done at a church in Regent-street, and at the Fountain in George-street, Westminster, at considerable cost, and it may be feared it is not likely to be frequently adopted, however necessary it may be.

An Architect.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on the 8th inst., Mr. H. C. Boyes, president, in the chair, the following gentlemen were elected members, viz., Messrs. G. A. Waters, S. Burmester, B. Daniell, H. Taylor, W. E. Mills, E. C. Shearman, R. T. Morris, E. W. Rich, and H. Russell.

Mr. T. N. Laslett read a short paper descriptive of a new instrument of which he is the inventor and patentee, and to which he has given the name of "metroscope." Mr. Laslett said that in the ordinary practice of every architect it often occurred that existing buildings had to be measured, both for plans and elevations. The plans were easily got at, but it was often a difficult matter to obtain the elevations. The means now resorted to for obtaining the necessary dimensions were such as measuring from ladders, counting the courses of bricks, or clambering over roofs and along ridges, and dropping a tape over while an assistant read it. These methods were more or less accurate, but they were troublesome and even dangerous. The metroscope was designed to obtain the same results more exactly and conveniently. It was intended not only for the measurement of heights, but afforded a means of performing much, if not all, of the instrumental work required in ordinary practice, such as levelling, laying out off-sets, and measuring distances. Of the instruments at present in use for measuring purposes, the most important, next to the expensive theodolite, was the sextant, but there were two objections to its use. In the first place, it measured by degrees, and so rendered necessary calculations or a table to convert degrees into lineal dimensions; and in the second place, the angle subtended by a given dimension varied with its height, *i.e.*, 10 ft. at the base of a building would subtend a greater angle than 10 ft. at the top. Seeing that these objections applied to all instruments reading by degrees, and believing that an instrument, to be of practical use, must be as simple as possible, Mr. Laslett has adopted, in the metroscope, the principle of measuring by two similar triangles, the smaller of which is made on the instrument. In order to measure an inaccessible height, such as the top of a chimney-shaft, two things must be known: its horizontal distance from a given point (called the base-line), and its degree of elevation as seen from that point, which Mr. Laslett calls its "reading," as it was not marked in degrees on the instrument. For measuring an inaccessible distance, readings must be obtained from two suitable points, the distance between which would form a base line. Sometimes this base line formed part of the instrument itself, when it was of course very short, and could only be used for short distances. The metroscope allowed of the choice base line in three positions: firstly, in a vertical line; secondly, lying in the direction of the distant mark, and whether level or not; and thirdly, horizontal, but at right angles to the direction of the object. The metroscope was also useful as a level and as an optical square.

Mr. H. H. Statham then read a paper "On the Architectural Treatment of the Roof," which will be found on another page.

In the discussion which followed,

Mr. Sulman said he had been much interested in Mr. Statham's suggestions for making dome or vault coverings of permanent material, but he failed to see that much was to be gained by such a method. Would such a method of construction be taken for what it was by the observer: in other words, would the *ensemble* bespeak the construction? He thought not. As far as its appearance externally was concerned such a roof might just as well be of the ordinary construction. The chief difficulty in making the external covering of a dome or vault homogeneous with the dome or vault itself, in accordance with Mr. Statham's suggestion, was that the architect would be forced to remodel the whole of his design. As to the use of iron, it was almost impossible to make a stable roof without it, and he (Mr. Sulman) could not see the objection to its use in the form of ties providing that its junction with the wood was shown, and so that everybody could see what it was. He begged to propose a vote of thanks to Mr. Statham for his interesting paper.

Mr. E. B. Ferrey, in seconding the vote of thanks, said the paper was so full of suggestiveness and originality that it was difficult to say anything about it. He could not see any objection either to iron ties or to panelled roofs. When iron ties were used, of course they should not be gilded and made ridiculous for the purpose of attracting attention. In Italy the use of iron ties in roofs was quite common, and he never heard any one complain against them. As to panelled roofs, they were almost a necessity in this country, inasmuch as they made buildings covered with them warmer in winter and cooler in summer than would be the case with roofs open to the ridge. Another advantage of such roofs was that they afforded scope for colour decoration, a matter of great moment now that it was beginning to be generally recognised that churches and other buildings need not of necessity be always bare and Puritanical in internal aspect. He heartily seconded the vote of thanks.

Mr. S. Flint Clarkson said it could not be denied, he thought, that buildings which were roofed with identical or analogous material to that of which their walls were composed were more monumental in appearance than when totally different materials were used for walls and roofing. Buildings constructed and roofed entirely in stone seemed to impress the beholder with a sense of eternity, which was wanting when identity of material was not maintained. He had been much struck with this during the Charente excursion of the Association, when the church at Plassac was visited. He was disposed to fight vigorously against Mr. Statham's suggestion for abolishing the transverse rib in quadripartite vaulting. Even if it were not constructively necessary, it had the great advantage of being a ready means of dividing a long building into distinct bays, which was in accordance with the idea of subordination in design seen in all Mediæval work. With reference to the use of wooden vaults, he thought they were not so utterly indefensible as Mr. Statham would wish to make out. He (Mr. Clarkson) had always regarded with some species of satisfaction one argument used in their favour, viz., that the Mediæval architects could, on occasion, put up with make-shifts. He demurred to the dictum that a balustrade or a parapet at the base of a steep roof was an utter absurdity, for such features would at times save the passer-by from being buried in an avalanche of snow, and might occasionally prevent a stray slate from descending and guillotining him. Flat roofs on ordinary residences would be much more desirable if the ingenious suggestion could be carried out of conducting all our smoke away, as we conducted our sewage, and discharging it from one monster chimney at Purfleet or elsewhere, unless it could be destroyed or profitably utilised. At present, the chimney-pots of London militated against the enjoyment of roof gardens. A great deal of ridicule had been incurred by architects fifteen or twenty years ago by the absurdly-steep pitch they considered necessary for roofs of rustic buildings.

Mr. White could not help agreeing with Mr. Statham in thinking that concrete would eventually become a material much used for roofs and domes. It was well known that the dome of St. Paul's consisted, in reality, of two domes besides the intermediate cone; while the dome of the Invalides in Paris was made up firstly of a perforated dome, then another dome, then a forest of woodwork shaped externally like a dome. He had sat upon the top of that dome, when the lead was last repaired, and could testify to the fact that the oak woodwork had simply eaten into the lead which covered it, and the whole of the lead had lately to be removed and replaced. Surely domes might be built in England in concrete exactly similar to that of the Pantheon at Rome. He was quite sure that there were at least half a dozen special contractors in London alone who would be equal to the task if called upon. In India, on the plains of Delhi, domes were built in the twelfth, thirteenth, and fourteenth centuries, which looked very well exter-

nally as well as internally. There was no deception about them, and they looked like what they were,—honest constructions. True, they had no terminal feature surmounting them. Concrete roofs would certainly be far preferable to the vernacular expanded V roof of the speculating builder; and the distinction between the speculating and speculative builders should always be borne in mind. On the question of roof and skyline, it might perhaps be permitted to refer to the roof of the *Times'* offices. Looking at the top of that building some months ago, it was possible to see only a pediment, half the span and twice the pitch of that of the Parthenon. This pediment contained on the front a clock, and some leaves of the *Wellingtonea gigantea* and other colossal plants; but it had nothing whatever behind it. In a paper which he had read at the Institute about two years ago, on "The Hope of Architecture," and the *Quarterly Review*, he had wished, he said, to criticise that pediment, because he knew it had not been designed by an architect. The authorities at the Institute, however, forbade him to say anything about it, because they did not wish to offend the *Times*. Since then, however, the error had been admitted, and the space behind the pediment in question had been roofed in by slow degrees.

The vote of thanks to Mr. Statham having been carried by acclamation, and the Chairman having made a few remarks, Mr. Statham briefly replied on the discussion, and the proceedings terminated.

A HOUSE PURCHASE AND IMPROVEMENT COMPANY.

A COMPANY was some time ago formed consisting of city merchants and others, amongst whom is Mr. Sutton Gover, chairman of the London Markets Committee, Mr. Aste, chairman of the London Corn Exchange, &c., the objects of which are, as stated in the prospectus, the purchase and selling of productive and progressive house property, and also for improving the dwellings of the working classes, on the self-supporting principle. The capital of the company is 1,000,000*l.*, in 40,000 shares of 25*l.* each. One condition is that the amount of the shares is to be fully paid up as they are issued. It appears that the first issue of shares was 4,000, upon which the full amount of all the shares has been paid up, and thirty-seven different estates, at a cost of 75,000*l.*, have already been purchased. Whatever the company may yet have done in improving dwellings it would appear that it has so far been financially a success, inasmuch as at Michaelmas last interest at the rate of 5 per cent. per annum was paid, and in addition to this a bonus is about to be declared which will increase the dividend receivable by the shareholders to 8 per cent. This has had the effect of bringing up the shares to a premium. Last week a number of new shares were allotted by the directors, and they were immediately afterwards at a premium of 1*l.* per share. We know nothing of the management of the company.

Royal Academy Prizes.—The annual distribution of prizes to the students of the Royal Academy Schools was made on Saturday last. No gold medals were given this year. Two new prizes had been instituted experimentally, viz., a silver medal for a cartoon of a draped figure in chalk or charcoal, life size, subject given, "Boadicea"; and a silver medal for a design for a coin, subject, "The Two Faces of a Crown-piece of the present Reign." The following is the prize list:—Architectural Travelling Studentship, Thomas Manly Deane; Cartoon of a Draped Figure, silver medal, Frederick Hamilton Jackson; Painting from the Life, silver medal, Henry Gibbs; ditto, extra silver medal, Walter Charles Horsley; Copy of an Oil Painting, silver medal, Janet Archer; Design for a Coin, silver medal, [not awarded; Drawing from the Life, first silver medal, L. Lexden Pocock; ditto, second ditto, H. H. La Thangue; Model from the Life, first silver medal, Will. Silver Frith; second ditto, not awarded; Architectural Drawing, first silver medal, Sydney Vacher; second ditto, Eley Emlyn White; Drawing from the Antique, first silver medal, W. Gunning King; second ditto, Edgar Hanley; Model from the Antique, first silver medal, James Stirling Lee; second ditto, not awarded; Drawing executed in the Life School during the year, premium of 10*l.*, P. Homan Miller; ditto, extra premium of 5*l.*, Stanhope A. Forbes.

THE PAST AND PRESENT OF ARCHITECTURE IN IRELAND.*

THE subject on which I propose to address you this evening is "The Past and Present of Architecture in Ireland," and I may possibly add some anticipations as to its probable future. Recognising the presence of so many who, though taking an interest in our art, are not professionally connected with it, it seems most fitting that I should endeavour to deal with the subject in a popular rather than a technical manner. The details of architectural practice, the troubles and difficulties experienced by its professors, however fitting subjects for papers and addresses to be read before purely professional audiences, can hardly be of much interest to the general public; the results of that practice as they appear in the buildings of past and present times must command the attention of all who may be possessed of intelligence and taste. The controversies which agitate the surface of the architectural world are not altogether unimportant to the public; above all, the hard-fought "Battle of the Styles" still waged, with doubtful result, and which, if ever decided, must be by the verdict of the public, and not of architects.

When we contemplate the past of Irish architecture it is necessary to limit the field of observation somewhat, and to relegate a long period to the region of antiquarian rather than architectural interest. Our national poets have been wont (like poets, as usual) to sing of the glories of former times compared with the degeneracy of later ages. Those nations of the world whose past has been great and glorious have generally some other evidences of it besides poetic rhapsodies, and amongst these none are more enduring or conclusive than architectural monuments. Tried by this standard, we must admit that the remains of what I shall call the first period of Irish architectural history, namely, that prior to the Anglo-Norman invasion, do not attest any such great or glorious age as some of the poets would have us to believe; but, nevertheless, they are of deep interest to the antiquary, and we are especially indebted to our countryman the late Dr. Petrie for his investigation and illustrations of them. Other labourers in the same field have followed,—some extending their investigations to later periods; amongst whom Mr. George Wilkinson, the Earl of Dunraven, Mr. Marcus Keane, and the late Mr. Richard Rolt Brash, of Cork, deserve honourable mention. I understand that an important work of the last-mentioned lamented gentleman remained unpublished at the time of his death, which it is to be hoped will appear ere long. One of our members, Mr. Arthur Hill, of the same city, has devoted much time and attention to the geometrical delineation of these monuments, and has published clear and complete measured drawings of Cormac's Chapel, Ardfert Abbey, and other churches. Another young Irish architect has carefully measured and published drawings of Holy Cross Abbey, county Tipperary,—a most interesting specimen of the ecclesiastical architecture of Ireland during the Mediæval period, or that between the Invasion and the reign of Elizabeth. It is much to be desired that these separate and scattered illustrations could be collected and added to, so as to present a complete series of illustrations of the ancient and Mediæval architecture of the country, to do for it something like what the works of Britton and Billings have done for that of England and Scotland. Although possessing little of the magnificence of contemporary structures in France and England, the remains of Mediæval architecture in Ireland are distinguished by a simplicity and truthfulness of design and construction, a skilful adaptation to the local materials, and by some marked differences of style from contemporary buildings in England, which make them deserving of close study. It is gratifying that so many of them have been recently placed under professional supervision by the Government, and it is to be hoped their preservation from further ruin and decay will be the first object. Restoration it is almost dangerous to speak of, ending so often as it has done in total confusion and obliteration.

The next or third period of Irish architectural history, comprising the reigns of Elizabeth and the Stuarts, deserves more attention than has yet been bestowed on it. In this country, as well as in England, this period was distinguished not so much for the ecclesiastical as for the domestic buildings erected in it. The fewness and comparative poverty of the resident nobility and gentry of Ireland during that period, and the restless and disturbed condition of the country prevented the erection of any such extensive and sumptuous piles as Wollaton, Longleat, or Hatfield, and some attempts that were made in Ireland to rival those stately mansions seem to have been sadly interrupted; nevertheless there are some to be met with in different parts of the country highly interesting as architectural studies, and not the less so because they are often not altogether dissociated from the families to which they originally belonged. I may mention Leimaneigh Castle, in the County Clare, the ancient seat of the O'Briens; Donegal Castle, Ballyvourney Court, County Cork; and some others illustrated in Mr. Wilkinson's work, some of which would be well deserving of restoration and occupation, if but some of our local nobility and gentry could be induced to recognise the superior interest attaching to such a restoration, than to the erection of a brand new stuccoed pile, or mock feudal castle, which so many of them seem to think the acme of architectural excellence.

The fourth period into which I shall divide my subject (and it must be borne in mind that all such divisions are necessarily imperfect and conventional) is nearly coeval with the eighteenth century. This is doubtless a very important period in the political as well as architectural history of the country, and the one is intimately connected with the other. A well-known writer and participator in the transactions of the latter part of the century, the late Sir Jonah Barrington, characterises that century as having witnessed two events of no small importance, viz., "the Rise and Fall of the Irish Nation." There are some of us who presume to think that the historian should have carried his researches a little further back as to the rise, and left the history of the fall to be written by posterity. However that may be, it is unquestionable that most of our really great and noble buildings were erected not only during that century, but during the precise period of it which Sir Jonah selects for his history. The growing powers and importance of the Irish Parliament, culminating in the Declaration of the Volunteers in 1782, and ending in the Act of Union in 1800, had a most important influence on the architecture of the time. During that time, the more settled and prosperous condition of the country enabled the nobility and gentry to erect more stately and sumptuous mansions on their estates than had ever existed before. The holding of Parliament in Dublin required their attendance there for a great part of the year, and hence led to the erection of lines of stately town residences that still impart so much of dignity to our capital city. The Parliament House itself, great part of the Castle, the Law Courts, Custom House, and other important public and national edifices, bear witness that, whatever may have been the misdoings of the old Irish Parliament, it was not deficient in architectural taste, and displayed an honourable ambition that the public edifices of Dublin should not suffer by comparison with those of any other European capital. The late Lord Macaulay, while asserting in one of his essays that "there never was a more corrupt and tyrannical Parliament than that which sat in College-green," is obliged to admit in one of his letters that "the public buildings of Dublin (the work of the same Parliament) would be thought magnificent even in Paris." Whatever good it may have accomplished, the Union certainly inflicted a terrible blow on the development of architectural taste in Ireland, by at once sending the cream of our nobility and gentry to spend their winters in London instead of in Dublin; but it will be my pleasing duty to acknowledge shortly that the blow, however terrible, was not fatal, and that in the last period into which I shall divide my subject, namely, that since the Union, no small amount of progress in architecture and the kindred arts has been witnessed.

The eighteenth century formed an important epoch in the architectural history of England as well as of Ireland. The Renaissance or revival of classical architecture can scarcely be said to have been complete in the preceding century there; but in this it was fully accomplished, and it is remarkable that during the whole of the century we see or hear nothing of any style being practised but one. The early part of the seventeenth century was distinguished by a large admixture of Gothic elements with Classic; the portion of the nineteenth which has elapsed has seen the adoption of nearly every style that has ever

* By Mr. W. Fogerty, president. Read at the meeting of the Architectural Association of Ireland, December 7.

appeared; but during the eighteenth century, in Great Britain and Ireland at any rate, but one style prevailed, which we may call Anglo-Classic or Hiberno-Classic, according to locality. It was certainly a great advantage to the architects of that time that they had not to fritter their energies on an endeavour to master the principles and details of several styles, but, having thoroughly acquired those of one, could devote themselves to pushing it to the utmost point of excellence of which it was capable.

At two periods in the present century it became the fashion to decry without mercy everything that belonged to the style just referred to. One was early in the century, when the discoveries of Stuart and Revett led to the introduction of Greek forms and details; and the other somewhat later, when the works of Rickman, Pugin, and others led to the Gothic revival. All that was not Greek in the first case or Gothic in the second was looked on as beneath contempt. The beauty of it was that the Gothic revivalists had no mercy on the Greeks any more than on the sober Anglo-Classicists before them; and, after many years of bitter controversy, it was suddenly discovered that there was great merit in certain buildings of the early part of the eighteenth century, and, under the name of the "Queen Anne style," the style of that century seems likely again to become the fashion.

Independently of these vagaries of fashion, it must be allowed that the most substantial, splendid, and conspicuous monuments of architecture in Ireland are those of the eighteenth century. It was generally admitted that the public buildings of Dublin at the close of that century (as they appear in the drawings of Malton) were rather beyond than behind what might be expected for such a city. The Castle then assumed its present form, with the exception of the chapel (added in the next century); the western front, chapel, hall, and library of the University were erected; the Houses of Parliament, Custom-house, Law Courts, and Exchange all erected; though at the Union considerable alterations were made in the Parliament House to adapt it to the present purposes of a bank. Albeit, the work of several successive architects, it is a building of which Ireland may well be proud. Classical in detail, and symmetrical in arrangement, it is yet original in composition, and produces an effect peculiar to itself, and different from any other Classical building I know of. We never see St. Paul's without being reminded of St. Peter's; the Capitol at Washington reminds us of both; nor can we see the Madeleine without thinking of the Parthenon; but the Bank of Ireland is unique. I never can cross College-green without a good look at it. The Custom-house stands as a splendid memorial to the genius of James Gandon, whose life by Mulvany is well worthy the perusal of all architectural students. The Four Courts, originally planned by Thomas Cooley, were completed by him. Until the completion of the new buildings now in progress, London will have no such law courts; and the distinguished architect engaged on these latter, however ultra-Gothic in his tastes, was glad to borrow a few suggestions from the Dublin ones, although now about one hundred years old. The Royal Exchange (now the City Hall), also the work of Cooley, has been thought worthy of reproduction by our American cousins in Philadelphia.*

CORPORATION MARKET AT KNOTT MILL, MANCHESTER.

The design for the new covered market which the Corporation of Manchester propose to erect at Knott Mill has just been selected by the markets committee, and will be submitted to the city council for consideration. About three months ago, the corporation invited Messrs. Magnall & Littlewoods, Messrs. Barker & Ellis, and Messrs. Corson & Aitken, architects, of this city, to compete for the best design for the market. Plans were prepared and submitted to Messrs. Mills & Murgatroyd, architects, also of Manchester, who were asked to report to the markets committee upon their respective merits. Messrs. Mills & Murgatroyd have selected the design of Messrs. Magnall & Littlewoods as being the most suitable in every respect.

The land proposed to be covered by the Corporation to form the new market is divided into two plots, separated by St. Matthew's Church. That bounded on the west by Lower Byrom-street is the larger, and contains in the aggregate 4,400 square yards; the other, nearer Deansgate, contains 2,757 square yards of nett land. The construction of the market, as proposed by Messrs. Magnall & Littlewoods, will consist of cast-iron columns and pilasters, and the supports at each angle of the market, and on each side of the main avenues and entrances, will be square cast-iron panelled pilasters, which will give solidity to its general appearance. Internally the columns will be round, so as to offer as little obstruction as possible. In laying out the land the ground has been kept as clear as possible of obstruction by the formation in the centre of each plot of a main avenue 50 ft. in width. The height of the roof to the main avenues will be 35 ft. from the ground to the louvred part, which is to rise 3 ft. 6 in. higher, and is to be filled in with louvres for ventilation. The roof to this portion is to be elliptical in outline, constructed with wrought-iron principals, tied with wrought-iron rods, which will be at the height of 29 ft. from the ground in the centre. An alternative proposal which Messrs. Magnall & Littlewoods have made is, that a wrought-iron lattice construction, principally of elliptical form, of 50 ft. span, should be erected over the main avenues. This roof would not require rods, but would involve an additional cost of about 1,000*l*. The cost of the market complete, including columns and foundations thereto, for covering the whole of the land, would be 18,000*l*.

* To be continued.

NEW FLOUR MILLS, SUDBURY.

The opening of the large flour-mills erected by Mr. J. F. Wiseman, of the Borley Flour Mills, on a part of the site of the Chilton Brickworks, on the Cornard-road, a few hundred yards from the town of Sudbury, was celebrated by a public dinner. The portion which has just been opened is, however, only the first part of a large and important undertaking. The remainder is being proceeded with, and will probably be completed next spring. The building which has just been opened is 45 ft. in length, 28 ft. wide, and about 65 ft. high, and consists of four stories above the ground-floor. The walls are built of white brick. The foundation is 6 ft. wide, and up to the first story the walls are 2 ft. thick; the walls of the next two stories are 21 in. thick; those of the next story 18 in., and above that to the gable 14 in. On the ground-floor are six pairs of 4-ft. stones driven by spur gear, with an upright shaft connecting all the machinery above, and also meal and endless conveyors and elevators. In addition to the six pairs of stones are two pairs of 4-ft. stones on pedestals, and driven by a strap from the upright shaft. The stage or upper floor contains the sack tackle, bran-dusting machine, by Huntley, Holcomb, & Co., and offal-separator, also two sets of mill elevators.

The engine-room is situated at the back of the main building, and in this is a pair of compound engines, by Beal, of Greenwich, and of thirty horse-power nominal. The boilers were supplied by Messrs. Ware & Co., of London, and the whole of the machinery was fixed by Messrs. Barton & Stearn, engineers, Sudbury, and Mr. H. Brewer, of Long Melford.

The mill is constructed in three parts, so that in case of fire one part might be destroyed and the others left intact. The shaft, which is a few yards from the boiler-house, is 82 ft. high, and the opening at the top is 2 ft. 2 in. in diameter. Adjoining the mill at the east end is an open brick reservoir, 30 ft. deep and 10 ft. in diameter, at the other end are the counting-houses.

The builder of the mill was Mr. Wanford.

THE NATIONAL GALLERY.

Sir,—I am induced, through reading a letter in your last number, to write to you upon the subject of the ventilation of the new portion of the National Gallery. It would be presumptuous on my part to say the arrangements for that purpose are not all they should be; in fact, they have not been carried out properly yet. What I wish to call your attention to is that, as far as I can ascertain (having no access to the roof) the whole of the appliances in the east, north-east, and north rooms (now respectively numbered 12, 13, and 14) are all closed, consequently the foul air cannot escape from above nor can the fresh air enter from below. Where so many valuable pictures are placed, and where hundreds, and occasionally thousands, of visitors assemble, the ventilation is of great importance.

A Visitor.

"STRAITS OF BROMPTON."

MARLBOROUGH ROAD.

At a meeting of the Chelsea Vestry, on the 5th, Mr. Lawrence said he wished to say a word relative to the corner of Marlborough-road. An article had appeared in the *Builder* of last week, and also one on August 12th last, relative to the matter. It was really a very great question, and if the scheme could be carried out it would be attended with great advantages. It was suggested that the Marlborough-road should be widened at the Fulham-road end. One of the houses, a draper's shop, happened to be in Kensington parish, but all the others were in Chelsea. It was a matter which was certainly beset with difficulties, and it had been before the Board and the Improvement Fund Committee several times, but nothing had been done. There was a suggestion in that week's *Builder* that the parishes of Chelsea and Kensington ought to combine, and endeavour to effect the improvement, thus making a direct thoroughfare from Chelsea to Kensington. He moved the reference of the subject to the Improvement Fund Committee.

Mr. Compton seconded the motion, and hoped that the Metropolitan Board would be communicated with on the subject, as the improvement, if carried out, would be almost of a metropolitan character. The motion was carried.

The unanimity displayed leads us to hope that the effort will be made with a will, and so have a chance of success.

A NEW BRIDGE AT GLOUCESTER GATE, REGENT'S PARK.

The St. Pancras Vestry are about to construct a new bridge near Gloucester Gate, Regent's Park. At the meeting of the vestry last week, a report was presented by the General Purposes Committee, reporting that the First Commissioner of Works had at length agreed to give the Vestry the required extent of ground for the construction of a new bridge at Gloucester Gate, and recommending that the works should be proceeded with as early as possible.

Mr. Richards, in moving the adoption of the report, said that for twenty years the Vestry had been striving to get this new bridge constructed, and he congratulated them on having at last been successful. It would be of the greatest advantage to the parish, and they would now have a direct road between Park-street and Gloucester Gate.

The adoption of the report was unanimously carried.

In answer to a question, the Chief Surveyor said that the plans would be ready in about a month, and as soon as they were approved by the Metropolitan Board of Works tenders would be advertised for, and the works would be at once proceeded with.

A NEW ROMAN CATHOLIC COLLEGE AT CLAPHAM.

A new college for the ecclesiastical training of students for the Roman Catholic priesthood is about to be erected in Clapham-road. It is to be established under the auspices of the Rev. Dr. Danell, the Roman Catholic Bishop of Southwark, who has purchased a freehold plot of land, with a mansion thereon, in the Clapham-road, for the purpose. The purchase-money for the land and buildings which have been secured is stated to be upwards of 10,000*l*., and the erection of the new college will be immediately commenced. In carrying out the works it is intended to retain the existing mansion, which is to be utilised as far as possible for the purposes of the college. The plans which have been prepared include, in addition to alterations in the mansion, which is large and spacious, the building of a new wing in the first instance. These portions of the intended college are expected to be finished and occupied for educational purposes in the course of a few months, but the entire building will not be completed until about the close of next year.

Architectural Union Company.—At the general meeting of this company held on their premises, 9, Conduit-street, last week, a dividend of 6 per cent. was declared after carrying 10 per cent. of the net income to the improvement fund, and setting apart the usual sum for fine to City for renewal hereafter.

COST OF LONDON SCHOOL-BOARD'S SCHOOLS.

AT a recent meeting of the Board the committee reported the cost of the following new schools and additions to schools. The statement shows in what cases the authority granted to the committee to sanction extras up to 10 per cent. on the contract amount has been exceeded:—

Accommodation.	Name of School.	Expenditure authorised by the Board.	Extras authorised by the Committee.	Cost per Child.
	NEW SCHOOLS.	£.	£.	£. s. d.
502	Laystall-street, Gray's-inn-road	5,172	522	11 6 10
785	Creed-place, East Greenwich	9,040	507	12 3 3
832	Regent-street, Deptford	7,333	262	9 2 7
582	Sydenham-hill-road.....	6,228	47	10 15 8
753	Hindle-street, Shacklewell.....	7,283	324	10 2 0
596	Jessop-road, Brixton	6,108	351	10 16 8
607	Garratt-lane, Wandsworth	5,773	299	10 0 1
548	Lower Park-road, Peckham	5,605	778	11 12 11
1,105	Mantua-street, Battersea	8,989	1,457	9 9 0
878	Neckinger-road, Bermondsey.....	8,174	320	9 13 6
837	Manor-road, Bermondsey	8,646	133	10 9 9
841	Albion-street, Rotherhithe	8,322	454	10 8 8
841	Knapp-road, Bromley	7,483	532	9 10 7
546	Glengall-road, Cubitt Town	6,332	50	11 13 9
	ENLARGEMENTS.			
168	Cook's-ground, Chelsea	1,590	31	9 2 11
619	*Original School*	5,576		
277	Victory-place, Walworth	2,450	635	10 0 7
1,036	*Original School*	10,084		
100	Aldenham-street, St. Pancras	1,124	28	7 14 3
1,016	*Original School*	7,451		
	ADDITIONS AND IMPROVEMENTS.			
	Marlborough-street, Blackfriars-road	555	148	...
	London-fields, Bethnal-green	1,476	78	...

MORE NEW BOARD SCHOOLS FOR LONDON.

THE election of the members of the London School Board having resulted in a large majority favourable to the policy of the old Board, who had given notice of their intention to purchase land for the erection of twenty-eight additional new Board schools in different parts of the metropolis, it may now be taken for granted that the building of these additional schools will be carried out. The total quantity of land proposed to be purchased is 67,521 square yards, or between 14 and 15 acres in extent. The quantity of land to be purchased in the Chelsea division is 16,730 yards, or about 3½ acres, for the erection of six schools; in Finsbury, 2,137 yards, for two schools; in Hackney, 8,264 yards, or nearly 2 acres, for six schools; in Marylebone, 5,334 yards, for three schools; in the Tower Hamlets, 3,672 yards, for two schools; in Lambeth, 17,110 yards, for six schools; in Southwark, 5,135 yards, for four schools; and in Greenwich, 8,539 yards, for four schools.

BAD CONSTRUCTION OF THE NUNHEAD NEW RESERVOIR.

As is generally known the Southwark and Vauxhall Water Company have for some three or four years past been engaged in the construction of new works, to meet the requirements for the needed additional supply within their district, and an enormous outlay of capital has been incurred in constructing new reservoirs at Nunhead, and laying down several miles of new mains to connect the reservoirs with the company's intake. These works are now all but completed, and until within the last few weeks it was expected that the additional supply of water would be furnished to the neighbourhood of Nunhead, Peckham, and the surrounding districts by filling the new Nunhead reservoirs. An unforeseen circumstance has, however, prevented this, and it now seems quite uncertain as to how soon the additional supply contemplated by the construction of the new works can be furnished. It appears that the company have recently taken into their service a new engineer, and according to the half-yearly report of the company which has just been issued, this gentleman has made statements of a very serious character respecting both the construction of the Nunhead reservoir, its situation, and the nature of the ground upon which it is placed. According to the directors' report to their shareholders, he states that he is neither satisfied with its mode of construction, its position, nor the geological strata upon which it rests, and that it will require much consideration on his part before he can take upon himself the responsibility of filling the reservoirs with water, and bringing them into active use. The precise defects of the reservoirs, whether in point of construction or otherwise, are not stated, but it is to be presumed that these will all be explained to the shareholders at the meeting. In the meantime the reservoirs remain empty.

NON-FULFILMENT OF CONTRACT.

AT the last meeting of the Urban Authority of Portsmouth, the subjoined clause from the Roads and Works Committee's report was moved by Mr. Jepps and seconded by Mr. Cunningham:—

Your committee recommend the rescission of the resolutions passed by the Council on the 6th of October last, accepting the tenders of Mr. J. S. Gabriel, for granite and chippings, and Messrs. Lees & Co., for lamp-columns, in consequence of their failing to enter into the necessary agreements for carrying their respective contracts into effect, and they recommend the acceptance of the following tenders in their place:—

A. F. Manuelle, Seething-lane, London,—
Broken granite, per ton..... 11s. 8d.
Granite chippings, per ton ..... 7s. 6d.
Jukes, Coulson, & Co., Clement's-lane, London,—
1*l.* 12s. per column.

Mr. A. Nance, jun., said it appeared that directly the contractor found out his tender was the lowest he withdrew from it. Mr. Gabriel was by no means a small business man, and ought to be exposed for treating the Council in the way he had done. So far as competency was concerned, Mr. Gabriel was as able to carry out the contract as Mr. Manuelle.

Mr. Cunningham divided the blame between Mr. Gabriel and the Authority. When the contract was accepted it should have been signed before any order was given, instead of which, granite was sent for. It would not go through the proper gauge, being 2½ in. instead of 2 in., and when it was sent back by the borough engineer, Mr. Gabriel refused to forward the proper size under 1s. a ton more than the tender. There was no legal claim on Mr. Gabriel unless a stamped agreement, which would cost 10*l.*, had been used.

The clause was ultimately agreed to.

BREACH OF CONTRACT.

AT Worship-street, Thomas Edwards, Thomas Rutter, and James Higgins, cabinetmakers, were summoned before Mr. Bushby by Messrs. Lawes, cabinetmakers, of 65, City-road, for breaches of contract. The cases were heard separately, but all arose out of the same matter. The evidence of Mr. J. W. Benn, a partner in the firm, showed that the defendants were in their service as cabinetmakers. A mahogany wardrobe was required to be made, and the defendant Edwards had the estimate and plan of the work handed to him. He agreed to make it according to the plan for 4*l.* 2s. 6d. It appeared, however, that on the plan being shown to other men in the shop it was voted a new kind of work, and they said it should not be done under 5*l.* 2s. 6d. The men and the defendants were members of the same Society, which ruled that the work should not be done at the agreed price. Edwards accordingly threw it up, although he had signed the usual contract for the job. The work was then offered to Rutter, who signed for it, but the shopmen refus'd to allow it to be done, except at their price, and he also threw up his contract. After some time Higgins signed the contract, but he was also coerced into breaking it. The work, it was said, still remained undone. Under these circumstances, Messrs. Lawes & Co. took the present proceedings, and claimed 10s. damages from each defendant. Mr. Benn wished, however, to inform the Court that such a sum was merely nominal, and the proceedings had been taken to show the men that they could not be allowed to rule the shop.

Mr. Bushby ordered Edwards to pay 10s. and 2s. costs.

Rutter said he should have gone on with the work if the men in the shop had not threatened to break his head and "be on to him."

Mr. Bushby said that in using threats the men had committed a very great offence, and if brought before him they would find that the law was strong enough to reach them. He would be happy to grant summonses, if applied for. If, however, men like the defendant consented to such "bullying," and had not spirit enough to resent it and act an independent part, then he supposed such systematic terrorism would go on.

Mr. Benn said that the Society upheld the men in the matter, and had boasted that they could pay all the damages.

Mr. Bushby ordered Rutter to pay the damages claimed, with costs, and also made a similar order in the case of Higgins. The money was paid for the three defendants almost immediately.

Alfred Horne, of 8, Axe-place, Hackney-road, also appeared to a summons taken out by Messrs. Lawes for breach of contract in somewhat similar circumstances, and was ordered to pay compensation to the amount of 6*l.*

BUILDERS' ACTIONS.

LACEY *v.* VILLIERS—VILLIERS *v.* LACEY.

THESE were cross actions, in the Queen's Bench Division, arising out of transactions between the parties in relation to the pulling down of the old and building of the new Canterbury-hall, Westminster-road.

Mr. Day shortly opened the case. The plaintiff, a builder, carrying on a large business in the City of London, entered into a contract with Mr. Villiers, proprietor of the Canterbury Hall, by which he was to take down the old well-known hall, and build and reconstruct the new Canterbury for an agreed sum of 9,000*l.*, of which 7,500*l.* was to be paid in cash, and the balance, 1,500*l.*, was to be represented by the old materials of the building: and disagreements having arisen between the parties, it was in reference to the 1,500*l.* for the old materials that the action was brought.

The Judge, Field, having looked into the particulars and seen that the case involved questions of complicated accounts, and exhibited masses of figures, suggested that the matters in dispute would be far more likely to be settled to the satisfaction of the parties by submitting them to a referee than by a jury, and advised counsel that in his opinion would be best course for plaintiff and defendant to take.

Counsel, having conferred with their respective clients and their solicitors, agreed to his lordship's suggestion; and the case, withdrawn from the jury, went off accordingly for settlement by a referee.

Litigants in such cases, knowing the course usually pursued, might save themselves expenses by agreeing to reference without first going into court.

COMPENSATION CASE.

BIRD *v.* THE LONDON SCHOOL BOARD.—A NEW SCHOOL AT MILE-END.

THIS was a compensation claim in the Sheriffs' Court, before Mr. Under-Sheriff Burchell and a Special Jury, by Mr. Bird, of Portman House, Globe-road, Mile-end, for land belonging to him near his residence required for the erection of a new school.

The claimant had resided more than sixty years in Portman House, and he had considerable property in the neighbourhood. He had a garden and orchard, and the property would be depreciated by the erection of a school, which would be a "nuisance" to persons in the immediate neighbourhood. The land could be utilised in building, and would realise a considerable sum.

Several valuers were called, and the estimate was about 5,000*l.*, and a question was raised as to the extent required by the School Board. No evidence was given on the part of the Board. It was proved that land in and near London was rising in value, and it was said that builders expected about "ten per cent." for their money. For the Board 1,718*l.* was named as the full amount of the claim that could be made for the property.

The Jury awarded 3,000*l.*

Lichfield Cathedral.—Soon after Archdeacon Bickersteth's appointment to the deanery, he expressed his great desire to advance the work of improvement of the cathedral another stage, and to commence the renovation of the exterior, more especially the west front, which, though originally one of the most beautiful façades in the kingdom, is now for the most part faced with Roman cement. This cement was applied to it about fifty years ago, and is now beginning to perish in several places. The restoration will be directed by the cathedral architect, Sir G. G. Scott, R.A., the Dean's object being to reproduce the whole in stone in accordance with the guiding details, which still remain in several places, more especially the north-western tower.

GLASS ROOFS FOR LONDON.

Sir,—I notice in your issue of the 25th ult. a reference to the glass roof over my offices in Bunhill-row, by Mr. Knight, in a paper read at the Royal Institute of British architects.

As I have had many inquiries respecting this mode of construction, and it has now stood the test of time, having been erected when the offices were built in 1872, perhaps you would kindly allow me to take the present opportunity of stating my experience in the matter.

The roof proper is flat, of iron and concrete faced with cement, the underside of the roof forming the ceiling of the bedroom below; a parapet-wall is carried up about 3 ft. high all round, and on this wall a sill is laid; from this sill circular bars spring and meet on the centre, where there is a raised hopper for ventilation; sashes open at each end, but no ventilation is provided at the sides.

An inner wall, about 2 ft. 6 in. from the parapet wall and parallel with it, forms a tank running round the house with a clear floor-space in the centre. This tank is filled with mould and planted with vines.

It is not quite correct to describe this as the Paxton principle, as Mr. Knight has done. Paxton's Crystal Palace roof is on the ridge and valley principle, one curved iron rib being larger than the next, and straight wood bars reach from one to the other, forming a succession of ridges and valleys. This system would greatly reduce the space in the roof of a London house, and mine is a simple curved roof, very similar to my illustration in my weekly advertisement in the *Builder*. The bar being of wood, bent on a principle patented by me, where, by steaming the bar, bending it whilst hot on a saddle in three pieces, and screwing them together whilst there, the outer member of the bar acts as a truss on the inner member, and the tendency to spring back is almost entirely obviated; as an instance of the adaptability of wood thus bent to its purpose, I may mention that after being fixed now for four years not a single square of glass has been broken or even cracked through any movement of the bar. The glass, I may mention, is not bent, only common straight glass is used, and by having a deep rebate in the bar the curved line alone is seen giving so much the effect of bent glass that a close inspection is necessary to convince people the glass is not really bent.

I am thus particular in describing the construction of my roof as I find an objection is raised on the score of expense and the cost of repairs. Its first cost would be about 2s. 6d. per foot superficial for the wood and glass, and the cost of repairs would be perhaps a coat of paint every two or three years.

And now as to what can be grown. I have said I have planted vines. These are doing very well. I have already gathered one or two bunches of grapes, and I hope ultimately to produce as good a crop as can be produced in an unheated vinery of the same size, although I am only seven minutes' walk from the Bank of England.

I say unheated, but, of course, it could be heated very easily, being on the top of the house. A boiler in connexion with any fire-place in the house might be connected with it.

The advantages of such a mode of construction, if generally adopted, would be a very great improvement in the roofs of our houses. As glass is to slates and tiles, so would these improved roofs be to existing ones in those dull November days. The room on the roof would be the brightest room in the house. With the streets of London getting more crowded daily, the children of the care-takers, who must live as best they can in town, would have a playground cheerful and safe, and after the labours of the day are over, the room on the roof, with its vines overhead and its peeping bulbs below, is a pleasant beneficial change that any one having once enjoyed would not readily part with.

I am quite sure if these roofs were better known, they would become more general, and I shall be very pleased to answer any questions that may be addressed to me on the matter.

W. H. Lascelles.

SALT IN STONE.

1. Would sandstone, quarried in a sea cliff, about 7 ft. below high-water level, be so saturated with salt as to be unfit for using in building a dwelling-house, the mortar being made with fresh-water sand, and the walls battened?
2. Would it be practically possible to put such stone through a process which would get rid of the salt; and if so, what is that process?

L.

A CHURCH IN THE FOREST.

A church dedicated to St. Andrew has been opened in the Forest of Melksham, in the county of Wiltshire,—a wild and uncultivated district. This church in the forest is not only erected in the sylvan retreat of "Woodpecker tapping at the hollow beech-tree," and the lair of foxes, but must look for a congregation from a very scattered district.

To the liberality of the Rev. E. L. Barnwell this little forest church and its primitive woodcutters are indebted, at a cost of 3,700*l*. The site was given by Mr. T. J. Heathcote, and other friends have helped to embellish the edifice. The architect is Mr. Charles Adye, of Bradford-on-Avon, who also designed the super-altar.

The edifice—70 ft. by 20 ft.—is capable of seating 180 persons, which, with but a few seats for the aged, &c., are all unreserved. St. Andrew's in the Forest is built in the thirteenth-century style, and of freestone. It consists of nave, chancel, and vestry, the chancel arch springing from foliated corbels. The stained-glass windows, by Mr. Powell, of Whitefriars, are grand for so small a church. The communion-table, of oak, is a fac-simile of that in the church of Bois Sainte Marie, Soane-et-Loire, France, of the eleventh century. The font is a copy of the thirteenth century one of Lymshall, Herefordshire. Why?

SANATORIUM, BANTRY BAY.

In a recent brief article of the *Builder* respecting the beautiful retreat of Glengariff, as compared with other watering-places, it was omitted to state that, in addition to its wide range of incomparable scenic beauties, the degree of temperature during winter and spring is 3½° higher than Montpellier, although situated more northward by 9°; besides that, as a place of summer resort, it is milder and more equable; for here there is no sunstroke, no malaria, no mistrale, no bise: in fact, the native vegetation proves the mildness of climate, as we find the arbutus and other flowering shrubs in richest luxuriance, decorating its wild and varied vales, hill-sides, and scarped rocky passes.

Open to a bay of over twenty miles in extent, having a width varying from four to seven miles, bordered by picturesque and craggy coasts—Bear Island at the entrance of its wide, deep waters; Garinish Isle and Tower midway; and then Glengariff Bay, with several Romanesque islets, of which the sanatorium and hotel command the richest views, this site is unequalled by any other resort for invalids, being certainly more temperate during summer than Nice, or any of the Mediterranean seaports, which cannot be tolerated by tourists for residence after April.

It is stated in Prince Puckler-Muskau's Tour so far back as 1828:—"The climate is the most favourable possible for vegetation; that all sorts of evergreens, azaleas, rhododendrons, and even camellias, stand abroad during winter; and that dates, pomegranates, magnolias, lyriodendrons, attain their fullest beauty."

All medical men of note in Ireland now recommend their patients in consumption, laryngial or bronchial diseases, to visit Glengariff Sanatorium; and Dr. Gilbert Smith, of Harley-street, in 1875 wrote that in his own individual case he had derived great benefit from a two months' happy sojourn at the Eccles Hotel there.

Dr. Hudson, ex-president of Queen's College, Dublin, states:—"I first became acquainted with the place when suffering from a laryngial cough, which, however, rapidly yielded to the influence of its mild climate. Since then I have induced many invalids to resort to it, with decided advantage in every instance. Glengariff appears to me to be suited to those who require a mild climate, with shelter from prevailing winds."

The climate of this part of Ireland is attested by the class of plants which grow luxuriantly in the open air; and the meteorological table of the district proves that the average temperature exceeds London by 7°; Torquay, 6°; Cove, 4½°; Undercliff, 5°; and Penzance, 4°; the difference being still greater in the spring months. As a summer resort, the numerous drives through magnificent scenery confer a greater value upon Glengariff, which, although there is yet no railway nearer than twenty miles, may be reached from London within eighteen hours,—the grand drive to Killarney lakes (*viâ* Kenmare); the pass of Kemineagh, and Gougane Borra; the harbour of Bearhaven; the celebrated caves in Bantry Bay; the Sugar-loaf Mountain; Hungry Hill and waterfall; Adrigole harbour; the Priest's Leap; the Cloonie and Inchiquin lakes; Glanmore Lake and Cobduff Mountain: such a continuation of enchanting views is not to be found in any other country. Thus lofty mountains (from 2,000 to 3,000 ft.), with interesting hills, crags, and ravines, protect the north, north-west, and north-east of the Sanatorium, which is provided with 40 acres of grounds, having extensive walks and plantations; so that complete shelter from wintry winds is secured by nature, which also attempers the sea by the influx of the warm Gulf Stream tiding in at this south-west extremity of Ireland, from the Gulf of Mexico to Bantry Bay.

The existence of such a *refugium patientorum* has been but lately appreciated in Ireland, and being wholly unknown in England, these few particulars are given by T. H. H.

RISK AT THAMES DITTON.

Sir,—Perhaps there is no church in Surrey that claims the attention of archæologists more than that of Thames Ditton, having, for one thing, escaped damage in Cromwell's time; for here we find brasses, 1534, seven or eight about this date, some Norman-French on one of the pillars, and an old lance-shaped window, also a peculiar arch, a Norman font found buried in the church, and, as Murray says, a remarkable monument to the Seargeant Confectioner of Henry VIII., and various other interesting relics. Notwithstanding all this, it is doomed to destruction either by churchwardens or some other Solon. There are three gaslights, with three jets each, placed from the wall within a foot of the ceiling,—if to burn the ugly gallery down alone, so much the better, but to destroy this ancient church would be as atrocious as burning Canterbury Cathedral. T. Browne.

UNHEALTHY BUILDING AT BATTERSEA.

The evils of cheap building by those needy and speculating builders who run up houses merely to sell, had an illustration last week at the meeting of the Wandsworth Board of Works. A letter was read from the Rev. John Toone, vicar of St. Peter's, Battersea, drawing the attention of the Board to the fact that in Palk-road, Battersea, houses were being built upon rubbish and dust-shoots, without basements, and with boarded floors close to the earth, and that in scarcely any of the houses was there any provision for ventilation beneath the floors. The letter elicited a discussion amongst the members of the Board, but with no practical result, the generally expressed opinion amongst them being, that in the present state of the law as to building within the metropolis they had no power to remedy the evils complained of. Mr. Cox, one of the members of the Board, suggested that the attention of the Metropolitan Board of Works be drawn to the manner in which modern houses were often built in the Battersea district, on which the chairman remarked that the Board were perfectly aware of the evils caused by the practices by builders complained of in the letter. They had endeavoured, at the cost of thousands of pounds, to remedy it, but their hands were tied. The Metropolitan Buildings Act seemed only to provide against fire.

The Proposed Aquarium at Birmingham.—The plans of this projected building have been printed and privately circulated. According to a Birmingham paper, they show the aquarium tanks skirting the ground-floor of the central hall, of which they form the outer walls. The tanks are twenty-one in number, the largest being 50 ft. long and spacious enough to contain most important and interesting specimens. The table-tanks will be numerous, and placed in a conservatory, which will serve as a vestibule to the corridors of the aquarium as well as to the central hall. The floor above the entrance to the building will be used as a tea-room, the windows of which will open on to the upper part of the conservatory. The tea-room will communicate with a gallery running round the central hall, intended for the exhibition of scientific models. The central hall, flanked by the aquarium tanks, will be used as a concert-room. The site proposed for the building is in New Edmund-street.

A BIGGER "JACK" STILL.

A CORRESPONDENT, "W. B. S.," writes thus:—You have a notice of a great roasting-jack made for the Duke of Westminster's kitchen at Eaton Hall, in your paper of last week, and an account of one still greater—made for the "Teach Miodhchuarta," or banqueting-hall, of ancient Tara—may perhaps interest your readers.

This gigantic spit, called "Bir Neohin," or the Spit of Nechin, the chief smith of Tara, appears to have been half the length of the hall, and so constructed as to shut, or be coiled up, when not in use. A very old Gaelic MS., preserved in Trinity College, Dublin, describes it as—"a stick at each end of it, and its axle was wood, and its wheel was wood, and its body was iron: and there were twice nine wheels on its axle that it might turn the faster: and there were thirty spits out of it, and thirty spindles, and thirty hooks, and it was as rapid as the rapidity of a stream in turning: and thrice nine spits and thrice nine cavities [pots], and one spit for roasting, and one wing used to set it in motion."

The household of the Monarch of Erinn, that sat in the hall, numbered over a hundred, and the daily allowance for dinner was two cows, two salted hogs, and two pigs. A great double-handed vessel, called the "dabhac," or vat, held a hundred "drinkings," and the vat was furnished with fifty grooved golden horns, and a hundred pewter vessels.

Two plans of the great hall of Tara, with this great spit and its attendant "daul," or waiter, the "dabhac," and the different positions set apart for the company, taken from the "Book of Leinster" and the "Yellow Book of Lecaine," are given in the series of *fac-similes* of the National MSS. of Ireland, made at the Ordnance Survey Office in Southampton.

THE SPA COMPETITION, SCARBOROUGH.

SIR,—Some few years back the Cliff Bridge Company advertised for plans for laying out the new grounds, and offered premiums of 100*l.* and 50*l.*, the premiums to merge in the commission on the cost of the successful architect's plan. Numerous competitors from all parts of England sent in designs under motto. I was fortunate enough to obtain the first premium of 100*l.*, but as yet no extensive works have been carried out. I have also since the competition, by order of the committee, prepared various plans for skating-rinks, baths, extension of the promenade, &c., none of which have been carried out. I think, therefore, I deserve some consideration at the hands of the shareholders, having, as I consider, fairly won the position I at present hold of "Architect to the Cliff Bridge Company," and as it is the invariable custom when there has been a competition for the successful competitor to be employed for the carrying out of any works of a similar character, I hope no exception will be made in my case,—otherwise why have competitions?—for no architect of any standing would compete, did his success lead to nothing beyond the premium. The 100*l.* I received scarcely paid for the cost of getting out the competition plans, and further I prepared plans and superintended the construction of a retaining wall to the new ground at an outlay of about 800*l.* at no charge to the company; the commission on the same being 40*l.*, it reduced the premium of 100*l.* to 60*l.*, actually leaving me considerably out of pocket.

I do not think many architects are aware that at a meeting of shareholders, on the 13th of November, my plans were produced and approved of generally by the committee. They did not bind themselves to them in detail, for they were only sketch plans; since then the committee have issued instructions to architects, and in these instructions I see in clauses Nos. 1 and 4 they actually suggest what was shown in my plans, and which embodies the general scheme, thus giving to the public the benefit of all my thought and work. Of the injustice to me in this matter I will make no comment.

C. A. BURY.

THE NEW BRIDGE OVER THE REGENT'S CANAL, CHALK FARM ROAD.

SIR,—At a meeting of the Highways and Public Works Committee, held on Monday last, a member drew the attention of the committee to a letter that appeared in the *Builder* of the 2nd of December, signed "Matt. T. Shaw & Co.", in which the following misstatements are made:—

"The novel feature of utilising the two main girders to serve as gas mains emanated from and has been carried out by us. We have constructed these girders so as to be quite gas-tight,"—and I am directed by the committee to request your permission to correct the misstatements.

The idea (which is *not* novel) of utilising the two main girders to serve as gas mains did *not* emanate from Matt. T. Shaw & Co. It emanated from Mr. Hersey, the well-known and much respected Chief Inspector of the Imperial Gas Light & Coke Company. I had made provision for carrying a gas main of the same size only as the main that was laid over the old bridge, not knowing that the requirements o the gas company rendered necessary much larger mains over the canal for the supply of the district to the north of the canal. Mr. Hersey suggested the use of two of five main girders when he first became aware of their shape and size. The idea is not novel to Mr. Hersey. In 1871 the Imperial Gas Company constructed a bridge over Sir George Duckett's Canal—the "Three Colts-lane" Bridge—of which the three main wrought-iron girders are used as gas mains, the capacity of the three girder mains being equal to two 48-in. mains that are laid in Three Colts-lane (which leads from Old Ford-road to Victoria Park) on either side of the canal.

The other mis-statement I am directed to correct is this, "We have constructed these girders so as to be quite gas-tight." Unfortunately they are *not* so,—indeed, so little satisfactory is their condition as to gas-tightness, and the delay caused by the endeavours to make them so is creating so much dissatisfaction, that I have reason to believe the gas company contemplate the abandoning the idea of using the girders as gas-mains, unless they are rendered completely fit for that purpose within a very limited period.

WILLIAM BOOTH SCOTT, C.E.
Chief Surveyor to the Vestry.

St. Pancras.

"THE INFLUENCE OF BUSINESS REQUIREMENTS UPON STREET ARCHITECTURE."

SIR,—As my paper on the above subject, read at the Institute on Nov. 20th, was published *in extenso* in your journal, you will do me a favour by publishing the accompanying letter from Messrs. Belcher, having reference to my criticism upon Mansion House buildings.

Their explanation affords but another instance of the injury to architecture, and injustice to its professors, likely to result when employers fail to entrust the entire structure, with all its finishings, to the one master-mind of its designer.

SAMUEL KNIGHT.

In your interesting paper read before the Royal Institute of British Architects on "Street Architecture," &c., we observed in your otherwise flattering allusion to our Mansion-house Buildings, at the corner of Queen Victoria-street, that you just y criticise its "substructure of shops." Such is the value of frontage for advertising purposes that, in spite of our urgent request, the ground-floor was taken out of our hands, that experienced shop-front fitters might contrive to cover every available inch of space with plate glass! Massive piers which we had built at the circular corner were afterwards cut away, amongst other things, for this purpose. Thus we are in no way responsible as architects for this ground-floor, except the entrance to offices, which we with some difficulty maintained.

We believe that a re-action is now setting in, and healthy criticism will aid it. The shop-keeper is learning the fact that he can attract the attention of the public otherwise than by his goods and wares, and that a well-designed ground-floor in connexion with the upper structure gives a character to his business and distinguishes his shop from his neighbour's, and that with reasonable-sized openings or sub-divisions goods can be better classified and displayed.

J. & J. BELCHER.

CHURCH-BUILDING NEWS.

Hambledon (*Hampshire*).—The Bishop of Winchester has re-opened a fine village church, that of Hambledon in Hampshire. This church has double nave divided by a transverse arch, forming the entrance arch of a smaller church built in pre-Norman times. That edifice appears to have been enlarged by the addition of a northern aisle, whose massive pillars resemble those of St. Cross, near Winchester. Subsequently, a southern aisle was erected; and then, in the thirteenth century, an extension eastward was made by the erection of a second nave with aisles and a spacious chancel. This church retains the ancient feature of a gradual slope of the floor upwards, from west to east. The chancel was restored by the Ecclesiastical Commissioners under their architect, Mr. E. Christian; and the rest of the church at the expense of the parishioners from the plans of Mr. James Foster, of Southampton.

Shirburn.—The parish church of Shirburn has recently been re-opened, after restoration at the entire cost of the Earl of Macclesfield. The church, as it now stands, mainly consists of fourteenth-century work, but traces of a much older church have been found during the progress of the works. It consists of nave, chancel, north and south transepts, and north chapel, the latter being used as a burial-place for the Parker family. The church has been, with the exception of north transept and north chapel, entirely re-roofed, open roofs of stained deal, plastered between rafters, being substituted for the plaster ceilings and leaky roofs of old. The chancel roof is boarded with moulded ribs. A new south porch has also been built, and a stair turret added to the tower. The whole of the roofs are covered with Broseley tiles, of a warm brown tint. The floors of the nave and transepts are laid with Staffordshire quarries, arranged in various patterns. The floors of the chancel and sacrarium, and the mosaics of the reredos, were supplied by Messrs. Simpson & Co. The east window and west tower window have been filled with stained glass by Messrs. Ward & Hughes, of London; the subjects being—in the east window, "The Adoration of the Magi," and in the tower window, "Christ blessing little Children," the tower being used as a baptistery. The painted glass has been given by the Countess of Macclesfield. Some interesting discoveries were made during the progress of the works. In the south transept a fine Decorated window, concealed, on the inside, by a large monument, and, on the outside, by brick and plaster, has been opened and restored. The whole of the works were executed by Messrs. Symm & Co., of Oxford, under the direction of Mr. T. H. Wyatt, architect, of London, Mr. J. Stockham, Estate Clerk of Works, superintending.

Seend.—The chancel of Seend parish church, near Bath, has just been re-opened, after rebuilding. Seend Church is a Perpendicular erection, the nave and north aisle having been rebuilt in the fifteenth century, while the lower part of the old church appears to belong to a still older fabric. The chancel being considered very inadequate and unsuitable, the Vicar resolved, if possible, to rebuild it, and consulted Mr. A. J. Style, architect, of Thames Ditton, from whose designs the chancel has been rebuilt. In preparing his designs, the architect kept in view what he believed would have been the intentions of those who restored the church in the fifteenth century, had they been enabled to effect the entire rebuilding. Bath stone has been used in the construction of the building, the roof, which is covered with lead, being partly of oak and partly of pitch pine. The stalls are of oak. The total cost of the restoration has been about 1,000*l.* The contractor was Mr. R. D. Mullings, of Devizes.

Buckie.—All Saints' Episcopal Church, Buckie, has just been opened. The new church stands on the Square, on ground given by Mr. Gordon, of Cluny, the proprietor of Buckie, and may be described as of the Decorated Gothic style. Internally it measures 73 ft. by 21 ft. 6 in. It consists of a nave and chancel, the latter having a circular end. The chancel is separated from the nave by a stone arch, and is elevated by a series of steps, three at the arch, and two at the *sacrarium*. There will be accommodation for 180 persons. The entrance-door is at the south-west angle of the nave. A porch has been erected here, and above it is a tower and broached stone spire, rising to the height of about 100 ft. Mr. Ross, Inverness, was architect of the building, and the contractors for the whole of the work were Messrs. Stuart & Taylor, Peterhead. The gasfittings were supplied by Messrs. Cox & Son, London. The total cost was 2,000*l.*

The Ruins of Persepolis.—In a second lecture delivered to the members of the Midland Institute at Birmingham, on the 4th inst., Mr. Arthur Arnold said that two distinguished Englishmen who had written upon the ruins of the halls of Darius and Xerxes at Persepolis—Professor Rawlinson and Mr. Fergusson—had never seen them. Had Professor Rawlinson seen the buildings of Italy, of Greece, of Egypt, and of Asia, he never would have written of the ruins of Persepolis, and in particular of the Hall of a Hundred Columns, as the great pillared halls which constitute the glory of Arian architecture, and which even in their ruins provoke the wonder and admiration of modern Europeans, familiar with all the triumphs of Western art, with Grecian temples, Roman baths and amphitheatres, Moorish palaces, Turkish mosques, and Christian cathedrals. This is just the point in which the buildings of Persepolis fail. They are deeply interesting as records of the Achæmenian dynasty; they are illustrated books of priceless value in their inscriptions and sculpture; but for grandeur, and even solidity, they never were comparable to some of the buildings of Athens, nor among modern and Christian buildings to the church of St. Isaac in St. Petersburg.

STAINED GLASS.

Charlton.—The east window of All Saints' Church, Charlton, Wilts, has been filled with stained glass, the subject being the Crucifixion. The window is by Hardman & Co., of Birmingham, and was the gift of Earl Nelson.

Clive.—The little church in the village of Clive, near Grinshill, has just had all its windows renewed. The window over the reredos has been erected by Miss Catharine Harding, of The Clive. The subject of the design is the Ascension of our Lord. The memorial window and the other new windows are the workmanship of Mr. John Davies, of Shrewsbury.

Nottingham.—The new west window in St. Mary's Church, Nottingham, was dedicated on the 16th ult. The window is the work of Messrs. Hardman, and is stated to have cost 1,400*l.* The subject of the whole is the life of St. Mary. This window is in memory of the late Thomas Adams.

Dover.—A stained-glass window has just been added to Trinity Church, Dover. The centre light has been given by the Misses Pain, in memory of their late father, Mr. Thomas Pain, and another light by the family of the late Mr. John Hayward, as a memorial of their parents. The window altogether consists of five lights. Above these is a circular light. The work, which covers upwards of 200 square feet of glass, has been designed and executed by Messrs. Lavers, Barraud, & Westlake.

Buckland.—It has been determined to accept the design and specification of Messrs. Clayton & Bell for a stained-glass window for the north side of the chancel of Buckland Church, as a memorial of the late Rev. Joseph Moore, rural dean and vicar of Buckland.

Books Received.

The Economy of Workshop Manipulation. By J. Richards. London and New York: E. & F. N. Spon. 1876.

Books on construction generally consist of examples, drawings, and explanations of things constructed, but in most cases the learner can examine the things themselves. Examples and drawings relate to *how* things are constructed, but a better inquiry for a learner is *why* they are so constructed.

In studying a steam-engine, for instance, steam, as the motive agent, should first be studied, and an apprentice must first learn to regard force as an indestructible element,—something that may be measured and transmitted, but not created or destroyed, by mechanism; then the nature of the mechanism may be understood. But a learner should study the nature of the force which acts upon an engine through the example of, and as acting upon, that engine, and not abstractedly. Take, for instance, the case cited by the author, "the sum of the squares of the base and perpendicular of a right-angled triangle," being equal to the square of the hypothenuse. "How dull and objectless it seems to a young man," without knowing a purpose to which the problem is to be applied. But if the same learner were to see the foreman of a building squaring a foundation by measuring out six on one side and eight on the other, and ten across from point to point, he might see in this operation the application of that tiresome problem, and would awake to a new interest in the matter. And so, in studying the force of steam or of water, if he regard it as applied to an actual engine he will study it with more effect.

In designing the parts of an engine, or anything to which motion is to be given, regard must be had to experience in the velocity of the motion in actual machines. The author's remarks are mostly of a general character on machinery; but in the matter of shafts he says that experience has demonstrated that, for ordinary cases, where power is transmitted and applied with tolerable regularity, a shaft 3 in. in diameter, making 150 revolutions a minute, its bearings three to four diameters in length, and placed 10 ft. apart, will safely transmit 50-horse power. The strength of shafts to resist torsional strain varies as the cube of the diameter, and by assuming the above-described example to be true,—and it can be proved in numerous examples in practice whether it is true or not,—the diameter of a shaft to transmit greater or less power can be ascertained. The length between the bearings should be as the diameter, and the speed inversely as the diameter. The transmission of power by means of belts, by gearing, by water, and by air, is commented upon by the author; and in respect of the use of air he gives a few useful directions for consideration:—1. The value of pneumatic machinery in reaching places where steam-furnaces cannot be employed. 2. The use that may be made of air after it has been applied as a motive agent. 3. The saving from condensation, to which steam is exposed, avoidance of heat, and the consequent expansion and contraction of long conducting pipes. 4. The loss of power by friction and angles in conducting air through pipes. 5. The lubrication of surfaces working under air-pressure, such as the pistons and valves of engines. 6. The diminished cost of generating power on a large scale compared with a number of separate steam-engines distributed over manufacturing districts. 7. The effect of pneumatic machinery in reducing insurance rates and danger of fire. 8. The expense of the appliances of distribution and their maintenance. We commend these remarks o the attention of our readers.

Throughout the book are dispersed hints and remarks useful alike to the apprentice, the workman, and the master.

VARIORUM.

Under the title of "Rough Sketches from the Hebrides," Miss Florence Selous is contributing to "Chambers's Journal" some graphic papers on this little known district. We quote a few sentences from her "Glimpses of Skye":—"Before quitting the Highlands, I must say just a few words about the people who live and die in these beautiful regions of mountain and valley, lake and sea. The rain, and the mist, and the sharp mountain air seem favourable for the development of muscle and bone, for these men and women are a fine, stalwart, healthy race; in many places, especially among the sailor and fisher classes, they are a handsome race as well, with fair hair and skins, fine features, and keen eyes. In and about Stornoway, many of the women are beautiful, and their beauty is set off to great advantage by a very picturesque costume. But everywhere, whether handsome or not, we have found them characterised by a peculiar gentleness and courtesy of manner, by a natural refinement, that removes them utterly from the very slightest tinge of vulgarity and commonness, and by an intelligence and cultivation which are rarely met with among the lower classes in the south. Not only do they nearly all read and write, even those who dwell in miserable mud hovels, but many of them read books, and think, and deliver themselves in well-chosen and intelligible, if quaint English, on various subjects of public and individual, or even political, interest, upholding their own opinion warmly and well when they happen to differ from you. Many of them feel and speak strongly on the subject of the system of large landholderships that prevails throughout the Highlands to the exclusion of peasant proprietors, and also of the severity of the game-laws, and the harshness of the punishments attendant on the breaking of those laws. In their speech they are singularly refined; and the very poorest, even when quarrelling, rarely make use of the vulgar, meaningless, and brutal words and oaths that disgrace and disfigure the speech of the poor in England either in town or country. As for real kindness, ready sympathy, and willing help in any emergency, I think these Highlanders cannot easily be surpassed."—*Cassell's Family Magazine* suggests comfort for cold journeys:—"During a far and tedious journey, the want of some method of warming railway carriages is a bitter experience to most travellers. Foot-warmers are not enough, and even these are not always available, or even procurable. People have, therefore, to remain, in half-frozen wretchedness, and it is, perhaps, not too much to say, that railway discomforts kill more people than railway accidents. A French inventor, however, has contrived a combustible compound which may help to introduce a golden age for travellers. 'It is,' he says, 'susceptible of numerous applications, but it is specially designed for warming vehicles employed for the transport of passengers on railways and common roads.' The base of this new fuel is carbonised tan or wood-bark, which is mixed with a small quantity of nitrate of lead, or spirit of nitre; slaked lime or loam being added as agglutinative or agglomerative matter. The composition burns very gradually, and the combustion may be rendered still slower by adding to the above materials a small quantity of the dust of wood-charcoal. Neither smell nor smoke is given off, and the new compound not only ignites with the greatest facility, but once ignited burns continuously and uniformly. A small quantity burned in a footwarmer or chafing-pan, with a limited supply of air, will not be completely consumed for about sixteen hours, and during that time will develop heat enough to warm a compartment of an ordinary railway carriage."—Messrs. T. Pettitt & Co. have issued a new pocket diary ruled for quantities, specially for the use of architects, surveyors, and builders.—"Mr. Punch's Pocket Book" retains its usual character. The frontispiece illustrates amusingly "the Autumn (Matrimonial) Manœuvres." Mr. Tenniel's "Modern Munchausen" is excellent.—We understand that of Captain Burnaby's "Ride to Khiva" not less than 1,000 copies, in addition to the large number required by the other libraries, have been taken by Mr. Mudie alone; that the first and second editions of the work were exhausted in a week; and that a third edition is already nearly exhausted. A fourth edition is in the press.

Miscellanea.

Art Teaching.—Mr. W. H. Fisk, of University College, delivered an address on Monday on this subject before the Society of Lady Artists, in their gallery, Great Marlborough-street. Mr. Fisk said that in the course of an experience of over thirty years in teaching he had learned the requirements and the difficulties of students. In the first place, art was a craft, and to produce good work certain rules must be followed. In a painting school, the subjects necessary for a pupil to study were form, methods of painting, composition, effect, colour, perspective, and the aspects of nature. As to whether the study of form should be pursued from the life first or from the antique, the antique, he said, should be used for improving the taste, but the pupil must be educated to understand where the beauty of the antique lay. With respect to methods of painting, the various methods used by the old masters should all be taught to the student, when he would discover some method through which he would feel that he could express himself with the brush. The rules of composition, colour, and effect should also be learned, for this reason,—that if a student had no feeling for any one of these, the knowledge of the rules would prevent his making blunders. The great evil of the present art-teaching was that the teachers staked everything upon the chance of the pupil having a feeling of art; and the rules which he urged as of importance after his long experience were lost sight of. A pupil could only learn his craft through the medium of analysis, and therefore the study first of all should be analytic. He considered it disgraceful that in this country there was no school for the students of landscape-painting.

Improvements in Prince's-street, Edinburgh.—Although, so far as the reconstruction of the Prince's-street carriage-way is concerned, arrangements with the Tramway Company and the Road Trust have not yet been completed, the City authorities, with a view to push on the work connected with the improvement of that important thoroughfare, have invited estimates for the widening of the north foot pavement and the erection of new parapets and railings alongside of the gardens. The probable cost of the work, for the portion of the street between Hanover-street and Hope-street,—being the section included in the agreement between the corporation and the West Prince's-street proprietors,—is stated at 12,160*l.*, 2,344*l.* going for the railing, copestone, &c., 7,412*l.* for the carriage-way, and 2,404*l.* for the foot-pavements. On the portion of the thoroughfare between Hanover-street and South St. Andrew-street, the expenditure is expected to be 6,084*l.*,—781*l.* for railing, 4,378*l.* for the carriage-way, and 925*l.* for the foot-pavements. The remaining part of the street has not been included in the estimate of the cost.

Bristol Free Libraries.—The active chief librarian, Mr. J. F. Nicholls, has just now issued an Index Catalogue of the volumes in the Central Library, King-street, Bristol,—including both the Lending and the Reading Department. The collection in the various Public Free Libraries there has become a very large and good one.

A Well-Earned Compliment.—Last year, when Mr. B. T. Brandreth Gibbs was for the thirty-third year elected the honorary secretary of the Smithfield Club, the Prince of Wales then being president of the Club, and occupying the chair, a special vote of thanks was given to that gentleman. This vote of thanks was duly engrossed on vellum, and enclosed in a handsome box of triptych form, made of coromandel wood, mounted with heavy ormolu hinges, ornamental clasps, and monogram in Mediæval style, made by Leuchars & Son, of Piccadilly. To add to the satisfaction of Mr. Gibbs at receiving such a testimonial of his long and useful labours in connexion with the club, the Prince of Wales graciously undertook to make the presentation in person. The Royal party, with the members of the council of the club, Mr. Gibbs, Mr. R. Leeds, Mr. Sidney, Professor Simonds, Mr. Beck, and other gentlemen, being assembled in the board-room, the resolution was read. It was headed "Smithfield Club. President, his Royal Highness the Prince of Wales, K.G. At a general meeting of the members, held Dec. 7, 1875, resolved unanimously that a special vote of thanks be presented to Mr. B. T. Brandreth Gibbs on the occasion of his election, for the thirty-third time, as honorary secretary, in recognition of the interest he has taken in the club, and the valuable and efficient services he has rendered it for so many years." This engrossed copy was taken from the box by the Prince, who affixed his sign manual, and then placing it in Mr. Gibbs's hands, said,—"I have very great pleasure in presenting you with this very well-earned testimonial." Mr. Gibbs, in reply, said,—"I have to offer your Royal Highness my most sincere thanks for the very great honour you have done me in deigning to present this to me personally. The fact that it bears your Highness's signature also greatly enhances its value in my estimation."

Disparity of Wages in London and Provincial Towns.—The *Lytham and Kirkham Times* of the 29th ult., writing under the heading "The Building Trade," says that for a considerable time there has been an under-current of dissatisfaction amongst provincial artisans, arising from the disparity between the wages paid in London, and (say) in Liverpool, Manchester, and Leeds. "It is true, that this course of discontent has not, as yet, been brought prominently to the front, but that it exists, and is widely spreading, is beyond all question. Complaints are also rife in all of the trade unions respecting the imperfect arrangements that have been made with the view of equalising wages in different districts. We do not know, nor do we at present care to inquire, what grounds there are for the dissatisfaction and discontent. We have only to chronicle the fact, and further state that we are informed, upon unimpeachable authority, that by one branch at least, of the building trade, there is organising a strike to take place early next spring, which, if successful, will put upon a par the wages paid in London and those of a wide manufacturing district in Lancashire. It is said the demand made will be for tenpence per hour,—and for the working time to be limited to forty-nine and a half hours per week. Notice of this impending strike has already been given by the officers of one if not more of the trade unions."

The Thames Valley Drainage.—Colonel Cox, the Local Government Inspector, reporting on the recent conference held on this question, says that, so far as the information before him enables him to form an opinion, it is that a scheme to unite for purposes of main sewerage Kingston, Surbiton, New Malden, Hampton Wick, Teddington, Twickenham, Richmond, Ham Common, East Molesey, parts of Kingston, and parts of Richmond Rural Sanitary Districts, is a practicable one, and one which it would be to the advantage of those districts to adopt. He accordingly suggests that the Local Government Board should direct a formal inquiry under section 279 of the Public Health Act on the application of the Hampton Wick Local Board, which would enable further information to be obtained so as to ensure that a decision may be come to as to whether or not a provisional order should be made forming a district.

Burton-on-Trent Archæological Society. On the 5th inst. there was a general meeting of the members of this Society in the Grammar School, when Mr. W. Molyneux, F.G.S., read the first portion of an interesting paper on "The Old Bridge of Burton-on-Trent."

London Water Companies.—The certified expenditure of the eight metropolitan water companies down to the end of the year 1875 was as follows:—New River Company, 2,792,201*l.*; East London, 1,898,087*l.*; Southwark and Vauxhall, 1,766,904*l.*; Lambeth, 1,215,706*l.*; Grand Junction, 1,190,729*l.*; Chelsea, 979,973*l.*; West Middlesex, 916,696*l.*; Kent, 535,910*l.* The total is 11,296,206*l.* About 360,000*l.* of this amount had been expended in the course of the year 1875, and as further expenditure was required for improvements in storage, filtering, and distributory works, the aggregate capital laid out must by this time be nearer twelve than eleven millions. In reporting on the companies' accounts for the year 1875, Mr. Stoneham, the author appointed under the Water Act of 1871, notices the practice adopted by some companies of borrowing from their bankers for purposes of revenue, or habitually keeping in hand a balance of capital to be temporarily appropriated towards defraying current expenditure and carrying on the daily operations pending the collection of the water rents.

The Thornton Viaduct, Bradford.—The keystone of the last arch of the large viaduct at Thornton in connexion with the Bradford and Thornton Railway was laid by Mr. Isaac Wood on the 29th ult. The first arch was keyed on May 2, 1874. The viaduct is 280 yards in length, and is an S-curve, the curvatures being at the two extremities of the viaduct. It is composed of twenty arches, each of 40 ft. span, the greatest depth being 108 ft. to the bottom of the Pinchbeck Stream, about 17,000 cubic yards of masonry, and three-quarters of a million bricks being used. The stone has been supplied from Messrs. Farrar's quarries at Bell Dean, and the bricks by Messrs. Thwaite, of Thornton. The engineer of the railway is Mr. John Fraser, and Mr. H. J. Fraser, resident engineer, from whose designs the viaduct has been built, and the work of construction has been under the supervision of Mr. Henry Wilson. Messrs. Benton & Woodiwiss are the chief contractors for the line, their manager being Mr. E. Shaw.

Reported Discoveries by Dr. Schliemann. The following copy of a telegram from Dr. Schliemann to the King of the Hellenes has been received at the London office of the *New York Herald*:—

"To his Majesty King George.

With unbounded joy I announce to your Majesty that I have discovered the monuments which tradition, as related by Pausanias, points out as the tombs of Agamemnon, Cassandra, Eurymedon, and their companions, who were all killed whilst feasting at a banquet by Clytemnestra and her lover, Ægisthus. These tombs are surrounded by a double parallel circle of tablets, which were undoubtedly erected in honour of those great personages. In these tombs I have found an immense archæological treasure of various articles of pure gold; this treasure is alone sufficient to fill a large museum, which will be the most splendid in the world, and which in all succeeding ages will attract to Greece thousands of strangers from every land. As I am labouring from a pure and simple love for science I waive all claim to this treasure, which I offer with intense enthusiasm in its entirety to Greece. Sire! May these treasures, with God's blessing, form the corner-stone of immense national wealth.

DR. HENRI SCHLIEMANN.

Mycenæ, Nov. 28, 1876."

Crystal Palace.—The dramatic season of 1876 at the Crystal Palace has been one of unusual activity, and its close has been marked by an event that may be justly claimed as one of considerable importance, namely, the production, for the first time on the English stage, of Euripides's drama "Alcestis," with Mr. Henry Gadsby's music to the choruses. The revival of Sophocles's "Antigone," with Mendelssohn's music, led to the first English stage performance of the same great tragedian's "Œdipus at Colonos," also with Mendelssohn's music; but the performance of "Alcestis" has an interest surpassing that attaching to the performance of its predecessors, as not being a rendering of an English version of a German version of the original, but an attempt to represent a Greek play by means of a direct English translation, and with music by an English composer.

A Contractor committed for "Manslaughter."—The Coroner for the borough of Windsor has concluded an inquiry respecting the death of Francis Tarrant, who was killed by falling from the steeple of the Wesleyan Chapel now in course of erection on St. James's-walk. Mr. Geo. Reavell, the contractor, was examined. The jury, after deliberation, came to the conclusion that "Mr. Reavell had been guilty of culpable neglect," which, the Coroner said, amounted to a verdict of manslaughter. Mr. Reavell was formally committed for trial.

New Skating-rink at Nottingham.—A new skating-rink, called the "Alexandra," has just been opened at Nottingham. It covers an area of 1,235 square yards, but an additional 600 yards have been secured with the object of establishing an outdoor rink. The building is a brick structure 60 ft. high, and the shape of the interior is described as that of a diamond or lozenge. The skating surface is of asphalte, supplied by the Birmingham Val de Travers Company, and it covers the large area of 9,500 square feet. The architects were Messrs. Evans & Jolly; the builders for the brickwork, Mr. Frederick Messon; for the woodwork, Messrs. Knight & Hammersley; while the iron roof was supplied by Messrs. Handyside, of Derby; the plumbing was executed by Mr. Cordon, and the painting work by Mr. Gascoyne, jun.

Discovery of Mica.—The *New York Times* states that the schooner *Era*, which was despatched by a Philadelphia company a few months ago to Cumberland Bay, Baffin's Land, in search of graphite and mica, has returned from her expedition. The *Era*, which was under the command of Lieutenant Mintzer, of the United States navy, arrived at the place known by whalers as the Nialtio Valley, where the crew, which consisted of thirty men, established a tramway and working sheds. The mica was found in veins 10 ft. below the surface, and some of the blocks brought back by the Mintzer expedition are of great size and purity, being nearly 20 in. square and weighing 50 lb. Altogether the crew of the *Era* obtained 15 tons of mica, and to do this exhausted three veins. The mica is estimated to be worth from $5 to $12 a pound.

The Burns Monument, Glasgow.—At a recent meeting of the committee entrusted with the erection of a monument to Burns in Glasgow, it was stated to be the intention of the committee to place four bas-reliefs on the pedestal of the statue. These relievos are intended to represent the "Cottar's Saturday Night," "Tam o'Shanter," "The Twa Dogs," and "The Vision." Mr. Ewing has these relievos in hand. In answer to inquiries, Messrs. Cox & Son, the founders, in London, had written saying that the cast of the statue had been one of the most perfect they had ever produced, and that they expected to have it ready for delivery by the end of December. Messrs. Meldrum Brothers, Dumfries, had also written, stating that the pedestal would be finished early in January.

Schools: Shepton Mallet.—New schools for the accommodation of 190 children, with master's house, and the necessary offices, have been erected and opened at Kilver-street, one of the outlying districts of the town. They are intended to be used on Sundays as a chapel of ease, the architects having considered the two-fold object in planning the buildings. The buildings are constructed of local lias stone, with Doulting stone dressings; the roofs of the schools are open timbered (pitch-pine), and covered with Bridgewater flat tiles and ornamental bands. The cost of the works is about 1,500*l.* This has been raised by voluntary contributions. Thus the necessity of a School Board and the burden of a rate have been superseded. The architects are Messrs. C. & J. Wainwright, and the builder is Mr. Luke Stock, all of Shepton Mallet.

Fine Art Exhibition for Derby.—Next year (says a Derby paper) will witness the realisation of an addition to our educational buildings, in the opening of the new School of Art, on Green-hill, when the work of the school will in future be pursued under every advantage for the study of art. The committee find that they have at their disposal about 8,000 square feet of hanging space. It is proposed to form an exhibition of works borrowed for the purpose, and of pictures exhibited by the artists themselves. An effort will be made to make a marked feature of high-class modern water-colour art. The officials of the Science and Art Department have promised a collection from the South Kensington Museum.

Destruction of the Nottingham County Hall by Fire.—On the night of the 1st inst. the County Hall at Nottingham was almost totally destroyed by fire. Of the old court, nothing remains but the bare and blackened walls, and the roof of the spacious new court which has lately been erected was burnt away, while the interior was greatly damaged. The fire is attributed to the over-heating of the flue in the old court. The damage is estimated at about 20,000*l.*

Redditch Sewerage.—At the last meeting of the Local Board at Redditch, on the 4th inst., it was resolved that Messrs. Gotto & Beesley's plan for the drainage of the town be adopted, and that the plan for Headless Cross be adopted, subject to certain modifications to be arranged between the engineers and the Public Works Committee. The Clerk was instructed to give formal notice to the Loan Commissioners that a sum not exceeding 10,000*l.* would probably be required for drainage, and to request the Local Government Board to send an inspector to examine and report on the adopted plans.

Darlaston.—On the 27th ult., two stones commemorative of the restoration of the Wesleyan Chapel, Darlaston, were laid by Mr. J. Taylor, of Knowle, and Mr. E. Horton, of Darlaston, in the porch of the structure. The restoration is to be complete, and it will include the raising of the front elevation and the addition of a porch, and the entire remodelling of the interior, with the decoration of the ceiling and the wall spaces, the total cost of the work being estimated to amount to 2,500*l.*

The Mansion-House Cistern.—The dreadful condition of the principal cistern in the residence of the Lord Mayor of London has been described in all the newspapers. We hope this occurrence will lead some of our readers to look to their own cisterns, and, above all things, to see that they have no connexion with the house-drains.

The Town Council of the Borough of South Shields have agreed, upon the application of Mr. Matthew Hall, borough surveyor, to pay him a commission of 2½ per cent. for carrying out the sewerage of new building estates, as private improvement expenses. Mr. Hall is also authorised to appoint a special inspector for the works, at a salary of two guineas per week.

Sewage Disposal at Bristol.—The Bristol Town Council have resolved to purchase the Cliff House Estate, near that city, for about 7,000*l.*, with the object of using it for receiving and disposing of the sewage of the city, which, under the Rivers Pollution Act, can be no longer allowed to enter the tidal river.

TENDERS

For the erection of house, offices, and stables, Steventon Manor, near Micheldever, Hants, for Mr. H. Harris. Mr. R. Morrison Marnock, architect. Mr. Geo. Fleetwood, surveyor:—

Hale & Son	£27,374 0 0
Fatcher	24,023 0 0
Patman & Fotheringham	24,470 0 0
Hill, Higgs, & Hill	24,200 0 0
Trollope	24,067 0 0
Holland & Hannen	23,379 0 0
Hayward	23,209 0 0
Brass	22,622 0 0
Bull & Son	20,778 0 0

For alterations and additions to South Bank, Surbiton-hill, for Mr. Wilberforce Bryant. Mr. Rowland Plumbe, architect. Messrs. Fowler & Hugman, surveyors:—

Nightingale	£8,793 0 0
Conder	8,391 0 0
Hill, Higgs, & Hill	8,190 0 0
Kilby	8,147 0 0
Sewell	7,870 0 0
Dove Bros.	7,800 0 0
Moreland & Nixon	7,791 0 0
Messom	7,697 0 0
Adamson & Sons	7,695 0 0

For subway to retort-house, cart-shed, and verandah to office window, at the Folkestone Gas and Coke Company's Works. Messrs. Burgess & Reeve, architects:—

Prebble	£2 9 0 0
Newman	197 0 0
Hoad	185 0 0
Clements	184 0 0
Webster	167 0 0
Ducks	138 10 0
Holdem	133 0 0
Butler (accepted)	128 0 0

For additions to residence, at Trewyn, near Abergavenny, for Mr. J. L. Rosher. Mr. E. H. Lingen-Barker, architect:—

Biggs (accepted)	£1,155 0 0

For a pair of villa residences and stabling, at Basingstoke. Quantities supplied. Mr. J. H. Moore, architect:—

Oliver	£1,639 0 0
Budden	1,522 0 0
Barnes	1,398 0 0
Allen	1,389 0 0
Charlton	1,332 0 0
Smith	1,143 0 0

For additions to the Osborne Hotel, Clacton-on-Sea. Mr. Horace Darken, architect:—

Pollard	£665 11 6
Cauler Bros. (accepted)	598 0 0

For alterations and improvements to the Lion Inn, Wivenhoe, for Messrs. A. T. Osborne & Co. Mr. Darken, architect:—

Barrell	£218 10 6
Pitt	218 0 0
Smith (accepted)	216 0 0

For painting works to warehouse, Old Change, for Messrs. Sharp, Perrin, & Co.

Pitman & Cuthbertson (accepted)	£234 10 0

For building carriage factory, Islington-green, for Mr. Brockelbank. Mr. A. C. Bean, architect. Quantities supplied:—

Dove Brothers	£3,873 0 0
Roberts (too late)	3,843 0 0
Adamson & Sons	3,497 0 0
Johnson	3,353 0 0
Carter	3,230 0 0
Bayes Brothers & Allen*	2,915 0 0

*Accepted.

For sewerage of new building estates, near Westoe, South Shields. Mr. Matthew Hall, surveyor:—

Lancaster	£2,220 0 0
Winter	1,977 13 9
Kennedy	1,895 12 9
Copeland	1,768 0 0
Bell	1,675 8 4
Harvey	1,651 13 0
Suddards	1,623 0 0
Marshall	1,350 10 0
Craig (accepted)	1,304 10 3

For sewerage of new building estates, on the Shields Heugh Estate. Mr. Matthew Hall, surveyor.—

No. 1 Contract.

Marshall	£905 7 2
Suddards	880 4 11
Copeland	768 0 0
Craig (accepted)	758 18 0

No. 2 Contract.

Marshall	£466 17 5
Suddards	435 2 4
Copeland	420 0 0
Craig	406 10 4

For new buildings, High-street, Shoreditch. Messrs. Fowler & Hill, architects. Quantities by Messrs. Fowler & Hugman:—

Brass	£8,793 0 0
Palmer	6,699 10 0
Hill, Higgs, & Hill	6,240 0 0
Wagner (accepted)	5,178 0 0

For a villa residence, at Stockwell-end, Tettenhall, for Mr. G. H. Perry. Mr. J. R. Veall, architect:—

Lovatt (accepted)	£2,400 0 0

For the erection of the Caw ndish Fireproof block of buildings, at Derby, for the Midland Improved Industrial Dwellings Association (Limited). Mr. Geo. R. Isborn, architect. Quantities supplied:—

Bell & Son	£12,476 0 0
Stevenson	12,380 0 0
Dennett & Co.	12,253 0 0
Barber	12,106 0 0
J. & E. Wood	11,598 15 0

For additions and alterations to Temple, Great Marlow, the seat of Colonel Owen Williams. Sand, ballast, &c., provided. Mr. W. H. Powell, architect. Quantities supplied by Mr. Thomas Ladds:—

Brass	£3,893 0 0
Trollope	3,697 0 0
Shaw (accepted)	3,000 0 0

For the erection of warehouse in Cannon-street, for Mr. H. Woods. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£5,096 0 0
Browne & Robinson	4,962 0 0
Deards	4,888 0 0
Brass	4,860 0 0
Bailey	4,830 0 0
Shepherd	4,800 0 0
Sewell & Sons	4,792 0 0
Morter (accepted)	4,650 0 0

For the erection of warehouse, Cannon-street, for Messrs. J. Brook & Bros. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Browne & Robinson	£4,751 0 0
Newman & Mann	4,699 0 0
Deards	4,627 0 0
Brass	4,554 0 0
Shepherd	4,500 0 0
Sewell	4,488 0 0
Kilby	4,456 0 0
Morter (accepted)	4,214 0 0

For rebuilding warehouse, Cannon-street, for Messrs. C. & J. P. Potter. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£4,790 0 0
Browne & Robinson	4,631 0 0
Brass	4,483 0 0
Sewell & Sons	4,426 0 0
Shepherd	4,4[illegible] 0 0
Deards	4,397 0 0
Kilby	4,340 0 0
Morter (accepted)	4,340 0 0

For rebuilding the Skinners' Arms, Cannon-street, for Messrs. Chapman Bros. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye:—

Newman & Mann	£7,798 0 0
Browne & Robinson	7,764 0 0
Brass	7,665 0 0
Deards	7,485 0 0
Sewell & Sons	7,454 0 0
Kilby	7,350 0 0
Shepherd	7,100 0 0
Morter (accepted)	6,994 0 0

For rebuilding 5, Bow-lane, for Mr. H. Woods. Messrs. Taylor & Locke, architects. Quantities by Mr. F. Overall:—

Farrell	£1,300 0 0
Kilby	893 0 0
Morter	890 0 0
Sewell & Sons	845 0 0
Shepherd	850 0 0
Woods	793 0 0
Beeton (accepted)	789 0 0

For rebuilding a warehouse, Goldsmith-street, City. Messrs. Ford & Hesketh, architects:—

Boyce (accepted)	£1,971 0 0

For additions and alterations to a warehouse, Love-lane, City. Messrs. Ford & Hesketh, architects:—

Nightingale	£13,856 0 0
Peto Bros.	13,806 0 0
Lawrence	13,776 0 0
Ashby Bros.	13,731 0 0
Browne & Robinson	13,663 0 0
Perry Bros.	13,544 0 0
Conder	13,383 0 0
Dove Bros.	13,[illegible]35 0 0
Brass	12,483 0 0
Shaw (accepted)	12,093 0 0

For rebuilding two warehouses, Jewin-street, City. Messrs. Ford & Hesketh, architects:—

Crabb (accepted)	£4,330 0 0

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Engineering Works in India.



ONE of the features which have most struck the imagination of the English public, and which have, perhaps, increased the disinclination at first naturally existing for the investment of capital in a distant and strange country, is the magnitude of the public works attempted and carried out in India. No doubt, individual works of great magnitude may be cited. The anniout across the Sone is 2½ miles long in an unbroken line. The two main canals starting from this point are each 150 yards broad, and 10 ft. deep. The bund of the Veranum tank in South Arcot is 12 miles long, and about 20 ft. high. The tank itself is 2¼ miles wide in the widest part, and it will contain about one hundred million cubic yards of water. The highest bund which Sir Arthur Cotton has seen was 54 ft. high, although he believes that there is a tank with a depth of 60 ft. of water.

Noble as these works unquestionably are, it is rather in distribution than in gross magnitude of work that the labours of the engineer in India differ from those of his professional brother in England. We can point to no railway embankment of 12 miles long, but it would be only a very small railway that did not contain 12 miles of embankment distributed in various portions of its course. In the works at the head of river deltas, as in the case of the Cauvery, or in those for collecting water in the hills, as in the instance of the Veranum tank, a vast amount of work, intended to affect many hundred miles of country, is concentrated. The physical nature of the country demands this kind of work. But the details are as simple, and the cost is not much more, than that of the same quantity of work distributed over a larger area of country. Nor can either the cost or the magnitude of these great embankments and dams compare, in a disadvantageous manner, with that of such familiar undertakings as the bridging the Menai Straits, or the tunnelling under the streets of London.

The simplicity with which works of permanent stability have long been constructed in India is a feature of their engineering to which we shall do well to pay attention. Extending over a great range of country, and formed out of every kind of materinl, the bunds are made without any such contrivance as a "puddle trench," which Sir Arthur Cotton regards as essentially mischievous, tending to lead to cracks in the mass of the bank. The great point is to have the embankments made of homogeneous material, so as to allow them to settle equally. Great watchfulness is also requisite, in the wet season, to prevent any overflow, except through the properly-arranged sluices. The bursts of rain in the Carnatic are tremendous. As much as 5 in. of rainfall in a single night is not unfrequent, and Sir A. Cotton has known as much as 12 in. of rain to fall in that time. The smallest rill that is allowed to trickle over the edge of an earthen bank wears itself a passage, and becomes a destructive torrent with extreme rapidity. On one occasion the water in the Veranum tank is said to have overflowed the whole twelve miles of the bund, and to have breached it in thirteen places. On another occasion the engineer in charge of a bund, finding the water rising with more rapidity than he was able to meet by the supply of earth, made a wall of the bodies of his labourers, causing them to lie down close to one another on the top of the threatened part of the dam, and thus keeping back the 2 in. or 3 in. of water, which, if unchecked, would soon have wrecked the whole bund, and ruined a wide district, until their places could be supplied by baskets full of earth. It was an original expedient, but it saved the district. What the labourers said about it we have not heard.

The districts of India which are naturally fitted for such works are full of noble tanks, of native construction, some of which are of venerable antiquity. Till within the last thirty years very little was done to keep these important works in repair. In 1827 the Veranum tank was in such utter disrepair that the people were almost in a state of rebellion from want of water. A report that the sum of 3,500*l.* ought to be laid out on it was made in that year; but by 1833 no steps had been taken to carry out the order for the work, and the people were in such a state of discontent that it was feared that it would be necessary to send troops into the district. A large number of tanks have now been put in good order by the Government. In Mysore the condition of these works, under the charge of Commissioners who have a considerable degree of power, is said to be excellent. In Madras there is great room for improvement. In Bombay two new and capacious tanks have been formed by shutting up valleys, one by a masonry bund, the other by an embankment of earth. Each will contain about 140 million cubic yards of water when the waste-weir is closed. But as, during the four months of the monsoon, a tank supplies water to the dependent canals at the same time that it is filling, the water which it preserves from being wasted is more than its actual contents when full. The tanks in question may thus convert to useful purpose as much as 200 million cubic yards of water a piece per annum. The loss by evaporation during the year is estimated at 72 in. over the surface of the water area, which will amount, in the cases in question, to about 6 per cent. of the whole supply afforded by the tanks.

The cost of the tank with the masonry bund, which is near Poona, is not at present accessible. The other, which is near Sholapoor, cost 90,000*l.*; of which some 20,000*l.* were spent on the canals for distribution. The capital laid out was thus about 500*l.* per million cubic yards of the contents of the tank, or 370*l.* per million cubic yards of the water actually utilised in a year by its agency.

Near Nagpoor is a site where it would be quite practicable to form a tank that would contain 2,000 millions of cubic yards of water. Such an inland sea would feed the stream of the Godavery for 200 days in the year with an average supply of 400,000 cubic yards of water, which is double the flow to which the river is now reduced in the dry season, thus facilitating the navigation of 500 miles of canal, besides the ultimate application of the water to the irrigation of the crops. The cost of such a work, which Sir A. Cotton estimates at 400,000*l.*, would not amount to more than 800*l.* per mile of navigation, or, at 7 per cent., to about 70*l.* per mile per annum for supply of water to the canals.

The great special works of the annicuts or dams at the head of river deltas, and of the tanks, or mountain reservoirs, for storing the copious rainfall of the highland districts, are, as we have seen, special features of India. In that portion of the system which lies between the tank and the anniout, we have occasion for works of a kind with which English and Dutch engineers have long been familiar; not that the peculiarities of the Indian climate do not impart a special character to Indian canal work. An Englishman would be apt, on looking at the map of India, to conclude that, in order to conduct an enormous amount of inland navigation, it would only be necessary to put boats on the great rivers. Had this been the case, the natives would not have left it to us to show them the way to do so. In point of fact, while greatly respecting the military power of England, they consider us, as engineers, as little better than savages,—anyway, inferior to some of the native rajahs who constructed the great works of past years. Nor can it be denied that in what, after all, is one of the best tests of the skill of the engineer, namely the production of a given effect with the least expenditure of power, and with the simplest machinery, the Indians have many centuries ago arrived at a *ne plus ultra*. Long before the science of the French engineers had arrived at the fact that the mode in which human labour can be most efficiently exerted is by man's raising his own weight, the Indians had watered their rice-fields on that very principle. We have seen, five and twenty years since, in France, elaborate contrivances for raising earth, at which an English navvy would laugh, but by means of which human labour became cheaper than horse labour. An inclined plane was constructed at an angle of between 45° and 60°, and two platforms were connected by wheels, chains, and pulleys, in such a manner that as one ran up the incline the other ran down. On to the platform which happened to be at the bottom the barrow-man wheeled a barrowful of earth, and left it there in the barrow. A couple of labourers quietly made their way up a sort of half-ladder, half-staircase,

laid up the slope, walked on to the upper platform, which descended by their weight, and thus raised the barrow of earth to the upper level. The daily work of a certain number of workmen thus consisted in walking up the slope and riding down it. It was an easy occupation, but the very ease depended on the fact that the muscular energy necessary to raise so many tons of earth so many feet in height was thus most efficiently exerted. A man can work in this way at the best advantage, just as a horse can do five times the amount of haulage at his natural pace of two miles and a half an hour that he can do at the driven pace of ten miles an hour. In England the work would either have been done by relays of barrowmen, each wheeling the barrow for a run, or by the aid of a horse, pulling the barrow, and in some cases the man who guided it, up a steep incline. The French mode,—strange as it looked to a muscular Englishman,—was really the cheapest. It involved, of course, some preliminary outlay in machinery. But the Hindoo lays a long plank, notched, to prevent slipping, over the fork of a post which he drives into the ground near a supply of water. That is all his machine, and very often the post takes root, and grows into a tree that shelters the workman. The water vessel, and the bamboo which attaches it to one end of the plank, the workmen takes home at night, to avoid theft. The day's work then consists in something like the English boy's game of see-saw,—the man walks along the plank backwards and forwards. As he approaches the tree, the water-vessel dips into the water. As he walks to the other end of the plank, the vessel is raised. The Madras engineers have made careful theories of the statistics of the employment of human power. Sir Arthur Cotton says that the cost of water raised by this contrivance, which is called a picottah, is about the same as that raised by bullocks, being about 1*l.* per 3,000 cubic yards. The great points to admire are the extreme simplicity of the machinery and the exertion of the minimum labour on the part of the workman.

It is thus tolerably clear that any one who approaches the question of Indian irrigation and water-carriage with the lofty idea that we have but to carry the science of our own highly-civilised country to the aid of a barbarous people, and that wealth and ease will follow our footsteps, totally misconceives the nature of the problem to be solved. In very much, of course, the progress of manufacturing industry made by us within the present century gives us a great advantage over the Oriental who has never seen a steam-engine. But the rapidity with which the Hindoo, still more the Chinese or the Japanese, will rise, by his great imitative powers, to the level of the European workman, is one of those facts which it would be well for this country if the English workman fully realised. In the Mint works of Madras and Calcutta, Col. Smith trained native workmen so closely to emulate his English workmen, that he obtained from the former, at the price of an anna, that for which he had to pay the latter a rupee. This is an extreme case, and the craft of the moneyer is one in which the Hindoo might, perhaps, have been expected naturally to excel. But, as a general rule, what India demands at our hands, is rather Governmental facilitation of remunerative works than anything else. Even capital, our great reliance, is not so much the need of India as confidence. There is abundance of native capital that would be forthcoming for works such as those which India requires, if only the wealthy natives were convinced of the hearty good wishes and sanction of the Government. To those of our readers who have never been out of England this assertion may seem incredible; but those who know the East, or even who know many parts of the South of Europe, are well aware of the slavish terror with which the mass of the people regard even the smallest official. Experience is ample and conclusive to the effect that the natives will hang back from supporting an object which they sincerely desire, if any jealousy or stupidity in the great hierarchy of officials gives them the suspicion that the Government does not really wish that object to be carried out. Convince them of that, and do so by giving that information and that administrative aid of which the Government has the means of disposing, and the degree of local support that will be forthcoming for well-considered schemes will be quite enough to satisfy the friends of India.

In the case of river navigation, the impulse of the central power is required, from the fact that widely-distant districts of country have a real solidarity of interest which only the central power can comprehend. Thus in the case of the proposed storing of the water of the Godavery this very cause of dispute has arisen. The new tank would be in one district; the main utility of its contents would be in another. But the former district intimates that it would consider the water stored in its valleys as its own, and would consult its own interests in its distribution, heedless of those of the lower river basin. Meantime the Cauvery is comparatively useless as a highway during the very season in which the carrying trade is naturally most active. A wise and comprehensive policy, collecting all the facts of the case, and facilitating administrative action that should most tend to the common good, is thus the prime need of India as regards public works.

The importance of canal development in India is one that cannot be measured in money. It is, indeed, possible to estimate the loss to the State, in mere annual revenue, that is caused by a great famine. But such a calculation, to say nothing of its quiet cynicism, is very far from representing the actual loss incurred by the decimation of a great province. In 1874, in consequence of a famine due to the want of water, about 4,000,000 people were fed by the Government in Bengal for some four months. They must, in that time, have consumed 350,000 tons of grain. This, not at the famine, but at the ordinary price of rice, must have cost 2,100,000*l.* The grain required might have been produced on 700,000 acres of land, by the application of 6,000 cubic yards of water per acre, or 4,200 million cubic yards. The value of this water would thus have been 1*l.* for 650 cubic yards, or more than a hundred-fold the cost of its storing and distribution. In Orissa, in 1866, there was a famine. The idea that it was within the power and the duty of Government to save the lives of the people had not taken root. The official papers state that a million and a half died. The loss of revenue to the Government, at 2½ rupees per head per annum, was 375,000*l.* for the year. At twenty-five years' purchase, this gives a national loss to the revenue of 9,377,000*l.* To save these lives would have required 150,000 tons of grain, costing 900,000*l.*, which it would thus have secured a tenfold profit to the Government to provide. But to have raised that quantity of rice would only have required the distribution of 1,800 million cubic yards of water. The value of this water, that is to say, its productive value, would thus have been 260 yards for a pound. Its cost, which by the *picottah* we have seen to be 3,000 cubic yards for the 1*l.*, we have found on the great irrigation works to be reduced to 70,000 cubic yards for 1*l.* These are incredible margins between the cost of neglect and the cost of forethought; to say nothing of the vast amount of human misery entailed by what has been shown to be a preventible evil,—local famine.

Not only in the production, but in the distribution of food, canals already play no small part in the production of the wealth of India. How very little now needs to be done in order to complete the service of some of the most important districts it is satisfactory to know. At the same time it is all the more urgent that the works in question should be pressed, with the least possible delay. Thus, if the 7,000 miles of canal which have been designed as easily to be constructed in connexion with river navigation in India were made (being less than twice the mileage of the canals of the United Kingdom), and if they conveyed an average traffic of two millions of tons over the entire system (which is the actual traffic of the Aire and Calder), the cost, at one-tenth of a penny per ton mile (which is double that which Sir Arthur Cotton estimates), would be 6,000,000*l.* The same amount of transport by road, at 3d. per mile, would cost 180,000,000*l.* By railway, at the existing rate of charges, it would be 90,000,000*l.* It is thus clear that the absence of water communication forms the bar to an immense internal traffic, which would not only augment the wealth of India, but would have a direct effect on the English market. Thus it has been calculated that the wheat which is at this moment selling on the Upper Mahanady at 9d. a bushel may, on the completion of the designed lines of inland navigation, be landed in England at 2s. 6d. per bushel cost price. The effect of this, or of anything approaching to this, immense revolution in the corn trade would be prodigious. From twenty to thirty millions a year would be paid to our own subjects in India, instead of to the United States. A corresponding outlet would be afforded to the goods of Manchester and our great manufacturing centres. Where merchants are now anxious to obtain a reduction of 2s. or 3s. per ton in freight by sea to Calcutta, they overlook the fact that is within the power of the engineer to reduce the rate of transport for 1,000 or 1,500 miles in India itself from 1½d. to one-tenth of a penny for ten miles, or by 150-fold.

The total expenditure upon the irrigation works of the North Western provinces of India up to the end of 1874–5 has been 4,565,578*l.* sterling (at the valuation of 10 rupees to the pound). Out of this sum 22,197*l.* were laid out on works that have been abandoned, and 675,175*l.* on works under construction, from which no revenue has yet been derived. The balance of 3,836,517*l.* represents works in partial operation, although yet incomplete. These are chiefly from,—viz., the Ganges, Eastern Jumna, and Agra Canals, the Dun, Rohilcund, and Bijnour water-courses, and the Bundelkhund Lakes. Of these the canals alone have cost 3,632,051*l.* In the second series the principal work is the Lower Ganges Canal, now in the third year of its progress, on which 622,502*l.* have been laid out. The income assessed for the first year in water rates and miscellaneous income on the partially opened canals was 295,560*l.*, to which has to be added a figure of 85,887*l.* credited in the civil accounts as increased land revenue due to the operations of the canals. On the total revenue of 381,447*l.* the working expenses have been 132,493*l.*, or 34·6 per cent., a ratio that no doubt will be considerably reduced by the completion of the works. As it is, however, the net revenue is enough to pay a dividend of 6·49 per cent. on the capital expended. These figures include the first year's operation of the Agra Canal, on which the expenditure has exceeded the income. Setting this aside, as a temporary feature, the profit on the works in full operation has been 7·48 per cent. on the capital expended to the close of the year. On the Eastern Jumna Canal alone, the profit on the outlay has amounted to the high ratio of 29·17 per cent. It will therefore be seen that the latest statistics furnished by the Indian Government are such as fully to bear out the statements of the advocates of irrigation canals.

It will be a thousand pities if facts like these are shrouded with any discredit by the personal views—not to say whims—of any of those persons to whom we have to look for information as to India. Especially we regret the attacks made on the Indian Government, and on the Indian railways. As to the latter, the wine is drawn, and we have to drink it. More than that, the majority of persons in this country will think that it has been well drawn. To construct 6,000 miles of great strategic lines at one-third the cost per mile of the English railways, and so to work them as to earn a *bonâ fide* 3½ per cent. on the capital, is not, in our view of the case, bad work. The fact that canals can be constructed at 1,000*l.* or 2,000*l.* per mile does not invalidate the position of the railways. But it does give promise of abundant increase of the wealth of India, and that increase will affect the railways advantageously,—whatever be the bulk of goods and number of passengers borne by water. Far more than was the case in England forty years ago has the internal traffic of India to be created. That it will spring up with immense rapidity we do not doubt. Nor do we hesitate to repeat that the main charm by which the face of India will be furrowed by canals, roads, and irrigation works will be found to be in producing the local conviction that the Imperial Government has that development of the communications and resources of India deeply and truly at heart.

Bristol and Gloucester Archæological Society.—A general meeting of the members of this Society was held at Bristol on the 13th inst., Sir William Guise in the chair, when a long discussion took place on St. Werburgh's Church, and ultimately the following resolution was adopted:—"That a committee of this Society be formed to communicate with the churchwardens of St. Werburgh's with respect to preventing the demolition of the tower, and to take some means of raising public subscriptions to restore it, with a view to its maintenance by the Corporation as a public monument." Bishop Clifford read an interesting paper on the origin of Bristol, and Mr. Clark gave an instructive address on Berkeley Castle.

FROM A DUCAL KITCHEN.

SOME valuable instruction having been given from a ducal kitchen to wives of the working classes, in the form of a lecture on cookery adapted to their means, and illustrated by several dishes made in the course of it, we have much pleasure in extending its usefulness by detailing the particulars to a wider sphere.

We must premise that the lecturer was the *chef-de-cuisine* of the Duke of Northumberland; that the lecture was given in the schoolroom of the National Schools, Alnwick; and that it was presided over by the vicar of the parish. The parents of the scholars were invited to be present gratuitously, and other members of the working-classes were admitted upon purchase of tickets, priced 3d. each.

The National Schools at Alnwick stand just outside the old boundary-wall of the town, and their chief approach lies through one of the old gateways. On Thursday evening, the 14th inst., at seven o'clock, little groups of women, in twos and threes, passed through the dark gateway, and made for the entrance of the girls' schoolroom. At the end of this long well-lighted room, they found a platform raised upon some of the school forms, with a small gas cooking-stove and two tables upon it. Upon the stove were two pans with soup, or stew, in them, gently simmering; and upon the tables were basins, bottles, jars, paper parcels, knives and spoons. Behind the tables stood a pleasant, sedate, young woman, who from time to time lifted the lids of the pans to inspect the progress of the contents, and opened the door of an oven below them to observe the condition of various dishes baking in it. Meanwhile, the schoolroom benches gradually filled with orderly matrons and maidens.

At the appointed time two gentlemen stepped upon the little platform. One was the vicar, the Rev. E. Trotter, who introduced the other as Mr. Thorpe, whom he had asked to give the audience the lecture they were about to hear, he said, in the hope that his instruction in the methods of producing variety and savouriness in their food, without increasing its cost, would be of service to them and their families.

Mr. Thorpe commenced his well-planned instructions by remarking that it is generally agreed that the money spent upon food by the working-classes does not yield them the same advantages as proportionate sums expended by the middle classes; and it is as generally agreed that the reason of this shortcoming is because the mode of cooking the food is not so satisfactory. And it seems to be as generally agreed, further, that the French working-classes are much better off in this particular than our own, because their mode of cooking is so much more painstaking and economical. Good cooking means economy as surely as bad cooking means waste. Things that with us are almost despised, such as herbs and many vegetables, form the principal ingredients of French soups, and good soups form a leading feature in French dinners. To illustrate the different way in which two people may set about the same object, both having the same intention in view, but the one having a happy knack, and the other an unfortunate way, Mr. Thorpe told the good old story containing the recipe to make stone soup. In the two soldiers, one of whom went without broth, whilst the other made some of excellent quality from a stone, we may see the unhandy cook, English or otherwise, who has no resources without finding everything ready to hand, and the clever provider, French or otherwise, who out of unconsidered trifles can produce a savoury and wholesome repast. "Could any one give me a little salt?" asked the old soldier, when his stone was quietly boiling in a borrowed pan. "How much nicer this stone soup would be with a few herbs in it," he remarked again when a bystander had given him a pinch of salt. And then, "what a much better flavour a scrap of bacon or beef would give this flint," he urged to another admiring spectator when some one had gathered him a few herbs. It was just this gathering together of small uncostly articles, taking pains, and using them with judgment, that constituted the gift of economical management. So much of our health, and consequently happiness, depends upon the quantity and quality of the food we eat, Mr. Thorpe continued suavely, that it is not too much to say that the downfall of many an unfortunate man may be traced to the want of decent meals at home. Everything that is worth doing at all is worth doing well, in cookery as in other matters, whether it is the production of a dish of porridge, or one compounded of the most expensive materials that can be bought.

The lecturer then proceeded to relate, clearly and briefly, how he had purchased two ox-cheeks for 4s.; four ox-feet for 2s.; two sheeps' heads for 1s. 8d.; and a pint of barley and half-pint of peas for 4d. more; amounting altogether to an expenditure of 8s. And then to show how, by judiciously using these articles, with the addition of various vegetables, which he presumed the audience grew in their respective gardens and allotments, he could produce the following dishes:—Six quarts of ox-cheek and barley soup; four quarts of harricot-bean soup; four quarts of cabbage soup; four quarts of dried pea soup; four quarts of potato soup; four quarts of artichoke soup; a cottage pie; a toad-in-the-hole; a sheep's head smothered in parsley sauce; a sheep's head baked with bread-crumbs, and served with liver sauce; and some collared beef.

At this stage of the lecture, plates and spoons were distributed to the audience, and the vicar, assisted by Mr. Thompson, the schoolmaster, passed round tureens of the different soups thus made from the same stock, but entirely varied in flavour and appearance by the addition of other items. The ox-cheek soup, for instance, was thin and clear, with a little barley in it; the haricot-bean soup was thick and glutinous, and what may be termed "filling"; the pea soup was a little less so, but piquantly flavoured with a sprinkling of dried mint; the cabbage soup thin, again, and meagre, though not *maigre*, or without meat, because, as mentioned, it was made of the same stock as the rest. Now there was a clatter of spoons and saucers which told of the hearty, though mute, appreciation of the audience, as they tasted the contents of the different tureens. After these soups were disposed of, Mr. Thorpe produced one of the sheep's heads, which was to furnish the next dish out of his investment. This, he proposed, should be served with parsley sauce, and in a few minutes' time the somewhat unsightly object lay in a little pool of green sauce, and presented a much more pleasing aspect. The other head was then treated in a different manner. Some parsley was fried in a little dripping, to give it a flavour not otherwise attainable, and poured upon it, and then some bread-crumbs were sprinkled over the parsley, and the brains placed at the four corners, and the dish placed in the oven, whilst a sauce of chopped liver was made to serve with it. Some of the cold ox-cheek was next operated upon. It lay upon one of the tables a small solid block of meat. The assisting maid cut off a few thin slices from it, and placed them in a pie-dish, and then handed Mr. Thorpe a basin of mashed potatoes, with which he filled up the dish. "If you have nothing else to do," he told the audience, "you can show your taste by decorating the flat surface of these potatoes, for any ornament you choose to put upon it will show up well when it is baked; but, as we cannot wait while this is baking, I have brought another dish, prepared exactly as you have seen this one prepared, already baked"; and here he passed down a good-looking pie, with a rich orange-coloured crust, gently curved, made of potatoes, as indicated. "For another change I will show you how to cook a few more slices of the same cold ox-cheek in batter, which process is equally applicable to any other fragments of cold meat." Here the assisting maid was ready with neat help again, broke eggs, beat them, added flour and milk,—showed the process, in fine; and then Mr. Thorpe drew another pie, prepared in the same way, from his oven, ready for eating, of a deep rich brown colour, also very agreeable to the eye. "But I have not yet used up all the materials. After making these six different sorts of soups, and serving up the two sheeps' heads in different ways, and using some of the ox-cheek in a cottage pie, and more in the toad-in-the-hole, or batter, I have still enough left for this," and he held up to view a dish of collared head, about as high and round as a Stilton cheese; "and I cannot say that this is yet all, for here is a glass jar of the soup that has become quite cold, and is, as you see, in a firm, clear jelly. This shows you the nourishing qualities in the ox feet. And even still I have some more of the soup at home, for there was no occasion to bring it all here. Besides the eight shillings I have accounted for, I have bought some tripe, a rabbit, some fish, and a few trifles for six more shillings, making in all an expenditure of fourteen shillings, which, you will see before we finish, will furnish sufficient food for a meal for 100 persons, or, in other words, for 100 dinners at 1½d. each.

Now the bright copper stew-pans were changed, and one was put upon the stove full of melted dripping. "We use more fat in frying than, I expect, you are accustomed to do," Mr. Thorpe began again; "but the extra quantity cooks the articles put into it so very much better, without making them so greasy, and as it can be used over and over again, I do not think it a much more expensive way of going to work. Fish can be got very cheap here, so I am going to show you the best way to cook it. You take all the meat off the fish, first on one side and then on the other, and cut it into slices; then you take these slices, and dip them into an egg, which you have previously beaten up on a plate, and then you stew them with bread-crumbs, or, if you have no bread-crumbs, with a little oatmeal. When thus prepared, you place them in the boiling fat, and leave them in it till they become of a light brown colour." As the lecturer gave these directions he suited every word with a corresponding action, and having deposited some slices in the bright little stewpan on the stove, he sent round a sample dish, prepared in the same manner, only already perfected, so as not to lose time. The application of forks to the plates on which it was dispensed made another clatter of appreciative applause more unmistakeable than words. "And if you have any cold fish left, you can break it up, and mix it with some rice and chopped egg, into a dish like this," he continued, as he handed down this fresh combination, called cadgerie, and there was a renewed, though always subdued, clatter of the forks on the plates of those tasting it. "Now, I know tripe is an article you often purchase, and I will tell you how to make the most of it. When it is thoroughly washed and perfectly clean, put a small piece of butter into a stew-pan, and shred an onion. Put that in too. Then add a spoonful of curry. Put in your tripe, with some milk and water, and let it stew; but, as we cannot wait to see the result, I have brought a curried rabbit with me, in this Norwegian stove, already cooked by the same method. Every one who likes peppers and hot things will like curry, and it is to be bought in bottles for a shilling, which bottleful will last you for a very long time, and make you many a pleasant change. Boiled rice should be served with curry, because it is good with it, and it also serves the purposes of making it go farther. I have also here," he continued, stooping down to the Norwegian stove he had opened to take out the curry, "I have also here a dish of haricot beans. They are very little used in this country, though they are very cheap, being only 3d. the quart, and very nourishing, and very nice. You ought to put a small piece of butter in your stew-pan and shred an onion into it, and then put the beans in with any gravy or stock you may happen to have, and let them stew till they are like this," and a most savoury-smelling and substantial-looking dish was passed round for inspection and tasting, in quick succession to the curry. A French cook, and any good cook, is never without stock. The French generally keep a stock-pot always at the side of the fire, and put every scrap and bone into it. They waste nothing: not even their snails. I once bought one of their snails in France, but I could not eat it, so I lost my money and my snail; but in most instances their dishes are very much to be commended. There is one more cheap article of food that has not yet come into the general use it well deserves, I mean macaroni. This can be bought, now, for, I believe, 4d. a pound. You take a piece of butter and put it into a stew-pan, add a little flour, and you take some grated cheese, or bits of cheese chopped up, and put them in, too, and gently stir them round," and here the lecturer took the wooden spoon from his careful and attentive assistant, who had been following out his directions, as in the other instances, and began to stir the contents of the stewpan himself, "and then you take some macaroni previously boiled in water till it is tender and put that in too, and you will have a cheap and satisfying dish like this," and the lecturer ladled the thick rich mixture on to a dish and sent it down to the audience likewise. "I do not have to study expense in my own experience," the lecturer remarked in the course of the evening, "but I can feel for those who must do so, and I have selected such articles to cook as I know are used by the working-classes, so that the little

improvements I may be able to suggest may make them more enjoyable. And I also take this opportunity to introduce you to a ld. cookery-book, which I consider quite a marvel in its way."

At the conclusion of the lecture, the vicar moved a vote of thanks to Mr. Thorpe for his kindly instruction, and announced it was part of a scheme of the management of the school to establish a cooking class for the elder girls. After a few more good words and good wishes the proceedings closed, and the matrons and maidens all filtered out of the bright school-room into the dark night, and went their several ways.

GREEK BUILDING RECORDS.

An exceedingly interesting and valuable article on "Greek Inscriptions" has been contributed to the current number of the *Contemporary Review*, by Mr. C. T. Newton, who, we need hardly observe, brings to the treatment of the subject the experience and knowledge acquired during many years of close attention to the elucidation of records of this class. The interest of the article, in addition to its utility as a kind of *catalogue raisonnée* of the various classes of existing inscriptions and their localities, centres a great deal in the relation of the subject to the general social and political history of Greece; but there is also reference to some inscriptions which have a very direct bearing upon the details of architectural practice among the Greeks. These are part of what Mr. Newton characterises as the records of the Athenian "Board of Works." Three such records are extant. Of one of these, the contract for repairing and strengthening the long walls connecting the Piræus with Athens, the writer merely observes that "the precision and minuteness of its specifications make this document a model for all future Boards of Works to study," a hint which will, no doubt, be taken in the proper quarter. This inscription is at Athens, and is published in Rangabé's "Antiquités Helléniques." The other two are connected with the Erechtheum The first, which is in the British Museum, is a survey of the building made, while it was in progress, by a special commission appointed by a decree of the people, B.C. 409. In this report, we are told, "the exact state in which the building is found by the surveyors is noted with a minuteness which could have left no room for future subterfuge or procrastination; for every block of marble which carries any ornament is specified as either finished and in position, or as partially finished and not yet in its place in the building." The conclusion which the existence of such a document at once suggests, apart from its historical interest, is that a building which could be thus minutely reported upon must have been carried out with a detailed care, precision, and prevision in regard to every part, as contrary as possible to any theory of the spontaneous development of architecture such as has been put forward sometimes as the true basis for a genuine architecture. Subordination of every portion under a directing head, and according to a carefully-prepared design, would be a necessary condition for rendering such a survey possible. The third document referred to by Mr. Newton (the original of which is at Athens, and is also to be found in Rangabé's publication) contains a statement of the sums paid for the sculptural decorations of the Erechtheum, with the names of the artists by whom they were executed. "These sculptors, none of whose names are otherwise known to us, were evidently employed under the direction of the architect to execute certain figures and groups in a continuous composition, designed by some master-hand." This work Mr. Newton believes to have been the frieze mentioned in the survey as having a background of dark Eleusinian marble. The prices are anything but high; ranging from 120 drachmæ (about 5*l.*) down to 60 drachmæ, for figures in baserelief about 2 ft. in height. "It would be interesting," says Mr. Newton, "to compare the prices paid for sculpture in this account with the prices paid by Messrs. Armistead and Philip to the skilful hands who carved the frieze round the Albert Memorial." But there seems to us to be a more interesting question still suggested by this list of payments: what was the artistic position, in regard to the work, of these sculptors whose names are thus rescued from entire oblivion by the price-list of their labours? Were they in the same position in reference to the real designer as the skilled carver, who "points" the model into marble for the modern sculptor, who simply transfers the thought of the designer, with rigorous accuracy, from the clay to the marble? Or were they in the position which there seems no doubt was occupied by the Mediæval sculptors and carvers (and in modern days by the "art-workman"), who carried out their own original ideas in the detail of the carving, subject to the general architectural scheme of the building? Mr. Newton appears to take the former view; but it is worth recalling that Mr. Leighton, in the course of some very interesting remarks made in connexion with this very same building (at the Institute meeting when Mr. Fergusson's paper on the "Erechtheum" was read), drew from the well-known caryatide statues a contrary conclusion. He had examined these carefully, and was struck with the fact that while they were so similar in general design as to preclude the idea of a separate model or design having been made for each, they nevertheless showed decisive and interesting variations in detail, which argued that those who executed them exercised their own freedom of taste and judgment in regard to the execution of the design. His inference was that, as it was not likely such heavy work would all be executed by the original designer *manu propriâ*, the subordinate art-workmen possessed a degree of original genius, or taste, which left it possible for each of them to put his own stamp on the character of his own work, and that (necessarily) with the concurrence and approbation of the master-mind. This gives quite a different idea of the office and culture of the executing artist from that of the mere "pointer"; and (as Mr. Leighton on the occasion alluded to seemed to infer) might give us some new light or suggestion as to the extension of art-culture among the Greeks, and some fuller explanation of the conditions of the great superiority of their sculpture work. The prices mentioned for the frieze figures certainly seem rather to suggest the idea of merely subordinate and semi-mechanical work;* but we should be still more indebted to an exponent who, like Mr. Newton, combines linguistic with architectural knowledge, if he could show whether the inscription he refers to gives any really definite information or suggestion as to the artistic position of the sculptors, and whether they were really artists in the true sense, or only carvers reproducing, from a model, what was set before them.

Apart from this particular question, the article is worth the attention of all who have a general interest in Greek archæology; and the author promises a future memoir on inscriptions relating to Greek religious worship.

THE BYRON MEMORIAL COMPETITION.

The circular inviting sculptors to join in the second competition has been issued, fixing the 1st of June of next year as the latest day for receiving models. The conditions are nearly the same as those of the previous circular, and where they differ it is not altogether for the better. The names of three sculptors, Messrs. Calder Marshall, Woolner, and Durham, are given as the professional advisers of the committee, to which names no one can make any objection. The suggestion that the competitors might themselves appoint three professional referees (not competitors) to co-operate with those appointed by the committee, is withdrawn; perhaps it could hardly have worked very well. We regret to see that there is no option given as to material, bronze alone being accepted for the statue; we should have liked competitors to have had the choice of marble or bronze. But the clause as to scale is most unfortunate. The former circular provided that the models should be on a scale of 2 ft. to the figure, which was overlooked or evaded in many cases; and we pointed out at the time the confusion of scale which resulted, and the consequently increased difficulty of making a fair comparison. But instead of insisting more stringently upon this, the committee have waived it altogether, and merely stipulate that the scale should be "not less than 2 ft. for the figure"; so there is nothing to prevent any competitor from sending a life-size or colossal figure if he pleases, and thereby securing a factitious advantage over those who cannot well afford to do the same; and the result will be confusion worse confounded. We do urgently recommend that the committee would add a "rider" to their circular fixing rigorously the scale of the figure, and excluding models which do not conform to it; otherwise a fair comparison is next to impossible.

* The cost of fluting one of the columns has been estimated from these documents as amounting to 360 drachmæ. That of the figures seems small in proportion to the higher character and difficulty of the work. "This work of fluting was executed by small gangs of workmen not exceeding seven in number, and hence may have been piece-work."

ENGINEERING MATTERS.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

The opening meeting of this Society for Session 1876–77 was held on the 14th inst., in the rooms of the Iron and Steel Institute, 7, Westminster-chambers, when the President (Mr. R. M. Bancroft, C.E., of the Great Northern Railway) delivered his inaugural address, from which we cull a few interesting items:—

Tram-cars and Omnibuses.—The weights of cars of course vary according to their loads and the gradients of the roads upon which they are used. In Leeds some one-horse cars to carry eighteen passengers weigh 34 cwt. when empty; and cars to carry twenty passengers weigh,—empty, 47 cwt.; fully loaded, 4 tons. The weight of a London Street Tramway Company's car intended to carry thirty-six passengers is (when empty) from 2 to 2¼ tons at the outside; and its cost is 200*l.* The duration of these cars is estimated at from twelve to fourteen years. The North Metropolitan Company's tram-cars, to carry forty-six passengers (twenty-two in and twenty-four outside) weigh about 2 tons 5 cwt. empty and over 5 tons 7 cwt. when fully loaded; it costs 220*l.* The life of a tram-car varies so much with the quality of materials and workmanship, its size, shape, mileage run, and whether it has roof seats or not, that it is rather difficult to give an average period of duration. Cars which have been in use by the North Metropolitan Company for nearly *seven years* are still in very good condition, while others used for a less time are worn out. This company finds that an American firm supplies the most durable, and therefore the most economical, cars, which are estimated to last fourteen years. The rapid growth of this particular branch of industry is remarkable; and foreign manufacturers find it to their interest to have agents established in our midst. I hope English makers will look to this, and not be *beaten* on their own ground.

The weight of an average London omnibus is above 24 cwt. empty, and upwards of 3 tons with a full load of passengers. Its cost is 140*l.*, and its life (if it is as well built as those the London General Omnibus Company make at their own works) will be from ten to twelve years; but if badly built, it will only last seven or eight years.

The cost of London tram-car and omnibus horses is from 39*l.* 10*s.* to 43*l.* each. The age at which horses are considered capable for this kind of traffic is rising five years, and with proper care and dieting (say 30 lb. of food, and running fifteen miles a day all the year round), they will be good for their work in London or in our large provincial towns for an average period of five years, although on a level tramway, and with no Sunday work, they may last for twelve years.

Anything that engineers can do to reduce this wear and tear of horseflesh and rolling stock to a minimum should be done. While so many schemes are now being tried to introduce other motive power than that of horses for street traffic, it would appear that until very lately the idea has not been entertained of storing up the power used in breaking and stopping the cars so as to utilise it for starting and propelling. This is now being tried by Mr. A. Squire, with some prospects of success. He purposes applying it to both omnibuses and tram-cars, and it is surprising to think that such a simple contrivance has not been used before. It consists merely of an ordinary pair of laminated springs, such as is used in every light carriage, being straightened out by means of a chain winding round a clutch-box on the axle, thus breaking the wheels, and thrown out of gear when the driver wishes to start the car thereby assisting to propel it, saving much strain upon the horses,—a subject well worth the support of the Society for the Prevention of Cruelty to Animals. Steam will, no doubt, in a great measure supersede horse-power for this work at some future time. Among those who are seeking to solve the problem is Mr. Perrett, a member of the Civil and Mechanical Engineers' Society.

Compressed Steel.—Speaking at the Iron and Steel Institute on the application of hydraulic power in forging, Sir Joseph Whitworth stated that his firm had recently completed two twin screw shafts for the *Inflexible*, 283 ft. in length, 17 in. in diameter, and cast with a 9-in. hole through them. These shafts were made of compressed steel, and weighed 63 tons, instead of 97 tons if made of iron,—a reduction permitted by the great strength of the compressed steel. He further stated that on applying the hydraulic pressure, a column of metal is reduced 1-8th in less than five minutes,—a remarkable indication of the effect of pressure in expelling air-cells. The strength of the shaft was 40 tons to the square inch, and its ductility or power of extension was 30 per cent. of its length. By using compressed steel, the driving-round of 34 tons was saved during the whole life of the engines.

Paper Railway Wheels.—So-called paper-wheels for railway carriages have been tried for a considerable time in America. One of the first made was exhibited at the Philadelphia Exhibition, after running over 300,000 miles under a Pullman car, without requiring the tyre to be turned. These wheels have steel tyres, made with an inside flange and cast-iron boss. On each side of the boss and tyre wrought-iron or steel plates, $\frac{1}{16}$ in. thick, are bolted, and the space between the plates is filled with compressed paper. This paper is made of straw boards, $\frac{1}{2}$ in. thick, pasted together with paste made of rye flour. These are subjected to a pressure of about 400 tons for about five hours, and are then dried with heated air. These sections are then pasted together in the same way, so as to get the requisite thickness,—about $3\frac{1}{2}$ in.,—and they are again pressed and dried. They thus form a disc, which is turned off, and the tyre forced on with a pressure of about 200 tons. The plates are then bolted to the inside and outside of the wheel with $\frac{3}{4}$-in. bolts.

Sanitation.—After all that has been said and done in draining and supplying water to towns, there yet remains much for the sanitary engineer to do in overcoming the prejudices of many who think he is attacking their interests in proposing any alterations or improvements likely to lead to the public good, simply because such works entail a first outlay upon their property, but which, if carried out, eventually become advantageous to all. When we consider the lamentable ignorance that exists upon these simple yet important matters, the only wonder is that the death-rate of our large cities is not greater. Very lately I visited a town on the East Coast, which, during the holiday season, is thronged with thousands of visitors who resort thither for the benefit of their health. In this place I found a case where the inmates of one dwelling had no other water-supply than a pump in their yard in close proximity to the privy. The medical inspector of the district certified that the water was grossly polluted, and a source of much danger to the public health, and the owner was compelled to lay on other water for the use of the tenants; but the medical officer assured me that, bad as this case was, there were several others in the same neighbourhood he had reported on where blood-poisoning by polluted well-water might be expected.

Railway Station Roofs.—The description of roof erected over the Midland St. Pancras Station in the Euston-road appears to have found much favour with railway engineers, for Messrs. Handyside, of Derby, are now constructing and fixing four station roofs of a similar outline. Mr. Ewing Matheson, who is publishing a work for the new year, has kindly favoured me with some information in advance, to enable me to place before this Society—

	Length. Ft.	in.		Span. Ft.	in.		Weight of Iron. Tons.
St. Pancras roof (given for comparison)	690	0	...	240	0	...	1,800
Joint Station Mid., G.N., and M., S., & L., Manchester	550	0	...	210	0	...	2,400
St. Enoch-sq., Glasgow...	518	3	...	198	0	...	1,460
Middlesbro', N. E. Ry. Co., in two spans, one...	309	0	...	74	0	} ...	402
The other...	189	0	...	42	2		
Cape Town, South Africa	256	9	...	77	0	...	200

As some anxiety is naturally caused as to the duration of constructions in iron roofs, I may state that a large-span roof has lately been erected over the St. Pancras Goods Station which years ago covered a station in Liverpool; it was afterwards pulled down, stowed away for several years, and is now doing duty a second time.

ARCHITECTURAL SOCIETIES.

Worcestershire.—The annual meeting of the Worcestershire Diocesan Architectural and Archæological Society was held at Worcester on the 13th inst. Mr. Hooper, the secretary, read the report, which congratulated the members on the resuscitation of the Society from a state of almost total extinction, and also spoke cheerfully of its renewed prosperity. The greater part of the report, however, was devoted to brief descriptive notices of numerous church erections and restorations which had taken place in the diocese during the past two or three years.

Northampton and Oakham.—The annual meeting of the Architectural Society of the Archdeaconries of Northampton and Oakham was held on the 11th inst. at Northampton. The thirty-first annual report (read by the honorary secretary, the Rev. N. F. Lightfoot) stated that notwithstanding the loss the Society has incurred by the death or removal of many of its valuable members, its numbers are still in excess of those printed in the previous report (1873), and the financial position is flourishing. For the last few years there has been an excess of income beyond expenditure. Without some special object in view, it seems undesirable for societies such as this to accumulate capital, but several matters had from time to time occupied the attention of the committee, which it would require more than the ordinary income of the Society to carry out, such, for instance, as the printing in a larger size than that of the associated volume, an illustrated account of ancient buildings about to be destroyed—an object in which the committee had in vain sought the co-operation of some other kindred societies, or a more accurate record of the several works of restoration which have been or are being carried out within the area of the Society's work—a subject to which the attention of the members was called last year by Mr. Carpenter,—or, again, what would be a still more expensive undertaking, the possible continuation of the work, one volume of which was so ably brought out many years ago, "The Churches of Northamptonshire." The committee would require the sanction of a general meeting of the members, however, to any scheme which might be devised for the employment of its accumulated funds. The report next gave interesting details of the summer excursion in July last, when, at the invitation of the Architectural Society of St. Alban's, the Leicestershire Society met the Northamptonshire Society at that interesting city. The report (which concluded with a detailed account of the "home-work" of the Society) having been adopted, Sir Henry Dryden gave an account of a visit to the churches of Wisby, Gotland; and Mr. R. E. Carpenter read an elaborate paper on Brigstock Church.

Oxford.—The Members of the Oxford Architectural and Historical Society recently visited the church of St. Mary Magdalen, where they were received by the vicar, the Rev. H. A. Harvey, who pointed out the nature of the improvements and alterations which had been effected in the restoration of the church. The party then proceeded to Trinity College, and were received by the president in the hall. After referring briefly to the history of the foundation of Durham College, he gave a fuller account of the foundation of Trinity College, in 1554, by Sir Thos. Pope, who purchased the old buildings for that purpose. By the aid of Loggan's View, he showed what were the old parts remaining, and what had been rebuilt, and how the buildings had been extended by Dr. Bathurst between 1667 and 1682. Mr. Jas. Parker added a few observations upon the foundation of Durham College, and its relationship to the Priory of Durham. The president then conducted the party to the chapel, and pointed out the chief features, such as the handsome carving by Gibbons, the painted ceiling by Berchet, and the new memorial window to Isaac Williams. A new organ-loft has been recently erected, from a design by Mr. Bruton. The party were then conducted to the library, which is part of the old work, having probably been erected by Bishop Heatfield.

Northern.—A meeting of the members of the Northern Architectural Association was held on the 12th inst., in the Old Castle, Newcastle. The President (Mr. Thos. Prosser) read an address, in the course of which he congratulated his brethren, the younger ones especially, on the greater public appreciation of the beauties of architecture in its various phases at the present day than obtained during his youth. The number of architects has increased in a much greater ratio than the population of the country. The late Mr. John Dobson, their distinguished first president, claimed to be at one time the only resident architect, pure and simple, in the county of Northumberland; the late Mr. Ignatius Bonomi being, at the same time, the only one in the county of Durham. Mr. Bonomi was the son of an Italian architect, brought to this country to build Lambton Hall, afterwards converted by the former into Lambton Castle. The Secretary (Mr. T. Oliver) said he was very wishful to resign his office, which he had held since the year 1857. He mentioned the matter now, to give time before the next quarterly meeting to select his successor.

NEW WORKHOUSE INFIRMARY FOR MANCHESTER.

THE foundation-stone of the new Workhouse Infirmary for Manchester was laid on the 22nd ult. by Mr. H. J. Leppoc, the chairman of the Board of Guardians. The sale of a large portion of the Workhouse in New Bridge-street to the Lancashire and Yorkshire Railway Company (by whom the premises are required for the enlargement of the Victoria Station) having necessitated the erection of new buildings for the accommodation of the inmates of the old Workhouse,—for the most part sick and infirm,—the guardians determined to build a new Workhouse Infirmary upon their estate at Crumpsall, and in connexion with the workhouse which was erected there about twenty years ago. The site is elevated and open, being about 250 ft. above the Ordnance datum at Liverpool, and the substratum consists of a deep bed of sand. The range of buildings, with the airing-yards attached, will cover an area of nearly nine acres, and will extend 315 yards from east to west, and 150 yards from north to south. It is divided into eight parallel blocks of buildings, three on one side for males, and four on the other for females, the centre being for the administrative department. These blocks are separated from each other by airing-yards, each about 80 ft. in width, and are connected across their centre by covered corridors, sub-dividing each block into two ranges, the corridors being 275 yards long. The buildings on each side of the administrative block are to be constructed on the pavilion principle, and appropriated to the pauper inmates. They extend on each side of the corridor or covered way, and are to be three stories high, with a ward on each floor, 103 ft. long, for thirty-one beds, and an apartment at the end of each, to be used as a day-room by the patients. There are lavatories, nurses' rooms, scullieries, &c., and staircases to reach from one story to another. The wards have windows on each side, carefully adjusted with reference to the position of the beds, fire-places, &c. The central, or administrative block, comprises the medical officers', head nurses', and other officers' rooms, with the dispensary and lavatory, at the rear of which is an extensive arrangement for culinary purposes, with the necessary larders, store-rooms, &c. The sleeping accommodation for the nurses is over the back portion, and provides for each nurse separately. The washing, both for the existing workhouse and the new Workhouse Infirmary, will be carried on in one division, and for this purpose the plans include a range of buildings to be erected between the two. The architects are Messrs. Mills & Murgatroyd, of Manchester, and the clerk of the works is Mr. Joseph Armstrong.

Society of Engineers.—At the Annual General Meeting of this Society, held on the 11th inst., the following gentlemen were balloted for and duly elected as the council and officers for the year 1877, viz.: as president—Mr. T. Cargill; as vice-presidents—Mr. C. Barnard, Mr. F. W. Hartley, and Mr. R. P. Spice; as other Members of Council—Mr. J. Bernays, Mr. J. Church, Mr. C. Horsley, Mr. T. G. Iveson, Mr. T. Porter, Mr. A. Rigg, Mr. J. Walker, and Mr. F. E. Duckham; as honorary secretary and treasurer, Mr. Alfred Williams; and as auditor, Mr. W. H. Bennett. It was announced by the president that the following premiums had been awarded by the council, for papers read during the year, viz.:—to Mr. Henry Davey, for his paper on "The Underground Pumping Machinery at the Erin Colliery, Westphalia"; to Mr. Charles E. Hall, for his paper on "The Conversion of Peat into Fuel and Charcoal"; and to Mr. J. W. Pearse, for his paper on "The Ventilation of Buildings."

QUEEN ELIZABETH'S GRAMMAR SCHOOL, HEATH, NEAR HALIFAX.

On Friday, the 15th inst., the whole of the designs sent in by competing architects for the new buildings to replace the present Grammar School of Queen Elizabeth, at Heath, were exhibited for inspection by the governors of the school. The *Halifax Guardian* says that it will be some time yet ere the final selection is made, and that the public will be admitted to view the plans, which are so numerous as to fill from end to end all the stands erected for them in the large ball-room of the New Assembly Rooms. All the designs are in the Gothic style, some, it is true, being more or less freely treated. The number of plans sent in under one motto varies very much, ranging from four plans affixed to a single board, to no less than fifteen separate drawings for one design. Altogether, there are no fewer than thirty-six different designs sent in.

SEVENTEENTH-CENTURY DOMESTIC ARCHITECTURE IN LONDON.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute, on Monday evening last, the 18th inst., Mr. Henry Currey, vice-president, in the chair, the following gentlemen were balloted for, and duly elected, viz.,—As Fellows: Mr. William Kidner, of Shanghai; and Mr. Thomas Prosser, of Newcastle-on-Tyne. As Associates: Mr. W. F. Bagnall, of Penge; Mr. E. J. Shrewsbury, of Maidenhead; and Mr. T. W. Willis, of St. Benet's-place, E.C.

Mr. Whichcord announced that the committee of which he was chairman had completed its work with reference to the proposed general bye-laws for building regulations, and as to which the committee had been in communication with the Local Government Board. After some fourteen sittings, and very elaborate work, he thought the committee had prepared a document that would enable the Government, if they saw fit to adopt it, to make what the Institute would consider to be a very perfect system of building regulations to be applied hereafter to all towns in the kingdom, as it was intended that the proposed statute should embrace the whole of the United Kingdom within its limits.

Professor Kerr asked whether the report referred to would be circulated amongst the members of the Institute before being submitted to the Government?

Mr. Whichcord replied in the negative, stating that as it was a report made to the Government in the first instance, it would not be available for circulation amongst the members,—at all events, not until after it had been adopted by the Government.

Professor Kerr asked whether such a course was the right one to take? If the report in question had been drawn up by a committee appointed by the council, it had virtually been drawn up by the council, and what was done by the council was done in the name of the general body of members. Surely, then, the Institute as a body ought to be informed as to the nature of the committee's recommendations? Could not the proposals be confidentially circulated amongst the members?

The Chairman read the "reference" to the committee, which directed them to "consider" and "report to provincial societies and to the Local Government Board." There was no direction as to reporting to the Institute.

Mr. Hansard said that "confidential" reports circulated amongst the members of the Institute were anything but what their name implied, and he did not consider it would be right to circulate the committee's report amongst the members (especially in view of the fact that the Government had in this matter come forward and recognised the Institute by entrusting it with this special inquiry) before it had been approved by the Local Government Board.

The subject then dropped, and

Mr. G. H. Birch, Associate, proceeded to read a paper entitled "Notes on the Seventeenth-century Domestic Architecture in London." He took a retrospective glance at old London under two widely different aspects. On the one hand, we had the Mediæval city, with accumulated historic glories of several centuries crowded within its walls, the stupendous cathedral of old St. Paul's towering above the narrow and tortuous streets and gabled roofs of private houses. In the London of Shakspeare and Ben Jonson the long roofs of several of the monastic churches were still to be seen, in spite of wanton spoliation and destruction. What things had that London seen "done at the Mermaid"! What words had it heard "so nimble and so full of subtle flame"! But its sun set for ever in the red glow of the Great Fire. Then the curtain rose on the London of the latter half of the seventeenth century. Amid the smoking embers Wren and Evelyn were elaborating, and the city was slowly rising again from its ruins. The Building Act of 19 Charles II. ordered that symmetry should take the place of irregularity, and thus was ushered in the London of the last four Stuart sovereigns, which is now so surely and swiftly being elbowed out. Attention was then called to the waifs and strays yet left us of the wreck. The districts of the City richest in relics of Elizabethan, Jacobean, and Caroline times are, of course, those wards which either wholly or in great part escaped the Great Fire of 1666,—viz., Bishopsgate, Portsoken, Aldgate, Tower, Lime-street, and Broad-street. Before the fire the London houses were half-timbered, and covered with rough-cast and plaster. Brick did not become universal until the reign of James I. The ward of Bishopsgate was especially rich in such remains, which had been exhaustively described in the Transactions of the London and Middlesex Archæological Society by the Rev. Thomas Hugo. The best preserved and most characteristic example was the well-known house of Sir Paul Pindar (+ 1650) in Bishopsgate-street. It had been sadly mutilated, but enough was left to give us no bad idea of a wealthy citizen's house at this period,—a man rich enough to give 10,000*l.* towards the restoration of old St. Paul's, and to leave, notwithstanding his vast sacrifices for the Royal cause, princely benefactions to Christ's Hospital, and to those of St. Bartholomew, St. Thomas, Bridewell, and Bethlehem. On account of alterations, additions, and partial demolitions, it was impossible to give a plan of the house; but there was very little doubt that the houses in Half Moon-street were portions of the mansion. The ceilings are exceedingly rich, one representing in flat relief the Sacrifice of Isaac; others being divided into geometrical patterns by projecting ribs, with foliage and pendants. In Great St. Helen's, immediately opposite the old priory, are some very beautiful mansions of cut red brickwork, with pilasters, cornices, and rustications, all in brick. A date, 1646, is on one of the pilasters. There was little doubt that it is from the hand of Inigo Jones. He is known to have been employed on the priory church of St. Helen, where some screenwork and doorways are still left bearing witness to his exquisite taste in design and proportion, and on comparing this work with the woodwork and general design of the houses in Great St. Helen's, and again with those on the west side of Lincoln's-inn-fields, Mr. Birch thought there could be very little room for doubt as to their designer. In No. 9, on the first-floor, is a good fireplace, which had been reproduced by Mr. Hugo, and there is another in No. 12 of the same style. Here, again, the house-front is adorned with red brick pilasters, but of rather bolder proportions and closer together, and instead of supporting a cornice, brick piers are carried up from the caps, a plain wall masking the roof and dormers. This, however, is probably an alteration. Over one of the windows is a very graceful tablet, with pediment and side scrolls in moulded brick. Crosby-square, built immediately after a fire which partially destroyed Crosby Hall in 1676, occupies the great quadrangle of that magnificent specimen of Mediæval art. The square still retains its old houses, one of which has a very fine projecting canopy over the door, delicately and beautifully carved, and many of the rooms are most handsomely panelled. Hard by, at No. 25, Bishopsgate-street, Crosby-hall-chambers, is a very noble chimney-piece. Mr. Birch attributed this house to Inigo Jones, owing to the peculiar rustication of the ground-floor. Passing on to Lime-street, the author of the paper described *con amore* a house of which he took drawings in 1872, before it was unhappily destroyed. This quarter was the Belgravia of Old London when the Court was habitually kept at the Tower. The gate was inscribed with the year 1631, but successive modernisations had robbed the outside of all interest, save, perhaps, to the antiquary. It was impossible fully to trace the history of this relic of London before the Great Fire. But there were names stirring enough identified with it. Before the fifteenth century ended the site was occupied by the town house of the powerful Scropes of Bolton, for Lime-street was then inhabited wholly by the wealthiest and greatest nobles,—the Nevilles, Bohuns, Fitzalans, Whittingtons, De Burleys, De Veres. The identification of the house in question with the Scropes was established by the will of one Richard Knyht Hustinge, dated in the 20th of Henry VII. (1505). The names of the next lessees were lost by the destruction of the archives of the Fishmongers' Company, to which it had been bequeathed, in the Great Fire; but eventually the house was leased to Sir Thomas Abney, Lord Mayor of London in 1701, and the patron of Dr. Isaac Watts. In his time it underwent changes, which Mr. Birch described in detail, and the owner kept his mayoralty there. The name and estates of the Abneys passed by marriage into the Hastings family, and became extinct in the direct male line on the death of the late Rawdon Plantagenet Abney Hastings, Marquis of Hastings. The Bordieus, very eminent merchants, were the next possessors, who lie buried in the neighbouring church of St. Mary Undershaft. Mr. Birch's drawings of this old mansion were shown, and it was mentioned that the Fishmongers' Company generously presented some of the noble fireplaces to the South Kensington Museum and one to the Guildhall, the latter being the only one which has yet "seen the light" as regards exhibition to the public. Some of the oldest London inns were next passed in review, the Tabard, the Swan with Four Necks, or "Nicks" rather, and the Oxford Arms in Warwick-lane. The views of the last taken by the society for photographing Old London were exhibited. The Oxford Arms was rebuilt immediately after the Great Fire, as a contemporary advertisement of Edward Bartlett, an Oxford carrier, whose head-quarters the inn was, demonstrably proved. These old inns were built on a sort of traditional plan, so that the present Oxford Arms resembled the old model. Old river-side houses, ancient tenements in Hoxton High-street, Wapping, Blackwall, Aldgate, Mile End-road, and Gray's-inn-lane were next spoken of, and then followed more detailed accounts of Lambeth Palace, Middle Temple Hall, Lincoln's-inn, Gray's-inn, with a slight mention of the minor Inns of Court. The history and architecture of the Charterhouse were sketched more fully. Before concluding the lecturer spoke of "one little gem of a room" in the Ward Schools of St. Botolph, Billingsgate, all panelled in oak, and in each of the panels an excellent painting in chiaroscuro in a very perfect state of preservation. Attention was also called to a house in Mark-lane,—not the well-known old house on the right going from Fenchurch-street, but on the left, close to the Corn Exchange, in which there was a very perfect room with a high chimney-piece, elaborate architrave and pediments to the door, with a very richly decorated plaster ceiling. Unhappily, it was about to be pulled down. In conclusion, Mr. Birch urged all architects whose practice brought them in contact with specimens of old domestic architecture to preserve whatever was possible, or failing that, to have measured detailed drawings made for publication or for presentation to the Institute of Architects or some cognate society.

In the discussion which ensued,

Mr. H. W. Brewer remarked that such papers as the one before the meeting were of the greatest possible value, inasmuch as they stored up a vast amount of useful information which could not fail to be of great value when the buildings referred to had passed away. With respect to the old house in Lime-street, he wished to ask Mr. Birch whether it was not possible that the house itself was more modern than he had stated it to be?—whether, in fact, it was not likely that the whole house had been rebuilt about a century ago, and the old fittings from the previous house, such as panelling, doors, and so forth, used up again in the new house? That was his (Mr. Brewer's) impression when he visited the house; there was an extremely modern look about the brickwork in the lower part of the house. He also wished to ask Mr. Birch whether any portion of what (judging from drawings he had seen) must have been a magnificent hall belonging to the Leathersellers, situate, he believed, close to the Church o St. Helen, Bishopsgate, remained? [Mr. Birch Not a stone of it remains.]

Mr. Phené Spiers called attention to a series

of photographs (six in number) illustrating the Oxford Arms Inn, Warwick-lane. These photographs were published by a society which had recently been established with the view of photographing portions of Old London. The Society proposed to publish six photographs per year, which would be issued to every subscriber of half-a-guinea. Mr. Marks, a brother of the well-known artist, had undertaken the management of the Society.

Mr. Hansard moved a vote of thanks to Mr. Birch for his interesting paper, and to Mr. Gardiner for his kindness in lending so many interesting prints and drawings in illustration of the subject. He regretted, however, that Mr. Birch had not said something as to the very excellent and interesting external ironwork which characterised the domestic architecture of the period under discussion.

Sir Walter Stirling said that not only did he regret, with Mr. Birch, the rapidity with which interesting portions of old London were removed to make way for modern changes or "improvements," but he regretted the extreme rapidity with which Mr. Birch had read his paper, seeing that very few persons could possibly have followed his remarks. In these days, when Belgrave-square rose with an unblushing front, and when Carlton-gardens appeared to be a base imitation of Belgrave-square, it was most desirable that public attention, and especially the attention of architects, should be called to the higher taste, the greater finish, and the elaborate beauty of buildings that had gone before. One would almost suppose that we were living in a barbarous age, like that of the Goths and Vandals, but for the great advance which had been made in architectural skill since the restoration of Windsor Castle. He did not know whether that work might be considered the mainspring of the revived taste for architecture, but probably all present would agree with him that it was a pity that the Castle was not restored at a subsequent period. As pertinent to the subject dealt with in the paper, he should like to know whether the new roof to the Guildhall of the City of London was considered by architects generally to be an advantage and improvement to the structure? It certainly obscured the light to a great extent. Then as to the removal of Temple Bar, there were two opinions on that subject. Whether the Bar was to be restored in its present or in some similar shape, or carried elsewhere, was a debateable question.

Mr. Whichcord, in seconding the vote of thanks, said the subject of Mr. Birch's paper was a very interesting one, and the Institute was to be congratulated on the fact that it had been read within its walls instead of being remitted to the Society of Antiquaries, or to either of the archæological societies. It appeared to him that, as often as possible, the Institute should endeavour to get papers read before it which, while to a great extent archæological, were at the same time eminently architectural, for the dual subject was one particularly suited for discussion at meetings of the Institute. No architect could have practised (as it had been his good fortune to do, to a large extent) in the city of London without continually coming in contact with a large number of interesting remains of the class referred to in the paper,—many of them in obscure and small places, and in small portions, but containing within them germs of considerable interest. To make way for modern necessities, not to say "improvements," a great number of these relics were obliged to be destroyed. Mr. Birch had brought to the notice of the meeting a great number of them. The paper was one of peculiar interest to the profession, because it took up a period which until very lately indeed had not received that amount of attention which had been bestowed upon preceding and subsequent periods. When we once got away from the Tudor period, we arrived at a totally altered condition of things; and beginning, as the seventeenth century did, with the very last years of the reign of Elizabeth, and extending up to the time of Queen Anne, it might be called the "Stuart" period of architecture. The style of this period seemed to denote the change from the Gothic type, as it passed through the Tudor period to the time of Queen Elizabeth,—and, in fact, the seventeenth century began with Elizabethan work. Mr. Birch had alluded to the late Charles James Richardson, who was an elaborate practitioner in, as well as an elaborate writer on, this style. He (Mr. Whichcord) knew of no one who appeared to love a style more thoroughly than Richardson loved the style he worked in, and that, be it remembered, at a time when comparatively little attention was given to the style. In his book he gave some illustrations of the works of John Thorp, which were very largely spread over the country, especially in Lancashire, Cheshire, Nottinghamshire, and the north-western portion of the country generally. In Thorp's buildings there was great quaintness of plan. As an instance might be cited the plan ⌈⊤ he designed for his own house, with the quaint motto,—

> "Of these two letters ⌈ and ⊤
> Join'd together as you see,
> I make a dwelling-house for me."

In quaintness and peculiarity, yet in perfect adaptability to practical requirements, the planning of Thorp was unequalled. For instance, in the planning of his own house, he was able to get two secluded court-yards, from which his rooms were lighted. Then, again, how cleverly-arranged was the planning of the houses of this period with the view of enabling all the principal rooms to face the south-west (as they should do in this climate), while at the same time the surrounding walls were kept free from apertures. In fact, good planning seemed to have been a primary consideration with the architects of the period. Mr. Birch had referred to Inigo Jones, but it should be borne in mind that in dealing with his name we were dealing with a giant. Both John Thorp and Inigo Jones and their school were antecedent to the Fire of London, but subsequently to that event we had Sir Christopher Wren and Sir John Vanbrugh. These were four men such as hardly any century could produce. They practised largely, and produced some grand buildings. Different, no doubt, their works were, and a very great difference was to be remarked between the works of the earlier of them (Thorp) and those of the latest (Vanbrugh). He had not heard Mr. Birch attribute any of the works he had referred to to Vanbrugh, although it was well known how largely he was engaged in the city towards the end of the seventeenth century. Amongst the least successful of his works was perhaps St. John's Church, Westminster, with its four angle towers, and which had been irreverently likened to an elephant on its back, with its four legs raised in the air.*

Professor Kerr said that architects were chiefly interested, in respect of the subject of Mr. Birch's paper, in that remarkable phase of art which was connected with the transition from the end of Mediævalism to the commencement of Classicism properly so called; and at the present day, when we were passing through a somewhat similar act of architectural change, it seemed to be peculiarly desirable that a clearer understanding should be arrived at than was at present possessed as to the characteristics of that style of architecture which Mr. Whichcord had so aptly named the architecture of the Stuart period. A good deal had been heard of late as to Queen Anne architecture, and he had been reading a book written by two young ladies on the subject of Queen Anne furniture, and found from their remarks that the style of Queen Anne (so-called) was acquiring more and more authority amongst those who might be considered to be leaders of taste at the present moment. It had been said that the style of Queen Anne was no style, because her reign had been too short to allow of the development of anything like a distinctive style. But if we took the whole of the period of the seventeenth century, as Mr. Whichcord had said, it would be possible to perceive a definite and distinct act, namely, that of the transition from Elizabethan to the style of Inigo Jones. He was inclined to think Mr. Birch was in error in ascribing much of the rococo work he had referred to in his paper to Inigo Jones. In his opinion Inigo Jones was incapable of producing such work, and it should be clearly shown, if possible, that he was its designer. Seeing that many architects of the present time had taken up Queen Anne, or rather Stuart, work,—for reasons which were no doubt very good, and which would no doubt turn out to be philosophic,—as a transition from the Mediæval architecture which they had so well exhausted, to the Classic architecture which was presently coming, it was time that they should seriously begin to understand from examples what the principles of the style really were, because it was unquestionable that the merits of the style were most distinct, and if architects were going to work in that style it was desirable that they should study its examples as systematically and as thoroughly as their predecessors had studied the forms of Gothic architecture during the past thirty years. He therefore ventured to suggest, in all seriousness, that some sort of text-book or book of examples of the Stuart style ought to be published, and he thought that in the drawings and prints exhibited on the walls, and in existing buildings of the seventeenth century, there was ample material for a most interesting and useful book of the kind he had named.

Mr. Eastlake having made a few remarks, the chairman put the vote of thanks, which was carried unanimously.

Mr. Birch, in acknowledgment, said that the house in Lime-street was certainly not so modern as Mr. Brewer was inclined to suppose. As to the Guildhall roof, he believed that Mr. Horace Jones and Sir Digby Wyatt (who was consulted on the subject) had good authority for the form which the restored roof had taken. As to Inigo Jones and rococo work, if Professor Kerr would go and look at the south door of St. Helen's Church, Bishopsgate (which was known to be by Inigo Jones), and compare it with some of the buildings he had referred to, he would see that there were very strong grounds for supposing that Inigo Jones was the designer of all.

The next meeting of the Institute will be held on Monday, January 8, 1877, when Mr. John Lanyon is announced to read a paper "On Sanitary and Practical Appliances calculated to Increase the Comfort of Dwellings."

* We have before now pointed out that Archer was the architect of this church.—ED.

PRACTICAL ENGINEERING AT THE CRYSTAL PALACE.

SINCE the Crystal Palace School of Engineering in connexion with the Company's School of Art, Science, and Literature was opened four years ago, the scope of its curriculum has been, albeit pretty wide at the outset, continuously and considerably extended. Originally the course embraced instruction and training in the drawing-office, in the pattern-shop, smith's shop, and foundry, and in the fitting-shop. To these an extra section has been added, in which the first term is devoted to general surveying and the preparation of plans, &c., for Parliament; the second term to the calculation of strains, and the preparations of general and working plans, specifications, and estimates of a railway and dock. The last extension of the course has been the addition of a Colonial section, designed particularly for gentlemen who intend to proceed to the colonies or abroad as explorers or settlers.

The winter term of the school closed on Saturday last, when the certificates awarded by the examiners, Messrs, John Imray, M.A., M.I.C.E., and D. K. Clark, M.I.C.E, were presented to the successful students by Mr. W. H. Barlow, F.R.S., vice-president I.C.E.

Mr. Barlow, who was introduced by Mr. Thos. Hughes ("Tom Brown"), chairman of the Palace company, delivered an interesting practical address to the students. Machinery, he said, was employed for locomotion, agriculture, manufacturing processes of all kinds, and in a thousand ways illustrating the importance of the engineering profession, and any institution that secured better education to young engineers, as this school did, he considered a boon to the country. Young men frequently entered engineers' offices devoid of the knowledge absolutely necessary as a foundation for the profession of civil engineers. This school supplied the want in giving the students some knowledge of applied science, and of the technical mode in which those sciences were brought into operation. The arrangements of the school throughout,—and he had thoroughly examined them before to-day,—were excellent. He, Mr. Barlow, had recently come from Philadelphia, where he had been asked to serve as one of the judges at the Centenary Exhibition. He found, as he had expected to do, from the inventive genius of the Americans, that they executed great works. At Niagara, there was a suspension bridge, carrying railway and road, of 810 ft. span; near it was another of 1,110 ft. span; and there was another now building between New York and Brooklyn of 1550 ft. span. The widest span of any suspension bridge in this country was the Clifton Bridge, on which he had been engaged with Sir John Hawkshaw, and it was only 702 ft. span. Cast-steel wire was extensively employed in these great structures, and he hoped that our Board of Trade might be induced ere long to sanction the introduction of this excellent material for structures in this country of a similar kind, possessing, as it did,

greater power of resistance to strains than any other, weight taken into the account.

Mr. Shenton, superintendent of the School of Art, Science, &c., then read the examiners' report to the committee of directors, which was much more full than those hitherto presented.

The chairman then proceeded to present the certificates. Thirty-six students had attended the lectures, and twenty-three presented themselves for examination, of whom eighteen passed satisfactorily. Mr. Wilson, the principal, stated that this was the highest percentage to which they had as yet attained. The highest number of marks possible is 232. The highest was S. R. Lowcock, with 202 marks; second, A. Jones, 199; and, third, E. Foord-Kelcey, 191; the others ranged from 189 to 107 marks. Each of these eighteen students had a second certificate for proficiency in some special department. In the drawing-office ten certificates were awarded,—L. S. M. Marsh, first; and L. W. Toms, second. In the pattern-shop and foundry, &c., thirteen certificates were awarded,—G. S. Firth, first; and A. R. Sennett, second. In the fitting-shop, ten certificates were awarded,—S. R. Lowcock, first; E. Foord-Kelcey and A. Jones, equal seconds. In the civil engineering section, first term, ten certificates were awarded,—E. A. Royston, first; S. A. Tidey and Lloyd Wilson, equal seconds: second term, A. T. Bean, first; and F. S. Richardson, second.

Thanks moved by Mr. Hughes to the examiners and to Mr. Barlow were acknowledged by Mr. Imray and Mr. Barlow.

Mr. Wilson, the principal, reported upon visits paid by the students to Birmingham, and to Earl Dudley's works, and that prizes received from Earl Dudley's manager for essays on the visit had been awarded to Mr. Howard Newton, first and leading student in the Colonial section, Messrs. Sennett, Bean, Byng, Marsh, Millidge, Lowcock, and others.

THE PAST AND PRESENT OF ARCHITECTURE IN IRELAND.*

Besides the great public buildings mentioned, the number of splendid private mansions erected, both in Dublin and the country during this period, is past counting, and, taking both together, we may look on it as the Augustan age of Irish architecture. A comparison of the court end of London at that time,—including the classic district of Mayfair, and the town houses of the Earls of Chesterfield and Burlington,—with the corresponding districts of Dublin, would not be at all unfavourable to the latter city. Foremost amongst these town houses, or *palazzi*, as they would be called in Italy, comes Leinster House, a noble and complete specimen of the aristocratic mansions of the time, the proportions and details of which are well worthy of study on the part of our younger members. Then we have Powerscourt, Tyrone, Charlemont, Aldborough, and numerous other stately mansions, not unworthy of mention beside the palaces which line the Strada Nuova at Genoa, or the Corso at Rome. In the house of the Provost of Trinity College we have a choice work of the Earl of Burlington, the most distinguished architectural critic and amateur of his time. Degraded as, alas! so many of these noble mansions are from their former uses, they yet impart a spaciousness and grandiosity to the portions of the city in which they are situate that I should be sorry to lose. As the special correspondent of *Punch* observed recently, they made Dublin look "old-fashioned and highly respectable."

The country mansions of the corresponding time are nearly always conceived in the same grandiose and symmetrical manner, and are particularly remarkable as compared with more modern structures for their sound and durable construction. They do not compare unfavourably with those erected at the same time in England, illustrated in the "Vitruvius Britannicus," except that we have no such princely and sumptuous ones as Blenheim, Castle Howard, Kedlestone, or Wanstead. Nevertheless, Carton, the seat of the Duke of Leinster; Powerscourt House, County Wicklow; Ardbraccan, the palace of the Bishop of Meath; and others too numerous to mention, present fair specimens of the Hiberno-Classic country-house, and are distinguished by the same stateliness, grandiosity, and solidity as the contemporary great houses in England. Some of the great architects of the latter country were glad to come over and execute commissions in Ireland,—in particular, Sir William Chambers, one of whose choicest works, the Casino at Marino, erected for the Earl of Charlemont, is within half an hour's drive of Dublin, and is richly deserving of being measured and delineated by architectural students. I observe this property has been recently advertised for sale; let us hope, if cut up,—as it is likely to be,—into lots for villas, that this charming work of a great master will be respected, and not altered into a Cockney villa, or, worse still, a public-house.

I have referred to the solidity observable in the construction of the buildings of this period. I might further draw attention to the elegance of the details and the richness and variety of the internal decorations, especially of the ceilings and chimney-pieces. The plaster-work was commonly wrought by hand by real artists, instead of being cast mechanically by a common workman. As for the chimney-pieces, it is remarkable that numbers of them having been taken down and replaced by modern rubbish, having been cleaned up and re-polished by some of our local marble workers, have fetched high prices in England, the recent revulsion in favour of the Queen Anne style having brought their good points into notice.

This architectural era closed with the Union, and brings us within a generation of the present. I have often wondered what a plight Dublin must have been left in by that important measure! How the lines of stately mansions must have looked after the departure of their aristocratic inmates! It is an ill wind blows no good; and soon we find the leading members of the legal and medical professions taking up their abodes in the deserted houses of the nobility. Dr. Bolus moves from Kildare-street into the mansion of Lord Poldoody in Merrion-square; Mr. Counsellor O'Fee, late of York-street, takes up his quarters in Lord Kilgobbin's late house in Stephen's-green. Some of the houses are found too big for the new inmates, even for the swell doctor or portly counsellor, and have to be divided into two unequal parts,—one retaining the spacious doorway, hall, and grand stairs; the other having to put up with the servants' stairs, a new doorway being made into it. For many even a worse fate is reserved. This is turned into a circumlocution office, that an hospital for incapables; another is purchased for a mere song by a firm of dry-goods merchants; another, still worse, cut into tenement houses! Sad it is to contemplate these reverses, and the sooner we pass from them to something more cheering the better.

The architectural history of Ireland during the thirty or forty years following the Union is not altogether so meagre as might be expected. Two leading practitioners seem to have flourished in Dublin,—Francis Johnston and Richard Morrison,—acquiring both fortune and fame by their practice. The Post Office, College of Surgeons, and St. George's Church are amongst the works of the former. The church is worthy of notice as by far the most stately of the parish churches of the city, and worthy to compare with some of the best works of Wren or his pupils, Gibbs and Hawksmoor, in London. He also added the chapel to the Castle,—a fair specimen of the Gothic of the time. Mr. Johnston deserves honourable mention for his munificent gift to the Royal Hibernian Academy of the present house. He was one of the first presidents of that body. Sir R. Morrison enjoyed a large practice in country mansions, for which a kind of sham castellated style was then the fashion, and also achieved a reputation for his knowledge of Greek architecture by the two large Roman Catholic churches of Marlborough-street and Westland-row. In the south of Ireland the Paines (one of them is still living, I believe the oldest architect in the kingdom) enjoyed a large practice. Mitchelstown, Dromoland, and Loughcarte Castles, and nearly all the county and public buildings of the province of Munster during the time, were erected by them. It is to this period we owe the Theatre Royal, the interior of which, whether for size, proportions, or decoration, ranks high amongst those of the chief cities of the world, but which, in common with most of the London theatres, suffers much from its surroundings and squalid exterior. The extension of Dublin, Limerick, and other cities by the building of new streets and squares which took place during the same period is very remarkable, having regard to the adverse influence of the Union on the number of resident gentry.

We now come to the present, meaning the lifetime of the present generation; and while we may not be able to point to progress equal to that of other centuries, it is gratifying that we can still point to much. The introduction of the railways gave a great impetus to architecture in the buildings connected with them, and those erected by some of our leading lines,—*e.g.*, the Great Southern and Western and the Midland Great Western of Ireland,—are decidedly above the average. It is to be deplored, however, that the really noble termini of these lines are in out-of-the-way places, while two of those which occupy commanding positions,—namely, the Wicklow and Kingstown lines respectively,—are mean and contemptible in the last degree. Let us hope that, as there has been an enormous advance in the value of railway property recently, owing to the increased traffic of the lines, the attention of the directors will be given to providing more suitable and dignified buildings at these important points. The banks have nearly all found it necessary to rebuild their head-quarters, as well they might, considering the enormous increase in their deposits and dividends. Most of these buildings are honourable to our profession, in particular the Hibernian Bank, just completed by our late president, which, for vigorous and original treatment, solid construction, and careful arrangement, will compare favourably with any similar structure I know of. The number of country branch-banks erected is beyond all counting, and, though of course modest in comparison with their metropolitan head-quarters, they are generally neat and appropriate buildings. Some of the provincial cities,—notably Belfast and Cork,—seem determined to be no way behind Dublin in the style of their banks as well as other public buildings. Next we have the insurance companies, which, although their head-quarters are usually located on the other side of the Channel, find it important to have their Dublin offices spacious and attractive, and have built, or are building, numerous handsome structures. We have then the warehouses and shops, of which the proprietors, too, seem to become at last alive to the fact that well-designed buildings for trade purposes are good investments.

When we come to notice the churches of all denominations erected during our last period, however, the progress is most remarkable, and were we to judge by them alone, we might still claim for our country its old appellation of the Island of Saints. The returning Irish emigrant, fresh from the grandeur of Fifth-avenue, New York, sees on the heights of Queenstown a stately cathedral rising, and when he goes up to the fair city of Cork, sees there another already risen, with neither of which New York, for all its boasted wealth, can as yet show anything to compare. If he goes on to Dublin, he sees there the venerable pile of St. Patrick's restored, and the other cathedral of Christ Church in process of restoration, all being accomplished either by voluntary contributions or single-handed munificence. Two stately fanes rise over the primatial city of Armagh to mark the seat of Ireland's great apostle, erected in the same manner. Dr Neilson Hancock has pointed to the statistics of the deposits in banks as evidences of the prosperity of the people, but perhaps another corroborative index would be found in the number and stateliness of the buildings erected by the various religious communities. The Roman Catholic Church stands first in point of numbers, and it must be gratifying to the members of that church to reflect that at no period in Ireland's history were so many and such noble buildings erected for its worship as during the last twenty-five years. It is rumoured that a metropolitan cathedral for the arch-diocese of Dublin is projected, that in Marlborough-street being now only called a pro-cathedral. Let us confidently anticipate that it will be a worthy one, and mark an important period in the architectural history of the country. Then if we look at the recently Disestablished Church, we shall find no signs of weakness such as were feared from its new position. The extinction of the Ecclesiastical Commission, with its mechanical system of building and repairing churches, has been no great loss architecturally. The liberality of the laity is now called forth, not to be put to the blush by their Roman Catholic countrymen, and a field of practice, hitherto almost closed by the official system, is now thrown open to private architects. If we are to judge by the crowded state of the churches in the suburbs of Dublin, more will soon be required, and let us hope that more correct canons of taste will be recognised in them. And if we look farther at some denominations not hitherto remarkable for their

* By Mr. W. Fogerty. See p. 1223, *ante*.

appreciation of architecture, we see much that is hopeful. One of the handsomest churches in Dublin was erected some years ago for the Presbyterians in Rutland-square by a private individual; and a church has been just built and handed over to the Wesleyan Methodists in Belfast by another, which is acknowledged to be the finest building yet erected anywhere for the worship of that wide-spread body—an especial honour both to Irish Methodism and the eminent Irish architect who designed it.

The lunatic asylums of the country have nearly all been enlarged, and many new ones erected during a short period; and at present several of the Dublin hospitals are being enlarged, let us hope to increase their efficiency, and maintain the *prestige* of the Dublin medical school, which owes so much to them. Buildings for pleasure and recreation have not been neglected, new theatres having been erected in Dublin, Belfast, Cork, and Waterford. The Dublin Exhibition Palace, although a financial failure, has served important purposes, and may yet, with its gardens, become a pleasant place of resort and recreation, which seems to be fully the case with our new and fashionable skating-rinks.

If we are to believe the statistics already referred to (putting Dublin for a moment out of the question) a larger proportion of our nobility and gentry now reside on their estates, and for longer periods than at any former time. This is a most hopeful sign, and leads me to remark that if the number of new mansions on a large scale erected throughout the country is not great, yet the style and finish of those that have been erected of late show a great advance. There is, however, a pretty extensive demand for a more modest type of country residence, especially in the environs of Dublin, Belfast, and Cork, and suburban villas on a smaller scale are still more in request. These latter, it is to be regretted, are too often handed over to the tender mercies of the speculative builders, who have filled the otherwise pleasant townships of Rathgar, Pembroke, Kingstown, and similar places with smug boxes or terraces, neatly faced or wigged with red brick, but the bareness of whose flanks and rear is most disagreeable, to say nothing of the flimsy construction and the little comfort to be had within. It is rare to meet one displaying any care or taste in its design,—a most unsatisfactory state of things which it concerns both our profession and the public to remedy.

We have spoken much of the mansions of the nobility and the residences of our wealthy middle-class; something should be said relative to those of our working population. I fear that as regards neither past nor present times can anything congratulatory be said on this subject. The dwellings of the peasantry and town working people of Ireland have been too long a reproach, but they were, and are still, commonly looked upon as beneath the notice of architects, or outside their province. With the increase of wages, and abundant employment which we have witnessed of late, this is a state of things which ought to find a remedy. I am glad to observe some efforts being made in that direction by the formation of an industrial tenements company, with a competent professional adviser; and it is to be hoped that among the good things which the future has in store, the amelioration of the dwellings of the working classes will not be wanting.

A bond of union and means of connexion for our profession in Ireland, and with our brethren who practise the same art in Great Britain, is still a desideratum. On this subject the recent address of the president of the Royal Institute of British Architects contains most valuable suggestions, which will be endorsed by every sensible architect in this country, although deprived of much of its political importance by the Union. The city of Dublin possesses many advantages as a centre for architectural education and practice, which it behoves us not to let slip. Its university, theological, medical, and legal schools enjoy a world-wide reputation. Why should it not take fair rank for its architectural school also? Having had occasion to note so much that is great in the past and encouraging in the present, let us look forward with hopeful eyes to the future.

Surveyor to the Board of Customs.—The *Civilian* says the Government have resolved to abolish the post of surveyor of buildings to the Board of Customs, and transfer the duties to the Office of Works.

SOME OLD HOUSES AND THEIR STORIES.

GOODMAN'S FIELDS PLAY-HOUSE AND GARRICK'S VILLA AT HAMPTON.

ON our way to Hampton we first take a look at a famous East London institution,—the Sailors' Home, in Well-street, Wellclose-square. The well and close which gave this eighteenth-century square its name were those of an old farm held in the sixteenth century from the Nuns of St. Clair,—called the Minories, or Minoresses,—by one Goodman. To this farm, Stow, as you may have read in his "Survaie," used to go across the fields to fetch "many a halfe penny worth of milk, and never had less than three ale pints for a penny in the winter, alwaies hot from the kine, as the same was milked and strained." Long after poor old Stow had died in poverty, sickness, and age, that is to say, after 1605, houses had sprung up here and there amongst the old nunnery gardens, trees, and hedgerows, the foremost heralds of invading London. While Charles II. was enjoying his "merry" sway, there stood, where this Sailors' Home now is, a little meeting-house of poor, persecuted, player-hating, player-ridiculed Presbyterians, or Independents, with its grave-yard attached to it; and there it stood through the gloomy reign of the second James. And there it stood in 1703, when a journalist of that day wrote as follows:—"The great play-house has calved a young one in Goodman's Fields, in the passage by the Ship Tavern, between Prescot and Chambers-street;" adding, "It is in a very good place in Rosemary-lane precinct; I know no reason why the quality at both ends of the town should not have the same diversions. This will be a great ease to the ladies of Rag Fair, who are now forced to trudge as far as Lincoln's Inn Field to mix themselves with the quality. The Mumpers of Knockvargis will now have the play-house come to them, who were not able to stump it to the other end of the town on their wooden legs: the does on Tower-hill Park and Rosemary-lane precincts will be foddered nearer home this winter; and the sailors will have better entertainment for their loose coins than formerly."

Thus wrote Tutchin in the *Observator*. But there were those who spoke of the new building in a very different spirit, for it stood close beside the old meeting-house, and covered the very graves of the pious, persecuted, long-suffering ancestors of its worshippers. They, of course, raised a great outcry against it, and the Rev. John Matlock, their minister, in pulpit and pamphlet, denounced the wickedness thereof with unsparing severity. Many believed that a curse would rest upon the place; that prosperity would never bless it; and that all who belonged to it would incur God's wrath.

And, strange to say, for many years after, something ailed the place; its history became one of constant misfortune and disaster, and so continued to the last.

By 1729 its earliest career as a theatre was over, and it was let out in tenements to the silk-throwsters and weavers who had formed a little colony in its neighbourhood. In that year the first licensee of the stage under Walpole's Licensing Act was a dramatic author named Thomas Odell, and he, unfortunately for himself, determined to revive the then already forgotten Goodman's Fields Theatre. Accordingly he displaced the honest weavers and throwsters, and set his workmen to pull down and restore, the painters and gilders to decorate, and the players to rehearse a new piece by one since known to fame as Henry Fielding. But ill-luck, the opposition of the lord mayor, aldermen, and his more respectable neighbours, and a sermon preached against the new theatre in Bishopsgate, at St. Botolph's Church, so frightened him, that he soon after sold his newly-acquired property, at a ruinous loss, to Mr. Henry Giffard, an actor, who pulled down, re-erected, and re-opened it in 1732. "He, however," to quote Cassell's "Old and New London," "was soon scared away, and in 1735 removed to Lincoln's Inn Fields." In 1741, however, he returned, and in that year a "stage-struck" young gentleman from Lichfield, who had been in the wine trade, and who had previously made a successful *début* in Ipswich, under the name of Lyddal, and had resolved to adopt the stage as a profession, joined his company. His name was David Garrick, and Goodman's Fields Theatre has ever since been known, and ever will be known, as the house in which his wonderful histrionic career had its real commencement.

As to the theatre, it was pulled down in 1746 rebuilt, and burned down in 1802, and having been again rebuilt, Malcolm, writing of the place in 1807, for his "Anecdotes of the Manners and Customs of London," said:—

"What will ensue from *new* play-houses being erected may be seen by that at Goodman's Fields: the street where it is built used formerly to be inhabited by silk-throwsters, riband weavers, and others whose trades employed the industrious poor; immediately on setting up this play-house, the rents of the houses were raised, as the landlords could let them to more profitable tenants; and now there is a bunch of grapes hanging to almost every door; besides an adjacent Bagnio or two,—an undoubted proof that innocence and morality are not the certain consequences of a playhouse. I could urge this much further; but as the regulation of the number of theatres is now before Parliament, *they* only are to determine whether the continuance of this Theatre, or the increase of others, is consistent with the public good."

In 1820, a member of Parliament, Mr. Peter Robinson, essayed its revival. Its locality was then a semi-rustic one in which handsome houses belonging to wealthy merchants had grown more and more numerous. He called it the Royalty, and thought it ought to succeed. But it did not. In 1826 it was, for the third time, burned down. Two years after it arose once more, enlarged and beautified under new proprietors at a cost of over 25,000*l*., and was called the New Royal Brunswick Theatre. The newspapers gloried in its beauty and numerous improvements. Everything that could make it a success had been secured. Two days after its completion, while a rehearsal was in progress, its too ponderous iron roof suddenly fell, crushing it into dust and ashes, destroying several of the surrounding houses, and burying in its ruins about 170 individuals. The newspapers filled pages with accounts of the awful disaster, and returned to it day after day. Savage mobs were aroused by it to attack the house of Mr. Whitewell, the architect, and endanger his life; the soldiers were called out from Tower-hill by it; sensational pictures of it, and sensational pamphlets on it, appeared all over London, and many of them may still be seen in the Guildhall Library. The old story of the meeting-house and graveyard was revived, and there was much talk of dead men's curses.

But the strange history of that ill-luck-haunted old house with its stories of ruined managers—poor John Palmer, who died on the stage while playing "The Stranger" amongst them; its desperate and useless bids for popularity; its law-persecuted and cruelly-imprisoned players; its odd schemes for evading a partial and unjust law when Parliament, secretly venting its spite against Fielding, limited the number of theatres; its celebrities of the theatrical world whose fame yet lives in the stage's latest records; its tragic, romantic, and farcical stories,—would fill a volume, and we are but briefly noting these few facts as, chatting and leisurely, we pursue our way from the old "Brunswick Maritime Establishment," now called the Sailors' Home, to Hampton.

The only brief glimpse of real prosperity which the Goodman's Fields Theatre ever knew began on the 19th of the aforesaid October, 1741, and was remarkable. The nameless young wine-merchant's success was, indeed, wonderful. In the first place, the theatre being without a licence no regular dramatic performances could be given; in the next place, it was in bad repute from the fact of so many beginners having displayed their incapacity upon its boards. Its rows of boxes and seats were always drearily empty, and it had all those elements of neglect, dirtiness, shabbiness, and discomfort which make a continuously unsuccessful theatre one of the most mournful of saddening sights. The courageous little fellow, despite all these things, succeeded mightily. He was not announced by name in the play-bill, but (falsely) as "a gentleman who had never appeared on any stage" to play Richard III., with other persons, who with him, performed gratis "for their diversion." The prices of admission, to avoid the law, were nominally paid for a commonplace concert, which preceded the play. The first night Garrick puzzled his critics. They could not doubt his success, but then there was something so startlingly novel in the realistic force of his acting. Richard in him was a real man, old stage traditions were ignored, nature assumed the place of art, the actor was altogether lost sight of. If this new player was right, the



Garrick's Villa at Hampton.

actors in whom they had so long delighted were clearly wrong. For seven nights his increasing fame improved the business, the previous state of which may be guessed, when we add that although the house was a large one, the sum taken in those seven successful performances averaged considerably less than 40*l.* a night. But afterwards the receipts rapidly and wonderfully increased. In Davies's "Life of David Garrick—of which, by-the-bye, the writer has Boaden's copy, containing notes in his handwriting,—we read, "Such was the universal approbation which followed our young actor that the established theatres of Covent-garden and Drury-lane were deserted. Mr. Garrick drew after him the inhabitants of the most polite parts of the town; Goodman's Fields was full of the splendour of St. James's and Grosvenor square; the coaches of the nobility filled up the space from Temple Bar to Whitechapel. He so perfectly convinced the public of his superior accomplishments in acting that not to admire him would not only have argued an absence of taste, but the grossest stupidity; those who had seen and been delighted with the most admired of the old actors, confessed that he had excelled the ablest of them. . . . . Mr. Garrick shone forth like a theatrical Newton; he threw new light on elocution and action; he banished ranting, bombast, and grimace; and restored nature, ease, simplicity, and genuine humour." Quin, who had been the greatest actor of the day, sneered at him as a preacher of heresy, and said, "Whitfield was followed for a time, but they will all come to church again." Chapels, however, survived Whitfield, and Garrick's school is still that of all great modern actors. Garrick, replying to Quin, wrote,—

> "Doctrines which meet with general approbation
> Are not call'd heresy, but reformation."

Colley Cibber came from Drury-lane to see him play *Bayes*, and speaking of him as the "completest little doll of a figure," said he did not think him superior to his son Theophilus. Mrs. Bracegirdle, who had then been off the stage more than thirty years, said of him,—"The actor who pleases everybody must be a man of merit." Pope said,—"That young man never had his equal as an orator, and never will." Garrick, speaking of Pope's presence in the Goodman's Fields Theatre, says,—"When I was told Pope was in the house, I instantly felt a palpitation at my heart,—a tumultuous, not a disagreeable, sensation in my mind. I was then in the prime of youth, and in the zenith of my theatrical ambition. It gave me a particular pleasure that *Richard* was my character when Pope was to see and hear me. As I opened my part, I saw our poetical little hero, dressed in black, seated in a side-box near the stage, and viewing me with a serious and earnest intention. His look shot and thrilled like lightning through my frame, and I had some hesitation in proceeding from anxiety and from joy. As *Richard* gradually blazed forth, the house was in a roar of applause, and the conspiring hand of Pope shadowed me with laurels."

Horace Walpole, writing in 1742, said,—"All the run is now after Garrick,—a wine-merchant who is turned player at Goodman's Fields. He plays all parts, and is a very good mimic." But Walpole did not think very highly of his acting, nor did the poet Gray, who wrote,—"Did I tell you about Mr. Garrick, that the town are horn-mad after? There are a dozen dukes a night at Goodman's Fields sometimes; and yet I am stiff in opposition." Cumberland witnessing Garrick's acting as contrasted with that of Quin and others in the same piece, said,—"It seemed as if a whole century had been stepped over in the changing of a single scene: old things were done away with, and a new order at once brought forward, light and luminous, and clearly destined to dispel the barbarisms and bigotry of a tasteless age, too long attached to the prejudices of custom, and superstitiously devoted to the illusions of imposing declamation." Goodman's Theatre was this year open on Christmas Day, when Garrick played *Coldio* in the "Fop's Fortune."

Through playing in an unlicensed house, it was soon remembered that Garrick and his fellows were in the eye of the law rogues and vagabonds. The two West End managers determined that the law against him should be promptly enforced. They were energetically aided by one of the most respectable chief magistrates in London, who, says Davies, "had reasons of a private nature to incense him against the comedians of Goodman's Fields." With his aid they soon reduced Mr. Giffard, the Goodman's Fields manager, to terms, in consequence of which Garrick was given up his agreement, and allowed to join Mr. Fleetwood, of Drury-lane, as one of his Majesty's servants, for an annual income of 500*l.* Through Garrick's influence, probably, poor struggling Giffard and his wife were themselves soon after engaged for Drury-lane Theatre, leaving its rival in Goodman's Fields to fall into the hands of Astley, who tried it as an amphitheatre, and failed. Garrick, before joining the Drury-lane company, made his *début* as a dramatic author in "The Lying Valet" and "Lethe."

Pursuing our way to Hampton, we move first to Drury-lane Theatre, where Garrick made his first appearance in May, 1742, and played gratuitously (in reality) for the benefit of Harper's widow, his part being that of *Chamont*, in "The Orphan," Mrs. Pritchard playing *Monimia*. In June, 1742, he went with one of his warmest admirers, Peg Woffington, to play in Dublin, where he drew such crowded audiences that a distemper arose in Sheridan's ill-ventilated theatre which attacked the playgoers, and spreading, became known as "the Garrick fever"!

It was while he was at Drury-lane that Garrick received a visit from an elderly gentlewoman, who informed him that he had won the heart of a lady of great beauty and wealth, who had seen him play *Chamont* and *Lothario*, and was willing to bestow her hand upon him. Garrick was eager to see the lady, and an appointment was made, but before it was kept the beautiful young heiress had seen him play *Abel Drugger*, and all her love for him had gone as suddenly as it had come.

At Drury-lane Garrick revived Shakspeare's "Romeo and Juliet," after it had been banished from the stage about eighty years. And many old playgoers were afterwards indignant with the management for permitting this tragedy to be played every evening for a fortnight, which was then regarded as a "run" of extraordinary length, although it was soon after entirely thrown into the shade by a new pantomime,—"Queen Mab,"—that actually ran forty nights!—in which Woodward, as harlequin, was immensely popular.

On the 22nd of June,* 1749, Garrick was married. The lady of his choice was Miss Eva Maria Veigel, or Violetti, and the ceremony of their union was performed by Mr. Franklin, at his chapel, near Russell-street, Bloomsbury, and the ceremony was repeated on the following day by Mr. Blyth, at a Roman Catholic church.

But concerning this lady, we have another story to tell. She was born at Vienna on the 29th of February, 1724, and Charles Lewis, the harlequin, in his "Memoire," openly asserted

* Davies says the marriage took place in July, but Boaden in his copy appends a note correcting the date, and adding the other particulars made use of above.

that she was the natural daughter of Richard Boyle, the fourth earl of Cork and third of Burlington. Dr. Carlyle, who used to be called Jupiter Carlyle, because Hamilton had made him his model for the king of gods and men, relates in his "Biography" how in the year 1746 he went with a pair of friends on board the packet which used to run between Helvœt, in Holland, and Harwich, and how amongst other passengers was a bashful and shy young Hanoverian baron, with a slim graceful figure, and a beautiful effeminate face, who had a berth to himself, and was said to be on his way to the Court of St. James's. Fair weather and a brisk gale carried them merrily on their way, until, the breeze freshening, the baron in an agony of fear began to utter little shrieks, and implore the doctor to tell him if there was any danger. Then Jupiter Carlyle knew that the bold baron was a woman, and a very charming woman, in disguise. He saw her not long afterwards dancing at the King's theatre, in the presence of the king, George II., and an unusually large and brilliant audience. The only explanation is one which is said to have been supplied years aftewards by the lady herself, who stated that the Emperor Frederick I. had paid her such marked attention that for her protection the Empress Maria Theresa had advised her to secretly take flight to England, for which purpose she supplied her with money and letters of introduction to various royal and noble personages. Hence, we conjecture, the disguise and the voyage Dr. Carlyle spoke of, the fact that George II. commanded the play on the occasion of her first appearance, and the fact that all the fashionable world conspired to pet and make much of her directly after her arrival in England. Walpole, writing to a friend in June, 1746, said, "The fame of the Violette increases daily. The sister Countesses of Burlington and Talbot exert all their store of sullen partiality and competition for her. The former visits her, and is having her picture, and carries her to Chiswick, and she sups at Lady Carlisle's." Lord Burlington, her reputed father, had his Italian villa at Chiswick, and she was introduced by him to Frederick Prince of Wales, at Leicester House, in what is now called Leicester-square. She sat with the Countess of Burlington at the trial of Lord Lovat for treason, in April, 1747, and it was noticed with what almost maternal tenderness the Countess regarded her. Walpole, describing to a friend a grand party given at Richmond in 1749, says:—"Lady Burlington brought Violette, and the Richmonds had asked Garrick, who stood ogling and sighing the whole time, while my lady kept a fierce look out," which was not, however, sharp enough to baffle the actor-lover, who on one occasion obtained a brief interview with his lady-love by dressing in a woman's clothes.

And now that we have got both halves of Garrick together, the inferior moiety having secured the good and beautiful better half's dower of 6,000*l.*, given to her by her munificent patron, the Earl of Burlington, we will leave the stage altogether and travel with them to Hampton under the guidance of Henry Angelo, the famous fencing-master, who says of Garrick:—"I knew him well; he was intimately acquainted with my father, and his wife was the friend of my mother,—the affection was mutual,—and I owe a thousand grateful recollections to acts of kindness bestowed upon me by Mr. and Mrs. Garrick, whilst sojourning under their roof at their town house [in the Adelphi] and their villa at Hampton, where I have passed many a delightful day, with my old schoolfellows, Carrington and Nathan Garrick" (his son died not many months ago) "during our school vacation. These were the nephews of his brother George. We were together at Eton, boarded with the same dame, and, both being very little boys, Carrington and myself were bedfellows. My father bequeathed to me a silver cup given him by Garrick, which was made by his order and inscribed '*Pegno d'amicizia di* David Garrick *al suo amicio Angelo Malevolti.*' It held on the first day of its presentation three bottles of the donor's Burgundy, and was used on festive occasions. Garrick, who had pledged my father and mother, myself and sisters, and pressed it to his lips, has been remembered by the friendly token with the accompaniment of many a tear. My father was at his funeral, and my mother was with his widow at the period of the awful ceremony, and I still wear his wedding-ring. I remember being at Hampton many years before he left the stage, and after supper, to amuse us boys, his reading Chaucer's 'Cock and the Fox.' He recited, too, the poem of the 'Hermit' by his friend Goldsmith, and fell asleep in his chair. Mrs. Garrick held up her finger to admonish us to silence; and, taking off her lace apron, fondly placed it over his face, when we received our candles and went to bed."

And here Coleman joins in our chat with his personal knowledge of Garrick at Hampton, saying, "The frequent letters passing between Garrick and my father at Richmond were so many opportunities for me to take airings on horseback, attended by the servant who carried the despatches. On these occasions I always on arriving ran about his gardens, where he taught me the game of trap-ball, which superseded our former nine-pins. He practised, too, a thousand monkey tricks upon me; he was punch, harlequin, a cat in a gutter,—then King Lear, with a mad touch, at times, that always terrified me; and he had a peculiar mode of flashing the lightning of his eye, by darting it into the astonished mind of a child (as a serpent is said to fascinate a bird), which was an attribute belonging only to this theatrical Jupiter."

The above reminds us that Macaulay describes Garrick as loving the society of children, partly from good nature and partly from vanity, and says, "The ecstacies of mirth and terror which his gestures and play of countenance never failed to produce in a nursery flattered him quite as much as the applause of mature critics. He often exhibited all his powers of mimicry for the amusement of the little Burneys, awed them by shuddering and crouching as if he saw a ghost, scared them by raving like a maniac at St. Luke's, and then at once became an auctioneer, a chimney-sweeper, or an old woman, and made them laugh till the tears ran down their cheeks."

But other than children found delight in Garrick's very pleasant summer villa by the Thames. Mrs. Garrick was a famous hostess; and Garrick, although not ostentatiously hospitable, was an excellent host. Burney, Boswell, Dr. Johnson, Hogarth, Gainsborough, Goldsmith, Burke, Angelo, Foote, Sterne, Lord Camden, Lord and Lady Spencer, Hannah Moore, Mrs. Montague, J. Cradock, Tom Davis, Rousseau, and many another celebrity, wandered about the gardens by the river, or were entertained in the house which he built, and which still stands, with the "temple" dedicated to Shakspeare, shown in our sketch, containing a cast from the original statue of the great dramatic bard, executed for it by Roubiliac. Cradock, in his "Miscellaneous Memoirs," says, "The gardens were well kept, and his table, when he had company, most liberally supplied. There was also an elegant coach and four." He brought up, chiefly at his own expense, all his brother George's numerous family.

Dr. Carlyle, to whom we have already referred, describes a dinner given by Garrick, at Hampton, to himself, John Home, the author of "Douglas," and others. The visitors were all Scotsmen, and at Garrick's particular request they brought with them golf clubs and balls, to play a game on Molesey Hurst, a place then famous for races and prize-fights, and other popular sports. They set out for Hampton in an open carriage, and passing through Kensington, there saw some of the Coldstream Guards, who, being Scotsmen, as most of the regiment then were, recognised the golf-clubs, and gave their countrymen three hearty cheers, whereupon the visitors pulled up, to disburse some coins, wherewith the soldiers might drink to the welfare of dear old Scotia. Garrick came out to meet them, being specially desirous to do honour to Home, whose play he had previously rejected. He took him along the garden-terraces, down into the lower garden, and so into the "Temple of Shakspeare," where they all drank wine to the great bard's memory, and Home was laughingly reminded of the pathetic verses he had addressed to that same statue on the occasion of the aforesaid rejection. Through the gardens a public road ran, and this was a source of annoyance which he expressed to Dr. Johnson one day previously to this visit, when they were walking together by the river side.

"I did at one time think of throwing a bridge over it," said Garrick, "but there was an objection to that process which I could not well overcome."

"Davy, Davy," said the ponderous doctor, "what cannot be overcome may be underdone," and Garrick taking the hint, cut a tunnel under the road, thus re-uniting the two portions of his extensive and beautiful grounds. Through this tunnel Jupiter Carlyle, making a wonderful stroke with his golf-club, sent the ball spinning over the terraces into the Thames. Garrick begs the club that it may be preserved as a memorial of the feat and the visit.

At dinner Carlyle notes that Mrs. Garrick—there was no other lady present—had grown fat; and says in his book "she did not seem at all to recognise me, which was no wonder at the end of twelve years, I having thrown away my bag-wig and sword, and appearing in my own grisly hairs and parson's clothes"; and adds that he was not likely to remind her of the very singular circumstances of their former meeting, when she was the slim young Hanoverian baron who was terrified by the waves and wind of a fresh bright day at sea. "We passed," he says, "a very agreeable afternoon, and it is hard to say which were happier, the landlord and landlady, or the guests."

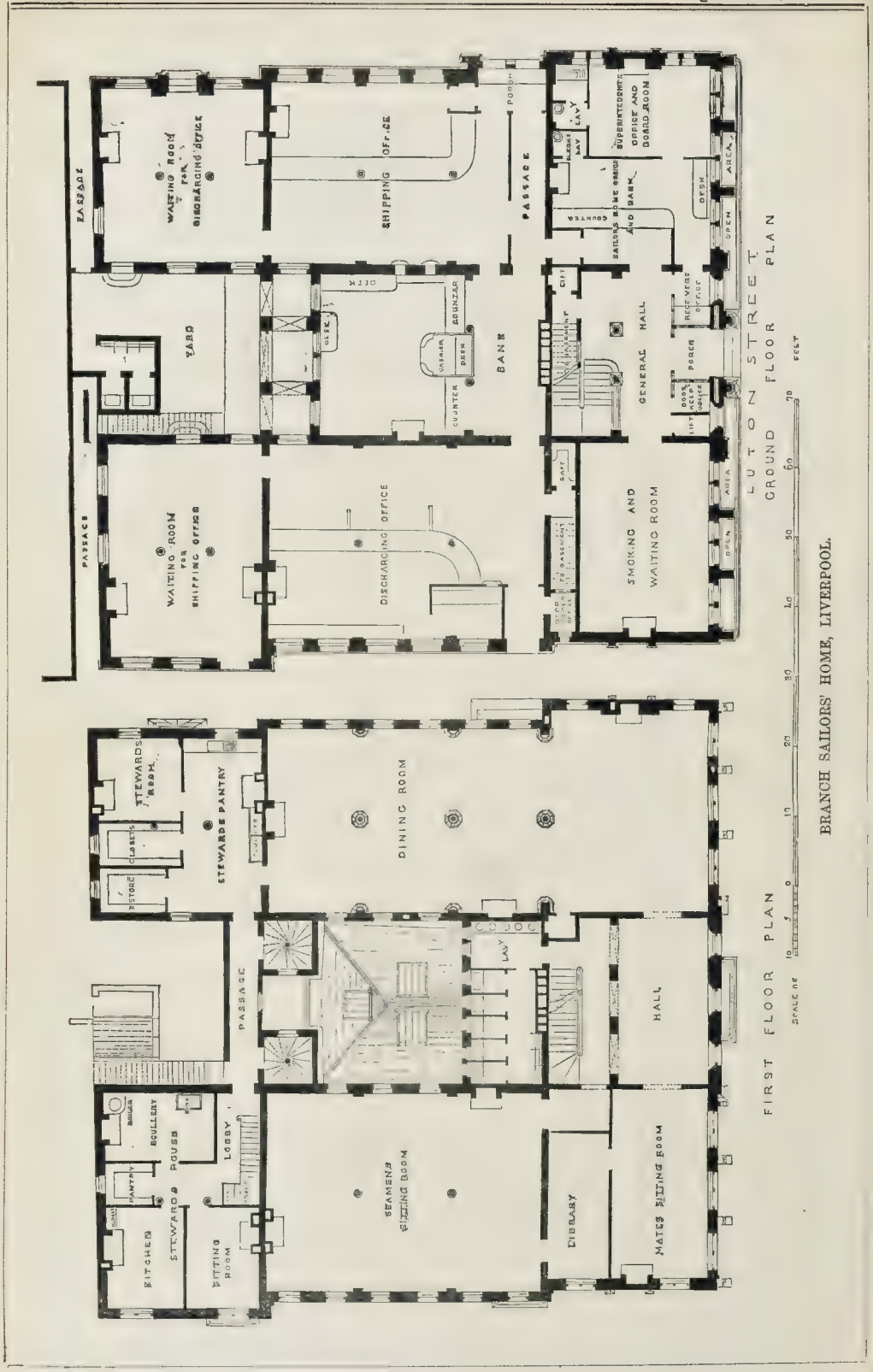
In 1776 Garrick bade the stage adieu, making his last appearance as *Felix*, in "The Wonder, a Woman keeps a Secret," and made a short unpretending farewell speech, "amidst the tears and acclamations of a most crowded and brilliant audience."

He was passing his Christmas of the year 1778 with his beloved wife at the country-seat of Earl Spencer, where he had frequently been a welcome and honoured guest, when he was suddenly taken ill, and, partially recovering, went to London, arriving at his house in the Adelphi on the 15th of January, 1779, where two days after he died. His body was most magnificently interred in Westminster Abbey, under the monument of his beloved Shakspeare. "He was attended to the grave," says Davies, "by men illustrious for their genius and famous for science, by those who loved him living, and sincerely lamented his death." The funeral was a public one, and its procession displayed every feature that could add to its stately dignity, while a concourse of people assembled to witness it larger than had ever been known on any similar occasion.

And so the quiet, old historic house of our sketch, in its quiet grounds by the quiet river-side, changed hands; but, knowing little other change, still stands beside the temple its builder erected to Shakspeare, a house of many stories and associations with great men and women who have served humanity in the past, and elevated those standards of emulation whereby a nation acquires both power and happiness.

BRANCH SAILORS' HOME, LIVERPOOL.

A NORTH END branch of the Liverpool Sailors' Home has long been required, not only from the fact that in less than twenty years the number of boarders in the old home has increased threefold, and that, consequently, the accommodation is stretched to its utmost capacity, but also that since the present Home was erected thirteen new docks have been formed at the north end of the town. In 1875 a sub-committee was appointed to undertake the erection of a branch Sailors' Home, and they acquired land in Luton-street, near the Sandon Dock, at a distance of over two miles from the present Home. The foundation-stone was laid on the 13th of September, in the presence of a large number of the leading merchants and ship-owners of the town. Mr. J. A. Time, chairman of the Sailors' Home Committee, presided, and the trowel was handed by Mr. Henry A. Bright to Mr. Ralph Brocklebank, by whom the stone was laid. There will be accommodation in the new building for 140 seamen and ten officers, and the building will also contain the North End offices of the Marine Department of the Board of Trade, waiting-rooms, and bank, also on the ground-floor, the remainder of which will be occupied by the Sailors' Home Bank, waiting and smoking rooms. The first-floor will contain general dining-hall, ante-room, officers' and seamen's sitting-rooms, library, and superintendent's house. The second and third floors will be occupied by officers' rooms, seamen's dormitories, baths, &c. On the top floor will be placed the necessary cooking-offices, communicating by means of hydraulic lifts with dining-hall and store-rooms in basements. Water-closets and lavatories will be provided in each floor between the wings, and extra bath-rooms will be placed on the basement, where also store and document rooms, for the mercantile marine department, will be provided. The main staircase will be of stone and iron, and special fireproof staircases will be provided at the end of each wing for egress in the event of fire. Messrs. Jones & Sons, of Liverpool, are the contractors; and Messrs. Houet & Wise, of Liverpool, the architects. The cost will be about 25,000*l.*



BRANCH SAILORS' HOME, LIVERPOOL.



BRANCH SAILORS' HOME, LIVERPOOL.—Messrs. Houet & Wise, Architects.

PROGRESS OF THE PARIS EXHIBITION BUILDING.

IT was a happy idea that of Clement VI., when the Papal Treasury was short of funds, to institute the festival of the Jubilee, and Gibbon tells us that so great was the concourse of pilgrims to the shrine of St. Peter, that two priests stood there day and night, raking in, without counting it, the money deposited on the altar by the faithful, for the remission of their sins. It will be much the same, beyond a doubt, with the Paris Exhibition in 1878, for the Republican Government is now preparing such a show for the world to come to that long before the opening time the inhabitants of all the quarters of the civilised globe will have determined to depose their obol on the shrine of pleasure.

Night and day the work progresses; 2,000 workmen and more may now be seen dotted over the Champ de Mars and the Trocadero, and a weird scene at night it is, as by the aid of the rising moon and the bright rays of the electric lamp the army of navvies may be seen, here digging and laying the foundations of the future palace, there heightening the levels, while through it all thread innumerable workmen busy at their labour.

By the end of February next, all the constructions of the Trocadero must be on the same level. Already, one wing is being completed, some 235 mètres in length, but the foundations of the central pavilion to be called the *Palais des Fêtes* are now being actively proceeded with.

Assuredly the Palace of the Trocadero will be the crowning success of the show of 1878; for, with whatever reason complaints may be made that exhibitions are a bore, from their being so like each other, no one will say so of that of Paris. Here on this beautiful hill, overlooking all the capital and its environs, will be established such a *belvédere* as the world has never seen, and in it will be shown such treasures as few nations can boast of possessing. For here will be established the *Histoire de Travail*, under the direction of M. Longperier, which formed so interesting a feature in 1867. Here also will be a large rotunda, where musical performances will constantly take place, which, with the open galleries looking on to the city, the Champ de Mars, the Bois de Boulogne, and the environs of Paris will form by no means one of the least interesting features of the Exhibition.

On the Champ de Mars the greatest activity reigns, and where so recently extended a dry and level area of sand, may now be seen hundreds of workmen busily employed in digging the foundations of the future palace, and laying the pipes for the gas and water supply which will be necessary. Some few days ago the works were stopped for the moment by the heavy rains, but as in nine months nearly all the constructions have to be finished, to facilitate the progress of the work, the tenders are parcelled out among a number of contractors. It is not long since that four lots of metallic constructions, involving an expense of no less than thirteen millions of francs, were commanded. When we consider that the total sum to be expended on the whole Exhibition is thirty-five millions, we see how large a part iron is going to play.

It is now quite clear that Germany's reluctance to exhibit, or, we should say, the Government's, to take any part in the Exhibition, is quite determined; but to make up for the German Emperor's refusal, courteous Austria has, it is said, promised to contribute some of her great treasures from her National museums, the Emperor having expressed his opinion that the world is more likely to be advantaged by the exhibition of noble works of art than by any attempt at nations emulating each other in the display of military projectiles.

There is a prospect of that great and ancient industry, the ceramic art, being more than usually well represented at this Exhibition. America, which is making rapid strides in this branch, is now industriously at work for 1878. According to a practical authority, Mr. Campbell M.P. (of the firm of Minton & Co.), who has lately returned from the United States, the Americans have already succeeded in producing faïence in every way equal to the European, except in the artistic quality of decoration. With all due deference, we should doubt the absolute perfection of their "potting," but in the very serious deficiency of artistic decoration, our manufacturers at home need not fear our cousins' competition just yet. In fact, as long as artistic superiority—always taking *artistic* in its widest sense—exists, no country need fear, we suspect, the competition of any other. Even those distant countries that for ages have been famous for the perfection of the artistic character of their work, who may at this moment be advantaged by the enormous European demand for their products, will find that want of interest in the beauty of their own work will be their ultimate ruin.

But if this Exhibition is to consist of enormous shows of various sorts of china, of endless counters of ormolu and bronze, of gorgeous silk hangings and quaint and luxurious pieces of furniture, of Gobelins' tapestry and questionable reproductions of antique art, of acres and miles of pictures, of newly-contrived musical instruments and specimens of pianos and miserably metallic harmonicons, from all parts of the world,—of heaps and heaps of finery, such as we, goodness knows, are already tired of,—such an exhibition is scarcely to be desired.

We may be certain, however, that the projectors of this Exhibition are perfectly alive to the popular objections, and we shall find that the croakers, who are not by any means few or unimportant, will be the first to admit that the Exhibition of 1878 will not bore them.

Who is ever tired of walking through the Pompeiian court at the Crystal Palace? If the promise is fulfilled here, we shall land in a gondola at the steps of a Venetian palace, we shall visit a quaint house such as Albert Dürer occupied at Nuremburg, or John of Barneveldt in the Netherlands,—a Spanish house, a Chinese, a Japanese, a Brazilian, a Russian, a Danish; in fact, if the directors be faithful, we shall see something of the most distant parts of the world, and, let other countries be ever so careful to select the beauties that they possess, France is determined to bring together at this Exhibition its most cherished treasures; here we shall have all the epochs,—the Roman, the Gothic, the Renaissance, the alternations of brick and stone of Louis XIII.'s reign, the grand lines of Louis XIV.'s, the still grander but mannered lines of Louis XV.'s, the exquisite delicacies of Louis XVI.'s Here, also, the forms peculiar to the provinces, where the art of building has always been honoured, will be found,—portions of Chambord, or of Chenonceaux, or the Palais de Justice at Rouen, or the house of Jacques Cœur at Bourges, or the splendid Palais Granvelle, the pride of Besançon.

Paris.

ARCHITECTURAL NOTES, BY AN IGNORAMUS.

I.—ON THE ROMANESQUE.

IT is now a truth universally recognised by every one with any pretensions to judge, that that style of architecture which was formerly called by our writers sometimes Norman and sometimes Saxon is simply a form of the ancient Roman Classic architecture carried on through the early Middle Ages. It differs in no essential respect from that of the baths and basilicas, the ruins of which still cumber the soil of the eternal city. The plainest and most unadorned manner of the style may be seen in the vast church of St. Stephen at Caen, built by William the Conqueror to commemorate his subjugation of the Anglo-Saxons, and dedicated in the year 1078. The wide surfaces of naked wall, unrelieved by either carving or painting, make the effect of the interior painfully heavy and monotonous. It has been remarked, with perfect truth, that its three tiers of round arches, one rising above another, with the size diminishing in well-proportioned gradation, irresistibly remind us of the Coliseum or Amphitheatre of Titus, from which we can hardly doubt that Lanfranc, who was the architect of the church, took the idea of his plan. In England the best examples of the round-arched style are Durham, Romsey, and Wimborne, all of which far excel the French specimens in the elegance of their mouldings, and are distinguished by a simple and effective mode of ornament, in harmony with the character of the style. Chichester, Southwell, and Waltham are amongst the most important churches of the same kind; but these are all plain, and with hardly an attempt at decoration, the two last examples having rather a stumpy effect in the interior, from the lowness of the first tier. The style kept its ground here far later than on the Continent. St. Stephen's Abbey Church is called by Michelet the last example of the Romanesque, and so it probably is, in France. Durham was founded in 1092, when the North of England was just beginning to recover from the dreadful ravages and desolations of the Conquest. Its foundation was attended by Malcolm Canmore, king of Scotland, and its style was imitated, not unsuccessfully, in Dunfermline Abbey, which was consecrated in the third quarter of the next century. Waltham Abbey, having been destroyed by fire, was restored about the year 1250, as we learn from Matthew Paris. This is the fabric we now see, though the walls may possibly contain remnants of the earlier structure reared by Harold, the last Anglo-Saxon king.

Of that form of the Romanesque which is distinguished by the elongated round arch, we possess no example in England, though it is found in several Continental countries. The most magnificent examples are the Pisan basilic in Tuscany, and the still larger and more imposing cathedral of Spires, or Speier, in the Palatinate. In the former we have the three structural members of the main tier (supported by round columns), triforium, and clearstory. Spires is particularly curious as following the plan of suppressing the triforium, to which some of the later Mediæval architects reverted, as seen in the Cathedral of Milan. The height of its lower tier is 60 ft., the same as that of Amiens, and the effect of the arcade, narrow, elongated, and perfectly round-headed, surmounted by the lofty windows of the clearstory, rivals in beauty that of the latest Pointed style. This church is passed over with slight notice, or none at all, by our architectural writers, but it merits far more than it has received, being one of the grandest and most interesting in Europe. The vestibule or *narthex* is designed with a boldness and imposing magnificence that far eclipse the porch of St. Peter's. Both Spires and Pisa date from the middle of the eleventh century, and upon either of them a volume might be written. Another variety of the elongated round arch is found in two highly curious and beautiful churches of Clermont, in Auvergne, which are said to date from the eighth or ninth century. In these the arcade rests on a row of round pillars, with capitals richly worked in vegetable and animal figures. The arch is high and narrow, with only a slight and plain moulding; the intervening surfaces flat, surmounted by a clearstory of moderate height. The effect is *sui generis*, and, whether the date assigned be reliable or not, it is certain that nothing similar is to be found in more recent styles. Perhaps, however, the truth is that the pattern was taken from the Saracenic mosques of Egypt and the East, and that the church was erected by crusaders in commemoration of their exploits in Palestine. Clermont, it must be recollected, was the place where the first crusade was preached by Pope Urban II., and where the French princes and nobles assumed the cross, in token of their vows to recover the holy sepulchre from the hands of the infidels.

THE COTTAGE HOMES OF ENGLAND FROM A SOCIAL POINT OF VIEW.

IN journeying through some of our picturesque country scenes, in which the balmy air insensibly braces one's nerves and gladdens one's heart, and in which the alternating hills and vales, clad with verdure, and rejoicing in a stillness and quiet broken only by the sounds of industry, the lowing of oxen, and the warbling of birds, what a feeling of sadness takes possession of one when in a shaded corner or on some heath he discovers what could only by the greatest stretch of imagination and the utmost amount of courtesy be termed a home. Yet there it stands: a blot upon an otherwise unsullied page: a blemish on Nature's lovely face: a record of the meanness of man in contra-distinction to the lavish liberality of the Most High conspicuous in all the surroundings. Above,—the summer sky glorious with the splendour of the "greater light," and swept by fleecy clouds of ever-varying outlines, now blending into one, now separating and sailing on in majesty and grace; around,—the lofty hills with their inspiration to ardent minds to soar high. Their bases are on the solid ground, but their peaks are near the sky.

In such a panorama as this, does one not well to look for dwellings that will harmonise with the scene, as if to show that the Creator's design has been understood and appreciated by those to whom He has given the fairest of earth's treasures in addition to the responsibilities of wealth?

Notwithstanding the brightness of the example, this is the result:—A three (or four) roomed cottage, smoky and ill-favoured, with close, stuffy rooms, no means of ventilation having been provided; windows patched up with rags; roof unsound; covering defective; walls falling outwards; and, as regards comfort and general appearance, as inconvenient and as unsightly as can be imagined.

What a protest against our narrowmindedness, our selfishness, and calculating dispositions! What wonder if in these dwellings (if such they can be called), with no provision for ensuring cleanliness or morality, and with no means of securing either convenience or comfort, the tastes and dispositions of the inmates be found to compare unfavourably with those of their fellows who are better housed and more cared for?

People read with astonishment some thrilling account of immorality in the lower classes, and attribute it to innate depravity; but before proceeding to such a length it would be well to examine the causes that are likely to lead to depravity, and if this were done it would often be found to arise, not from inherent badness, but from the fact of their being familiarised in childhood with scenes unfit for youthful eyes, and to sounds unfit for youthful ears.

This is particularly the case where there are large families, and is owing to the vicious system formerly adopted in many parts of the country, and prevalent even now, of giving to a cottage only two bedrooms at the most. A great amount of overcrowding necessarily takes place, and the relationship between the sexes becomes very vague, and is almost entirely lost sight of.

Neither should it be overlooked that, in outlying districts, many cottages are distant from any other dwelling to the extent of quite a quarter of a mile, whilst some are even more distant. In this state of isolation persons unconsciously relapse into the manners of a semi-savage race, and should any one by chance pay them a visit he is looked upon both by parents and children as a visitor from another world.

Still, rough and uncouth as many of them are, it is very seldom one meets with a churl, and their failings would soon be corrected if it were possible to bring a civilising influence to bear upon them. As it is, they labour under many difficulties in addition to the degrading influence of their ill-constructed abodes. They have no wells from which to obtain water, and often have to walk some hundreds of yards before any can be procured, and when in summer's drought this source fails them they must trudge still further. They have no earth-closets, nor, indeed, any other sanitary provision, and their substitutes are of a very primitive type—much to be avoided. Shut out from intercourse with others, except on certain occasions, they are bound to lose that innate pride most people feel in clean and orderly homes. They lose that spirit of emulation which dwells within those who are assembled in villages or in blocks of cottages, and take no pleasure in endeavouring to make their homes, such as they are, as attractive as possible with the means at their command.

Again, in some parts of England such a regard has been exhibited for space in days gone by, that it is very much to be doubted if more compact planning could possibly have been devised. No space is lost in passages, one room is entered from another, a most reprehensible arrangement as regards the bedrooms; stairs are abandoned as a worthless idea, or, probably, as an expensive one, and a step ladder is substituted for them. Add to this description uneven floors, decayed joists, shrunken doors, rattling casements, and perpetual draughts, internally, and a battered and weather-beaten exterior, and it may rightly be asked if this is a place to live in?

As long as these remain, so long will the tastes and feelings of the inmates remain at a low ebb, so long will their intellects be stunted, and their morality be impaired. These dwellings being the heritage left us by those who have gone before, and who built for the sake of profitable investments, without regard to the wants and necessities of their labourers, it becomes the bounden duty of land and property owners now to remedy this shocking state of affairs, and to provide for them far better accommodation than they have hitherto possessed, and that, not for the selfish consideration of obtaining a better labourer (although that may be a consideration with some), but for the nobler motives dictated by feelings of humanity and true philosophy.

A decent cosy cottage, with its proper adjuncts, will go a great way to secure a contented and well-disposed tenant. Home would have many charms, village agitators smaller audiences, and considerably less to dilate upon.

There are, fortunately, noble-minded landowners who are clearing away most of these tumble-down looking structures, and are substituting for them comfortable and ornamental cottages, at a reasonable rental; and now, in some districts, a winding path or a turn of the road may reveal some spot of exquisite beauty, and, striking in its picturesqueness, the cottage forms the centre-piece. Or by the side of some high road a block of modern cottages may be seen which conveys to one a pleasing impression; and it must certainly be allowed that in thus aiming at the improvement of the social position of their poorer tenantry these landowners are improving their own property likewise.

It must not, however, be imagined that it is an easy matter to transplant people from cottages of the old stamp to modern ones. Habits cling to all of us, and even in changing residences where both are equal in point of convenience, we feel strange for a time until we have adapted ourselves to the change. How much more difficult, then, to transplant into neat well-arranged cottages persons who have become so thoroughly habituated to the free and easy style of living, entailed by passing a lengthened period in a dwelling devoid of convenience, as to be utterly unconcerned about such trivialities as cleanliness and tidiness?

One thing is certain, it is quite useless to attempt to reform the aged. They have seen the day and rejoice in the sight; but it is not their day. Their time for improvement is past. They should be allowed to eke out their little span of life in the old building endeared to them by so many memories.

There is a chord in the human heart that is touched most sensibly by the memories and records of ancestors, whether great or simple, and it is displayed here to a surprising degree.

On large estates where these apologies-for-dwellings are cumbering the ground, it is a wise and humane proceeding to weed them out *gradually*, having, however, a due regard for the feelings of elderly inmates, and not expelling *them* peremptorily, nor suddenly transferring them to buildings to which they have been unaccustomed. On the death of these elderly cottagers such buildings should be pulled down, and modern cottages, replete with all possible comforts and requisite arrangements, should be substituted for the rising generation.

Thomas Bales.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

The last "walk" of the Society for this term took place on the 2nd inst., when, owing to the extremely wet weather, a small number only assembled in the Hall of New College, the buildings of which foundation had been fixed upon for inspection. They were met by the Rev. A. E. Robinson, one of the Fellows, who, after welcoming them to the College, proceeded to explain the chief features in the history of the site and buildings. The site, he thought, with the exception of the important fragment of the old city wall still remaining, had no history much before the foundation of the College. Omitting the part on which the cloisters stood, the rest of the College occupied ten different plots of ground, which William of Wykeham bought between 1368 and 1379, some from Queen's College, some from Osney Abbey, some from the Priory of St. Frideswide, and some from the city of Oxford. The part of the site now occupied by the gardens, lower quadrangle, and cloisters, was added some few years afterwards, by procuring some ground on which some old halls stood. The vicar of St. Peter-in-the-East lost his ecclesiastical dues owing to the pulling down of these old halls, and he complained about it, and before the question could be settled it had to be referred to no less an authority than the Pope, and then it was passed on to the Council of Trent. There was a "bull" in the muniment tower which said that the vicar must not have his dues. History repeated itself in this as in other matters, but with a different result. During the erection of the new buildings lately, it was necessary to pull down some houses in Holywell, and the people came to the College and said they had lost the voluntary rate which the houses used to pay, and they wanted the College to pay the money. There was this difference, however, between the two periods: the College of the nineteenth century meekly submitted to the claim and paid the money, but the Pope, or the Council of the fifteenth century, said that the vicar of St. Peter's must go without his dues. The cloisters were built in 1400, and the only changes that had been made in the site all belonged to the present century. The Chapel and Hall were, as regards the fabric, almost exactly as they were when the College was first founded. They had never been refaced, although 500 years old, and the stone was good and durable. As regarded the Chapel, he supposed that at first it had some sort of open timber roof, but it was not certain of what design it was. The east end also had been decorated with a canopy, but this was destroyed by order of Bishop Horne in the sixteenth century. About 1636, when a great deal of work was done, the east end must have been absolutely different from anything there was now, for in some way or other it was made to be circular. The last change was in the last century, when a good deal was done in the way of restoration,—only, unfortunately, it was almost all plaster work from first to last. The canopies and the ceiling were principally plaster, and the niches in the east end were also plaster. The Chapel was the most interesting building of the whole College, because, he supposed, in design, at any rate, it might claim to be one of the finest specimens of William of Wykeham's genius as an architect.

ST. STEPHEN'S GREEN, DUBLIN.

The dispute that has existed for several months between the Corporation and the Commissioners of St. Stephen's Green has been amicably settled, and it is now hoped that this splendid area will soon be opened for the free enjoyment of the public. At a conference it was agreed by a committee of the Corporation and the Commissioners that the Bill promoted by the former for opening the Green, and the suit in Chancery to restrain proceedings in reference to the same, be respectively withdrawn, with a view of the Government introducing a Bill on the terms proposed by the city members, and that the city members be requested to take charge of the negotiations. The Commissioners are willing to surrender all their rights and privileges in the Green. They give up their right of compensation, estimated by some at 35,000*l.*, and to withdraw all legal proceedings against the Corporation, and they ask the Corporation to withdraw their Bill for the compulsory opening of the Green, and to forego the rent of 280*l.* a year.

Sir Arthur Guinness renewed the offer he made several months since, of giving 5,000*l.* or upwards towards beautifying the Green, notwithstanding the ungenerous taunts flung at him by the very men who now acknowledge their personal wrongheadedness. It is taken for granted that the Government will now do what is requisite to carry the resolve into practical embodiment. It will involve an outlay of perhaps 1,200*l.* or upwards to maintain the Green as a royal park; and if the Government consents, it will no longer be necessary to tax the citizens 600*l.* a year. The Corporation propose to give gratuitously a supply of water for the intended fountains, and we suppose that in the case of a lake or lakes being made, they would also be prepared to do the same.

A PROPOSED RESERVOIR.

Instigated by previous mishaps, the Consett Water Company, Durham, are about constructing a not over extensive reservoir to contain about fourteen millions of gallons, and form a basin and banks of six acres. This is perhaps a fair weight for consideration, for the height of high water here is about 930 ft. above Ordnance level, with an average depth of reservoir water of 14 ft.

The engineer of the new works, Mr. George Lambton, of Newcastle, has now some laurels to win; and this is how he proposes to build his waterworks. The bottom or bed of the reservoir, and all slopes in cutting, will be covered with cement concrete, laid upon a sub-stratum of clay puddle, and have a uniform inclination from south to north. This is not only to render it water-tight, but enable it to be effectually cleansed whenever necessary. The inner slopes of all embankments will be pitched with rubble stone from top to bottom. The main pipe discharges into the reservoir by means of a simple valve,

placed at the reservoir end of that pipe, whilst a supply for the Company's customers will pass through very fine copper wire gauze, to prevent the passage of any foreign substance into the supply-pipe.

Due precautions are to be taken for emptying the reservoir, whenever it should be necessary to do so, by means of a 12-in. cast-iron sludge-pipe, placed at the lowest point and discharging itself into the natural drainage of the coating; and injury to the embankment, arising from too much being discharged into the reservoir, will be prevented by a properly-constructed overflow, or weir, built of cement concrete.

There are some houses in connexion with the reservoir in question, standing at a higher level than the water in the reservoir. These it is proposed to supply by means of an elevated tank or small reservoir, built of brickwork in cement, and arched over, and having a complete system of inflow, overflow, outflow, and sludge or cleansing pipes. The tank will contain several days' water supply, and can be refilled in a very short time by simply working a single valve. It can also be thoroughly cleansed when required, and at all times the water will be completely ventilated and kept free from impurities.

To prevent persons bathing, or otherwise polluting the water, a cottage, above the level of the embankments forming the reservoir, is so placed that the occupier, entering or departing from it, will have an entire view of the water-works.

The works will be enclosed by a stone wall, 7 ft. high, having piers 12 ft. apart, and finished with a stone coping. The outer slopes will be covered with soil, thickly sown with grass-seeds, and afterwards planted with shrubs of a binding nature.

The tender for the above works is said to be below the cost of others completed. The contractor, Mr. G. Hunter, is bound to complete the works by November, 1877.

In reservoir-work what is proposed goes but a short way towards success. A "little rift" makes other things than a late quite valueless.

OUR CANAL POPULATION.

THE Commissioners appointed to inquire into the operation of the Factory and Workshops Act have reported that "nothing short of a prohibition of the residence of children of school age in canal-boats will be sufficient to secure schooling for the offspring of the parents who at present reside permanently or a great part of the year in barges," and recommend that the residence in canal-boats of female young persons, and of children above the age of three years, should be forbidden. The Council of the Social Science Association say, "These recommendations, it is believed, are owing entirely to the efforts of Mr. George Smith; and his friends, therefore, feel that such work deserves special aid, and propose to raise a fund, to be placed at his disposal, for the purpose of enabling him to press forward the task he has undertaken."

Quite right that this should be done. We shall be excused, perhaps, for saying that, if one of our early volumes be looked to, or the little books by Mr. Godwin, in which statements in our pages were gathered up, sketches will be found made by us on board canal-boats, with descriptive particulars, showing the evil condition of the occupants of such craft, at a time when few knew we had a canal population.

AMBLE.

SINCE our notice of this rising little port on the north-eastern coast, not only have the directors of the North-Eastern Railway yielded to the request of the inhabitants and conceded them a branch for passengers, but the station for it is already in course of erection. The foundations of a large hotel are also now laid. The namers of the rapidly-forming streets having loyally called the first Queen-street, and decorously termed the next Church-street and Cross-street, have now turned their attention to the poets, and have named the last one Byron-street. The system of sewerage which we mentioned as about to be undertaken by the Rural Sanitary Authority has also, since our notice, been rapidly carried on, and is now nearly completed. Quicksands, wagon-ways, and many intricacies of levels, have presented difficulties in turns, and been successively surmounted. The cost of these works will be about 2,000*l.* They are to be succeeded by the formation of the necessary pumping-station and other works to carry water from Amble to the village at the coal-pit close by, called Radcliffe Colliery, whose residents in dry seasons have suffered serious inconvenience from the absence of a due supply. A cemetery is also proposed. At the present time burials are made at Warkworth. The road between Amble and Warkworth lies along the edge of the river Coquet, and at high tides is overflowed in some places, and a cemetery will, therefore be another improvement.

"THE DICTIONARY OF ARCHITECTURE."

WE are glad to hear that the printing of letter O is now far advanced, and that the committee will, early in 1877, be able to issue a new part of "The Dictionary of Architecture," comprising in about 250 pages the letters M, N, O (equal to nearly 1,000 pp. 8vo.).

Considering the limited number of the earlier parts of the Dictionary which remain available for new subscribers, the general meeting of subscribers held in May, 1874, passed the following resolution, viz.—"That from this time the price of 'The Dictionary of Architecture,' including all which may hereafter be published by means of the present available funds, shall be 20 guineas—21*l.*"; and those who have joined the Society since May, 1874, have paid that amount of contribution.

The carrying on of the Dictionary to its completion without any considerable further demand being made on the subscribers depends on the remaining stock being successfully disposed of; it is, therefore, to the interests of each, individually, to assist in bringing in new subscribers. Some of our readers who are not subscribers may feel disposed to send their names.

STRENGTH OF STAFFORDSHIRE VITRIFIED BLUE BRICKS.

SOME experiments have been made at Mr. Kirkaldy's to ascertain the resistance to a gradually-increased thrusting stress of six bricks, received from Mr. Joseph Hamblet, of the Piercy Blue Brick Works, West Bromwich, and the following are the results:—

Dimensions. Inches.	Base area. Square in.	Stress in Pounds, when Cracked Slightly.	Cracked Generally.	Crushed Steelyard drop.
2·55, 9·03 by 4·30	38·82	187·500	341·600	449·880
,, ,, ,,	,,	161·300	306·000	404·270
,, ,, ,,	,,	153·600	291·000	396·160
,, ,, ,,	,,	148·200	285·400	387·820
,, ,, ,,	,,	124·600	244·100	382·750
,, ,, ,,	,,	115·800	210·200	366·340
Mean		148·900	280·717	397·837
Pounds per square inch		3·812	7·188	10·115
Tons per square foot		245·1	462·1	654·9

These bricks were bedded between pieces of pine ¼ in. thick.

CANTERBURY.

AT a meeting of the British Archæological Association, held on the 13th inst., the Rev. S. M. Mayhew in the chair, after the exhibition of a large number of interesting antiquities, Mr. John Brent, F.S.A., read an elaborate and exhaustive paper on "Ancient Canterbury." He remarked upon the small amount of work of Roman date now above ground, the Roman level being about 8 ft. below that of the modern city. He adduced carefully collected evidence in proof of the small extent of the original Roman settlement, and challenged the statements recently made as to the existence of a large lake on the west side of the city, and showed, from recent discoveries, that this never existed. The lecturer exhibited a large collection of Roman ornaments, mostly of bronze, some being enamelled and inlaid; and also many examples of prehistoric flint implements.

The South African Exhibition.—Messrs. Newall & Co., of the Strand, are to supply their copper rope lightning-conductors to the South African International Exhibition buildings, which are to be opened at Cape Town on the 15th of March in next year.

SANITARY WORK AND THE PULPIT.

THE Health Officer of Islington, Dr. Tidy, in his last report, says truly,—"As yet the public generally have not roused themselves to the importance of true sanitary work. It is this apathy we have to contend with, and which is the true barrier to the carrying out of more efficient sanitary measures. That apathy is too often ignorance. I will make but one suggestion to meet the difficulty. If at every church and chapel (for here we ought to find the true spirit of work and progress) Sanitary Organisation Societies (not Charity Organisation Societies), were started, what an immense work they might effect! Ignorance is the parent of filth, and filth is the parent of disease; knowledge is the parent of cleanliness, and of the love of the beautiful, and these bring forth health. We may be certain of this, that in sanitary measures, even so simple a thing as cleanliness requires to be learnt just as much as the Latin grammar; and similarly too, its use is not always appreciated at the time it is being learnt. Where else can we look for it to be taught but to recognised teachers?"

LANDLORD AND TENANT.

A CASE, just decided by Mr. Justice Lindley, at Manchester, is of some public interest as defining the position of tenants holding non-repairing leases. The landlord, in this instance, had covenanted to keep the roof, windows, main timbers, and exterior of the house in an effectual state of repair. After a time, water frequently penetrated through the roof to such an extent that the tenant was obliged to remove his wife to the kitchen, while many of his goods were completely spoilt. On this being represented to the landlord's agent, he empowered the tenant to get some one to execute the repairs, previously forwarding an estimate of their cost. The tenant failed to find any person who could give such an estimate, and therefore had the repairs executed at once. When the rent-day arrived, he deducted the amount he had so spent, and tendered the balance. This was refused by the agent, who thereupon put in an execution, and sold off all the property on the premises under distraint. These proceedings resulted in an action before Justice Lindley, which terminated in favour of the tenant. The jury held that, while the landlord had a right to his rent, 30*l.*, he must pay to the tenant 7*l.* 2*s.* 6*d.* for repairs, 5*l.* for damage done by rainwater, and 35*l.* for illegal distraint, less 5*l.* 15*s.* 4*d.*, the amount realised by the sale. The important point in this decision is that it sanctions the execution of repairs by non-repairing tenants, at the cost of their landlords, when the latter either fail to perform the duty, or are guilty of unjustifiable delay.

IMPORTANT TO HIGHWAY SURVEYORS.

DENNY *v.* THWAITES.

IN the Court of Appeal, on the 23rd ult., Baron Cleasby gave judgment in this case, in which the appellant, a surveyor of highways, had been convicted and fined by justices of Essex, under the 52nd section of the Act 24 and 25 Vict., cap. 97,—"The Malicious Injury to Property Act."

It appeared that the respondent's house was approached from the high road by an access which crossed a drain which ran by the side of the road. One of the appellant's predecessors had carried the drain through the access by means of a pipe. The respondent took up this pipe, and put down a larger one, and increased the size of the access, thereby bringing it within 15 ft. of the centre of the road. This caused an obstruction, and the appellant, with some men, removed the access and took up the pipe. The Justices found as a fact that the appellant had not acted under a fair and *bonâ-fide* supposition of right.

The Court, however, thought that, notwithstanding this finding, it appeared from the facts stated in the case, which were uncontradicted, that the appellant was justified in doing the act complained of. The appellant being the surveyor of highways, the duty of controlling the drains and removing obstructions was imposed upon him by the Act of Parliament.

INSTITUTION OF CIVIL ENGINEERS.

SIR,—On Tuesday, the 12th inst., occurred the annual election of president, vice-presidents, and council of the Institution of Civil Engineers. Out of this list of twenty persons nominated by the existing council, I find there are no less than seven who are contractors and manufacturers. My impression always was, that the calling of an engineer and that of contractor was as totally distinct as that of architect and builder. Everything ought to be done that can be to make the profession of civil engineers like Cæsar's wife, so that "it must not even be suspected."

24, *Great George-street.* A. LAMB.

MARVELLOUS POWER AND ENDURANCE IN WALKING.

Weston has walked 115 miles in twenty-four hours. If his weight is 150 lb., and he takes 2,000 steps to one mile, he has taken 230,000 steps,—moving 150 lb. at each step over the vertical and horizontal space traversed. In the 500 miles to be walked in six days there will be one million steps, so that his weight of 150 lb. will have to be moved up and forward by one million efforts, and probably some calculating boy will put this into "horse-power." No mechanism, the invention and manufacture of man, burning any sort of fuel, can give such a prodigious performance. To walk 500 miles in six days, about two steps forward must be made each second during the whole time.

Weston having walked 115 miles in twenty-four hours, at 2,000 steps per mile, has taken 230,000 steps in this time, or considerably over two steps and a half each second, during the day of twenty-four hours, as there are 86,400 seconds against 230,000 steps.

HARRIS'S SYSTEM OF VENTILATION.

The object of the system patented by Mr. R. Harris is to provide a simple and inexpensive, as well as a thorough, method of ventilating rooms, without any objectionable draught. The invention consists in providing a narrow supplementary door, or shutter, attached to the door-post in such a manner that when the door is partially open, the supplementary door occupies such a position that it closes the side opening which would otherwise exist, only leaving the *top* open for the admission of air, which opening directs the entering current upwards towards the ceiling in such a manner that it ventilates the whole.

The desirability of ventilating upon this principle will be obvious to all those who have, whilst hanging pictures, approached near the ceiling. By this arrangement a large opening can be given for the admission of fresh air, in comparison with some other modes of ventilation.

ENCAUSTIC PAINTING.

Sir,—Until an opportunity shall occur in this country for thoroughly testing the durability of a *properly*-executed fresco, and by this means removing the prejudice which exists against its adoption for mural painting, it would, perhaps, tend to facilitate the introduction of art into our public buildings if we accepted the encaustic process.

The durability of wax, and its power to resist the action of acids, have long been known. The encaustic process, too, has to English eyes another recommendation in its favour, admitting as it does of the use of pigments which are utterly inadmissible in fresco, and consequently of a richer scale of colour.

My object in writing this letter is to suggest that the experience of English painters in encaustic painting, and the descriptions of the methods which they have used, should be collected and printed for the information of the profession. And as you, Sir, are always ready to aid in any good work, you would, perhaps, allow the columns of the *Builder* to be the means of publishing and communicating such information.

In my paper on "Mural Decoration," read at the meeting of the Social Science Congress at Liverpool, I stated that modern chemistry might probably furnish us with a process of painting which would possess all the valuable qualities of fresco without presenting the same amount of technical difficulty. In making that statement I had such a process in view, but I require time and opportunities to test it.

W. Cave Thomas.

Testimonials. — Mr. George W. Brumell has lately been presented with a gold watch, by the officers and workmen of St. Pancras parish, on his appointment to the surveyorship of Sevenoaks.——The workmen in the employ of Messrs. John Bolding & Sons, brass-founders, of South Molton-street, at their annual supper, presented Mr. Jas. Pentin, a foreman, with a handsome gold chain and medallion, as a token of their respect and esteem, and in appreciation of his services in the firm for forty-eight years. A service of forty-eight years speaks well for both master and man.

VAULTED ROOFS.

Sir,—Mr. Statham, in his admirable paper on "The Architectural Treatment of the Roof," states that,—"Although the dome and the vault have been used to such a great extent in Roman and post-Roman architecture, there are comparatively few instances of any note in which the built dome is used as the real roof, irrespective of any other covering; and, as far as I know, there is not one in which a vaulted roof *is* so used."

An example of a vaulted roof so used will be found at Roslyn Chapel, a building in this and other respects *sui generis*. That this was done of forethought is shown by the circumstance that the gable follows the line of the vault, which is not groined, but is a pointed barrel vault. The remarkable state of preservation in which this building has existed during a long period of utter neglect is attributed to the fact that there is no timber whatever used as a structural material.

The chapel was restored and fitted up for service a few years ago, and in the course of the operations the mosses and lichens which grew on the roof were torn off, and a coating of asphalt substituted. This might have been necessary to check incipient decay, but it certainly does not add to the beauty of the exterior; in fact, it has deprived it of one of its greatest charms.

While I am writing, I take leave to observe that a balustrade or parapet at the foot of a high-pitched roof may be of some value in preventing an avalanche of snow falling upon an unwary passenger, a catastrophe which happened last winter to your humble servant, Signet.

LIERNUR'S SEWERAGE SYSTEM *v.* THE LOCAL GOVERNMENT BOARD.

Sir,—In your issue of the 2nd inst. you mention that the Commissioners say that the Liernur system is one for dealing with the solid of human excrement, that it is complicated, and that it is liable to get out of order. Now, the Liernur system is one that deals with excremental matter; with house, rain, and street water; with factory waste-water, and with subsoil water; and one that prevents pollution of streams. I deny, therefore, that it is a system for dealing with the solid of excrement; I deny that it is complicated; I deny that it is liable to get out of order; and I challenge the Commissioners to establish their statements. I have in my possession official documents from all the three Dutch towns they are supposed to have visited to see the pneumatic system (which is simply one subdivision of the Liernur sewerage system), and these letters completely contradict the Commissioners, who ought not to need me to tell them what the Liernur system really is.

I take this opportunity of protesting against the unfair conduct of the Commission. One of its members has for months past used his official position to disseminate untrue statements as to the Liernur system, through deputations waiting upon him; without by the issue of their report (which is still delayed) giving any public opportunity of refuting such statements. I take, for instance, the remarks he made to the deputation from the Winchester Corporation, as published in the local paper. At my interview with you this day, I showed you letters from the officials of the three Dutch towns testifying to this; and I may add that in two cases they say they are not aware the Commissioners ever visited their towns, or applied for official information; at any rate, they did not make themselves known.

I may add that one of them, on being informed by the secretary of one of our learned societies that he had received under the hand of the Burgomaster of Amsterdam himself a letter which contradicted a most important statement that member had made, remarked,—"I don't care, we shall not alter our report!"

With regard to the Liernur system itself it is, however, more interesting to know that in its session of October last the official Sanitary Board of Holland, sitting at the Department of the Interior, came to the following resolution upon the question on the order of the day, viz., the sewerage of towns:—

"No other system answers so fully and so well all the claims that ought to be put to the collection and removal of excremental matter, of slop and rainwater, and of the soiled water of factories, and to the regulation of the subsoil water, as the Liernur system does, as well from a sanitary as from an æsthetical, technical, and economical (agricultural and financial) point of view."

Is it possible that the thirteen Government medical inspectors of Holland, who sit on the Sanitary Board, do not know the meaning of the word technical? Do they require to be taught by the learned commissioners from England? I think not. Adam Scott.

HARWICH SEWERAGE COMPETITION.

Sir,—In August last, a premium of 200 guineas was offered by the Harwich Corporation for the best plan or system of sewerage for the borough. The result was that ten schemes were sent in, at great expense to the competitors. These ten schemes were submitted to Mr. Wilson, C.E., 9, Deans-yard, Westminster, who was to report to the Council as to which one was the best.

Mr. Wilson's decision was to the effect that none of the plans were suitable; and he, the paid adviser of the Council, at the same time produced a plan of his own, of which Mr. Councillor Franks remarks that he, Mr. Wilson, "has taken his ideas" "from three of the competition plans" sent in; yet the Council (it appears) decided at its meeting on the 9th inst. to employ Mr. Wilson to make use of the hints conveyed to his mind by the "three schemes" referred to, and to carry the same into effect, so as to produce a "suitable" scheme.

If I were to express my opinion upon the action taken by Mr. Wilson and the members of the Town Council of Harwich, I know you would not insert this letter; therefore, I refrain from doing so.

Accompanying this is a copy of the local newspaper, giving a full account of the meeting referred to.

Thos. W. Grindle, Assoc. Inst. C.E.,
One of the Competitors.

THE LIVERPOOL CATHEDRAL.

Sir,—I have seen in a recent issue of the *Builder* what I take to be an excellent suggestion. A correspondent proposes that Wren's first design for St. Paul's (the Kensington model) should be made of practical use, as the design for the proposed cathedral for Liverpool. I think this suggestion is worthy of some notice, and I am sorry to see it put aside by you. If it is really good architecture we are striving for, then, surely, the interests of "the living present" should not be our first consideration in carrying out a work of this kind; we should aim at having the finest design that can be had, irrespective of any minor consideration. And I am content to leave this masterpiece of church planning to speak for itself; it only requires to be known to be universally appreciated. If it were built with a few modifications on the elevations, it would be undoubtedly the finest church of modern times.

The first great objection to building a cathedral in this style seems to be already overcome, as the design already submitted for the Liverpool Cathedral is in the Classic style; and if it is intended to carry out the building in this style, I am confident that a better design than this one of Wren's could not be obtained.

I think that this suggestion is indeed worthy of some consideration at the present time, when new Sees are about to be formed, and cathedrals built in one or two of our large cities, and there are many reasons that may be urged for the adoption of this design of Wren's. The plan is magnificent, and more suitable to our Protestant service than any Gothic design; its architecture would be more in harmony with the street architecture of our large cities: and, if adopted, it would be paying a well-deserved honour to the greatest English architect who has ever lived. J. M. R.

ORGANS.

Armagh Cathedral.—The organ in Armagh Cathedral has just received extensive additions and improvements at the hands of Messrs. J. W. Walker & Sons, of London. The instrument has now three complete manuals and pedals, and six stops have been added.

Blandford.—The organ of Blandford Church, Dorset, was "reopened" on the 12th inst., after restoration by Messrs. Hill & Son, of London, in accordance with a plan proposed by the Rev. C. H. Fynes Clinton. All the action throughout the instrument is new, or so thoroughly repaired, re-bushed, or re-leathered as to be equal to new in every respect. The restoration has cost 284*l*. The organ was built nearly a century ago, by England, of London.

Kensington Parish.—The parish surveyor, Mr. Weaver, in a recent report on the slopping, dusting, and watering of Kensington, estimated that an annual saving of at least 3,350*l*. could be effected by the vestry doing their own work, and he pointed out means by which the amount of saving might be greatly increased. At their last meeting the vestry adopted the recommendation.

THE TEMPLE OF ABOO-SIMBEL.

AT a meeting of the Society of Biblical Archæology on the 5th inst., Dr. Birch (of the British Museum) in the chair, a paper was read "On some Recent Discoveries at Aboo-Simbel," by Miss Amelia B. Edwards. In this paper the author gave an account in full of some remarkable discoveries made at Aboo-Simbel in the month of February, 1874. These discoveries consist of the foundations of a large pylon, built in crude brick; a vaulted pronaos, likewise in crude brick; and an inner chamber excavated in the rock. The pylon is situated some few hundred yards to the south of the great Temple of Ra, and its walls are 7 ft. thick. The dimensions of the vaulted pronaos and of the excavated chamber are also given. The walls of the latter are covered with coloured bas-relief sculptures of great beauty, interspersed with short hieroglyphic texts. These are all in a state of the highest preservation. The large tableau represents Rameses II. adoring Ra and Ammon-Ra; and Queen Nofre-Ari adoring Hathor. This monument, though under the protection of the tutelary gods of the great temple adjoining, is, however, dedicated apparently to Thoth, and is supposed to have been the library attached to the principal temple. The whole is of the period of the great temple, and strictly corresponds in style. Translations of the inscriptions, as well as a translation of a remarkable graffito in the hieratic character left by a contemporary visitor, are also given. A very perfect arch in crude brickwork was found at a depth of nearly 12 ft. below the surface of the sand. This arch seems to have led from the landing at the bottom of the pylon-stairs to the pronaos of the library. The landing was paved with very curious cones in hand-moulded clay, quite unlike the famous funereal cones found in the Theban necropolis. The author indicates what she believes to be the site of a second pylon, which stood to the north of the great temple, at about the same distance as the site occupied to the south of the pylon already described. Miss Edwards is of opinion that these pylons were approaches to the great temple, and not to the library. Copies of the inscriptions, as well as of some of the decorations of the rock-cut chamber, accompany this paper, having been carefully fac-similed upon the spot by Miss Edwards. The original drawings, with various other sketches of Egyptian temples, were shown by Miss Edwards at a meeting of this society in June, 1875.

CADOGAN PLACE AND SQUARE.

THE condition of this important open space, bordered on one side by Sloane-street (the most frequented south-western thoroughfare), and on the other side, as also the northern and southern ends, by ninety-nine first-class houses, has long been a blot on the West End, if not a discredit to the owner of the large estate, as well as the aristocratic occupiers of those fine mansions which bound and adjoin the recognised Belgravian districts.

Large plantations of deciduous trees and shrubs were, many years back, arranged with walks, surrounded with an iron railing, extending in length about 400 yards, and in width 96 yards. Forest-trees of vigorous growth now stand throughout as high as the surrounding houses; but no evergreen shrubs, save ivies only, so that the whole extent is now, and has been for many years, a wilderness, except only that section (about one-fourth part of the whole) lying between the traverse cut of Pont-street and Cadogan-place, north. At this point a road, 70 ft. wide, has been lately opened and enlarged, leading from Belgravia to the new Hans-place Estate, which bids fair to become the great western Belgravian district of fashion.

The condition of this small north portion is not much better than the large south plateau, which latter is really "the abomination of desolation,"—trees, shrubs broken, uprooted, interlaced; shreds of pottery, broken glasshouse frames, and refuse scattered throughout in utter hideousness; discernible from without, but unapproachable by reason of the continuous iron railing. In the centre of this large parallelogram of, say four acres, three low houses or villas, or shanties, stand, luckily half-concealed from view (save one) by the surrounding desert wild,—that one was let out to a nurseryman and florist, who raised cabbages and vegetables there for some years, and who erected a long shop-frontage in the *centre of the square*, facing Sloane-street (nearly opposite Pavilion-road), but he has been lately ejected, and a dancing-school supplements his place! As to the other two villas, the casual occupants, *during summer*, when the foliage is thick, and interlacing thorns and lilacs curtain off the houses, may indulge in fantastic dreams, such as "Far in a wild unknown to public view," for certainly they have all the realities of rude nature,—a "retiro" that is only remarkable for its seclusion in the main centre of fashion, for its perennial increase of smoky deposit, and for undisturbed waste.

Considering the class of houses in the vicinage, and the recent increase of rental, nothing could more effectually improve it than the reclamation and ornamental plantation of at least the borders of this the largest open reserve or square of the south-west district. It would add, at least, 10 per cent. to the value of over 200 surrounding houses. It is true that Sloane-street is, in the main, a business line; but, nevertheless, even on that line the benefit would be no less appreciable.

When we look to the exquisite floral gardening in Hyde Park, the Regent's Park, and, indeed, to the wondrous advance of floriculture in Battersea Park, Victoria Park, and all the open squares and places of resort, and take into account the warmth of popular approval excited by these simply hortulan advances, there can be little doubt of the advantages that must accrue for the benefit of the owners and occupiers of the now desolate Cadogan or Sloane inclosure and estates, by properly laying out the grounds, and simply arranging the shrubs now growing there, with a trifling addition of evergreens to complete the array. One year's *increase* on the rental would defray the outlay, whereas the public approval and benefit acquired would be in perpetuity. This being the proper season to begin rectification and plantation of trees and shrubs, these suggestions are given, by

QUONDAM.

ARCHITECTS' CLAIMS.

TAYLOR *v.* WILLIAMS.

THIS action was brought by Mr. John Taylor, of Whitehall and Birchington, architect, against Mr. Walter Williams, of Creswell Hall, Stafford, for designs and obtaining tenders for alterations and additions proposed to be done to Sugnall Hall. The cause came before Lord Coleridge and a special jury, and was by the direction of the judge referred to a barrister in chambers.

Mr. Day, Q.C., Mr. Philbrick, Q.C., and Mr. Jones, were on behalf of the plaintiff; and Mr. Waddy, Q.C., and Mr. Powell, for the defendant.

The defendant brought a counter claim for 900*l.* damages against the plaintiff, for:—

1. Unskilfulness and negligence in preparing such unreasonably extensive alterations to an old house.

2. Employing a quantity surveyor without authority, whereby the defendant had incurred heavy expenses.

3. Obtaining tenders without authority.

Letters from the plaintiff were read, urging the defendant not to make such extensive alterations to an old house, but rather to build a new one. Also a letter from the defendant in reply, that even if it cost him more he preferred to make what he wished out of the old pile. Private family reasons were also given. A letter from the defendant authorising the employment of a quantity surveyor, and requesting to be furnished with a copy of the quantities; also a letter to the plaintiff to obtain tenders, and naming the contractors, were read.

When the contract drawings had been examined, and the evidence of the plaintiff had been given, and before any defence had been heard, an award was agreed to in favour of the plaintiff for 850*l.*, and all the costs of the trial and reference.

CLAIM FOR PREPARING PLANS.

BERRY *v.* ROBSON.

IN this case (heard in the Driffield County Court on the 12th inst., before Mr. Bedwell, judge) the plaintiff, Joseph Berry, described as a builder and architect at Driffield, sued John S. Robson, of the same place, retired farmer, for 10*l.* for preparing plans, &c., for a house which defendant contemplated building.

Plaintiff said defendant had had his plans some time, and had built two houses from plans prepared from his. Defendant had offered him 1*l.* for his trouble, which he refused. If the plans had been carried out he would have been entitled to 5 per cent. on the contract, and in the event of the work not being done, to 2½ per cent.

Wm. Hawe, architect, Beverley, said such per-centages were correct.

The defendant contended that plaintiff was not an architect by profession, but simply a builder, who occasionally prepared plans, and therefore was not entitled to charge so much.

His Honour said as plaintiff had been drawing plans for thirty years, he thought he must have some professional knowledge.

Verdict for 7*l.* 7*s.*

GRANITE FOR THE PORTSMOUTH URBAN AUTHORITY.

SIR,—Noticing in your last number a paragraph relating to an offer I recently made to the Urban Sanitary Authority of Portsmouth for the supply to them of broken Guernsey granite, allow me to state that the specification they issue to intending contractors is likely to mislead others as it did me. From it I understood their requirements to be "ordinary"-sized broken granite, such as is used on most of the London roads; and as such I delivered a cargo, which was rejected by the surveyor because the stones were of too large a gauge. I afterwards ascertained that his requirements were for "special"-rized, or 2-in. gauge granite, which is not thus described in the specification and form of tender. For this particular material I asked an additional price of 1s. per ton, subsequently amending my offer to 9d.

It seems strange to me that, whilst the Board publicly acknowledge my ability to supply the granite they require, they have accepted a tender at 11s. 8d. per ton for exactly the same material I have offered to supply at 11s. 3d.!

JOSEPH S. GABRIEL.

SCHOOLS OF ART.

Darlington.—The annual distribution of prizes to the students of the Darlington School of Art took place on the 16th inst., Mr. Henry Pease in the chair. Mr. J. C. Ianson, one of the secretaries, read the report, from which it appears that in the year ending July 31 the total number of students who attended the school was 167, and in addition to these there were sixty-two pupils under instruction by the master, Mr. Elton, in private schools, making a total of 229. The amount of the grant from the Department of Science and Art was 70*l.* 7*s.*, and the amount of the private subscriptions 65*l.* 16*s.* 6*d.* The annual examination in May was attended by forty-eight students from the School of Art, of whom eighteen were successful; and seventy other candidates, of whom thirteen were successful. One hundred and twenty of the students sent up 915 works in all to the annual examination at South Kensington, and there were awarded four third-grade prizes, and also a free studentship to William Mitford. The total income, including fees from private classes, shows an increase of 41*l.* 9*s.* 7*d.* on the sum received in the previous year.

York.—The annual meeting of the subscribers and friends of the York School of Art was held on the 13th inst., the Lord Mayor presiding. The report, read by Mr. William Monkhouse, one of the honorary secretaries, stated that during the past year the students had been diligently at work in the execution of a large number of paintings and drawings. Four hundred and seven of these, by 127 students, were sent up to the Department for examination. The local examination in the "second grade" was attended by sixty-eight students, of whom thirty-eight were successful. Seven third-grade prizes have been awarded, and the same number to those students whose works were marked "excellent" in the second grade. The number of students who have attended the various classes during the year has been 162. The committee state that under the excellent teaching of Mr. Dominy the school is efficiently answering the object of its establishment. Mr. Edward Taylor, the other honorary secretary, read the balance-sheet, from which it appeared that the balance in hand of 88*l.* 6*s.* 0½*d.* with which the year was commenced, had increased to 97*l.* 1*s.* 3½*d.* Mr. Dominy, the master of the school, then delivered a practical address.

St. Martin's.—The annual distribution of prizes awarded to the students in connexion with the St. Martin's School of Art, took place on the 15th inst. at the school in Castle-street, Longacre, under the presidency of Mr. T. Woolner, R.A. In addressing the students the chairman pointed out that drawing was the basis of all excellence in art, and said that great things had been done by artists in England without such advantages as were possessed by those who now desired to learn. One hundred and thirty years ago there was painted a series of pictures which might be seen in the National Gallery, viz., "Le Mariage à la Mode," by Hogarth. The wider the student's means of knowledge, and the more deeply he studied art, the more profound

would be his admiration for the knowledge displayed in those works, and for the inimitable manner in which they were rendered. Hogarth lived at a time when there were no such facilities for the promotion of art as those who now studied it were permitted to enjoy, but, notwithstanding the disadvantages under which he laboured, an assiduous application to his task enabled him to become one of the greatest stars of his nation's glory. The chairman did not know that he could offer a more striking instance of difficulties overcome, and of showing them how with determination they might excel in their studies by the greater ease with which they could at present be pursued. Mr. W. F. Yeames, A.R.A., next delivered an address. The school is attended by about 120 students.

CHURCH-BUILDING NEWS.

Gumley.—The parish church of St. Helen, Gumley, was reopened on the 1st inst., after restoration. The church was until lately in a most dilapidated condition. It consisted of a nave, small south aisle, and the chancel. Some two years ago Mr. Bodley, of the firm of Bodley & Garner, architects, was called in, and the restoration has been most successfully carried out under the direction of that firm. The church is one of the early fourteenth century. The nave has been thoroughly restored, the gallery removed from the tower arch, the arch re-opened, and the walls of the nave raised, and clearstory window inserted. The flat plaster ceiling is removed, and there is now an open timber roof. The south aisle has been similarly restored. A new carved oak screen has been erected between the chancel (which has been rebuilt upon the original lines) and nave. The new east window in the chancel has three lights, representing the passion of our Lord. The window was made under the superintendence of the architect. The whole cost is about 2,000*l.*

Humber.—The chancel of Humber Church, near Leominster, after having been closed for a few months during the progress of restoration, has been completely renovated, and was re-opened on the 30th ult. The church is a small stone edifice, consisting of nave and chancel, with porch and tower. In restoring the chancel the south wall has been rebuilt. The open-timber roof which covered the chancel before the restoration commenced has been re-placed and varnished, and the chancel has been re-seated with open benches of pitch pine, and new encaustic tiles have been laid. Some of the old encaustic tiles which were taken up by the contractor have been re-laid within the altar-rails, and the new tiles were supplied by Mr. Godwin, Lugwardine. Mr. Thomas Wyatt, of London, was the architect whose designs have been followed in the work, and Mr. J. Davies, of Leominster, was the contractor.

Llandegley.—The parish church of Llandegley, Radnorshire, was re-opened on the 7th inst., after a restoration which has comprised the entire reconstruction of the chancel; the taking down and rebuilding the walls where they were defective; and the covering of the whole of the church with a new roof. The architect has sought to reduce the great apparent length of the interior of the church by the insertion of buttresses. The whole of the work of restoration was designed by, and carried out under the superintendence of, Mr. Stephen W. Williams, Radnor, county surveyor. Mr. Berry, of Kington, was the builder. The entire cost is computed at 1,200*l.*

Wrotham.—For some time past the buttresses of the tower of Wrotham Church have been thought unsafe, but lately they have been put under the builder's hands, and more recently the work of restoration has been completed. They had been repaired from time to time with lead, bricks, and sandstone, all of which were out of keeping with the church. These materials have been taken away, and their places supplied with Kentish rag and Bath stone weatherings. The tower has also been made perfectly stable. Mr. R. Wheeler, of Tunbridge Wells, was the architect, and the builder was Mr. Bishop, of Birling.

Barnsley.—The new chancel at St. George's parish church, Barnsley, was consecrated on the 23rd ult. The new chancel, which has been built by Messrs. Robinson & Sons, contractors, of Barnsley, exactly corresponds in style with the main building, which is Decorated Gothic in style. These with other recent improvements in the church will cost about 2,000*l.*

Perlethorpe.—Earl Manvers having, a few years ago, erected a mansion in Thoresby Park, has recently, at his sole cost, erected a church at Perlethorpe, which was consecrated on the 21st ult. The church is Early English in its prevailing style, and it consists of nave, north and south aisles, chancel, vestry, west tower, and spire, north and south porches, and west door. The east window is of painted glass from Paris, illustrative of the life of Christ. The reredos is of Caen stone; the centre figure under a niche is Christ as the Good Shepherd, the other four under canopies being the four Evangelists. The greatest length of the sacred edifice is 103 ft. clear. The height of the tower and spire is 130 ft. The roof is of stained pitch pine. The stalls in the chancel are carved with grotesque figures. Chairs are used in the body of the church at present. The stone used is the Ancaster for the interior, piers and capitals in Steetly stone for strength. The church is dedicated to St. John.

Little Hulton.—On the 14th inst. the Bishop of Manchester consecrated the new church of St. Paul's Peel, Little Hulton. The church has been built to take the place of the old brick chapel, which dates from 1759, and which has little attraction outside or in to boast of. It was at first only proposed to build the nave and its aisles, and the chancel and its aisles; but, as the work proceeded, it was resolved to undertake also the lower story of a western tower, and a northern porch. The church is built of stone inside and out. It will accommodate 850 worshippers,—upwards of 700 of these on fixed benches, and the remainder on chairs in the open space at the west end. The contracts, which include everything required to complete the church—excepting the upper part of the tower—amount to about 6,300*l.* The tower (which has not yet been completed) will be surmounted by an octagonal broach spire, which will rise to a height of 140 ft. to the top of the metal vane. The general outline of the plan of the church is that of a parallelogram, the nave and chancel and the aisles being respectively the same widths. The sanctuary projects to the east, the vestry to the south, the porch to the north, and the tower to the west.

Porton.—The dilapidated old church at Porton, near Salisbury, has been taken down, and with the materials a new church of a more commodious character is in course of erection on a piece of land leading from the village to the railway station, given by Mr. J. A. Ingram, of Wylye. The new church is estimated to cost 1,467*l.*, and will contain 153 sittings.

Boxley.—Boxley Church, Kent, has just been re-opened, after being closed for six or seven months for internal reparation. The roof of the chancel and nave is one of the most marked of the improvements. The roof had got into a dilapidated state, and this led to the Ecclesiastical Commissioners being petitioned to repair the building. They agreed to repair the chancel on condition that the parishioners evinced their interest in the work by re-roofing the nave; and this the parishioners accepted, and have carried out the work in the most complete manner. Over the nave and chancel a new roof of stained pine has been placed, and the age-stained timbers have been used for the roofs of the side aisles, which have also been cleared of the disfiguring white plaster, and panelled. The chancel is fitted with choir stalls of carved oak. A new stained-glass window has also been added, to the memory of the Rev. Tatton Brockman. The subject is "The Ascension." The south entrance to the church has been entirely rebuilt, of ragstone flints with Bath stone facings; and the exterior of the east end of the building has been faced and pointed in keeping with the new work. The exterior of the north and west fronts have been left untouched. Altogether, the work has cost about 2,500*l.* The renovation has been carried out under the direction of Mr. W. Vaughan, of Maidstone, builder.

Codsall.—The interior of the parish church has been painted and decorated from designs by Mr. J. R. Veall, architect. The expense of the chancel has been borne by Lord Wrottesley, the patron of the living, and the remainder has been paid by voluntary subscriptions of the parishioners. The works have been carried out by Mr. Geo. Lewis, of Wolverhampton.

Sanitary Institute of Great Britain.—A general meeting of the members of the society so called was held at their rooms in Spring-gardens on Tuesday, the 12th instant, when the committee presented a report.

SCHOOL BOARD SCHOOLS.

Normanton.—On the 18th ult., the memorial-stone of a new school for the Normanton School Board was laid at Normanton Common. The buildings, when complete, will accommodate 300 children. The building contains a mixed school 55 ft. by 20 ft., with a class-room 10 ft. by 20 ft.; also an infants' room, 40 ft. by 20 ft., with class-room 20 ft. by 20 ft. The height to the wall-plates will be 12 ft. 6 in., and to the collar 22 ft. The style is Gothic, and the materials used are red bricks with Huddersfield stone dressings. The rooms will be plastered, and boarded round to the height of 4 ft., the wood-work being stained and varnished. Lavatories, out-offices, play-ground, and every other convenience are provided, and also a bell for calling the children together. There will also be erected a six-roomed house for the master. The architect is Mr. William Watson, of Wakefield, and the buildings are being erected by Mr. Robert Young, of Lincoln, for 3,000*l.*

Stanhope.—Five Board schools in the parish of Stanhope, Weardale, have recently been opened. The architect of all the buildings was Mr. John Smith, of Shotley Bridge. The tenders for the buildings were let as follow:—Rookhope school was let April 21, 1875; the total cost, including site and furniture, is 1,753*l.* This school will accommodate 200 children. Wearhead was let Jan. 10, 1875; total cost 1,324*l.*, and will accommodate 200 children. Lanehead, let Jan. 18, 1875; total cost 1,150*l.*; accommodate 140 scholars. Westgate, let Jan. 18, 1875; total cost 2,100*l.*; accommodate 250 children. St. John's Chapel, let Sept. 22, 1875; total cost 1,646*l.*; accommodate 160 children.

Lambeth.—The School Board for London has recently opened new schools at the corner of Wheatsheaf-lane, South Lambeth-road. The new building is partially encircled by a spacious play-ground. Following the usual style of the London Board schools, Mr. E. R. Robson, the architect, has provided accommodation for 849 children, inclusive of 266 boys, as many girls, and 317 infants. The area of the site and premises is 25,795 superficial feet. The cost of the site was 4,670*l.*, which, with 7,921*l.* for the building, gives a total of 12,591*l.*, or a total cost per head of 14*l.* 16s. 7d. The work was carried out by Messrs. Higgs & Hill, contractors.

Eastmoor.—At a special meeting of the Wakefield School Board, on the 21st ult., the plans of Mr. W. Watson were accepted for the proposed new Board Schools for the Eastmoor district. The following are details with regard to the proposed new schools, which are to be proceeded with as speedily as possible. Mr. Watson's design is Gothic in style, intended to be red brick, with stone dressings. The buildings stand back from the Eastmoor-road, and will be enclosed with a dwarf wall and iron railings. The site proposed for school purposes is 3,000 yards in extent, the remainder being left for future extension, teacher's house, or for disposal as building land. The buildings are planned to accommodate 600 children, viz., 200 boys, 200 girls, and 200 infants. The rooms for the boys and girls are 55 ft. by 25 ft. each, with four class-rooms, 25 ft. by 15 ft. The infants' room will be 43 ft. by 26 ft., and class-room, 26 ft. by 20 ft.

Books Received.

ALMANACS AND DIARIES.

The British Almanac and Companion, 1877, still stands by right at the head of any list of such productions. The "Companion" comprises the usual number of useful essays, amongst which the chapters on "Architecture and Public Improvements" are eminent.——Messrs. Letts, Son, & Co. issue as usual their *Diaries, Pocket-Books, and Almanacs*, of all sizes and shapes: some for the library table, some for the office desk, and others for the waistcoat pocket. Letts's No. 39 Rough Diary and Scribbling Journal gives a foolscap page to three days, interleaved with blotting-paper, and all for 18d.——*Blackwood's Scribbling Diary for* 1877 goes for a shilling, but it does not give so much space for each day.——*Pettitt's Oblong Diary and Dimension Book*, 1877 (Frith-street), has the peculiarity of being ruled for dimensions and squaring, under each day's date, so as to be handy for surveyors and builders.——*Calvert's Mechanic's Almanack* is intended for the workshop, and contains a good deal of cognate and useful information.

VARIORUM.

The series of little sixpenny books in course of publication by Macmillan & Co., entitled *Science Lectures at South Kensington*, is valuable and well timed. We have before us "Photography," by Captain Abney, R.E.; "Kinematic Models," by Professor Kennedy, C.E.; "What the Earth is Composed of," by Professor Roscoe; and "Sound and Music," by Dr. W. H. Stone. Others have been published, and more will be.—— *The Iron and Metal Trades' Companion*, by Thos. Downie (Lockwood & Co.) is a calculator or ready reckoner for ascertaining the value of goods from 1s. per cwt. to 112s. per cwt., and from ¼d. per lb. to 1s. per lb. It will be found useful in many shops and offices.——From Messrs. Partridge & Co. we have received a bundle of the books which form their speciality,— *The Children's Friend*; *The Friendly Visitor*; *The Infants' Magazine*; and *The Family Friend*. Bound in thick, showy covers, they have a handsome appearance, at small cost. Like the *Band of Hope Review*, and *The British Workman*, which come from the same publishers, and go all over the world, they are noticeable for the excellence of the wood-cuts with which they are profusely illustrated.

Miscellanea.

Discoveries at the Tower of London.—Some very interesting historical discoveries have been made during the past few days by the Office of Works in their restoration of certain parts of the Tower of London. The special scene of their labours has been the Church of St. Peter-ad-Vincula. The Commission of Superintendence, under whose orders the work of removing the flooring and examining the various vaults took place, consisted of the secretary of the Board of Works, a well-known London surgeon, and a representative of the Constable of the Tower. Across the floor in the centre of the chapel was found the body, which was pronounced to be that of a woman of at least seventy years of age, and which, according to all probability, was that of the Countess of Salisbury, the last of the Plantagenets, whose execution by Henry VII. was considered by most contemporary and subsequent statesmen as an inevitable necessity. Not far from this spot was discovered the body of a man of great stature and bulk, which would answer to the description given of Robert Dudley, Duke of Northumberland, the father of Lady Jane Grey. For some time it was doubted whether the fact of the head being found with the body did not upset this theory, but further search among the Tower records showed that in his case the usual formality of placing the head on London Bridge had been dispensed with.

Scarcity of Cottages in Ipswich.—In a letter to the *Suffolk Chronicle*, Mr. Alfred Piper "improvements in the housing of families and the economical distribution of homes, either in the metropolis or in the great manufacturing centres of the country. Much discussion has been expended upon the advantages which the Artisans' Dwellings Act was passed to confer; but with the nature of those advantages the public is still precluded from becoming practically [illegible] which would comply with legal regulations, and which would let at from, say, 2s. 9d. to 3s. 6d. per week, could be so constructed as to realise five per cent. on the outlay, with a fair margin for depreciation. Many will contend that the use of bricks at their present cost would be out of the question, and probably weather-boarding for exteriors would be objectionable on account of its perishable character and the cost of frequent painting; it is, however, a question whether the carcasses and dividing walls could not profitably be made of concrete."

Bede's Mission Room, Gateshead.—This new mission-room, situate in the Sunderland-road, Gateshead, has been opened by Archdeacon Prest. It will accommodate 400 worshippers, and is provided with desk seats, so that classes may be held in it, as well as parochial meetings. It has a lofty open-timbered roof, and is warmed by six open fireplaces. The whole of the work has been executed from the plans of Mr. Gibson Kyle, architect, Newcastle, by the Brick and Stone Company, Gateshead.

Remains of Carthage.—A correspondent of the *Times*, who has recently visited the site of ancient Carthage, about ten or twelve miles from Tunis, writes:—"The only remains in any way complete are the reservoirs and the aqueduct. The former are in a good state of preservation and are constructed on a scale of great magnificence. They are calculated to hold a large supply of water. These have all been arched over, but some of the arches are beginning to give way, and have tumbled into the tanks. . . . The aqueduct, constructed of enormous blocks of stone, and extending away towards the direction of Tunis, has in many places given way; but enough remains above ground to enable us to trace it through many miles. . . . It was with regret I found among the material collected for building purposes at the town of Goletta parts of marble columns with carved work of the most magnificent description, all of which are being broken up to erect some humble steadings. The Italians and Spaniards of the Middle Ages have adorned their palaces with marbles from Carthage, and the Venetians have their friezes and columns, which were once the admiration of Dido and of Hannibal. Is it too much to hope that an effort might yet secure for us some relic of a city the very foundations of which may before long become lost to our sight?"

Model Lodging House for Single Men, Derby.—A new lodging-house for single men has just been opened in Nun-street, Derby, by the Midland Improved Industrial Dwellings Association (Limited), for the accommodation of sixty weekly and nightly lodgers. The house has been fitted up with special reference to the comfort and convenience of regular weekly lodgers; each bed is enclosed by partitions 7 ft. high, so as to give the privacy of a separate room; and a lavatory is attached to each set of bedrooms. In addition to the kitchen, the weekly lodgers have the use of a large and well-lighted dining-room with two fireplaces, a look-up box and cupboard for the security of their property; the use of a library, and other advantages. The nightly lodgers have a separate bed, but not partitioned off, the use of a large kitchen with cooking stoves, and suitable cooking utensils. The ventilation and sanitary arrangements have received special attention.

St. George's Hall, Hereford.—A new hall, to bear the above title, is nearly completed at Hereford, in connexion with Mr. Watkins's skating-rink. The foundations of the new hall were commenced during the first week in October last, and building operations have advanced so as to enable the contractor to commence the erection of the roof. The walls are of red brick. The main ribs of the roof have a span of 64 ft., and are of pitch pine, bolted together with iron. The length of the hall is 84 ft. The floor will be laid as an in-door skating-rink, and there will be around the entire space a promenade for visitors. Above this promenade, on either side, will be a gallery. The interior arrangements, when finished, will provide for the accommodation of about 2,000 persons.

Tipton New Public Offices.—The memorial stone of the new public offices at Tipton was laid on the 13th inst. The offices will afford accommodation, on the ground-floor, for clerks', surveyors', collectors', and inspectors' offices, waiting-room, with entrance-hall and vestibule 9 ft. wide, which will be laid with Maw's encaustic tiles; these rooms will be 12 ft. high. The Board-room will be on the upper floor, size 40 ft. by 24 ft. 9 in., and 15 ft. high, with deep-coved enriched cornice and centres; this room will be lighted by twelve windows. Adjoining is an office for the use of the clerk to the School Board. In the basement are cellars for fuel, gas-meter, and stores. The general design of the building is plain Italian, with a Mansard roof and ornamental iron cresting.

The Affairs of Messrs. Peto, Betts, & Crampton.—The case of Peto, Betts, & Crampton was before the London Bankruptcy Court on the 11th inst. The bankruptcy occurred in July, 1867. A dividend meeting was held under the separate estate of Sir Samuel Morton Peto and Mr. E. L. Betts, and it appeared by the account of Mr. Paget, the official assignee of the court, that a sum of 60,081*l.* stood to the credit of the estate. A resolution was passed by the creditors present to pay a further dividend of 1s. in the pound, making, with previous dividends, a total of 4s. 9d. in the pound. The debts proved amount to no less than 1,184,000*l.*, and the present dividend will absorb 59,000*l.* and upwards.

Houses Blown Down.—Loss of Life.—During a gale of wind and rain on Wednesday, a chimney and part of a bank against which a house was built in Pandon, Newcastle-on-Tyne, fell, and broke in the roof, ceiling, and floor of the house, burying in the ruins four persons. Two women were got out alive, but with broken legs; but a man, George Jobling, and a woman named Bridget Parish, were dead when extricated. The property was very dilapidated, and forms portion of some that the Corporation intend clearing away. At Sunderland the roof and upper portion of a rickety house was blown in by a strong gust of wind. The upper story was known to be occupied by a widow named Mary Lee, with her children. On the neighbours running to their rescue they removed a quantity of rubbish and found the children in bed comparatively unhurt, though unconscious, but the mother was dead, her neck having been broken.

Proposed New Street in Bristol.—The project of a proposed new street to run from near Bristol Bridge through Baldwin-street, coming out near the Drawbridge, may (according to a Bristol paper) be said to be practically deferred for the present; for, while nearly 200,000*l.* would be required to proceed with it, the Local Government Authority in London will not allow the Town Council to borrow more than 50,000*l.* This looks like a stopper, as there are only three years in which to do the work. And perhaps it is just as well that works which will wait should wait; while the works that will not wait—like those for drainage—will require an outlay of from 100,000*l.* to 200,000*l.* The sewage necessity is certainly a much more pressing one than a new street.

Death of a Cornish Antiquary.—The Rev. J. J. Wilkinson (late rector of Lanteglos-by-Camelford-cum-Advent), who has just died after a very brief illness, was a man of mark in Cornwall, particularly as to antiquarian matters. He saved from destruction many objects of interest, such as crosses, an old font, and a very curious inscribed stone, and had them placed in the rectory grounds. He had held the living of Lanteglos for some twenty-five years, and was the first to call attention to the bee-hive hut, and the Celtic remains at Rough Tor and Brown Willy. Mr. Wilkinson was a man of most genial manners, and will be remembered by many who visited Cornwall a few months ago under the auspices of the British Archæological Association. On that occasion we mentioned some of Mr. Wilkinson's good doings.

Alleged Important Discovery for Preserving Ironwork.—According to the London correspondent of a provincial paper, a discovery of great importance to the iron industries in this country has been made by Professor Barff, of the London University. The use of iron as a building material and for shipping purposes is greatly checked by its tendency to corrosion and rapid decay; and all experiments for casting it with protective washes have hitherto proved useless. Professor Barff is said to have discovered a process of oxidising iron so as to prevent corrosion under any circumstances.

The Durham Joiners.—Last week a meeting of master joiners, presided over by Mr. G. Gradon, was held in the Mayor's Chamber, Durham, to take into consideration the condition of the trade in that city. It was alleged that great slackness prevailed, and a resolution to reduce the wages of the *employés* by 1d. an hour was come to. As the men work fifty-three hours per week, the reduction will amount to 4s. 5d. weekly. Notices to this effect were posted up in the various workshops, and a few days later a large meeting of the men was held in the Griffin Inn to consider the proposed reduction, which will come into operation on the 1st of January. After some discussion it was resolved to accept no reduction.

The Glasgow Joiners.—A meeting of the Glasgow joiners was held in the Albion Hall on the 13th inst. to consider the new code of by-laws which has been drawn up. The rules were gone over *seriatim*, but no material alterations were made.

The Brussels Exhibition.—Eighty per cent. of the guaranteed fund subscribed in Belgium for the Brussels Hygienic and Life-saving Exhibition is about to be returned to the guarantors pending the final settlement of the accounts.

Builders' Hardware.—It is stated that at Birmingham considerable orders for builders' brass and iron work, door and window fastenings, columns, girders, &c., are under execution for some of the larger manufacturing towns.

TENDERS

For the erection of schools to accommodate 754 children, with covered playgrounds and caretaker's house, at High Felling Durham, for the Heworth School Board. Mr. Thomas Oliver, architect:—

Foster	£7,122	0	0
Greason & Stockdale	7,103	0	0
Lee	7,100	0	0
Southron	6,462	0	0
Hutchinson	6,372	0	0
Handcock	6,190	0	0
Oake	6,150	0	0
R. & J. Harrison (accepted)	5,739	0	0

For rebuilding premises, Mason's Avenue, City. Mr. E. Woodthorpe, architect:—

Heeps	£1,149	0	0
Pritchard	1,093	0	0
Therry	1,086	0	0
Boyce	1,060	0	0
Johnson	1,037	0	0
Outhwaite	939	0	0
Larke (accepted)	890	0	0

For repairs to four houses, Heneage-lane, City. Mr. John Young, architect:—

Heeps	£573	0	0
Read & Son	540	0	0
Oram	490	0	0
Roper (accepted)	450	0	0

For the erection of seven 6-roomed houses, Plumstead Park estate. Mr. W. S. Witherington, architect:—

Coombs (accepted)	£1,600	0	0

For house, Third Avenue, West Brighton estate, Brighton. Mr. W. G. Davie, architect. Quantities supplied:—

Temple & Foster	£5,682	0	0
Lockyer	5,200	0	0
Sheldon	5,129	0	0
Oxley	5,000	0	0
Hall	4,879	0	0
Bratton	4,650	0	0
The National Co-operative Builders and Contractors' Society	4,573	0	0
Howard	4,440	0	0
Battley	4,400	0	0
Vincent	4,042	0	0
Hide & Co.	3,994	0	0

For the erection of a warehouse, 13, Thomas-street, Stamford-street, for Mr. Mark Mills. Mr. G. Legg, architect:—

Shurmur (accepted)	£1,043	0	0

For alterations and repairs to the Monster Public House, Pimlico. Mr. Thos. E. Parker, architect:—

Shurmur (accepted)	£369	0	0

For works in the erection and completion of a Congregational church, schoolroom, and appurtenances at Croydon, Surrey. Mr. John Sulman, architect:—

Colls & Sons	£9,3 0	0	0
Downs	9,137	0	0
Newman & Mann	9,100	0	0
Dove Brothers	8,915	0	0
Tarrant & Sons	8,307	0	0
L. H. & P. Roberts	8,079	0	0
Perry & Co.	7,895	0	0

For proposed works at East Greenwich, for the Directors of the London Seed-crushing Company (Limited). Mr. E. A. Gruning, architect. Quantities supplied by Mr. E. Andrews:—

	Credits.				
Croaker	£5,415	0	0	£80	0 0
Lawrence	5,359	0	0	75	0 0
Merritt & Ashby	5,248	0	0	60	0 0
Newman & Mann	5,125	0	0	40	0 0
Lander	4,555	0	0	120	0 0
Condor	4,438	0	0	40	0 0
Brass	4,384	0	0	130	0 0

For alterations to No. 9, The Grove, Clapham-road, for Mr. R. E. Larke. Mr. Legg, architect:—

Kent	£1,415	0	0
Chessum	1,376	0	0
Sweeting	1,245	0	0
Rider	1,204	0	0
Shurmur (accepted)	1,162	0	0

For a steam-boiler at the St. Olave's Union Infirmary laundry, Deptford Lower-road, Rotherhithe. Mr. H. Saxon Snell, architect:—

Benham & Sons	£250	0	0
May Brothers	186	0	0
Fraser Brothers	185	0	0
Potter & Sons (accepted)	173	17	0

For new water-tower, Lambeth Workhouse. Messrs. Fowler & Hill, architects. Quantities by Messrs. Lamb & Church:—

Taylor	£2,810	0	0
Battley	2,740	0	0
Prebble & Co.	2,540	0	0
Le Fevre & Co.	2,435	0	0
Hutchinson & Co.	1,950	0	0

TO CORRESPONDENTS.

S. W.—A City Builder.—J. F. N.—J. K. T.—W. S. W.—E. W.—H M C.—J. T.—G. M.—F—E. W. P—J W.—Mr. B.—T McC.—J. H. H.—H. S. S.—W. S. (should send names of those who tendered).—R. T. (not quite the thing).

We are compelled to decline pointing out books and giving addresses.

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The Builder.

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Retrospective.

IF we record the close of a year, prolific of promise, admonition, and discourse, with some little discontent and impatience, we do but acknowledge the inflexible law which prescribes that state of feeling as the necessary accompaniment of progress; and it is satisfactory to remember Macaulay's dictum that there is constant improvement because there is constant discontent. The year opened with rumour of great changes in the aspect of poorer London from the salutary influence of a special Act of Parliament, and closes with little, if any, substantial evidence of its action. Societies, associations, companies, commercially philanthropic in their origin and progress, have announced the possible advent of benefit to the population by the judicious purchase of worn-out houses, and the scientific covering of lands long encumbered and ill-administered; but the twelve hundred and odd pages of this thirty-fourth annual *Builder* tell of few radical alterations or improvements in the housing of families and the economical distribution of homes, either in the metropolis or in the great manufacturing centres of the country. Much discussion has been expended upon the advantages which the Artisans' Dwellings Act was passed to confer; but with the nature of those advantages the public is still precluded from becoming practically acquainted. At the same time we are far from wishing to condemn the delay which has occurred in the execution of schemes both public and private; nor would we for a moment disparage the value of the many communications and suggestions which have been made by thoughtful people of all kinds and callings respecting the better ordering of cities, and the social as well as legal application of sanitary laws. To us whose business it is to write and talk about these things, it is peculiarly gratifying to find that the example of Dr. Richardson,—who, last year, left his own beaten track to help architects and builders to mend theirs,—has been followed, in this, by numerous imitators in essays of a similar character; and that both the Society of Arts and the Social Science Association have moved on the urgent necessity for better legislative interference in matters of health and sewage and of house construction than has yet been obtained from the wisdom of Parliament.

Such a vexed question as the present unequal and often contradictory laws affecting the construction of buildings throughout the country was not omitted from the discussions of the Conference held last June in London by a fairly representative number of British architects. The meeting convened to consider the "Building Regulations for the United Kingdom" was presided over by Mr. Whichcord; and within the last few days a committee, of which this gentleman was also chairman, has completed a document for the use of the Local Government Board, which will enable the latter to apply generally a system of building regulations to all towns in the kingdom, if it so choose, and if Parliament consent. The first event of the Conference of Architects was the presentation to M. J. L. Duc, of the Queen's Gold Medal; and it was followed, the next day, by a discussion upon "Improved Dwellings" under the presidency of the conductor of this journal. The papers thereon treated of houses for the poorer classes, but it cannot be too often repeated that improvement in London to be lasting and effectual must be aimed at all and every one; and that the middle and even the higher classes have as much right,—and, in some instances, as much need,—to share in the benefit of scientific improvement as the lower ones. For long years to come the question in too many neighbourhoods must remain one of building rather than of architecture. It is clearly certain,—however uncertain things relating to art often are,—that a comfortable and healthful interior is of primary, an elegant exterior of secondary, importance. During the Conference, the architects devoted an evening to the re-kindling, in the hope of some Classical re-culture, of Greek enthusiasm; and no surer proof of the distaste which thinking men must feel for the vagaries of a still popular school can be given than by the evident inclination to examine once more those early principles which the Greek, perhaps unconsciously, evolved from his common-sense practice and the utilitarian nature of his invention. The lectures delivered at the Royal Academy by Mr. Edward Barry have treated the subject of architecture in an argumentative and a scholarly fashion; and we cannot speak with too encouraging an emphasis of that section of current literature,—of which they form a part,—which bases the future of artistic construction and decoration upon a broader foundation of scientific knowledge than is at present deemed necessary to the professional man. Nor, if discussions at the Royal Institute of British Architects lead, as those upon "Concrete" have recently led, to so practical a termination as the appointment of a committee for the purpose of drawing up a report to a select Parliamentary one, can we doubt that many others hold a like opinion to our own,—and this step is due, we believe, to the suggestion of Lord Elcho.

It would be Quixotic to hope that the not-improbable passing of a good Building Act will be accompanied by a serious disposition on the part of the House of Commons to inquire into, if not to reform, the abuses of divided and irresponsible government in a colossal metropolis. Those abuses too often fester to the public cost and disadvantage from the fact that sometimes the honorary officials who should correct them are interested in their continuance. Nor is the vaunted English fashion of decentralisation always a bar to those acute practices which, in over-centralised Paris, swallowed up a *préfet*, and ultimately contributed to destroy an empire. In the French capital, when the cutting of a new street was often apparently decided upon one week and effected the next, official secrets were marketable; and the scandalous news that property, doomed to expropriation and certain of consequent compensation and eventual increase of value, had been previously bought by a friend of the prefêt or another high-placed official was complacently received with the usual shrug of helplessness and intelligence. Nor was the would-be speculator, who paid his court to certain members of the board or commission in the hope of getting early news, always successful; for the latter were sometimes purchasers of the very land they had been deputed to sell for the public benefit. The Parisians, it is well known, condoned the even open corruption while the rebuilding of their beautiful city presented accumulated proofs of the benefits they derived therefrom; but London alterations, even the best, have not exhibited similar, or, at least, equal, proofs; nor can it be expected that metropolitan improvements will be effected here with the artistic completeness of Paris. There is, therefore, the more reason why Londoners, once convinced of the fact, are unlikely to tolerate any emulation, however distant, of the practices of a fallen French administration; nor do we think such emulation possible in the few building schemes which have been lately projected in London, or the few sales of public lands which have recently aroused the attention of a limited circle of onlookers.

The present state of London affords material for innumerable reflections upon the cause, and the means of remedying the worst, of the evils which impede improvement. We have noted the recent check to the increase of its area. In a quarter of a century—from 1849 to 1874—more than 270,000 houses are declared to have been added to London, making an average of 10,813 houses per annum; and in one particular year of commercial activity at least 18,000 were built. But although in 1876 and the preceding year, nothing like these figures have been attained or even expected, the increase of accommodation is in excess of the increase of persons to be accommodated. Nor, seeing the great waste of property which parts of Central London present, can it be desirable, at least for some time to come, to increase the metropolitan area. Although the value of land near Charing-cross has been confirmed by the prices secured upon a small part of Northumberland-avenue, whole acres in the immediate neighbourhood are occupied by low, ill-built houses. A glance at the map, and at

the condition of the greater number of the tenements which obstruct the making of a long-talked-of high thoroughfare from Trafalgar-square to Oxford-street suffices to show, not only the continued blindness of the landowner, but, which is worse, the mischievous consequences of leasehold custom and abuse. It is said, with some appearance of truth, that the great obstacle to street reforms and building improvements lies in the difficulty, due to many and conflicting interests, of initiating them. To suggest to the Duke of Bedford that he should pull down Bedford-bury—and this vitiated thoroughfare has been frequently condemned in our columns—is to invite the answer that a hundred and more individuals have vested rights in the rickety, overcrowded, and valuable houses; and that improvement must bide its time. We presume to think, however, that that time ought not at any cost to be delayed; and that the landowners on either side of the Strand, and particularly those who own the island flanking Holywell-street, between the churches of St. Mary and St. Clement, may conveniently take steps, without further hesitation, to render the houses which cover their land fit for the tenants who are compelled, so to speak, to occupy them.

That ever-crowded highway, once, and comparatively not long ago, the only road from the City to Westminster, continues a checkered scene of chronic disturbance. The removal, however, of Temple Bar is happily imminent. The present occupiers of the dilapidated room over the central arch have received formal notice to quit; and the widening of that part of Fleet-street and the Strand will assist in calling attention to the increasing difficulties of passage through the straits formed by the churches and the curved alignement of the neighbouring houses. It is a consolation to remember that the traditional dirtiness of a thoroughfare which originally served as the land approach to palaces of the nobility is subject of historical record. A hundred years ago stones, for which an even and less noisy surface of wood and asphalte is now being substituted, were first laid down in lieu of mud and mire. The new pavement appears to have been executed with even more care than that expended upon Northumberland-avenue. The opening of this thoroughfare, which last March afforded an opportunity of congratulatory satisfaction to the members of the Metropolitan Board of Works, has not been followed by any activity on either side of it; and the western extremity of the Strand now presents an appearance not dissimilar to that which its eastern end but lately offered, even for years, to the gaze of a patient population.

But at last the New Law Courts are rising; and so much has been done during these twelve months as to favour a hope that the Office Block, which flanks Bell-yard, and is nearly 500 ft. long, will be completed by the stipulated time. Three stories of this block have been executed since the Spring; and, besides, the roof has just been fixed and boarded. Greater progress would possibly have been made in this portion of the building had not the after-thought of ornamental brickwork for the chimney-shafts retarded nearly every description of labour engaged upon it. These red bricks, both plain and moulded, are made at Southampton by Messrs. Bull, the contractors for the whole building. To their skill and energy is due the organisation by which the work is at present conducted, as it were, in a groove and with mechanical regularity. To their general foreman, Mr. Epps, has been confided the design and erection of the scaffolding, itself alone a work of magnitude, and composed wholly of large timbers. Their first care, after having erected offices and a shelter for themselves, was to build a house for the reception of a couple of steam engines. By this means more than twenty saw-frames, each fitted with a number of blades, are almost constantly in motion; together with several mechanical tables for rubbing stone, and to every couple of these tables, which are of cast-iron, is fixed a hand-crane for lifting materials upon them. The "beds" of each stone are rubbed upon these tables, though necessarily all the faces and mouldings are worked and rubbed by hand. No Bath stone is used; the quarries of Portland and of Hopton Wood have mainly supplied the requisite materials. All the masons' shop-yards, protected from wind and rain, are lighted by gas; and each, containing a certain number of workmen, is presided over by a special foreman. The mode of reception and carriage of blocks of stone, under every phase of workmanship and of all sizes, is neither uninteresting nor old. Three steam-travellers are used, and they roll upon two distinct "gantries;" which, for the benefit of some of our readers, are large timber scaffoldings framed together and tied with iron. First, the traveller takes the rough block from off the wagon in which it is brought to the spot; and it lays this block with others in the pack. As occasion requires, the traveller proceeds to the said pack, and taking up a rough stone, conveys it to the sawing-frame, where it is cut into sizes according to prescription. The next thing it does is to carry the sawn stones to the different masons' shops, where, after having been worked by hand into the requisite form, and often into complicated mouldings, they are pushed along narrow-gauge tramways by labourers, specially employed for the purpose, to the lower parts of the new building. These worked stones are then raised by steam-hoists to points on the scaffolding, from which they are conveyed along similar tramways to their destination. Other smaller travellers assist in fixing the stones in their place upon the walls. But before this half-mechanical, half-manual work can be begun, a different kind of labour has to be carefully accomplished. Over the engine-house is a masons' "lodge," or "*œuvre*," in which the templets, or, in language of millinery, the shapes of each stone, are prepared by a special staff. This department is superintended by the chief foreman of the masons, Mr. Clark. There copies of the architect's drawings are to be found. Bit by bit these are redrawn to a large scale upon paper; the jointing is thus arranged, and each stone is carefully numbered. These drawings are afterwards enlarged to real size upon a perpendicular surface, composed of upright boards, planed and whitened, instead of the method, more generally adopted in England, of setting out masonry upon a floor. From the full-sized diagram a templet is cut in zinc to the shape of each stone, it being a rule that the men who make these drawings shall also cut the templets. Plaster models of groining and of complicated bits of stonework are also put together in the "lodge"; and we must not omit to state that much of this part of the organisation—especially the numbering, comparing, referencing, and, indeed, the general interpreting of the architect's numerous drawings by Mr. Monday—is an undoubted innovation, and almost special to the New Law Courts. Although a critic who knows men and countries is wisely cautious about vaunting the progress or capabilities of his own race or nation, we venture to affirm that in the great building-days, at no remote date, of the French capital, no *chantier* of equally scientific arrangement was ever seen in working order comparable to that which is enclosed between Temple Bar and Carey-street.

Along this same thoroughfare of the Strand flock nightly eager crowds of people who frequent theatres concealed behind the houses and shops which line it. The imminent dangers from fire and panic which hang over them are not brought home to possible victims by disasters, however terrible, reported from abroad. But the pursuit of pleasure in a metropolitan theatre is burdened with the same risks as those which were accepted at Brooklyn, in the United States, by 800 miserable spectators, 300 of whom have just met, at one swoop, a violent and an aggravated death. We have frequently called attention, and not always without effect, to the insecure condition and imperfect arrangements of many London theatres, both new and old. The example set this year by the German Government might be advantageously followed in England; and a serious inquiry into the constructive character of all such places of nightly resort would, we feel convinced, bring before the public excellent reasons for not frequenting several attractive entertainments. The actual provision, condoned by the reticence of authority, for the protection of men, women, and children, wedged together inside a London theatre, is of the most primitive description, and it may perhaps be useful to hint again to an exalted functionary that to issue a command is one thing, but to get it executed is another. On the very night that the recent reminder of the Lord Chamberlain's former memorandum to the various managers and lessees was communicated to the press, the pit gangways of the Olympic Theatre were encumbered with standing spectators, and nevertheless money was still accepted at the doors. The gangways of the best and only old-fashioned pit in town, that of the Haymarket, are systematically made profitable as standing-room. It may be doubted, however, whether an attempt, even if it be successful, to keep gangways clear is sufficient to afford a means of escape in case of panic. We have but to take three of the comparatively new theatres to show the slight security obtained by such a precaution. The pit of the Globe Theatre, sunk far below the level of the street, is so planned that the only entrance and exit for the occupants is at one corner, and by means of a narrow flight of steps; the upper boxes of the Vaudeville Theatre are similarly and even worse situated, for there is no gangway, and it is difficult, even with the utmost patience, for the "off" half of the spectators to make a way through the "near" half. Equal anxiety, though for a different reason, attends the possibility of any sudden rush from parts of the Gaiety Theatre,—perhaps the best, or one of the best, managed houses in London. The stairs, leading to the dress-circle, upper boxes, and amphitheatre, are of naked stone, supported, at one end only, in the wall of the staircase. An iron railing is fixed at the other end as a guard to the large open "well-hole" in the middle. An alarm of fire would cause a rush to be made from the amphitheatre and the upper boxes simultaneously down the top flight; while the lower one would be choked with people rushing from the dress-circle. There would be inevitable squeezes in different parts sufficient to force the railing, and precipitate many into the "well-hole,"—as at Brooklyn; and, as the fire reached the staircase, the naked stones would succumb to the flames, dropping in flakes upon any fallen unfortunates who may be lying below—as, we believe, happened at Brooklyn. It is not our wish to sensationalise over the dangers which have been, and probably will long continue to be, incurred by theatre-goers in London; but we think that had a competent censorship of plans, as well as plays, existed before many of the present theatres were built, the public would thereby have been gainers. It is, however, not too late now to order a scientific inspection of them, and compel such a re-arrangement of seats as to secure the distribution of wide gangways, to be kept clear by the aid of the police; and, above all things, to withdraw the license from those houses in which the means of ingress and exit are palpably and suicidally insufficient.

It will be seen, on reference to our description of the new Wagner Theatre at Bayreuth, that an exceptionally large space is there devoted to the comfort of the audience and to their means of escape in the event of necessity. Constructed of solid stone, it holds 1,344 commodious seats, and there are twelve places of exit, whereby the people can quit the building in even a few minutes. Several new theatres recently erected in various parts of the Continent have been illustrated in our pages during the course of this year. That of Athens has a charming Neo-Greek exterior, and is an excellent addition to the group of similar architectural edifices which adorn the modern city. Views of the new theatre and the new opera-house at Buda-Pest, the new theatre at Düsseldorf, a circus at St. Petersburg, another at Berlin, have been given by us. Nor have we failed to present our readers with some description, pictorial and verbal, of remarkable buildings, both small and great, which are rising, or have just risen, in cities remote and near. The Votive Church of Vienna is a striking example of modern architectural adaptation, and of the skill and learning with which Mediæval precedents are now applied almost everywhere in Europe. The new Town-hall of Manchester will surely add increased lustre to the already-brilliant reputation of Mr. Waterhouse. The new Town-hall of Philadelphia is of imposing character and dimensions. An International Exhibition, held in that city, has appropriately celebrated the hundredth year of American independence, and afforded many Englishmen an opportunity of visiting the new world; while, in the old, a similar Exhibition though of a different character, held at Brussels, is admitted to have been as interesting as it was novel and remarkable.

The restoration, if not the re-building, of Chester Cathedral has been successfully accomplished by Sir Gilbert Scott, and the completion by the same architect of that of St. Alban's Abbey is no longer rendered doubtful from want of the necessary funds.

In Liverpool, Mr. J. A. Picton, as president of the Architectural Society, delivered an admirable address. That of the president of the Royal Institute of British Architects was equally dis-

tinguished for the good sense it embodied, and the good taste it evinced. His remarks upon the present state of architectural competition, unintentionally seconded by Sir Edmund Beckett in his recent book, pointed to the often unscrupulous speculation which the actual system, or defiance of system, favours. The exhortation that professional brethren should make it a point of honour "to refrain from all artifices of drawing, misleading estimates, or from showy and inflated descriptions which may be calculated to mislead the very singular and frequently incompetent bodies who affect to act as judges," is eminently suggestive. That this sort of competition is simply a trial of skill and pictorial device between men who work not up to their own, but down to the public taste, is quite unintelligible to many Parisians. The French architects have received Mr. Charles Barry's condemnation of "the baleful system of competition" with wonder and opposition; but in no part of France are architectural competitions carried on as they are in this country. The temperament of our neighbours naturally inclines to an admiration for theories, but they have only to put in practice for twelve months a system which has flourished here, perhaps in its greatest vigour, for twenty years, to add their unqualified condemnation of it to our own.

Many of the addresses to kindred societies have been equally happy. From one end of the country to the other a singularly hot season preceded, and even accompanied, the recreative labours of a legion of archæologists. Of all the numerous excursions, that into Cornwall was the most successful; and perhaps this was due as much to the energy and activity of the Association and its leaders, as to the novel and unhackneyed character of the ground which was explored.

The yearly meeting of the prophets and disciples of Social Science produced an inevitable flood of talk, which, from the enforced distribution of those who attend a congress in several rooms, would be almost entirely thrown away were it not for the diligence of the press. We have done our part in recording what passed in St. George's Hall, more especially in the Health and Art sections, and have but recently terminated ourc ommente thereon. Firm believers in the progress,—slow, no doubt,—which has attended the teaching and remonstrance of sanitary and art reformers for the last thirty or forty years, we have, nevertheless, attentively listened to Mr. Hawksley and the Rev. Mark Pattison, who think otherwise, and whose remarks are always respectfully received. The latter, at Oxford, has expressed his approval of Mr. Poynter's assertion that mechanical production is opposed to art production, and we see no reason to doubt the truth of it; but, just as the machinery of 1866 produced more artistic things than that of 1856, so the machinery of 1876 has provided the many, and at slight cost, with better shaped and better ornamented objects than that of ten years earlier. Mr. Hawksley admitted that "the natural term of life of our urban population is unnaturally shortened by preventible causes to the extent of one-fifth"; but he sought for these preventible causes, "not in the water-pipes and sewers, but chiefly in the homes and habits of the industrial classes." We think that he admits, however, only half the truth; and his arguments are powerless to shake our mature conviction that it is possible to protect, if not to lengthen, life, as much by habits of cleanliness without, as of godliness within, the homes of the community at large.

Other papers upon other subjects, archæological and architectural, have attracted attention, but few more than Mr. Fergusson's bold hypothesis regarding the enigma of the Erechtheum at Athens. We have printed the strictures of Dr. Forchammer, of Kiel, upon it, and the English author's reply. To the latter is due one of the great books of the year. The history of "Indian and Eastern Architecture" is perhaps a work that of all living archæologists only Mr. Fergusson could write. The "Habitations of Man in all Ages"—also a work of the year—touches, as M. Viollet-le-Duc alone can touch, without absolute inaccuracy upon happy probabilities of the past. He has been able, in the seclusion of his study, to draw Hindu architecture on a grand scale, without having seen its exquisite pettiness on the spot; and if he has erred in his pictures of Early Chinese and Egyptian architecture, he has always accurately maintained the existence of principles, possibly imperceptible to the original builders, which mark the construction of the best buildings in all countries and in all ages until within comparatively recent times. The present moment lends to India and the City of the Great Mogul an enviable notoriety. The throne of the descendants of Tamerlane, vacant for twenty years, is again filled, and by the representative of a reigning European house, in the immediate presence of a splendour unsurpassed even in Oriental traditions; and, far and wide, of a prosperity beyond the dream of Akbar. Upon three continents—at Constantinople, at Suez, and at Delhi—lie, still half obscured, the solid foundations of a Second and more extended Empire of the East.

BRIDGE OR SUBWAY: REPORT OF THE SPECIAL COMMITTEE.

DURING a recent discussion we endeavoured to show that while, as a surveyor's question, it is manifestly unwise to think of widening London Bridge; as an engineering question such a proceeding would be decidedly unsafe. London Bridge was built under unusual difficulties, owing to the decision on the part of the City Authorities to leave the old bridge standing while the new one was in course of construction. The mode proposed by Mr. Rennie was to erect a temporary bridge to carry the traffic, and then to pull down the old bridge, and to erect the new one on the same site. As an engineering question, no doubt this was the best mode. The same remark applies to the plan of the approaches. There can be little doubt that the London traffic would at this moment be better served if Rennie's advice had been followed; and it is difficult to trace any advantage whatever as resulting from the maintenance of the old line to the latest moment, then to be altogether destroyed. One result of this obstinacy was so to complicate the difficulties of putting in the new foundations, that the limit of stability was very closely approached, and that even, for a short time, it appears to have been exceeded. The London abutment began to sink, when the masonry had reached a certain height; and although it came to a new bearing, and has since completion been perfectly durable, the indication was one that no engineer would dare to disregard. There is thus good reason, from the history of the actual building of the bridge, to anticipate that if a weight not contemplated by the designer or by the builder of the structure were thrown upon the foundations, the result would be damaging, and possibly destructive.

It is well to recall these important facts to public attention. They are not private opinions, but ascertained and recorded truths. We conclude that the former publication in our columns may have had much to do with the very desirable change that has come over the counsels of the authorities. Until, however, the matter is settled, beyond fear of reopening, it is desirable that they should be kept to the fore.

The question, then, now before the committee is as to the class of work which it is desirable to adopt for the crossing of the Thames to the east of London Bridge; the lightening of the traffic at that locality by such a measure being now regarded as a proven necessity.

The plans which have been brought before the committee, and as to which they have desired further time to enable them to report, may be divided into four main classes, according as they propose to cross the river by a bridge, by a ferry, by a ford, or by a tunnel.

The bridge plans may further be considered as either contemplating an ordinary bridge with inclined approaches, a swing or otherwise opening bridge, or a high-level bridge provided with hydraulic lifts for elevating and lowering the vehicles and passengers which make use of the communication.

As throwing light on the subject, "Mr. Architect" has prepared for the committee returns of the actual traffic over London Bridge, of the directions in which it approaches, and by which it diverges from that crossing, and of the number and character of the vessels passing up the River Thames westward of St. Katherine's Docks, with the height of their respective masts, from the 4th to the 11th of May, 1876, inclusive. This latter return is of value, as indicating the height to which the soffit of the central arch of a bridge not made to open must be raised above the level of the river, in order not to interfere with the tops of the loftiest masts. During the week in question, out of 144 vessels, one had a mast of 95 ft. high, and one a mast of 90 ft. As many as nine had 85-ft. masts. If these dimensions are taken (as would appear to be the case from the form of the return), not from the flotation line, but from the decks of the respective vessels, something has to be added for that difference. The question will arise whether it is needful to have clearance at Trinity high-water level, or at half-flood; again, whether it is necessary to add 10 ft. to a clearance that is enough for 98 per cent. of the vessels using the river. These are points important to bring out. At all events, making allowance for the thickness of the bridge itself, we cannot reckon on a less height than 90 feet above Trinity high-water mark as the level of the roadway over the central arch of the new bridge; and this height, allowing a slight fall to either abutment, has to be regarded both as affecting the cost of the structure and that of its approaches, and as measuring the work done by the teams or single horses that make use of the proposed bridge.

On this part of the question the committee will do well to call upon "Mr. Architect" for the corresponding information with regard to the depth below the surface of the river at which a tunnel may be supposed to be practicable. A section of the river is required for this purpose, as well as a list of the draughts of the vessels passing, as in the previous case, above St. Katharine's Docks. The hydraulic movement of the Thames at the proposed spots must also be indicated. Again, the geological nature of the bed of the river must be ascertained. If we take Trinity high-water line as a datum, we have seen that 90 ft. have to be allowed above that level for the roadway of a fixed bridge. For depth below we must allow for the fall of the tide, say 22 ft.; for the draught of a laden vessel, say 35 ft.; for the crown of the tunnel, say 3 ft.; and for the clearance of the tunnel itself, say 18 ft. This gives a total of 78 ft., or 12 ft. less to descend than we had, in the former case, to ascend. But it must be observed that these dimensions, if possible for a subway, are not possible for what we usually understand as a tunnel. A certain thickness of soil beneath the bed of the river is essential for any process of tunnelling. A subway, with the soffit of its arch only 60 ft. below Trinity high-water line, could only only be put in by coffer-dam, or by some process that would be equivalent to tunnelling, not through earth, but through water. Considering, then, the natural preference for a daylight line, the great extra risk and cost of the subway, and the necessary expense of pumping, to keep it dry, and of gas to light it, it does not seem to us probable that a gain of 12 ft. in the height to be ascended and descended on the approaches is such as to turn the balance, as far as the advantage of the land traffic is regarded, in favour of the subway. There is also a practical reason in favour of the bridge that deserves note. For the bridge, the traffic has first to ascend and then to descend. Any vehicle that can do the one can certainly do the other. For the subway the traffic has first to descend, and it is thus quite possible that a heavily-laden vehicle, which had easily made its way to the lower level, would be found too much for its horses on the ascent, and would thus cause an obstacle to the traffic.

Thus far we have regarded the land traffic. As far as the river commerce is concerned, there is no doubt that a subway would be preferable to a bridge. But it is the land traffic that has first to be considered. The return printed by the committee takes no note of the tonnage of the vessels enumerated; and the column headed "description" is filled up in a somewhat eccentric, not to say unintelligible, manner. Some vessels are therein called schooner, brigantine, or ketch, but we generally find the line in question filled by the letters P.S., or S.S., or by the numerals one, two, three, or five, which are, we honestly confess, beyond our comprehension. As to the traffic over London Bridge, it is stated in the analysis of returns of traffic (p. 33 of the report), at about 7,800 vehicles of all kinds per day, from north to south, and about 7,600 ditto from south to north, making an average total of 15,200 vehicles daily crossing the bridge. But in the two weeks extending from Monday, the 25th of January, to Saturday, the 6th of February, 1876 (omitting the intervening Sunday), the total number of vehicles enumerated as crossing London Bridge averaged 19,161 per day, besides 121 led or ridden horses, and 104,159 foot-passengers. Observations of the lines of road from which this great body of traffic converges on London Bridge have led Mr. Horace Jones, the City architect, to the conclusion that 30 per cent. of the traffic now poured over this line of communication may be

diverted by the construction of an eastward crossing of the river.

With regard to the details of the different schemes submitted to the committee, they seem all to have the family likeness of either absence of estimate, or estimate which takes no account of the actual outlay which has been made on our principal Thames crossings, including the great tunnel at Rotherhithe. Mr. John Keith is the only designer who has proposed a subway. This he estimates at 163,346*l.* for the work, and 316,190*l.* for the approaches. This allows a sum of 252,800*l.* for the purchase of property for approaches which, so far as we can gather from the report, must exceed a mile in aggregate length. The length of the subway itself is not given in the report. That of the Rotherhithe tunnel is 400 yards, and the cost was 455,000*l.* The approaches of Waterloo Bridge cost 465,000*l.* The whole cost of that bridge, for works and land, was 1,030,000*l.*, and that of London Bridge was about 22,000*l.* less, as we stated in our article on the architecture of the Thames Bridges. (See *Builder*, September 23, 1876). We must, therefore, regard any estimate of much less than a million of money for crossing the Thames to the east of London Bridge as based upon imagination rather than upon experience.

Mr. Guthrie, indeed, proposes to solve the difficulty for the extremely modest sum of 30,000*l.* He would lay a line of rails across the bed of the Thames, at a uniform or nearly uniform level, on which should run a framed staging or carriage with deck, offering, he says, very little resistance to the water, and projecting above the level of high water. The carriage would be driven by machinery, and move on the submerged lines between the two quays. The effect of the upward rush of the tide on a staging 55 ft. high may be more easily conceived than described. Less original than this submarine traveller is the simple project of Mr. E. Waller, to whose name the expression "Thames Steam Ferry Company" is significantly attached. He simply asks for two paddle-wheel steam ferry-boats, each 82 ft. long by 27 ft. wide between paddle-boxes, and capable of carrying twelve two-horse vans and 250 foot passengers, which are to ply to and fro between Irongate-stairs and Butler's Wharf, Shad Thames. Both north and south quays are to be made available at any state of the tide by hydraulic lifts, and all this is to be accomplished for 55,000*l.*, and 8,000*l.* per annum for working expenses.

Coming, now, to what we are likely to come to, in fact,—a bridge,—we have a project by Mr. Frederic Barnett, to form a double, or looped, bridge, on a low level, with swing galleries on the loop,—the idea being that when one of them was opened for the passage of a vessel the traffic would go over the other; the ship thus passing first into, and then out of, a sort of dock between the two galleries. The cost is estimated at about 400,000*l.*, but the Commissioners say that "only four of the parties give any estimate of the expense of carrying their designs into execution," and add that these four are Mr. Bruce, Mr. Duer, Mr. Keith, and Mr. Perrett. This is another of those little anomalies in the report on which we may expect to see some comment hereafter.

Mr. Bruce's design is that of a movable or roller bridge, 300 ft. long by 100 ft. wide, which is to move backwards and forwards on the top of six piers, which divide the river into seven spans or openings,—so that a portion of the water-way would always be open for vessels. Whether it is intended that the rolling platform shall remain on one side of the river until it has become filled with a line of vehicles going, for example, northward, then roll across and remain on the north side until the platform has been emptied and re-filled with a line of vehicles going southward, the analysis of "Mr. Architect" does not say. Probably this remark may elicit the reply that two alternating platforms each 50 ft. wide may be substituted for one of 100 ft. wide. But it would appear to be a result of such an arrangement that the vessels would have to pass as the case might be through the north or south landward openings, and that the inconvenience would thus be impartially distributed between the river and the road traffic. The cost of the construction is estimated at 134,381*l.*, with a further sum of 10,000*l.* as capitalisation of the working expenses. There is no estimate for approaches. The platform is to leave the same shore every six minutes, and to carry upwards of 100 vehicles and 1,400 foot-passengers.

Mr. Duer proposes a high-level bridge, with a pair of hydraulic hoists at each end to raise and lower the vehicles. He proposes to carry 250 vehicles in each direction over in an hour, besides foot-passengers. The cost of the bridge and hydraulic apparatus is estimated at 136,500*l.*, and the working expenses at 1,872*l.* per annum. As in the former case, no estimate is given for approaches. There is no doubt that in the case of a swing bridge, or bridge in any way worked by machinery, the cost of approaches would be comparatively small, and might, in fact, be more than covered by the increased value given to the property. And we think it is also clear that any movement which is confined to the accommodation of the land traffic alone, and which is thus freed from the risk of delay attendant on the passage of a vessel, would be less objectionable, both as regards land and water traffic, than any opening by swing or other bridge over the river. But it will require very much to induce the carriers and the travelling public to entrust themselves to hydraulic lifts, instead of making use of their own and their horses' feet to ascend the approaches of a bridge in a normal manner.

Mr. Perret also proposes a high-level bridge, with hydraulic hoists, to accommodate 350 vehicles and 12,000 passengers per hour in each direction. The total cost of works and approaches is taken at 340,000*l.*, and the working expenses at 4,000*l.* per annum, or more than double those contemplated by Mr. Duer.

We may remark here that it is difficult to ascertain, from a daily average of passengers, the proportionate number that require the use of a bridge at any hour of the day or of the night. This fact is a strong argument in favour of a fixed and always accessible bridge. The means of passage might be a matter of life and death, or at least of extreme urgency, to a few individuals in the course of the year at hours of the night at which it would hardly be expected that a costly hoist should be set in motion at the call of a single passenger. Yet the mere fact of the concentration of traffic on the selected spot would give to individual travellers a strong claim to instant attention at any moment. If we average the day at twelve hours, and consider that all the traffic of London Bridge is equally distributed through those twelve hours (which is a very rough approximation to fact), we find that 1,596 vehicles, and 8,696 foot-passengers cross every hour. Of these it is estimated that 30 per cent., or nearly 500 vehicles, and 2,600 passengers, would be diverted to the new eastern bridge. But we shall very much undervalue the service which the proposed communication is likely to render to the metropolis if we credit it only with the traffic which it may abstract from London Bridge. It would create, if placed at a suitable spot, a large traffic of its own,—a traffic that in all probability would soon equal that which it was at first calculated to divert. Then if we consider how traffic is concentrated at certain hours, we shall find that no engineer would be justified in undertaking a costly work of a permanent nature for the accommodation of the eastern traffic which should not be capable of transmitting a current of at least 800 vehicles, and 4,000 passengers per hour in each direction through the busy time of the day. This is far beyond the capacity of either of the proposed hydraulic-lift bridges, and is an additional indication of the fact that it will be wiser for the City of London to look to a permanent bridge, regularly approached, although it may have a million to pay for it, than to endeavour to save expense by any hitherto untried expedient. Indeed, if any other course is to be considered, we are disposed to advocate that of a regular steam-ferry, such as already is well known to work with considerable regularity in other parts of England. It is remarkable that no inventor has suggested a plan of the kind,—not a paddle-wheeled boat, but a platform working by chains across the river. The experience of the Gosport Bridge, and of that near Devonport, are here available for our guidance; and if saving of immediate cost be the first consideration, the committee would do well to collect full information on this score.

It is, however, not so much of importance to do what is cheapest as to do what is best. Contrary, we must confess, to our own anticipations, we find that our judgment inclines, on the evidence before us, neither to a subway nor to any complex mechanical means of crossing the river; but to a permanent bridge, at a high level, approached by well-formed roads. As an architectural monument, of course nothing can compare with this method of treatment. We desire to speak with all reserve; it is possible that evidence will be forthcoming that may modify this view. But, as far as the matter has been brought before the world by the Special Bridge and Subway Committee, such do we take to be the outcome.

MR. PARKER'S NOTES ON THE COLOSSEUM.*

"The Flavian Amphitheatre, commonly called the Colosseum," forms the subject of No. VII. of Mr. J. H. Parker's volumes on the "Archæology of Rome." The first point, and much the most difficult, in digesting the contents of one of Mr. Parker's books, is to find out what it is that he really intends to tell us. Any connexion between the facts brought forward and theories founded on them, or between one fact and another as bearing on the theory, it is left for the reader to discover by a wearisome and puzzling process of putting two and two together; the particular fact on which the author's whole assumption mainly rests being sometimes found in some out-of-the-way corner of his book; at other times repeated in the self-same words in half a dozen places, but in a manner so apparently unconnected with any argument that it is only by observing the frequent repetitions of the same statement that we are led to conclude that the author attaches some special importance to it, and are put on a process of hunting out what this may be. This is perhaps a salutary means of making a reader think for himself; but it seems very unfair that the author should throw upon the reader all the burden of arranging the facts into something like order, and compel him to be reader and editor in one. We have endeavoured to fulfil the joint office according to our ability; and if our remarks are a little tinged by acerbity, Mr. Parker must take this as evidence that we have paid his book the compliment of studying it attentively, and have thereby arrived at that state of mental exasperation which is the inevitable result of such an exercise.

The gist of what Mr. Parker lays before his readers is this:—In the first place, the recent more thorough excavations in the arena have given quite a new aspect to this portion of the structure:—

"These were made under the ground, at the foot of the *podium*, which is the same as that of the original *arena*: this large level space has been indifferently called the ground, the floor, the stage, the area, or the arena; no one had any idea that the original pavement would be found 21 ft. below that level, and that the intervening space was filled with walls and passages, dens for wild beasts, places for lifts to send up men, and dogs, and animals,† and canals for water, and several other contrivances for the use of the performers on the stage above; for practically the *arena* was the stage on which the performances took place. These excavations have enabled us to ascertain that this had been a boarded floor covered with sand, or *arena*, whence its name, and that this floor could be moved and replaced in a short time, at the word of the emperor. The evidence of this is brought out clearly in the present work."

Mr. Parker further undertakes to explain in detail the methods of raising the "dogs and animals" from the subterranean dens to the arena, of letting in and out the water for naval spectacles, of removing and storing the boarding when not in use, and other details of the machinery of the spectacles, as he considers them to be made manifest by the evidences to be found in the remains of the substructures.‡ Furthermore he propounds the theory that the amphitheatre is on an old site and mixed up with remains of former works of the same kind; that it was the site of the amphitheatre of Scaurus, described by Pliny, and by him characterised as an insane project; that the substructures of the arena are partially the remains (so we understand him) of this amphitheatre, considerably shaken by earthquakes and repaired in the time of Nero, and subsequently also; that this was, again, Nero's amphitheatre for shows and naval spectacles, and had probably brick galleries built around it, in the style of the period, for the spectators; that finally the great stone edifice of the Flavian emperors was built round the arena in place of Nero's galleries, the ancient substructures of the arena being still retained in

* The Archæology of Rome. By John Henry Parker, C.B., &c., &c. Part VII. The Flavian Amphitheatre, commonly called the Colosseum. Oxford: James Parker & Co. London: John Murray.

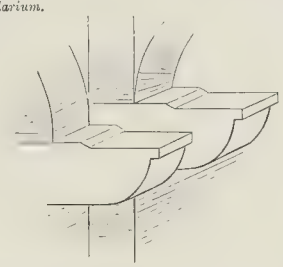
† *Sic*: a dog not being, we suppose, an "animal" in the author's vocabulary.

‡ Mr. Parker accuses the French engineers who superintended the partial excavations of 1812, of not having seen that they had excavated the tops of arches, the lower parts of which were buried. How does he know they did not see it? There surely may have been other reasons for discontinuing the excavation besides the idea that everything possible had been accomplished.

the centre of the new building and made to serve their original purpose, with modifications; that the upper story of this last structure was originally of wood, and was rebuilt of stone (after a fire caused by lightning) in the reigns of Alexander Severus and Gordianus; and that of this rebuilding evidence is left by the existence of piers of hard travertine stone carried up from the basement, through the softer tufa and brick walls, to assist in carrying the weight of the stone upper story; the manner in which these piers cut through the rest of the walling showing, says the author, that they were subsequent insertions apart from the general building of the structure.

The first phase in the historical portion of this scheme is a curious illustration of Mr. Parker's habit of assuming a theory and then twisting everything into a proof of it. He twits other archæologists with accepting the phrase, "it must have been thus," as a proof of a thing; but this and other parts of his own work are nothing but the employment of the argument of "must have been" on a most extensive scale. Scaurus was accused of insane extravagance in building a theatre which held 80,000 people; Mr. Parker cannot imagine any other possible site for this in Rome, therefore it "must have been" here. The theatre of Scaurus (which is called "theatrum," and not "amphi-theatrum,") is cited by Pliny as an instance of a private man having outdone in size every other theatre, at his own expense. "Hic fecit in ædalitate sua opus maximum omnium, quæ unquam fuere humana manu facta, non temporaria mora, verum etiam æternitatis destinatione." This, says Mr. Parker, in a note, "seems to mean that the upper part was temporary, but the sub-structures were permanent or eternal"; and this is how he gets the origin of the sub-structures of the present Colosseum. The context of the passage, which seems to contrast this theatre of Scaurus with the permanent structures of other builders, would suggest a different reading; and in Mr. Parker's own appendix, in which the translation of the passage is given at length, he forgets his argument, and translates it, — "during his ædileship, and only for the temporary purposes of a few days, Scaurus executed the greatest work that has ever been made by the hands of man, *even when intended to be of everlasting duration.*" Then follow the words "Scena ei triplex in altitudinem," which Mr. Parker translates to mean that the building was in three stories, like the Colosseum, though he admits that *scena* always means the stage (or more correctly, perhaps, the proscenium), and the lower part of the *scena* is said to have been of marble, the middle of glass, and the upper of gilt wood. We can scarcely imagine the middle gallery for spectators being of glass; but the whole is quite intelligible if we apply it to the decoration of the proscenium. The *cavea*, Pliny says, held 80,000; and if we regard it as a theatre, the *cavea* would be the hollow curve of the auditorium, as distinguished from the *scena* or stage portion. But Mr. Parker takes the *cavea* to be the amphitheatre seats, and jumps at the similarity of numbers, as the Colosseum itself held 87,000 spectators. Here the *scena* and *cavea*, evidently contrasted in the original, are made by the author to be the same part. But in the description of the existing Colosseum he twice cites a passage from Prudentius, to prove that the *cavea* meant the hollow portion in the centre under the arena, where the dens and the stage machinery were. At that particular part of the book it suits him that *cavea* should have that meaning. After this, Mr. Parker had better drop the amphitheatre of Scaurus. It might have done as a passing suggestion; but to find an author dogmatising, in the positive way in which Mr. Parker always does dogmatise, upon the basis of such an utter confusion of ideas and arguments as this, is really too ludicrous.

It is otherwise in regard to the second stage in the historical analysis, the separate construction of the Flavian Amphitheatre around previously built substructure walls in the centre. Taking the fact that, within the basement wall of the stone structure (beneath the arena level), there runs an arched tufa-wall very close to it, but nowhere bonded with it, and that the piers of the inner wall do not correspond with those in the outer wall, the conclusion that the two were not built at the same time seems irresistible; and the probability is that the inner and less important and costly wall, which has no connexion with the outer structure, existed first, as, if it had been built later, it would be so easy to make its piers coincide with those of the outer wall. This is, to our mind, the chief argument in favour of the theory: Mr. Parker lays great stress upon the existence of arches, in parts of the substructure, turned with the long Neronian bricks (3 ft. or 4 ft. in length); but this fact alone might hardly be inconsistent with the reconstruction of the whole when the external design was carried out, merely supposing some old bricks that were on the spot to have been used up again. Another point drawn attention to by Mr. Parker, in support of the previous existence of the tufa walls under the arena, is, in fact, if anything, directly against such a supposition. On each pier of the outer wall (on its *inner* side) are a couple of projecting corbels, with a deep groove between them, which is evidently intended for the support and fixing of the masts carrying the inner edge of the *velarium*.



Immediately in front of these corbels comes the tufa wall; Mr. Parker says (notes to Plate xviii.) they are "built into" it, but his section in the plate shows them merely touching it; but either way, it seems a most unlikely thing that corbels should be moulded at the end, as shown, when they were to be hidden by an existing wall in front of their position. This is an instance of the way in which Mr. Parker, even when he adopts a probably right conclusion, brings in support of it facts which, if he rightly realised the processes or conditions of building, he would see were adverse to it. Similarly, in regard to his theory of the subsequent introduction of the hard travertine piers, before referred to, for supporting the upper gallery, he is possibly correct in his supposition; but his Plate xxi., showing where a travertine pier has been removed from between two relieving arches in the brick wall, without disturbing them, does not the least prove that the whole was not built up at once: he might find numberless instances, in ruined structures, of relieving arches that are held up in the masonry above and below them, while their theoretical points of support, or abutments, are gone.

Mr. Parker's description of what may be called the stage machinery of the Colosseum is in some points interesting and somewhat ingenious; but he shows his usual tendency to be too positive about the truth of every idea he has entertained, and it is evident that in his imaginary descriptions he often quite fails to realise how things would actually operate. The substructure of the arena is divided longitudinally by very strong and thick walls into five long openings or canals, of which the centre one, he considers, was a dry dock, and the four side ones huge canals or troughs of water for the naval spectacles, the two inner canals carried on beams and on a thickening of the wall below them, and the two outer ones on brick groining. In conjunction with the photographs, we may, perhaps, accept this as a not impossible explanation of this part of the structure. But then he tells us (and he takes it as absolutely proved) that the flooring-boards, when removed from the arena on such occasions, were tumbled down in the narrow space round the edge between the stone wall and older (?) tufa wall before mentioned, and rested on the pairs of corbels which we have sketched above, and which, he thinks, were prepared for the reception of the boards, on account of the sinking on their upper face. How that would make them any better fitted for the purpose, or why the flooring-boards should be pitched into a crevice several feet deep between two walls, from which it would be most troublesome to fish them out again,* it is impossible to say; and we may here observe that this idea of the loose flooring-boards does not appear to rest on one iota of authority, and is merely evolved from the depths of Mr. Parker's inner consciousness. But has not Mr. Parker logic enough to see that if these corbels always occur in pairs on each side of the groove for the masts, and nowhere else, they must be connected with some arrangement at that special point? To our thinking, the object of the double corbels and the sinking on their face would seem to be to aid in the fixing of a crosspiece to steady the masts, which were footed on a template at the bottom of the groove a few feet lower down, and were secured from movement inwards at the level of the double corbels. As to the loose boards, if such an awkward arrangement really existed, naturally they would go into the dry dock in the centre. Mr. Parker wants to keep the galleys there, till required for action, because he found at the bottom of the "dock" the remains of a timber frame like what he is told are used in graving-docks for the ships to rest on. And how in that case were the galleys to be got into the canals at the side when wanted? Hoisted up, we suppose, with a system of sheers and tackle, and swung over into the canals? Why, if (as Mr. Parker supposes) there was a system for letting water into and out of the canals when required, of course the galleys would be kept in them when dry, and would float up with the water when it was let in; nothing simpler. In his description of the machinery for hoisting the animals up to the arena level he is also more imaginative than practical. The vertical grooves seen in the walls were probably for lifts to work in, and the larger grooves very possibly, as he suggests, for counterweights. Certain round holes in the floor he will have are sockets for windlasses to wind up the cages. If these sockets were found before each den, this might be an obvious theory; but by his own showing on the plan (Plate viii.) they are not, and they occur in other places apart from the neighbourhood of the arena: and his own view of the *modus operandi* (Plate xvi.) shows that there could be no convenient room for working capstans with horizontal bars, nor could they be necessary, if we are to suppose the existence of counterweights. The author, by the way, describes the cages (*pegmata*) as of wood, but he shows them as iron; but the whole account of this part of the operation is confused, and the working of the machinery, as he indicates it (Plate xvi), most awkward and improbable.

The illustrations, including comparative plans of some other amphitheatres, are of real interest, and, being mostly photographs, can be depended upon. As to style, when we complained, in noticing the last number of the series, of the confusion and needless repetitions of the book, Mr. Parker wrote saying that we could not know the difficulties under which he laboured in bringing it out. Whether he is haunted by difficulties that other authors are exempt from we know not; but his difficulties seem to us to arise from a want of literary perception and of common care in editing. As a specimen of Mr. Parker's "vain repetitions," we subjoin the following:—

Page v. *of Preface.*—"These sockets, of which there are a great number in the pavement, are evidently made for a pivot to work in each; and these pivots must have been the lower end of a post for a capstan, to wind the 21 ft. of cord upon when the animal in his cage was pulled up to the top, and the trap-door opened by the same cord from below," &c.

Page 30.—"Where the cage on the lift was pulled up to the level of the floor of the arena, under one of the trap-doors, the upper part was pulled up by a cord from below. . . . . In the original pavement is a round hole for the socket of a pivot to work in, evidently for the windlass for winding up the cord."

Notes to Plate vi.—"In the passage is a long series of sockets seen in the pavement, apparently each for a capstan to wind the 21 ft. of cord upon, when the cage was pulled up to the top, and the traps opened."

Notes to Plate xxiii.—"Behind the place for each cage in the paved floor of the passage, is a socket for a pivot to work in, at the foot of a capstan and post, to wind the 21 ft. of cord upon, with the lift, when pulled up to the trap-door," &c.

Is it any wonder that the reader loses his temper at having this utterly imaginary "21 ft. of cord" dangled before him in this foolish fashion? This is only a specimen: how many times we are told that the "area was covered with loose boards and strewed with sand and thence called *arena*" we should be afraid to count; it is a complete puzzle to make out whether one has read any particular page before or not; and as to anything like a regular and consecutive carrying on of the argument, that seems out of the question. We repeat that a Mr. Parker cannot arrange his matter into if decently readable form, he should secure the assistance of a friend with some literary ability

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* We must refer the reader who cares to go into the question to Plate xviii. of the book.

to get his books into shape for him. We have taken the trouble to get at his meaning, knowing that he has information to give; but no author has a right to worry his readers by putting forth books in such a state of jumble and confusion.

Since the above remarks were put into type, we have had opportunity of examining the beautiful set of drawings of the Colosseum made for the French Government in 1812, which are referred to by Mr. Parker. They were purchased for the British Museum not very long since, and are in the Manuscript Room there. They consist of a number of large drawings or mounted tracings, showing (geometrically) every portion of the building as far as excavated at the period, in its actual state, and with carefully-drawn restorations based upon the remains. The drawings of the actual state of the building are evidently made with the most minute regard to accuracy; all the different materials are carefully distinguished by colouring, and full explanations appended in small but beautifully-neat manuscript.

As we anticipated, the drawings at once contradict the supposition of Mr. Parker, that a set of French engineers could have been capable of excavating the upper part of a series of arches without seeing that there must be something more below, whilst they furnish further proof of the hasty character of some of his assertions, and show that if he really examined the French drawings he has done so without taking any trouble to understand them. In the face of these drawings, the statement on the first page of his preface, that before the excavations of 1874 no one had any idea as to the real depth of the central area, or the existence of walls and dens under the apparent ground level, is simply ridiculous. The French engineers' restorations on the drawings numbered 4 and 5 in the collection, made sixty years ago, show not only that they had a perfectly distinct perception on this point, but that their conjectural restoration comes very near the actual depth found in excavating; they give a depth of nearly 20 ft. from the base of the podium to the floor of the substructures, the discovered depth being 21 ft. (the length of Mr. Parker's "cord"). Now as to the double corbels noted above: in the French drawings they are shown with the sinking on the surface square in section, and coincident with the plane of the wall, and not advanced from it; and as Mr. Parker's photographs show these corbels to be very dilapidated and knocked out of shape, quite sufficiently to leave room for conjecture, we are much disposed to accept the French engineers' restoration. Well, now we come to an important point. We noticed above that the fact of these corbels being moulded ornamentally and yet *shut out of sight* by the interior tufa wall built almost against them, in itself would go to prove that the inner wall was *later*, and had been built up in front of them afterwards. We find, from the notes on the French drawings, that their authors adopt as a matter of course the opinion that these corbels must have been meant to be visible when built, and that the substructure walls have been altered afterwards. In the notes on Sheet 1 of the drawings they say that, "judging by the nature of the materials and of the work, all these constructions must have been greatly altered since the origin of the amphitheatre, and we can easily see the numerous repairs which have been rendered necessary by earthquakes." Mr. Parker falls back upon his knowledge of the bricks of different epochs (which we do not care to contest), to show that parts of these structures are earlier than the exterior; but of course mere sleeper walls in a subterranean construction are exactly the portions in which old materials are likely to be used up again, and there is the fact that the French theory explains the position of the corbels, and Mr. Parker's does not. The theory of the French engineers is that at the time when the sea-fights or *naumachiæ* were the most popular entertainments, the stage had a permanent floor some little distance below these corbels, and that the said corbels carried the springers of the stone *revêtements* of the arches between them (which now show brick only), and that through these arches the water was poured in cataracts to fill the arena for the naumachiæ, and that the small vertical shafts which Mr. Parker calls feeding passages for the dens (but which do not reach nearly to the floor of the dens) were sluices to let in the water. Afterwards, when chases and combats became more popular than naval fights, the floor or pit was found too low, and was raised to the level indicated by the sub-structure walls as they now remain, and a movable wooden floor provided. Any one looking at the restored sketch of the first arrangement, in Sheet 27 of the French drawings, will at once see, at all events, what a far finer naval spectable could be ensured in this way than by Mr. Parker's idea of the limited tanks in the middle of the arena, where the triremes could only, in fact, move in one straight line. The dens for the animals would be in the subterranean story below this permanent floor, with inclined passages and trap-doors which could be made water-tight when the arena was flooded. Evidences of this very arrangement of a permanent floor and trap-doors are brought forward by Mr. Parker himself, in the case of the amphitheatre at Pozzuoli, of which he gives illustrations. This theory gives also an explanation of the double row of arches seen in Mr. Parker's Plate xviii., the flat arches below carrying the sills of the semicircular arches above them, over which sills the water was supposed to flow into the arena. The mere admission of the water in this way would in itself have been a fine spectacle; whereas we can hardly imagine anything more paltry than the *naumachia*, as conceived by Mr. Parker, taking place in two isolated parts in the middle of the arena, of most awkward shape, and of which only part of the surface (over the two canals) was really deep enough for galleys to move in, the rest being covered with shallow water for appearance only! We may depend upon it, the Romans did the thing better than that, if they did it at all. The French scheme, also, throws open (whether for the *naumachia* or the land combats) the whole area within the walls; while Mr. Parker, for some reason that we have in vain endeavoured to realise, imagines an inner barrier or railing, contracting very seriously the available area of the arena, and leaving a space between it and the walls all round which is entirely wasted. As evidence in favour of this he gives a photograph (Plate xxiii.), of a rude sketch scratched on a stone found in the recent excavations, showing what appears to be a kind of open railing with cross braces, and below this a series of semicircular arches with flat sills, and below that again rude figures engaged in some sort of performance. Mr. Parker takes this as evidence in his favour; the railings represent the barrier between the people and the arena, and the rough arches, with some sort of grill fitted into them, the dens of the animals; quite forgetting that these latter *could not be seen from the arena*, on his own showing, since they would be below the floor level. But turn to sheet twenty-seven of the French drawings, which shows their idea of the arrangement before the floor was raised, and there we have, in their restoration, the actual thing which is (rudely and out of proportion) shown in Mr. Parker's photograph: the railing above and the row of semicircular arches below with flat sills at the springing. We do not lay much stress on so rough a fragment; but there is the fact, that what it shows can be reconciled with none of Mr. Parker's restoration, but is completely in keeping with what is shown in one of the French restoration drawings, and might, in fact, pass for a rude memorandum of it.

Looking, again, at sheets two and three of the French drawings, representing in coloured geometrical drawings the actual state of the substructure walls as far as then excavated, we see a good many series of square holes in an oblique line in the walls. No one who examines these drawings can doubt their substantial accuracy; and these oblique rows of holes, which Mr. Parker avoids mentioning at all, can only be explained as the seating for bearers for inclined planes. The explanation of these by the French engineers, that they were the inclined planes furnishing the passage for the animals from the dens to the arena, seems the only one possible; and it is certainly more reasonable to suppose that the animals should have run up in this way, than that hundreds of men should have been employed to wind them up to the proper level by such clumsy expedients as those which are attempted to be indicated in Mr. Parker's Plate xvi. The vertical grooves in the walls are easily explained, as necessary for winding up stage erections and decorations for scenic effects, which could not raise themselves.

We are by no means necessarily accepting the restoration of the French engineers; but any one studying their full and elaborate notes and drawings cannot fail to be struck with the consistent and logical method in which their theory is stated, and the clear perception it evinces of the actual working of the operations which they suggest. It cannot be necessary that we should apologise for criticising Mr. Parker in plain language, for no writer has shown more of the *odium archæologicum*, none has been more ready to use the strongest and most unkind language in regard to every one who was unfortunate enough to question his views, than Mr. Parker himself; and he is so confident in stating his own opinions, and so contemptuous in dealing with those of every one else, that many who have not the time or the means to investigate the grounds of his opinions may not unnaturally suppose that there must be very unanswerable reasons for such positive and dogmatic statements. We must repeat our opinion that Mr. Parker has done good service to archæology by collecting a great number of facts, for which let him have all credit; but that his deductions from his facts are often utterly illogical and untrustworthy, because when he has once formed a theory he either will not or cannot see anything that contradicts it; he forgets in one place what he has said in another; and, whatever his merely archæological knowledge of ancient materials, he obviously has not a sufficiently clear perception of the actual process of architectural design and construction to realise the working of his own suggestions, or the practical contradictions involved in them.

"ST. PETER'S AND ST. PAUL'S."

Although the scheme for decorating the metropolitan cathedral is at present in abeyance, and will probably hardly be revived in the form which it last took, the solid sum of over 40,000*l.* has been subscribed and is in hand, and is bound to be applied, sooner or later, in furtherance of the object for which it was advanced. With the view of smoothing the way for carrying on the work,—so far, at least, as the funds in hand will go,—Mr. Oldfield, a member of the Executive Committee for the decoration scheme, has availed himself of the opportunity of a short tour in Italy to note the characteristics in the decoration of the churches which most resemble St. Paul's in style, and frame from these observations some conclusions as to the best methods of carrying out the work in our own cathedral, which he has embodied in a letter addressed to the Dean of St. Paul's,* and forming a small volume of between 90 and 100 pages. All suggestions on a subject on which it is so difficult to arrive at any satisfactory conclusion must be received with due caution; but we may at once say that Mr. Oldfield's remarks are worth the perusal of all who are interested in the matter, not only for their good sense and moderation, but for the unusually correct and refined ideas in regard to the æsthetics of decoration of which they afford evidence. The author, we imagine, has been in a minority on his committee; for had such counsels as those which he gives been in the ascendant, some propositions which we have had to review would never have been made.

On his way to Rome, or at least before arriving there, Mr. Oldfield takes Florence, Genoa, and Milan. The Capella dei Medici at Florence suggests the consideration that permanent polychromy, formed by applying to the walls veneers of thin marble, though a legitimate decoration, is only suitable where the architectural forms are simple. "Where the building is at all complex, large marble mosaics are liable to perplex the eye and confound substance with surface." Under which head the author considers St. Paul's to come he does not here say; but he subjoins in a note his protest against the idea of cutting away solid ashlar masonry to build in white and coloured marble coatings,—a system, as he observes, "not to be found in Italy." An observation as to the bronze-gilt statues in the chapel is very significant in regard to the subject in hand. The chapel decorations in general are in so high a key, that plain bronze, or even marble, would have seemed mean. Let us not, he says, overlook the lesson. "There is little likelihood that St. Paul's would ever be incrusted with the gorgeous substances of the Capella dei Medici, as this would require many millions of our money; but it is not beyond conception that some less costly but hardly less ostentatious method of embellishment might be attempted, *which would seriously impair what*

* St. Peter's and St. Paul's: Notes on the Decorations of a few Churches in Italy, including St. Peter's on the Vatican at Rome; with Suggestions for Proceeding with the Completion of St. Paul's; in a Letter to the Very Rev. R. W. Church, D.C.L., Dean of St. Paul's. By Edmund Oldfield, M.A., F.S.A. London: Longmans.

in many of our monumental sculptures is the only merit, the decorative effect of their marble." We call attention to this because, in the most prominent of the schemes for decorating St. Paul's, the consideration of the part which the large number of monumental works now in existence there would claim in the total design seems to have been quite overlooked. In passing through Milan, Mr. Oldfield notes S. Vittore al Corpo as an instance of a church which, without presenting anything of the highest rank of art when taken in detail, has a most satisfactory total effect, from the completeness and balance of the whole decorative scheme. As to the general deductions which he evidently wishes us to draw from this consideration we have a word to say just now. But the following suggestions in detail are sufficiently well put to bear quotation (page 29) :—

"Without presuming to prescribe any design for the future ornamentation of St. Paul's, it may be permitted me to call marked attention to two of the details here described. 1. To the gilding of the fillets between the flutings of the shafts of the principal order. Assuming that gold will be more largely applied in the upper part of the building, this would serve to carry down the enrichments in a moderate and refined form to the level of the eye; whilst it would have in St. Paul's a special recommendation not applicable at St. Vittore, that it would leave the stone fabric of the shafts themselves uncovered and undisguised. 2. To the monochrome panels with bas-reliefs on the lateral faces of the nave piers, which are obviously imitated from the beautiful work of Giovanni da Udine, in the Vatican. These suggest a treatment for the panels which Wren has so largely introduced in nearly similar positions, and which seem intended expressly for decoration. If the pier itself is left to display a substance of Portland stone (as may be at least assumed for argument's sake), this stone would hardly combine agreeably with marble, porcelain, glass mosaic, or any very rich and polished surface in the panels. But white stucco figures, in very low relief upon a flat tinted ground, would be quiet and harmonious in effect. Stucco is a material which Wren himself has freely used for ornamental reliefs; and the proposed application of it belongs strictly to the most approved period, having been adpoted alike by Raffaelle at the beginning, and by Alessi towards the end, of the sixteenth century."

The bulk of the treatise is devoted, as its title implies, to a consideration of the decorative scheme of St. Peter's in detail. One or two only of the considerations on this part of the subject we can specially notice. The author adds his assistance towards dispelling the ridiculous popular notion about the "proportions" of St. Peter's and their effect on the apparent size of the building,—a notion which, we begin to hope, may be hunted down in time. In reference to designs which have been before now proposed for the apse of St. Paul's, Mr. Oldfield observes that nowhere in any Cinquecentist church has he seen the isolated form of the Saviour in glory in the centre, surrounded by isolated forms of saints or angels in lateral compartments; and whatever the solemn grandeur of the large figures which look down from behind the altar, in the early Christian basilicas, the introduction of such a figure into the apse of a building erected by Wren would be a solecism. We are glad to find one member of the committee, at least, who perceives this. In the *Builder* for May 16th, 1874, Mr. Oldfield will find (perhaps has found) our own still stronger condemnation of the suggestion, for reasons relating to scale and effect, as well as to the question of anachronism. The satisfactory effect of the large piers of the nave, in spite of their comparative meanness of material, is touched upon:—"all is coated with stucco, painted to resemble a greyish-white marble, slightly veined; whilst the real marble of the statues in the niches has nearly the same hue. Thus the whole looks uniform, broad, and quiet, ... whilst a busy polychromy would have distracted the eye from taking in the breadth of the architectural construction." There is a great deal of truth in this; though in regard to the abstract question of structural polychromy, it may be said that it would need a tolerably "busy" polychromy to look at all too prominent or marked in the light by which the interior of St. Paul's is seen in most days in the year. The question of constructing such a polychromy now, after the building has been long completed, is, of course, another thing entirely.

Much of the St. Peter's decoration our critic considers, and with good reason, to be vulgar and objectionable. But on the decoration of the dome he bestows nearly unqualified praise, as far as regards its decorative effect. This satisfactory result, he urges, can lie neither in the size of the dome, which is equalled by that of Florence, nor in the superior excellence of Cesari's figures in themselves, since they are, from a painter's point of view, far inferior to other works by greater masters in a similar position, and which are universally regarded as failures in point of effect. For the grand effect of St. Peter's dome we must look to the fact that the figure subjects are arranged in subordination to an architectural framework conveying the idea of constructional * expression, and that they are kept entirely flat, and with none of that attempt to give them a vanishing perspective, the result of which often is that the nearest part to the eye is the sole of a foot, or, when the figures are seated on clouds, "something even less interesting." There is no occasion, however, to insist on the mistake of such attempts at pictorial fore-shortening in decorative painting of this kind. The one thing in regard to which, at least, there seems now to be entire unanimity among our artists, is that decorative wall-painting should be flat and in one plane. The further conclusions suggested are, that nothing can be more effective for a dome than "an overhanging array of simple, solemn figures"; that the number of these should be sufficient to give an idea of great space, and the scale, though large enough to secure distinctness, yet small enough not to diminish by comparison the size of the vault,† or bring the upper and lower parts of the same figure at perceptibly different angles to the eye: to design the figures with severe statuesque simplicity, but *not with archaic conventionality* (the italics are our own); and to adopt the system of gold backgrounds, which keeps the whole flat and diminishes the absorption of light.

And now as to Mr. Oldfield's "practical conclusion" in reference to the business in hand—the profitable employment of the funds already subscribed for the "completion" of St. Paul's (the author places the word "completion" between commas when he makes use of it, by which we conclude that he perceives the expression to be, as it really is, a begging of the question). The suggestion is that the money should be employed in decorating the dome with mosaic by way of making an impressive and striking commencement of the decoration in the part of the building and in the material concerning which alone there is any definite record of Wren's wishes; which is the architectural centre,—and, in consideration of the interest recently attaching to the dome services, may almost be said to have become, in the eyes of the people at large, the ritual centre of the building. The work should be regarded as purely a painter's work, and three or four artists who are known to have capacity and more or less experience in decorative work on a large scale should be invited to submit designs; all to be remunerated for their labour, and the one whose design is approved to carry out the work.

There is much in this suggestion that may seem to recommend it, but we doubt whether it would really be wise to sink all the funds that are in hand at once in decorating the dome. It must be supposed that one object in doing this is to present something which would arouse public interest, and give an impetus to the carrying on of the work. But look up at the dome on any day of not extraordinary brightness, and it must be apparent that decoration applied there, and there alone, will hardly strike any one very much, or be very effective: there is not light enough, and it is too far from the eye; and, as the author himself observes, figures at such a height immediately overhead, are always seen "with great difficulty and discomfort." As a part of a great scheme of decoration, to which the rest of the work would lead the eye up, it would be better estimated; but as standing alone, we very much question the prudence of putting all the available money into it. We should rather suggest the decoration of the chancel completely, and the carrying of the decoration, or its main features, as far along the choir as present funds will allow. Whatever is there done can be seen and appreciated, and will go further in effect than anything done at such a height as the dome. As to making it an artist's rather than an architect's work, there we are quite with Mr. Oldfield; that, we are disposed to think, is what should have been done at first.

One word, before we dismiss the subject, as to an idea which very much pervades the author's suggestions; namely, that a generally well-balanced and well-considered decorative effect is more to be aimed at than any remarkable display of pictorial genius in any one portion of the work. Due subordination and arrangement of the general scheme is absolutely necessary, certainly; but there is another side to the matter, and we can hardly say that a well-balanced decorative effect is the highest thing to be arrived at, when once the question of pictorial decoration is admitted at all. Whatever may be said, and with truth, as to the want of architectural or decorative fitness for their position in some of the great Italian works in mural (under which term we include ceiling) painting, let it be remembered that, in spite of this, it is to these that all the world crowds in admiration, and these have made the names of their inventors great in all lands. By all means, aim at decorative fitness, at a true mural style, at coincidence with the architectural design and construction of the building; but a decorative scheme which displays all this will hardly be an adequate return for the sum that must be expended upon it, unless to these qualities be added something of the light and glory which only *genius*, speaking through the highest and grandest form of pictorial art, can shed over the whole. If the decoration of St. Paul's can evolve and develop this, it will be worth anything that may be spent upon it; but hardly otherwise.

We must, however, compliment Mr. Oldfield on a contribution to the literature of the subject which is marked by no little thought, taste, and judgment, and which deserves the most respectful consideration.

* In regard to the actual construction of St. Peter's dome, we may observe that Mr. Oldfield does not quite appreciate the force of Wightwick's criticism on the "chains of iron," against which he protests in a note. The fact that Wren introduced a chain in his dome, "to make assurance doubly sure," does not place the two domes on the same constructional footing. Wren's dome would, in all probability, be safe without the chain; St. Peter's, on the lines and on the scale on which it is built, manifestly would not, and is an unscientific and unstable construction.

† In regard to this point we cannot but observe that the mosaic figures already in two of the spandrels under the dome of St. Paul's seem too large, and tend to reduce the scale.

NEW WORKS IN EDINBURGH.

THE year now drawing to a close shows no decrease in building enterprise in this city, although it has been marked by the completion of only one building of much architectural importance,—the Union Bank offices, in George-street. Several works of minor importance, however, have been brought to a successful issue, and a considerable number, more or less important, are in progress and in contemplation.

The first step taken by the Edinburgh School Board, in order to procure suitable plans, was to institute a limited competition, giving as a test two sites differing materially in their nature: one at Leith-walk, which, being entirely isolated, and having ample space at command, gave free scope to the architect; the other, at Fountainbridge, situated in a narrow street, and closed in on each side by adjoining buildings, and, therefore, a more difficult one to grapple with. Schools have now been erected on both these sites, and they are each remarkably good examples of their class, and will bear comparison with any others in the kingdom.

As regards school accommodation and endowment, Edinburgh stands in an exceptionally favourable position, owing to the numerous benefactions left for these purposes. The call upon the ratepayers was consequently small compared with that in other cities, being at the rate of 1½d. per pound, and with this rate the Board were in a position to be liberal as to the nature of the accommodation to be provided. It was, therefore, resolved that the schools should not be kept down to the bare requirements; the Government requirement of 8 square feet for each scholar was raised to 10 square feet, and it was considered that the buildings should possess some degree of elegance so as to be a means of educating the taste of the pupils. This has been done at a cost of 18*l.* 11*s.* per head, which is, we believe, at a higher percentage of expenditure than elsewhere. The Fountainbridge School, designed by Mr. R. Anderson, is in a style of Gothic characterised by dignified simplicity; there is nothing in the slightest degree redundant about it; the details are simple, but every feature and accessory is of the most substantial description. It consists of a centre block of three stories thrown back from the street line, with advanced wings, having square towers at the re-entering angles. In these towers are ample staircases affording separate entrances for the boys and girls, and the wings contain cloak-rooms and retiring-rooms for the teachers. On each floor there is a large hall, a portion of which is screened off by a glass partition so as to form a small class-room under the eye of the master. The light is ample and the ceilings high, those of the two lower halls

showing the main beams which support the roof above, resting on stone corbels, and the ceiling of the upper one is open timber boarded. At the rear are separate asphalted playgrounds, with the necessary offices and covered sheds for shelter in wet weather. The building tells its purpose effectually, and its height and the substantiality of construction give it the character of a public building. It is intended to accommodate 750 scholars, but at present that number is exceeded pending the erection of another school at Dalry in the immediate neighbourhood.

In the Leith Walk School, designed by Messrs. Moffat & Aitken, similar accommodation is provided, but in two stories only. The style is also Gothic, but not quite so reserved in manner as that of the Fountainbridge School.

Other Board schools of the same description are in progress at Stockbridge, Marshall-street, and Causewayside, and others are arranged for.

A large new school in connexion with Heriot's Trust has been erected in Davie-street, but it is neither so perfect in its arrangements, nor so good in an architectural point of view, as the Board schools. The style is a pretentious travesty of that of the parent institution.

The new fruit and vegetable market, at the site at the east end of the valley of Princes-street, formerly occupied by the Northern Railway Station, is now in use. It is constructed of iron and glass, with a flat roof upon the level of Princes-street, which is to be used as a promenade. This roof is pierced at intervals with lights, which are to be surrounded by flower borders. The accommodation is in excess of the ordinary requirements, and the area is, upon occasions, to be used for flower and other shows. The usual "Christmas show" of cattle and poultry has been held in this market.

The new fish-market is a stone structure, on the rising ground between Market-street and Cockburn-street. To afford access to the higher level a staircase has been formed, which is covered by an arcade, formed of massive Gothic columns, with moulded caps, spanned by arches slightly pointed. Part of the market building projects over this arcade, which forms a very picturesque feature. Both markets have been carried out by Mr. R. Morham, the city superintendent.

A "wonderful lamp," which from its magnitude and style (said to be *Norman Gothic*), and the conspicuous position it occupies in juxtaposition to the Scott Monument, cannot be overlooked, challenges attention. It is really a strange conglomeration of convoluted ironwork. To whom the merit of this rare specimen of art is due we are unable to state, the honour is said to be contested by sundry persons, and it would be invidious to prefer any one of them.

Building operations at the cathedral progress slowly and steadily. The arches of the nave and choir have been set, and the centering for the transept arches is in place. It is proposed to complete the nave first and board it off from the transepts so that it may be used while the central tower is in course of erection, an operation which will, necessarily, take a considerable time.

The nave of All Saints', Morningside, has been used for some time, and the tower and chancel are in progress. A beginning has been made to the proposed group of Free Church buildings at Mayfield. The hall, calculated to accommodate upwards of 200 persons, is in use as a provisional church. Outwardly it presents the features of a small church having a miniature narthex projected at the west, above which appears a disproportionately large circular window filled with tracery very much cusped. There are no windows at the sides, but there are two at the east end. The light, however, is sufficient for the small interior, and the building is suitable for the purpose for which it is erected, but it is decidedly perky in character. Mr. R. J. Blane is the architect.

A Free Church of considerable importance, and which is to cost about 10,000*l.*, is in progress in Chambers-street, opposite the Museum of Science and Art. It is designed by Mr. R. Thornton Shiells, in the Lombardic style. A massive recessed doorway just now appears above the hoarding; it will greatly depend for its success upon the treatment of the detail, as the form has been prescribed by the City Improvement Trust so that it may be in conformity with the other buildings in the street, which are of a commercial character. We observe that there are still some sites in this street undisposed of; the parts already constructed combine unity of style with variety of outline and grouping, and the single departure as to style in the church will, we conceive, give piquancy to the remainder. Mr. Shiells is also architect for a new Baptist church which is springing up in Marshall-street, another of the new thoroughfares projected by the Improvement Trust; it, too, is Lombardic in style, the architect apparently being of opinion that that style is more suitable for a Dissenting church than Gothic.

At Fountainbridge a new church in connexion with the Evangelical Union is progressing, from the designs of Mr. Hay, of Liverpool; it is Gothic in style, simple, and severe in detail.

The extension of the city calls for the formation of new ecclesiastical districts, and three new Established churches are contemplated at Liberton-road, Gilmore-place, and Dalry respectively; and a new Free church is projected at the latter suburb, and a United Presbyterian church at Meadow-place.

The last of the works comprised under the City Improvement scheme has been commenced. It consists of the formation of a new thoroughfare connecting Grindly-street with Lauriston-place, crossing the West Port and skirting the Cattle-market. This market has long been a nuisance in the heart of the city; it is proposed to supersede it by the formation of another in a more suitable position, and sundry of the suburban residents to the westward have taken alarm lest it should be set down in their vicinity, but at the last meeting of the Town Council it was announced that no decisive steps had been taken as to securing a new site.

A project has been set on foot for the formation of a new bridge at Belmont, to the west of the Water of Leith village. The present bridge is narrow, and consists of one arch, the approaches to which are by downward gradients. It is proposed that the new bridge shall consist of three arches, at a level of 40 ft. above the present one, and that the approaches be widened and levelled up. This improvement will give greater facility of access to a district where there are many beautiful building sites, some of which are, indeed, already occupied by new buildings.

The West-end Theatre appears to have been conceived on too great a scale to be successful in a monetary point of view. The original design has been greatly modified, the towers have been entirely dispensed with, and the statues, which were to adorn the parapet, have been superseded by vases of not the most elegant design. The wings, which were to contain an aquarium, winter garden, skating-rink, &c., are still in the womb of the future, and the bare brick flanks exposed to view are not attractive.

The West Princes-street Gardens have now been acquired by the city, and are thrown open to the public. It is proposed to carry out several important improvements in connexion therewith. The formation of tramways along Princes-street has been found detrimental to the general traffic, and it is intended to widen the street along its whole length by taking a strip of about 12 ft. in breadth from the gardens, removing the north line of rails to the south of the existing south line, thus giving a greater breadth of carriage-way in front of the single row of buildings which forms a terrace rather than a street. To the west of the gardens there is a deep-cut roadway leading from the Lothian-road to the Grassmarket. This road it is suggested, might be shut up, and another substituted along the southern slope of the Castle-hill. By this means the garden ground in front of Castle-terrace could be added to the public garden, and a walk formed from Cornwall-street to the Royal Institution, which would greatly facilitate foot passengers in that direction.

We have repeatedly adverted to the spiritless monotony of the new streets and terraces at the West End. There is no improvement in this direction; a new terrace, facing the north, called Dougal's-terrace, is springing up; the elevation is a repetition of the uninteresting yet pretentious one of the adjoining Magdala-terrace, consisting of an unvarying recurrence of oriels, identical in form and detail. There is here an utter negation of art which is painful to witness; it would cost no more to builders were the designs somewhat varied; it is not expensive detail that is wanted, but grouping and graceful-ness of outline. This is one of the evils of having one architect to design all the buildings upon an extensive property. The slightest trouble in providing new elevations is often shirked; the affair is a mere matter of so much per centage, and the result such as we have described. The work carried out by the architects of the City Improvement Trust are a happy example of the other side of the question. Where, as in the former instance, the ground belongs to a public body, which has displayed great spirit in other respects, we might reasonably have looked for a different result; but *laissez faire* obtains here, as elsewhere, so far as art is concerned.

Two companies have been formed with the view of providing new cemeteries to the south-west of the city, the one to the south of Morningside, and the other to the west of Merchiston. Both schemes meet with opposition from the proprietors of villas in the vicinity, and a paper war has been raging on the subject. It is a singular fact, however, that when a cemetery is formed in a neighbourhood, it is soon surrounded by houses if the sites are at all suitable.

The fever wards at the Royal Infirmary are approaching completion, but it will be at least two years hence before this extensive building can be in working order. As yet, nothing has been done as to clearing the site acquired for the extension of the University. It seems that more space is wanted for the requirements of the medical schools, and that a grant in aid is looked for from Government.

The city generally is in a very satisfactory condition as regards health, the death-rate being much below the average; and with the improvements going on, Edinburgh is not likely to lose its attractiveness as a place of residence.

HYDRAULIC REMAINS IN ITALY.

The following interesting notes on some recently-discovered Roman remains have been communicated to the French Academy of Sciences by Father Secchi, the distinguished Italian astronomer, and are published in a late number of *Comptes Rendus*. These remains consist of:—

1. An aqueduct at Alatri, the supposed date of construction 200 B.C., supplied by an inverted syphon, having its point 101 mètres (331 ft.) below the distribution level, and consequently supporting at the lowest part a pressure of at least eleven atmospheres. The supply-pipes are of terra-cotta embedded in solid rubble masonry; they are about 30 centimètres (12 in.) in diameter, jointed in a very solid manner, and formed of excellent earth. The total length of the aqueduct is about 12 kilomètres (seven English miles). This remarkable construction appears to have served as a model to Vitruvius in his discourse on aqueducts with inverted syphons.

2. A complete system of drainage found in the neighbourhood of the same city, and formed of enormous pipes of porous earthenware, each about 1·10 mètres (3 ft. 6 in.) long, 0·42 mètres (16 in.) in diameter, and with an average thickness of 0·02 mètres ($\frac{8}{10}$ in.). The drainage was intended to carry off the water from a plain used as a military exercise-ground.

3. Areas expressly prepared with solid foundations, forming inclined planes, for collecting the rainfall over a large extent of surface, and conducting it to a settling basin, whence it was led off into reservoirs for storing. These collecting-grounds were formed on the summit of an eminence, and designed for the supply of the town of Segni.

4. An example of the method employed to prevent filtration in porous soil, by interposing layers of impermeable clay, to lead off the surface water to an aqueduct.

5. An ingenious arrangement for cooling the *aqua tepula*, which appears to have been found too warm for drinking after it had been led into the capitol. The spring furnishing the supply has been discovered and the temperature found to be 17° to 18° centigrade (62° to 64° Fahr.) only in winter, showing the need there was for intermixing it with the Julia water, which has a temperature of about 11° centigrade (52° Fahr.) only. It is interesting to note that the temperature of this spring must have varied very little within the last 2,000 years, as it is highly improbable that it would have been laid on to the city had its temperature exceeded 18° centigrade. This spring, now called Preziosa, rises in an extinct volcanic crater. The observation proves the extreme slowness with which cooling proceeds in the interior of the globe.

The notice concludes with an account of the method employed in getting rid of the carbonate of lime held in solution by the water in large quantities. It consisted in boiling the water, and cooling it suddenly by the application of snow to the exterior of the containing vessels.

FROM GLASGOW.

New Bird and Dog Market.—In close proximity to the building recently erected to meet the requirements of the "old clothes" trade in Glasgow, there was opened recently a new bird and dog market, which has been erected by the Bazaar Committee at a cost of something like 5,000*l.* The traffic in household pets, birds and dogs, which has been an increasing one in Glasgow, was carried on for a period of thirty-three years in Police-lane. Being placed under the more immediate control of the Town Council, the market was, in 1870, removed to Jail-square, the site of the present building, which has been erected with a view to the greater convenience and better accommodation of those engaged in the business. The new premises are one story in height, and consist of one large hall about 77 ft. long by 55 ft. wide at one end, and 35 ft. at the other, light being obtained from the roof. The plans of the new structure were prepared by Mr. Carrick, city architect, and the building operations have occupied over twelve months.

Hutcheson's Hospital.—Considerable renovations and improvements have recently been completed by Mr. John Baird, an old pupil of the original architect, in connexion with the Hutcheson's Hospital Building, Ingram-street. The edifice, which is regarded as one of the most commemorative in the city, was erected in 1802–5, from designs by the late Mr. David Hamilton, as a memorial to the charitable Brothers Hutcheson, when the old hospital in Trongate was demolished. The present building is about 50 ft. in height, and has a rusticated basement story, while the façade to Ingram-street, on the upper floor, has two Corinthian columns in antæ, flanked by pilasters of the same order, and in the niches between them, on either side, are the statues of Messrs. Geo. and Thos. Hutcheson, of Lamblull, founders of a magnificent charitable and educational institution, of which the citizens are proud. Originally the interior of the building consisted of three floors, the street floor having a height of 11 ft., the hall above being 53 ft. in length, 25 ft. wide, and 20 ft. high, an apartment above this being formerly used for school purposes. The floor of the hall has now been raised about 3 ft., with a view to improve the street flat, which is at present occupied by Messrs. Holms Brothers, the well-known manufacturers, while the upper apartment has been removed, thus increasing the height of the hall to 30 ft.

TWO YEARS' STREET-WORK IN LEEDS.

FROM a report made to the Council of the borough of Leeds by Mr. Alderman Tatham, the chairman of the Streets and Sewerage Committee, it appears that during the last two years as much as 25 miles 4 furlongs and 148 yards of sewers have been laid in that borough, and, in addition to this great length of sewers, there have been laid 5 miles 3 furlongs and 88 yards of branch-pipes from the sewers towards the houses, *i.e.*, as far as the curbstones of the foot-paths; and that 1,801 street-gullies have been made and connected with the sewers by the contractors who have done the other work; but in addition to these the workmen regularly employed and paid by the corporation put in 395 new gullies, rebuilt 396 old ones, and repaired the large number of 2,024.

The cost of these extensive works has, of course, been great. The total cost of sewerage works, including the branches, has been, in the two years, 29,390*l.*

If we regard the surface-work of the streets the amount done appears equally large. The number of streets paved and flagged during the two years has been 146, being in length 7 miles, 3 furlongs, and 171 yards. When houses are built, and new streets laid out by the owners of the land, these are paved and flagged at the expense of those owners. They may do the work themselves, if they please, provided it be done under the direction, and according to the rules, of the Corporation; but as they cannot in general do the work for less money than the Corporation can do it for under their periodical contracts, the custom is that, in general, the Corporation pave and flag the new streets, and charge the expenses to the owners. It is usual to allow the greater number of houses intended to be built in a new street to be built before the paving or flagging is done, but inasmuch as, without some guide, the levels of the several door-sills would not be at all uniform, the ground is roughly levelled, and the curbstones set from end to end of the intended street, from which, opposite to them, the levels of the several door-sills are fixed. With this explanation it is less surprising than it otherwise would be to see the total length of curbing done in the last two years, set down as being 17 miles, 3 furlongs, and 127 yards.

The total cost of paving, flagging, and curbing chargeable to owners has been 32,450*l.*, and the total cost of paving and flagging paid out of improvement rates, 1,860*l.* Thus the total cost of sewers and paving has been 64,120*l.*, or upwards of 30,000*l.* a year, taking a mean of the two years. These are works of and under the surface.

According to another report presented to the Council of the borough of Leeds by the Chairman of the Building Clauses Committee (Mr. E. Gallsworthy, the present mayor), there were presented to that committee for approval during the last two years plans for the building of 7,559 houses, of which 4,874 were approved. The numbers for the year 1876 were about one-seventh greater than for the previous year, being 3,546 in 1875 and 4,013 in 1876 presented for approval, and 2,074 in 1875 and 2,800 in 1876 approved.

During the same two years the plans of 553 buildings were approved, consisting of mills, warehouses, stables, workshops, &c., and there were submitted plans for three churches, fifteen chapels, six mission-rooms, one synagogue, one Roman Catholic seminary, twenty-seven schools, two skating-rinks, one theatre, two circuses, three bridges, one orphanage, one dining-hall.

One thousand, two hundred, and forty-four dwelling-houses have been completed and certified for occupation during the present year. The population is, we believe, estimated at about 280,000 at this time.

EXTENSION OF THE METROPOLITAN DISTRICT RAILWAY FROM HAMMERSMITH TO THE SOUTH-WESTERN LINE.

THE Metropolitan District Railway Company are at present engaged in the carrying out of extension works of an important character, which, when completed, will place their line in direct connexion with that of the South-Western Company, by a junction near the Shaftesbury-road Station, and thus give the Metropolitan District Company a through communication with Richmond and Windsor. The extension line commences by a deviation to the south of the District Railway, a short distance before entering the Hammersmith Station from North End, being carried on the same level until it reaches Broadway, when it crosses under that thoroughfare by a tunnel, the roadway being supported by twenty iron girders and brick arches. After passing under Broadway the line is continued underground on an ascending gradient, until it reaches the Grove, the roadway above being on supporters and arches similar to those in Broadway. From this point it is carried forward some distance, through an open cutting, and still on an ascending gradient, the line being inclosed on each side by strong retaining walls. It is thence continued on an embankment, crossing over Mansion House-street, which has been lowered 10 ft., by an iron girder bridge; also over Cambridge-road, which has also been lowered 8 ft., by a similar bridge. A short distance beyond Cambridge-road the line is continued on a brick viaduct of ten arches, and thence over Clifton-road by another girder bridge, close to which it forms a junction with the South-Western line, near the Shaftesbury-road Station.

The Hammersmith Station will be doubled in width by the extension, and there will be two sets of double lines of rails in addition to a separate line and sidings. The new sets of rails on the south side of the station will be for the through traffic to Richmond, whilst those on the north side will continue to be used for the local traffic between the Mansion House and the Hammersmith Stations. The central platform, a portion of which has been removed, in order to admit of one of the new lines of rails being laid down, will be reconstructed and lengthened, and a wide new platform will also be erected on the south side. For the purposes of the works several houses and shops, on both sides of Broadway, have been purchased and taken down by the company, as well as other buildings on the line of route. In consequence of some portions of the line passing under the level of the sewers belonging to the Metropolitan Board of Works the railway company have had to construct a new sewer, about 200 yards in length, the dimensions of which are 4 ft. by 3 ft. The company are likewise under an obligation to make a new road from Broadway to Grove-road, 40 ft. in width, and also to raise the level of Bradmore-lane 6 ft. Several portions of the works are already in a forward state, the tunnel under Broadway being nearly completed, as well as the covered way in continuation, and the retaining walls enclosing the open cutting, to the point where the embankment commences, and likewise the bridges and viaduct. It is expected that the extension works will be finished and ready for the through traffic to Richmond about March next.

The works are being carried out by Mr. Gilbert, the company's engineer, Messrs. Lucas & Aird being the contractors. The Thames Ironworks Company supply the girders and iron, and Mr. Cleaver is the sub-contractor for the brickwork. Mr. Price is the general superintendent in charge.

It is stated that in constructing the tunnel it has been found that great facilities exist for joining the District and Metropolitan systems, and that a very slight extension only will be required, with a trifling ascent from the District to the Metropolitan, to complete the "outer circle." It is added that negotiations for effecting this completion have already taken place, and that a prospect exists of its being shortly carried out, when much change and inconvenience will be avoided.

A NEW MISSION HOUSE, OLD KENT ROAD.

THE Bishop of Guildford has laid the foundation-stone of a new mission-house, which is about to be erected in connexion with St. Philip's Church, Avondale-square, and which was consecrated and opened a few months ago. The building is intended to be utilised for general secular purposes, as well as for those of a distinctly religious character, for the benefit of the rapidly-increasing vicinity of Avondale-square, which was only the other day a field, but is now almost covered with a very good class of houses, as well as several of those more especially suited to the labouring population. The new building, the site of which is immediately alongside the church, will be uniform with the last-named structure in its architectural features, which are Gothic, and the materials are Kentish rag and Bath stone. It will consist of one lofty story, with an ornamental gable at each end, and will contain a spacious public room 180 ft. in length, and 40 ft. in width, together with committee and retiring rooms. The architect is Mr. Richard Coe, of Furnival's Inn, and the builders are Messrs. Lapthorne.

NEW TOWN HALLS.

Newbrough.—On the 15th inst. the foundation-stone of a new town-hall was laid at Newbrough, Northumberland, by Miss Todd, of Newbrough Park, at whose sole cost the building is being erected. The building will consist of a main front two stories in height, with a public hall behind. The hall will be lighted from the roof. The building is designed in the Italian style. The principal elevation next the main road will be divided by pilasters into three divisions. In the centre division is the main entrance; this part of the façade being carried up above the parapet, surmounted by a moulded pediment on pilasters with a centre opening for clock dial. At each side of the entrance on the ground floor are double windows circular-headed; the first-floor windows having architraves and square heads. Above this the parapet has been carried up with dwarf pilasters and turned balusters. The walling is built of chiselled block, in courses, with moulded and chamfered stone dressings. The contractors are Mr. Thomas Welton, of Birtley Shield, and Mr. John Martinson, of Bellingham; and the architects are Messrs. Thompson & Dunn, of Newcastle-upon-Tyne.

Lochmaben.—The Lochmaben town-hall committee have resolved to advertise for tenders for the erection of the new town-hall. On the ground-floor to the west will be the council-chamber, town-clerk's chamber, reading-room and library, record office, &c.; and to the east the market-hall. The town-hall, which will be 50 ft. long

by 20 ft. broad, will be on the upper floor, reached by a staircase on the east end of the building, the general entrance being to the front under the steeple. There will be, on the upper floor, also, an ante-room, cloak-room, &c. The present steeple will be overhauled. The estimated cost is upwards of 1,000*l.*

Inverness.—At a meeting of the special town-hall committee of the Inverness town council, on the 14th inst., it was agreed to instruct the town clerk to return the different plans and designs to the respective architects, along with an expression of thanks for the attention given to the council's request.

NEW BANKING PREMISES.

Chippenham.—The Wilts and Dorset Bank is about to erect new premises in High-street, Chippenham, on the opposite side of the street to its present offices. The tender of Mr. Long, of Bath, has been accepted by the directors, at the sum of 3,920*l.* The highest tender was 5,000*l.*

Warrington.—The increasing business of Parr's Banking Company, Warrington, has rendered it necessary that their premises at the head office in Warrington should be re-arranged and considerably enlarged, and during the past twelve months Messrs. Gibson & Son have been engaged in erecting, in the rear of the existing premises, a large building which is to constitute the future telling-room of the Bank. The telling-room, which is now approaching completion, is 66 ft. by 60 ft. The centre portion, 36 ft. in width, is supported by eight massive pillars of red Aberdeen polished granite, 20 ft. high, including the richly foliated caps and stone-moulded bases. A bold cornice with cantilevers, dentils and foliated enrichments, is carried round the central portion above the capitals, and from this springs a deeply-coved ceiling. An abundant supply of light has been obtained, the whole of the centre and two side ceilings being arranged in panels of tinted glass, supplied by Messrs. Edmundson, of Manchester. A dado is formed with Minton & Taylor's glazed encaustic tiles and majolica, 4 ft. 6 in. from floor, finished with polished oak surbase and moulded skirting. The flooring is in two thicknesses,—¾-in. red deal, covered with 1¼-in. pitch pine. The public space, 36 ft. by 16 ft., will be covered by Dantzic oak flooring and parqueterie border from Messrs. Gillow. The blank walls on the south side are panelled and moulded to correspond with the windows on the north side. The end window is executed in Caen stone, with three granite columns from Shap. The doorways are surmounted with pediments, filled in with enrichments in plaster and carried on ornamental trusses. On the east end of the telling-room are placed rooms for the directors, manager, &c. The lavatories have been fitted up by Messrs. Jennings, of London. The heating apparatus and warming arrangements are being carried out by Messrs. Newton & Chambers, of Sheffield; and the desks and fittings are being made by Messrs. Garnett & Sons, from designs specially prepared by the architects. The building is in the Italian style; the painted decorations being executed by Messrs. T. Hesketh & Son, of Warrington; and the plastering, &c., has been done by Mr. T. Jones, of Liverpool. Mr. Williams has acted as clerk of works; and the general contractors are Messrs. Gibson & Son, who have carried out the work from plans and designs furnished by the architects, Messrs. John White & Co., under the immediate superintendence and direction of Mr. Beesley.

NEW DOCKS.

Devonport.—The enlargement or reconstruction of No. 3 Dock at Devonport Dockyard has been undertaken by Mr. J. Pethick, contractor. It will be 450 ft. long, 45 ft. deep, and will be about four times the present area. The bottom will be slightly elevated in the centre, sloping towards the ends, thus obviating the present inconvenience felt by the docks, as at present constructed with flat bottoms, being always wet. The cost of its construction is estimated at little short of 200,000*l.* 20,000 tons of Dartmoor granite will be used, and this is now being hewn at Princetown. The cost will be distributed over the Navy Estimates for the years 1876-7-8-9. It will therefore be four years in hand. It is stated that to avoid controversy, should it be deemed advisable, as the work proceeds, to modify or in any way alter the plans, and also to enable a strict Government supervision of the work, it has been decided to depart from the usual system of contracting for the work in block, and to accept contracts for the work as per measurement. It will, therefore, be built upon the piece-work basis, entirely under the control and supervision of the Government officials and the director of Works Department.

Middlesbrough.—The new graving-dock which has been constructed near Normanby Jetty, at Middlesbrough, has been formally opened. The construction of this dock was undertaken by the Tees Conservancy Commissioners, at the solicitation of the shipowners and others trading on the Tees. The dock is 500 ft. long, 25 ft. wide at the entrance, 50 ft. wide at the foot, and 70 ft. wide at the head. The depth is from 16 ft. 6 in. to 18 ft. It lies in a transverse position to the river. The contract has been carried out by Messrs. Ridley & Hodgson, of Middlesbrough and Newcastle. Messrs. Gwynne & Co. of Essex-street, Strand, have supplied two centrifugal pumps of such power that the dock can be pumped dry in two and a half or three hours. Each of these engines has a cylinder of 18 in. diameter, by 18 in. stroke, working at a pressure on the boiler of 50 lb. per square inch. Each is capable of lifting 10,000 gallons per minute. The drainage pump is 6 in. diameter, 6 in. stroke, and capable of lifting 500 gallons per minute. The whole of the work has cost about 35,000*l.* The Commissioners have reserved land in the immediate neighbourhood of the dock, in order that another dock may be constructed if necessary.

Whitehaven.—The new wet-dock at Whitehaven was opened on the 23rd ult. It has been constructed from plans by Mr. Brunlees, C.E., who has been authorised by the Dock Trustees to proceed with the preparation of plans for the construction of a graving dock, also of a railway to connect the extreme points of the harbour, and likewise to deepen the same at the present frontage, where an accumulation of sand has taken place. The works have been in progress for the last five years.

NANT-CLWYD HALL, NEAR RUTHIN.

The estate of Nant-Clwyd, situate about four miles from Ruthin, and until within the last few years the property of Mr. Richard C. Naylor, by whom it was sold to its present proprietor, Lieut.-Col. Naylor Leyland, has recently undergone extensive improvements. The work first undertaken has been the mansion, the older portions of which are reputed to have been from the designs of Inigo Jones. Although the house had been considerably enlarged in 1857, by the owner, under the direction of Mr. J. K. Colling, architect, of London, and the additions at that time consisted of a new saloon, entrance-hall, and bedrooms, yet the old servants' offices remained; and the staircase, which was a fine specimen of Italian foliated work in oak, with grotesque figures on carved newels, and scroll balustrades, lost much of its effect from the contracted space in which it was placed; and the arrangements of the house being insufficient for Colonel Leyland, he determined upon doubling its capacity, and called in the services of Mr. David Walker, architect, Liverpool, who has so enlarged and improved it as to render it one of the most complete country residences in the Vale of Clwyd. The additions embrace a large range of kitchens, offices, servants' hall, housekeeper's, and other apartments, covering a ground-floor area of 600 square yards, with servants' bedrooms, ranges of stable offices, coachman's house, &c., whilst the reception-rooms consist of a banquet-hall, 30 ft. by 52 ft. and 23 ft. high; drawing-rooms, billiard and other suites of private apartments, and a magnificent staircase of oak, in which the old work has been incorporated, and the new finely-carved work designed to correspond. A long corridor, 10 ft. wide, with a dark oak dado, leads to the banquet-hall, an apartment with a richly-panelled and coffered timber ceiling, and a multiform-panelled dado of finely-marked oak, broken on two sides by massive oak and marble chimney-pieces, carved by Rogerson, of Liverpool. The floor has a wide margin of Arrowsmith's parquet, the centre being laid for dancing. The exterior of the old house is of the period of James I., with high-pitched roof and other characteristic features, and the new work has been carried out in the same style. The general facing of the walls is of red brick, with quoins, architraves, and pediment heads of Minera stone, with carvings in the tympanums. A new drive, with entrance-gates, and lodge, has been constructed, and the ground laid out by Messrs. F. & A. Dickson, of Chester. The several works have cost over 20,000*l.* The contractor for the buildings was Mr. D. Readdie, of Liverpool, Mr. William Laidlow being clerk of the works; the architect, as before mentioned, being Mr. David Walker.

THE GRAND LODGE TEMPLE IN PHILADELPHIA.

AMERICAN FREEMASONS.

Among the many handsome buildings erected by the Freemasons of America, none can rival the Temple of the Grand Lodge of Philadelphia. This costly building is in the style of architecture called by the Americans, "Norman," probably because they are under the impression that their forefathers, the English, who introduced it in America, obtained something like it in the time of William the Conqueror, from Normandy. The principal corridor, 20 ft. wide, and 250 ft. long, built in the Doric style, is reached from the external portal. The library of the temple, 30 ft. high, 45 ft. broad, and 65 ft. long, is adorned by a double row of columns; the banqueting-hall, of the same height and breadth, and of nearly double the length, which has its walls decorated with paintings of flowers, fruit, and birds, is lighted by fifteen candelabra. At the upper end of the principal staircase is a fountain, round which groups of exotic plants will be placed. The hall of the Grand Lodge is executed in the Corinthian style, and its decorations are of a gorgeous description. The subjects are the symbolic figures of Freemasonry. The chapter-room is in the style of Italian Renaissance; then follows an Egyptian hall, fitted up like an Egyptian temple; then a Norman and an Ionic hall, a hall of commanders of Great Templars in the Corinthian style, and yet many other rooms and halls, all fully decorated. The tower forming the right-hand corner of the temple has a height of 250 ft. Fireproof vaults in the basement contain the archives and insignia of the Grand Lodge. The building has consumed about ten millions of bricks. Some idea may be formed of the wealth of the Grand Lodge of Pennsylvania, when it is stated that during the three or four years taken for the erection of the temple they have expended on it $1,400,000.

LONDON STREET ARCHITECTURE: 79, MARK-LANE.

Our engraving illustrates the Mark-lane front of a block of buildings, having even a larger frontage towards London-street, and which is being erected for Messrs. Sandon Brothers, of St. Swithin's-lane, upon the site recently occupied by Nos. 76 to 81, Mark-lane, and Nos. 14 to 18, London-street, and covering an area of about 11,300 ft. Being in the centre of the corn, wine, and shipping trades, two stories of cellars have been constructed, connected with offices on the ground-floor.

The upper portion of the building is arranged as suites of offices, and is approached by a double stone staircase, which ascends from the central corridor, there being entrances both from Mark-lane and London-street.

The tympanum of the pediment over the entrance in the Mark-lane front is enriched by sculptured figures of Bacchus and Ceres, and that of the London-street front by figures of Neptune and Europa. Both fronts are of stone.

The buildings were designed, and are being carried out by Mr. W. Seckham Witherington, of Leadenhall-street. The total cost is estimated at about 40,000*l.*

City Improvements.—At a meeting of the City Commissioners of Sewers, on the 19th inst., Mr. Deputy H. L. Taylor said he had brought before the Metropolitan Board of Works the question of contributions towards their improvements. Out of the 120,000*l.* which the Board had Parliamentary power to expend with regard to improvements in the metropolis, 60,000*l.* were allocated to the City towards the improvements undertaken by this Commission. Of the 60,000*l.*, there was a balance of 23,582*l.* due to them. Acting on the instructions of the Commission, he had brought the matter before the Board, who had agreed to advance 23,000*l.* of the 23,582*l.*



FREEMASONS' GRAND LODGE TEMPLE, IN PHILADELPHIA, U.S.



LONDON STREET ARCHITECTURE: 79, MARK LANE.—Mr. W. S. Witherington, Architect.

NEW CATTLE MARKET AT STOCKTON.

ON the 13th inst. a new cattle-market, which has been in course of construction since June last, was opened at Stockton. For many years the market has been held in the High-street, but it was felt that the holding of it in a crowded street was a great inconvenience. The desirability of removing the market was brought before the Town Council, and eventually it was decided to utilise the Green, a large space lying behind the parish church, close to the High-street. Mr. Geo. Edwards, the borough surveyor, submitted, in August, 1875, a plan for its conversion into a cattle market. That plan provided for the division of the space into three sections. The west-end section, immediately behind the church, and nearest to the High-street, was to be furnished with 59 fat-cattle pens, each to hold 10 animals; and the east-end section with 23 store-cattle pens, each to hold 26 animals. The centre section was to be allotted for sheep and pigs, and 200 sheep-pens and 42 pig-pens, each capable of holding 12 animals, were proposed to be constructed. With the exception of a few minor details, the work has now been completed. The whole is surrounded by trees and substantial iron railings. The contractors were:—Pens, Mr. Thomas Hanvy, Stockton; outer railings, Messrs. R. & S. Adams, Gainford; excavating and formation of foundations, Mr. Nicholson, Stockton; the paving was done by the Corporation. The total cost of the market, including the amount expended in acquiring the vicarage and land behind, and the Commissioners' interest in the Green, is estimated at between 17,000*l.* and 18,000*l.*

RAILWAY DEVELOPMENT.

IN the course of his inaugural address on the 14th inst., as President of the Civil and Mechanical Engineers' Society, Mr. R. M. Bancroft said that in 1819, when Thomas Gray, the first promoter of railways, published a work on the subject, he was considered little better than a madman; but his name, associated with those of Joseph Sanders and William and Edward Pease, should always be held in respect, for these were the men who first promulgated and brought the subject commercially home to the people of their time.

Fifty-four years ago it took seventeen hours, and forty years ago mail coaches were fourteen hours, running from Derby to London, the distance being about 130 miles; the outside fare 30s., and the inside fare 52s. The charge for sending letters at this time was 10d. each. To send silk goods by boat cost 5s. per cwt.; other goods, from 3s. 6d. to 5s., according to their value. To send goods of all sorts by Pickford's vans, or by coach, the charge was 14s. per cwt.

In addition to paying their fares, passengers had to stop for refreshments three times on the journey, and each time there was a change of coachmen and guards, who had all to be *feed*. The Midland Company, as all know, will now take you this journey in about three hours, the third class fare being 10s. 7d.; and the first-class fare 17s.; such is the change that has been brought about by railways.

The following statistics, compiled from six of our principal companies' half-yearly reports, will in some measure serve to show us what magnitude railways have grown to in the United Kingdom:—

MELBURY CHURCH, DORCHESTER.

THIS church has been lately re-opened, after having been fully restored at the sole cost of the Earl of Ilchester. The church is situated within the park, and close to the mansion at Melbury. It is small but most perfect in form; consisting of nave, transepts, and chancel, with a square tower at the intersection, and is all of the same date,—the fifteenth century. It is wholly built of Ham-hill stone, and the exterior is in a very good state of preservation. Crosses have been added to the gables where deficient, and figures on pedestals (consisting of the four Evangelists) at the feet of the gables to the transepts,—St. Peter and St. Paul at the east end, and Moses and David at the west end. The supporters of the family, the fox and the lion, have been also added at the angles of the tower, seated on pedestals.

Internally the ceilings were of plaster throughout, and the fittings of late eighteenth-century work. New oak open timber roofs have been substituted for the plaster ceilings. That in the nave is a hammer-beam roof with carved bosses, and supported on sculptured and carved stone corbels. The roof of the chancel is vaulted in oak, divided into elaborate and richly-carved panelling. The tower has a new oak ceiling with arched ribs and central glazed oak lantern, admitting the light to the church from the belfry windows.

The nave and transepts are filled with open oak benches with carved arm-rests, carved panel backs, and carved front panelling. The chancel is filled with richly-carved oak stalls, having the supporters and arms of the family on the stall-ends. The pulpit and reading-desk, which are of oak, are carried out in the same manner, with open carved panelling, and foliage and flowers intermingled with the tracery. The reredos, which is also new, is formed in Caen stone, containing in the centre the Last Supper executed in alto-relievo in statuary marble. The sides of the reredos are divided into compartments, having enriched and projecting ogee canopies, over bas-reliefs in alabaster, consisting of the emblems of the four Evangelists, the holy dove, the pelican in its piety, the three fishes, as emblematical of the name of Christ, and the Agnus Dei. The side-walls above the stalls have enriched panelling in Caen stone, filled in with marbles in geometrical patterns. The plain portions of the reredos, as well as the dado within the altar-rails, are also inlaid with polished marbles in pattern, and the shafts of the columns to the reredos and the windows are of green marble. Above the springing of the side-windows, and over the east window, the walls are again inlaid with coloured marbles in geometrical patterns. The remaining portions of the walling throughout the church have been lined with Ham-hill stone ashlar. The floors have been laid with Minton's tiles.

The carving is arranged from natural foliage, interspersed with birds, insects, animals, &c. The variety in the foliage, both in wood and stone, is very great, there being scarcely two examples alike throughout the whole work. The architect was Mr. James K. Colling, and the carving was all executed from full-sized drawings and designs made by that gentleman with his own hands. The sculpture, carved stonework, and marble inlay, as well as the whole of the oak seating, stall-work, pulpit, desk, &c., were carried out by Mr. James Forsyth, of Edward-street, Hampstead-road. The carved oak roofs were by Messrs. Cornish & Gaymer, of North Walsham, and the restoration of the heraldic glass, new windows in the nave, as well as the new east window representing the ascension of Our Lord, were executed by Messrs. W. M. Pepper & Co., of the Euston-road.

The church contains some interesting monuments belonging to the ancestors of the Earl of Ilchester, the Fox-Strangways, especially two canopied tombs in Purbeck marble, with recumbent figures in alabaster, in excellent preservation, of knights in full armour,—one, that of "Sir Gyles Strangways, Knyght," the date of which is 1532. There is also a brass, which was in the floor, to this knight, with a figure also in armour, accompanied by his arms and that of Lady Jane, his wife, eldest daughter of John Mordaunt, of Meryfylde, esquire; also the arms of Henry Strangways, esquire, who died at the siege of Bolleyne, and of Margaret, his wife, daughter of Lady George Ross. These, with other remains of brasses, have been taken up and placed, so as to preserve them, upon the transept walls, inlaid on Purbeck marble slabs, with inscriptions beneath saying from what parts of the church they have been taken. There is also a beautiful kneeling statue by Chantrey, of a former Countess of Ilchester, mother of the present Lady Caroline Kerrison, of Oakley Park, Suffolk.

DRAINAGE MATTERS.

Rhyl.—The Rhyl commissioners and ratepayers have been greatly astonished by the amount of estimated expenditure necessary for the completion of an entire system of drainage. Mr. Baldwin Latham, C.E., estimates that the drainage and providing for an outfall by gravitation will cost 28,000*l.*, whilst the outfall, managed by pumping, would cost 23,000*l.*, but the latter would take 400*l.* yearly to work it.

Bognor.—Mr. H. Denman, of Brighton, was lately engaged by the Bognor Local Board to report as to the best means of carrying off the sewage of the town. The present drain in High-street and West-street he proposes to intercept at two points, viz., at York-road and at the south end of West-street, by this means utilising nearly the whole of the existing drains. The present outfall at West-street he proposes to alter, and retain as a storm overflow, which will greatly help the discharge in case of a sudden glut. He proposes placing the outfall chamber at the south end of York-road; thence the sewage will be taken by a cast-iron 24-in. pipe, bearing eastward to a point about due south of Black Rock. This in itself will have the advantage of taking the sewage to the eastern extremity of the parish, and the tide will complete the scheme, running as it does four hours and a half to the east, and then returning westward. By this means, the sewage will be taken right away to the eastward, it being allowed to flow in during a portion of the time the tide is running east, so that it will not return. The whole cost is estimated at 6,646*l.* The Board has decided on carrying Mr. Denman's suggestions into effect.

Selkirk.—The Selkirk Town Council on the 11th inst. resolved to take steps to secure the thorough drainage of the town, and afterwards proceeded to appoint an engineer, the Provost moving that Mr. Carter, Edinburgh, be employed. He said Mr. Carter was well acquainted with the connexion of pipes and drains, and house-pipes, and with trapping and ventilation. Mr. Scott moved the appointment of Mr. Young, C.E.,

Table showing Mileage, Number of Stations, Locomotives, Passenger, Goods, and Mineral Rolling Stock, &c., possessed by Six Principal Railway Companies.

Name of Railway.	Miles authorised.	Miles constructed.	Number of Stations.	Men and Boys employed.	Horses.	Locomotive Engines.	Locomotive Tenders.	First-class Coaches.	Second-class Coaches.	Third-class Coaches.	Composite Coaches.	Luggage, Break and Post-office Vans.	Horse Boxes.	Carriage Trucks.	Total Coaching Stock.	Cattle Trucks and Sheep Vans.	Goods Wagons.	Coal, Coke, and Mineral, &c.	Timber Trucks.	Permanent-way Trucks.	Goods Break Vans.	Total Merchandise and Mineral.	Lorries, Drays, Vans.	Total Receipts for Half-year, ending:—
																								£. s. d.
Great Western ...	2071	2729½	694	34,687	1500	1461	986	476[1]	429	1172	589	537	455	436	4097	1329	25,685[10]	1701	2000	741	704	32,260		3,479,519 6 8 July 31, '76
Lond. & N. Weste.	1684	1590½	75	40,000	1591	2032	1733	1084	181	1168[4]	4	686[7]	553	509	4781	2066[7]	36,500	3025				41,651	104	4,440,937 19 3 June 30, ,,
North Eastern ...	1521	1411	457	25,000	926	1364		272	230	1049	317	385	238	86	2577	1357	20,065[11]	17,000	6881	562	801	76,304		3,142,245 0 2 July 31, ,,
Midland	1544	1463½	507	30,000	2608	1261	1116	324		1281	656	4914	352	236	3343	1285	25,5 8[2]	19 3	1635		823	31,136	18[7]	2,946,944 11 5 June 30, ,,
Great Northern ...	857½	695½	265	16,100	1340	566	463	244[3]	221	394	277	169	145	95[6]	1728	503	13,934[12]	208	250	397	402	15,686	112	1,399,184 2 3 June 30, ,,
North British ..	793½	782	327	11,483	1091	453	385	298	105	824	145	149	150	104	1579	718	533	21,888			104	313	24,556		1,064,984 15 2 July 31, ,,
Totals	8483	7871	2993	157,268	9074	7137	4683	3284	1166	6892	1984	242	1993	1466	18,105	7263	122,283	75,725	10,566	1834	3945	168,573	3121	£16,444,155 13 11

[1] Carting at all principal stations done by contract.
[2] Three royal carriages.
[3] Twenty-three saloon carriages.
[4] Included in first class.
[5] Including thirty-seven Post-office vans.
[6] Including fifty-five Post-office vans.
[7] Including one Post-office van.
[8] Forty-eight open, forty-seven covered.
[9] Including 100 sheep-trucks.
[10] Including 2,846 covered trucks.
[11] Including 440 covered trucks.
[12] Including 905 covered trucks.
[13] Including 1,019 covered trucks.

Perth, as he had been formerly engaged in surveying the town for the purpose, and his plans had been accepted. A good deal of discussion followed as to the appointment, in the course of which the Liernur system of pneumatic drainage came up. Upon a vote being taken as to whether the Town Council should employ Mr. Carter or Mr. Young as their engineer, six voted for the Provost's motion and nine for Mr. Scott's. The motion to employ Mr. Young was therefore declared carried.

WATER SUPPLY.

Heanor.—New waterworks are to be erected at Langley, Heanor, by the Heanor Local Board. The estimated cost is 10,300*l.* Mr. Richards, of Langley, is the engineer, and has prepared a plan for submitting to the Local Government Board in London.

Richmond.—It would seem that Richmond is threatened with a discontinuance of its water-supply. For several months the Select Vestry of Richmond, Surrey, being dissatisfied with the quantity and quality of the water supplied to the town by the Southwark and Vauxhall Company, have been engaged in carrying out works for the supply of water to the town from an artesian well. Application was made by the Southwark and Vauxhall Company to Vice-Chancellor Malins to restrain the vestry from proceeding with the works, but it was dismissed with costs. On the 19th inst., at a meeting of the vestry, a letter was read from Mr. Rumble, engineer to the company, stating that in going through the papers in connexion with the late legal proceedings, and reviewing the decision of Vice-Chancellor Malins and the several Acts of Parliament relating to the Richmond Water Company, and also those relating to the Southwark and Vauxhall Company, he was compelled to come to the conclusion that the company had no Parliamentary right to extend the water-supply for the use and convenience of the inhabitants of Richmond, or for other sanitary purposes. Under these circumstances, acting under the instructions of his directors, he was obliged to give the vestry notice that, on and after the 13th day of January next, the company would cease the water-supply to the town of Richmond, and, in order to make the cessation complete, on that day he proposed to cut off all connexions of supply, unless the vestry were prepared to pay compensation for the continuance.

Taunton.—The Taunton Local Board of Health have resolved to apply for leave to borrow 30,000*l.* for purchasing the waterworks and other rights to enable them to supply the town with water.

Peebles.—At a recent meeting of the Peebles Town Council, the plans submitted by Mr. Buchanan, C.E., for increasing the supply of water were taken into consideration. Mr. Buchanan's scheme was generally approved of, and details were remitted to a committee, with a view to meet the engineer, and report to the Council at an early date, so as to allow the works to be proceeded with immediately. The present supply of water from Meldon Burn was introduced nine years ago, at a cost of about 5,000*l.*, and was then thought to be sufficient, but the town having since that time greatly increased, chiefly through the erection of two large factories and numerous villas, a scarcity of water has been for some years experienced. The additional supply, together with the improvement upon the drainage, is estimated to cost 1,500*l.*, and to increase the present supply of thirty-one gallons per head on a population of 4,000 to forty-seven gallons.

Downpatrick.— Mr. Bateman, C.E., has reported to the Downpatrick Water-supply Committee on the schemes proposed by Messrs. Ancketill and Stockdale, Mr. Henry Smith, C.E., and Mr. H. N. Reid. The report stated that the scheme of Messrs. Ancketill & Stockdale was decidedly the cheapest and best which had yet been projected. Mr. Bateman believed, however, that it could not be carried out for less than 6,000*l.*, to which must be added the cost of pumping and the rent of the mills; "still," continued Mr. Bateman, "even including these items, it is cheaper, and, in my opinion, a better scheme than Mr. Smyth's Struell project, or than any of those which I had before me at the time of making my former report." After some discussion, it was resolved,—"That this committee, having an aversion to supplying the town by means of pumping, and preferring that by gravitation, recommend the adoption of Mr. Reid's plan from Tanaghmore, at a cost not exceeding 9,500*l.*, provided that, on an analysis being obtained, the water be found unobjectionable." It was further resolved,—"That, in case Mr. Reid's specification should not, at the cost of 9,500*l.*, satisfy the Local Government Board, or that the quality of the water be not satisfactory, then we recommend the adoption of Mr. Bowers's scheme at a cost not to exceed 13,000*l.*, with a 7-in. pipe."

Exeter.—At a meeting of the Exeter Town Council on the 15th inst. the town clerk mentioned that he had received a report from Mr. Richard Hassard, C.E., of London, relative to a new water-supply for the city. As the document was a very lengthy one, it was referred to the sanitary committee.

Tunbridge Wells.—After a long debate the Local Board has decided upon proceeding at once with an enlargement of the water-supply of Tunbridge Wells, at an estimated cost of 32,000*l.* Considerable difference of opinion exists as to the exact amount of the present supply. The yield seems to vary from 250,000 to 500,000 gallons a day, in the different seasons of the year, and unceasing.

Mexborough.—At a meeting of the Mexborough Local Board, on the 7th inst., Mr. Tomlinson, C.E., attended to explain certain schemes which he was prepared to carry out, the Government inspector (Mr. W. J. Sendall) being present. Mr. Tomlinson said there were several schemes which were feasible for Mexborough. One was to obtain a supply from Sheffield, which would, perhaps, be the most costly. Then there was the St. Helen's and Ludwell scheme, and a supply might also be obtained from the east end of Mexborough. He was of opinion that the interests of the town would be better served by a company. As a rule, companies were doing better than local authorities in this matter. He was quite prepared to form a private company to carry out the water scheme at once, and have it finished during the next summer, provided the Local Board would offer no opposition. He would undertake to find a supply for double the present population, and satisfy the demands of the Local Government Board. The late Dr. Fairbank (medical officer of the Board) had said that the Local Government Board would not sanction a scheme which gave a less supply than twenty gallons per head per day. Now he (Mr. Tomlinson) would emphatically deny that; he had seen Mr. Rawlinson, of the Local Government Board, and had put the question to him, and that gentleman told him that if he presented a scheme for Mexborough, or any where else, giving a supply of ten gallons per head per day, he would pass it. He was quite prepared to carry out a scheme, and a good one too, for 4,000*l.* Mr. Sendall asked if Mr. Tomlinson included a reservoir in his calculation? Mr. Tomlinson: Yes, a covered reservoir. The further consideration of the subject was adjourned.

NEW FOUNTAINS.

Leek.—A drinking-fountain, the gift of Mr. William Challinor, has been erected at the bottom of the Market-place, on what is known as the "Butter-market," where the so-called old Town Hall recently stood. The designer of the ornamental portion of the fountain is Mr. Joseph Durham, A.R.A. The work consists of a double drinking-fountain, cast in bronze, showing two nude children gambolling among the water-flags, until one detects a frog and recoils with child-like horror, while the one on the other side continues his laughter and his game. This part of the work was in the last Academy Exhibition. The base of the fountain consists of an octagon pillar, resting upon a series of four steps, while upon the pillar is this inscription,—

"From limpid streams beneath the rocks and heather."
"A thing of beauty is a joy for ever."

Upon this pillar rests a circular basin of red polished granite, which was executed by Mr. Robertson, of Aberdeen, and which came from quarries at Peterhead, north of the town. A portion of the design includes a single jet of water rising from the centre 3 ft. in height; but this will not be usually in play.

Cahir, Ireland.—A new fountain in connexion with the supply of water from the Scarrough mountains to the inhabitants of Cahir, has been erected in the Square, nearly opposite the Glengall Arms Hotel, through the munificence of Lady Margaret Charteris. An octagonal basin, 8 ft. in diameter, formed of cut limestone, 2 ft. 3 in. high, is useful as a font, from which horses and cattle can drink. A square plinth of cut-limestone, 2 ft. 6 in. on each side, and 2 ft. 3 in. high, is placed in the centre of this basin, on which is set a base that supports a circular column of limestone, 1 ft. 3 in. high, and 1 ft. 5 in. in diameter. A carved stone is placed on this, on which four lions' heads are formed, through each of which an ornamental iron pipe is placed that conveys the water on pressing a small brass knob. On this column, which supports the lions' heads, another of the same height is placed, the top of which is capped by a carving, somewhat of Corinthian form. A square stone rests on this, on the eastern side of which the date, 1876, is cut, and on the western the words, "In Memoriam," doubtless to the memory of the late and much-lamented Colonel the Hon. R. Charteris. This is surmounted by a canopy, supported by four small columns with grotesque lions' heads carved on the corners; and the top, consisting of a carved finial, with shamrocks nearly cut on each face. The entire forms a column, 11 ft. 6 in. high. The architect is Mr. Young, of Exeter Hall, London, and Mr. Sharpe, of Brunswick-street, Dublin, was the contractor.

NEW CEMETERIES.

Taunton St. James.—A new cemetery for the parish of Taunton St. James was consecrated on the 5th inst. The cemetery has been laid out, and the buildings constructed from the plans of Mr. John Bevan, architect, Bristol, which were chosen in competition. The cemetery is upwards of four acres in extent. The chapels occupy about the centre of the ground from north to south. The size of the Episcopal chapel is 33 ft. by 18 ft., standing due east and west; and at right angles with it is the Nonconformist chapel, 29 ft. 6 in. by 18 ft. A chancel is provided. A vestry, having a water-closet and lavatory, is attached to each chapel. Adjoining the chapels, and separated from them by glazed screens at the sides (and, in the case of the Episcopal chapel, opposite the entrance porch), are mortuaries, 14 ft. 6 in. long by 8 ft. each, for the reception of coffins during the performance of the burial service. The mortuaries are arranged with doors at each end, so as to afford the best means of ingress and egress, together with perfect ventilation. The walling is of Monkton stone. The quoins, tracery, and other dressings are of Bath stone. The shafts to the bell-turret are of Lydeard and Westleigh stone, rubbed and sanded, or tooled, according to the use made of it. The roofs are of red deal, covered with Bangor blue and Penmoyle sea-green slates in patterns. Internally the walls are stuccoed. The style adopted for the design is Early Pointed. The work has been carried out by Mr. Spiller, builder, of Taunton, under the superintendence of Mr. George C. Strawbridge, who acted as clerk of the works. The cost (exclusive of site) has been about 2,500*l.*

Gloucester.—An addition to the Gloucester Cemetery has recently been consecrated by the Bishop of the diocese. The cemetery was laid out, and the chapels, &c., built nineteen years ago from the designs of Messrs. Medland & Maberly, eight acres being appropriated to members of the Church of England, and four acres to Dissenters. The ground just added is between ten and eleven acres in area, nearly half of which has been consecrated.

OBITUARY.

Mr. Joseph Burtt, F.S.A.—We regret to record the death of Mr. Joseph Burtt, F.S.A., Assistant Keeper of the Public Records, and hon. secretary of the Royal Archæological Institute. Mr. Burtt died on the 17th inst., in his fifty-ninth year. The annual excursions of the Archæological Institute for several years past have owed not a little of their success to Mr. Burtt's uniform courtesy and business tact. His loss will be widely felt.

M. D. Laurent de Lara.—M. de Lara died at his residence, Torrington-square, on the 15th inst., aged seventy. He was for many years a member of the Society of Arts and an illuminating artist to the Queen. M. de Lara gained a prize medal for an illuminated chess-table on vellum at the Great Exhibition of 1851. He was the author of a manual on the art of illuminating, published by Messrs. Longman, which reached a fifth edition.

DRURY-LANE MANAGEMENT.

THE discreditable scene in front of the pay-place of the upper-boxes, or what is called the balcony, at Drury Lane Theatre, to which we have before now referred, was repeated on Tuesday, and ought to insure the condemnation of any management which permitted its recurrence. Without the slightest pretence of a barrier, a crowd of persons are allowed to fight and struggle first to get to the pay-place and then to get away from it. To make the matter worse, the patient people who have waited under the portico for the opening of what would seem to be the only door, find, when admitted, that a second stream is entering from an opening in the lobby of the Russell-street pit-door, which cuts them off from the pay-place. Watches are lost and dresses torn, and many give up the task as hopeless and go away. If this were an unexpected occurrence, the omission of proper means to remedy it might be pardoned, but occurring as it does year after year it is inexcusable and scandalous.

MEANS OF EGRESS FROM THEATRES.

THE LESSON OF THE BROOKLYN DISASTER.

THE dreadful calamity at the Brooklyn Theatre has impelled the Lord Chamberlain to look more heedfully into the means of exit in case of fire in London theatres. Captain Shaw has been instructed to look into the matter, and several theatres have already been visited, and examination being made not only of their means of outlet for the audience, but of the precautions taken against fire, the water supply, hose, and the like. Captain Shaw's report, if made public, would be fatal to the prosperity of any theatre he condemned. Captain Shaw's inquiry, too, might well be extended to music-halls, churches, and other buildings of public resort.

A "memorandum" relative to the means of exit from theatres in case of fire was issued from the Lord Chamberlain's office on the 21st inst., and a supplementary "memorandum," dated the 23rd inst., has also been issued, in which the Lord Chamberlain says :—

"Considering the crowded state of the theatres during the Christmas holidays, and more particularly the large numbers of women and children attending the performances of the pantomimes, the Lord Chamberlain requires that all doors not habitually used for exit, but available as additional means of escape in case of fire or alarm, be regularly opened on every occasion when a performance takes place, from Boxing-day until the 1st of February next. The Lord Chamberlain takes this opportunity of suggesting to managers the prudence of establishing among their staff of servants and attendants, before and behind the curtain, some sort of regular system according to which each person so employed shall be told off to his appointed station in case of fire or alarm, so as to prevent hesitation or confusion on any such emergency, and to facilitate the safe and quiet departure of the audience from all parts of the house, by all available means of exit."

FINANCES OF THE INSTITUTION OF CIVIL ENGINEERS.

IN the report read at the annual meeting, on the 19th ult., it was stated that the property of the Institution comprised securities of the nominal value of 14,322*l.* 3s. 1d. held in trust for various purposes, of 22,494*l.* 1s. 8d. invested on the general account, and of a cash balance of 326*l.* 11s. 7d., together 37,142*l.* 16s. 4d., as against 35,297*l.* 15s. 8d. last year. Also, the stock in hand of the forty-six volumes of the "Minutes of Proceedings," numbering together about 7,000 volumes; the collections of original drawings and of portraits of past-presidents and other eminent engineers, to which a portrait of the late Mr. Joseph Miller had lately been added; and the library, unrivalled and unique of its kind, now containing 13,431 volumes, being an increase of 3,000 volumes during the past three years. These effects were insured for 10,000*l.* The statement of accounts showed receipts in the twelve months amounting to 11,181*l.* 17s. 7d., made up of three items, viz. :—To the credit of income, 8,844*l.* 10s. 4d., to that of trust funds, 459*l.* 19s. 3d., and to capital, 1,877*l.* 8s. The payments might be summarised under five heads, thus:—By house and establishment charges, 1,864*l.* 12s.; salaries and wages, 2,419*l.* 3s.; library, 605*l.* 4s. 3d.; publications, "Minutes of Proceedings," 4,055*l.* 15s. 4d.; and by premiums under trust, 313*l.* 7s. 8d.; while 1,847*l.* 17s. 3d. had been invested, and the cash balance was, as before stated, 326*l.* 11s. 7d. Favourable as these results appeared to be, they were not entirely so, the committee said, as the liabilities to the printers and engravers, as well as to the several trust funds for unexpended dividends and to capital, were greater than at the same date last year. In fact, the expenditure now exceeded the income, though not the receipts, which comprised admissions and building fund fees hitherto regarded as capital.

WARMING RAILWAY CARRIAGES.

WE alluded recently to the invention of a combustible compound by which railway travellers might make themselves independent of the "foot-warmers," and ensure warmth and comfort on a journey. The French Government, it appears, have ordered the adoption by French railway companies of some method of warming second and third class carriages during the winter months. No special system is enforced or suggested, and it is left to the discretion of the directors to adopt such measures as they may think most desirable. The specification of "second and third class carriages" in the order of the Government is a curious and perhaps unintentional satire on the policy of railway managers generally. It is certain that second and third class carriages will not be warmed to the exclusion of the first class, and, unless it is suggested that the richer travellers may continue to give their "tips" to the porters for the inevitable warm-water pan, while the poorer classes must have the same accommodation without being subject to this black-mail, some universal system of heating all the carriages alike will no doubt be adopted. There are many plans more or less suitable for making use of the waste steam of the locomotives for this purpose, and when any of them are adopted across the Channel we may probably expect to find a similar course carried out in this country.

SEDIMENT IN WATER CISTERNS.

DR. STEVENSON MACADAM read a paper "On Sediments in Domestic Water Cisterns" at a recent meeting of the Royal Society of Arts, Edinburgh. He said that on several previous occasions, in referring to water supply and other sanitary matters, he had brought before the Society the question of the contamination of water in domestic cisterns, and the desirability of the cleansing out of the cisterns at short intervals. Lately, however, he had devoted special attention to the subject, and was now convinced that in many cases the evil effects of impure water supply were directly traceable to the contamination of the water by its being retained in cisterns containing deposits lying there for lengthened periods. These sediments in cisterns are primarily formed by the clayey and earthy matter carried by the water into the cisterns, and where, on settling, the suspended matter is deposited as an earthy-looking sediment. If these deposits solely consisted of earthy matter, there would be no serious objection to their remaining in the cisterns, but the analyses of a number of sediments taken from cisterns in different parts of Edinburgh and Portobello proved that the earthy matter was intermingled with minute particles of carbonate of lead, derived from the action of the water upon the lead of the cistern, as well as of organic matter, derived in part from ordinary street or house dust, and in other part from insects, &c., and even at times a stray mouse. When the water is being drawn from the cistern and fresh water is running in, a portion of the fine sediment is for the time raised in suspension, and flows out with the water, which thus becomes contaminated with lead and organic *débris*. Even when the cistern is emptied by the ordinary pipes, the sediment remains still further accumulating from time to time. The analyses of the water supplied to the city before entering the house-cisterns, and of the water which had stood for a week over the deposits or sediments from cisterns, showed that the water suffered serious contamination alike as proved by the proportions of saline and albumenoid ammonia determined in the million parts, or by the proportions of the oxygen, nitrogen, and carbonic acid dissolved in the imperial gallon, which formed a very delicate test of the purity of water, too much overlooked at the present day. The remedy lay in the periodic cleansing out of domestic cisterns, at least every three months, which should be done by taking out the waste-pipe and using a very soft brush for removing the sediment. Care must be taken that the surface or skin of the lead of the cistern be not disturbed or scraped.

LORD SHAFTESBURY'S COTTAGES.

IN a pleasant article, headed "the Earl of Shaftesbury at St. Giles's House" ("Celebrities at Home"), the *World* says,—"Wimborne St. Giles is veritably a model village. Thatch,—beautiful in a picture, but a bad sign in fact,—has nearly disappeared, and wattle-and-dab has been completely replaced by brick. Here and there is a venerable cot, like that which on destruction was found to have received twelve coats of thatch, as infallible a sign of 224 years' life as the rings in a tree-trunk; but the old type has almost entirely vanished, and the new labourer's cottage, spick and span, brick-built, slate-roofed, and soundly constructed, has taken its place. These new cottages, in which Lord Shaftesbury takes great pride, are built in pairs. Each one contains its front parlour and back kitchen on the ground floor, above which are three bedrooms, absolutely unconnected with each other, and having independent doors opening on to the common landing. The landlord, energetically wielding his mighty walking-stick, points out with a quiet laugh that the long strip of garden with which each cottage is endowed is 'in front.' Lord Shaftesbury has no opinion of back gardens; 'public opinion cannot be brought to bear upon them, and they degenerate into dust-heaps.' The houses, 'you will observe, face the south; it saves a large per-centage of fuel during the mild winters of Dorsetshire, and ripens the apricots as well.' Every cottage has its apricot-tree, and the chronicles of these trees would bear no slight resemblance to a certian sacred narrative. Some are fair and well-grown, bringing forth fruit abundantly; others cling hopelessly to the walls, stunted and fruitless. Each cottage has also its pump,—or, rather, half a pump, for there is one between two,—its separate sanitary arrangements, its independent pigsty, and individual allotment of a quarter of an acre. For these accommodations, which, excluding the cost of the land, stand the proprietor in 160*l.* per holding, the 'down-trodden Dorsetshire labourer' pays exactly 2*l.* 12s. per annum, a fact which will explain the meaning of many landlords, who, when their farmers cry out for cottages, offer to build as many as they like if they will guarantee 5 per cent. on the capital invested. The owner of Wimborne St. Giles tells us that his labourers always pay their rent. Good times and bad he gets his 1¼ per cent. well and duly paid; for there is sharp competition for his cottages, and the one bit of foresight shown by the Wessex husbandman is to keep a roof over his head."

STATUES.

Sir Robert Peel.—The statue of Sir Robert Peel, in Parliament-square, has been completed and placed *in situ*. It is of bronze, and stands on a polished granite pedestal. This makes the third statue erected on the spot, the present one nearly facing Parliament-street; the others,—those of Lord Derby and Lord Palmerston,—stand opposite the Houses of Parliament. Mr. Edwards, who was entrusted by the late Mr. Noble, the sculptor, to carry out his works, writes to state that this statue is the last work of Mr. Noble. The commission for it was given to him by the friends of the deceased statesman, of whom the Duke of Buccleuch is the chairman, in order that this statue might be substituted for the one by the late Baron Marochetti, formerly erected in Palace-yard.

David Livingstone.—The statue of Dr. Livingstone, for George-square, Glasgow, will be completed, it is expected, about two months hence. The *Scotsman* states that Mr. Mossman, the sculptor, has succeeded in producing a statue worthy of his subject. His design represents Livingstone standing by the stump of a palm-tree, over which his cloak is carelessly thrown. The missionary seems in the act of speaking. The right hand,—in which is firmly clasped the well-known cap, which Livingstone always wore, as a sort of official badge,—rests upon the tree, as if partly supporting the figure; while the left holds a Bible, one of the fingers being inserted between the leaves. The statue, which stands about 9 ft. high, will be placed on a granite pedestal 11 ft. in height. Messrs. Cox & Son, London, are to be entrusted with the casting.

Robert Burns.—At a meeting of the committee intrusted with the arrangements for the unveiling of the Burns statue in January, held in Glasgow, the chairman, Mr. W. Wilson, said

the idea had been hinted at, and it was one of considerable importance, that a bust of Burns should be placed in Westminster Abbey. In her Majesty the Queen and in Dean Stanley he believed they would have allies when the time came for asking permission to place a bust of Burns in the "Poets' Corner." One of the delegates thought they should not lose their identity or nationality by sending a bust of Burns to Westminster. Why not place it in the Parliament House, Edinburgh? He thought they should try to get back the coronation-stone which was in Westminster. The chairman believed there might be a possibility, when Burns's bust was placed in Westminster Abbey that they would get the stone in exchange.

Mr. W. Rathbone.—Foley's statue of the late Mr. W. Rathbone, of Liverpool,—the full-sized model for which was completed prior to the decease of the artist,—has been erected in Sefton Park, and will be unveiled on Monday, the 1st of January next.

Wanton Outrage on Lord Derby's Statue at Preston.—At the Preston Police-court, on the 19th inst., James Roberts, insurance clerk, and James Dobson, stationer's assistant, were charged with maliciously damaging, on the 13th inst., the Lancashire memorial statue of the late Lord Derby, by daubing the semblance of a garter under each knee, and a broad ribbon across the breast, with blue paint. Dobson had confided the secret of the "lark," as he called it, to a girl named Sarah Seward, and she imparted the information to Inspector Brown, and the prisoners were arrested. Both prisoners were committed for trial, heavy bail being accepted.

THE PORTICO OF ST. MARTIN'S-IN-THE-FIELDS.

At a meeting of the St. Martin's Vestry, on the 21st inst., a communication was received from the Metropolitan Board of Works, forwarding amended plan for dealing with St. Martin's Church, in relation to the proposed new street from Tottenham-court-road.

Mr. Churchwarden Scott said he totally disagreed with the proposed alteration. He did not think they had been quite fairly treated by the Metropolitan Board, who should have informed them long since of their intention to interfere with the church, instead of surprising them with their plan, and in not accepting the modified plan submitted by the Vestry at the request of the Board. He thought the proper course for the Vestry to take would be to stand against any alteration of the church whatever, and in that course he was sure they would receive the support of the parishioners.

Mr. Soame was of opinion that the course recommended by Mr. Scott would not be the most efficient one. The Vestry should, instead, try to aid the Board of Works to obtain a plan that would carry out the improvement of the thoroughfare and injure the church as little as possible. For his part, he did not see the necessity for the steps in front of the portico, to maintain the beauty of the church.

The Chairman (the vicar) said the question under discussion did not concern the parish alone, but the public, and as the church was one of the ornaments of the metropolis, they were responsible to the public for its maintenance in its original beauty. All the people to whom he had spoken had expressed their regret at the intention to interfere with it. He was sure the portico could not be touched without being injured. It was only the great importance of the improvement proposed by the Metropolitan Board of Works induced him to listen to any such proposal.

The further consideration of the matter was postponed.

ST. WERBURGH'S TOWER, BRISTOL.

It will be known to the readers of the *Builder* that the Corporation of Bristol some time ago decided to pull down St. Werburgh's Church, ostensibly on the ground that it stands in the way of certain street improvements. A strong feeling grew up in favour of retaining the tower, one of the oldest and most ornamental in the city, and the question came before the Town Council the other day as to whether the tower also should be pulled down or allowed to stand. A resolution in favour of retaining the tower was moved by Mr. G. Wills, and seconded by Mr. T. T. Taylor. After some discussion, the resolution was rejected by 30 votes to 23.

Well may the *Bristol Times and Mirror* observe that it would hardly care to have strangers estimate the culture and taste of Bristol and Bristolians from this resolution to pull down the tower of an old historic city church. "The decision of the Town Council leaves nothing for hope or fear, as after the 31st of the present month,—this, we presume, being thought a suitable way to inaugurate the new year,—pickaxes and shovels will begin the work of demolition upon the sacred building, it being decided that the tower, too, is to come down; and perhaps it is best for us and for our own character as a city, that since an ancient historic church in the centre of the city should be destroyed, to widen a street, no trace of our Vandalic disposition should remain. Not that we think either the Town Council or the inhabitants of Bristol are the parties chiefly accountable for the business. To put the saddle on the right horse, we are bound to agree with Mr. Wills when he said 'The churchwardens and vestry are the Goths on this occasion.' But for them, and the patron, and the parson, St. Werburgh's would continue to stand."

It may be noted that Mr. Josiah Thomas, city surveyor, reported (1) that the cost of restoring the tower would be about 1,500*l.*; (2) that the annual cost of repair and maintenance after such restoration would for many years be a nominal sum, say 10*l.* per annum; (3) that the value of the land actually occupied by the tower, calculated at the same rate as agreed to be paid for the whole site, is about 560*l.*

ARCHÆOLOGICAL SOCIETIES.

Chester.—At the usual monthly meeting of the Chester Archæological Society, held on the 4th inst., Mr. Thomas Hughes, F.S.A., read a paper by Dr. Kendrick, of Warrington, on the Roman remains discovered at Wilderspool, Cheshire, the supposed site of the Roman station of Condate. The site of the discovery of these remains forms a parallelogram of thirty-six statute acres in extent, and the whole of it is in process of removal for the excellent building sand which is below its surface. So early as the beginning of the present century the existence of Roman remains here was discovered on carrying the Old Quay Canal through the site, but it is only since 1863 that the excavation of the whole property has been determined on, and gradually proceeded with. The precise site occupied by the Roman station was until recently known as the Town Field.

Cumberland and Westmorland.—The winter session of the members of this society was held at Kendal on the 11th inst., Mr. Ferguson, M.P., in the chair. Mr. R. S. Ferguson read the first paper, on Roman roads in Cumberland and Agricola's line of march to the Solway. Archdeacon Cooper read a short paper, by Canon Knowles, on Saxon crosses. The interlaced crosses Canon Knowles was inclined to consider Irish, and that they originated in wattle-work. The Rev. T. Lees said that theory was the best they could have, and was also held by Mr. Greenlow, and enunciated by him at Hexham. Mr. Jackson, St. Bees, contributed a paper on "Some Roman Remains," including a camp about a mile and a quarter from Bewaldeth, not far from Ireby and Bothel, which showed well-developed ramparts, and deep, well-preserved ditches. After dinner a *conversazione* was held, and a paper was read by Mr. G. E. Moser, on the "Kendal Parish Registers"; after which Mr. Bellasis read a contribution on "A Glimpse of Social Life at Kendal in the last Century." A meeting for business was held in the Kendal Museum on the following day.

Berks.—The annual *soirée* of the Berks Archæological and Architectural Association was held on the 29th ult., at Reading, Sir John Conroy presiding. Professor Rupert Jones having delivered a short address on some sepulchral remains found during the excavations made along the line of the Plummery ditch for drainage purposes, Mr. James Parker gave an address on the Roman remains at Silchester, in course of which he incidentally remarked that there was a great tendency in the present day to the centralisation of architectural and archæological objects, which had been the greatest curse to those engaged in working out the history of the country. He did hope the time would come when Reading would have a museum, and that one great feature of that museum would be the Roman remains. Captain King, of Sandhurst, then delivered an interesting address on flint chips, implements, and weapons, illustrated with numerous specimens, some of which he had found at Bob's Mount, Kategrove, and argued, amid applause, that a certain amount of centralisation in regard to archæological objects was advantageous for purposes of comparison.

THE MANUFACTURE OF STEEL.

At Leeds, the other evening, Mr. B. Walker, of the firm of Tannett, Walker, & Co., presided at the annual dinner of the Leeds Foremen Engineers. In proposing "Prosperity to the Association," he referred to the processes of steel-making, stating that for the Bessemer process the iron must be free from phosphorus. The Middlesbrough iron contained from one to two per cent. of phosphorus. Steel could be made from this iron as from hematite iron, but would be unsound and rotten. Mr. I. Lowthian Bell, M.P., had said he had found out a process by which the phosphorus could be extracted, and he proposed to take Middlesbrough iron, or pig-iron made in Yorkshire, and put it into a Bessemer converter, and get rid of the silicium and phosphorus before running it into the puddling furnace. The phosphorus could not be got rid of in a puddling furnace; but puddling was very laborious and difficult work, and he (Mr. Walker) was quite sure that when the iron trade revived ironmasters would experience great difficulties from the want of puddlers. At least 5,000 puddlers had been turned away in the Middlesbrough district, and most of these had been absorbed in other occupations in other districts. This difficulty could be avoided by using nothing but hematite iron, because they could do away with puddling by the Bessemer process. If hematite iron were to rise very much in price, Mr. Bell's process would become a valuable one; but so long as there was only 1*l.* or 30*s.* difference in price between the two classes of iron it would scarcely pay to adopt Mr. Bell's extra process. The Bessemer process was undoubtedly the simplest of all for doing away with puddling, and all that was required was iron free from phosphorus and sulphur. A good deal had been said about Belgium and America being likely to run this country a very close race in the manufacture of iron and steel. He was thoroughly convinced that, so far as the manufacture of pig-iron was concerned, it would be very difficult for any country to beat us. He thought there was considerable improvement to be made in the manufacture of wrought iron, and the furnaces, as a rule, consumed far too much coal. Still we could make bar iron more cheaply than any other country. A good trade could be done with America if only the tariff were taken off. The Americans were quite wrong in maintaining the new tariff, which was the protection of a few to the injury of the many. With regard to the saving of coal, he was convinced that if the whole of the steam-engines in use were to be thrown on the scrap-heap and replaced by new ones, a saving of 10 per cent. on the outlay could be effected. The saving of coal, so far as steam-engines were concerned, was to be effected by having high pressures, and that meant better boilers.

ORGANS.

Gloucester Cathedral.—A Gloucester paper says:—"Eight or ten years ago, when the restoration of the cathedral was under consideration, it was suggested that what has been aptly termed 'the absurd screen,' erected by Bishop Benson at the entrance to the choir, and the organ which stands upon it, should be removed. The proposal did not, we believe, at that time find much favour with Sir Gilbert Scott and some of the authorities, while the late Dr. Wesley was strongly opposed to the views of those who have elsewhere been termed 'the vista theorists' in reference to cathedral restoration." The same paper states that on the 29th ult. Sir Gilbert Scott, accompanied by Mr. Waller, the resident architect to the chapter, minutely examined the screen and organ, and as the result they recommended to the chapter, at their meeting on the following day, that the screen should be taken down, the organ placed in the north transept, and other incidental alterations made in the internal arrangements.

Lincoln.—The organ of St. Martin's Church, Lincoln, has been enlarged and removed from an unsightly position in the body of the church: Mr. James Waller, painter, is, at his own cost, decorating the metal pipes of the organ.

Sherborne Abbey.—The grand organ of Sher-

borne Abbey has been re-opened, after undergoing repairs and additions by the makers, Messrs. Gray & Davison. The chief additions to the instrument have been an enlargement of the swell and the addition of a sweet stop,—the harmonic flute.

Hebden Bridge.—A new organ has just been placed in St. James's Church, Hebden Bridge. Dr. W. Thomas is the generous donor of the instrument, which has been built by Messrs. Foster & Andrews, of Hull. It occupies a position near the choir, and its case was designed by Mr. R. Norman Shaw, A.R.A., the architect of the chancel.

DISPUTES WITH WATERWORKS CONTRACTORS.

Dundee.—The *Dundee Courier* understands that an action has been raised by the contractors (Messrs. Eddington & Co. and D. Y. Stewart & Co.) against the Water Commissioners, for upwards of 22,000*l.* for extra work in connexion with the construction of the Lintrathen waterworks. The commissioners, at a meeting on the 5th inst., agreed to ask the contractors to a conference, with the view of coming to a satisfactory settlement if possible. The serving of a summons to the above effect has been the answer. At a subsequent meeting of the water committee it was considered advisable to hold the conference still, if that could be accomplished, previous to adopting legal proceedings.

Warwick.—At a meeting of the Warwick Town Council on the 12th inst., the clerk said he had received a letter, which he should not read if he acted, as he considered, wisely. The writer had, however, asked him to lay it before the council. The Mayor said he had better read it. The letter was as follows:—

"Milverton, Dec. 11th, 1876.

"SIR,—I have now gone through the accounts of the work done at Haseley with Mr. Pritchard, and the measurements have been agreed upon between us. Mr. Pritchard is prepared to give his final certificate, but declines to include therein a sum of 500*l.*, which was promised to me in addition to the scheduled prices. On the faith of that promise I proceeded with the works, which I should otherwise have discontinued, as I could not have undertaken to struggle with the difficulties of the job without some additional payment. I feel sure that when the whole matter is explained to the council, my claim to this sum of 500*l.* will be admitted, and I merely write this letter in order that it may not be supposed that I have, in agreeing to Mr. Pritchard's measurements, in any way withdrawn such claim. I shall be obliged if you will lay this letter before the council at their meeting to-morrow.—Yours faithfully,

"GEORGE F. SMITH."

The clerk said there was no promise of the sort. Alderman Glover thought the letter had better be laid before the waterworks committee before the cheque recommended by Mr. Pritchard was drawn. It was finally decided to lay the letter before the waterworks committee, the resolve to draw the cheque being adhered to.

LIGHT AND AIR CASES.

BARKER *v.* LINDSAY.

THIS was a motion in the Chancery Division, before Sir R. Malins, made on behalf of Mr. W. R. Barker to restrain Sir Coutts Lindsay, bart., from raising the walls and roof of the Grosvenor Gallery, New Bond-street, to such a height as to deprive the plaintiff of light and air.

The plaintiff represented the chemists, Messrs. Savory & Moore, 143, New Bond-street, and stated that the house with regard to which the injury was complained of was used by them for the preparation of chemicals, and was especially convenient to them on account of its being close at the back of their shop; their landlord was Sir Coutts Lindsay, and they had a lease of six years.

Mr. Bristowe, Q.C., and Mr. T. A. Roberts, appeared for the plaintiff, and Mr. John Pearson, Q.C., and Mr. Watson, for the defendant.

The Vice-Chancellor ordered that the defendant might roof in the gallery at the present height of the walls upon his undertaking to remove the roof and lower the walls so far as the Court should direct at the hearing of the cause.

A Lighthouse Washed Away.—Coatham was visited by a severe gale on the 21st inst. The pier has suffered severely, the whole of its "head," upon which has recently been built a lighthouse, and more than 290 yards of the promenade, were completely washed away, and the *débris* lies scattered on the beach between the Victoria Hotel and Tees mouth. About two years ago the pier was cut into three distinct pieces by two ships going through during a very heavy gale, and it was only repaired about a year ago at a large outlay. When perfect, it was one of the longest promenade piers on the coast; it extended 2,500 ft. into the sea.

THE NATIONAL OLYMPIAN FESTIVAL.

President ..... *Vice-President* .....

Council .....

IT is proposed that an annual festival, under the above title, shall be instituted for the purpose of centralising the various associations having for their objects the encouragement of intellectual and of athletic contests, as, for instance, the Eisteddvodts of Wales, and the athletic associations throughout the kingdom, in order that by the establishment of such a festival, both the intellectual and physical contest may be brought into the same arena, and that the public may be impressed with the important truth that the *mens sana in corpore sano* consists in the development and maintenance of a due proportion or balance between mind and body. This festival would be founded on the same principle, and with the same objects as the Olympic Games.

Prizes will be offered for essays, poems, musical compositions, choral singing, &c.; and for success in the various kinds of athletic games. But the highest prize will be awarded to him who shall exhibit the largest general power.

It is further proposed that the Crystal Palace at Sydenham shall be the place where the Annual Olympian Festival shall be held, not only on account of the extent of the Palace grounds, but that the festival shall be identified with the Palace, and be made to contribute to its financial success and preservation.

W. CAVE THOMAS.

CONCRETE ROOFS.

SIR,—I have read in your paper of the 16th inst. a report of the proceedings of the Architectural Association at a meeting held on the 8th inst., at which an interesting paper was read by Mr. H. H. Statham, "On the Architectural Treatment of the Roof." Mr. Statham condemns every known material used for roofs as perishable and out of character with the substructure, and points to a something which will eventually answer all the requirements of "a glorified roof." He finally winds up by saying, "It may be suggested that concrete, even if it, does not attract much as a material for walls, may have a part to play for roofing." Although not a member of the honourable profession to which Mr. Statham belongs, I take the liberty to observe that far away in the wilds of Kerry an experiment has been tried which, as a first attempt, has proved remarkably successful. A cottage 24 ft. by 16 ft. has been roofed with concrete, the shape being segmental, the cord of the arc being 14 ft. and the height to the roof 14 in., the thickness of concrete being 8 in. at springing and 4 in. at crown. The proportions used were one of cement to three of well-washed sand and gravel.

An engineer who examined it expressed his belief that this roof would sustain the Kerry regiment if it could be crammed into so small a space!

ROBT. W. CLUBE.

EXTINCTION OF FIRES.

SIR,—Your correspondent "R. T." appears to have overlooked one or two trifling considerations in his arrangements for extinguishing fires. Taking into consideration the fact that the majority of fires are occasioned by carelessness in people who are retiring for the night, and that such fires usually occur in rooms where the inmates are most likely asleep, it appears to me more than probable that not only the fire, but the sleeper as well, would be extinguished.

In addition, if "R. T." bears in mind that carbonic acid gas is a heavy fluid, and as such very slow in its movements, I am more than inclined to suspect that before a sufficient quantity of the fluid had found its way through the "pin-hole," or even through a much larger orifice, the whole of the damage would have been done, and the "extinctor" would arrive, like the proverbial policeman, after the mischief was perpetrated.

I grant that in some classes of buildings, such as large warehouses, it might possibly be useful, but from the fact that every one must at once vacate the premises and close every orifice, even to the exclusion of that best of all fire extinguishers, the fire brigade,—its value must certainly be of a very tentative character, as the accidental omission to close a window or door or chimney-shaft, would undo the whole.

W. JACQUES.

THE POOR AT THE VESTRY-HALL.

SIR,—In your last week's paper you published a report by Dr. Tidy, the health officer of Islington. I cannot wholly agree with his statements, as I find from my own experience that when the *poor* apply at the vestry-hall to have existing nuisances removed they are sometimes treated in a very off-hand manner, and have to apply more than once. I think if the *poor* were treated with a little more respect when they make complaints, and the sanitary officers did their duty better, we should find a wonderful improvement in the sanitary state of the homes of the poor.

ONE OF THE POOR.

"SCARCITY OF COTTAGES IN IPSWICH."

SIR,—You were kind enough to notice favourably, on its first introduction, my patent "Concrete Slab Cottage," and you also reported a discussion at the Royal Institute of British Architects, where I expressed my opinion that I should succeed in producing a good four-roomed house for 100*l.* I know you will be glad to hear I have succeeded, and that I am making arrangements to manufacture them on a large scale. I hope to commence the supply about next June, and did not intend making the matter public till then, but your memo., headed as above, seems so exactly to meet the case that I have forestalled the matter a little, as I know many people besides yourself are most anxiously looking for a solution of the problem.

W. H. LASCELLES.

A CENTRAL PARK FOR LONDON.

SIR,—The desirability of a large central area for recreation in the heart of London is a matter which no one can question, and the idea has no doubt passed through the minds of hundreds of thousands of us, though there are difficulties in the way which at first seem insuperable. As regards expense, it would seem unfair to effect the object under consideration by a tax upon the whole nation, whether direct or indirect; and to carry out the same by means of a general rate upon the metropolis would be conferring an especial benefit upon the patrons of it surrounding the central park at the expense of those living at more remote distances. At the same time, it would require contributions to so large an amount that no local district could be expected to stand the expense of purchasing property sufficient for anything that could be called a "park," and by a park I mean not an expanded square of about 20 acres, but one of at least 160 acres, if not 320 acres. I would suggest that a committee be formed, called the Central Park Association, who should meet periodically, receive voluntary subscriptions, grants, and legacies, with a view of purchasing and clearing land as near as possible, if not wholly or partly in, the East or West Central districts,—the clearing to be enlarged gradually as funds accumulate. Some of the land adjoining the new street from Bloomsbury to Shoreditch would be as advantageous a site as I can think of; and if the matter were to be taken up energetically few contributors but might live to see the idea properly carried out.

WALTER SCAGILL.

ACCIDENTS.

ON the 18th inst., two houses which have been recently erected in Stockwell-green, fell down with a crash into the footpath and road, and many workmen and others narrowly escaped with their lives. A number of plasterers, slaters, and others had been employed at the houses, but fortunately had left work for dinner when the two houses fell to the ground. The whole of Stockwell-green is now built over. At the meeting of the Metropolitan Board of Works on the 22nd inst., Mr. Fowler moved "That it be referred to the Building Act Committee to consider and report as to an amendment of the Section 98 of the 25 & 26 Vict., c. 102, and that the solicitor do report to the committee thereon." Mr. Fowler said he should propose a resolution that Mr. Valliamy be instructed to report upon two houses which had recently fallen at Stockwell-green; and also that his attention be directed to other houses which were in a dangerous condition. These houses had collapsed in consequence of the inefficient manner in which they had been constructed. Fortunately there had been no loss of human life, but it was a very disgraceful thing that such buildings should exist. The resolution was carried unanimously. More recently a third house has fallen at the same place.

On the 20th inst., a frightful scaffold accident, which it is feared will terminate fatally, occurred at the new buildings belonging to Mr. Doulton, High-street, Lambeth. It appears a number of bricklayers and labourers were engaged on the scaffolding, when a man named William Abrahams pitched head foremost over the scaffolding, and fell a distance of 40 ft. In his descent he struck against the transverse poles, and on his being removed to St. Thomas's hospital it was found that he had sustained a compound fracture of the right leg, a fractured jaw, and serious internal injuries.

On the 13th inst. an old stable, at St. John's, Worcester, fell bodily into the street. A young girl was buried in the ruins. She was got out fearfully injured, and at once conveyed to the Infirmary, where it was found necessary to amputate one of her legs. It seems the building has been for a long time in a dilapidated condition. Who is to blame for leaving it to fall?

The Proposed Museums on the Victoria Embankment.—At the last meetings of the Chambers of Commerce of Liverpool and of Exeter it was unanimously resolved to memorialise her Majesty's Government in favour of the establishment on the old Fife House site on the Victoria Embankment of the proposed India and Colonial Museums.

CHURCH-BUILDING NEWS.

Banbury.—The works of improvement and decoration which were commenced in the parish church, Banbury, about twelve years ago, have lately been brought to a conclusion by the completion of Mr. Blomfield's original design. The interior of the chancel has (according to the *Banbury Guardian*) been entirely remodelled, and now finishes with an apse and semi-dome, the composite order of the church, with its entablature, being carried all round. This alteration involved the construction of a complete new shell, contained within the old external walls, the removal of the old chancel arch, and a new roof connected with that of the nave. The choir has been brought out into the nave, and surmounted by a low stone and marble wall, according to the basilican arrangement. The choir-stalls are of oak, handsomely carved, in an appropriate style. The whole of this work has been carried out by Messrs. Davis, Brothers, of Banbury. The tessellated pavement is by Messrs. Godwin, of Lugwardine. A font in white marble, with coloured inlays, has been presented to the church by the sister of the vicar. Mr. Blomfield's design for the font was carried out by Mr. Alfred Claridge, of Banbury. The coloured decorations have been executed under the architect's superintendence by Messrs. Heaton, Butler, & Bayne, of London. The semi-dome is occupied by a large painting illustrating the description given in Rev. iv., of our Lord enthroned in majesty. The central figure is surrounded by an emerald rainbow, while the four-and-twenty elders appear at His feet, with the signs of the four Evangelists at their sides, and the seven lamps. Below the subject is the text which it represents. The wall of the apse is divided into three spaces in which are introduced life-sized figures of the twelve Apostles on a gold ground, with Scriptural trees represented behind them. The pilasters are decorated with gold flutings, and the capitals are gilt. The organ, which is now placed in a chamber on the north, has been entirely reconstructed by Messrs. J. W. Walker & Sons, of London. The new carved oak case was made from the architect's design by Messrs. Rattee & Kett, of Cambridge.

Hethersgill.—The new Church of St. Mary, Hethersgill, Cumberland, was consecrated on the 14th inst., by the Bishop of Carlisle. It is intended as a chapel-of-ease to Kirklinton, and has been erected from the designs of Messrs. Habershon & Brock, of London, which were selected in competition. It is built in the Early English style of local red sandstone, with lancet-pointed lights of clear glass; a wheel-window in the west gable, mullioned and of stained glass; and a memorial window in the east gable, consisting of three lights, bearing designs representing the Annunciation, the Nativity, the Adoration of the Magi, the Departure into Egypt, the Crucifixion, and the Ascension. The window was designed by Mr. John Scott, of Carlisle, and put in by Mr. Graham, of Hawksdale. The church is seated for about 200 people. The fittings are all of yellow pine, stained and varnished. Messrs. C. & J. S. Armstrong, of Carlisle, were the builders, the contract sum being 1,300*l.*

Salisbury.—Fisherton Church, Salisbury, was re-opened on the 6th inst., after the erection of a new north aisle. The work has been executed at a cost of nearly 2,000*l.*, and has been in hand about seven months, the architect being Mr. T. H. Wyatt, diocesan architect; the builders, Messrs. Hale & Co., of Salisbury; and the clerk of the works, Mr. F. W. Mansel. Before the erection of the north aisle the roof of the church was rather weak, but by means of this addition it has become considerably strengthened. By the alterations 200 additional sittings have been obtained, accommodation now being afforded for 850. In the north aisle there are eight windows, six at the side and one at each end, and the necessary heat is supplied by Diplock's heating apparatus.

Almondbury.—Almondbury parish church, which has been undergoing restoration for the last five years, was completely re-opened on the 27th ult. The nave was re-opened on March 24th, 1874. The galleries and organ-loft, which rendered it dark, have been removed, and the tower is opened as a baptistery. The spacious chancels and side chapels were separated from the church by temporary walls, and the service was conducted in the nave alone, the whole of which area was furnished with oak seats and desks, mats, and hassocks. Up to this time 4,000*l.* had been expended. The work of restoration was resumed in autumn, 1875. The chancel and side chapels, belonging to the Kaye family, represented by the Earl of Dartmouth, and the Beaumonts, of Whiteley and Bretton, have been extended by the addition of two memorial chapels. At the east end of the church are three stained-glass windows, the gift of Sir John Wm. Ramsden, bart., representing the Crucifixion, the Agony, and the Resurrection. The whole of the expense of the chancel with its new oak roof, tesselated pavement, gas standards, oak stalls, and two new arches, has been defrayed by Sir John William Ramsden,—about 2,000*l.* The Kaye Chapel has been restored by the Earl of Dartmouth, at a cost of 400*l.*; and the South Chapel by contributions, 100*l.* The external sculpture is not yet complete. Pinnacles, gargoyles, and bosses are being added. The total cost will be above 7,000*l.*

Belford.—The committee appointed to receive tenders for the enlargement of St. Cuthbert's Church, Bedford, have decided to accept the tender of Mr. Foster, of Kempston, which was the lowest sent in, being 1,180*l.*

Warthill.—Warthill Church, near York, has been re-opened, after having been almost entirely re-built through the munificence of Mrs. and Miss Agar, of Brockfield. The late church was barnlike in appearance, and hemmed in by dilapidated cottages. The cottages have been removed, the churchyard enlarged, and thrown open to the road and fenced by a palisading of ornamental ironwork. The church is of brick with stone facings. On the south side of the nave there is the tower, which now contains a peal of three bells. The nave is seated with open benches, and the chancel with oak stalls. The pulpit and lectern are of oak, carved. There is a handsome reredos, designed and painted by Miss Agar. The new church has been built in the Early Decorated style, from the designs of Mr. J. G. Hall, of Canterbury, architect. The whole of the masons' work has been carried out by Mr. Clark, of Barker-hill; the joiners' and all timber work by Mr. Rookledge, of Little Stonegate, York; the bricklaying by Mr. J. Nichols, of Dunnington; and the glazing and coloured glass by Mr. Hodgson, of York. The bells were supplied by Messrs. Warner & Sons, of London.

Clare.—It has been determined to restore the fine parish church of Clare, Suffolk. The work of restoration has been intrusted to Mr. J. P. St. Aubyn, architect, and will be carried out by degrees as the funds will permit, the committee having decided not to incur any heavy debt, and to do thoroughly whatever they undertake.

Arminghall.—The ancient church of Arminghall, near Norwich was re-opened on the 5th inst., having undergone restoration. In June last the work was commenced by the contractors, Messrs. Cornish & Gaymer, of North Walsham. The restoration consists of entirely new external walls of flint, with stone dressings, a pine roof, an oak screen, benches of oak in the chancel, and red-wood deal in the nave (the old oak poppy-heads being utilised for the former), new windows glazed with cathedral glass, fittings for lighting the church with the patent "Alpha" gas, and a flooring of Minton's tiles. The tower has also been renovated and its windows are repaired. The restoration has been carried out from designs prepared by Mr. J. P. Seddon. The total cost has been about 920*l.*

Stourport.—It was decided, at a meeting held at the Town-hall on the 14th inst., to request the churchwardens to raise 470*l.* by a voluntary rate, for the purpose of carrying out Mr. Meredith's plans for improvements of the parish church.

Tudely.—All Saints' Church, Tudely, near Tonbridge, has recently undergone a partial restoration. Of the original church little remains, it having been mainly rebuilt, about eighty years since, of brick, with windows, seats, &c., of the wretched description usual at that period. The style selected by the architect for the present restoration was Late Decorated, to suit that of the few remains of old work which were of that date. The original church had only nave and chancel, but in order to gain extra accommodation to make up for the loss of seats entailed by the destruction of the hideous gallery, a new aisle, with three arches between it and the nave, has been added on the north side of the church. The church now accommodates about 300, and, with chairs, may be made to hold many more. The choir seats are of pitch pine, those of the nave and aisle together, with the aisle roof, being of red deal. The altar and lectern are of oak, made from designs of the architect. One of the south chancel windows is filled with stained glass by Clayton & Bell. The south porch has been rebuilt, with the exception of the roof, and the spire covered with red tiles instead of shingle. The total cost of the restoration has been 900*l.*, and the work has been carried out by Messrs. Tulby & Son, of Tudely, from the designs and under the superintendence of Mr. R. Medley Fulford, architect, Exeter.

DISSENTING CHURCH BUILDING NEWS.

Haverstock-hill.—A lecture-hall, which is intended as an adjunct to a new Presbyterian church on the slope of Haverstock-hill, was opened on the 19th ult. by the Presbyterian congregation formerly worshipping at the old church in Oxendon street, Haymarket. This long-established church was founded by Richard Baxter, in the year 1676, and he was the first minister. In January last the bi-centenary was observed in the old church, near Leicester-square, and soon afterwards the congregation came to a resolution to dispose of the freehold site and building, the latter having become entirely unsuitable as a modern place of worship. The lecture-hall is to be used temporarily for public worship, pending the building of the new church; is in the Gothic style, from a design by Mr. Arnold, of Basinghall-street, architect; and has been built by Messrs. Manley & Rogers, at a cost of about 1,300*l.* The hall will seat 260 persons, but under pressure will probably accommodate 300.

Felling.—On the 22nd ult. a new chapel for the Methodist New Connexion was opened in Wellington-street, Felling. The chapel is built of freestone, in the Early English style. The interior is 48 ft. long, 30 ft. wide, and 21 ft. 6 in. high, and will accommodate about 300 persons. There is also a schoolroom behind the chapel to accommodate 120 children. The whole of the joiner work is executed in American yellow pitch-pine. There is also a vestry, &c., attached to the buildings near the north-east corner. The following were the contractors:—Messrs. Robinson & Steele, mason work; Messrs. Greason & Stockdale, carpentry and joiner work, and other fittings; Thomas Rule, plaster work; John Alder, cement work; W. Birnie, plumbing; and G. E. Almond, painting and glazing, all of Gateshead. The buildings have been erected from the designs of the architect, Mr. R. Pots de Redder, of South Shields. The cost, exclusive of land, was 1,900*l.*

Sankey Bridges.—The new Wesleyan Chapel at Sankey Bridges, near Warrington, was opened on the 23rd ult. The building has been erected by Messrs. Wallington, builders, Warrington, and will accommodate from 200 to 250 people.

Frodsham.—The foundation-stone of a new Primitive Methodist Chapel has been laid at Frodsham. The site of the new chapel is at the lower end of Main-street, and when completed the building will accommodate 200 persons, and is estimated to cost 700*l.*, the contractor being Mr. Davies, of Frodsham.

Horbury.—On the 23rd ult. a new Primitive Methodist Chapel was opened at Horbury. The building occupies the site on which the old chapel formerly stood, but, being of much larger dimensions, it has been necessary to take in other land, both on the east and south, in order to carry out the plans of the architects, Messrs. Kirk & Sons, of Dewsbury. The new chapel will accommodate 600 worshippers, as compared with 250 in the old chapel. It is built of stone. The total cost has been 2,000*l.* The contracts have been carried out by Messrs. Tolson & Mercer, masons, Ossett; Messrs. Gibson & Maude, joiners, Ossett; Mr. Exley, plasterer, Horbury; Mr. Coates, plumber and glazier, Dewsbury; Mr. Walker, painter, Idle; Mr. Wright, slater, Dewsbury.

Woodhouse.—It has been decided to erect a new Wesleyan Methodist chapel at Woodhouse, near Rotherham, at an estimated cost of 2,500*l.* Mr. Webster, of Sheffield, will be the architect.

High Easter.—The Congregational chapel at High Easter was re-opened on the 28th ult., after renovation. The building was erected thirty years ago, but the work seems to have been badly done, for it has ever since been a trouble and expense to the worshippers. Mr. Pertwee, architect, of Chelmsford, was requested to inspect the building, and on his advice a contract was entered into with Mr. Fincham, of Chelmsford, to execute the necessary works for 330*l.* The floor has been restored and raised, and the place reseated uniformly throughout.

Dundee.—A new Free Church is in course of erection in the Annfield-road, Dundee, for the

congregation at present worshipping in Hawkhill Free Church. The church will have sitting accommodation for 1,000 persons. Besides the church there will be two halls on the ground-floor, which will hold about 400 and 170 respectively. In connexion with these there will also be the officer's house, session-house, vestry, &c. On the gable to Annfield-road will be a spire about 100 ft. in height. The cost of the whole erection will amount to about 5,000*l*. The architect of the building is Mr. Alexander Petrie, of Glasgow. The following are the contractors:—Alexander Duncan, mason; Garvie & Farquharson, joiners; Robert Murray, glazier; Andrew Butter, slater; Alfred Guthrie, plasterer; David Brown, plumber.

Glasgow.—The congregation which has occupied the Regent-place United Presbyterian Church, Blackfriars-street, Glasgow, will require shortly to remove, in consequence of the extensive railway operations in that locality. It is stated that the price obtained for the present church from the railway company is 12,665*l*. The Dean of Guild Court has approved the plans for the new church. The style is Italian, with a square tower, from designs by Messrs. H. & D. Barclay, architects. The estimated cost of the structure and site will be about 11,000*l*.

Handsworth.—The new Swedenborgian church in Wretham-road, Handsworth, has been opened. The church has been designed by Mr. Thomas Naden. It has a stone front, with tower and spire, being built of hard red stone with Bath stone dressings, and in the Decorated Gothic style. The plan consists of nave, aisles, and chancel. Accommodation is provided for 600 persons. The cost of the building alone is over 6,500*l*. The pulpit and font are of stone, and have been executed by Mr. John Roddis, of Birmingham. The whole of the gas-fittings have been executed by Messrs. Winfield & Co. The entire cost of casing the front of the church with Hamstead stone was borne by Mr. Bloor, the builder.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Newton-Stewart.—The new Roman Catholic Church of Our Lady and St. Ninian, Newton-Stewart, was formally opened on the 7th inst. The belfry, rising 3 ft. above the ridge of the building, is divided by two openings for bells, with a carved and polished medallion, above which, in the filling in below the main arch, is a cusped cinque-foil opening. In the gables north and south are two large wheel-windows,—the one behind the altar filled in with stained glass, and forming a cinquefoil window; the other is filled in with stained tracery, forming three trefoils. The other windows are lancet-shape. The nave of the church measures 67 ft. by 26 ft. The flooring is of encaustic tiles laid on boarding. The roof is of open woodwork. The walls are lined 3 ft. 6 in. high round and round, and finished with the best plaster up to the ceiling. The apices of the gables are finished with ornamental terminals from M'Farlane's Saracen Foundry, Glasgow. The architects are Messrs. W. & R. Ingram, Glasgow; and the contractors, Messrs. Wallace & Morgan, Coatbridge.

Clifton.—Considerable extensions to the procathedral at Clifton are in progress, and the first section having been completed, was opened on the 30th ult. This portion may be divided into three parts,—first, the school; second, the atrium; and, third, the façade of the cathedral. The former is 69 ft. long, 32 ft. wide, and 30 ft. high, exclusive of a recessed gallery at one end; there is a platform or stage at the opposite end to the gallery, raised about 3 ft. The floor-space and gallery, independent of the platform, will accommodate 550, or, with the platform, 600. It is intended to carry out the remainder of the church, and plans have already been prepared by Mr. Hansom, at the Bishop's request, for continuing the work on the site of the present building. The plan shows a corridor on the outside, communicating with the atrium at one end and transept at the other. Outside of this corridor is a massive campanile or bell-tower, 20 ft. square and 200 ft. high, the lower part of which will form a noble baptistery, communicating by double arches with the church. Further along the corridor is a projecting chapel with semi-circular apex, and arched opening from the church. The present windows will be done away with, and a series of semicircular-headed windows will be formed in the upper part of the wall, above the roof of the corridor, as a clearstory, three windows in each bay. The circular pillars will be cut into square pilasters, and a projecting cornice and parapet will be formed above the windows by means of stone corbels built in between the windows. Internally the bays are divided by pilasters and carved capitals, and under the window there will be a wide space for paintings or sculpture. The works have been carried out by Messrs. Wilkins & Sons, builders, of Bristol, from the designs and under the superintendence of the architect, Mr. Charles F. Hansom.

St. Helen's.—Arrangements are in progress for the erection of a new Roman Catholic Church for St. Helen's. The total cost of the building, plans for which have been prepared by Mr. Pugin, of London, is estimated at about 6,000*l*.

Bury St. Edmund's.—St. Edmund's Roman Catholic Church has been re-opened, after redecoration. The building, which was erected forty years ago, is Classic in character, and the decorations have been designed and carried out in accordance with that style, by Mr. Robert Park, of Preston, Lancashire.

BELLS.

Sandwich.—Messrs. Gent, of Sandwich, have lately been engaged in repairing the bells of the old town, the "Curfew Bell" of St. Peter's having had new gudgeons attached thereto. The bell of St. Mary's having got cracked, has been replaced by a new one. The one at St. Clement's is also undergoing some alteration.

Rotherham.—The bells of the parish church, Rotherham, have been re-hung by Messrs. Mears, of Whitechapel, London, at a cost of 170*l*.

Otley.—The church bells at Otley have been re-hung by Messrs. G. Day & Son, of Eye, Suffolk, at a cost of 56*l*. The bells are of various dates, and are all of them as sound as when they left their founders' hands. The tenor bell (weight, 11 cwt.; diameter, 13¾ in.; note, G sharp), was cast by Stephen Tonni, of Bury St. Edmund's; it bears the date 1576, and is, therefore, exactly 300 years old. The second, third, and fourth bells are of still earlier date, and bear old Latin inscriptions of the pre-Reformation type. The second is probably the oldest bell in the tower, and, like the tenor, was cast at Bury. The third and fourth bear the shields, which are the mark of a Norwich foundry. The treble bell, cast by Pherps, of London, was presented to the church in 1723 by a Mr. Russell.

Shrewsbury.—Mr. David Davies, an enthusiastic campanologist, lately delivered a lecture on "The Bells of Shrewsbury," in aid of a fund for supplying the deficiency which exists in the peal of bells at the Abbey Church through one of the number being cracked. In the course of his remarks, Mr. Davies adduced a great deal of interesting information. From the parish books he read the following, amongst other entries:—"At an assembly of the parish of the Holy Cross and St. Giles, upon the 7th of October, 1673, ordered—That the great bell, called by the name of St. Wenefrede's bell (or the greatest of the five old bells), be taken down, broken, and converted for the use of the parish church, in consideration of the great want of money for the supplying of the work now in hand, which is the making of eight new bells in the said church (p. 345)." St. Wenefrede's bell was said to be 35 cwt. by one account, and 30 cwt. by another, and was famed for its deep musical tone. A complete peal of bells was cast for the Abbey tower in 1673. Six of these bells had been re-cast or re-placed since that date, and some of them more than once. The newest bell in the tower was the fifth, which was cast thirty years ago, and bore this inscription,—"Come when I call, to serve God all." The old fifth was cracked on Sunday, the 1st of November, 1840, in ringing for the Rev. Edward Bickersteth (now Dean of Lichfield) and his bride, who had just returned from their wedding tour. The treble and second bells were cast fifty-one years ago, the old bells being flat and ill-tuned. The fourth bell was cast sixty-four years ago, the old one having been cracked in ringing for the election of 1807, when the Hon. William Hill and Mr. Thomas Jones were elected members of Parliament. The eighth, or tenor, bell, was cast 163 years ago, by Abraham Rudhall, of Gloucester; and the sixth in 1745 by Abel, his son. This bell and the tenor bell were admitted on all hands to be the best in the tower; and so great a favourite was the sixth, that some people hazarded the statement that for its weight it was not to be surpassed for fineness of tone by any bell in any tower in England. The motto on the sixth bell was,—"Prosperity to the Church of England;" on the tenor,—"Religion and loyalty do make the best harmony." The tenor bell was also re-cast 194 years ago,—that was thirty-one years before it was re-cast by Abraham Rudhall, and nine years after it was cast by Mr. Oldfield in the peal of eight,—by a Mr. Thomas Roberts, with additional metal. Mr. Davies now came to the "bell of the evening." He was sorry it was cracked. He regretted it because those two fine-toned bells, the sixth and the tenor, could never be heard to advantage without a good seventh. He also regretted it because he believed few towns in England, if any of the same size, could boast of six such peals of bells as Shrewsbury. He thought it a little discreditable to the proud Salopians that they should have allowed one of the best peals of bells to have been incomplete and partially silent for over fourteen years. Moses Leigh was vicar of the parish when the bell was first hung in the tower, and he was one of the 2,000 clergymen who had been excluded from their livings under the Act of Uniformity. The companion bell to the seventh was the third, telling them—without a date—"G. Oldfield cast these eight." There was an old king who employed an architect to build him a lighthouse, and ordered an inscription in honour of himself to be engraved thereon. The architect, however, coveted that honour for himself, and put the king's inscription on a plaster surface and his own name underneath on durable stone. The inscription on the third bell was like that in the durable stone on the lighthouse. Its sentiment was "I did it," and there it would remain an abiding monument of the egotism of its founder. When its companion bells with their inscriptions had passed away, and when the seventh cracked bell with its date left the tower, they could say of it as Scott said of his last minstrel,—

> "For well-a-day its date has fled,
> Its tuneful brethren all are dead."

But if they judged Oldfield's egotism in that way it was only fair to measure his loyalty, too, by the same rule, and how much he loved his king let that seventh bell testify. Its inscription was "God save the King." On the 9th of November, fourteen years ago, the Prince of Wales came of age, and the bells were expected to ring. The restoration of the church was in progress at that time, and either it was considered impracticable or unsafe to raise the bells or the sexton could not get ringers enough to ring them. The ropes, therefore, were tied to the bell tongues in order that they might be struck against the bell sides, as was done in ordinary chiming for church. To make the chiming, however, sound as much like ringing as possible, the ringers pulled at their ropes and numped the bells,—as bell-ringers call it,—as lustily as they could. The old loyal seventh bell was the first to turn sulky under such merciless and ungrateful treatment. Somebody had been trying to mend the old bell. A great gap had been cut into it 14 in. deep and ⅝ in. wide. He admired the pluck and the patience of the operator. He fancied he could see the man at work and almost hear his very thoughts:

> "Chip! Chip! Chip!
> Till I'm bother'd to death with the din.
> Chip! Chip! Chip!
> I feel swarin can 'ardly be sin.
> Drill and chisel and rasp!
> Rasp and chisel and drill
> But my solace I know when my backs's aglow,
> And I swig till I get my fill."

About the wisdom of the operation he would rather not express his opinion too plainly; but they could not tinker a fractured bell. It was beyond the power of

> "All the king's horses
> And all the king's men."

They could not bring it back to itself. They must have a new bell, and he trusted when it arrived at the tower the seventh would be a loyal bell still, and that when it struck its first note it would say "God save the Queen."

North of England Master Slaters' Association.—The annual meeting of the above association was held on the 13th inst. at Durham. Mr. Wanless, of Darlington, the president, in the chair. The following gentlemen were elected office-bearers for 1877:—President, Mr. Roger Rule, Durham; vice-president, Mr. Dickenson, Newcastle; treasurer, Mr. Robertson, Sunderland; secretary, Mr. Place, jun., North Shields.

THE BODLEIAN LIBRARY, OXFORD.

During the past year some extensive structural repairs have been commenced and partially carried out at the Bodleian Library. The exterior walls of the reading-room, which are considerably out of the Perpendicular, though, it is said, not more so than in Wren's days, have been trussed together by iron ties, and the whole of the flooring, which it appears rested somewhat dangerously upon the vaulting of the Divinity School below, has been raised a foot, diminishing (unfortunately, though necessarily) the height of the room to that extent. The old woodwork was found on examination to be extremely massive, and constructed so as to avoid all lateral thrust upon the outside walls. The internal fittings have of necessity been cleared away for these repairs, and a discussion has for some time been going on as to the propriety of restoring them, with or without modifications. The old book-cases, which form recessed reading compartments, or "dens," as they are familiarly called, are of so solid a framework, and are accused of taking up so much room and obstructing so much light and air, that a utilitarian party is for completely sweeping them away, and substituting an arrangement of ordinary reading-tables with modern appliances, such as those at the British Museum. The advice of Mr. Jackson, architect, has been called in, and there is some guarantee that no violent change will be made.

ARCHÆOLOGICAL DISCOVERIES.

Ancient Monumental Stones in Shetland.—At the last meeting of the Society of Antiquaries of Scotland, a paper by Mr. G. Goudie was read, giving an account of the recent discovery of two monumental stones in Shetland, with inscriptions in the Ogham character, a species of cryptic writing characteristic of Early Celtic inscriptions. Only five such inscriptions are known on the mainland of Scotland, and five are now known in the island groups of Shetland and Orkney. One of the stones described by Mr. Goudie was found by him in the ancient burying-ground of St. Ninian's Isle, Dunrossness, and the other was dug up from under five or six feet of moss in Lunnasting, on the mainland of Shetland.

The Ostrian Catacombs, Rome.—A *Daily News* telegram from Rome states that an important archæological discovery has just been made in the Ostrian Catacombs, two miles along the Via Nomentana. Signor Rossi had already established the spot as that where the Apostle Peter was wont to baptise, and where he first sat in the crypt of the subterranean chapel. Signor Armellini has succeeded in deciphering an inscription in which occurs the name of St. Peter, and which would seem to corroborate the previous conclusions as to the Apostle's connexion with the Ostrian catacombs.

CAUTION.

Sir,—Allow me to put your readers on their guard. I find from two sources, where inquiry was thought prudent, that a young man calling himself Werner is going about to members of the profession asking aid, showing a letter purporting to be signed by me and saying I had told him to call.

He is quite unknown to me even by name. He has not been to me, nor have I ever given a begging letter of this sort. William White,
Wimpole-street.

SCHOOL BOARD SCHOOLS.

Tudely.—New school-buildings for the united district of Tudely-cum-Capel, Kent, have recently been erected by the Board. They are built of brick with Ham-hill stone dressings in the First Pointed style, the roofs (which are open on the inside) being covered with dun-coloured tiles. The buildings accommodate 114 boys, 83 girls, and 46 infants, there being a class-room for each of the two former, with porches, lavatories, &c., complete. The master's and mistress's residence stands in the centre of the block. The schools are fitted with Shillito & Shortland's Manchester school-grates. The desks are those patented by Mr. Whippell, of Exeter. The total cost of the buildings, including desks, boundary-walls, &c., has been 1,957*l.* 7*s.* The works have been carried out by Mr. W. Mugford, builder, of Exeter, from the designs of Mr. R. Medley Fulford, architect, also of Exeter.

Great Sampford.—The new Board school at Great Sampford, Essex, is nearly completed, and will be ready for opening with the new year. It has been erected by Messrs. Whiffen & Sons, of Saffron Walden, from designs by Mr. Charles Pertwee, architect, Chelmsford.

Luton.—New Board schools in Waller-street, Luton, were opened on the 27th ult. The schools, which will be the only boys' schools under the management of the Board in the town, occupy a good central position just opposite the Swimming Baths in Waller-street. The buildings have been erected at a total cost of about 2,250*l.*, to accommodate 300 children. The roofs are open-timbered, stained and varnished. Mr. J. R. Brown was the architect, and Mr. A. Smart, the builder.

Rotherhithe.—New Board schools at Medway-place, Rotherhithe, have recently been opened by the School Board for London. The building has been erected to accommodate 276 boys, 271 girls, and 315 infants,—a total of 862. The area of the site is 25,609 square feet, and it cost 900*l.* net, the legal expenses making the total cost 1,084*l.* 8*s.* 1*d.* The contract for the building, taken by the late Mr. Thomas Ennor, was 8,884*l.*, Mr. Robson's commission as architect and Mr. Carter's salary as clerk of the works making the cost of the building 8,986*l.* 15*s.* 8*d.*, and the grand total of cost 10,071*l.* 3*s.* 9*d.*, an average per head of 11*l.* 13*s.* 7*d.*

MONUMENTAL.

Constantinople.—A monument to the late Lord Strangford, to be erected in the Memorial Church at Constantinople, has just been completed by Mr. Physick, sculptor, who received the commission from Lady Strangford. It is composed principally of dark crimson serpentine marbles, enriched with ornamental work in gilt relief.

Welcombe.—The large obelisk recently erected at Welcombe, near Stratford-on-Avon, by Mr. Robert M. Philips, M.P. for Bury, at a cost of 7,000*l.*, in memory of his late and only brother. Mr. Mark Philips, who was the first representative of Manchester, has just received its inscription, which states that "On the passing of the Reform Bill he (Mr. Mark Philips) was elected, in 1832, the first member for Manchester, and continued to represent that city for fifteen years."

Ardclach.—A monument to the memory of the late Rev. H. M'Leod has just been erected in the picturesque churchyard at Ardclach. It is of red, sparkling, highly-polished granite from the Kinsteary (Nairnshire) Quarry, and was designed and executed by Messrs. D. & A. Davidson, sculptors, Inverness.

STAINED GLASS.

Dumbarton.—A stained-glass window has just been placed in Dumbarton parish church. It is the second window from the east on the south side. It is described by a Scotch paper as being in the "Mosaic" style, and has been erected in memory of Mr. William Paterson, writer and bank agent, who died in 1875, leaving nearly 10,000*l.* to the church. The subject of the window is Christ's Sermon on the Mount, and underneath the picture is the beatitude. The window is from the works of Messrs. Keir, St. Vincent-street, Glasgow.

Abbotsley.—A stained-glass chancel window, of two-lights, has lately been erected in St. Margaret's Church, Abbotsley, to the memory of the late Bishop Douglas, of Bombay, formerly vicar of Abbotsley. The window, which is by Mr. Gibbs, and which was designed under the superintendence of Mr. Butterfield, represents our Lord's charge to St. Peter. It has been erected by the Bishop's former parishioners and friends at Abbotsley.

Huntingdon.—A new east window is being placed in St. Mary's Church, Huntingdon, the gift of the Ven. Archdeacon Vesey (archdeacon of Huntingdon). The tracery of the window is of Bath stone, with three lights, moulded jambs, rising from circular moulded bosses, with double annulets, marble columns (black), surmounted by beautiful moulded caps, moulded inner arches, with hood-moulds springing from carved bosses. The contractors for this work are Messrs. W. Balmer, builders, Huntingdon, and Mr. A. Wrighton, stone mason and carver, Godmanchester. The window will be filled with stained glass.

Shirburn.—Several of the windows of the recently-restored parish church of Shirburn, near Watlington, have been filled with stained glass by Messrs. Ward & Hughes. The subject of the chancel windows is the Nativity: the Virgin and Child with St. Joseph in the background, are in the centre; while the Wise Men of the East occupy the right-hand light, and the Shepherds the left. In the little baptistery window in the tower the group illustrates the text, "Suffer little children to come unto me."

Handsworth.—The new Swedenborgian church of Handsworth contains several memorial windows, one an east window, about 15 ft. by 20 ft., of which the principal subject is the Transfiguration. There is a window of similar proportions at the west end, containing the following subjects:—The Lord blessing little children, John the Baptist exhorting to repentence, Christ at the door, and Mary's choice, with the emblems of the four Evangelists, the lilies of the field, the bread of life, and the victors' crown and palms in separate quatrefoils. Four of the eight windows in the aisles contain either figures or floriated subjects, and the eighteen clearstory windows, which are of stained glass, have been executed by Messrs. Camm Brothers, of Smethwick.

Miscellanea.

A Railway Station for Northumberland Avenue.—At the meeting of the Metropolitan Board of Works, on the 22nd inst., a report was presented from the Works Committee on the subject of the proposal of the Metropolitan District Railway Company for an exchange of land at Charing-cross, with a view to the erection of a new station, the plans and elevation of which the company would submit for the approval of the Board prior to the works being commenced. The report stated that the architect had prepared four plans, showing the varied proposals made by the company, and he had also presented a report, as directed by the committee, upon the question of value. The company wished to acquire certain land, which had an area of 3,250 ft., fronting on the Northumberland-avenue east, and also the land adjoining the pillars on both sides of the station, comprising an area of about 5,100 ft. In exchange for this the company propose to cede to the Board the approach over the railway in continuance of Villiers-street, 50 ft. wide, giving a direct access to the Embankment. The committee recommended that, subject to stipulations to the effect that the Board should not be required to covenant for title, and that no advertisements or placards be exhibited on the exterior of the station unless with the consent of the Board, the proposed exchange be agreed to. The recommendation was adopted.

A New Street-cleansing Machine.—Trial has been made in Bristol of a new machine designed for sweeping and carting the street mud, which is the invention of Mr. George Case, engineer to the Bristol General Hospital. The spot selected for the trial was a portion of Newfoundland-road and Newfoundland-street, as, being partially pitched and partially macadamised, it offered the opportunity of testing the capabilities of the invention on either description of road. The trial was witnessed by the city engineer, Mr. Ashmead, Mr. Mark Whitwill, and several gentlemen interested in municipal matters. The machine, which is triangular in form, is so constructed as to be readily attached to an ordinary mud-cart. It consists of two revolving brushes of similar dimensions, surmounted by an iron casing. These brushes sweep the dirt up an incline and into a gutter, which is placed crosswise of the machine. The dirt, as it enters this gutter, is carried from right to left by a series of scrapers or elevators attached to an endless chain, almost similar in construction to the elevators used in the mud dredgers. These elevators having drawn all the mud to the extremity of the gutter, force it up a shoot about 4 ft. in height, and the top of which overhangs the mud cart, into which the matter falls, and the elevators pass down the opposite shoot empty and recommence their services.

Professor Sidney Colvin lately delivered a lecture at Ipswich in connexion with the Suffolk Art-Union. His subject was "Art in Greece, Art in Tuscany, and Art in Suffolk."

"Necessity the Mother of Invention." A red pocket-handkerchief occasionally, it appears, says the *Commercial Traveller's Gazette*, becomes valuable on railways. At the collision which occurred at Wolverton, on the London and North-Western Railway, a short time since, the red lamps on the trains were smashed and rendered useless. It was known that, in a few minutes, the Scotch express would arrive on the scene of the disaster, and consequently a red light was urgently needed. But the much-needed crimson glass was not forthcoming, and all were at their wits' ends to devise a plan for staying the progress of the flying monster they knew was rapidly advancing. Suddenly somebody produced a red pocket-handkerchief, and said it might perhaps answer the purpose, if placed over a white light. The plan was successful, and the express was brought to a standstill. Had the Scotchman ran into the wreck of the other trains the smash would have been of a most disastrous character. No doubt, after this narrow escape care will be taken in providing a few red lights to long-journey trains besides those which are required for immediate use. It is stated that, to meet cases of emergency where red signals are needed, Great Northern men are all required to wear red neckties.

The Will of J. M. W. Turner, the Artist.—It is reported that a very interesting suit is coming on in Chancery. Turner, the artist, left nearly all his property to the nation. His relatives (he had no children) disputed the will, and the Government compromised the matter by handing over a portion of the property to them. Among the property so handed over was Turner's house in Queen Anne-street, which came into possession of one of the artist's nephews. He, strangely enough, does not seem to have examined the house, and when he died, three or four years ago, and his will could not be found, two surviving nephews agreed that the property should be shared, and that if the will turned up neither of them should administer it. When the house in Queen Anne-street was searched it was found full of the most valuable engravings and plates, which were estimated by a valuer to be worth 100,000*l*. Some of these have been sold under an order in Chancery; but on hearing what a splendid treasure had been found, the other and more distant relatives of the artist have come forward and claimed a share.

The Plane-Trees on the Thames Embankment.—Owing to certain paragraphs which have appeared condemning the management of these trees, we were led (says the *Garden*) to examine them, and have merely to record that we have never seen a finer batch of young trees. Instead of being in bad health or suffering in any way, they are, over the greater portion of the older Embankment, models of health and vigorous development. We remember a well-known nurseryman saying, when they were first planted, that the strong winds by the river would injure the foliage and prevent healthy growth. Nothing of the kind has taken place; in fact, the main care which the first plantations will require for the future will be the removal of every second tree in good time. The younger plantations promise equally well. They have been pruned a good deal with a view to keep their heads sufficiently open to allow the wind to pass through them. On the other hand, however, the whole of the trees on the Albert Embankment from Lambeth Bridge westwards were removed on the 21st inst., the reason being that the exhalations from the adjacent potteries have destroyed their vitality.

Flaxman.—At a recent meeting of the Cambridge Antiquarian Society, Professor Colvin exhibited two pencil drawings of John Flaxman, R.A., which had been among those remaining in the artist's family after his death, and sold at the sale of his grand-nephew, Mr. T. J. Denman, in April last. They represented two compartments of the famous sculptures in relief, executed in the early part of the fourteenth century, on the façade of the Cathedral of Orvieto. Professor Colvin gave a brief account of the general character of these sculptures, insisting on their peculiar excellence, and their, in many respects, unique character, among the works of Italian sculpture, and on the improbability of the tradition assigning their execution to Giovanni Pisano. The subject was illustrated by several photographs of the façade and of its details. The compartments which Flaxman had copied were two representing scenes of the Last Judgment,—the Resurrection of the Dead, and the Condemnation of Sinners.

Samlesbury Hall, near Preston.—The proprietors of the *Preston Guardian* have issued a well-got-up sheet almanack for the coming year, illustrated with a view of Samlesbury Hall, a fine old half-timbered manor-house in Ribbledale, about four miles above Preston. The mansion, when it came into the possession of its present owner (Mr. Joseph Harrison), was greatly dilapidated, but Mr. Harrison had no sooner acquired the hall than he formed the resolution to have it effectually and worthily restored. He found the progress of decay upon the fabric was still for the most part superficial, and not structural for the walls were as stable and upright, and the oaken timbers of the framework, the ceilings, and roofs were as sound as when they were first fixed. Between 1862 and 1866 the restoration was systematically prosecuted under the direction of the proprietor, who, in the decorative departments of the restoration, called in the services and counsel of the late Mr. Shaw, F.S.A., of London, author of "Decorative Arts of the Middle Ages."

New Steam Flour Mills near Sudbury.—For some months past a number of workmen have been engaged on the high road from Sudbury to Colchester, about half a mile from the former town, in erecting a large steam flour-mill, five stories high, for Mr. J. F. Wiseman. Mr. Wiseman having purchased the Chilton brick-works, and the land connected with the same, determined not only to carry on the works and the manufacture of bricks, but to employ the latter in the erection of several extensive steam flour-mills. The first of the buildings has just been completed, and will be in full work very shortly. The walls of mill No. 2 are also rapidly rising, and the mill itself will be completed about February next. All the works have been carried on to the satisfaction of the proprietor by Mr. Wanford, contractor, of Sudbury. The machinery has been fixed by Messrs. Barton & Stearn.

A **New Steam Brake.**—A steam brake is being applied to the locomotives of the South-Western Railway Company, the improvement of Mr. Beattie, their locomotive engineer, upon an experimental brake tried early last year. Steam is supplied to the brake cylinders through copper pipes, which are led up from the cylinders to the back of the fire-box, where they are connected to a three-way steam-cock. By this means the action of the brake can be nicely regulated, and the steam discharged into a cistern under the foot-plate after having been used. There is a screw adjustment for following up the wear of the brake blocks. The advantages claimed for this improved arrangement are uniformity of pressure on all four driving-wheels, the absence of the cross-shaft, and facilities for the adjustment of the brake blocks, which are of cast iron.

The Tomb of "John of Monmouth."—The *Hereford Times* says that the tomb of "John of Monmouth," the ancient worthy who, among other acts of kindness towards the people of Monmouth, founded the (long since destroyed) Hospital of the Holy Trinity, outside Dixton-gate, for old and poor persons, has perished, with not a fragment remaining. Happily, it is mentioned and figured in the "Progress" of Henry, first Duke of Beaufort, in 1684. An enlarged copy has been made for the Monmouth Athenæum, by Mr. W. H. Greene, formerly editor of the *Monmouth Beacon*. This shows the figure of John recumbent on the tomb. The monument, "anciently gilt and painted," stood, as we learn from the Beaufort "Progress," on the right entering the great south door of Monmouth Church.

St. Sepulchre's Church Tower.—Mr. S. G. Lidstone, the contractor for the restoration of the tower and porch of St. Sepulchre's Church, has, it appears, lost 1,245*l*. by the job. He says,—"The total amount I received, including all "extras," was 4,749*l*. 12s. 9d. The work cost me 5,995*l*. 3s. 3d., leaving me a loser of 1,245*l*. 10s. 6d. I may remark my tender was 3,453*l*. lower than the highest, while the next tender to mine was 1,237*l*. higher. I attribute my loss and the long time the work took to carry out to the walls of the tower being in a much more dilapidated condition than I expected, and requiring a quantity of needling, shoring, and under-pinning, which was impossible to foresee." Under these circumstances he has asked the Vestry to reduce his loss to a smaller figure than 1,245*l*., but the Vestry has ordered his letter to "lie on the table."

A most Undesirable Habitation.—At the Staines Petty Sessions, recently, an application was made on behalf of the Rural Sanitary Authority for an order to close the old workhouse in the parish of Laleham, the same being alleged to be unfit for habitation. Evidence was given in support of the application by Dr. Lundy, medical officer, who said the building was totally unfit for habitation. In one room a man and wife and eight children resided, the oldest child being of the age of sixteen, and the youngest sixteen months. The rooms were in a most dilapidated condition. There being no privy accommodation, the place was most filthy. There were four families living in the place, with an aggregate of twenty-eight individuals. An order was at once made to close the place within seven days.

Light.—The Rev. Percival J. Brine, one of the Senior Fellows of King's College, Cambridge, is, we understand, about to publish a series of photographic illustrations of the doctrines he seeks to establish in regard to the relations between light and its reflection. According to *Bell's Messenger*, his main object is to prove that the prevailing mode of measurement by the sextant cannot always be depended upon for coast lines and marine distances, and that disasters by sea are the frequent result—a "startling" state of things—if correct—as our contemporary, the *Times*, pointedly remarked in a recent article upon the loss of the troop-ship *St. Lawrence*. Whether right or wrong, therefore, in his views, Mr. Brine's motives are certainly laudable, and as a close and experienced observer of nature in all her moods, and throughout her entire area, his opinions ought to command attention, even where they fail to secure acquiescence.

Assyrian Discoveries.—The London correspondent of the *Manchester Guardian* states that the first fruits of Mr. Rassam's mission to the East have already been received in this country. They include two bronze plates which represent the figures of tribute-bearers to an Assyrian king, probably Shalmaneser. One of these, about 12 in. by 4 in., shows the figures of some thirteen men, Tyrians and Sidonians, as they are called in the cuneiform legend of the plate, but almost certainly including Jews laden with skins of the wine of Aleppo, with baskets or cases of fruit and flowers, while two of them in the middle are the bearers of trays on which ingots of bullion are placed. The other plate is chiefly occupied with about twenty-four figures, who march in couples, while each pair of couples support a cedar of Lebanon.

Manx Antiquities.—His Excellency the Lieutenant-Governor of the Isle of Man has issued a commission, under the public seal of the island, "for the purpose of making inquiry as to the number and position of runic stones, treen chapels, tumuli barrows, stone circles and crosses, sculptured stones, inscribed slabs, and all other interesting ancient monuments, coins, ornaments, and ancient instruments of war or husbandry, and to report the steps that seem to them the most advisable to be taken to preserve the same; and whether ancient remains of interest and value exist in sufficient number to render desirable the establishment of a public museum in which they might be deposited; and, if so, the best means to be adopted for attaining that object."

Public Museums.—The Society of Arts, being desirous of promoting increased knowledge of works of art and applications of science illustrating productive industry, have given notice that they will award prizes and certificates to persons who pass satisfactory examinations, the special object of these being to encourage the study and acquirement of a knowledge of the technical value of objects in any public museum and collections in any part of the United Kingdom. Papers of questions will be set, the answers to which may be illustrated by sketches from memory. Whilst these examinations will be open to members of institutions in union and others, under the general regulations of the Society's examinations, the artisan class is specially invited to compete.

Moulding Artificial Stone.—A series of apparatus has been invented by Mr. J. C. Sellars, manufacturing chemist, of Birkenhead, for moulding into various forms artificial stone when in a semi-plastic condition for the production of hollow blocks, slabs, linings, jointings and other shapes in stone employed in building.

Alexandra Palace.—On the 22nd inst. Mr. Rawlinson, the Chief Clerk of Vice-Chancellor Malins, had three summonses before him in reference to the winding-up order of the Alexandra Palace made during the long vacation. The principal discussion was in reference to the sale of the property by auction, in order that it might be re-opened next season, and the object of all parties was to obtain as large a sum as possible for the numerous creditors. It was mentioned in the course of the case that the mortgages were large, and the unsecured debts about 300,000*l.* It was eventually arranged that the mortgagees should sell under the Court, and that a preliminary advertisement of the sale should appear, and a reserve price be agreed upon. The sale would be in February or March, in order that the Palace may be re-opened at the usual period next season.

Sewage in the Thames.—At the Hampton Petty Sessions recently the Hampton-wick Local Board was summoned by the Thames Conservators for neglecting to cut off the flow of sewage into the river Thames, whereby they had committed a misdemeanour, and subjected themselves to penalties amounting to 122,000*l.* Mr. Frere, who attended for the prosecution, informed the justice that an application had been made to the conservators to allow the proceedings to be suspended till the 1st of June next, and the Bench consented to adjourn the summons without prejudice to that date. Another summons, for penalties of 100*l.*, and not exceeding 50*l.* a day for 509 days, against Mr. Gibs, of Staines, for allowing sewage to drain into the river Colne, was also adjourned by consent till the 4th of May next.

Children's Emigration Homes, Birmingham.—The foundation stones of a new home for girls, to be erected in St. Luke's-road, Birmingham, have been laid. The new building will occupy a site adjoining that upon which five years ago the Boys' Emigration Home was built. The latter institution is at present occupied by 112 children, and 250 have already been taken out to Canada, where, almost without exception, they are stated to be doing well. It is proposed to extend this building, and thereby provide accommodation for 150 boys, and also to erect a school capable of accommodating forty girls. Hitherto a number of girls have been provided for in a house rented for the purpose. The erection of the new building, and the enlargement of the boys' home, will incur an expenditure of 6,100*l.*

Royal Institution of Great Britain.—The arrangements for the Friday evening meetings before Easter, 1877, promise to be very satisfactory. At the first, January 19th, Professor Tyndall will lecture; and at the second, January 26th, Professor Huxley. Then will follow, February 2nd, Professor Osborne Reynolds, on "Vortex Motion"; February 9th, Mr. Francis Galton, on "Typical Laws of Heredity"; February 16th, Professor F. Guthrie, on "Solid Water"; February 23rd, Mr. J. F. Moulton; March 2nd, Sir John Lubbock, on "Ants"; March 9th, Mr. Frederick J. Bramwell; and on March 23rd, Professor Gladstone.

Church of England Institute, Norwich.—The new buildings for the Church of England Young Men's Society at Norwich have been completed and opened, the work having been carried out by the contractor, Mr. G. E. Hawes, from the designs of the architect, Mr. Edward Boardman, both of Norwich. The buildings are of a semi-ecclesiastical character, and are constructed of red brick, with a tracery window of red Mansfield stone inserted in the front gable, and they have a frontage of 42 ft. next Little Orford-street, on the opposite side to the Savings Bank. The cost has been 3,000*l.*

Flooded out at Christmas.—At two o'clock a.m. on Sunday last, the 24th inst., nearly the whole of the low-lying river-side cellars and basements between Deptford and Woolwich were flooded. At Charlton several blocks of houses lying below high-water mark near the pier were flooded. The water came in so quietly and insidiously in the dead of night that it was not discovered until it overflowed the beds of the persons sleeping in the lower rooms, who were rendered homeless, and had to be sent by the relieving officers either to the workhouse or temporary homes.

The Falkland Memorial.—A public meeting is to be held at the Corn Exchange, Newbury, on Tuesday, the 9th January, 1877, at half-past two o'clock, to promote this object.

Look to your Chimney-pots.—At the Clerkenwell County Court, on the 18th inst., a man claimed 8*s.* for damage done to slates on the roof of his house through a chimney-pot falling from his next-door neighbour's house. The wet ran through to the ceiling, and damaged it. Plaintiff said he had cautioned the defendant two months before as to the dangerous state of the chimney-pot. The Judge said the defendant (who attributed the damage to the wind) must pay the money, and look better after his chimney-pots in the future.

Damage on the Victoria Embankment.—A sentence of hard labour for two months has been passed, by Mr. Vaughan, at Bow-street Police Court, on Alfred Henry Pride, eighteen years of age, for wilfully damaging the iron railings on the Victoria Embankment. The prisoner was seen to take up a stone and break off a piece of the railing. It was stated in evidence that every piece so broken off would cost the Board of Works from 2*l.* to 3*l.* to repair, and that on one Sunday as many as seventy-six pieces were broken off.

Recent Discoveries in Caves of Yorkshire and Derbyshire.—Professor Dawkins recently lectured on this subject before the Halifax Literary and Philosophical Society, and gave a most interesting discourse, notwithstanding that, at its close, one of his audience (a Mr. J. H. Smith) said that, "in his opinion, a great number of these men paraded the country lecturing on science, and they knew no more about science than this pencil" (holding out a pencil). "He maintained that geology was not a science." (!)

Central Trades Hall for Liverpool.—At a recent meeting of working men held in Liverpool, for the purpose of promoting the establishment of a Central Trades Hall, it was resolved 'That in the opinion of this meeting the time has arrived when it is both the duty and interest of the working classes of Liverpool to provide themselves with a Central Trades Hall for the transaction of business, with more advantage to themselves than the accommodation offered affords." It is proposed to raise from 13,000*l.* to 15,000*l.* in 1*l.* shares.

The Old Cross at Kidderminster.—The *Church Times* says:—"The old cross in St. Mary's churchyard, which possesses some historical interest, from its having been mutilated by the Puritans in the time, and with the approval, of Richard Baxter, is now undergoing restoration. Ancient records describe it as having been a crucifix, so that if the announcement in the local parish magazine be reliable, 'that it will be made somewhat like its old appearance,' it will be indeed an ornament."

"Sand's Paviours," Sheffield.—The removal of a quantity of old property between Bow-street and Barker-pool, Sheffield, has caused the obliteration of one of the old street names of Sheffield,—Sand's paviours. This little court seems (according to a writer in the *Sheffield Independent*) to have derived its name from one Samuel Sands, who flourished in the reign of Queen Anne.

Salting the Roads.—Mr. W. B. Scott, the chief surveyor of St. Pancras, has applied for instructions as to the course he shall pursue in the event of a heavy fall of snow. It was agreed by the Vestry that the Tramway and General Omnibus Companies be authorised to salt the roads if they desired to do so.

Good Feeling.—On Friday, the 22nd inst., the workmen in the employ of Messrs. Watson Brothers, builders, of Charlotte-street, were entertained at supper by Mr. Walter Watson on the occasion of his retiring from business, when the workmen presented him with an illuminated address, handsomely framed.

Eton College.—Considerable progress is being made with the restoration of the college buildings. The west wall of the chapel is being faced with Bath stone, and the façade of the clock-tower is also undergoing repair. It excites great dissatisfaction.

The Izaak Walton Memorial for Stafford. The committee, including the Earl of Shrewsbury, have entrusted Mr. Richard Belt with the commission to execute the monument of Walton, the father of anglers, and who was also a benefactor of the town.

A Colonial Builder.—The *Hobart Town Mercury* announces the death of Mr. George Grant, builder, aged eighty-one. Mr. Grant was one of the oldest of Tasmanian colonists, having arrived at Hobart Town in April, 1825. Subsequently he commenced business as a builder.

TENDERS

For the erection of warehouse, in the Southwark Bridge-road, for Messrs. Petty, Wood, & Co. Mr. R. L. Roumieu, architect. Quantities by Messrs. Welch & Atkinson:—

Dove, Brothers	£24,375 0 0
Longmire & Burge	24,230 0 0
Smith & Co.	24,090 0 0
Lawrence & Sons	23,833 0 0
Brass	23,693 0 0
Pritchard	23,299 0 0
Macey	21,777 0 0

For the erection of dwelling-house, office, and sample-room, in Middle-street, Brighton, for Messrs. Wallis & Hack. Messrs. Holford & Clayton, architects:—

Cheesman & Co.	£1,380 0 0
Bolling	1,365 0 0
Barnes	1,356 0 0
Bruton	1,350 0 0
Lockyer	1,330 0 0
Patching & Webber	1,186 0 0

For warehouse, in Stone-street, Brighton, for Mr. Frank Maynard. Mr. B. H. Nunn, architect:—

Newnham	£877 0 0
Patching & Webber	875 0 0
Cheesman	867 0 0
Lockyer	866 0 0
Barnes	853 0 0
Parsons (accepted)	796 0 0

For rebuilding the stabling, workshops, and residences, Nos. 113, 114, and 115, Church-street, Brighton, for Messrs. Attree & Kenyon. Mr. T. Simpson, architect:—

Bolling	£4,410 0 0
Garrett	4,389 0 0
Lockyer	4,350 0 0
Parsons	4,320 0 0
Bruton	4,260 0 0
Cheesman	4,100 0 0
Barnes	4,090 0 0
Newnham	3,987 0 0
Patching & Webber	3,960 0 0
Nash & Co.	3,703 0 0
Colwell	3,350 0 0
Stenning, Brothers	3,240 0 0

For cabinet, at the City Arms public-house, Westsquare, Southwark. Mr. J. Viney, architect:—

Shurmur	£229 0 6
Taylor	223 0 0
Hill	219 0 0

For alterations, at 9, The Grove, Clapham-road, for Mr. R. E. Larke. Mr. G. Legg, architect:—

Shurmur (accepted)	£1,152 0 0

For factory and warehouse building, on the south side of George's-row, York-road, City-road, for Mr. E. Wheeler. Mr. W. W. Lee, architect. Quantities prepared by Messrs Welch & Atkinson:—

Hill, Higgs, & Hill	£8,525 0 0
Ashby, Brothers	8,331 0 0
Newman & Mann	8,327 0 0
Colls & Sons	8,315 0 0
Pritchard	8,128 0 0
Bayes (Brothers) & Allen	8,067 0 0
Holland & Hannen	8,033 0 0
Woodward	8,023 0 0
Brass	7,997 0 0
Scrivener & White	7,970 0 0
Browne & Robinson	7,875 0 0
Conder	7,729 0 0
Nightingale	7,686 0 0
Brown	7,500 0 0

For additions to Boys' Industrial Home, Bisley, Surrey, for the National Refuges and Ship "Chichester" Society. Mr. Williams, secretary. Messrs. E. Habershon & Brock, architects:—

Brass	£543 0 0

For proposed alterations to be done at Nos. 8 and 10, Rye-lane, Peckham, for Mr. James Scales. Mr. George Ward, architect:—

Harvey	£673 0 0
Shapley	610 0 0

TO CORRESPONDENTS.

Alpha (we have already replied to the question)—H. W. B.—G. R. I.—C. C.—G. C. H.—S. W.—T. B.—S. J.—O.—H. C.—B. R.—A. S.—J. G.—W.—J. F.—Ignoramus.—G. M. C.—J. C. S.—R. R.—P O W.—W. C. (next week)—T. L. (at what page does expression occur?).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c must be accompanied by the name and address of the sender, not necessarily for publication.

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